TP 003

Chelmsford Local Plan

Evidence Base Document

Topic Paper 3: Transport

June 2018

Chelmsford Local Plan

Chelmsford Local Plan Topic Paper 3

Transport

1. Purpose

1.1. This topic paper is one in a series which sets out and summarises how the Council has prepared its Local Plan. It describes how transport matters and transport impacts have been considered when preparing the Local Plan and how the Local Plan seeks to provide a development strategy compatible with sustainable movement objectives.

1.2. This topic paper reflects suggested additional modifications to the Pre-Submission Local Plan as set out in the 'Pre-Submission Local Plan Schedule of Suggested Additional Changes, May 2018' (Reference SD – 002). These modifications do not affect the soundness of the Plan and are in response to comments made to the Pre-Submission Local Plan, and to ensure the Local Plan is consistent, reflects the latest position and latest evidence base.

1.3. The intention of the topic papers is to provide background information; they do not contain any policies, proposals or site allocations. Topic papers will form part of the Local Plan evidence base which will be submitted alongside the Local Plan for independent examination.

1.4. This topic paper covers the following areas:

- Transport Context
- Transport Vision
- Evidence Base - Transport Modelling
- Consultation Responses
- Duty to Co-operate
- Future Work
- Conclusions

1.5. Overall, the Local Plan shapes where development takes place and sets out how the area will be connected by walking and cycle routes, public transport corridors and the local and strategic road network in pursuit of the Plan's Strategic Objectives, Spatial Strategy and Vision.

1.6. The Local Plan policies broadly identify what and where new transport infrastructure is required. These have been informed by a robust evidence base and through engagement and support from key stakeholders including Essex County Council (ECC), Highways England (HE) and the promoters of the main developments.

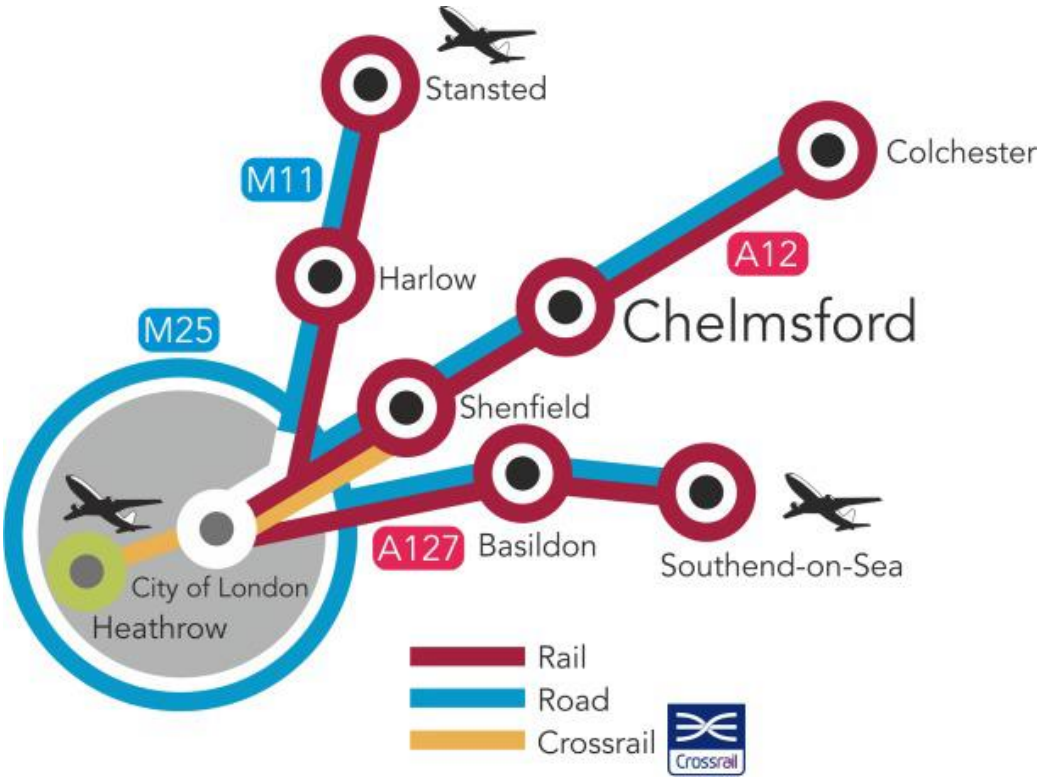
1.7. Chelmsford City Council (CCC) has worked in partnership with ECC and HE as Highways Authorities to ensure projected development growth in Chelmsford is tested robustly and a strategy for mitigation is formulated.

2. Transport Context

2.1. Chelmsford is located in the heart of Essex, 30 miles north-east of London and consists of the principal settlements of Chelmsford and South Woodham Ferrers, surrounded by villages set within countryside.

Local Road Network

2.2. Chelmsford benefits from good road accessibility to London and the wider region including Braintree, Cambridge and South Essex. The principal roads that connect Chelmsford to the rest of the strategic road network are the A12, which connects Chelmsford to the M25 and London, Colchester and Ipswich; the A131, and A130 which run north-south across Essex; and the A132 and A414 corridors. Chelmsford also has good connections to London Stansted and Southend airports. Chelmsford's connectivity is illustrated below:



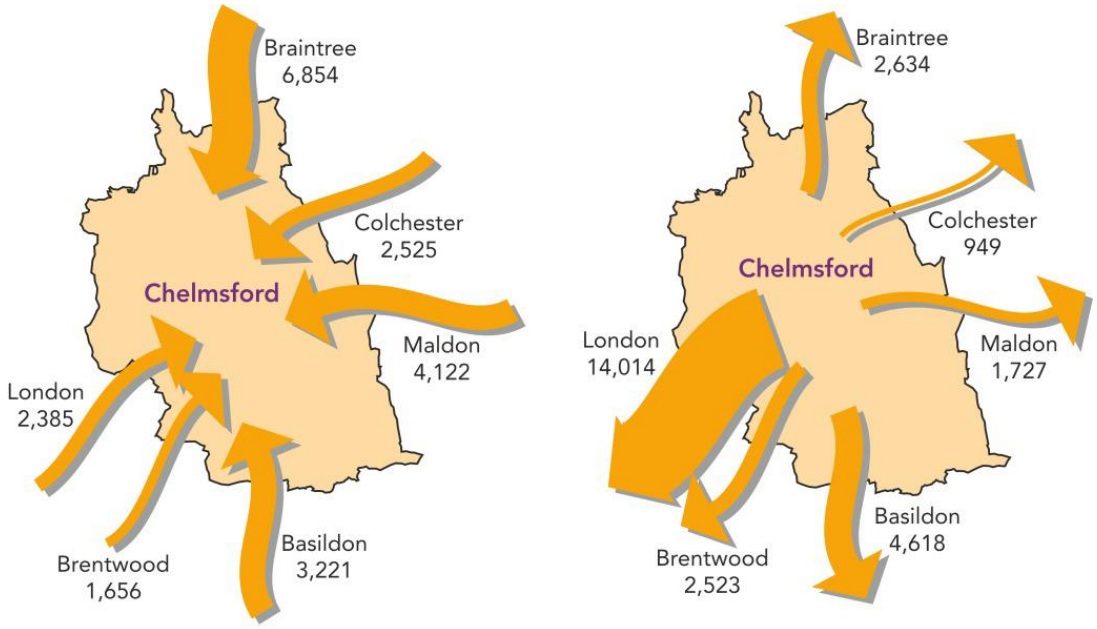
2.3. Relatively high levels of affluence in Chelmsford and the good access to the local and strategic road network encourages use of the private car and a high level of car ownership. This contributes towards heavy use of Chelmsford's road network with some main roads through Chelmsford at, or near to, capacity during peak periods. This includes peak time congestion into and within Chelmsford City Centre, notably around the Army and Navy Junction and along Baddow Road and also along Broomfield Road, Springfield Road and Waterhouse Lane. There are also congestion 'hotspots' on the strategic network for example, the A12 between junctions 15 and 19, and the A414 east of the A12 can be heavily congested during peak hours.

2.4. There is one road transport related Air Quality Management Area (AQMA) in Chelmsford around the Army & Navy Junction and Baddow Road.

2.5. High levels of car ownership are also highlighted in 'travel to work' data. 2011 Journey to Work census data identifies that more than 50% of Chelmsford residents working within Chelmsford administrative area drive to work. Also, 35.2% of Chelmsford residents who live within 4km of the city centre (acceptable cycling distances) and work in the city centre travel by car. A further 15.5% of Chelmsford residents travel to work by train and 14% by foot. A smaller proportion travel to work by bus, as passenger in a car and by bicycle (5.2%, 4.4%, and 4.2% respectively).

2.6. Chelmsford also has a wide influence on its surrounding area and has travel to work relationships with many neighbouring places including London, Braintree, Colchester, Maldon and Brentwood. The private car is the first choice mode of transport to work from outside of Chelmsford, therefore contributing to peak period congestion in and around Chelmsford and on parts of the strategic road network in the wider area. The main commuting flows into and out of Chelmsford are shown below.

Main commuting flows into and out of Chelmsford



Source: ONS (2011)

Rail

2.7. Chelmsford has regular main line rail services that connect the city with London Liverpool Street (with up to ten trains per hour), Ipswich and Norwich. The network also carries freight traffic to and from Harwich International Port, which handles container ships and freight transport to the rest of the UK. Although services are more limited, the Southminster branch line provides train services to London and other wider destinations available from the town of South Woodham Ferrers and small settlement of Battlesbridge.

2.8. Chelmsford's rail network is heavily used, particularly given the proximity to and connectivity with London. Chelmsford rail station is one of the busiest in the East of England, accommodating up to 7.5 million passenger trips per year. A new rail station in north east Chelmsford at Beaulieu will improve rail infrastructure from the mid-2020s onwards and help to relieve pressure on the existing station. Planned new rolling stock upgrades on the London Liverpool Street line will further increase rail capacity. By locating new development within acceptable public transport travel distances (cycle, walk, bus) of the existing and proposed rail station at Beaulieu, there will be greater potential for residents to make their journeys by rail.

Bus

2.9. Bus services are concentrated within the centre of Chelmsford, linking the city centre, railway station and the surrounding areas. The majority of services run through Chelmsford bus station, and therefore the city centre is well served by existing bus services. Chelmsford Area Bus Based Rapid Transit (ChART) is a direct, frequent bus service that connects development in North East Chelmsford with the City Centre, and the existing and new rail stations. It is critical for enabling local, frequent travel without reliance on the private car. When the railway station comes on line subsequent phases of ChART will create a link to serve the station.

2.10. Further out from the centre, the number of buses serving the local area decreases although South Woodham Ferrers and larger villages have a good service particularly during the peak period to Chelmsford and other larger settlements such as Braintree and Basildon. A new bus service has been introduced at St Luke's, Runwell. This connects a large new residential-led development with the rail station at Wickford and was a S106 requirement. This is a similar express bus service, with priority measures, to ChART. Travel by bus offers a main alternative to journeys made by private car. By locating new development adjacent to urban areas there will be greater potential for residents to make their journeys by public transport.

2.11. Chelmsford has two existing Park and Ride sites at Chelmer Valley and Sandon, which have 1,000 and 1,475 spaces respectively. Both have been expanded, Sandon three times since opening. Buses run approximately every 10-15 minutes during the day into Chelmsford city centre. Patronage has steadily increased and there is further scope for their expansion to increase usage. As such, land is safeguarded at both Park and Ride sites for their expansion in the Local Plan along with an additional site to serve west Chelmsford.

Cycling and Walking

2.12. Chelmsford has National Cycle Network (NCN) Route 1 which provides east / west connectivity through the city centre and provides access to Writtle and Chelmer Village alongside the river and in parks, with on-road routes provided on quieter roads.

2.13. There is an extensive and well used cycle network within Chelmsford although it also has huge capacity that isn't currently being used. However, the cycle network is incomplete and there are a number of barriers to cycling including physical barriers but also a lack of signage, lack of cycle parking facilities across the city and poorly maintained or poorly lit routes.

2.14. Significant investment is being made by ECC in the walking and cycling network in Chelmsford through the £15M Chelmsford City Growth Package, including upgrades to cycle links, signage, surfacing and lighting. ECC Chelmsford Cycling Action Plan, March 2017 sets out a review of the existing network provision and barriers and sets out opportunities to develop and promote cycling in Chelmsford through improved infrastructure. There are opportunities to further enhance cycle routes along Chelmsford's Green Wedges.

2.15. The successful cycle parking initiative, CyclePoint, has also demonstrated that there is potential to influence travel behaviour to/from train stations and this has potential to be replicated at the proposed Beaulieu Railway Station. Other measures are also encouraging people to use the improved walking and cycling network including promotional incentives and personalised travel planning.

Forecasting Future Demand

2.16. Planned new development has the potential to contribute to increased levels of traffic generation in the Chelmsford area. Recent published studies for the Chelmsford City Growth Package have highlighted that the city's roads are under significant strain with only 4% capacity left during peak periods. This leads to queuing, unreliable journey times, poor air quality and increased traffic on unsuitable residential streets. It also impacts bus users, and the quality of journeys made by walking and cycling. These are all consequences of a road network exceeding its 90% operational capacity at peak, whereby it cannot cope with the level of traffic generally, and any incidents on the network (such as an accident, or even a parked delivery vehicle) result in significant congestion.

2.17. Forecast modelling for the Pre-Submission Local Plan has shown that peak hour background traffic flows in the Do Minimum scenario[1] will increase by an average of 4% in the city centre up to 2036, with a further increase (over the Do Minimum) of 2% resulting from Local Plan development and infrastructure. It will not be possible to build sufficient physical infrastructure to address urban congestion to increase Chelmsford's road capacity. Therefore, a strong emphasis will need to be placed on improving sustainable travel infrastructure, promoting the use of non-car modes, effective travel planning and addressing the sustainable accessibility of future development.

[1] The reference case against which to compare the various Local Plan Spatial Option scenarios. See paragraph 4.5 for more details on the model.

Summary

2.18. Given its transport context, the Chelmsford Local Plan has sought to identify the most sustainable locations for growth where the impact on the local and strategic transport network can be minimised and a modal shift to more sustainable modes of travel can be made and maximised.

3. Transport Vision

3.1. Good transport provision is essential to Chelmsford's continuing prosperity and improvements need to be implemented in ways that are both sustainable and minimise the adverse environmental and social impacts.

3.2. Given high levels of commuting, the relative prosperity of Chelmsford and ongoing demand for services and facilities, transport infrastructure is already under pressure. A significant change in how people make their journeys towards more sustainable travel choices is necessary.

3.3. Therefore, the Local Plan promotes improvements to transport infrastructure to ensure that new development is accessible by sustainable forms of transport and which allows Chelmsford to be well-connected. It also ensures that new development will not unduly exacerbate congestion and will provide appropriate mitigation measures to ameliorate effects on local road network, and maximises and improves the way people move around by sustainable modes of transport.

3.4. This is demonstrated throughout the Pre-Submission Local Plan including:

- **Strategic Priorities 5 and 6** - these seek to deliver new and improved strategic and local infrastructure including ensuring the transport network accommodate future growth

- The Local Plan **Vision** – this seeks to maximise opportunities for sustainable transport by providing increased opportunities for walking, cycling and public transport

- The **Spatial Strategy (Policy S9)** - this focuses new development at well-connected locations (in line with **Strategic Policy S1**) for example along strategic transport corridors, close to existing local services, in areas with a good level of existing or proposed transport infrastructure including sustainable transport, and where daily needs can be met locally where possible. This will help reduce the need to travel, and maximise opportunities for sustainable travel and modal shift through planned new development

- **Strategic Policy S11** - this recognises that new development can place additional demand upon existing infrastructure and services, and requires new development to be supported by sustainable means of transport to serve its need including walking, cycling and public transport modes. It also sets out how new highway infrastructure should help reduce congestion, link new development and provide connections in the strategic road network. It further lists a number of transport improvement schemes that are proposed across Chelmsford and which will help to relieve congestion or provide connections to new developments. These schemes include:

    - A new train station at Beaulieu
    - Chelmsford North East Bypass
    - An additional new Radial Distributor Road 2 in North East Chelmsford
    - New access road to Broomfield Hospital
    - Additional and expanded Park and Ride sites
    - Improvements to the Army and Navy Junction
    - Improvements to A130 (Essex Regiment Way) and A131
    - Junction improvements on the A12 and other main roads to reduce congestion
    - Capacity improvements to the A132 between the Rettendon Turnpike and South Woodham Ferrers, including necessary junction improvements to be brought forward as early as possible
    - Multi-user crossings of the B1012 in South Woodham Ferrers which may include a bridge or underpass
    - Bus priority schemes and rapid transit measures
    - Improvements to inter-urban public transport
    - New and improved cycling and walking routes both within development sites and to provide connections to centres and hubs of activity such as transport nodes, City, Town and Neighbourhood Centres, strategic areas of recreation and employment areas
    - Transport links between new neighbourhoods and Chelmsford City Centre and employment areas
    - Improved road infrastructure aimed at reducing congestion and providing more reliable journey times.

