A12 Chelmsford to A120 widening scheme

TR010060

9.37 Applicant's Comments on Essex County Council's Local Impact Report

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A12 Chelmsford to A120 widening scheme

Development Consent Order 202[ ]

Applicant's Comments on Essex County Council's Local Impact Report

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CONTENTS

1 Introduction

1.1.1 The Development Consent Order (DCO) application for the A12 Chelmsford to A120 widening scheme (the Scheme) was submitted by National Highways to the Secretary of State for Transport via the Planning Inspectorate on 15 August 2022 and accepted for Examination on 12 September 2022.

1.1.2 The purpose of this document is to set out the Applicant's comments on the Local Impact Report (LIR) received by Essex County Council (ECC) [REP2-055], one of the Scheme host authorities.

1.1.3 ECC's LIR [REP2-055] was published on the Planning Inspectorate website on 15 February 2023.

1.1.4 The Applicant has responded to each of the sections in the LIR in the table below.

1.1.5 The Applicant has responded to paragraphs numbers found in the ECC LIR [REP2-055], grouping paragraphs where relevant. The paragraph references can be found on the right-hand side of the table below.

2 Comments on Essex County Council's Local Impact Report

0. Executive Summary - 3. Description of the Current Situation

0 - 1.1

The Applicant notes the content of the executive summary and is grateful for the support of the scheme expressed by Essex County Council.

The Applicant also notes that more detail will be provided by Essex County Council in further sections of the Local Impact Report. The Applicant will provide a substantive response to each of these points within the specific sections set out in the Local Impact Report.

The Applicant has undertaken extensive engagement with the council and recognises that in terms of design and traffic the central matters in discussion and have been:

- · Main Road compliance with proposed speed limits
- · Provision of a Maldon Link Road
- · Proposals for the sections of the road to be de-trunked
- · Additional local road interventions to manage traffic flows on the B1023, and in Messing and Tiptree
- · Walking, cycling and horse-riding facilities and their compliance with LTN 1/20
- · The council's desire for traffic monitoring to be undertaken following the opening of the scheme

The Applicant will provide responses to the matters listed above, amongst other topics, within this detailed response to the Local

Impact Report. Of note are the letter exchanges that the Applicant has had with the council which can be found in Applicant's Response to Relevant Representations [REP1-002]. In addition, of note is the Statement of Common Ground with Essex County Council [REP2-017] which sets out the Applicant's ongoing discussion with the Council in relation to the requested changes.
1.2 - 1.2.4
The Applicant notes Essex County Council's comments regarding ongoing engagement and the sharing of information including the reference to letter exchanges. In regards to the table of documents, the Applicant has received the following documents: • · B1137 Main Road Boreham technical note (Essex Highways) - received 7 February 2023. • · National Highways J24, Inworth Road and Community Bypass Technical Report dated 29 July 2022 – received 14 February 2023. • · Inworth, Messing and Tiptree mitigation options technical note (Essex Highways) - received 7 February 2023. • Messing Action Group Report Review - received 12 July 2022 The Applicant has not received the following documents: • · Duke of Wellington junction technical note • · Junction 21 technical note • · Gore Pit junction technical note

• · De-trunking technical note (Essex Highways) • Design review of Inworth Road roundabout and Maldon link road options As discussed at the Issue Specific Hearing 1, it is the Applicant's understanding that these will formally be submitted by the council at deadline 3. As such the Applicant will provide a response at deadline 4. The Applicant can confirm it received Appendix 1 on 7 February 2023, and met with Essex County Council on 21 February 2023 to discuss the contents of it. The Applicant believes it has responded to the issues raised in the letter within this response to the council's Local Impact Report. However, the Applicant will of course continue to engage with the council on these matters and the next planned meeting is 13 March 2023.
1.3.1 - 1.3.4
The Applicant notes Essex County Council's concern around PPA and funding. A PPA was agreed for pre DCO submission (Aug 22) covering Stage 3 activities, these include preliminary design and submission of our DCO. As the applicant is running Stage 4 and 5 concurrently, (Stage 4 being the DCO Examination and Stage 5, construction preparation and detailed design, a PPA is currently under consideration for the detailed design phase. For clarity, where the Applicant has concluded that mitigation is required as part of the application for development consent, this has been included within the documents submitted. As noted by the council, however, there are further enhancements beyond the requirements of the scheme that the council is seeking and the council is correct to say these could be submitted as applications for designated funds. An example of this might be additional active travel provision to be delivered outside of the proposed scheme. The council is also correct to say that there is no guarantee that a bid for Designated Funds would be successful, however considering that the DCO is not reliant upon these applications being success the Applicant does not believe that this should result in the particular intervention being a requirement of the DCO.

Outside of the DCO process, the Applicant does look forward to ongoing engagement on Designated Fund opportunities with the council to ensure that any applicant does have the best chance of success.
2.1 - 2.2.1
The Applicant notes the Essex County Council'scomments and welcomes Essex County Council's in principle support.
3.1 - 3.6
The Applicant notes Essex County Council's comments.
4. National Planning and Transport Policy **4.1 - 4.2**
The proposed scheme's assessment against the current National Policy Statement for National Networks is set out in Appendix A: National Networks National Policy Statement Accordance Table of the Case for the Scheme [APP-250]. While the review of the NPSNN is undertaken, the NPSNN remains relevant government policy and has effect for the purposes of the Planning Act 2008. The NPSNN will, therefore, continue to provide a proper basis on which the Examining Authority can examine, and the Secretary of State for Transport can make decisions on, applications for development consent. Upon the arrival of the reviewed NPSNN in 2023, the Applicant will undertake a review of the emerging policies and dependant on the status of the document may provide a supplementary accordance table should that be necessary. To note that the Draft NPSNN is likely not to be a material consideration due to its release late into the proposed scheme examination or decision process.
4.3 - 4.3

Local Plans and other documents, such as the National Planning Policy Framework (NPPF) (The Department for Levelling Up, Housing and Communities, 2021), can be a relevant consideration when making decisions on DCO applications. The NPPF states that NPSs are the primary decision-making document for NSIPs under the Planning Act 2008. Paragraph 5 of the NPPF states: 'The Framework does not contain specific policies for nationally significant infrastructure projects. These are determined in accordance with the decision making framework in the Planning Act 2008 (as amended) and relevant national policy statements for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework).' Paragraph 1.17 and 1.18 of the NPSNN (DfT, 2014) states that the overall strategic aims of the NPSNN and NPPF are consistent and that the NPPF will be an important and relevant consideration 'but only to the extent relevant to [the] project'. In some instances the NPPF may provide more detail. Consequently, throughout the Environmental Statement [APP-069 to APP-085] chapters there are references to the NPPF. The Case for the Scheme [APP-249] assesses the proposed scheme against policy and how the proposed scheme meets the requirements of the objectives set out in the NNNPS. This assessment is available in Appendix A of the Case for the Scheme [APP-250]. The National Planning Policy Framework is a material consideration under the 2008 Act and as such the applicant has prepared an assessment against the relevant Development Plan policy in the Case for the Scheme - Appendix F: Local Planning Policy Accordance Tables [APP-252].
4.4 - 4.4

A number of embedded (design) and standard mitigation measures are proposed in order to reduce the carbon footprint of the scheme. These include (as described in paragraphs 15.10.2 and 15.10.6 of Chapter 15: Climate [APP-082]):

- · design alterations to reduce the magnitude of GHG emissions associated with construction phase activities;
- · measures which have been taken in order to support active travel, thereby encouraging modal shift from private car and reducing operational phase road user GHG emissions;
- · measures which have been taken in order to reduce carbon losses from existing carbon stores (such as soil and vegetation) and improve carbon sequestration;
- · measures which would reduce the magnitude of GHG emissions associated with construction phase activities; and
- · measures to reduce the magnitude of GHG emissions associated with the use of materials and waste disposal.

Furthermore, additional measures (which have not been accounted for within the assessment) are being considered as part of the ongoing detailed design process in order to further avoid or reduce GHG emissions during the construction stage, where practicable and cost-effective, including:

- · using electric (or alternative lower-carbon fuel) construction equipment instead of conventional diesel-powered construction plant
- · using vehicles fitted with telematics and start/stop technology
- · using onsite renewable energy generation and storage to reduce diesel generator use and power taken from the grid
- · using low resource and low energy solutions for the site compound, offices and welfare facilities
- · ensuring availability of grid connections for compounds (maximising access to lower carbon-intensity energy from grid

electricity) Measures would also be taken to further avoid or reduce GHG emissions associated with the consumption of raw materials, where practicable and cost effective, including: · The design specification, which will be developed as part of the detailed design, would aim to reduce or avoid, where practicable, the use of carbon intensive materials (e.g. concrete and cement). Where this is not practicable, material volumes or processes would be substituted with lower intensity replacements where practicable and if achievable within the bounds of the design standards for safety and quality. In order to help guide this process, a voluntary 30% carbon reduction target has been set for the embodied carbon associated with the proposed scheme, progress against which would be determined and assessed with reference to PAS:2080 (the British Standard for managing carbon in infrastructure). Further specific commentary on the impact of the proposed scheme on modal shift, and active and sustainable travel, in response to Section 8 of this LIR, is provided within the responses below.
4.5 - 4.5
The Applicant recognises the aspirations set out in these DfT documents and the extensive new and improved routes for these modes that form part of the proposed scheme reflect that ambition. The proposals provide both utility and leisure routes which are substantially better than the existing provision, and where further improvements for specific elements can be achieved these will be considered. An example of a further improvement that may be considered is the removal of staggered signal crossings in favour of single-stage provision where this can be accommodated.
4.6 - 4.6

The Applicant notes Essex County Council's observations. The proposed scheme removes severance for these modes in several locations, and provides substantially improved routes and crossings in others, for example removal of routes alongside the A12 in favour of segregated routes alongside quieter roads. For this reason, the proposed scheme is considered to demonstrate a substantive contribution to the support for active travel infrastructure and its use.	
	4.7 - 4.7
The Applicant recognises these aspirations in LTN 1/20 and the need to provide infrastructure that is as direct and convenient as feasible to maximise attractiveness especially for utility use. It is the Applicant's view that the design does meet the requirements of LTN 1/20. The guidance recognises that desirable criteria set out for design provision should always be the aspiration, but that constraints also limit feasibility in places and compromises are needed in those situations. Therefore the design approach has been to conform to the desirable design characteristics where feasible, but that in all cases the design meets the minimum criteria set out in LTN 1/20. In addition to the extensive new provision of routes for example using connected access tracks, the Applicant's design also brings existing routes alongside A12 and local roads up to LTN 1/20 level of service.	
	4.8 - 4.8
The Applicant notes the content of the GG 142 design reference document and confirms that the proposed scheme has complied with those requirements, in completion of reports as required by that document and in the design development which is still ongoing.	
5. Sub-Regional Transport Policy - 6. Local	**5.1 - 5.1.6**

Planning and Transport Policy
The Applicant agrees with Essex County Council's comments about the strategic importance of the A12 and is of the view that the proposed scheme meets the vision set out in the Transport East Transport Strategy. The proposed scheme will improve safety, reduce congestion on the road and make the road more resilient.
6.1 - 6.1
Chapter 16: Cumulative Effects Assessment of the Environmental Statement [APP-083] includes a cumulative assessment of surrounding developments. This covers cumulative effects on housing, services, facilities, employment, education and skills resulting from the proposed scheme in combination with NSIPs in the region. The proposed scheme's assessment against the National Policy Statement for National Networks is discussed in Appendix A: National Networks National Policy Statement Accordance Table of the Case for the Scheme [APP-250] and the assessment against the relevant Development Plan policy is discussed in Case for the Scheme - Appendix F: Local Planning Policy Accordance Tables [APP-252].
6.2 - 6.2
The proposed scheme objectives as set out in the Case for the Scheme [APP-249] support the outcomes and commitments set out in Everyone's Essex. One of the key objectives of the proposed scheme is to support the growth identified in Local Plans by reducing congestion related delay, improving journey time reliability and increasing the overall transport capacity of the A12. The proposed scheme also aims to reduce environmental impacts by reducing the visual, air and noise quality impacts of the proposed scheme on affected communities on the route and reduce the capital carbon and biodiversity impact of the proposed scheme. The Applicant has sought to maximise biodiversity delivery, as reported in Appendix 9.14 of the Environmental Statement [APP-138]). This demonstrates that based on the design and Order limits from DCO submission, the current biodiversity unit forecast for area based habitat is estimated to be 25.01% gain in units, as compared to the baseline. This is substantially greater than the

provision for the anticipated mandatory requirement to provide a 10% BNG, associated with the recent Environment Act 2021. Embedded design measures have also been taken in order to support active travel, thereby encouraging modal shift from private car and reducing operational phase road user GHG emissions as set out in Chapter 15: Climate [APP-082]. Measures have also been taken to reduce GHG emissions during the construction stage, where practicable and cost-effective. The proposed scheme would also provide considerable improvement to walking, cycling and horse riding (WCH) provision as shown on the Design Access Statement [APP- 268] and its Appendix A WCH Strategy [APP-269]. The proposed scheme would include a total of 30km of new and/or improved WCH facilities, six road bridges with walking and cycling provision, five of which would be new or upgraded provision, five road bridges with walking provision and five new WCH bridges with one improved walking and cycling bridge. Overall, there would be 20km of additional WCH provision. The proposed scheme is also bringing over 3.5km of existing facilities up to compliance with current guidance such as LTN1/20. These improvements would encourage the use of active transport within the region. The proposed scheme would also benefit public and private transport such as coaches and buses with reduced journey times as shown on the Design Access Statement [APP- 268] and its Appendix A WCH Strategy [APP-269].
6.3 - 6.3
The Mineral Resource Assessment (MRA) [APP-144] addresses the relevant policies from the adopted Essex Minerals Local Plan (MLP) 2014, including Policy S8. The MRA concluded that prior extraction of the mineral resource is not practical for the reasons set out in the MRA which are not repeated here.
6.4 - 6.4
The Sustainable Drainage Systems Design Guide for Essex, 2020, was consulted as part of the drainage design for the proposed scheme as reported in the Surface Water Drainage Strategy [APP-174]. The Essex Preliminary Flood Risk Assessment (PFRA), 2011 amended 2018, the Braintree and Witham Surface Water Management Plan, 2016 , the Mid Essex Strategic Flood Risk Assessment, 2007, the Chelmsford Surface Water Management Plan, 2018 and the Chelmsford City Strategic Flood Risk Assessment, 2018 were all consulted in the preparation of the Flood Risk Assessment [APP-162]. In particular, information relating to the risk of flooding contained within these documents has been used as

part of the assessment of flood risk to and from the proposed scheme.
6.5 - 6.5
The applicant acknowledges Essex Net Zero: Making Essex Carbon Neutral advice and principles. At a national level, ‘Decarbonising Transport: A Better, Greener Britain’ (Department for Transport, 2021) sets out the Government’s commitments and the actions needed to decarbonise the entire transport system in the UK. The plan includes commitments for zero emission vehicles, delivering a zero emission freight and logistics sector, maximising the benefits of sustainable low carbon fuels, more choice and better efficiency in the future transport system, hydrogen’s role in decarbonising the transport system and increased investment in cycling and walking. The plan recognises, however, that continued high investment in our roads is, and will remain, as necessary as ever, to ensure the functioning of the nation and to reduce congestion which in itself is a major source of GHG emissions. ‘Net Zero Highways: Our 2030/2040/2050 Plan’ (National Highways, 2021) sets out National Highway’s programme for a net zero future, including the ultimate aim of achieving net zero carbon travel from users of the National Highways Network by 2050 (road user emissions). Specifically, the plan commits National Highways to: • · Present a report to government on global HGV technology trials and our proposals for UK trials (further details of which can be found here [redacted] • · Publish a blueprint for Electric Vehicle charging services and energy storage by 2023 • · Publish a plan to improve public transport on the Strategic Road Network in 2023 and implement through Road

Period 3 (2025-2030)

- · Report in 2023 how National Highways can help reduce empty lorry movements
- · Have a preferred investment plan for HGV charging by 2028, for Road Period 4 (2030-2035) implementation

Design principles, which consider green infrastructure objectives to reduce significant effects on green infrastructure assets, are presented in the Design Principles document [REP2-006] and cover multiple aspects relevant to green infrastructure including landscape and planting design, design of attenuation ponds, earthworks and borrow pit restoration. The design principles have been used to inform development of the landscape led proposed scheme design, including both the highway alignment and the Environmental Masterplan on Figure 2.1 of the Environmental Statement [APP-086, APP-087 and APP-088]. Mitigation for green infrastructure assets is identified within Chapter 8 (Landscape and Visual) [APP-075] and Chapter 9 (Biodiversity) [APP-076] of the Environmental Statement. The Environmental Masterplan [APP-086, APP-087 and APP-088] illustrates how green infrastructure would be addressed in terms of landscape and biodiversity mitigation. The Landscape and Ecology Management Plan [APP-193] within the first iteration of the Environmental Management Plan presents how natural assets would be protected during construction and how environmental mitigation would be secured within the REAC [APP-185].

A holistic approach has been taken to developing the objectives and principles through collaborative working between environmental disciplines and engineering specialists. The landscape objectives seek to mitigate adverse landscape and visual effects, including effects on existing green infrastructure, and to contribute to the green infrastructure network (paragraph 8.10.2 of Chapter 8 of the Environmental Statement [APP-075]).

As described in paragraph 15.10.2 of Chapter 15: Climate of the Environmental Statement [APP-082] a number of design measures have been included with the proposed scheme to support active travel, thereby encouraging modal shift from private car and reducing operational phase road user GHG emissions.

The proposed scheme is delivering a net gain of habitats (as presented in Table 9.23 of Chapter 9 of the Environmental Statement

[APP-076]). Once habitats have become established, the array of habitats created would generally be more diverse than the majority of the largely arable habitat present along the existing A12 corridor. The planting design would use native species of local origin. Landscape planting has been designed to support green infrastructure objectives, through the use of planting to link into existing field boundary vegetation to provide screening and integration into the local pattern and character, as well as connection of existing wildlife corridors (paragraph 9.10.14 of Chapter 9of the Environmental Statement [APP-076]). Ecology mitigation areas have been located in areas with connectivity to existing habitats and these areas will be created in advance of construction where practicable. With regard to the need to develop integrated water management and natural flood management techniques, it is noted that the proposed Drainage Strategy [APP-174] for the proposed scheme makes use of sustainable drainage systems (SuDS) wherever practicable to manage water quality and flood risk. These measures include attenuation ponds, filter drains and swales. Along with activities being undertaken at a national level to decarbonise road transport, National Highways is also playing a full and active role in achieving net zero by 2050 within Essex and across England as a whole.
6.6 - 6.6
The Design Principles [REP2-006], which consider green infrastructure objectives, have taken national and local policy and guidance into consideration, including the Essex Green Infrastructure Strategy (Essex County Council, 2020). Mitigation for green infrastructure assets has been identified within Chapter 8: Landscape and visual of the Environmental Statement [APP-075] and Chapter 9: Biodiversity of the Environmental Statement [APP-076]. Figure 2.1 of the Environmental Statement [APP-086, APP-087 and APP-088] illustrates how green infrastructure would be addressed in terms of landscape and biodiversity mitigation, and public rights of way and access provision. The Register of Environmental Actions and Commitments [APP-185] presents how environmental mitigation would be secured through the Development Consent Order. Appended to the First Iteration Environmental Management Plan, the Landscape and Ecological Management Plan [APP-193] presents how the landscape and ecological features

would be protected during construction, and how landscape and ecological mitigation would be implemented and maintained. Where relevant, the nine green infrastructure principles identified within the Essex Green Infrastructure Standards Guidance, (Essex County Council, 2022) have been incorporated within the proposed scheme, including through the Design Principles [REP2-006] and the environmental mitigation proposed.
6.7 - 6.7
The Applicant notes the emerging updates to the matrix of strategy documents. The increasing recognition of active travel modes for individual and commercial use, and the reduction of severance, are all reflected in the proposed scheme design which provides extensive new and improved infrastructure for these modes, for leisure and utility use as shown on the Design Access Statement [APP- 268] and its Appendix A WCH Strategy [APP-269].
6.8 - 6.8
The applicant noted the interested parties' comments with regards to Essex's Asset Management Strategy. The Applicant notes Essex County Council's view regarding the proposed de-trunked sections of the A12. National Highways has continually engaged with Essex County Council on this matter as evident in correspondence in Appendix A of the Applicant's Response to Relevant Representations [REP1-002]. National Highways' Operational Team has developed the following principles for de-trunking standards and National Highways will continue to work with Essex County Council to achieve these principles: 1. The de-trunked assets will meet the standard of safe and serviceable operation, as set out in the Design Manual for Roads and

Bridges. 2. The condition of the de-trunked roads will be similar to other comparable roads on the Strategic Road Network as measured by the Pavement Condition Key Performance Indicator in Roads Investment Strategy 2: 2020-2025 (or any relevant replacement from the time to time in force). 3. Prior to de-trunking, maintenance will have been undertaken in accordance with an intelligence-led system designed to achieve optimum intervention for each individual asset by improving asset quality and customer satisfaction whilst offering greater value for money. 4. Maintenance schemes for de-trunked assets which have previously been identified for delivery through funding in Road Investment Strategy 3: 2025 to 2030 will be completed or funded by National Highways.	
7. Description of the Proposed Development	**7.1 - 7.1**
The Applicant notes Essex County Council's comments.	
8. Assessment of Highway and Transport Effects	**8.1 - 8.1**
The Applicant notes Essex County Council's comments.	
	8.2.1 - 8.2.9
The Applicant notes Essex County Council's view regarding the proposed de-trunked sections of the A12. The Applicant has continually engaged with Essex County Council on this matter as evident in correspondence in Appendix A of the Applicant's Response to Relevant Representations [REP1-002], as well as the draft Statement of Common Ground [REP2-018].	

The National Highways Strategic Design Panel Progress Report 2 and the principles of National Highways Road to Good Design are intended for new schemes on the network. The elements of the proposed scheme at are new adhere to the principles outlined in the Strategic Design Panel Progress Report. As the section of the A12 to be detrunked is an existing asset, it is not subject to these design principles. Instead, as discussed in correspondence with Essex County Council in Appendix A of the Applicant's Response to Relevant Representations [REP1-002], National Highway's Operational Team has developed a set of principles for the standard of de-trunked roads that National Highways will seek to agree with ECC. The principles are as follows:

1. The de-trunked assets will meet the standard of safe and serviceable operation, as set out in the Design Manual for Roads and Bridges.

2. The condition of the de-trunked roads will be similar to other comparable roads on the Strategic Road Network as measured by the Pavement Condition Key Performance Indicator in Roads Investment Strategy 2: 2020-2025 (or any relevant replacement from time to time in force).

3. Prior to de-trunking, maintenance will have been undertaken in accordance with an intelligence-led system designed to achieve optimum intervention for each individual asset by improving asset quality and customer satisfaction whilst offering greater value for money.

4. Maintenance schemes for de-trunked assets which have previously been identified for delivery through funding in Road Investment Strategy 3: 2025 to 2030 will be completed or funding by National Highways.

The Applicant will continue to work with Essex County Council to achieve these principles

The environmental design for the parts of the proposed scheme to be detrunked has been undertaken in accordance with the

principles set out in DMRB LD 117 and is illustrated on the Environmental Masterplan Figure 2.1 of the Environmental Statement [APP-086, APP-087 and APP-088]. These principles have been applied to areas adjacent to the detrunked sections to provide separation, mitigate landscape and visual effects, integrate the proposed scheme into the landscape and to contribute to green infrastructure. As per Table 9.32 within Section 9.13 of Chapter 9 Biodiversity of the Enviromental Statement [APP-076] the proposed scheme would result in a net gain of 25% of habitats, 26% of hedgerows and 156% of rivers. Further detail can be found within Appendix 9.14 Biodiversity Net Gain Report [APP-138]. The proposed scheme includes substantial improvements to Walking, Cycling and Horse riding facilities including approximately 30km of new and enhanced facilities including bringing 3.5km of the existing Local Road Network facilities up to LTN 1/20 compliance. The Design Principles report [REP2-006] details the design policy context and design principles of the proposed scheme in accordance with National Policy Statement for National Networks (NNNPS) criteria for 'good design' for national networks, and includes Essex Green Infrastructure Strategy (EGIS) in the overarching design principles. Appendix F in the Case for the Scheme [APP-252] Table E indicates how the proposed scheme is compliant with Essex County Council's local planning policy. Appendix A in the Case for the Scheme [APP-250] sets out the proposed scheme's compliance with the NNNPS. With regard to the proposals presented by the Council in Appendix 2 of the Local Impact Report [REP2-055], the Applicant has and will continue to engage with Essex County Council on this matter as discussed in letter correspondence between the two parties [Appendix A, REP1-002]. For further information, refer to the Applicant's response to Issue Specific Hearing 1 submitted at Deadline 3.
8.2.10 - 8.2.19

The proposed scheme would provide a considerable improvement to walking, cycling and horse riding (WCH) provision. The proposed scheme submitted for development consent would include:

- A total of 30km of new and/or improved WCH facilities.
- Six road bridges with walking and cycling provision, five of which would be new or upgraded provision.
- Five road bridges with walking provision.
- Five new WCH bridges, one improved walking and cycling bridge.

Overall, there would be 20km of additional WCH provision.

The project is also bringing over 3.5km of existing facilities up to compliance with current guidance.

The Applicant notes the benefits of directness to make routes both attractive and safe in practice – for example to deter riders taking the direct route less safety if an indirect provision is made in design.

Design combines many inter-related factors, and the design of the proposed scheme is the draft design which the Applicant considers is the appropriate balance of all of these factors, including the particular design complexities at J19, J21 and J24. The detailed design will seek to improve the coherence, directness, safety, convenience and attractiveness of all routes, especially at these particular junctions, in accordance with LTN 1/20 so far as feasible within the parameters of the consent.

Regarding staggered crossings, these were only provided where a straight across crossing was not considered feasible at the preliminary design stage – for example where adverse effects including operational safety were too great to permit a single-stage

crossing. In the detailed design these decisions will be reviewed and if single-stage crossings are deemed feasible, designs will be amended within the parameters of the consent. An example is the A120 dumbbell link pedestrian and cycle crossing. This crossing was initially modelled as a staggered crossing in the traffic modelling presented in Appendix F of the Transport Assessment [APP-259]. The Applicant is now considering a single-phase arrangement and will share detailed documentation of this in due course. It is the view of the Applicant that the design proposals in the DCO submission do comply with LTN 1/20. That document recognises that geometric and other constraints can limit the physical form of facilities, and gives both desirable and minimum criteria to reflect these constraints. Examples of constraints are limited space (for example at J25 between A12 and A120) and environmental impact. The A14 is cited as an example; that scheme was not subject to the constraints to which the proposed scheme is subject, and the Design Panel Council did not raise objections regarding the form of any of the A12 WCH bridges in this context. The WCH Review Report will be shared with Essex County Council by 22 March; this was prepared before some recent enhancements such as described above, and an updated WCH Review will be undertaken in the detailed design stage, in compliance with the requirements of GG 142.
8.2.20 - 8.2.23
As described in Chapter 3 of the Environmental Statement, a long list of 23 options were identified, which included 5 public transport options. These were discounted as they did not address the identified route problems, study objectives, or were considered to not be feasible or deliverable in planning or engineering terms. Regarding public transport networks, the identification of public transport routes and stops on the local highway network needs to be integrated in the authority-wide network, so the design of appropriate infrastructure, such as bus stops, will be undertaken as part of detailed design once route review and network proposals have been undertaken by the relevant local highway and transport operator organisations.

Regarding public transport infrastructure, the design reference document proposed for the proposed scheme is DMRB GD 300 which provides for a motorway-equivalent level of service on a high-speed Strategic Trunk Road. Forecast traffic flow will fully utilise the widened route capacity, and as such, dedicated lanes for the very small proportion of public transport vehicles are not appropriate, and therefore one of the lanes could not be used as a bus lane. Construction phase impact on public transport, and permitted operational arrangements, are covered through the Outline Construction Traffic Management Plan [REP-003]. The Outline Construction Traffic Management Plan [REP2-003] includes a Public Transport Forum (Table 3.1) where communication, input into and review of proposals that affect public transport services or connectivity to services during the construction period would be discussed. The Applicant is of the view that this is sufficient to ensure that the impact on local bus services will be limited. The OCTMP will need to be developed into the Construction Traffic Management Plan ahead of commencement. At that time Appendix C: Potentially affected Bus Routes [APP-276] will be updated to reflect the bus services operating at that point. Regarding permanent network changes, the Applicant looks forward to continuing to liaise with Essex County Council in the detailed design stage to support the determination of where amended routes should run, and the appropriate location of stops on those amended routes, and where practical to do so consider how closed bus stops could be reinstated.
8.2.24 - 8.2.29
The Applicant welcomes Essex County Council's comments that despite the inherent degree of uncertainty within modelling future conditions, the traffic models used by the Applicant have been constructed and validated to appropriate standards. The Applicant also agrees with Essex County Council's comments that the traffic models give a good indication both of where mitigation on the local highway network is most likely to be required, and where impacts are expected to be close to accepted mitigation thresholds. As noted, the Applicant has engaged with Essex County Council on matters relating to the traffic modelling work over an extended

period of time. A full record of engagement can be seen in 8.12 Statement of Common Ground with Essex County Council [REP2-018]. This engagement included a series of four traffic workshops from late 2021 to answer specific traffic modelling queries received from Essex County Council. The workshop worked through many requests from the Council and provided them with a comprehensive presentation of almost 200 slides summarising the traffic modelling work undertaken and providing responses to specific requests from the Council for additional detailed traffic model data relating to the local road network. The workshop worked through many requests from the Council and provided them with a 200-slide deck, whose content can be found in Appendix B of the Applicant's response to the Council's Local Impact Report. These meetings were superseded by Statement of Common Ground meetings which began in March 2022. The Applicant notes that Essex County Council have provided a list of additional queries relating to the traffic modelling work. The Applicant provided detailed responses to these queries on 22nd February 2023, through a slide deck of additional traffic model data. A copy of this response is provided as Appendix C of the Applicant's response to the Council's Local Impact Report. The responses address concerns that the strategic traffic model may be underrepresenting existing congestion at some locations. Written summaries of the Applicant's responses to these concerns are provided in the responses to 8.3.22 - 8.3.27 and 8.3.53 - 8.3.58. The Applicant's response to Essex County Councils comments on monitoring of scheme impacts is provided in the response to 8.3.22 - 8.3.27.
8.2.30 - 8.2.37
As part of the standard evaluation process that National Highways projects are subject to, the Applicant plans to undertake 'baseline' traffic surveys in autumn 2023. This is the last available period when surveys can be done before the planned start of construction works, given the constraints that traffic surveys are not typically undertaken in the winter months of mid-December to mid-February. The exact detail of these surveys, including their location, will be defined during spring to summer 2023. The specification of post-opening traffic surveys in the same location will also be defined.

