A120 Corridor Study
Revised Development Scenario (March 2024)

Document no: *[Document number]*
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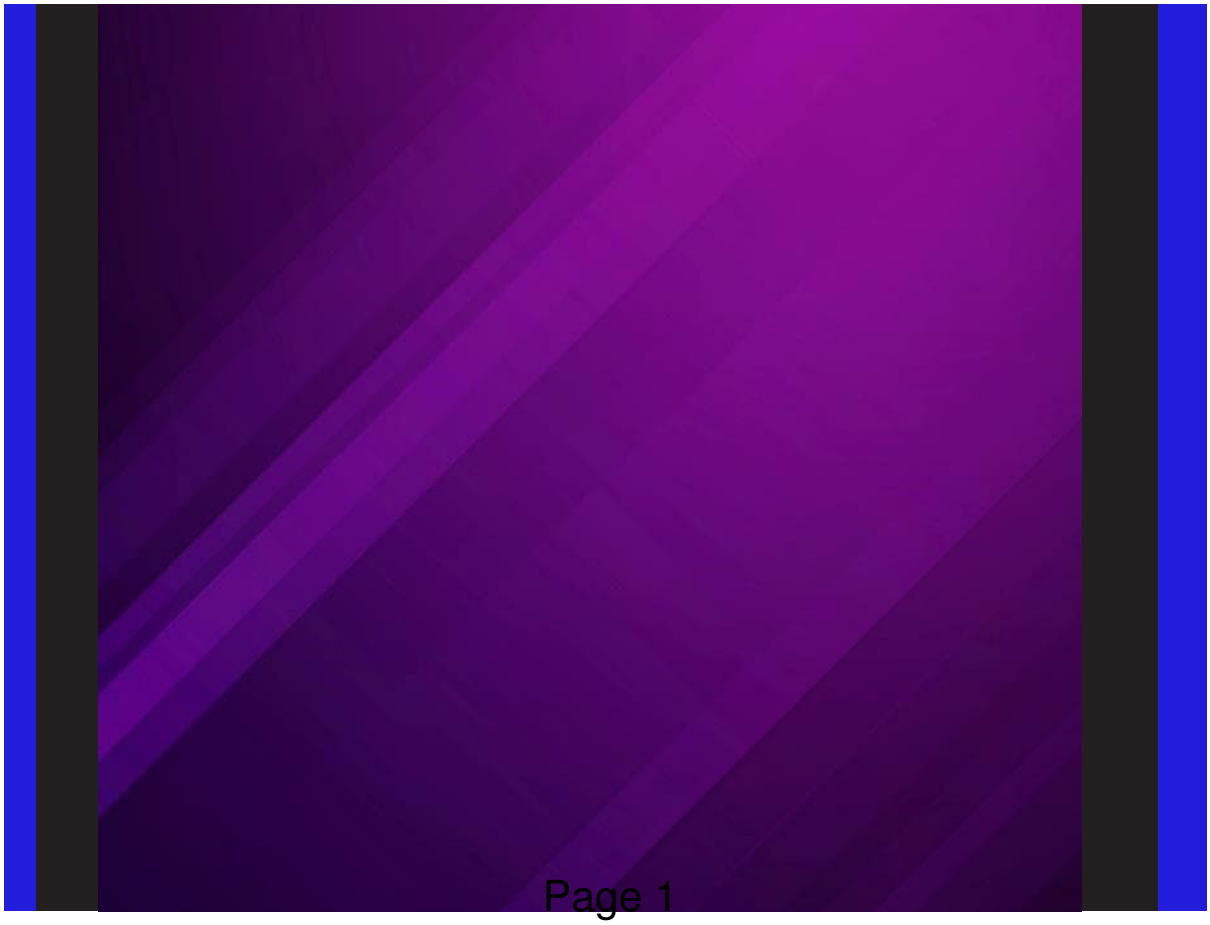
Essex County Council and Uttlesford District Council
B3553RK2

Uttlesford A120 Corridor Multi-Modal Viability Study
15 May 2024



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Client name:	Essex County Council and Uttlesford District Council		
Project name:	Uttlesford A120 Corridor Multi-Modal Viability Study		
Project no:	B3553RK2	**Project manager:**	Tom Beck
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1. Introduction

1.1 Background

Uttlesford District Council (UDC) and Essex County Council (ECC) have commissioned Essex Highways to undertake a multi-modal viability study for the A120 corridor in Uttlesford, part-funded by Homes England.

Homes England is an executive non-departmental public body, sponsored by the Department for Levelling Up, Housing and Communities. They encourage the development of affordable and quality homes, and encourage the pace of house building and regeneration across the country.

In 2019 Uttlesford's Local Plan was withdrawn with a need for further detail. One element of this was the need to provide more analysis around the viability of rapid transit along the A120 corridor. This has led to this viability study being commissioned following Uttlesford's review of development locations in the district.

The aim of this study is to consider for the revised development scenario (March 2024), the most viable public transport service enhancements that would be viable with the level of development planned.

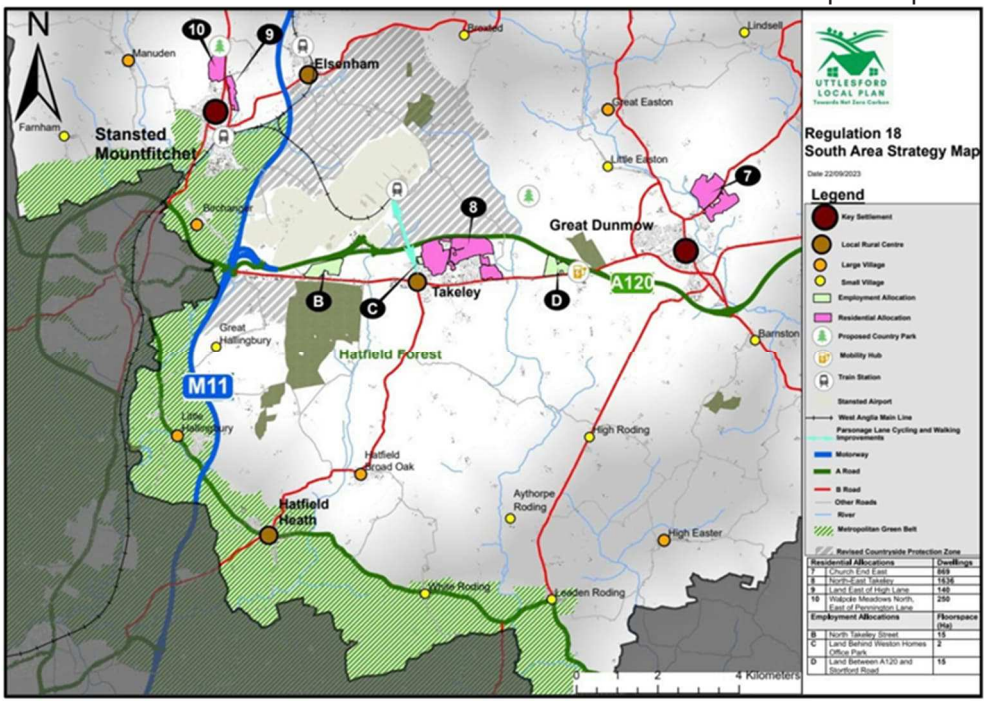


Figure 1.1: UDC South Area Strategy Map

1.2 Objectives

The overarching objective of this study is to assist in the delivery of sustainable transport across the region, as well as aiding the response to the climate emergency, reducing emissions, supporting the economy and people's health and wellbeing. This quote is taken for the Uttlesford Spatial Vision, and is a key aim for this corridor study:

'Development will be located in ways to optimise opportunities for delivery of new infrastructure and use of public and active transport.'

Additionally, Core Policy 26 in the Uttlesford Draft Local Plan states:

'The Council will support measures identified in the Essex Local Transport Plan and the area travel plans and work with Essex County Council to ensure that transport improvements contribute positively to the attractiveness and safety of our places, quality of life, and respond sensitively to our natural and historic environment.'

'All strategic developments as set out in the Area Strategies will be expected to provide direct bus access, rapid electric charging points, car and electric vehicle community sharing clubs and mobility hubs.'

- Additionally, Homes England's 5-year Strategic Plan[1] starting 2023, sets out five interconnected strategic objectives that work together to deliver their mission:Support the creation of vibrant and successful places that people can be proud of, working with local leaders and other partners to deliver housing-led, mixed-use regeneration with a brownfield first approach;
- Facilitate the creation of the homes people need, intervening where necessary, to ensure places have enough homes of the right type and tenure;
- Build a housing and regeneration sector that works for everyone, driving diversification, partnership working, and innovation;
- Promote the creation of high-quality homes in well-designed places that reflect community priorities by taking an inclusive and long-term approach; and
- Enable sustainable homes and places, maximising their positive contribution to the natural environment and minimising their environmental impact.

This document develops options based on the Revised Development Scenario (March 2024), including discussions with stakeholders to draw out the promising public transport service enhancement options for the key locations along the corridor, as well as complementary measures to support other forms of sustainable transport.

Options should consider:

- what level of service provision could be delivered to support the local plan growth and deliver mode shift to sustainable modes. To consider proposals around existing routes required to achieve this, pertaining to, but not limited to amendments to existing bus services, new buses services, active travel improvements and potential mobility hubs in key areas, and;
- ensure proposals allow for future expansion for long term service provision that could be delivered beyond the existing plan, such as future rapid transit services serving new and future developments.

1.3 Report Structure

This report summarises evidence gathering and data collation and helps inform the next stages of the Local Plan. The report is structured as follows:

- Chapter 2 summarises a review of existing studies and evidence base documents and sets out the collation of data for the study area to provide a picture of demographic and transport related issues, assessment of local and strategic drivers for change, looking specifically at constraints and opportunities to influence future travel patters (aligning with insight from LTP4 data assessment)
- Chapter 3 outlines the findings from travel demand analysis utilising the West Essex Model to understand both local and strategic Public Transport trips along the corridor for the Revised Development Scenario (March 2024).

[1] Source: Homes England strategic plan 2023 to 2028. https://www.gov.uk/government/publications/homes-england-strategic-plan-2023-to-2028

- Chapter 4 considers Public Transport Service Enhancement Options based on the level of development planned.
- Chapter 5 considers Active Travel and includes an initial assessment of possible Mobility Hub locations.

Appendix A – Model Calculations

Appendices B-E – Mobility Hubs Assessments

2. Review of Existing Studies and Evidence Base Documents

2.1 Introduction

This chapter comprises a review of relevant regional and local policy/strategies which relate with the A120 corridor. Review of existing and previous linked workstreams associated with the corridor as well as open-source datasets have been studied to draw out any insight or potential option considerations.

A number of documents that focus on the A120 corridor and are listed below have been reviewed.

- Emerging Infrastructure Delivery Plan
- Withdrawn UDC 2019 Local Plan and associated transport evidence base
- A120 LCWIP and District Cycle Plan
- Bus Back Better Uttlesford and Braintree Network Review Reporting
- Rapid Transit Operational Planning
- Northside distribution park planning application (Uttlesford planning portal)
- Stansted Airport Expansion and emerging Development Plan
- Stansted Airport Surface Access Strategy Update
- Emerging Essex LTP4
- Hertfordshire Essex Rapid Transit (HERT) proposals
- West Anglia Mainline Rail Improvement Study

The key points from the above documents and datasets are summarised in this section to better understand the regional and local context of this corridor.

2.2 Transport Modes

There is a clear dominance of car trips (50%) along the corridor currently, with a pattern of people accessing rail stations (1%), but low share of bus (0.2%) to access key working locations. (Census 2011).

TRACC analysis has been reviewed to understand public transport journey times from Stansted Airport Rail Station, shown in Figure 2.1.

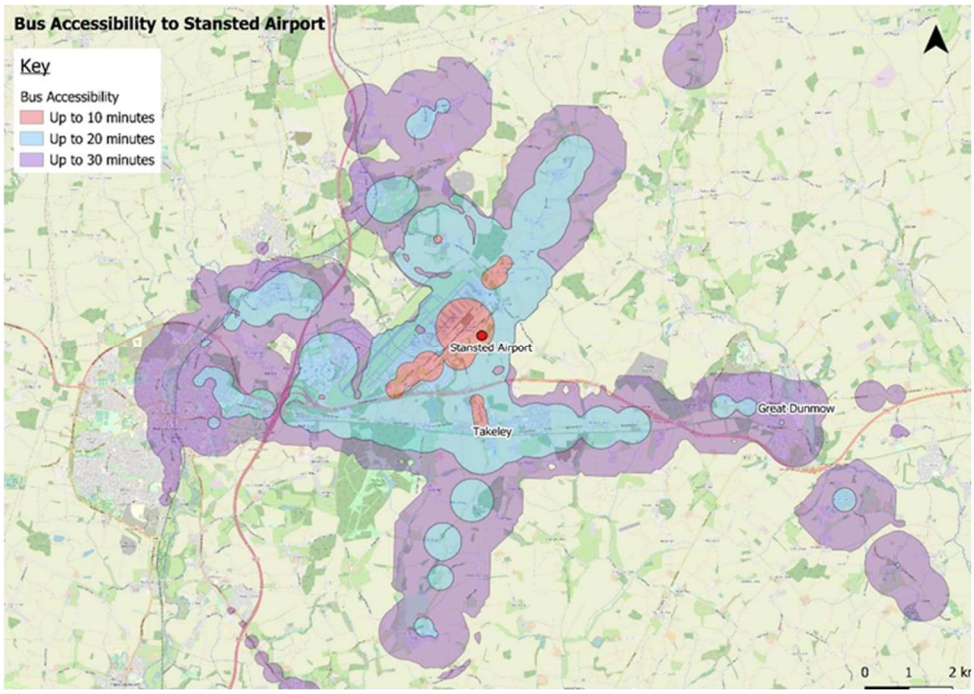


Figure 2.1: Map showing bus accessibility to Stansted Airport

2.2.1 Bus services

There are ten bus routes which operated or interact within the study area, these are shown in Figure 2.2. Majority of the bus routes serve Bishop's Stortford, Takeley and Great Dunmow and some of them have a link to the further away villages and towns such as Lindsell, Saffron Walden, Chelmsford and Braintree. Four of these routes are fully subsidised by the county council with cumulative passenger numbers of ~404 per day based upon 2022 data provided as part of the Uttlesford Bus Network Review.

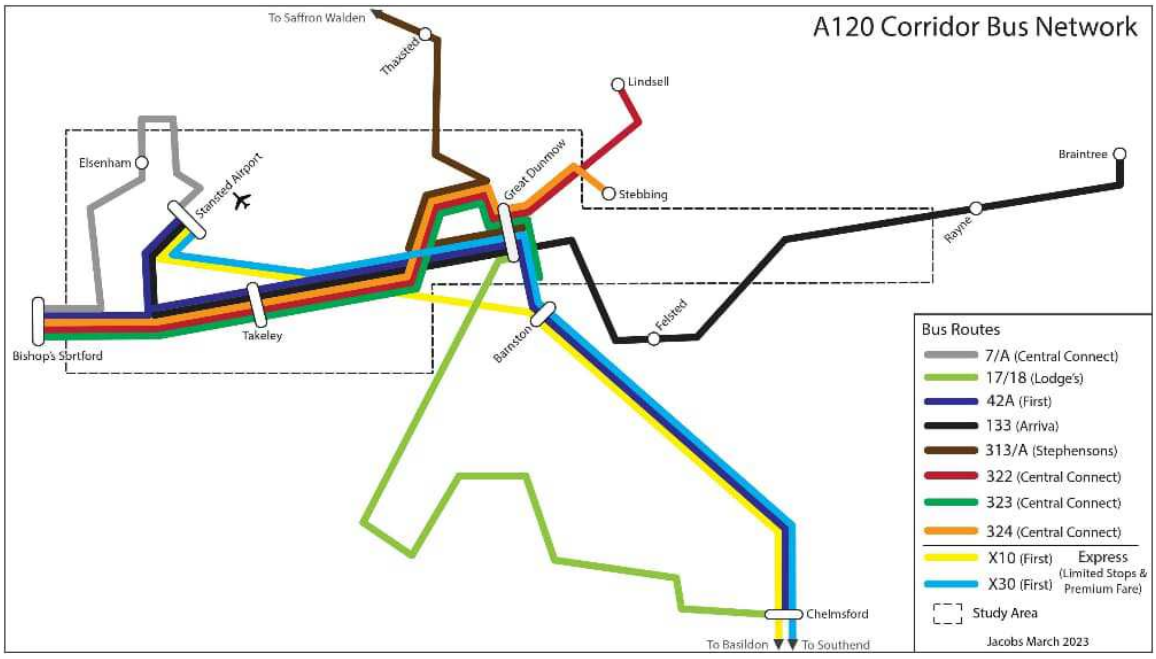


Figure 2.2: A120 Corridor Bus Network

Table 2.1: Key bus services

Bus Number	Destinations
42A	Bishops Stortford-Chelmsford
133	Stansted Airport-Braintree
324	Bishops Stortford-Stebbing
322	Bishops Stortford-Lindsell
323	Bishops Stortford-Great Dunmow
313/A	Saffron Walden-Great Dunmow
X10	Basildon-Stansted Airport
X30	Southend-Stansted Airport

Key bus services are shown in Table 2.1. Bus service provision within the study area has been reviewed, with those having the highest departures per week centred at Stansted and north of Takeley. Next most frequent is in Great Dunmow. This relates strongly with the frequency of buses, where routes through Great Dunmow, and along the B1256 and A120 are classed as Low Accessibility.

Essex County Council have Digital Demand Responsive Transport (D-DRT) areas operating in some of the most rural parts of the county. One of these covers the central and eastern part of the study area, although misses out Great Dunmow and feeds into Braintree.

The Plus Bus fare scheme which offers fares for those travelling by rail and bus, covers the west of the study areas, encompassing Great Dunmow. It is not clear from the data that we have what the use of this scheme is in this area, but there will be scope to better promote this.

From the review of documents and data, the following opportunities and constraints have been identified associated with bus services:

- Bus frequency and times do not support staff commuting to the airport – there is the opportunity for commuter buses – but bus frequencies will need to line up with shift patterns
- There is the opportunity to run smaller buses that could help with the affordability and frequency of the services.
    - Smaller services were suggested in public consultation as part of the Uttlesford Bus Network Review that could run more frequently to smaller housing developments, particularly around Dunmow where they are needed to navigate the developments
- Improvements in the evening and weekend services would boost economy and accommodate late commuters
- The Hertfordshire Essex Rapid Transport system to eventually link to up to Stansted Airport via Bishops Stortford – there are opportunities in future stages to understand what future interaction there might be with this beyond the Local Plan period.
- Ensure high quality public transport options are provided for new development to encourage mode choice.
- Extending Demand Responsive Transport to access Great Dunmow.
- Increased promotion of and possible extension of the Plus Bus scheme

2.2.2 Railway Services

Within the study area ~500 people currently travel to work by train, majority of those living closest to Stansted Airport (Census, 2011).

Railway stations around the study area are mapped in Figure 2.3. For the majority of the study area there is a need to travel some distance to access rail stations either in Braintree, Bishops Stortford, Elsenham, Stansted Mountfitchet or Stansted Airport. Of these stations Stansted Airport is the closest to the planned development areas in Takeley and Great Dunmow.

Bishop's Stortford Train Services

Service	Frequency (Monday-Friday)
Bishop's Stortford to London Liverpool Street	Up to 4 trains per hour
Bishop's Stortford to Stratford	Up to 2 trains per hour
Bishop's Stortford to Cambridge North	Up to 2 trains per hour
Bishop's Stortford to Stansted Airport	Up to 2 trains per hour

Braintree Train Services

Service	Frequency (Monday-Friday)
Braintree to London Liverpool Street	Up to 1 train per hour
Braintree to Witham	Up to 1 train per hour

Stansted Airport Train Services

Service	Frequency (Monday – Friday)
Stansted Airport to London Liverpool Street	Up to 3 trains per hour
Stansted Airport to Norwich	Up to 2 trains per hour
Stansted Airport to Birmingham New Street	21 trains per day

Stansted Mountfitchet

Service	Frequency (Monday – Friday)
Stansted Mountfitchet to London Liverpool Street	25 trains per day
Stansted Mountfitchet to Stansted Airport	38 trains per day
Stansted Mountfitchet to Cambridge North	17 trains per day
Stansted Mountfitchet to Cambridge	40 trains per day
Stansted Mountfitchet to Ely	1 train per day

Elsenham

Service	Frequency (Monday-Friday)
Elsenham to London Liverpool Street	29 trains per day
Elsenham to Cambridge North	18 trains per day
Elsenham to Cambridge	28 trains per day
Elsenham to Ely	1 train per day

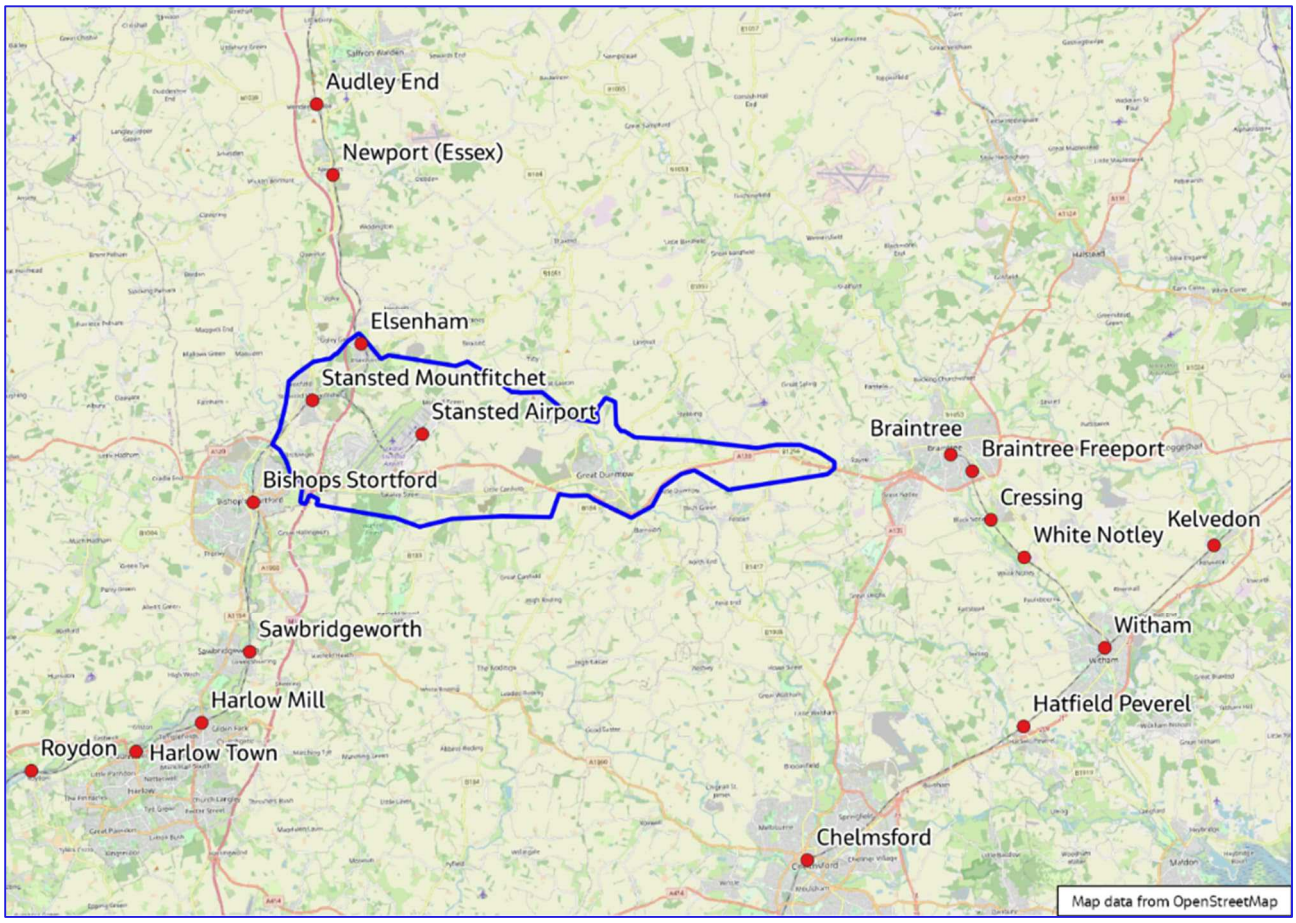


Figure 2.3: Map of Railway Stations around the Study Area

West Anglia Main Line Improvements looks at improving journey times and connectivity to Stansted Airport, with more frequent and regular trains, which benefit local residents should adequate connections to rail stations are developed.

2.2.3 Cycling and Walking

When looking at Census data, ~2% people originating in Great Dunmow cycle to work (Census 2011).

Existing national cycleway along Flitch Way connecting Stansted Airport and Gt Dunmow - & beyond to Braintree (NCR16). National Route 16, running east to west through the district and connecting Stansted and Braintree. Much of this runs along the route of the former railway line between Braintree and Bishops Stortford: the Flitch Way. There is an additional National Route 50 which runs through Takeley and is proposed to continue north up to Stansted Airport.

Figure 2.4: NCN Map showing routes 16 and 50 (OS Website)

Figure 2.5: Flitch Way

From the review of documents, the following opportunities and constraints have been identified associated with walking and cycling:

- 2011 LTP notes the intention to improve cycling networks and walking routes and encouraging their greater use.
- Opportunity to improve cycling mode share to the airport by adding potential new routes from Takeley to the Airport. Takeley being within 20 minutes cycle of the Airport.