    A number of transport and highways infrastructure schemes are also safeguarded from development or are allocated on the **Policies Map.**

- **Strategic Policy S12 –** this provides the means to secure necessary infrastructure and mitigate the impact of development. Infrastructure will be secured through the use of planning conditions and/or planning obligations and/or financial contributions through the Community Infrastructure Levy or its successor

- **Site allocation policies and Policy GR1** require developments to provide appropriate mitigation, compensation and enhancements to the local and strategic road network as required by the Local Highway Authority and appropriate measures to promote and enhance sustainable modes of transport. In doing so, planned new development will provide physical local highway mitigation measures as well as opportunities for sustainable transport to enable the modal shift of trips away from car borne to sustainable travel modes. All major development will also be encouraged to follow the modal hierarchy with walking, cycling and public transport modes prioritised over private cars (in accordance with **Strategic Policy S1**)

- Development Management **Policies CO2, CO2 and CO4** set out the circumstances whereby new local transport infrastructure such as a Park and Ride facility, new roads and bridges could be provided outside of built-up or allocated areas. **Policy CF1** seeks to ensure that new community facilities are accessible by sustainable modes of transport such as by public transport, cycling, or on foot. Public transport links should be in close proximity to the site and provide an adequate service. Measures to reduce car dependency will also be supported. **Policy MP2** requires all new major development to create well-connected places that prioritise the needs of pedestrians, cyclists and public transport services above the use of the private car. **Policy MP5** provides maximum standards for parking in non-residential developments in order to encourage more sustainable transport methods. **Policy MP6** says that the Council will support proposals for tall buildings around the transport interchange of the train and bus stations.

3.5. The above Local Plan policies are considered consistent with the NPPF for example by promoting modal shift, more sustainable modes of transport and reducing reliance on car use.

3.6. The City Council has also prepared a parking vision statement (EB 030 A and EB 030 B) which sets out a number of key objectives to ensure Chelmsford offers sufficient, high quality and appropriately located public parking. This is linked to Park and Ride to support the Park and Ride Strategy to remove journeys from the city centre at the outskirts. The vision will support the economic and community activities of the city whilst balancing a reduction in the number of car trips into the city centre to help ease congestion and to improve air quality.

4. Evidence Base - Transport Modelling

4.1. A number of traffic modelling studies have been undertaken during the Local Plan preparation to assess the impact of emerging and preferred development options on the transport network. The following section sets out in more detail the stages and key findings of these studies. This includes proposed mitigation, where appropriate.

4.2. The Local Plan traffic modelling evidence base is considered by Essex Highways to be appropriate and robust to support the Local Plan. The junction modelling report assesses the likely impacts of planned growth on the highway network in the Chelmsford area. This has included a high-level analysis of cross boundary traffic flows on key corridor routes including A130 to/from Basildon Borough and A414 East to/from Maldon District.

4.3. Some Local Plan consultation responses from members of the public raise concerns that the Local Plan modelling does not consider enough detail for example around site accessibility and sustainable travel uptake. The modelling evidence is considered commensurate with the strategic nature of the Local Plan, and localised concerns around congestion and accessibility will be expected to be addressed by developers in Transport Assessments/Statements. These will form part of future planning applications when they are submitted. Transport Assessments/Statements will also be required to consider the transport implications and mitigation measures (where appropriate) necessary in the Borough/Districts including adjoining Maldon, Basildon and Rochford in respect to Strategic Site Allocations in South Woodham Ferrers. As well as impact on the highway network, traffic generation, site access and mitigation, Transport Assessments/Statements should also include detailed analysis of sustainable transport options. Transport Assessments/Statements are required by various policies within the Local Plan including Site Allocation Policies and Policy GR1.

The Model

4.4. The traffic modelling has been commissioned by Essex County Council (ECC), as Highways Authority, on behalf of the Council. Both Councils have worked together closely with Highways England (HE) throughout its preparation to ensure that it is robust, accords with national published guidance, and is compatible with ECC and HE's County's wider remit in terms of managing the local and strategic road network.

4.5. The modelling uses a VISUM model. This is an area-wide assignment modelling package used to assess the impact of development traffic on the wider strategic road network in and around Chelmsford by the end of the upcoming Local Plan period in 2036. It includes a Do-Minimum model[2] against which to compare the various Local Plan Spatial Option scenarios.

4.6. The Chelmsford Traffic and Access Strategy Local Model Validation Report and Traffic Forecast Reports (EB 031 and EB 032), August 2016, demonstrate that the model is robust and provide information on the scope of the model and its validation.

[2] This is the reference case against which to compare various Local Plan Spatial Option scenarios.

4.7. Areas of the VISUM model on the periphery of the Chelmsford Local Authority such as around South Woodham Ferrers and Great Leighs have not been calibrated or validated to the same level of detail as the modelled urban area of Chelmsford. Consequently, the strategic highway impact of Local Plan development in these areas cannot be robustly quantified using the same modelling approach adopted for developments closer to Chelmsford. For this reason, the impact of Local Plan development and infrastructure has been assessed exclusively at a local junction level, with modelled results and analysis (see Technical Report 4 discussed later in this section).

4.8. Highways England confirmed in the Pre-Submission Local Plan representations that they have agreed the Local Model Validation Report and are satisfied that it is an appropriate tool for assessing the impact of development on the highway network. Highways England are fully aware of the traffic modelling evidence base used to inform and support the Draft Local Plan and consider the transport modelling evidence base to be 'sound' and, therefore, fit for purpose, and in transport terms that the Draft Local Plan is also 'sound'. Essex County Council, as Local Transport Authority, have also approved the Chelmsford Traffic and Access Strategy Local Model Validation Report and Local Model Forecast Reports (EB 031 and EB 032). Officers have further reviewed the transport modelling reports and are satisfied that these indicate that the impacts of proposed Local Plan growth on the Chelmsford transport network can be mitigated so as not to result in any severe cumulative impact in the network (the key traffic impact test within the NPPF).

4.9. In order to assess the high-level impacts of growth on the highway network in a manageable way, the model focuses on peak hours, when by definition roads are likely to be most congested. It also covers the time horizon of up to 2036.

4.10. All the transport evidence base reports including the validation and forecast reports referred to in paragraph 4.6 are available in full on the Council's Local Plan evidence base website pages via www.chelmsford.gov.uk/new-local-plan/evidence-base

4.11. The traffic modelling studies assess the likely impacts of planned growth on the highway network in the Chelmsford area. As discussed earlier, more detailed analysis of traffic impacts and mitigation options testing will be required through the preparation of Transport Assessments/Statements as part of future planning applications when they are submitted.

4.12. Six technical modelling reports have been produced using the Chelmsford Strategic Model (VISUM) to accompany each key stage of the Local Plan preparation starting with the modelling report of the Issues and options Local Plan through to the modelling report of the Pre-Submission Local Plan. These are listed in the table below. The purpose and conclusions of these are then discussed in chronological order. A further four reports have been produced to provide a technical response to public representations made regarding the transport modelling work undertaken. These are discussed in Section 5 of this Topic Paper.

Technical Report	Reference Number	Title	Date
1	EB 023	Transport Impact of Local Plan Spatial Options	March 2017
2	EB 024	Transport Impact Sensitivity Testing & Sustainability Review	March 2017
3	EB 025	Transport Impact of Local Plan Preferred Spatial Option	March 2017
4	EB 026	Transport Impact of Local Plan Preferred Option Strategic & Local Junction Modelling	January 2017
5	EB 027	Chelmsford Local Plan Preferred Option Strategic & Local Junction Modelling Addendum (Summary of Infrastructure Studies)	January 2018
6	EB 029	Chelmsford Local Plan Pre-Submission Strategic & Local Junction Modelling	January 2018

Technical Report 1 - Transport Impact of the Local Plan Spatial Options (March 2017) (EB 023)

4.13. This report presents the outcomes of the initial run of the transport model. It assesses the likely impacts of the three Local Plan Issues and Options Spatial Options:

- Option 1 – Urban Focus
- Option 2 – Urban Focus and Growth on Key Transport Corridors
- Option 3 – Urban Focus and Growth in Key Villages

4.14. Information about these options can be found in the Local Plan Issues and Options Consultation Document (EB 115) and in Appendix B of the modelling report.

4.15. Analysis focuses on the relative transport impact of options tested based on changes in vehicle flow and levels of network congestion over a 2036 forecast-year 'Do-minimum' scenario without Local Plan development. Mitigation infrastructure has then been assessed based on its relative effect on vehicle flows and network congestion for each Spatial Option.

4.16. The model applied a fixed (rather than a variable) demand highway assignment as the variable demand component was not ready for use at this stage. The fixed demand highway assignment does not consider behavioural responses to congestion for example switches to other travel modes such as bus or rail. However, in the real world, should a road become congested, it is common that drivers would opt for alternative routes, switch to other modes such as bus or rail, or change their travel time to avoid peak congestion. As such the modelling results at this initial stage, although still considered robust, probably overestimate the predicted traffic levels following the Local Plan growth. Later stages of traffic modelling (discussed later) do make use of the model with a variable demand element to account for travel behaviour responses.

Main Conclusions

4.17. The report concludes that it is difficult to differentiate between Options 1-3 with regards to the impact of development traffic on levels of congestion across the wider Chelmsford urban area by 2036.

4.18. With the addition of Local Plan development flows, Spatial Option 2 results in the highest increases in traffic flow concentrated on key routes across Chelmsford, and Spatial Option 1 the lowest. However, congestion due to background growth and subsequent wide-scale route reassignment away from strategic links and corridor routes to/from the city centre, appears to neutralise any variability between Options in the impact on network congestion across the wider area.

4.19. The focus on urban development associated with Spatial Option 1 would probably have the greatest potential to encourage mode shift to sustainable travel alternatives.

4.20. Congestion due to background growth and subsequent wide-scale route reassignment away from strategic links and corridor routes to/from the city centre, appears to neutralise any variability between Options in the impact on network congestion across the wider area. At a more local level, modelling generally reflects the impact of development traffic on congestion in the immediate vicinity of larger Local Plan developments – such as those to the west of Chelmsford.

4.21. Proposed transport infrastructure aimed at mitigating growth in future traffic levels identified at this stage (e.g. A132 dualling and Additional Park & Ride in NE Chelmsford) alone will be unlikely to mitigate the high levels of congestion modelled across the city. The impact of each Spatial Option on the local road network around Great Leighs and South Woodham Ferrers is expected to be consistent with the quantum of housing proposed for each. However, as the VISUM model is less refined in these areas, local junction modelling is recommended as it is not possible to draw accurate conclusions regarding the likely extent of congestion on the road network in the future, or the specific impact of the Spatial Option development flows in these areas without this more detailed traffic modelling. Therefore, junction modelling was commissioned by ECC on behalf of the City Council and is discussed later in this section.

Technical Report 2 - Transport Impact Sensitivity Testing & Sustainability Review (March 2017) (EB 024)

4.22. Following consideration of the initial traffic modelling study (discussed above) and representations to the Issues and Options Local Plan, three alternative Spatial Options were identified by the Council and assessed to help inform the policies and proposals within the Preferred Options Local Plan:

- Test A – Alternative Urban Focus and Growth along Key Corridors
- Test B – New Settlement and Safeguarding Green Wedges
- Test C – Deliverability Focus

4.23. Information about these options can be found on page 5 in the modelling report.

4.24. As with the Issues and Options Spatial Options modelling report (Technical Report 1), the analysis in this second modelling report (Technical Report 2) focuses on the relative transport impact of options tested based on changes in vehicle flow and levels of network congestion over a 2036 forecast-year 'Do-minimum' scenario without Local Plan development. Mitigation infrastructure has then been assessed based on its relative effect on vehicle flows and network congestion for each Spatial Option. The model also applies the fixed demand highway assignment as the variable demand component was not available for use.

4.25. The modelling report includes an outline assessment of a proposed Writtle Bypass connecting the A1060 to the A414 as a measure to mitigate growth in traffic flow through Writtle, and carriageway widening of the A12 around Chelmsford. These are alternative mitigation measures to those that have been incorporated into the overall package of Local Plan mitigation. The widening of the A12 between A12 Junctions 15 and 19 is not currently on the Highways England Road Investment Strategy (RIS) programme. Therefore, the carriageway widening was included in the modelling to test a 'what if' scenario, rather than being modelled with an expectation that the assumption would be taken forward in subsequent modelling. Similarly, there are no proposals for a Writtle Bypass connecting the A1060 to the A414 as a measure to mitigate growth in traffic flow through Writtle, and it was also included in the modelling to test a 'what if' scenario.

4.26. The report also includes an appraisal of sustainable transport infrastructure as a mitigation measure to help address future congestion concerns. This includes a review of the existing situation and development proposals for public transport and the impact of improved bus services and cycling on proposed development locations.

Main Conclusions

4.27. As with Spatial Options 1-3, the report concludes that it is difficult to differentiate between Tests A-C with regard to the impact of development traffic on levels of congestion across the wider Chelmsford urban area by 2036. This is understood to be due to a number of contributory factors including the influence of wider traffic re-routing as a result of A12 congestion.

4.28. Test C is consistent in generating the smallest overall traffic flow increases across the Chelmsford urban area, along the A12 and city centre routes. This is perhaps understandable with Test C having the lowest overall quantum and broadest dispersal of development across the administrative area.

4.29. The larger quantity of housing at the proposed Hammonds Farm development associated with Test B, results in higher modelled traffic flows along the A12, at the A12 Junction 18, and along rural rat-run routes through Sandon, Bicknacre and East Hanningfield.

4.30. Mitigation testing suggest that the A12 widening to three lanes appears to have little overall impact on overall levels of congestion predicted along corridor routes into the city centre and through the city centre itself. Congestion is likely to remain on the widened A12 carriageway between Junctions 17 and 19, limiting the transfer of longer-distance trips from city centre routes back to the A12 trunk road.

4.31. Mitigation testing also suggests that the network impact of the proposed Writtle Bypass will be localised to Ongar Road, Lordship Road and adjacent rural routes.

4.32. With limited opportunities to increase the capacity to address congestion across the urban area of Chelmsford, a strong emphasis will need to be placed on improving sustainable travel infrastructure, promoting the use of non-car modes, effective travel planning and addressing the sustainable accessibility of future development.

4.33. In reviewing sustainable transport, there is potential for modal shift - especially for journey to work trips from within 4km of the city centre towards the centre, switching from car to bus or bicycle. Development location-specific action is likely to improve existing bus and cycle infrastructure, and encourage the uptake of more sustainable forms of travel.

4.34. The sustainable infrastructure review finds that the best way to tackle future congestion across the urban area of Chelmsford, will be to place a strong emphasis on:

- Improving sustainable travel infrastructure
- Promoting the use of non-car modes
- Effective travel planning, and
- Sustainable development – in terms of accessibility

4.35. There would appear to be potential for modal shift from driving, to travelling by bus or bicycle to work in the city centre. Potential housing locations in the city centre and in North Chelmsford (Broomfield) are located within an acceptable walking distance of existing public transport services and are currently the best served in terms of existing bus provision on their closest routes. In this regard, these locations might be considered the best for encouraging bus use to/from new developments.

4.36. Potential housing locations in Great Baddow/Sandon (East Chelmsford) and Writtle (West Chelmsford) are also located within an acceptable 4km cycling distance of the city centre. Development in North East Chelmsford will also be located within cycling distance of a proposed rail station at Beaulieu Park. Focus should therefore be spent on promoting cycling at these locations, and investing in cycling infrastructure to maximise uptake.

4.37. Improvements to cycle links are likely to form part of the Chelmsford Growth Package, including upgrades to signage and lighting for example, and there are opportunities to further enhance cycle routes along Chelmsford's Green Wedges. The successful cycle parking initiative, CyclePoint, has demonstrated that there is potential to influence travel behaviour to/from train stations and this has potential to be replicated at the proposed Beaulieu Station.