The Applicant notes Essex County Council's suggested locations for traffic monitoring, and will take these into consideration when defining the baseline and post-opening traffic survey locations during spring to summer 2023. The Applicant will consider further the potential for a commitment to monitoring at specific locations where the Applicant is predicting an increase in traffic in its modelling. The Applicant will not commit to additional post scheme commitments beyond clearly justified monitoring at specific locations. The Applicant will respond further at Deadline 4. Regarding Essex County Council's comment that they are awaiting responses to additional queries about the traffic modelling data, full responses to these queries have been provided in Appendix C of the Applicant's response to the Council's Local Impact Report submitted at Deadline 3. Written summaries of the Applicant's responses to the queries are provided in the responses to 8.3.22 - 8.3.27 and 8.3.53 - 8.3.58. In relation to stakeholder concern about changes in traffic flows between the Statutory Consultation (June 2021) and the DCO application (August 2022), the Applicant has provided a detailed response in Appendix OFH1A of the Applicant's Response to Open Floor Hearing 1 [REP1-009].
8.2.38 - 8.2.40
The Applicant agrees with Essex County Council with regards to minimising impacts on the local road network. The Outline Construction Traffic Management Plan (OCTMP) [REP2-003] sets objectives including • · 'Minimise disruption to all road users, local businesses and communities by keeping construction traffic on the A12 and by HGV construction traffic avoiding local roads as much as is reasonably practicable' and sets strategies to achieve this which include

- · Keeping two lanes of traffic on each direction on the A12 during weekday daytimes.

Additionally, the Applicant has proposed a strategic diversion route as shown in Appendix A Part 1 [APP-273] and Appendix A Part 2 [APP-274] of the Outline Construction Traffic Management Plan (OCTMP) [REP2-003], which plans to keep traffic on the strategic road network where possible for closures of the A12 mainline. In instances where this is not possible for example when Station Road Bridge is replaced the Applicant has shown local road network diversion routes in Appendix A Part 2 of the OCTMP. The local diversion routes have been selected to have the least impact on local communities as possible whilst also considering obstructions such as low height bridges.

Recognising the impacts of current and proposed traffic management on the A12 the Applicant has weekly meetings via our traffic management teams and is also an invitee to a quarterly meeting with the junction 25 – 26 scheme. To co-ordinate proposed works the Applicant has also had an initial meeting with the Margaretting scheme (junction 13 – 15) and is planning follow up meetings in the future.

A lessons learnt session is also planned between all three schemes to understand the learning from the junction 25 – 26 scheme, and incorporate this into the traffic management design layouts for the proposed scheme

The Applicant appreciates the importance of public transport and has detailed this in section 5.5 of the OCTMP [REP2-003] and has listed potentially affected bus routes in Appendix C [APP-276] of the OCTMP The Applicant would also encourage that representatives of the bus services attend the Public Transport Forum as detailed in Table 3.1 of the OCTMP [REP2-003].

The Applicant looks forward to engaging with Essex County Council on the content of the proposed traffic management forums as detailed in Table 3.1 of the OCTMP [REP2-003] to ensure that they are effective for all parties involved.

8.3.1 - 8.3.5
The Applicant notes Essex County Council's comments regarding issues at specific locations listed within the Local Impact Report. The Applicant has provided a substantive response to each of these locations in subsequent sub-parts. The Applicant has worked closely with Essex County Council and does not agree with the comments provided on changes to the proposed scheme. Several changes were made following the Statutory Consultation which are captured in section 7.4 of the Consultation Report [APP-045], including a considerable change at junction 21. The Supplementary Consultation presented these changes and further information can be found in Consultation Report - Annex J2: Section 47 Consultation Material [APP-057]. The Applicant looks forward to continuing this engagement with Essex County Council.
8.3.6 - 8.3.15
Junction 19 Compatibility with wider development plans With regard to the compatibility of junction 19 with future developments, particularly the Chelmsford North East Bypass (CNEB), as this is not a committed scheme the Applicant encourages Essex County Council to engage with the National Highways Spatial Planning team as per the letter exchanges between Essex County Council and National Highways as contained in the Applicant's Response to Relevant Representations [REP1-002]. Generals Lane Junction – Pedestrian/cycle crossings The design of the splitter islands at Generals Lane Roundabout presented as part of the DCO application is a preliminary design which will be progressed prior to construction. Whilst ensuring the developed design complies with requirement 10 of the draft DCO, the turn radii for cyclists on the splitter islands will be considered in accordance with LTN 1/20 guidelines during detailed design

development.

Paynes Lane WCH Overbridge

The Applicant notes Essex County Council's comments regarding the design of Paynes Lane overbridge. A narrative matrix of decisions leading to the number of foldbacks on the bridge ramps has been shared with Essex County Council which explains that lengthening the southern ramp to reduce the number of foldbacks would have an adverse impact on the tie in to Paynes Lane. Since the distribution of this matrix the Applicant has met with Essex County Council a number of times and is now considering a southern ramp alignment in the detailed design which reduces the amount of foldbacks in a similar fashion to the northern ramp alignment. Additionally, a minimum 5m external radius where ramp sections change directions will be considered by the Applicant on both the northern and southern ramps in the detailed design. The Applicant will make these considerations while ensuring the developed design complies with requirement 10 of the draft DCO.

The proposed 4m path width is sufficient to provide a 3m shared use path with 0.5m offset on either side. This complies with LTN 1/20 guidelines and provides adequate capacity for the expected future active transport growth. It is noted that the impact of the proposed scheme does not explicitly warrant the need for a WCH overbridge to reconnect the historically severed PRoWs 213_23 and 213_45 either side of the A12 and Great Eastern Mainline railway, however this provision has been included as an enhancement to the WCH facilities in the area and the Applicant hopes Essex County Council can support the proposed design.

With regard to the design of Paynes Lane bridge, the Design Panel suggested exploring additional design options for the footbridges to add interest and character along the route.

The Paynes Lane bridge would use the Warren Truss type of structure which is coherent with the other footbridges on the proposed scheme providing a family of structures along the A12 route. The Applicant provided in the Design Access Statement [APP-268] a review of the bridge design options considered. The Applicant has also submitted at Deadline 2 a revised Design Principles report [REP2-006] that demonstrates how the design principles are secured against certified documents within the DCO or through Industry standards.

The Applicant has taken the proposed Beaulieu Park Station and Chelmsford Garden Community to the north of Paynes Lane into consideration, carefully balancing the bridge design with the need for high design quality and being visually sensitive to the character of Boreham farmland plateau landscape character area and Boreham House listed building and registered park and garden by keeping as low as practicable in the open landscape.

The light and weight-saving Warren Truss bridge is the preferred solution as it provides a smaller footprint for the bridge. The steel equilateral triangles create an almost 'see-through' type aesthetic which camouflages the structure within the surrounding environment, reducing the visual impact of the footbridge across Boreham farmland plateau and Boreham House listed building.

Bridge span requirements are set by the clearance envelope of the undercrossing facility and legislative requirements. The bridge is affected by key-specific constraints such as the Great Eastern railway line, existing A12 carriageway and the proposed Beaulieu Park and Network Rail station development located approximately 90 m from the north end of the bridge. A truss was selected as the preferred option as it minimizes construction depth, thereby reducing the length of the approach ramps, facilitates off-siting and accelerated construction, minimizes maintenance interventions and provides a light and graceful appearance. The Warren Truss presented is particularly effective as all the diagonals have been set at the same angle and verticals have been omitted which reduces visual confusion.

Trusses also have the advantage that pedestrian parapets can be incorporated within the structural envelope, without requiring additional posts and fittings. This is particularly important at this location as the parapets will be 1.8m high for equestrian usage which could have a detrimental effect on the aesthetics of other forms of footbridge.

The Applicant provided a Materials and Landscape Palette [REP2-033] at Deadline 1, which provides Essex County Council with further indicative imagery of the proposed footbridge.

There are outstanding detailed design elements, including the colour of the steel structure. The Applicant will engage with Chelmsford City Council and Essex County Council at detailed design to agree the final detailed design. B1137 walking/cycling link from Paynes Lane to Boreham With regard to the off-carriageway pedestrian/cycle provision between the Paynes Lane overbridge and Boreham village, although the new overbridge is likely to increase pedestrian/cycle demand, the Applicant is not proposing to widen this path. The proposed reduction in speed limit on the B1137 will assist with creating an environment consistent with shared use and active travel.
8.3.16 - 8.3.21
As previously communicated in letter correspondence with Essex County Council [Appendix A, REP1-002], the Applicant reaffirms their position that additional interventions are not required to ensure compliance with the proposed reduced speed limit within Boreham Village and between Main Road and Boreham Village. That said, the Applicant appreciates that the council and others would like to see additional measures. The Applicant has reviewed the proposals put forward by Essex County Council regarding additional intervention measures on the B1137 and will continue to engage in open discussions with Essex County Council on this matter during the detailed design stage.
8.3.22 - 8.3.27
The Applicant welcomes Essex County Council's conclusion that, subject to receipt and analysis of further information from the traffic model, the increases in modelled delay and queueing on Maldon Road do not represent a "severe" impact. The additional traffic modelling information requested was provided to Essex County Council on 22nd February 2023. This shows that the strategic traffic model reflects observed journey times on the approach to the Duke of Wellington junction (between Maldon Road and The Street) with a sufficient level of accuracy as defined in the Department for Transport's Transport Analysis Guidance

on traffic model development. As the Applicant has confirmed to Essex County Council, most recently on 21 February 2023, no additional works to the slip road arrangements at Junction 21 are required as part of the proposed scheme and as such the Applicant does not intend to secure any additional works at Junction 21 through the DCO. However, the Applicant does recognise Essex County Council's historical and ongoing aspirations for a Maldon Link Road and will continue to engage with them on this matter.
8.3.28 - 8.3.33
8.3.28. No dedicated equestrian provision is proposed across Wellington Bridge, as no need for such provision was identified through the Walking Cycling and Horse-riding Assessment and Review. 8.3.28 and 8.3.29. The Applicant looks forward to working with Essex County Council to develop the detailed design of walking and cycling provision, including the form of the route and the intended crossing to the south of the bridge to connect to the active travel route to the south of A12 and for journeys through Hatfield Peverel. It is considered that this can be achieved within the red line boundary set out in the DCO. 8.3.30. The Streets, Rights of Way and Access Plans show a continuous route, with lighting, for walking and cycling between Witham and Hatfield Peverel, segregated from the carriageway. This connects to all PRoW in that section of the scheme. 8.3.31 The Applicant looks forward to working with Essex County Council to develop the detailed design of this aspect of this route. 8.3.32. The potential adverse impacts of zig zag ramps are noted, and these have been avoided or minimised where feasible, but in some cases constraints such as available space make them the appropriate design choice.

8.3.33 The Applicant notes Essex County Council's comments regarding the design of Gershwin Boulevard overbridge. As shown in the Statement of Common Ground with Essex County Council [REP2-018], a narrative matrix of decisions leading to the number of foldbacks on the bridge ramps has been shared with Essex County Council which explains that amending the northern ramp would result in increased visual impact to residents, and amending the southern ramp would have an adverse impact on the tie in to footpath 121_95 and the route through to the open space parallel with the A12. Since the distribution of this matrix the Applicant has met with Essex County Council a number of times and is now considering a minimum 5m external radius where ramp sections change directions on both the northern and southern ramps. The Applicant will consider this further during detailed design and ensure that the developed design complies with requirement 10 of the draft DCO [AS-020].
8.3.34 - 8.3.42
The Applicant welcomes Essex County Council's support of the proposed design for junction 22. Responses to Essex County Council's comments regarding Little Braxted Lane overbridge are given in the response to 8.3.43 - 8.3.52 below. With regard to the design of the de-trunked sections of A12 between junction 22 and Rivenhall End West and between Rivenhall End West and Rivenhall End East, the Applicant will be handing over a safe and serviceable road and it will be for Essex County Council to re-engineer the carriageway as it sees fit. The extent of the proposals from Essex County Council cannot be justified in terms of clear demand nor purpose and they introduce significant engineering challenges due to existing level difference between the north and southbound carriageways in Rivenhall End. The request from Essex County Council to include provision for renewable energy facilities, future vehicle rapid charging stations and ground mounted solar farms and/or wind farms are not within the scope of the DCO design and the extent of this intervention is not proportionate and reasonable in accordance with NPSNN Paragraph 5.215. The Applicant has proposed a reduction in speed limit to 40mph between junction 22 and Rivenhall End East which is deemed suitable for the local traffic that is expected to use the de-trunked route.

The Applicant has and will continue to engage with Essex County Council on this matter as discussed in letter correspondence between the two parties [Appendix A, REP1-002]. For further details on the planning policies taken into consideration in the development of the scheme please refer to the response to sections 8.2.1 - 8.2.9 of this Local Impact Report.
8.3.43 - 8.3.52
The design of Little Braxted Lane overbridge presented as part of the DCO application is a preliminary design which will be progressed prior to construction. A minimum 5m external radius where ramp sections change direction will be considered by the Applicant, on both the northern and southern ramps during the detailed design stage. These considerations will comply with Requirement 10 of the Draft DCO. A narrative matrix of decisions leading to the number of foldbacks has been shared with Essex County Council, explaining that as Little Braxted Lane falls towards the River Blackwater Valley, reducing the number of foldbacks would increase the overall length of the southern ramp. Additionally, as well as serving the existing cycling and walking movement from Little Braxted Lane to Motts Lane and the onward National Cycle Network route 16, it provides an opportunity for walkers using the proposed footpath south-west of the southern ramp to cross the proposed A12. For these reasons, the most compact ramp arrangement was sought. The crossing provision on Colchester Road is a preliminary design and whilst shown as a staggered crossing in the DCO application materials, the Applicant has tested a single-phase unstaggered arrangement and is content that this would have no meaningful impact to the traffic capacity of the nearby Eastways Junction and will share detailed documentation of this in due course. The crossing provision on the Henry Dixon Road/Braxted Road junction is a preliminary design and whilst shown as a staggered crossing in the DCO application materials, the Applicant is considering an arrangement which allows pedestrians to cross Henry Dixon Road via a staggered crossing and cycles to cross in a single-phase remote from the junction whilst still on the desire line. The Applicant will share detailed documentation of this in due course. The design of Snivellers Lane overbridge presented as part of the DCO application is a preliminary design which will be progressed

prior to construction. A minimum 5m external radius where ramp sections change direction will be considered by the Applicant, on both the northern and southern ramps. A narrative matrix of decisions leading to the number of foldbacks on this bridge has been shared with Essex County Council, explaining that as the bridge serves two parallel walking and cycling routes either side of the proposed A12, as well as the perpendicular Snivellers lane/footpath 92_27/footpath 92_32 desire line, the most compact ramp arrangement was sought to minimise the length of detour for users from these directions. Regarding the existing cycle track between Rivenhall End and Kelvedon, unless otherwise shown by a solid blue line designating new Cycle Track on the Streets, Rights of Way and Access Plans (AS-027 & AS-028) the Applicant is not proposing any amendments to existing cycle-provision as part of the proposed scheme. Where new provision is proposed, this will be a minimum of 3m wide shared use 2-way cycle/footway except at localised constraints which will be discussed with Essex County Council.
8.3.53 - 8.3.58
As part of the additional traffic modelling information requested provided to Essex County Council on 22nd February 2023, information on modelled journey times along Braxted Park Road was provided. A copy of the information provided is included as Appendix C of the Applicant's response to the Council's Local Impact Report [TR01600/EXAM/9.37]. A summary of this is presented below. The route from Tiptree to the A12 via Braxted Park Road was not included as a journey time route in the traffic model's calibration and validation, so its performance is not reported in existing documentation. However, journey times from the base year traffic model have been extracted and compared to observed journey time data. This shows that the strategic traffic model reflects observed journey times on this route with a sufficient level of accuracy as defined in the Department for Transport's Transport Analysis Guidance on traffic model development, in both the AM and PM peak.

At Appleford Bridge, the traffic model contains a fixed journey-time penalty to represent the additional delay caused at this narrow bridge. This was based on analysis of observed journey time data. The junction between B1022 Maldon Road and Braxted Park Road is included in the SATURN model, with right-turning traffic from B1022 having to give way to oncoming traffic but in a single lane. The B1022 approach to this junction has 26s delay in the AM base model. Regarding Appleford Bridge, Essex County Council state that Appleford Bridge should be widened so that delays are not magnified by the expected uplift of flows due to the proposed scheme. Although the traffic changes on Appleford Bridge are not presented in the Transport Assessment, the traffic model actually predicts that traffic would reduce over the bridge by 244 vehicles per hour in the AM peak and 179 vehicles per hour in the PM peak. For this reason, the Applicant will not widen the bridge as part of the proposed scheme.
8.3.59 - 8.3.61
Regarding the A120 Braintree to A12 Scheme, the proposals for improving this stretch of road, initially developed by Essex County Council (ECC), were transferred to National Highways in 2020. Since the transfer, National Highways has been validating and updating the work completed by ECC. This work has now concluded and has been passed to government for consideration. No decision has been made on the A120 Braintree to A12 scheme and any updates will be set out in due course. Where a project is in its early stages of development and has not yet secured planning permission, it is not considered a committed scheme. In accordance with government guidance, uncommitted schemes cannot be considered in the traffic modelling and environmental assessment. The A120 Braintree to A12 scheme is currently uncommitted but both schemes have held regular meetings to share information and report on progress and adjust strategies in a collaborative manner as show on the

Interrelationship document [APP-271]. This collaboration will continue. The proposed A12 scheme design doesn't preclude any future A120 scheme.
8.3.62 - 8.3.64
The Applicant acknowledges the comments Essex County Council has made regarding junction 24. The Applicant has responded to points made regarding junction 24 in the response to sections 8.3.65 - 8.3.71 of this Local Impact Report.
8.3.65 - 8.3.71
The intention of the proposed Inworth Road roundabout is to signify the transition from the Strategic Road Network to the local road network and encourage drivers to behave in a manner that is appropriate to the network they are on. The approaches and exits of the proposed roundabout have been designed for a speed limit of 30mph in accordance with Manual for Streets which is the appropriate standard for local roads which are not solely focused on the conveyance of vehicular traffic. Designing the roundabout links for a speed limit of 50mph would give drivers the wrong impression about the local road nature of the B1023 and Kelvedon Road and could encourage drivers to accelerate as they approach the proposed roundabout. The current average observed speed along the B1023 between the existing A12 and Inworth village is 30mph in the northbound direction and 31mph in the southbound direction in the interpeak hours (10:00 to 16:00). This is consistent with the approach speed designed for at the roundabout, and therefore additional engineering measures are not required to control drivers' speed. With regard to the widening of Hinds Bridge to accommodate two large vehicles passing in opposite directions, the Applicant has previously stated in response to Relevant Representation RR-025-010 [REP1-002] and in letter exchanges with Essex County Council [Appendix A, REP1-002], that despite the small forecast increase in general traffic during peak hours in 2042, the proposed

scheme's forecast traffic flows predict a reduction in the volume of heavy and wide vehicles using the bridge. As such, the Applicant is not proposing any interventions at this location. The Applicant notes Essex County Council's requests to provide measures to encourage speed compliance where vehicle speeds may increase due to pinch point widening, include further walking and cycling improvements on the B1023 and for the inclusion of subtle interventions in Messing Village to reduce the likelihood of traffic using inappropriate routes to access the A12. The Applicant maintains the position outlined in the letter to Essex County Council dated 1st December 2022 [Appendix A, REP1-002] regarding these issues. The Applicant will review the report provided by Essex County Council regarding subtle interventions on local roads in Messing village and will take this into consideration in the detailed design.
8.3.72 - 8.3.74
The Applicant notes the very poor existing provision for walking, cycling and horse-riding on B1023. Footway is present in Inworth village and Feering but not on connecting sections. There is no cycling or equestrian provision on this route at all. The scheme's proposed easing of pinch points is intended to improve safety for pedestrians in Inworth because it reduces the likely over-running of the path by larger vehicles. Increases in traffic flow would increase the likely time to cross B1023 for example, but do not materially change the nature of the route, which is very unattractive for walking cycling or horse-riding. The aspiration for future provision of a dedicated facility for these users from Tiptree to Kelvedon is noted, but widening the bridge beneath the A12 for this potential project is outside the scope of the proposed scheme. Essex County Council will be involved in the detailed design of the scheme including where routes cross A12.
8.3.75 - 8.3.75
The Applicant acknowledges that the ordering of the components of the relevant sheet is incorrect. For the avoidance of doubt the

proposed bridge is shown on the Structures Engineering Drawings and Sections – Part 2 [APP-031], the Streets, Rights of Way and Access Plans – Part 2 [AS-027] and the Permanent Works Plans [AS-002]. The Applicant will consider the correction of this presentational drawing.
8.3.76 - 8.3.80
The Applicant notes Essex County Council's view regarding the proposed de-trunked sections of the A12. As noted in the responses to sections 8.2.1 - 8.2.9 and 8.3.34 - 8.3.42 of this Local Impact Report, the Applicant has continually engaged with Essex County Council on this matter as evident in correspondence in Appendix A of the Applicant's Response to Relevant Representations [REP1-002]. With regard to the design of the de-trunked section of A12 between junction 24 and junction 25, the Applicant will be handing over a safe and serviceable road and it will be for Essex County Council to re-engineer the carriageway as it sees fit. The extent of the proposals from Essex County Council cannot be justified in terms of clear demand nor purpose and they introduce significant engineering challenges due to existing level difference between the north and southbound carriageways and the number of accesses and side roads. The Applicant has and will continue to engage with Essex County Council on this matter as discussed in letter correspondence between the two parties [Appendix A, REP1-002]. For further details on the planning policies taken into consideration in the development of the scheme please refer to the response to section 8.2.1 - 8.2.9 of this Local Impact Report.
8.3.81 - 8.3.82
The design of Potts Green overbridge presented as part of the DCO application is a preliminary design which will be progressed prior to construction. A minimum 5m external radius where ramp sections change direction will be considered by the Applicant. A narrative matrix of decisions leading to the number of foldbacks has been shared with Essex County Council, explaining that at the southern ramp of Potts Green overbridge, which is primarily to reconnect footpath 114_19, but also provides a crossing opportunity

for walkers on the proposed cycle track which runs parallel to the south of the proposed A12 in this area, has been designed to minimise the length of detour for users from these three directions. As there are no existing cycle facilities north of the proposed A12 in the vicinity of Potts Green overbridge, the Applicant is unable to designate the bridge itself as cycle track, but it is being designed as future proof for walkers, cyclists and horse-riders.	
	8.3.83 - 8.3.94
A120 Coggeshall Road pedestrian and cycle crossing Regarding the A120 Coggeshall Road pedestrian and cycle crossing, the background imagery in the Vissim figures in Appendix F of the Transport Assessment [APP-259] is a previous iteration of the General Arrangement drawings which facilitated optioneering of the junction arrangement as requested by Essex County Council. The traffic model outputs included in Appendix F of the Transport Assessment [APP-259] are for a straight-across crossing, not a staggered crossing. The layout of the straight crossing is shown on Sheet 18 of the Streets, Rights of Way and Access Plans [APP-028]. Western junction – cycle crossing on Western Link The western link cycle and pedestrian crossing has been modelled as a staggered crossing as shown on the Streets, Rights of Way and Access Plans [AS-008]. A staggered crossing is required to allow the exit to be in use while pedestrians and cyclists are crossing the entry, and vice-versa. By inspection of the performance of the crossing with a staggered arrangement, designing this crossing as a single phase will cause the junction to operate poorly as it will introduce additional inter-green time. A120 dumbbell link – pedestrian and cycle crossing The crossing provision on the A120 dumbbell link is a preliminary design and whilst shown as a staggered crossing in the DCO application materials, the Applicant is considering a single-phase arrangement. High level traffic modelling results have been	

provided to show that a straight-across pedestrian and cycle crossing does not result in queuing back to Old Rectory Junction or Prince of Wales Junction. The Level of Service (LOS) results and queues at this crossing have not been evaluated in the modelling but full results will be provided for Old Rectory Junction and Prince of Wales Roundabout. The Applicant will share detailed documentation of this with Essex County Council in due course.

Designs for the A120 Coggeshall Road crossing, Western Link crossing and A120 Dumbbell Link crossing are preliminary designs, and the Applicant will continue to optimise the design to maximise the cycle routes' coherence, directness, safety, convenience and attractiveness in accordance with LTN 1/20.

Marks Tey A12 Overbridge

The Applicant notes Essex County Council's comments regarding the design of Marks Tey overbridge. A narrative matrix of decisions leading to the number of foldback on the bridge ramps has been shared with Essex County Council. This explains that the geometry and changes in level between the A12 and the A120 limit the possible changes to the ramp direction. Turn radii of five metres will be investigated in the detailed design phase and provided where practicable on the northern ramp. The southern ramp consists of turn radii greater than 5m and does not include zig-zag ramps.

Applicant has considered a structure which crosses both the A12 and the A120 dumbbell link, the A120 dumbbell link in this location being approximately 2m higher than the A12. The Applicant is unsure what further detail is requested by Essex County Council as it was understood that the opportunity sought to be explored was a simple extension of the proposed Marks Tey overbridge, rather than a wholesale additional series of ramps between the A12 and the A120 which is necessitated by the aforementioned level difference of these two roads.

Paynes Lane Bridge

The applicant has responded to the matters raised by Essex County Council regarding the alignment of Paynes Lane Bridge in the response to sections 8.3.6 - 8.3.15 of this Local Impact Report above.

Bridge Design Principle

With regard to the design of Marks Tey bridge, the Design Panel suggested exploring additional design options for the footbridges to add interest and character along the route.

Marks Tey footbridge would use the Warren Truss type of structure which is coherent with the rest of the footbridges on the proposed scheme providing a family of structures along the A12 route. The Applicant provided in the Design Access Statement [APP-268] a review of the bridge design options considered. The applicant has also submitted at Deadline 2 a revised Design Principles document [REP2-006] that demonstrates how the design principles are secured against certified documents within the DCO or through Industry standards.

The Applicant has carefully balanced the footbridge design with the need for high design quality and being visually sensitive to the character of sub-area B2A of the Easthorpe Farmland Plateau landscape character area by keeping as low as practicable in the open landscape.

The light and weight-saving Warren Truss bridge is the preferred solution as it provides a smaller footprint for the bridge. The steel equilateral triangles create an almost 'see-through' type aesthetic which camouflages the structure within the surrounding environment, reducing the visual impact of the footbridge.

Trusses also have the advantage that pedestrian parapets can be incorporated within the structural envelope, without requiring additional posts and fittings.

The Applicant provided a Materials and Landscape Palette [REP2-033] at Deadline 2, which provides Essex County Council with

further indicative imagery of the proposed footbridge. There are outstanding detailed design elements, including the colour of the steel structure. The Applicant will engage with Chelmsford City Council and Essex County Council at detailed design to agree the final detailed design.	
9. Assessment of Wider Impacts - 10. Next Steps	**9.1.1 - 9.1.3**
Given the inherent uncertainty of air dispersion modelling discussed in ES Chapter 6 Air Quality Section 6.6 [APP-073] the Applicant acknowledges the request for monitoring and will continue to discuss this with Essex County Council. The Applicant also acknowledges the emerging draft Essex Air Quality Strategy. Since the ES has been made public, (of the four local authorities relevant to the scheme) Braintree District Council has installed new NO2 diffusion tubes in the vicinity of the mini roundabout on The Street and Maldon Road junction.	
	9.2.1 - 9.2.16
The Arboriculture Impact Assessment included within Appendix 8.4 of the Environmental Statement [APP-122] was carried out in accordance with the proposed proportionate and targeted methodology presented within Appendix H of the Environmental Scoping Report (Highways England, 2020). This noted that 'Veteran and ancient trees will be recorded as such where verification of this status has been previously obtained (i.e. Ancient Tree Inventory). Trees considered as potential veteran or ancient trees (i.e. not verified or easily identifiable as such during the survey) by the surveyors will be indicated as such within the survey data although the survey methodology does not include a specific assessment for either of these status groups.' Agreement was sought on the methodology and proportionate, targeted approach to the arboricultural assessment through consultation with local planning authorities, as described within paragraph 8.3.6 of Chapter 8 Landscape of the Environmental Statement [APP-075]. Multiple features that are likely to meet the criteria of ancient and/or veteran tree status were inspected by the tree survey and identified within the Arboriculture Impact Assessment presented within Appendix 8.4 of the Environmental Statement [APP-122]. All	

features that meet these criteria have been awarded category A grading and are recorded as potential ancient or potential veteran within the tree survey schedule. The word 'potential' is applied to differentiate these trees from verified veteran and ancient trees as defined by the Woodland Trust, however, for the purposes of the Arboricultural Method Statement (AMS) and Tree Protection Plan (TPP) they will be treated as veteran trees and protected and managed as per the guidance of the Ancient Tree Forum and Woodland Trust. Information within the Arboriculture Impact Assessment relating to ancient and veteran trees would be used to inform the AMS and TPP that would be prepared during the detailed design phase.

Where appropriate, the AMS will contain detailed specifications for the protection and management of all identified veteran trees through the construction process. Design principles relating to veteran trees, based on standing advice from Natural England and Forestry Commission, are presented in the Design Principles document [REP2-006].

For all confirmed veteran and potential veteran trees Natural England and Forestry Commission standing advice on root protection areas was followed. That is 'For ancient or veteran trees (including those on the woodland boundary), the buffer zone should be at least 15 times larger than the diameter of the tree. The buffer zone should be 5 metres from the edge of the tree's canopy if that area is larger than 15 times the tree's diameter. This will create a minimum root protection area. Where assessment shows other impacts are likely to extend beyond this distance, the proposal is likely to need a larger buffer zone.'

The arboricultural survey was conducted early in the preliminary design process and the information gathered from it was used to minimise all impacts on trees within the Order limits, with a significant focus on minimising impacts on Veteran (both confirmed and potential), Notable and A and B category trees. Chapter 3 Assessment of alternatives of the Environment Statement [APP-070] sets out specific examples of where iterative design was used to minimise important tree loss. Key examples include the dismissal of an alternative alignment of the scheme at Inworth Road which would have resulted in loss of potential veteran trees, and realignment of Junction 24 to 25 to avoid two confirmed ancient trees and move construction activity outside the root protection zones. The retention of any tree is reliant on the balance of competing constraints within a complex engineering scheme. The loss of potential veteran tree T316 is a clear example. Relocation of the haul road was considered but the area is constrained by the flood plain of the River Blackwater to the east and the A12 to the west.

