# Access to Harlow:
# Stage 1 Option Assessment Report
## Transport Consultancy

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Essex County Council

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# 1 Introduction

## 1.1 Purpose of Report

Ringway Jacobs are framework consultants to Essex County Council (ECC) and, under the terms of this contract, Jacobs are commissioned to undertake transport planning, modelling and appraisal projects on behalf of ECC, and also to deliver a Business Case for the preferred scheme.

This Stage 1 Option Assessment Report is one of a number of Business Case documents produced at this stage of scheme development which will include:

- Strategic Outline Case (SOC)
- Stage 1 Option Assessment Report (OAR)
- Appraisal Specification Report (ASR)

This Option Assessment Report (OAR) documents the Stage 1 scheme appraisal process of identifying the need for intervention and the process of option development and selection. This OAR will provide the following, in order to meet the requirements set out within the Department for Transport's (DfT) Transport Appraisal Process:

- A sound body of analysis to provide evidence of the problems, challenges and need for intervention, framed within the context of relevant policy and strategy objectives;
- A future 'without intervention' scenario, considering potential scenarios;
- Identified study objectives and intended outcomes, and sufficient information to facilitate an understanding of the links between issues and context and the final statement of objectives;
- Option generation, sifting, and assessment. Decisions made on discarded options will be recorded, along with supporting evidence;
- Documented results of the subsequent assessment of potential options against the Option Assessment Framework. Evidence will be presented in relation to Strategic Case, the Value for Money Case, the Delivery Case, the Financial Case and the Commercial Case;
- Summary of the headline results across all options considered and conclusions on the comparative performance of options;
- Identification of the better performing option(s) to be taken forward for further, more detailed appraisal in Stage 2 as part of a Business Case submission.

These elements form Steps 1-8 of the appraisal process. Step 9 involves clarifying the modelling and appraisal methodology, and is separately documented within the ASR.

Stage 2 involves the further appraisal of a small number of better performing options in order to enable decision-makers to make rational and auditable decisions about whether or not to proceed with intervention. This focusses the analysis on estimating the likely performance and impact of interventions against criteria in the Transport Business Case and should provide sponsoring organisations with sufficient evidence to decide whether or not to proceed with intervention.

## 1.2 Structure of Report

The DfT's Transport Appraisal Process guidance for the Technical Project Manager[1], dated January 2014 sets out the steps and procedure to be followed. It includes their Figure 1, reproduced here at Figure 1.1.

Stage 1 of the Appraisal process, which this report covers, "*involves identifying the need for intervention and developing options to address a clear set of locally developed objectives. It involves generating a broad range of options, which reflect a range of modes, approaches and scales of intervention, [which] are then sifted and assessed against criteria from the Transport Business Case Five Case Model to identify the better performing options for further appraisal in Stage 2.*"[2]

[1] 'Transport Analysis Guidance, Guidance for the Technical Project Manager', Jan 2014, Department for Transport, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/427078/webtag-tag-guidance-for-the-technical-project-manager.pdf

[2] Chapter 2, Transport Analysis Guidance, The Transport Appraisal Process, Jan 2014, Department for Transport, www.gov.uk/transport-analysis-guidance-webtag

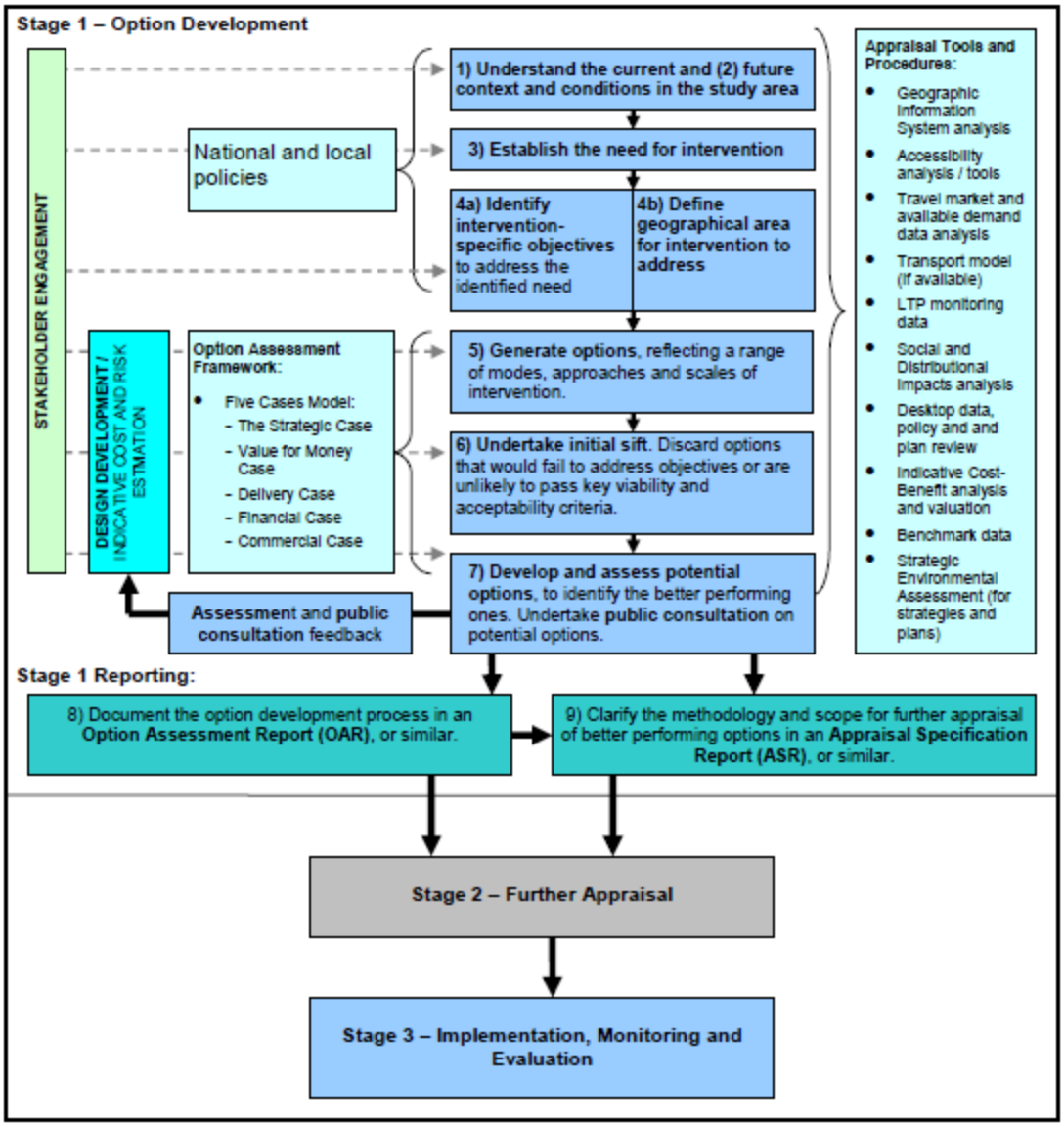


Figure 1.1 Stage 1 Option Development (Source: WebTAG)

This report follows the format of the Stage 1 process and its structure is as follows:

Section 1: Introduction, outlining the purpose and background of the report;

Section 2: Reviews national and local policy and strategy documents to establish the strategic policy context of the study;

Section 3: Outlines the current context and conditions within the study area;

Section 4: Sets out the future context and likely conditions within the study area;

Section 5: Identifies the intervention-specific objectives to address the identified need for the scheme and defines area of impact to be addressed;

Section 6: Draws together the various options, referencing their history, and current basis;

Section 7: Sets out the sifting process within the Five Case Model, reports on this process, and identifies options which do not pass the key viability and acceptability criteria;

Section 8: Develops and assesses the potential options to be taken to public consultation;

Section 9: Summary and Conclusions

# 2 Policy Review

## 2.1 Introduction

This section outlines the key strategies and policies relating to planning and transportation within the study area, as articulated at the National, Regional and Local level.

In developing an understanding of the current situation, it is important to establish the strategic policy context in order to identify potential land use, and plans and proposals for development that may have implications for the travel market to which any intervention may relate. Furthermore, it is important to ensure that any interventions identified and assessed are consistent with these policies.

Policy has been and continues to be in a state of change and development; therefore the information presented in this report is accurate at the time of writing but may change during the course of the business case development.

The key policy documents that have been referenced in this report and their hierarchy are set out in Figure 2.1.

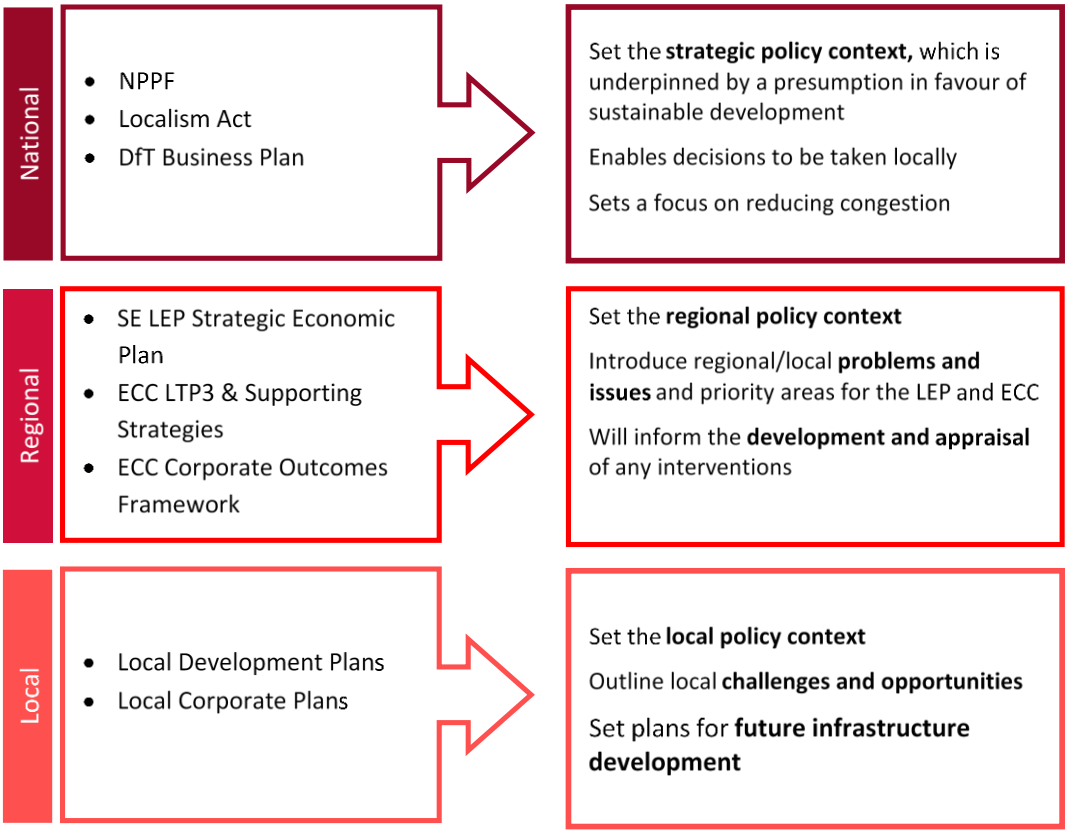


Figure 2.1 Key Policy Documents

## 2.2 National Policy

### 2.2.1 Localism Act 2011

The Local Growth White Paper, 'Realising every place's potential', issued in 2010[3], focussed on planning and future development to help deliver strong, sustainable and balanced growth, whilst also being tailored to local aspirations and requirements. The Localism Act 2011[4] provides the legislative foundation for this. The Act decentralises power, giving local government new freedom and flexibilities, provides new rights and powers for communities and individuals, reforms the planning system, and enables decisions to be taken locally.

[3] Local Growth: realising every place's potential, The Stationery Office, HM Government, October 2010 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32076/cm7961-local-growth-white-paper.pdf

[4] Localism Act 2011, http://www.legislation.gov.uk/ukpga/2011/20/pdfs/ukpga_20110020_en.pdf

### 2.2.2 National Planning Policy Framework

In March 2012, the Department for Communities and Local Government (DCLG) published the National Planning Policy Framework (NPPF), which sets out the Government's economic, environmental and social planning policies. The NPPF aims to reform the planning system and is underpinned by a presumption in favour of sustainable development. There is a focus on planning for prosperity, people and places, promoting increased levels of development and supporting infrastructure, whilst also protecting and enhancing the natural and historic environment. It is designed, however, to be interpreted and implemented locally, and delegates responsibility for achieving this vision to local planning authorities. Further guidance was issued in March 2014, which replaced the previous guidance documents, but did not replace the 2012 policy[5].

### 2.2.3 Department for Transport's Business Plan

The Government's vision for transport is also one that encourages growth, but is greener, safer and improves the quality of life in our communities. The Government's transport priorities and key actions in order to deliver this national vision are set out within the DfT Business Plan[6]. There is a focus on improving road safety, reducing congestion and pollution and making changes at a local level. Priority four in particular outlines the need to 'support sustainable growth by investing in local transport, decentralise funding and powers, tackle local congestion and make public transport (including light rail), walking and cycling more attractive'.

Priority four in the Plan, '*to invest in our roads to promote growth, while reducing congestion and tackling carbon*' is of particular relevance as it calls for investment in the strategic road network to promote growth and address congestion that affects people and businesses.

### 2.2.4 Highways England

Highways England, formerly the Highways Agency, is a government-owned strategic highway company responsible for long term strategic planning. Funding of the strategic road network (SRN), is being introduced through the Road Investment

[5] NPPF web-based guidance, March 2014: http://planningguidance.planningportal.gov.uk/
[6] DfT, 2013. Business Plan 2013-15 http://transparency.number10.gov.uk/business-plan/11

Strategy[7] (RIS) published in December 2014, and updated in March 2015. The new organisation is tasked over the next five years with:

"Making the network safer and improving user satisfaction, while smoothing traffic flow and encouraging economic growth."

A total of £15bn of capital investment has been committed, with 127 major schemes over the course of the first Road Period (2015/16-2019/20). The network is expected to directly contribute to economic growth, through improved connectivity, and users will benefit from safety improvements and reduced congestion.

Within the RIS there are two committed M11 schemes referenced subject to value for money and if applicable any necessary statutory approvals, with the stated aim of providing capacity and connectivity to support national and local economic activity:

- ***M11 Junction 7 upgrade*** – expansion of junction 7 on the M11 to provide better access to Harlow.
- ***M11 Junctions 8 to 14 – technology upgrade*** – addition of several elements of the Smart Motorway package on the M11 between Stansted Airport and the Girton interchange north of Cambridge to help deal with congestion.

## 2.3 Regional & County Policy and Guidance

### 2.3.1 Local Transport Body and Scheme Prioritisation

The Local Growth White Paper, set out a new approach for driving sustainable economic growth based on local rather than top-down decision making through newly formed Local Transport Bodies (LTB's). The subsequently formed Harlow Stansted Gateway Transportation Board (HSGTB), was chaired by ECC, and brought together Hertfordshire County Council, Harlow, East Herts and Epping Forest District Councils, Highways England , the DfT, Harlow Renaissance and private sector interests such as Manchester Airports Group (MAG) (which owns Stansted airport) and Abellio Greater Anglia. Its focus was to improve travel in and around Harlow and identify investment needed to support regeneration and growth.

[7] 'Road Investment Strategy Strategic Vision, December 2014, DfT, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/383145/dft-ris-strategic-vision.pdf

### 2.3.2 South East Local Enterprise Partnership

Included in the Localism Act is the power to abolish Regional Spatial Strategies and with that the South East Plan, which previously set out the region's targets for housing, economy, transport and environmental challenges. LEPs have taken on the Regional Development Agencies' role in this process, with Essex forming part of the South East Local Enterprise Partnership (SELEP).

SELEP is the business-led, public/private body established in 2011 to drive new economic growth across East Sussex, Essex, Kent, Medway, Southend and Thurrock. As well as being the biggest LEP outside of London, representing a combined population of 3.9m people, home to more than 130,000 businesses, and providing more than 1.3m jobs, it is also one of the most local.

SELEP operates a fully devolved model with increased reach into local communities through local delivery partnerships/boards in East Sussex, Kent & Medway, Greater Essex and Thames Gateway South Essex. By 2021, SELEP's aim is to:

- Generate 200,000 private sector jobs, an average of 20,000 a year or an increase of 11.4% since 2011;
- Complete 100,000 new homes, increasing the annual rate of completions by over 50% compared to recent years; and,
- Lever investment totalling £10 billion, to accelerate growth, jobs and homebuilding.

SELEP's Growth Deal[8] allocated £442 million of public investment for the SELEP area with more to come. Matched by private and public funds, this will be invested in a programme of activities that will improve the transport and business infrastructure in the SELEP area. The Growth Deal also brings new influence over rail, skills and housing programmes.

SELEP has recently agreed an expansion of its Growth Deal with the government, which will see an extra £46.1m of funding invested in the area between 2016 and 2021.

Within the SELEP Strategic Economic Plan, it is recognised the several key transport investments are required in the M11-Harlow-Stansted-Cambridge corridor to unlock full growth potential. It states at paragraph 2.101:

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[8] 'South East LEP Growth Deal and Strategic Economic Plan 2014, SELEP, http://www.southeastlep.com/images/uploads/resources/SECTION_2_South_East_LEP_-_Growth_Deal_and_Strategic_Economic_Plan_WEB-2.pdf

"*In particular, the M11 Junction 7a is vital if the EZ is to reach its full capacity and to enable significant housing growth at Harlow. Investments in the A414 to address existing bottlenecks are also essential. In this Corridor we can accommodate 1,050 jobs and 1,230 new homes by 2021 and facilitate 17,200 jobs and 19,000 homes through our proposed transport schemes.*"

As part of the Growth Deal, funding for technical feasibility work and for production of an outline business case for the M11 J7a scheme has been committed, and support for the technical work has been committed by Highways England.

### 2.3.3 Essex Transport Strategy: the Local Transport Plan for Essex

Essex's Local Transport Plan (LTP3), consists of a Transport Strategy[9] and an Implementation Plan. It is the third Local Transport Plan for the county, setting out policies, strategies and priorities to address transport-related issues and challenges across the 15 year period to 2026. The LTP3 is focused on achieving the following five broad outcomes, developed in parallel with those of the Council's Highways Strategic Transformation (HST) programme:

- Provide connectivity for Essex communities and international gateways to support sustainable economic growth and regeneration;
- Reduce carbon dioxide emissions and improve air quality through lifestyle changes, innovation and technology;
- Improve safety on the transport network and enhance and promote a safe travelling environment;
- Secure and maintain all transport assets to an appropriate standard and ensure that the network is available for use; and
- Provide sustainable access and travel choice for Essex residents to help create sustainable communities.

For each of these five outcomes, a series of challenges were identified, which will need to be met for the outcomes to be achieved. The outcome which is most pertinent to the options being assessed within this OAR is that of connectivity. The challenges relating to this outcome are:

a) Providing good connectivity to and within urban areas to support self-contained employment and housing growth and regeneration;

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[9] Essex Transport Strategy, a Transport Plan for Essex, Essex County Council, June 2011, http://www.essex.gov.uk/EnvironmentPlanning/Planning/Transport-planning/Documents/Essex_Transport_Strategy.pdf

b) Providing good inter-urban connectivity within Essex and with adjacent major urban areas; and
c) Maximising the benefit to the local economy of Greater Essex's international gateways and strategic transport links to London, the East and South East of England and the rest of the UK.

It is acknowledged within the LTP that, while most journeys by car between the four main towns in Essex can be achieved in under an hour, there are specific sections of road where congestion is common, including connections from north and west Harlow to the M11.

The approach to this issue, to enable the economy of Essex to grow and to maintain and build on the vibrancy of Essex towns, is to ensure that centres are well connected to each other by both road and public transport. As the Essex economy is closely interlinked with neighbouring areas, to secure growth, good connectivity with adjacent economic areas (including London, Cambridgeshire, Suffolk, Hertfordshire, Thurrock and Southend) is also needed.

The specific ECC transport policies that seek to address connectivity issues are Policy 3 – Congestion and Network Resilience, and Policy 5 – Connectivity, as set out in Table 2.1.

Table 2.1 Essex Transport Strategy: Key Transport Policies

| **Policy 3 – Congestion and Network Resilience** |
| --- |
| The County Council will facilitate the improved reliability of journeys by:<br>• undertaking its network management duty in line with the Traffic Management Act:<br>• monitoring and managing the impact of traffic through the Essex Traffic Control Centre;<br>• focusing investment on those parts of the network that would give the greatest benefit to the economy and quality of life;<br>• using a functional hierarchy of routes to manage traffic;<br>• working with operators to improve the punctuality of bus services;<br>• minimising disruption by co-ordinating and managing the impact of roadworks undertaken by the County Council and utility companies;<br>• applying the Speed Management Strategy. |

| Policy 5 - Connectivity |
| --- |
| Transport networks will be strengthened to support a vibrant, successful and sustainable future for Essex by:<br>• improving travel links within and between our main towns;<br>• focussing investment on routes where improvements will give the greatest benefit to the economy of Essex;<br>• improving journey times and journey-time reliability by targeting congestion improvement measures (see Policy 3);<br>• providing for the use of more sustainable forms of travel (see Policy 8);<br>• ensuring international gateways have effective surface access strategies that promote appropriate and sustainable transport;<br>• developing appropriate provision of park and ride facilities serving our main towns;<br>• working with partner agencies to identify and deliver essential improvements to nationally important road and rail connections. |

### 2.3.4 Harlow Transport Strategy

As outlined in LTP3, Harlow is an evolving New Town. It is a primary economic and growth centre in the west of Essex. To support planned growth, in-line with current policies, a number of improvements are required to address current issues with the transport infrastructure and services in and around Harlow.

ECC is responsible for developing and maintaining Transport Strategies for major urban areas within the County. With the recent revisions to national and regional planning and transport policy, ECC are developing a Transport Strategy for Harlow to support the aspirations of the LTP3, Harlow's emerging Local Development Plan[10] and the SELEP Growth Deal and Strategic Economic Plan (SEP), which collectively outline the priority areas for investment in roads, buildings and facilities within Essex and Harlow to 2031.

Harlow is a relatively compact town located in the West of Essex, within the London-Stansted-Cambridge Corridor (LSCC). It is situated close to both the M11 and M25 key

[10] 'Harlow Local Development Plan, Emerging Strategy and Further Options, Consultation Summary Report', Dec 2014, Harlow Council, http://www.harlow.gov.uk/sites/harlow.gov.uk/files/Emerging%20Strategy%20and%20Further%20Options%20Consultation%20summary%20report%20v4.pdf

strategic routes, which provide access to London and the South East, Cambridge and beyond. The northern section of Harlow has two railway stations which are served by the West Anglia Main Line, connecting London, Stansted Airport and Cambridge.

Due to Harlow's location and its history of manufacturing and industrial business, it has been recognised as one of 24 Enterprise Zones, as part of the SELEP's SEP3. As a result there is a push toward promoting economic growth, creating jobs and building new homes in the local area, with a target of 16,000 new houses and 12,000 new jobs by 2026.

This is predicted to put additional strain on the transport infrastructure of Harlow, which has been described as one of the single most significant barriers to accommodating the level of development needed to meet the aspirations of the SEP and LTP3**.** Congestion is described as severe at peak times on both the strategic and local road network, with a number of junctions operating at capacity or near capacity, including J7 of the M11.

The Harlow Transport Strategy sets out the transport and infrastructure conditions in Harlow. It identifies the areas of concern within the local network, and outlines the specific investment priorities for particular areas and types of transport service, to support District Council land use planning.

The overall aims of the Transport Strategy are:

- To summarise the current transport conditions in Harlow
- To forecast future conditions across the network, including an assessment of the planned growth in housing and employment
- To develop potential options, subject to a thorough appraisal process, addressing the potential problems associated with existing and future levels of travel.

### 2.3.5 West Essex Area Implementation Plan

The scheme sits within the West Essex area, which comprises Harlow, Epping Forest and Uttlesford Districts. At the time of publication of the LTP the level of growth for each of the districts was as set out in Table 2.2.

Table 2.2 LTP3 Growth Forecasts

| District | Dwellings 2011-2021 | Job Target 2011-2031 |
|---|---|---|
| Epping Forest | 1,120 | 3,600 |
| Harlow | 16,000 | 12,000 |
| Uttlesford | 3,229 | 10,300 |

**Source:** Table 3.2 and Table 3.3, LTP3, 2011.
**Please note** that these figures have been superseded by the ongoing Local Plans process.

