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M11 Junction 7A

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Construction Phase Traffic & Transport Impact Assessment

B3553F05-0000-REP-0081 | 1

January 2017

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Essex County Council

M11 Junction 7A Construction Phase Traffic & Transport Impact Assessment

Project no:	B3553F05
Document title:	Construction Phase Traffic & Transport Impact Assessment
Document No.:	B3553F05-0000-REP-0081
Revision:	1
Date:	January 2017
Client name:	Essex County Council
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File name:	M11 J7A Construction Phase TIA 13-01-17.docx

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Document history and status

Revision	Date	Description	By	Check	Review	Approved
0	15/12/2016	M11 J7A Construction Phase Traffic & Transport Impact Assessment	JD, VL	TK	CJ	
1	13/01/2017	Wording re M11 closure amended	JD	TK	CJ	

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Executive Summary

Ringway Jacobs are framework consultants to Essex County Council (ECC) in their delivery of highway network improvements across the County. Jacobs has been commissioned to assist ECC Major Programmes and Infrastructure in developing a proposal for improving access to and from the M11 in the Harlow area. The current proposal is for the provision of a new motorway junction (J7A) on the M11 between Junctions 7 and 8, a road linking J7A to the existing B183 (Gilden Way) and widening of Gilden Way itself.

M11 J7 is currently Harlow's only connection to the Strategic Road Network (SRN), accessed via the A414. Both are subject to heavy congestion in peak periods. Harlow Town Centre has been identified as an area for regeneration and two Local Harlow Enterprise Zones (HEZ) have been designated for employment growth in the town. Much residential growth is also planned for the town. Without an improved link to the motorway, the town and surrounding area will not be able to realise their full future potential. As such, M11 J7A has been identified as a priority in the Essex Growth Strategy (EGS) and is also supported by the South East Local Enterprise Partnership (SELEP). It is believed that M11 J7A will assist in relieving the congestion at M11 J7 and help to facilitate local growth in and around Harlow.

This Construction Phase Traffic & Transport Impact Assessment has been developed to identify the transport impacts of the construction of the proposed M11 J7A scheme. It has considered public transport users, non-motorised users and other road users. It is planned to construct the scheme in three phases: Phase 1; Phase 2A and Phase 2B. It has been assumed for the purposes of the assessment that there are the following main impacts:

- Off-site construction vehicle traffic (movement of construction vehicles on the live road network) resulting in additional trips on the network (potentially causing delay, re-assignment of trips and junctions exceeding capacity); and
- Staff vehicular trips, resulting from staff accessing and egressing the construction sites, causing additional trips on the network which may contribute towards delay, trip re-assignment and junctions operating above capacity.

The assessment has found that the scheme's construction is unlikely to have a major effect on public transport service provision in the local area, with the exception of the 59 bus service, which may suffer from some delay to running times and disruption to the existing bus stops during the Phase 1 works. The impact of the construction of the proposed M11 J7A scheme on public transport users is likely to be negligible overall.

Off-site Construction Vehicle Trips

The number of off-site construction vehicle trips associated with M11 J7A was determined by calculating the quantities of material that need to be moved, an assumed rate of production and the proposed construction programme, comprising HGV or similar vehicles only. Using the Harlow Transport Model "do-minimum" Core Growth Scenario for 2021, construction trips were manually assigned to and from the M11 J7A site using the most likely route, restricted to main roads.

The highest resulting assignment of heavy vehicle flows is seen to occur in the AM peak hour (08:00 to 09:00), but volumes of trips are negligible in the context of background traffic, so are unlikely to cause significant problems for network flow or capacity. In September 2019, for example, seven construction vehicle trips are likely in the AM peak hour travelling in each direction along Gilden Way to and from Site Compound CS1. In May 2020, the impact on Gilden Way of construction vehicle traffic associated with Phase 1 is potentially reduced to two vehicle trips travelling in each direction as the majority of construction vehicle trips are instead more likely to route via the M11 to access the construction sites from the new slip-roads that will eventually become M11 J7A. In May 2021, it can be seen that off-site construction vehicle traffic is again most likely to route via M11 J7 and J8 to access the M11 J7A Phase 2B construction site and site compound CS4 via the new slip-roads. In May 2021, the volume of off-site construction vehicle trips in the AM peak hour could be lower on the local road network than during Period 1 (September 2019) and Period 2 (May 2020), with two trips in each direction using the A414, converging to a maximum of four trips on the southbound A414 approaching the M11 J7 roundabout.

In the context of the background daily traffic, the number of off-site construction vehicle trips generated by the M11 J7A construction phases is likely to be insignificant, even in the worst case AM peak scenario. As a result, the impact on the highway network is likely to be low and should be able to be accommodated. The extent of night time working has in itself been minimised in the working programme and where it does occur, the impact on other road users would again be likely minimal, mostly owing to the far lower overnight vehicle flows using the affected road. The exception to this would be in relation to the M11 and the bridge-over installation at the new motorway junction. The programme allows for work on the M11 bridge for 15 to 16 days, including night works, in September 2020. It is anticipated that this will require full carriageway closure of the M11 at night time for 2 to 3 nights in total. A traffic diversion would operate between M11 J7 and J8 via the A414 through Harlow, Sawbridgeworth and around Bishop's Stortford, which would need to be discussed and agreed with Highways England and with the Principal Contractor who has yet to be appointed.

Staff Trips

The volume of staff trips would be dependent on the level of activity during each phase of the site works and be influenced by the number of off-site construction vehicle movements. The likely maximum staff numbers travelling to the construction sites for each phase of works were calculated to be 50 trips for Phase 1; 125 for Phase 2A (West of the M11); 40 trips for Phase 2A (East of the M11); and 50 trips for Phase 2B (East of the M11).

With on-site working hours scheduled to be between 08:00 and 18:00, it was assumed that staff would arrive between 07:00 and 08:00 and leave between 18:00 and 19:00. There is no inter-peak movement as there is no shift change scheduled during the working day. It has been assumed that all staff would travel by single occupancy private vehicles, giving a worst case assessment for considering the traffic and transport impacts.

Assigning staff trips to the Core Growth do-minimum Scenario network flows from the Harlow Transport Model (with peak hour (08:00-09:00 and 17:00-18:00), factored to the hour coinciding with the staff arrival (07:00-08:00)), reveals that the most significant impact to network flows occur in the AM peak hour in the Period 1 and Period 2 scenarios (September 2019 and May 2020 respectively). There is far less modelled impact on network flows in the Period 3 scenario, and in the Period 1 (PM), or Period 2 (PM) scenarios.

The strategic modelling for the Period 1 (September 2019) AM Peak suggests that traffic would increase travelling southbound along the A1019 and eastbound along First Avenue Mandela Avenue, while traffic would decrease travelling westbound along Edinburgh Way and southbound along Howard Way. Similarly in the Period 2 (May 2020) AM Peak, the modelling suggests that traffic would increase travelling northbound along the A414 and westbound along Edinburgh Way, while traffic would decrease travelling northbound along Howard Way.

This suggests that there are secondary rerouting effects in the model caused by the addition of staff trips due to the construction of the proposed M11 J7A scheme. This is likely to be caused by the level of congestion in the model and the existence of more than one very similar cost route available in the area. While the Harlow Transport Model suggests this rerouting will occur, more detailed modelling would be required to establish whether or not these secondary effects are likely to occur in practice.

Some works would be required at night, resulting in staff trips to facilitate the off-site construction vehicle trip arrivals and departures. Other than the M11 closure for 2 to 3 nights and resulting traffic diversion required to enable the over-bridge to be constructed in the Phase 2A Section B Phase B works, the impact of the night-time works would likely be negligible given the levels of traffic using the affected roads at these times, and the construction staff vehicle trips would be unlikely to have a great impact on other road users.

In summary, the traffic flows resulting from staff trips being assigned to the network indicate negligible impacts in the PM peak periods throughout the modelled time points. The most significant impact is seen during the AM peak hour during September 2019 (Phase 1 works) and May 2020 (Phase 2A works) at three junctions:

- A414 Edinburgh Way/A1184 Cambridge Road 'Gates' Roundabout;
- A414/B183 First Avenue Roundabout; and

- B183 Gilden Way/London Road Roundabout.

ARCADY analysis indicates that all of the junctions operate with a good level of service and within capacity for all scenarios, with the exception of the A414 South arm and B183 West arm of the A414/B183/First Avenue Roundabout. These arms are seen to already operate near to or above their theoretical capacity without the M11 J7A Construction, with considerable queuing and delay expected.

It is important to note that the proposed M11 J7A scheme has yet to be discussed or agreed with Highways England, or with the Principal Contractor who has yet to be appointed, and is consequently subject to future discussions and revision to the plans used to create this Construction Phase Traffic & Transport Impact Assessment.

1. Introduction

1.1 Background

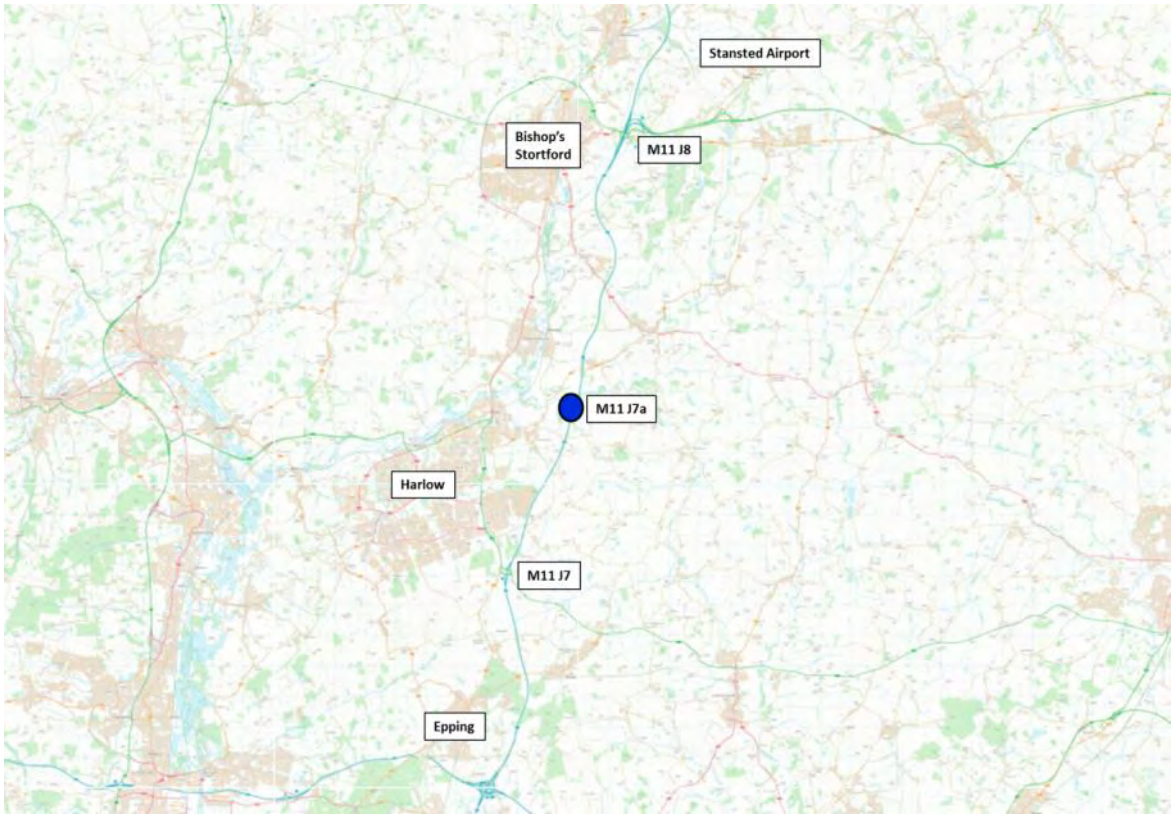
Ringway Jacobs are framework consultants to Essex County Council (ECC) – the Local Highway Authority – in the delivery of ECC's objectives to improve the highway network across the County. Jacobs has been commissioned to assist ECC Major Programmes and Infrastructure in developing a proposal for improving access to and from the M11 in the Harlow area. The current proposal is for the provision of a new motorway junction (J7A) on the M11 between Junctions 7 and 8, a road linking J7A to the existing B183 (Gilden Way) and widening of Gilden Way itself. This is known throughout this Construction Phase Traffic & Transport Impact Assessment as the 'Proposed Scheme' or 'J7A'.

Harlow is situated in the west of the County of Essex. The town is flanked by the M11 to the east, which provides its main connectivity (via Junction 7) to the M25, London, Stansted Airport and the north of England. Another major link within the county and into Hertfordshire is provided by the A414 which links to the A10. Harlow is also served by a direct rail link to London Liverpool Street, Stratford, Bishop's Stortford, Stansted Airport and Cambridgeshire.

Harlow's resident population of almost 85,000 people, and working population of over 40,000, places high demand on the only two major routes into and out of Harlow. Having largely been constructed in the 1950s and 1960s, much of the town's transport infrastructure is now ageing and was originally designed for a time of lower levels of car ownership and mobility than today, which results in congestion at many junctions across the town in peak periods. Harlow currently has just one connection to the Strategic Road Network (SRN) - M11 Junction 7 (J7) accessed via the A414 - which is also already subject to heavy congestion in peak periods. Without an improved link to the motorway, the town and surrounding area will not be able to realise their full future potential.

A significant intervention is required to address the challenges of capacity, alongside other planned road improvements. M11 J7A (its proposed location is shown in Figure 1.1 overleaf) has been identified as a priority in the Essex Growth Strategy (EGS) and is also supported by the South East Local Enterprise Partnership (SELEP). M11 J7A has been suggested to assist in relieving the congestion at M11 J7 and to help facilitate local growth in and around Harlow.

Figure 1.1 : Location of the proposed M11 Junction 7A



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1.2 The Proposed Scheme

From east to west, the proposed M11 J7A scheme would comprise a new grade-separated dumbbell configuration junction (approximately 3.5 miles north of the existing M11 J7) and new link roads joining the M11 to the east of Harlow via the B183 Sheering Road/Gilden Way (Figure 1.2). Between the two dumbbell roundabouts at the motorway junction, a four-lane overbridge would be erected over the existing M11. To the west of the M11 at Mayfield Farm, Sheering Road/Gilden Way would also be widened towards the London Road Roundabout, with two lanes provided for traffic heading west into Harlow Town and a single lane for outbound traffic in the direction of the M11 motorway. Other proposed improvements to Gilden Way include the installation of combined footpath/cycleways, upgrades to existing pedestrian crossings and three new pedestrian crossings. Churchgate Roundabout would be upgraded to a 'hamburger' design roundabout to improve traffic flow along Gilden Way.

Figure 1.2 : M11 Junction 7A Proposed Scheme

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More detailed information about the proposed scheme and its construction are provided in Chapter 4 of this report.

1.3 Purpose of this Traffic & Transport Impact Assessment

This Construction Phase Traffic & Transport Impact Assessment will report findings of the assessment undertaken to determine the possible traffic and transport effects of the construction phase on local roads and the SRN and on local public transport and sustainable modes. It also suggests potential mitigation measures that could be effected at the site, and by staff and off-site vehicle traffic, to reduce the traffic impact from the construction.

The findings will be used to inform the Environmental Statement, Environmental Impact Assessment and a full Business Case for the proposed M11 J7A scheme.

With regard to the operation of M11 J7A once constructed, rather than producing a separate assessment for this, its contents will be captured as follows:

- via the submission of this Construction Phase Traffic & Transport Impact Assessment as a stand-alone document;
- with additional text provided within the Planning Statement summarising the findings of the traffic modelling for the scheme as a whole; and
- provision of details of impacts on Non-Motorised Users (NMUs) from the Environmental Statement, drawing together information on operational traffic and transport issues.

1.4 The Transport Assessment Process

The March 2007 Department for Transport (DfT) 'Guidance on Transport Assessment' document was withdrawn in October 2014. The Transport Assessment Process is now covered within the Planning Practice Guidance (PPG) suite of web-based documents, notably the content relating 'Travel Plans, Transport Assessments and

Statements in decision taking' (http://planningguidance.communities.gov.uk/blog/guidance/travel-plans-transport-assessments-and-statements-in-decision-taking/).

Accordingly, this Traffic & Transport Impact Assessment has been prepared in accordance with Paragraph 32 of the National Planning Policy Framework (NPPF), which states that all developments that generate significant amounts of transport movement should be supported by a Transport Statement or Transport Assessment.

In line with the above guidance and best practice, this Traffic & Transport Impact Assessment has considered:

- the scale of the proposed M11 J7A scheme and its potential for additional trip generation during the construction phase;
- information about the scheme layout and construction requirements;
- existing transport use and the availability of public transport; including provision/ frequency of services and potential public transport changes arising from the M11 J7A construction;
- information about neighbouring uses, amenity and character, existing functional classification of the nearby road network;
- impact on other priorities/strategies (such as promoting walking and cycling);
- identification of critical links and junctions on the highways network;
- an assessment of the likely associated impacts on transport related to the construction; and
- measures to mitigate the transport impacts during construction, by improving the accessibility of the location (such as provision/enhancement of nearby footpath and cycle path linkages) where these are necessary to make the development acceptable in planning terms.

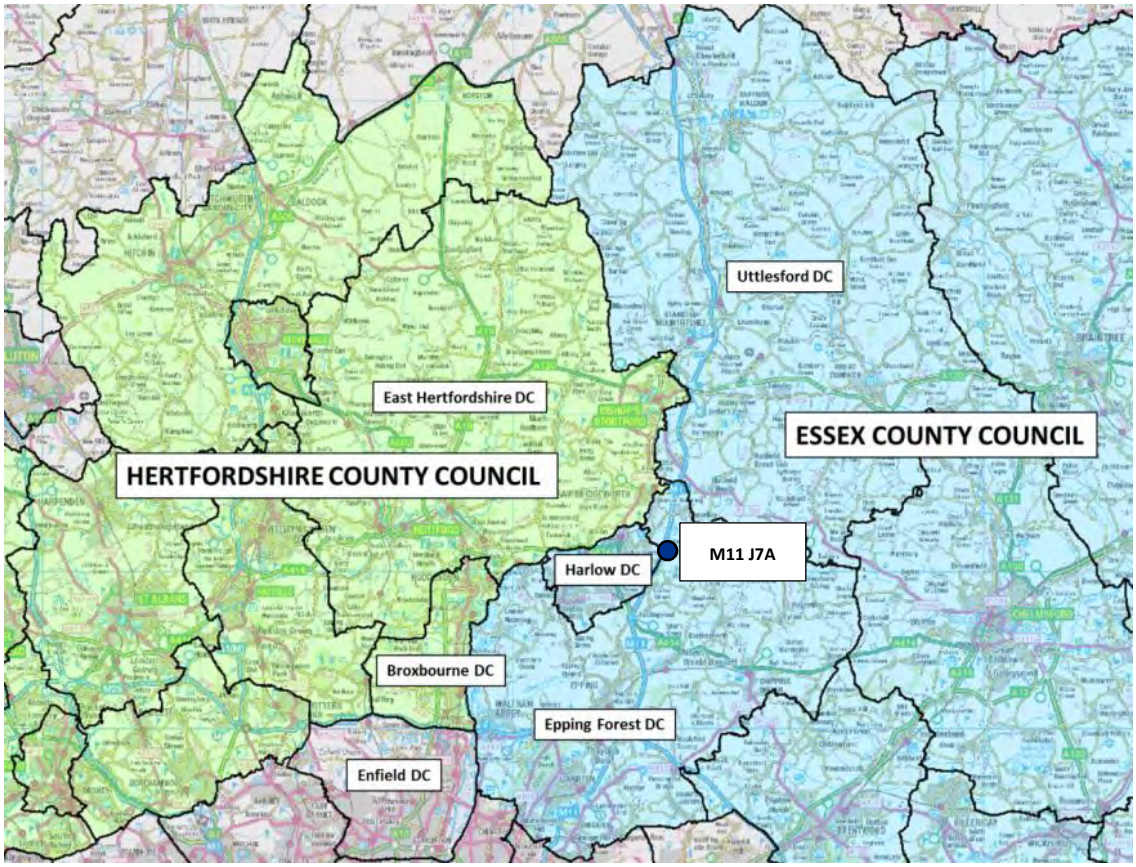
1.5 Area Context

The following section provides background to the overall M11 J7A proposal in the context of the future development, investment and growth around Harlow, and the importance of M11 J7A to these proposals.

Harlow, Epping Forest, Uttlesford and East Hertfordshire District Councils are all currently evaluating existing and future employment needs and housing supplies in accordance with the requirements of the NPPF. They are at various stages of the process and the outcome will undoubtedly result in significant housing and employment growth within and around Harlow, Bishop's Stortford and Stansted Airport. Figure 1.3 displays the location of the above local authorities.

Broxbourne and Enfield District Councils are also evaluating their housing and employment needs. Although these districts are not within the immediate area of influence their development needs must also be taken into account.

Figure 1.3 : Local Authorities in the vicinity of Harlow



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A further increase in housing, beyond that which already has planning permission, is proposed in both Harlow District and Epping Forest District through their emerging Local Plans, which will place additional pressure on the local road network and SRN. It is anticipated through Emerging Spatial Option work being undertaken by AECOM that bringing forward a number of the most suitable potential sites in and surrounding Harlow could lead to the creation of 15,875 new homes by 2033. Of this, some 8,000 dwellings including those with permissions, could be situated within Harlow itself.

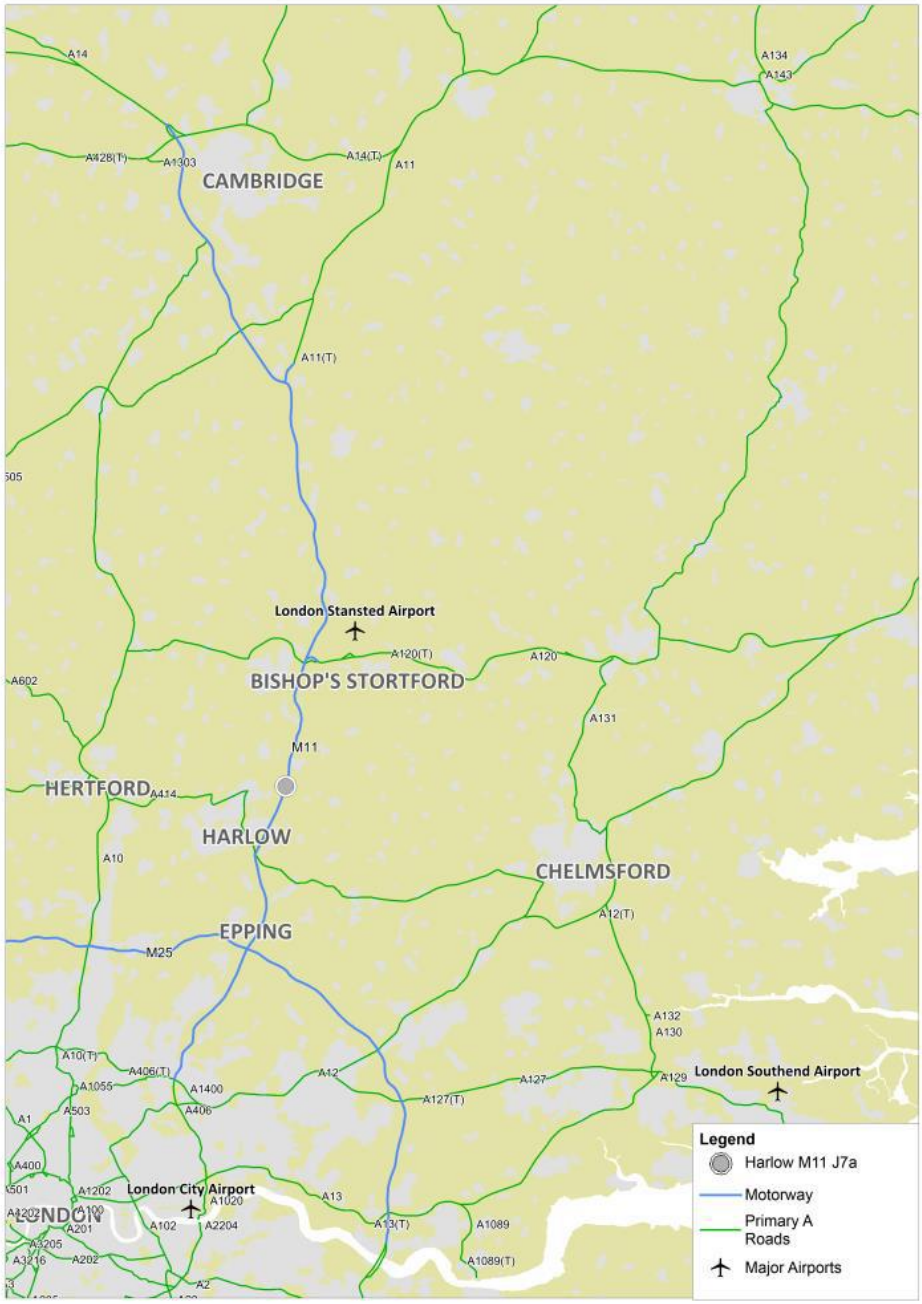
Significant committed housing development is also taking place in Bishop's Stortford, as well as the ongoing expansion of passenger numbers at Stansted Airport, which has experienced 8.6% growth in passenger traffic between September 2015 and September 2016.

The emerging Harlow Local Plan highlights that the inability of the existing transport system is the biggest single barrier to accommodating the level of growth needed in Harlow. Harlow's transport infrastructure deficit has also been identified as a major issue for both local business and residents. The issue is exacerbated by the location of key industrial sites/employment areas (Edinburgh Way and The Pinnacles) on the northern and western sides of the town, which are the furthest points from the single connection to the SRN to the south-east of the town (M11 J7) – see Figure 1.5 overleaf. This means that network resilience is poor with significant congestion and delay experienced due to minor incidents. Routes through Harlow also act as a relief valve when incidents occur on the M25 or M11 creating further problems in the town.

In addition to demand placed on the SRN from work-related trips, adjacent towns and villages have otherwise limited access to the M11 and so tend to travel through Harlow in order to reach M11 J7. Access to the M11 itself is also restricted within Epping Forest District to the south of Harlow, with M11 J5 having only a south-facing on-slip, and M11 J4 at the southern end of the motorway being some 12 miles away from M11 J7.

Harlow is also identified as a key growth area in the SELEP-recognised London-Harlow-Stansted-Cambridge corridor, as illustrated in Figure 1.4 overleaf:

Figure 1.4 : London-Harlow-Stansted-Cambridge Corridor



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The London-Harlow-Stansted-Cambridge corridor is acknowledged as requiring key transport investment to unlock its full growth potential, compliant with the aspirations of the Economic Plan for Essex (EPfE) that will update and incorporate the Greater Essex Integrated County Strategy (ICS) and the ECC Economic Growth Strategy. The package of improvement proposed within the corridor (including M11 J7A) supports the delivery of the Essex Local Transport Plan, and has the support of partner authorities.