Highways DCO applications are assessed against the National Networks National Policy Statement (NNNPS) (Department for Transport, 2014). Section 5.32 of the NNNPS, Irreplaceable habitats including ancient woodland and veteran trees states: 'Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Once lost it cannot be recreated. The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the national need for and benefits of the development, in that location, clearly outweigh the loss. Aged or veteran trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be affected by development proposals, the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons for this.' Table 3.4 of Chapter 3 Assessment of alternatives of the Environmental Statement [APP-070] clearly states the reasons why the loss of the five potential veteran trees is unavoidable. Preliminary design involves outline design work which often lacks the necessary detail to make a full, detailed assessment of tree removal. Therefore, the retention category of certain trees remains 'at risk' until fixed detail design is available. While it is often possible to retain at risk trees during detailed design, the use of the 'at risk' category allows the assessments to present a 'worst case' arboricultural impact of the scheme to the examining body. Following the completion of detailed design, definitive tree and vegetation removal plans will be produced which will clearly illustrate the impact of the proposed scheme as described in the First Iteration Environmental Management Plan (EMP) [APP-184]. The First Iteration EMP also states that a detailed arboricultural method statement (and tree protection plan) would be produced which will clearly set out how retained trees will be protected throughout the construction process including any specific veteran tree management required to protect and enhance the population in the area. The Applicant does not believe that a pre-determination survey is necessary because the level of detail is not available at preliminary design. For example the limits of deviation would be unchanged so it is not possible to provide definitive losses. Whilst changes in forestry (including tree groups and individual trees) during the construction phase are estimated to result in a small increase in greenhouse gas (GHG) emissions due to a reduction in carbon sequestration during the construction phase (as shown in

Table 15.21 of Chapter 15: Climate [APP-082]), once operational, the increase in the area of woodland with the proposed scheme is estimated to result in a much larger net reduction in GHG emissions from forestry over the longer term (as shown in Table 15.22 of Chapter 15: Climate [APP-082]).
9.3.1 - 9.3.53
The Applicant's response to Essex County Council's (ECC) Local Impact Report Section 9.3 Climate Change has been subdivided into four main issues, each of which is dealt with in turn below. 1) The impact of the proposed scheme on emissions within the county and potential impact on the target for Essex to be net zero by 2050 Within paragraph 9.3.6, ECC states that "The impact of the proposed scheme on emissions within the county and potential impact on the target for Essex to be net zero by 2050 should be included in the assessment" and implies within paragraph 9.3.3 that such an assessment has been omitted. However, when assessing the significance of estimated changes in Greenhouse Gas (GHG) emissions, the Institute of Environmental Management and Assessment (IEMA) guidance on 'Assessing Greenhouse Gas Emissions and Evaluating their Significance' (IEMA, 2022) explains: "The crux of significance is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050." As noted in paragraph 15.1.9 of Chapter 15: Climate [APP-082], the only statutory carbon targets are the carbon budget targets and the Net Zero 2050 target that are set at a national level i.e., they are targets for the UK as a whole. There are no sectoral targets

(e.g., for transport), nor any trajectories to Net Zero by 2050 set at a subnational geographic scale. This means that, for the purposes of assessing the likely significance of the effects of the proposed scheme in accordance with the IEMA guidance, the only available trajectory is that contained in the national carbon budgets.

No other trajectory has been produced for a less than national scale which is demonstrably consistent with the national carbon budgets. Mathematical exercises in apportioning emissions derived from the national carbon budgets do not result in trajectories which can be appropriately used since, were the Government to undertake such an exercise, it may be that for policy reasons certain geographical areas might be weighted differently than others. It is then not reasonably possible for the Applicant to produce an alternative baseline trajectory against which the significance of the proposed development's carbon emissions could be assessed since it is unable to make the policy judgments relating to the apportionment to a smaller geographical area. Accordingly, there is no reasonable basis upon which the Applicant can assess the potential likely significant effect of the proposed scheme's carbon emissions at anything other than at the national level.

ECC states in paragraph 9.3.15 that "given that the proposed scheme is located entirely within the area administered by the council (para 15.8.4) and the data used (BEIS 2021f) for determining the carbon emissions baseline is presented at both national and county level, then it would be straightforward for the applicant to carry out an assessment so that the impact of the scheme on the County target is fully understood and can inform the decision-making process". It should be noted, however, that the baseline emissions presented in Section 15.8 of Chapter 15: Climate [APP-082], which are published by the Department for Business, Energy and Industrial Strategy (BEIS), are allocated on an "end-user" basis where emissions related to energy use are distributed according to the point of energy consumption (and therefore do not, in all cases, reflect emissions which physically occur within the geographical region of Essex). Furthermore, no comparable estimates are available of future year GHG emissions within Essex. As such, there is no suitable future baseline for GHG emissions in Essex (or as noted above, a trajectory towards net zero by 2050) against which changes in GHG emissions associated with the proposed scheme in the future could be compared.

It should also be noted that the assessment of changes in GHG emissions as a result of the proposed scheme presented in Chapter 15: Climate [APP-082] is considered likely to be worst case. This is because the estimated operational road user GHG emissions presented, which make up the majority of the estimated increase in GHG emissions in future years as a result of the proposed scheme (derived using Defra's Emission Factors Toolkit v11 (Defra, 2021)) do not fully account for the most recent projections for the uptake of electric cars and vans described in the latest version of DfT's TAG data book (with the most recent version being published in January 2023). Nor do they take account of the projected reductions in GHG emissions depicted in Figure 2 of the Transport Decarbonisation Plan (TDP) (DfT, 2021b, page 45). The impacts of the TDP are expected to lead to a substantive decrease in GHG emissions from all forms of road transport between now and 2050. As the TDP has only recently been published, vehicle composition projections and emission factors have not yet been updated to reflect the emerging policy position described by the TDP.

In addition to the TDP, National Highways has published its own 2030/2040/2050 Net Zero Highways Plan (National Highways, 2021). This plan includes commitments to ensure that National Highways' corporate GHG emissions will become net zero by 2030, its maintenance and construction activities will become net zero by 2040 and road user GHG emissions on the strategic road network will become net zero by 2050. Again, the impacts of these commitments have not been factored into the assessment.

By 2050 therefore, the date by which ECC has committed to achieve net zero, both operational maintenance and road user emissions on the strategic road network (including the A12) will be substantially reduced and are planned to be net zero.

2) Any requirement for the proposed scheme to be 'net zero'

In paragraph 9.3.16, ECC states that "Throughout the Environmental Statement Chapter 15, the applicant has not acknowledged the importance of reducing the impact of the scheme to as close to net zero as possible. The applicant considers that as the net zero target is set for the UK as a whole then there is no requirement for the proposed scheme to have net zero GHG emissions".

In response, the Applicant confirms and asserts that there is no requirement for the proposed scheme, or any other development for that matter, to be 'net zero'. For example, the National Networks National Policy Statement (NNNPS) states "any increase in carbon emissions is not a reason to refuse development consent, unless the increase in carbon emissions resulting from the proposed scheme are so significant that it would have a material impact on the ability of Government to meet its carbon reduction targets". This sentiment is echoed by IEMA guidance on 'Assessing Greenhouse Gas Emissions and Evaluating their Significance' (IEMA,

2022) which states that "a project that is compatible with the budgeted, science-based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and 'good practice' reduction measures to achieve that has a minor adverse effect that is not significant. It may have residual emissions but is doing enough to align with and contribute to the relevant transition scenario, keeping the UK on track towards net zero by 2050 with at least a 78% reduction by 2035 and thereby potentially avoiding significant adverse effects".

The NPSNN also states that "evidence of appropriate mitigation measures (incorporating engineering plans on configuration and layout, and use of materials) in both design and construction should be presented" and that such measures should be developed to "ensure that, in relation to design and construction, the carbon footprint is not unnecessarily high". Furthermore, the Design Manual for Roads and Bridges (DMRB) LA 114 Climate guidance requires that "Projects shall seek to minimise GHG emissions in all cases to contribute to the UK's target for net reduction in carbon emissions".

Mitigation measures have therefore been proposed within Section 15.10 of Chapter 15: Climate [APP-082] in order to minimise GHG emissions associated with the proposed scheme so that they are not unnecessarily high and on net zero trajectory, rather than being 'net zero'.

3) The appropriateness of proposed mitigation measures

Comments made by ECC relating to proposed embedded, standard and additional mitigation measures and potential enhancements are discussed below in turn.

Embedded mitigation

In paragraph 9.3.22 ECC states proposed embedded mitigation measures "mainly relate to scoping out works, and modifying works, to avoid the need for construction and demolition activity". This approach has purposefully been taken, as this is the first step in the recognised emissions reduction hierarchy set out in paragraph 3.22.1 of DMRB LA 114 Climate, which is to 'avoid / prevent' GHG emissions, for example by maximising the "potential for re-using and/or refurbishing existing assets to reduce the extent of new construction required". In the same paragraph, ECC goes on to state "As an example, existing pathways are to be retained, but there is limited comment on how these pathways, cycleways and horse-riding facilities are going to be truly enhanced to benefit the environment, for example through planting or integration of permeable surfaces". In response it is noted that materials and planting for WCH routes will be considered during detailed design to respond appropriately to local conditions. Design principles for WCH and Landscape are included with the Design Principles [REP2-006] document.

With regard to proposed measures to support active travel to encourage a modal shift away from the use of the private car, ECC states in paragraph 9.3.24 that the proposed measures "are a minimum, in that they seek to facilitate the continued use of existing infrastructure for current users of active travel modes and to ensure these are not inhibited. There is no evidence presented in the Chapter to demonstrate that these measures are likely to stimulate a significant modal shift. The council would urge the applicant to address this by incorporating more innovative and enabling active travel measures to encourage a significant modal shift".

Design reference document GD 300 section E/3.10 requires a "significant contribution" for walking and cycling and horse-riding (WCH) by "delivering quality provision that includes the removal of severance on routes and unlocks latent demand by WCH" The inclusion of 30km of new and/or improved WCH routes, plus new and improved crossings of A12 all futureproofed for all three non-motorised modes as part of the A12 scheme reflects that ambition.

In paragraph 9.3.6, ECC states that the species type and mix of the trees and shrubs which are proposed to be planted "should be carefully considered, making sure that they are the right species in the right place, offering the greatest absorption of greenhouse gases, are drought tolerant, and from stock native to the area". This observation is noted and will be considered going forwards.

Standard mitigation

With regard to 'sourcing materials from local suppliers, where practical and cost-effective to do so', ECC requests in paragraph 9.3.31 that "National Highways should make a greater commitment to this, setting targets for local procurement and this should be integrated into the proposed Sustainable Procurement Plan which currently only commits to 'sustainably and responsibly sourced materials and products". In response, the Applicant notes that the proposed Sustainable Procurement Plan would specify the "Use of locally sourced and recycled materials, where available and permitted by the Specification for Highway Works, and where practicable and cost-effective to do so", as noted in paragraph 11.10.15 of Chapter 11: Material Assets and Waste [APP-078].

With regard to the proposed 'Site Waste Management Plan' ECC states in paragraph 9.3.32 that "The Site Waste Management Plan is to become the responsibility of the Principal Contractor but there are no details about how this contractor will be identified and their experience in the management of waste and circular economy principles and what the expectations are. The inclusion of measurable targets would be advisable". In response, the Applicant notes that the principal contractor (Costain) has already been appointed and is highly experienced in both the management of waste and implementation of circular economy principles on highways and other strategic infrastructure projects. Furthermore, an outline Site Waste Management Plan is included as Appendix L to the First Iteration Environmental Management Plan [APP-196], which includes measurable key performance indicators in line with prevailing National Highways targets.

With regard to the proposed 'Sustainable Procurement Plan' ECC states in paragraph 9.3.33 that "Whilst the Applicant refers to the preparation of a Sustainable Procurement Plan (SPP) and also a Sustainable Waste Management Plan, it is noted that there are a number of limitations to this, particularly because reference is made to a number of 'principles'. Of particular concern is the 'value for money' principle which will likely trump all environmental considerations given its narrow focus. Greater emphasis should be placed on environmental considerations in the decision making process, including evaluating the 'services' the environment provides, and the cost to wider society of not taking environmental matters into account". ECC's concerns are noted, however, the Applicant would refer ECC to the following locations in the DCO application where sustainable procurement is discussed, and where wider environmental considerations are inherently included as part of the decision framework for the procurement of key construction material and products, i.e. alongside other factors such as cost, specification and availability:

· Paragraphs 2.2.127 and 2.2.128 of Environmental Statement Chapter 2: The Proposed Scheme [APP-069];

· Paragraph 11.10.15 (bullet point 2) of Environmental Statement Chapter 11: Materials Assets and Waste [APP-078]; and

· Reference No. MW2 in the First Iteration Environmental Management Plan - Appendix A: REAC [APP-185]

Additional mitigation

In paragraph 9.3.34 ECC states that “It is disappointing that no additional mitigation measures have been identified (para 15.10.8). Overall, the mitigation measures listed focus on the delivery of the scheme, with little consideration or commitment to the ongoing improvement in materials in road construction. For example, where possible, using recycled materials for maintenance, sourcing local materials, using local and considerate contractors and through the sharing of best practice or ‘lessons learnt’”. In response, it is noted that ‘additional mitigation’ is defined as mitigation measures which are required, over and above embedded and standard mitigation, in order to mitigate a significant effect. As the proposed scheme, following the implementation of embedded and standard mitigation measures, is not considered to have a significant effect on climate, then no such measures are considered necessary.

Going forwards, however, the National Highways 2030/2040/2050 Net Zero Highways Plan (National Highways, 2021) includes commitments to ensure that all construction plant and compounds on National Highways construction and maintenance projects will be zero emissions by 2030 and that all maintenance and construction activities on National Highways projects will become net zero by 2040. This ambition has been supported by the recent publication of a zero carbon roadmap for concrete, steel and asphalt [redacted], which includes a commitment to drive ‘best practice in design and construction’.

Enhancement measures

In paragraph 9.3.36 Essex County Council states that “The measures listed as enhancements in Section 15.10.9 [of Chapter 15: Climate [APP-082]] are the type of measures that the council would expect to be taken to demonstrate how to reduce and avoid GHG emissions on an infrastructure project of this scale” and in paragraph 9.3.7 that “It is disappointing that the applicant says they cannot confirm the measures and say they are not necessary to mitigate emissions. The council disagrees, National Highways – as an 'arm' of Government – and a significant infrastructure provider, should be leading the construction industry by example and striving to achieve and play their part in contributing to the national goal of achieving net zero by 2050. Therefore, the council would urge the applicant to commit to these measures and seek to implement them in full as this is not drawn out in Chapter 15 at this time".

In response, and with regard to measures which would be taken to further avoid or reduce GHG emissions during the construction stage, it is noted that the National Highways 2030/2040/2050 Net Zero Highways Plan (National Highways, 2021) includes commitments to ensure that all construction plant and compounds on National Highways construction and maintenance projects will be zero emissions by 2030. As such the availability and affordability of low emission construction plant and machinery, for example, is likely to increase over time as we approach this milestone. Furthermore, whilst the suitability and performance of such equipment is currently being demonstrated on high profile projects such as HS2, it is not yet commonly used in the construction industry. It is therefore expected that some low emission construction plant will be used on the proposed project as the availability, affordability and technical readiness of such equipment improves over time. However, it is not yet considered possible or appropriate to make specific commitments at this stage, which it may not be possible or cost effective to deliver.

With regards to measures which would be taken to further avoid or reduce GHG emissions associated with the consumption of raw materials and the voluntary 30% carbon reduction target which has been set for the embodied carbon associated with the proposed scheme, it is noted that such measures can only be developed and assessed at the detailed design stage when more detailed design information is available than currently. This is because it is only at this stage when the 'final' design and associated material quantities are known and where the practicality, cost effectiveness and any implications for design standards relating to safety and quality of such measures can be fully understood. As such, it is not considered possible to commit to specific carbon reduction measures at this stage. The same argument holds true in relation to the opportunities for enhancement that have also been listed in paragraph 15.10.10 of Chapter 15: Climate [APP-082] in relation to vulnerability to changes in climate.

4) The assessment of cumulative Impacts

In paragraph 9.3.45, Essex County Council state "It is the cumulative impact of such projects that needs to be assessed and a judgement made on the significance of the effects of all the projects together on the ability of the UK to meet the net zero target”.

In response it is noted that Paragraph 5 of Schedule 4 to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 states that an environmental statement is required to include:

“a description of the likely significant effects of the development on the environment resulting from, inter alia— (e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;”.

Thus, the focus of an environmental statement is upon whether the proposed development is likely to have a significant effect upon the environment of itself and/or in combination with other existing and/or approved projects. It is not the function of an environmental statement to provide an assessment of the likely significant effects of other potential related or unrelated projects which will be subject to their own assessments and decision-making processes. As a result, the Environmental Statement assessed the likely significant effects of the proposed scheme.

The Environmental Statement Chapter 15: Climate [APP-082] details the assessments undertaken by the Applicant and the approach taken with regard to cumulative impacts, namely:

- · Paragraphs 15.11.14 to 15.11.19 of Chapter 15: Climate [APP-082] explain that the assessment of climate impacts is inherently cumulative through the inclusion of the proposed scheme and other locally committed transport schemes and developments within the traffic model on which the greenhouse gas (GHG) emissions calculations are based.
- · The national carbon budgets themselves are cumulative since they address carbon emissions from a wide variety of sources across the sectors of the economy.
- · The approach to climate change assessment utilised in the Environmental Statement Chapter 15 (which applies that set out in the DMRB LA 114) is itself cumulative in the sense that it includes background growth, other local

committed development and the Scheme itself within the traffic model. It provides a total of the emission for all these sources which can be set against and in the context of the UK carbon budgets As such, it is considered that an appropriate assessment of likely cumulative impacts on climate has been undertaken.
9.4.1 - 9.4.14
The Applicant acknowledges the collaborative engagement that has been undertaken with Essex County Council as the Lead Local Flood Authority and welcomes its support for the proposed scheme. In relation to Inworth Road, the proposed drainage design would indeed only mitigate the impact of additional paved areas. Flood mitigation has been provided to reduce the existing risk of flooding from surface water.
9.4.15 - 9.4.19
The Applicant acknowledges that Essex County Council as Lead Local Flood Authority is satisfied with the proposed scheme surface water drainage proposals and welcomes its support for the proposed scheme. With regard to the provision of water quality measures the Applicant has provided measures as determined by the assessment method detailed in the Design Manual for Roads and Bridges (DMRB) LA113 Road drainage and the water environment and set out within the Water Quality Assessment Report [APP-158], which is supplemented by the Surface Water Drainage Strategy [APP-174, Section 11] and associated proposed drainage catchment plans shown on the Drainage and Surface Water Plans Part 1 [APP-033] and Part 2 [APP-034]. The Water Quality Assessment report [APP-158] concludes that there would be no significant environmental impact on the water environment as defined by LA 113.
9.4.20 - 9.4.21

The Applicant acknowledges Essex County Council's written representation. The Applicant's approach to water management and associated mitigation is secured within the Water Management Plan of the First Iteration Environment Management Plan [APP-198]. The Second Iteration Environment Management Plan will be developed prior to construction providing more detail on the mitigation measures the applicant will take in regards to water management as required by Requirement 3 of the dDCO [AS-020].
9.4.22 - 9.4.28
The Applicant acknowledges that the result of the water quality assessment, reported in Water Quality Assessment Report [APP-158] and referred to in paragraphs 9.4.22 to 9.4.24, concludes that there is no environmentally significant impact as defined by Design Manual for Roads and Bridges (DMRB) LA113 Road drainage and the water environment. With regards to section 9.4.25 to 9.4.28 the Applicant agrees that untreated road run-off contains pollutants and confirms that through the assessment method any discharges that were assessed as significantly polluting to the water environment have been addressed by way of embedded mitigation. Where required, sustainable drainage measures have been provided to treat run-off as identified by detailed assessment within the Water Quality Assessment Report [APP-158]. The Applicant confirms that there are some locations where the assessment, as defined by DMRB LA113, identifies there is no significant risk to a water receptor without treatment. The Water Quality Assessment Report [APP-158] concludes that there is no significant risk to the water environment following the assessment process as described within DMRB LA113 that was developed with the Environment Agency and is considered appropriate in line with national policy requirements for determining significance of effects of the proposed scheme. The Water Quality Assessment Report [APP-158] for the proposed scheme has been supplemented with the Surface Water Drainage Strategy [APP-174] and Drainage and Surface Water Plans Part 1 [APP-033] and Part 2 [APP-034]. Section 6 and Table 11.1 to 11.3 of Section 11 of the Surface Water Drainage Strategy [APP-174] provides a summary of the catchment specific sustainable drainage mitigation measures proposed for the highway drainage system which when read alongside the Drainage and Surface Water Plans Part 2 [APP-034] are considered to provide an appropriate level of information for the proposed scheme sustainable drainage measures. Further details of the proposed sustainable drainage mitigation measures will be developed through

detailed design including consideration of CIRIA c753 technical detail requirements for water quality as directed by the DMRB and will be communicated through ongoing consultation in accordance with requirement 11 of the DCO [AS-020] with Essex County Council.
9.4.29 - 9.4.30
The assessment undertaken in the water quality assessment report [APP-158] concludes that there would be no significant environmental impact on the water environment and supports the conclusion of Water Environment Regulations (WFD Regulations) Compliance Assessment [APP-159] that the proposed scheme is compliant with the Water Framework Directive. Further discussion with the Applicant is welcomed through the detailed design process.
9.4.31 - 9.4.32
The Applicant notes Essex County Council's comments.
9.4.33 - 9.4.40
The Applicant acknowledges that Essex County Council as Lead Flood Authority is satisfied with the proposed scheme surface water drainage and flood risk mitigation proposals and welcomes its support for the scheme. With regard to the provision of water quality measures the Applicant has provided measures as determined by the assessment method detailed in Design Manual for Roads and Bridges (DMRB) LA113 Road drainage and the water environment and set out within the Water Quality Assessment Report [APP-158], which is supplemented by the Surface Water Drainage Strategy [APP-174] and associated drainage plans shown on Drainage and Surface Water Plans Part 1 [APP-033] and Part 2 [APP-034]. The use of the DMRB assessment method is considered appropriate in line with national policy requirements for determining significance of effects of the proposed scheme.
9.4.41 - 9.4.41

The Applicant notes Essex County Council's comments.
9.5.1 - 9.5.20
The Applicant welcomes the comments from Essex County Council with respect to green infrastructure and provides the following response. Paragraph 9.5.2 of the LIR The Applicant acknowledges that green infrastructure is multi-functional. The Design Principles document [REP2-006] covers multiple aspects relevant to green infrastructure including landscape and planting design, design of attenuation ponds, earthworks, and borrow pit restoration. The design principles have been used to inform development of the landscape-led proposed scheme design, including both the highway alignment and the Environmental Masterplan on Figure 2.1 of the Environmental Statement [APP-86, APP-87 and APP-88]. Of the scheme-specific design principles as described in paragraph 2.2.5 of Chapter 2 The Proposed Scheme of the Environmental Statement [APP-070], one is to support green infrastructure objectives through the use of planting to link into existing field boundary vegetation to provide screening and integration into the local pattern and character, as well as connecting existing wildlife corridors. Table 2.2 of Chapter 2 of the Environmental Statement [APP-070] details the proposed scheme-specific objectives and how these align with RIS2 strategic outcomes. This includes reducing the biodiversity impact of the proposed scheme to deliver better environmental outcomes. Paragraph 9.5.4 of the LIR

With regards to the water quality measures, it is noted that appropriate mitigation measures have been provided as determined by the assessment method detailed in Design Manual for Roads and Bridges (DMRB) LA113 and set out within the Water Quality Assessment Report [APP-158]. Details on the highway drainage catchments and associated discharge points to River Blackwater including proposed mitigation measures (e.g., attenuation pond) can be found on Sheet 12 of 21 and Sheet 13 of 21 of Drainage and Surface Water Plan Part 2 [APP-034]. The Water Quality Assessment Report [APP-158] concludes that there is no environmentally significant impact on the water quality from the highway drainage catchments discharging to River Blackwater. It is noted that appropriate water quality mitigation measures will be provided during the construction stage as secured by the REAC [APP-185] (commitment RDWE1, RDWE2, RDWE3, RDWE4).

The Applicant has undertaken an assessment of the effects of the project on the Blackwater Estuary, as presented in the Habitats Regulations Assessment No Significant Effects Report (NSER) [APP-201]. The assessment recognises the hydrological connectivity between the River Blackwater and the Blackwater Estuary. However, the report concludes no likely significant effects on the international designated sites within the Blackwater Estuary (Blackwater Estuary (Mid-Essex Coast Phase 4) SPA/Ramsar and the Essex Estuaries SAC).

As per Table 9.1 of Chapter 9 Biodiversity of the Environmental Statement [APP-076], on the 19 October 2021, Natural England issued a letter stating they are in agreement with the HRA Stage 1 Screening Assessment conclusion that no likely significant effects on any sites within the national site network are anticipated, when considered alone or in combination with other plans and projects.

Paragraph 9.5.5/6 of the LIR

The proposed scheme has been designed in line with the requirements outlined in the National Planning Policy Framework (NPPF). Of relevance to this question are the following:

- As stated in paragraph 9.10.8 of Chapter 9 of the ES [APP-076], in line with the requirements of the NPPF and National Networks National Policy Statement (NNNPS) the proposed scheme aspires to maximise biodiversity delivery. Where habitats are lost as a result of the proposed scheme, new habitats of equal or greater value would be created (see Section 9.13 of Chapter 9 Biodiversity of the ES [APP-076]).

- The Surface Water Drainage Strategy (Appendix 14.6 [APP-174]) includes details of proposed sustainable drainage systems (SuDS). The objective of SuDS is to minimise the impacts from the proposed scheme on the quantity and quality of surface water runoff and to maximise the amenity and biodiversity opportunities. Where practicable, SuDS have been used to reduce the impact of surface water runoff discharged into the natural environment, thereby reducing flood risk and improving water quality.

- A Flood Risk Assessment (FRA, Appendix 14.5 [APP-162]) has been developed for the proposed scheme in parallel with the Surface Water Drainage Strategy [APP-174]. The FRA demonstrates that with appropriate flood risk mitigation measures, the proposed scheme will remain operational and safe and will not increase flood risk elsewhere.

Paragraph 9.5.7 of the LIR

As per paragraph 9.8.140 of Chapter 9 Biodiversity of the Environmental Statement [APP-076], the assessment undertaken for the proposed scheme including the biodiversity net gain calculations used the restored Colemans Quarry restoration plan in the baseline (as per the restoration plans reference [C45/01/05] approved by the local planning authority at the time of DCO submission). With respect to the County Council's concerns that a recently revised restoration plan has been submitted as part of a revised planning application, and in particular that the revised restoration plan shows an increase of arable habitat under the footprint of the A12, the Applicant can confirm the proposed habitat creation for the A12 (as shown on Environmental Masterplan [APP-086 to APP-088]) has not changed. The Applicant is committed to maximising biodiversity delivery as the design is developed at detailed design and would only use revised restoration plans for Coleman's Quarry where this would result in habitats of a higher value in the baseline.

Paragraph 9.5.9/10/11 of the LIR

To address the severance caused by the proposed scheme, there would be a 3m wide shared use cycle track through Rivenhall End to the north of the de-trunked A12, connecting with existing cycle tracks, with a new crossing of the de-trunked A12 connecting to Oak Road (south) (as detailed in Table 2.3 of Chapter 2 [APP-070]). A new 4m wide shared use cycle track would also be provided over Braxted Road Overbridge. Landscaping and habitat planting outlined on the Figure 2.1 Environmental Masterplan [APP-087] (Part 2, Sheet 11 of 21) and as committed to in BI21 in the REAC [APP-185] would be further developed at the detailed design stage to include linear woody planting on the embankments of Braxted Road Overbridge and Easthorpe Road Overbridge. The linear planting at these locations would include larger stock and faster growing native trees at strategic locations on the new embankments and existing A12 where practicable, which would contribute to green infrastructure objectives by linking into existing vegetation to provide screening and integration into the local pattern and character, as well as connection of existing wildlife corridors.

The Applicant's environment and infrastructure design specialists have worked in close collaboration to avoid or reduce environmental impacts through the proposed scheme design. This is referred to as embedded (or design) mitigation, which is described in Section 8.10 of Chapter 8 Landscape and Visual [APP-075], and includes a series of landscape design measures to reduce the visual impact of the proposed scheme and to help integrate the proposed scheme with the local landscape, and to support objectives for biodiversity. This would help protect the quality of green spaces, which is also relevant for human health (paragraph 13.17.3 of Chapter 13 Population and Human Health [APP-080]). As the design of the proposed scheme is developed in more detail, the Applicant is committed to retaining existing vegetation within the Order Limits as far as reasonably practicable including temporary works areas (commitment LV4 of the (REAC) [APP-185]).

Paragraph 9.5.12 of the LIR

All land temporarily occupied would be restored and returned to an appropriate condition relevant to its previous use wherever practicable and appropriate, including the ripping, minor regrading and re-spreading of topsoil. Hedgerows, fences and walls would be reinstated to a similar style and quality to those that were removed with landowner agreement (paragraph 9.10.23 of Chapter 9 Biodiversity [APP-076]).

Paragraph 9.5.13 of the LIR

As per commitment LV18 of the Register of Environmental Actions and Commitments [APP-185] and the Landscape and Ecology Management Plan [APP-193], both in the first iteration of the Environmental Management Plan [APP-184], a five-year aftercare period would be established for all soft environmental features of the proposed scheme.

The long-term management, maintenance and monitoring of the soft estate would pass to National Highways.

As biodiversity net gain is not mandatory for the proposed scheme the Applicant does not consider it appropriate to secure management of habitats for the purpose of biodiversity net gain. However, whilst not maintained specifically for the purpose of biodiversity net gain, long term management of the soft estate would pass to National Highways.

Paragraph 9.5.14/15/16 of the LIR

The maintenance responsibility for the existing highway drainage system serving the A12 is with National Highways. However, any surface water drainage assets located on local roads are the responsibility of the local highway authorities.

The various drainage elements that comprise the highway drainage systems for the proposed scheme will require periodic maintenance. The responsibility for the maintenance of the highway drainage and SuDS features (i.e., attenuation ponds) will be undertaken by National Highways for the strategic highway network and Essex Highways for the local highway network (full details are provided in paragraph 13.2.1 of Appendix 16.6 Surface Water Drainage Strategy [APP-174]).

Consultation is ongoing with National Highways and Essex Highways to discuss and agree the ownership allocation between both parties, of the proposed highway drainage including the SuDS attenuation features and the associated downstream outfalls within the Order Limits. Prior to handover, arrangements for the operation and maintenance of the proposed highway drainage would be agreed with National Highways and Essex Highways.

Details of the post-construction maintenance proposals, including the handover of maintenance obligations, are provided within the Landscape and Ecology Management Plan (LEMP, Appendix I [APP-193] within the first iteration Environmental Management Plan [APP-184]) and have been designed to ensure the successful establishment of landscape and ecological mitigation associated with the proposed scheme.