The key transport priorities for the West Essex area include:

- Improving access to and from the M11 corridor;
- Tackling congestion and improving the management of traffic in Harlow town centre;
- Providing the transport improvements needed to support housing and employment growth;
- Improving the attractiveness of the bus and rail services;
- Revitalising the cycle and walking networks to promote greater use;
- Improving the attractiveness of public spaces;
- Working with Transport for London to improve the journey experience of Essex residents using Central Line underground services;
- Improving access to Stansted Airport by low carbon forms of transport.

Specific objectives for the Harlow area include: tackling congestion in the town centre, reducing congestion on strategic routes including A414 and J7 of the M11, improving public transport connections to major cities, continued investment in the cycle network, improving public spaces and developing a sustainable transport system to service the economic and developmental growth.

## 2.4 Local Policy

### 2.4.1 Harlow Council Corporate Plan

Harlow Council's latest Corporate Plan was published in 2014. It sets out the Local Council's vision and priorities for service delivery for the next three years, with a focus on community, leadership and resource management. The five main priorities for residents, businesses and visitors to Harlow are listed below:

- More and better housing;
- Regeneration and a thriving economy – which includes a focus on securing infrastructure that is appropriate for sustainable growth;
- Wellbeing and social inclusion;

- A clean and green environment;
- Successful children and young people.

### 2.4.2 Harlow Local Development Plans

Harlow Council's 2006 Adopted Replacement Local Plan sets out the policies and proposals for development and land-use in Harlow for the period up until 2011. It is due to be replaced in the near future by the new Harlow Local Development Plan, which will set out the framework to guide and shape development in Harlow up to 2031. The key objectives of the 2006 adopted plan are listed below:

- Make Harlow safer, cleaner and greener;
- Improve the public transport and cycle network;
- Produce higher density housing and develop employment opportunities;
- Facilitate sustainable growth and regenerate the town centre.

In 2011 Harlow Council carried out an issues and options consultation, as part of the new Local Development Plan, the results of which were published in the Core Strategy Issues and Options Report. The consultation was part of the first stage in developing a new Local Plan for the town, and documented some of the concerns of local residents. Key issues included:

- Developing a new bypass to link with a new M11 junction;
- New junction on the M11;
- Dualling the A414;
- Improving bus links between neighbourhoods and extending the Central Line;
- Tackling congestion in the town centre, especially in the north.

In April 2014 Harlow Council published an Emerging Strategy and Further Options Consultation Report. The report documents all emerging schemes, and outlines the overall strategy direction up to 2031. Some of the key points are listed below:

- Meet housing needs & continue sustainable growth;
- Regenerate the town centre and neighbourhoods;
- Continue to improve the public and private transport network;
- Mitigate the effect of climate change.

The Report set out five options for delivery of the growth needed to fulfil the Council's requirements, which were:

1. Focussed on Priority Regeneration Areas;
2. Environmental/Landscape Led;

3. Passenger Transport Led;
4. Regeneration and Landscape Led;
5. Northern Bypass Led.

It is recognised that delivery of Harlow's growth will require cross-boundary co-operation with neighbouring districts, a point which was also mentioned by respondents to the Consultation[11]. The Options that received the most support were: 3 - Passenger Transport led, and 5 - Northern Bypass led. The main issue raised by respondents related to infrastructure capacity and whether the local infrastructure would be able to cope with the proposed levels of development. Comments regarding infrastructure capacity mostly focussed on transport infrastructure (roads and public transport provision), sewerage, health facilities and school facilities.

### 2.4.3 Epping Forest Local Strategic Partnership Community Strategy

The partnership, 'One Epping Forest', originally established in 2002, comprises representatives from local councils, education, the police, health services and business and community groups. Its aim is to promote the economic, social and environmental well-being of the district and deliver the shared vision, outcomes, and values enshrined in the Community Strategy. Its function is to bring all the agencies and groups that have a role in delivering these outcomes together, with the one aim of 'Together making Epping Forest District a great place to live, work, study and do business'.

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[11] Harlow Local Development Plan, Emerging Strategy and Further Options, Consultation Summary Report, December 2014, http://www.harlow.gov.uk/sites/harlow.gov.uk/files/EmergingStrategyandFurtherOptionsConsultationsummaryreportv4.pdf

The Community Strategy[12], published in 2010 for the period 2010-2031, is the "*long term plan to deliver better quality of life and improve the economic, social and environmental well-being of the Epping Forest District over the next 20 years and beyond"*. It is the *"cornerstone of all the other plans that affect public services and long term planning policies in the district included in the Local Development Framework which replaces the Local Plan. It tells local people, and importantly regional and national government, on whose support and co-operation we depend, how we will achieve the outcomes in this strategy. It brings together the key plans of partners into one co-ordinated local strategy including the Essex Strategy.*"

### 2.4.5 Epping Forest District Council Corporate Plan

Epping Forest Council's latest Corporate Plan[13] was published in 2011. It describes the district and sets out the aims and priorities of the council for the period, and the challenges it faces to improve services and local quality of life.

The Corporate Plan provides a description of the District, which includes:

> "*Much of the 131 square miles of the Epping Forest District is green and rural. 94% is within the Green Belt or in use for horticulture and farming. Approximately half of our 123,900 residents live in 5% of the area of the district, close to the boundary with London. … . The local population is set to grow over the coming years and pressure for development and the demand for homes, jobs and leisure facilities has never been greater.*
>
> *The district is traversed by both the M11 and M25 motorways and is the only district in Essex that enjoys the benefits of London Underground services. It also has access to Network Rail services, both within the district at Roydon and nearby at Harlow, Broxbourne and Chingford. Stansted Airport is also only a short journey away. However, bus services to railway stations and other public service locations within the district are inadequate and traffic congestion is a problem.*"

In terms of planning growth, the Corporate Plan states:

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[12] "Putting Epping Forest First" The Community Strategy, 2010-2031, August 2010, Epping Forest's Local Strategic Partnership, http://www.eppingforestdc.gov.uk/index.php/help/file-store/category/111-sustainable-community-strategy

[13] 2011-2015 Corporate Plan, Epping Forest District Council, 2011, http://www.eppingforestdc.gov.uk/index.php/home/file-store/category/374-corporate-plans?download=289:corporate-plan-2011-2015

"*The local economy should be able to provide jobs and services for local residents, with high-quality and accessible employment land and premises so that there can be effective competition with adjoining areas.*

*The council's Strategic Housing Market Assessment for the district identified that around 4,620 affordable homes need to be provided within the district to meet current and forecast need. It is a considerable challenge for the council to increase the amount of affordable housing over the next four years.*

*As the population grows and changes, provision needs to be made for additional housing in a manner appropriate to the council's over-riding priority to protect and conserve the environmental heritage of the district. This will put further pressure on available land, transport services and jobs.*"

### 2.4.6 Epping Forest Local Development Plan

Epping Forest District currently has a mixture of policies from the Adopted 1998 Local Plan and the Adopted 2006 Local Plan with alterations, all of which are set out in the Combined Policies document[14], published in 2008. The district is currently developing its Local Plan and its Issues and Options went out to 'Community Choices' consultation, in 2012, with the responses reported to Cabinet in June 2013[15].

The consultation presented three potential housing targets for the plan period (2011-2033), based on various population and household projections. These were: 10,200 based on governmental projections, 8,900 based on East of England Plan (EEP) and updated official projections, and 6,400 based on the original EEP target. Employment growth options were 28.5ha based on EEP, and 21.5ha based on identified need. A total of seven spatial options for distribution of growth were presented.

The key issues raised in the responses, as summarised in the 2013 report to Cabinet, were:

- continuing to protect the Green Belt;
- using "brownfield" (ie previously developed) land before releasing any Green Belt for development;
- preventing London from sprawling into the district and preventing larger urban areas (eg Harlow) from merging with nearby villages (eg Roydon);

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[14] Combined Policies of Epping Forest District Local Plan (1998) and Alterations (2006), February 2008, http://www.eppingforestdc.gov.uk/index.php/home/file-store/category/168-current-policy?download=688:combined-local-plan-1998-and-alterations-2006-policy-document

[15] Community Choices Consultation (Issues & Options) Summary, June, EFDC, http://rds.eppingforestdc.gov.uk/documents/s49377/C-006IOResponsesRpt.pdf

- establishing accurate forecasts for population growth and related new housing targets;
- establishing accurate forecasts for new numbers of jobs which would be needed;
- whether local services have the capacity to cope with the current population and any future growth, eg schools, GP surgeries, public transport including the Central Line and rural bus services, sports, leisure and other community facilities, town centre car parking, and sewerage (in some parts of the district). Traffic congestion, the general capacity of local roads and motorway junctions, and problems with commuter parking near Central Line stations were also frequently raised issues;
- protecting the countryside and landscape, including Epping Forest, and acknowledging the importance of agriculture in the district; and
- protecting the heritage and character of the district's towns and villages.

The responses mentioning transport raised several issues, including concerns about traffic congestion and the general capacity of motorway junctions and the local road network, the impact of road traffic on Epping Forest, and the impact of HGVs on rural roads.

The next stage will be consultation on the Preferred Options, which will take place later this year.

### 2.4.7 Hertfordshire County Council

The Herts LTP3 has a suite of daughter documents that include Urban Transport Plans, which set out the framework to focus transport improvements and investment within specific areas over the next 20 years. These identify possible interventions to deal with existing issues and longer spatial strategies to facilitate future growth and development.

The LPT3 addresses five nationally set goals:

- Support economic development and planned dwelling growth;
- Improve transport opportunities for all and achieve behavioural change in mode choice;
- Enhance quality of life, health and the natural, built and historic environment;
- Improve the safety and security of residents and other road users; and
- Reduce transport's contribution to greenhouse gas emissions and improve its resilience.

The Hertfordshire Inter-Urban Route Strategy is a daughter document to their LTP3, and is concerned with corridor improvements up to 2017. It acknowledges that

pressures of growth and population mean increasing levels of traffic are forecast which will exacerbate existing capacity issues in peak times, that east-west movement can be difficult, particularly by passenger transport, and that there is a major airport immediately to the east at London Stansted.

Herts are currently developing a 'Transport Vision' to identify packages of transport interventions to enable growth across the county to 2050. The accommodation of East:West movements will be a key consideration in this work. Herts are also seeking to establish clear working arrangements between all authorities on the A414 in Hertfordshire and Essex to address the emerging challenges associated with growth in a managed way along the corridor.

Herts have recently commissioned consultants to build a county-wide transport model to meet a range of short, medium and long term objectives. These include:

- Understanding road and rail travel patterns;
- Develop evidence base of present day network operation and congestion to enable modelling of incidents and events impacts;
- Identify future issues and solutions for strategic and spatial development planning;
- Enable strategic option and policy testing.

The Herts Model development is expected to take place over the next 18 months.

### 2.4.8 East Hertfordshire District

The East Herts District emerging District Plan (EHDCDP) is being developed in accordance with the NPPF and a draft has been produced. This sets out the key issues and challenges facing the district, which all mainly relate to managing the high levels of growth and the effects of population increase. The EHDCDP recognises the importance of providing the infrastructure and services which are need to support new development, which includes transport infrastructure and the need to deliver this alongside growth.

The district is predominantly rural, making provision of comprehensive public transport a key challenge. This means that many local communities are reliant on private cars, and there is a need to ensure that development is directed to sustainable locations to encourage reduced reliance on the car.

The EHDCDP sets out the vision for East Herts in 2031 together with nine strategic objectives as stepping stones to deliver the vision. These include: mitigation of climate

change effects, safe and vibrant mixed communities, housing market mix, protection of the countryside from inappropriate development, employment and education, cultural facilities, and the environment.

The key objectives with regard to growth and infrastructure are:

To improve access opportunities, minimise the need to travel, encourage necessary journeys to be made by sustainable means to ease congestion and help to reduce East Herts' carbon footprint;

To ensure that development occurs in parallel with provision of the necessary infrastructure.

The existing over-arching transport policy document for East Herts is the Hertfordshire Local Transport Plan (LTP3). While this identifies some specific schemes in the district, the majority of transport schemes have been identified through a rolling programme of Urban Transport Plans (UTP) which identified how and where the strategic objectives and targets could be delivered at a local level. These documents are in the process of being replaced.

The Hertford and Ware UTP was adopted in 2010. The key issues referenced of relevance to the Harlow study area are those pertaining to the A414 which, although dual carriageway in its entirety within East Herts, is subject to significant congestion as it passes through Hertford, as well as at its junction with the A10 at Rush Green[16]. Longer term schemes have been identified using a Scheme Assessment Framework (SAF), including widening the circulatory carriageway at Rush Green, but the possible solution for the A414 congestion through the town is likely to require a bypass. This is considered to be undeliverable within the current LTP period to 2021 due to "*lack of policy support, environmental impacts of new road building, insufficient funding available for compulsory purchase of land.*" However, ongoing reviews may involve revisiting bypass proposals and reassessment.

[16] Appendix B – Key Issues, Hertford & Ware Urban Transport Plan, November 2010, Herts County Council
http://www.hertsdirect.org/services/transtreets/tranpan/tcatp/handwutp.pdf/18440647.pdf/

### 2.4.9 Broxbourne Borough

Broxbourne Borough are currently developing their Local Plan, the vision being set out in the their framework document[17]. Preparation is ongoing with consultation likely to take place in Summer 2016, and submission in Spring 2017.

The Hertfordshire LTP3 is the key transport policy document for the district, together with the Hoddesdon and Broxbourne UTP, which was adopted in 2012. The key issue of relevance to the Harlow study area is the acknowledged congestion on the A10, and how planned and new developments in the borough may affect this[18].

[17] Local Plan, a Framework for the Future Development of the Borough, Borough of Broxbourne, October 2015
https://www.broxbourne.gov.uk/sites/default/files/Documents/Planning/151012LocalPlanDocOct15_NEW.pdf
[18] Table 4.1, Hoddesdon & Broxbourne UTP, March 2012, Hertfordshire Highways
http://www.hertsdirect.org/services/transtreets/tranpan/tcatp/hodbroxutp/18440668.pdf/

# 3 Understanding Current Situation

## 3.1 Key Issues

Taken from Harlow's Local Development Plan Emerging Strategy 2014 Consultation, 'A Spatial Portrait of Harlow'[19] this extract provides the background to the current situation in the town:

> "*Harlow is a relatively small town of 82,200 people located on the borders of Essex and Hertfordshire. The town is surrounded by the Green Belt and a number of important ecological sites; the floodplain of the River Stort lies to the north and landscape ridges surround the town. Harlow's Green Wedges give the town a distinctive character and connect residential neighbourhoods with open spaces and the countryside beyond. A key design feature of Harlow was higher density housing with the majority of the town's open space provided within the Green Wedges.*
>
> *Designated in 1947 to meet the development needs of London and the wider south east the town was originally planned to house 60,000 people but this was increased to 80,000 in the 1952 Masterplan. Harlow underwent rapid growth between the 1950's and the 1960's, reaching a peak population of 81,000 in 1974. However, Harlow's population began to fall in the late 1970s and throughout the 1980s, dropping to 73,000 people by 1994. The town's population began to increase in the late 1990s and throughout the 2000s to 82,200 people in 2011.*
>
> *Today Harlow forms part of a wider network of towns that extend across Essex and Hertfordshire forming an arc of settlements around London. These centres provide a range of services and facilities as well as housing and employment opportunities and are closely related to London. The town has good rail links to London, Stansted Airport and Cambridge. To the east of the town is the M11 motorway which is a key north-south route linking London to Cambridge and beyond. The M25 (3 miles to the south of Harlow) provides access to other parts of London and the wider south east. Epping Forest District adjoins the town to the south, east and west while East Hertfordshire District lies to the north.*
>
> *The latest forecasts show that the town's population is estimated to grow by 14,036 people between 2011 and 2031. This would require a minimum of 7,500 new dwellings to meet Harlow's population growth alone. In addition changing social trends (people living longer and living in smaller households) has put pressure on the existing housing stock. Moreover, property prices in Harlow*

[19] Taken from Harlow Local Development Plan Emerging Strategy 2014 Consultation: http://harlow.jdi-consult.net/ldp/readdoc.php?docid=11&chapter=3&docelemid=d483

*have increased by approximately 150% between 2000 and 2012 and although property prices are lower than in surrounding areas there are still considerable affordability problems for the town's residents with a growing number unable to afford to buy their own home.*

*Harlow has traditionally been a good location for manufacturing and industrial businesses. Compared to the national average Harlow has a much higher proportion of employment in Manufacturing, Wholesale and Retail Distribution, Administrative and Support Services and Health and Social Work. Conversely, it is under-represented in Public Administration, Professional, Scientific and Technical Services and Financial Services. The town has experienced a large reduction in jobs between 2008 and 2011 as a consequence of the international financial crisis and subsequent recession.*

*Approximately 14% of Harlow's employed residents commute to London and in overall terms the labour market is well balanced with Harlow having a net in-flow of just over 500 workers. Although the district is a net importer of managers and professionals from its immediate neighbours (East Hertfordshire, Epping Forest and Uttlesford) it is a net exporter of workers in lower paid occupations. Although the Council has been working with partners to address this, Harlow needs to be seen as an attractive location to employers in its own right, in order to improve the range of employment opportunities in the town and secure regeneration.*

*Harlow is also home to one of 24 Enterprise Zones set up across England in 2011 to promote business growth and job creation. The Enterprise Zone is split across three sites and aims to create approximately 5,000 jobs in the Advanced Manufacturing, Research and Development, ICT and Health and Allied Industries in Harlow. The Council has adopted three Local Development Orders* [LDO] *to fast track planning applications on these sites.*

*The Enterprise Zone's aims and objectives reflect Harlow's wider economic growth aspirations for the town which seeks to boost economic growth, diversify the economic base and to capitalise on the town's proximity to the Cambridge and London economies and connections to rest of the UK and beyond.*"

In addition, Harlow commissioned a study to examine the relationship between regeneration and growth in Harlow[20] which reported in 2013 that:

*"New Towns face a unique range of economic, social and environmental challenges that reflect their original design, age and evolution.*

[20] Nathaniel Lichfield & Partners (NLP), "Harlow Future Prospects Study: Linking Regeneration & Growth", August 2013

*The problems facing New Towns are almost universal and, as all aspects of these towns were built at the same time, everything needs replacing as one. One of the most acute problems is that the earliest New Towns were not planned for car usage and many walkways and green spaces are out of sight of both houses and roads creating expanses of unsafe land. Low density development typical of the New Town design has also made operating public transport financially unviable with residents cut off from services and the town centre. Skills shortages in all New Towns are mainly attributed to the provision of large quantities of social housing.*

*The use of experimental architecture styles and materials has led to swathes of undesirable and some structurally unsound homes and town centres. The difficulty of accessing the town centre by car means residents shop elsewhere.*

*Many New Towns have failed economically due to being of modest scale and with an over-reliance on one sector of employment. The key message from the literature is that bigger populations can sustain more diverse economies which are better placed to endure economic decline and attract inward investment whilst evening out the split between housing tenures."*

## 3.2 Current Travel Issues

### 3.2.1 Congestion

The Harlow Transport Strategy reports that there are several factors that contribute towards the traffic conditions in Harlow, especially during weekday and weekend peak periods. As well as the limited access routes into and out of the town, the 2011 Census data indicates that 16,000 outbound and 16,500 inbound travel to work trips are made each day. In addition to the demand placed on the strategic road network from these work-related trips, adjacent towns and villages have limited access to the M11 and so tend to travel through Harlow in order to reach J7. The A414 as it passes through the town is also mainly single carriageway. Access to the M11 itself is also restricted within Epping Forest District to the south of Harlow, J5 having only south-facing slips, and J4 at the southern end of the motorway is some 12 miles distance from J7.

As previously stated, it is recognised in the emerging HDLP that congestion on the strategic and local road network is severe at peak times and a number of junctions are operating close to capacity or in excess of their original design thresholds. The local road network within Harlow is based on a grid system, with limited east:west routes which experience delays as a consequence. The north:south situation is worse as there are only two links from the north (A414 and A1184), and a single exit to the south (A414), and so all traffic entering or leaving Harlow in this direction is routed

through J7. This situation leads to a tendency for local or regular drivers to use less suitable minor routes to the north-east (B183) and south (B181) of the town.

The AM network peak hour congestion in a neutral month in 2013-14 is illustrated in Figure 3.1 below, where links shown in red and darker are operating at 30% or less of the links' freeflow speed. The grid nature of the network is also evident, as is the congestion on the A414 between Harlow and J7 in the south, at Eastwick in the north, and on the A1184 through Sawbridgeworth (the old A11).

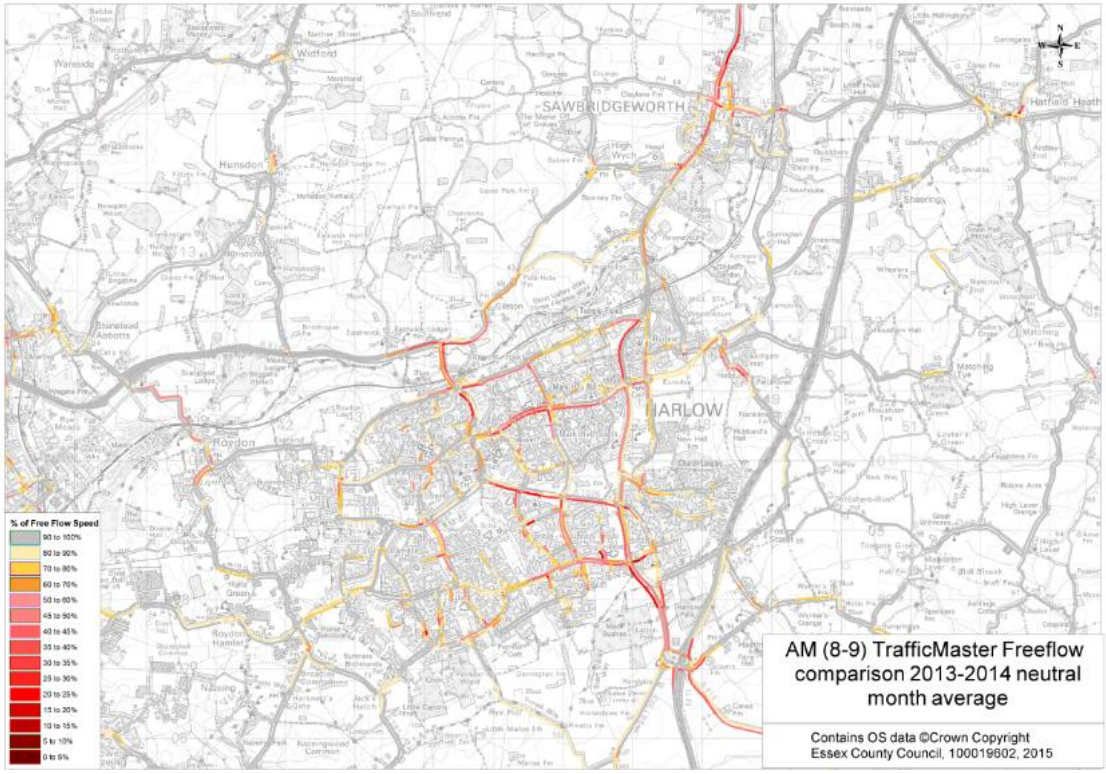



Figure 3.1 TrafficMaster Freeflow AM 2013-14 neutral month

More detailed analysis of the TrafficMaster data, focussing on three key routes, further demonstrates the congested nature of the road network. Comparison has been made between off-peak and AM peak hour journey times on routes with the following end-points:

A) North:Harlow – between A1184/B1383 Thorley Wash south of Bishop's Stortford and A414/A1019 Burnt Mill roundabouts, via either:
   Route 1) A1184/High Wych Road, or
   Route 2) A1184/A414 Edinburgh Way;

B) South:Harlow – between M11 J7 and A414/Eastwick Rd, via either:

Route 3) A414, or

Route 4) A414/A1025/A1019;

C) North:South – between Bishop's Stortford town centre and Harlow town centre, via either a more local route, or via the strategic network:

Route 5) B1383/A1184/A414 ('old A11'), or

Route 6) M11/A414/A1025 (M11).

These routes are illustrated in Figure 3.2, Figure 3.3 and Figure 3.4 respectively. It should be noted that this analysis focusses on the morning AM peak situation, but it would be expected that the evening PM peak situation would be similar but with the effects reversed.