The congestion issue at M11 J7 has been previously recognised by Highways England (HE) back in 2013 with their requirement during the Local Development Order (LDO) process to cap the number of jobs approved at the

two Harlow Enterprise Zone (HEZ) sites until this situation can be mitigated. HE are currently undertaking a study of J7 to identify the optimal scheme to increase its capacity as part of the DfT Road Investment Strategy.

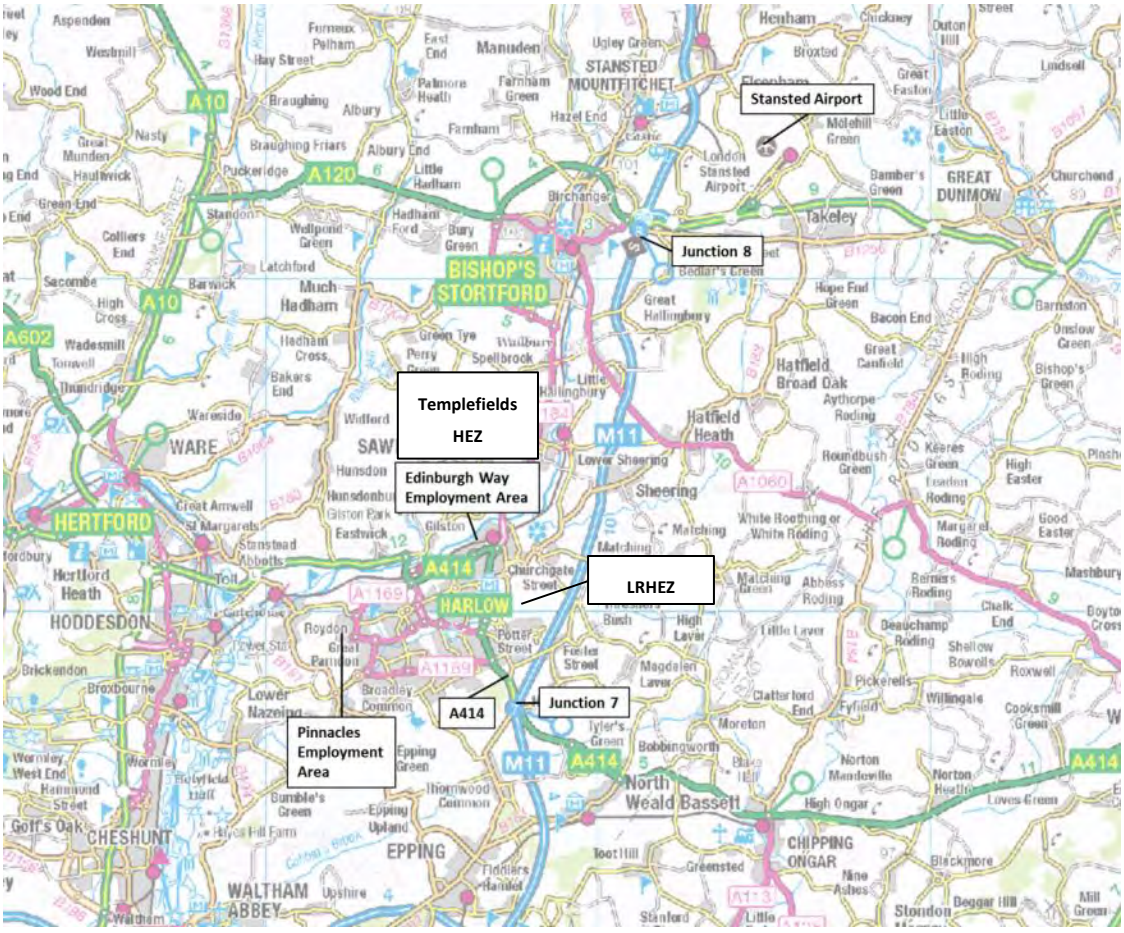
The London Road HEZ (LRHEZ) is situated just 0.3 miles from the western end of Gilden Way and the proposed M11 J7A scheme. In September 2016, the first tenants moved into the first completed building (Kao One) at Kao Park within the LRHEZ. Work is now commencing on Kao Two, which is scheduled to open in October 2017. The LRHEZ site has also been chosen by Anglia Ruskin University as the location for its new Medical Technology (MedTech) Campus, which will offer specialist support to new and growing health innovation and medical technology businesses.

A condition of the Local Development Order for the Templefields HEZ is that additional employment growth at this site cannot be brought forward without the provision of M11 J7A.

Preliminary evaluation work for Uttlesford District Council's next Local Plan to 2031 has also highlighted concerns for M11 Junction 8 (J8), with committed and planned growth from Stansted Airport, East Herts and Uttlesford likely to result in additional peak period pressure at this junction.

Figure 1.5 below shows the location of M11 J7, current and future employment sites and the current SRN to the east of Harlow.

Figure 1.5 : Strategic Road Network (SRN) and Key Employment Sites around Harlow



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1.6 Scheme Objectives

The main overarching objectives of the Proposed Scheme (J7A) are:

- to improve accessibility to and from Harlow;
- to reduce congestion primarily for the A414 corridor;
- to ensure the proposed infrastructure is of the appropriate scale for future traffic demands; and
- to facilitate future housing developments around Harlow and employment growth to the east of Harlow.

It is anticipated that the Proposed Scheme could achieve a number of other outcomes including:

- maintaining and improving the reliability of journey times along the A414 corridor;
- improving access between key centres; and
- improving air quality by reducing nitrogen dioxide (NOx) emissions.

Without an improved link to the M11 Motorway, the town and surrounding districts would not be able to realise their full potential.

The above objectives have been further defined and split into the following 3 categories:

Economic

- To provide connectivity to and within the urban area to support self-contained (i.e. solely within Harlow) employment, housing growth and regeneration;
- To provide good connectivity within Essex and with adjacent major areas, maximising benefits to the local economy of international gateways and strategic links to London, the east and south-east;
- To enable housing and employment growth and regeneration; and
- To unlock development land.

Transport

- To address Harlow's network infrastructure capacity issues and improve network resilience; and
- To reduce congestion and improve traffic management within Harlow, along the A414 corridor and at M11 J7.

Community and Environment

- To minimise adverse impacts on health and environment caused by traffic congestion.

1.7 Report Structure

The remainder of this report is set out as follows:

- Chapter 2 – Gives an overview of the key strategies and policies relating to planning and transportation within the study area, at the national, regional and local level;
- Chapter 3 – Provides a summary of the baseline current situation/existing context of the area where the proposed M11 J7A would be situated;
- Chapter 4 – Presents a summary of the proposed scheme and the construction phasing approach;
- Chapter 5 – Explains how the Harlow Traffic Model was used in this study;
- Chapter 6 – Describes the off-site construction vehicle movements trip generation and distribution;

- Chapter 7 – Describes the construction staff vehicle movements trip generation and distribution;
- Chapter 8 – Summarises the potential traffic impact from constructing the proposed M11 J7A scheme, and potential mitigation measures to be explored further; and
- Chapter 9 – Summary of findings and conclusions.

2. Policy Context

2.1 Introduction

The following chapter outlines the proposed M11 J7A scheme's compatibility with and its potential to help towards achieving key strategies and policies relating to planning and transportation within the study area, as articulated at the national, regional and local level.

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 time between now and the construction period (between 2019 and early 2022).

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

Figure 2.1 : Key National, Regional and Local Policy Documents

2.2 National Planning Policy

Localism Act 2011 – The Local Growth White Paper, 'Realising every place's potential', issued in 2010, focused 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 provides the legislative foundation for this. The Act decentralises power, giving local government new freedom and flexibilities, reforms the planning system, and enables decisions to be taken locally.

National Planning Policy Framework – In March 2012, the Department for Communities and Local Government (DCLG) published the NPPF, which set out the UK Government's economic, environmental and social planning policies in England. 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.

The **DfT's Action for Roads - A Network for the 21st Century –** published in July 2013, identifies an action to 'keep the locally-managed road network functioning', this being vital to promoting growth locally and nationally. In March 2016, the DfT announced the National Roads Fund from 2020/21, which guarantees that all revenue raised from Vehicle Excise Duty (VED) in England will be allocated to a new fund and be invested directly back into the SRN. This funding could also support projects on local road networks close to the SRN, where it can be clearly demonstrated that this would help the SRN, such as in the case of M11 J7A.

DfT Business Plan – The Government's National Vision for Transport is one that encourages growth, but is greener, safer and improves the quality of life in communities. The transport priorities and key actions to deliver this include 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 *'to invest in roads to promote growth, while reducing congestion and tackling carbon'* is of particular relevance as it calls for investment in the SRN to promote growth and address congestion that affects people and businesses.

HE is funding improvements to the SRN through the **Road Investment Strategy (RIS 1)** published in December 2014, and updated in March 2015. 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 SRN 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:

- M11 Junction 7 upgrade – expansion to provide extra capacity and better access to Harlow; and
- M11 Junctions 8 to 14 – technology upgrade in 3 phases between Stansted Airport and the Girton interchange north of Cambridge to help improve safety, relieve congestion and support plans for additional housing, via several elements of the Smart Motorway package, including emergency roadside telephones, signals on slip-roads, Motorway Incident Detection and Automatic Signalling, variable message signs, CCTV cameras and gantries.

In March 2016, it was announced that an additional £59 million had been made available in the RIS 1 Supplementary Estimate, for the continuation of the Pinch Point programme originally announced in 2011, and £54 million to complete work on Small Network Improvements, which focused on accident hot-spots, local safety and economic development initiatives.

The **Highways England Delivery Plan 2015-2020** outlines what HE will do over the next five years to deliver against the commitments and performance specification in RIS 1 and how HE will deliver against the five strategic outcomes in its Strategic Business Plan 2015-2020.

Road Investment Strategy Post 2020 (RIS 2): Planning Ahead – RIS 2 will seek to integrate the SRN with local road networks: Road users want a smooth and reliable journey regardless of which stretch of the network they are driving on. The DfT will continue to work with local highways authorities to ensure that the different parts of the network work as an integrated whole. RIS 2 will continue and extend RIS 1's practice of investing off of the SRN, where this helps the SRN to function better.

2.3 Regional Planning Policy

Essex is a constituent member of the **SELEP**, the business-led, public/private body established to drive new economic growth across East Sussex, Essex, Kent, Medway, Southend and Thurrock, and the biggest LEP outside of London.

Between July 2014 and July 2016, SELEP have been successful in agreeing £488 million of Growth Deal funding, to be invested in the area. It will transform transport and business infrastructure and bring significant

additional housing, jobs and third party investment to the SELEP region. In July 2016, SELEP submitted a further Growth Deal bid to Government, seeking £229 million investment.

Work is underway on the construction of a new partly-SELEP funded access road into the London Road HEZ. This will link the A414 with London Road and help to facilitate the development of the Kao Two and MedTech Campus Parks. The London Road HEZ site is situated just 0.3 miles from the western end of Gilden Way and the proposed M11 J7A scheme.

SELEP, therefore, see investment in M11 J7A as integral to unlocking development in Harlow, particularly for sites such as the HEZ, which has been successful in attracting over 5,000 new jobs, but further growth is constrained by access from the M11. ECC made a successful bid to the DfT through SELEP for £1.5m funding, which will contribute towards ongoing works developing and designing the new M11 J7A.

In terms of cross-LEP support, the Hertfordshire LEP has been supportive of the proposed M11 J7A scheme, recognising its importance to help deliver an initial 3,000 homes at Gilston, just north of Harlow, in the current East Herts local plan period to 2033 and up to 10,000 further homes in the longer term.

2.4 Local Planning Policy

The **Essex County Council Transport Strategy: the Local Transport Plan for Essex (LTP3)** consists of a Transport Strategy and an Implementation Plan. It sets 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:

- 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 M11 J7A is connectivity. The challenges relating to this outcome are:

- Providing good connectivity to and within urban areas to support self-contained employment and housing growth and regeneration;
- Providing good inter-urban connectivity within Essex and with adjacent major urban areas; and
- 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 response to this issue is to take steps to ensure that centres are well connected to each other by both road and public transport.

The **ECC Local Corporate Plan 2012-2017** highlights ECC's desire to ensure the physical and technological infrastructure is in place to enable businesses to flourish.

The **ECC Vision for Essex, July 2013-2017**, pledges that ECC work tirelessly to keep Essex as an economic powerhouse ensuring more jobs are created and local businesses supported, and to achieve that ECC must develop and maintain the infrastructure that enables its residents to travel and businesses to grow.

The **ECC Key Corporate Outcomes Framework 2014-2018**, states the commitment to providing sustainable economic growth for Essex communities and businesses, and delivering increased connectivity and journey time reliability on the Priority Route (PR1) Network, with the A414 north-south and east-west sections, Second Avenue, Southern Way, Third Avenue, Elizabeth and the A1184 Cambridge Road forming the current PR1 Network in Harlow. The proposed M11 J7A scheme would link to the PR1 Network via First Avenue/Mandela Avenue, which is being upgraded at present, with completion expected during 2017.

The **West Essex Area (comprising Harlow, Epping Forest and Uttlesford Districts) Implementation Plan's** key transport priorities include:

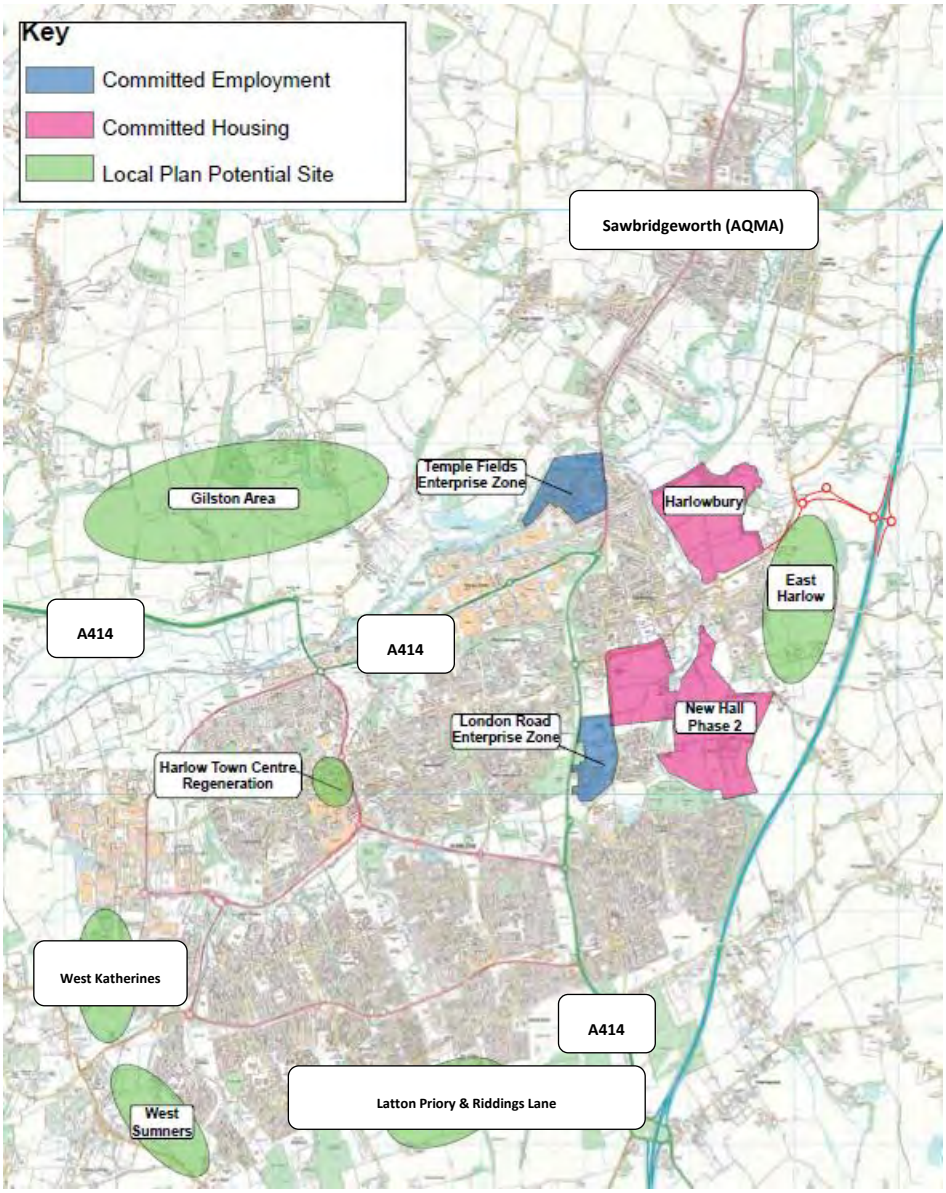
- Improving access to and from the M11 corridor; and
- Providing the transport improvements needed to support housing and employment growth;

Specific West Essex Area Implementation Plan Objectives for Harlow include:

- Tackling congestion in the town centre; and
- Reducing congestion on strategic routes including A414 and J7 of the M11/

Figure 2.2 shows the proposed M11 J7A scheme in relation to the surrounding area, transport system and permitted and proposed land use developments.

Figure 2.2: M11 Junction 7A in relation to the surrounding area



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In terms of permitted and proposed land use developments, Harlow, Epping Forest, Uttlesford and East Hertfordshire District Councils are all currently evaluating existing and future employment needs and housing supplies in accordance with the requirements of the National Planning Policy Framework.

Harlow Council's Corporate Plan – first published in 2014, set out the Local Council's vision and priorities for its service delivery for the next three years. Following a change in the leadership of Harlow Council, the Plan is now updated each year for the following 3 years, with the latest version covering the period 2016-2019. To achieve the Plan's outcomes, Harlow Council have identified a number of priorities, with the following relevant to the proposed M11 J7A scheme:

- Regeneration and a thriving economy – regenerating Harlow and supporting a thriving economy that benefits all the people of Harlow. Working with our partners in local and national government, the community, and the private sector, to create an infrastructure that is appropriate for sustainable growth.

Harlow Council's New Local Development Plan – This will replace the Adopted Replacement Harlow Local Plan and will set out the framework to guide and shape development in Harlow to 2031 and beyond. In terms of Harlow's New Local Development Plan production, the Local Development Scheme is currently being updated. It is anticipated that the draft Pre-Submission Harlow Local Plan will be considered at a Full Council meeting in early 2017, followed by a Pre-submission Public Consultation, Submission for Examination, then Examination in Public in Summer/Autumn 2017, and Adoption in Winter 2017/18.

The **Cooperation for Sustainable Development Members Board (CfSDMB)** was established to support Local Plan-making and the delivery of sustainable communities across administrative borough/district boundaries in West Essex and East Hertfordshire, with HE, the City of London (Conservators of Epping Forest) and the adjoining London Boroughs (Havering and Redbridge) also represented at their monthly meetings. During 2016, the CfSDMB have been liaising with the Parliamentary under-Secretary of State for Transport at the DfT, seeking the support of the DfT for M11 J7A and other improvements and interventions, demonstrating that the level of growth planned for West Essex and East Hertfordshire cannot be delivered without M11 J7A. A letter was also sent to The Chancellor of the Exchequer in November 2016, ahead of the Government publishing its Autumn Statement, with M11 J7A included as one of eight infrastructure investments highlighted to the Chancellor as key issues that need serious consideration.

Harlow Council is preparing other joint Local Plan evidence with Epping Forest District, Uttlesford District and East Hertfordshire Councils, including a strategic sustainability assessment of emerging spatial development options and a site selection report examining the development merits of strategic sites around Harlow. This reveals bringing forward a number of the most suitable potential sites in and surrounding Harlow that could lead to the creation of 15,875 new homes in the area by 2033. Of this, some 8,000 dwellings, including those with permissions (e.g., Harlowbury and Newhall), could be situated within Harlow itself.

The proposed M11 J7A is located on the eastern outskirts of Harlow and would stand to benefit the residents of East and North Harlow particularly. However, the grade-separated junction at the M11 and the J7A scheme east of Mayfield Farm is actually situated within Epping Forest District.

The **"Putting Epping Forest First" Community Strategy 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 the Epping Forest District depends, how the District will achieve the outcomes in this strategy. It brings together the key plans of partners into one coordinated local strategy including the Essex Strategy"*.

The Corporate Plan for Epping Forest District Council 2015 - 2020 – Published in early 2015, this document sets out a framework for Epping Forest District Council (EFDC) policy and decision making over that five year period. The Corporate Plan's key contents are:

- A vision of where the Council wishes the district to be in five years' time; and
- Outlining the key aims and objectives for the Council which are designed to ensure that the vision becomes a reality.

Epping Forest District Council New Local Plan 'Planning Our Future' – EFDC has been working to produce a new up-to-date Local Plan, which will set out the plans and policies that will guide development in the District up until 2033.

The Draft New Local Plan states that EFDC's housing requirement is approximately 11,400 new homes over the Local Plan period from 2011 until 2033. This figure has been established following work undertaken by external consultants appointed by EFDC, together with three neighbouring authorities (East Herts, Harlow and Uttlesford District Councils).

The delivery of strategic development around Harlow is a key part of the Council's strategy for the future delivery of these new homes within the District, and to support the opportunities that Harlow's Enterprise Zones

offer to create new jobs. The New Local Plan recognises that a key part of the infrastructure needs to support this strategy is the provision of M11 J7A.

As agreed by EFDC's 'Full Council', a six-week consultation on the Draft New Local Plan was held until mid-December 2016. In 2017 the Council will take on board the responses received, with a Pre-Submission Publication of a Revised New Local Plan expected in Summer 2017. EFDC will then submit the New Local Plan to the Planning Inspector for Independent Examination at the end of 2017, and subject to any alterations required by the Inspector, the New Local Plan should be adopted by Autumn 2018.

2.5 Summary

The proposed M11 J7A scheme aligns with the objectives and principles of many of the identified national and regional planning policies above, in that it would:

- improve accessibility;
- reduce congestion along primary/priority corridors;
- be built to cater for future traffic demands; and
- provide a catalyst for future housing development, new employment and economic growth.

Current Local Planning Policies and documents contain objectives which M11 J7A could help achieve, or in some cases highlight the proposed scheme itself as being pivotal to achieving the planned growth and associated development.

3. Baseline / Current Situation

3.1 Introduction

This section of the Construction Phase Traffic & Transport Impact Assessment provides a qualitative description of the existing travel characteristics around the location of the proposed M11 J7A scheme. It also describes the surrounding existing highway network, current congestion issues, existing public transport provision, and current sustainable transport provision surrounding and bisecting the proposed scheme.

3.2 Congestion Analysis

The A414 is the prime distributor route within Harlow, as well as a through route between Chelmsford, Hertford and beyond. ECC has been reviewing the A414 route through Harlow, as the area suffers from congestion in peak periods.

ECC annually receive Trafficmaster GPS journey time data from the DfT. The latest processed data set available is for the period September 2014 to August 2015.

Trafficmaster data is obtained from approximately 120,000 vehicles in the UK fitted with specific GPS equipment. (On trunk roads the GPS data is supplemented by roadside detectors and ANPR cameras.)

Plots of Trafficmaster 2014 – 2015 data have been created by extracting the average speeds for passenger vehicles and light goods vehicles for each hour and averaged for weekdays in neutral months between September 2014 and August 2015. Free flow conditions are approximated by speed data from 20:00 to 21:00 and the diagrams show the speed during the peak hours as a percentage of the approximated free flow speed.

Figures 3.1 and 3.2 show that in both the morning (08:00 – 09:00) and evening peak hours (17:00 – 18:00), many of the main routes through Harlow Town Centre are operating at less than 50% of freeflow speeds.

The existing M11 J7 and A414 Northbound congestion is shown by the red and orange lines on entries and exits to the junction in Figures 3.1 and 3.2. However, Gilden Way, in the 2014-2015 AM peak hour, was operating at between 55% and 85% of freeflow speeds, and in the PM peak hour between 75% and 95% of freeflow speeds. The proposed M11 J7A scheme, which would provide a new access into north and east Harlow via Gilden Way, could alleviate the congestion at M11 J7 and along the A414 into Harlow.

Figures 3.3 and 3.4 show the Trafficmaster 2014 – 2015 Average Speeds across Harlow in the morning (08:00 – 09:00) and evening peak hours (17:00 – 18:00), illustrating the lower average speeds as a result of the congestion at M11 J7 and along the A414.