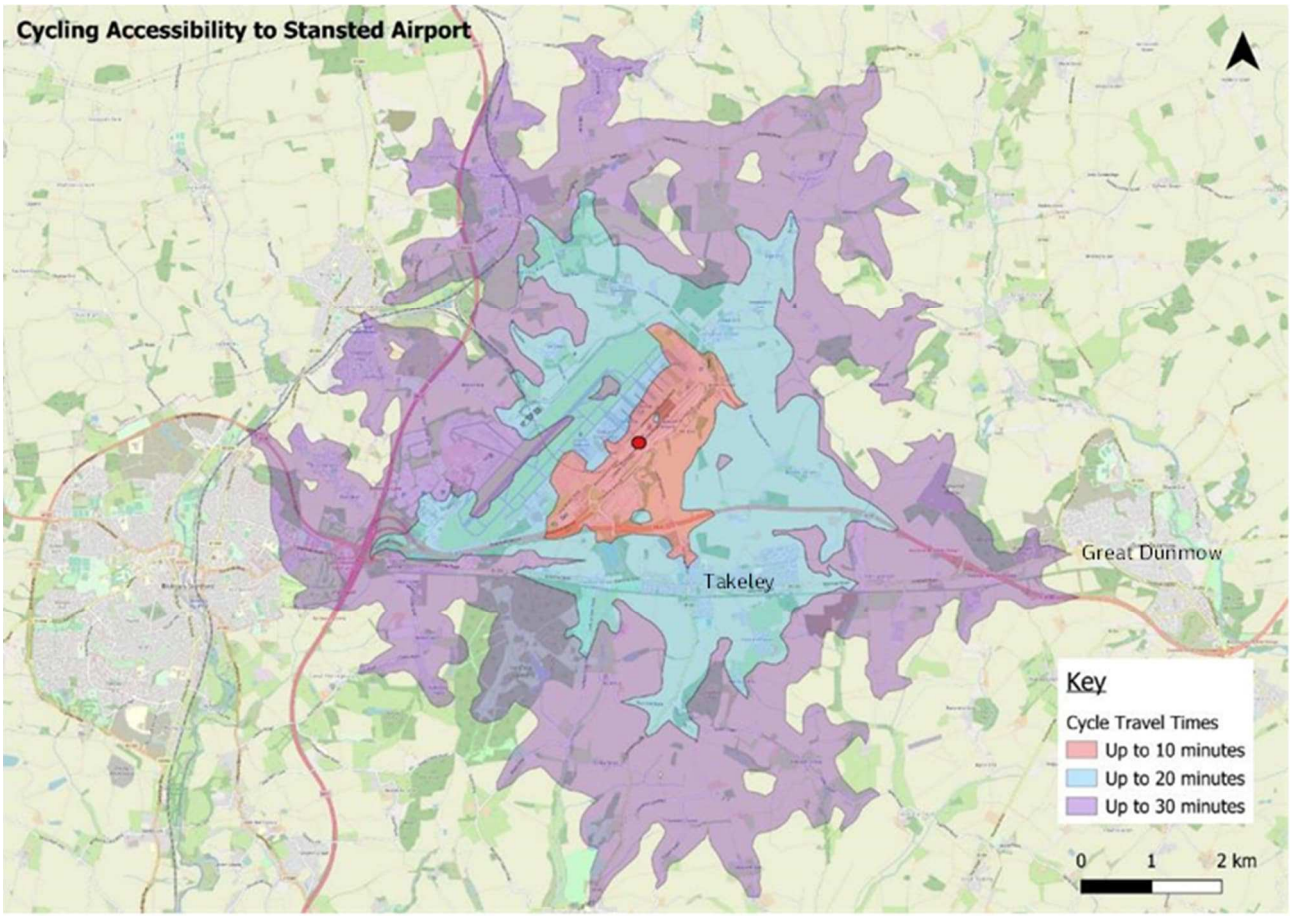


Figure 2.6: Map showing areas accessible to Stansted Airport via cycling

2.3 Stansted Airport

Stansted Airport is the largest single-site employer in the East of England. Growth in the airport is expected to create more education and employment opportunities.

2011 Local Transport Plan notes the intention to improve access to Stansted Airport by low carbon forms of transport; improving access to and from the M11 corridor & improving the attractiveness of bus services.

Enhanced connectivity to Stansted is a key factor in driving economic regeneration and productivity in some local areas in A120 corridor. The airport is committed to deliver high quality and reliable transport infrastructure with sustainable travel choices for both passengers and employees. It is targeting no more than 70% employees driving to work which means that public transport connectivity is essential in achieving this target.

There are a relatively high number of internal car trips within the Stansted airport zone. Improving cycle infrastructure in this vicinity and between it and key origins would assist mode shift of employee journey to work trips by car to bike. Notable. origins for employee journey to work at the airport include: Takeley, Canfield, Great Dunmow, Elsenham, Henham and Stansted Mountfitchet.

2.3.1 Airport Staff Access

The Airport Travelcard is the key initiative to promote public transport use and is available to employees with an airport identity card. It offers up to 80% off weekly travel costs to and from the airport on selected bus and train routes as illustrated in Figure 2.7.

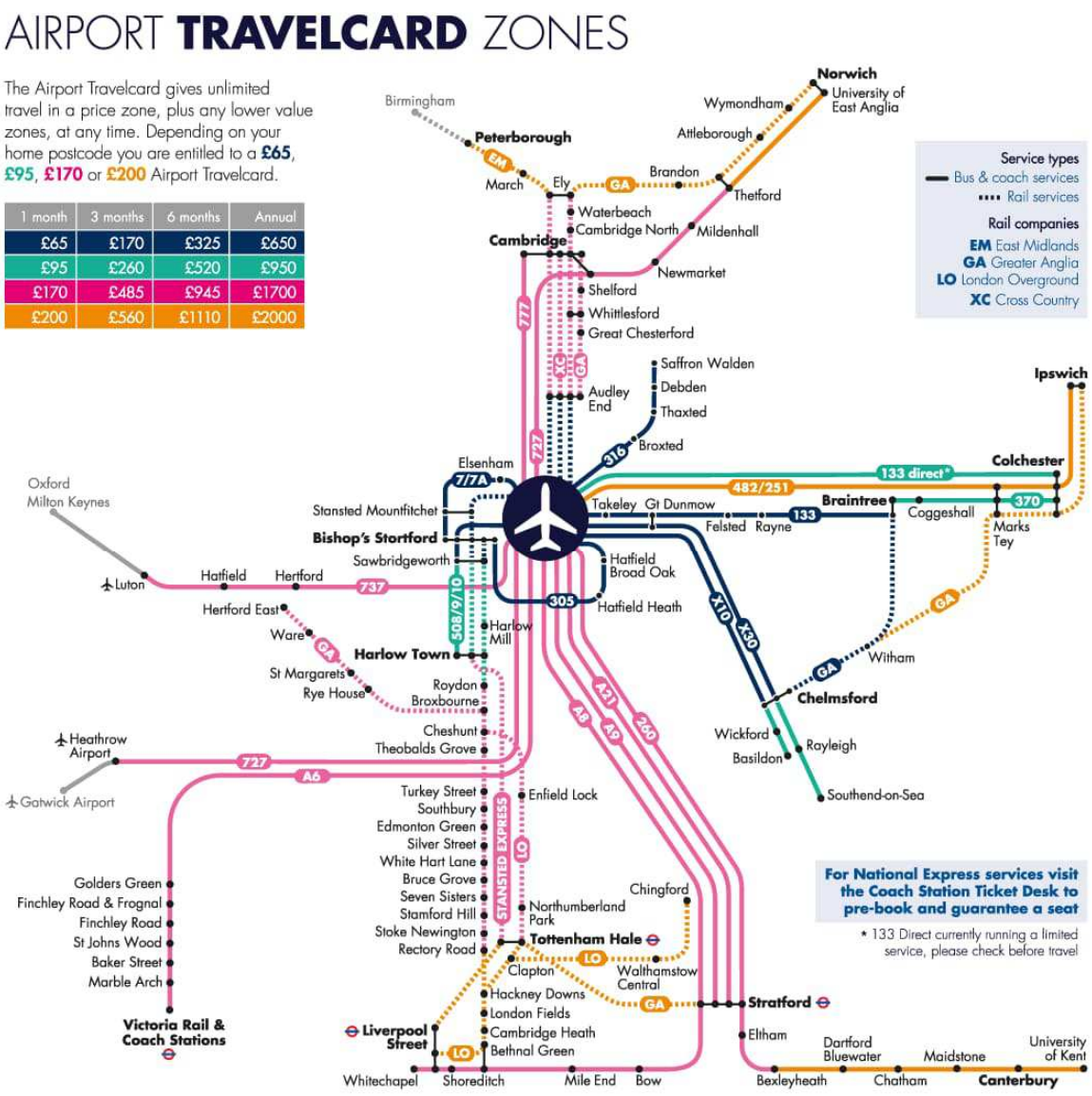


Figure 2.7: Airport Travelcard Zones

The Airport Travelcard can also be used on Night Run Shuttles, which currently operate between Tottenham and Stansted Airport in the early hours.

Airport Saver Ticket is a similar initiative to Airport Travelcard. Airport Saver Tickets can be bought as a book of 20 for £32.50 or £42.50 (depending on which service) and can be used as and when you like. They never expire. It is only valid on the following Arriva services:

- Bishops Stortford: 309, 508, 509 and 510 – cost £32.50
- Harlow: 509 and 510 – cost £42.50
- Braintree: 133 – cost £42.50

2.4 Local Settlements

The study area is predominantly residential land use, green spaces with smaller pockets of employment. There is limited retail land use which means that residents have to travel to larger towns for retail with travel times in excess of 60 minutes by public transport.

The corridor has a low population density although the highest population density is shown in Great Dunmow and Takeley. This will increase with new developments.

Takeley defined as a key village, Great Dunmow a Market Town – 2 and 1 in settlement hierarchy respectively.

Economic activity as a proportion of total population above the age of 16 concentrated to the west of Great Dunmow – opportunity for improving economic activity to the north and east of Great Dunmow with improved connectivity to employment.

Residential areas of Takeley and Great Dunmow show lowest levels of deprivation (deciles 8-10) although Takeley has the highest percentage of households deprived in at least one dimension of deprivation (education, employment, health, housing) – likely associated with connectivity and accessibility.

2.5 Environmental Considerations

When reviewing air quality within the study area, there are high levels of Carbon Dioxide and Nitrogen Oxides along the whole A120 corridor, with the highest levels closest to Stansted Airport.

There are two Sites of Special Scientific Interest along the corridor study area – Hatfield Forest to the south west of Takeley and High Wood, Dunmow to the west of Great Dunmow along the A120.

3. Revised Development Scenario (March 2024)

3.1 Revised Development Scenario (March 2024)

3.1.1 Housing Growth

Figure 3.1 depicts the areas for housing growth in the A120 corridor area as set out in the Revised Development Scenario. This includes known committed sites and the Highwood Quarry Site which is now proceeding following an Appeal.

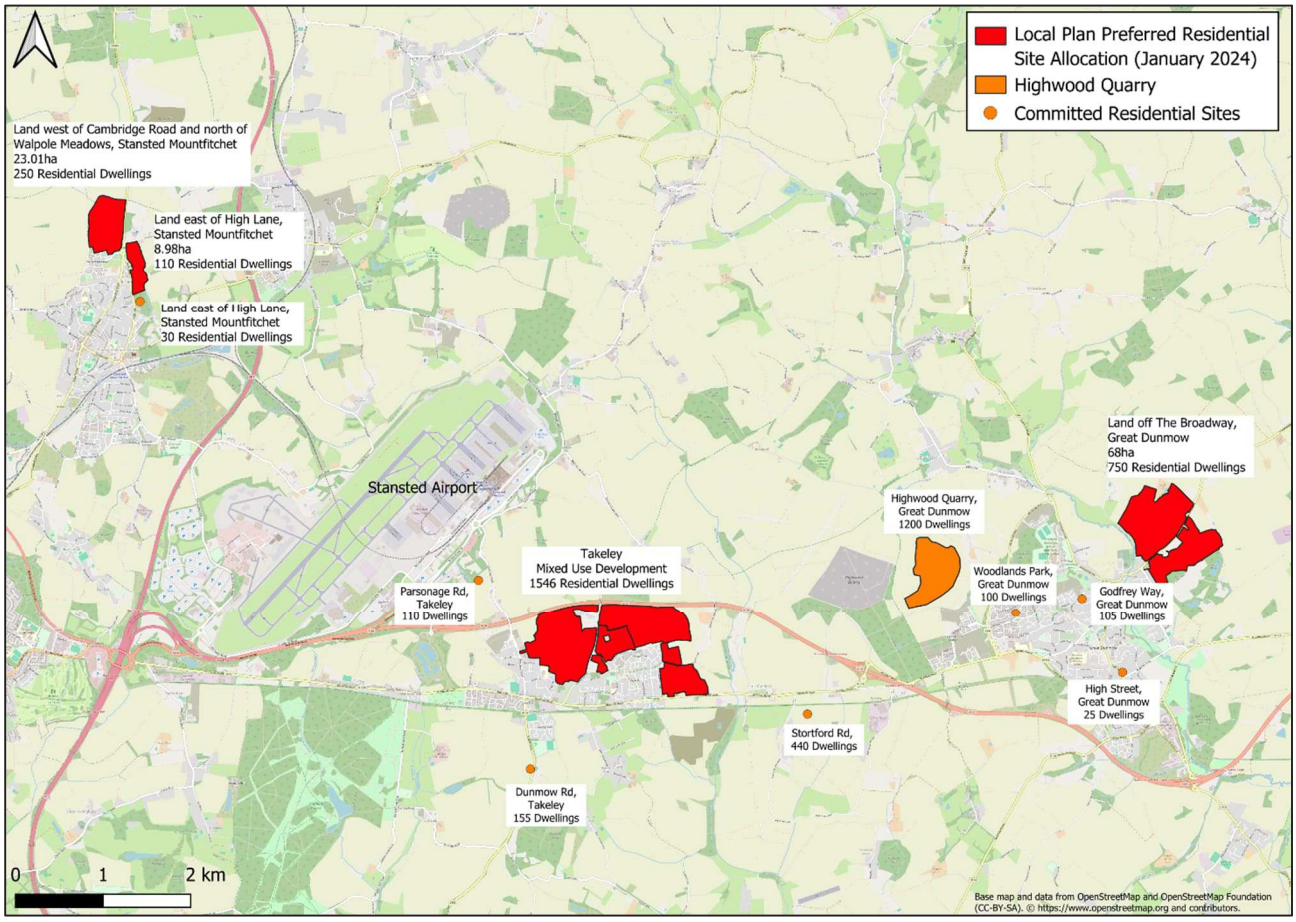


Figure 3.1: Housing Development (Revised Development Scenario)

3.1.2 Employment Growth

Figure 3.2 shows the areas for employment growth A120 corridor area as set out in the Revised Development Scenario (March 2024).

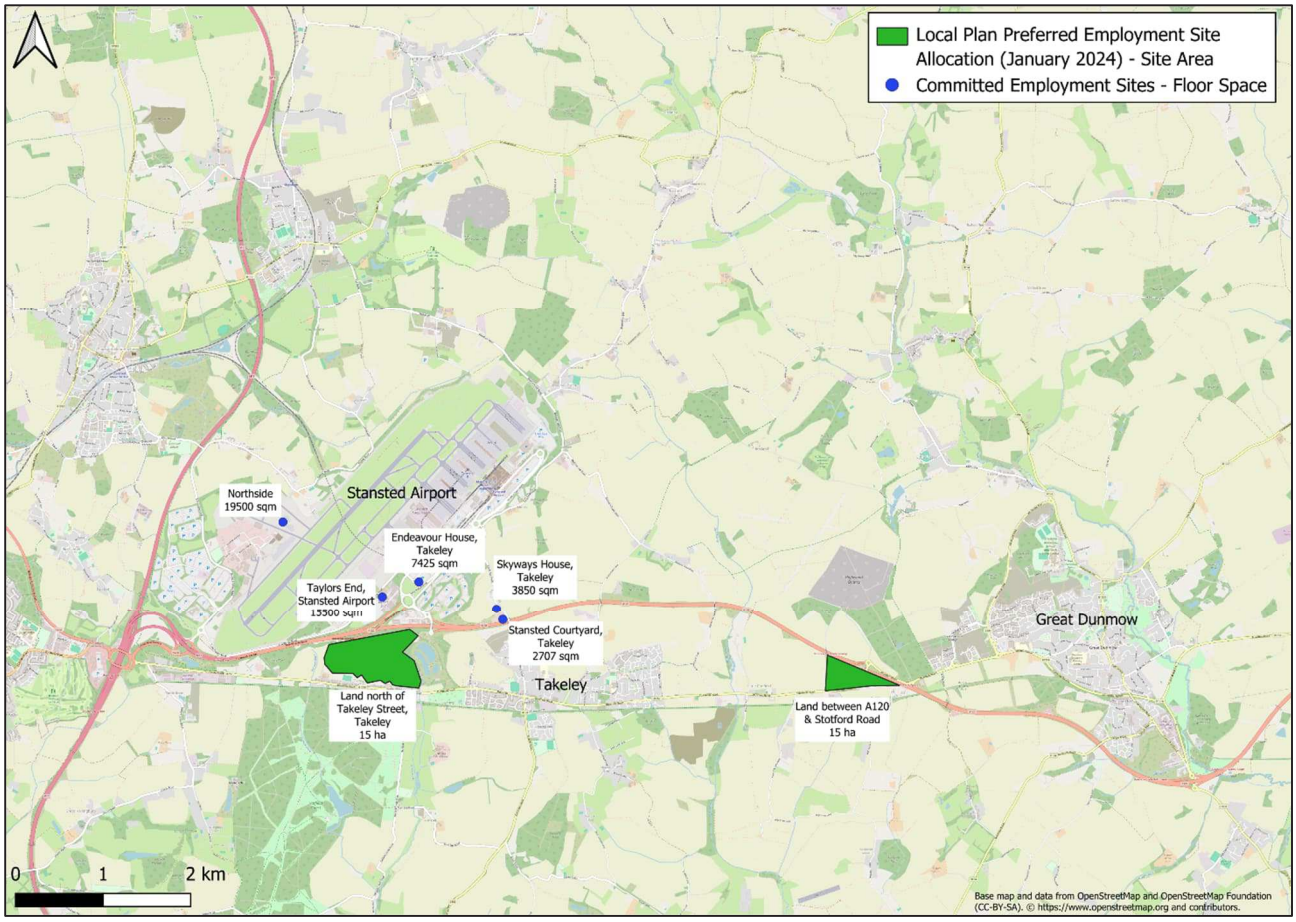


Figure 3.2: Employment Development (Revised Development Scenario)

3.2 Public Transport Flows

3.2.1 Future Year Public Transport Flows (AM Peak)

Figure 3.3 represents the average flow in the AM peak for an average hour from the EMME, West Essex Model. It assumes the current situation with no new development traffic. A tabular version of this figure can be found in Appendix A.

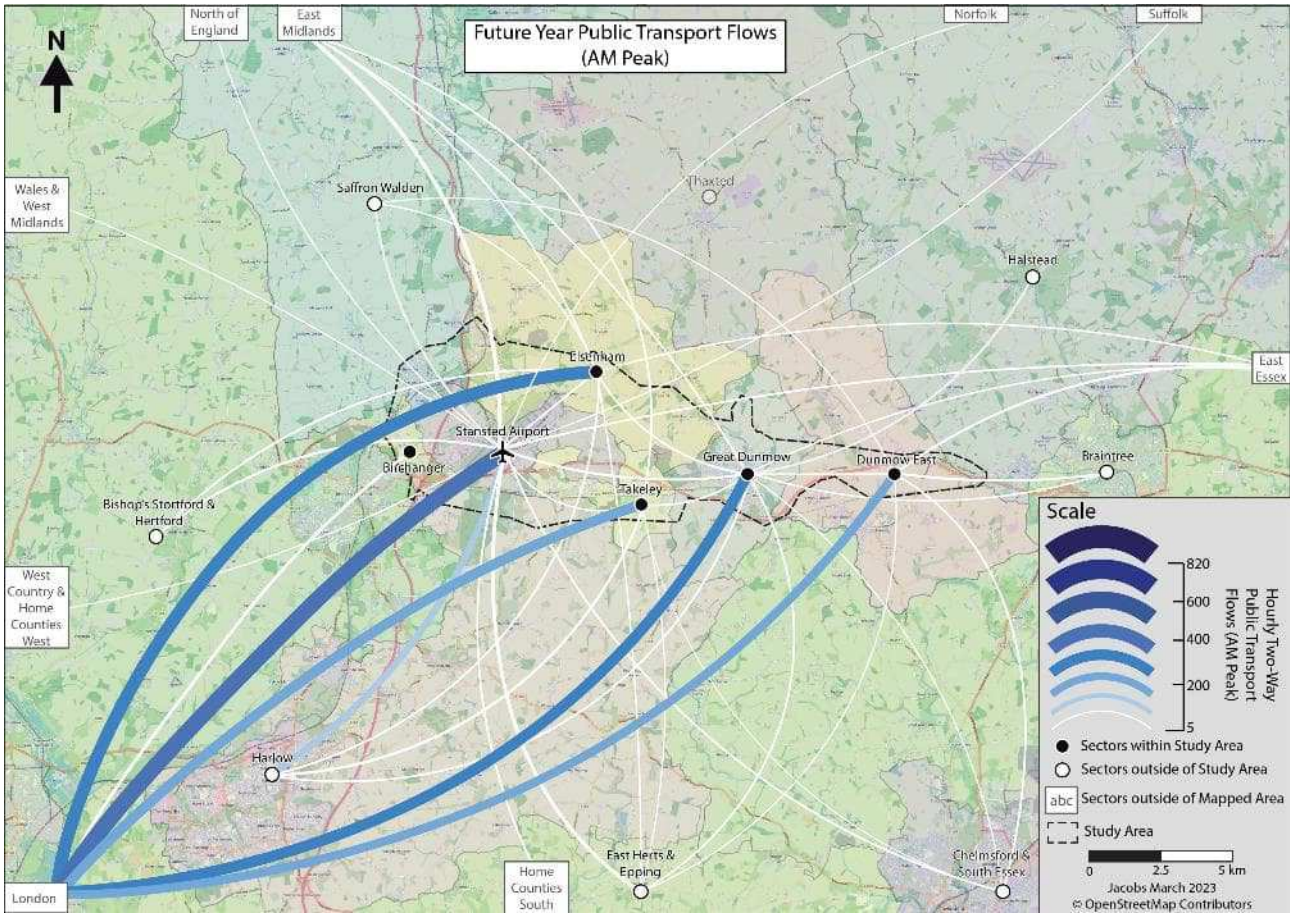


Figure 3.3: Future Year Public Transport Flows (AM Peak)

3.2.2 Future Year + Revised Development Scenario PT Flows (AM Peak) – Low PT MS

Figure 3.4 depicts the average flow in the AM peak for an average hour from the EMME, West Essex Model. It represents a low public transport mode share, for developments which is derived from Jacobs' previous work on development in Essex. A tabular version of this can be found in Appendix A.

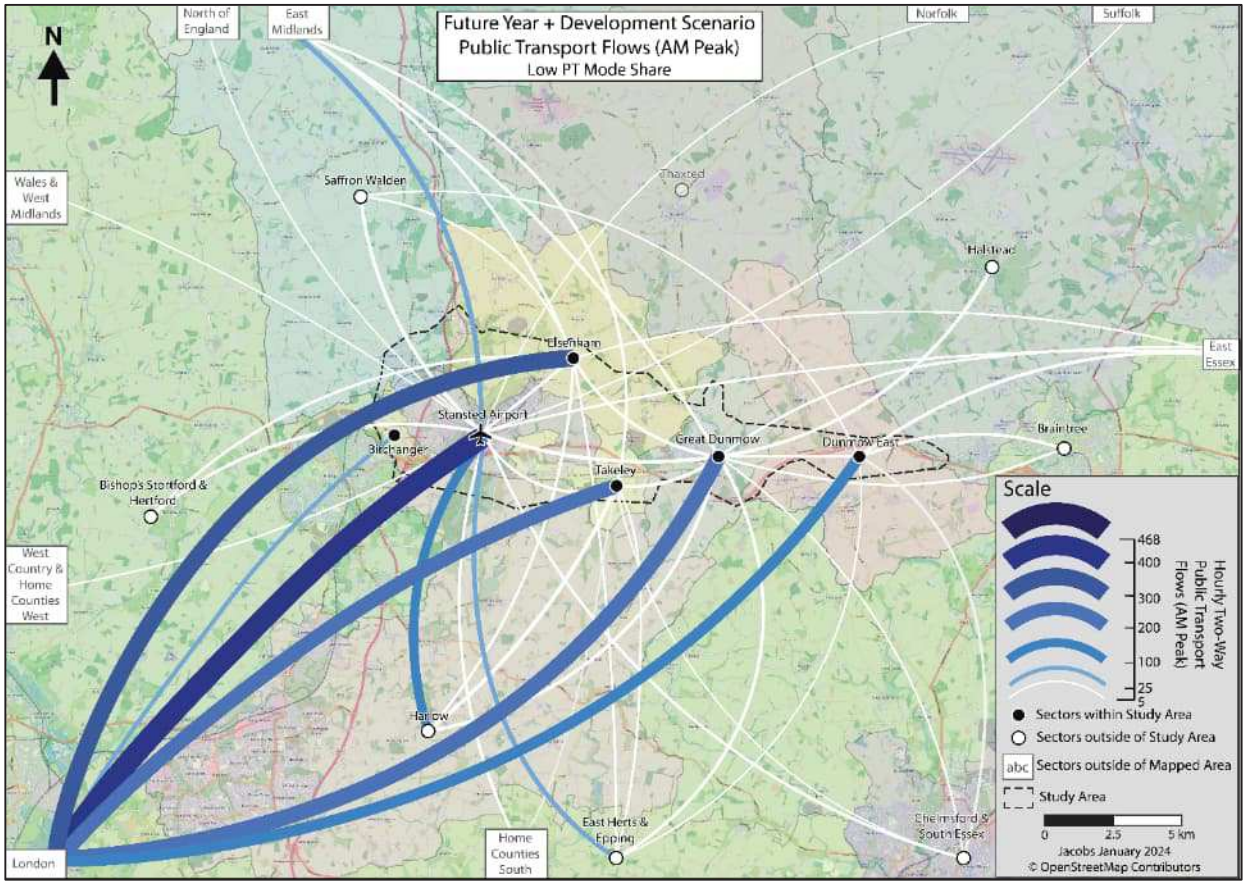


Figure 3.4: Future Year + Development Scenario PT Flows (AM Peak) – Low PT MS

3.2.3 Future Year + Revised Development Scenario PT Flows (AM Peak) – High PT MS

Figure 3.5 represents the average flow in the AM peak for an average hour from the EMME, West Essex Model. In High PT MS, it represents a third of new development car trips transferring to Public Transport, assuming high quality public transport in operation. This has been used to represent the maximum mode share expected for high quality public transport. A tabular version of this can be found in Appendix A.