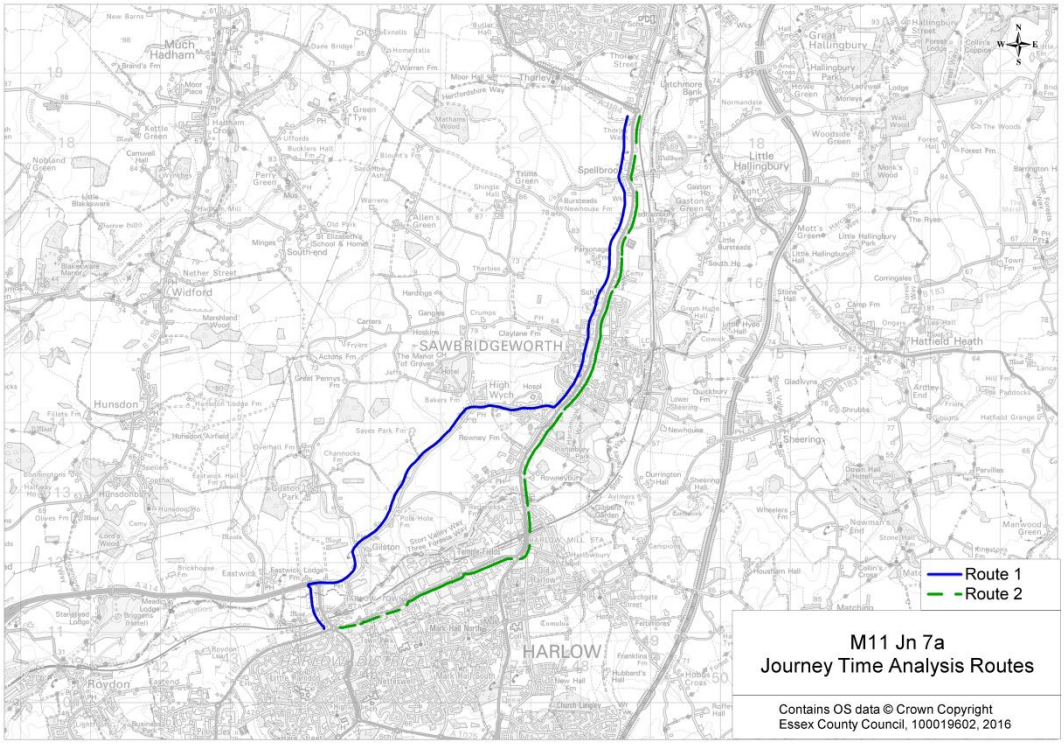



Figure 3.2 TrafficMaster Routes Comparison - North:Harlow

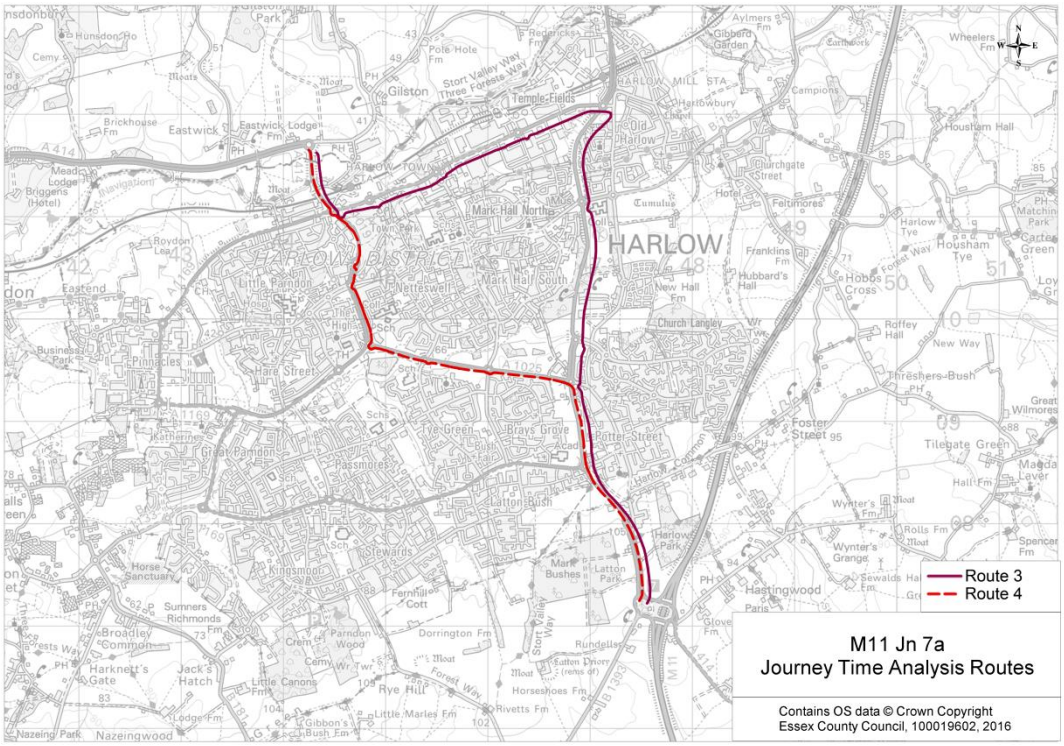



Figure 3.3 TrafficMaster Routes Comparison - South:Harlow

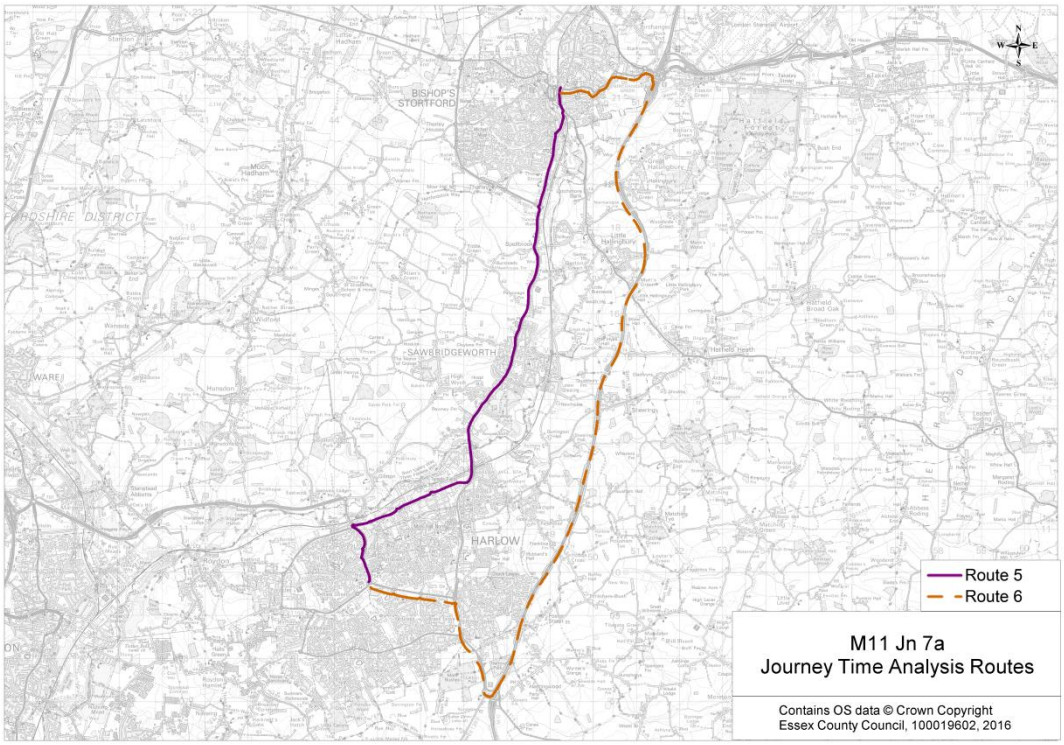



Figure 3.4 TrafficMaster Routes Comparison - North:South

In broad terms, Routes 1 and 2 provide detail on two key local competing routes to the north of Harlow, Routes 3 and 4 detail two key local competing routes to the south of Harlow, and Routes 5 and 6 enable comparison of a local route (broadly following part of the old A11) with that of a strategic route via the M11.

Table 3.1 Route Comparisons: AM peak vs Free-Flow Journey Times

| | | | | Journey Time (mins) | | |
|---|---|---|---|---|---|---|
| **Ref** | **Route** | **Dir** | **Distance (km)** | **AM (0800-0900)** | **Free-Flow (2000-0000)** | **AM – Free-Flow % diff** |
| North:Harlow (Harlow-centred) | | | | | | |
| 1 | A414 Burnt Mill/Edinburgh Way/ A1184/B1383 Thorley Wash | NB | 3.8 | 15.3 | 11.2 | +37% |
| | B1383 Thorley Wash/A1184/Edinburgh Way/ A414 Burnt Mill | SB | 3.8 | 20.2 | 10.9 | +86% |
| 2 | A414 Burnt Mill/Eastwick-High Wych Rd/ A1184/B1383 Thorley Wash | NB | 3.9 | 14.9 | 10.7 | +39% |
| | B1383 Thorley Wash/A1184/High Wych-Eastwick Rd/A414 Burnt Mill | SB | 3.9 | 19.7 | 10.7 | +85% |
| South:Harlow (Harlow-centred) | | | | | | |
| 3 | M11 J7/A414/Eastwick Rd | NB | 3.5 | 20.7 | 9.4 | +119% |
| | A414 Eastwick Rd/A414/M11 J7 | SB | 3.8 | 14.5 | 10.1 | +44% |
| 4 | M11 J7/A414/A1025/A1019/A414 Eastwick Rd | NB | 2.6 | 20.0 | 7.5 | +165% |
| | A414 Eastwick Rd/A1019/A1025/A414/M11 J7 | SB | 2.8 | 11.9 | 7.7 | +54% |
| North:South (Local ['old A11'] vs Strategic [M11]) | | | | | | |
| 5 | A1019/A1025 Velizy Ave/Edinburgh Way/ A1184 Cambridge Rd/B1383 London Rd/ A1250 Hockerill | NB | 14.3 | 31.3 | 17.9 | +75% |
| | A1250/B1383 Hockerill/ B1383/A1184/A414 Edinburgh Way/A1019 Velizy Ave/A1025 | SB | 14.1 | 28.0 | 16.5 | +69% |
| 6 | A1019/A1025 Velizy Ave/A1025/A414/M11 J7/M11 J8/A120/A1250/B1383 Hockerill | NB | 22.5 | 24.7 | 17.8 | +39% |

| | | | | | | |
|---|---|---|---|---|---|---|
| | A1250/B1383 Hockerill/ A1250/A120/M11 J8/M11 J7/A414/A1025/A1019 Velizy Ave | SB | 23.3 | 32.8 | 19.4 | +69% |

As set out in Table 3.1, during the AM peak route 1 and 2 southbound journeys from the north, and route 3 and 4 northbound journeys from the south, are much slower than those in the opposite direction. The southbound route 1 and 2 peak hour journey times increase by ~85%, while the northbound ones increase by ~38%. Routes 3 and 4 show even greater peak hour congestion impacts, with the northbound routes peak hour journey times increasing by between 119%-165%, and the southbound routes increasing by 44-54%. This directional difference is undoubtedly due to the time of day, and it would be expected that this situation would be reversed during the evening peak.

The substantially greater delays for Harlow-bound traffic, with significant peak time increases for this traffic as set out in Table 3.1, indicate that there is much greater pressure on the network for journeys travelling towards Harlow from all directions. Both routes 1 and 2 are adversely affected by delays in both directions through Sawbridgeworth, although southbound delays through the town in the morning are greater. Routes 3 and 4 are both affected by northbound delays on the A414 between the M11 J7 and A1025 Second Avenue.

For routes 1 and 2, there is little difference in distances and travel times between them, and in either direction. This is likely to lead to some traffic diverting to the less suitable High Wych route rather than using the A1184/A414 primary route as there is no apparent time benefit from using the more suitable signed route.

Routes 3 and 4 are both primary routes; route 3 via the A414 is the strategic signed route through the town but is about one mile longer than route 4 which goes through the town centre. As a consequence the shorter route 4 is likely to experience greater traffic demand and therefore delays in peak periods, although this route remains quicker than the signed A414 route for traffic crossing the town.

When looking at the local vs strategic routeing journey times for routes 5 and 6 in the morning peak, these both show similar journey time changes during the AM peak, increasing by 69-75%, with the exception of the north-bound strategic route 6 via the M11 which, with an increase in journey time of 39%, is less affected by the morning peak period congestion.

All the journeys illustrated above demonstrate the impact on the network of only having three key access routes into Harlow, ie via A414 at Eastwick, via A1184, and via the A414 at J7. This funnelling of traffic leads to significant peak period delays and congestion and a greater tendency for regular drivers to use less suitable rural routes, particularly to the south via B181, and to the north-east via B183. It also results in reduced network resilience which means that any incidents that occur on the key links have even greater impacts on journeys to and from Harlow.

Surveys undertaken in April 2014 confirmed the data obtained from Trafficmaster, finding that extensive queues occurred at J7 during the morning and evening peak periods. Both the northbound and southbound M11 off-slips were found to have queues of almost 200m over extended periods during the AM peak period, and on the northbound off-slip again during the PM peak period. To the south-west, the B1393 also had queues in excess of 100m for much of the AM peak period, and to the north-west the A414 also had queues reaching 100m for much of the AM and PM periods.

To the north of Harlow, one of the issues affecting access to and from Harlow is the congestion on the A1184 through Sawbridgeworth, as discussed above. Queue surveys in July 2013 found that there was extensive queuing at the A1184/Station Rd/West Rd double mini-roundabout junction. Queues on the A1184 were found to be in excess of 70m throughout both peak periods. At the A1184/High Wych Rd junction, queues on the High Wych Rd, particularly during the PM period, were continuous and extended beyond the sight of the surveyors (>115m) for the majority of the survey period.

Other queue surveys in 2011 indicate extensive queuing on the A414 to the north-west of the town, at both the Eastwick and Burnt Mill junctions (the latter has since had capacity improvements).

The significant congestion at J7 has been recognised by the Highways Agency with their requirement during the Local Development Order (LDO) process in 2013 to cap the number of jobs approved at the Harlow Enterprise Zone sites until this situation can be mitigated. The 2012 traffic assessment for the EZ[21] investigated capacities of a number of junctions within the town.

[21] Enterprise West Essex @ Harlow, Transport Assessment, August 2012, Mouchel for Harlow District Council
http://moderngov.harlow.gov.uk/Data/Cabinet/20130131/Agenda/Transport%20Assessment%20and%20Framework%20Part%20A%20(pdf).pdf

The background to the EZ employment cap is set out in the 'Agreed Statement of Common Ground between Harlow District Council and the Highways Agency'[22]. This document commented on supplementary transport assessment work which found that M11 J7 would be expected to be operating at the limits of its capacity by the end of 2019, and during 2022 (with all three EZ phases in place) the junction operation would further deteriorate, particularly during the AM peak. The conclusion reached by the HA was that "*the majority of the revised quantum of EZ development can be accommodated at M11 J7. However, there is a need to cap the final phase of EZ development until J7a has been provided and is open for use*."

The EZ TA also found that other junctions within the town would be experiencing capacity issues, and undertook sensitivity tests with J7a in place. The summarised results are set out in Table 3.2.

[22] Agreed Statement of Common Ground between Harlow District Council and the Highways Agency, May 2013, http://www.harlow.gov.uk/sites/harlow.gov.uk/files/documents/files/London%20Road%20North%20Statement%20of%20Common%20Ground%20-%20Highways%20Agency_0.pdf

Table 3.2 Harlow Enterprise Zone TA A414 Junction Assessments

| Junction | Time Period | Year / Scenario (Max DoS%/Max RFC) | | | |
|---|---|---|---|---|---|
| | | 2011 Base | 2021 with Committed | 2021 with EZ | 2021 with EZ & J7a |
| A414 / A1169 Southern Way | AM | 92% | 101% | 132% | 111% |
| | PM | 116% | 128% | 106% | 91% |
| | | | | | Comments |
| A414 / A1025 Second Ave | AM | 1.00 | 1.59 | 1.94 | Mitigation proposed |
| | PM | 0.95 | 1.29 | 1.08 | |
| A414 / Church Langley | AM | 0.82 | 1.11 | 1.31 | |
| | PM | 0.71 | 0.90 | 0.96 | |
| A414 / Gilden Way | AM | 0.82 | 1.19 | 1.04 | Mitigation proposed |
| | PM | 0.79 | 1.10 | 1.04 | |
| A414 / A1184 Cambridge Rd | AM | 0.78 | 0.89 | 0.97 | Mitigation proposed |
| | PM | 0.67 | 0.81 | 0.75 | |
| A414 / East Rd | AM | 62.9% | 69.4% | 61.5% | Mitigation proposed |
| | PM | 90.3% | 104.2% | 92.1% | |

The junctions that were identified as needing additional capacity mitigation measures, have since had designs approved and the schemes are currently programmed by ECC for 2016/17; these schemes include improvements to pedestrian facilities.

### 3.2.2 Through Traffic

In order to understand the impact of through traffic on Harlow an analysis of movements on key links immediately surrounding Harlow was undertaken, based on mobile phone data. Figure 3.5 and Figure 3.6 show the results of the analysis.

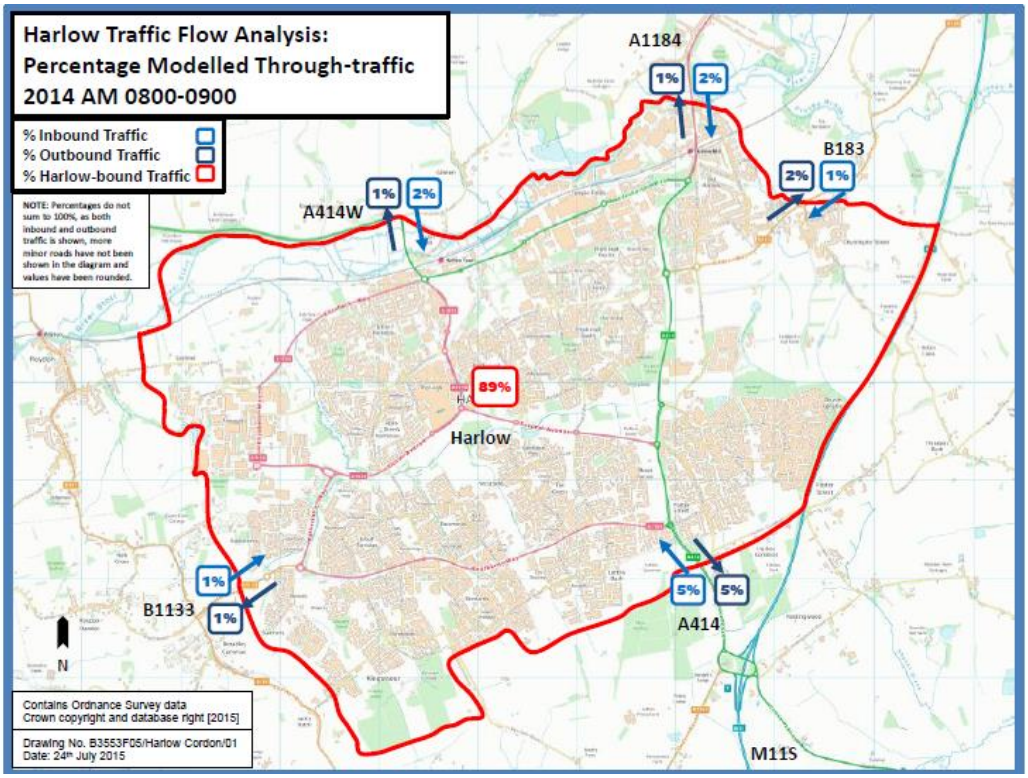



Figure 3.5 Through-Traffic Analysis 2014 AM

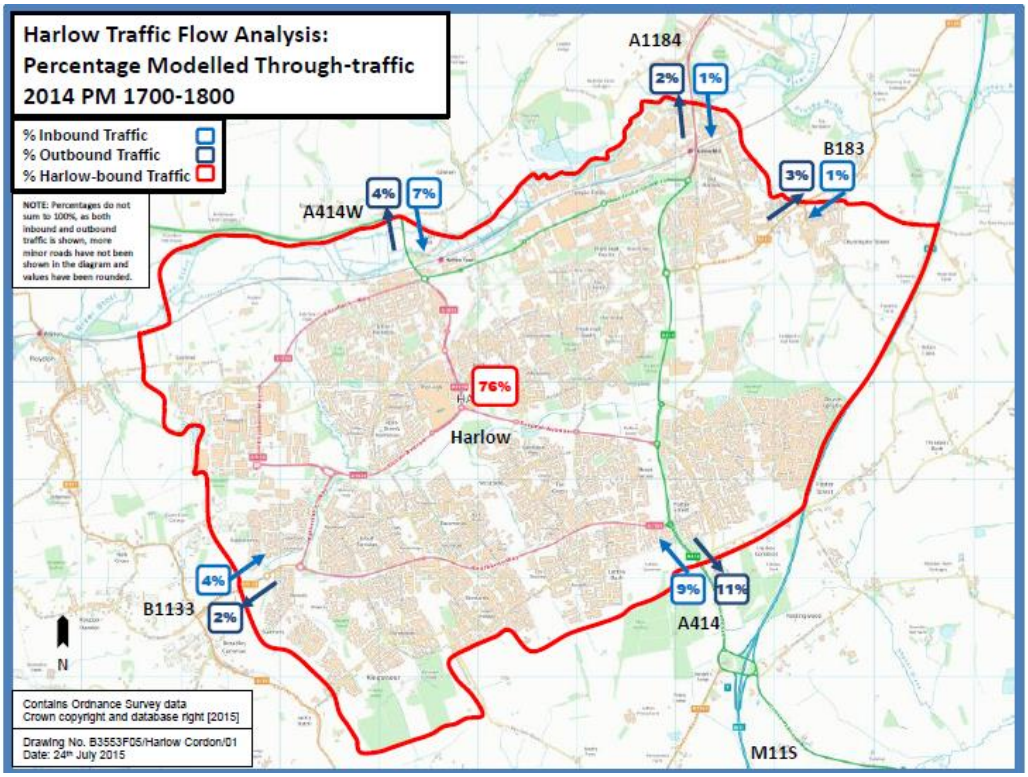



Figure 3.6 Through-Traffic Analysis: 2014 PM

It can be seen that during the AM peak approximately 89%, and during the PM peak approximately 76%, of trips had an origin or destination within Harlow. The analysis found that through trips within the town make up only around 11% in the AM and around 24% in the PM. The connection which has the highest level of through traffic in both time periods is on the A414 immediately north of J7; in the AM through trips on other key links are evenly spread, while in the PM the A414 to the north of the town has the next greatest level of through trips after the southern A414.

This supports the objective that access to and from Harlow needs to be improved as it is a key origin or destination of the majority of trips on the network.

### 3.2.3 Mode Choice

There is also a high dependency on the use of the private car, with 75% travelling to work in Harlow by car/van as driver or passenger, and 70% of Harlow residents travelling to work by car/van. The attractiveness of this mode of travel is compounded by the large number of car parks available in the town and at places of work.

The town has a comprehensive local bus network, with around 40 daytime bus routes, run by six operators. However, most services travel to the centrally located bus station and so bus journeys to the key employment and retail sites on the periphery of the town often require an intermediate change of buses.

The West Anglia mainline, which serves the two rail stations, links the key international gateways of Stansted and Stratford, and is, in common with the rail network across Essex, reaching full capacity. Both rail stations are in the north of the town, the main station, Harlow Town, providing regular trains between London, Cambridge and Stansted Airport. The peripheral locations of these stations, the lack of both direct and evening bus services, and the need to cross the A414 to reach the town are factors which affect the mode of travel used to reach the stations.

London Underground services, available at Epping, some seven miles to the south, are attractive to commuters as, despite being slower, they offer lower fares than mainline rail services to London. Commuters also tend to drive to Epping station, resulting in additional peak period trips on the local road network.

When Harlow was built it included a comprehensive network of segregated footpaths and cycleways, connecting the individual ‘villages’ with the town centre and employment areas. Despite this only 2% of commuters cycle to work, although 40% of journeys to work are less than 3km in length.

There has been significant investment in cycle infrastructure by ECC in recent years, to help to improve the condition of the network and to plug gaps which had developed over the years. Personal Travel Planning (PTP) has also been extensively rolled out, helping to publicise the improvements and encourage modal shift in the targeted areas. This has resulted in reduced car use and increased reliance on more sustainable modes. As a consequence PTP is now considered a core element in delivering more sustainable travel in Harlow.