Figure 3.1 AM Congestion in Harlow (weekdays in neutral months between September 2014 and August 2015)

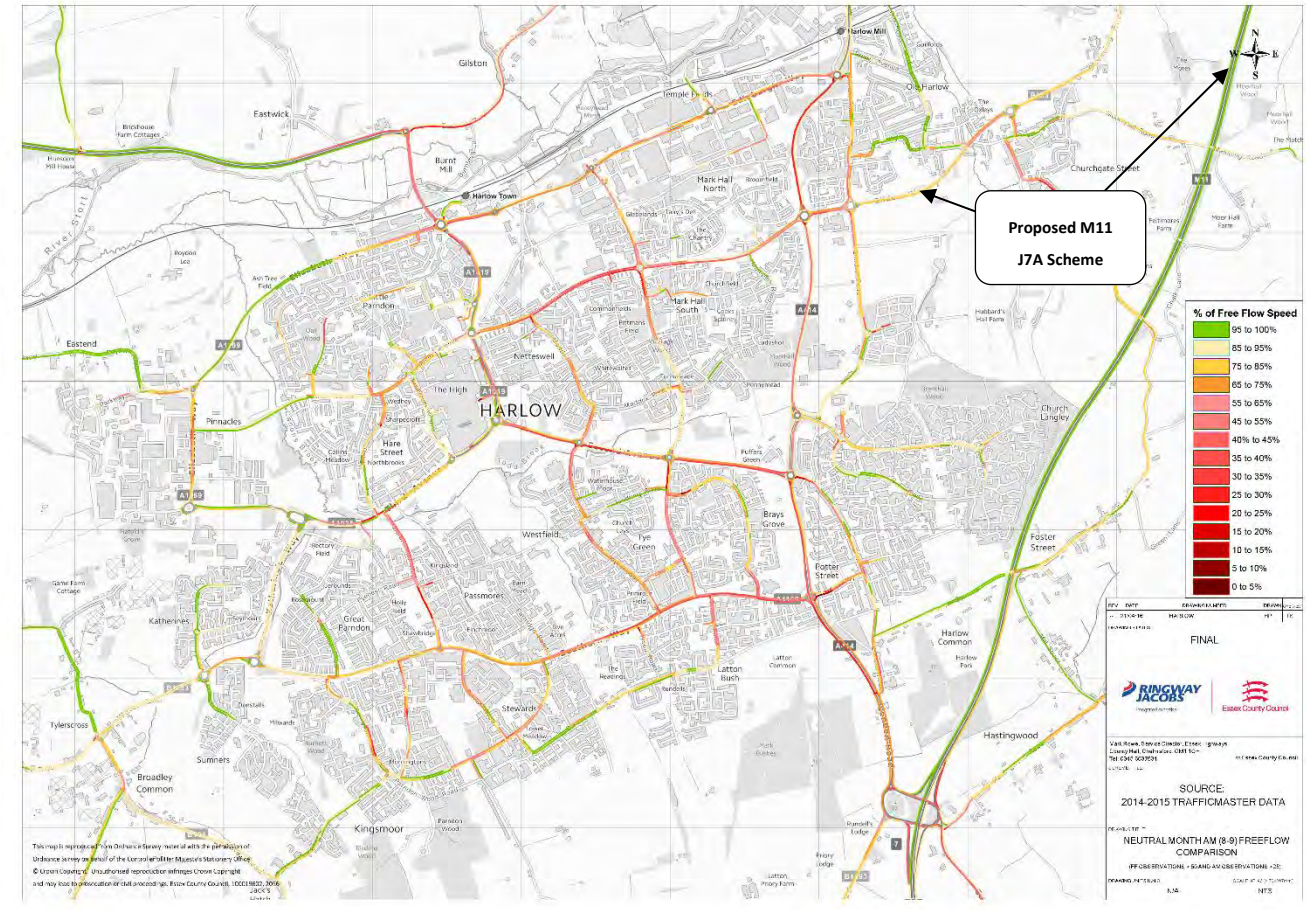

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Figure 3.2 PM Congestion in Harlow (weekdays in neutral months between September 2014 and August 2015)

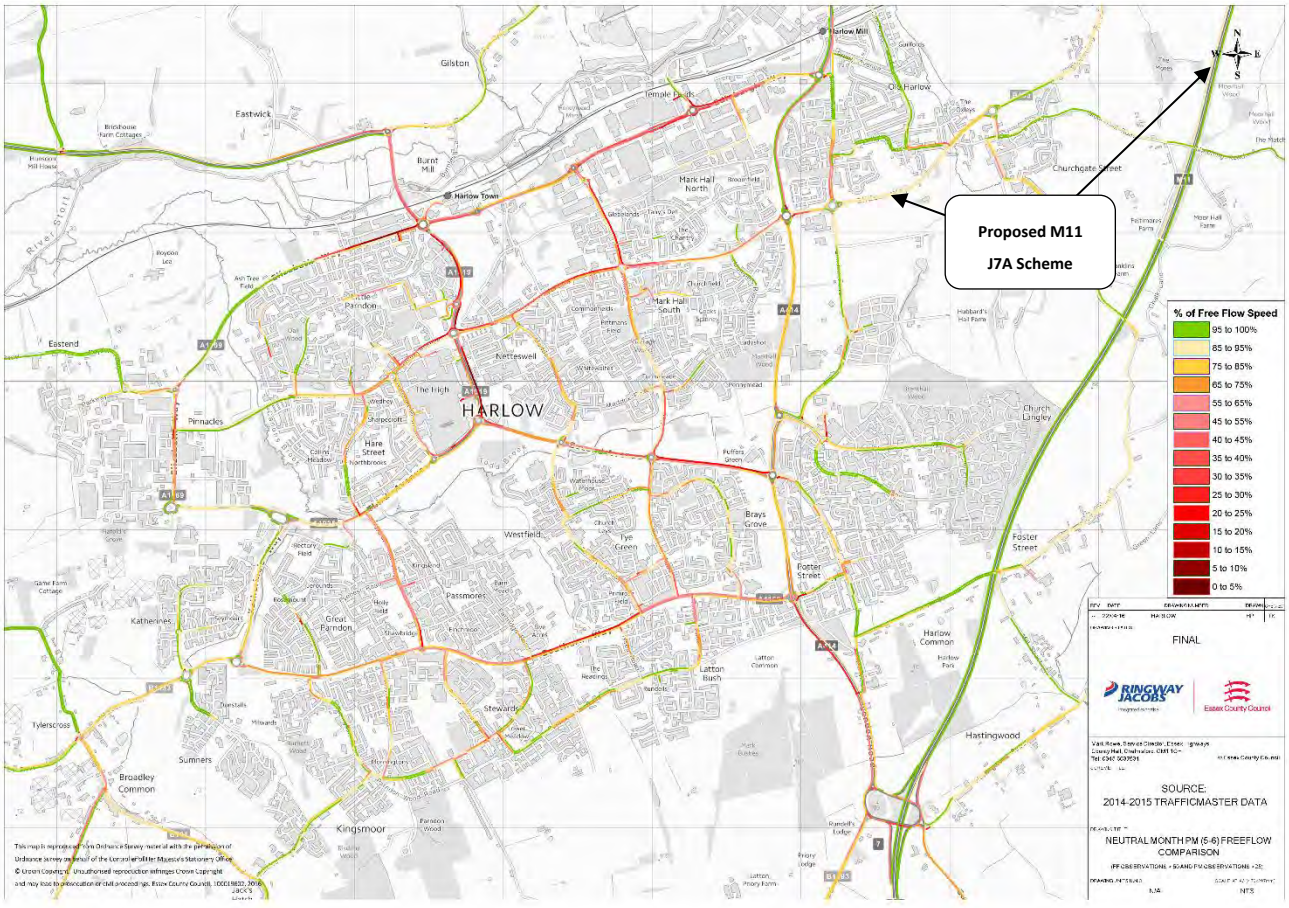

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Figure 3.3 AM Average Speeds in Harlow (weekdays in neutral months between September 2014 and August 2015)

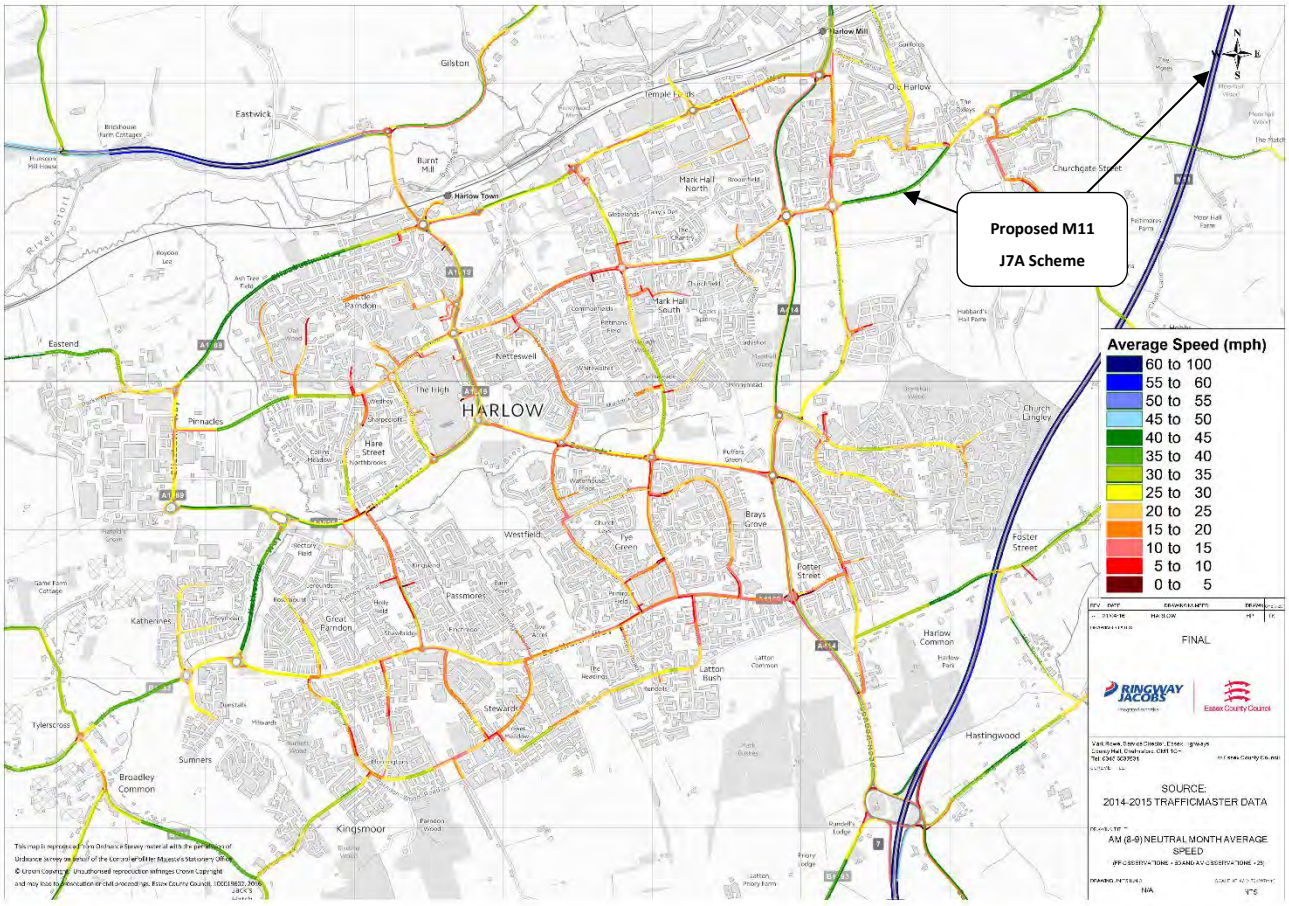

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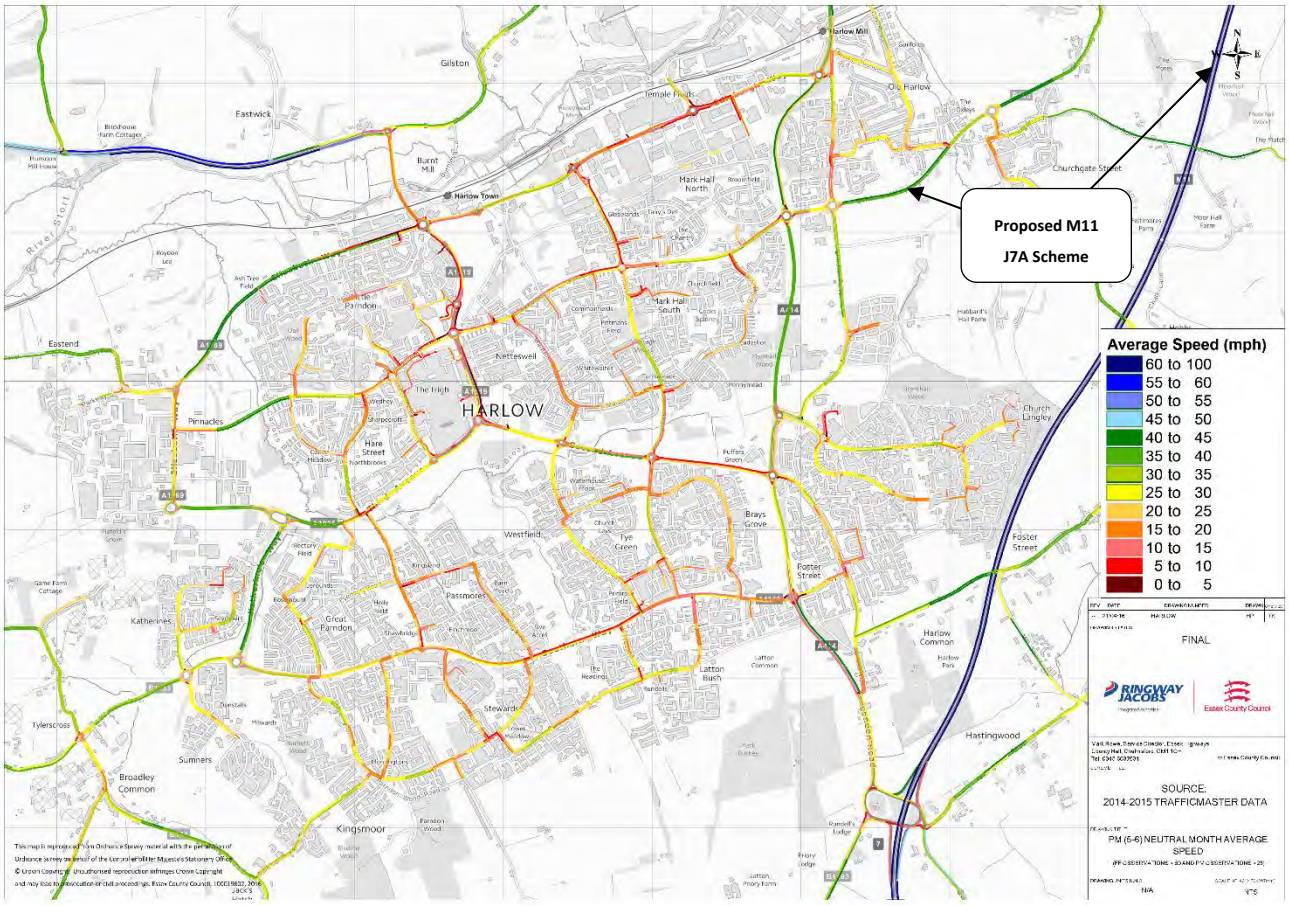
Figure 3.4 PM Average Speeds in Harlow (weekdays in neutral months between September 2014 and August 2015)



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3.3 Recent Highway Schemes

Since 2010, a number of improvements to the A414 in southern Harlow have taken place. ECC submitted a number of bids in February 2013 to the Government's Local Pinch Point Fund. These bids were for schemes that would address local pinch points and assist in the release of economic and housing growth:

- **M11 Junction 7 to Southern Way –** dualling and junction improvement;
- **Burnt Mill Roundabout –** construction of a new carriageway layout, decreasing the size of the centre island and adding an additional dedicated left turn lane to Elizabeth Way; and
- **Second Avenue/Clock Tower Junction A414/A1025 –** scheme removed left turns into and out of Second Avenue from the roundabout circulation, which improved junction capacity and accessibility to Harlow's town centre and Enterprise Zones.

3.4 Current Highway Schemes

Following the above schemes, a number of additional highways schemes, totalling £15 million investment and funded by the SELEP Growth Fund, have been designed and are being constructed to support local development proposals by improving traffic flow and reducing congestion, making journey times more predictable and aiding economic growth and regeneration:

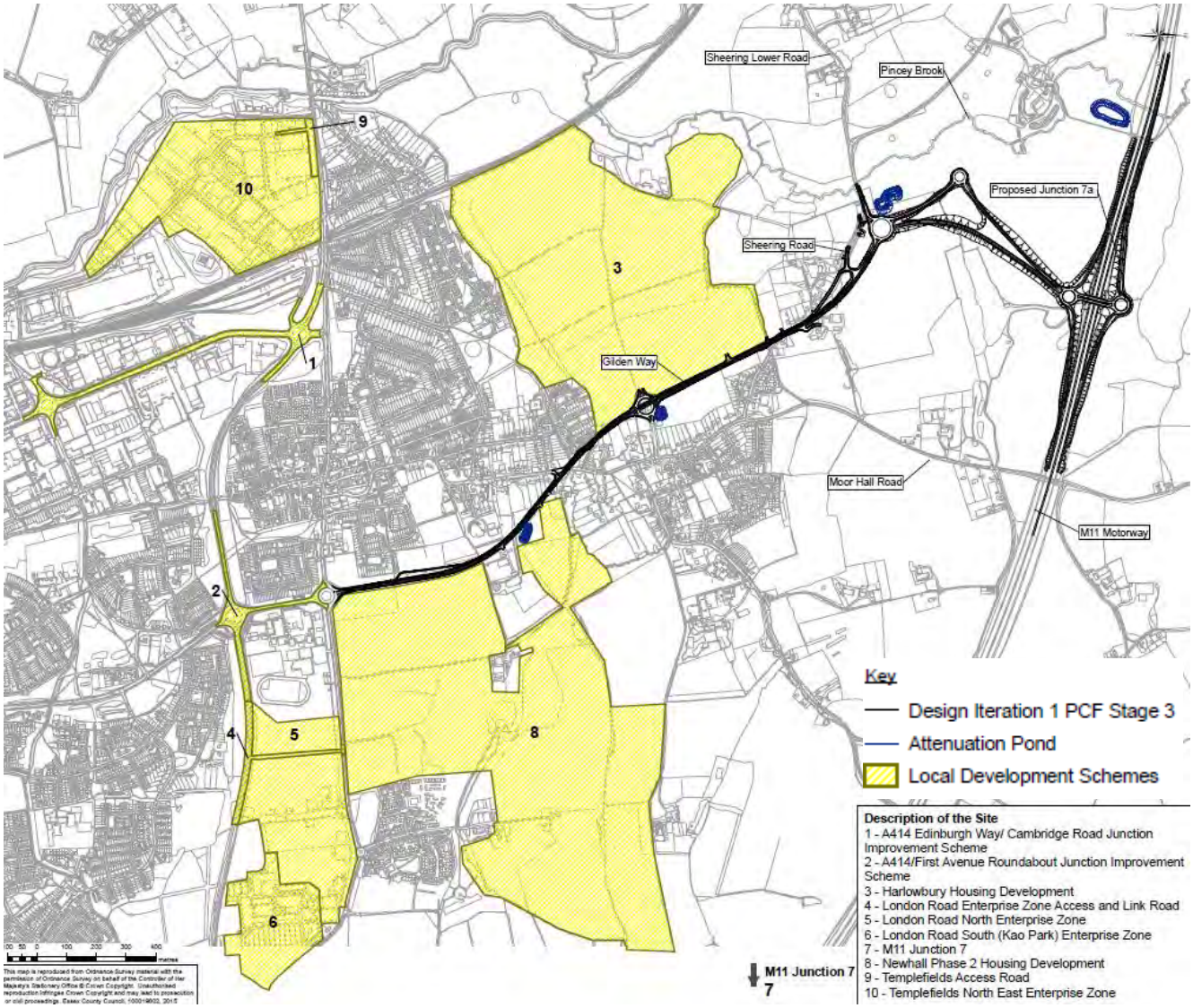
- **London Road Enterprise Zone Access and Link Road –** This scheme will provide a signal controlled junction with the A414 and the Enterprise Zone site, and construction of a new link road from the junction with the A414 through the Enterprise Zone site to London Road. A segregated

right turn will be created into the Enterprise Zone and two 'continue ahead' lanes in both directions on the A414. Main construction began in October 2015 and will continue into 2017;

- **A414/First Avenue Roundabout junction improvement –** First Avenue will be widened to two lanes in each direction between the A414 and London Road and a dedicated left turn will be created onto the A414. A second dedicated left turn is being created from the A414 southbound to B183 eastbound. Safety barriers will be provided to deter pedestrians from crossing and vehicles from stopping in unsafe locations, and primary drop off points for the school will instead be in London Road. Main construction began in late Autumn 2015 and is expected to continue into 2017;
- **Templefields Access Road improvement –** This scheme, to promote economic growth in the Templefields area, will provide a new signal-controlled junction access from Cambridge Road to the Templefields Enterprise Zone on River Way, which currently ends in a cul-de-sac in this area. Scheme works are due to begin in Spring 2017 and will take up to a year (i.e. completion Spring 2018); and
- **A414 Edinburgh Way/Cambridge Road junction improvement –** The A414 Edinburgh Way leading from the Cambridge Road Roundabout will become dual carriageway, as far as the River Way Roundabout, and the existing signals at East Road will be upgraded. In addition, footpaths and cycle ways will be constructed on either side of Edinburgh Way between the Cambridge Road Roundabout and the River Way Roundabout, and Cambridge Road Roundabout (also known as the Gates Roundabout) will be realigned to include a dedicated left turn from the A414 onto Edinburgh Way. Main construction is expected to start in Summer 2017. It is estimated that the works will take approximately 24 months (i.e. completion early 2019).

Figure 3.5 overleaf shows the above schemes in the context of the local development proposals they are supporting and with the proposed M11 J7A scheme also shown.

Figure 3.5 Current Highway Schemes and Local Development Areas in East Harlow, including proposed M11 J7A



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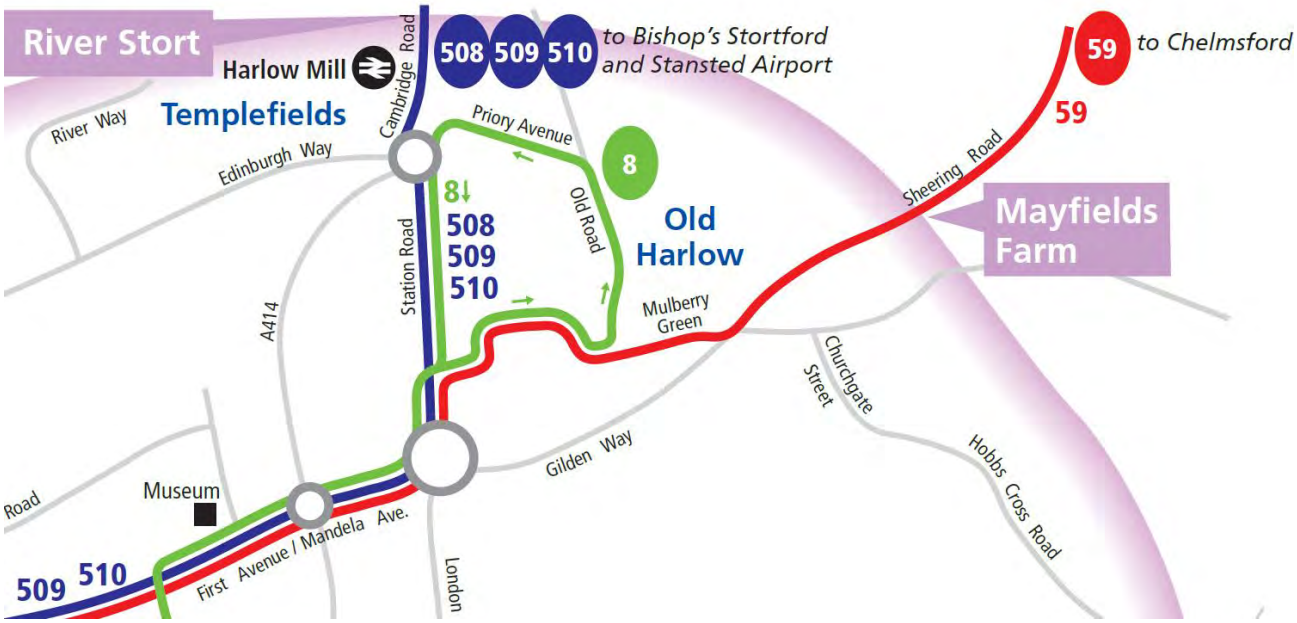
3.5 Current Public Transport Provision

Buses

The extent of the proposed M11 J7A scheme along Gilden Way contains four existing bus stops (two serving eastbound services and two serving westbound services. In addition, some bus services utilise the junction of Gilden Way and Mulberry Green, and/or the Churchgate Roundabout – as a result there are additional bus stops situated to the north-west and south-east of Gilden Way. The local bus network in the vicinity of the proposed M11 J7A scheme is shown in Figure 3.6, and services calling at these bus stops are summarised in Table 3.1.

Figure 3.6 North-East Harlow Arriva Bus Network August 2016



In the vicinity of the proposed scheme and Gilden Way, there are bus stops on the north side of the B183 First Avenue, between the A414 and London Road Roundabouts. In addition, there are bus stops on London Road: the northbound bus stops to the north of the B183 roundabout and the southbound bus stop to the south of the roundabout. Bus services calling at these bus stops are summarised in Table 3.1.

Table 3.1 Bus services stopping in the vicinity of the proposed scheme

Bus service	Route	Daytime frequency
B183 between A414 and London Road roundabouts (opposite/ outside Marks Hall School)		
8	Old Harlow-Harlow	Every 15 mins
8A	Old Harlow-Central Harlow	Hourly, Mon-Sat
10	Harlow-Church Langley	Every 20 mins
47	Ongar – Harlow	One bus per day Tues, Thurs, Fri, Sat.
59	Chelmsford City Centre - Harlow	Hourly, Mon – Sat 2 hourly, Sun
147	Ongar – Harlow	One bus per day Weds
508	Stansted Airport	Every 30 mins Mon- Sat
509/510	Stansted Airport	Every 15 mins, Mon-Fri
LCB1	Kingsmoor-Old Harlow	Hourly, Mon-Fri
B183 adjacent/ outside The Oxleys		
47	Ongar – Harlow	One bus per day Tues, Thurs, Fri, Sat.
59	Chelmsford City Centre – Harlow	Hourly, Mon – Sat 2 hourly, Sun
147	Ongar – Harlow	One bus per day Weds
322	Saffron Walden- Old Harlow	Schooldays only, Mon-Fri, one bus per day
B183 approach to Churchgate Roundabout, outside/ opposite Pitten House		
47	Ongar – Harlow	One bus per day Tues, Thurs, Fri, Sat.
147	Ongar – Harlow	One bus per day Weds

Bus service	Route	Daytime frequency
London Road, N/S of B183 roundabout		
8	Old Harlow-Harlow	Every 15 mins
8A	Old Harlow-Central Harlow	Hourly, Mon-Sat

Olympian Coachways commuter service 741 from Harlow Bus Station to London Victoria calls twice on weekday mornings at the bus stop on the north side of the B183 First Avenue between the A414 and London Road Roundabouts. Regal Busways run the Route 322 school service from Old Harlow to Saffron Walden past this stop daily on weekdays in term time. The prescribed route for this service does not include Gilden Way, and therefore it should be unaffected by the on-line construction works for the proposed M11 J7A scheme.

The Arriva Bus Routes 8, 59 and the 509/510 travel along London Road and through Old Harlow, with the 59 emerging at the junction of Mulberry Green and Gilden Way. Therefore only the 59 service and the 322 school service could be potentially impacted by the Phase 1 on-line construction works for the proposed M11 J7A scheme along Gilden Way. See Section 8.10 for further details.

Along the M11 (both Northbound and Southbound), National Express Coach Services (A6, A7, A8 & A9), Stansted Citylink (Service 767) and Airport Bus Express Coach Services operate to and from London and Stansted Airport. These services amount to approximately 600 trips daily (Northbound and Southbound combined). These trips could take slightly longer than currently due to the roadworks and traffic management along the section of the M11 where the J7A slip-roads and overbridge would be built.

National Rail

Harlow is served by two railway stations, forming part of the Abellio Greater Anglia Rail Franchise Network.

Harlow Town Railway Station – located in the north-west of the town, close to the Town Centre and approximately 2.6 miles from Gilden Way. Typical off-peak rail services from this station provide 4 trains per hour (tph) to London Liverpool Street, 2 tph to Stratford, 2 tph to Stansted, 2 tph to Cambridge and 2 tph to Bishops Stortford.