Technical Report 3 - Transport Impact of Local Plan Preferred Spatial Option (March 2017) (EB 025)

4.38. The two earlier studies discussed above assisted the Council in developing their Local Plan Preferred Option and the selection of strategic sites through understanding the likely impact of earlier Spatial Options on the road network. A further study was subsequently undertaken on the Local Plan Preferred Spatial Option.

4.39. Detail on the residential and employment allocations modelled is given on page 6 of the report.

4.40. A sensitivity test considers the highway impact of a model-wide 5% reduction in vehicle trips to understand what might happen if congestion did have an impact on travel behaviour in the peak hours. The 5% reduction was used to test the modelled 'resilience' of the future road network. In the absence of Variable Demand Model (VDM) capability at the time, the 5% reduction provided insight into the extent of route reassignment occurring in the model. It did not assume an unsubstantiated 5% reduction in traffic flows to account for peak spreading as some representations to the Issues and Options Local Plan suggested. If (as was shown to be the case) the 5% reduction results in little change in flows along main roads, this is a sign that the modelled network is predicted to be notably congested, and that wider-scale route reassignment is predicted to be occurring as a result.

4.41. An updated sustainable infrastructure review was also undertaken for proposed housing developments over 500 dwellings. This builds on that undertaken for traffic modelling report number two by assessing travel statistics and the role of public transport, cycling and sustainable transport planning.

4.42. The modelling used updated development and infrastructure assumptions and updated mitigation infrastructure agreed with the City Council.

Main Conclusions

4.43. It is difficult to differentiate between the modelled network performance of the Preferred Spatial Option and that of the six Spatial Options that preceded it. This indicates that the patterns and severity of congestion across Chelmsford in the modelling remain broadly consistent regardless of differences in Local Plan development allocation and the mitigation measures identified.

4.44. A 5% reduction in traffic flow (the sensitivity test) causes lower traffic flows along the A12, A1016 Chelmer Valley Road and central Parkway in particular. There is however, little-to-no impact on modelled traffic congestion in the city centre and along urban corridors, indicating the scale of network congestion and latent vehicular demand modelled in and around the city centre.

4.45. As identified in earlier traffic modelling reports, areas of the VISUM model on the periphery of the Chelmsford Local Authority area have not been calibrated or validated to the same level of detail as the modelled urban area of Chelmsford. Modelled flows along the A132 in the vicinity of South Woodham Ferrers and the A130 at Great Leighs for example, are not likely to be accurate enough for use in assessing the impact of developments in these areas. Nevertheless, the VISUM model highlights the potential for congestion at the junction of the B1418 and B1012 Burnham Road in the vicinity of the proposed development north of South Woodham Ferrers. Accordingly, further detailed junction modelling was commissioned by ECC on behalf of the City Council and is discussed later in this section (See Technical Report 5).

4.46. Sustainable travel planning will need to play an important role in promoting sustainable travel at large sites over 500 dwellings. Implementation of travel plans for new developments can influence travel behaviour locally. Measures may include:

- implementation of car sharing schemes;
- inclusion of public transport vouchers or discount schemes for residents of new developments (in conjunction with any new bus services/routes);
- shuttle bus services for employment travel (for example the implementation of the Channels bus service); and
- facilities for encouraging cycling – e.g. secure storage lockers and changing facilities.

Technical Report 4 - Preferred Option Strategic & Local Junction Modelling (January 2018) (EB 026)

4.47. Technical Reports 1-3 considered the impact of proposed Spatial Options on the strategic (area-wide) road network and the headline findings and model outputs for these have been largely consistent across the various assessments. Subsequent work was commissioned by ECC to update the earlier Preferred Option assessment using a version of the Chelmsford Strategic Model (in VISUM) with variable demand functionality.

4.48. In addition, this modelling report (Technical Report 4) undertakes further work to understand the impact of Local Plan proposals on 27 junctions in the city centre and across the wider administrative area. As highlighted above, this was necessary as outputs from the VISUM model that are extracted from peripheral areas of the Chelmsford Local Authority area such as South Woodham Ferrers and Great Leighs are less robust and less detailed, with network validation focussed on the urban area of Chelmsford. For all junctions, the actual peak hours were modelled to represent a “worst case” scenario in terms of transport impact. The results, including committed mitigation but excluding proposed mitigation are summarised in the modelling report on pages 9 and 10.

4.49. The initial Preferred Options modelling report (Technical Report 3) was used to identify and prioritise the junctions to be assessed based on proximity to development sites and the scale of congestion modelled. Mitigation measures that may be possible for a number of junctions forecast to be overcapacity by 2036 is also considered. Where the mitigation has been proposed or is committed by a developer, this has been stated. Where mitigation is proposed by Essex Highways, it is noted that the options tested have only looked at the potential transport benefits and have not, at this stage, considered Construction Design Management (CDM) regulations.

4.50. This modelling incorporates updated development and infrastructure assumptions and revisions to housing numbers and road infrastructure proposals.

Main Conclusions

4.51. Peak hour (08:00 – 09:00 and 17:00 – 18:00) modelling in VISUM suggests that by 2036, background growth in Chelmsford without Local Plan development or infrastructure is likely to result in significant congestion along corridor routes into the city centre, through the city centre and along the A12. Modelling also illustrates the likely wider impact of Local Plan development traffic on the Chelmsford road network, with significant increases in peak hour vehicle flow focussed in the north east of Chelmsford and on northern corridor routes into the city centre. Growth in traffic flow over the Do Minimum scenario is more apparent in the AM peak, particularly in the city centre.

4.52. With the addition of Local Plan development, modelled congestion is shown to worsen along corridor routes into the city centre – notably along the A1060 Rainsford Road and A1016 Rainsford Lane, Springfield Road in the vicinity of Victoria Road, and B1008 Main Road through Broomfield. The junction of Chignal Road and Roxwell Road is also modelled to experience greater levels of congestion as a result of development proposals in the west of Chelmsford.

4.53. The Junction modelling indicates that several of the 27 junctions assessed are likely to be operating within capacity in 2036. These include:

- 1. Moulsham Hall Lane, Great Leighs
- 2. Main Road – Banters Lane, Great Leighs
- 17. Essex Yeomanry Way – Maldon Road – Baddow Hall Avenue, Great Baddow, and
- 22. Clements Green Lane – Hullbridge Road, South Woodham Ferrers.

4.54. 18 junctions are assessed as operating near to or at capacity on at least one approach arm in 2036 with Local Plan growth in place. The results from the modelling of the Local Plan scenario is summarised on the plan in Figure 1.1 on page 14 of the report using a Red, Amber, Green status for whether they are overcapacity, near or at capacity or within capacity respectively. Junctions forecast to be overcapacity in 2036 with the Local Plan growth in place include:

- 3. Deres Bridge, Great Leighs
- Junctions around North-East Chelmsford including 4. Sheepcotes, Little Waltham and 7. Nabbotts Farm, Springfield, and
- Junctions around South Woodham Ferrers including 27. A132/A130 and 25. Rettendon Turnpike.

4.55. Nine of the 27 tested junctions will be able to accommodate the increase in traffic predicted in 2036 with the Local Plan growth in place either with or without some form of proposed improvement or mitigation. At a number of the junctions forecast to be near, at or over capacity in 2036, it is envisaged that the majority could be improved to encourage increased use of sustainable transport through walking/cycle improvements and/or bus links.

4.56. ECC have set out a strategy for Chelmsford's Future Transport Network and have defined three zones of travel: Outer, Mid and Inner. Within these zones, the intention is to prioritise and promote travel via particular modes in order to reduce growing pressure on the road network:

- **Outer Zone:** Park and Ride, Rail, Bus and dynamic signage of general traffic to use appropriate strategic routes
- **Mid Zone:** Local Bus, Cycling
- **Inner Zone:** Walking, Cycling

4.57. This strategy will shape the nature of improvements needed at the junctions identified to be at or over capacity by 2036. Figure 1.1 of the report shows the different zones of Chelmsford's Future Transport Network's zonal strategy, which indicates the types of transport schemes preferred in each area.

4.58. Improvement schemes, including committed developer schemes, were modelled for 10 of the junctions forecast to be operating near or at capacity in the 2036 Local Plan scenario. Six of these mitigation schemes will provide sufficient mitigation so that the junction should not operate over capacity. The four junctions forecast to be operating overcapacity are within the Outer and Mid Zones so should have a strong focus on encouraging use of sustainable transport as described above. Developers will also be expected to demonstrate that they can mitigate the impacts of their developments.

4.59. Given the level of congestion predicted in the future, it is unlikely that improvements which benefit general traffic alone will be possible in the available road space or effective in resolving overall congestion. As such, developers will need to be encouraged to not only mitigate the local impact of their developments as much as possible, but also focus on sustainable transport links to their developments and provide contributions to or deliver sustainable transport infrastructure measures.

Additional commentary/ Additional Committed Infrastructure in North East Chelmsford

4.60. Although not discussed in the modelling report, it is important to note that the majority of the developer funded highway improvement schemes in the junction modelling report are improvements to existing junction and links, which are necessary to accommodate the additional traffic associated with the development proposals. The mitigation for the Beaulieu development does, however, include the construction of a new radial distributor road (RDR) which connects Essex Regiment Way with the A12 Junction 19 at Boreham Interchange. The RDR is likely to become the A130 primary route. The first section (Phase 1) which runs eastwards from Essex Regiment Way has been completed by the developers of the Channels development.

4.61. Phase 2a of the RDR, which is a continuation eastwards, is expected to be commenced in Autumn 2018 with completion in Summer 2019. Phase 2b which runs southwards from 2a is expected to be constructed concurrently with Phase 2a. Phase 3 which includes the construction of a new General's Lane bridge and demolition of the existing bridge is expected to be commenced in Spring 2020 with completion in Spring 2021.

4.62. In addition to the RDR, major improvement works have been secured for the A12 J19 Boreham Interchange to include works to the Generals Lane, Generals Farm and Drovers Way roundabouts including signalisation, together with improvements to the southbound A12 on-slip. These works are expected to be commenced in Autumn 2019 with completion in Spring 2021.

Technical Report 5 - Preferred Option Strategic & Local Junction Modelling Addendum – Summary of Infrastructure Studies (January 2018) (EB 027)

4.63. Alongside the development of the Local Plan, separate studies are being progressed to consider the feasibility and/or design of a number of infrastructure proposals in the Chelmsford administrative area which would be expected to mitigate traffic flows on the local and strategic road network.

4.64. This document serves as an addendum to the Essex Highways Preferred Option Strategic & Local Impact Modelling report (Essex Highways, January 2018), and provides more detail of infrastructure proposals that are currently under consideration in the Chelmsford area. The aim of this document is to summarise these and provide an understanding of how these future infrastructure proposals in Chelmsford could support the Local Plan.

4.65. This addendum reviews the following infrastructure studies:

- A12 Widening (Junctions 19 – 25)
- A12/A130 (Junction 17) Howe Green
- Chelmsford North East Bypass Phasing Study
- Beaulieu Station
- A131 Chelmsford to Braintree Route Based Strategy

- A132 Route Based Strategy / South Woodham Ferrers Integrated Transport Package
- Chelmsford Army & Navy Roundabout
- Chelmsford Cycling Action Plan
- Chelmsford City Growth Package
- Broomfield Road Corridor Study
- Chelmer Waterside Development Route Study

4.66. Most of these studies are ongoing, with some expecting to report following the completion of this Local Plan modelling. Therefore the information provided on each of these projects is up to date as of December 2017, however, these plans are still subject to change at a later date. For each study, the addendum summarises its current status, as well as reviewing scheme proposals, likely delivery timescales and common stakeholders. Where information is available, the addendum will also summarise the potential transport impacts of schemes in relation to the latest Local Plan proposals (i.e. The Pre-Submission Option). Therefore, all references to the Local Plan are made in reference to the 2021-2036 Local Plan, unless otherwise stated.

4.67. Information on committed transport schemes is also provided in Section 3 of the Infrastructure Delivery Plan (EB 018 A and B).

Main Conclusions

4.68. The addendum summarises the current status of a number of projects that will or could mitigate the transport impact of the development proposals in Chelmsford's 2021 – 2036 Local Plan. It concludes that there are a number of strategic schemes currently proposed, such as the A12 widening in RIS1, Chelmsford North East Bypass and improving the capacity of the A12/A130 (Junction 17) Howe Green Junction, which are designed to provide much wider benefit beyond mitigating Chelmsford's Local Plan. They will require support from the Government and/or third parties to deliver.

4.69. Specifically, for the city of Chelmsford, the focus of mitigation will be on sustainable transport. ECC have already outlined their vision for the Future of Transport in Chelmsford, commencing with the Chelmsford City Growth Package which will provide a range of measures to generate a step change and encourage people out of the private car. The package of agreed schemes will be delivered by March 2021.

4.70. It is recognised that this needs to be supported with other initiatives to promote the use of sustainable transport, such as working with the local public transport companies to offer competitive ticketing to encourage people onto the bus and trains.

4.71. ECC and CCC will also need to work together on a Parking Strategy to support the two existing and two planned Park and Ride sites, thus reducing the number of private car trips into the city centre.

4.72. Developers will also be expected to demonstrate that they can mitigate the impacts of their developments. A number of the schemes from studies such as the Chelmsford Cycling Action Plan, A132 Route Based Strategy / South Woodham Ferrers Integrated Transport Package and those identified by but not delivered by the Chelmsford City Growth Package will require developer funding to implement them.

Technical Report 6 - Pre-Submission Strategic & Local Junction Modelling (January 2018) (EB 029)

4.73. The Council refined its Preferred Local Plan Spatial Option following consideration of the public consultation comments and updated evidence. This became the Pre-Submission Spatial Option and a further traffic modelling study was undertaken on this to assess the impacts on the local and strategic road network. This study (Technical Report 6) completes the traffic modelling undertaken on the Local Plan.

4.74. This study compares the likely impact of the Pre-Submission Local Plan with the Preferred Options Local Plan (Technical Report 3) on the transport network and should be read alongside this report. It incorporates changes to development and infrastructure assumptions since the modelling of the 2036 Preferred Spatial Option of the Local Plan. Revisions to infrastructure assumptions include modelling the existing single lane layout of the flyover at the Army & Navy Roundabout (previously it was modelled as a two-way flyover). Essex Highways are currently undertaking an appraisal of various improvement options of which a two-way flyover at the Army and Navy Roundabout is one. There are no firm timescales set for delivery of the schemes being considered. As such, proposed infrastructure upgrades have not been included in this modelling study.

4.75. The report includes up-to-date traffic model plots illustrating the modelled strategic highway impact of the Pre-Submission option, and documents the results of a study into the likely impact of traffic growth on journey times in Chelmsford's city centre.

4.76. It also provides a comparison of cross boundary traffic flows from the Chelmsford Pre-Submission Local Plan assessment and in Local Plan assessments undertaken by neighbouring authorities by:

1. A comparison of forecast year modelled traffic flows on main routes crossing the administrative boundary with flows modelled by neighbouring authorities; and
2. A review of the modelled assignment of cross-boundary trips to/from larger proposed Local Plan developments located outside of Chelmsford city centre.

Main Conclusions

4.77. At a strategic network level, the latest model outputs, illustrate that the impact of 2036 Pre-Submission Local Plan development and infrastructure, are broadly comparable to those presented in the Preferred Option Strategic & Local Junction Modelling report. This suggests that earlier observations and conclusions made around the future network capacity of the wider road network remain largely unaffected by the changes made to the 2036 development assumptions for the Pre-Submission.

4.78. However, with an overall reduction in Local Plan development modelled for the Pre-Submission, the subsequent weakened impact of variable demand modelling is shown to result in higher levels of modelled traffic flows along trunk roads and corridor routes into and out of Chelmsford city centre. This, along with local changes made to development allocations to the north of Chelmsford, is modelled to result in different traffic flows through a number of assessed junctions.

4.79. Published studies have revealed that in the peak hour there is around 4% spare network capacity in Chelmsford city centre. Forecast modelling for the Pre-Submission Local Plan has shown that peak hour background traffic flows could increase by an average of 4% in the city centre up to 2036, with a further possible increase (on top of the background growth) of 2% resulting from Local Plan development and infrastructure. This is therefore forecast to cause the city centre network to become over-saturated with vehicles during the course of the AM and PM peak hours in a 2036 forecast year, leading to forecast increases in vehicle journey time along routes including Parkway and Springfield Road.

4.80. Whilst a focused review of the impact on the city centre road network was not included in the Preferred Option assessment, it is recognised that the impact of maintaining the single lane flyover at the Army and Navy Roundabout has had an impact on flows along Parkway, with noticeable changes likely over the strategic model outputs presented for the city centre in the Preferred Option modelling report.