The calculations in the next section, considering financially sustainable Public Transport improvements, are based on an average of Low and High PT MS results

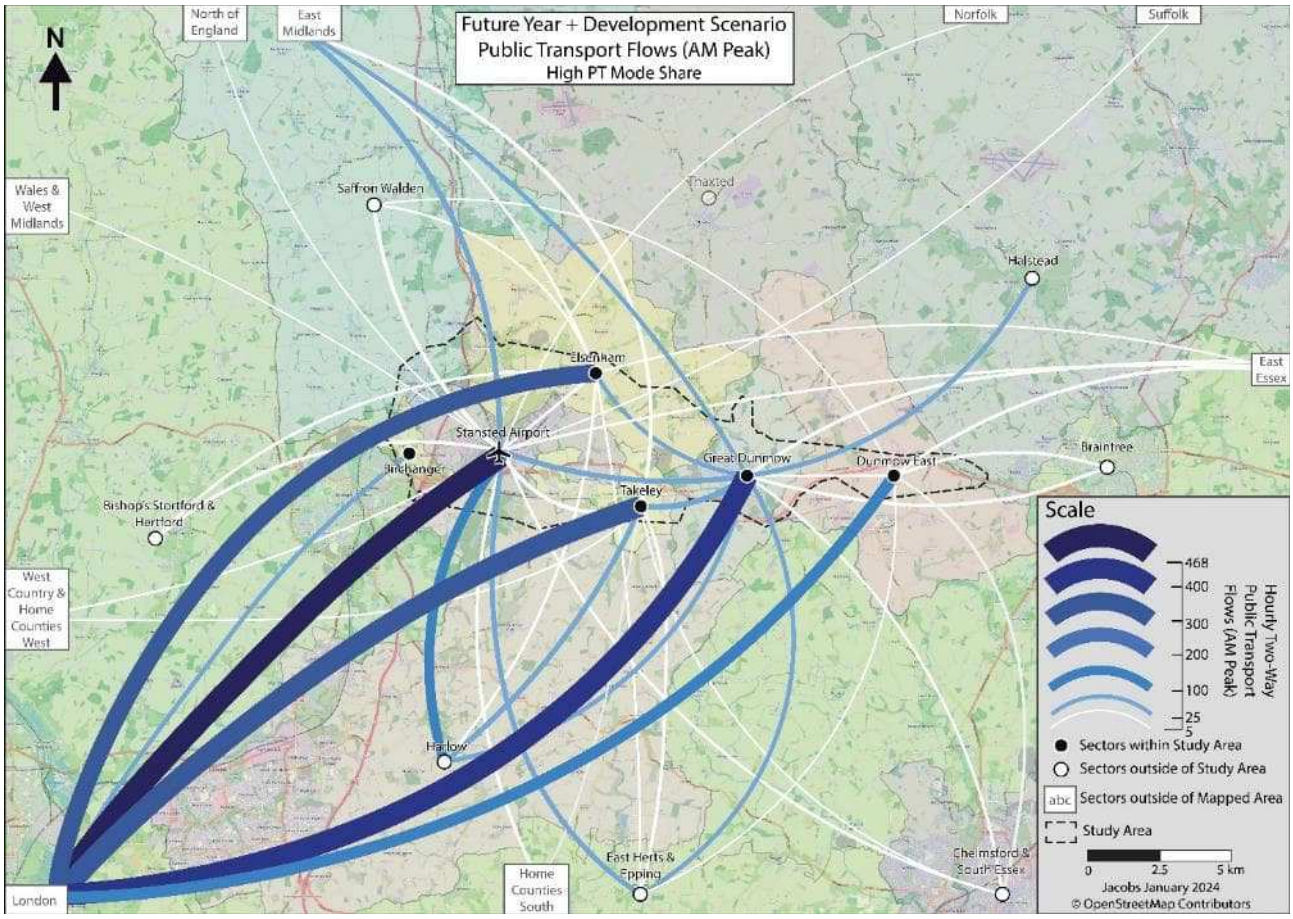


Figure 3.5: Future Year + Development Scenario PT Flows (AM Peak) – High PT MS

3.3 Summary

Those public transport trips shown from Takeley, Great Dunmow to London will likely have to interchange at Stansted to access railway stations via public transport or having travelled by car to park or kiss & drop. Developing attractive public transport options will be key to encourage as much travel to Stansted Airport Rail Station by sustainable modes.

The next section considers financially sustainable Public Transport improvement options to to encourage as much travel by public transport.

4. Public Transport Service Enhancement Options

4.1 Public Transport Service Enhancement Options

This chapter considers financially sustainable public transport service enhancement options for the level of development planned in the Revised Development Scenario.

Modelling work undertaken by Tetra Tech (September 2023), and set out in the Draft Uttlesford Local Plan 2021 – 2041[2], highlights that planned development is likely to lead to additional pressure on the highway network, especially through Takeley and Great Dunmow.

This work highlighted the importance of a mitigation package which provides realistic alternatives to the car to benefit both new residents and the existing communities.

The most common reason given by non-bus users is a belief there was 'no direct route'[3]. Among those who said they could, at least in theory, use public transport to travel to work, the most common reason for not doing so was the belief it would 'take too long'. The public transport service enhancement options devised below are targeted at providing convenient public transport links for new development on the corridor. However, it should be noted the service frequencies to be discussed are not "turn up and go" (i.e every 12 minutes or less) as the scale of development in the Revised Development Scenario would not likely provide sufficient patronage for such a service frequency.

4.2 Existing Bus Services

Following the review of existing bus routes undertaken in Section 2. Figure 4.1: presents the existing bus services that operate around the planned developments in Takeley and Great Dunmow.

As can be seen, one service (324 Central Connect) operates through the Residential Preferred Site Allocation (Land off The Broadway) north-east of Great Dunmow, however this runs only every 2 hours between 08:00-18:00 Monday to Friday. On the other hand, multiple bus services (133/508 Arriva, 305/323/324 Central Connect, X20/X30 First), pass the Takeley Preferred Site Allocations representing over 8 hourly services Monday to Friday.

The next section proposes bus services to improve access to these development sites.

[2] Source: Draft Uttlesford Local Plan 2021 – 2041 (Regulation 18) - Draft Version for LPLG September 2023

[3] Study conducted by the Scottish Government in 2010. https://www.gov.scot/publications/understanding-people-use-buses/pages/6/#:~:text=Routes%20were%20sometimes%20discussed%20in,seen%20as%20more%20time%2Defficient.

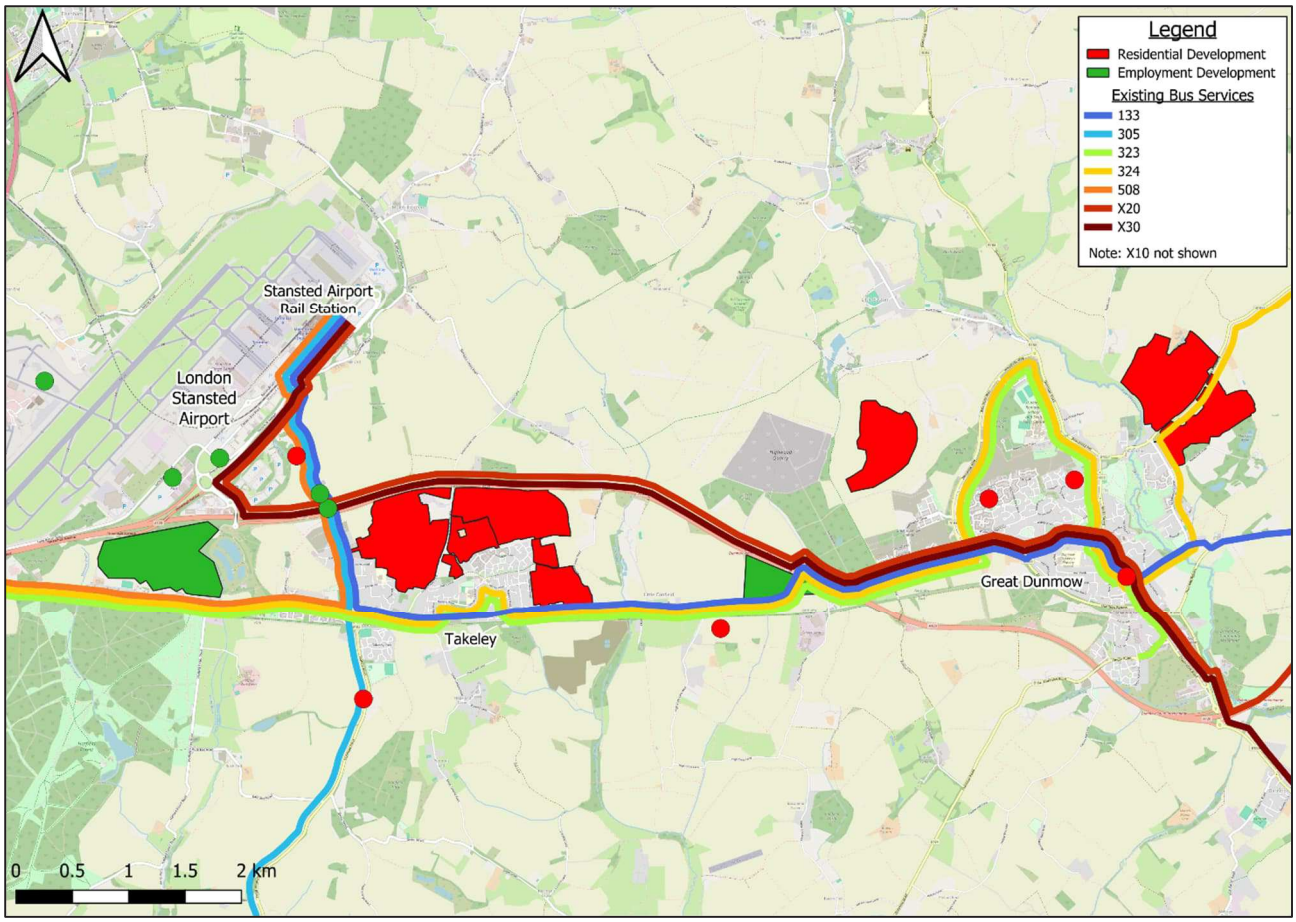


Figure 4.1: Takeley and Great Dunmow planned developments and existing Bus Services

4.3 London Stansted Airport Bus and Coach Station

The bus and coach station at London Stansted Airport is positioned opposite the main terminal entrance, approximately a 2-minute walk from the airport terminal. Figure 4.2 provides a diagram of the station layout. As can be seen there are 39 bays, available for designated use by buses, express buses and coaches, as well as 22 layover bays. There is a one-way entry and exit from the station onto Terminal Road South.

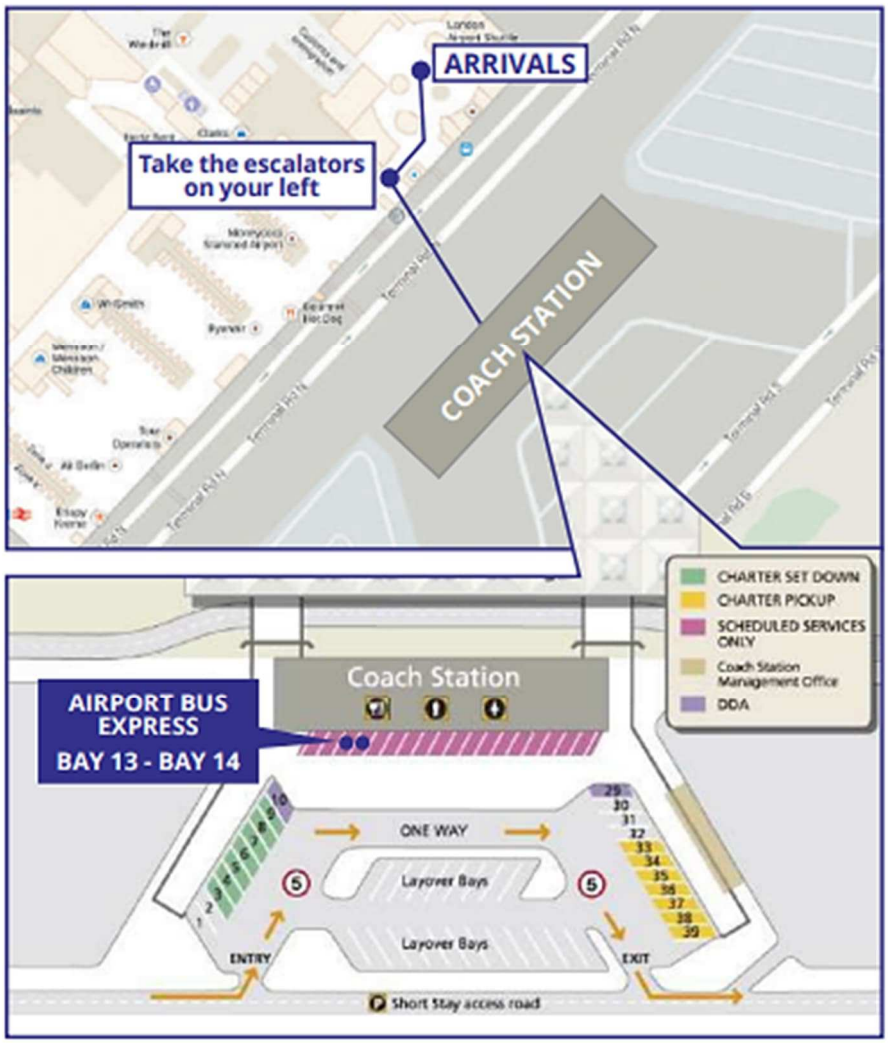


Figure 4.2: London Stansted Airport Coach Station layout[4]

At current, bays 3 – 9 are designated drop-off bays, bays 33 – 39 are designated pick-up bays, and bays 10 and 29 are wheelchair lift accessible.

There are over 200 daily services alone that operate into London. There are approximately 10 daily services to key destinations such as; Birmingham, Cambridge, Colchester, Coventry, Gatwick, Heathrow, Ipswich, Luton, Norwich and Oxford. Other destinations have daily services, but the frequency varies.

Table 4.1 sets out the bus services that serve the airport Coach Station. There are 11 different frequent services providing routes across Essex, typically using bays 13, 14, 15 and 17. This table does not account for coaches, however National Express are the coach operators, with 14 different coach services.

Table 4.1: Typical weekday bus services that serve London Stansted Airport

Service Number	Operator	Origin – Destination	Timetable	Designated Bay
7	Stephensons of Essex	Stansted Airport - Bishops Stortford	Every 2 hours	13
7A	Stephensons of Essex	Stansted Airport - Bishops Stortford	Every 2 hours	13
133	Arriva Herts and Essex	Stansted Airport - Braintree	Hourly	14
305	Central Connect	Stansted Airport - Takeley - Hatfield Heath - Bishop's Stortford	Hourly	13

[4] Source: https://airportbusexpress.co.uk/Images/Linee/Orari/159.pdf

Service Number	Operator	Origin – Destination	Timetable	Designated Bay
316	Central Connect	Stansted Airport - Takeley - Thaxted - Debden - Saffron Walden	Hourly	13
508	Arriva Herts and Essex	Stansted Airport - Harlow	Every 30 minutes	15
509	Arriva Herts and Essex	Stansted Airport - Harlow	Every 30 minutes	15
510	Arriva Herts and Essex	Stansted Airport - Harlow	Every 30 minutes + hourly night services	15
X10	First Essex	Stansted Airport - Wickford, Chelmsford - Chelmsford - Wickford, Chelmsford - Basildon	Hourly	17
X20	First Essex	Stansted Airport - Great Dunmow - Braintree	Hourly	14
X30	First Essex	Stansted Airport - Southend Airport, Rayleigh, Broomfield Hospital - Chelmsford Bus Station - Southend Airport, Rayleigh, Broomfield Hospital - Southend Travel Centre	Hourly	17

As described, this could amount to up to 14 bus services an hour into the bus station on a typical weekday. If a designated bay is already occupied, there is sufficient space available to accommodate buses arriving at a similar time. With this in mind, it is expected that the capacity of existing provisions at Stansted Airport Bus and Coach Station is sufficient in the event that there is an increase in bus services, at the scale discussed in the next section.

4.4 Proposed Bus Services

4.4.1 Indicative Routes

Three new bus service options and three rerouted bus route options have been proposed across Takeley and Great Dunmow, as shown in Figure 4.3 to Figure 4.8, and look to serve the developments outlined above.

These new services will allow connection with existing services which will also improve the viability of these services. Chapter 5 considers potential locations for Mobility Hubs to further benefit both new and existing services.

In Takeley, three bus services are proposed to be rerouted, shown in Figure 4.3 and Figure 4.4

Bus services 323 and 324, previously routing through the centre of Takeley, would be rerouted along Parsonage Road and through the Residential Site Allocations north of Takeley centre. In this scenario, the 133 service would be rerouted through the centre of Takeley, resuming the stops served by the 323 and 324 services. This reroute adds approximately 2km onto the roundtrip of the 323 and 324 bus services. Approximately 1km would be added to the roundtrip of the 133 service.

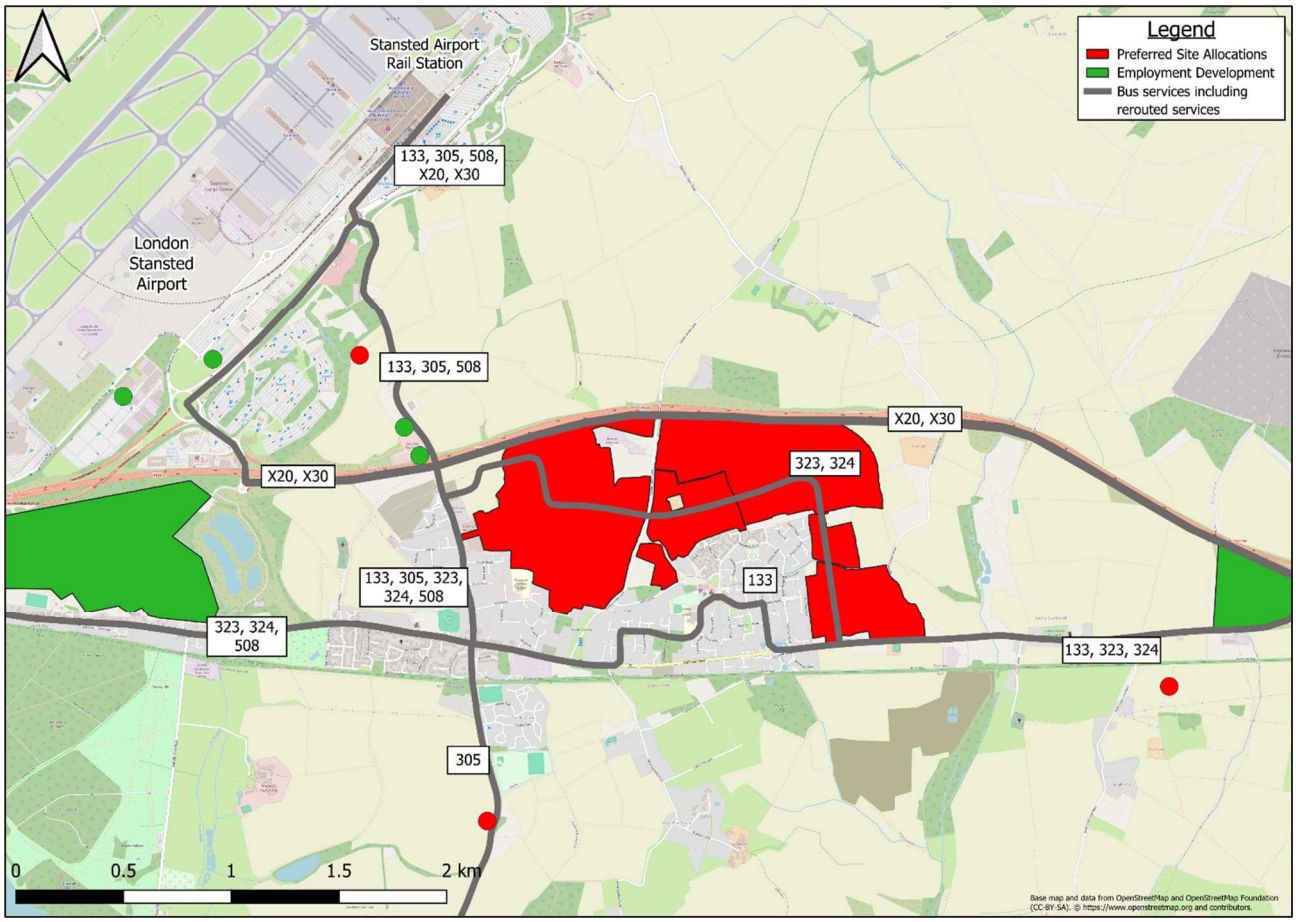


Figure 4.3: Takeley planned developments and Proposed Bus Service 323/324 rerouting through development

Alternatively proposed (Figure 4.4), is to reroute the 133 service through the Residential Site Allocations north of Takeley. In this scenario, the 323 and 324 services would continue their original route through the centre of Takeley. This reroute adds approximately 1.5km onto the roundtrip of the 133 bus service.

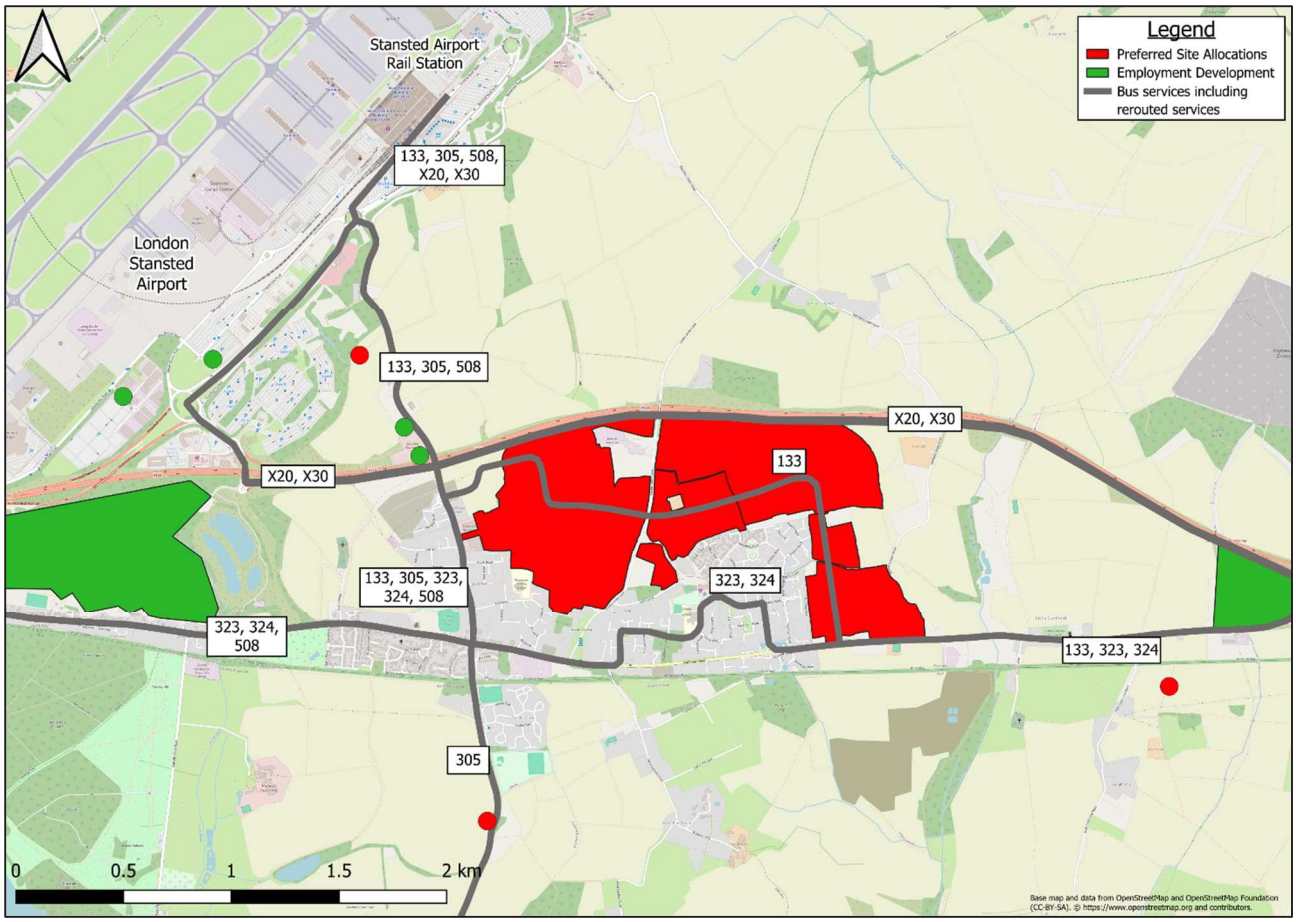


Figure 4.4: Takeley planned developments and Proposed Bus Service 133 rerouting through development

This proposed rerouting is beneficial as it provides a direct link into the development from Stansted Airport, however this would mean that the existing service would no longer be able to serve the route between Takeley to Braintree.