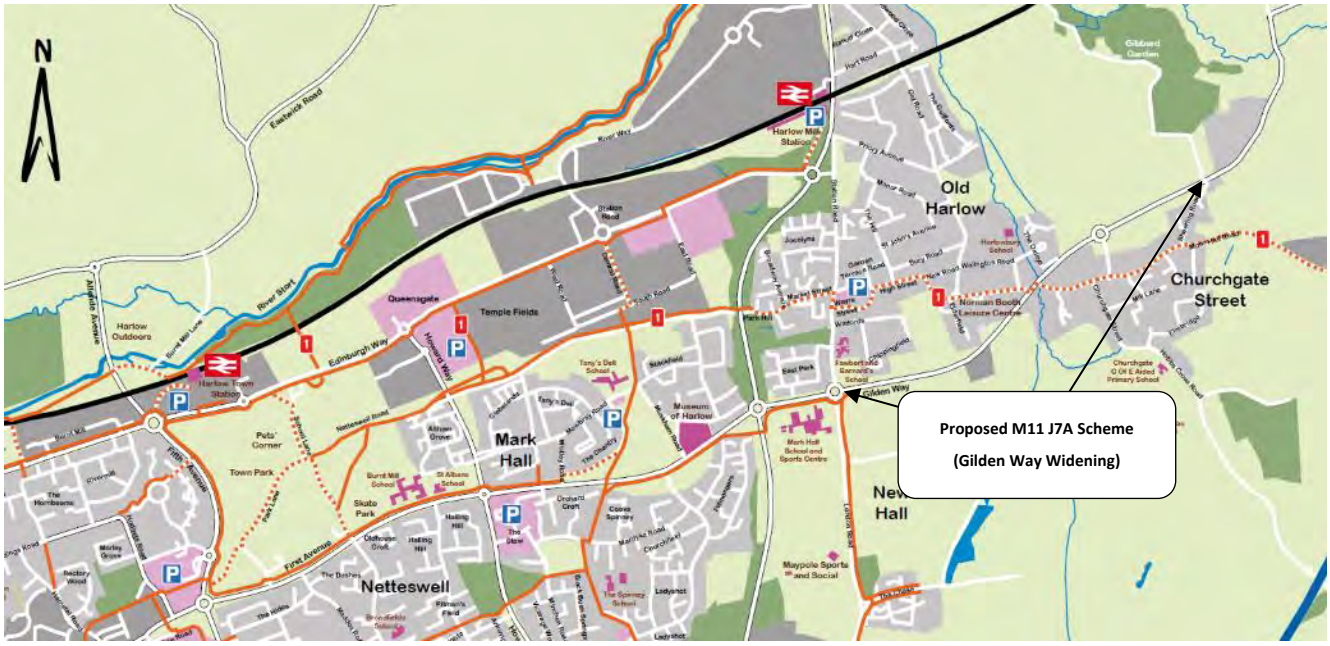
Harlow Mill Railway Station – located in the north-east of the town in Old Harlow, and the closest station to Gilden Way, situated approximately 1 mile from the London Road Roundabout and the western end of the proposed M11 J7A scheme. This station is currently served by a twice hourly train service between London Liverpool Street and Cambridge, and by an hourly service between Stratford and Bishop's Stortford. The Arriva Bus Route 59 eastbound service towards Chelmsford can be accessed from a bus stop on Station Road/London Road approximately 900m south of Harlow Mill station outside the Old Harlow Post Office, with this service travelling along Mulberry Green to Gilden Way/Sheering Road. Station Road/London Road could also double as a walking route from Harlow Mill station to the site compound for Phase 1 works (CS1), a distance of 1.1 miles.

Summary- impact of construction on public transport services

Construction of the proposed M11 J7A scheme would not have a major effect on public transport service provision in the local area, with the exception of the No 59 bus service, which may suffer from some delay to running times and disruption to the existing bus stops during Phase 1 works. As such, the impact of the construction of the proposed M11 J7A scheme on public transport users would likely be minimal. Staff working at the site would have the option of using local public transport to access the construction site for their journeys to and from the site, which is explored further in Chapter 8 of this report.

3.6 Current Sustainable Transport Provision

Figure 3.7 Harlow Railway Stations in the context of the proposed M11 J7A



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The Cycle Harlow Project was set up as a partnership between ECC, Harlow Council, Hertfordshire and West Essex NHS, the Cycle Harlow Club and other national and local organisations. It produced a Cycle Harlow Map of cycle routes in 2011, a section of which is reproduced in Figure 3.7 above with cycle routes marked in orange. A number of projects including provision of additional cycle parking, improved signage and a new cycle path connecting schools have been completed after discussions between the Cycle Harlow Partners, Harlow Renaissance and Cycling UK (formerly the Cyclists' Touring Club (CTC).

Existing NMU Facilities

Harlow has an extensive network of on-road and off-road cycle routes. These include National Cycle Network Route 1 which crosses the B183 Gilden Way at the Mulberry Green junction and a shared footway/cycleway along the south side of B183 First Avenue and the west side of London Road south of First Avenue.

Heading west from Harlow, there is an existing footway along the south side of the B183 Gilden Way between the First Avenue Roundabout and the London Road Roundabout, which is being upgraded as part of the A414/First Avenue Roundabout junction improvement and widening scheme, together with improvements to the existing footway on the north side of the road.

There is also an existing footway alongside the north side of the B183 Gilden Way between the London Road Roundabout and The Oxleys (east of Mulberry Green), which is likely to be upgraded to a combined footway/cycleway as part of the Phase 1 Gilden Way widening element of the M11 J7A scheme.

There are existing subways under the B183 Gilden Way near Mark Hall Academy and near the Oxleys. There is an existing toucan crossing by the junction with Mulberry Green. There are uncontrolled crossings on the B183 Gilden Way at the London Road Roundabout.

There are no bridleways in the immediate vicinity of, or which bisect the M11 J7A scheme, with the nearest equestrian route being situated on the east side of the M11 between High Lane and Housham Hall, approximately 600 metres east of the proposed grade-separated junction that would be constructed as part of the J7A scheme in early 2020.

3.7 Current Sustainable Transport (NMU) Desire Lines

Please refer to the M11 J7A NMU Context Report (February 2016 - B3553F05-REP-31) which reports on a number of NMU desire lines along the length of and across the proposed M11 J7A scheme.

4. Scheme Proposals and Construction Phasing

Subject to planning approval, it is anticipated that construction of the proposed M11 J7A Scheme could start from December 2018, with main construction at the London Road Roundabout end of the scheme taking place from Summer 2019 onwards. Three overall phases of construction would then follow (see Section 4.5 below for details) over the next 2.5 years, with the full completion of the scheme in early 2022.

The scheme is shown in detail in Construction Phasing Drawings B3553F05-0100-DR-0801 to DR-0811 (shown in Appendix A) and Construction Site Layout Drawings B3553F05-0100-DR-0813 to DR-0818, and is described in detail in the following reports - B3553F05-0000-REP-0063: Constructability Phasing / Sequencing Report, and B3553F05-0000-REP-0076: Construction Methodology Report. The description of the completed scheme which follows here should be read in conjunction with General Arrangement Layout Plans B3553F05-0100-DR-0101 to DR-0107.

It is important to note that the proposed M11 J7A scheme has yet to be discussed or agreed with Highways England, or with the Principal Contractor who has yet to be appointed, and is consequently subject to future discussions and revision to the plans used to create the following sections of this Construction Phase Traffic & Transport Impact Assessment.

4.1 Scheme Overview - London Road roundabout to Churchgate roundabout

Construction of the proposed M11 J7A scheme would begin to the west, at the London Road Roundabout on Gilden Way (B183) and involves widening of the existing two-lane carriageway to three lanes. When completed, two of the lanes would take traffic in a westerly direction into Harlow Town and the third lane would take the outbound traffic on to the M11 motorway. Proposed improvements to Gilden Way include the installation of combined footpath/cycleways. Two existing pedestrian crossings would be signalised and upgraded and three new pedestrian crossings are proposed. Churchgate Roundabout would be upgraded to a ‘hamburger’ design roundabout to improve traffic flows along Gilden Way.

4.2 Scheme Overview - Churchgate roundabout to Sheering Road roundabout

East of the Churchgate Roundabout, Gilden Way becomes Sheering Road and it passes Marsh Lane on the left and Mayfield Farm on the right, entering the Epping Forest District. As above, two of the lanes would take traffic in a westerly direction into Harlow Town and the third lane would take the outbound traffic on to the M11 motorway. At Mayfield Farm, the proposed widened carriageway begins to head offline to the south-east of its present route, with a new carriageway to be built linking the existing Sheering Road with a new roundabout to the north known as Sheering Road Roundabout. The existing Sheering Road would be converted into a local access road for use by residents of The Campions, which would link to the realigned Sheering Road via a new junction to the south of the new Sheering Road Roundabout. A new access would also be created from the realigned Sheering Road to Mayfield Farm.

4.3 Construction Methodology-Sheering Road roundabout to M11 J7A

Between the new Sheering Road Roundabout and the new M11 J7A junction, access would be via two lanes northbound (the Pincey Brook Link) up to another new roundabout known as Pincey Brook Roundabout. A southbound lane from Pincey Brook Roundabout back to Sheering Road Roundabout would also be provided for vehicles not intending to join the M11.

East of the Pincey Brook Roundabout, an ‘Eastbound Merge Link’ single lane road provides the approach to the new dumbbell roundabout on the western side of the M11. This route would be built with the future in mind to allow for the construction of a Northern Bypass in the future.

A new two-lane road, known as the ‘Westbound Diverge Link’, would take traffic in the opposite direction, from the M11 towards the new Sheering Road Roundabout. The new merge and diverge links rise on an embankment close to the motorway to allow for the difference in elevation between Sheering Road and the M11.

Two new dumbbell roundabouts and associated north and south bound on/off-slipways would be constructed on either side of the M11, connected by a new four-lane bridge (two lanes in each direction) spanning the existing M11 motorway.

4.4 Scheme Overview - Gilden Way Pedestrian / Cycleway

In relation to the Harlowbury development, an improved pedestrian/ cycleway is set to be constructed along the majority of the length of the Gilden Way Phase 1 works (from the London Road Roundabout to Churchgate Roundabout), with the existing footway widened from the current sub-standard width to 3 metres. It is likely that it would be built as part of the M11 J7A scheme, having initially been designed as part of Harlowbury development's Section 106 and 278 agreements. It would connect to the proposed Harlowbury development shared-use footway/cycleway east of Churchgate Roundabout and with the Newhall Mobility Path (which has planning permission until October 2018), expected to serve as an important NMU route north out of the Newhall development to and from Old Harlow and Harlow Mill Railway Station. In addition, two new pedestrian crossings are proposed and a further uncontrolled crossing point would be installed to facilitate crossing of Sheering Road at the proposed Sheering Road Roundabout. This would link to a new footpath, extending northwards and connecting with the Pincey Brook footpath.

4.5 Construction Phasing

Construction of the proposed M11 J7A scheme would be undertaken by an appointed Principal Contractor, who would create the final proposals as to how the scheme should be constructed. For the purposes of assessing the impacts of construction and to aid the appointed Principal Contractor, a possible construction methodology has been produced by the construction planning engineers, employing various assumptions. It is described in more detail in the following reports - B3553F05-0000-REP-0063: Constructability Phasing / Sequencing Report, and B3553F05-0000-REP-0076: Construction Methodology Report.

For the purposes of this report the assessment was based on this methodology. Whilst it is based on best practice and is within the constraints of the site and the design, it is not necessarily the only methodology that could be used. If the Principal Contractor chooses to employ a different methodology, a review of the impacts would need to be carried out, with an explanation of why the alternatives were preferable to those currently laid out.

Using the current construction planning methodology, the building of the proposed M11 J7A scheme would be spilt into three main phases and sub-sections as shown in Figure 4.1 and described below:

- **Phase 1 –** the widening of the existing Gilden Way between London Road Roundabout and Mayfield Farm to address the existing capacity issues and to minimise the inconvenience to residents by taking account of the new development of Harlowbury.

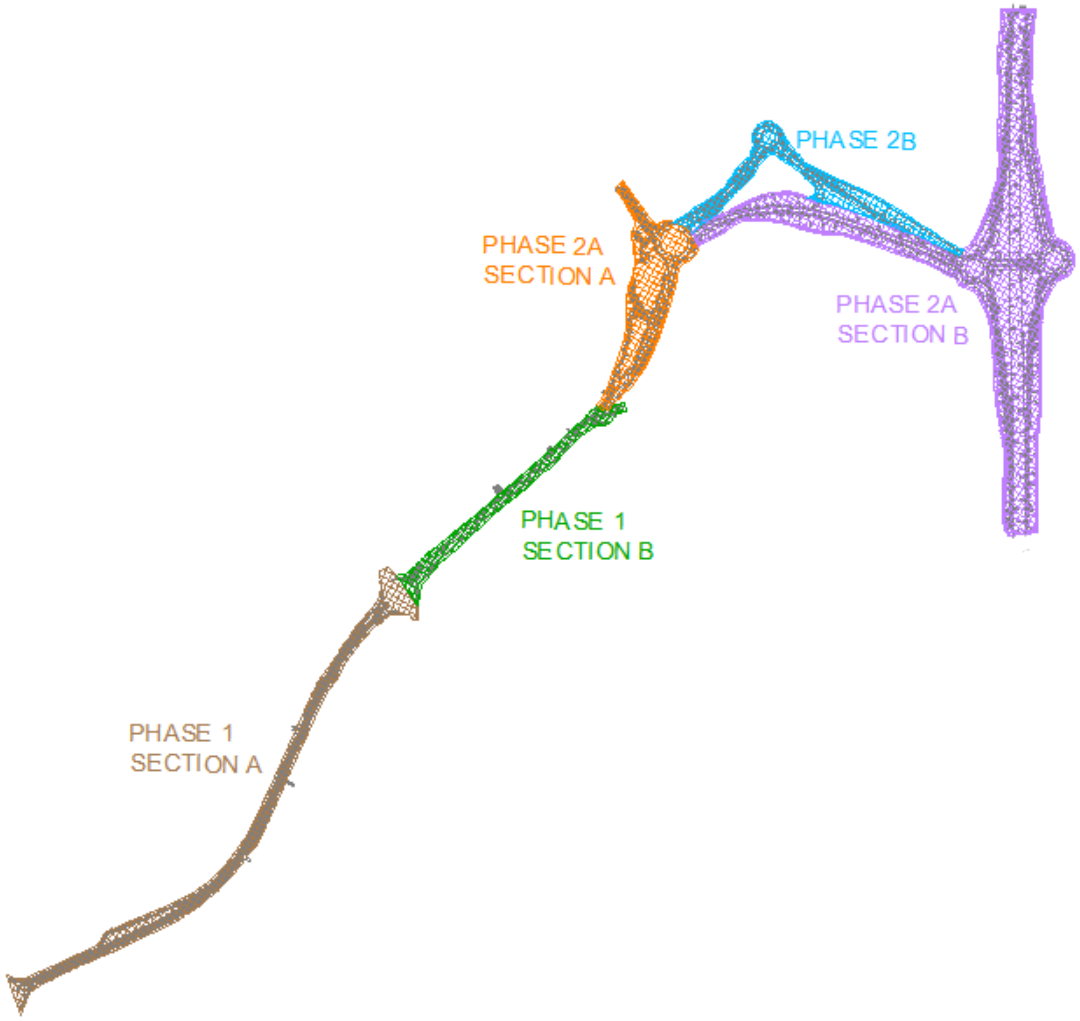
  For the purpose of understanding the constructability of Phase 1, it is proposed to split this phase further into two sections: Section A: London Road Roundabout to Churchgate Roundabout; and Section B: Churchgate Roundabout to Mayfield Farm. Section A and Section B would be constructed concurrently between September 2019 and February 2020, with Section A daytime works continuing until April 2020. Section B surfacing works would be carried out at night between March and mid-April 2020, and Section A surfacing works would be carried out at night between mid-April and mid-July 2020.

- **Phase 2A –** the construction of a new off-line carriageway between Mayfield Farm and a new Sheering Road Roundabout including construction of the new Westbound Diverge link between new Sheering Road Roundabout and a new grade-separated junction over the existing M11. Phase 2A would also include installation of an overbridge over the existing M11 spanning between the eastern & western roundabouts of the new grade-separated junction over existing M11. Also the construction of the north and south bound merge and diverge in order to provide direct links to the existing M11 along with the re-alignment of the existing Sheering Road.

For the purpose of understanding the constructability of Phase 2A it is proposed to split this phase further into two sections named: Section A: Mayfield Farm to new Sheering Road Roundabout; and Section B: east of new Sheering Road Roundabout to the M11 Dumbbell Link and J7A slip-roads. On completion of Phase 2A works, M11 J7A would open to traffic, with the 2-lane Westbound Diverge Link used in both directions temporarily as a 2-lane westbound and 1-lane eastbound link.

- **Phase 2B –** construction of an eastbound merge link from the M11 western Dumbbell Roundabout to new roundabout known as Pincey brook Roundabout. Phase 2B would also include construction of an additional link between Pincey Brook Roundabout and Sheering Road Roundabout. This link would enable a future Northern Bypass to access both the M11 and Harlow via the roundabout. When fully operational, traffic travelling from the M11 into Harlow would travel along the remarked 2-lane Westbound Diverge link and the traffic from Harlow would travel along the 1-lane Eastbound Merge link to gain access onto the M11.

Figure 4.1 : Proposed Phasing Breakdown (Main Phases & Sub-Sections)



4.6 Phase 1

Phase 1 Section A refers to the section of carriageway between London Road Roundabout and Churchgate Roundabout and **Phase 1 Section B** is the section between Churchgate Roundabout and Mayfield Farm (Figures 4.2 and 4.3).

Figure 4.2 Construction Phase 1 Section A

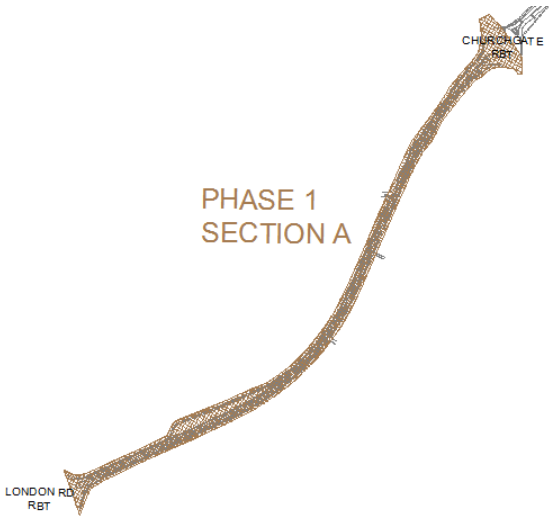
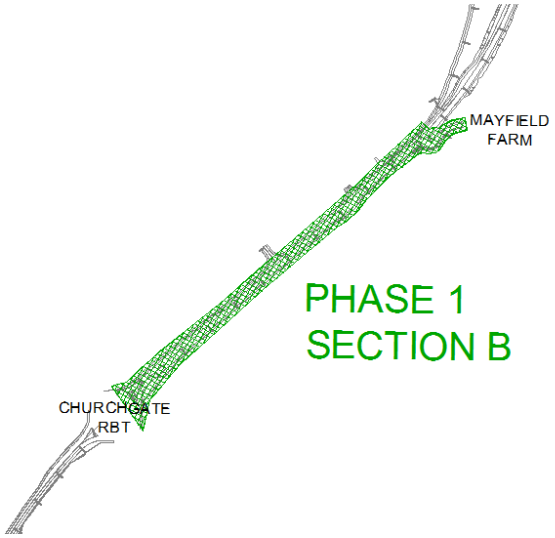


Figure 4.3 Construction Phase 1 Section B



The overall strategy for the Phase 1 works is to first widen the road to three lanes and then carry out improvement works to the existing road on Gilden Way. In order to conduct the works for this phase, a number of temporary traffic management plans would be required throughout the construction period. The speed limit would be reduced during the works when and where required and traffic lanes narrowed to 3 metres to enable safe exclusion zones that separate working areas from live traffic. Where lane widths drop below 3.25m a 20mph speed limit would be implemented according to the DfT 'Cyclists at Road Works' Traffic Advisory Leaflet 15/99.

This phase also includes construction of the footpath on the north side between London Road roundabout and the access to Long Barn Cottage (CH0-CH830). Please refer to drawing B3553F05-0100-DR-0801 B3553F05-0100-DR-0805 for details.

Most of the normal widening works in Phase 1 for the existing eastbound and westbound lanes would be carried out during normal day time working with the exception of tie-ins, which would be carried out during night-time in order to have minimum impact to the current traffic flow on Gilden Way.

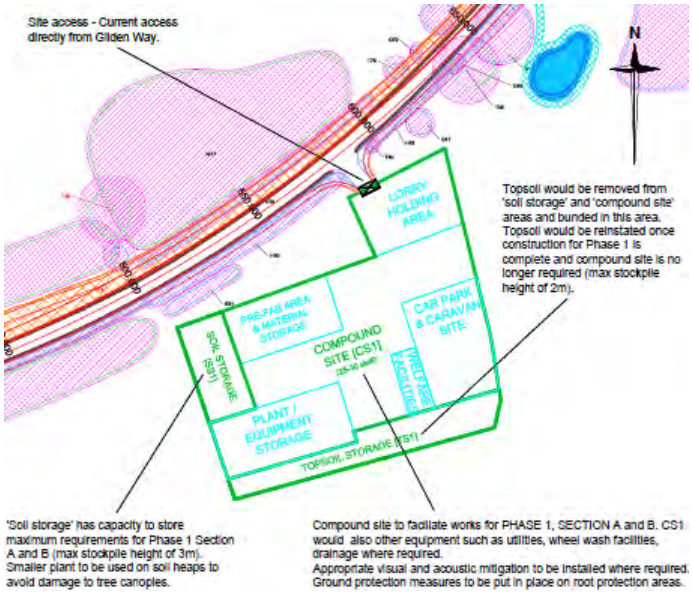
The widening of the local access road to Mayfield Farm would be carried out completely off-line and would not require any traffic management.

For the purposes of this assessment it has been assumed that where footpaths cross the road during construction, a temporary diversion or closure order would be put in place for safety reasons. Pedestrian crossing points would be reinstated at the end of Phase 1. Within Section A, the National Cycle Network would maintain its crossing point throughout construction and be integrated as part of a new Toucan Crossing across Gilden Way east of Mulberry Green on completion of Phase 1 works. Three other new crossings would be installed along Gilden Way as part of Phase 1.

Access to Phase 1 by off-site construction vehicle traffic (primarily 20t road wagons, 9t dumpers and concrete mixers) has been assumed to be on existing highways converging on the First Avenue/London Road/Gilden Way Roundabout, but routing decisions would be the responsibility of the Principal Contractor. However, as Phase 1 and Phase 2A would be running in parallel, there may be scope for the use of Phase 2A haul routes directly from J7A later in the programme.

The site compound for Phase 1 works (CS1) would be located on the south side between the London Road Roundabout and the Churchgate Roundabout at an old nursery site. CS1 is designed to accommodate between 25-30 staff. CS1 would be setup prior to main construction works and would only be required throughout the construction period for Phase 1.

Figure 4.4 Site Compound CS1 (access to/from Gilden Way)

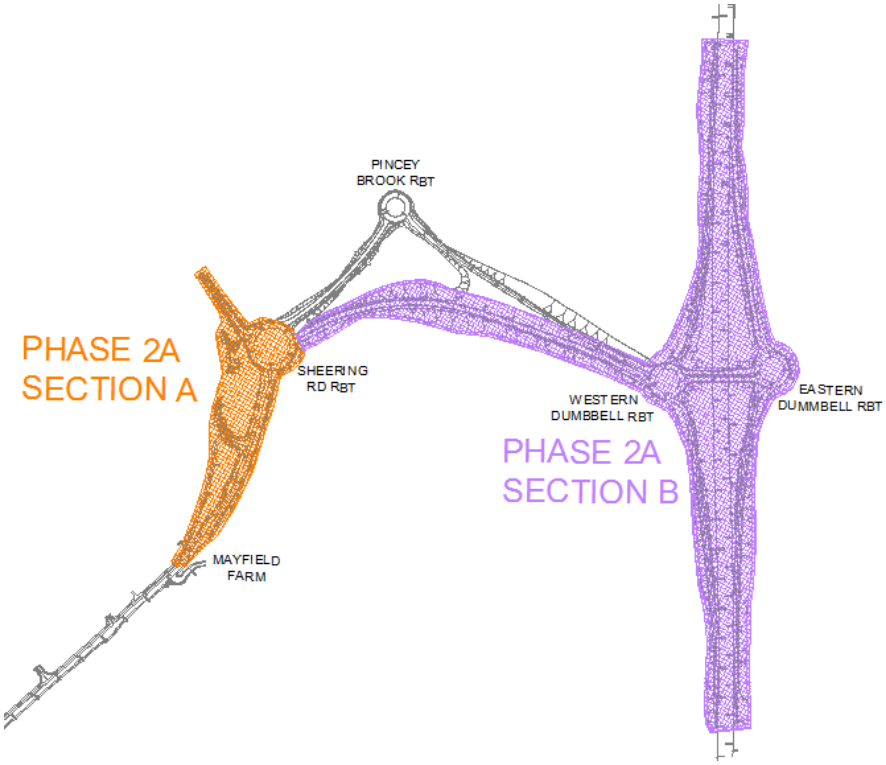


4.7 Phase 2A

Phase 2A Section A would include the construction of a new carriageway between Mayfield Farm and a new Sheering Road Roundabout and the construction of the new Westbound Diverge link between the new Sheering Road Roundabout and M11 Western Dumbbell Roundabout.

Phase 2A Section B would include the construction of M11 Eastern and Western Dumbbell Roundabouts along with the installation of an overbridge over the existing M11 spanning between the two roundabouts and the construction of the northbound and southbound merge and diverge (slip-roads) in order to provide direct links to the existing M11. Please refer to drawing B3553F05-0100-DR-0809 for further details. The four slip-roads would be constructed from the M11 up to at grade level and act as an access for off-site construction vehicle traffic (primarily 20t road wagons, 9t dumpers and concrete mixers) until Phase 2A is complete and open to traffic. Subject to future discussions with HE and the Principal Contractor (who has yet to be appointed), it is likely that during this phase, traffic management would be required, potentially in the form of closure of the hard shoulder and a narrow lane arrangement on the M11. See drawing B3553F05-0100-DR-0810 for further details.

Figure 4.5 Construction Phase 2A



As the majority of these works are 'off-line', the works would be carried out during normal day time hours with the exception of:

- tying in the northern and southern arms of new Sheering Road Roundabout to the old Sheering Road and Gilden Way;
- the tying ins of the southbound and northbound merge and diverge;
- the bridge-over installation across the M11 at the new motorway junction requiring a full closure of the M11 in both directions, likely for 2 to 3 nights in total in September 2020.