4.81. With the exception of the Boreham Interchange, flow differences modelled at local junctions are shown to be small and/or are unlikely to adversely impact overall performance. Prior analysis and recommendations for mitigation made in the Preferred Option Strategic & Local Junction Modelling report therefore remain relevant. Whilst the latest modelling suggests additional traffic will route through the Boreham Interchange, overall conclusions on junction performance remain consistent, with the latest findings strengthening the case for further capacity enhancements to accommodate flows in a Do Minimum scenario.

4.82. Development in both North East Chelmsford and Great Leighs would be expected to add to background traffic flows heading north to/from Braintree District via the A131 and Uttlesford District via the B1008. However, flows from these developments represent a small proportion of overall development trip totals, with the bulk of journeys heading to/from the south via Chelmsford.

4.83. The larger Local Plan development sites might be expected to contribute around two or three additional trips a minute in either direction along the A131 and B1008 in a typical peak hour.

4.84. Development in South Woodham Ferrers, and also in North East Chelmsford, might be expected to add to background traffic flows heading south to/from Basildon Borough via the A130. The volumes of traffic modelled crossing the administrative boundary might be expected to contribute up to three additional trips a minute in either direction along the A130, with higher volumes modelled in the PM peak hour.

4.85. Elsewhere, traffic volumes travelling on main routes between Chelmsford and neighbouring authorities are modelled to be small in both peak hours. Development traffic routing via the A12, for example, is likely to be restricted in number given the lack of forecast available capacity along the route.

Overall conclusions from transport modelling studies

4.86. A number of transport modelling studies and response reports have been undertaken during the period from 2015-2018. The number of studies and reports reflects the desire to respond to concerns amongst local communities about the distribution and scale of development proposed and whether this can be satisfactorily mitigated as well as changing circumstances over this time.

4.87. The transport modelling studies have assessed the impacts on the local and strategic road network of the options considered for growth at various stages of preparation of the Local Plan. These studies have also assessed a range of transport mitigation measures to show how the impact of growth can be accommodated on the transport network and have shown that these impacts can be mitigated.

4.88. Overall these studies have helped the identification and assessment of reasonable options and have contributed, as part of a wide evidence base, to the selection of a preferred development strategy for the Local Plan.

4.89. Overall, the modelling shows that when considering the impacts of different spatial growth strategies on the Chelmsford highway network, there is little observed difference in terms of levels of congestion at a strategic level.

4.90. In general terms by 2036 there is likely to be significant congestion along corridor routes into the city centre, through the city centre and along the A12 either with or without the growth proposed in the Local Plan. This is in line with other published studies which have revealed that there is only 4% spare network capacity in Chelmsford City Centre in peak hours.

4.91. In many cases, the traffic modelling evidence base reports conclude that increasing road capacity and delivery of sustainable transport measures can help to mitigate the impact of growth – particularly in peripheral areas away from town/city centres. However, there is an expectation that commuter travel behaviour will have to change (i.e. people will have to make use of the sustainable transport measures) in order to manage future congestion associated with limited network capacity in city centres.

4.92. Given the level of congestion predicted in the future, it is unlikely that improvements which benefit general car-based traffic alone will be possible in the available road space or effective in resolving overall congestion. It is therefore crucial that sustainable transport infrastructure is improved, provided and promoted. As such, developers will need to be encouraged to not only mitigate the local impact of their developments as much as possible, but also focus on sustainable transport links to their developments and provide contributions to or deliver sustainable transport infrastructure measures.

4.93. Therefore, the Pre-Submission Local Plan seeks to maximise opportunities for sustainable transport, reduce the need to travel and encourage the use of non-car modes. The Spatial Strategy focuses growth at well located and well-connected locations for example along strategic transport corridors, close to existing local services and in areas with a good level of existing or proposed transport infrastructure including sustainable transport. Individual policies will also ensure sustainable transport opportunities are promoted in new development by providing increased opportunities for walking, cycling and public transport.

4.94. Dialogue has taken place with ECC and Highways England throughout the process in order to understand what the potential implications of the traffic modelling for the emerging Development Strategy. Both authorities are satisfied that the traffic modelling undertaken is appropriate and robust.

4.95. Officers at ECC have also advised that they are satisfied that the traffic modelling evidence base indicates that the impacts of proposed Local Plan growth on the Chelmsford transport network can be mitigated so as not to result in any severe cumulative impact on the network (a key test in the NPPF). Overall, the Council is satisfied that the Pre-Submission Local Plan is compatible with sustainable movement objectives and in transport terms considers the Plan to be 'sound' and, therefore, fit for purpose.

5. Consultation Responses

5.1. Responses to the main transport and traffic modelling issues raised in the consultation responses to the Preferred Options and Pre-Submission Consultation Document are summarised in the four response reports discussed below. The Council's Regulation 22 Consultation Statement also summarises the main issues raised in the consultation responses to consultations on the emerging Local Plan. Together these have been taken into account in formulating the policies and allocations within the Local Plan.

Response to Representations on Transportation Matters, Preferred Options Consultation and Technical Responses to Public Representations (January 2018) (EB 028)

5.2. The Council commissioned Essex Highways to review and consider the highway and transportation responses received to the Preferred Options Local Plan consultation process. This report has been used to understand and respond to matters of concern raised in the responses and to inform the preparation of the Pre-Submission Local Plan.

5.3. The report was published alongside the Pre-Submission Local Plan and is given in **Appendix 1**. Part One of the report is Essex Highways' response to questions/comments relating general transport and traffic concerns/matters. Part Two specifically responds to comments related to the technical aspects of the traffic modelling methodology.

5.4. Responses are addressed by issue rather than by individual representation as many comments contained common themes including concerns regarding the scope of the VISUM model and that it does not consider delay at junctions; the relevance of 2011 Census data; the achievability of a 5% reduction in vehicle trips carried out as a sensitivity test and the scope of the sustainability review. Responses are made to the main concerns raised in the representations in the report.

5.5. Responses to the Hammonds Farm representations are provided in an addendum at the end of the technical note.

5.6. The Council considers that overall the report indicates that the traffic modelling undertaken and commissioned to date, and the approach to transport and traffic within the Local Plan are appropriate. It confirms that further work is underway to assess the junction impact of Local Plan proposals in response to limitations of the VISUM model on the periphery of the local authority area.

Responses to Public Representations (June 2018)
Responses to North and West Chelmsford Parishes Group (NWCPG) Report (June 2018)
Responses to Hammonds Farm Report (June 2018)

5.7. The Council commissioned Essex Highways to review and consider the highway and transportation responses received to the Pre-Submission Local Plan consultation process. These reports have been used to understand and respond to matters of concern raised in the responses and to inform the preparation of the Pre-Submission Local Plan Schedule of Additional Changes.

5.8. The responses are set out within three separate reports given in Appendices 2-4. **Appendix 2** is Essex Highways' response to questions/comments relating general transport and traffic concerns/matters and technical aspects of the traffic modelling methodology. Responses are addressed by issue rather than by individual representation as many comments contained common themes. Responses are made to the main concerns raised in the representations.

5.9. **Appendix 3** addresses specific representations made by the North West Chelmsford Parishes Group produced by consultants TTHC Ltd. The main themes are categorised as follows:

- Distribution of development trips
- Trip generation methodology
- Junction selection for capacity modelling
- Traffic routing through north Chelmsford
- Sustainable transport modes

5.10. **Appendix 4** reviews the Hammonds Farm Transport Representation in response to the published findings within the 'Chelmsford Local Plan Pre-Submission Strategic & Local Junction Modelling' report (January 2018). The representation was produced by consultants WSP Ltd on behalf of Hammonds Farm, a large omission site to the east of Chelmsford. This technical response is structured around four specific modelling points raised by WSP in their representation document, as shown below:

- Growth in Maldon and Junction improvements at A12 Junction 18
- Impact of Hammonds Farm in the inter-peak period
- A12 Junction 18/A414 Maldon Road junction capacity
- Mitigation on the A12 corridor

5.11. It should be noted that the Essex Highways' response is provided with an awareness of concerns around the robustness of the modelling undertaken by WSP as part of their local junction modelling of the Hammonds Farm proposals.

5.12. Having reviewed the response reports, the Council remains of the view that the traffic modelling undertaken and the approach to transport and traffic within the Local Plan is appropriate.

<u>General Observations</u>

5.13. Some representations to the Local Plan consultations have brought into question the deliverability of new housing and employment development due to the uncertainties over funding of major transport schemes such as the Chelmsford North-East Bypass. Information on possible funding sources and delivery timescales for this and other schemes are outlined in the Infrastructure Delivery Plan. The Local Plan also makes clear that developers will be required to provide appropriate improvements to the local and strategic highway network and that these will be secured through the use of planning conditions and/or planning obligations and/or financial contributions. More details are given in Section 3 of this Topic Paper and should provide reassurance that developer funding will be in place to deliver identified schemes.

5.14. Some representations to the Local Plan consultations also have brought into question the future level of public transport accessibility and the future uptake of sustainable transport modes. This Topic Paper highlights the need to promote public, walking and cycling modes and how this can be achieved through the Local Plan for example through new and enhanced cycle paths and the implementation of travel plans. ECC are also committed to public transport enhancements for example through the Chelmsford City Growth Package and Chelmsford Cycling Action Plan.

5.15. Some representations raise concerns regarding the impact of development on local roads around proposed development sites in particular around Writtle or South Woodham Ferrers. Studies listed in Technical Report 5 provide details on parallel work being undertaken to address traffic issues in the Chelmsford area that could support the Local Plan. These include the A132 Route Based Strategy/SWF Integrated Transport Package and Chelmsford Cycling Action Plan. These may complement the policies and transportation measures identified within the Local Plan. The main Junction Modelling report (Technical Report 4) also considers that the modelled increase in traffic along roads in Writtle with the Local Plan developments in place is considered to be relatively minor and could be reduced with effective implementation of public transport and cycling links.

5.16. Stow Maries Parish Council raised concerns at Pre-Submission stage on the potential effects of increased use of the Stow Maries Great War Aerodrome, outside the Chelmsford City Council area, on the Local Plan allocation for South Woodham Ferrers. The Aerodrome comprises two grassed runways which can be used by light aircraft. A planning application was made in 2016 to increase the number of flight movements from the Aerodrome which was refused by Maldon District Council. It is considered by the Council that there is no evidence to support the concerns that proposed development at Strategic Growth Site 7 would be seriously blighted by the Aerodrome. More information is set out within the Position Statement at **Appendix 5**.

6. Duty to Co-operate

6.1. Issues relating to transport have been regularly discussed through Duty to Co-operate discussions which have been undertaken in the Plan making process. These discussions and any related outputs are set out within the Duty to Co-operate Compliance Statement (SD 010).

6.2. Following consideration of representations to the Preferred Options Local Plan, a change was made in respect to transport matters in the Local Plan Pre-Submission Local Plan to add text to Strategic Growth Site 7 - North of South Woodham Ferrers to ensure that impacts of development in the adjoining Maldon District are considered.

6.3. Following consideration of representations to the Preferred Options Local Plan, changes were made in respect to transport matters in the Local Plan Pre-Submission Local Plan. These included:

- Updating Strategic Policy S11 and individual site allocation policies to require development to be supported by new infrastructure to serve its needs such as highways and transport improvements including sustainable transport schemes including car clubs and new and enhanced cycle paths, and
- Adding text to Strategic Growth Site 7 - North of South Woodham Ferrers to ensure that impacts of development in the adjoining Maldon District are considered and mitigated.

6.4. Following consideration of representations to the Pre-Submission Local Plan, further changes are being made in respect of transport matters in the Local Plan Pre-Submission Local Plan. These include adding text to Strategic Growth Site 7 - North of South Woodham Ferrers to ensure that impacts of development on highways outside the City Council's area are assessed (Changes AC50 and AC192).

6.5. There are not considered to be any significant outstanding cross-boundary strategic impacts that have not been addressed. Statements of Common Ground will also be prepared, where appropriate, with relevant neighbouring local planning authorities ahead of the Examination in Public.

6.6. Further traffic modelling work with be required to support planning applications for new development in the Plan. These will inform and refine the delivery of planned development and include the involvement where appropriate of adjoining LPAs.

7. Future Work – Beyond the Local Plan

7.1. The Local Plan traffic modelling evidence base is considered to be adequate and robust by Essex Highways to support the Local Plan. The junction modelling report assesses the likely impacts of planned growth on the highway network in the Chelmsford area. This has included a high-level analysis of cross boundary traffic flows on key corridor routes including A130 to/from Basildon Borough and A414 East to/from Maldon District as described above.

7.2. More detailed analysis of traffic impacts and mitigation options testing will be required through the preparation of Transport Assessments/Statements as part of future planning applications when they are submitted. These will also be required to consider the transport implications and mitigation measures (where appropriate) necessary in the Borough/Districts including adjoining Maldon, Basildon and Rochford in respect of Strategic Site Allocations in South Woodham Ferrers. The need for future modelling work identified above is not considered to be critical to the delivery of the Plan as such, but will inform the site-specific detailed measures employed to mitigate development at the local level. Developers will be required to complete a Transport Assessment (TA) to accompany planning applications for sites in excess of 50 dwellings or equivalent size for commercial development, or a Transport Assessment for smaller developments if required by the Highway Authority. As well as impact on the highway network, traffic generation, site access and mitigation, the TA should also include detailed analysis of sustainable transport options.

7.3. Further work in respect of transport matters related to bringing forward planned strategic development in the Local Plan will be addressed through detailed site masterplans as required in relevant site allocation policies. These may involve further transport modelling as well as public consultation. The transportation and highway elements of the Masterplan should be agreed with the Highway Authority. Alternatives to the private car are to be considered as a first principle to minimise the number of trips by private vehicles. As such, sustainable travel infrastructure for cycling, walking, public transport and horse riding will be given priority in consideration of the design and layout of proposed development.

7.4. The transport modelling undertaken identifies the need to deliver a range of mitigation schemes. Where these schemes have already been confirmed as being necessary, these are included within the Infrastructure Delivery Plan (IDP). Information concerning costs, funding and phasing are included, where this is currently known, within this document. The IDP is a live document and will be updated as information becomes available or further refined through any design stages.

7.5. Essex County Council, working in partnership with the City Council, has also been successful at Expression of Interest stage in the recent Housing Infrastructure Fund (HIF): Forward Fund bid for the two largest elements of strategic infrastructure: Chelmsford North East Bypass and Beaulieu Rail Station. The bid can now progress to the co-development stage. This next stage is a rolling application process during 2018/19 supported by Homes England and The Ministry of Housing, Communities and Local Government (MHCLG). The County Council are awaiting further details of the co-development stage but this is likely to require further modelling to support a business case.

8. Conclusions

8.1. The purpose of the Local Plan is to shape where development takes place and at the same time to set out how the area will be connected by walking and cycling routes, public transport corridors and the local and strategic road network in pursuit of the Plan's Strategic Objectives, Spatial Strategy and Vision.

8.2. The Spatial Strategy focuses new development at well-connected locations for example along strategic transport corridors, close to existing local services, in areas with a good level of existing or proposed transport infrastructure including sustainable transport, and where daily needs can be met locally where possible. This will help reduce the need to travel, and maximise opportunities for sustainable travel and modal shift through planned new development.

8.3. Strategic Policy S11 together with individual site allocation policies (discussed in Section 3 of this Topic Paper) broadly identify what and where new transport infrastructure is required. This is informed by a robust evidence base and through engagement and support from key stakeholders including ECC, Highways England and the promoters of the main developments. The Local Plan policies are broadly consistent with the NPPF.

8.4. Chelmsford City Council has worked in partnership with ECC and HE as Highways Authorities to ensure projected development growth in Chelmsford is tested robustly and a strategy for mitigation is formulated. Both key bodies consider the Plan to be 'sound' and, therefore, fit for purpose.

Appendices

- Appendix 1 - Response to Representations on Transportation Matters, Preferred Options Consultation and Technical Responses to Public Representations (January 2018)
- Appendix 2 - Technical Responses to Public Representations (June 2018)
- Appendix 3 - Technical Responses to North and West Chelmsford Parishes Group (NWCPG) Report (June 2018)
- Appendix 4 - Technical Responses to Hammonds Farm Report (June 2018)
- Appendix 5 - Stow Maries Parish Great War Aerodrome Position Statement (June 2018)

APPENDIX 1

29th January 2018
Your Ref:
Our Ref:HT/TPD /SD/ CHL-LP/HG

Essex County Council

CC: (by email)

Andrew Cook
Director for Highways and Transportation

To:

Jeremy Potter
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Dear Mr Potter

Response to Representations on Transportation Matters, Preferred Options Consultation

The representations received in relation to transportation issues have been reviewed, and the Highway Authorities comments on these issues are included in the table below. Technical responses to specific transport modelling issues, in the public representations, have been compiled by Essex Highways, a copy of which is attached.