Paragraph 9.5.17 of the LIR

The first iteration of the Environmental Management Plan (EMP) [APP-184] presents how natural assets would be protected during construction and how environmental mitigation would be secured within the Register of Environmental Actions and Commitments (REAC) [APP-185]. Appended to the first iteration EMP, the Landscape and Ecological Management Plan [APP-193] presents how the landscape and ecological features would be protected during construction, and how landscape and ecological mitigation would be implemented and maintained. As per commitment GN1 of the REAC [APP-185] a second iteration Environmental Management Plan (EMP) would be prepared and approved by the Secretary of State for Transport prior to commencement of any works. The second iteration EMP (the equivalent of a construction environmental management plan (CEMP)) would detail the measures that shall be undertaken prior to, and during construction of the proposed scheme. The construction of the proposed scheme must be carried out in accordance with the approved second iteration EMP. The second iteration EMP must be based on, and incorporate, the requirements of the first iteration EMP

[APP-184] and shall include the implementation of industry standard practice and control measures for environmental impacts arising during construction.

As stated within commitment LV10 in the REAC [APP-185], opportunities for planting early in the construction phase would be sought where practicable, including green infrastructure. Subject to planning consent where required and with landowner agreement, some ecological mitigation areas would be created as part of advanced works to allow time for the establishment of habitats. Further details are provided in Section 9.10 of Chapter 9 Biodiversity of the Environmental Statement [APP-076].

The first iteration of the EMP [APP-184] presents how natural assets including retained green infrastructure, such as trees, hedges and vegetation, as well as any nature designated sites would be protected during construction and how environmental mitigation would be secured within the Register of Environmental Actions and Commitments (REAC) [APP-185]. For example LV4 states that 'all trees to be retained would be protected throughout the construction period in accordance with BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations', BI2 states 'exclusion zones would be marked where appropriate around protected habitat areas such as trees, woodlands, hedgerows and watercourses to avoid accidental damage in accordance with the Retained and Removed Vegetation Plans [APP-035 and AS-017]. Marking of protected areas would be based on proximity and risk of encroachment, and based on these factors, markings may include physical barriers or signage. Construction compounds would be fenced off', and BI3 states 'Exclusion zones would be marked around Brockwell Meadows Local Wildlife Site (LWS) which is adjacent to the Order Limits, and around retained parts of Whetmead Local Nature Reserve (LNR)/LWS and Riverview Meadows LWS in accordance with the Retained and Removed Vegetation Plans [APP-035 and AS-017].'

A five-year aftercare period would be established for all soft environmental features of the proposed scheme and would be included as part of the construction contract requirements. Thereafter, the soft estate would be maintained by National Highways through its managing agents. National Highways would be responsible for long term management of land acquired within the Order Limits for operational and safety reasons.

Paragraph 9.5.18/19/20 of the LIR

The Applicant notes the comments from ECC's Planning and Advisory Service with respect to Biodiversity Net Gain (BNG) and future calculations. The Applicant will re-run the BNG calculations once further landscaping information becomes available through detailed design. The Applicant notes the guidance within the FAQ section of the metric which suggests that, given the minor changes between Metric 3.0 and Metric 3.1, it is acceptable to continue using an older version of the Metric (i.e., 3.0) if a project has already begun. However, as stated in paragraph 5.3.1 of Appendix 9.14 Biodiversity Net Gain Report [APP-138], Biodiversity Metric 3.1 will be considered for future metric calculations at the detailed design stage of the project.

While the Applicant has not produced a dedicated BNG plan, the information requested by ECC (and as outlined in the Environment Act) is contained within Appendix 9.14 Biodiversity Net Gain Report [APP-134].
9.6.1 - 9.6.22
Paragraph 9.6.1 of the LIR – Local issues The Applicant notes the concerns raised with respect to barrier of movement from one side of the A12 to the other. The following measures are proposed to prevent this impact. · Movement of species across the proposed scheme has been considered during this design stage with a view to minimising fragmentation (see Section 9.10 of Chapter 9 of the Environmental Statement [APP-076]). · As per paragraph 9.10.7 of Chapter 9 Biodiversity of the Environmental Statement [APP-076], mammal ledges positioned at least 150mm above the 1 in 100 year flood level and with at least 600mm headroom would be fitted within culverts along the Rivenhall Brook, Domsey Brook (east), Domsey Brook (west) and Roman River, headroom and health and safety risk assessment permitting. Mammal ledges would be at least 500mm wide and accessible from the bank by ramps. Mammal ledges are labelled on the following sheets of Figure 2.1 Environmental Masterplan [APP-086 to APP-088]: Rivenhall Brook Culvert (sheet 11), Domsey Brook Bridge (sheet 14), Domsey Brook East Culvert (sheet 17) and Roman River Culvert (sheet 19). In addition, the provision of numerous 600mm, 1200mm, and 1500mm culverts for minor ditches would enable mammals, reptiles and great crested newts (GCN) to cross safely beneath the proposed scheme. Where practicable, landscape planting would be designed to guide mammals to these features. · As per paragraph 9.10.7 of Chapter 9 [APP-076], landscaping and habitat planting have been designed to increase connectivity across the landscape and avoid fragmentation of foraging and commuting habitats (see Figure 2.1 Environmental Masterplan [APP-086 to APP-088]). The detail of landscaping proposals would be further developed at the detailed design stage to include linear woody planting on the embankments of Braxted Road Overbridge, Highfields Overbridge replacement, Ewells Overbridge

replacement, Prested Hall Overbridge, Easthorpe Road Overbridge and Wishingwell Overbridge. The linear planting at these locations would include larger stock and faster-growing native trees at strategic locations on the new embankments and existing A12 where practicable, to act as hop-overs and to guide bats over the new road. Where possible, linear planting would tie in with culverts to guide bats through these as opposed to over nearby side roads.

Paragraph 9.6.4/5/6 and 9.6.11 of the LIR – Adequacy of the information provided

The Applicant considers that the areas of key interest where Essex County Council does not feel adequate information has been provided relate to bats and dormice. Data from the bat report [APP-128] has been summarised within this response to assist the Council in understanding the effects on bats. A summary of the status of the assessment with respect to dormice is also provided.

Dormouse surveys were completed in 2022 for the gas main corridor and the survey report (Dormouse Survey Report [AS-036]) is available via the Examination library (since 12 December 2022). No records of hazel dormice were returned from the desk study which included a 2km buffer of the study area, nor were any hazel dormice found during the surveys. Dormice are therefore considered likely absent from the gas main corridor, as well as from the wider proposed scheme, and the residual effect on this species is considered 'neutral'.

If the Council has any other specific concerns with respect to gaps in information the Applicant would welcome further details with a view to resolving those concerns.

The Applicant notes that Essex County Council is concerned that without mitigation for non-significant effects they would be unable to discharge their duties under the NERC Act. Under s40 of the NERC Act Essex County Council must consider what action it can take to further the general biodiversity objective to conserve and enhance biodiversity. This duty does not mean that all non-significant impacts must be mitigated.

Paragraph 9.6.7 of the LIR – Meetings The Applicant has been keen to engage with Essex County Council throughout the preliminary design stage for the proposed scheme. As per Table 9.2 of Chapter 9 Biodiversity [APP-076] meetings were held between the Applicant and Essex County Council / Place Services (Essex County Council's internal ecological consultancy) on 18 March 2021 and 26 May 2022. They were also invited to attend the Preliminary Environmental Information Report workshop on 29 April 2021 but sent their apologies. They did attend the briefing session on the Environmental Statement on 16 March 2022 where they had the opportunity to provide comments on the proposed scheme in advance of statutory consultation and submission of the DCO application. The Applicant requested a follow up meeting with Place Services after the most recent meeting on 26 May 2022 in order to close out actions however the Council did not respond to the meeting requests. During the meeting on 26 May 2022, a plan was presented showing the locations of barbastelle activity recorded on static detectors and during bat transect surveys – this figure will be submitted to the Examination at Deadline 3. Attendees from ECC commented that they were satisfied with the deviations from the Bat Conservation Trust survey guidelines on the whole, with a small detail to be closed out regarding specific methodology for online and offline sections. Additionally, the representative from ECC commented that she was satisfied with the assessment of impacts to barbastelle bats but requested a response as to whether any international obligations contained with the Bern and Bonn Conventions (Annex II) needed to be considered. Following the meeting, Place Services was provided with further information regarding the methodology for bats as requested via email on 30 May 2022. No further communication has been received from the Council despite the Applicant following up on multiple occasions. The Applicant would like to reassure Essex County Council that as per Annex N of the Consultation Report (containing tables evidencing regard had to consultation response [APP-062]) and as summarised in Table 9.2 and Table 9.3 of Chapter 9 Biodiversity of the Environmental Statement [APP-076], all comments raised during the course of the production of environmental documents and associated consultation period have been taken into account at this stage. These documents summarise how we have taken the feedback into account. Paragraph 9.6.8 to 9.6.9 of the LIR - Bats

The Local Impact Report correctly states that both Nathusius' pipistrelle and barbastelle bats have been recorded during surveys of the proposed scheme and that these are rarer species of bats. The Applicant notes the issues raised with respect to bats including these rarer species and provides the following information extracted from the Bat Survey Report [APP-128] to provide reassurance that impacts to bats have been adequately addressed.

However, to provide some context to the data, recordings of these species were infrequent compared to other bat species and comprised a single Nathusius' pipistrelle during a transect survey (on the eastern edge of Coleman's Reservoir), an incidental record (i.e. a passing bat) of a single Nathusius' pipistrelle on an emergence/re-entry survey, and approximately 30 passes of Nathusius' from 1,140 nights of surveying over a 6 month period (recorded on static detectors and during transect surveys), equating to an average of 0.03 passes per night, with no more than 1 pass in any one location in a single night.

A total of 38 barbastelle passes from 1,140 nights of surveying over a 6 month period (recorded on static detectors and during transect surveys). That would be an average of 0.03 barbastelle passes per night.

Of additional relevance is the Core Sustenance Zones (CSZ) for these species (as defined by the Bat Conservation Trust, 2016). Core sustenance zones are defined as the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost. The core sustenance zone for Nathusius' pipistrelle is 3.15km and for barbastelle is 6.47km. Desk study data concerning bat roost records (as presented in Table 5.1 of Appendix 9.4 Bat Survey Report [APP-128]), identifies the nearest known roost for Nathusius' pipistrelle is 6.8km away and for barbastelle is 6.0km away. No Nathusius' pipistrelle or barbastelle roosts were identified during field surveys. Applying the CSZs it can be concluded that the proposed scheme is outside the CSZ for known Nathusius' pipistrelle roosts and on the extremities of the CSZ for known barbastelle roosts. Therefore, it is unlikely that the proposed scheme would impact the commuting and foraging habitat of bats using the known roosts.

The Applicant would like to ensure that Essex County Council has not misinterpreted statements made within 9.4 Bat Survey Report [APP-128]. The statement included in the report, 'key areas for commuting and foraging bats in the survey area included Prested

Hall and along the River Blackwater and the River Ter, where high levels of bat activity were recorded, including for rarer species such as barbastelle and Nathusius' pipistrelle,' provides a generalised summary of where bat activity was highest, relative to bat activity levels across the entirety of the proposed scheme, and was not meant to imply levels of barbastelle and Nathusius' pipistrelle activity were high.

The low levels of records of both species on the proposed scheme is suggestive of commuting behaviour only, as it is recognised that this species forages intensively in select foraging areas to which it is highly faithful. The passes were also recorded throughout the survey season (May to October), which indicates that the proposed scheme supports general commuting activity for this species rather than being specifically linked to key transitional or sensitive periods for bats (such as maternity season). It is also important to recognise that the landscape within the Order Limits is predominantly arable and while there are small blocks of woodland, these do not support barbastelle which is primarily a woodland specialist with a strong preference for roosting in trees and foraging in woodland.

The plan shared informally with Essex County Council during the meeting on 26 May 2022, showing the use of the site by barbastelle bats will be submitted to the Examination at Deadline 3 and is attached to this response.

As shown on the plan (figure reference HE551497-JAC-EBD-SCHW-DR-LE-0003 to HE551497-JAC-EBD-SCHW-DR-LE-0011) barbastelle activity, while infrequent, is fairly distributed across the extent of the proposed scheme, both north and south of the existing A12. Highest activity levels were recorded near Marks Tey (junction 24) and Feering, with an average of 1.31 and 1.00 pass(es) per night respectively, although these numbers remain low. These data indicate that barbastelle bats are either crossing the existing scheme or navigating east to west (or vice versa) along it. In either case, it is considered that this species is therefore adept at navigating the existing A12 and will continue to do so. Taking into consideration the foraging and roosting preferences for this species (as mentioned above), the survey data support the conclusion that the proposed scheme supports low numbers of barbastelle in a commuting capacity only.

Mitigation to offset impacts due to fragmentation of the proposed scheme comprises several different measures. This is of benefit as it reduces the risk of mitigation being ineffective by not relying on one technique, and also caters for the preferences of different bats species.

The Applicant acknowledges the importance of hedgerows and other linear habitat features for bats in aiding connectivity across the landscape. Minimising loss and fragmentation of existing hedgerows and maximising planting of new hedgerows was therefore desirable to maintain connectivity for bats. Although construction of the proposed scheme would result in a loss of 15.81km of hedgerow, this would be mitigated through the creation of 42.15km of new hedgerow (paragraph 9.11.87 and 9.11.88 of Chapter 9: Biodiversity [APP-076]).

Other ways in which connectivity for bats would be maintained are summarised below (commitment references for the Register of Environmental Actions and Commitments [APP-185] are indicated in brackets where applicable):

- - The retention of existing culverts (Boreham Culvert, River Ter Bridge, Brain Bridge and Domsey Brook Bridge) which have been shown to be used by bats to cross under the existing A12.
- - Provision of new culverts (Rivenhall Brook Culvert and Domsey Brook East crossing) which could be used by bats to cross under the new offline sections of the A12.
- - Sympathetic design of new and modified culverts to improve their value to bats.
- - Design of landscape planting to avoid fragmentation of foraging and commuting habitats and to improve the connectivity of habitats either side of the proposed scheme.
- - Where possible, linear planting would tie in with culverts to guide bats through these as opposed to over nearby side roads [BI21].
- - At detailed design, landscaping proposals would be developed to include linear woody planting on the embankments of Braxted Road Overbridge, Highfields Overbridge replacement, Ewells Overbridge replacement, Prested Hall Overbridge, Easthorpe Road Overbridge and Wishingwell Overbridge [BI21].
- - Use of larger stock and faster-growing native trees at strategic locations on the new embankments and existing A12

where practicable, to act as hop-overs and to guide bats over the new road [BI21].

- - Temporary lighting would be provided to ensure safe working conditions and to maintain security within construction compounds and working areas. Best practice measures would be implemented where practicable to ensure temporary lighting is avoided or directed away from bat roosts and important commuting habitats, as well as heritage assets, residential and/or other ecological receptors such as watercourses, woodland and badger setts [LV11].

Section 9.9 of Chapter 9 [APP-076] acknowledges the potential for severance impacts on bats during operation of the proposed scheme resulting from physical impacts on existing wildlife corridors and road lighting (for light-shy species such as the brown long-eared bat). Landscape planting would be designed to maximise biodiversity delivery by improving the value of habitat throughout the proposed scheme and improving wildlife connectivity by incorporating linear habitats such as hedgerows and lines of trees, linking with retained woodland and hedgerows where feasible. Vegetation loss and retention is illustrated on the Retained and Removed Vegetation Plans [APP-035, AS-017].

As per paragraph 9/10/6 of Chapter 9 of the Environmental Statement [APP-076] the use of permanent lighting would be developed at the detailed design stage in accordance with best practice guidance (including Bats and artificial lighting in the UK, BCT Guidance Note 08/18 (BCT and Institution of Lighting Professionals, 2018)) to minimise impacts on wildlife including sensitive design of lighting to avoid creating a barrier to aquatic species or foraging bats on watercourses. Lighting would be limited to junctions, handrail lighting on the bridges for walkers, cyclists and horse riders (WCH), and side road approaches to junctions, and designed to best practice to reduce light spill. LED luminaires would be used, which use less energy than conventional luminaires, while reducing light spill into adjacent areas.

As per commitment LV11 of the REAC [APP-185], temporary lighting would be provided to ensure safe working conditions and to maintain security within construction compounds and working areas. Best practice measures would be implemented where practicable to ensure temporary lighting is avoided or directed away from heritage assets, residential and/or ecological receptors such as watercourses, woodland, badger setts, bat roosts and important commuting habitats.

It is acknowledged that there would be some loss of low quality commuting habitat as a result of construction of the proposed scheme, particularly where the new A12 alignment is proposed and therefore the potential for localised severance. However, there is sufficient alternative commuting habitat which is generally of higher quality directly south of the new A12 alignment (particularly near junction 25) that would allow bats (especially barbastelle, which are less likely to use culverts) to divert for a short distance before resuming existing flight paths adjacent to the existing A12. It is therefore considered that the movement of bats east to west across the proposed scheme would be maintained and no additional mitigation for barbastelle bats is required. Paragraphs 9.6.12 and 9.6.21 of the LIR - Veteran trees With respect to the comments in paragraphs 9.6.12 and 9.6.21 of the Local Impact Report, please see the information provided earlier in sub-part 002 of this response. Paragraphs 9.6.13/14/15 of the LIR - Priority habitats In response to paragraphs 9.6.13/14/15, the creation of Open Mosaic Habitat (OMH) on Previously Developed Land for the Lower Thames Crossing DCO is primarily driven by the significant effects on invertebrates that the project reports. It should also be recognised that the Lower Thames Crossing DCO, is in a different part of Essex, where creation of new habitat (including OMH) has been designed to complement and enhance existing biodiverse areas around the Thames Estuary. Conversely, the proposed scheme concludes slight beneficial and neutral impacts on invertebrates in construction and operation respectively (Table 9.29 and Table 9.31 of Chapter 9 Biodiversity of the Environmental Statement [APP-076]). For the proposed scheme there is some provision for the creation of south facing sandy banks and earth 'cliffs' within the ecological mitigation areas (as described in paragraph 9.10.110 of Chapter 9 [APP-076] and committed to in BI44 in the Register of Environmental Actions and Commitments [APP-185] in the first iteration Environmental Management Plan [APP-184]) which would

create a mosaic of habitats.

The proposed scheme is looking to retain more OMH through the detailed design process. In addition, the proposed scheme would create other Priority Habitats: 42.15km of new hedgerow which once matured would qualify as BAP habitat, 3.38ha of eutrophic standing water and 42.52ha of woodland and forest (see Table 9.23 of Chapter 9 [APP-076]).

With respect to the provision of low nutrient grassland, as described in Section 9.10 of Chapter 9 [APP-076] and committed to in LV8 in the Register of Environmental Actions and Commitments (REAC) [APP-185] within the first iteration Environmental Management Plan), no topsoil would be incorporated within grassland areas on new earthworks to create low-nutrient soil substrate for species rich grassland establishment and increase local biodiversity where reasonably practicable. New road verges would support low-nutrient grassland habitats which are of high ecological value. On inherently linear road verges of the proposed scheme, the creation of low-nutrient grasslands would provide an important wildlife corridor.

Paragraphs 9.6.16 to 19, and 9.6.22 of the LIR - Coleman's Farm Quarry

The Applicant will address the Essex Minerals Local Plan (specifically Policy S12) through the implementation of a Sustainable Procurement Plan (SPP) and Site Waste Management Plan (SWMP), as detailed in Table 11.6 of Chapter 11 Material Assets and Waste of the ES [APP-078].

Given the existing habitats within the site, creation of neutral grassland is considered more achievable than acid grassland. However, the suitability of acidic grassland will be considered at detailed design stage once the results of the soil resource survey have been made available which would indicate the pH of the soil. The array of habitats created would generally be more diverse than the majority of the largely arable habitat present along the existing A12 corridor (as described in Section 9.11 of Chapter 9 [APP-076]).

In line with LV17 of the Register of Environmental Actions and Commitments [APP-185], the landscape proposals illustrated on the

Environmental Masterplan, Figure 2.1 of the Environmental Statement [APP-086, APP-087 and APP-88], would be refined at the detailed design stage based the Design Principles document [REP2-006]. Detailed landscape design would take account of, and seek to dovetail with, the latest approved restoration plan for Coleman's Farm Quarry.

Habitats to be created within ecology mitigation areas to the south and north-east of junction 22 (i.e., the closest mitigation areas to Coleman's Farm Quarry) include orchard trees, open mosaic habitat on formerly developed land in the form of banks and bare earth, neutral grassland and reedbed within both wildlife ponds and attenuation ponds. The location of the ecology mitigation area to the south of Little Braxted Road provides direct connectivity to the remaining areas of quarry to be restored by the landowner following mineral extraction. In addition, newly created linear landscapes along the verges of the new A12 would provide connectivity with the wider landscape.

Paragraph 9.6.19 - Burghey Brook

The Applicant's proposal for the realignment of Burghey Brook requires the shorter length of a new culvert underneath the proposed A12 mainline (i.e., Culvert CL-12 shown on Sheet 10 of 21 of Drainage and Surface Water Plan Part 2 [APP-034]). This proposal negates the impact to ecology, habitats and wider water environment in comparison to the culvert provision along the existing alignment of Burghey Brook which will be significantly longer and deeper due to its proximity to the proposed elevated Junction 22. The shorter length of the proposed culvert CL-12 is also considered to be easier to build and provides suitable means of access for future maintenance purposes compared to the longer culverted watercourse to retain the existing alignment of the Burghey Brook. This is due to the potential requirements of additional intermediate chambers that would need to be installed along the length of a culvert (which would also need to be significantly larger/deeper) for safe means of future maintenance access. Further to this, the Applicant's proposal for the diversion of the Burghey Brook has taken into account the localised constraints to arrive at feasible solutions in combination with the development of the proposed scheme highway geometry (i.e. to suit the feasibility of the proposed A12 mainline alignment, new Junction 22 and new Braxted Road Overbridge located in the vicinity of Burghey Brook) and associated highway drainage mitigation measures (i.e. proposed scheme ability to provide adequate attenuation storage and an appropriate measure for the treatment of surface water runoff). It should also be noted the proposed diversion of Burghey Brook has been hydraulically designed to ensure this will not have any adverse impact on the existing flood risk situation. Therefore, the proposal for a diversion of Burghey Brook is considered appropriate to deliver the proposed scheme. As the design progresses, further

consideration will be given to minimising the proposed diversion of Burghey Brook considering the constraints as explained above.
9.7.1 - 9.7.23
The Applicant welcomes Essex County Council's comments on the background to the cultural heritage assessment of the proposed scheme, and the suitability and effectiveness of the non-intrusive and intrusive works conducted to identify and assess the value of archaeological remains. The Applicant welcomes Essex County Council's recognition that consultation was undertaken to support the assessment of impact presented in Chapter 7: Cultural Heritage of the Environmental Statement [APP-074]. The Applicant also welcomes Essex County Council's comments on the coverage and quality of the supporting appendices. The Applicant has received Essex County Council's comments on the Archaeological Trial Trenching Final Report [APP-115], and a revised report has been produced by the archaeological contractor which will be submitted to the Examining Authority in due course. A specialist with experience of Palaeolithic archaeology is interrogating the data presented in the Palaeolithic and Palaeoenvironmental Evaluation Report. The results of this work will be a more detailed understanding of the potential Palaeolithic archaeological remains and of the impacts of the proposed scheme upon it. This will allow detailed proposals for the mitigation of any such impacts to be developed, in consultation with ECC's archaeological advisors and other heritage stakeholders including Historic England, in due course. The resulting mitigation proposals, including a methodology for preservation in situ of deposits of national significance if they are encountered, will be included in the main works written scheme of investigation (WSI) as enacted through Commitment CH5 of Appendix A: Register of Environmental Actions and Commitments [APP-185], of the First Iteration Environmental Management Plan [APP-184]. A written scheme of investigation would normally be prepared after determination of the DCO by the contractor commissioned to

conduct the archaeological mitigation work needed to fulfil the requirements of the DCO and Archaeological Mitigation Strategy [APP-118], secured through Commitment CH2 of the REAC [APP-185]. Consultation with the heritage consultees, including ECC, on an overarching WSI for the advanced works is ongoing, and consultation on the main works WSI will follow in due course. The Applicant notes Essex County Council's comments on public understanding and the archaeological legacy of the project. Public outreach during the mitigation works is addressed in Section 16 of the Archaeological Mitigation Strategy [APP-118], and would be included in the written scheme of investigation. This would be secured through the requirements of the DCO and Commitment CH2 of the REAC [APP-185]. The role of the Local Authority curators in the monitoring process is set out in Section 7 of the Archaeological Mitigation Strategy [APP-118]. The Applicant will add a table to this section setting out the roles and responsibilities of the key parties to the mitigation process for submission in due course. The requirement for a post-excavation assessment report to be completed within one year of completion of the mitigation fieldwork would be included in the written scheme of investigation. This would be secured through the Commitment CH2 of the REAC [APP-185]. The Applicant will add text to this effect to the Archaeological Mitigation Strategy [APP-118] and Commitment CH2 of the REAC [APP-185] for submission in due course.
9.7.24 - 9.7.33
The Applicant acknowledges Essex County Council's comments regarding Chapter 7 Cultural Heritage of the Environmental Statement [APP-074] and Appendix 7.8: Cultural Heritage Impact Assessment Summary Tables [APP-117]. The Applicant welcomes the fact that Essex County Council agrees that the information provided on assessment is appropriate, the Heritage Impact Assessment Summary tables are comprehensive providing a sufficient description of the asset, and the study area appropriate. In regard to the request to provide more detailed street addresses and post codes for historic buildings, to allow identification, each heritage asset is related to an individual number which is shown on the associated figures entitled Built Heritage and Historic Landscape, Figure 7.2 [APP-216] of the Environmental Statement.

The results of the noise and vibration assessments are presented in Chapter 12: Noise and vibration, of the Environmental Statement [APP-079] and Appendix K: Noise and Vibration Management Plan[APP-195], of the First Iteration Environmental Management Plan [APP-184]. During construction activities the proposals to ensure the use of Best Practicable Means (BPM), plus monitoring during construction, are considered appropriate by the Applicant.

As only very limited construction works are proposed in the immediate vicinity of potentially vulnerable building it is not anticipated that construction related vibration would cause any issues to these properties.

In relation to the evaluation of vibration with respect to historic buildings during operation, it should be noted that the proposed scheme is not changing the permitted use of any roads, and so there is no implication that larger vehicles will be using the local road network. In addition, British Standard 7385-2:1993 Evaluation and measurement for vibration in buildings - Part 2: Guide to damage levels from ground-borne vibration, states that "A building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive".

The Applicant accepts that recording, removal, storage and reinstatement in a new location of two distance marker posts on the Chelmer and Blackwater Navigation (Assets 47 and 48) would diminish their historical integrity to a degree. However, taking the value of these assets into account and in line with the methodology presented in Chapter 7: Cultural Heritage [APP-074], the Applicant considers that after their reinstatement the predicted significance of effect of Slight adverse to be appropriate.

In relation to the recommendation to assess all Conservation Areas as a 'High Value' assets, the Applicant has considered each area on a case-by-case basis using professional judgement and appropriate guidance. The assessment of the values of each Conservation Area is considered appropriate in each case and, in part, reflects these 'character and appearance' of each area's contribution to the local and regional historic environment. The assessed value also avoids the 'double-counting' of the individual Listed Buildings within those areas which are already have individual protection and protection of their settings as national designations.

The Applicant acknowledges that Essex County Council agrees that the proposed photographic recording of a section of the water feeder ditch for the Chelmer and Blackwater Canal (Assets 42 and 43), and Level 2 recording of Boreham House landscape park (Asset 67) and its setting, and six historic landscape types (HLT; HLT 7, HLT 11, HLT 12, HLT 13 and HLT 14) is an appropriate level of mitigation.
9.8.1 - 9.8.18
The Applicant acknowledges Essex County Council's comments regarding Chapter 8 Landscape and visual of the Environmental Statement [APP-075]. See response to paragraph 9.2.1 – 9.2.16 relating to the veteran tree survey.
9.9.1 - 9.9.49
The Applicant welcomes the Mineral and Waste Planning Authority's (MWPA) confirmation that following an assessment of the impact of delivering the proposed scheme on the permitted mineral reserves and waste management capacity of the administrative area of Essex, that it is satisfied with the conclusion made in Environmental Statement Chapter 11: Material Assets and Waste [APP-078] that assessed impacts result in not-significant effects, that is effects that are not material in the decision-making process. In addition, the Applicant notes that the MWPA accepts the conclusions of the Mineral Resource Assessment (MRA), Mineral Infrastructure Assessment (MIA) and Waste Infrastructure Assessment (WIA). As reported in paragraph 11.5.4 of Chapter 11: Material Assets and Waste [APP-078], these assessments have been prepared to accompany the Environmental Statement and DCO application at the request of Essex County Council in line with its Local Planning Policy advice. These assessments have not been used in the assessment of likely significant effects in Section 11.11 of this Chapter. As reported in Deadline 2 Submission - 8.12 Statement of Common Ground with Essex County Council, meetings were held with the

MWPA on 5 February 2021 and 19 November 2021 to discuss the Applicant's responses to its Scoping Opinion and Statutory Consultation comments, and seek agreement of any necessary changes to the scope or methodology for this aspect of the Environmental Statement. A detailed record of the Applicant's responses was issued to the MWPA following each of these meetings, and a summary of these responses was included in Chapter 11: Material Assets and Waste [APP-078] and Environmental Statement Appendix 5.1: Scoping Opinion Response Table [APP-096].

A follow-on meeting was subsequently held with Essex County Council's Principal Planning Officer (National Strategic Infrastructure Projects) on 18 January 2023 to go through Environmental Statement Chapter 11: Material Assets and Waste [APP-078] to see how it aligned with the comments the MWPA had previously made to the Applicant in consultation on this aspect of the Environmental Statement. No outstanding issues were identified by Essex County Council at this meeting, and it was therefore recommended by Essex County that this issue be reclassified in the Statement of Common Ground with Essex County Council from 'In discussion' to 'Agreed'.

The Applicant welcomes the findings for the material assets and waste aspect of the Environmental Statement, as reported in Section 9.9 Minerals and Waste of the Essex County Council Local Impact Report (LIR), which largely formalise those tacit agreements that were made between the Applicant and the MWPA following the receipt of its Scoping Opinion and Statutory Consultation responses. Whilst the Applicant acknowledges the findings of the LIR, as they relate to the wider impacts of the proposed scheme on the statutory duties of Essex County Council, the Applicant wishes to note the following areas where its view diverges from that of the MWPA.

· Paragraph 9.9.2 – Whilst the Applicant recognises that Colemans Farm Quarry has reconfigured its previously permitted scheme of works to avoid the sterilisation of mineral as a result of the proposed A12 route, it does not accept this as a fair / comparative example for there being more opportunities for prior extraction to have been realised within the Order Limits. The Applicant notes that Colemans Farm Quarry is an already consented operational sand and gravel quarry that has been in operation since September 2017 (to target proven sand and gravel resources), and that the quarry has simply reconfigured its consented extraction phasing, and added a western extension to its consented operations. Colemans Farm Quarry is the only existing consented minerals extraction within the Order Limits, and therefore it was able to vary its consented operations without having to submit a full planning application. The Applicant also notes that the MWPA accepts that it has no information to demonstrate that other prior extraction opportunities would definitely exist within the Order Limits.