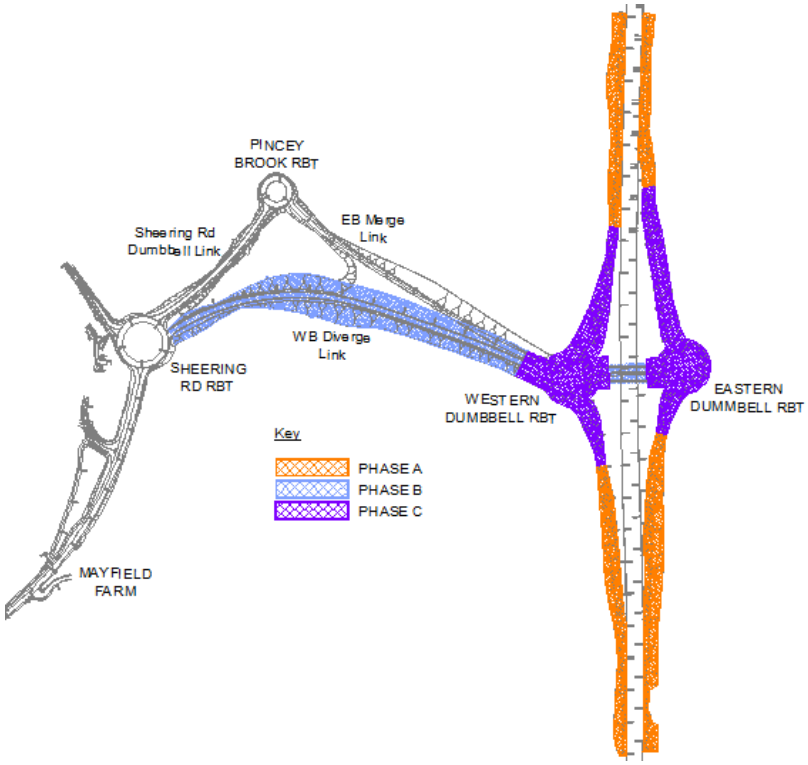
These exception works would be carried out in stages during night-time working with minimum disruption to live traffic. Temporary traffic light systems would be utilised to keep disruption to the live traffic flowing on the existing Sheering Road to a minimum. Installation of the bridge structure over the existing M11 motorway would require to be carried out at night, with traffic management north and south of here on the existing M11 motorway diverting traffic between M11 J7 and J8 via the A414 through Harlow, Sawbridgeworth and around Bishop's Stortford. This would need to be discussed and agreed with Highways England and with the Principal Contractor who has yet to be appointed.

Construction of the on and off slips (the northbound merge and diverge and the southbound merge and diverge) would be carried out first to allow use of the slips as haul routes by off-site construction vehicle traffic. This would allow the off-site construction vehicle traffic to access and egress the construction locations and associated site compounds directly from the M11 motorway, thus avoiding site traffic travelling through Harlow and along Gilden Way. Some traffic would however need to access along Gilden Way initially in order to construct site compound CS2 and more westerly works.

The tying-ins of the on & off slips to the existing M11 motorway in particular may be carried out during normal day time, but would be carried out under the influence of traffic management and closed / narrow lanes on the M11 motorway. Once the northbound and southbound merge and diverge are built, a manned booth barrier control system would be installed at the exit points to and from the motorway to ensure that a clear line of

demarcation is set between the off-site construction vehicle traffic and the general motorway traffic flowing on the existing M11.

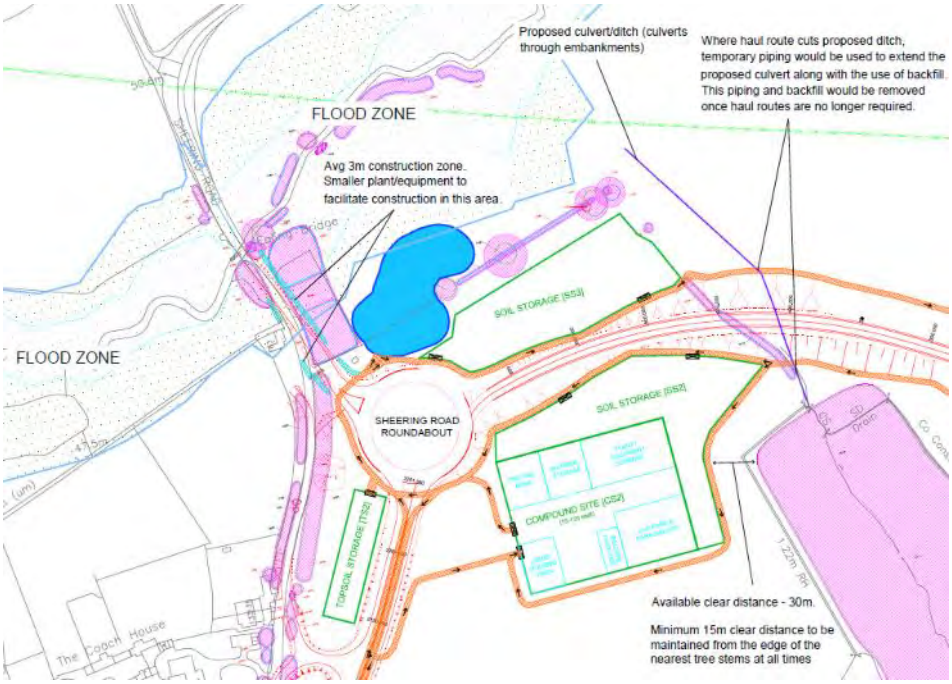
Figure 4.6 Construction Phase 2A, Section B Phases A, B & C



On completion of Phase 2A works, M11 J7A would open to traffic, with the 2-lane Westbound Diverge Link used in both directions temporarily as a 2-lane westbound and 1-lane eastbound link, until the Eastbound Merge Link, Pincey Brook Roundabout and Pincey Brook Link are constructed during the Phase 2B works.

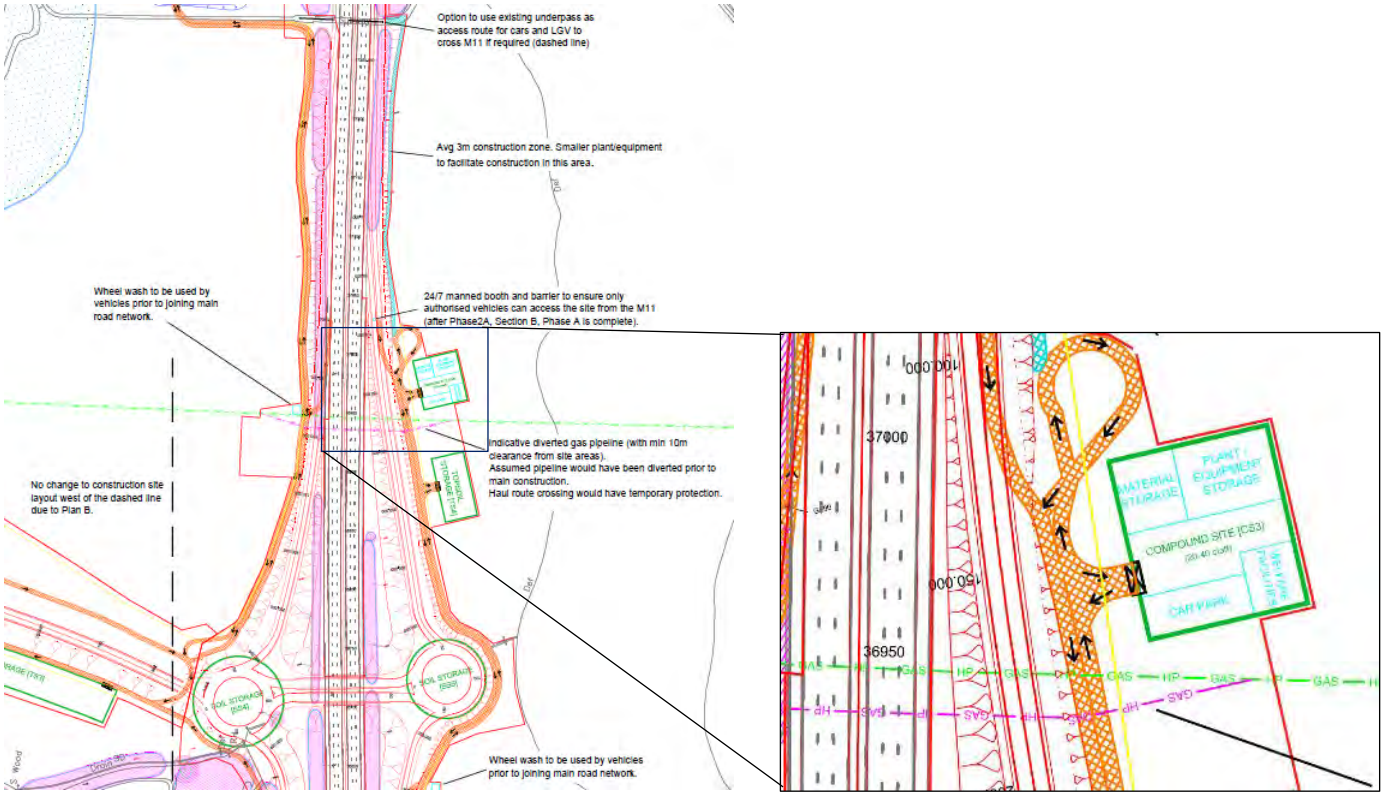
Phase 2A proposes two site compounds (CS2 and CS3). CS2 would be located just south of the westbound diverge link and east of the Sheering Road Roundabout. CS2 would facilitate the majority of the work in Phase 2A including Section A and Section B works. CS2 is designed to accommodate between 75 and 125 staff.

Figure 4.7 Site Compound CS2 (access to/from Gilden Way initially and then from M11 J7A)



A secondary site compound (CS3) would be located on the eastern side of the M11 adjacent to the proposed Southbound diverge off-slip. CS3 would only facilitate Phase 2A Section B works (to the east of the M11). CS3 is designed to accommodate between 20 and 40 staff and provide material storage, plant/equipment storage, welfare facilities and a car park.

Figure 4.8 Site Compound CS3 (access from M11 Southbound)



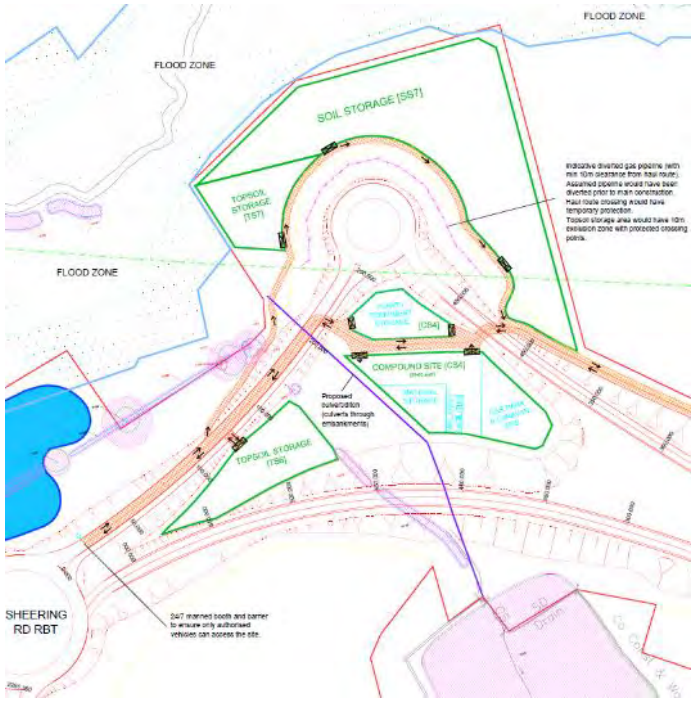
CS2 and CS3 would be required to set up prior to commencing the main construction works and would only be required throughout the construction period for Phase 2A.

4.8 Phase 2B

Phase 2B would include construction of the Pincey Brook Roundabout, Sheering Road Dumbbell Link (between Sheering Road Roundabout and Pincey Brook Roundabout) and the eastbound merge link between Pincey Brook Roundabout and the M11 Western Roundabout.

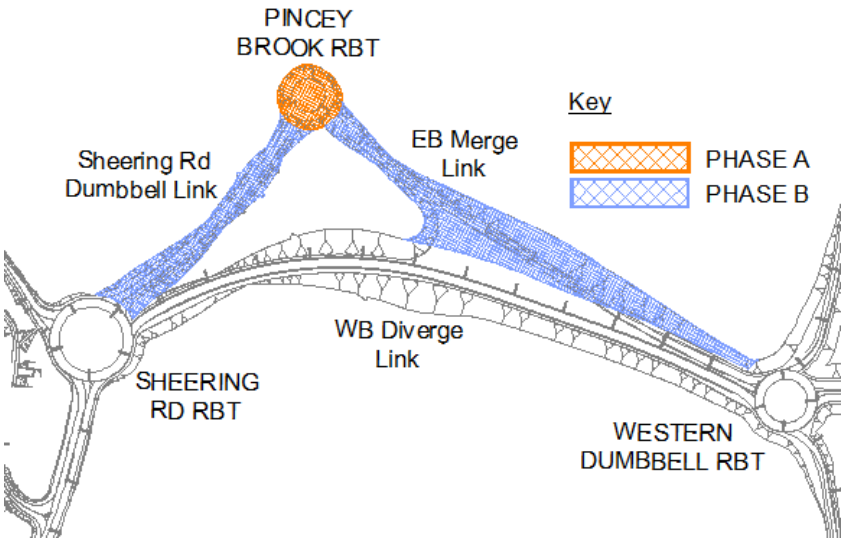
The majority of Phase 2B construction would be off-line; therefore, the construction could be carried out during normal daytime hours and without any traffic management. The only exception would be the tying in of the new eastbound merge link with the M11 Western Roundabout, which would require a minimal amount of traffic management to be put in place to ensure minimum disruptions to the traffic already using the newly built M11 Dumbbell Roundabout junction and the westbound merge link in both directions.

Figure 4.9 Site Compound CS4 (access from M11 J7A)



On completion of Phase 2B, the eastbound merge link would be open to traffic. The previously constructed westbound diverge link would be remarked from the temporary three lane arrangement to the final two lane arrangement. Once Phase 2B is constructed the scheme would be considered “complete”. Refer to drawing B3553F05-0100-DR-0811 for further details.

Figure 4.10 – Construction Phase 2B



5. Traffic Modelling

5.1 Use of the Harlow Transport Model

Jacobs was commissioned in June 2014 by ECC to construct a strategic traffic model of Harlow and its surrounding area. The primary objective of the Harlow Transport Model development was to assess the impact on the local and SRN of an additional access to Harlow from the SRN, specifically on the M11.

Forecast models have been produced for two future years: 2021, which at the time was the anticipated opening year of the proposed M11 J7A scheme, and a forecast year: 2036. There are three growth scenarios for which models have been produced –a Core Growth Scenario, an NTEM (lower) Growth Scenario and a High Growth Scenario.

Two sets of models have been produced for each scenario, namely the “do-minimum” and “do-something”. The do-minimum represents 2021 background growth with additional trips added for planned employment and housing development sites, as well as network changes made to represent planned highway improvements, but without the scheme. The 2036 forecast year is not considered as part of this Construction Phase Traffic & Transport Impact Assessment, as the scheme is planned to be operational by 2022.

For the purposes of this Construction Phase Traffic & Transport Impact Assessment, the “do-minimum” modelled traffic has been utilised, specifically the Core Growth Scenario of this model. The off-site construction vehicle traffic and construction staff numbers have then been added to the Core Growth Scenario traffic figures, to enable the effect of the M11 J7A construction on the wider highway network to be assessed.

5.2 Modelled Time Periods and Dates

Although the Harlow Transport Model contains three time periods (AM, Inter-Peak (IP) and PM), only the AM and PM peak periods were deemed to be required for the construction staff assessment. Staff would work 5 days a week, 10 hours a day starting from 08:00, with staff arriving from 07:00 to 08:00 and leaving between 18:00 and 19:00 Mondays to Fridays. It has been assumed that trips enter the site in the AM and leave in the PM, and that there is no shift change anticipated at this time. The Harlow Transport Model contains AM and PM peak time periods as follows:

- AM: 08:00-09:00; and
- PM: 17:00-18:00.

It was therefore necessary to adjust the time periods above, to represent the arrival and departure times of staff to and from the M11 J7A site compounds. This was achieved by assigning staff trips to the Core Growth do-minimum Scenario network flows from the Harlow Transport Model (with peak hour (08:00-09:00 and 17:00-18:00) factored to the hour coinciding with the staff arrival and departure (07:00 to 08:00 and 18:00 to 19:00).

For the off-site construction vehicle traffic assessment, the AM, IP and PM peak periods were all required and it has been assumed that off-site construction vehicle traffic (primarily 20t road wagons, 9t dumpers and concrete mixers) is spread evenly across the working day (see Chapter 7 and Appendix B for more details).

During the construction period, three construction vehicle traffic peak months have been identified: September 2019, May 2020 and May 2021. These are described in the modelling undertaken as Period 1, Period 2 and Period 3:

- Period 1: September 2019 (1024 off-site construction vehicle trips)
- Period 2: May 2020 (3016 off-site construction vehicle trips)
- Period 3: May 2021 (1149 off-site construction vehicle trips)

The corresponding number of staff trips per month during the above peak months are as follows:

- Period 1: September 2019 = 125 staff trips to/from Phase 1 and Phase 2A (West of the M11) works;
- Period 2: May 2020 = 150 staff trips to/from Phase 1 and Phase 2A (West of the M11) works; and
- Period 3: May 2021 = 50 staff trips to/from Phase 2B works.

A fourth traffic peak was also apparent for construction staff vehicle movements in November 2020 (100 staff trips to/from Phase 1 and Phase 2A (West of the M11) works). However, the corresponding number of off-site construction vehicle trips in November 2020 is only expected to be 624, considerably less than the four-figure numbers of construction trips identified for September 2019, May 2020 and May 2021, so it has not been used as a peak period in the subsequent analysis.

It should be noted that after completion of the modelling, a small error was found in the trip generation spreadsheet, where 40 staff trips in the AM and PM destined to access the M11 J7A construction via the M11 Southbound were incorrectly assigned to Period 3 (May 2021) instead of Period 2 (May 2020). 40 staff trips is considered to be small in comparison with flows on the M11 and not have significant impact on the rest of the network that was analysed.

5.3 Summary

Three peak time periods have been used in the subsequent analysis which correspond to the different phases of construction works and are the peak months for construction vehicle traffic:

- Period 1: September 2019: Phase 1 works;
- Period 2: May 2020: Phase 2A works; and
- Period 3: May 2021: Phase 2B works.

These peak time periods have been used as the basis for assessment in the spreadsheet model, which has been developed in order to estimate the volume of off-site construction vehicle traffic and staff vehicular movements throughout the construction period. These movements are discussed further in the following chapters.

6. Off-Site Construction Vehicle Movements

6.1 Introduction

In determining the impacts of the construction of the proposed M11 J7A scheme on the road network and other road users, it is necessary to estimate the volume of traffic that could be generated to and from the four site compounds over the construction period. Traffic movements have been calculated based on material quantities that need to be moved, an assumed rate of production and the proposed construction programme, comprising HGV or similar vehicles only (i.e. not including movements of LGV or cars related to construction). A spreadsheet calculation was then developed from the traffic movements provided, shown in Appendix B.

In addition to the required roadworks to enable the construction of the proposed M11 J7A scheme, the traffic impact of the construction (described in detail in Chapter 7) is two-fold: the impacts of off-site construction vehicles and the impact of construction staff. This chapter provides an account of the off-site construction vehicles' trip generation, distribution and assignment to the road network, with construction staff vehicle movements described in Chapter 7.

6.2 Off-Site Construction Vehicles Trip Generation

The consideration of off-site construction vehicles concerns the movement of construction and plant vehicles on the normal (live) road network, i.e. outside the bounds of the construction site itself and, therefore, where it could have an impact on other road users. On-site construction vehicle movements are those vehicular movements wholly within the bounds of the construction site and so, generally, do not impact other road users. These movements are not expected to have any impact on the highway network as they would be restricted to temporary haul routes away from the live road network, so are outside the scope of this report and are not considered further here, except for where they cross the live road network. In addition, it is assumed that the majority of plant equipment required for a long duration would be brought on-site once and then be stored on-site and transported via the haul routes until no longer required.

In the spreadsheet model, traffic flows during different peak hours of the day and different phases of construction were derived, based on the off-site construction vehicle traffic movements calculations for the project (shown in Appendix B). This calculated the quantities of material to be imported and exported per month and by phase in the programme, and the resulting numbers of vehicles (primarily 20t road wagons, 9t dumpers and concrete mixers) that would be required to facilitate that. The B3553F05-0000-REP-0076: Construction Methodology Report has provided the basis for estimating construction staff numbers and related vehicle movements to and from the site.

Three peak months of construction vehicle traffic have been identified:

- September 2019;
- May 2020; and
- May 2021.

September 2019 denotes the first large increase in construction vehicles trips after the contract mobilisation. May 2020 coincides with the start of the ramp down of Phase 1 daytime construction activities along Gilden Way, and the transition of off-site construction vehicle traffic access, from Gilden Way to access instead via the newly constructed M11 J7A slip-roads, which would be built during early 2020. May 2021 represents the beginning of a sustained period of construction activity associated with Phase 2B, with a higher average number of one way trips per hour each day than in surrounding months, due to there only being 19 working days in May 2021. The assumed traffic movements per month are shown in Tables 6.1 to 6.4 below.

Table 6.1: Off-site construction vehicle one-way movements per month, July 2019 – February 2020

	Jul 2019	Aug 2019	Sep 2019	Oct 2019	Nov 2019	Dec 2019	Jan 2020	Feb 2020
TOTAL OFF-SITE PHASE 1	19	22	960	658	250	192	19	20
TOTAL OFF-SITE PHASE 2A	0	56	64	2	0	0	45	253
TOTAL OFF-SITE PHASE 2B	0	0	0	0	0	0	0	0
TOTAL OFF-SITE WHOLE SCHEME	19	78	1024	660	250	192	64	273

Table 6.2: Off-site construction vehicle one-way movements per month, March 2020 – October 2020

	Mar 2020	Apr 2020	May 2020	Jun 2020	Jul 2020	Aug 2020	Sep 2020	Oct 2020
TOTAL OFF-SITE PHASE 1	34	107	51	18	19	19	18	19
TOTAL OFF-SITE PHASE 2A	342	2520	2965	2005	2100	2077	2491	1133
TOTAL OFF-SITE PHASE 2B	0	0	0	0	0	0	0	0
TOTAL OFF-SITE WHOLE SCHEME	376	2627	3016	2023	2118	2096	2509	1151

Table 6.3: Off-site construction vehicle one-way movements per month, November 2020 – June 2021

	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021
TOTAL OFF-SITE PHASE 1	18	19	19	17	6	0	0	0
TOTAL OFF-SITE PHASE 2A	606	66	0	0	0	0	0	0
TOTAL OFF-SITE PHASE 2B	0	0	0	0	778	1015	1149	1230
TOTAL OFF-SITE WHOLE SCHEME	624	85	19	17	784	1015	1149	1230

Table 6.4: Off-site construction vehicle one-way movements per month, July 2021 – December 2021

	July 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021
TOTAL OFF-SITE PHASE 1	0	0	0	0	0	0
TOTAL OFF-SITE PHASE 2A	0	0	0	0	0	0
TOTAL OFF-SITE PHASE 2B	1173	1174	1165	975	420	293
TOTAL OFF-SITE WHOLE SCHEME	1173	1174	1165	975	420	293

The monthly movements above were converted into average daily numbers and estimated hourly flows, by using equal distribution over workdays in the month and over the anticipated 10 working hours per day (08:00-18:00). Due to the relatively small numbers and to ensure robust estimates rather than potentially underestimating trips due to rounding, all figures were rounded up rather than down. Further, where spreading

did not result in a whole number, remainders were assigned to the AM peak hour (08:00-09:00) to ensure sums are still allocated and create a worst case where higher flows will coincide with higher background flows.

Overall, this only resulted in single digit numbers away from an even spread, and only a relatively small diversion from the total estimated external heavy goods vehicle traffic. The final estimate of off-site construction vehicle traffic is therefore slightly higher than the initial average and hourly flows, which makes for a robust worst case assessment of network conditions after these trips are allocated to the 2021 do-minimum network.

The resulting peak traffic months, shown by the red bars in Figures 6.1 and 6.2 below, reveal six off-site construction vehicle trips in the AM Peak Hour in Period 1 (September 2019, primarily to/from Gilden Way), 17 vehicle trips in the AM Peak Hour in Period 2 (May 2020, primarily associated with Phase 2A) and seven vehicle trips in the AM Peak Hour in Period 3 (May 2021, in relation to Phase 2B construction). The inter-peak hour and PM peak hour off-site construction vehicle trips reveal slightly fewer trips in each of the peak traffic months, as extra trips arising from the spreading method were assigned to the AM peak, but the same pattern as for the AM peak, as shown in Figure 6.2 below.

Figure 6.1: AM Peak Hour Off-Site Construction Vehicles

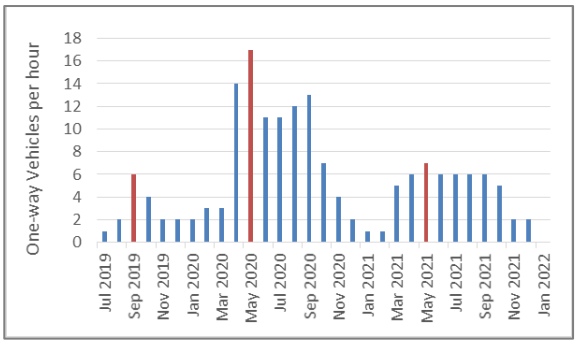
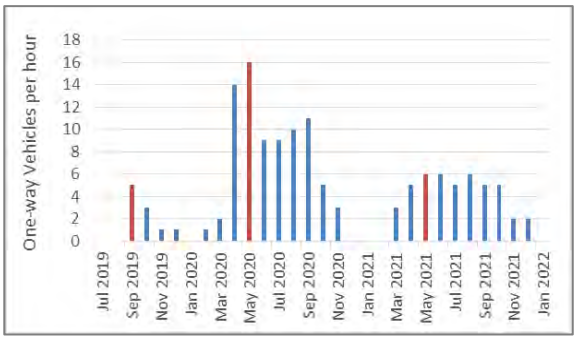


Figure 6.2: Inter-Peak Hour Off-Site Construction Vehicles (PM Peak Hour figures are same values)



6.3 Off-Site Construction Vehicles Trip Distribution

As specific construction materials contractors will only be appointed at a later stage and their detailed off-site construction plans are therefore not yet produced, currently the detailed origin and destination of material to and from the J7A site is not yet known. For the purposes of this report therefore, assumptions have been made regarding the likely origins and destinations of construction materials. There is likely to be an adequate supply of aggregate from local sources. Nevertheless, it is also expected that some materials would have to be transported from areas further afield; for example, steel, plastic and pre-cast concrete elements.

It was identified that there are 33 construction suppliers and demolition recycling sites within the county of Essex, which in 2014 were either currently operating or under construction. There is therefore an adequate geographical distribution of recycling sites, which cluster near urban areas and transport routes. There is additional capacity available through mobile plant firms and in 2014 it was estimated that there were approximately 20 mobile plant firms registered in Essex.