Representation	Reference	Transport Issue	ECC comments
Ballard (North and West Parishes Group) Journey Transport Planning (North and West Parishes)	PO1602 PO1578 PO1597	1. Potential developments identified based on potential improvements to bus service which are not deliverable due to conditions on ground.	Capacity constraints on highway network, especially city centre will necessitate travel by sustainable modes. Broomfield Rd corridor well served by public transport and there is scope to increase this. ECC committed to public transport enhancements along this route and from West Chelmsford e.g. Chelmsford City Growth Package schemes.
		2. Broomfield Rd and Roxwell Rd likely to present challenges for delivery of cycle schemes to improve cycle connectivity.	Draft Chelmsford Cycle Strategy identifies several potential schemes along this route. West Chelmsford has good cycle connectivity though Admirals park which could be improved to enhance these routes. ECC committed to cycle route enhancements e.g. Chelmsford City Growth Package and Cycle Strategy schemes.
Maldon District Council (Butt)	PO1428	Highways investment needs to consider improving capacity and alleviating congestion at: • The Shaw Farm roundabout	The transport modelling assesses A132/B1012 corridor to assess the necessary mitigation. More detailed assessment of local roads and junctions would be required at the

		• B1012 Burnham Road with the B1418 • B1012 Burnham Road with Hullbridge Road, which acts as an alternative access to SWF • B1012 Burnham Road with Ferrers Road /Hamberts Road • B1012 Woodham / Lower Burnham Road with the Woodham Road to Cold Norton	planning application stage.
Rochford DC Basildon BC	POQ531 PO537	1. Consideration needs to be given to impact on strategic highway network in vicinity of South Woodham Ferrers e.g. A132, A130, A1245 and A127.	A Route Based Strategy and Integrated Transport Package study for South Woodham Ferrers and the A132 has been commissioned. Development in South Woodham Ferrers might be expected to add to background traffic flows via the A130 but this is a small amount comparative to the existing traffic flows. Transport modelling does not include A127 as traffic from South Woodham site would disperse on numerous routes so likely to be limited impact on A127. Developer would be expected to identify and mitigate the impact of development traffic at planning application stage.
		2. Necessary to identifying more sustainable public transport options in addition to highways improvements including improvements to the railway line through South Woodham Ferrers.	Agreed sustainable travel options are important for South Woodham site. Developer would be required to provide suitable sustainable travel measures and associated infrastructure.
		3. Improvements to A12/A130 junction are	Agreed improvements are important. Study of Howe Green junction

		vital.	currently being undertaken by Essex Highways.
Broomfield PC (Hurrell) Writtle PC (Walker) Little Waltham PC (Walker)	POQ524 POQ517 POQ533	1. No certainty that Chelmsford NE bypass (CNEB) will be delivered in the plan period.	Proposed that CNEB constructed in phases with developers either building or contributing towards single carriageway first phase, during plan period.
		2. Concern about public transport and cycling as sustainable alternatives for Local Plan sites.	See comments re public transport and cycling alternatives in ECC response points 1 and 2 rep. PO1602 PO1578 PO1597 above
		3. Suggest improvements to Sheepcotes roundabout and other roundabouts along Essex Regiment Way to improve capacity and encourage traffic to use A130 instead of B1008. Also extensions to bus lanes of Essex Regiment Way.	Improvements are planned for Sheepcotes roundabout including a segregated left turn slip from A131 to A130 as part of ECC's Chelmsford to Braintree A131 route based strategy. Also extension of bus lanes and improvements to other roundabouts.
Archer Bell Jackson Jackson	PO1465 PO1435 PO1451 PO1453	Local and strategic roads are at capacity at peak times now without 800 houses.	Acknowledged that many roads are at or near capacity in peak hours e.g. 4% reserve capacity in city centre in peak hours. However focus would be on sustainable modes of travel which is possible because of location of Warren Farm site. This will be complemented by the investment of the Chelmsford City Growth Package schemes,
Birch	POQ299	No intention of providing the necessary infrastructure to make development in South Woodham Ferrers sustainable.	A Route Based Strategy and Integrated Transport Package study for South Woodham Ferrers and the A132 has been commissioned. Developers will be required to provide the necessary public transport, cycling and walking infrastructure to mitigate the impact of their development and minimize the need to travel by car, which is possible from South Woodham Ferrers site.
Bray Littlewood	POQ581 POQ709	No adequate transportation infrastructure for the proposed sites at Warren Farm and North of Broomfield these sites are not sustainable.	Developers will be required to provide the necessary public transport, cycling and walking infrastructure to mitigate the impact of their development and minimize the need to travel by car which is possible from Warren Farm and Broomfield sites.

Bright	PO1633	Has cumulative impact been considered?	The transport modelling does assess the cumulative impact of development and the junction modelling assesses key junctions in the district. More detailed assessment of local roads and junctions would be required at the planning application stage.
Brunning	PO216	Modelling assumes dualling of A132.	The latest transport modelling does not now include the dualling of the A132.
Edwards (South Woodham Ferrers Neighbourhood Plan)	PO1482	1.Keeping current A132 / B1012 route will result in: a) a development that is separate and NOT integrated and b) runs the risk of dividing current community by forcing 'through traffic' to use Ferrers Road route through town. Why no consideration to a new 'boundary road' / 'bypass' to replace the current A132 /B1012 route?	Connectivity between South Woodham site and town centre would be extremely important; therefore developer expected to provide adequate facilities to accommodate necessary linkage. Expected to be combination of grade separated and at-grade crossings, at various locations along the A132/B1012 frontage.
		2. Suggest an express bus service like at Beaulieu Park.	Expected that express bus service would be provided by the developer, similar to Beaulieu, to link to local facilities including South Woodham and Wickford stations.
Howard	PO672	Increased volume and speed of traffic on local roads near John Shennan site.	Developer would be expected to mitigate impact of development traffic on local roads. Site in good location for sustainable travel to local facilities and city centre.
Wakeling	PO1328	Concern about additional traffic from South Woodham Ferrers site.	Developers will be required to provide the necessary public transport, cycling and walking infrastructure to mitigate the impact of their development and minimize the need to travel by car, which is possible from South Woodham Ferrers site.
Massie	PO1131	Suggest left turn slip or traffic signals at Shaw Farm roundabout.	Congestion likely to be caused by Burnham Road merge from two lanes to one. Developer expected to mitigate impact of development traffic to address this and by providing sustainable transport alternatives.
Hammonds Estates LLP	Various including PO1970, PO2130,	Various, including reasons why site promoter considers site is acceptable in highway and transportation terms.	1. Hammonds Farm site is severed by A12, Maldon Road and A414, all of which are close to capacity and experience congestion and

	PO2125 and PO1939		delays. Site is adjacent to A12 junction 18; consequently expected traffic generation from site in this location expected to have additional impact on the A12 carriageway. 2. New settlement at Hammonds Farm could mean benefits arising from development on edge of Chelmsford Urban Area reduced as large proportion of new development would be detached from existing urban area, which could lead to increase in car/traffic movements to facilities in city centre. 3. Modelling impact of growth in Maldon Local Plan A12 junction 18 considered to be operating satisfactorily. However, growth proposed in this alternative spatial strategy, along with background growth in plan period, would require detailed assessment to be undertaken to ascertain the impact on the capacity of junction and A12 carriageway, along with possible mitigation options. 4. Site would require access to A414, which is strategic route linking Maldon with Chelmsford, and wider network. Significant growth planned in Maldon Local Plan, along busy strategic route which passes through urban areas, including Danbury towards A12, Junction 18. Principal traffic flows on A414 are westbound in morning peak towards A12 and Chelmsford, and eastbound in afternoon peak. In modelling impact along this route of planned growth in Maldon District Local Plan installation of pre signals at Eves Corner will assist in peak hour operation of junction by end of Maldon District Council plan period (2014 – 2029). ECC did not model any additional growth along route (other than background growth), and hence additional modelling necessary to consider potential impact of any additional growth. 5. Access to proposed phase 2 via bridge over A12 likely to encourage more trips by car into city centre as Park and Ride

			would be bypassed. 6. Although site is located close to Sandon Park and Ride site, traffic from Hammonds Farm site would have to travel through Junction 18 to Park and Ride facility with consequent impact on that junction. A further Park and Ride site suggested within Hammonds Farm site. ECC acknowledges that Park and Ride is key strategy in managing volume of longer distance journeys from outlying developments along congested corridor routes into city centre. However additional Park and Ride likely to have effect on viability of neighbouring Sandon site, Chelmer Valley, and potential additional two sites. 7. Large development at Hammonds Farm would significantly increase use of city centre rail station, which is already close to capacity, more than site in NE Chelmsford which will be in close proximity to proposed station at Beaulieu Park. 8. Although Hammonds Farm site fairly close to proposed new rail station at Beaulieu Park travel between them would be via A12 which currently experiences congestion, or by rat running though minor roads to north of site which would not be acceptable.

Yours Sincerely

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Responses to Public Representations made concerning Local Plan traffic modelling

Essex Highways has reviewed and considered the highway and transportation responses received during the public consultation process for the Chelmsford Local Plan Preferred Options. Essex Highways' response to questions/comments relating specifically to the technical aspects of the traffic modelling methodology are documented in this technical note.

The public representations regarding the Local Plan traffic modelling reported in March 2017 contain some common themes. Indeed, points raised in the Chelmsford North and West Parishes Group Report (May 2017) were subsequently referenced in representations made by members of the public. Therefore, these comments/areas of concern have been addressed issue by issue rather than by individual representation. The table below shows which combination of technical responses should be applied to each representation. Where no response number is referenced, the representation did not include questions/comments related to traffic modelling. Responses to Hammonds Farm representations have been provided in an addendum at the end of this technical note.

Name	Code	Please refer to response:
Archer	PO1465	2, 3
Ballard	PO1578	1
Ballard	PO1597	-
Ballard	PO1602	-
Bell	PO1435	2, 3
Birch	POQ299	4
Bray	POQ581	3
Bright	PO1633	9
Brunning	PO216	3, 4
Butt	PO1428	6
Edwards	PO1482	4
Hayward (Rochford District Council)	POQ531	-
Howard	PO672	-
Hurrell	POQ524	1, 5, 6
Jackson	PO1451	2, 3, 7, 8
Jackson	PO1453	2, 3, 7, 8
Littlewood	POQ709	5, 6
Massie	PO1131	-
Styles	PO256	10
Wakeling (North Fambridge Parish Council)	PO1328	-
Walker	POQ517	1, 2, 3, 5, 6, 7, 8
Walker	POQ533	1, 5, 6
Winslow (Basildon Borough Council)	PO537	-
Chelmsford North and West Parishes Group		1, 5, 6

1) Common Theme: "VISUM is a link-based model and does not consider delay at junctions"

Public Representation (Sample):

The traffic model used by Ringway Jacobs is a 'link based' model and takes no account of junctions. It provides only a strategic overview of the Chelmsford City area network in terms of link performance, based on theoretical link based capacity. The model predicts certain links across the network will be operating in excess of capacity during the modelled periods but the assessment does not take into account the presence of junctions and bottlenecks within the network. As such, it assumes that all assigned traffic can access the network equally and will only re-assign to alternative routes in response to link congestion based on journey times and congestion.

Essex Highways Response:

Whilst network capacity in the VISUM traffic model is built around 'links' (roads) rather than 'nodes' (junctions), delays at junctions are nevertheless accounted for and are determined by the volume of conflicting vehicle movements and/or the presence of traffic signals. The base year Chelmsford VISUM model used to forecast the impact of Chelmsford's Local Plan proposals, has been checked against observed journey times along a number of routes through the city. This would not have been possible if delays at junctions were not effectively modelled. Summary analysis found in the Local Plan transport impact technical reports uses link-based volume/capacity plots to illustrate areas of congestion as part of a strategic overview. Both route based and junction based delays are, however, modelled and influence overall vehicle routing in the model.

2) Common Theme: "Journey to Work patterns have changed since 2012 following Chelmsford attaining City status. Census information is therefore out of date"

Public Representation (Sample):

Under the summary of findings, Appendix 4, assumptions made– Next Steps, states that journey to work trips are based on 2011 census data. However, in 2012, Chelmsford achieved City status since when the City and its environs have seen significant construction, regeneration and expansion, which has not been reflected in the 2011 census data.

Essex Highways Response:

Whilst we acknowledge that journey patterns will have changed to a certain extent since 2012, 2011 census data is still an extremely reliable, comprehensive and widely accepted source of data for use in developing trip distributions in traffic models. The base-year traffic model used in the Local Plan assessment makes use of 2011 census data, alongside traffic count and mobile phone data obtained in 2014. Trips associated with new development since 2014 have been identified using Chelmsford County Council planning data and have been accounted for in the forecast modelling.

3) Common Theme: "The stated 5% reduction in traffic flow to account for mode shift is not achievable"

Public Representation (Sample):

Heavy weight is placed on non-use of the private car, where the Study anticipates there will be a 5% reduction in traffic, as shown in the model, which will result in lower traffic flow along major routes around the area, which will in turn make the plan feasible. However, it is considered that such a reduction cannot and will not be achieved.

Essex Highways Response:

The 5% reduction in overall vehicle trips was carried out as a sensitivity test to consider the impact of a change in travel behaviour on road conditions, and to gain a greater understanding of the severity of congestion on the road network. It was made clear in the reporting that whilst a reduction of 5% was considered to be significant, but not unrealistic, there was no evidence to suggest this would be achievable, or that it could be achieved uniformly across all trips in Chelmsford. Changes in travel behaviour as a result of peak hour congestion will be modelled to Department for Transport standards as part of upcoming Local Plan transport studies.

4) Common Theme: "Models use and 0800-0900 AM peak whereas the real peak period is earlier"

Public Representation (Sample):

In South Woodham Ferrers you produced (Appendix4) Volume/Capacity figures to ascertain peak volumes. The morning study was conducted between 8.00am - 9.00am, which was the wrong time as by then the peak of the traffic has gone. The survey needed to be conducted between 6.45am - 8.00am. The evening survey needed to be done between 4,45pm and 7.00pm instead of finishing at 6.00pm. The figures you have based your transport plan on are therefore flawed.

Essex Highways Response:

The Chelmsford VISUM Model that was used to assess the likely impact of Chelmsford's Local Plan proposals on the strategic road network, has been built for the peak hours of 0800-0900 in the morning and 1700-1800 in the evening. This reflects peak hour traffic conditions across the urban area of Chelmsford. It is acknowledged, however, that this does not reflect the true peak hour at all junctions in the administrative area and in particular in outlying towns and villages. Upcoming Local Plan transport studies will take into account the actual peak hours in South Woodham Ferrers when looking at the traffic impact of Local Plan developments on the surrounding local road network.

5) Common Theme: "The Sustainability Review does not provide a detailed enough evaluation of possible mitigation measures"

Public Representation (Sample):

(The Sustainability Review) does not provide an accurate review of the quality or reliability of the (bus) services available. Many of the services provided do not have specific infrastructure, therefore do not and will not represent an attractive mode for occupiers of new or existing development…..The sustainability review has identified potential development areas/corridors based on potential to improvements to bus services that are not defined or realistically deliverable due to conditions on the ground.

It cannot therefore be assumed that future development will be supported by a step change in terms of bus usage. In terms of cycle accessibility…..no detailed evaluation of the deliverability of such proposals has been undertaken and as such it is considered that it would be premature to identify development locations based on potential improvements to transport infrastructure and an assumption as to the extent of modal shift which can be achieved, at least without some assurance of deliverability of the infrastructure which will be needed to support this.

Essex Highways Response:

The main purpose of the sustainability review was to carry out a high level assessment of the feasibility of sustainable travel to/from Local Plan developments. Documents produced for the Chelmsford City Growth Package Public Consultation (June/July 2017) detail the County Council's vision for travel in Chelmsford up to 2036, and present a programme of improvements to the road network over this time. These include significant improvements made to the cycle network across the city, and the provision of bus priority measures along key transport corridors. Growth Package schemes have been subject to feasibility studies, and have been shaped by an awareness of the network capacity pressures that will arise through further development in Chelmsford in the future.

6) "Traffic modelling does not include the impact on junctions"

Essex Highways Response:

Initial focus of the highway impact of Local Plan proposals was placed on the strategic road network. A more detailed study of the development impact on local junctions has been commissioned for completion before Public Consultation in January.