## 3.3 Opportunities and Constraints

Constraints:

- majority of district already developed resulting in very limited opportunities to deliver required growth within boundary;
- existing highway network constraints need to be addressed before growth can occur;
- restriction on number of jobs at Enterprise Zones until strategic network access issues addressed;
- major improvement to J7 may result in unacceptable pressure on A414 junctions within town, limiting the effectiveness of the increased junction capacity;
- likelihood of adjacent districts proposing urban extensions to Harlow during current round of Local Plan development as provides more sustainable growth location if network constraints can be reduced;
- physical and environmental constraints likely to reduce viability of some network congestion solutions.

Opportunities:

- Emerging Local Plans provide mechanism for delivering and funding network improvements;
- Growth in the vicinity of Harlow provides an opportunity for sustainable development due to opportunity to improve current and future public transport accessibility;
- Opportunity to open up development land within and around district for housing and employment;
- Improving network resilience will encourage private sector investment and help to deliver new jobs and homes;
- Improving network will also encourage regeneration, Harlow is in the most deprived 30% of local authorities, and is 2$^{nd}$ most deprived in Essex.

# 4 Understanding Future Situation

## 4.1 Study Area

The geographical area of impact to be addressed by the potential intervention has been informed by the evidence reviewed in earlier sections of this OAR, including the extent of current and future transport problems and underlying drivers. The geographic extent of the study area is illustrated in Figure 4.1.

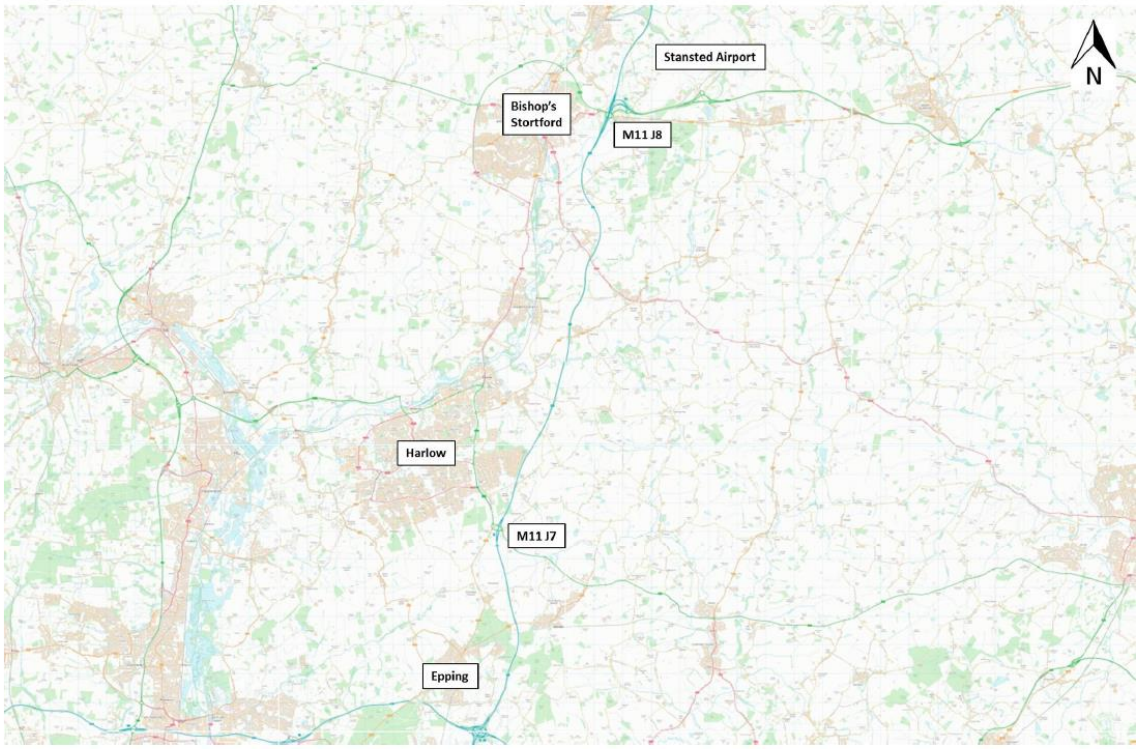





Figure 4.1 Indicative Study Area

## 4.2 Future Land Use and Policies

The Harlow Local Development Plan (HDLP) Emerging Strategy Consultation, with reference to the need for high quality infrastructure, states:

> *"2.16 The ability of the transport system to accommodate growth has emerged as one of the single biggest barriers to accommodating the level of development needed in Harlow. On the strategic and local road network congestion is severe at peak times and a number of junctions are operating close to capacity or in excess of their original design thresholds. The existing*

*road layout within some residential areas can also make parking and manoeuvring difficult.*

*2.17 Although there are a number of planned improvements to the road network to support committed development schemes in Harlow (Newhall, the Harlow Enterprise Zone and the Gilden Way development) the evidence shows that junction 7 on the M11 is operating close to its planned capacity and that any significant growth (housing and/or employment) in the Harlow area will cause the junction to exceed this capacity. Therefore, a new junction on the M11 (Junction 7a) is required to deliver growth in and around the town.*

*2.18 The strategy for Harlow will need to include measures that integrate transport and land use planning in order to provide an increase in public transport use as well as implementing enhanced access to the M11 through a new junction*."

There are already several committed developments within Harlow, including the Harlow Enterprise Zone, and several large housing sites, all within the eastern sector of the town. In addition, significant committed housing development is taking place in Bishop's Stortford, as well as the ongoing expansion of passenger numbers at Stansted Airport. These developments will increase pressure on the local and strategic transport infrastructure within the study area.

All four districts in the vicinity of Harlow, including Epping Forest, East Herts and Uttlesford, are part of the same Strategic Housing Market Assessment area (SHMA), and Opinion Research Services (ORS) were jointly commissioned by them to undertake a housing assessment in order to establish the districts' objectively assessed need (OAN)[23]. The SHMA report also includes employment projections. The estimates for both are summarised in All four districts are in the process of developing new Local Plans to address their OAN and, given that the Plans have yet to be agreed, all development information contained in this section is based on informed assumptions made early in 2015, following discussions with district planning officers. It should be noted that this information pre-dates the later SHMA values, and will be subject to change as the spatial options for the Local Plans are developed and evaluated, at which point the most up-to-date OAN housing and employment numbers will be used.

[23] West Essex & East Herts Strategic Housing Market Assessment, Report of Findings, Sept 2015, Opinion Research Services;
http://www.uttlesford.gov.uk/CHttpHandler.ashx?id=5344&p=0

*Table 4.1*.

All four districts are in the process of developing new Local Plans to address their OAN and, given that the Plans have yet to be agreed, all development information contained in this section is based on informed assumptions made early in 2015, following discussions with district planning officers. It should be noted that this information pre-dates the later SHMA values, and will be subject to change as the spatial options for the Local Plans are developed and evaluated, at which point the most up-to-date OAN housing and employment numbers will be used.

Table 4.1 Draft Housing & Employment Estimates 2011 to 2031

| District | Estimated Housing | Estimated Jobs |
|---|---|---|
| Harlow | 5,100 | 3,900 |
| Epping Forest | 9,520 | 3,600 |
| East Herts | 12,920 | 9,700 |
| Uttlesford | 9,520 | 9,200 |
| Total | 37,060 | 26,400 |

As part of the options assessment, districts were asked to provide planning information on possible development sites and their housing and employment levels. This information has been used to assess future highway network capacity, which will in turn be fed back to the districts to inform their site allocation and spatial options processes. In addition to Harlow, Epping Forest, Uttlesford and East Herts, planning information was also sought from Broxbourne and Enfield councils. The resulting totals are summarised in

Table *4.2*; it should be noted that the highway modelling has a base year of 2014 and a forecast year of 2036 and the table reflects this period of assessment.

Guidance states that forecasts of population, households and employment should be based on the TEMPRO database[24]. While this provides a useful reference case with which to compare model outputs, for the purposes of the options assessment it was considered pertinent to base the evaluation on best available planning data as current TEMPRO forecasts do not include, and are therefore much lower than, the emerging Local Plan growth predictions.

[24] Further Guidance on Option Assessment, Technical Analysis Guidance for Technical Project Manager, DfT WebTAG January 2014

Table 4.2 Inputs to 2036 Highway Modelling Matrix Building (Medium Growth)

| District | Estimated Housing | Estimated Jobs |
|---|---|---|
| Harlow | 4,850[#] | 6,000 |
| Epping Forest | 6,575 | 9,725 |
| East Herts | 15,550 | 2,400 |
| Uttlesford | 10,455 | 7,750 |
| Other Districts | 18,775 | 9,800 |

[#] It should be noted that the level of development in the immediate vicinity of Harlow will include sites that are located within East Herts and Epping Forest. These would comprise around 8,000 homes that would also be likely to impact on the immediate area of Harlow.

In the absence of detailed and site-specific information on other areas within the study area, TEMPRO background growth factors have been applied. For further information about modelling methodology refer to the Appraisal Specification Report (ASR), the Local Model Validation Report (LMVR) and the Model Forecast Report (MFR).

## 4.3 Future Changes to Transport System

A number of studies have been undertaken to identify the likely impact of the committed and emerging Local Plan growth, the most recent of which is the Harlow highway model. This has resulted in the identification of a number of highway schemes which are currently being constructed, designed, and/or are awaiting determination of funding streams to enable their implementation. The majority of these are to mitigate the likely impact of already committed development and are listed in Table 4.3.

Table 4.3 Capacity Improvement Schemes for Committed Development

| Scheme | Description | Status |
|---|---|---|
| A414/B183 Gilden Way | Improved geometry and link widening | Construction scheduled 2016/17 |
| B183 Gilden Way / London Rd | Approach width improvements | Part of Harlowbury development S278 |
| B183 Gilden Way | Capacity enhancements and cycle way improvement | Part of Harlowbury development S278 |

| Scheme | Description | Status |
|---|---|---|
| Sheering Rd / Churchgate St | Improved geometry and link widening | Part of Harlowbury development S278 |
| A414 / A1184 | Junction capacity improvement | Construction scheduled 2016/17 |
| A414 west of A1184 | Link widening | Construction scheduled 2016/17 |
| A414 / New Hall Link | New link & junction with A414 | EZ improvement, Construction scheduled 2015 |
| London Road | Restriction of link to bus / cycle / peds | Implementation 2021 |
| Templefields / A1184 | New link & junction with A1184 | EZ improvement, funded |
| A414 / A1025 Clocktower rbt | Improved geometry | Completed |
| A1025 Second Ave / A1019 | Improved geometry | Preliminary design |
| A1019 / First Ave | Improved geometry | Preliminary design |
| M11 J7 short term scheme | Hamburger link north to south | Preliminary design |
| M11 J8 short term schemes: | Segregated LT slip from M11 SB off-slip to A120E | Preliminary design |
| | Widening of M11 NB offslip nearside lane | Preliminary design |
| | Widening of A120W | Preliminary design |
| A120 / A1250 rbt | Reconfiguration to signalised junction | Preliminary design |
| A120 / B1393 rbt | Improved geometry | S106 funding from BS North |
| A120 / BSN site access | New rbt junction | S106 funding from BS North |
| A120 Lt Hadham Bypass | Single c'way bypass | HCC LEP scheme, scheduled for 2018 |

Over and above these identified improvements, the level of growth likely to come forward as a result of the emerging Local Plans will undoubtedly require additional and major transport infrastructure to be provided.

In terms of public transport, the planned four-tracking of the West Anglia Mainline, and Crossrail2 (with the possibility of extending both schemes to Harlow Town) are both key rail projects which will have a significant impact on accessibility, connectivity and growth in the study area.

## 4.4 Future Travel Demands

Earlier work was undertaken to identify the likely impact of Local Plan growth using a SATURN model. While this was broadly WebTAG-compliant and gained the approval of the Highways Agency for high level assessment of strategic impacts, it was not considered suitable for the assessment of more local issues. However, it did provide valuable information with regard to several schemes which are currently under construction (as shown in Table 4.3).

To ensure that a reliable assessment of future travel demands and impacts could be obtained, ECC commissioned Jacobs to develop a highway assignment model in Visum in 2014.

The new model methodology follows WebTAG guidance; origin:destination information used within it has been informed by mobile phone data. The 2014 base model is in the process of being signed off by Highways England. The variable demand model (VDM) is in its final stages and will be incorporated for the next stage of more detailed option modelling, which will be presented as part of the planning application for the preferred option. As such, outputs reported herein should be considered high level and as a worst case as they do not take into account mode shift, etc, that VDM would allow for.

The modelling has included an evaluation of the 'without intervention' scenario, referred to as the 'Do Minimum model'. Following WebTAG guidance, a Constrained version of this model has been run, in which the growth has been constrained to TEMPRO. The future year matrices have been developed using an Uncertainty Log, which contains the best available planning information obtained from the various districts. The planning and network assumptions information is summarised in Appendix A. The Constrained models include those sites and schemes which are near certain (NC) or more than likely (MtL), and with overall district and model area growth constrained to TEMPRO.

The various options modelled to determine the need for intervention are set out in Table 4.4.

Table 4.4 Transport Intervention Determination Modelling Scenarios

| Scenario | Network | Matrix |
|---|---|---|
| 2014 Base | Existing network | 2014 matrix |
| 2021 Do Minimum | Includes schemes in Table 4.3 | Base plus committed development plus TEMPRO background growth |
| 2036 Do Minimum - Constrained | Includes schemes in Table 4.3 | Base plus Local Plan NC & MtL sites, constrained to TEMPRO |
| 2036 Do Minimum - Unconstrained | Includes schemes in Table 4.3 | Base plus Local Plan sites; TEMPRO growth applied to non-study area trips |

It should be noted that 2021 is the assumed Opening Year for any major network intervention, and 2036 is the corresponding Design Year. Model outputs used to estimate Design Year option benefits and value for money reported later in this OAR have been taken from both the 2021 and 2036 Do Minimum unconstrained models.

## 4.5 Do Minimum Modelling Outputs

The modelling in VISUM shows how traffic in the study area is expected to increase from the 2014 base to the 2036 Do Minimum Unconstrained scenario, ie with committed developments and schemes, with growth in the detailed model area as per emerging Local Plan requirements, and with growth in the wider non-study area constrained to TEMPRO. As the Unconstrained modelling shows the greatest impact on the network due to the level of growth included, all outputs reported in this OAR are from the Unconstrained modelling.

The model plots for the AM and PM peak hours shown in Figure 4.2 and Figure 4.3 illustrate the level of change in flows that can be expected without any of the major highway options being implemented. It can be seen that traffic would be expected to significantly increase on the strategic road network, particularly on the M11, A120, A10 and M25. In the vicinity of Harlow, the A414 corridor on the immediate approaches to the town indicate significant increases, as does the B183 Sheering Road/Gilden Way.

It should be noted that the A1184/B1393 corridor (the old A11) shows little or no change in flows which is likely to be due to the corridor being already at capacity. Traffic wishing to travel between Harlow and Bishop's Stortford is seen to be using less suitable roads to avoid the congested route through Sawbridgeworth, particularly the A1060/B183 Sheering Road/Gilden Way route, and unclassified roads north of High Wych. To the south of Harlow, the B181 is shown to be carrying significantly more traffic, particularly in the PM period, which is likely to be as a result of congestion at M11 J7 and through Epping. This traffic is also shown to be routeing around the west of Harlow on the A1169. During the PM peak traffic on the A414 east of the M11 is also not shown to increase, which may also be as a result of M11 J7 congestion.

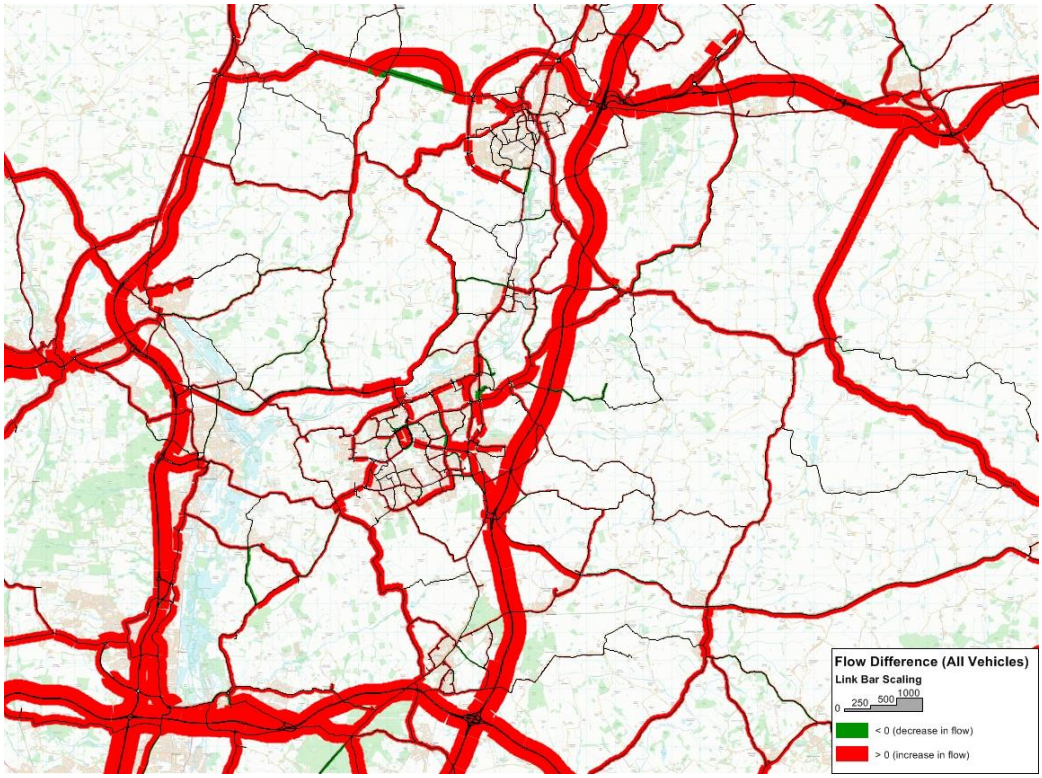



Figure 4.2 Change in flows: 2014 to 2036 Do Minimum AM (Unconstrained)

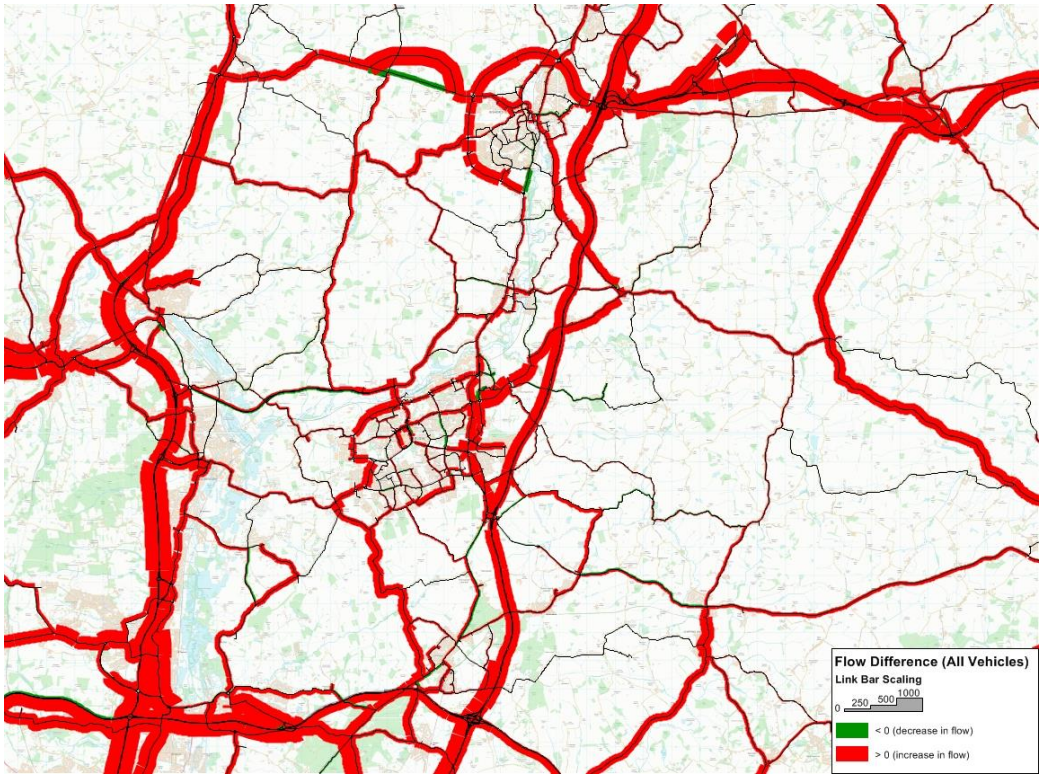



Figure 4.3 Change in flows: 2014 to 2036 Do Minimum PM (Unconstrained)

Daily flows on key links would be expected to increase significantly, as set out in Table 4.5. It can be seen that flows on links within Harlow could increase by between 45-76% in 2036 with no intervention.

Table 4.5 Forecast Model Traffic Flows on Key Links without major network interventions

| | 2-way AADT | | Change over 2014 |
|---|---|---|---|
| **Link** | **2014** | **2036** | **%** |
| A414 south of Eastwick | 23,100 | 39,000 | +69% |
| A414 north of J7 | 41,400 | 72,400 | +75% |
| A414 Edinburgh Way | 22,600 | 32,700 | +45% |
| A1184 Cambridge Rd | 15,900 | 26,900 | +69% |
| A1025 Second Ave | 23,900 | 38,800 | +62% |
| A1019 Velizy Ave | 9,800 | 16,000 | +63% |
| B183 Sheering Rd | 11,000 | 19,400 | +76% |
| M11 J7:J8 | 86,300 | 127,500 | +48% |
| M11 J6:J7 | 97,500 | 153,100 | +57% |

Almost all of these links are shown to currently experience significant peak period congestion, as illustrated in Figure 3.1 and, therefore, additional demand as a result of traffic growth would be a key indicator of future increased and more widespread congestion within the town.

# 5 Need for Intervention

The need for intervention is set out in the NLP regeneration and growth study[20] which states that:

> *"There is a well-founded concern that the issues of localised deprivation, skills shortages, economic restructuring, areas of poor quality housing, insufficient range of housing, inadequate infrastructure and ageing physical environment will continue to affect the town without concerted effort to address these. Without intervention Harlow's long term prospects are considered to be weak, particularly given the position of comparator towns and cities elsewhere."*

It concludes that there is a clear link between growth and regeneration outcomes, and that recent developments in the town have delivered jobs, homes, infrastructure investment and new community facilities.

As set out in sections 3 and 4, evaluation of the existing situation and highway modelling of future demands has shown that there is a need for intervention to increase highway capacity to help to facilitate likely levels of growth and improve accessibility within the town.

## 5.1 Underlying Drivers or Causes

As previously stated in Section 3, Harlow was originally planned in the 1950s to have a population of 80,000, and a peak of 81,000 was reached in 1974. However, the population declined to 73,000 during the 1980s, and only exceeded the earlier high levels in the late 2010s; the 2011 Census indicated that the population was 82,200.

Over the past 20 years, the underlying drivers for change have shifted in priority. Whereas the priority in the early 1990's was focussed on improved road access to the wider network and congestion relief in the Harlow urban area, the priority has more recently become enabling sustainable economic growth and regeneration within the West Essex and East Herts area, with particular reference to Harlow and the London-Stansted--Cambridge corridor.

In particular, there is recognition that it will not be possible to release the residential and employment development potential of key sites around Harlow in the emerging Local Plans without major transport interventions and associated improvements to the local road network.

## 5.2 Current Transport-related Problems

The key current transport problems relate to the configuration of the existing J7, which is already at capacity during peak periods, and which provides the only access to the strategic road network. The resilience of the A414 is also compromised by its routeing through J7, as well as the existing and future capacity issues at some of its junctions (see Table 3.2) through Harlow, where peak period congestion already leads to traffic routeing along less appropriate roads, particularly the town centre.

Existing growth in Harlow is already constrained by the lack of capacity at J7, with the LDO for the Enterprise Zone capped until additional network capacity is realised. This situation is recognised by Highways England within the RIS, and a Stage 0 study to identify possible junction capacity improvement at J7 is currently being undertaken on their behalf.

## 5.3 Future Transport-related Problems

As well as existing and committed growth constraints the existing highway network congestion situation will be exacerbated by growth arising from OAN that the districts will need to deliver as part of the emerging Local Plans process. Additional highway infrastructure improvements are needed to enable future growth, particularly along the A414 corridor, and through the town centre.