Potential HGV routes to and from the four Site Compounds have been identified, and informed assumptions have been made regarding the distribution of these trips based upon the locations of construction materials suppliers within 20 miles of the J7A Scheme. These construction materials suppliers could well be approached in due course to become a supplier in the scheme by the Principal Contractor, although it is important to note that the Principal Contractor has yet to be appointed at the time of writing.

Construction Traffic Management Plans would be produced by the Principal Contractor for each of the main worksites and these would ultimately specify the routes to be used by HGVs through consultation with the relevant local authorities. The specified routes would take into account the location of sensitive sites such as schools and hospitals.

Based on the construction programme, likely site access points were identified for each peak traffic date to provide a basis for trip distribution. This identified three access points to the M11 J7A construction site, with trips assigned to each in the three peak hours as shown in Figures 6.3 to 6.8 below.

It has been assumed that the construction site would be accessed via:

- Gilden Way, via A414/ First Avenue Roundabout (primarily associated with Phase 1 works);
- M11 Southbound, entering the M11 at Junction 8 (primarily associated with Phase 2A works); and
- M11 Northbound, entering the M11 at Junction 7 (Phase 2A Section B and Phase 2B works).

Figure 6.3: AM Peak Off-Site Construction Vehicles Accessing Site via Gilden Way

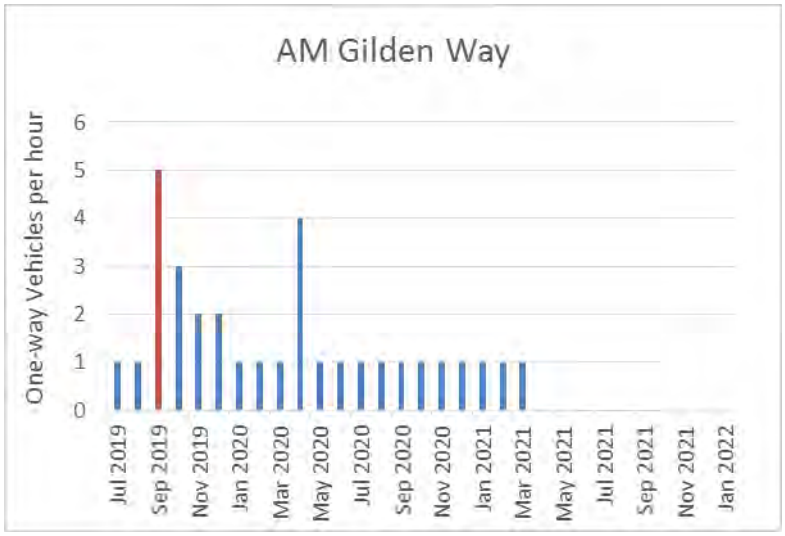


Figure 6.4: PM Peak Off-Site Construction Vehicles Accessing Site via Gilden Way (Inter Peak = same figures)

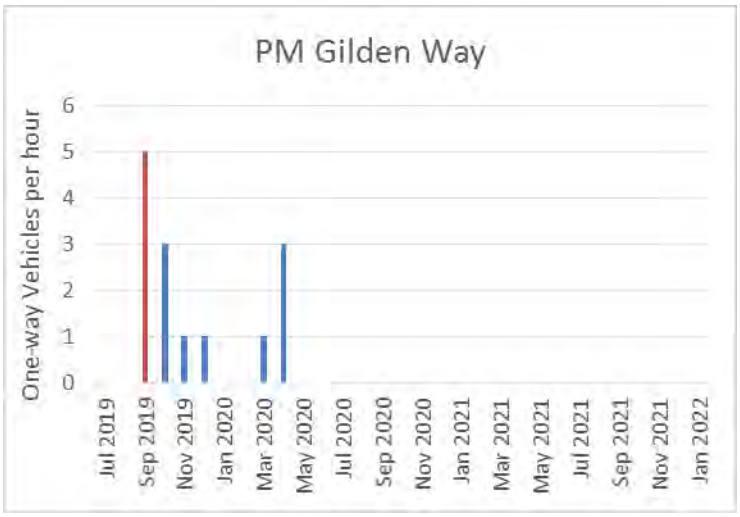


Figure 6.5: AM Peak Off-Site Construction Vehicles Accessing Site via M11 Southbound

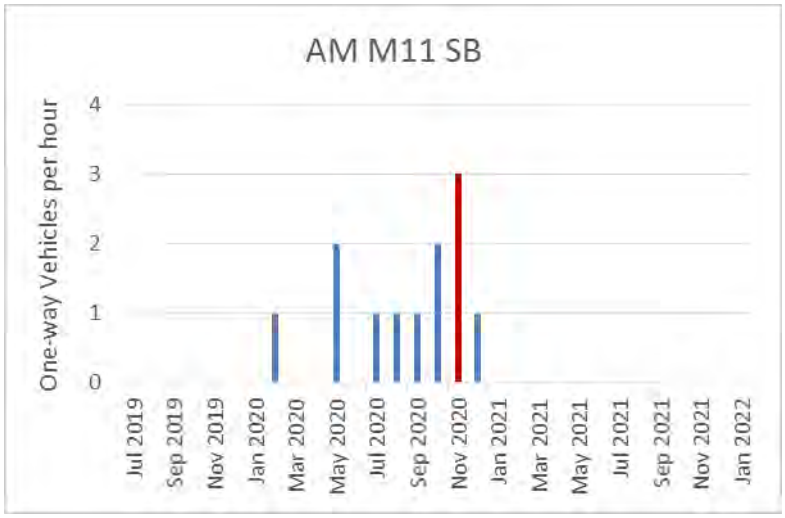


Figure 6.6: PM Peak Off-Site Construction Vehicles Accessing Site via M11 Southbound (IP = same figures)

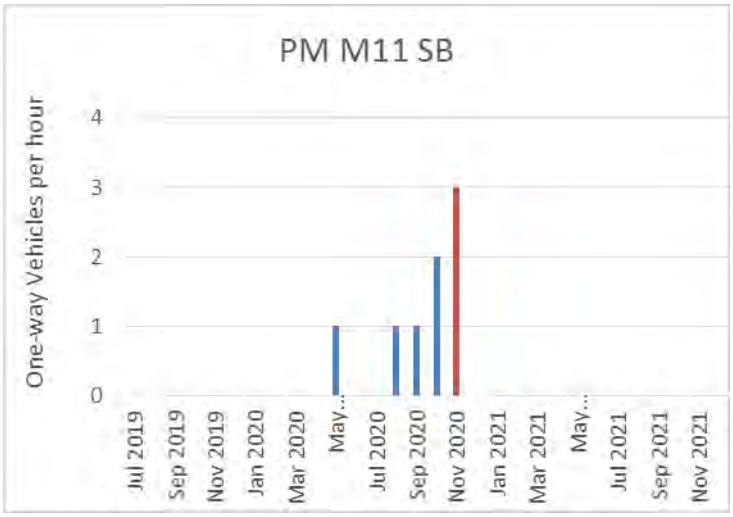


Figure 6.7: AM Peak Off-Site Construction Vehicles Accessing Site via M11 Northbound

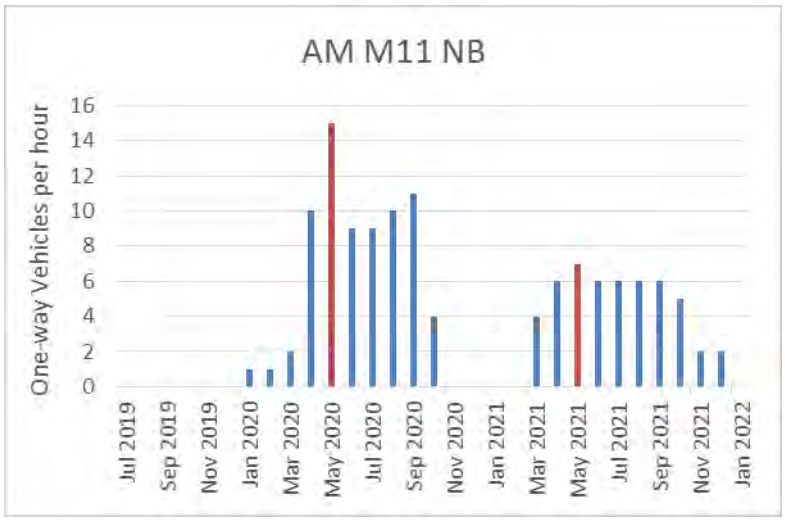
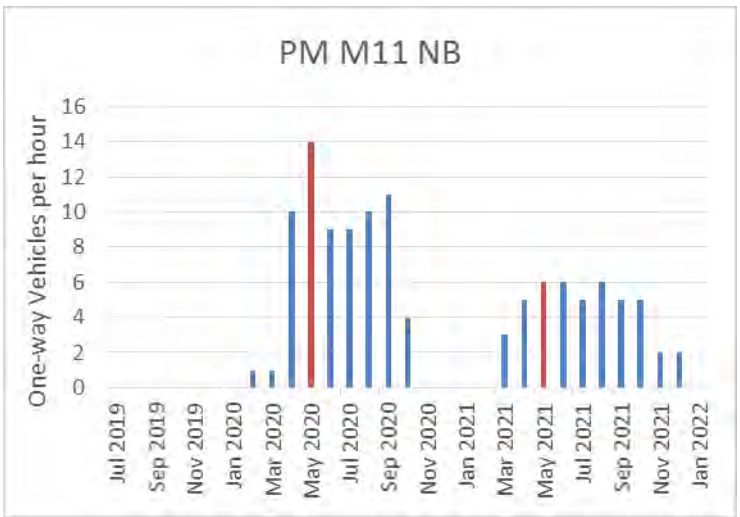


Figure 6.8: PM Peak Off-Site Construction Vehicles Accessing Site via M11 Northbound (IP = same figures)



6.4 Network Assignment

Using the Harlow Transport model "do-minimum" Core Growth Scenario for 2021 (see Chapter 5), construction trips were manually assigned to and from the M11 J7A site using the most likely route, restricted to main roads.

The highest resulting assignment of heavy vehicle flows in the AM peak hour (08:00 to 09:00) in each of the construction phases are shown in Figures 6.9 to 6.11 below. Corresponding figures for the IP and PM peak hours are not shown here as the impact of off-site construction vehicle traffic is most significant in the AM peak hour.

Figure 6.9 Highest resulting assignment of off-site construction vehicle trips (AM peak hour) during Period 1 (September 2019)

Figure 6.9 shows seven construction vehicle trips in the AM peak hour in September 2019 travelling in each direction along Gilden Way to and from Site Compound CS1. These trips originated from and returned to five different locations, which all converge at the A414/First Avenue Roundabout to the west of Gilden Way. A larger version of Figure 6.9 above can be seen in Appendix C.

Figure 6.10 Highest resulting assignment of off-site construction vehicle trips (AM peak hour) during Period 2 (May 2020)

In the AM peak hour in May 2020 (Figure 6.10 above), the impact on Gilden Way of construction vehicle traffic associated with Phase 1 is reduced to two vehicle trips travelling in each direction. The majority of construction vehicle trips are instead now routed via M11 J7 and J8 to access the construction sites from the new slip-roads that will eventually become J7A. The trip assignment shows a worst case of eight construction trips during the AM peak hour using the A414 southern approach to the M11 J7 roundabout and nine construction vehicle trips on the northbound J7 roundabout itself. A larger version of Figure 6.10 above can be seen in Appendix C.

Figure 6.11 Highest resulting assignment of off-site construction vehicle trips (AM peak hour) during Period 3 (May 2021)

In May 2021 (Figure 6.11 above), it can be seen that off-site construction vehicle traffic is again routed via M11 J7 and J8 to access the Phase 2B construction site and site compound CS4 via the new slip-roads that will eventually become Junction 7A. Overall, the volume of off-site construction vehicle trips in the AM peak hour is lower on the local road network than during Period 1 and Period 2, with two trips in each direction using the A414, converging to a maximum of four trips on the southbound A414 approaching the M11 J7 roundabout. A larger version of Figure 6.11 above can be seen in Appendix C.

6.5 Impact on the Highway Network

Overall, the level of off-site construction vehicle trips added to the network in the peak hour are negligible in the context of the background daily traffic using the same roads in the peak months. Therefore it is anticipated that vehicles associated with the construction of M11 J7A (see Tables 6.1 to 6.4 and Appendix B for the trip numbers) would be unlikely to have a measurable impact on junction operation in either Period 1, Period 2 or Period 3, and given that these represent the peak construction months, the impact during the rest of the construction period would likely be less than that described above.

6.6 Night-time working

Outside of the daytime peak off-site construction vehicle traffic trips identified above, some activities in the construction programme currently proposed would need to be undertaken either solely or additionally during night-time hours between March and September 2020. See Section 7.7 for further details of these activities.

The impact of these night-time construction vehicle trips would likely be minor in terms of impact on traffic, given the much lower flows overnight and therefore far fewer road users being affected by any delays from the surfacing works. The exception to this would be in relation to the M11 and the bridge-over installation at the new motorway junction. The programme allows for work on the M11 bridge for 15 to 16 days, including night works, in September 2020. It is anticipated that this will require full carriageway closure of the M11 at night time for 2 to 3 nights in total. A traffic diversion would operate between M11 J7 and J8 via the A414 through Harlow, Sawbridgeworth and around Bishop's Stortford, which would need to be discussed and agreed with HE and with the Principal Contractor who has yet to be appointed.

6.7 Summary

In summary, the number of off-site construction vehicle trips generated by the M11 J7A construction phases are relatively insignificant in the context of the background daily traffic, even in the worst case AM peak scenario. As a result, the impact on the highway network can be seen to be low and could be accommodated. The extent of night time working has in itself been minimised in the working programme and where it does occur, the impact on other road users is again minimal, mostly owing to the far lower overnight vehicle flows using the affected roads.

7. Construction Staff Vehicle Movements

7.1 Trip Generation

It was agreed with the construction planning team that staff numbers would be dependent on the level of activity during each phase of the site works and be influenced by the number of off-site construction vehicle movements. For example, during Phase 1, there would be 25 staff present if one-way off-site vehicle movements are less than a threshold of 100, or 50 staff present if the off-site vehicle traffic movements exceeds the 100 vehicles threshold.

Staff numbers for the other phases are shown in Table 7.1 below. The location of the current work and access to the site would change through the various phases of the work, also incorporated in Table 7.1.

Table 7.1 Assumptions Regarding Staff Numbers according to Phase of Work

Staff Works Location	Off-site construction vehicles threshold	Staff (if off-site traffic is less than threshold)	Staff (if off-site traffic is more than threshold)
Phase 1	100	25	50
Phase 2A West of M11	1000	75	125
Phase 2A East of M11	1000	20	40
Phase 2B West of M11	500	25	50

With on-site working hours scheduled to be between 08:00 and 18:00, it is assumed that staff would arrive between 07:00 and 08:00 and leave between 18:00 and 19:00. There is no inter-peak movement as there is no shift change scheduled during the working day. Although the aspiration is to encourage sustainable mode travel and initiatives like car sharing, it is recognised here that:

- the arrival and departure hours for construction staff are relatively early and late;
- the staff are likely to have geographically spread origins; and
- the site is currently relatively poorly served by public transport from these geographically spread origins.

It has therefore been assumed for the purposes of this Construction Phase Traffic & Transport Impact Assessment that all staff would travel by single occupancy private vehicles, which will give a worst case assessment for considering the traffic and transport impacts. Travel Planning would nonetheless be an important activity to try and encourage car sharing and or the use of more sustainable modes, which is described further in Chapter 8. The highest staff flows applied in the modelling are highlighted in Figures 7.1 to 7.4.

7.2 Staff Arrival in the AM Peak Hour

Figure 7.1 shows that during September 2019 (Period 1), 50 staff trips to the site during the AM peak hour could be expected, accessing the Phase 1 works site compound CS1 via Gilden Way. In addition, 75 staff trips are generated in the AM peak hour for Phase 2A off-line carriageway construction west of the M11, as shown in Figure 7.2, which in terms of access would utilise a combination of the M11 northbound and Gilden Way to reach the Phase 2A works site compound CS2.

In May 2020 (Period 2), 25 staff trips are generated during the AM peak hour for Phase 1 works, as shown in Figure 7.1, which would continue to access the construction site and site compound CS1 from Gilden Way. In addition, as shown in Figure 7.2, 125 staff trips are expected to be generated for Phase 2A works west of the M11, which would either access the construction sites from the M11 northbound or from Harlow via Gilden Way.

There would also be 40 staff trips arriving for Phase 2A works utilising the M11 southbound, exiting the motorway via a partially completed new off-slip that will eventually become part of Junction 7A. Please see Section 5.2 relating to the small error in the trip generation spreadsheet relating to these staff trips.

Figure 7.1 AM Peak Construction Staff Trip Generation during Phase 1

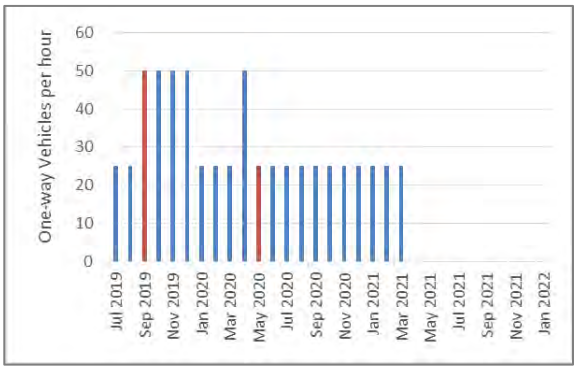


Figure 7.2 AM Peak Construction Staff Trip Generation during Phase 2A (West of the M11)

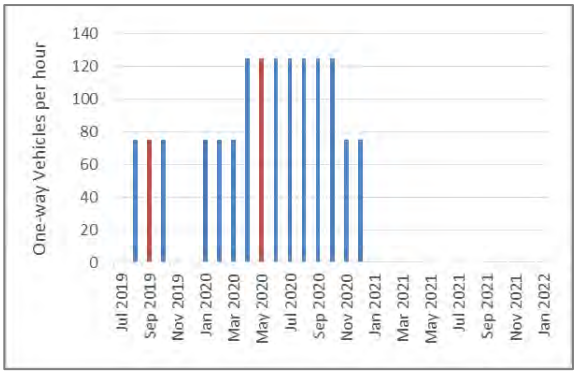


Figure 7.3 AM Peak Construction Staff Trip Generation during Phase 2B (West of the M11)

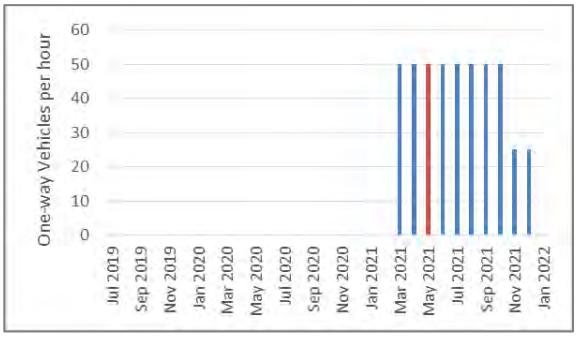


Figure 7.3 above shows that in May 2021 (Period 3), 50 staff trips could be expected in the AM peak hour for the Phase 2B works west of the M11, with likely access via the M11 northbound, utilising the new off-slip built during 2020 that will eventually become part of Junction 7A.

7.3 Staff Trip Distribution

As the geographic origins of the construction staff are not known at this time, the trip distribution from the Harlow Transport Model of the Pinnacles industrial area in Harlow was used as a basis for determining the likely distribution of staff trips to and from the construction sites, although it may be expected that staff for the M11 J7A construction may be expected to travel from further afield overall. The Pinnacles is a predominately light

industrial area and while the homes of these staff may be less dispersed than construction workers, it is considered that the way they would access the site would be similar to traffic from further afield.

The distribution for The Pinnacles shows that:

- 65% of staff travel from the Harlow and Sawbridgeworth area;
- 7% from Bishop's Stortford;
- 7% from Greater London; and
- the remainder from other locations further afield.

7.4 Network Assignment of Staff Trips

The Harlow Transport Model was used to assign staff trips based on the above trip origins to the 2021 Core Growth Scenario do-minimum network. Only 08:00 to 09:00 and 17:00 to 18:00 models are available (as described in the previous chapter) and these were used to assign the construction staff traffic.

To adjust for only 08:00 – 09:00 and 17:00 -18:00 models being available, flows from the Harlow Transport Model, before the addition of the projected site traffic, were factored to the hours coinciding with the staff arrival and departure (07:00 –08:00 and 18:00-19:00) using available peak period junction counts. Counts were not available for the London Road / Gilden Way roundabout and so the same factors as for the A414 / First Avenue Roundabout were used.

The changes in network flows for September 2019 (Period 1), May 2020 (Period 2) and May 2021 (Period 3) are shown on Figures 7.4 to 7.9 below for the AM and PM peak hours. The numbers shown in these figures illustrate those flows where the difference amounts to more than 100. Table 7.2 in the next section summarises all the changes in network flows.

Figure 7.4 Changes to Network Flows in September 2019 (AM Peak) resulting from Staff Trips Assignment to the Network

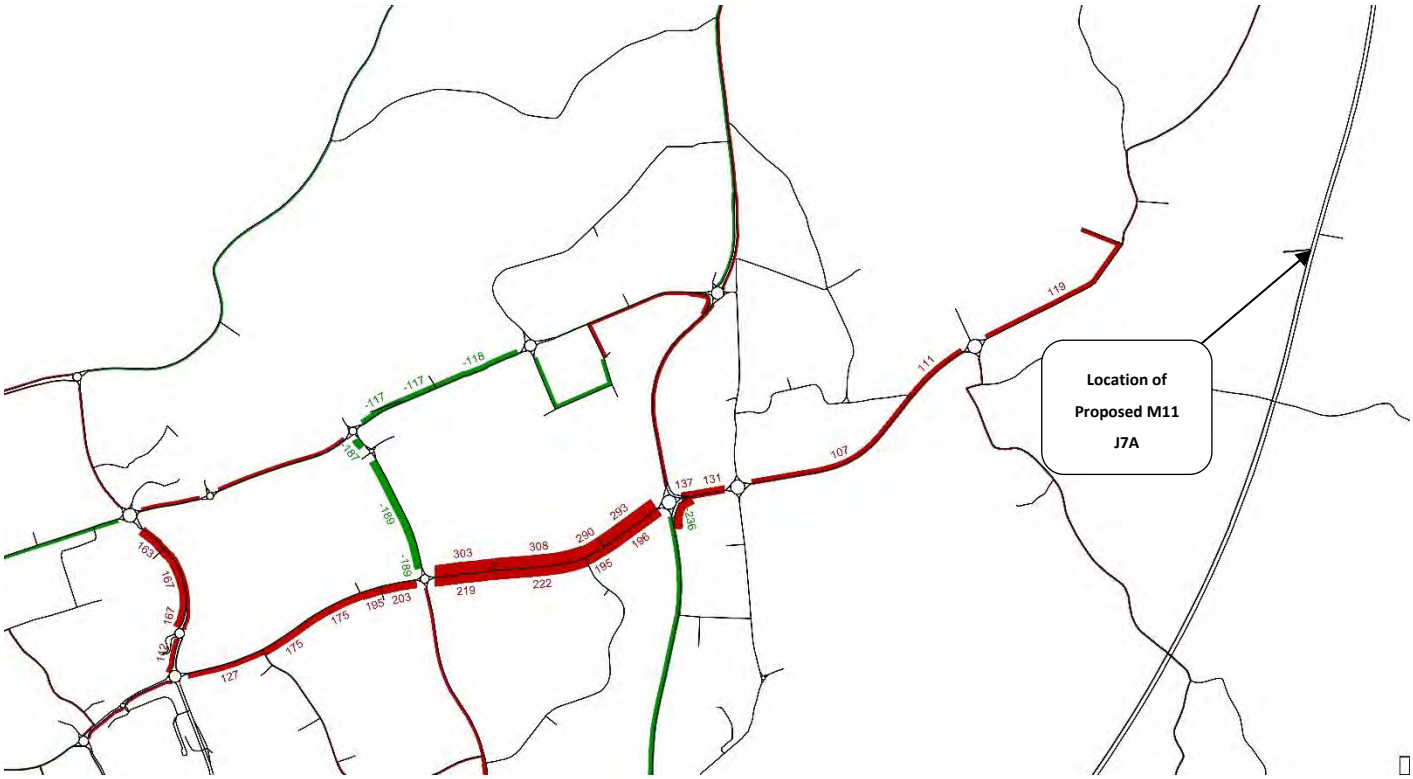


Figure 7.5 Changes to Network Flows in September 2019 (PM Peak Hour) resulting From Staff Trips Assignment to the Network

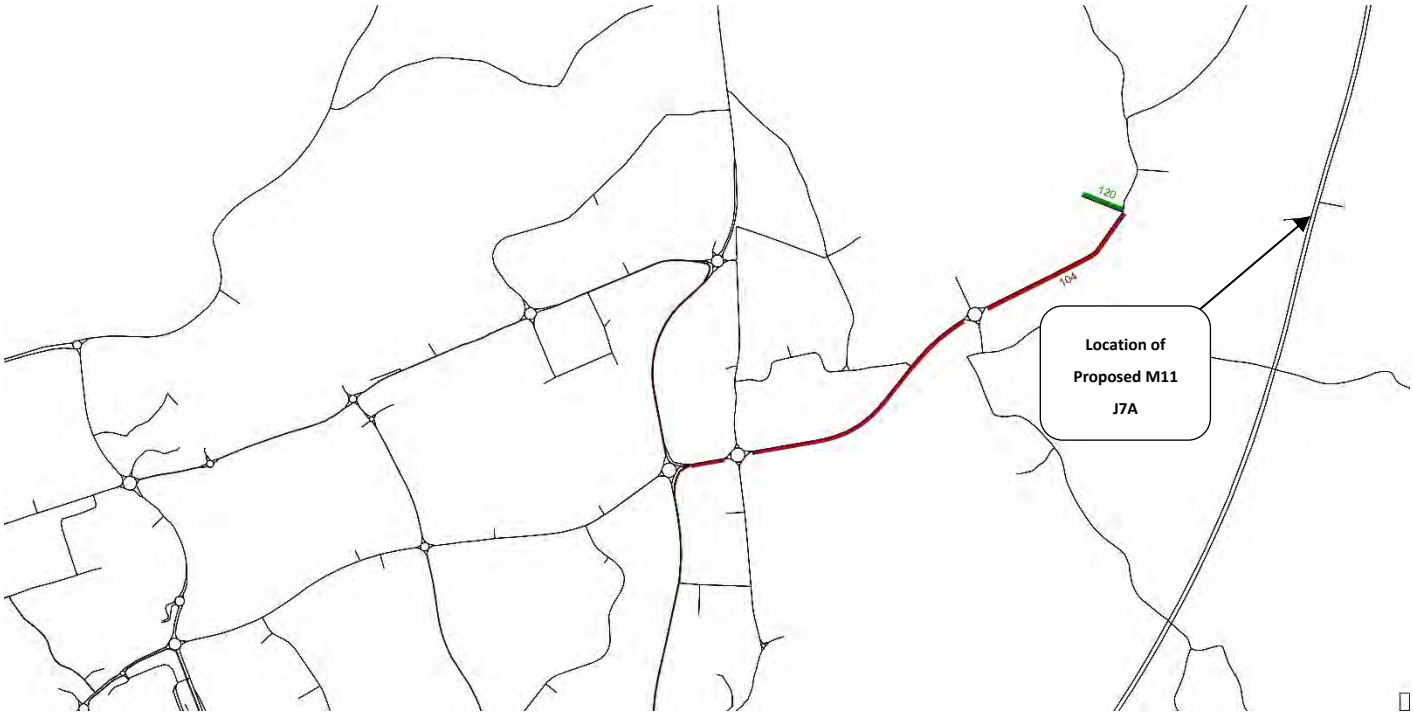


Figure 7.6 Changes to Network Flows in May 2020 (AM Peak Hour) resulting From Staff Trips Assignment to the Network