7) "The Park and Ride at Widford has not been taken into account" (in terms of attracting traffic through Writtle)

Essex Highways Response:

The proposed Park and Ride site at Widford has been incorporated into the Local Plan strategic modelling. A proportion of vehicle trips in the model that travel to and from the city centre along routes in the vicinity of the Park and Ride site have been reassigned as trips to and from the Widford Park and Ride site.

8) "Areas on the periphery of the Chelmsford local authority area have not been calibrated or validated to the same level of detail as the modelled urban area of Chelmsford. Information currently being relied upon in assessing local impact is insufficient to make a reasoned calculation of Local Plan impact"

Essex Highways Response:

Limitations associated with the approach adopted for the strategic assessment of the Local Plan impact have been acknowledged and documented. Essex Highways have since been commissioned to undertake further work to assess the junction impact of Local Plan proposals. This looks to address the limitations of the VISUM model on the periphery of the local authority area by reducing the reliance on VISUM model outputs in these areas. Observed traffic data is, for example, being used as the basis from which to forecast traffic flows at junctions.

9) "Has the cumulative impact of increased traffic been considered?"

Essex Highways Response:

Traffic has been modelled using observed 2014 traffic volumes which have then been increased to account for a growth in trips to/from areas outside of the Chelmsford administrative area up to the end of the Local Plan period in 2036. Predicted trips to/from existing and proposed developments within the Chelmsford administrative area in 2036 have then been added. All these trips have been included on the future road network in the model to measure the cumulative impact.

10) "The report by Ringway Jacobs does not show Sandford Road as being over capacity at peak times, however as a local resident I can argue that it is over capacity"

Essex Highways Response:

The volume/capacity plots in the report are presented as an indicator of modelled congestion on the road network in Chelmsford. By this indicator, Sandford Road is not shown to be congested in the modelled peak hours, as modelled traffic flows along the road are lower than the modelled capacity. It is understood to be the signalised junctions at either end of Sandford Road that hold traffic in queues along the route. These junctions are included in the modelling and do contribute to congestion, but the delays that they cause to journeys are not shown within the volume/capacity plots.

Addendum – Hammonds Estates LLP:

Representations were received from WSP and Terence O'Rourke Ltd. on behalf of Hammonds Estates LLP regarding the Local Plan modelling of development on Hammonds Farm. These are summarised as follows:

1) WSP Comment: "Limited detail provided with regards to the assumptions in the modelling work"

Limited detail provided with regards to: Trip generation of identified sites, Trip assignment of identified sites, Design scheme used for A12 Junction 19 / Boreham Interchange and assumptions made with regards to trip reduction / reassignment associated with existing /future Park and Ride sites and Beaulieu Park Railway Station.

No detail on the validation of the model. It is not possible to determine what level of model validation work has been completed or the extent of model area that the 'periphery' relates to.

Essex Highways Response:

Comments around a lack of detail on model development and validation have been addressed by providing WSP with the appropriate VISUM model documentation.

2) WSP Comment: *"*There appear to be anomalies within the results of the completed modelling"

The most pertinent one in relation to Hammonds Farm being the saturation / queue data on the A414 Maldon Road corridor at Junction 18.

Essex Highways Response:

The V/C plots are not an illustration of queue extents, but rather an indication of potential congestion on roads. Projected 2036 traffic volumes along the A414 in the Chelmsford VISUM Model are modelled to be similar in both directions, so network conditions might therefore be expected to be broadly similar – as demonstrated in the V/C plot.

3) WSP Comment: "Hammond Farm Tests do not include the significant supporting highway infrastructure over the last two years, and do not present fair representation of future conditions and benefits of Hammonds Farm"

Essex Highways Response:

Mitigation tested for the Local Plan modelling reported in March 2017 covered strategic schemes identified by ECC and CCC with a focus on tackling traffic growth across the wider administrative area of Chelmsford. Modelling at the time did not consider schemes designed to mitigate the impact of specific proposed developments (with the exception of committed infrastructure improvements). It is considered that the right level of detail has been modelled at this stage of the assessment.

4) Terence O'Rourke Ltd. Comment:

Inadequate testing of the highways implications of the preferred option spatial strategy and the alternative spatial strategy has been undertaken to inform the Preferred Options Consultation Document, particularly in respect of the highways infrastructure that would support Hammonds Farm.

Essex Highways Response:

See previous comment.

Document Control Sheet

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Responses to Representations made concerning Local Plan traffic modelling

Essex Highways has reviewed and considered the highway and transportation responses received during the public consultation process for the Chelmsford Local Plan Pre-Submission Option. Responses to questions/comments specific to the technical aspects of the transport modelling methodology developed by Essex Highways for assessing the impact of Chelmsford City Council's Local Plan on the transport network are documented in this technical note.

Separate technical notes have been produced to address specific representations made by the North West Chelmsford Parishes Group, and the developers of the proposed Hammonds Farm site to the east of Chelmsford.

To assist Essex County Council (ECC) and Chelmsford City Council (CCC) with their own responses to representations, non - modelling queries have also been identified with common themes listed in the table below. Please note the comments below are not exhaustive, but cover the main concerns raised in the representations.

Theme	Comment	Rep no.
Development facilities	Warren Farm - insufficient facilities	PS262, PS706
	South Woodham Ferrers development - unlikely to encourage town centre integration	PS706
Site accessibility	Writtle - should be more than one access point to Warren Farm development	PS711
	Writtle - most amenities > 25 min walk and Roxwell Road unlikely to promote walking	PS711
	South Woodham Ferrers – Congestion and road safety concerns including access to Hayes Country Park	PS1028, PS1379, PS 1468
Alternative scheme proposal	Writtle Bypass should be implemented	PS707
	Review positioning of Burnham Road/Ring Road South Woodham Ferrers	PS601, PS931
	Consider dual carriageway for the A132 between Rettendon Turnpike and the junction with Willow Grove + improved street lighting and crossing points	P665, PS1028
Alternative site proposal	Development should be located to the east of Chelmsford	PS262, PS331, PS711
	Additional development should be allocated on Hammonds Farm – other sites are subject of significant transport constraints	PS1276, PS1259
	West of Chelmsford and south of Writtle should be included as site allocation	PS2039
	Strategy overly relies on redevelopment of brownfield sites which can take longer to develop	PS1276, PS1468
	Development in north should be allocated to Green Belt at Skeggs Farm	PS2039
Infrastructure	Unclear on stated infrastructure improvements regarding funding and implementation e.g. Chelmsford North East Bypass	PS953, PS1808, PS1277

	Greater consideration for traffic management to west of Chelmsford	PS706
	Growth north of Broomfield a concern	PS1810
	North East Chelmsford heavily reliant on delivery of Chelmsford North East Bypass	PS1988
	Lack of rail capacity in South Woodham Ferrers to accommodate growth	PS597
Environment/ Sustainable Transport	Channels golf course proposed for development removing valuable open space	PS1277
	Concerns around environmental / heritage impact of proposals in SWF and insufficient mitigation	PS1468
	Current methods to promote public transport not successful in the long term	PS1379, PS1808

The representations regarding the Local Plan traffic modelling reported in January 2018 contain some common themes. These comments/areas of concern have been addressed issue by issue rather than by individual representation.

1) Common Theme: "Access to the Dengie Peninsula will be limited through proposed access points and congestion on the B1012. Furthermore, housing expansion within the Dengie Peninsula has not been thoroughly considered."

Representation(s): *PS262, PS597, PS953, PS601, PS602, PS1440*

Essex Highways Response:

Roundabout junctions along the B1012 around South Woodham Ferrers, and along the A132 to the A130 Rettendon Turpike are currently being assessed in greater detail as part of a separate ongoing A132 corridor study by Essex Highways. Junction improvements along the B1012/A132 - connecting the Dengie Peninsula to the A130/A127, are being identified to help address local congestion with mitigation expected to be provided by developers. At the same time, sustainable measures are also being explored to help mitigate the impact of development to the north of South Woodham Ferrers.

Traffic modelling includes National Trip End Model based background growth forecast in Essex, and as such, will have indirectly accounted for development growth in the Dengie Peninsula. However, it was not within the scope of the transport evidence base production to model specific planned developments outside of the Chelmsford Administrative Area.

2) Common Theme: "No evidence of impact of Crossrail on traffic flows through Writtle to Shenfield"

Representation(s): *PS262, PS597, PS711*

Essex Highways Response:

Given the longer travel time, Crossrail is not expected to attract additional passengers to mainline rail services into London. Instead, it will create additional capacity on the existing network and allow through journeys across London. As such, it is unlikely to attract significant vehicle demand from anywhere in Chelmsford. For this reason, specific modelling of Crossrail demand has been deemed to fall outside the scope of the Local Plan highway modelling.

3) Common Theme: "Modelling should include development with and without Chelmsford North East Bypass delivery"

Representation(s): *PS579*

Essex Highways Response:

Modelling of the likely impact of the Pre-Submission Local Plan on the transport network considers a single set of infrastructure proposals as part of an overall mitigation strategy that also considers the implementation of sustainable measures. The programme has not allowed for the production of multiple forecast scenarios for Examination in Public. The modelling undertaken is considered to be robust and fit for the purpose of the Local Plan assessment. The Chelmsford North East Bypass is the subject of ongoing feasibility studies aimed at optimising scheme delivery around the availability of public and private developer funding. The scheme has also successfully progressed through the first stage of the Housing Infrastructure Fund (HIF) bid process.

4) Common Theme: "Chelmsford North East Bypass will have limited capacity and encourage rat-running"

Representation(s): *PS1841, PS1808*

Essex Highways Response:

The Chelmsford North East Bypass is the subject of ongoing feasibility studies aimed at optimising scheme delivery around the availability of public and private developer funding. The scheme itself is proposed to be built with sufficient capacity at year of opening, and consideration is currently being given to accommodating further capacity upgrades in the design. At the same time, parallel studies have been conducted to investigate junction capacity upgrades along the existing A130/A131 corridor between Braintree and Chelmsford, including the A131 Chelmsford to Braintree Route Based Strategy.

5) Common Theme: "Additional studies are needed to look at "with and without" scenarios for A12, A414 and A130 being upgraded/improved."

Representation(s): *PS579*

Essex Highways Response:

Options for upgrading the capacity of the A12, A414 and A130 route corridors are currently being considered as part of ongoing feasibility studies. At this stage, committed schemes have yet to be identified, and widening of the A12 around Chelmsford is not currently proposed within the Local Plan period. Infrastructure proposals modelled as part of the Local Plan evidence base focus on those that directly mitigate the impact of Local Plan development in Chelmsford. It is considered that this modelling approach is robust and fit for purpose for the Local Plan assessment.

6) "Strategic & Local Junction Modelling (Jan 2018) states highway mitigation not possible at Burnham Road/Ferrers Road junction (Table 6.1, pages 112 & 113)"

Representation(s): *PS1440*

Essex Highways Response:

In Chapter 6 of the '*Preferred Option Strategic & Local Junction Modelling*' it states there is "no mitigation identified that would benefit the private car". The junctions discussed are within ECC's Chelmsford's Future Transport Network and therefore public transport and cycling schemes will provide potential mitigation. See comment below (Chapter 6 - Summary, Conclusions & Next Steps)

"*ECC's Chelmsford's Future Transport Network zonal strategy*[1] *suggests that mitigation in the Outer and Mid Zones should focus on encouraging use of the Park and Ride and rail use, routing private car trips onto the strategic road network through dynamic signing, improving public transport and cycling links in the vicinity. The majority of the junctions that are forecast to be operating near or at capacity in the 2036 Local Plan scenario are located within these zones. The emphasis in terms of mitigation should therefore be on sustainable transport*."

7) "What is the impact of developments north of South Woodham Ferrers on roads in the Basildon district, including the A130 and A132 through Wickford?"

Representation(s): *PS586, PS1028, PS1379*

Essex Highways Response:

[1] http://www.essexhighways.org/highway-schemes-and-developments/major-schemes/chelmsford-future-transport-network.aspx

In the Essex Highways 'Chelmsford Local Plan Pre-Submission Strategic and Local Junction Modelling' report (January 2018) trip rates were examined on key roads crossing the Chelmsford administrative border. The cross boundary analysis included the A130 corridor between Chelmsford and Basildon. The report shows trips from the main developments represent a small number of trips compared to overall traffic along this corridor. The developments will therefore have limited impact on traffic in the Basildon Borough. The modelled trip rates referred to above can be found in Section 6, Table 6-1 and Table 6-2 and are shown by AM and PM peak periods. See report extract comment below which provides further detail (Section 6.3.2):

"*Development in South Woodham Ferrers, and also in North East Chelmsford, might be expected to add to background traffic flows heading south to/from Basildon Borough via the A130. The volumes of traffic modelled crossing the administrative boundary might be expected to contribute up to three additional trips a minute in either direction along the A130 (on average during a typical peak hour)"*

Further assessment of development north of South Woodham Ferrers will be undertaken alongside the testing of local mitigation measures, by developers as part of Transport Assessments, and by Essex Highways as part of an A132 Route Based Strategy commissioned by ECC. The latter will look to address challenges identified in the area around road safety, parking, crossing points along Burnham Road and management of congestion in the area.

8) "Roads won't accommodate bus/cycle lanes and there is no guarantee that people will switch to walking/cycling"

Representation(s): *PS1841*

Please note this is not a modelling query but would require a joint response from CCC.

Essex Highways Response:

ECC publications documenting the Essex Cycling Strategy[2] and the Chelmsford Future Transport Network[3] provide further detail on the focused strategy for the delivery of sustainable infrastructure improvements in Chelmsford in the future. The strategy is aimed at encouraging sustainable travel, through targeted investment in the delivery and promotion of walking, cycling and public transport infrastructure in order to provide viable sustainable alternatives to the private car.

[2] http://www.essexhighways.org/getting-around/cycling/cycle-strategy.aspx
[3] http://www.essexhighways.org/highway-schemes-and-developments/major-schemes/chelmsford-future-transport-network.aspx

9) *The queries below relate to the development at Warren Farm (West Chelmsford)*

(i) "Figure 3.15 shows a 250% increase for the Lordship Road junction by the entrance to Writtle University College."

(ii) "The modelling shows congestion will be 100% plus in the morning and evening peak along A1060 Roxwell Road and Lordship Road junction."

(iii) "No improvements are planned for the A1060/Chignal Road junction to mitigate traffic to and from the Warren Farm development. "

Representation(s): *PS707, PS711*

Essex Highways Response:

i) This representation would appear to be in reference to Figure 3.13 of the Essex Highways report 'Chelmsford Local Plan Preferred Option Strategic & Local Impact Modelling' (August 2017). The figure in question is a flow difference plot which shows the change in traffic flow between the Do Minimum and the Pre-Submission Local Plan. The plot illustrates a modelled increase of up to 250 vehicle trips by the entrance to Writtle University College as opposed to a percentage value for either congestion or capacity.

ii) This comment likely refers to Figures 3.21 and 3.23 from the Essex Highways 'Chelmsford Local Plan Pre-Submission Strategic and Local Junction Modelling' report (January 2018). The VISUM model plots show the volume of traffic flow calculated as a percentage of the capacity of the road in both peak periods for the 2036 Local Plan forecast scenario. Whilst it is accepted that development in west Chelmsford will likely lead to an increase in traffic routing through Writtle and along Roxwell Road in the future, the strategic model outputs are presented as indicators of likely congestion only. Model outputs provided for the strategic-level assessment of the Local Plan Pre-Submission will need to be supported by further detailed local modelling, to be undertaken by developers as part of future planning applications, in order to provide a more robust assessment of the local impact of future traffic flows through Writtle and along Roxwell Road.

iii) Essex Highways modelling shows the A1060/Chignal Road junction is likely to reach capacity within 2036 - as documented in the 'Chelmsford Local Plan Preferred Option Strategic & Local Impact Modelling' report (August 2017). The report further states that developer mitigation is expected at this junction, suggesting that this could be in the form of carriageway widening of the Roxwell Road West and Chignal Road approach arms. In addition to developer mitigation, the development at Warren Farm and surrounding junctions fall within the 'Mid Zone' outlined in ECC's Chelmsford Future

Transport Network[4]. As such, there will be targeted investment to provide viable sustainable alternatives to the private car, including improved walking, cycling and public transport infrastructure.