Figure 4.5 shows the indicative alignment for service 1a (blue) routing from the Stansted Airport Rail Station, down Parsonage Road to the Residential Site Allocation in Takeley, terminating at the southeast end of the Residential Site Allocation. An alternative route for service 1a is also shown, where the bus would operate from Stansted Airport Rail Station, down Parsonage Road, onto Dunmow Road, via Takeley Crossroads, and then into Canfield before returning through the Residential Site Allocation and back on to Parsonage Road to return to Stansted Airport Rail Station. It is proposed that these services would operate extended hours to benefit those working at the Airport (including workers already living in Takeley).

The final alignment of the route will be determined as the site allocation is confirmed, as well as a review of any improvement works possible at the Takeley crossroads.

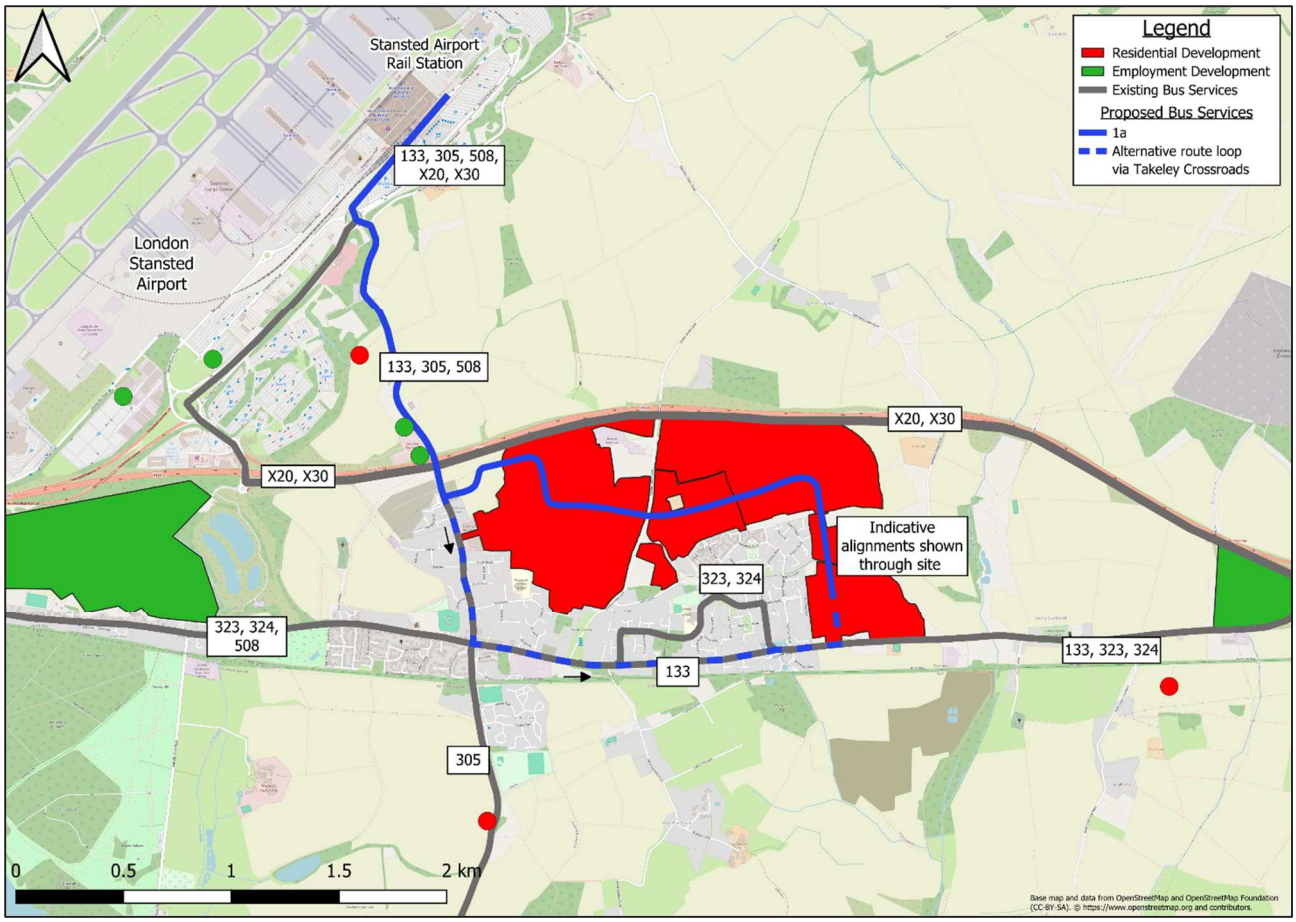


Figure 4.5: Takeley planned developments and Proposed Bus Service 1a

In Great Dunmow (Figure 4.6), it is proposed to reroute the 324 service through the Residential Site Allocation Land of The Broadway. This reroute adds approximately 0.5km onto the roundtrip of the 324 bus service.

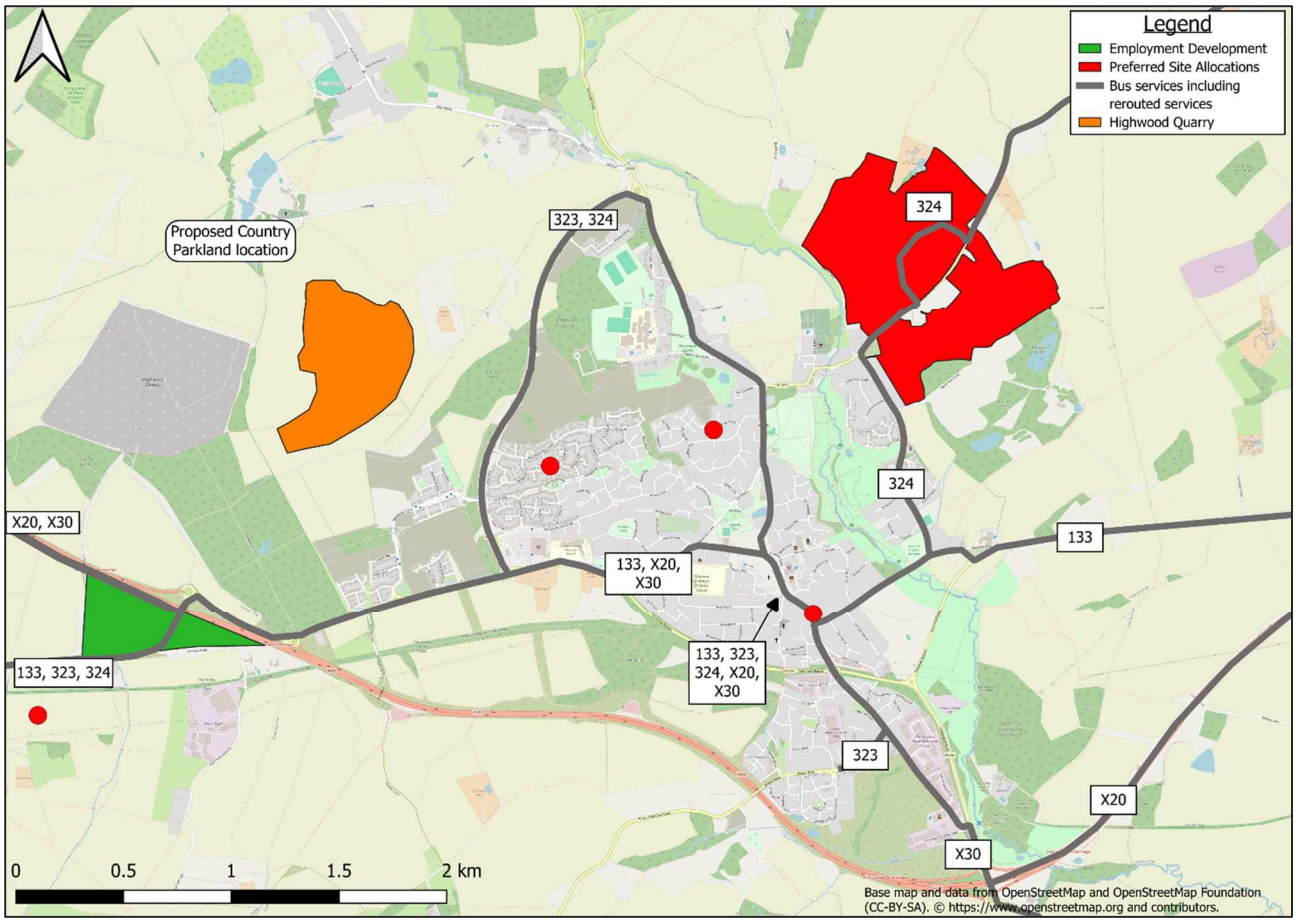


Figure 4.6: Great Dunmow planned developments and Proposed Bus Service 324 rerouting through development

Otherwise proposed in Great Dunmow, as shown in Figure 4.7, Service 2a (solid yellow line) routes from a loop in the Land of The Broadway development, south along St Edmunds Lane, and then west towards Great Dunmow High Street along Braintree Road. An alternative route (dashed yellow line) is proposed on the prerequisite that structural improvements are made to the Bridge on Church End; this would route from the proposed development, along the B1057, then south on the B1008 to reach Great Dunmow High Street.

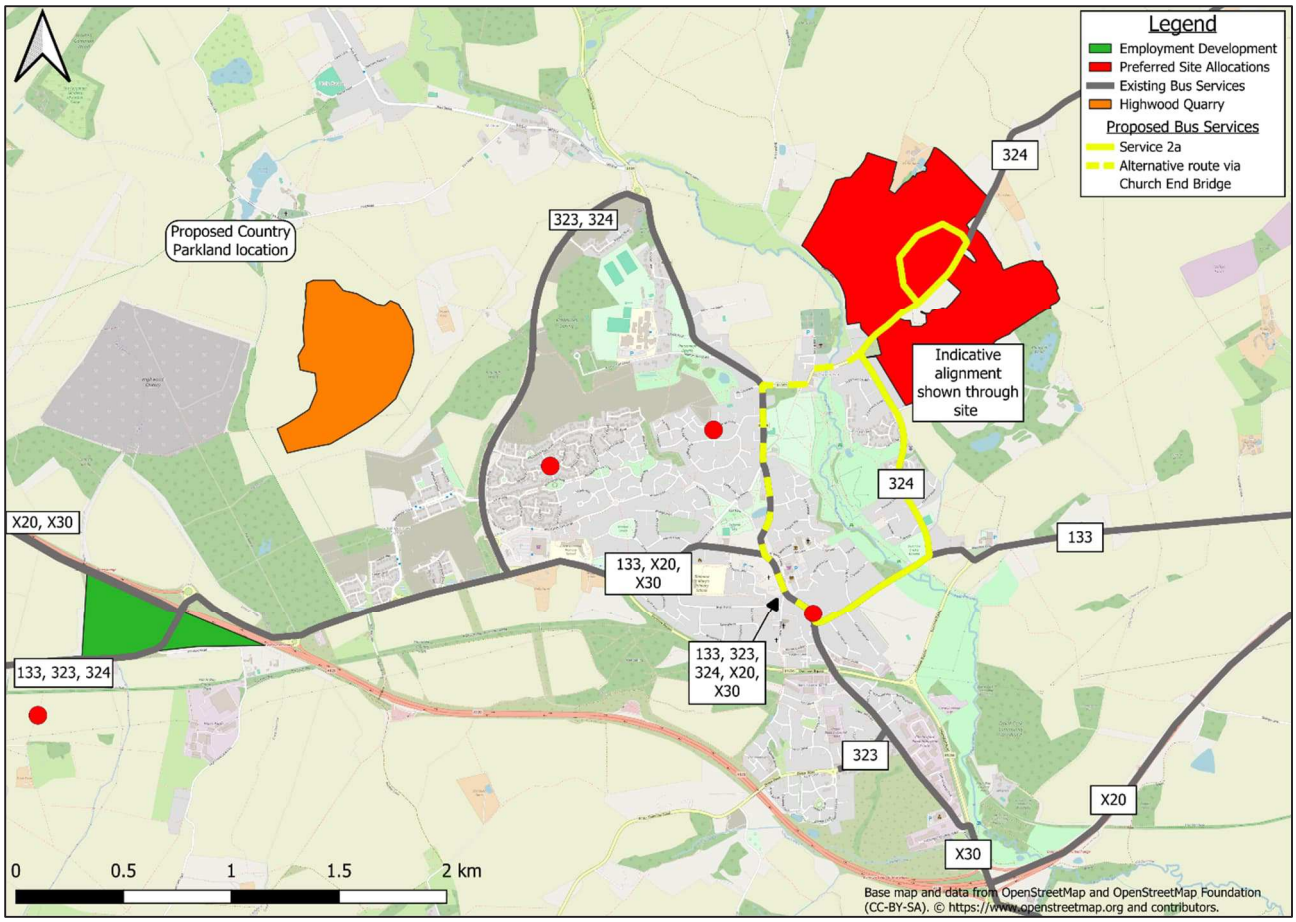


Figure 4.7: Great Dunmow planned developments and Proposed Bus Service 2a

Alternatively, service 2b (blue) shown in Figure 4.8, is a proposed cross-town route between the Land of The Broadway development, through Great Dunmow town centre, and the Highwood Quarry development. As with Proposed Service 2a, an alternative route (dashed yellow line) is proposed along the B1057, then south on the B1008 to reach Great Dunmow High Street, however structural improvements are required on the Bridge along Church End.

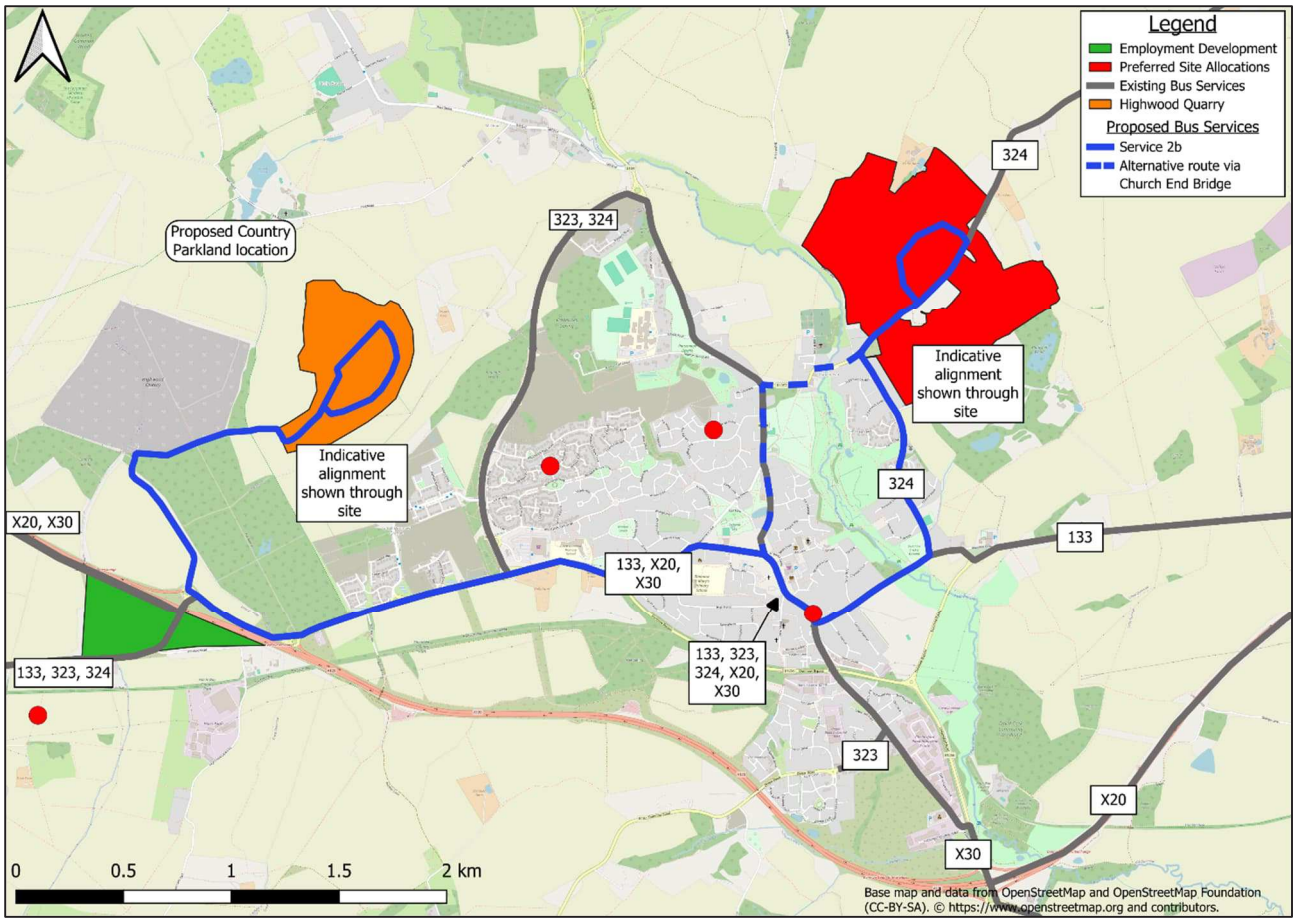


Figure 4.8: Great Dunmow planned developments and Proposed Bus Service 2b

These routes could be changed as more information is made available regarding forecast traffic movements and planned locations for new amenities.

4.4.2 Indicative Operational Cost

Calculations have been undertaken to determine the number of buses and indicative annual operating cost of the two proposed services.

By calculating the estimated distance of the proposed bus routes, and applying an estimated speed (20kph), the total round-trip journey time can be determined. To the total round-trip journey time, different headways are applied to each route, along with an allowance for layover time (1.1x journey time).

The number of buses required to operate the service is then calculated by dividing the total journey time by the headway.

The outcomes to these calculations for each proposed service, with different headways for comparison, are set out in Table 4.2, Table 4.3 and Table 4.4.

Table 4.2 presents the calculations for the proposed Takeley service (Service 1a), using an estimated annual operating cost for an extended hours bus service of £200,000 per vehicle. The proposed service has a round-trip distance of 9km, estimated to take 30 minutes total including layover time. For a 30-minute headway, 1 vehicle would be required, whilst 2 vehicles would be required for a headway of 15 minutes. Subsequently, the annual operating cost is estimated to be either £200,000 or £400,000, for the two headway scenarios.

Table 4.2: Calculation of number of vehicles and indicative operating cost for proposed 1a service in Takeley

Parameters	30 Minute Headway	15 Minute Headway
Distance (km)	9	
Speed (kph)	20	
Time (min)	27	
Time (min) inc layover	30	
Number of Buses	1	2
Annual Operating Cost per Bus (£) extended hours	£200,000	
Annual Operating Cost (£)	£200,000	£400,000

In regard to the rerouting of bus services 323 and 324 in Takeley, of which would add 2km to the existing bus, would equal around an extra 3 minutes onto the trip in one direction. This is not considered significant to warrant an increase in vehicles.

Table 4.3 presents the calculations for the proposed Great Dunmow 2a services. The proposed 2a service has a round-trip distance of 6km, estimated to take 20 minutes total including layover time. For a 20-minute or 30-minute headway, 1 vehicle would be required, whilst 2 vehicles would be required for a headway of 10 minutes. The indicative operating costs for the two headway scenarios are £180,000 and £360,000, respectively. These calculations are based on a slightly lower operating cost per vehicle (£180,000) as the service would not be expected to operate extended hours.

Table 4.3: Calculation of number of vehicles and indicative operating cost for the proposed 2a service in Great Dunmow

Parameters	Service 2a	
	20 or 30 Minute Headway	10 Minute Headway
Distance (km)	6	
Speed (kph)	20	
Time (min)	18	
Time (min) inc layover	20	
Number of Buses	1	2
Annual Operating Cost per Bus (£)	£180,000	
Annual Operating Cost (£)	£180,000	£360,000

Table 4.4 presents the calculations for proposed Great Dunmow 2b services. The proposed 2b service has a round-trip distance of 18.5km, estimated to take 60 minutes total including layover time. For a 30-minute headway, 2 vehicles would be required, whilst 4 vehicles would be required for a headway of 15 minutes. The indicative operating costs for the two headway scenarios are £360,000 and £720,000, respectively. These calculations are based on a slightly lower operating cost per vehicle (£180,000) as the service would not be expected to operate extended hours.

Table 4.4: Calculation of number of vehicles and indicative operating cost for proposed 2b service (incorporating Highwood Quarry) in Great Dunmow

Parameters	Service 2b (incorporating Highwood Quarry)	
	30 Minute Headway	15 Minute Headway
Distance (km)	18.5	
Speed (kph)	20	
Time (min)	55	
Time (min) inc layover	60	
Number of Buses	2	4
Annual Operating Cost per Bus (£)	£180,000	
Annual Operating Cost (£)	£360,000	£720,000

4.4.3 Indicative Revenue (Full Build Out)

Using key modelled Public Transport flows for the Future Year + Revised Development Scenarios for High and Low PT share (from Section 3), an indicative Revenue has been calculated for Full Build Out by multiplying the AM peak figures by a factor of 2.75, the interpeak figures by a factor of 4, and the PM peak multiplied by a factor of 2.75. The sum of these figures are then multiplied by a factor of 250 to provide an overall revenue figure for the whole year, with an assumed single fare of £2.

For London trips, it has been assumed that 1/3 of Public Transport London trips from the model will use public transport to interchange with rail services from Stansted Airport Rail Station.

Table 4.5: Indicative Revenue Future Year + Revised Development Scenarios

Low PT Share	High PT Share	Average
£1.1m	£2.0m	£1.6m

4.5 Summary

Table 4.6 shows the approximate number of existing households in Takeley and Great Dunmow, along with the expected dwellings to be built as a part of the proposed developments in the Revised Development Scenario (March 2024). These can be used to indicate how much revenue is expected to be generated as of a result of implementing the proposed bus services that can be attributed to new development.

Table 4.6: Takeley and Great Dunmow committed, planned and existing housing

	Committed and Planned Development (dwellings)	Existing Households (approx.)
Takeley	2,205	2,100
Great Dunmow	2,184	4,500
Total	**4,389**	**6,600**

The total indicative revenue from the average of the mode share scenarios is £1.6 million. It is reasonable to attribute around 40% of this figure to new developments in the area (comparing new households to existing households). Therefore there should be sufficient revenue at Full Build Out of around £0.6m to cover a 30-minute headway service in Takeley (Service 1), and a 30-minute headway service in Great Dunmow (Service 2b, incorporating Highwood Quarry). Alternatively this revenue would be sufficient to explore reorganising

existing services, subject to discussion with current bus operators. All calculations will be reviewed by the ECC PT Team once Development Site proposals come forward.

These proposed services would assist in meeting the objectives set forward by Homes England and the Uttlesford Spatial Vision, listed in Section 1.2.

To support both proposed services there is the opportunity for these routes to interchange with other routes in the area, as well as the support of sustainable movement in and out of the towns. This is discussed further in the next section on Active Travel and Mobility Hubs.

5. Active Travel and Mobility Hubs

The findings set out in this section are intended to contribute to a wider discussion on integration of Sustainable Modes. This will draw on work being undertaken separately on the LCWIP and Development Masterplans.

5.1 Walk and Cycle Options

The review of existing studies and evidence has highlighted existing cycle provision on the corridor including the east/west Flitch Way cycle route that would remain a key corridor for linking Takeley and Great Dunmow.

The most direct link between Takeley and Stansted Airport is Parsonage Road over the A120. There is currently a footpath alongside this road which could be widened to provide provision for both pedestrians and cyclists. This work would also require improved lighting and potentially a reduced speed limit on Parsonage Road. Crossing facilities and new cycle and footpaths would also be required between Parsonage Road and Stansted Airport Rail Station and Terminal Building as no pedestrian and cycle facilities are currently provided at this location.

5.2 Principles and Guidance

The remainder of this section considers illustrative examples of possible Mobility Hub locations, including one site identified in the UDC South Area Strategy. Providing such Mobility Hubs will improve access to Public Transport and Active Modes and improve interchange between existing and proposed Public Transport services.

The concept for mobility hubs can vary considerably. The following definition has been developed in ECC Mobility Hubs Guidance for use across Essex:

“Safe and connected places that facilitate convenient access to public, shared and active travel modes”

In addition, hubs can provide:

1. Logistics elements for first/last mile delivery goods

2. Green public space

3. Community facilities

4. Additional public realm elements could be considered to further improve hub/halt attractiveness, but these would be dependent upon the location itself, funding opportunities and aspirations and would not be expected to be delivered as part of the hubs/halts as entities.