In addition, land that could be brought forward for development in the east of Harlow is constrained by lack of transport infrastructure to enable connection to the local road network.

## 5.4 Impacts of Not Changing

Thus the immediate impacts of not changing are:

- Very limited scope for growth in housing and employment, and regeneration to meet required regional and local objectives.
- Worsening congestion at J7, with consequential impacts on traffic on the A414 through Harlow, access to the M11 and Stansted Airport;
- Worsening connectivity within the town;
- Worsening inter-connectivity with major centres including London, Cambridge and Stansted Airport.

# 6 Generating Options

Since the decision to expand Stansted Airport in 1985 there has been recognition of the need for intervention within the Harlow area, and there have been a number of studies of possible road schemes. Some of these have been in outline only, and others in more detail. This section sets out the history of options development and then details the initial sifting process.

## 6.1 Evaluation of Alternative A1184-M11 Connections (1994)

The 1994 report of a A414-M11 Link Road study, jointly commissioned by both Herts and Essex County Councils, set out the background to its own remit and noted that, following consultation in 1988, three objectives for the comprehensive improvement of the road network in the Hertfordshire/Essex border area had been identified. These were:

- To provide a high quality access to Stansted Airport along the A414 corridor;
- To relieve the urban area of Harlow of A414 Primary Route traffic;
- To relieve Sawbridgeworth of through-traffic on the A1184 without further exacerbating conditions in Bishop's Stortford.

The 1994 report noted that the early work on broad strategies led to the adoption of a scheme to provide a link connecting the A414 to the M11 north of Harlow, and a Sawbridgeworth bypass ('Strategy E'). Strategy E comprised 3 elements:

i. An Eastwick to Harlow Mill link;
ii. A Harlow Mill to M11 link; and
iii. A Sawbridgeworth bypass.

Following further public consultation in 1992, Herts County Council Environment Committee agreed on the optimal routes for each element (i. Route C, ii. Route D, iii. Routes A or B, both these alternatives also included a Spellbrook bypass). However, while ECC Members accepted Route C for the Eastwick to Harlow Mill section, they rejected all routes developed for the Harlow Mill to M11 section, taking the view that the environmental impact was unacceptable; they had no view on the Sawbridgeworth bypass element as it was wholly within Herts. As agreement had not been reached both authorities agreed that further investigation was required to try and identify a more environmentally acceptable solution.

This formed the remit for the 1993 Study which reported in January 1994. Three possible route corridors were identified, which would avoid significant demolition of property:

- Original Harlow Mill to M11 corridor, Route D, with vertical alignment modifications, including passing over the railway and under the M11;
- Area between Sawbridgeworth and Spellbrook; and
- Area to south-east of Bishop's Stortford.

All three corridor options were to take into account the routes retained for other sections of the scheme and any consequential effects. It should be noted that the Sawbridgeworth bypass element was the subject of a separate report [unseen]. Within each of these corridors specific routes were identified and these, plus one additional route, were taken forward for more detailed investigation, including the production of 1:2500 scale drawings, longitudinal sections and environmental constraint plans [also unseen]. Subsequently, additional traffic modelling was supplied for two further modifications, one of which was the replacement of the proposed dual-carriageway Harlow Mill - M11 link with single carriageway, the other being an A1184-M11 link to the north of Sawbridgeworth.

A key conclusion of the report is that:

> *"In operational terms, a scheme incorporating a Harlow Mill to M11 link is much better than any other option and meets all of the objectives set for the project. The new motorway junction can be built to current design standards, and would not be opposed by the Department of Transport."*

However, the proposed scheme raised what was considered to be a significant issue:

> *"Environmentally, however, there is a major obstacle on the (then proposed) alignment where it crosses a site for which scheduled ancient monument status has been applied. This is likely to be insurmountable."*

The report therefore suggested the investigation of other alignments, but noted that these may not permit the continuous grade separated layout of the original route.

The issues around each of the options reviewed in the 1994 study are summarised in Table 6.1.

Table 6.1 1994 Study - key findings summary

| Scheme | Pros | Cons |
|---|---|---|
| Harlow  Mill to M11 Route D | Meets all objectives of project | Crosses scheduled ancient monument, other alignments would need to be investigated |
| Bps Stortford SE Bypass | | Doesn't remove A414 primary traffic from Harlow;<br>Attracts traffic to A414/A1184 corridor – bypass would need to be dual 3-lane;<br>A414 west of Harlow seriously overloaded;<br>Affects proposed M11 airport slip roads [now constructed];<br>Thorley St ecologically sensitive sites affected |
| A1184-M11 Link north of Sawbridgeworth | Meets two of three objectives | Doesn't remove A414 primary traffic from Harlow;<br>Attracts traffic to A414/A1184 corridor;<br>Full visibility standards of new M11 junction not achievable;<br>Less environmental impact but still ecologically sensitive |
| A414-M11 link to north of Harlow only (dual A414-A1184, single A1184-M11) | Relieves Harlow of A414 traffic to lesser extent than full dualled option;<br>Provides improved access to Airport | Only minor relief to Sawbridgeworth;<br>Modelling indicates should be dualled throughout;<br>Crosses scheduled ancient monument, other alignments would need to be investigated |

| Scheme | Pros | Cons |
|---|---|---|
| General | | Any A1184 connection to M11 north of Sawbridgeworth effectively abandons objective of relieving Harlow of A414 traffic; would only provide access to Airport; flows not likely to be high enough to justify costs and environmental impacts |

The A1184-M11 Link north of Sawbridgeworth is the option that has been included in the high-level evaluation of schemes set out in section 6.7 below, where it is referred to as the 'Northern Northern Bypass'.

## 6.2 The Harlow Transportation Study (2005)

The 2005 Harlow Transportation Study was undertaken by MVA on behalf of Harlow Council to test the feasibility of major population and employment growth in the Harlow area against the existing transport infrastructure. The project included development of a strategic area model, using TRAM.

Its objectives were to:

- identify existing and emerging transport problems, issues and opportunities;
- examine issues and capacity and identify broad locations and scope for more housing and employment development;
- identify additional transport schemes to enable delivery of development.

It noted that the London-Stansted-Cambridge corridor had been identified as a potential area for growth and economic regeneration through the Government's Sustainable Communities Plan and Regional Planning Guidance, and that the area between Epping, North Weald, Harlow and Stansted occupied a key position within this corridor.

When considering the current highway provision, the study report noted that:

> *"The fact that the A414, a primary east-west route, dog-legs through central Harlow, is a major influence on traffic conditions in the town.*
>
> *There are three main entry corridors through which traffic accesses and leaves Harlow: A414 to the north-west, A1184 (old A11) to the north-east, and A414 to the south.*

*That Harlow is dependent on a single junction access to the strategic motorway network is unusual in towns of a similar size and character.*

*The location of M11 J7 to the south east of Harlow is less than optimal for serving the District and is not what was envisaged when the town was originally planned. This single junction access to the motorway causes strategic and local route choices that are to the detriment of Harlow Urban Area road users and residents."*

The report also recognised that J7 had a dual function of providing access to Harlow and the wider corridor served by the A414. In particular it noted that

*"Taken together, the location of J7 relative to the town and the operational limitations of the junction during peak periods result in restricted access to the motorway network from Harlow and the A414 corridor."*

With regard to public transport, the study considered that the urban area of Harlow was served by a good network of local bus routes, with buses well used and facilities improving. However, it considered that there was scope for further improvement to local bus services, particularly in regard to the quality of the bus fleet, the facilities and information provided at stops, the integration of ticketing, and that some areas may be better served by different routeing patterns.

The study recognised that development of significant scale in and around the town offers the potential for a step-change in the public transport offer. It considered that improvements should be focussed not only on linking development areas to the town centre, but also connecting Harlow to areas south and east of the District, particularly creating improved accessibility to the London Underground network at Epping.

The study considered two main planning scenarios based around the construction of 19,000 new housing units over and above the then existing Local Plan commitments by the year 2021.

- Scenario 1 placed the additional development on a north:south axis, including significant residential development to the north of the A414 in the vicinity of Eastwick and Gilston Park.
- Scenario 2 placed the additional development on an east:west axis, with a smaller cluster of residential development along the B183 to the north west of the town.

Both schemes also included significant development at North Weald. It should be noted that the currently emerging Local Plan is likely to result in a planning scenario which combines major elements of both of the scenarios tested in the 2005 study. The

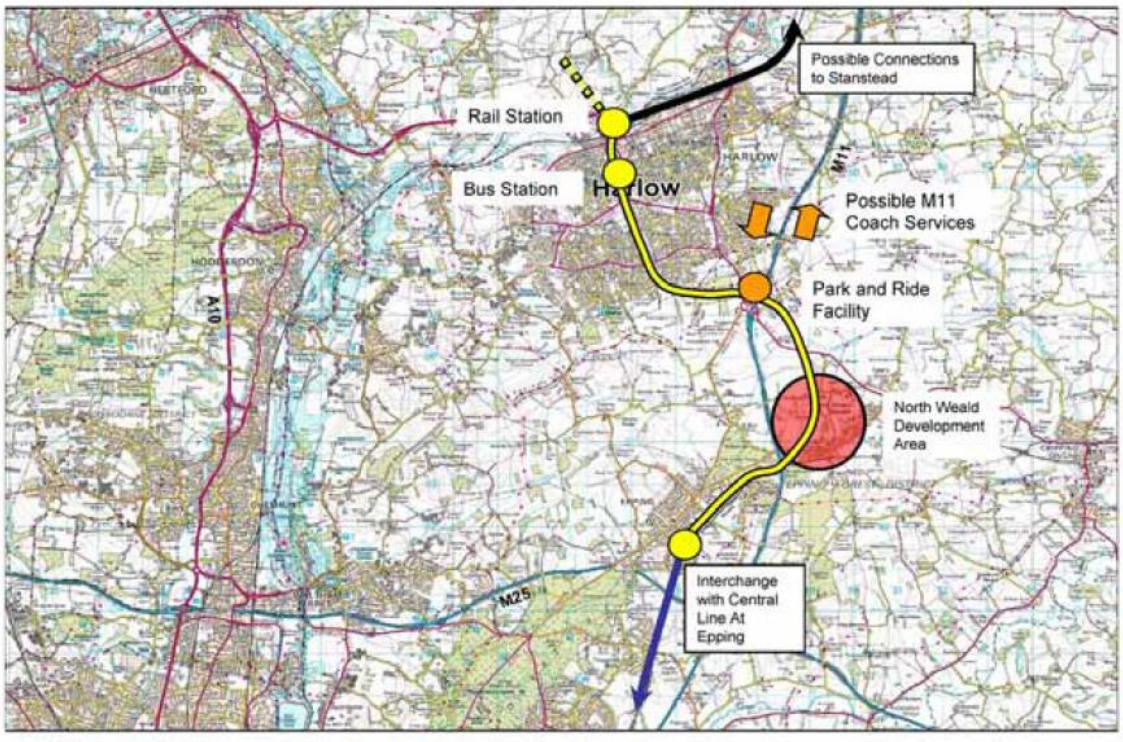
difference would be less development to the north and south, at Gilston and North Weald respectively.

The study considered two main transport schemes, as follows:

- A Northern Relief Route, linking the A414 with the M11, with sub-options for
    - A route south of Sawbridgeworth to a new junction with the M11
    - A route north of Sawbridgeworth to a new junction with the M11
    - A Sawbridgeworth western bypass with link to the Bishop's Stortford bypass
- A Southern Relief Route linking into the M11 at J7 with two sub options, each linking into the A414 either side of Roydon.

All of the highway schemes were required to include (unspecified) improvements to J7 to deliver additional capacity to alleviate current and forecast peak period congestion.

All scenarios also assumed that a high quality, 10 minute frequency, guided bus-based public transport corridor is in place, linking key development areas with Harlow Town station, the bus station, south Harlow, J7 (where a park and ride facility would be in place), North Weald and Epping Central Line station. This scheme is illustrated in Figure 6.1.




Source: Figure 3.3, Harlow Transportation Study, 2005

Figure 6.1 2005 Study High Quality Public Transport Corridor

The study noted that, given the congestion levels measured on the A414 and in the north-east quadrant, it was likely that major expansion of the town was unfeasible without major new transportation infrastructure. To maximise any opportunities, land-use and transport planning needed to be integrated to keep travel to a minimum, place less reliance on private car, increase opportunities to use sustainable modes, support regeneration and help tackle social deprivation.

The findings of the study were presented as a set of scenario and scheme appraisal matrices. The schemes were developed as outline routes rather than detailed drawings, thus there is only a high level appraisal of engineering feasibility and environmental impacts.

The report concluded that the two best performing options were:

> Planning Scenario 1, with northern relief road to the south of Sawbridgeworth between Eastwick and a new junction on the M11, with a junction on the A1184, major improvement to J7, and a high quality PT corridor; and
>
> Planning Scenario 2 with southern relief road, connecting the A414 east of Roydon to J7, with intermediary junction, major improvement to J7 and the high quality PT corridor.

The Stage 2 NATA appraisal findings for these scenarios are summarised in Table 6.2.

Table 6.2 2005 Study - key findings summary

| Scenario / Appraisal | PS1 (north, central & N Weald) | PS2 (dispersed south, west, east & N Weald) |
|---|---|---|
| Transport | | |
| Engineering Feasibility | More extensive viaduct required; PT corridor extended to serve Gilston dev would require new rail and river bridges | |

| Scenario<br>Appraisal | PS1<br>(north, central & N Weald) | PS2<br>(dispersed south, west, east & N Weald) |
|---|---|---|
| Operational Feasibility | Requires new M11 Jnc, resulting in new patterns of movement, would provide traffic relief to J7, reducing scale of improvement needed at J7 | |
| Outline Capital Costs | Around 10% lower than PS2;<br>Cost per km higher due to engineering complexity; extension of PT corridor to Gilston mean costs 20% higher | |
| Local Policy Objectives | Consistent with regeneration; helps strengthen potential as sub-regional centre; concentrated form enhances regional gravitational pull; all devs would be served by PT corridor; access to SRN improved to from north/east Harlow | Consistent with regeneration; helps strengthen potential as sub-regional centre; may create more dispersed town to threaten centre; local bus connections needed for some devs; access to SRN improved to from south/west Harlow |
| National/Regional Objectives | Broadly consistent with RSS14; don't reflect distribution of dev being consulted on for EEP | Broadly consistent with RSS14; don't reflect distribution of dev being consulted on for EEP |
| Appraisal: Shared Priority Targets | | |
| Congestion | Significantly benefits A414 and A1184, some benefits to Harlow Urban Area; dev traffic concentrated on key links, causing localised congestion and lower speeds | Significant benefits to A414; benefits (and traffic) more dispersed across network; |

| Scenario / Appraisal | PS1 (north, central & N Weald) | PS2 (dispersed south, west, east & N Weald) |
|---|---|---|
| Environmental Impacts | Avoids most critical env constraints; extensive viaduct needed – visual intrusion; noise impacts during and after construction; mitigation required; generates increase in emissions (40%) in urban area | Avoids most critical env constraints; requires viaduct – visual impact; noise impacts during and after construction; mitigation required; generates higher emissions (60% increase) with urban area but lower beyond; traffic more dispersed results in higher growth in vkm and so higher emissions |
| Accessibility and Integration | PT corridor improves accessibility to wards with highest levels of social deprivation, creates new ops for access to employment and essential services; improved access to bus and rail stations will improve integration between modes | PT corridor improves accessibility to wards with highest levels of social deprivation, creates new ops for access to employment and essential services; improved access to bus and rail stations will improve integration between modes |
| Other NATA Objectives | | |
| Economic Appraisal (methodology results in over-estimation of benefits) | PVB £1037m; costs lower; PVC £339m; BCR 3.1 | PVB £1679m; PVC £368m; BCR 4.6 |
| Deliverability | 5-7 years; significant contributions likely from developers; shortfall likely requiring public funds; PT corridor 7-12 years, require 25% local contribution | 5-7 years; significant contributions likely from developers; shortfall likely requiring public funds; PT corridor 7-12 years, require 25% local contribution |

It should be noted that the 2005 Transport Study concluded that the southern relief road scheme would also require major improvements at M11 J7 but did not provide any information on the improvement required. Accordingly the evaluation of this

scheme reported in section 6.7 of this report has not included any costs (or benefits) arising from the impact of including major improvements at J7.

## 6.3 J7 Harlow: Direct access with A414 (2005/6)

Irrespective of its consideration of transport infrastructure requirements, including a new junction on the M11, the 2005 Report highlighted the shortcomings of the existing M11 J7, although it didn't provide any information on possible capacity improvements. As previously stated, the A414 provides the only link to the wider highway network in the south of Harlow. It is a crucial link and its resilience is severely compromised by its routeing through J7.

2014 ANPR surveys indicate that between 5,300-5,800 vehicles pass over the junction in each peak hour, with 35-40% of that traffic either coming into or leaving Harlow via the A414, its busiest arm.

J7 is a five-arm grade separated signalised roundabout, with three circulatory lanes on its western side, but only two circulatory lanes on the eastern side, which is constricted by the width of the two motorway over-bridges. The junction provides access to the M11, the A414 to Ongar and Chelmsford, and the B1393 to Epping and Loughton.

The 2005/6 study, undertaken by Mouchel, investigated the possibility of removing some of the circulatory traffic by establishing a direct link between the A414 (Harlow) and the M11 to the south.

Four initial options were produced, including layouts which allowed free movement of northbound traffic from the M11 to the A414, but with a southbound link either restricted to 50 kph or requiring an on-line junction. Two further options were also produced with fully grade-separated southbound links, one with a bend restricted to 85 kph.

In order to minimise assessment work at this stage Option C was selected for further evaluation as part of this options assessment.

## 6.4 A414-M11 Link Road Feasibility Report (2007)

The 2007 Feasibility Study noted that the A414-M11 link had been investigated a number of times over the previous 10-20 years, and looked at the feasibility of two possible solutions to address the requirements of the East of England Plan which recommended an urgent need to address the existing traffic congestion problems within Harlow.

As with the 1993/4 study, the main purpose of the 2007 study was to assess the feasibility of constructing a link road from the A414 dual carriageway north of Harlow through to the M11. Whereas in 1993/4 the objective had been better access to Stansted and relief of through traffic, the key objective was to open up development potential within and around Harlow.

A key driver for the study was the opportunity put forward by site promoters for a mixed-use development north of Harlow, comprising 10,000 homes with commercial, industrial and retail premises providing up to 12,000 jobs.

Other sites had also been identified for possible development in Harlow by both the Draft East of England Plan and at its subsequent Examination in Public. One of these areas, known as New Hall, is situated east of Harlow and had the potential to provide approximately 5,000 dwellings.

Thus the 2007 study introduced a second distinct objective:

> *"The other objective … is to investigate the feasibility of providing a link into the east of Harlow as an alternative to the A414-M11 link. This alternative deals with completely separate issues, which are currently faced with on the existing road network within Harlow."*

The options considered were therefore:

- Providing a link from the existing A414 north of Harlow to the M11 (A414 – M11 strategic link);
- Providing a link from the M11 to the east of Harlow (local link into east Harlow).

The Study report stated that:

> *"The proposed housing developments that have been identified in the Draft East of England Plan play a major role in the proposed route alignments that have been identified in this report. The A414-M11 link (option 1) allows for the possibility of a major housing development to the north of Harlow and is likely to improve traffic conditions within Harlow, while the link into east Harlow (option 2) simply provides better access between the M11 and any proposed development to the east of Harlow."*

In common with the 1993/4 study, this report investigated the feasibility of several alignment options for both the A414-M11 link, and the eastern access link, both of which required a new junction on the M11, now referred to as J7a.

## 6.5 Harlow Eastern Access Study (2011)

Aecom were commissioned by ECC to undertake traffic modelling work to assess various schemes to provide additional eastern access opportunities from Harlow to the M11. This assessment work looked at:

- Long northern bypass, connecting A414 just east of Stanstead Abbots, skirting around the north of the Gilston development, crossing the A1184 just south of Redricks Lane, connecting with the M11 south of the Sheering Road overbridge;
- Short northern bypass, connecting from A414 at Eastwick, to the A1184 and to the M11 in the same locations as the long northern bypass;
- Southern bypass, from The Pinnacles, west of Katherines, and south of the urban area of Harlow, connecting through to the J7 gyratory;
- New link with A414 500m south of B183 Gilden Way across to new junction on M11;
- New link with B183 Gilden Way utilising the existing B183/London Road roundabout across to new junction on M11.

The study provided an overall summary of the options against performance indicators as set out in Table 6.3.

Table 6.3 2011 Harlow Eastern Access Study Summary

| Scheme | Delays | Volume to Capacity | Journey Times |
|---|---|---|---|
| M11 J7a Green | Some performance increase | Limited/No performance increase | Some performance increase |
| M11 J7a Blue | Some performance increase | Limited/No performance increase | Some performance increase |
| Southern Bypass | Some performance increase | Limited/No performance increase | Some performance increase |
| Long Northern Bypass | Performs well | Performs well | Performs well |
| Short Northern Bypass | Performs well | Some performance increase | Some performance increase |
| New Link from A414 | Limited/No performance increase | Limited/No performance increase | Some performance increase |
| New Link from Gilden Way | Limited/No performance increase | Limited/No performance increase | Some performance increase |

The conclusion at that stage was that the Long Northern Bypass was the best performing option based on the assumptions used and modelled assessment method. It was recommended that additional scenario testing be undertaken to assess the effect of alternative development and planning options.

However, the Short Northern Bypass is closest to the Northern Bypass option included in the evaluation of schemes set out in section 6.7 below.

## 6.6 Harlow Junction 7a Feasibility Study (2011)

During 2010/11 a suite of reports and technical notes was produced by Mouchel, documenting work undertaken for ECC to assess the feasibility of a new junction on the M11 between junctions 7 and 8, together with a new link road connecting into the existing Harlow road network.

The initial package included four reports:

- Harlow J7a: Feasibility Study (August 2011, updated March 2012)
- Harlow J7a: Junction Location Optimisation (June 2011)
- Harlow J7a: Unlocking Harlow's Development Opportunities (June 2011, amended and reissued March 2012)

- Harlow Eastern Access - Gilden Way Extension, Technical Note (October 2011)

A subsequent report set out details of costing and design.

Whereas earlier studies had considered a new junction on the M11 in the wider context of strategic links to the A414 and wider development strategies, the focus of the 2011 feasibility study was more limited:

> *"The study will only assess J7a and its link road within a study area that has been specified by ECC. As such, it will not confirm that a J7a-related scheme is necessarily the most appropriate highway infrastructure improvement scheme for Harlow. It will simply demonstrate whether there is a feasible J7a scheme."*

A crucial difference between this study and previous schemes was the extent of the associated link road. All the previous schemes had envisaged a new more strategic link road from the M11 at least as far as the A1184 at Harlow Mill, and generally without an interchange on the B183. In complete contrast, this study envisaged that the connection to the new junction should be provided by an extension and possible upgrading of B183 Gilden Way to provide a more local link.

The aim of the 2011 Development Opportunities report was to strengthen the business case for the junction and associated extension of Gilden Way, by tying the scheme into potential, committed or proposed developments, and as a tool for unlocking new developments, to generate further economic benefits in line with wider long-term plans for Harlow's development.

The study made recommendations on the optimum locations for J7a, and the associated infrastructure required to connect into the local highway network.

## 6.7 Option Identification

As set out in this section, a number of options have been identified which could fulfil some or all the scheme objectives. For the purposes of this assessment, the options have been refined to the following, which broadly cover the range and extent of the schemes devised to date:

Option 1: New M11 junction to east of Harlow, J7a, with local link to B183 Gilden Way;

Option 2: Improved M11 J7;

Option 3: Both Option 1 and Option 2;

Option 4: 'Northern Bypass', which includes the Option 1 J7a scheme together with a dual carriageway link from J7a through to A414 at Eastwick, and an additional single carriageway access into Harlow via River Way;

Option 5: 'Northern Northern Bypass', which comprises a dual carriageway link from A414 at Eastwick, aligned to the south of Gilston, and then to the west of Sawbridgeworth, connecting with the M11 via a new junction south of Little Hallingbury;

Option 6: 'Southern Relief Road', which comprises a dual carriageway link from the A414 east of Roydon, skirting the western and southern edges of Harlow, and connecting with J7 via the B1393. Please note that the capacity improvement required at J7 in conjunction with this scheme has not been modelled or assessed.

These options are illustrated in Figure 6.2. It should be noted that at this stage in the option development process, the alignments of all of the bypass schemes are conceptual in nature as extremely limited scheme design has been undertaken. For J7, the scheme drawn up by Mouchel has been used which will be superseded by scheme(s) identified by the Stage 0 study for J7 currently being undertaken for HE.