[4] http://www.essexhighways.org/highway-schemes-and-developments/major-schemes/chelmsford-future-transport-network.aspx

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1 Introduction

Essex Highways have reviewed the North and West Chelmsford Parishes Group (NWCPG) technical response to the 'Chelmsford Local Plan Pre-Submission Strategic & Local Junction Modelling' report published in January 2018. The technical response was produced by consultants TTHC Ltd on behalf of NWCPG.

The purpose of this document is to provide an Essex Highways response to concerns and queries raised by TTHC regarding the technical elements of the Pre-Submission modelling report. The main themes are categorised as follows:

- Distribution of development trips
- Trip generation methodology
- Junction selection for capacity modelling
- Traffic routing through north Chelmsford
- Sustainable transport modes

To support the review of the TTHC report, the 'Chelmsford Local Plan Preferred Option Strategic & Local Junction Modelling Addendum' also published in January 2018 will be referred to for knowledge of wider infrastructure proposals expected to impact the north and/or west of Chelmsford.

2 Response to modelling queries

2.1 Distribution of development trips (Sections 2.1 – 2.5 of Report) + Alternative Sites (Section 10)

The TTHC report uses 2011 Census journey to work data for trip distribution analysis. It shows the majority (73%) of residents in Chelmsford who drive to work either use the A12 south towards Brentwood, or the A130 south towards Southend. Based on these findings, it is suggested future residential development should be located close to the A12 and Greater East Main Line (GEML) corridor.

Essex Highways Response: It is anticipated that locating development on or close to the A12 would result in a higher volume of private vehicle commuter trips being made via A12 to destinations including Brentwood and Southend. Forecasting, however, shows that the A12 will be operating at capacity by 2036 without carriageway widening between Junctions 15 and 19. Consequently, trips originating from developments along the A12 corridor - including Hammonds Farm, are shown in modelling to rat-run through local villages and hamlets including Little Baddow, Bicknacre and East Hanningfield. As A12 carriageway widening around Chelmsford is currently not being considered as part of Highways England's RIS2 package of improvement schemes, sites along the A12 corridor are therefore located in a particularly congestion-sensitive area.

It is anticipated that sites to the north and west of Chelmsford will generate fewer private car commuter trips via the A12 than sites on or close to the A12. Proposed sites to the

west of Chelmsford are located closer to the city centre and are therefore likely to encourage greater volumes of cycling trips to employment destinations in the city centre or via the GEML to destinations in London. Locating new and sizeable developments close to each other, as proposed in North East Chelmsford, improves the viability of introducing public transport services to encourage a greater uptake in sustainable commuting to the city centre.

2.2 Trip generation methodology (Sections 4.6 and 5.7 of Report)

The TTHC report provides detailed trip rates calculated for each type of proposed Local Plan development using the TRICS database. It is stated that the trip rates used in the Local Plan modelling report do not necessarily reflect the accessibility of the individual development locations, and do not represent trip-generation from specific land-uses such as retirement homes and affordable housing.

Essex Highways Response: The Local Plan modelling undertaken by Essex Highways uses broader land-use categories from the TRICS database to calculate trip rates. These are outlined in Appendix D of the 'Preferred Option Strategic & Local Junction Modelling' report (August 2017). At the time of model development, the specific composition of proposed Local Plan sites was yet to be confirmed. Therefore, residential trip rates used in the model are representative of sites with a mix of dwelling types (privately owned houses, rented flats, etc.) This is considered commensurate with the level of detail required for a strategic Local Plan document. It is expected that developers will use more specific trip rates when appraising the highway impact of their developments.

2.3 Junction selection for capacity modelling (Section 5.11 of Report)

For Development Site 2 – Warren Farm (West of Chelmsford) the report questions the omission of mitigation proposed for the nearby A1060/Lordship Road junction.

Essex Highways Response: The A1060/Lordship Road junction is not a mitigation priority as it is not expected to exceed capacity in 2036. These results can be found in an earlier modelling report 'Chelmsford Local Plan Preferred Option Strategic & Local Impact Modelling' published in August 2017 (Table 5-16: Roxwell Road/Lordship Road model results). At the same time, development of Strategic Growth Site 2 (Warren Farm) includes proposals to upgrade the A1060/Lordship Road junction and to deliver a new roundabout access into the development.

2.4 Traffic routing through North Chelmsford related to delivery of the Chelmsford North East Bypass (Section 7.9 - 7.11 & Section 9.7 of Report)

The report highlights concerns regarding the growth in traffic across the North of Chelmsford and suggests that the Chelmsford North East Bypass (CNEB) will be necessary to mitigate the impact of development on Site 4 (North East Chelmsford), Site 5 (Moulsham Hall and North Great Leighs) and Site 6 (North Chelmsford - Broomfield). It is further stated that even if the CNEB is delivered, the Radial Distributor Road 1 (RDR1) would provide insufficient capacity to accommodate forecast strategic and local traffic flows.

Essex Highways Response: The CNEB is proposed to be delivered by 2036. The scheme is the subject of a number of ongoing studies commissioned by Essex County Council aimed at optimising scheme delivery around the availability of public and private developer funding. The scheme itself is proposed to be built with sufficient capacity at year of opening, and consideration is currently being given to accommodating further capacity upgrades in the design. At the same time, parallel studies are being conducted to investigate junction capacity upgrades along the existing A130/A131 corridor between Braintree and Chelmsford, including the A131 Chelmsford to Braintree Route Based Strategy. Further details of these studies can be found in the 'Chelmsford Local Plan Preferred Option Strategic & Local Junction Modelling Addendum' January 2018. These schemes are expected to help mitigate traffic growth in North Chelmsford.

Development Site 4 (North East Chelmsford) and Site 6 (North Chelmsford - Broomfield) are located within the 'Mid Zone' outlined in ECC's Chelmsford Future Transport Network. Investment in these areas will be targeted at providing viable and sustainable alternatives to the private car. Schemes will focus on accommodating trips through provision of fast and reliable public transport; and a safe, high quality cycling network. In addition, there are a number of proposed public transport schemes in the north of Chelmsford including a new Park and Ride facility at Beaulieu Park, bus rapid transit between Beaulieu Park and the city centre, as well as additional bus services which would make use of existing bus priority infrastructure along the Chelmer Valley Road corridor. These schemes will help to promote sustainable travel between North East Chelmsford and the city centre, and manage capacity pressure on the local road network.

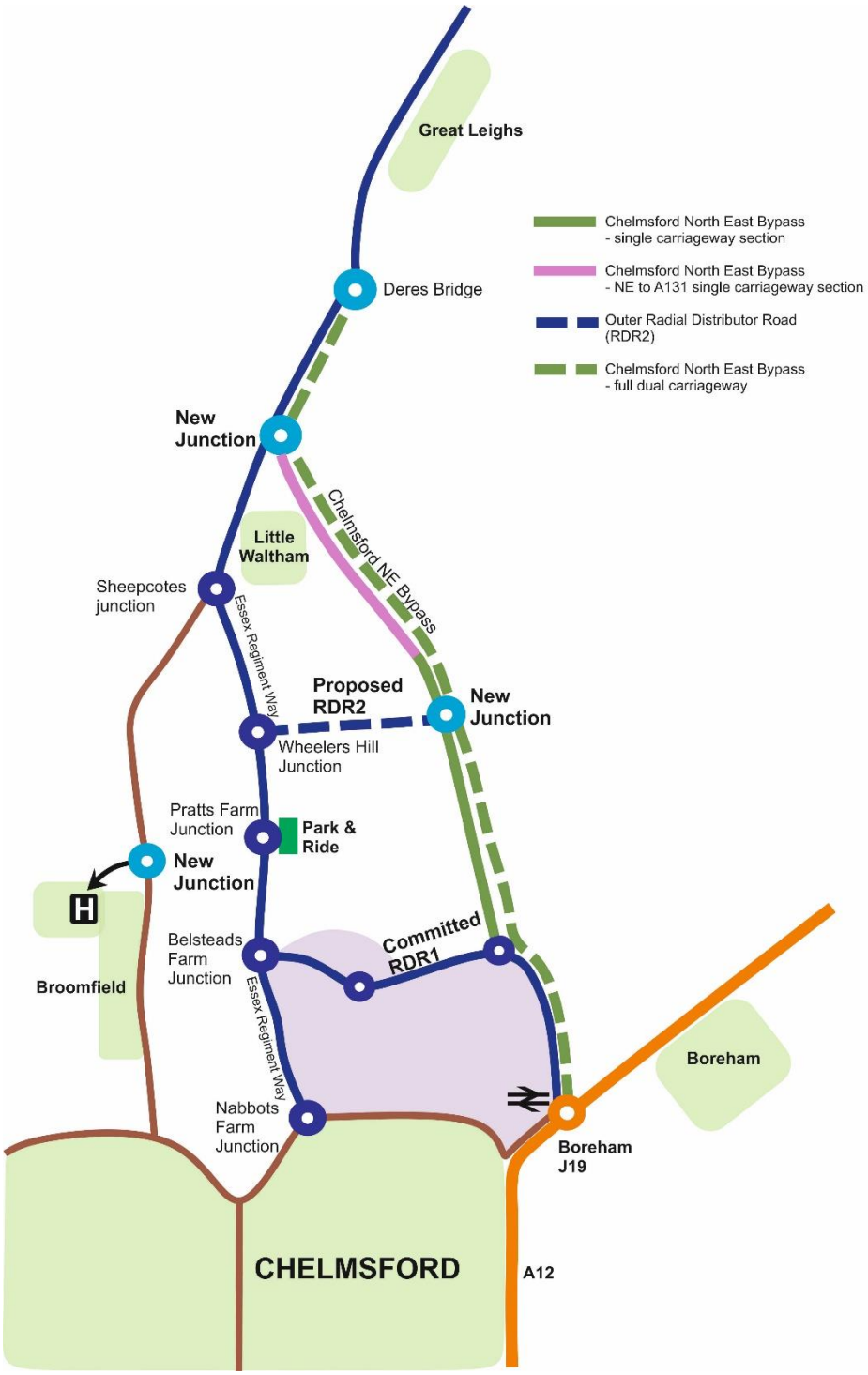

Figure 1: Proposed highway network in North East Chelmsford[1]

[1] 'Chelmsford Infrastructure Delivery Plan Update (Fig 3.1)' – Chelmsford City Council, May 2018

Figure 1 above illustrates the proposed highway network in North East Chelmsford, including the RDR1, RDR 2 and the northern section of the CNEB.

Traffic routing between the A130 north of Chelmsford and the A12 will have the option by 2036 to route via the CNEB, RDR1 or RDR2. Forecast modelling of the Local Plan Pre-Submission suggests that all three available routes will operate with sufficient capacity at the end of the Local Plan period in 2036. Longer distance through-movements are shown to route via the CNEB and RDR2, with local trips to/from the Beaulieu Park development routing via the RDR1.

2.5 Sustainable transport and connectivity in West of Chelmsford (Section 5.2 – 5.5 of Report)

The report raises concerns that the Warren Farm development will not promote sustainable trips to the town centre and requires improved connectivity for walking and cycling trips. The report also states congestion forecast at the end of the Local Plan period (2036) along A1060 Roxwell Road would impact journey time reliability for buses.

Essex Highways Response: Essex Highways acknowledge that the distance from the Warren Farm development to the city centre may not encourage walking trips. However, there are ongoing initiatives such as the Essex Cycling Action Plan and ECC's Chelmsford Future Transport Network (as stated in response 2.4) which are aimed at encouraging sustainable travel through public transport and improved cycling connectivity. The developer will also be expected to address the need for sustainable transport accessibility to/from Warren Farm as part of the Transport Assessment for the development. This could involve discussions with Essex County Council and local bus companies to extend and/or introduce new services to the site.

Signalised junctions on the A1060 Roxwell Road into the city centre meter traffic flows, and effectively contribute to journey time reliability along the route. It is acknowledged that the A1060 route between the proposed Warren Farm site and the city centre is currently congested. Yet, because of this, and as a result of traffic signal metering, journey times for cars and buses between Chignal Road and Parkway would not be expected to worsen significantly as a result of an increase in development in West Chelmsford.

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Introduction

Essex Highways have reviewed the latest 'Hammonds Farm Appendix 4 Transport Representation' in response to the published findings within the 'Chelmsford Local Plan Pre-Submission Strategic & Local Junction Modelling' report (January 2018). The representation was produced by consultants WSP Ltd on behalf of Hammonds Farm.

The review of the latest Hammonds Farm representation responds to technical queries made regarding the scope of the Pre-Submission modelling undertaken by Essex Highways. These have been raised by WSP in light of their key concern that the Pre-Submission modelling does not give due attention to an alternative Local Plan scenario with the Hammonds Farm development included. The review also provides a technical response to key developer modelling assertions made in their representation in support of the Hammonds Farm development.

This technical response is structured around four specific modelling points raised by WSP in their representation document, as shown below:

- Growth in Maldon and Junction improvements at A12 Junction 18
- Impact of Hammonds Farm in the inter-peak period
- A12 Junction 18/A414 Maldon Road junction capacity
- Mitigation on the A12 corridor

It should be noted that the Essex Highways response is provided with an awareness of continued concerns around the robustness of the modelling undertaken by WSP as part of their local junction modelling of the Hammonds Farm development. Where appropriate, concerns raised by Essex Highways in our 'Hammonds Farm Document Review' (January 2018) have been restated or expanded upon. The review note is also appended to this document for reference.

This document does not cover a review of the mitigation proposed by WSP in their representation. Proposals are understood to be the same as those included in the Hammonds Farm Site Access Appraisal (October 2016). Essex Highways were not previously commissioned to review this document, and a separate study would be required to assess the viability of the mitigation proposed.

The Hammonds Farm representation also questions the viability of current Pre-Submission development sites. It is anticipated that developer concerns around deliverability and sustainable transport provision will be addressed separately in a co-ordinated response between Chelmsford City Council and Essex County Council.

Responses to Hammonds Farm Representation

1.1 Growth in Maldon and Junction improvements at A12 Junction 18

Section 1.6 of the Hammonds Farm representation states that the Local Plan Pre-Submission modelling does not take account of growth associated with the Maldon Local Plan, and has not considered mitigation at the A12 Junction 18 to address congestion modelled at the junction in the future.

Essex Highways Response: The Chelmsford VISUM Forecast Model used in the Local Plan Pre-Submission assessment, incorporates development growth in Maldon through the use of TEMPro/NTM growth factors to calculate future background traffic flows. This standard approach is considered to be reasonable, commensurate with the strategic nature of the modelling, and comparable with the approach adopted by other Essex local planning authorities.

Section 5 of the Essex Highways Preferred Option Strategic & Local Junction Modelling' report (January 2018) considers mitigation at key junctions across the Chelmsford administrative area. Junction improvement proposals reported in the Preferred Option modelling report focused on smaller-scale capacity enhancements. It was concluded that larger-scale junction capacity improvements, including bridge widening over the A12 would likely be required at Junction 18 to accommodate future traffic flows. However, the report acknowledges that such capacity improvements would have the potential to encourage a greater number of car trips into the city centre. It therefore states that mitigation should focus on improved signage for strategic trips in the area and encouraging the use of local park and ride and public transport services – in line with Chelmsford's Future Transport Strategy.

1.2 Impact of Hammonds Farm in the inter-peak period

Section 1.3 and Appendix A of the Hammonds Farm representation states that the Hammonds Farm development will have less of an impact on the road network in the inter-peak period than other development scenarios. This assertion is based on outputs taken from the Chelmsford VISUM Model showing total vehicle kilometres and total vehicle hours travelled across the modelled area (as reported in Appendix A of the representation document). These outputs were compared between the Local Plan Preferred Option and WSP's alternative Hammonds Farm allocation scenario, and showed that values were lower in the inter-peak VISUM model with the Hammonds Farm development included.

Essex Highways Response: In earlier correspondence with WSP, Essex Highways advised that the measure of total kilometres and hours travelled across the VISUM modelled network could not be considered robust, as it is influenced by vehicle routing across the wider Essex area contained within the buffer network. The wider Essex area in the buffer network is modelled with a less comprehensive road network, a more

simplistic assignment of vehicle trips, and is not expected to contain accurate volumes of vehicle trips away from the Chelmsford area. An evaluation of total vehicle distance and time travelled within the validated area of Chelmsford would likely offer a more robust appraisal of the wider impact of the development, albeit focussed on the urban area of Chelmsford.

Essex Highways would therefore argue that the modelling evidence referenced by WSP in their representation is insufficiently robust to confirm the merits of the Hammonds Farm development in the inter-peak period.