· Paragraph 9.9.11 – The Borrow Pits Report [APP-278] states that while the borrow pits are anticipated to meet the earthworks general fill material deficit and granular material requirement, high quality aggregates that are not available within the borrow pit locations would still need to be imported. This also states that, depending on the quality of the granular material excavated from Borrow Pit J, processing and treatment would be necessary to gain higher quality aggregates for products such as concrete and drainage aggregates for use on the proposed scheme. With the relatively small volume of drainage aggregates required for the proposed scheme the Applicant cannot justify further land take to win and subsequently process more material for inclusion in the works. The borrow pit material itself has a relatively low volume of gravel that meets the specification for drainage purposes, which would mean a substantial amount of material needing to be excavated to meet the volumes required by the proposed scheme and the remaining product would be largely in excess of what is required for sand-based products to be used in engineering applications.

- · Paragraph 9.9.36 – Whilst the limitations are typical of an EIA for this aspect, the materials and waste quantification presented in Chapter 11: Material Assets and Waste [APP-078] is considered to represent an appropriate level of detail, in line with the most recent design information at the time of the assessment, to ensure that adequate information is available to inform the DCO determination. The ancillary sub-regional discussion that was included in Section 11.11 of Chapter 11: Material Assets and Waste [APP-078], in response to Essex County Council's Scoping Opinion and statutory consultation feedback for this aspect, was specifically provided to support Essex County Council with determining any local impacts on the availability of minerals and the capacity of waste facilities.
- · Paragraph 9.9.37 – As stated in Section 11.7 of Chapter 11: Material Assets and Waste [APP-078] setting the study area at the regional level takes account of the need for the inter-regional movement of materials and waste within England, and echoes the broader approach to minerals and waste planning and management that has traditionally been undertaken on a regional and county-level basis. Reference to Greater London and the South East of England (Kent) was simply made to exemplify that the proposed scheme is likely to have access to material suppliers and waste management facilities outside Essex. However, this statement does not override the selection of the East of England as the defined study area / receptor for the Environmental Statement as was tacitly agreed with the MWPA post Scoping Opinion and Statutory Consultation. As per Paragraph 9.9.36, additional ancillary discussion was included in the Environmental Statement to assist the MWPA with fulling its statutory duties to plan for an

appropriate amount of minerals and waste capacity to be available over a defined period.

- · Paragraph 9.9.39 – As per paragraphs 11.8.71 to 11.8.76 of Chapter 11: Material Assets and Waste of the Environmental Statement [APP-078], the material assets and waste assessment does not consider (non-landfill) waste treatment, recycling and recovery facilities to be receptors as they are viewed to be part of a system that could reduce the impacts associated with the disposal of waste. The statement that "there are likely to be sufficient opportunities for C&D waste arisings to be transferred, treated, recycled or recovered as appropriate within the second study area" was therefore added to reflect the numerous facilities with the potential to take waste of the type that will arise from the proposed scheme. Again, ancillary discussion was included in the Environmental Statement to account for any differences between the DMRB LA 110 Material assets and waste assessment method and the needs of Essex County Council as the MWPA.
- · 9.9.41 – In the absence of the Essex County Council's own unpublished forecasts, future landfill capacity was estimated by the Applicant using the Microsoft Excel 'Forecast' function as per the method detailed in paragraphs 11.8.77 to 11.8.81 of Chapter 11: Material Assets and Waste [APP-078]. This method of projecting future landfill capacity values, based on the average annual percentage change in capacity, is commonly used in the environmental impact assessment (EIA) of nationally significant infrastructure projects, and the Microsoft Excel 'Forecast' is specifically referenced in the Institute of Environmental Management and Assessment (IEMA) EIA guidance for this aspect. Whilst it is recognised that the inclusion of two new landfill sites (Stanway Quarry Landfill and Dollymans Farm Landfill) gaining permission in 2019 and 2020 in the dataset so close to the projection base-date may somewhat skew the future forecasts for inert landfill capacity in the Greater Essex subregion, reference to historic Environment Agency data confirms that the subregion has observed a 36.58% average annual percentage change in landfill capacity between 2005 and 2021 (the latest year available from the Environment Agency). This has reduced from the 39.48% average annual percentage change that was observed between 2005 and 2020. Ultimately the Applicant considers its estimates to be of the correct order of magnitude, and thus do not materially undermine the assessment of likely significant effects (i.e. which are predicated on a >1% reduction or alteration in the regional capacity of landfill as a result of accommodating waste from a project).
- · Paragraph 9.9.44 – The Applicant stands by its conclusion that the waste arisings from the proposed scheme would be the equivalent of a less than 1% reduction in inert and non-hazardous waste landfill capacity void space in both the East of England and the Greater Essex subregion. As detailed in paragraph 9.9.37 above, the East of England is

	the defined study area / receptor for this aspect of the Environmental Statement. The proposed scheme is estimated to result in the disposal of approximately 40,059 tonnes (or 10,015 tonnes per annum) of inert waste and 32,044 tonnes (or 8,011 tonnes per annum) of non-hazardous waste to landfill during its construction between 2024 and 2027. Working from first principles, it is therefore unlikely that proposed scheme would realise a 1% reduction in landfill capacity. For this to be realised the East of England region and Greater Essex sub-region would need to have corresponding average annual inert and non-hazardous landfill capacities of approximately 1,001,500 tonnes per annum and 801,100 tonnes per annum respectively between 2024 and 2027. Putting aside the issues of 'exactness' covered in paragraph 9.9.41 above, the inert and non-hazardous landfill capacity in the East or England region and Greater Essex subregion would need to be of an order of magnitude below where it is likely to be during the construction of the proposed scheme for a 1% reduction to occur. The historic baseline capacity data, provided in Table 11.18 Chapter 11: Material Assets and Waste [APP-078], would suggest that these levels of capacity are unlikely to be realised during the construction of the proposed scheme. The Applicant also notes that the MWPA accepts that these arisings in isolation do not deviate from 'business as usual' and as such are not considered to be significant and therefore accepts that they are not material to the decision making process.
9.10.1 - 9.10.14	
The Applicant acknowledges the comment on the economic growth and how it influences Essex County Council's wider ambitions. The Applicant acknowledges that written representation is focused on the six most populated settlements along the route (Chelmsford/Boreham/Hatfield Peverel/Kelvedon/Marks Tey/Witham), and that localised potential impacts will be identified by District or Parish Councils. The Applicant welcomes the support from Essex County Council and agrees with the identified employment benefits resulting from the scheme. The Applicant is engaging with other nationally significant infrastructure projects and major projects within Essex to reduce any potential impacts caused by overlapping construction programmes. The proposed scheme is planned to be open to traffic in 2027	

before the ECC's expected peak. The Applicant has responded to Essex County Council's questions about the Skills and Employment in the response to sections 9.10.31 - 9.10.31 of the LIR. The Applicant and Principal Contractor would aim to use national and local partnerships to benefit the area and will set targets ahead of the construction phase for spend through local small and medium-sized enterprises. For more detail see section 13.17 of the Environmental Statement - Chapter 13: Population and Human Health [APP-080]. As noted in section 13.19 of Chapter 13: Population and Human Health in the Environmental Statement [APP-080], monitoring is proposed to understand the performance of the Principal Contractor's employment and skills strategy. The Applicant acknowledges the comment made by Essex County Council and has put into place a number of traffic management strategies such as maintaining a minimum of two lanes of traffic in each direction throughout the length of the A12 affected by traffic management during weekday daytime, and coordinating the works so as to, where reasonably practical, maximise the works that are carried out within lane, carriageway and total closures, thereby reducing the numbers of closures required. Further detail can be found in section 1.2 of the Outline Construction Traffic Management Plan (OCTMO) [REP2-003] Section 5.9 of the Outline Construction Traffic Management Plan (OCTMP) [REP2-003] describes the measures proposed when each of the bridges in Hatfield Peverell is closed for demolition and reconstruction. The duration of the closures at Station Road and Bury Lane are expected to last approximately six months each. Therefore, the Applicant has identified suitable alternative routes for each identified group of users of the bridges and has included this within tables 5.1, 5.2 and 5.3 of the OCTMP. The tables describe the alternative provision to be made available for each group during the closures of Station Road, Bury Lane and Wellington Bridge respectively. The Temporary Vehicular, Pedestrian and Cyclist Connection between the Hatfield Grove and Bury Farm Estates (Sections 5.9.26 to 5.9.33 of the OCTMP) provides a restricted use diversion that would be undertaken within the powers included in Article 57 of the

draft Development Consent Order [AS-020]. Plot 5/20a on Sheet 5 of the Land Plans [AS- 009] and Work No. T8 shown on Sheet 5 of the Works Plans Temporary Works [AS-004] shows the temporary land and the works associated with the proposed temporary route. The road users who will be permitted to use this temporary route are: • • Residents of properties on Station Road, Terling Road and Hatfield Road north of the A12 but south of the turn with Witham Road • • Residents of properties in the existing Pines Estate and other roads off Station Road to the north of the A12 • • Residents of properties in the new Hatfield Grove Estate • • Carers supporting residents in properties identified above • • Emergency services • • Royal Mail • • Refuse collection providers
9.10.15 - 9.10.22
The Applicant notes Essex County Council's comments
9.10.23 - 9.10.27
The Applicant notes Essex County Council's comments on the adequacy of the DCO.

With reference to comments made in paragraphs 9.10.24 and 9.10.25 of the LIR [REP2-055], the methodology applied for the Population and Human Health assessment in the Environmental Statement [APP-080] is set by National Highway's standard, the DMRB LA 112 Population and Human Health. LA 112 provides a methodology for a land use assessment rather than a socio-economic assessment. The impact assessment criteria set out in Table 3.12 of DMRB LA 112 relate to direct land take and severance. The study area of the Order Limits plus 500 metres was considered sufficient to capture the scope of impacts covered by the LA 112 standard. As noted in the Applicant's Scoping Report (paragraph 13.2.3) a wider context was considered to help understand the potential purpose of walking, cycling and horse riding journeys across routes in the study area. However, socio-economic impacts on settlements and visitor attractions are not within the scope of assessment set out in LA 112. It should be noted that the National Networks National Policy Statement does not specifically require the Applicant to undertake a socio-economic assessment. This is the reason the Environmental Statement has more focus on individual businesses and sites rather than recognising the socio-economic role of the settlements on the route and that, accordingly, the study area is limited to this focus. The Applicant notes Essex County Council's comment in paragraph 9.10.24 of the LIR that the impact of reduced access and/or delayed journeys on these [settlement] centres during construction works is an important consideration. The Applicant also notes the information in paragraph 9.10.25 of the LIR about Cressing Temple Barns, Braxted Park and Tiptree jam factory being important local destinations. These are approximately 4km, 670m and 2.6km respectively from the Order Limits. As noted above indirect impacts on the local economy are not covered in the scope of LA 112. However the Population and Health chapter in the Environmental Statement [APP-080] assessment identifies the potential for some delay to journeys for all modes of travel in the context of access to facilities, services, employment, education and skills, while also noting that access to destinations would not generally be prevented during construction (paragraph 13.18.24 – 26 and 13.18.34 in APP-080]. The economic impact of delayed journeys during construction is presented in the Combined Modelling and Appraisal Report (ComMA) [APP-261]. Table 4.6 of the ComMA [APP-261] presents an economic loss of £60,857,000 from traffic delays due to construction across the affected road network. This cost has been factored into the economic case for the proposed scheme. The Outline Construction Traffic Management Plan (OCTMP) [REP2-003] sets out proposals to minimise disruption on all road users, local businesses and communities and ensure the safety of all road users as they travel through the existing strategic road network, local road network and other routes affected as a result of the proposed scheme. Section 3.2 of the OCTMP states that the Principal Contractor will set up traffic management forums and road user groups, the purpose of which is to seek input into the proposals as they are developed and feedback on the implementation of proposals. The OCTMP is secured via Requirement 9 of

the draft DCO [AS-020]. This will provide opportunities for representatives of destinations potentially affected by journey delays, to have input into the traffic management proposals to help limit negative impacts on their destinations due to delays where practicable. Regarding the comment in paragraph 9.10.26 of the LIR about the Chelmsford Garden Community, the Applicant notes that it has not specifically mentioned the detail of 45,000sqm of employment space against its summary description of the development presented in Table 16.1 of the Cumulative Effects chapter [APP-083] or within Table 16.1 of Appendix 16.1 Longlist and Shortlist of Other Developments [APP-182]. However this development was not shortlisted for assessment as no masterplan application had been submitted at the time of preparation of the Environmental Statement on which to inform the cumulative effects assessment and therefore details of the development were not reported. The traffic model which has underpinned much of the assessment within the Environmental Statement takes account of 3000 homes at North East Chelmsford as this represents the proposed development where planning applications had come forward. Details of what has been included or excluded from the traffic model are provided in Appendix A from page 117 onwards of the document "Combined Modelling and Appraisal Report – Appendix C: Transport Forecasting Package Report" [APP-264].
9.10.28 - 9.10.28
Chapter 16 [APP-083] of the Environmental Statement presents the assessment of cumulative effects. For each environmental topic, study areas were set according to the extent of the zone of influence of the proposed scheme on receptors. This approach is in accordance with the Planning Inspectorate's Advice Note 17: Cumulative Effects Assessment. These study areas range from 100m to 10km, as shown on Figure 16.1 [APP-248]. Within these study areas, proposed developments were identified and scoped in or out of the cumulative effects assessment according to the methodology set out in the chapter [APP-083], which included identifying the potential for temporal overlaps between the developments and the proposed scheme. In total, 48 developments were scoped into the cumulative effects assessment, and these are listed in the short list in Appendix 16.1 [APP-182] and shown on Figure 16.1. With reference to garden communities, the Beaulieu Park development, which is approximately 1.5km from the proposed scheme, was included in the short list of developments and was assessed for cumulative effects. Cumulative effects were reported in relation

to heritage, landscape, agricultural land, and land use and accessibility (see ES Chapter 16 [APP-083]). Chelmsford Garden Community, which would be an extension of the Beaulieu Park development, was included in the long list but not in the short list, as it was at an early stage of development with no environmental impact assessment or fixed masterplan on which to base an assessment of cumulative effects. It is understood that the developer is still working on developing the masterplan for the site. It will be necessary for the developer to carry out a cumulative effects assessment for their development in due course.

Tendring Colchester Borders Garden Community would be located approximately 9.6km from the proposed scheme and so was included in the long list of other developments. It was not included in the short list for the assessment of cumulative effects because environmental studies are awaited before the environmental effects of the garden community can be known. It will be necessary for the developer to carry out a cumulative effects assessment for their development in due course.

The cumulative effects study areas do not extend to the whole of Essex, so do not include, for example, Freeport East or the Thames Freeport as these are too far from the Proposed Scheme to have been included within the study area. However, the traffic model covers the whole of the affected network, an area that is significantly larger than the study areas set specifically for the identification of developments for the assessment of cumulative effects.

Longfield Solar Farm has been included in the cumulative effects assessment [APP-083]. Cumulative effects were reported in relation to landscape and agricultural land.

Details of the traffic data used in the environmental impact assessment are provided in Appendix 6.2 [APP-101] of the Environmental Statement. Future baseline conditions were modelled for the peak of construction [2025] and the opening year [2027], accounting for known planning commitments and developments.

The transportation of materials and of workers is included in the modelled construction traffic data for the proposed development.

The cumulative effects chapter [APP-083] includes a section on regional socio-economic effects, which looks at the wider region

beyond the 10km cumulative effects study area. It identifies nine nationally significant infrastructure projects in addition to the proposed scheme and includes an assessment of the cumulative effects on employment in the region. NSIPs No likely significant cumulative impacts relating to the construction workforces are anticipated between the proposed scheme and the proposed nuclear new build projects of Sizewell C and Bradwell B. The likely significant impacts of Sizewell C would be restricted to the 60-minute area around the proposed nuclear site, which is outside the study area for the proposed scheme. It is not likely that the construction phases for the proposed scheme and Bradwell B would overlap, based on current anticipated timescales. No likely significant cumulative impacts relating to construction workforces are anticipated between the proposed scheme and the Nautilus Interconnector, East Anglia One North, East Anglia Two and North Falls Offshore Windfarm projects. As with Sizewell C, the potential impacts of these other NSIPs would be focused more towards the coast, and are geographically remote from the settlements most likely to be affected by the proposed scheme. The A122 Lower Thames Crossing and the M5 junction 28 projects would both potentially draw on the Essex workforce as well as from the London area. The A122 Lower Thames Crossing is anticipated to require some 10,000 workers at peak construction (Highways England, 2021b). As with the proposed scheme, there is a large pool of labour within commuting distance of these projects, hence no significant cumulative effects are expected in relation to construction workforces.
9.10.29 - 9.10.29
At the time of the proposed scheme application, the A120 Braintree to A12 scheme (the 'A120 scheme') is awaiting a ministerial decision to make a Preferred Route Announcement (PRA). The announcement will provide details of the scheme timeline. The proposed junction 25 is designed to accommodate the existing connection with the A120. Junction 25 is forecast to operate with a satisfactory level of service in 2042 with forecast increases in traffic on the A12 and the A120. Any future changes to the A120 alignment would need to consider the proposed junction 25 arrangement in the future scheme's transport assessment. As the A120

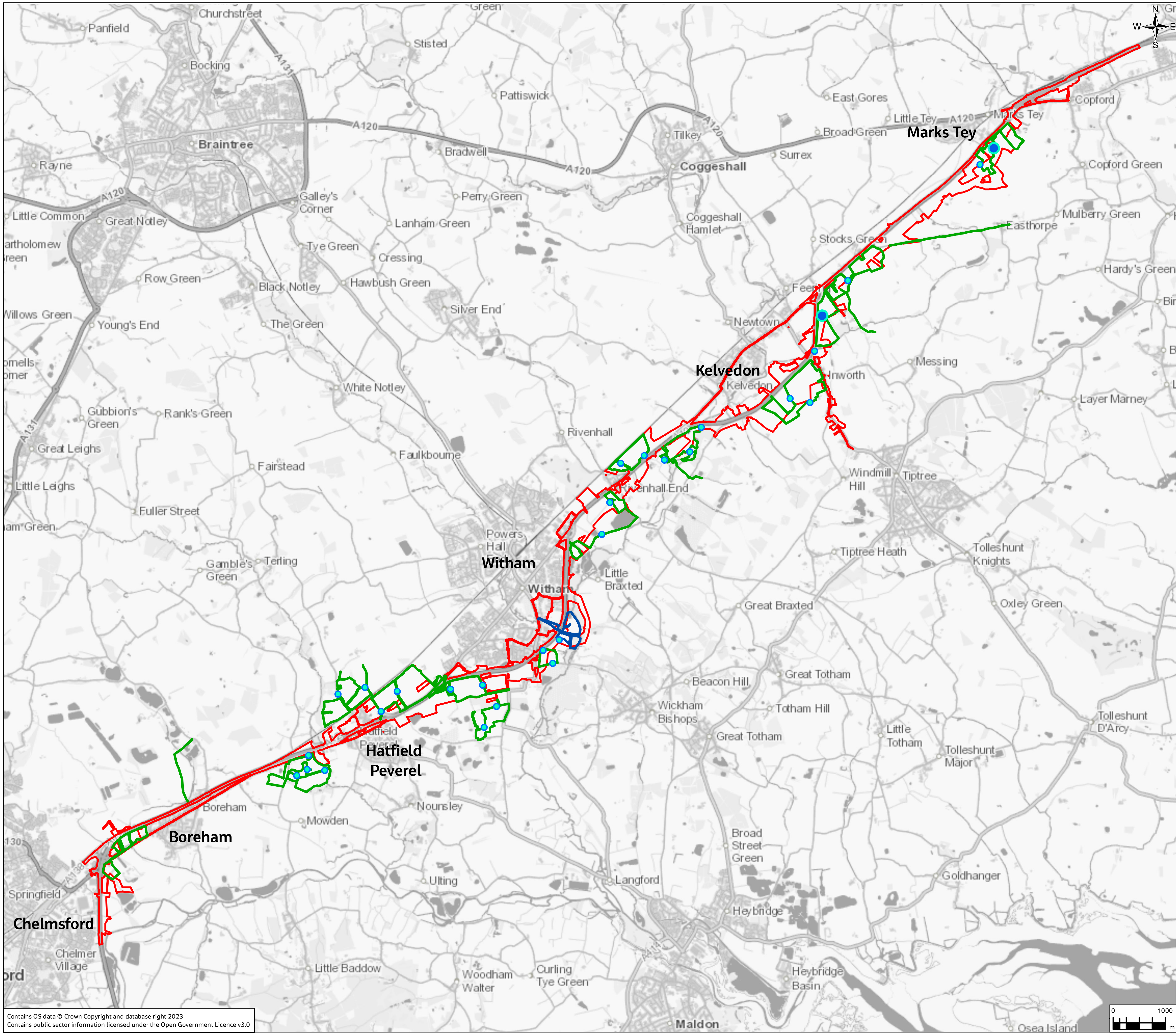
scheme is not committed, the layout and location of the junction is not known.
9.10.30 - 9.10.30
The Applicant notes Essex County Council's observation about references to an Employment and Skills Plan. An Employment and Skills Plan is a contractual requirement for the proposed scheme. Please refer to our response to sections 9.10.31 - 9.10.31 of the LIR.
9.10.31 - 9.10.31
The Applicant would, according to contractual requirements, produce an Employment and Skills Plan prior to the commencement of construction that sets out measures it will implement in order to advertise and promote employment opportunities associated with the project in the local area via the Essex Opportunities portal, the Department for Work and Pensions (DWP), and via other local organisations and platforms. It will be designed to help maximise positive gains for the local economy, including upskilling the construction workforce and supporting emerging modern green methods of construction within education settings, as well as jobs and skills retention in Essex. The plan will be developed in conjunction with ECC and other local organisations: the Applicant has already met with the South East LEP and other local/regional organisations discussing ways that the project can support the region's Priority 2: Developing Tomorrow's Workforce and the ambitions of Essex County Council's Everyone's Essex plan, as part of the National Highways East Region Employment Education & Skills (EES) and Equality, Diversity & Inclusion (EDI) Forum with the other main contractors in the region. The Employment & Skills Plan will aim to address the concerns set out in Essex County Council's Local Impact Report sections 9.10.3 – 9.10.7 relating to jobs and skills during the construction phase by working with local organisations to the principles outlined in the ECC Skills and Employment Principles for Major Projects and Developments document, in particular to seek to address the recommendations of the Essex Green Skills Infrastructure Review 2022 with reference to green and digital skills. The principal contractor recently created a new two week Green and Digital Skills work experience and training course with The Prince's Trust, which provided a cohort of eight unemployed young people furthest from the labour market with five qualifications and relevant experience in highways construction: our intention is to repeat and refine this and other similar schemes for the proposed scheme. The A12 Employment & Skills Plan will include a suite of targets against the social value metrics as per the National Highways Social

Value Plan aimed at maximising local impact. These targets will be set by working with the local organisations as outlined above, and will be measured and monitored throughout the life of the project. Whilst National Highways requires these metrics to be reported within a national framework., Discussions with local organisations may highlight other metrics that are believed will increase the social value benefits to the local area, which can be taken into consideration in the development of the plan.
9.10.32 - 9.10.32
The Applicant notes the many aspects of route and vehicle technologies currently in development. These areas are covered at a programme/national level by National Highways, and where practicable, there are referenced in the relevant design reference document GD 300, which recognises where potential can and should be reflected in scheme design. Charging of electric vehicles and alternative fuelling provision are expected to be provided in roadside service facilities, rather than on-network. These are therefore not part of the scheme design proposals. Principal Contractor would support local schools and colleges offering apprenticeships, work placements and Science, Technology, Engineering and Maths (STEM) ambassadors. Further information is detailed in paragraph 13.17.21 of the Environmental Statement - Chapter 13: Population and Health [APP-080]. The Applicant would engage with Essex County Council to support local Skills and employment but the Council's requirements for a new construction and roadworks skills training facility and to sponsor or invest in a training facility for heavy vehicle operation relating to construction and roadworks go considerably beyond the scope and budget of the proposed scheme. The Applicant would engage with key stakeholders such as Essex County Council as part of the skills and employment target setting process. As part of this process the Applicant will consider the councils Skills and Employment Principles for Major Projects and Developments as contained in Appendix 3 of this LIR. Further information is detailed in 13.17.20 of the Environmental Statement - Chapter 13: Population and Health [APP-080].
10.1.1 - 10.1.3

The Applicant notes the support expressed by Essex County Council in regard to the scheme. The Applicant has provided detailed responses to all points raised within the Local Impact Report and looks forward to continued engagement with Essex County Council.

Appendix A – Barbastelle Bat Activity Figure

FIGURE 1



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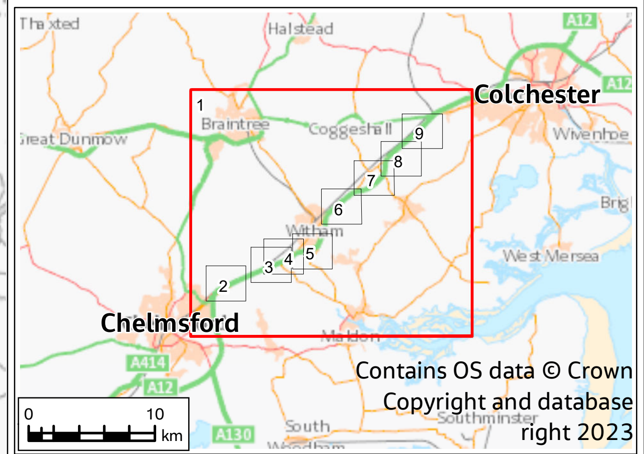
Legend

- Order Limits
- Transect with barbastelle bat activity
- Transect without barbastelle bat activity

Average number of barbastelle bat passes recorded per static detector per night

- <1 pass
- 1-2 passes

0.18 Average number recorded



P01	06/03/23	Final	AD	TM	AJ	SG
Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

Client

national highways

Project

REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title

RESULTS OF BARBASTELLE BAT ACTIVITY FROM STATIC DETECTOR DEPLOYMENT AND TRANSECT SURVEYS
SHEET 1 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:70000	DO NOT SCALE
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Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-EBD-SCHW-DR-LE-0003

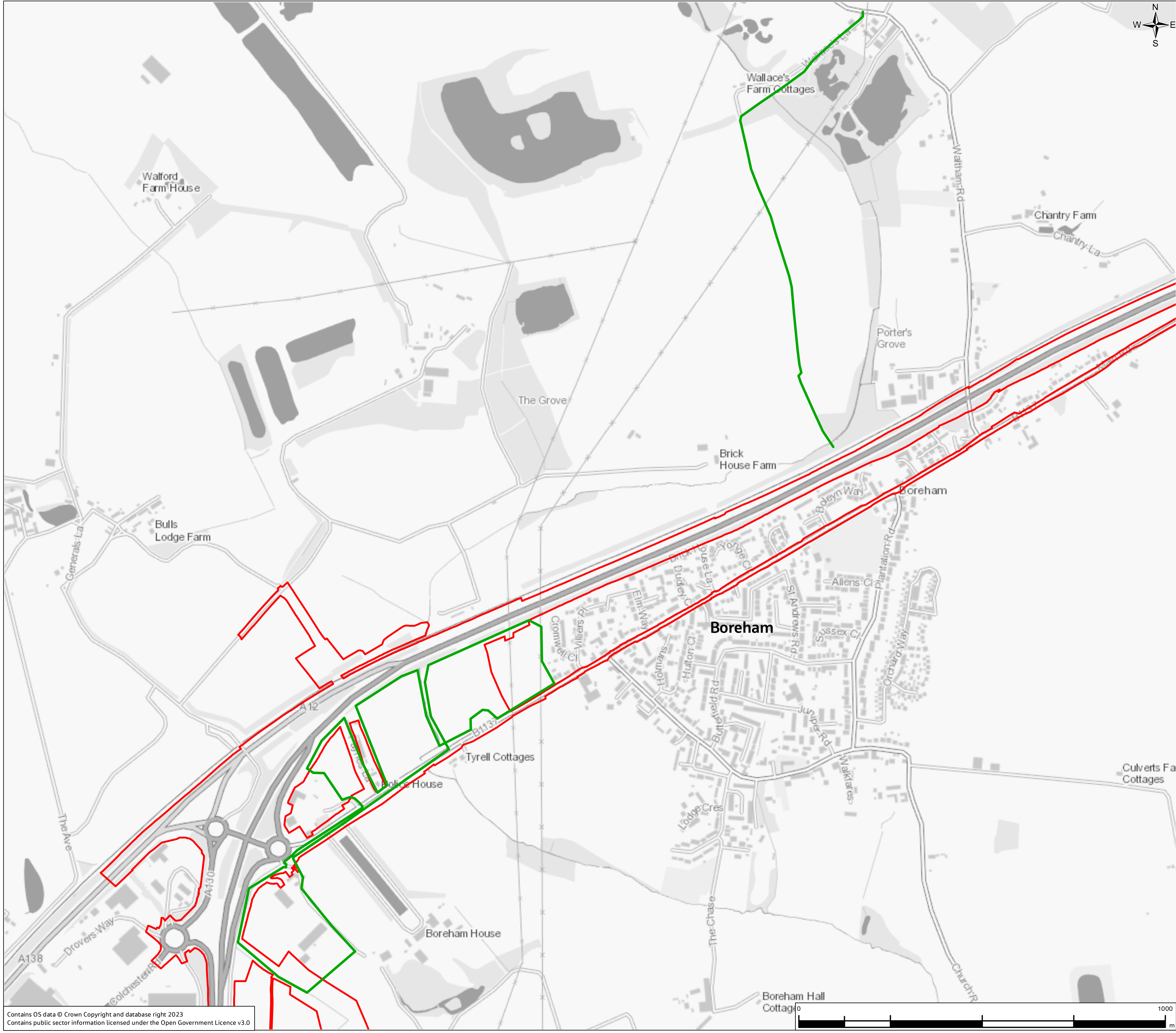

FIGURE 1

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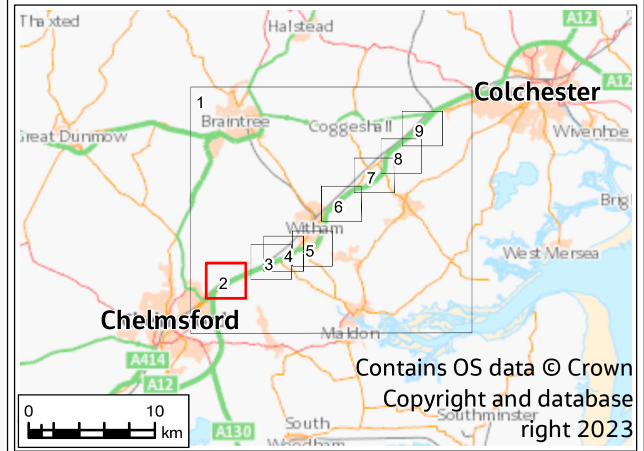