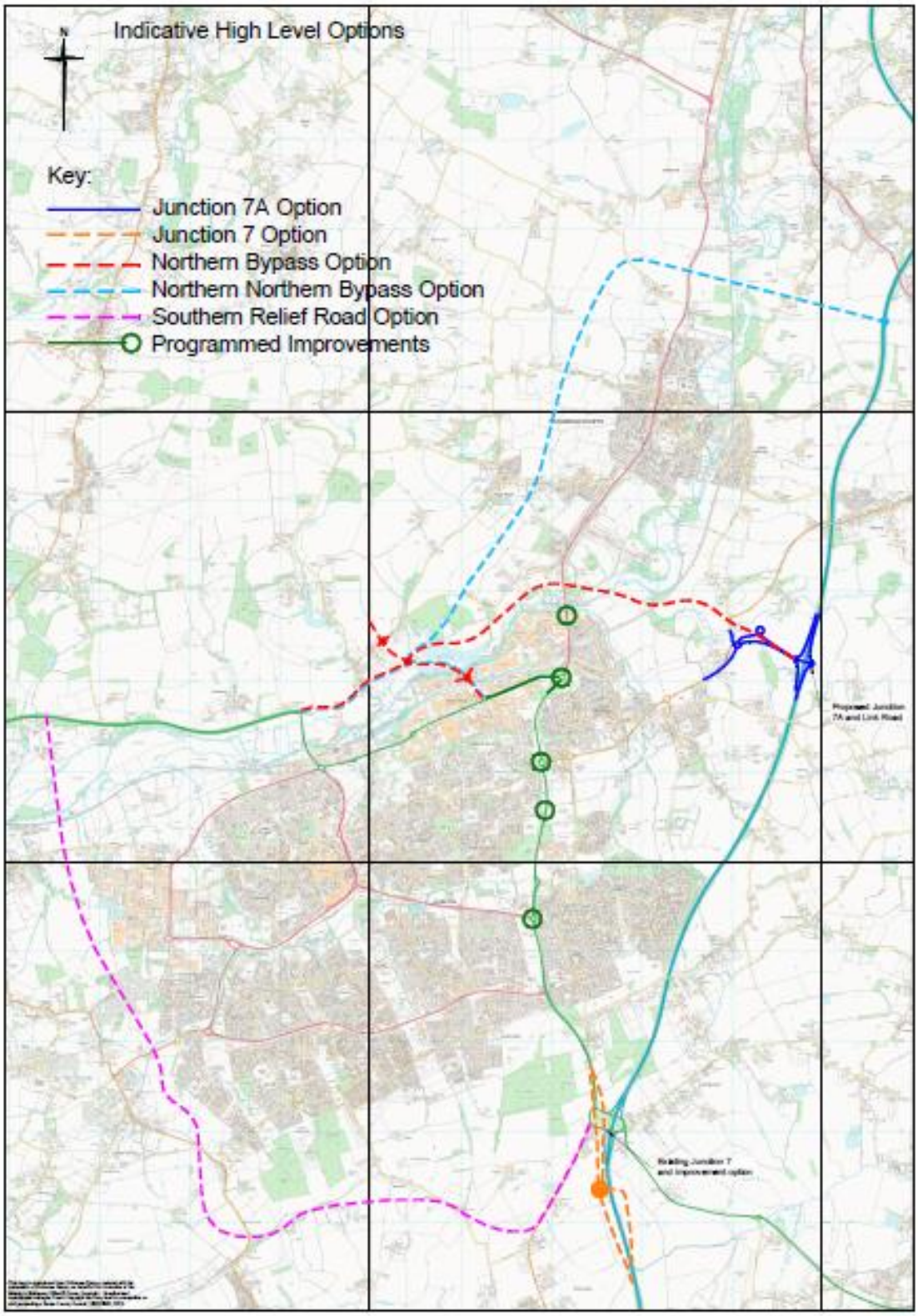



Figure 6.2 High Level Intervention Options – indicative configurations

# 7 Initial Sifting

## 7.1 Scheme Objectives

The scheme objectives have been derived from the policy documents referenced in section 2. These are:

- To provide connectivity to and within urban areas to support self-contained (ie solely within Harlow) employment and housing growth and regeneration;
- To provide good connectivity within Essex and with adjacent major areas, maximising benefit to the local economy of international gateways and strategic links to London, the East and South East;
- To address network infrastructure capacity issues and improve network resilience;
- To reduce congestion and improve traffic management within Harlow and along the A414 corridor and at M11 J7;
- To enable housing and employment growth and regeneration;
- To unlock development land.

## 7.2 Option Evaluation - Methodology

A number of methodologies have been used to assess the available options and to identify which schemes to take forward for more detailed assessment. The detailed methodologies are set out in the following sections and comprise:

- Highway assignment modelling of options;
- Economic appraisal to estimate BCR and VfM;
- EAST evaluation and weighting.

## 7.3 Do Something Model Development

These potential intervention options have been assessed using the VISUM forecast traffic models; the modelling methodology follows that set out in the ASR and uses an early version of the model, as reported in the MFR. Each option has been modelled individually. The 2021 and 2036 Do Minimum scenarios establish a forecast of traffic conditions within the study area, against which infrastructure interventions have been assessed comparatively in terms of total vehicle hours for the model area.

Use of the highway assignment modelling has enabled the wider strategic impacts of the various options to be assessed.

The benefits of each option, in terms of time benefits (changes in total vehicle hours from those in the Do Minimum scenarios), have been extracted from the VISUM modelling for the opening and design years, which are assumed to be 2021 and 2036 respectively. No other benefits have been included in the assessment.

The total vehicle hours for each user class in the fully model area have been extracted in order to capture the full benefits of each option. These wider model benefits for all of the options are set out within each option assessment section.

The user classes used in the modelling are set out in Table 7.1.

Table 7.1 VISUM Model User Class Classification

| Purpose | User Class (UC) |
|---|---|
| Car: Home Based Work (HBW) | UC1 |
| Car: Home Based Employers' Business (HBEB) | UC2 |
| Car: Home Based Other (HBO) | UC3 |
| Car: Non-Home Based Other (NHBO) | |
| LGV | UC4 |
| HGV | UC5 |

The Do Minimum total vehicles hours are set out in Table 7.2. It should be emphasised that all of the options being assessed are likely to lead to a reduction in time over the Do Minimum, no intervention, scenario as they either provide shorter routeing, or additional faster links. Of more importance is the effect that they have on access to and within Harlow, and how each of the options meet the scheme objectives.

Table 7.2 VISUM Model Outputs: Do Minimum

| Total Time | Do Min Opening Year (2021) Total Time (veh hrs) | Do Min Design Year (2036) Total Time (veh hrs) |
|---|---|---|
| AM UC1 | 23,653 | 28,796 |
| AM UC2 | 2,967 | 3,723 |
| AM UC3 | 11,020 | 16,827 |
| AM UC4 | 6,556 | 9,478 |
| AM UC5 | 1,748 | 2,284 |
| IP UC1 | 6,715 | 7,952 |
| IP UC2 | 2,282 | 2,899 |
| IP UC3 | 12,563 | 19,853 |
| IP UC4 | 4,843 | 6,856 |
| IP UC5 | 791 | 989 |
| PM UC1 | 22,533 | 27,707 |
| PM UC2 | 3,164 | 4,063 |
| PM UC3 | 12,929 | 20,157 |
| PM UC4 | 6,478 | 9,479 |
| PM UC5 | 767 | 988 |

## 7.4 Option Modelling: 2036 Unconstrained

The following sections provide high level commentary of plotted key flow differences for each option when compared with the 2036 Do Minimum scenario.

The option assessment modelling reported here was carried out in 2015 and has been subject to further refinement during the subsequent stage of the more detailed evaluation, which has since taken place. As such, the development and infrastructure assumptions used, differ from those used since in the most recent stage of the scheme assessment, when the modelling had been improved.

It should also be noted that the model, at this stage, is considered to be suitable for assessing strategic impacts, but is less suitable for more localised impacts. These impacts will be better understood once more detailed modelling becomes available for the next stage of options assessment.

### 7.4.1 Option 1 - Junction 7a

The effects of Option 1 J7a on total vehicle hours, when compared with the Do Minimum scenarios are set out in Table 7.3.

Table 7.3 VISUM Model Outputs: Option 1 Without and With J7a

| Total Time (Veh Hrs) User Class | Do Min 2021 | Do J7a 2021 | Diff with J7a 2021 | Do Min 2036 | Do J7a 2036 | Diff with J7a 2036 |
|---|---|---|---|---|---|---|
| AM UC1 | 23,653 | 23,525 | -127 | 28,796 | 28,602 | -194 |
| AM UC2 | 2,967 | 2,958 | -9 | 3,723 | 3,697 | -26 |
| AM UC3 | 11,020 | 10,922 | -98 | 16,827 | 16,677 | -151 |
| AM UC4 | 6,556 | 6,524 | -32 | 9,478 | 9,403 | -76 |
| AM UC5 | 1,748 | 1,746 | -2 | 2,284 | 2,293 | 9 |
| IP UC1 | 6,715 | 6,686 | -29 | 7,952 | 7,919 | -33 |
| IP UC2 | 2,282 | 2,278 | -4 | 2,899 | 2,892 | -7 |
| IP UC3 | 12,563 | 12,511 | -52 | 19,853 | 19,767 | -86 |
| IP UC4 | 4,843 | 4,828 | -15 | 6,856 | 6,833 | -23 |
| IP UC5 | 791 | 788 | -3 | 989 | 991 | 2 |
| PM UC1 | 22,533 | 22,338 | -195 | 27,707 | 27,431 | -276 |
| PM UC2 | 3,164 | 3,146 | -19 | 4,063 | 4,028 | -36 |
| PM UC3 | 12,929 | 12,824 | -105 | 20,157 | 19,965 | -192 |
| PM UC4 | 6,478 | 6,431 | -47 | 9,479 | 9,384 | -95 |
| PM UC5 | 767 | 769 | 2 | 988 | 991 | 3 |

It can be seen that Option 1, the J7a scheme, results in a reduction in total vehicle hours for virtually all user classes and in all time periods.

With regard to changes in flows on key links, as shown in Figure 7.1 and Figure 7.2, implementation of Option 1 is likely to significantly affect flows on the M11 north of Harlow, but has only limited impact on the M11 between J7 and J7a. More traffic would be expected to be attracted to the M11 through J8 and J8a via the A120, and some additional traffic would use the A414. It is likely that increases on both these strategic routes are as a result of traffic switching from more minor routes, evidenced by the reduction in flows on these routes either side of the M11 both north and south of Harlow.

Within Harlow, traffic would be expected to generally increase on the routes in the vicinity of J7a (B183 Gilden Way, A414 Edinburgh Way, First Avenue), and decrease on routes to the south of J7a (A414 London Rd north of J7), to reflect the reassignment of southern trips which currently use J7, or northern trips which currently use less suitable routes.

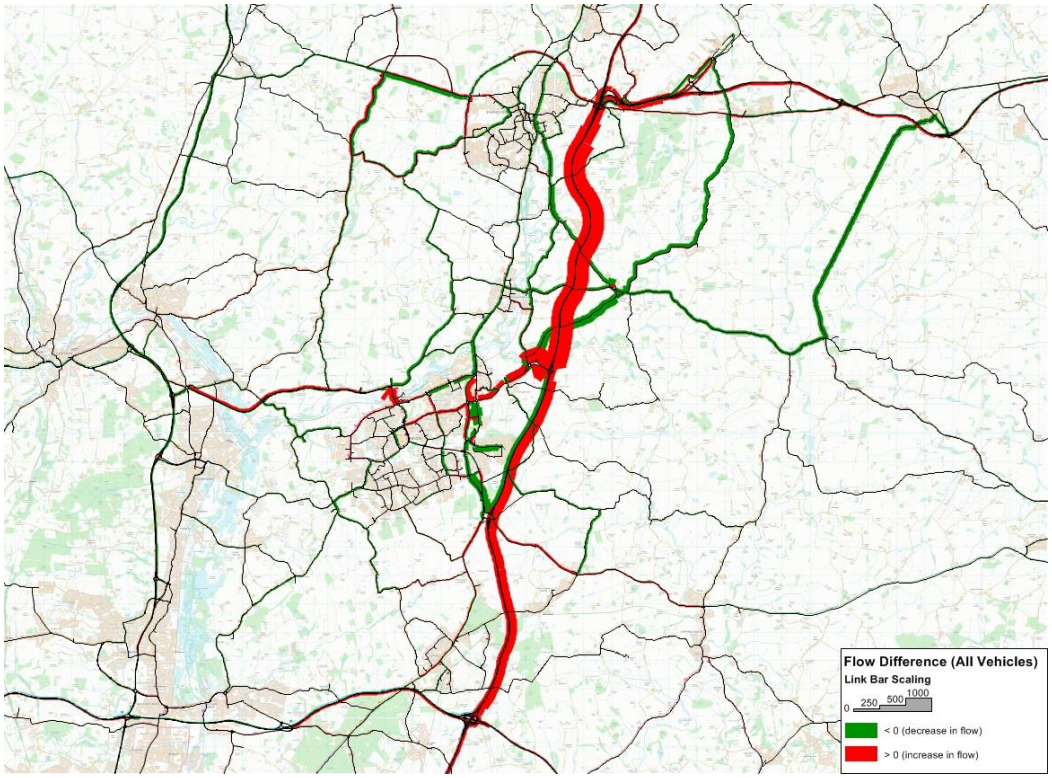



Figure 7.1 2036 Option 1 - With J7a Flow Differences: AM

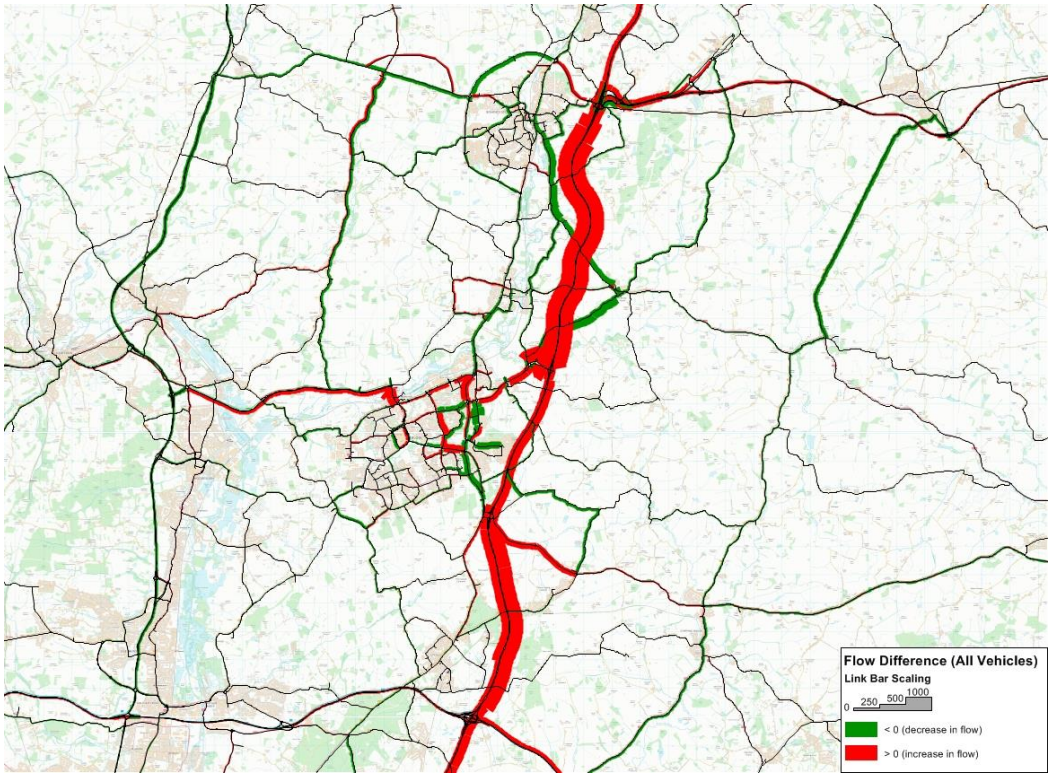



Figure 7.2 2036 Option 1 - With J7a Flow Differences: PM

A key benefit of J7a is that the majority of the less suitable, more minor routes around Harlow would be expected to become less used as rat-runs, as these journeys would become more attractive via the M11. This is particularly evident for the A1060 and B183 Sheering Rd/The Street and Dunmow Rd, B184 Ongar Rd to the east of the M11, and the B1004 Gt Hadham Rd and High Wych Ln.

Select link analysis (SLA) of peak period traffic using the new link to J7a is set out in the following four figures: Figure 7.3, Figure 7.4, Figure 7.5 and Figure 7.6. These show the origins and destinations of traffic using the scheme.

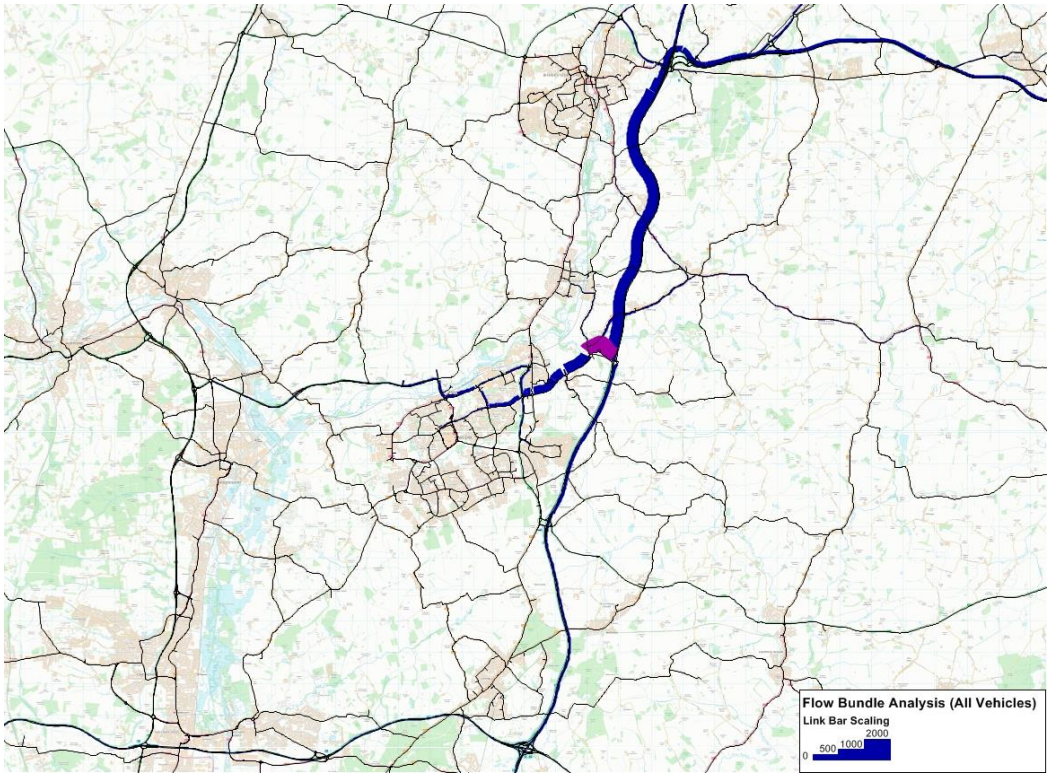



Figure 7.3 2036 Option 1 - With J7a SLA: Eastbound AM

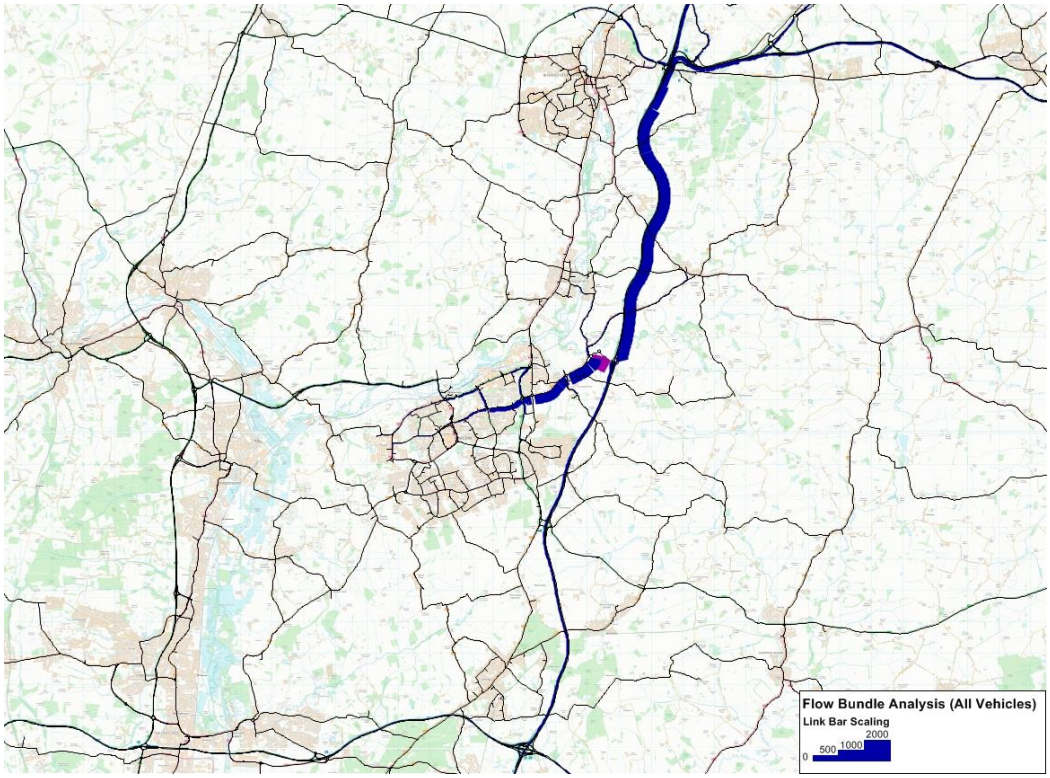



Figure 7.4 2036 Option 1 - With J7a SLA: Westbound AM

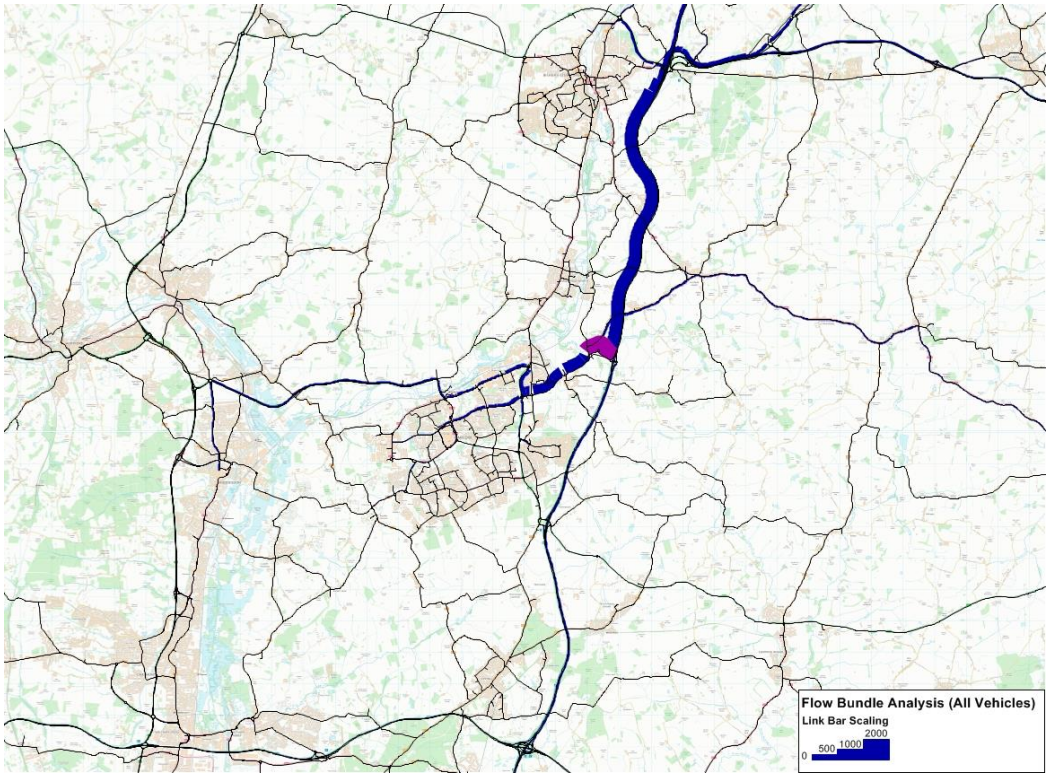



Figure 7.5 2036 Option 1 - With J7a SLA: Eastbound PM

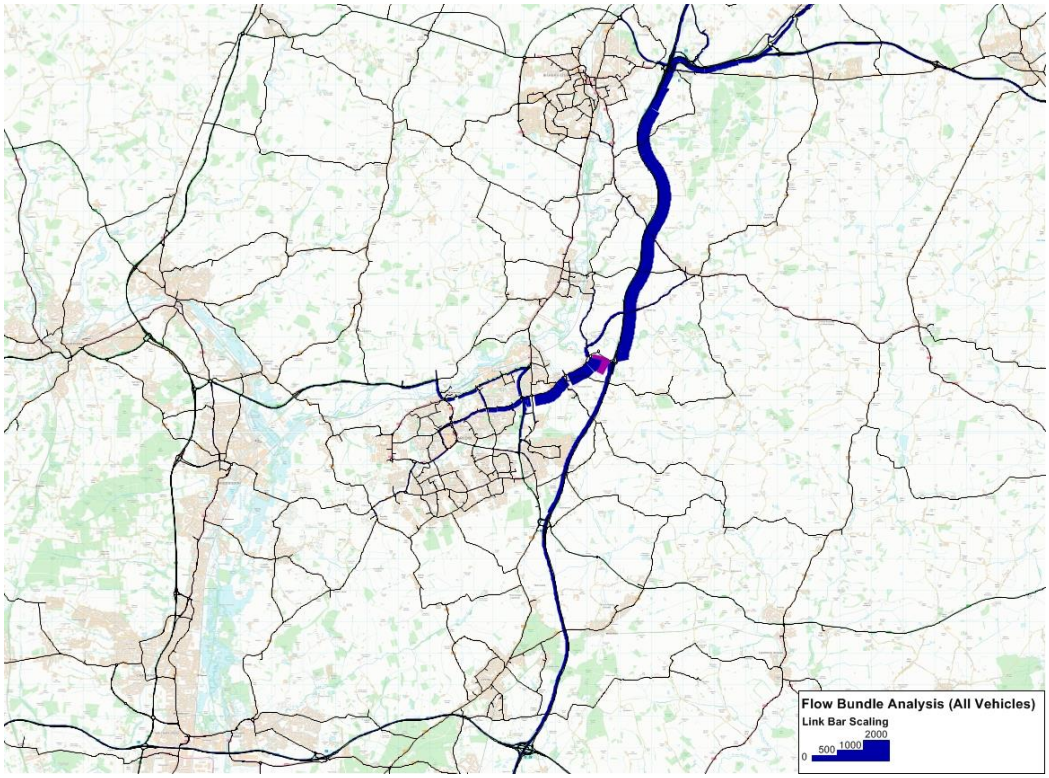



Figure 7.6 2036 Option 1 - With J7a SLA: Westbound PM

During both the AM and PM peak periods it can be seen that the majority of traffic in both directions using the new link to J7a have either an origin or destination within Harlow, with very little traffic passing straight through the town.