Essex has adopted a number of design principles for mobility hubs, developed in line with Rapid Transit Design Principles and High-Quality Public Transport criteria:

- **Integrated**: Providing connectivity with other transport options with sustainable travel modes given prominence. Tying into surrounding infrastructure with ease of access onto local pedestrian and cycle routes. Consideration given to modal separation if deemed appropriate (conflict of interest / safety) and thinking of Hubs/Halts forming part of a network.
- **Accessible**: Optimising access to ensure ease of use and convenience. If we expect passengers to interchange, need to consider design and accessibility between modes to make journey seamless in terms of physical accessibility.
- **Inclusive**: Taking into account user diversity, providing safety and security, comfort and shelter.
- **Visual and experiential consistency**: Positively contribute to the passenger experience to give an immediate sense of what is provided, how to use it and to know that their experience will be the same

level as elsewhere . To embed a visual identity that is consistent with the TravelEssex brand which is easily recognised and use of consistent design materials.

- **Operational soundness**: Facilitating vehicular movements to support frequency of services.
- **Financially realistic**: Ensuring that management and maintenance is affordable and matched to income streams for the long term

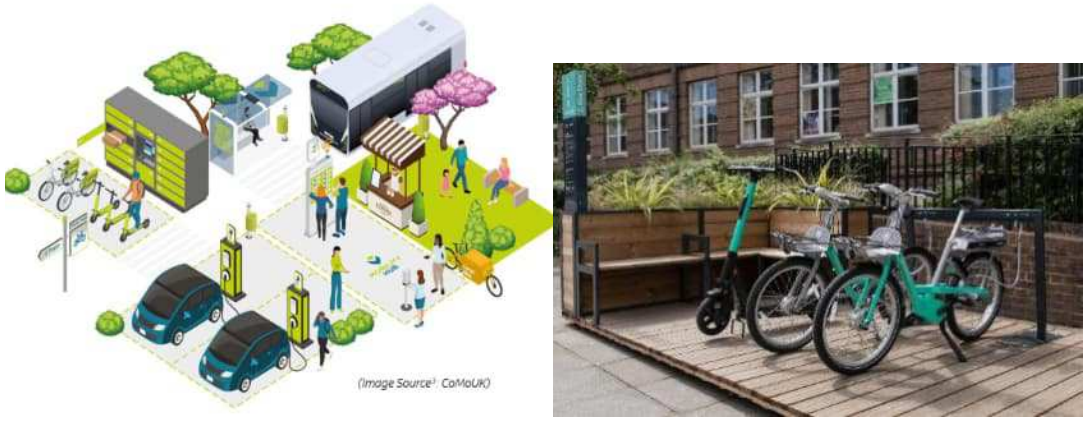


Figure 5.1: Images of example mobility hubs

5.3 Mobility Hubs along the A120 corridor

It is considered that mobility hubs could be developed to support sustainable movement along the A120 corridor, particularly within Takeley connecting to Stansted Airport, and Great Dunmow future developments accessing the town centre.

Mobility hubs rarely work in on their own, and therefore using the airport as a ready-made hub node with a couple of locations within Takeley with additional hubs could unlock sustainable travel to and from the railway station, as well as within Takeley itself.

Additional consideration should be taken to the active travel routes between each hub-node to ensure that these align with the hub principles of being safe, inclusive and attractive. This is essential to maximising hub usage as an interchange point for active and public transport travel.

The same principle could be adopted in Great Dunmow with the town centre acting as a main node, as well as new Hub at the South Area Strategy Location, with residential areas benefiting from their own 'Community' hubs where appropriate.

Four sites have been identified as being suitable locations for new mobility hubs. These include:

- South Area Strategy Location 'Standard' Hub
- Great Dunmow Allocation 'Community' Hub
- Takeley Allocation 'Community' Hub
- Takeley Allocation 'Community' Hub (alternative location, by Parsonage Road)

All four sites have been reviewed in the Essex Mobility Hub Toolkit with each assessment included in Appendices B-E.

5.4 Mobility Hub Assessment

The Essex Mobility Hub Toolkit serves to define the correct and most suitable typology for a particular location which could act as a mobility hub. The different typologies include:

- Halt
- Community Hub
- Basic Hub
- Standard Hub
- Premium Hub

Each typology is classified by the inclusion of different components. For example, a Halt is the most basic hub type and requires the minimum needed for a mobility hub such as a sheltered waiting area and a bus stop flagpole and timetable. Whereas a Premium Hub requires a lot more components such as at least two types of shared mobility (bike share, E-scooters) and Wi-Fi access.

The Component Inclusion and Component Quality tables from each site can be found in Appendix B-E.

5.4.1 South Area Strategy Location 'Standard' Hub

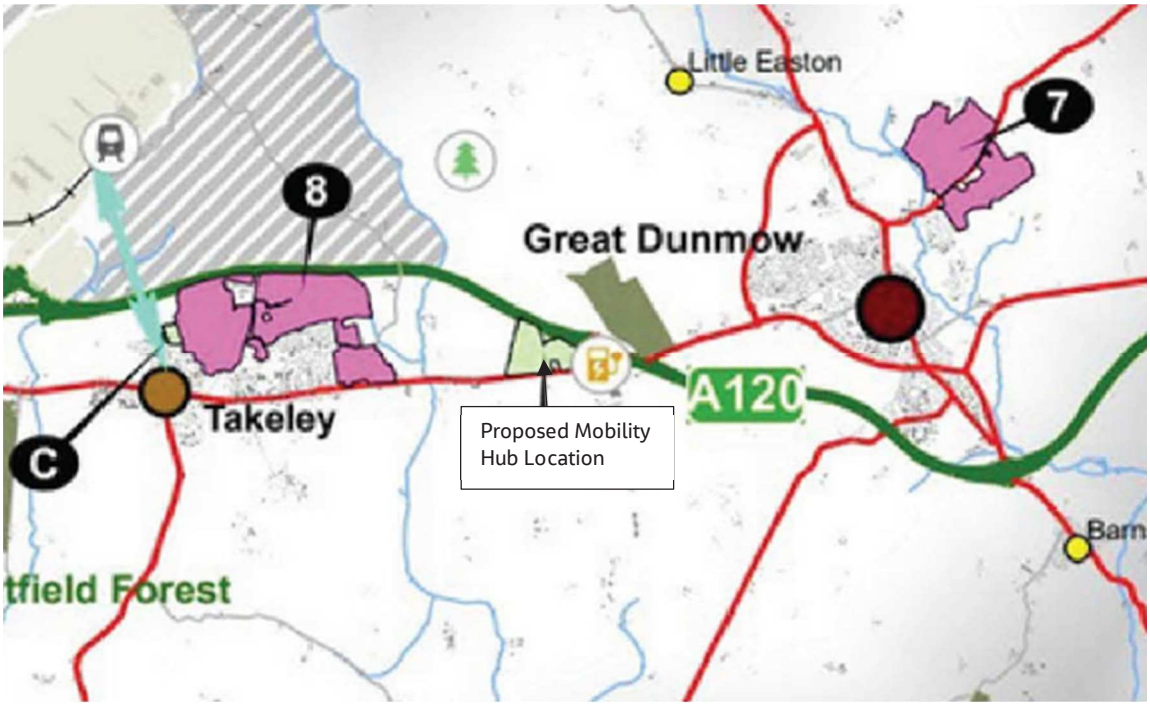


Figure 5.2: Mobility Hub Site Identified in UDC South Area Strategy.

Figure 5.3: Aerial view of proposed site location

There is the opportunity to provide a mobility hub at a new proposed development site in the UDC South Area Strategy. The site is situated west of Great Dunmow and lies upon the B1256, south of the junction with the A120.

The Current Situation

The site has good opportunity for a mobility hub with the Flitch Way cycle path being located along the south side of the site (see Figure 5.3). There are also two bus stops within close proximity to the site which travel to Great Dunmow, Braintree, Stebbing, Stansted Airport and Bishops Stortford.

Mobility Hub Potential

Due to the location and size of the site, this mobility hub has the potential to become a Standard Hub. To be classified as a Standard Hub, this mobility hub would have to include Community Transport, 2 forms of shared mobility (car clubs, bike share), cycle parking and a sheltered waiting area. Components to consider also include EV charging for buses and private vehicles, a local information board and local services/amenities.

5.4.2 Great Dunmow Allocation 'Community' Hub

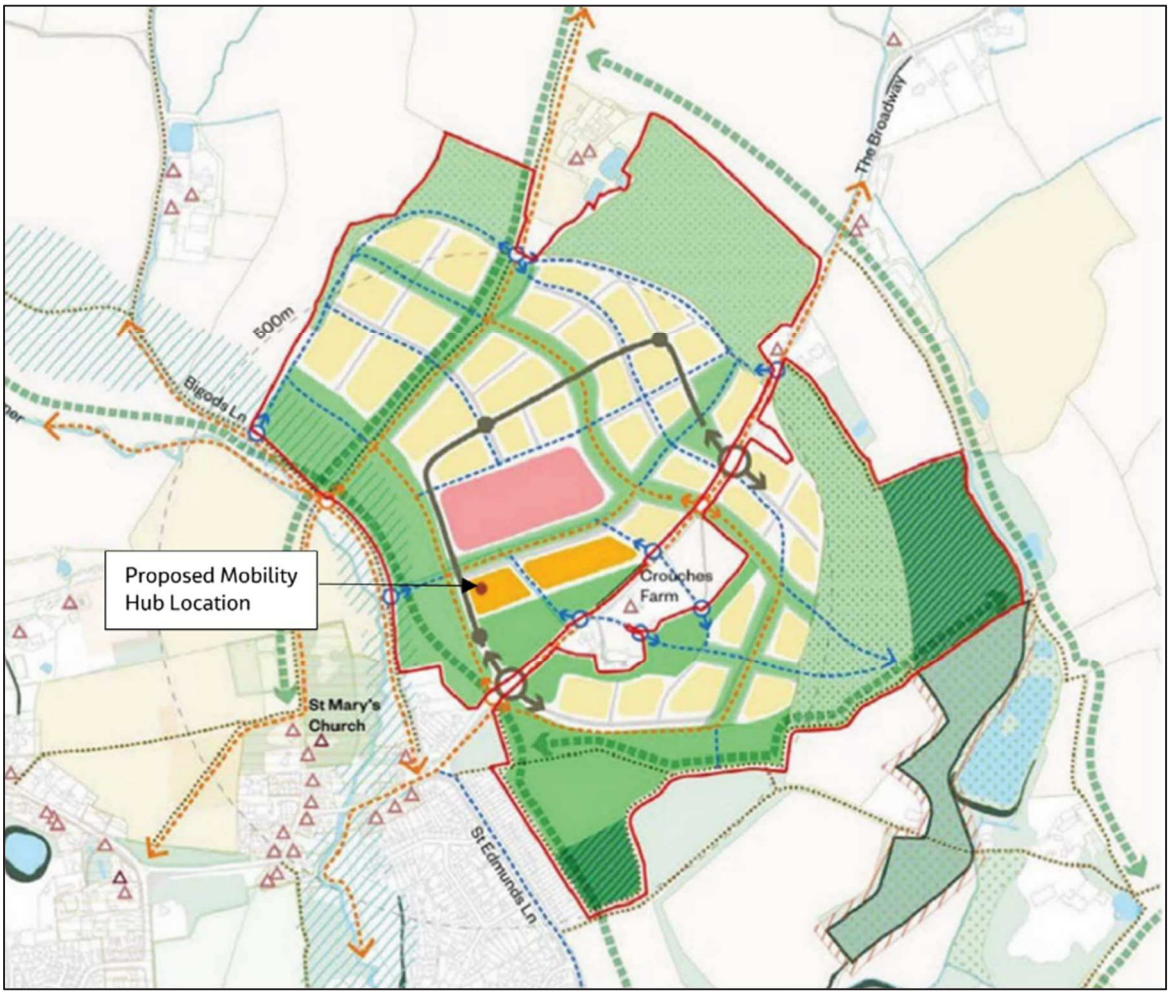


Figure 5.4: Proposed Great Dunmow Mobility Hub Location

Figure 5.5: Aerial view of site location

The proposed mobility hub location for Great Dunmow is situated northeast of the town near the village of Church End. The land is situated north of the B1057.

The Current Situation

As shown in Figure 5.5, the nearest current bus stop to the site lies within the village of Church End on St Edwards Street. The bus stop serves buses that travel from Bishops Stortford, Lindsell and Stebbing. The proposal for this site in the South Uttlesford Area Strategy would provide enough housing and amenity to support the need for a new mobility hub location.

Mobility Hub Potential

Due to the sites location, this mobility hub would be considered to have the potential to become a Community Hub. To be classified as a Community Hub, this mobility hub would have to include Community Transport, 1 form of shared mobility (car clubs, bike share), and a local information board. A Community Hub requires less components than a Standard Hub, however components to consider include EV charging for private vehicles and CCTV.

5.4.3 Takeley Allocation 'Community' Hub

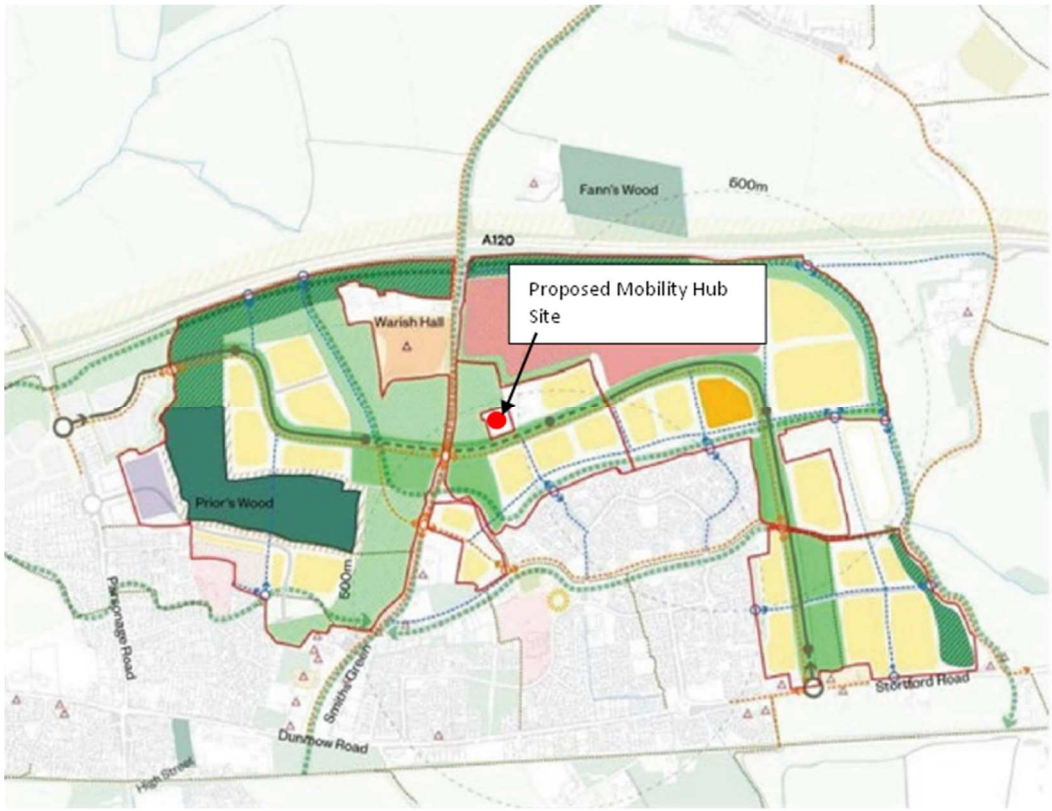


Figure 5.6: Proposed location of mobility hub site in Takeley

The proposed allocation within Figure 5.6 seeks to deliver around 1,636 dwellings, within integrated neighbourhoods, enhancing the vitality of Takeley and the wider area. Key considerations for planning for this site include:

- a new primary school, adjacent to a new local centre and on a public transport corridor
- a new Secondary school along the north-eastern boundary of the site, adjacent to new local centre and on a public transport corridor
- a new local centre in the eastern parcel positioned to maximise its catchment , providing for a range of uses including for health care
- an active travel and public transport spine should be provided connecting the new neighbourhoods and new local centre

The Current Situation

The nearest bus stops to the proposed site are all situated in the village of Takeley. These bus stops serve buses that travel from Stansted Airport, Harlow, Bishops Stortford, Braintree, Chelmsford and Stebbing. The proposal for this site in the South Uttlesford Area Strategy would provide enough housing and amenity to support the need for a mobility hub. There is currently EV charging infrastructure for private vehicles available at the Priors Green local centre.

Mobility Hub Potential

Due to the sites location, this mobility hub would be considered to have the potential to become a Community Hub. To be classified as a Community Hub, this mobility hub would have to include Community

Transport, 1 form of shared mobility (car clubs, bike share), and a local information board. Other components to consider include EV charging for private vehicles and CCTV.

5.4.4 Takeley Allocation 'Community' Hub (Alternative Location)

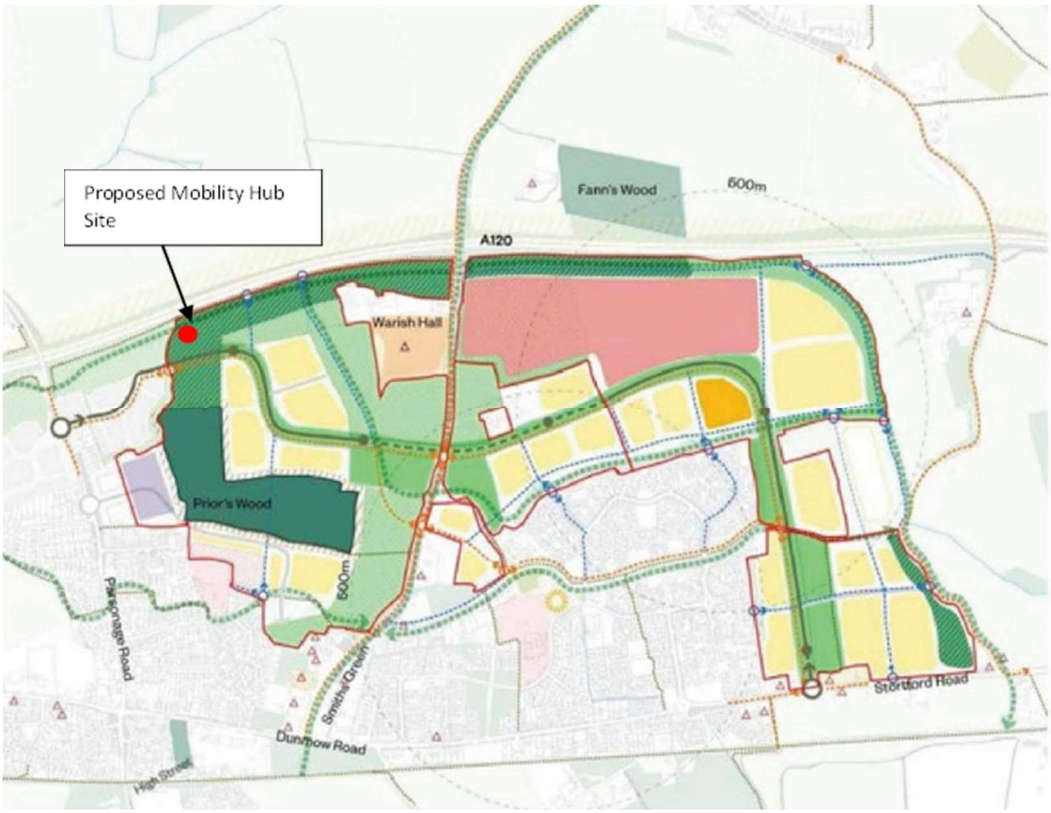


Figure 5.7: Proposed location of an alternative mobility hub site in Takeley

As detailed above, the proposed allocation within Figure 5.7 seeks to deliver around 1,636 dwellings and will require new integrated transport links to support the new neighbourhoods created in this development.

The Current Situation

This alternative mobility hub location will be situated closer to Parsonage Road which is a key transport route into the village of Takeley from the A120. Unfortunately, the Mobility Hub cannot be situated any closer to Parsonage Road, however there may be potential for existing bus services to make a diversion and call at the new Mobility Hub, in addition to the proposed services considered in the previous section. Therefore, this mobility hub could link easily with existing key bus routes. There are currently 5 bus stops along Parsonage Road. These bus stops serve buses that travel from Stansted Airport, Harlow, Bishops Stortford, and Braintree. The proposal for this site in the South Uttlesford Area Strategy would provide enough housing and amenity to support the need for a mobility hub. There is currently EV charging infrastructure for private vehicles available at the Priors Green local centre.

Mobility Hub Potential

this mobility hub would be considered to have the potential to become a Community Hub. To be classified as a Community Hub, this mobility hub would have to include Community Transport, 1 form of shared mobility (car clubs, bike share), and a local information board. Other components to consider include EV charging for private vehicles and CCTV.

5.5 Summary

All proposed mobility hubs locations would attract both new residents and existing residents to sustainable modes. The hubs will help remove reliance on the private car and breaking down barriers to use of shared travel modes and active travel.

Standard and Community Hubs have the potential to form the centre of the community through offering extended services tailored to the specific community. A strong focus would be required on what the community requires in terms of active and sustainable travel, alongside what amenities are already in the location which could be supported in order to boost Hub use.

Appendix A. Model Calculations

A.1 Introduction

This chapter summarises the methodology and findings of model demand outputs and calculations that have been undertaken during this study.

A.2 Methodology

A.2.1 Demand Calculations and Analysis

Analysis of demand along the A120 corridor has been done using Reference Case scenarios extant in the West Essex EMME model. Standard demand matrices have been constructed for public transport modes for these future years.

Proposed development household and employment square metreage, together with assumptions on trip rates and existing trip distributions within the model have informed the additional trip numbers and zone-pairings. Calculations have been undertaken using the sector system described below.

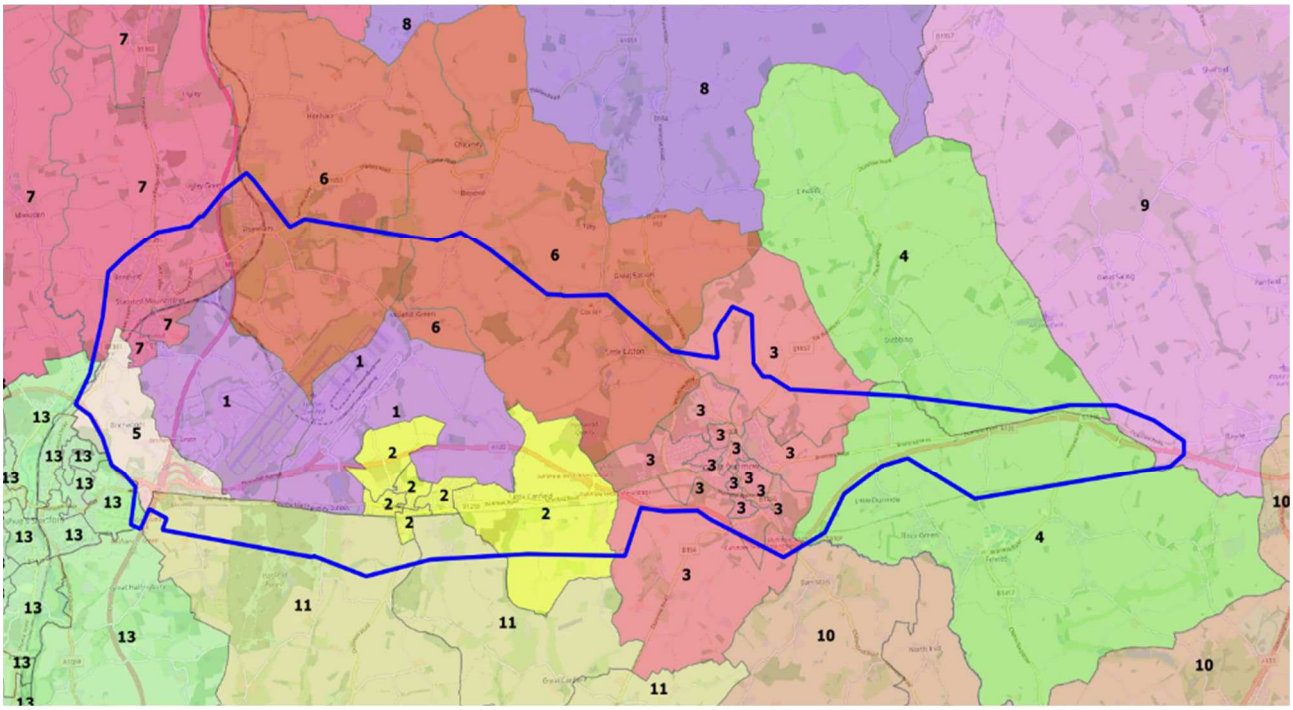
A.2.2 Input Data

The inputs to the demand analysis are listed below:

1. Bus demand matrices for each of the three time periods (AM peak, inter-peak and PM peak) for the base year.
2. Rail demand matrices for each of the three time periods, for the base and future years.
3. Sector definition, as defined and mapped in the subsection below.
4. Development household numbers, divided between the model zones.
5. Employment land area in square metres, divided between the model zones.
6. Trip rates per household per hour, as gained from TRICS data, used in the analysis of developments elsewhere in Essex.

A.2.3 Sectors

The West Essex model contains nearly 600 zones, and these are collapsed into 25 sectors for ease of calculation and analysis. Six of these sectors contain parts of the Study Area. The figure below shows the sector system in the vicinity of the Study Area (bordered in blue in the figure):



Model Sectors

The sector system has been devised to cleanly encompass the larger built-up areas in this part of the Essex, with sufficient disaggregation in the Study Area to capture the various east-west movements along the corridor. The rest of the county and neighbouring London contains larger zones, with the wider country divided into broader regions.