P01	06/03/23	Final	AD	TM	AJ	SG
Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

Client

national highways

Project

REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title

RESULTS OF BARBASTELLE BAT ACTIVITY FROM
STATIC DETECTOR DEPLOYMENT AND TRANSECT SURVEYS
SHEET 2 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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Client No.	HE551497	Rev	P01

Drawing Number: HE551497-JAC-EBD-SCHW-DR-LE-0004

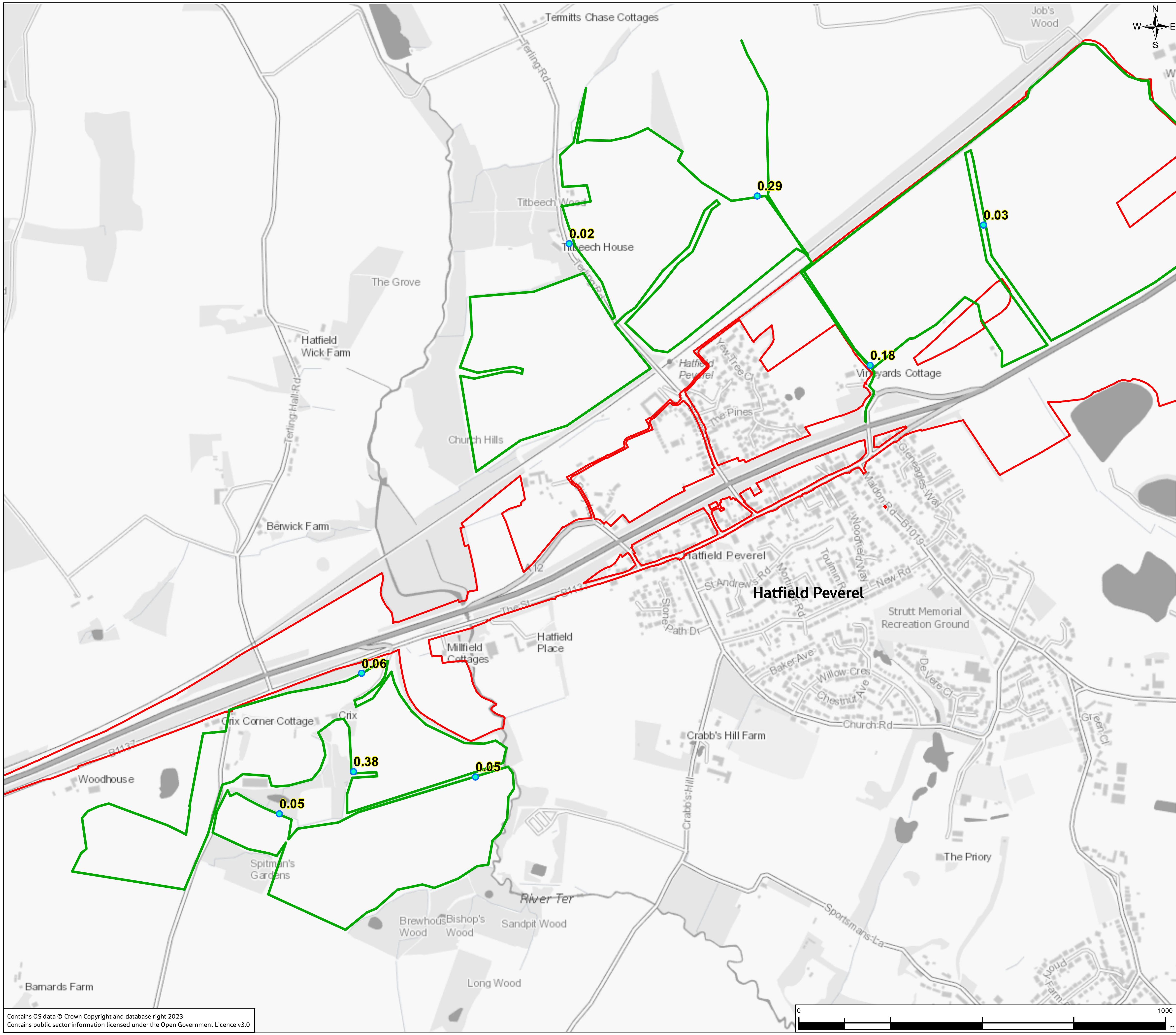

FIGURE 1

Legend

- Order Limits
- Transect with barbastelle bat activity
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Average number of barbastelle bat passes recorded per static detector per night

- <1 pass
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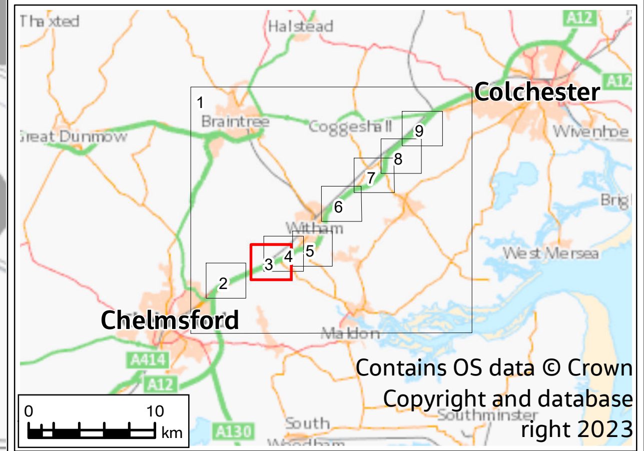

Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P01	06/03/23	Final	AD	TM	AJ	SG

Client

national highways

Project

REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title

RESULTS OF BARBASTELLE BAT ACTIVITY FROM STATIC DETECTOR DEPLOYMENT AND TRANSECT SURVEYS
SHEET 3 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:10000	DO NOT SCALE
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Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-EBD-SCHW-DR-LE-0005

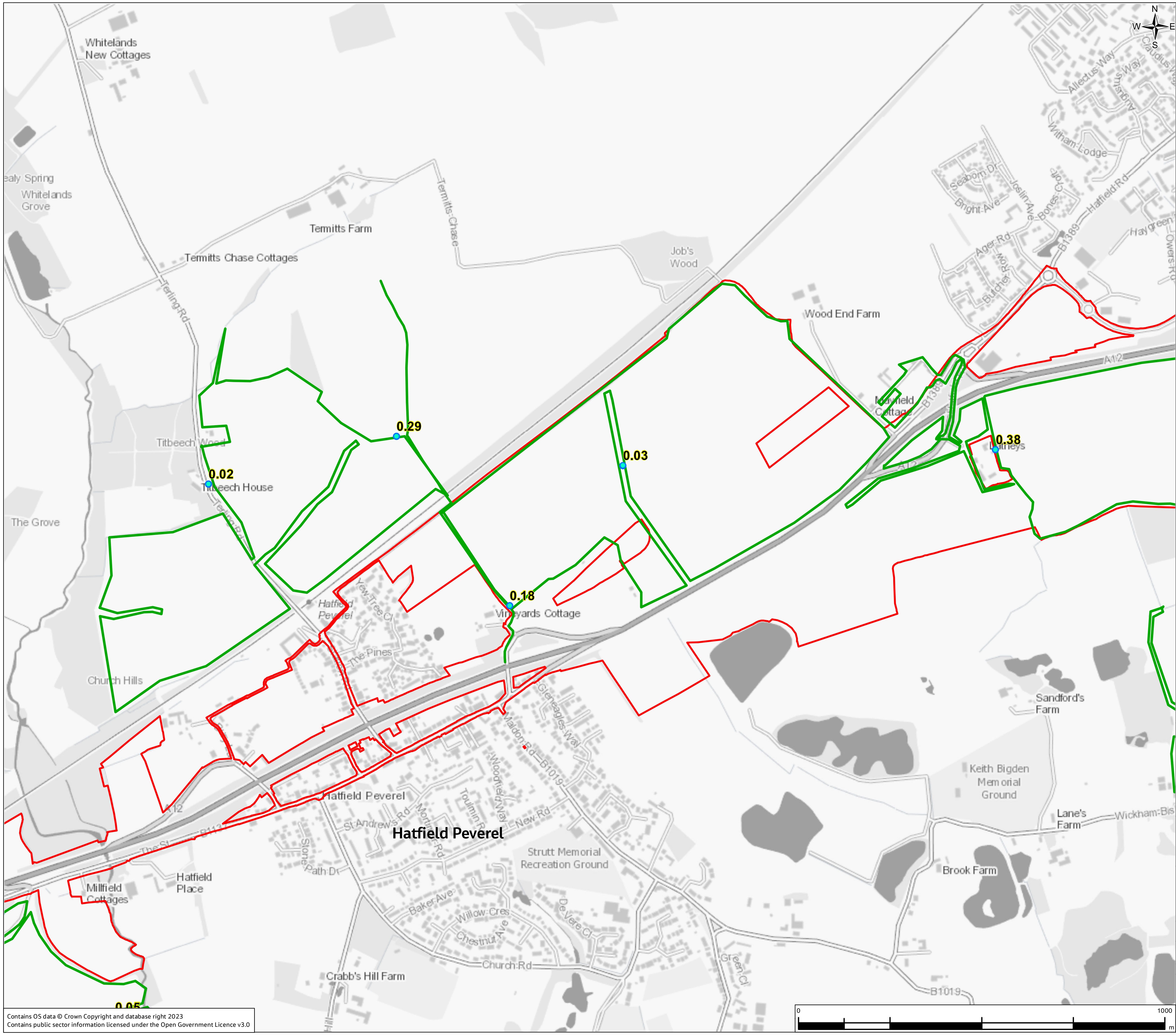


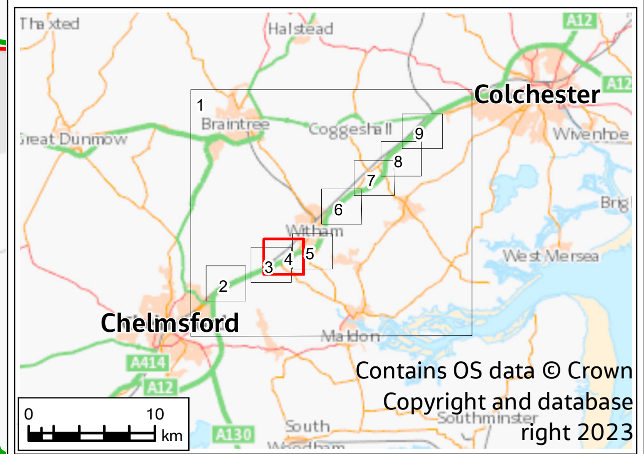
FIGURE 1

Legend

- Order Limits
- Transect with barbastelle bat activity
- Transect without barbastelle bat activity

Average number of barbastelle bat passes recorded per static detector per night

- <1 pass
- 1-2 passes
- 0.18 Average number recorded



P01	06/03/23	Final	AD	TM	AJ	SG
Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

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SHEET 4 OF 9

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Scale @ A3	1:10000	DO NOT SCALE
Jacobs No.	B36601D1	
Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-EBD-SCHW-DR-LE-0006

FIGURE 1

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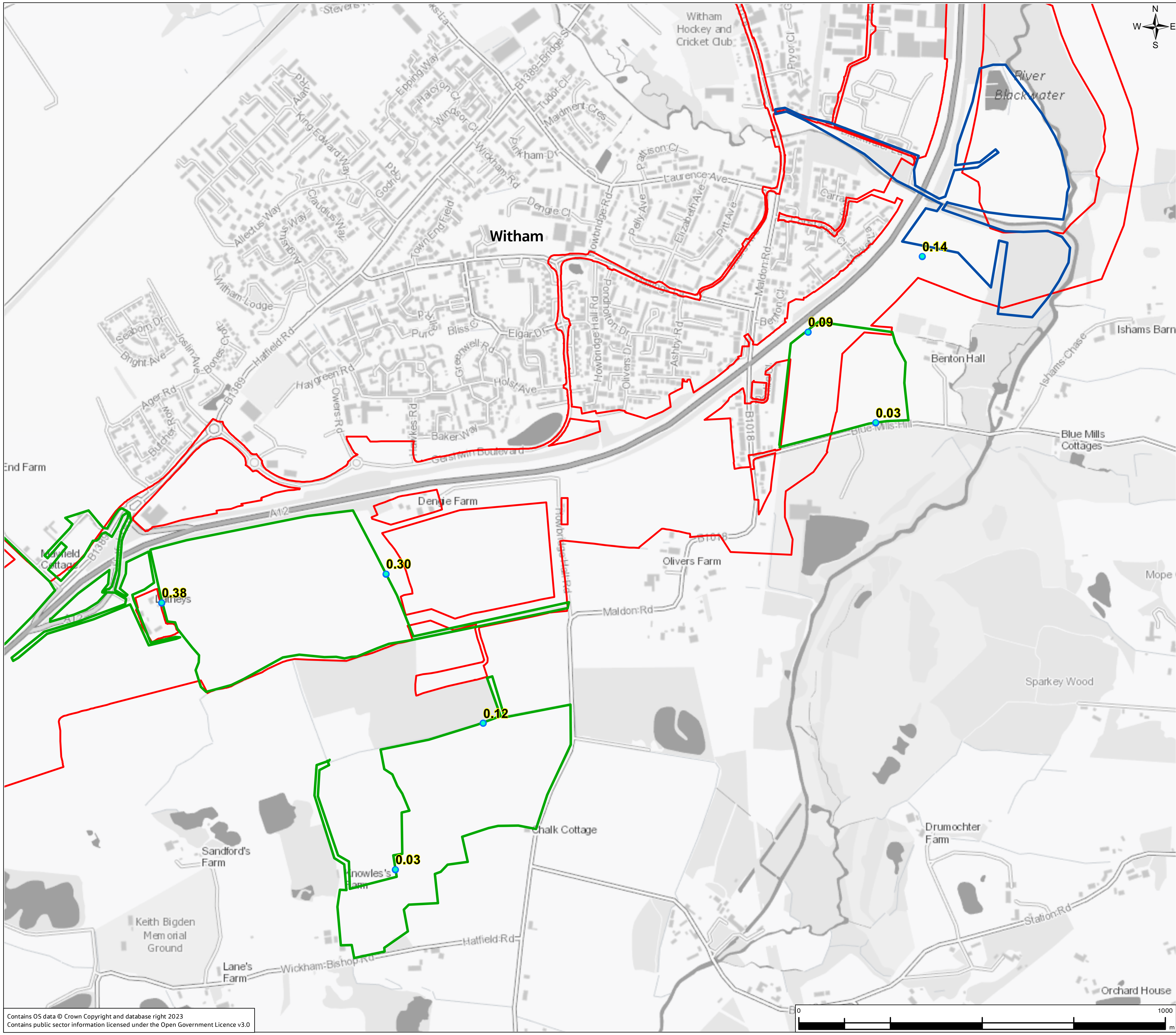

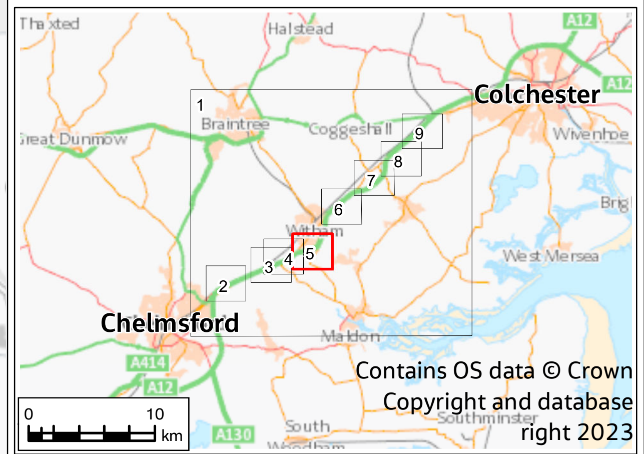

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RESULTS OF BARBASTELLE BAT ACTIVITY FROM
STATIC DETECTOR DEPLOYMENT AND TRANSECT SURVEYS
SHEET 5 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:10000	DO NOT SCALE
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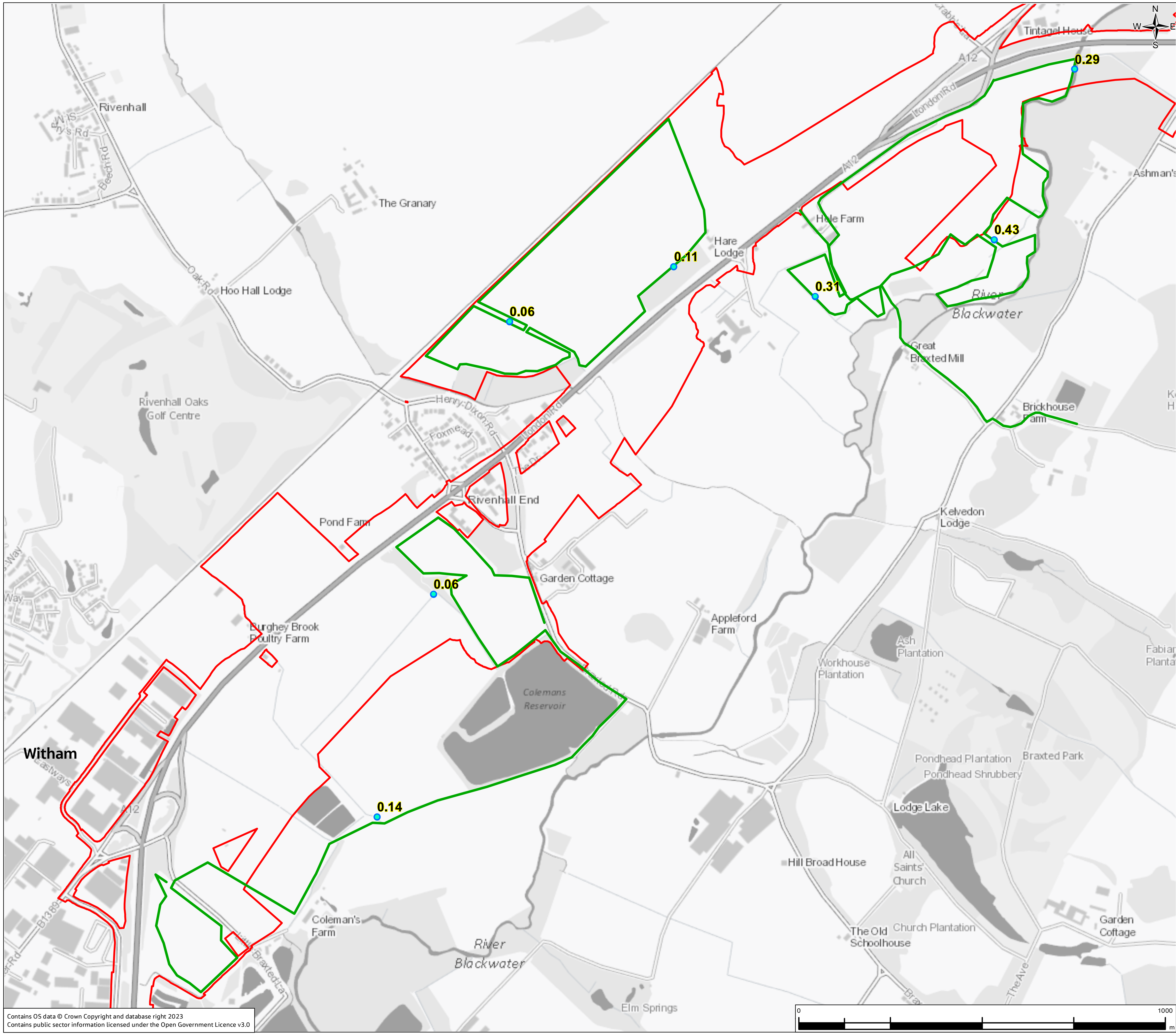
Client No.	HE551497	

Drawing Number

HE551497-JAC-EBD-SCHW-DR-LE-0007

FIGURE 1



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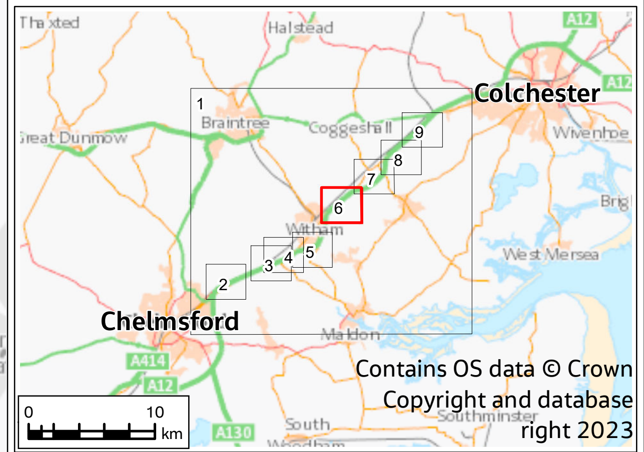

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RESULTS OF BARBASTELLE BAT ACTIVITY FROM STATIC DETECTOR DEPLOYMENT AND TRANSECT SURVEYS
SHEET 6 OF 9

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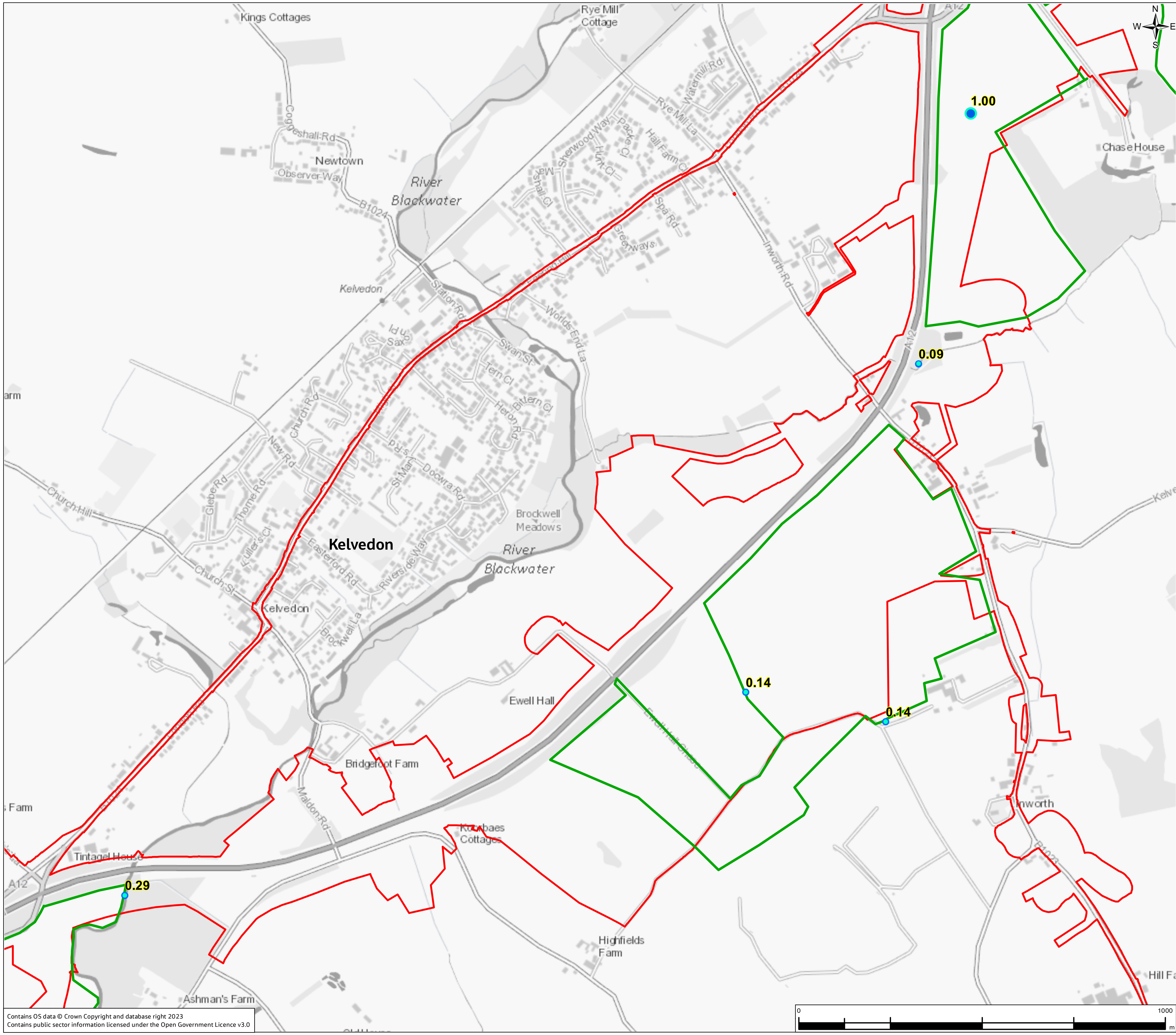

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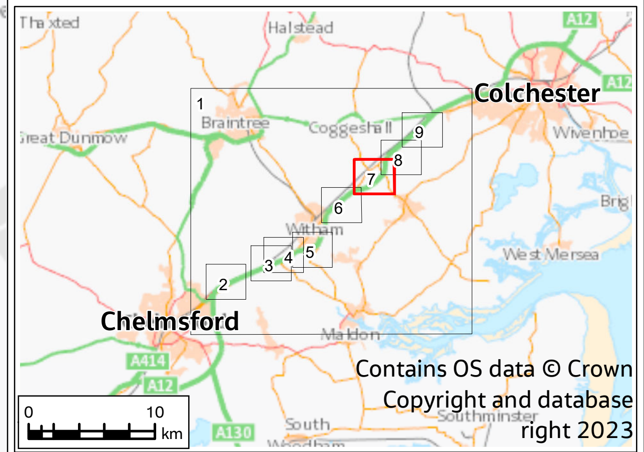

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A12 CHELMSFORD TO A120 WIDENING SCHEME

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RESULTS OF BARBASTELLE BAT ACTIVITY FROM STATIC DETECTOR DEPLOYMENT AND TRANSECT SURVEYS
SHEET 7 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:10000	DO NOT SCALE
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Client No.	HE551497	

Drawing Number

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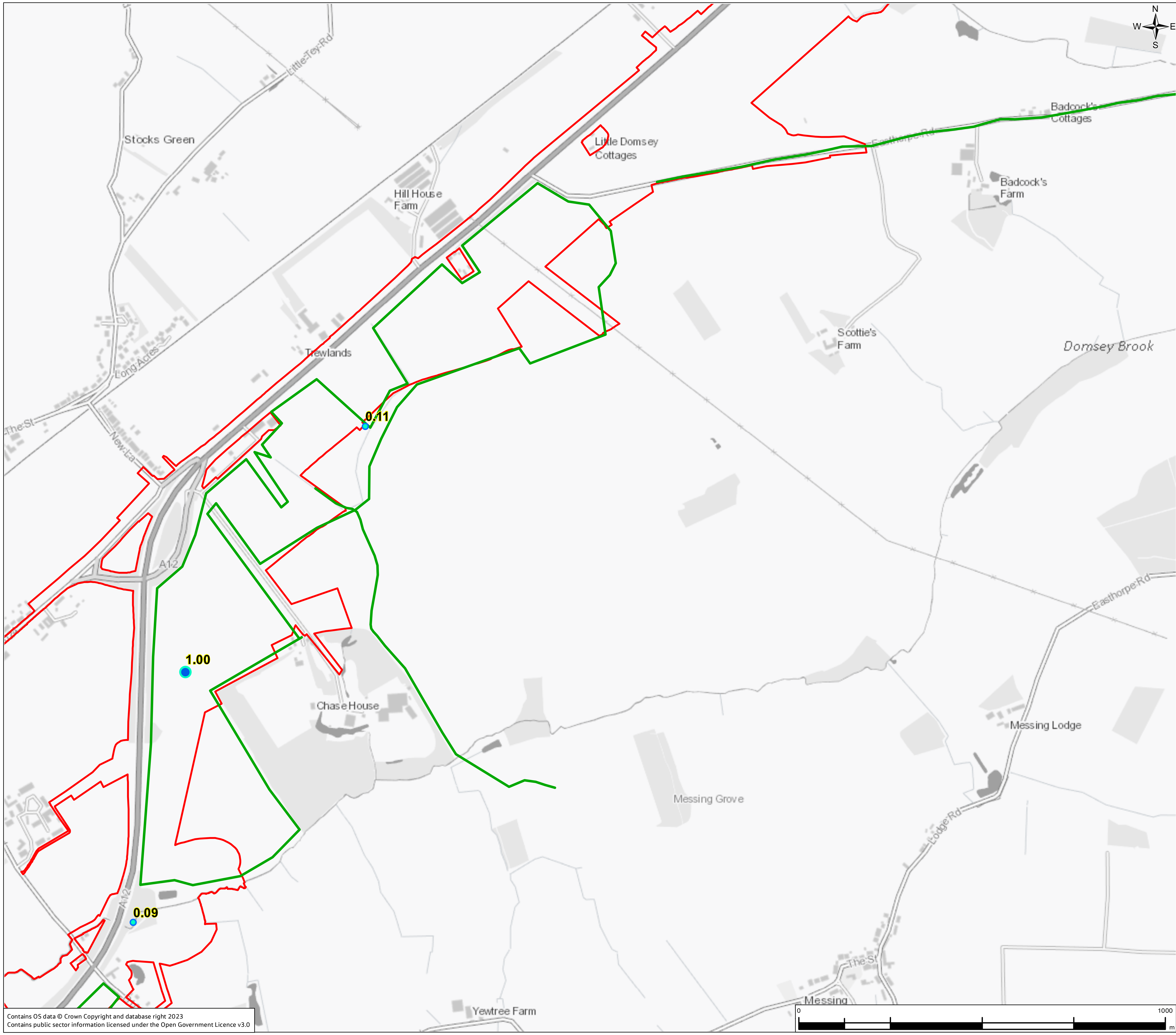

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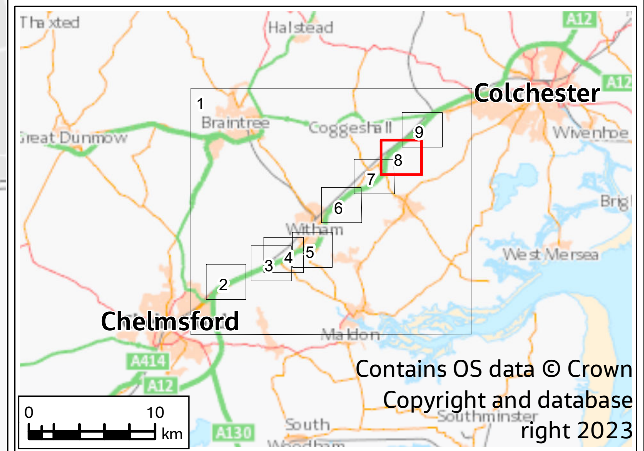