This indicates that this option would improve access to Harlow without attracting additional through-traffic.

### 7.4.2 Option 2 - Junction 7

The Junction 7 scheme that was modelled for the Option Assessment is taken from the latest available information at the time of the modelling. As such it is likely to be superseded by the scheme that is currently being studied by Highways England. The historic scheme design that has been modelled focuses on improving access between Harlow and the southern M11, at the same time freeing up capacity on the signalised motorway roundabout.

The effects of Option 2, J7, on total vehicle hours, when compared with the Do Minimum scenarios are set out in Table 7.4. It can be seen that while the J7 scheme results in a reduction in total vehicle hours for virtually all user classes and in all time periods, these reductions are not as great as those resulting from the J7a scheme.

Table 7.4 VISUM Model Outputs: Option 2 Without and With J7

| Total Time (Veh Hrs) User Class | Do Min 2021 | Do J7 2021 | Diff with J7 2021 | Do Min 2036 | Do J7 2036 | Diff with J7 2036 |
|---|---|---|---|---|---|---|
| AM UC1 | 23,653 | 23,605 | -48 | 28,796 | 28,659 | -137 |
| AM UC2 | 2,967 | 2,963 | -5 | 3,723 | 3,706 | -17 |
| AM UC3 | 11,020 | 10,984 | -36 | 16,827 | 16,661 | -166 |
| AM UC4 | 6,556 | 6,542 | -14 | 9,478 | 9,418 | -61 |
| AM UC5 | 1,748 | 1,745 | -3 | 2,284 | 2,278 | -6 |
| IP UC1 | 6,715 | 6,703 | -12 | 7,952 | 7,916 | -35 |
| IP UC2 | 2,282 | 2,280 | -2 | 2,899 | 2,893 | -6 |
| IP UC3 | 12,563 | 12,535 | -28 | 19,853 | 19,741 | -112 |
| IP UC4 | 4,843 | 4,835 | -8 | 6,856 | 6,828 | -28 |
| IP UC5 | 791 | 789 | -1 | 989 | 999 | 10 |
| PM UC1 | 22,533 | 22,408 | -125 | 27,707 | 27,535 | -172 |
| PM UC2 | 3,164 | 3,151 | -14 | 4,063 | 4,049 | -14 |
| PM UC3 | 12,929 | 12,861 | -68 | 20,157 | 20,013 | -144 |
| PM UC4 | 6,478 | 6,441 | -37 | 9,479 | 9,418 | -61 |
| PM UC5 | 767 | 772 | 5 | 988 | 991 | 2 |

For network effects, as shown in Figure 7.7 and Figure 7.8, the J7 improvement scheme is likely to significantly increase northbound trips on the M11 south of J7 during both the AM and PM peak periods, and southbound during the PM peak. North of J7, there would be a slight increase in traffic on the motorway during the AM, and a larger increase northbound during the PM.

On the A414 south-east of the town, there is likely to be an increase in northbound traffic north of J7 in both time periods. South of J7 there would also be an increase in A414 northbound flows approaching J7 during the PM peak. West of the town, flows on the A414 decrease slightly, with this traffic likely to be re-routeing via the M25 and M11.

There is little overall impact on the wider network; A120 east flows may reduce slightly in the AM and increase slightly east and west in the PM peak period; A10 flows may also reduce slightly in the AM.

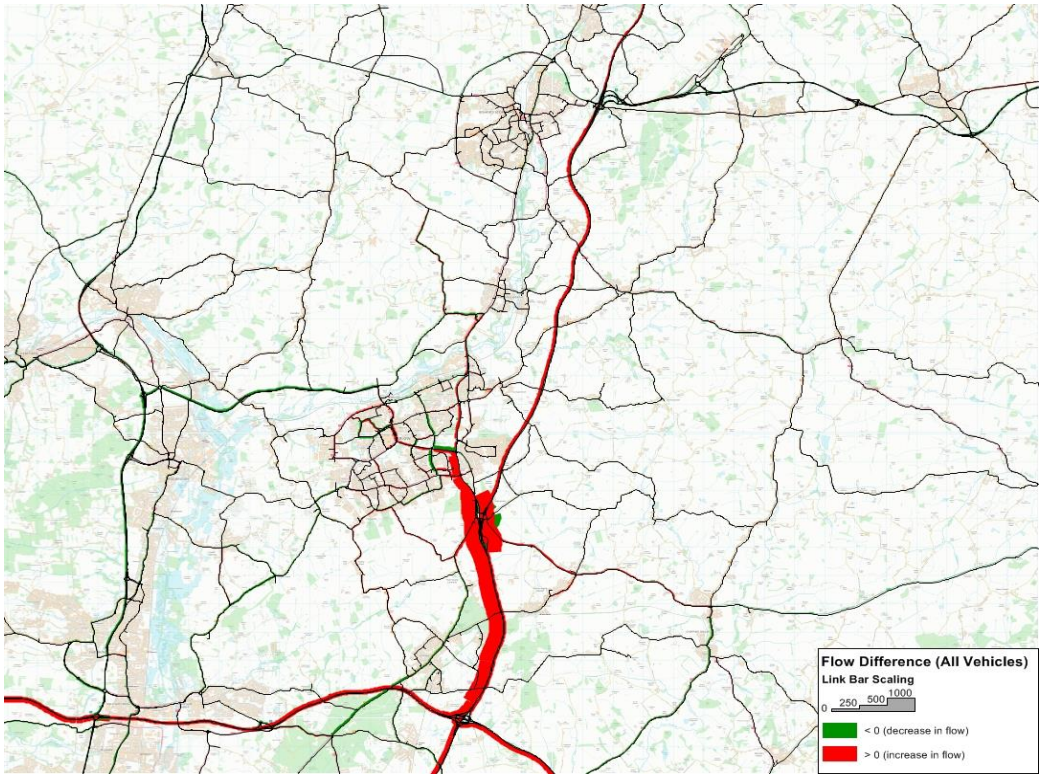



Figure 7.7 2036 Option 2 - With J7 Flow Differences: AM

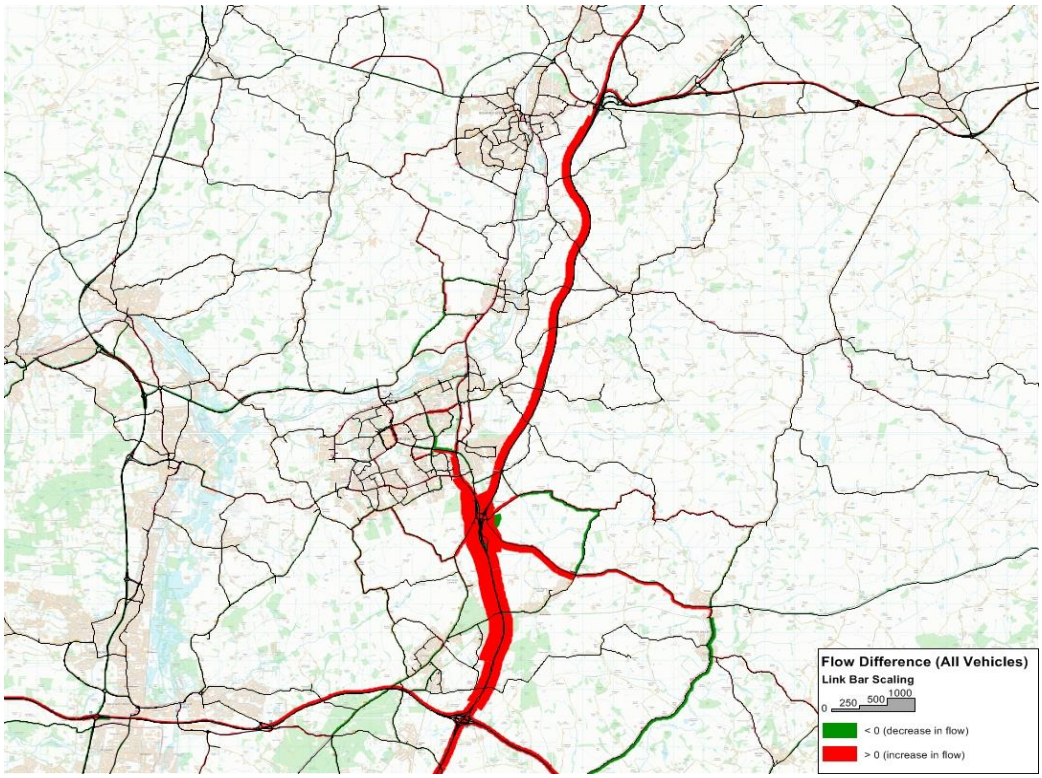



Figure 7.8 2036 Option 2 - With J7 Flow Differences: PM

Within Harlow, there is no clear pattern of changes in vehicle flows. During the AM flows on the A414 London Rd, A1025 Second Ave and A1019 Velizy Ave would be likely to increase slightly, while flows on parallel routes would reduce slightly due to traffic reassigning across the town to avoid congested areas. During the PM there would be additional east:west flows on A1025 Second Ave and First Ave, and on A1019 Velizy Ave.

Select link analysis (SLA) of Option 2 peak period traffic using the section of the A414 immediately north of J7 is set out in the following four figures: Figure 7.9, Figure 7.10, Figure 7.11 and Figure 7.12. These show the origins and destinations of Harlow-related traffic using the J7 scheme.

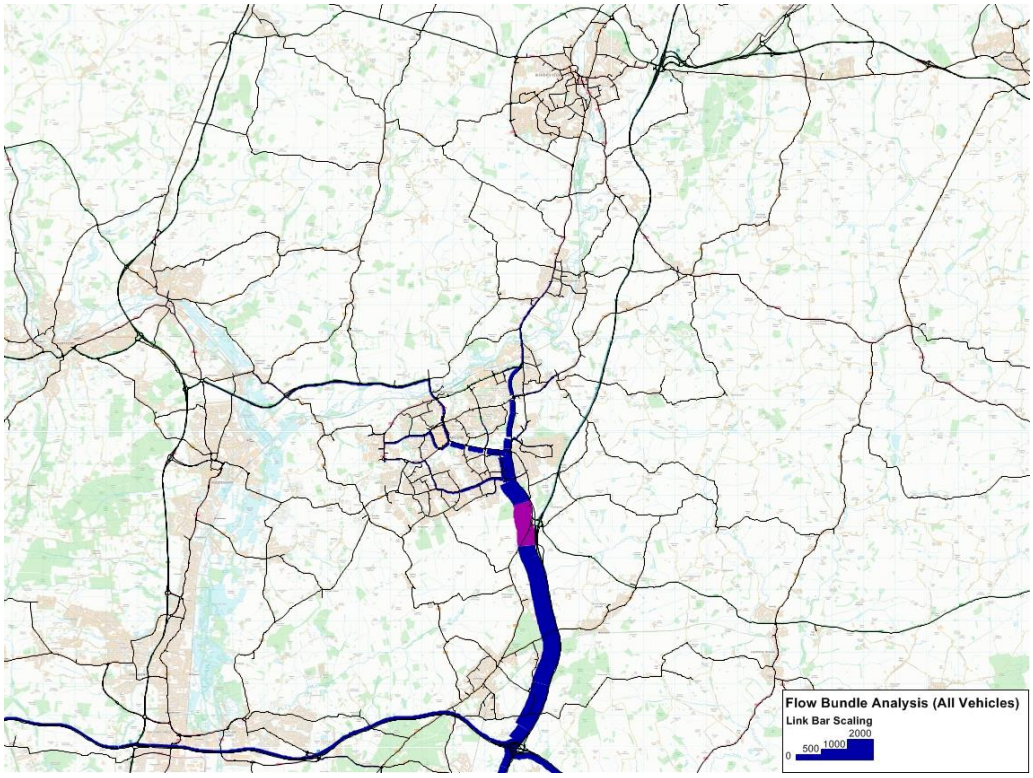



Figure 7.9 2036 Option 2 - With J7 SLA: Northbound AM

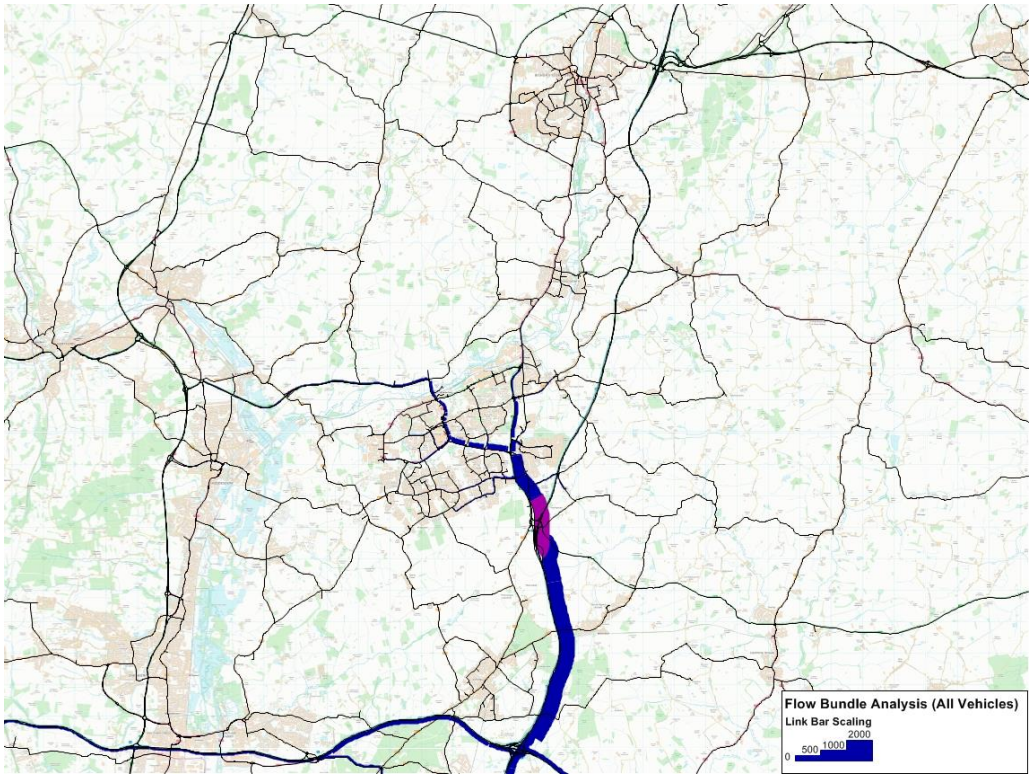



Figure 7.10 2036 Option 2 - With J7 SLA: Southbound AM

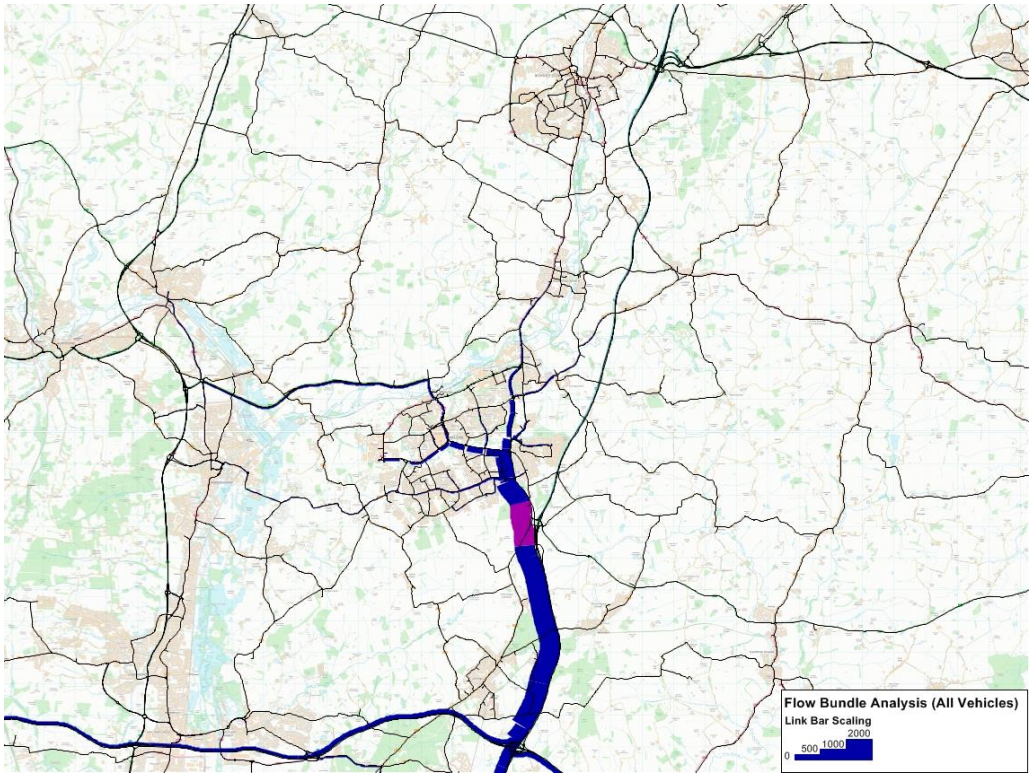



Figure 7.11 2036 Option 2 - With J7 SLA: Northbound PM

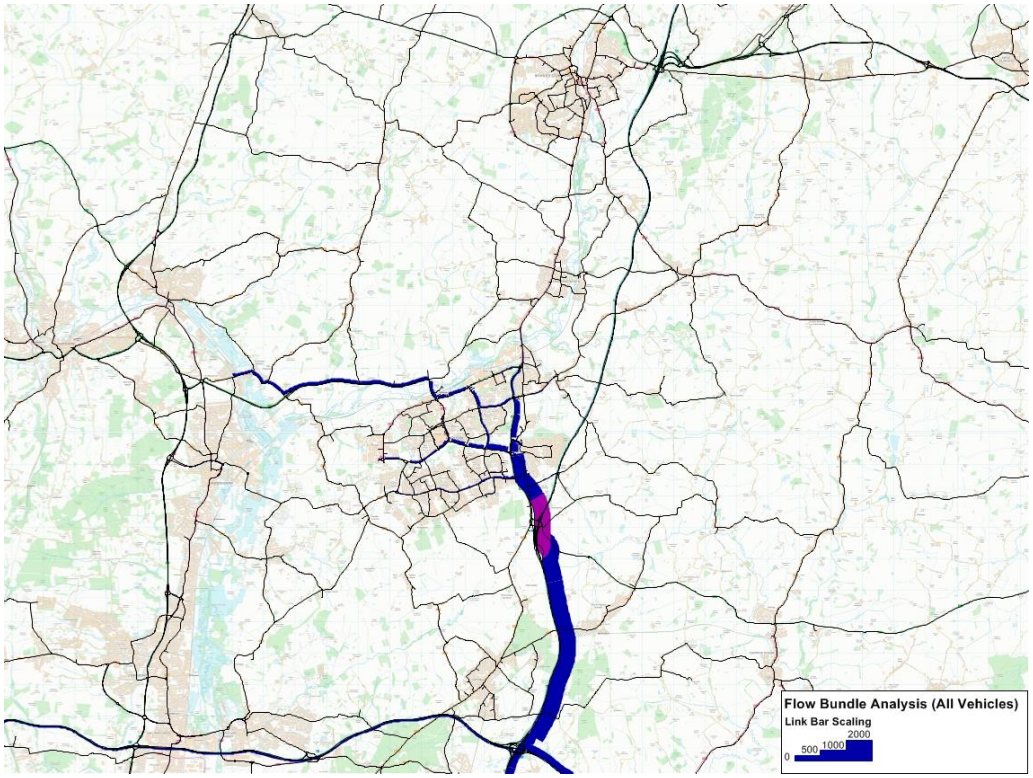



Figure 7.12 2036 Option 2 - With J7 SLA: Southbound PM

Analysis of the origins and destinations of the traffic using Option 2, the J7 scheme, shows that, like the J7a scheme, the majority of the trips on the A414 are Harlow-related, but primarily to and from the south via M11 J6. This is likely to be influenced by the scheme design used, which is likely to be more beneficial to trips to and from the south. Slightly more of the J7 scheme traffic would be likely to use the A414 west than with the J7a scheme during both the AM and PM peak periods, but these through trips form only a small proportion of the scheme traffic.

It is concluded that while this scheme provides some additional capacity at J7, it has little impact on Harlow itself, and does not provide any relief to the pattern of trips within the town.

### 7.4.3 Option 3 - Junction 7 and Junction 7a

The implementation of both Junction 7 and Junction 7a schemes have been modelled in order to assess their likely combined effects.

The effects of Option 3, J7 and J7a in combination, on total vehicle hours, when compared with the Do Minimum scenarios are set out in Table 7.5.

It can be seen that, like the individual evaluations of Options 1 and 2, Option 3 results in reductions in total vehicles hours in virtually all time periods and for all classes. It should be noted, however, that the combined schemes in Option 3 result in greater time savings than either Option 1 or 2 alone, indicating that the combination of these 2 options would result in greater time benefits on the network.