1.3 A12 Junction 18/A414 Maldon Road junction capacity

Appendix B of the latest Hammonds Farm representation states the existing A12 Junction 18 currently operates within 91% capacity. With a revised layout, additional growth and Hammonds Farm (Phase 1) development trips, the junction is forecast to operate at a maximum capacity of 65%. Under the alternative Local Plan scenario, this junction could therefore accommodate the development traffic to and from Hammonds Farm.

Essex Highways Response: These findings are understood to come from the 2016 Site Access Appraisal which was the subject of concerns raised at the time by Essex County Council, Chelmsford City Council and Highways England around the calculation of forecast traffic flows at Junction 18. In response, the 2017 'Hammonds Farm Strategic Highway Modelling' report issued by WSP, demonstrated that 2036 forecast flows at Junction 18 taken from the Chelmsford VISUM model were lower than those used in their 2016 Site Access Appraisal, and provided apparent justification for the continued use of forecast flows presented in the 2016 appraisal.

However, outputs provided by Essex Highways from the Chelmsford VISUM Model were subject to a number of caveats alongside recommendations on how the model outputs could be used to facilitate a more robust capacity assessment of Junction 18. Specific caveats associated with the VISUM outputs provided are outlined below:

- Outputs omitted traffic flows to/from Hammonds Road
- Need to account for a diversion of traffic flows away from the A1414 and Junctions 18 – with higher traffic flows routing via Woodhill Road
- Need to account for a reassignment of traffic flows away from the A12 and via routes including the B1418
- VISUM model flows considered suitable only for use in determining assignment of development trips – with background growth required to be applied separately to traffic counts.

These caveats do not appear to have been acknowledged and the recommendations on how they should be used do not appear to have been followed. Consequently, Essex Highways contend that the current modelling evidence provided by WSP is insufficient in addressing the prior concerns raised in 2016.

1.4 Mitigation on the A12 corridor

The latest Hammonds Farm representation raises concern that Essex Highways have not modelled the A12 widening scheme (J15-19) as a mitigation measure.

Essex Highways Response: The Local Plan modelling has not considered A12 widening around Chelmsford as it is not currently part of any Highway England proposals, including the RIS2 package of planned infrastructure improvements. Consequently, there is no funding currently attached to road widening between J15 and J19. In order to manage the scope of the Local Plan modelling, the forecast year includes committed future development and infrastructure only, whilst the Local Plan scenario includes Local Plan infrastructure proposed to directly address the impact of Local Plan development.

Appendix A

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1 Introduction

1.1.1 The following document has been reviewed by Essex Highways in relation to the proposed development on Hammonds Farm, Sandon, Chelmsford.

- Hammonds Farm, Strategic Highway Modelling Report (WSP, September 2017)

1.1.2 The Hammonds Farm Strategic Highway Modelling report documents the latest modelling of the transport impact of the proposed development, and makes use of outputs from the Chelmsford Strategic Model (in VISUM) that were supplied by Essex Highways in September 2017.

1.1.3 This review focuses on the use of VISUM outputs and the robustness of the conclusions drawn from the latest modelling. It has been carried out with an awareness of the known limitations of the VISUM model and the corresponding recommendations made on use of the model data provided by Essex Highways to WSP prior to commissioning model runs for their September 2017 assessment.

1.2 Hammonds Farm Strategic Highway Modelling Report - Review

1.2.1 With regards to wider strategic impact, WSP have concluded that flow and congestion differences between the Local Plan Preferred Option and the Hammonds Farm alternative option are marginal. This is accepted as being in line with the general conclusions derived from the assessment of alternative development allocation scenarios[1], as well as from observations made between the modelling of the Local Plan Preferred Option and the latest Pre-Submission Option.

1.2.2 A review of the total distance and time travelled in the model has been presented for the Local Plan Preferred Option and WSP's alternative allocation scenarios. However, similar analysis has not previously been undertaken for the Local Plan modelling. Therefore, it is not possible to comment on the validity of the conclusions drawn. The robustness of total model outputs could, for example, be affected by the incorporation of data obtained from the peripheral areas of the model. An evaluation of total vehicle distance and time travelled within the validated area of Chelmsford would likely offer a more robust appraisal of the wider impact of the development, albeit focussed on the urban area of Chelmsford.

1.2.3 With regard to the local impact on A12 Junction 18, WSP have demonstrated that the 2036 forecast flows from the VISUM model passing through the junction are significantly lower than those used in their 2016 Site Access Appraisal. This is consistent with our own understanding of forecast flows in the Chelmsford Strategic Model outside of the validated area. However, as we previously advised, the VISUM model is not an appropriate tool for directly assessing the highway impact at specific junctions located outside of the model validation area – including Junction 18.

1.2.4 Specific factors have previously been identified by Essex Highways that have led to a reduction in flow in VISUM through Junction 18:

- The omission of traffic flows to/from Hammonds Road
- The diversion of traffic flows away from the A414 and Junction 18 – with higher traffic flows routing via Woodhill Road
- Reassignment of traffic flows away from the A12 and via routes including the B1418 through Bicknacre

[1] As documented in 'Chelmsford Local Plan – Transport Impact Sensitivity Testing & Sustainability Review – March 2017'

1.2.5 WSP argue that, by accounting for diverted trips on Woodhill Road, adjusted modelled traffic flows entering Junction 18 remain lower than those predicted at the junction in the 2016 Site Access Appraisal. Essex Highways remain of the opinion that VISUM model outputs should not be used directly in capacity assessments of Junction 18. Rather, as advised in the brief response to WSP, the change in flow through the junction, with development and associated infrastructure included, should be taken from the VISUM model and applied to observed traffic flows factored by TEMPro/NTM to a forecast year. The change in model flow would need to account for routing discrepancies associated with the factors bulleted above.

1.2.6 When agreeing the scope of the modelling work requested by WSP, Essex Highways provided guidance in their brief response document on how to best address the absence of Hammonds Road in the VISUM model. This involved the use of observed count data to supplement the model outputs provided at Junction 18. It is not clear from the report how WSP have separately incorporated Hammonds Road traffic flows into a new assessment of the junction. If, as it appears, WSP have reported VISUM model outputs directly in their comparison with junction approach flows from their 2016 appraisal, then the VISUM values presented do not include Hammonds Road traffic and will likely be an underestimate of forecast totals.

1.2.7 We accept that the modelling shows the Hammonds Farm development to have little impact on conditions along the A12 corridor. However, this is understood to be because the A12, in the vicinity of the development, is at capacity in the modelled forecast year (2036). Congestion modelled along the A12 without carriageway widening is shown to result in Hammonds Farm development trips and background traffic flows routing away from Junction 18. It should be acknowledged that the development impact on Junction 18 will likely need to be re-evaluated in the event that HE proposals for the A12 in Chelmsford are revised.

Stow Maries Great War Aerodrome Position Statement June 2018

1. Purpose

1.1 This position statement provides an account of evidence on future use of Stow Maries Great War Aerodrome, outside the Chelmsford City Council area. This is in response to concerns raised by Stow Maries Parish Council during consultation, on the potential effects of increased use of the Aerodrome on the Local Plan allocation for South Woodham Ferrers.

2. The Aerodrome

2.1 Stow Maries Great War Aerodrome is the most complete World War One airfield in Europe, and is of outstanding architectural and historic significance. It was bought from private owners in 2013 with national and local funding including the National Heritage Memorial Fund, and is run as a charitable and educational visitor venue.

2.2 There are two grassed runways which can be used by light aircraft, and the site houses a small collection of original and reproduction historic aircraft. Occasional Special Public Event Flying Days are held to display these aircraft and other visiting historic aircraft.

3. Local Plan

3.1 The Local Plan proposes to allocate land to the north of South Woodham Ferrers (Strategic Growth Site 7) for development of 1,000 new homes, 1,000sqm of business floorspace, 1,900sqm of convenience retail floorspace, 5 serviced plots for Travelling Showpeople, and supporting development.

3.2 The distance between the Aerodrome and the allocated site is 1.3 kilometres at the closest point. It is located in Purleigh Parish, within the adjoining Maldon District.

4. Stow Maries Parish Council

4.1 Stow Maries Parish Council is also in the Maldon District, and its western boundary adjoins the eastern boundary of Chelmsford City Council's area.

4.2 In response to the Local Plan – Pre-Submission consultation, Stow Maries Parish Council made a representation to Strategic Growth Site 7 as follows (Consultation reference number PS2026):

> 'PROPOSED DEVELOPMENT AREA SERIOUSLY BLIGHTED (PYLONS/INCREASED AIR TRAFFIC)
> The development (and inevitably housing areas) would also be sited directly beneath approved take-off/landings routes to/from Stow Maries

Great War Aerodrome (currently proposed 4,200 flight movements per annum, 30 per day) for which the Aerodrome's own data records 87dB noise levels at adjoining Edwins Hall.'

5. Aerodrome Planning History

5.1 As referenced in Stow Maries Parish Council's representation, a planning application had been considered by Maldon District Council to increase the number of flight movements from the Aerodrome.

5.2 The existing number of flight movements, approved under planning reference 09/00250/FUL (March 2009), and the level proposed by the planning application 16/01142/FUL are shown below:

Existing 09/00250/FUL	**Proposed** 16/01142/FUL
Take-off/landing between 08.00 and 20.00 or sunset if earlier	Take-off/landing between 08.00 and 20.00 or sunset if earlier
2 Special Public Event Flying Days a year each not exceeding 3 days	4 Special Public Event Flying Days a year each not exceeding 2 days
Maximum of 12 take-off/landings per day* 74 take-off/landings in a calendar month*	Maximum of 25 take-offs and 25 landings per day in winter, and weekdays in summer. Maximum of 50 take-offs and 50 landings per day in summer on Saturday, Sunday and Bank Holidays; 25 additional take-offs and 25 landings per day for Special Public Event Flying Days (no monthly figure)
360 take-off/landings in a calendar year*	8,000 take-off/landings in a calendar year
** Later clarified to mean take-off **or** landing; effectively doubling the above figures to 24 per day, 150 per month and 720 per calendar year.*	

5.3 Planning application 16/01142/FUL was considered by Maldon District Council's North Western Area Planning Committee in June 2017. The recommendation was for approval, but it was called in by Members for a decision by full Council. Full Council refused the planning application at their meeting in July 2017, for the following reason:

'The development would take place in a relatively quiet and tranquil rural location. The proposed significant increase in flight movements from that what is approved at this time of 360 movements per annum, to the proposed maximum of 8,000 movement per annum, is considered to result in a detrimental impact on the area and on the

existing residential amenity due to a substantial increase in the number of disturbances. The proposal would significantly and unacceptably change the character of the surrounding area and therefore the development is considered to be contrary to Policies D1 and D2 of the Maldon District Local Development Plan and Paragraph 123 of the National Planning Policy Framework in that the impact of the increased flight movements would adversely affect the tranquility of the rural area.'

5.4 The Aerodrome submitted an appeal against refusal in September 2017, but this was withdrawn in November 2017.

5.5 A further planning application has been submitted under the reference 17/01071/FUL, reducing the number of proposed aircraft movements from 8,000 to 4,200 a year, including 30 aircraft movements a day (reduced from 50), and 120 on Special Public Event Flying Days (reduced from 150). This application has not yet been determined.

5.6 A number of other planning applications for work to buildings on the site, including Listed Buildings Consent, have been approved by Maldon District Council between 2009 and 2018.

6. Aerodrome Noise Evidence

6.1 Much of Maldon District Council's discussion has centred around the potential for noise nuisance from the increased number of flights.

6.2 The Aerodrome application was accompanied by a Noise Impact Assessment carried out by consultants Sharps and Gayler in March 2017.

6.3 The report uses a noise index to model noise levels over a period of time, called LaeqT. Noise levels are described in terms of decibels (dB).

6.4 Current Government Policy is contained in the Noise Policy Statement for England, which sets out adverse effects of noise as ranging from low to significant. Although it does not quantify these levels with dB figures, the World Health Organisation Guidelines for Community Noise (1999) suggests 50 dB causes low effects, and 60 dB causes significant effects.

6.5 The consultants carried out a survey to record prevailing ambient and background sound levels, and of an aircraft taking off and landing. Then the aircraft movements were modelled, and predicted effects shown on a contour map. The contours show the highest noise levels at Edwins Hall, south-west of the Aerodrome, and just north of the site boundary of Strategic Growth Site 7, at 45 dB on weekdays, and 48 dB on Special Public Event Flying Days. A single noise level was recorded at 87 dB at Edwins Hall, but it is common practice – as has been calculated in this report – for levels to be modelled as averages over a period of time.

6.6 The contours, when overlaid on the site area of Strategic Growth Site 7, show that predicted noise levels range from 46 dB to 34 dB.

6.7 As these levels are below the 50 dB, the report concludes that the effects of increasing the number of flight movements would not exceed the 'low effects' level, and therefore no mitigation measures are necessary.

6.8 In addition, the Planning Statement accompanying the planning application outlines the guidance issued by the Aerodrome to pilots. This directs aircraft to follow prescribed routes and avoid flying over areas of habitation, when approaching and leaving the Aerodrome. Due to its proximity to Southend Airport, a designated corridor for light aircraft visiting Southend Airport, or for passing on a south-west to north-east axis, passes over the Aerodrome. Therefore, much of the existing air traffic in the Stow Maries area is using this corridor, and not using Stow Maries Aerodrome.

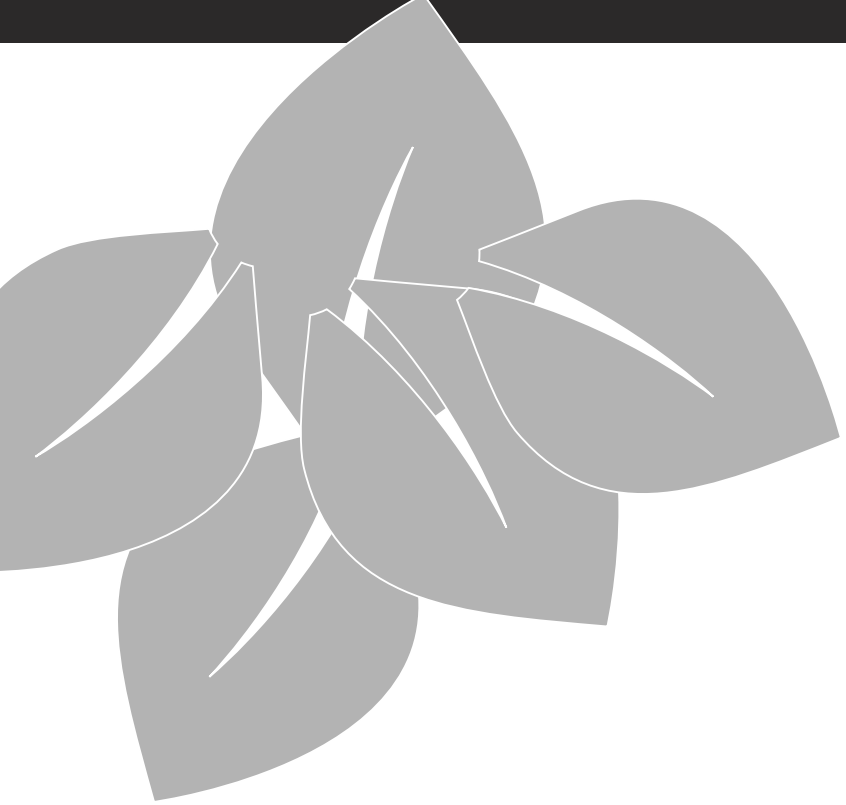
6.9 The Aerodrome is committed to establishing an Airport (or Aerodrome) Consultative Committee (ACC) if planning permission is granted in future. The Government endorses use of an ACC to involve the community in operation of airfields and to resolve local issues. This can include agreeing on optimum flight paths to minimise noise disturbance to local houses.

6.10 The ACC would also improve the procedure for giving prior permission to visiting pilots to land, to ensure the number of flight movements is not exceeded and that pilots understand Aerodrome operating procedures.

7. Conclusion

7.1
- Stow Maries Aerodrome is a small facility for light aircraft, with restricted use
- The available evidence demonstrates that the proposed additional flight movements would not raise the noise level to cause significant effects
- Pilot guidance directs aircraft to follow prescribed routes and avoid habitation
- There is already a quantity of air traffic in this area using a designated flight corridor
- The community would have a means of discussing noise and other issues through an ACC
- It should also be noted that planning application reference 16/01142/FUL was refused on grounds including the effect on the tranquillity of the rural area. If development proceeds as proposed in the Local Plan, this area will no longer be rural in nature.

7.2 There is, therefore, no evidence to support the objection that proposed development at Strategic Growth Site 7 would be seriously blighted.



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