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A12 CHELMSFORD TO A120 WIDENING SCHEME

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RESULTS OF BARBASTELLE BAT ACTIVITY FROM STATIC DETECTOR DEPLOYMENT AND TRANSECT SURVEYS
SHEET 8 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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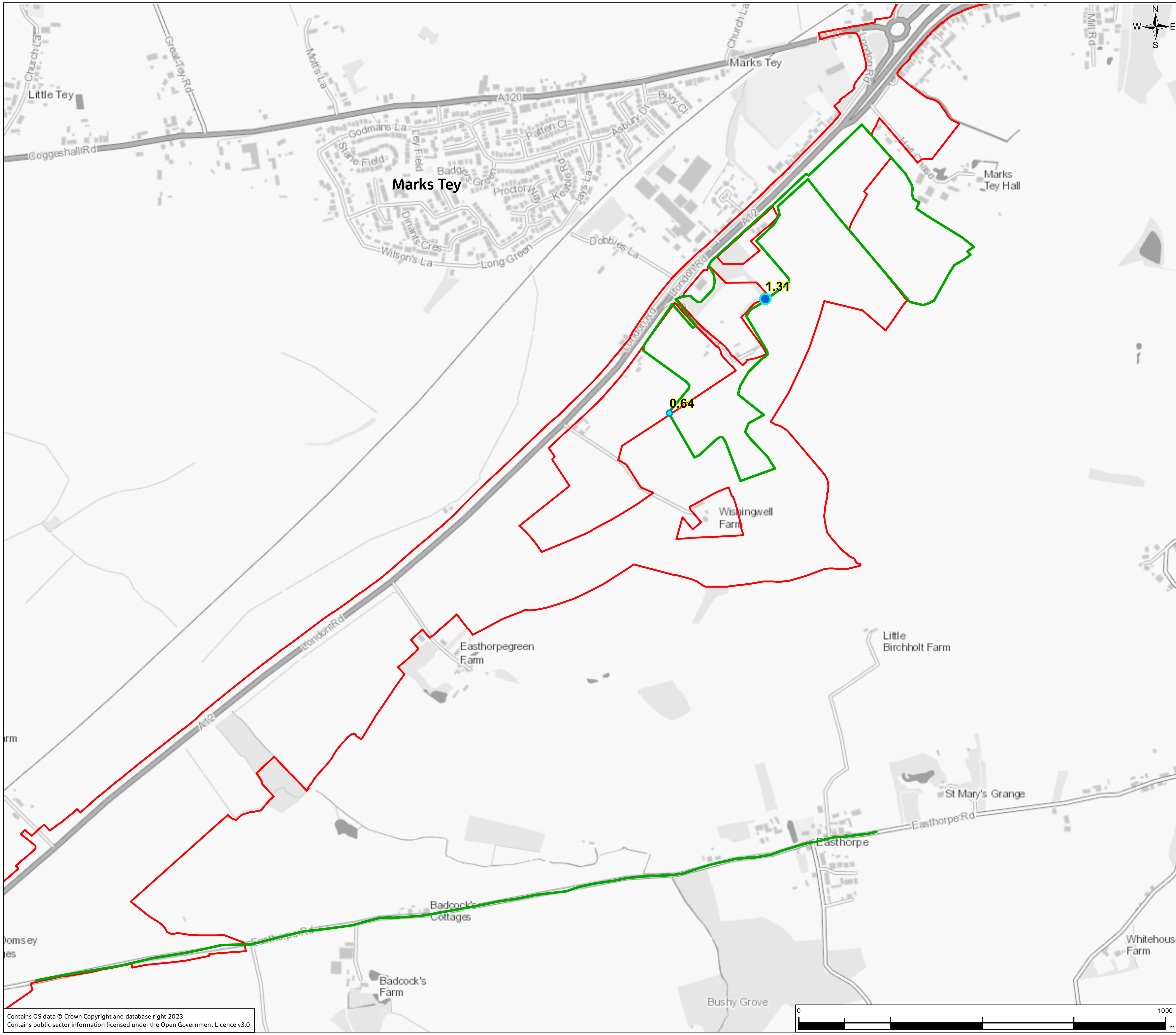

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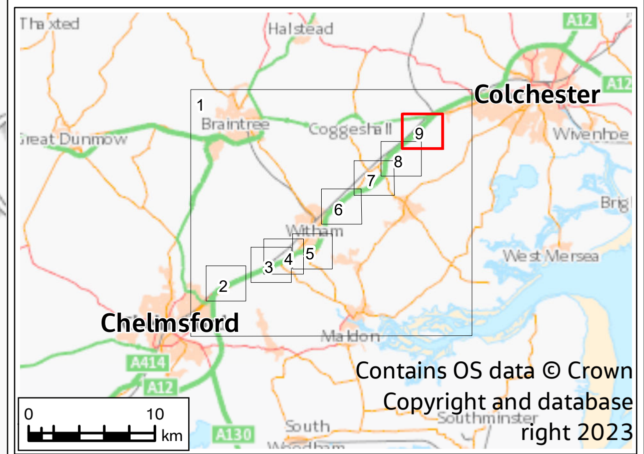

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RESULTS OF BARBASTELLE BAT ACTIVITY FROM STATIC DETECTOR DEPLOYMENT AND TRANSECT SURVEYS
SHEET 9 OF 9

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

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Client No.	HE551497	Rev P01

Drawing Number: HE551497-JAC-EBD-SCHW-DR-LE-0011

Appendix B – Essex LIR response – Traffic data pack May 2022

A12 Chelmsford to A120 widening

27 May 2022

The information shared in this presentation represents the most up to date proposals. This may evolve for several reasons, and as such, may be subject to change.

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Updates added to slide deck after the 25th Feb 2022 traffic workshop are highlighted blue

Info shared to date (best available info shared at the time)

- Stat con traffic model results in *"traffic report for consultation"*
- *Level of service (LoS) information for junction 19*
- *LoS information for junction 25*
- *LoS for Maldon Road/The Street junction*
- *Journey time information for Inworth Road*

Post-Stat Con information sharing

- *Traffic workshop 3rd November 2021*
- *Traffic workshop 10th December 2021*
- *Traffic workshop 27th January 2022*
- *Traffic workshop 25th February 2022*

As we move forward, we will update this information and share it. This slide deck sets the bench of where we are currently.

We plan to use this slide deck as a 'live' set of shared traffic data. We will add information as it becomes available ahead of each traffic workshop, and track any changes made.

Traffic model data requests from ECC

List of traffic requests from Essex County Council

Summary list of data requests shown below. Green = information provided on the following slides. Red = to be included in later version of slide deck

Junction	ECC Request	Information required from National Highways (NH):
Junction 19 (Boreham)	Data	Modelled data for 2027 and 2042 (with and without DCO scheme), as follows: • Junction model results, in format set out in separate tables below, for Jn 19 (2042 without scheme not provided) • Hourly traffic flows on mainline A12 through Jn 19 and on A12 slip roads • Select link analysis of Main Road Boreham (on approach to Jn 19)
Junction 21 (Hatfield Peverel)	Data	Modelled data for 2027 and 2042 (with and without DCO scheme), as follows: • Junction model results, in format set out in separate tables below for Maldon Road/The Street junction • Select link analysis of Maldon Road south of the Maldon Road/The Street junction, to be able to identify potential 'in-scope' trips for transfer to other modes
Junction 22 (Witham)	Data	Modelled data for 2042 (with DCO scheme), as follows: • Junction model results, in format set out in separate tables below, for Colemans Junction • Hourly traffic flows (and HGV %age) on Little Braxted Lane – if available • Select link Origin-Destination data on Little Braxted Lane – if available
Junction 22 to 23 (De-trunked A12)	Data	Modelled data for 2042 (with DCO scheme), as follows: • AADT and peak hour traffic flows, plus peak hour volume/capacity ratios for each section of old A12: o Junction 22 to Braxted Road o Braxted Road to roundabout East of Rivenhall End o Roundabout East of Rivenhall End to Kelvedon

Junction	ECC Request	Information required from National Highways (NH):
Junction 24 (Kelvedon North)	Data	Junction model results, in format set out in separate tables below, for 2027 and 2042 (with and without DCO scheme) for the following junctions: o Station Road / Feering Hill / High Street (Kelvedon) o Feering Hill / Inworth Road (Feering) Modelled peak hour traffic flows for 2027 and 2042 (with and without DCO scheme), on all approaches to the following junctions: o Kelvedon Road / Maypole Road / Church Road / Maldon Road (Tiptree) o Maldon Road / Station Road (Tiptree) o Station Road / Church Street (Tiptree)
Junction 24 to 25 (De-trunked A12)	Data	Modelled data for 2042 (with DCO scheme), as follows: • AADT and peak hour traffic flows, plus peak hour volume/capacity ratios for each section of old A12: o New Lane to Realigned Easthorpe Road o Realigned Easthorpe Road to Wishing Well Farm Roundabout o Wishing Well Farm Roundabout to Junction 25
Junction 25 (Marks Tey)	Data	• Junction model results, in format set out in separate tables below, for 2027 and 2042 (with and without DCO scheme) for the following junctions: o Station Road Junction o Western Junction 25 roundabout

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Junction 19

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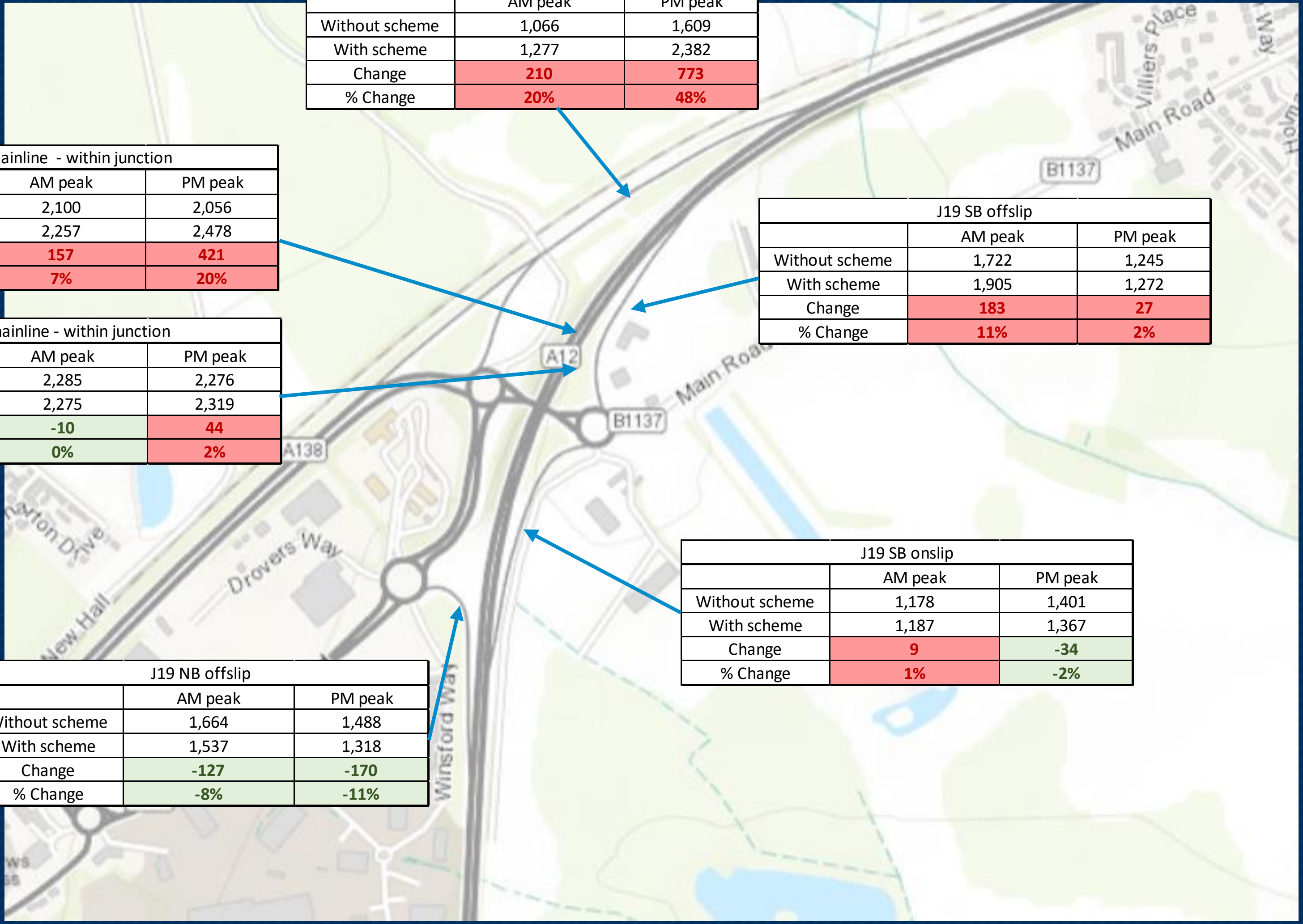
Junction 19

Junction	ECC Request	Information required from National Highways (NH):
Junction 19 (Boreham)	**Data**	Modelled data for 2027 and 2042 (with and without DCO scheme), as follows: • Junction model results, in format set out in separate tables below, for Jn 19 • Hourly traffic flows on mainline A12 through Jn 19 and on A12 slip roads • Select link analysis of Main Road Boreham (on approach to Jn 19)

Junction 19

- *Hourly traffic flows on A12 mainline through junction 19 and on A12 slip roads. (2027)*



J19 NB onslip		
	AM peak	PM peak
Without scheme	1,066	1,609
With scheme	1,277	2,382
Change	210	773
% Change	20%	48%

J19 NB mainline - within junction		
	AM peak	PM peak
Without scheme	2,100	2,056
With scheme	2,257	2,478
Change	157	421
% Change	7%	20%

J19 SB offslip		
	AM peak	PM peak
Without scheme	1,722	1,245
With scheme	1,905	1,272
Change	183	27
% Change	11%	2%

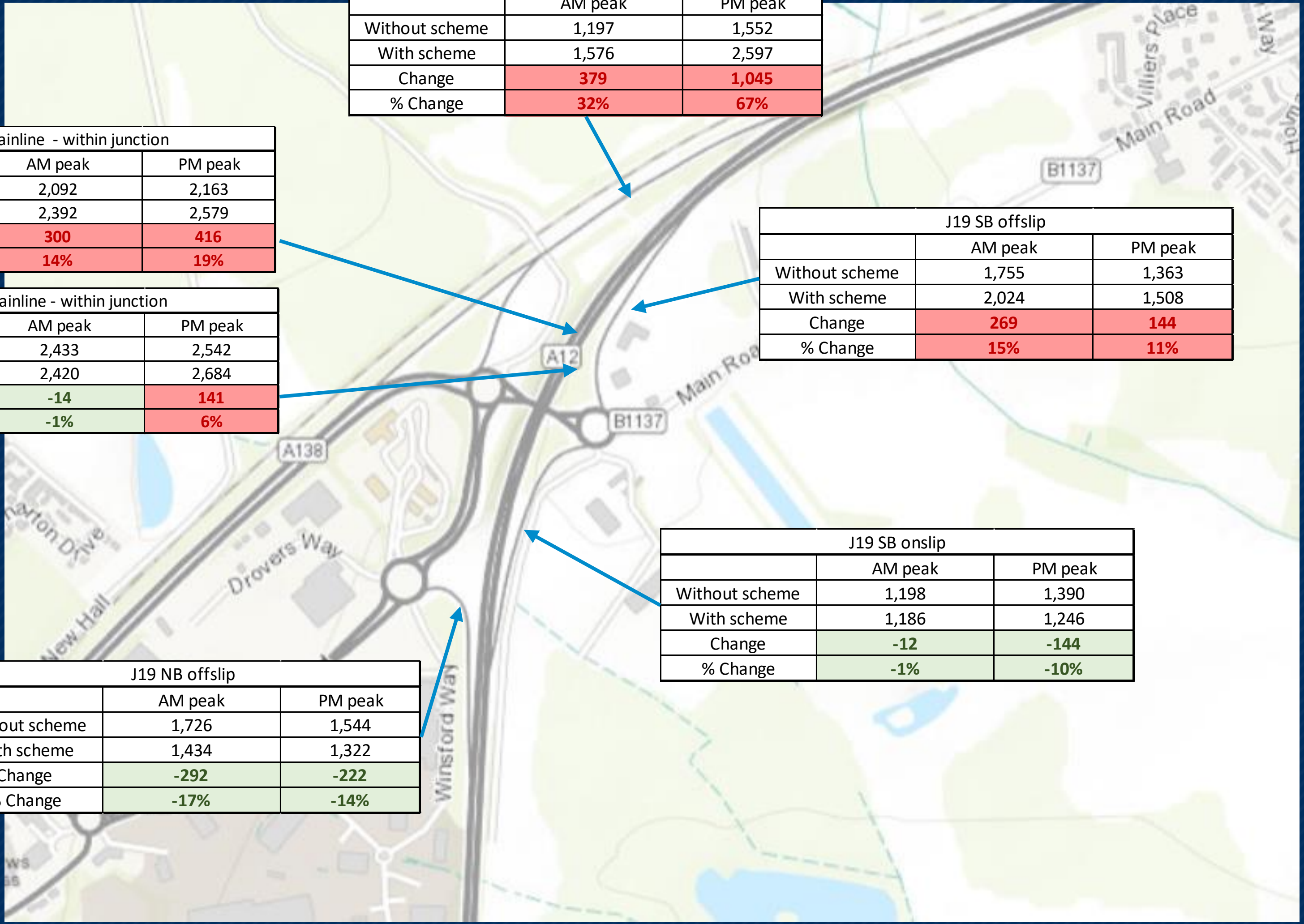
J19 SB mainline - within junction		
	AM peak	PM peak
Without scheme	2,285	2,276
With scheme	2,275	2,319
Change	-10	44
% Change	0%	2%

J19 SB onslip		
	AM peak	PM peak
Without scheme	1,178	1,401
With scheme	1,187	1,367
Change	9	-34
% Change	1%	-2%

J19 NB offslip		
	AM peak	PM peak
Without scheme	1,664	1,488
With scheme	1,537	1,318
Change	-127	-170
% Change	-8%	-11%

Junction 19

- *Hourly traffic flows on A12 mainline through junction 19 and on A12 slip roads. (2042)*



J19 NB onslip		
	AM peak	PM peak
Without scheme	1,197	1,552
With scheme	1,576	2,597
Change	379	1,045
% Change	32%	67%

J19 NB mainline - within junction		
	AM peak	PM peak
Without scheme	2,092	2,163
With scheme	2,392	2,579
Change	300	416
% Change	14%	19%

J19 SB mainline - within junction		
	AM peak	PM peak
Without scheme	2,433	2,542
With scheme	2,420	2,684
Change	-14	141
% Change	-1%	6%

J19 SB offslip		
	AM peak	PM peak
Without scheme	1,755	1,363
With scheme	2,024	1,508
Change	269	144
% Change	15%	11%

J19 SB onslip		
	AM peak	PM peak
Without scheme	1,198	1,390
With scheme	1,186	1,246
Change	-12	-144
% Change	-1%	-10%

J19 NB offslip		
	AM peak	PM peak
Without scheme	1,726	1,544
With scheme	1,434	1,322
Change	-292	-222
% Change	-17%	-14%

Junction 19 – without scheme [updated slide]

Vissim model results, 2027 DM full results table

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Generals Lane Roundabout (West)	CNEB	Signalised	F	1100	127	1005	1128	E	1485	63	838	1101
	Bridge between dumbbells (over A12)	Signalised	D	1151	42	53	123	E	872	58	60	139
	A130	Signalised	F	1280	115	382	490	E	1666	75	312	423
	A138	Signalised	C	443	31	12	42	D	623	44	27	74
	A138 Slip (not part of junction)	Unsignalised	A	779	2	0	0	A	1463	4	0	0
	ip to Southern Roundabout (not part of junctio	Unsignalised	A	623	2	0	2	A	606	3	0	1
	Total	**Signalised**	E	**5376**	**66**			**D**	**6714**	**45**		
Generals Farm Roundabout (East)	A12 Offslip	Signalised	F	1455	166	2195	2301	F	1308	90	177	283
	B1137 Main Road	Signalised	D	405	47	8	35	E	167	69	5	24
	Bridge between dumbbells (over A12)	Signalised	C	1129	31	49	154	C	1926	31	188	316
	Total	**Signalised**	F	**2989**	**99**			E	**3400**	**55**		
Drovers Way Roundabout (South)	A130 (N)	Signalised	E	662	61	28	72	B	673	19	5	38
	A12 Offslip	Signalised	F	1653	182	412	572	D	1591	44	56	156
	Winsford Way	Unsignalised	F	94	429	119	148	F	304	60	25	64
	A130 Colchester Road (S)	Unsignalised	F	452	310	178	210	F	728	133	124	171
	Drovers Way	Unsignalised	F	18	927	83	90	F	92	376	69	83
	Boreham Services	Unsignalised	F	16	1089	112	121	F	72	513	81	96
	Total	**Signalised**	F	**2895**	**192**			E	**3460**	**78**		

The future operation without scheme scenarios generate congested networks whereby traffic is unable to complete their journeys through junction 19.
It is not possible to use the Vissim results for this scenario with any degree of certainty.
Due to how the results from Vissim are collected, not all the vehicle delay from the queuing in this scenario has been recorded. Where queue lengths are long, the vehicle delay result will be an underestimate.
Only results for 2027 have been presented for the DM scenario.

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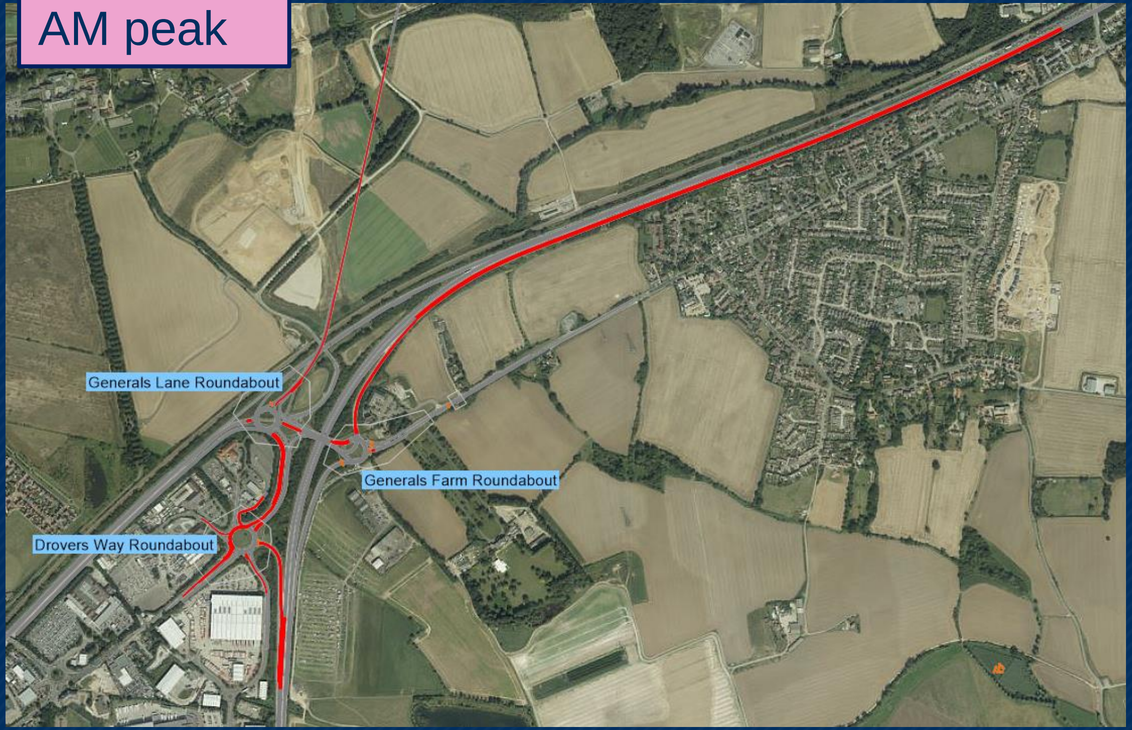
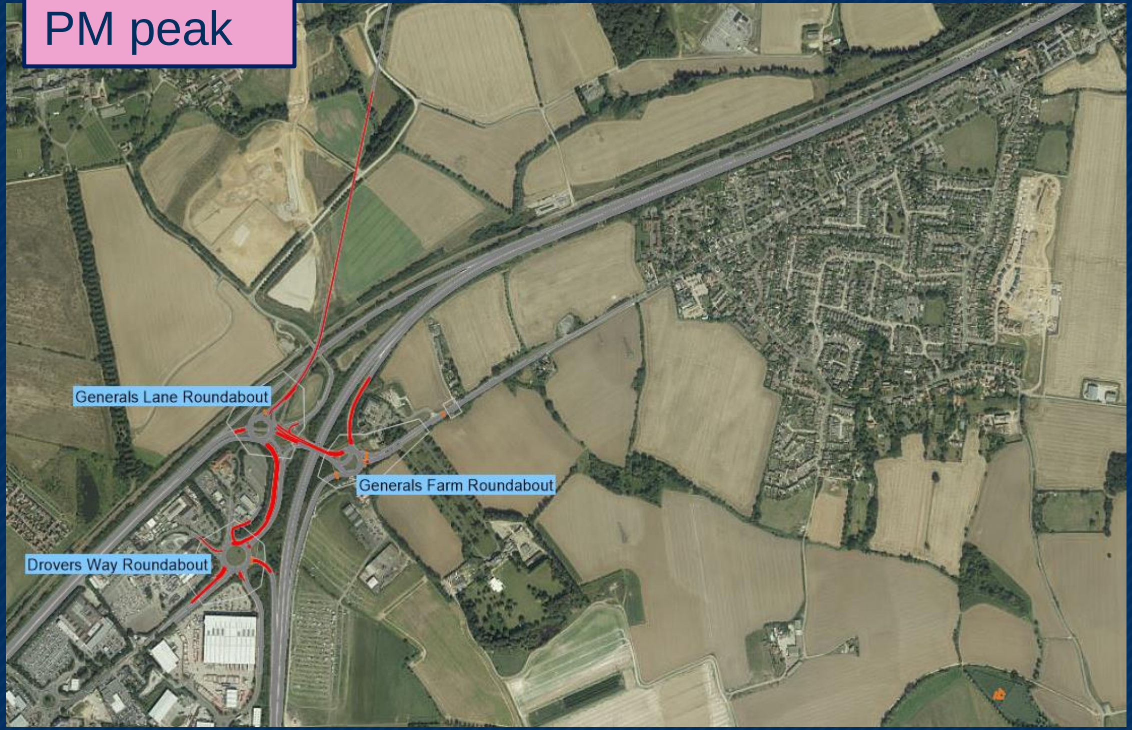
Junction 19 – without scheme [updated slide]

Vissim model results,
DM 2027: average queue lengths

AM peak



PM peak



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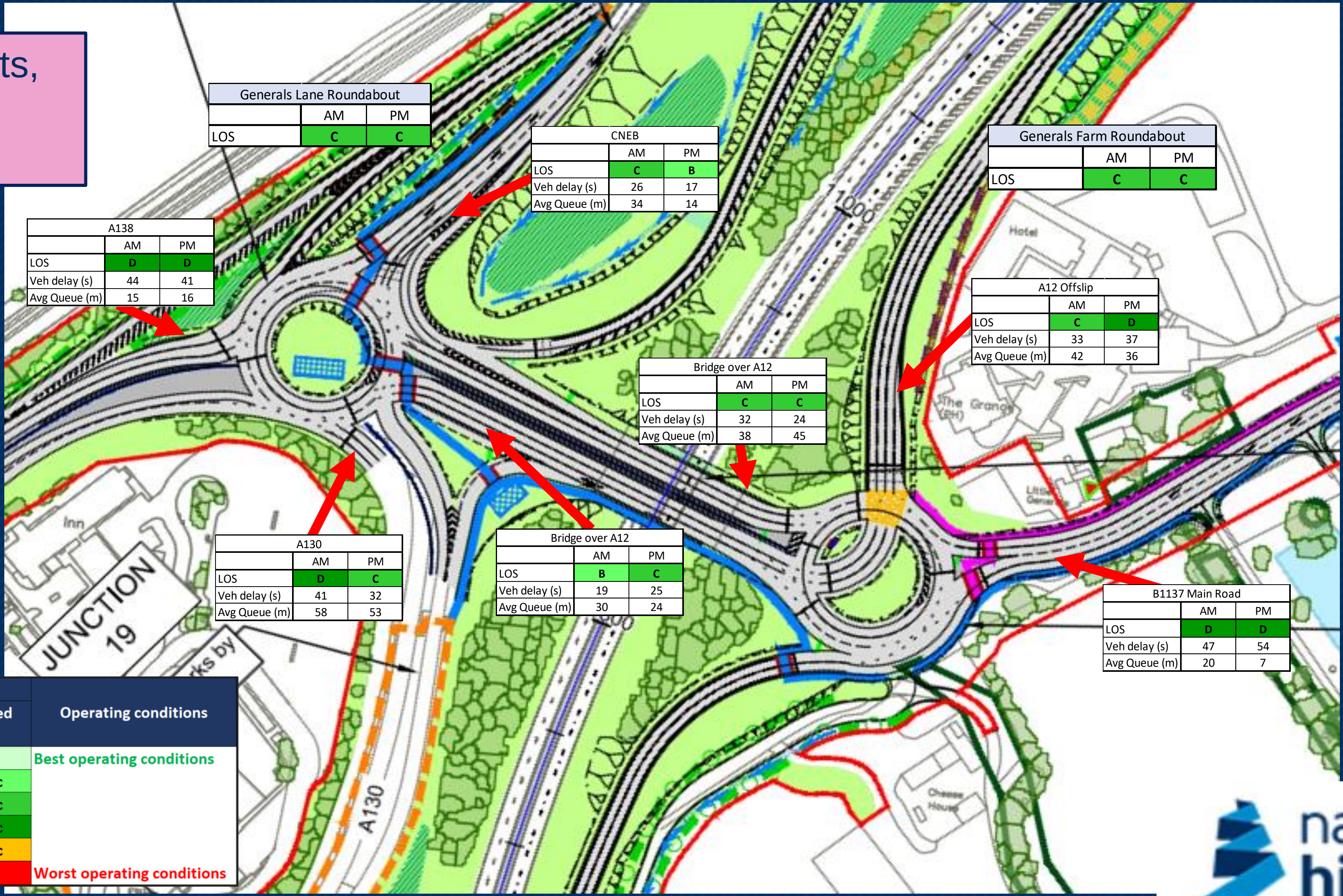
Junction 19 – with scheme