The table below shows the number of households, and the square metreage of employment in each of the four sectors of the Study Area containing proposed developments.

Dwellings and Employment Area by Sector

Sector	Housing	Emp. (Sq/m)
1	0	43,445
2	2,205	6,557
3	2184	107,500
Total	5,189	157,502

A.2.4 Future Year Demand

Construction of the initial future year demand figures, to which the development-derived figures would be added, relied on summing together the available future year matrices initially segregated by mode. Since there were only base bus figures, these were used for both base and future matrices, thus:

Future Year PT matrices (without developments) = Base Year Bus matrices + Future Year Rail matrices

These demand matrices contain all of the assumed future year trips, by public transport, between each of the zones in the West Essex model. The number of trips emanating and destined for all of those zones in which proposed developments lie can be output. The impact of additional developments and jobs can therefore be found by applying factors to a sub-set of these zones.

A.2.5 Revised Development Scenarios Trip Rates

In order to find the number of trips that should be added to the standard future year demand matrices, the number of households and the area of employment have to be converted into trips.

Trips generated by the development in the peaks for workers working outside of development areas, and for predominantly leisure and other trips in the inter-peak, are generated using TRICS values as used in the Tendring-Colchester Borders Garden City (TCBGC) project. All rates are stated in trips per dwelling (household) per hour. The trip rates used are the non-development trips of that project, since the car-ownership policy related to that development may differ from that assumed on the A120 corridor.

Revised Development Scenarios Trip rates for households within developments

Initial trip-rates used for arrivals and departures from the TCBGC are shown below – these are combined and amended to make the trip rates assumed for the A120 corridor:

Initial departure trip rates taken from TCBGC

Departures	Non Dev	Dev
AM-Car	0.275	0.208
AM-Bus	0.017	0.013
AM-Rail	0.005	0.004
IP-Car	0.151	0.114
IP-Bus	0.006	0.005
IP-Rail	0.001	0.001
PM-Car	0.159	0.12
PM-Bus	0.003	0.002
PM-Rail	0.001	0.001

Initial arrival trip rates from TCBGC

Arrivals	Non Dev	Dev
AM-Car	0.117	0.088
AM-Bus	0.002	0.002
AM-Rail	0	0
IP-Car	0.155	0.117
IP-Bus	0.008	0.006
IP-Rail	0.001	0.001
PM-Car	0.293	0.221
PM-Bus	0.015	0.011
PM-Rail	0.005	0.004

Two scenarios have been considered:

1. Lower = Non-development TCBGC values are assumed, without further amendment.
2. Upper = Non-development TCBGC values are adjusted so that one-third of the car trip rate is assumed to shift to using bus. Given the high initial car trip-rate and the very low initial bus trip-rate, this marks a transformational shift in bus mode share, albeit applied to low initial figures.

Public transport trip rates are simply the sum of the bus and rail trip rates. The trip rates per dwelling per hour by time period and direction for the Lower and Upper scenarios are shown below:

PT Trip Rates

Public Transport	Lower	Upper
AM Origins	0.022	0.114
AM Destinations	0.002	0.041
IP Origins	0.007	0.057

IP Destinations	0.009	0.061
PM Origins	0.004	0.057
PM Destinations	0.020	0.118

The "contra-peak" trip rates are set to zero, since the rates above are meant to apply specifically to those living in the developments. Therefore in-commuting in the morning peak and out-commuting in the evening peak is a function rather of the areas provided for employment.

The effect of transferring part of the car trip rate to the bus trip rate is very significant, with some segments increasing ten-fold. This is a function of the very high proportion of trips assumed to be made by car in this region. The possibility remains that even the Upper scenario is conservative, given that transformational changes to public transport infrastructure between developments could affect a still starker mode shift, lessening the dominance of cars.

The full origin-destination tables are as follows.

PT Future Year: AM average hour

			Destination																														
			Other	Stansted Airport	Takeley	Great Dunmow	Little Dunmow and Stebbing	Birchanger	Elsenham and Great Easton	Saffron Walden and Newport	Thaxted and Hempstead	Halstead and Great Yeldham	Braintree and Great Waltham	Harlow and Hatfield Heath	East Essex	Hertford and Royston	Beds and East Bucks	East Herts and Epping	South Essex	London	Home Counties South	West Country and Home Counties	Wales and West Midlands	Suffolk	Norfolk and The Wash	East Midlands and Lincs	North of England	Scotland	Study Area	Total
Origin	Other		0	5	1	0	0	0	0	2	1	0	0	4	2	11	2	45	10	654	2	2	2	0	0	4	2	0		750
	Stansted Airport		0	6	3	2	0	0	2	3	0	0	0	11	2	5	1	10	3	156	4	2	1	1	2	12	2	0	14	229
	Takeley		0	8	1	6	0	0	1	0	0	0	0	10	1	1	1	4	2	124	1	1	1	0	1	6	0	0	16	170
	Great Dunmow		0	16	7	15	0	0	9	0	0	2	1	8	2	1	0	6	3	186	0	1	0	0	0	10	0	0	47	269
	Little Dunmow and Stebbing		0	0	0	5	9	0	0	5	2	1	11	0	9	0	1	2	11	136	0	1	0	0	0	2	1	0	15	196
	Birchanger		0	1	0	0	0	0	0	1	1	0	0	2	0	1	0	0	0	22	0	0	0	0	0	1	0	0	2	32
	Elsenham and Great Easton		0	12	0	4	0	0	5	3	0	0	0	11	2	7	0	4	1	189	2	1	0	0	0	5	1	0	21	249
	Saffron Walden and Newport		0	16	1	2	2	1	7	189	10	1	1	21	1	27	2	5	3	322	1	1	1	1	0	30	1	0		645
	Thaxted and Hempstead		0	1	0	0	1	0	0	31	9	1	0	1	0	0	0	1	3	94	1	0	0	1	0	4	0	0		149
	Halstead and Great Yeldham		0	1	0	15	2	0	1	6	2	116	88	2	40	0	0	9	35	165	1	0	0	0	0	1	0	0		485
	Braintree and Great Waltham		0	2	1	8	5	0	2	3	2	59	502	4	135	1	1	63	307	926	10	1	0	2	1	4	1	0		2,040
	Harlow and Hatfield Heath		0	90	11	8	0	2	3	18	2	0	2	803	3	36	5	92	23	707	3	1	1	0	1	12	2	0		1,825
	East Essex		0	10	3	8	10	0	6	2	2	20	169	8	3,210	2	8	131	630	1,795	30	11	4	21	21	6	6	0		6,113
	Hertford and Royston		1	11	1	1	0	2	6	16	1	0	0	49	1	13	73	36	2	2,896	8	10	3	1	1	72	8	0		3,214
	Beds and East Bucks		0	2	0	0	0	0	1	3	0	0	1	5	4	46	283	21	6	4,164	32	19	6	4	3	137	27	0		4,767
	East Herts and Epping		2	21	4	9	4	1	6	3	1	3	25	257	38	52	22	1,492	318	6,821	26	15	6	3	2	11	18	0		9,149
	South Essex		0	10	3	4	3	0	2	4	3	9	106	26	220	5	13	492	8,348	9,770	57	19	8	6	4	7	10	0		19,132
	London		29	291	81	35	15	4	114	62	27	17	119	177	310	401	1,015	1,479	1,301	26,741	775	204	89	92	103	680	659	28		34,849
	Home Counties South		0	11	3	0	0	0	3	1	1	1	4	4	17	8	27	27	47	1,934	2	10	12	5	5	34	42	1		2,199
	West Country and Home Counties West		0	5	2	0	0	0	2	1	0	0	1	2	6	4	12	9	11	299	10	0	0	2	3	15	11	0		396
	Wales and West Midlands		0	5	1	0	0	0	1	0	0	0	1	1	3	2	4	3	6	87	10	0	0	1	1	4	0	0		132
	Suffolk		0	5	1	0	0	0	1	1	1	0	3	2	41	3	7	4	15	416	10	4	1	6	2	183	4	0		712
	Norfolk and The Wash		0	4	1	0	0	0	1	1	1	0	1	1	40	1	6	3	6	292	7	4	2	2	0	66	6	0		444
	East Midlands and Lincs		0	25	6	4	1	1	8	9	3	0	1	10	4	26	122	10	6	2,074	38	17	5	21	13	99	10	1		2,513
	North of England		0	5	1	0	0	0	2	1	0	0	1	2	4	5	19	8	9	832	43	12	0	3	5	10	0	0		964
	Scotland		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	31	1	0	0	0	0	0	0	0		34
	Study Area only			42	13	33	10	1	17																				116	
	Total		34	560	133	128	54	13	185	367	70	232	1,039	1,420	4,094	659	1,625	3,957	11,106	61,836	1,075	335	143	173	170	1,414	802	32		91,657

Future Year + Development Scenario (Low PT Mode Share): AM average hour

		Destination																												
		Other	Stansted Airport	Takeley	Great Dunmow	Little Dunmow and Stebbing	Birchanger	Elsenham and Great Easton	Saffron Walden and Newport	Thaxted and Hempstead	Halstead and Great Yeldham	Braintree and Great Waltham	Harlow and Hatfield Heath	East Essex	Hertford and Royston	Beds and East Bucks	East Herts and Epping	South Essex	London	Home Counties South	West Country and Home Counties ...	Wales and West Midlands	Suffolk	Norfolk and The Wash	East Midlands and Lincs	North of England	Scotland	Study Area	Total
Origin	Other	0	6	1	0	0	0	0	2	1	0	0	4	2	11	2	45	10	654	2	2	2	0	0	4	2	0		751
	Stansted Airport	0	8	4	3	0	0	2	3	0	0	0	11	2	5	1	10	3	156	4	2	1	1	2	12	2	0	17	232
	Takeley	0	12	2	10	0	0	1	0	0	0	0	14	1	1	1	6	3	171	2	2	1	1	1	9	1	0	25	239
	Great Dunmow	0	25	11	28	1	0	14	1	0	5	4	12	4	1	0	11	6	297	1	1	0	0	0	13	1	0	79	437
	Little Dunmow and Stebbing	0	0	0	7	11	0	0	5	2	1	12	0	10	0	1	2	13	159	0	1	0	0	0	2	1	0	18	229
	Birchanger	0	2	0	0	0	0	0	1	1	0	0	2	0	1	0	0	0	22	0	0	0	0	0	1	0	0	3	33
	Elsenham and Great Easton	0	12	0	5	0	0	5	3	0	0	0	11	2	7	0	4	1	189	2	1	0	0	0	5	1	0	22	250
	Saffron Walden and Newport	0	23	1	2	2	1	7	189	10	1	1	21	1	27	2	5	3	322	1	1	1	1	0	30	1	0		653
	Thaxted and Hempstead	0	1	0	0	1	0	0	31	9	1	0	1	0	0	0	1	3	94	1	0	0	1	0	4	0	0		149
	Halstead and Great Yeldham	0	1	0	18	2	0	1	6	2	116	88	2	40	0	0	9	35	165	1	0	0	0	0	1	0	0		488
	Braintree and Great Waltham	0	2	1	9	5	0	2	3	2	59	502	4	135	1	1	63	307	926	10	1	0	2	1	4	1	0		2,041
	Harlow and Hatfield Heath	0	103	11	8	0	2	3	18	2	0	2	803	3	36	5	92	23	707	3	1	1	0	1	12	2	0		1,839
	East Essex	0	11	3	9	10	0	6	2	2	20	169	8	3,210	2	8	131	630	1,795	30	11	4	21	21	6	6	0		6,115
	Hertford and Royston	1	12	1	2	0	2	6	16	1	0	0	49	1	13	73	36	2	2,896	8	10	3	1	1	72	8	0		3,216
	Beds and East Bucks	0	2	0	0	0	0	1	3	0	0	1	5	4	46	283	21	6	4,164	32	19	6	4	3	137	27	0		4,767
	East Herts and Epping	2	23	4	11	4	1	6	3	1	3	25	257	38	52	22	1,492	318	6,821	26	15	6	3	2	11	8	0		9,153
	South Essex	0	11	3	4	3	0	2	4	3	9	106	26	220	5	13	492	8,348	9,770	57	19	8	6	4	7	10	0		19,133
	London	29	300	84	40	15	4	114	62	27	17	119	177	310	401	1,015	1,479	1,301	26,741	775	204	89	92	103	680	659	28		34,866
	Home Counties South	0	11	3	0	0	0	3	1	1	1	4	4	17	8	27	27	47	1,934	2	10	12	5	5	34	42	1		2,199
	West Country and Home Counties West	0	5	2	0	0	0	2	1	0	0	1	2	6	4	12	9	11	299	10	0	0	2	3	15	11	0		396
	Wales and West Midlands	0	5	1	0	0	0	1	0	0	0	1	1	3	2	4	3	6	87	10	0	0	1	1	4	0	0		133
	Suffolk	0	5	1	0	0	0	1	1	1	0	3	2	41	3	7	4	15	416	10	4	1	6	2	183	4	0		712
	Norfolk and The Wash	0	4	1	0	0	0	1	1	1	0	1	1	40	1	6	3	6	292	7	4	2	2	0	66	6	0		444
	East Midlands and Lincs	0	26	6	4	1	1	8	9	3	0	1	10	4	26	122	10	6	2,074	38	17	5	21	13	99	10	1		2,515
	North of England	0	5	2	0	0	0	2	1	0	0	1	2	4	5	19	8	9	832	43	12	0	3	5	10	0	0		964
	Scotland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	31	1	0	0	0	0	0	0	0		34
	Study Area only		59	18	52	12	1	22																				164	
	Total	34	614	142	161	56	13	190	368	70	235	1,043	1,428	4,098	660	1,626	3,965	11,111	62,017	1,077	336	143	174	171	1,420	803	32		91,987

Future Year + Development Scenario (High PT Mode Share): AM average hour

		Destination																												
		Other	Stansted Airport	Takeley	Great Dunmow	Little Dunmow and Stebbing	Birchanger	Elsenham and Great Easton	Saffron Walden and Newport	Thaxted and Hempstead	Halstead and Great Yeldham	Braintree and Great Waltham	Harlow and Hatfield Heath	East Essex	Hertford and Royston	Beds and East Bucks	East Herts and Epping	South Essex	London	Home Counties South	West Country and Home Counties West	Wales and West Midlands	Suffolk	Norfolk and The Wash	East Midlands and Lincs	North of England	Scotland	Study Area	Total
Origin	Other	0	9	1	0	0	0	0	2	1	0	0	4	2	11	2	45	10	654	2	2	2	0	0	4	2	0		754
	Stansted Airport	0	16	4	4	0	0	2	3	0	0	0	11	2	5	1	10	3	156	4	2	1	1	2	12	2	0	27	242
	Takeley	0	37	5	34	0	1	2	1	0	0	0	30	2	3	2	15	7	369	5	4	2	2	3	19	2	0	78	544
	Great Dunmow	0	78	31	111	2	0	35	1	0	17	13	28	10	2	1	32	16	759	3	4	1	1	1	27	4	1	257	1,179
	Little Dunmow and Stebbing	0	0	0	11	19	0	0	7	3	2	19	0	17	0	1	4	22	254	1	1	0	0	0	3	2	0	30	367
	Birchanger	0	5	0	0	0	0	0	1	1	0	0	2	0	1	0	0	0	22	0	0	0	0	0	1	0	0	6	36
	Elsenham and Great Easton	0	14	0	7	0	0	5	3	0	0	0	11	2	7	0	4	1	189	2	1	0	0	0	5	1	0	26	254
	Saffron Walden and Newport	0	51	1	4	2	1	7	189	10	1	1	21	1	27	2	5	3	322	1	1	1	1	0	30	1	0		683
	Thaxted and Hempstead	0	1	0	0	1	0	0	31	9	1	0	1	0	0	0	1	3	94	1	0	0	1	0	4	0	0		149
	Halstead and Great Yeldham	0	1	1	32	2	0	1	6	2	116	88	2	40	0	0	9	35	165	1	0	0	0	0	1	0	0		503
	Braintree and Great Waltham	0	4	1	12	5	0	2	3	2	59	502	4	135	1	1	63	307	926	10	1	0	2	1	4	1	0		2,046
	Harlow and Hatfield Heath	0	156	13	11	0	2	3	18	2	0	2	803	3	36	5	92	23	707	3	1	1	0	1	12	2	0		1,897
	East Essex	0	13	3	15	10	0	6	2	2	20	169	8	3,210	2	8	131	630	1,795	30	11	4	21	21	6	6	0		6,123
	Hertford and Royston	1	17	1	3	0	2	6	16	1	0	0	49	1	13	73	36	2	2,896	8	10	3	1	1	72	8	0		3,222
	Beds and East Bucks	0	3	0	1	0	0	1	3	0	0	1	5	4	46	283	21	6	4,164	32	19	6	4	3	137	27	0		4,769
	East Herts and Epping	2	30	4	18	4	1	6	3	1	3	25	57	38	52	22	1,492	318	6,821	26	15	6	3	2	11	18	0		9,169
	South Essex	0	16	3	4	3	0	2	4	3	9	106	26	220	5	13	492	8,348	9,770	57	19	8	6	4	7	10	0		19,139
	London	29	337	96	61	15	4	114	62	27	17	119	177	310	401	1,015	1,479	1,301	26,741	775	204	89	92	103	680	659	28		34,936
	Home Counties South	0	12	3	1	0	0	3	1	1	1	4	4	17	8	27	27	47	1,934	2	10	12	5	5	34	42	1		2,201
	West Country and Home Counties West	0	5	2	0	0	0	2	1	0	0	1	2	6	4	12	9	11	299	10	0	0	2	3	15	11	0		396
	Wales and West Midlands	0	5	1	1	0	0	1	0	0	0	1	1	3	2	4	3	6	87	10	0	0	1	1	4	0	0		133
	Suffolk	0	6	1	0	0	0	1	1	1	0	3	2	41	3	7	4	15	416	10	4	1	6	2	183	4	0		713
	Norfolk and The Wash	0	5	1	0	0	0	1	1	1	0	1	1	40	1	6	3	6	292	7	4	2	2	0	66	6	0		445
	East Midlands and Lincs	0	30	7	7	1	1	8	9	3	0	1	10	4	26	122	10	6	2,074	38	17	5	21	13	99	10	1		2,522
	North of England	0	6	2	0	0	0	2	1	0	0	1	2	4	5	19	8	9	832	43	12	0	3	5	10	0	0		965
	Scotland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	31	1	0	0	0	0	0	0	0		34
	Study Area only		151	41	167	20	1	44																				425	
	Total	34	8,588	1,844	3,399	644	133	2,122	3,711	711	2,447	1,060	1,461	4,112	663	1,628	3,996	11,133	62,772	1,082	340	1,445	176	173	1,445	808	333		93,422

Appendix B. UDC South Area Strategy Mobility Hub Assessment – Standard Hub

		INPUT				Standard Hub
Current Infrastructure						
Categories	Components	Exists or not	Additional comments		RTS	Not Required
Mobility Components	RTS	No			Bus	Meets Requirement
	Bus	Yes			Rail	Not Required
	Rail	No			D-DRT	Not Required
	D-DRT	No	desirable at community hub		Community Transport	Does Not Meet Requirement
	Community Transport	No			Taxis	Meets Recommendation
	Taxis	Yes	essential at basic & community hub	Mobility Components	Car clubs	Requires 2 Shared Mobility Features
	Car clubs	No			Bike share	Requires 2 Shared Mobility Features
	Bike share	No			Cargo bike share	Requires 2 Shared Mobility Features
	Cargo bike share	No	essential at community hub		E-scooters	Requires 2 Shared Mobility Features
	E-scooters	No			Shopmobility	Requires 2 Shared Mobility Features
	Shopmobility	No			Pedestrian access	Meets Requirement
	Pedestrian access	Yes	required at all hubs		Cycle access	Meets Requirement
	Cycle access	Yes	required at all hubs	Place Components	EV bus charging/battery swap	Consider
Place Components	EV bus charging/battery swap	No			EV charging private vehicle	Not Required
	EV charging private vehicle	No			EV charging - car clubs (and parking space)	Consider
	EV charging - car clubs (and parking	No			D-DRT charging	Not Required
	D-DRT charging	No			Cycle parking	Does Not Meet Requirement
	Cycle parking	No			Docking staations	Consider
	Docking staations	No			Sheltered waiting area	Does Not Meet Requirement
	Sheltered waiting area	No			Bus stop flag pole and timetable case	Does Not Meet Requirement
	Bus stop flag pole and timetable case	No			Seating	Does Not Meet Requirement
	Seating	No			Real time information screen	Does Not Meet Requirement
	Real time information screen	No	required at all hubs		Wifi	Does Not Meet Requirement
	Wifi	No	required at all hubs		Phone charging	Does Not Meet Requirement
	Phone charging	No			Seating (benches)	Consider
	Seating (benches)	No			Toilets	Consider
	Toilets	No			Recycling bins	Consider
	Recycling bins	No			Water fountain	Consider
	Water fountain	No			Lighting	Does Not Meet Requirement
	Lighting	No			CCTV	Does Not Meet Requirement
	CCTV	No			Local information board	Consider
	Local information board	No			Digital Pillar	Consider
	Digital Pillar	No	required at all hubs		Virtual Help Point	Consider
	Virtual Help Point	No		Demand Components	Personal storage lockers	Consider
Demand Components	Personal storage lockers	No			Cycle repair tools & pump	Consider
	Cycle repair tools & pump	No			Bike seat & trailer hire	Consider
	Bike seat & trailer hire	No			Package lockers	Consider
	Package lockers	No			Refreshments/ café / vending	Consider
	Refreshments/ café / vending machine	No			Other local services / amenities (e.g. Post Office, Banking, Dry Cleaners)	Consider
	Other local services / amenities (e.g. Post Office, Banking, Dry Cleaners)	No			Parking (Limited to P&R, P&C or essential disabled parking provision)	Consider
	Parking (Limited to P&R, P&C or essential disabled parking provision)	No			Parking (Limited to P&R, P&C or essential disabled parking provision)	Consider
	Parking (Limited to P&R, P&C or essential disabled parking provision)	No				

Appendix C. Great Dunmow Mobility Hub Assessment – Community Hub

		INPUT	
Current Infrastructure			
Categories	**Components**	**Exists or not**	**Additional comments**
Mobility Components	RTS	No	
	Bus	Yes	
	Rail	No	
	D-DRT	No	desirable at community hub
	Community Transport	No	
	Taxis	Yes	essential at basic & community hub
	Car clubs	No	
	Bike share	No	
	Cargo bike share	No	essential at community hub
	E-scooters	No	
	Shopmobility	No	
	Pedestrian access	No	required at all hubs
	Cycle access	Yes	required at all hubs
Place Components	EV bus charging/battery swap	No	
	EV charging private vehicle	No	
	EV charging - car clubs (and parking space)	No	
	D-DRT charging	No	
	Cycle parking	No	
	Docking staations	No	
	Sheltered waiting area	Yes	
	Bus stop flag pole and timetable case	Yes	
	Seating	Yes	
	Real time information screen	No	required at all hubs
	Wifi	No	required at all hubs
	Phone charging	No	
	Seating (benches)	Yes	
	Toilets	No	
	Recycling bins	No	
	Water fountain	No	
	Lighting	Yes	
	CCTV	No	
	Local information board	No	
	Digital Pillar	No	required at all hubs
	Virtual Help Point	No	
Demand Components	Personal storage lockers	No	
	Cycle repair tools & pump	No	
	Bike seat & trailer hire	No	
	Package lockers	No	
	Refreshments/ café / vending machine	No	
	Other local services / amenities (e.g. Post Office, Banking, Dry Cleaners)	No	
	Parking (Limited to P&R, P&C or essential disabled parking provision)	No	
	Parking (Limited to P&R, P&C or essential disabled parking provision)	No	

Mobility Components	RTS	Not Required
	Bus	Above Typology Specification
	Rail	Not Required
	D-DRT	Consider
	Community Transport	Does Not Meet Requirement
	Taxis	Meets Recommendation
	Car clubs	Requires 1 Shared Mobility Features
	Bike share	Requires 1 Shared Mobility Features
	Cargo bike share	Requires 1 Shared Mobility Features
	E-scooters	Requires 1 Shared Mobility Features
	Shopmobility	Requires 1 Shared Mobility Features
	Pedestrian access	Does Not Meet Requirement
	Cycle access	Meets Recommendation
Place Components	EV bus charging/battery swap	Not Required
	EV charging private vehicle	Does Not Meet Requirement
	EV charging - car clubs (and parking space)	Consider
	D-DRT charging	Consider
	Cycle parking	Consider
	Docking staations	Consider
	Sheltered waiting area	Meets Requirement
	Bus stop flag pole and timetable case	Meets Requirement
	Seating	Meets Requirement
	Real time information screen	Consider
	Wifi	Not Required
	Phone charging	Not Required
	Seating (benches)	Meets Requirement
	Toilets	Consider
	Recycling bins	Consider
	Water fountain	Consider
	Lighting	Meets Requirement
	CCTV	Does Not Meet Requirement
	Local information board	Does Not Meet Requirement
	Digital Pillar	Consider
	Virtual Help Point	Consider
Demand Components	Personal storage lockers	Consider
	Cycle repair tools & pump	Consider
	Bike seat & trailer hire	Consider
	Package lockers	Consider
	Refreshments/ café / vending machine	Not Required
	Other local services / amenities (e.g. Post Office, Banking, Dry Cleaners)	Consider
	Parking (Limited to P&R, P&C or essential disabled parking provision)	Not Required
	Parking (Limited to P&R, P&C or essential disabled parking provision)	Not Required