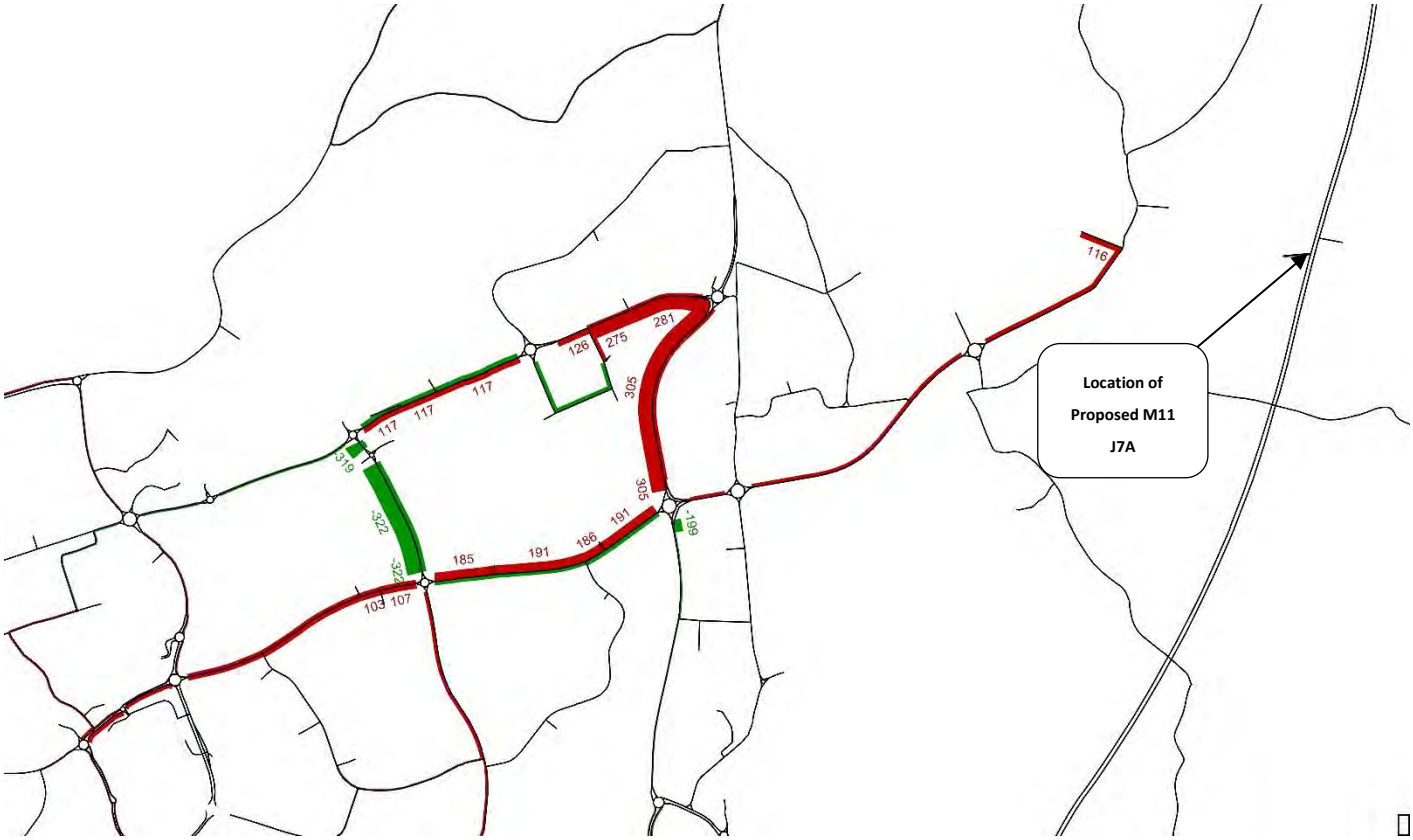


Figure 7.7 Changes to Network Flows in May 2020 (PM Peak Hour) resulting From Staff Trips Assignment to the Network

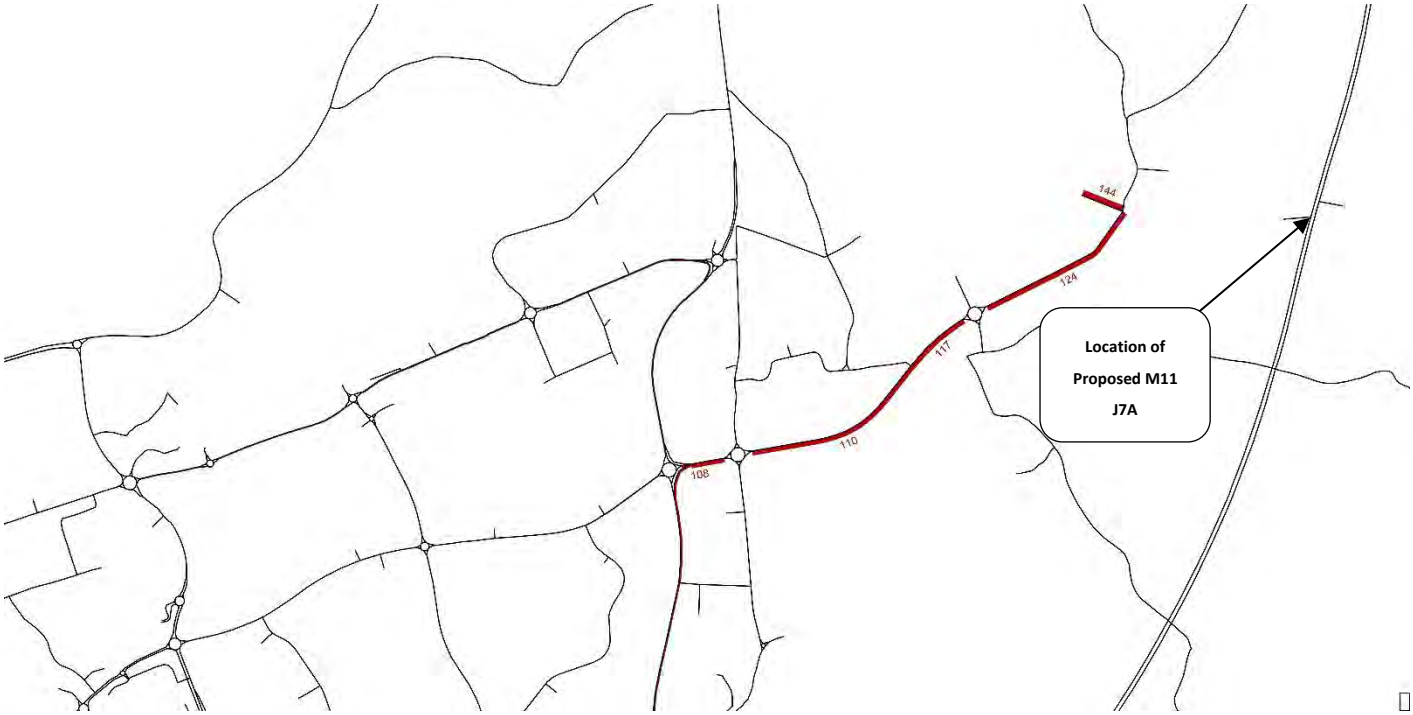


Figure 7.8 Changes to Network Flows in May 2021 (AM Peak Hour) resulting From Staff Trips Assignment to the Network

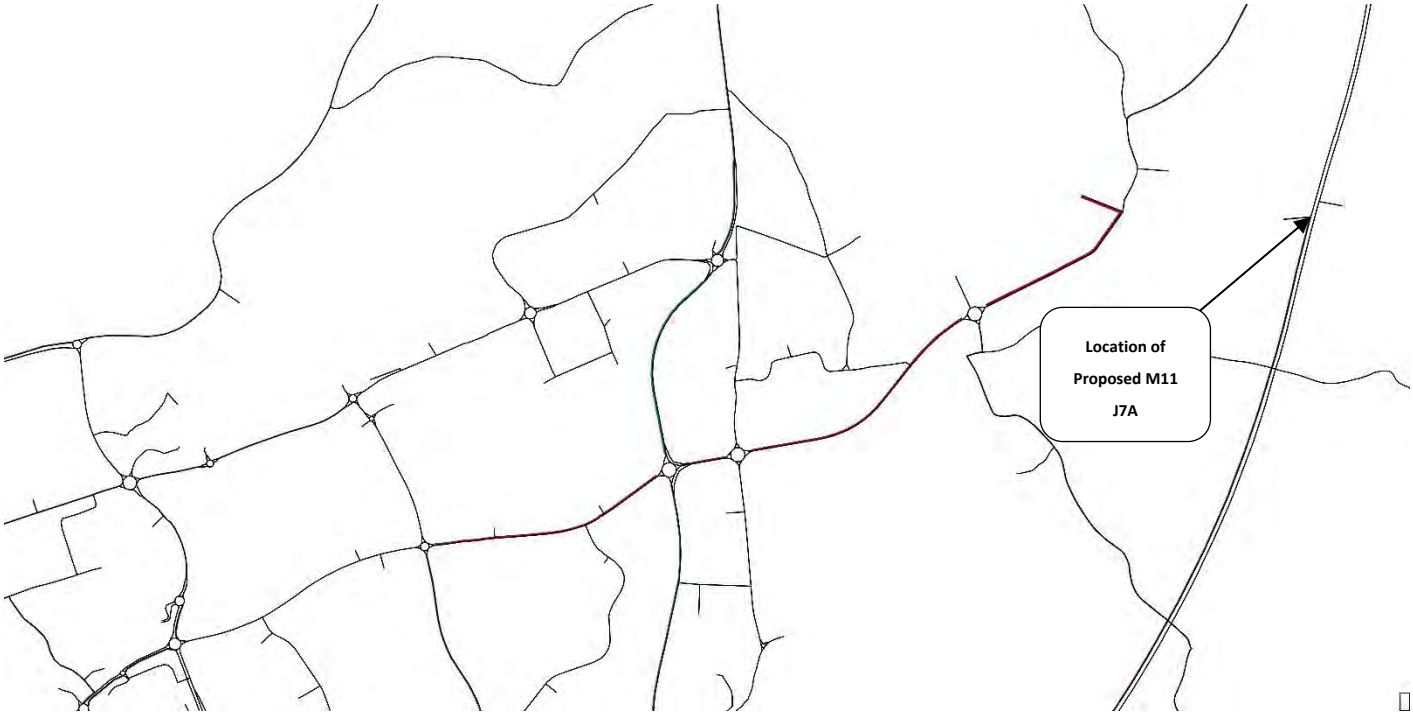
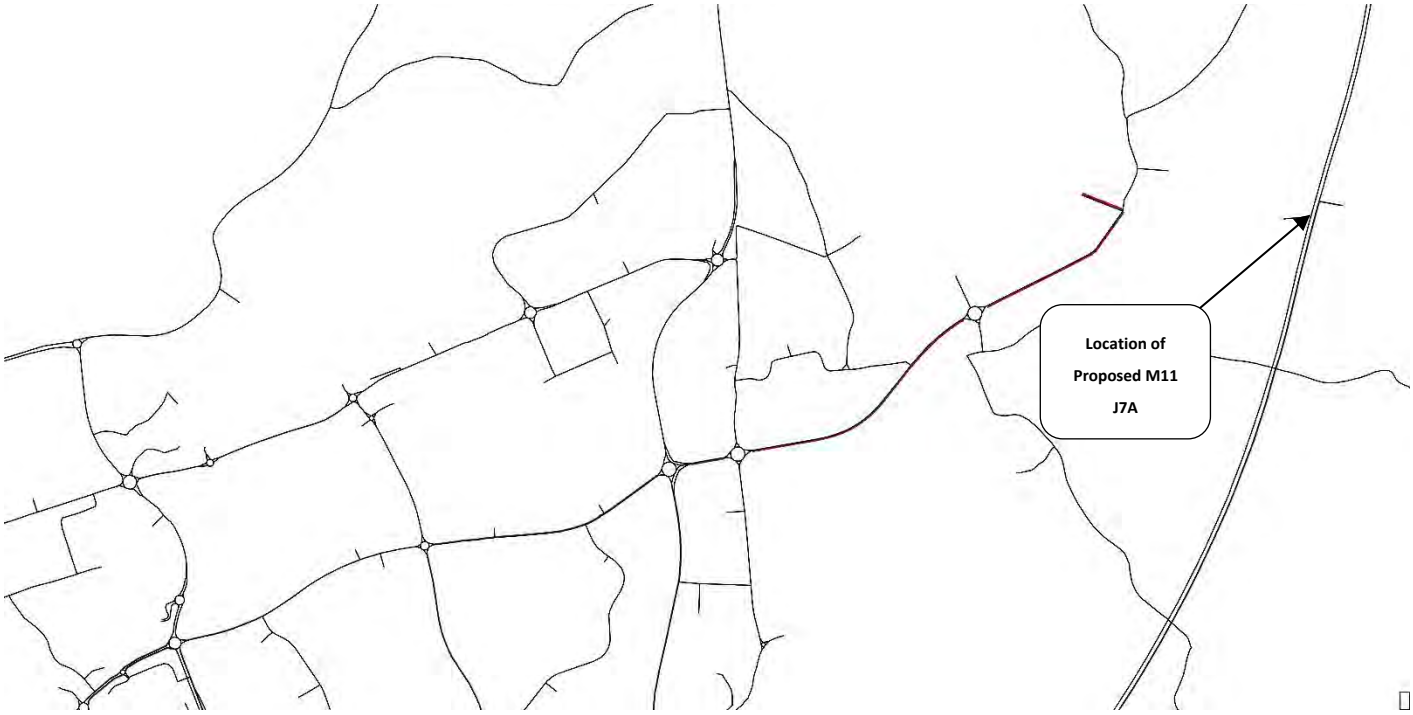


Figure 7.9 Changes to Network Flows in May 2021 (PM Peak Hour) resulting From Staff Trips Assignment to the Network



7.5 Network Assignment Analysis

Analysis reveals that the most significant changes to network flows occur in the AM peak hour in the Period 1 and Period 2 scenarios (September 2019 and May 2020 respectively). There is far less change in network flows in the Period 3 scenario, and in the Period 1 (PM), or Period 2 (PM) scenarios (see Table 7.2 below).

Red: additional flows

Green: reduction in flows

= no change in flows

Table 7.2 Changes to Network Flows Following Staff Trip Assignment

Link	Sept 2019 AM Peak Hour	Sept 2019 PM Peak Hour	May 2020 AM Peak Hour	May 2020 PM Peak Hour	May 2021 AM Peak Hour	May 2021 PM Peak Hour
A1019 NB	167	5	11	1	18	4
A1019 SB	80	2	37	8	19	1
Edinburgh Way (W) EB	84	1	24	=	20	5
Edinburgh Way (W) WB	28	25	39	26	19	18
Mandela Avenue EB	12	15	80	7	4	16
Mandela Avenue WB	203	8	107	15	2	=
Howard Way NB	189	12	322	16	3	7
Howard Way SB	9	18	94	3	8	10
Edinburgh Way (E) EB	117	6	98	6	=	14
Edinburgh Way (E) WB	30	25	117	34	3	3

Link	Sept 2019 AM Peak Hour	Sept 2019 PM Peak Hour	May 2020 AM Peak Hour	May 2020 PM Peak Hour	May 2021 AM Peak Hour	May 2021 PM Peak Hour
First Avenue EB	308	4	191	9	47	34
First Avenue WB	222	11	75	12	12	17
B183 Gilden Way EB	363	=	214	1	52	4
B183 Gilden Way WB	93	47	5	52	10	30
A414 (N) NB	41	33	305	31	50	7
A414 (N) SB	63	22	76	1	7	1
A414 (S) NB	92	20	16	13	34	24
A414 (S) SB	39	37	36	49	6	24

7.6 Rerouting due to construction staff trips

The strategic modelling for the Period 1 (September 2019) AM Peak suggests that traffic would increase travelling southbound along the A1019 and eastbound along First Avenue Mandela Avenue, while traffic would decrease travelling westbound along Edinburgh Way and southbound along Howard Way.

Similarly in the Period 2 (May 2020) AM Peak, the modelling suggests that traffic would increase travelling northbound along the A414 and westbound along Edinburgh Way, while traffic would decrease travelling northbound along Howard Way.

The above suggests that in the model there are secondary rerouting effects caused by the addition of staff trips due to the construction of the M11 J7A scheme. This is likely to be caused by the level of congestion in the model and the existence of more than one very similar cost routes available in the area. While the Harlow Transport Model suggests this rerouting will occur, more detailed modelling would be required to establish whether or not these secondary effects are likely to occur in practice.

7.7 Night-time working

Outside of the daytime peak construction staff vehicle trips identified above, some activities in the construction programme currently proposed would need to be undertaken either solely or additionally during night-time hours between March and September 2020. Night-time working hours are normally dependent on the nature of traffic on the stretch where the works are required to be undertaken. Depending on traffic conditions, the relevant authority may not allow the Principal Contractor to start any night-time working until 22:00, with work permitted from then until 05:00. If traffic is considered to be low however, then the Principal Contractor might be able to start their night works from 20:00 and continue until 05:00.

Construction staff would potentially be required on-site overnight for the following phases/stages of construction:

- Phase 1, Section A: Surfacing along Gilden Way between London Road Roundabout and Churchgate Roundabout overnight between mid-April and mid-July 2020. 187 off-site construction vehicle trips over 59-60 nights, associated staff trips unknown at this stage;
- Phase 1, Section B: Surfacing along Gilden Way from Churchgate Roundabout to Mayfield Farm overnight between March and mid-April 2020. 23 off-site construction vehicle trips over 31 days/nights, associated staff trips unknown at this stage;
- Phase 2A, Section A, Phase B: to allow tying-in of the newly built carriageway north-east of Mayfield Farm, tying-in the new link road to the Old Sheering Road and tying-in the northern arm of the newly built Sheering Road Roundabout – 28th April to 1st June 2020. 11 off-site construction vehicle trips over 22-23 days/nights, associated staff trips unknown at this stage; and

- Phase 2A, Section B, Phase A: Overnight closure of nearside lane(s) on M11, 18th March 2020, 16 off-site construction vehicle trips, associated staff trips not known at this stage;
- Phase 2A, Section B, Phase B: M11 bridge-over installation (lifting and placing of pre-fabricated steel beams on the top of the bridge abutments) envisaged to require full closure of M11 in both directions for 2 to 3 nights, traffic diversion required between M11 J7 and J8 via A414 through Harlow, Sawbridgeworth and around Bishop's Stortford, to be discussed and agreed with HE and the principal contractor, August-September 2020.

Other than the M11 closure and resulting traffic diversion described above, the impact of the night-time works would likely be negligible given the levels of traffic using the affected roads at these times, and the construction staff vehicle trips would be unlikely to have a great impact on other road users.

7.8 Summary

As can be seen in Figures 7.4 to 7.9, the resulting traffic flows resulting from staff trips being assigned to the network indicate negligible impacts in the PM peak periods throughout the modelled time points. The most significant impact is seen during the AM peak hour during September 2019 (Phase 1 works) and May 2020 (Phase 2A works). The biggest impact would be on the three junctions:

- A414 Edinburgh Way/A1184 Cambridge Road 'Gates' Roundabout;
- A414/B183 First Avenue Roundabout; and
- B183 Gilden Way/London Road Roundabout.

These junctions have been subject to junction modelling using the Junctions 9 (ARCADY) software, described in Section 8.3.

8. Traffic Impacts from Scheme Construction

Tables 8.1 and 8.2 below show the estimated increases over the Core Growth 2021 Scenario from off-site construction vehicle traffic and construction staff traffic movements during the peak months on the highway network during the peak hours. The 2021 Existing/Opening Year traffic model, constructed as part of the Harlow Transport Model, has been used to represent the Do-Minimum 'Without Scheme' Case, and provide background traffic estimates on each link.

Table 8.1: Off-site Construction Vehicle Trips (one way trips per hour, over a day)

Link	Period 1 (September 2019)	Period 2 (May 2020)	Period 3 (May 2021)
Gilden Way	5	1	0
M11 Southbound	0	2	0
M11 Northbound	0	15	7

Table 8.2: Construction Staff Vehicle Trips/ Hour. AM and PM Peak hour (AM in, PM out)

Link	Period 1 (September 2019)	Period 2 (May 2020)	Period 3 (May 2021)
Phase 1 West	50	25	0
Phase 2A West	75	125	0
Phase 2A East	0	40	0
Phase 2B West	0	0	50

Loading these trips into the Harlow Transport model has shown that there is a negligible impact on traffic flows across the road network, with the exception of three junctions in the AM peak hour during Period 1 and Period 2 construction works, identified in Section 7.8 and discussed further in Section 8.3.

Other impacts of the construction are discussed in the following sections of this report and include:

- Traffic management impacts on the SRN and Priority Route Network (PRN);
- Roundabout theoretical capacity assessment;
- Night time construction;
- User delays;
- Accidents and impacts;
- Parking provision;
- Roadside properties;
- Public transport provision/ users; and
- Sustainable transport infrastructure.

8.1 Traffic Management

Vehicular access along the B183 and Gilden Way would be maintained for the duration of the construction works, subject to speed limits and other traffic management as required. There would be periods where certain movements are subject to minor diversions. It is also envisaged that temporary overnight closures would be necessary at key stages in the construction of the highway tie-in. Access to community facilities would need to be maintained as far as possible.

The likely traffic management for Phase 1 works would involve a reduction in the current speed limit on Gilden Way (presently 60mph) reducing this to 40mph via an initial Traffic Regulation Order prior to works and then again to 20mph during construction, in line with the DfT's Cyclists at Road Works Traffic Advisory Leaflet 15/99,

which states that narrow running lanes under 3.25 metres in which cyclists may also be present need to be reduced to 20mph.

Construction Traffic Management Plans would be produced by the Principal Contractor for each of the main worksites and these would ultimately specify the routes to be used by HGVs through consultation with the relevant local authorities. The specified routes would take into account the location of sensitive sites such as schools and hospitals.

8.2 Daytime Impact on the Highways England Strategic Road Network

The main impact on the M11 Motorway from the construction of the proposed M11 J7A scheme is likely to be felt from November 2019 (according to the current programme), with traffic management signalling the preparations for the start of the part-construction of all four M11 J7A slip-roads. The four slips would be constructed from the M11 sloping up to grade level and act as an access and haul route for construction traffic up until Phase 2A is complete and open to traffic (January 2021 according to the current programme).

Subject to future discussions with HE and the Principal Contractor (who has yet to be appointed), it is likely that during this phase, the traffic management required could potentially involve the closure of the existing hard shoulder of the M11 via traffic cones.

The hard shoulder closure would enable the provision of a site access lane, often required on major reconstruction works on motorways. According to the Traffic Signs Regulations and General Directions 2016 - Traffic Safety Measures and Signs for Road Works (formally known as Chapter 8 Guidance), this access lane should be a minimum of 3m in width to allow access by HGVs etc., who in the case of M11 J7A would join the site access lane from the M11 traffic lanes, which would then lead to the newly partially constructed slip-roads.

Given the normal M11 motorway lane width of 3.65m, and the considerable use of the M11 by heavy goods vehicles, the lane widths on the approaches and through the J7A works may be reduced to 3.25m (desirable minimum) or, where there is a shortage of space, an absolute minimum of 3.0m.

Speed reduction in these narrow lanes is considered on a case-by-case basis and should involve a site-specific risk assessment. Generally for motorways and dual carriageway roads normally subject to the national speed limit, a temporary maximum speed limit should be not less than 40 mph and is often set at 50 mph with enforcement via average speed cameras.

The above has yet to be discussed or agreed with HE, or with the Principal Contractor who has yet to be appointed, and is consequently subject to future discussions and revision.

8.3 Daytime Impact on ECC Priority 1 & 2 Road Network (PRN)

The Construction Staff Vehicle Movements Assessment revealed that the largest impact of staff trip arrivals in the AM Peak and return journeys in the PM Peak would be on the three ECC PRN junctions to the west and north of the Phase 1 works:

- A414 Edinburgh Way/A1184 Cambridge Road 'Gates' Roundabout[1];
- A414/B183 First Avenue Roundabout; and
- B183 Gilden Way/London Road Roundabout.

The above junctions were modelled using Junctions 9 (ARCADY) Software. To adjust for only 08:00 – 09:00 and 17:00 -18:00 models for 2021, flows from the Harlow Transport Model, before the addition of the projected site traffic, were factored to the hours coinciding with the staff arrival and departure (07:00 –08:00 and 18:00 – 19:00) using available peak period junction counts. Counts were not available for the Gilden Way/London Road Roundabout and the same factors as for the A414/B183 First Avenue Roundabout were used.

[1] Modelled with current improvements (see Chapter 3) assumed to be completed before construction of M117A – completion currently expected in early 2019.

The results of the junction modelling with and without the construction staff traffic are described below.