Table 7.5 VISUM Model Outputs: Option 3 Without and With J7 & J7a

| Total Time (Veh Hrs) User Class | Do Min 2021 | Do J7a_J7 2021 | Diff with J7a&J7 2021 | Do Min 2036 | Do J7a_J7 2036 | Diff with J7a&J7 2036 |
|---|---|---|---|---|---|---|
| AM UC1 | 23,653 | 23,488 | -165 | 28,796 | 28,548 | -248 |
| AM UC2 | 2,967 | 2,954 | -13 | 3,723 | 3,686 | -37 |
| AM UC3 | 11,020 | 10,893 | -127 | 16,827 | 16,583 | -244 |
| AM UC4 | 6,556 | 6,512 | -43 | 9,478 | 9,362 | -117 |
| AM UC5 | 1,748 | 1,744 | -4 | 2,284 | 2,279 | -5 |
| IP UC1 | 6,715 | 6,676 | -39 | 7,952 | 7,892 | -59 |
| IP UC2 | 2,282 | 2,277 | -6 | 2,899 | 2,887 | -12 |
| IP UC3 | 12,563 | 12,489 | -74 | 19,853 | 19,687 | -166 |
| IP UC4 | 4,843 | 4,822 | -21 | 6,856 | 6,811 | -45 |
| IP UC5 | 791 | 787 | -4 | 989 | 999 | 10 |
| PM UC1 | 22,533 | 22,270 | -263 | 27,707 | 27,338 | -369 |
| PM UC2 | 3,164 | 3,142 | -23 | 4,063 | 4,023 | -40 |
| PM UC3 | 12,929 | 12,791 | -138 | 20,157 | 19,884 | -273 |
| PM UC4 | 6,478 | 6,412 | -66 | 9,479 | 9,358 | -121 |
| PM UC5 | 767 | 771 | 4 | 988 | 994 | 5 |

For changes in flows, as shown in Figure 7.13 and Figure 7.14, implementation of both of the motorway junction schemes has broadly the same impacts as would be expected from their combined effects.

During the AM period for the strategic routes, the A120 west would be unaffected by the schemes, the A120 east is likely to have slightly more eastbound trips, the A414 south of J7 is likely to have a reduction in westbound flows, while the eastbound increase remains the same as for the separate schemes. The A414 west of Harlow indicates a slightly greater reduction in eastbound flows, which is an improvement over the J7a slight increase.

On the A414 north of Burnt Mill there is likely to be a lower increase in flows in both time periods than would be the case with just J7a in place.

On the A1184/B1393 corridor there is a lower reduction in flows in both time periods through both Sawbridgeworth and Epping with both schemes in place, and a corresponding lower impact on trips rat-running between Bishop's Stortford and Harlow to the west of the corridor. Reductions in flows on the minor links to the east of the corridor are consistent with those for the individual schemes.

With both schemes in place, routeing along the A414 to the north of the town more consistently increases in both time periods, and there is less tendency for rat-running around the western side of the town.

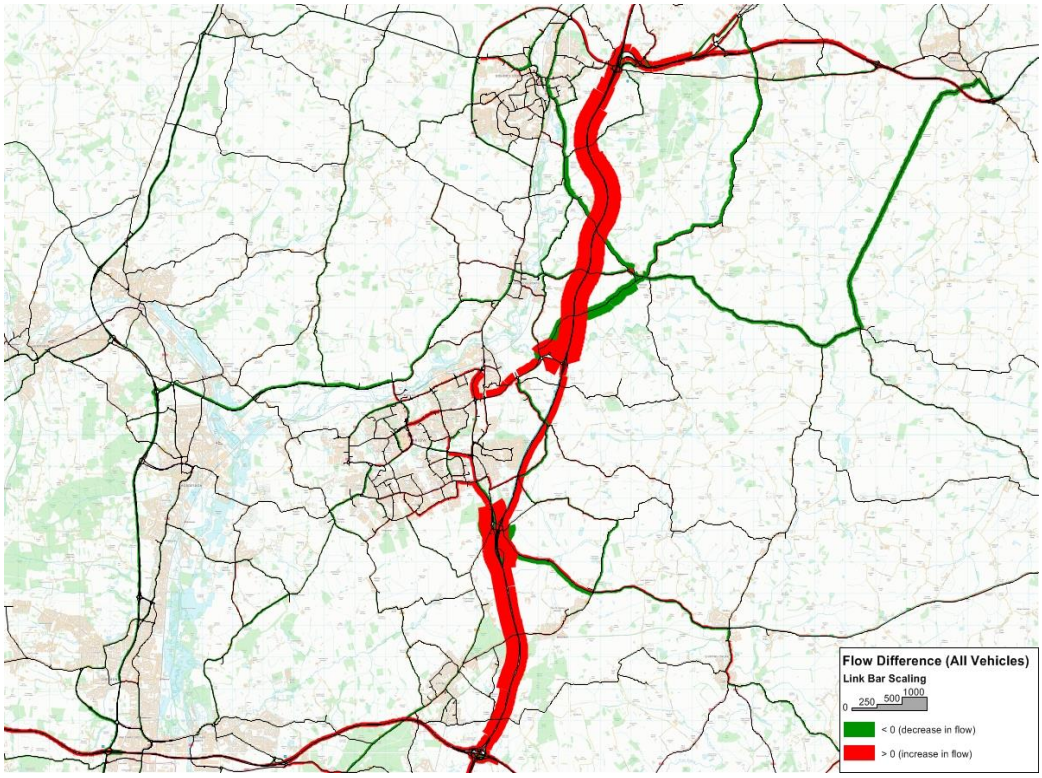



Figure 7.13 2036 Option 3 - With both J7 & J7a Flow Differences: AM

During the PM peak northbound flows on the A414 immediately north of J7 show a slightly lower increase than with just J7, while southbound flow reductions are shown to be consistent with those anticipated with just J7a in place.

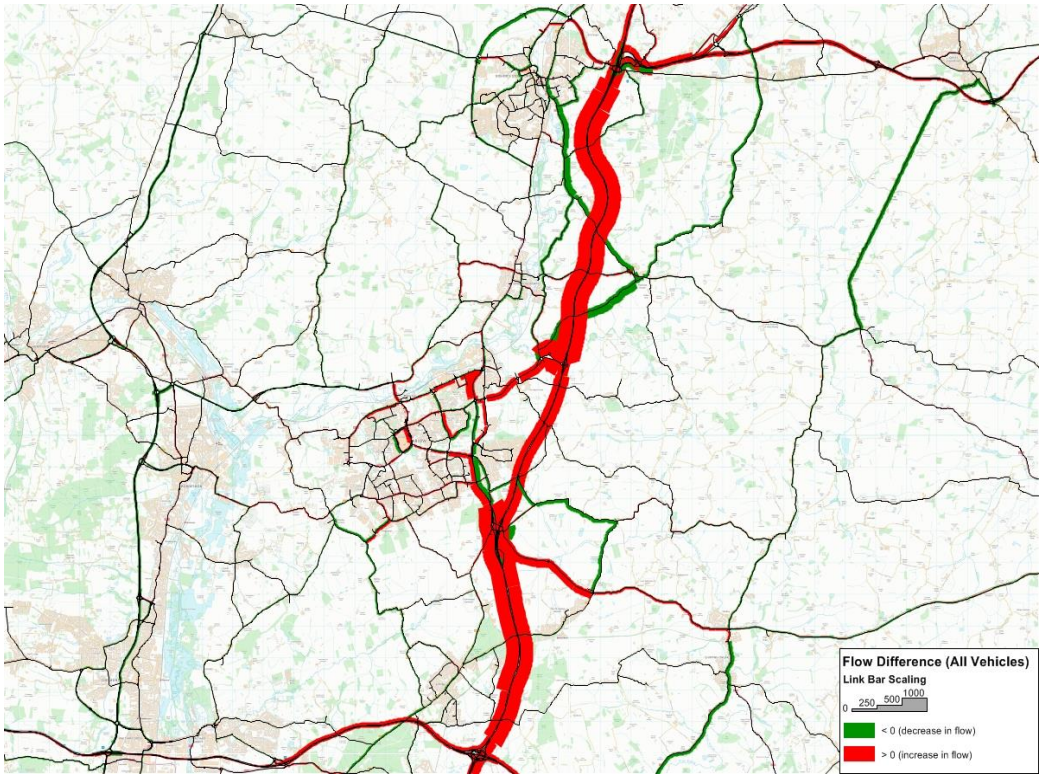



Figure 7.14 2036 Option 3 - With both J7 & J7a Flow Differences: PM

Select link analysis (SLA) of peak period traffic using the section of the A414 immediately north of J7 is set out in the following figures: Figure 7.15, Figure 7.16, Figure 7.17, Figure 7.18, Figure 7.19, Figure 7.20, Figure 7.21 and Figure 7.22. These show the origins and destinations of M11 traffic to both the north and south of Harlow and their use of Option 3, the combined J7 and J7a scheme.

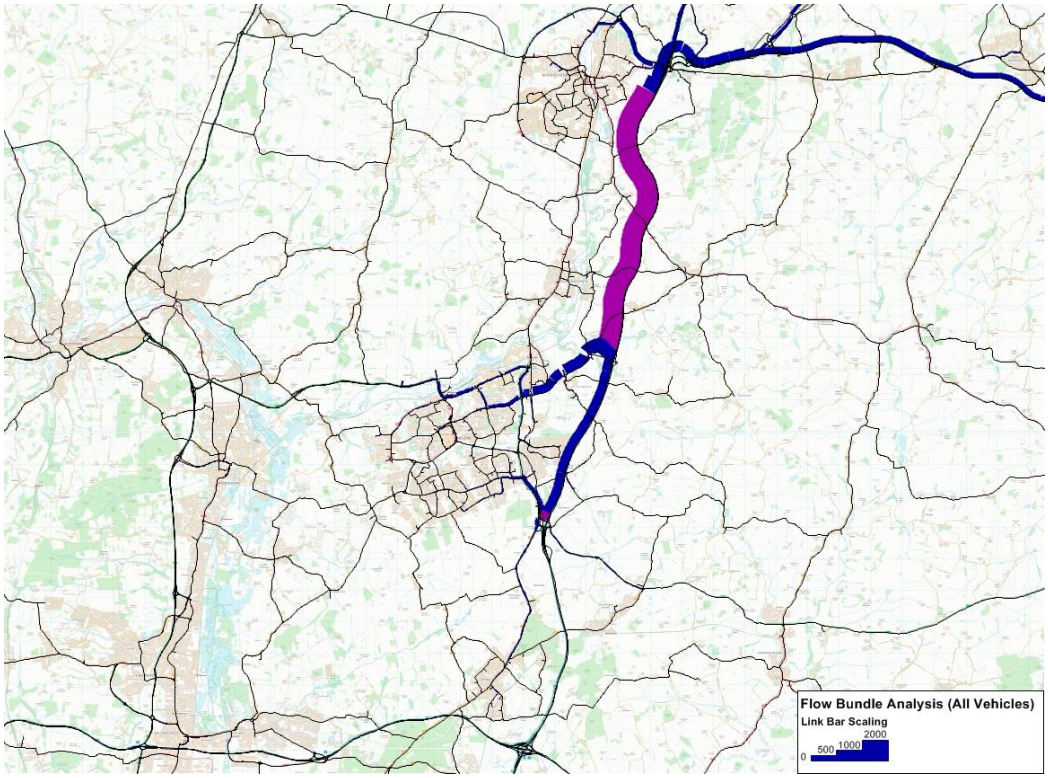



Figure 7.15 2036 Option 3 - With J7 & J7a SLA M11 North of Harlow: Northbound AM

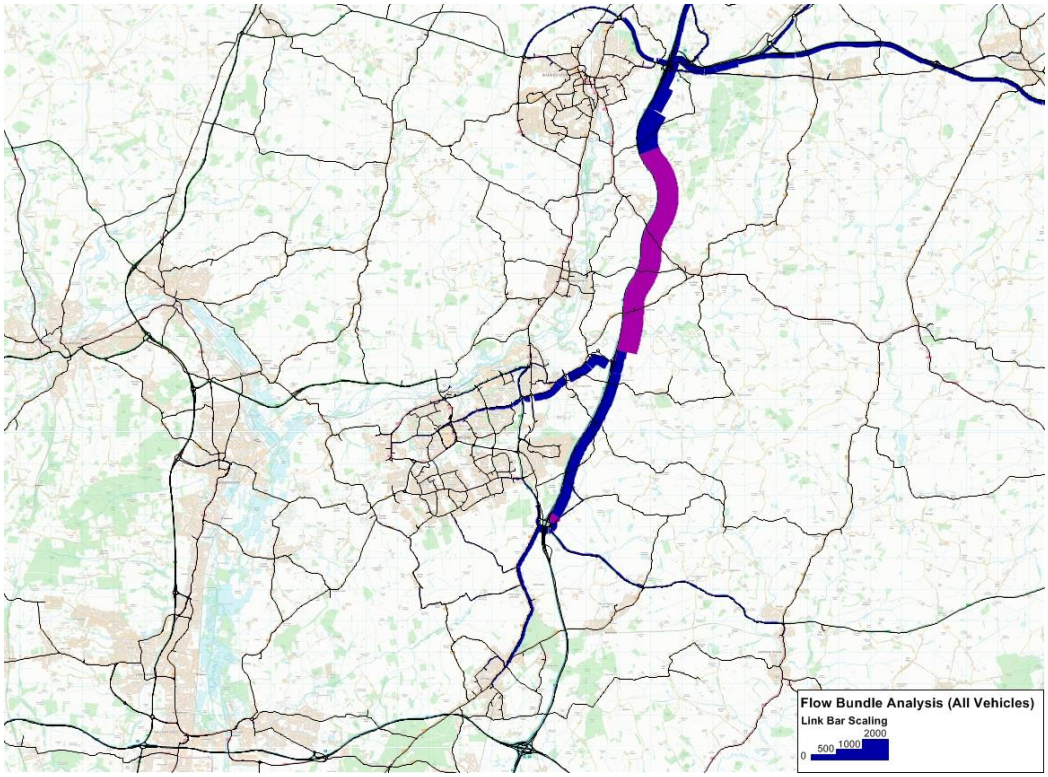



Figure 7.16 2036 Option 3 - With J7 & J7a SLA M11 North of Harlow: Southbound AM

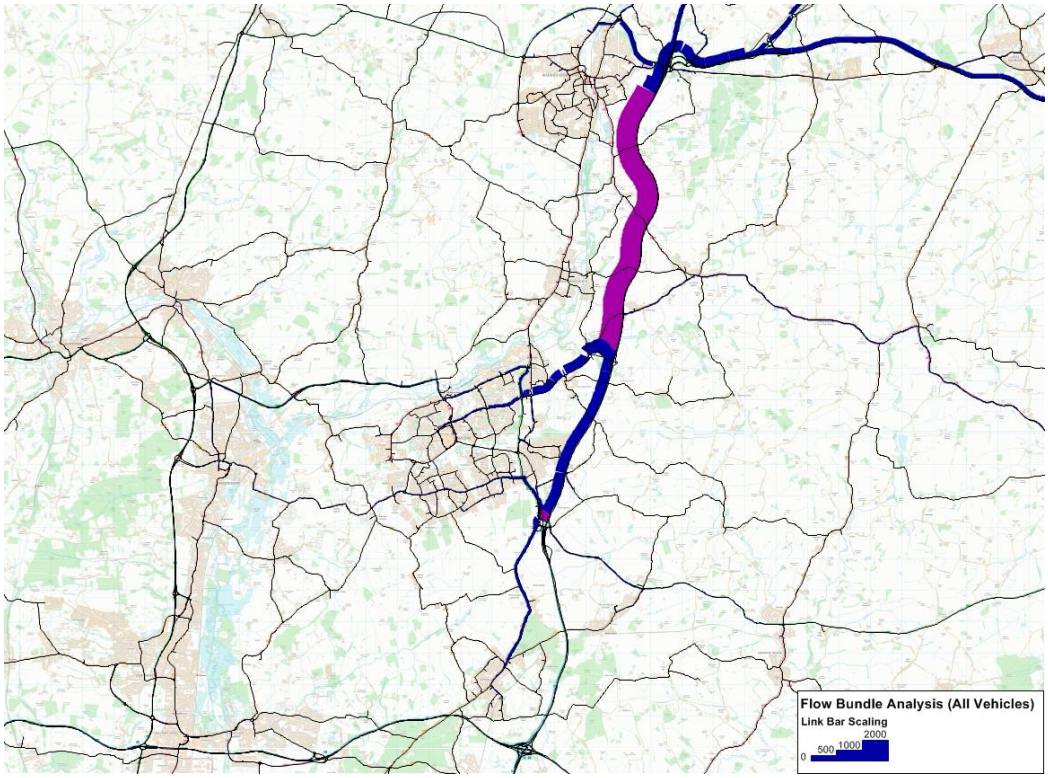



Figure 7.17 2036 Option 3 - With J7 & J7a SLA M11 North of Harlow: Northbound PM

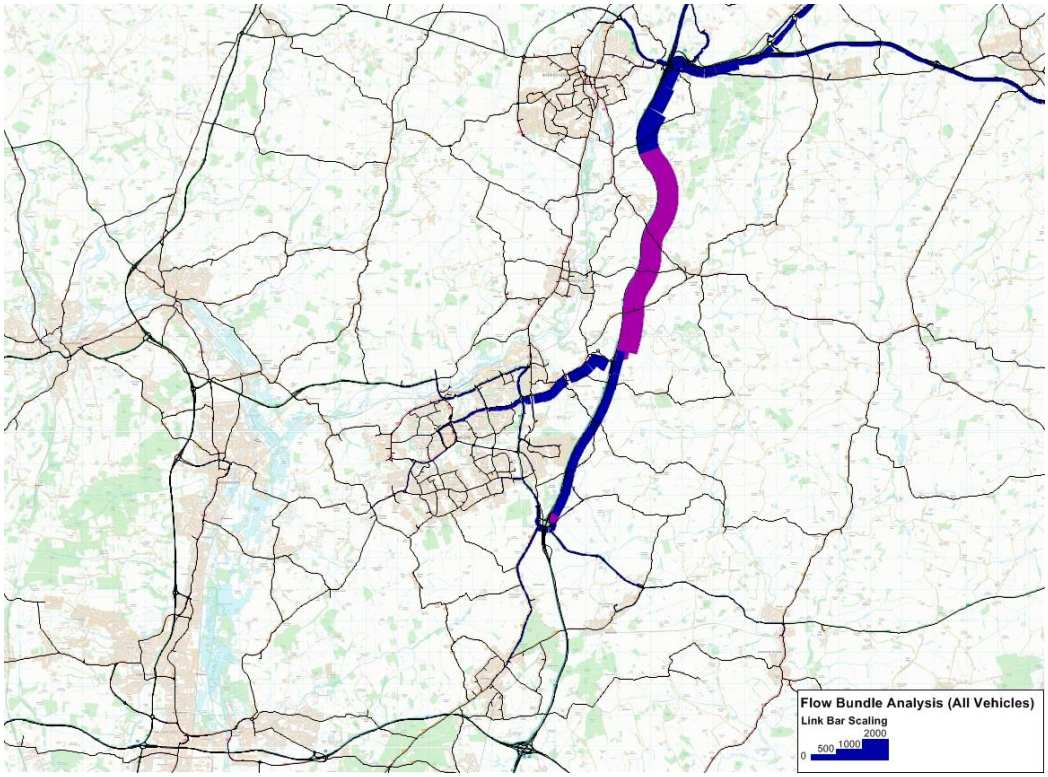



Figure 7.18 2036 Option 3 - With J7 & J7a SLA M11 North of Harlow: Southbound PM

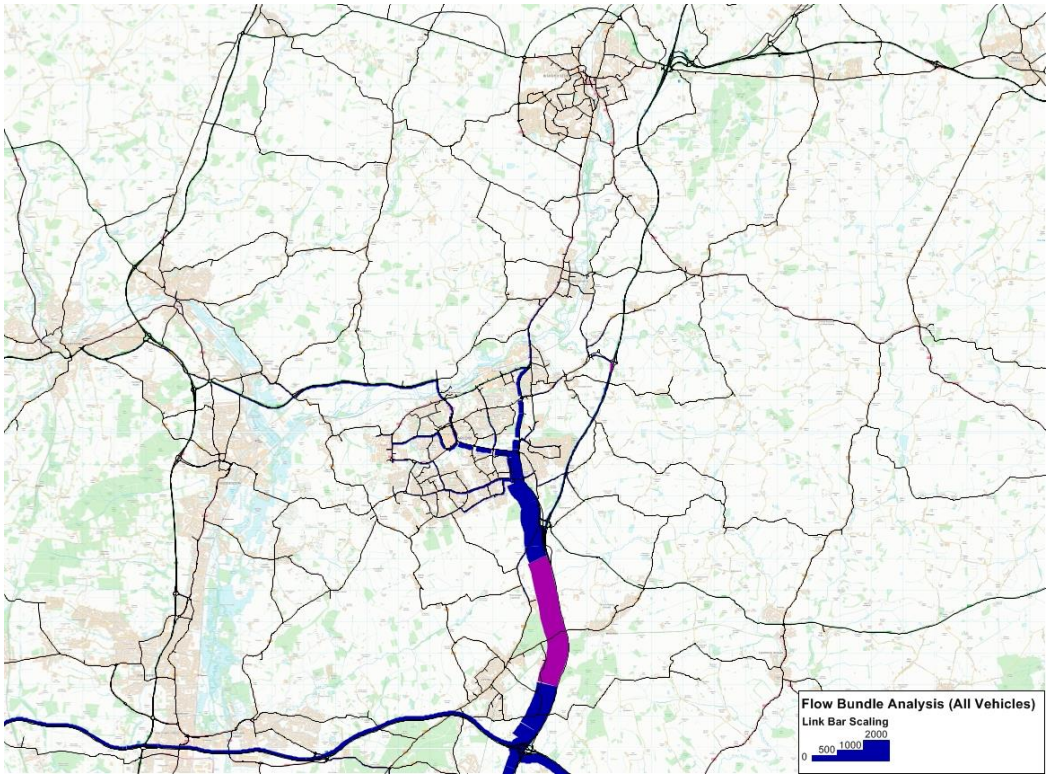



Figure 7.19 2036 Option 3 - With J7 & J7a SLA M11 South of Harlow: Northbound AM

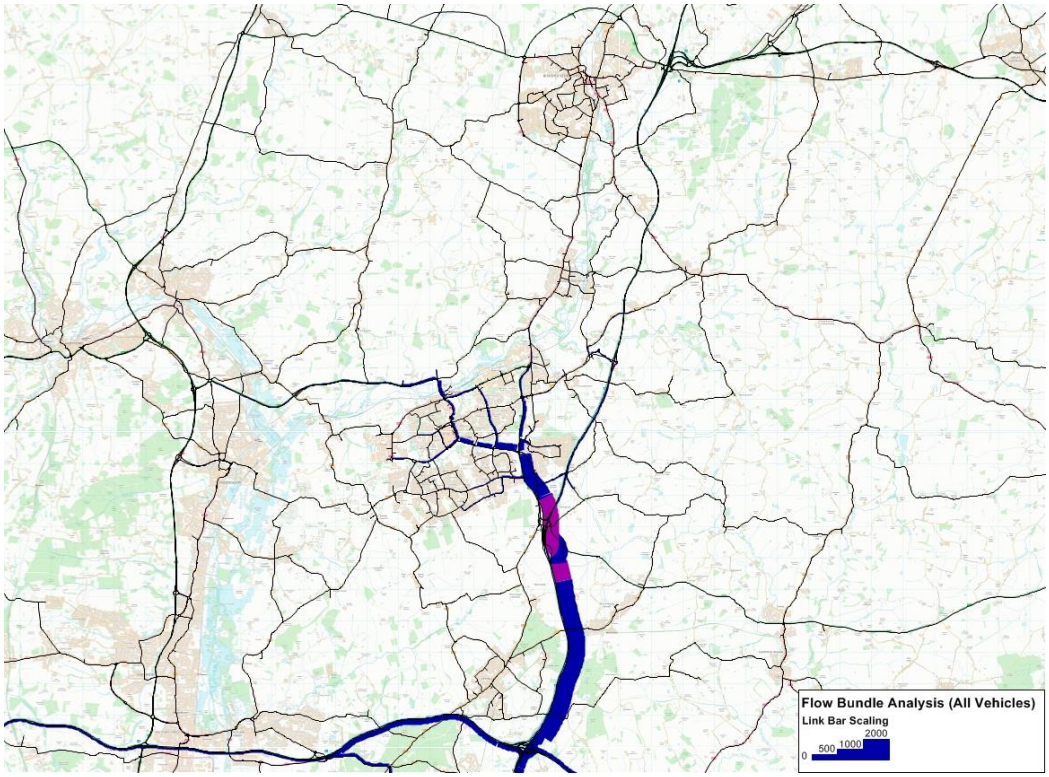



Figure 7.20 2036 Option 3 - With J7 & J7a SLA M11 South of Harlow: Southbound AM