Appendix D. Takeley Allocation Mobility Hub Assessment – Community Hub

		INPUT				Community Hub
Current Infrastructure						
Categories	Components	Exists or not	Additional comments		RTS	Not Required
Mobility Components	RTS	No			Bus	Above Typology Specification
	Bus	Yes			Rail	Not Required
	Rail	No			D-DRT	Consider
	D-DRT	No	desirable at community hub		Community Transport	Does Not Meet Requirement
	Community Transport	No			Taxis	Meets Recommendation
	Taxis	Yes	essential at basic & community hub	Mobility Components	Car clubs	Requires 1 Shared Mobility Features
	Car clubs	No			Bike share	Requires 1 Shared Mobility Features
	Bike share	No			Cargo bike share	Requires 1 Shared Mobility Features
	Cargo bike share	No	essential at community hub		E-scooters	Requires 1 Shared Mobility Features
	E-scooters	No			Shopmobility	Requires 1 Shared Mobility Features
	Shopmobility	No			Pedestrian access	Does Not Meet Requirement
	Pedestrian access	No	required at all hubs		Cycle access	Consider
	Cycle access	No	required at all hubs	Place Components	EV bus charging/battery swap	Not Required
Place Components	EV bus charging/battery swap	No			EV charging private vehicle	Meets Requirement
	EV charging private vehicle	Yes			EV charging - car clubs (and parking space)	Consider
	EV charging - car clubs (and parking space)	No			D-DRT charging	Consider
	D-DRT charging	No			Cycle parking	Consider
	Cycle parking	No			Docking staations	Consider
	Docking staations	No			Sheltered waiting area	Does Not Meet Requirement
	Sheltered waiting area	No			Bus stop flag pole and timetable case	Does Not Meet Requirement
	Bus stop flag pole and timetable case	No			Seating	Does Not Meet Requirement
	Seating	No			Real time information screen	Consider
	Real time information screen	No	required at all hubs		Wifi	Not Required
	Wifi	No	required at all hubs		Phone charging	Not Required
	Phone charging	No			Seating (benches)	Does Not Meet Requirement
	Seating (benches)	No			Toilets	Consider
	Toilets	No			Recycling bins	Consider
	Recycling bins	No			Water fountain	Consider
	Water fountain	No			Lighting	Does Not Meet Requirement
	Lighting	No			CCTV	Does Not Meet Requirement
	CCTV	No			Local information board	Does Not Meet Requirement
	Local information board	No			Digital Pillar	Consider
	Digital Pillar	No	required at all hubs		Virtual Help Point	Consider
	Virtual Help Point	No		Demand Components	Personal storage lockers	Consider
Demand Components	Personal storage lockers	No			Cycle repair tools & pump	Consider
	Cycle repair tools & pump	No			Bike seat & trailer hire	Consider
	Bike seat & trailer hire	No			Package lockers	Consider
	Package lockers	No			Refreshments/ café / vending machine	Not Required
	Refreshments/ café / vending machine	No			Other local services / amenities (e.g. Post Office, Banking, Dry Cleaners)	Meets Recommendation
	Other local services / amenities (e.g. Post Office, Banking, Dry Cleaners)	Yes			Parking (Limited to P&R, P&C or essential disabled parking provision)	Not Required
	Parking (Limited to P&R, P&C or essential disabled parking provision)	No			Parking (Limited to P&R, P&C or essential disabled parking provision)	Not Required
	Parking (Limited to P&R, P&C or essential disabled parking provision)	No				

Appendix E. Takeley Allocation (Alternative) Mobility Hub Assessment – Community Hub

		INPUT	
Current Infrastructure			
Categories	Components	Exists or not	Additional comments
Mobility Components	RTS	No	
	Bus	Yes	
	Rail	No	
	D-DRT	No	desirable at community hub
	Community Transport	No	
	Taxis	Yes	essential at basic & community hub
	Car clubs	No	
	Bike share	No	
	Cargo bike share	No	essential at community hub
	E-scooters	No	
	Shopmobility	No	
	Pedestrian access	No	required at all hubs
	Cycle access	No	required at all hubs
Place Components	EV bus charging/battery swap	No	
	EV charging private vehicle	Yes	
	EV charging - car clubs (and parking space)	No	
	D-DRT charging	No	
	Cycle parking	No	
	Docking staations	No	
	Sheltered waiting area	No	
	Bus stop flag pole and timetable case	No	
	Seating	No	
	Real time information screen	No	required at all hubs
	Wifi	No	required at all hubs
	Phone charging	No	
	Seating (benches)	No	
	Toilets	No	
	Recycling bins	No	
	Water fountain	No	
	Lighting	No	
	CCTV	No	
	Local information board	No	
	Digital Pillar	No	required at all hubs
	Virtual Help Point	No	
Demand Components	Personal storage lockers	No	
	Cycle repair tools & pump	No	
	Bike seat & trailer hire	No	
	Package lockers	No	
	Refreshments/ café / vending machine	No	
	Other local services / amenities (e.g. Post Office, Banking, Dry Cleaners)	Yes	
	Parking (Limited to P&R, P&C or essential disabled parking provision)	No	
	Parking (Limited to P&R, P&C or essential disabled parking provision)	No	

Mobility Components	RTS	Not Required
	Bus	Above Typology Specification
	Rail	Not Required
	D-DRT	Consider
	Community Transport	Does Not Meet Requirement
	Taxis	Meets Recommendation
	Car clubs	Requires 1 Shared Mobility Features
	Bike share	Requires 1 Shared Mobility Features
	Cargo bike share	Requires 1 Shared Mobility Features
	E-scooters	Requires 1 Shared Mobility Features
	Shopmobility	Requires 1 Shared Mobility Features
	Pedestrian access	Does Not Meet Requirement
	Cycle access	Consider
Place Components	EV bus charging/battery swap	Not Required
	EV charging private vehicle	Meets Requirement
	EV charging - car clubs (and parking space)	Consider
	D-DRT charging	Consider
	Cycle parking	Consider
	Docking staations	Consider
	Sheltered waiting area	Does Not Meet Requirement
	Bus stop flag pole and timetable case	Does Not Meet Requirement
	Seating	Does Not Meet Requirement
	Real time information screen	Consider
	Wifi	Not Required
	Phone charging	Not Required
	Seating (benches)	Does Not Meet Requirement
	Toilets	Consider
	Recycling bins	Consider
	Water fountain	Consider
	Lighting	Does Not Meet Requirement
	CCTV	Does Not Meet Requirement
	Local information board	Does Not Meet Requirement
	Digital Pillar	Consider
	Virtual Help Point	Consider
Demand Components	Personal storage lockers	Consider
	Cycle repair tools & pump	Consider
	Bike seat & trailer hire	Consider
	Package lockers	Consider
	Refreshments/ café / vending machine	Not Required
	Other local services / amenities (e.g. Post Office, Banking, Dry Cleaners)	Meets Recommendation
	Parking (Limited to P&R, P&C or essential disabled parking provision)	Not Required
	Parking (Limited to P&R, P&C or essential disabled parking provision)	Not Required

Uttlesford District Council

Evidence for Biodiversity Net Gain

Regulation 19 Local Plan

Final report
Prepared by LUC
July 2024

Uttlesford District Council

Evidence for Biodiversity Net Gain
Regulation 19 Local Plan

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1.	Draft report	Heather Ennis Kirsten Williamson	Philip Smith	Philip Smith	26.06.2024
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Contents

Chapter 1
Introduction

Biodiversity Net Gain in Uttlesford District Council Local Plan Policy

1.1 Uttlesford District Council declared a climate and biodiversity emergency in late 2019 and is seeking to enhance the minimum level of biodiversity net gain of 10% and require 20% within Core Policy 40: Biodiversity and Nature Recovery of their Local Plan. This report sets out the evidence-base to support the requirement for a 20% biodiversity net gain. The minimum mandatory biodiversity net gain of 10% is considered the lowest level that would deliver meaningful biodiversity gains related to development sites.

Policy Context

Legislation and National Policy

1.2 The Government's 25 Year Environment Plan (2018) made a commitment to embed a "*net environmental gain*" requirement for development to support the delivery of environmental improvements. The Environmental Improvement Plan 2023 builds on the vision of the 25 Year Environment Plan and sets out a delivery plan for enhancing the environment and creating a thriving place for plants and wildlife. The plan identifies that the promotion of biodiversity net gain will help to deliver the Government's overarching goal, which is to support national nature recovery.

1.3 Schedule 14 of the Environment Act 2021 made provision for biodiversity gain to be required in relation to planning permission in England. The requirement for Biodiversity Net Gain is set out within Schedule 7A (Biodiversity Net Gain in England) of the Town and Country Planning Act 1990. The legislation has been updated through the Levelling Up and Regeneration Act 2023. Further support is provided for biodiversity net gain through the National Planning Policy Framework, most recently revised in 2024, through paragraph 180 part (d) which states that:

> *"planning policies and decisions should contribute to and enhance the natural and local environment by":*
>
> *"minimising impacts on and providing net gains for biodiversity, including by establishing coherent*

ecological networks that are more resilient to current and future pressures".

1.4 This is further supported within NPPF paragraph 185 part (b) which states that plans should "*identify and pursue opportunities for securing measurable net gains for biodiversity".*

1.5 The UK Government also published Planning Practice Guidance (PPG) in relation to Biodiversity Net Gain. The PPG provides further guidance on how biodiversity net gain should be applied. The PPG states that development should deliver *"at least a 10% increase in biodiversity value".* The PPG also states that:

"a policy which required a gain greater than 10% on an area wide basis or for an allocation may still be relevant as the statutory biodiversity gain objective is for **at least** a 10% gain."

1.6 Defra has indicated that 10% was the minimum biodiversity net gain below which biodiversity enhancements and habitat creation would have a negligible impact on biodiversity[1]. Ten percent Biodiversity Net Gain is a minimum requirement and not a cap. An increasing number of Local Planning Authorities are adopting local policies that require or encourage a percentage net gain higher than the mandatory 10%[2] in order to deliver necessary local nature recovery.

1.7 In 2023, Natural England produced a Green Infrastructure Framework which aims to help increase the amount of green cover to 40% in urban residential areas. Biodiversity net gain forms a key part of the framework by supporting the aim of increasing green cover in new developments. The framework sets out guidance for the development of green infrastructure in large scale developments, such as those that will be brought forward in the local plan[3]. This is complemented by the Council's own green infrastructure evidence base and strategy.

Regional Policy

1.8 The Lawton Review of England's Wildlife Sites and Ecological Networks (on which the principles of Biodiversity Net Gain are based) is often paraphrased as calling for important habitats to be 'bigger, better, more joined-up' and the Uttlesford Local Plan aims to support this ethos through relevant policies.

1.9 Uttlesford District Council falls within Essex County and therefore works closely with Essex County Council which is the Responsible Authority for delivering the Local Nature Recovery Strategy (LNRS) for Greater Essex and coordinating the Essex Local Nature Partnership. The Local Nature Partnership will publish the draft Local Nature Recovery Strategy for public consultation in 2024. This will identify areas that could provide the greatest benefit for nature and the wider environment and therefore support the implantation of 20% biodiversity net gain.

1.10 The Essex Planning Officers Association represents the 12 planning authorities in Essex. In collaboration with the Essex Local Nature Partnership, an Essex Biodiversity Net Gain Guidance Pack has been produced. The guidance pack provides details on delivery of biodiversity net gain including the use of the biodiversity metric and onsite and offsite net gain delivery.

1.11 The Essex Green Infrastructure Strategy was published in 2020 and provides a vision and objectives for the future delivery of green infrastructure in Essex. The vision of the strategy is:

"We will protect, develop and enhance a high quality connected green infrastructure network that extends from our city and town centres, and urban areas to the countryside and coast and which is self-sustaining and is designed for people and wildlife".

1.12 One of the proposals within the strategy is embedding the environmental net gain principle for development. The strategy is supportive of the application of biodiversity net gain to secure multi-functional green spaces.

Uttlesford Local Plan Policy

1.13 The Uttlesford Local Plan 2021 – 2041 is under preparation and will form part of the statutory development plan for the district, providing the basis for all planning decisions. Relevant policies within the Draft Uttlesford Local Plan 2021 – 2041 (Regulation 19) include:

- **Core Policy 38:** The Natural Environment covers the protection and enhancement of designated sites.
- **Core Policy 39**: Green and Blue Infrastructure requires development to adopt an approach that is environment and landscape-led so as to maximise the benefit of GBI for people and nature.
- **Core Policy 40:** Biodiversity covers the conservation and enhancement of habitats, species and sites including the promotion of connections outside the site boundary. It also outlines requirements for BNG.

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/839610/net-gain-ia.pdf
[2] https://www.wcl.org.uk/biodiversity-net-gain-can-be-more-than-glorified-offsetting-scheme.asp
[3] https://designatedsites.naturalengland.org.uk/GreenInfrastructure/GISTandards.aspx

- **Core Policy 41:** Landscape character covers the preservation of the character and appearance of the landscape, ancient landscapes and geological sites.

1.14 The Draft Uttlesford Local Plan 2021 – 2041 (Regulation 18) also contains a number of area-specific policies for North Uttlesford, South Uttlesford, Thaxted and the district's rural areas.

Green and Blue Infrastructure Study

1.15 LUC was commissioned in 2023 to prepare a Green and Blue Infrastructure (GBI) Strategy in support of the Uttlesford Local Plan.

1.16 The strategy forms the basis for a subsequent GBI delivery plan which will be additionally informed by the outcomes of the Local Plan consultation and further targeted consultation on the identified GBI opportunities.

1.17 The strategy set the context for GBI within Uttlesford and provided a framework for different geographic locations within the district, under the following vision:

Vision for the GBI Strategy

- The unique historic and landscape character of Uttlesford and the high-quality of life the district offers to local communities will be enhanced and protected from the effects of climate change and ecological decline through a strategic and well-planned approach to the provision of high quality GBI which is attractive, well managed, resilient, multi-functional and designed to be meet the needs of a growing and ageing population.
- Areas lacking in biodiversity and recreational opportunities (including attractive routes for walking and cycling) and areas that are anticipated to be hardest hit by the effects of climate change (such as increased flood risk) will be prioritised for new GBI.
- Pressures on existing GBI assets will be relieved through better management and by improving movement through the district and access to alternative spaces.
- GBI will support the integration of new development into the landscape, minimising its visual impacts while maximising the opportunities for outdoor recreation and for people to connect with nature.

Implementing BNG above 10%

1.18 The implementation of BNG as a mandatory requirement is relatively recent and so local plan policy and implementation across the country are at a fairly early stage. As discussed elsewhere in this paper, the Defra LNRS impact assessment in relation to biodiversity net gain sets out that there is little additional financial increase compared to the cost of providing 10% and 20% biodiversity net gain on individual development sites. A number of counties have considered the implementation of BNG at a level greater than 10%, and examples from the south east of England are summarised below.

Essex

1.19 The planning authorities and environmental organisations in Essex are at an early stage of preparation of their plans and strategies in relation to the implementation of BNG. The publication of the LNRS at the end of 2024, with its associated evidence base, will provide support for development of the market for offsite BNG, and the framework for individual developments to contribute to wider, landscape level improvements in biodiversity.

Greater Cambridge

1.20 The Greater Cambridge 'First Proposals' Local Plan (Regulation 18: Preferred Options)[4] includes a proposed policy that will require development to achieve a minimum 20% biodiversity net gain.

1.21 The requirement for 20% BNG was considered in the 'Greater Cambridge Green Infrastructure Opportunity Mapping – Part 2 Recommendations Report' [5] prepared by LUC on behalf of South Cambridgeshire District Council and Cambridge City Council in September 2021. This set out that due to the landscape of much of Cambridgeshire – largely planned countryside – the area of land within Greater Cambridge that is protected and managed for nature is relatively small compared to other areas of the county, resulting in less protection for habitats and wildlife and fewer opportunities for communities to interact with nature. It also means that there is a greater need to repair that loss and restore biodiversity across the area, where possible, through the planning and development process.

Kent

1.22 Kent County Council prepared a viability assessment for BNG in 2022 [6] which concluded that the biggest cost for delivering BNG was from 0% to 10%. Subsequent increases in requirements for BNG to 15% or 20% did not make a

[4] https://consultations.greatercambridgeplanning.org/greater-cambridge-local-plan-preferred-options/supporting-documents

[5] https://consultations.greatercambridgeplanning.org/sites/gcp/files/2021-09/GREATE~3_0.PDF

[6] https://kentnature.org.uk/wp-content/uploads/2022/07/Viability-Assessment-of-Biodiversity-Net-Gain-in-Kent-June-2022.pdf

significant difference to cost, and as the cost of BNG is relatively low, no site within the assessment was considered to be unviable because of increased requirements in relation to BNG.

Surrey (Guildford Borough Council)

1.23 The Surrey Nature Partnership put forward a case for 20% BNG. The paper was concise and provides brief details on biodiversity loss and natural capital. Guildford Borough Council included BNG within their overall Local plan and CIL viability assessment that was submitted for examination. They also commissioned additional studies looking at three developments and how 20% BNG would be dealt with.

1.24 The inspector was satisfied that 20% BNG was viable. However, added the below caveat to the policy within the Local plan: "In the event BNG not viable, requirement will drop from 20% to 10%".

Local Plans with a requirement for greater than 10% BNG

1.25 Through a series of Freedom of Information requests, Wildlife and Countryside Link prepared a paper in February 2024[7], which sets out which local planning authorities have adopted planning policies that require greater than 10% BNG, or are in the process of consulting on local plans within requirements for BNG above the mandatory requirement. The paper noted that of all local planning authorities (more than 300):

- 20 local authorities have emerging BNG policies above 10%, ranging up to 30% for Kingston Upon Thames and Tower Hamlets.
- A further 6 local authorities are seriously considering BNG policies above 10% and plan to explore this in consultations.
- 24 local authorities had adopted a target of around 10% BNG prior to it becoming mandatory

1.26 The south east of England had the most ambitious BNG policies as:

- All councils that have adopted local plan policies for BNG have set the threshold above 10%; and
- 77% of the local authorities in England that are considering implementation of BNG policies above the statutory minimum are within the south east.

1.27 Other than Uttlesford District Council, the following local planning authorities were identified as having BNG policies with a requirement greater than 10% within draft local plans:

- Birmingham City Council
- Canterbury City Council
- Cherwell District Council
- East Devon District Council
- Elmbridge Borough Council
- Mole Valley District Council
- Mid Sussex District Council
- London Borough of Ealing
- London Borough of Tower Hamlets
- London Borough of Richmond upon Thames
- Sevenoaks District Council
- Sheffield City Council
- South Oxfordshire and Vale of the White Horse Council
- Surrey Heath Borough Council
- Swale Borough Council
- Royal Borough of Kingston Upon Thames
- West Oxfordshire District Council
- Wiltshire Council

7 https://www.wcl.org.uk/docs/Biodiversity_Net_Gain_progress_report_7.2.2024.pdf

Chapter 2
Uttlesford's Biodiversity

Uttlesford is a predominantly rural, agricultural district. It contains areas rich in biodiversity, but also areas where biodiversity is significantly depleted.

2.1 There are no Habitats Sites within the District[8] However, there are several nationally and locally designated sites which are important for biodiversity. These include 14 nationally designated sites, including 12 Sites of Special Scientific Interest (SSSIs), two National Nature Reserves (NNRs) and 282 Local Wildlife Sites. The majority of these designations aim to protect small pockets of remaining Ancient Woodland, now degraded through fragmented within an arable landscape.

2.2 Hatfield Forest is the largest remaining tract of woodland within Uttlesford comprising over 403 ha with a mix of deciduous Ancient Woodland, Wood Pasture and Parkland. It is designated as a Site of Specific Scientific Interest (SSSI) and a National Nature Reserve (NNR). A smaller area of Ancient Woodland in the north-west of the district at Hales Wood is also designated as a NNR.

2.3 Uttlesford District is crossed by a network of Chalk Stream habitats which are both globally and nationally rare. These include the River Cam, River Stort, Wicken Water, Fulfen Slade and Debden Water SSSI. All of these watercourses should support high levels of biodiversity but are currently in suboptimal ecological condition..

2.4 Most of Uttlesford District is classified, according to UK Centre for Ecology & Hydrology Land Cover Maps, as being of arable land cover[9]. Other main land cover categories within the district, though in much smaller proportions, are woodland, improved grassland, suburban and urban. Uttlesford is considered to have a relatively large potential for increasing

[8] These sites (Special Protected Areas, Special Areas of Conservation, and Ramsar sites) were sites previously protected through international and European legislation, and now form part of the National Sites Network. Department for Environment, Food and Rural Affairs, Natural England, Welsh Government and Natural Resources Wales (2021) Habitats regulations assessments: protecting a European site [online]

[9] https://www.ceh.ac.uk/data/ukceh-land-cover-maps

biodiversity, due to low baseline levels relative to districts of similar size and population density (Tables A.1 to A.3)[10].

2.5 Across England and within Uttlesford District there has been a significant decline in species numbers and habitat loss. Habitats across the UK have suffered degradation over the last fifty years. England has seen that abundance of wildlife decrease by more the 30% since 1970. The 2023 State of Nature Report found that 16% of England's species are under threat of extinction. Across the UK, 151 species have already become extinct. Since the1970s more than half of our flowering plants, mosses and their relatives have been lost from areas where they used to thrive. Habitats across the UK have suffered degradation over the last fifty years. England has seen the abundance of wildlife decrease by more the 30% since 1970.

Uttlesford Habitat degradation

2.6 Uttlesford district has followed the national pattern of decline and Uttlesford District Council declared an ecological emergency in 2019. This committed the Council to protecting and enhancing local biodiversity. Additional information is contained within the tables in Appendix A.

2.7 Uttlesford's biodiversity degradation includes:

Hedgerow loss

2.8 Comparison of modern-day satellite maps[11] with online historical maps[12] shows that since 1940, Uttlesford District has lost approximately 112km of hedgerow[13]. Assuming a uniform width of 2m and moderate condition, this is the equivalent of approximately 968 Hedgerow Units as defined by the Statutory Hedgerow Metric for BNG[14].

Hedgerow carbon sequestration loss

2.9 By applying protocols for modelling hedgerow carbon sequestration potential developed by the University of Leeds, this historical loss of healthy hedgerow habitat alone represents an estimated loss of the potential to sequester up to approximately 4,246,016 Mg C over this period[15][16].

Wildflower meadow loss

2.10 Essex has identified Protected Roadside Verges as a nationally unique category of Local Wildlife Sites (LoWS)[17]. These LoWS are the last remaining remnants of the wildflower meadows and species-rich grasslands, often on chalky soils, that were once common on in the district. The highest spatial density of these protected verges is in Uttlesford District (Appendix A). These are biodiverse habitats and provide a snapshot of the biodiverse habitats that were common across the district in the recent past and the extent of biodiversity decline experienced in Uttlesford through recent intensive arable farming practices. Species recorded in these unique LoWS designations can be considered lost across current arable monoculture biodiversity desert landscapes that dominate the district (Appendix A).

Bird population declines and extinctions

2.11 Recent decades have seen steep declines in bird populations in Uttlesford according to local expert groups[18]. Many of these species were once present in Uttlesford's now lost woodland, hedgerow and non-intensively farmed arable landscapes.

Butterfly population declines and extinctions

2.12 Causes of butterfly species decline, described by local expert groups[19], are multi-factoral and include woodland, hedgerow, species-rich grassland and chalk meadow loss as well as climate change.

Moth population declines and extinctions

2.13 Local experts[20] advise that populations have seen precipitous declines in recent decades, due to the loss of flower-rich meadows, increased use of herbicides and pesticides, hedge removal and excessive cutting, and ditch clearance. The district has suffered 148 species extinctions (110 micro moths and 38 macro moths) equalling approximately 8% of the total number of species recorded on the Essex Moth Species List, which includes over 1,950 species (Appendix A).

Bat populations

2.14 All UK bats depend on small insects as prey and have been impacted by the large number of extinctions seen in local moth populations caused by modern intensive arable farming practices. Local records show that 10 of the 17 bat species present in the UK have been recorded in Uttlesford[21]. There is

[10] https://nbnatlas.org/
[11] https://magic.defra.gov.uk/maintenance.html
[12] https://maps.nls.uk/geo/explore/side-by-side
[13] Paul Dooley, Uttlesford District Council study
[14] https://www.gov.uk/guidance/biodiversity-metric-calculate-the-biodiversity-net-gain-of-a-project-or-development
[15] Biffi, S., et al. 307 (2022) *Journal of Environmental Management*, 114484.
[16] Biffi, S., et al. 892 (2023) *Science of The Total Environment*, 164482.
[17] Special Roadside Verges https://www.essexwtrecords.org.uk/SRVs
[18] *Pers comms* Neil Harvey – Natural Environment Manager, Place Services, Essex County Council based on The Birds of Essex by Simon Wood and Annual Essex Bird Reports
[19] Pers comms Rob Smith – Butterfly recorder for Essex Butterly Conservation, Cambridgeshire & Essex Branch based on The Butterflies of Essex by David Corke
[20] Pers comms, Simon Wood – Chair, Essex Moth Identification Verification Committee
[21] Essex Field Club https://www.essexfieldclub.org.uk/portal.php

scope to improve habitat for bats within Uttlesford, although some species will remain absent or in low numbers as they prefer habitat that is more prevalent elsewhere in the country.

River habitats

2.15 Uttlesford can accommodate the proposed level of development in relation to the water environment by adhering to the recommendations for watercourse protection and enhancement through re-naturalisation set out in the Local Plan.