8.4 Capacity Assessment of A414/B183 First Avenue Roundabout

Table 8.3 ARCADY Analysis for A414/ B183/ First Avenue Roundabout

	AM				PM			
	Queue (PCU)	Delay (secs)	Ratio of Flow to Capacity (RFC)	Level Of Service (LOS)	Queue (PCU)	Delay (secs)	RFC	LOS
Roundabout Arm	**2021 Do-Minimum, Without Scheme**							
1 - A414 (N)	1.1	5.04	0.52	A	0.9	5.29	0.46	A
2 - B183 (E) First Ave	1	3.93	0.5	A	0.5	2.77	0.32	A
3 - A414 (S)	47.5	72.51	1.02	F	2.4	4.96	0.7	A
4 - B183 (W) First Ave	7	26.22	0.89	D	2.7	9.72	0.73	B
Roundabout Arm	**September 2019 – Phase 1 and Phase 2A West**							
1 - A414 (N)	1.5	5.95	0.59	A	0.9	5.43	0.48	A
2 - B183 (E) First Ave	1.3	4.59	0.56	A	0.5	2.9	0.34	A
3 - A414 (S)	57.1	88.75	1.04	F	2.4	5.14	0.71	A
4 - B183 (W) First Ave	65.4	156.55	1.09	F	2.8	10.16	0.74	B
Roundabout Arm	**May 2020 – Phase 1 and Phase 2A West**							
1 - A414 (N)	1.2	5.12	0.54	A	0.9	5.3	0.46	A
2 - B183 (E) First Ave	1	3.87	0.5	A	0.5	2.89	0.34	A
3 - A414 (S)	48.3	74.13	1.02	F	2.5	5.2	0.71	A
4 - B183 (W) First Ave	77	201.53	1.13	F	2.9	10.45	0.75	B
Roundabout Arm	**May 2021 – Phase 2B**							
1 - A414 (N)	1.2	5.36	0.54	A	0.8	5.26	0.45	A
2 - B183 (E) First Ave	1	3.91	0.5	A	0.4	2.74	0.31	A
3 - A414 (S)	34.8	56.72	1.00	F	2.3	4.82	0.69	A
4 - B183 (W) First Ave	9.4	33.63	0.92	D	2.9	10.09	0.74	B

The ARCADY analysis indicates that all arms of the roundabout operate within their theoretical capacity during the PM peak hour for all three peak traffic dates (September 2019 (Period 1), May 2020 (Period 2) and May 2021 (Period 3) and provide a good level of service. In the AM Peak, the A414 North arm and B183 Gilden Way arm operate satisfactorily as well for all scenarios.

However, the A414 South arm and B183 West arm of the A414/ B183/ First Avenue Roundabout is seen to operate close to or above its theoretical capacity in all scenarios, with considerable queuing and delay expected. The most considerable impact would appear to be on the B183 (W) First Avenue arm of the roundabout in the AM peak hour in September 2019 and May 2020, which is operating close to its theoretical capacity in the 2021 'without scheme' scenario, and then above its capacity in September 2019 and May 2020 as a result of construction of the proposed M11 J7A.

Please refer to Section 7.7 for an explanation of the Harlow Transport Model's suggested rerouting of traffic caused by the addition of staff trips, which could partly explain why the A414 South arm and B183 West arm of the A414/ B183/ First Avenue Roundabout is seen to operate close to or above its theoretical capacity in all scenarios.

8.5 Capacity Assessment of B183 Gilden Way/London Road Roundabout

Table 8.4 ARCADY Analysis for B183 Gilden Way/ London Road Roundabout

	AM				PM			
	Queue (PCU)	Delay (secs)	Ratio of Flow to Capacity (RFC)	Level Of Service (LOS)	Queue (PCU)	Delay (secs)	RFC	LOS
Roundabout Arm	**2021 Do-Minimum, Without Scheme**							
1 – London Road (N)	0.3	4.16	0.23	A	0.2	4.38	0.14	A
2 – Gilden Way (E)	0.3	5.05	0.24	A	0.2	3.87	0.16	A
3 – London Road (S)	0.6	2.27	0.38	A	0.8	2.53	0.44	A
4 - B183 First Ave	0.3	4.16	0.23	A	0.2	4.38	0.14	A
Roundabout Arm	**September 2019 – Phase 1 and Phase 2A West**							
1 – London Road (N)	0.3	4.53	0.25	A	0.2	4.38	0.14	A
2 – Gilden Way (E)	2.2	7.25	0.68	A	1.1	4.59	0.51	A
3 – London Road (S)	0.3	5.26	0.24	A	0.2	4.07	0.17	A
4 - B183 First Ave	0.8	2.48	0.43	A	0.8	2.53	0.44	A
Roundabout Arm	**May 2020 – Phase 1 and Phase 2A West**							
1 – London Road (N)	0.3	4.34	0.24	A	0.2	4.38	0.14	A
2 – Gilden Way (E)	1.9	6.54	0.66	A	1.1	4.72	0.53	A
3 – London Road (S)	0.3	5.04	0.24	A	0.2	4.12	0.17	A
4 - B183 First Ave	0.7	2.38	0.41	A	0.8	2.53	0.45	A
Roundabout Arm	**May 2021 – Phase 2B**							
1 – London Road (N)	0.3	4.28	0.23	A	0.2	4.38	0.14	A
2 – Gilden Way (E)	1.9	6.49	0.65	A	0.8	3.89	0.43	A
3 – London Road (S)	0.3	5.01	0.23	A	0.2	3.78	0.16	A
4 - B183 First Ave	0.7	2.35	0.40	A	0.8	2.53	0.45	A

The above ARCADY analysis shows that all arms of this roundabout operate within their theoretical capacity for all peak traffic periods in both the AM and PM peak hours. The construction of the proposed M11 J7A scheme does not appear to worsen the operation of the roundabout from the 2021 'without scheme' scenario. All arms continue to operate with little queuing, minor delays and therefore a good Level of Service throughout the assessed times.

8.6 Capacity Assessment of A414 Edinburgh Way/A1184 Cambridge Road 'Gates' Roundabout

Table 8.5 ARCADY Analysis for A414 Edinburgh Way/ A1184 Cambridge Road 'Gates' Roundabout

	AM				PM			
	Queue (Veh)	Delay (secs)	RFC	LOS	Queue (Veh)	Delay (secs)	RFC	LOS
Roundabout Arm	**2021 Do-Minimum, Without Scheme**							
B - Station Road	0.3	3	0.24	A	0.3	2.98	0.22	A
C - A414 South	0.7	3.42	0.42	A	0.8	3.52	0.44	A
D - A414 Edinburgh Way	0.2	2.1	0.19	A	0.5	2.43	0.34	A
E - Station Approach	0.1	4.63	0.06	A	0.1	5.73	0.08	A
A - A1184 Cambridge Road	0.5	2.61	0.32	A	0.4	2.63	0.29	A

	AM				PM			
	Queue (Veh)	Delay (secs)	RFC	LOS	Queue (Veh)	Delay (secs)	RFC	LOS
Roundabout Arm	**September 2019 – Phase 1 and Phase 2A West**							
B - Station Road	0.3	3.05	0.23	A	0.3	2.99	0.22	A
C - A414 South	0.6	3.2	0.39	A	0.8	3.52	0.44	A
D - A414 Edinburgh Way	0.2	2.14	0.18	A	0.5	2.47	0.35	A
E - Station Approach	0.1	4.34	0.06	A	0.1	5.81	0.08	A
A - A1184 Cambridge Road	0.5	2.72	0.35	A	0.4	2.66	0.3	A
Roundabout Arm	**May 2020 – Phase 1 and Phase 2A West**							
B - Station Road	0.3	3.09	0.24	A	0.3	2.97	0.22	A
C - A414 South	0.7	3.42	0.42	A	0.8	3.53	0.44	A
D - A414 Edinburgh Way	0.3	2.27	0.22	A	0.5	2.43	0.34	A
E - Station Approach	0.1	4.73	0.06	A	0.1	5.72	0.08	A
A - A1184 Cambridge Road	0.5	2.71	0.33	A	0.4	2.65	0.3	A
Roundabout Arm	**May 2021 – Phase 2B**							
B - Station Road	0.3	3.02	0.24	A	0.3	2.96	0.22	A
C - A414 South	0.7	3.31	0.4	A	0.8	3.51	0.44	A
D - A414 Edinburgh Way	0.2	2.17	0.18	A	0.5	2.42	0.33	A
E - Station Approach	0.1	4.42	0.06	A	0.1	5.69	0.08	A
A - A1184 Cambridge Road	0.5	2.66	0.33	A	0.4	2.63	0.3	A

The ARCADY analysis shows that all the arms of the 'Gates' Roundabout appear to operate within their theoretical capacity in the 2021 'Without Scheme' scenario in both the AM and PM peak hours. Staff trips associated with the construction of the M11 J7A scheme would not appear to adversely affect the arms of the Gates Roundabout, which continue to operate within their theoretical capacity.

8.7 Night-time Construction Impact

Outside of the daytime peak off-site construction vehicle traffic trips identified, some activities in the construction programme currently proposed would need to be undertaken either solely or additionally during night-time hours between March and September 2020. See Section 7.7 for further details of these activities.

The impact of these night-time construction vehicle and construction staff trips would be minor in terms of impact on traffic, given the much lower flows overnight and therefore far fewer road users being affected by any delays from the surfacing works. The exception to this would be in relation to the M11 and the bridge-over installation at the new motorway junction. The programme allows for work on the M11 bridge for 15 to 16 days, including night works, in September 2020. It is anticipated that this will require full carriageway closure of the M11 at night time for 2 to 3 nights in total. A traffic diversion would operate between M11 J7 and J8 via the A414 through Harlow, Sawbridgeworth and around Bishop's Stortford, which would need to be discussed and agreed with HE and with the Principal Contractor who has yet to be appointed.

8.8 Impact of Construction during Winter Period

The B183 Gilden Way/Sheering Road currently forms part of Essex Highway's Winter Gritting Network, and the gritting lorries could either be permitted access to continue to grit the road as during previous winters prior to the construction period, or otherwise during the Winter of 2019-2020, Essex Highways may choose to suspend their gritting through the M11 J7A Phase 1 and Phase 2A roadworks, and replace this with an alternative means of gritting, established and managed by the Principal Contractor constructing the widening associated with M11 J7A.

8.9 Impact on Parking Provision

The Site Compounds (CS) for each of the phases (described in Chapter 5) have the following staff capacities, and it is assumed that the car parks within each CS are capable of accommodating the same number of staff vehicles:

- CS1 (Phase 1): capacity for 25-30 staff;
- CS2 (Phase 2A West of the M11): capacity for 75-125 staff;
- CS3 (Phase 2A East of the M11): capacity for 20-40 staff; and
- CS4 (Phase 2B): capacity for 25-50 staff.

In Chapter 7, it is shown that there would be a need to accommodate considerable numbers of construction staff at various periods during the building of the proposed M11 J7A, with the peaks identified as follows (see Section 7.2 for details):

- Period 1: September 2019 = 50 staff trips to/from Phase 1 and 75 staff trips to/from Phase 2A (West of the M11) works;
- Period 2: May 2020 = 25 staff trips to/from Phase 1, 125 staff trips to/from Phase 2A (West of the M11) works; and
- Period 3: May 2021 = 50 staff trips to/from Phase 2B works.

The above shows that in September 2019 (continuing on to December 2019 according to the traffic movement calculations), it may be possible that the CS1 car park may be under pressure to accommodate all the required staff.

Potential Mitigation

To mitigate the above potential parking pressures at CS1, it may be necessary for the Principal Contractor to make arrangements with other nearby off-street parking facilities, or engage with local people in respect of parking on-street during daytime construction hours.

Alternatively, the Principal Contractor may look to encourage the construction workforce to travel together (i.e. car share) to reduce the number of staff vehicles. The Principal Contractor should commit to producing a Construction Site Travel Plan with the assistance of Essex County Council's Sustainable Business Travel Team, who could work with the construction firms involved to develop the most efficient, sustainable solution to staff travel requirements.

8.10 Impact on Public Transport Provision/Users

DMRB guidance does not cover bus users; however, this assessment has considered how the proposed M11 J7A scheme would impact the ability of individuals to physically access bus stops within the local area, throughout both the construction and operational phases. In the absence of defined guidance, a qualitative assessment has been conducted.

Bus stops have been assessed in terms of how access would be disrupted during the construction phase. The impact assessment has determined two effects on bus travellers:

- A disruption impact where access for bus travellers would be impeded as a result of the proposed M11 J7A scheme; or
- A beneficial effect where access is made more convenient.

Bus services have also been qualitatively assessed in terms of the impact on running times as a result of the speed limits and carriageway narrowing associated with road works. The potential impacts upon individuals' access to bus stops and bus service impacts during the construction phase, and potential mitigation measures, are described in Table 8.6.

Whilst unlikely, it is possible that construction staff associated with M11 J7A could be encouraged to use public transport as a result of the Travel Planning process. The Arriva 59 Harlow to Chelmsford eastbound service departing at 07:30 from Harlow Bus Station would enable staff to reach Site Compound CS1 for example before the 08:00 shift start. A service back to Harlow departs at just before 18:00. In late 2016, Arriva Bus launched an Employer Travel Club (ETC) to employees in businesses in the areas where they operate (e.g. Harlow). This encourages bus passengers to take advantage of an annual ticket paid for monthly over a 12 month period with no contract or up-front costs, to save them money and hassle. It may be possible for ECC to negotiate this discount with Arriva Bus for staff working at the Site Compounds associated with the M11 J7A scheme, together with the potential for temporary request stop/hail and ride bus stops along Gilden Way/Sheering Road close to the locations of the Site Compounds. Alternatively, safe walking routes for staff could be provided between the nearest bus stops and Compound Site CS2.

Table 8.6: Assessment of M11 J7A construction impacts to bus travellers

Current bus stops	Description of impacts	Potential Mitigation
47/147	Section of 47/147 (Ongar/Toot Hill – Harlow) route via Churchgate Roundabout between the south-eastern part of Old Harlow and the main part of Old Harlow could be delayed by Gilden Way traffic management, but not significantly, as the route only operates once a day between Tuesdays and Saturdays.	Advertise the likelihood of potentially slower journeys in and around the Mulberry Green – Churchgate Roundabout section of this route in advance, to the bus operator and bus passengers.
Bus stop on the north side of the B183 Gilden Way just northeast of the junction with Mulberry Green. Arriva Bus Route 59. Regal Busways Route 322 school service from Old Harlow to Saffron Walden.	Slight disruption in public transport access likely as a result of the widening works. Service would likely run slower through road works, potential timetable implications.	Advertise the likelihood of potentially slower journeys in and around the Mulberry Green – Pincey Brook section of the 59 route particularly, in advance, to the bus operator and bus passengers.
Bus stop on the south side of B183 Gilden Way just northeast of the junction with Mulberry Green. Arriva Bus Route 59. Regal Busways Route 322 school service from Saffron Walden to Old Harlow.	Slight disruption in public transport access likely as a result of the widening works. Service would likely run slower through road works, potential timetable implications.	Advertise the likelihood of potentially slower journeys in and around the Mulberry Green – Old Harlow section of the 59 route particularly, in advance, to the bus operator and bus passengers.
Bus stop on the north side of Gilden Way/Sheering Road opposite the current entrance to Mayfield Farm.	Slight disruption in public transport access for residents living in the Campions residential area as a result of the widening works, new link road and Sheering Road	Advertise the likelihood of potentially slower journeys in and around the Mayfield Farm –

Current bus stops	Description of impacts	Potential Mitigation
Arriva Bus Route 59. Regal Busways Route 322 school service from Old Harlow to Saffron Walden.	Roundabout. A bus stop would be retained in the same general vicinity. Service would likely run slower through road works, potential timetable implications.	Pincey Brook section of the 59 route particularly, in advance, to the bus operator and bus passengers.
Bus stop on the south side of the Gilden Way/Sheering Road located opposite the junction with Marsh Lane. Arriva Bus Route 59. Regal Busways Route 322 school service from Saffron Walden to Old Harlow.	Slight disruption in public transport access for residents living in the housing estate off Sheering Road as a result of the widening works, new access road to Mayfield Farm, the new link road and Sheering Road Roundabout. Bus stop would be retained in the same general vicinity. Service would likely run slower through road works, potential timetable implications.	Advertise the likelihood of potentially slower journeys in and around the Mayfield Farm – Mulberry Green section of the 59 route particularly, in advance, to the bus operator and bus passengers.
National Express A6, A7, A8 & A9 Coach Services to and from London and Stansted Airport travelling along the M11 (services do not stop on the M11)	420 trips per day along the M11 (Northbound and Southbound)	Advertise in advance the likelihood of potentially slower journeys in and around the roadworks associated with the M11 J7A construction on both sides of the M11, to the coach operator and passengers.
Stansted Citylink 767 Coach Service to and from London Kings Cross and Stansted Airport	83 trips per day along the M11 (Northbound and Southbound)	Advertise in advance the likelihood of potentially slower journeys in and around the roadworks associated with the M11 J7A construction on both sides of the M11, to the coach operator and passengers.
Airport Bus Express Coach Services to and from London and Stansted Airport	98 trips per day along the M11 (Northbound and Southbound)	Advertise in advance the likelihood of potentially slower journeys in and around the roadworks associated with the M11 J7A construction on both sides of the M11, to the coach operator and passengers.

8.11 Impact on Sustainable Transport Infrastructure

Table 8.7 below describes the potential impacts upon individuals' access to (NMU) facilities and infrastructure (e.g. to public footpaths and the National Cycle Network Route 1 that bisect Gilden Way), and potential mitigation to reduce these potential impacts.

Table 8.7: Assessment of M11 J7A construction impacts on Non-Motorised Users

NMU Category/Facility	Description of impacts	Potential Mitigation
Public Footpaths	Pedestrians could experience a loss of amenity due to construction activities and construction compounds. This is likely to impact the following routes: Phase 1: • Footpaths 185_135 and 185_168 (to be improved as part of Newhall Mobility Path) • Footpath 185_136 at Norman Booth Recreation Centre • Footpaths 185_22, 185_26, 185_20, 185_106, 185_14 and 204_35 where these footpaths intersect with Gilden Way Phase 2A: Footpath 204_30 at Mayfield Farm where it bisects the new construction and realigned Sheering Road Phase 2A and Phase 2B: Footpaths 204_17, 204_26 and 204_29 where they tie in with Sheering Road to the north of the new Sheering Road Roundabout and Pincey Brook Roundabout.	• Provide a diverted NMU route away from the construction scheme between the Churchgate Roundabout and Footpath 204_17, via existing connecting Footpaths • Assist pedestrians crossing the B183 Gilden Way at key locations such as near Marsh Lane, at Mulberry Green, near London Road and between Public Footpaths 185_135 and 185_168. • Determine diversion route for Footpath 204_30
Cyclists	East-West access for Cyclists along Gilden Way	• Traffic Management TTRO/TRO for Phase 1 works - Current speed limit on Gilden Way of 60mph to be reduced to 40mph via a TRO prior to works and then again to 20mph during construction, in line with roadworks guidance which states that narrow running lanes under 3.25 metres need to be reduced to 20mph to primarily provide safer conditions for cyclists. • Provide 'Cycle Route Ahead' signs where required along Gilden Way in advance of gaps in exclusion zones and provide banksmen at cycle route and PROW crossings, to enable north-south passage of NMUs. • Within narrow lane running along Gilden Way, provide suitable derivative of TSRGD Diagram 886 'Share Space' signs, to inform road users that motorists and cyclists should expect to share the same space within the east-west

NMU Category/Facility	Description of impacts	Potential Mitigation
	North-South access for Cyclists across Gilden Way at London Road Roundabout, proposed Newhall Mobility Path Uncontrolled Crossing and NCN1 Crossing (Mulberry Green <-> Sheering Road, Old Harlow).	narrow lane running. • Alternatively, create the legal order required to permit cyclists to use the footway along the north side of Gilden Way. • Provision of banskman at location of existing uncontrolled crossing east of London Road Roundabout. • Provision of banskman at proposed location of Newhall Mobility Path Uncontrolled Crossing (if built before the start of M11 J7A Construction) • Consider alternative more attractive cycling provision diverting cyclists away from the M11 J7A Construction, signing them via NCN1 to the north, or from the south via the existing Linden Homes Site Entrance/Delivery Route (an off-road path appears to already run parallel to the road) which doubles as the access to Old Harlow Boarding Kennels & Cattery. Improvements to the surfacing of PROW 185_168 and the creation of a legal order to permit cycling along it would be required.

9. Summary and Conclusions

Jacobs has been commissioned to assist ECC Major Programmes and Infrastructure in developing a proposal for improving access to and from the M11 in the Harlow area. The current proposal is for the provision of a new motorway junction (J7A) on the M11 between Junctions 7 and 8, a road linking J7A to the existing B183 (Gilden Way) and widening of Gilden Way itself.

M11 J7 is currently Harlow's only connection to the Strategic Road Network, accessed via the A414. Both are subject to heavy congestion in peak periods. Harlow Town Centre has been identified as an area for regeneration and two Local Harlow Enterprise Zones (HEZ) have been designated for employment growth in the town. Much residential growth is also planned for the town. Without an improved link to the motorway, the town and surrounding area will not be able to realise their full future potential. As such, M11 J7A has been identified as a priority in the Essex Growth Strategy (EGS) and is also supported by the South East Local Enterprise Partnership (SELEP). It is believed that M11 J7A will assist in relieving the congestion at M11 J7 and help to facilitate local growth in and around Harlow.

This Construction Phase Traffic & Transport Impact Assessment was developed to identify the transport impacts of the construction of the proposed M11 J7A scheme. It has considered public transport users, non-motorised users and other road users. It is planned to construct the scheme in three phases: Phase 1; Phase 2A and Phase 2B. It was assumed prior to carrying out the assessment that there would be the following main impacts:

- Off-site construction vehicle traffic (movement of construction vehicles on the live road network) resulting in additional trips on the network (potentially causing delay, re-assignment of trips and junctions exceeding capacity); and
- Staff vehicular trips, resulting from staff accessing and egressing the construction sites, causing additional trips on the network which may contribute towards delay, trip re-assignment and junctions operating above capacity.

The assessment has found that the scheme's construction is unlikely to have a major effect on public transport service provision in the local area, with the exception of the 59 bus service, which may suffer from some delay to running times and disruption to the existing bus stops during the Phase 1 works. The impact of the construction of the proposed M11 J7A scheme on public transport users is likely to be negligible overall.

Off-site Construction Vehicle Trips

The number of off-site construction vehicle trips associated with M11 J7A was determined by calculating the quantities of material that need to be moved, an assumed rate of production and the proposed construction programme, comprising HGV or similar vehicles only. Using the Harlow Transport model "do-minimum" Core Growth Scenario for 2021, construction trips were manually assigned to and from the M11 J7A site using the most likely route, restricted to main roads.

The highest resulting assignment of heavy vehicle flows were seen to occur in the AM peak hour (08:00 to 09:00) but volumes of trips were negligible in the context of background traffic, so are unlikely to cause significant problems for network flow or capacity. In September 2019, for example, seven construction vehicle trips are likely in the AM peak hour travelling in each direction along Gilden Way to and from Site Compound CS1. In May 2020, the impact on Gilden Way of construction vehicle traffic associated with Phase 1 is potentially reduced to two vehicle trips travelling in each direction as the majority of construction vehicle trips are instead more likely to route via the M11 to access the construction sites from the new slip-roads that will eventually become M11 J7A. In May 2021, it can be seen that off-site construction vehicle traffic is again most likely to route via M11 J7 and J8 to access the M11 J7A Phase 2B construction site and site compound CS4 via the new slip-roads. Overall, the volume of off-site construction vehicle trips in the AM peak hour could be lower on the local road network than during Period 1 (September 2019) and Period 2 (May 2020), with two trips in each direction using the A414, converging to a maximum of four trips on the southbound A414 approaching the M11 J7 roundabout.

In the context of the background daily traffic, the number of off-site construction vehicle trips generated by the M11 J7A construction phases is likely to be insignificant, even in the worst case AM peak scenario. As a result, the impact on the highway network is likely be low and should be able to be accommodated. The extent of night-time working has been minimised in the working programme and where it does occur, the impact on other road users would again be likely minimal, mostly owing to the far lower overnight vehicle flows using the affected road. The exception to this would be in relation to the M11 and the bridge-over installation at the new motorway junction. The programme allows for work on the M11 bridge for 15 to 16 days, including night works, in September 2020. It is anticipated that this will require full carriageway closure of the M11 at night time for 2 to 3 nights in total. A traffic diversion would operate between M11 J7 and J8 via the A414 through Harlow, Sawbridgeworth and around Bishop's Stortford, which would need to be discussed and agreed with HE and with the Principal Contractor who has yet to be appointed.

Staff Trips

The volume of staff trips would be dependent on the level of activity during each phase of the site works and be influenced by the number of off-site construction vehicle movements. The likely maximum staff numbers travelling to the construction sites for each phase of works were calculated to be 50 trips for Phase 1; 125 for Phase 2A (West of the M11); 40 trips for Phase 2A (East of the M11); and 50 trips for Phase 2B (East of the M11).

With on-site working hours scheduled to be between 08:00 and 18:00, it was assumed that staff would arrive between 07:00 and 08:00 and leave between 18:00 and 19:00. There is no inter-peak movement as there is no shift change scheduled during the working day. It was assumed that all staff would travel by single occupancy private vehicles, giving a worst case assessment for considering the traffic and transport impacts.

Assigning staff trips to the Core Growth do-minimum Scenario network flows from the Harlow Transport model (with peak hour (08:00-09:00 and 17:00-18:00), factored to the hour coinciding with the staff arrival (07:00-08:00)), revealed that the most significant impact on the network flows is likely to occur in the AM peak hour in the Period 1 and Period 2 scenarios (September 2019 and May 2020 respectively). There was far less modelled impact on network flows in the Period 3 scenario, and in the Period 1 (PM), or Period 2 (PM) scenarios.

The strategic modelling for the Period 1 (September 2019) AM Peak suggested that traffic would increase travelling southbound along the A1019 and eastbound along First Avenue Mandela Avenue, while traffic would decrease travelling westbound along Edinburgh Way and southbound along Howard Way. Similarly in the Period 2 (May 2020) AM Peak, the modelling suggests that traffic would increase travelling northbound along the A414 and westbound along Edinburgh Way, while traffic would decrease travelling northbound along Howard Way.

It is suggested that there are secondary rerouting effects in the model caused by the addition of staff trips due to the construction of the proposed M11 J7A scheme. This is likely to be caused by the level of congestion in the model and the existence of more than one very similar cost route available in the area. While the Harlow Transport Model suggested this rerouting will occur, more detailed modelling would be required to establish whether or not these secondary effects are likely to occur in practice.

Some works would be required at night, resulting in staff trips to facilitate the off-site construction vehicle trip arrivals and departures. Other than the M11 full closure for 2 to 3 nights and resulting traffic diversion required to enable the over-bridge to be constructed in Phase 2A Section B Phase B works, the impact of the night-time works would likely be negligible given the levels of traffic using the affected roads at these times, and the construction staff vehicle trips would be unlikely to have a great impact on other road users.

In summary, the traffic flows resulting from staff trips being assigned to the network indicated negligible impacts in the PM peak periods throughout the modelled time points. The most significant impact is seen during the AM peak hour during September 2019 (Phase 1 works) and May 2020 (Phase 2A works) at three junctions:

- A414 Edinburgh Way/A1184 Cambridge Road 'Gates' Roundabout;
- A414/B183 First Avenue Roundabout; and

- B183 Gilden Way/London Road Roundabout.

ARCADY analysis indicates that all of the junctions operate with a good level of service and within capacity for all scenarios, with the exception of the A414 South arm and B183 West arm of the A414/B183/First Avenue Roundabout. These arms are seen to already be operating near to or above their theoretical capacity without the M11 J7A construction, with considerable queuing and delay expected.

It is important to note that the proposed M11 J7A scheme has yet to be discussed or agreed with Highways England, or with the Principal Contractor who has yet to be appointed, and is consequently subject to future discussions and revision to the plans used to create this Construction Phase Traffic & Transport Impact Assessment.