2.16 Research by the University of Essex has determined that Uttlesford's rivers are more degraded than the average water body in England and that its Chalk Rivers are more degraded than other English Chalk Rivers. None of Uttlesford's watercourses has been assessed recently by the Environment Agency as being in 'good' ecological condition[22].

2.17 Research by the University of Essex has determined that the Chalk Rivers/Streams within Uttlesford have characteristics that are unique for this habitat, including as headwaters with higher elevations and higher gradients, and greater proximity to higher levels of population density[23] thereby increasing their national and global rarity and strengthening their designation as Habitats of Principal Importance

2.18 Agriculture and rural land management are stated by the Environment Agency as Reasons for Not Achieving Good (RNAG) ecological condition for Chalk Stream habitat within Uttlesford including through physical modifications and changes to the natural flow and level of water.

[22]Defra River Catchment Data Explorer https://environment.data.gov.uk/catchment-planning/v/c3-plan

[23] Wilkes, M Uttlesford District Council River Environments, Report to Uttlesford District Council 9th May 2024

Chapter 3
Delivering Biodiversity Net Gain in Uttlesford

This chapter considers the case for increasing the requirement for net-gain from 10% to 20%.

3.1 While a 10% biodiversity net gain is mandatory for new developments, Uttlesford District Council is proposing a requirement for a 20% biodiversity net gain to reduce biodiversity loss and support the Nature Recovery Network. Following declaring an ecological crisis, the Council asserts that a 20% biodiversity net gain will provide more opportunity to support the creation of new habitats for wildlife and help to support increased tree cover as part of new development.

3.2 Implementation of 20% biodiversity net gain will be an integral part of delivering housing and employment growth across Uttlesford, compensating for the impacts of development on the natural environment and historic biodiversity loss.

3.3 As well as targeting biodiversity loss, a 20% Biodiversity Net Gain requirement can provide social benefits as part of the creation of multi-functional green space where appropriate. Requiring a higher level of biodiversity net gain can thereby promote health and wellbeing by providing more greenspaces and opportunities for residents to connect with nature. Biodiversity net gain can be used to enhance areas of existing green infrastructure and support the natural resilience of Uttlesford's small towns and settlements.

3.4 Expanding, enhancing and connecting existing sites designated for nature is a stated aim of the Uttlesford Local Plan. A key tool for delivery is through off-site Biodiversity Net Gain. Requiring 20% Biodiversity Net Gain will help to support nature recovery within these designated sites.

3.5 Requiring 20% Biodiversity Net Gain will also help the Council to meet its climate targets, provide shade and natural cooling. Increasing biodiversity and green cover will support the use of nature-based solutions to mitigate and adapt to climate change.

Assessing the potential impact on agriculture within Uttlesford

3.6 Uttlesford is predominately a rural district, with an estimated 80% (513km^2) of the land currently being used as intensively farmed arable land[24]. Therefore, there are many opportunities for promoting sustainable farming methods to ensure food security while enhancing local ecosystems and wildlife habitats.

3.7 Improvements to biodiversity, including the water environment, can be achieved through improved agricultural practices and rural land management. The UK Government, Welsh government, Farming Advisory Service (FAS Scotland), and other farming bodies, within England, have identified that BNG can be a source of income for farmers through the creation and enhancement of habitats offered as Biodiversity Units.

3.8 Many arable farmers in the east of England are looking to share concerns about climate change (including the arrival of new pests and diseases), market volatility and agricultural labour shortages[25]. Leasing land to local habitat banks is an attractive option to diversify their income and there is huge potential for this in Uttlesford, using less productive land while retaining food production capacity[26].

3.9 Existing and emerging Farmer Clusters[27] in Uttlesford are keen to work together to deliver biodiversity gains through habitat creation, creating income streams through BNG wherever possible. Dr Simon Lyster, Chair of the Essex Local Nature Partnership is working with Farmer Clusters and Essex County Council to generate a sustainable source of off-site BNG units through arable farmland diversification. Essex County Council is in support of Uttlesford's requirement of 20% BNG and believes this to be a feasible approach[28].

3.10 Engagement with the farming community, through these existing networks, has the potential to generate significant capacity to deliver 20% BNG for current levels of development in Uttlesford[29][30]. The capacity for habitat creation in Uttlesford is so significant that it has the capacity not only to deliver 20% BNG within the district but to deliver off-site units for neighbouring districts with much higher population densities and less land availability. Such habitat creation would represent meaningful biodiversity gains, significant at a landscape scale in Uttlesford which has seen such radical biodiversity losses in recent decades.

3.11 The least productive land is often wet or prone to flooding and therefore not suitable either for food production or development and is ideal for wetland habitat creation through BNG delivery[31]. Such watercourse biodiversity units are likely to be of high ecological and economic value[32].

3.12 The potential for nature recovery through Farmer Clusters and similar agricultural networks is therefore significant.

Viability and deliverability

3.13 A Statutory Biodiversity Metric has been produced by Government as a way of measuring biodiversity value to help net gain requirements to be assessed and implemented. Biodiversity is measured in standardised biodiversity units by measuring the biodiversity value of habitats. Biodiversity Net Gain can be delivered onsite and offsite. The NPPF sets out a Biodiversity Net Gain hierarchy for delivery, requiring that onsite delivery should be the first priority.

3.14 The delivery of 20% biodiversity net gain requirement would be achieved as individual development sites come forward, through the development management process. Therefore, the developer or the landowner will likely take on the cost of biodiversity net gain as a development requirement.

3.15 Dixon Searle have undertaken a viability assessment of the draft Local Plan and have confirmed that the delivery of 20% biodiversity net gain would not significantly affect viability.

3.16 This reflects DEFRA's impact assessment in relation to the delivery of biodiversity net gain, which compared the costs of requiring a 20% biodiversity net gain instead of 10%. The assessment concluded that the cost of delivering 20% net gain is only 19% higher than delivering 10% net gain. This suggests that requiring the delivery of 20% net gain will not result in significant costs to the developer.

3.17 Where there is difficulty in providing BNG on-site, there will be opportunities to provide BNG off-site within Uttlesford and more widely in Essex in accordance with the NPPF hierarchy for BNG delivery. The market for off-site BNG within Essex is relatively new. The opportunities will increase as the market develops, and the Local Nature Recovery Strategy will

[24][24]UK Centre for Ecology & Hydrology Land Cover Maps https://www.ceh.ac.uk/data/ukceh-land-cover-maps
[25] UK Agricultural Finance : 4 factors affecting arable farmer in East Anglia https://www.ukagriculturalfinance.com/blog/arable-farming-finance-4-factors-affecting-farmers-in-east-anglia/#:~:text=Farmers%20in%20East%20Anglia%20are,to%20help%20manage%20price%20risk.
[26]Environment Bank Business Diversification https://environmentbank.com/habitat-bank-creation/
[27] Farmer Clusters https://www.farmerclusters.com/
[28] *Pers comms* Simon Lyster – Chair, Essex Local Nature Partnership
[29]Uttlesford District Council Local Plan https://www.uttlesford.gov.uk/article/4915/The-new-Local-Plan
[30] UK Centre for Ecology & Hydrology Land Cover Maps https://www.ceh.ac.uk/data/ukceh-land-cover-maps
[31] UK Centre for Ecology & Hydrology Land Cover Maps https://www.ceh.ac.uk/data/ukceh-land-cover-maps
[32] https://www.gov.uk/guidance/biodiversity-metric-calculate-the-biodiversity-net-gain-of-a-project-or-development

provide guidance to suitable sites to maximise BNG in relation to strategic priorities for nature.

3.18 The new Uttlesford Plan sets out a strategy for medium dispersed growth, and site allocations predominantly have a low to medium density, to align with existing settlement patterns and densities across the district. The level of density within these proposed developments should provide additional options for on-site BNG, above the mandatory 10%, with the potential for off-site delivery where this is not possible.

Biodiversity Net Gain in relation to Suitable Alternative Natural Greenspace (SANG)

3.19 Guidance from Natural England and the experience of The Land Trust[33] suggest that it is possible to provide BNG on sites that also need to contribute SANG. The following key issues need to be addressed to make sure that development adequately addresses the different requirements of SANG and BNG:

- Development must provide separate and distinct areas for SANG and BNG;
- Development must provide BNG on land designated as SANG, but the BNG must be additional to any SANG requirement i.e. SANG may require a level of grassland habitat, and BNG may be provided to further improve the quality of the grassland;
- Biodiversity Units in relation to protected species and habitats can only be used to demonstrate 'no net loss' and cannot be counted towards the 10% or higher net-gain; and
- Developers should be aware of the differences in requirements for management of SANG and BNG, including the legal requirements of maintenance and the timescales involved. SANG are required to be managed 'in perpetuity'.

3.20 SANG sites in Uttlesford have been identified to mitigate the impact of recreational development on Hatfield Forest. Discussions with Natural England in relation to initial evidence to support SANG within Uttlesford, indicate that there may be opportunities to provide BNG within the SANG sites. Given the above, it will be possible to deliver BNG at a level higher than 10% alongside SANG requirements, within Uttlesford.

[33] https://thelandtrust.org.uk/suitable-alternative-natural-greenspace-sang-and-biodiversity-net-gain-bng

Chapter 4
Conclusion

Conclusion and Recommendations

4.1 Uttlesford District's current biodiversity levels are far below those in other districts of similar size and population density (Tables A.1 to A3). Decades of intensive arable farming have seen significant habitat loss and degradation as well as species losses across a diverse range of flora and fauna. In some areas arable monocultural desert habitat with extensive hedge removal has replaced the previous landscape of species-rich woodland, grassland, meadow and river habitats, depleting both biodiversity and habitat connectivity.

4.2 The district therefore has enormous potential for nature recovery, through habitat regeneration and creation, with rapidly emerging and supportive Farmer Cluster networks and similar agricultural diversification instruments providing capacity to deliver significant biodiversity gains through BNG.

4.3 Uttlesford District Council is seeking to set a requirement for 20% biodiversity net gain within their Local Plan to help address loss in biodiversity and improve access to nature. The 20% biodiversity net gain target is considered deliverable and achievable within Uttlesford District, and should not affect the viability of new developments.

4.4 The unique combination of characteristics found within Uttlesford District, including low biodiversity levels, significant habitat losses and species extinctions and the practicable means for the delivery of significant biodiversity gain, represent a seminal opportunity to put Lawton's principles into practice through the requirement of 20% Biodiversity Net Gain.

Recommendation

4.5 As this report demonstrates, the low levels of biodiversity across many areas of the district, and the assessment of viability within the district, could allow for an increase in BNG of over 10%, and to at least 20%. The local plan should seek to provide 20% BNG within site allocations and new development, unless there are specific circumstances on site that would impact on the delivery of other local plan objectives, and would impact on the feasibility of development. There is no allowance within the legislation to delivery less than 10% BNG.

4.6 The Local Plan should include provision for the preparation of a technical advice note or supplementary planning document for BNG, to provide more guidance and certainty for development that comes forward within the lifetime of the local plan.

Appendix A

Local Environment Data

The tables below set out some of the key environmental information relating to Biodiversity Net-Gain in Uttlesford.

Table A.1 Relative size (species (spp.) Per km2) of Essex Districts – source National Biodiversity Network Atlas[34]

Rank	Essex District	Area km^2
1	**Uttlesford**	**641.2**
2	Braintree	611.7
3	Maldon	357.8
4	Epping Forest	339
5	Chelmsford	338.8
6	Tendring	336.3
7	Colchester	328.2
8	Rochford	167.1
9	Brentwood	153.1
10	Basildon	110
11	Castle Point	44.67
12	Harlow	30.54

Table A.2 Population density (species (spp.) Per km2) of Essex Districts – source National Biodiversity Network Atlas[35]

Rank	Essex District	Pop den km-2
1	Harlow	3058
2	Castle Point	2008
3	Basildon	1706
4	Colchester	586
5	Chelmsford	537

[34] https://nbnatlas.org/

[35] https://nbnatlas.org/

Rank	Essex District	Pop den km-2
6	Rochford	516
7	Brentwood	504
8	Tendring	443
9	Epping Forest	298
10	Braintree	224
11	Maldon	186
12	**Uttlesford**	**143**

Table A.3 Biodiversity (species (spp.) Per km2) of Essex Districts – source National Biodiversity Network Atlas[36]

Rank	Essex District	Biodiversity spp. km-2
1	Harlow	38.76
2	Castle Point	33.93
3	Basildon	23.10
4	Colchester	15.29
5	Epping Forest	15.18
6	Brentwood	13.52
7	Tendring	13.45
8	Chelmsford	10.98
9	Rochford	9.58
10	**Uttlesford**	**9.49**
11	Maldon	9.29
12	Braintree	6.74

Table A.4 Notable plant species listed in Uttlesford Protected Roadside Verge designations

Species	Common Name
Anacamptis pyramidalis	Pyramidal Orchid
Anthyllis vulneraria	Kidney Vetch
Astragalus glycyphyllos	Wild Liquorice
Blackstonia perfoliate	Yellow-wort

[36] https://nbnatlas.org/

Species	Common Name
Campanula glomerata	Clustered Bellflower
Campanula rotundifolia	Harebell
Campanula trachelium	Nettle-leaved Bellflower
Clinopodium calamintha	Lesser Calamint
Cruciata laevipes	Crosswort
Dactylorhiza fuchsii	Common Spotted Orchid
Erigeron acer	Blue Fleabane
Geranium pratense	Meadow Crane's-bill
Helianthemum nummularium	Rock-rose
Lamiastrum galeobdolon	Yellow Archangel
Lathyrus aphaca	Yellow Vetchling
Lathyrus sylvestris	Narrow-leaved Everlasting-pea
Linum perenne	Perennial Flax
Listera ovata	Twayblade Orchid
Melampyrum cristatum	Crested Cow-wheat
Ophyrys apifera	Bee Orchid
Orobanche minor	Common Broomrape
Salvia horminoides	Wild Clary
Succisa pratensis	Devil's-bit Scabious
Rhinanthus minor	Yellow Rattle
Thalictrum minus	Lesser Meadow-rue
Trifolium ochroleucon	Sulphur Clover
Valerian officinalis	Common Valerian

Table A.5 Bird population declines and extinctions in Uttlesford District

Species	Common Name	Uttlesford Decline/Extinction
Acanthis cabaret	Lesser Redpoll	Decline since 1980s and extinct by 2004
Anthus trivialis	Tree Pipit	Formerly widespread but extinct by 1970s

Species	Common Name	Uttlesford Decline/Extinction
Caprimulgus europaeus	Nightjar	Small local population last recorded in 1950s
Coccothraustes coccothraustes	Hawfinch	Last stronghold recorded in Hatfield Forest but extinct by 2000
Emberiza calandra	Corn Bunting	Possibly extinct or few remaining
Lanius collurio	Red-backed Shrike	Formerly widespread, declined rapidly through 1900s. Last pair recorded in 1962 at Great Chesterford
Luscinia megarhynchos	Nightingale	Recorded as particularly abundant around Saffron Walden in 1903 but extinct by early 1980s
Passer montanus	Tree Sparrow	Formerly widespread but population collapse led to extinction by mid 1990s
Perdix perdix	Grey Partridge	Probably naturally extinct though artificial releases may mask this
Phoenicurus phoenicurus	Redstart	Last recorded breeding in Uttlesford woodlands in 1960s but now extinct
Poecile montanus	Willow Tit	Population collapsed in 1990s with last few pairs recorded in early 2000s
Streptopelia turtur	Turtle Dove	Declines in late 1900s, no longer recorded
Vanellus vanellus	Lapwing	Possibly extinct though once present on chalkland in the northwest of the district

Table A.6 Butterfly population declines and extinctions in Uttlesford District

Species	Common name	Uttlesford decline/extinction
Erynnis tages	Dingy Skipper	1 record at Hatfield Forest between 1940 and 1980, now extinct
Fabriciana adippe	High Brown Fritillary	1 record at Hatfield Forest between 1940 and 1980, now extinct
Lasiommata megera	Wall Brown	Locally extinct but present on Essex coast
Leptidea sinapsis	Wood White	Last record at High Wood, Duddenhoe End in 1976 now extinct
Nymphalis polychloros	Large Tortoiseshell	4 records between 1940 and 1980 now extinct
Pyrgus malvae	Grizzled Skipper	3 records between 1940 and 1980 now only at one site on Langdon Ridge, Basildon

Species	Common name	Uttlesford decline/extinction
Speyeria aglaja	Dark Green Fritillary	Extinct but occasional vagrant records

Table A.7 Uttlesford Moth extinctions[37][38][39][40][41]

Species	Common Name
Micropterix tunbergella	Red-barred Pollen-moth
Enteucha acetosae	Sorrel Dot
Stigmella sorbi	Barred Rowan Dot
Trifurcula cryptella	Cryptic Dot
Bohemannia quadrimaculella	Four-spot Dot
Ectoedemia agrimoniae	Agrimony Dot
Ectoedemia arcuatella	Strawberry Dot
Incurvaria praelatella	Strawberry Cutter
Lampronia capitella	Currant Shoot Borer
Lampronia luzella	Raspberry Shoot Borer
Lampronia corticella	Raspberry Moth
Coptotriche gaunacella	Scarce Blackthorn Blotch-miner
Bacotia claustrella	Shining Bagworm
Psyche crassiorella	Scarce Grass Bagworm
Triaxomasia caprimulgella	Tree Hollow Moth
Tinea dubiella	Speckled Clothes Moth
Parornix fagivora	Beech Parornix
Phyllonorycter kuhlweiniella	Scarce Oak Leaf-miner
Ypsolopha lucella	Netted Ochre
Ochsenheimeria vacculella	Cereal Stem Moth
Glyphipterix equitella	Stonecrop Moth
Digitivalva perlepidella	Spikenard Moth
Argyresthia laevigatella	Larch Tip Moth

[37] Firmin J et al 1975 A Guide to the Butterflies and Larger Moths of Essex, Essex Naturalist Trust, Colchester
[38] Emmet AM 1981 The Smaller Moths of Essex, Essex Field Club, London
[39] Emmet AM and Pyman GA 1985 The Larger Mopths and Butterflies of Essex, Essex Field Club, London
[40] Goodey B, 2004 The Moths of Essex, Lopinga Books, Wimbish
[41] Essex Field Club website individual species pages https://www.essexfieldclub.org.uk/portal.php

Species	Common Name
Leucoptera lotella	Trefoil Blister Moth
Tinagma ocnerostomella	Speckled Bugloss Moth
Crassa tinctella	Plain Bark Moth
Epicallima formosella	Beautiful Epicallima
Pleurota bicostella	Heath Streak
Aplota palpellus	Gold-flecked Hopper
Dasystoma salicella	Spring Reveller
Agnoea flavifrontella	Yellow-headed Concealer
Agonopterix atomella	Greenweed Buff
Agonopterix nanatella	Carline Buff
Depressaria pimpinellae	Pimpinel Brown
Depressaria depressana	White-headed Brown
Hypercallia citrinalis	Milkwort Beauty
Pancalia leuwenhoekella	Violet Beauty
Pancalia schwarzella	Scarce Violet Beauty
Cosmopterix orichalcea	Canary-grass Beauty
Aproaerema cinctella	Scarce White-barred
Aproaerema taeniolella	Common White-barred
Aproaerema albipalpella	Broken White-barred
Metzneria aestivella	Carline Seedhead Moth
Monochroa tetragonella	Milkwort Borer
Monochroa arundinetella	Pond-sedge Miner
Monochroa suffusella	Cottongrass Borer
Mirificarma lentiginosella	Greenweed Smith
Gelechia sororculella	Eyed Gelechia
Gelechia cuneatella	Willow Spinner
Gelechia turpella	Poplar Gelechia
Scrobipalpula diffluella	Fleabane Miner
Caryocolum junctella	Winter Groundling

Species	Common Name
Coleophora trigeminella	Scarce Thorn Case-bearer
Coleophora fuscocuprella	Hazel Case-bearer
Coleophora orbitella	Dusky Case-bearer
Coleophora genistae	Petty-whin Case-bearer
Coleophora pyrrhulipennella	Heath Case-bearer
Coleophora vibicigerella	Scarce Saltern Case-bearer
Coleophora adjunctella	Saltern Rush Case-bearer
Coleophora virgaureae	Goldenrod Case-bearer
Coleophora squamosella	Blue Fleabane Case-bearer
Coleophora wockeella	Betony Case-bearer
Elachista subocellea	Brown-barred Grass-miner
Elachista unifasciella	Blister Grass-miner
Elachista gangabella	Yellow-barred Grass-miner
Elachista regificella	Wood-rush Miner
Elachista biatomella	Twin-spot Sedge-miner
Elachista alpinella	Marsh Sedge-miner
Elachista cinereopunctella	Glaucous Sedge-miner
Elachista serricornis	Dusky Sedge-miner
Mompha miscella	Rock-rose Mompha
Mompha terminella	Enchanters Mompha
Scythris grandipennis	Gorse Runner
Scythris picaepennis	White-dusted Runner
Scythris cicadella	Sand Runner
Oxyptilus parvidactyla	Small Plume
Porrittia galactodactyla	Spotted-white Plume
Phaulernis fulviguttella	Yellow-spotted Drab
Phaulernis dentella	Dusky Ridge-back
Epermenia profugella	Tawny Drab
Prochoreutis sehestediana	Banded Skullcap Skeletoniser

Species	Common Name
Clepsis rurinana	Scarce Pale Tortrix
Acleris shepherdana	Fen Tortrix
Acleris hyemana	Heath Tortrix
Aethes piercei	Greater Marbled Straw
Cochylidia subroseana	Goldenrod Straw
Falseuncaria ruficiliana	Rusty-tipped Straw
Hedya atropunctana	Black-spot Marble
Olethreutes arcuella	Coppice Beauty
Endothenia pullana	Woundwort Marble
Eucosmomorpha albersana	Honeysuckle Beauty
Ancylis obtusana	Lesser Hook-wing
Ancylis geminana	Willow Hook-wing
Ancylis apicella	Streaked Hook-wing
Rhopobota stagnana	Scabious Marble
Gibberifera simplana	Scarce Clouded Tortrix
Epinotia pygmaeana	Dingy Spruce Tortrix
Epinotia nigricana	Fir-bud Tortrix
Notocelia tetragonana	Dark Rose Shoot Tortrix
Dichrorampha sylvicolana	Sneezewort Moth
Cydia leguminana	Elm Bark Moth
Pammene spiniana	Blackthorn Flower Moth
Synanthedon spheciformis	White-barred Clearwing
Pyropteron chrysidiformis	Fiery Clearwing
Adscita statices	Forester
Zygaena trifolii trifolii	Five-spot Burnet
Nyctegretis lineana	Agate Knot-horn
Anania funebris	White-spotted Sable
Paratalanta pandalis	Bordered Pearl
Thisanotia chrysonuchella	Powdered Grass-veneer

Species	Common Name
Eriogaster lanestris	Small Eggar**
Hemaris tityus	Narrow-bordered Bee Hawk-moth
Scotopteryx mucronata	Lead Belle
Hydriomena ruberata	Ruddy Highflier
Chloroclysta miata	Autumn Green Carpet
Colostygia olivata	Beech-green Carpet
Colostygia multistrigaria	Mottled Grey
Minoa murinata	Drab Looper
Rheumaptera hastata	Argent & Sable
Pareulype berberata	Barberry Carpet
Odezia atrata	Chimney Sweeper
Eupithecia irriguata	Marbled Pug
Eupithecia insigniata	Pinion-spotted Pug
Eupithecia extensaria	Scarce Pug
Eupithecia denotata	Campanula Pug
Isturgia limbaria	Frosted Yellow
Cepphis advenaria	Little Thorn**
Plagodis pulveraria	Barred Umber
Pachycnemia hippocastanaria	Horse Chestnut
Cleora cinctaria	Ringed Carpet
Siona lineata	Black-veined Moth
Thetidia smaragdaria	Essex Emerald
Clostera pigra	Small Chocolate-tip
Arctornis l-nigrum	Black V Moth
Dicallomera fascelina	Dark Tussock
Orgyia recens	Scarce Vapourer
Parasemia plantaginis	Wood Tiger
Setina irrorella	Dew Moth
Deltote uncula	Silver Hook**

Species	Common Name
Moma alpium	Scarce Merveille du Jour
Jodia croceago	Orange Upperwing
Dicycla oo	Heart Moth
Anarta myrtilli	Beautiful Yellow Underwing
Polia bombycina	Pale Shining Brown
Polia hepatica	Silvery Arches
Mythimna turca	Double Line
Mythimna litoralis	Shore Wainscot
Actebia praecox	Portland Moth

Table A.8 UK bat species absent in Uttlesford due to habitat loss

Species	Common name	Uttlesford decline/extinction
Myotis alcathoe	Alcathoe bat	Absence likely to be due to decline in woodland and undisturbed open water habitats and prey insect declines caused by intensive farming practices
Myotis bechsteinii	Bechstein's bat	Absence likely to be due to decline in Ancient Woodland and other woodland habitats and prey insect declines caused by intensive farming practices
Myotis brandtii	Brandt's bat	Absence likely to be due to decline in woodland, undisturbed open water habitats, undisturbed barns and buildings prey insect declines caused by intensive farming practices
Myotis mystacinus	Whiskered bat	Absence likely to be due to decline in hedgerows and other wooded habitats prey insect declines caused by intensive farming practices
Rhinolophus ferrumequinum	Greater Horseshoe bat	Absence likely to be due to decline in hedgerows and other wooded habitats and prey insect declines caused by intensive farming practices
Rhinolophus hipposideros.	Lesser Horseshoe bat	Absence likely to be due to decline in undisturbed vegetated lowland valleys and prey insect declines caused by intensive farming practices