Vissim model results, DS 2042 Level of Service



Generals Lane Roundabout	AM	PM
LOS	C	C

CNEB	AM	PM
LOS	C	B
Veh delay (s)	26	17
Avg Queue (m)	34	14

Generals Farm Roundabout	AM	PM
LOS	C	C

A138	AM	PM
LOS	D	D
Veh delay (s)	44	41
Avg Queue (m)	15	16

A12 Offslip	AM	PM
LOS	C	D
Veh delay (s)	33	37
Avg Queue (m)	42	36

Bridge over A12	AM	PM
LOS	C	C
Veh delay (s)	32	24
Avg Queue (m)	38	45

A130	AM	PM
LOS	D	C
Veh delay (s)	41	32
Avg Queue (m)	58	53

Bridge over A12	AM	PM
LOS	B	C
Veh delay (s)	19	25
Avg Queue (m)	30	24

B1137 Main Road	AM	PM
LOS	D	D
Veh delay (s)	47	54
Avg Queue (m)	20	7

Level of Service	Loss Time		Operating conditions
	Signalised Junction	Unsignalised Junction	
LOS A	≤10 sec	≤10 sec	Best operating conditions
LOS B	10–20 sec	10–15 sec	
LOS C	20–35 sec	15–25 sec	
LOS D	35–55 sec	25–35 sec	
LOS E	55–80 sec	35–50 sec	
LOS F	>80 sec	>50 sec	Worst operating conditions

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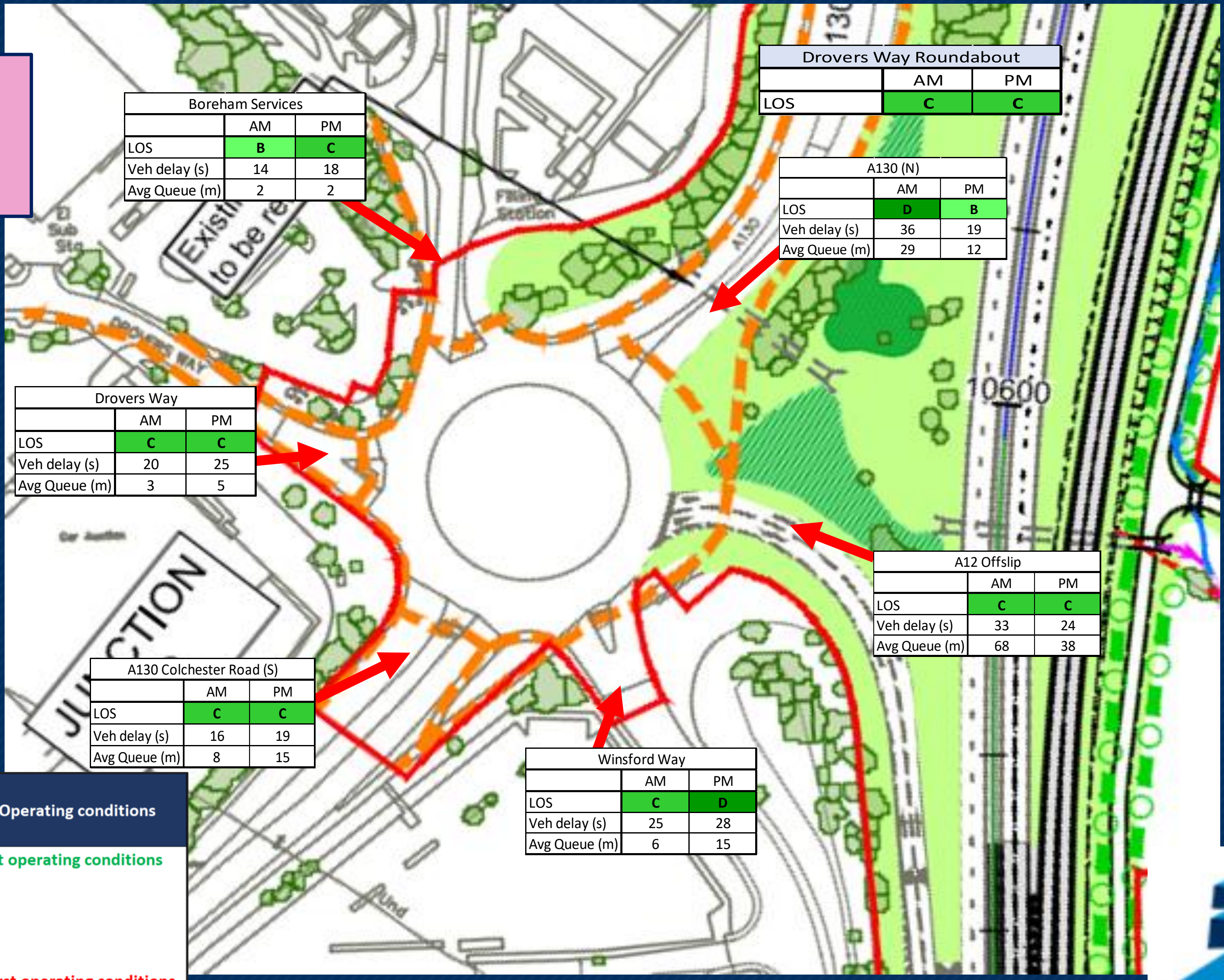
Junction 19 – with scheme

Vissim model results, DS 2042 Level of Service



Drovers Way Roundabout	AM	PM
LOS	C	C

Boreham Services	AM	PM
LOS	B	C
Veh delay (s)	14	18
Avg Queue (m)	2	2

A130 (N)	AM	PM
LOS	D	B
Veh delay (s)	36	19
Avg Queue (m)	29	12

Drovers Way	AM	PM
LOS	C	C
Veh delay (s)	20	25
Avg Queue (m)	3	5

A12 Offslip	AM	PM
LOS	C	C
Veh delay (s)	33	24
Avg Queue (m)	68	38

A130 Colchester Road (S)	AM	PM
LOS	C	C
Veh delay (s)	16	19
Avg Queue (m)	8	15

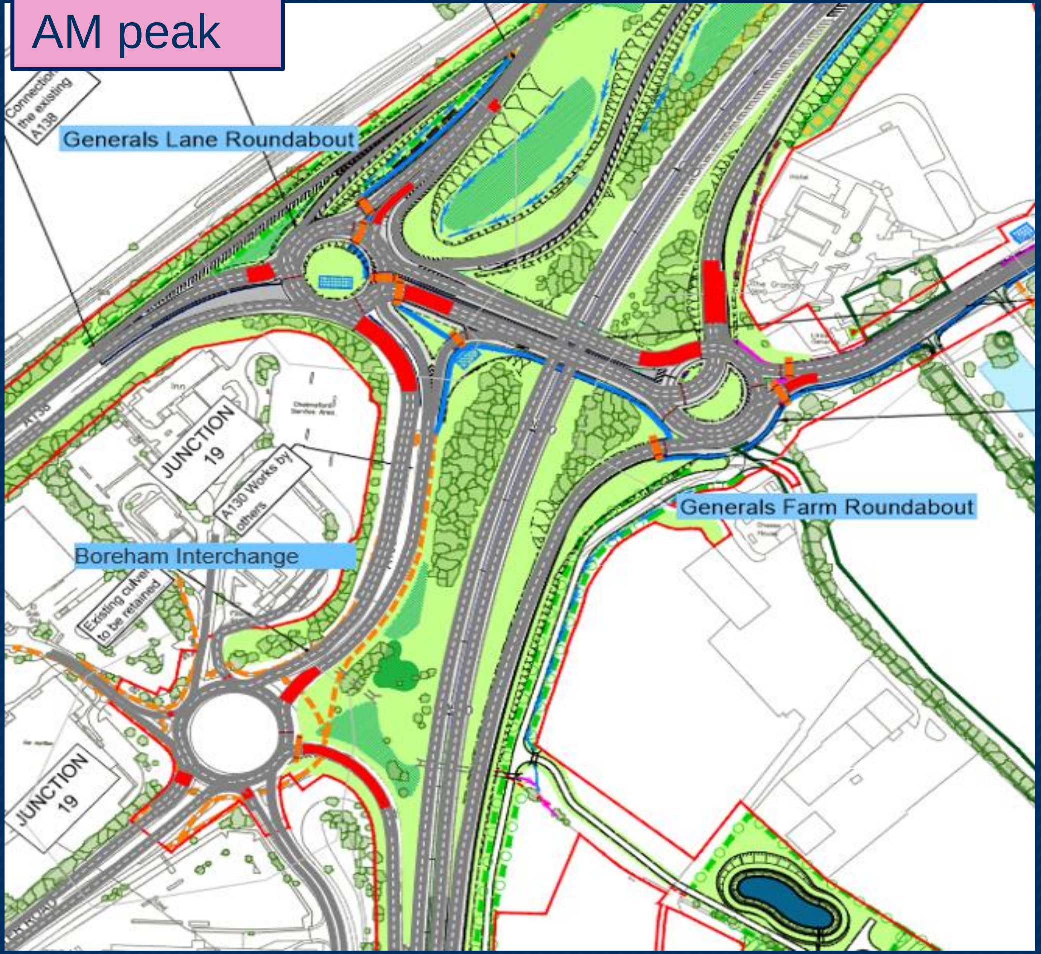
Winsford Way	AM	PM
LOS	C	D
Veh delay (s)	25	28
Avg Queue (m)	6	15

Level of Service	Loss Time		Operating conditions
	Signalised Junction	Unsignalised Junction	
LOS A	≤10 sec	≤10 sec	Best operating conditions
LOS B	10–20 sec	10–15 sec	
LOS C	20–35 sec	15–25 sec	
LOS D	35–55 sec	25–35 sec	
LOS E	55–80 sec	35–50 sec	
LOS F	>80 sec	>50 sec	Worst operating conditions

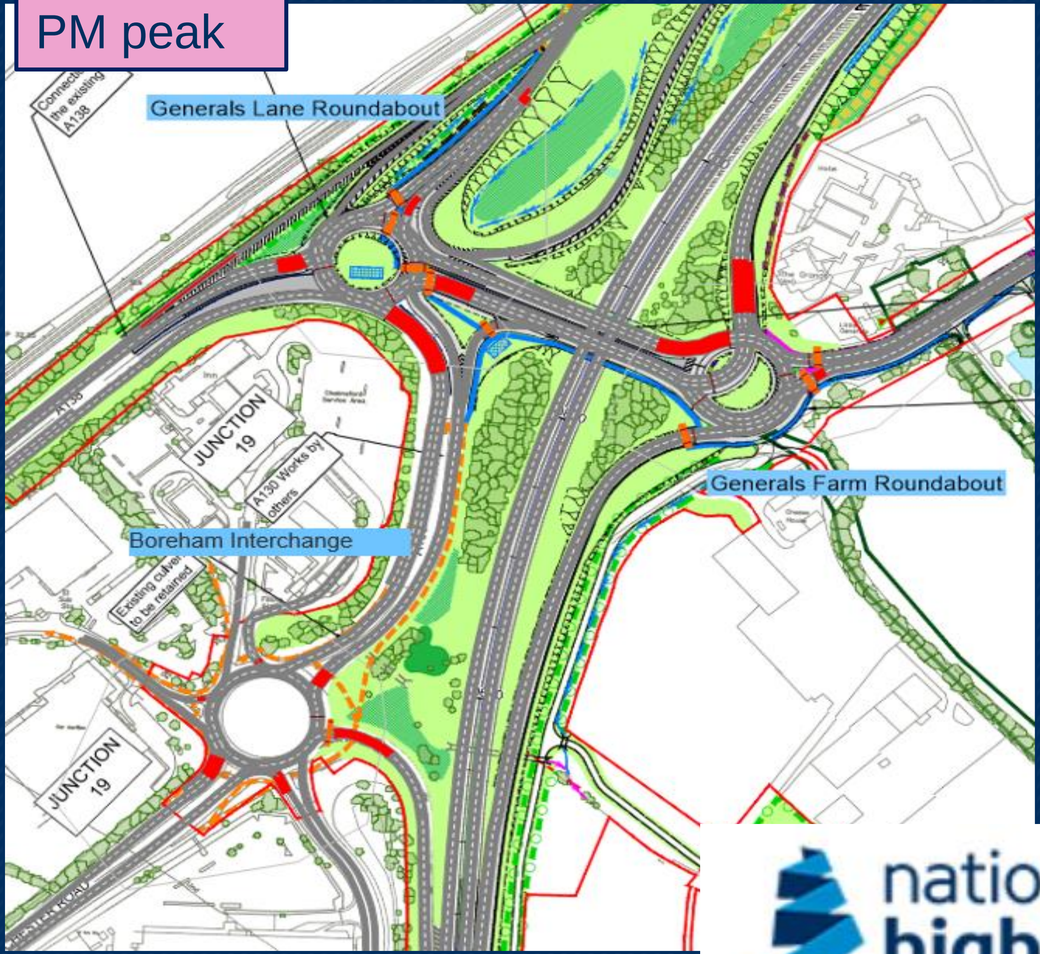
Junction 19 – with scheme

Vissim model results,
DS 2042: average queue lengths

AM peak



PM peak



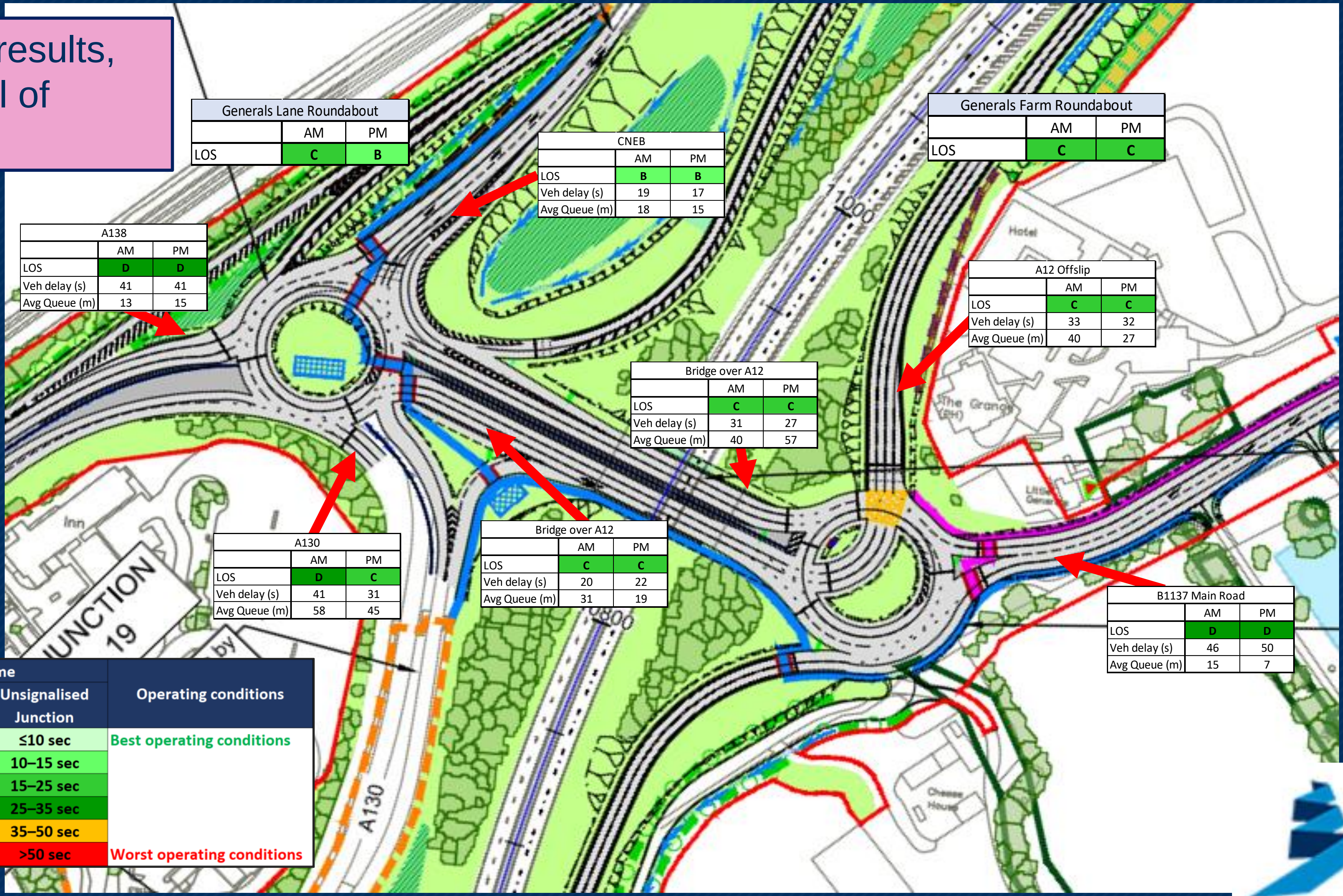
Junction 19 – with scheme

Vissim model results,
DS 2042: full results table

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Western Dumbbell	CNEB	Signalised	C	1418	26	34	86	B	1677	17	14	40
	Bridge between dumbbells (over A12)	Signalised	B	1765	19	30	138	C	1127	25	24	94
	A130	Signalised	D	1487	41	58	130	C	1822	32	53	139
	A138	Signalised	D	501	44	15	43	D	599	41	16	47
	A138 Slip (not part of junction)	Signalised	A	1133	3	0	0	B	2012	15	78	128
	Slip to Southern Roundabout (not part of junction)	Signalised	A	900	2	0	3	A	751	2	0	0
	Total	**Signalised**	**C**	**7203**	**22**			**C**	**7988**	**21**		
Eastern Dumbbell	A12 Offslip	Signalised	C	2169	33	42	121	D	1607	37	36	99
	B1137 Main Road	Signalised	D	709	47	20	66	D	300	54	7	32
	Bridge between dumbbells (over A12)	Signalised	C	1299	32	38	109	C	1705	24	45	139
	Total	**Signalised**	**C**	**4177**	**35**			**C**	**3611**	**32**		
Southern Roundabout	A130 (N)	Signalised	D	955	36	29	89	B	830	19	12	62
	A12 Offslip	Signalised	C	1550	33	68	177	C	1408	24	38	130
	Winsford Way	Priority	C	137	25	6	32	D	323	28	15	51
	A130 Colchester Road (S)	Priority	C	642	16	8	39	C	889	19	15	52
	Drovers Way	Priority	C	122	20	3	22	C	136	25	5	24
	Boreham Services	Priority	B	124	14	2	20	C	137	18	2	20
	Total	**Signalised**	**C**	**3530**	**29**			**C**	**3722**	**22**		

Junction 19 – with scheme

Vissim model results, DS 2027 Level of Service



Generals Lane Roundabout	AM	PM
LOS	C	B

CNEB	AM	PM
LOS	B	B
Veh delay (s)	19	17
Avg Queue (m)	18	15

Generals Farm Roundabout	AM	PM
LOS	C	C

A138	AM	PM
LOS	D	D
Veh delay (s)	41	41
Avg Queue (m)	13	15

A12 Offslip	AM	PM
LOS	C	C
Veh delay (s)	33	32
Avg Queue (m)	40	27

Bridge over A12	AM	PM
LOS	C	C
Veh delay (s)	31	27
Avg Queue (m)	40	57

A130	AM	PM
LOS	D	C
Veh delay (s)	41	31
Avg Queue (m)	58	45

Bridge over A12	AM	PM
LOS	C	C
Veh delay (s)	20	22
Avg Queue (m)	31	19

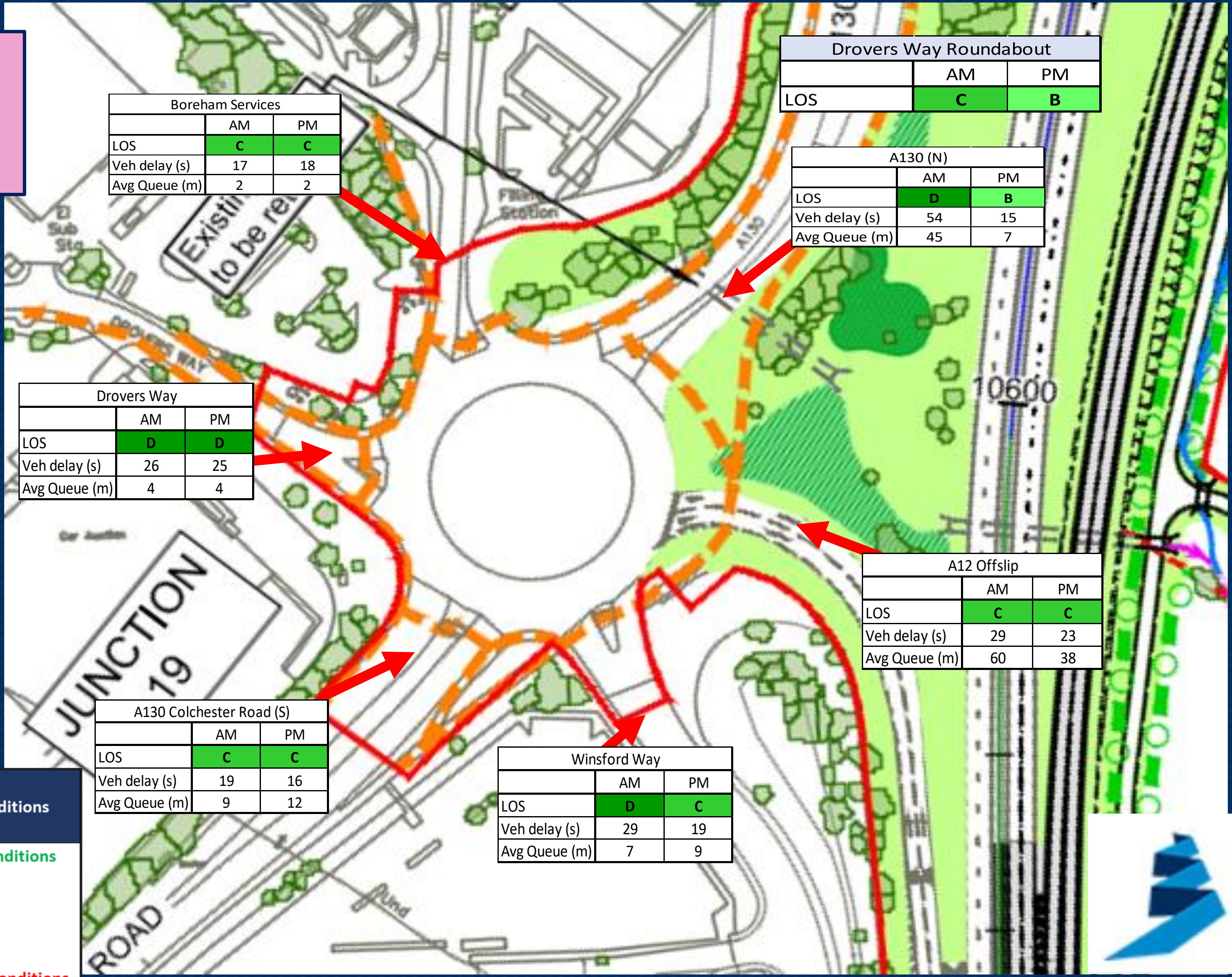
B1137 Main Road	AM	PM
LOS	D	D
Veh delay (s)	46	50
Avg Queue (m)	15	7

Level of Service	Loss Time		Operating conditions
	Signalised Junction	Unsignalised Junction	
LOS A	≤10 sec	≤10 sec	Best operating conditions
LOS B	10–20 sec	10–15 sec	
LOS C	20–35 sec	15–25 sec	
LOS D	35–55 sec	25–35 sec	
LOS E	55–80 sec	35–50 sec	
LOS F	>80 sec	>50 sec	Worst operating conditions

national highways

Junction 19 – with scheme

Vissim model results, DS 2027 Level of Service



Drovers Way Roundabout		
	AM	PM
LOS	C	B

Boreham Services		
	AM	PM
LOS	C	C
Veh delay (s)	17	18
Avg Queue (m)	2	2

A130 (N)		
	AM	PM
LOS	D	B
Veh delay (s)	54	15
Avg Queue (m)	45	7

Drovers Way		
	AM	PM
LOS	D	D
Veh delay (s)	26	25
Avg Queue (m)	4	4

A12 Offslip		
	AM	PM
LOS	C	C
Veh delay (s)	29	23
Avg Queue (m)	60	38

A130 Colchester Road (S)		
	AM	PM
LOS	C	C
Veh delay (s)	19	16
Avg Queue (m)	9	12

Winsford Way		
	AM	PM
LOS	D	C
Veh delay (s)	29	19
Avg Queue (m)	7	9

Level of Service	Loss Time		Operating conditions
	Signalised Junction	Unsignalised Junction	
LOS A	≤10 sec	≤10 sec	Best operating conditions
LOS B	10–20 sec	10–15 sec	
LOS C	20–35 sec	15–25 sec	
LOS D	35–55 sec	25–35 sec	
LOS E	55–80 sec	35–50 sec	
LOS F	>80 sec	>50 sec	Worst operating conditions

Junction 19 – with scheme

Vissim model results, DS 2027: full results table

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Western Dumbbell	CNEB	Signalised	B	1410	19	18	52	B	1637	17	15	50
	Bridge between dumbbells (over A12)	Signalised	C	1672	20	31	134	C	964	22	19	83
	A130	Signalised	D	1583	41	58	134	C	1789	31	45	124
	A138	Signalised	D	427	41	13	37	D	556	41	15	43
	A138 Slip (not part of junction)	Signalised	A	899	3	0	0	A	1857	7	1	11
	Slip to Southern Roundabout (not part of junction)	Signalised	A	839	2	0	5	A	635	1	0	0
	Total	**Signalised**	**C**	**6830**	**21**			**B**	**7438**	**19**		
Eastern Dumbbell	A12 Offslip	Signalised	C	2046	33	40	115	C	1349	32	27	82
	B1137 Main Road	Signalised	D	608	46	15	50	D	306	50	7	33
	Bridge between dumbbells (over A12)	Signalised	C	1375	31	40	115	C	1753	27	57	167
	Total	**Signalised**	**C**	**4029**	**35**			**C**	**3408**	**31**		
Southern Roundabout	A130 (N)	Signalised	D	911	54	45	104	B	716	15	7	49
	A12 Offslip	Signalised	C	1690	29	60	171	C	1402	23	38	128
	Winsford Way	Priority	D	125	29	7	32	C	310	19	9	40
	A130 Colchester Road (S)	Priority	C	616	19	9	40	C	878	16	12	48
	Drovers Way	Priority	D	111	26	4	23	D	129	25	4	23
	Boreham Services	Priority	C	113	17	2	19	C	131	18	2	20
	Total	**Signalised**	**C**	**3566**	**33**			**B**	**3565**	**19**		

Main Road, Boreham

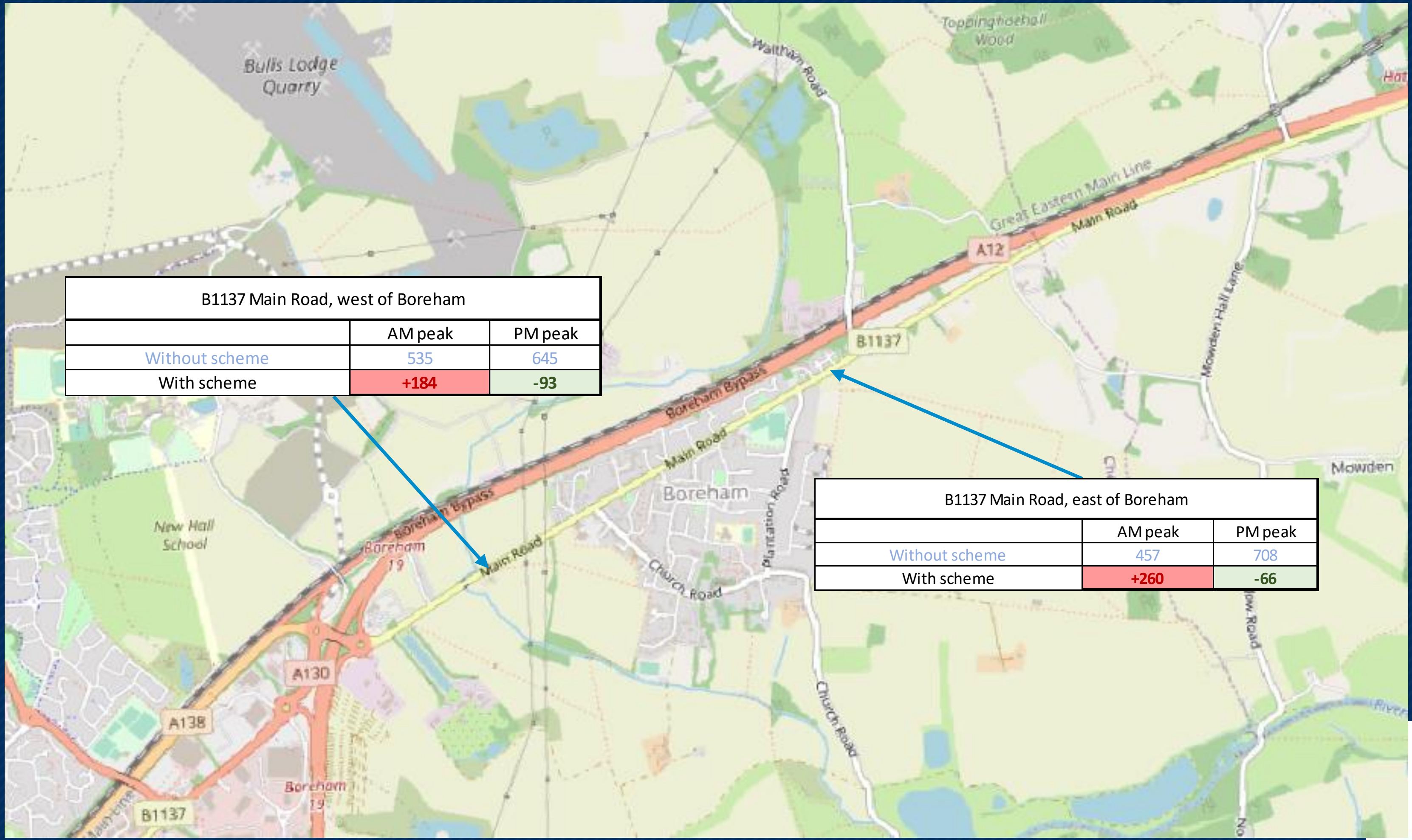
ECC consultation response: *“There is a clear increase in traffic forecast on Main Road Boreham in AM Peak. We don’t have select link analysis, but this appears to be coming via Hatfield Peverel, probably due to the closure of the southbound on-slip just south of Hatfield Peverel.”*

The increase in trips in the AM peak westbound on Main Road is attributed to the closing of the A12 Junction 20a on-slip for traffic originating within Hatfield Peverel and heading southbound.

The following slides show the traffic travelling through Boreham.
Select Link Analysis shows the traffic that accesses junction 19 towards Chelmsford/London via Boreham. It shows when traffic increases in the Do Something scenario, it is driven by traffic coming from Hatfield Peverel itself, rather than from further afield such as Maldon.

Main Road, Boreham

2027 Traffic Flow Comparison

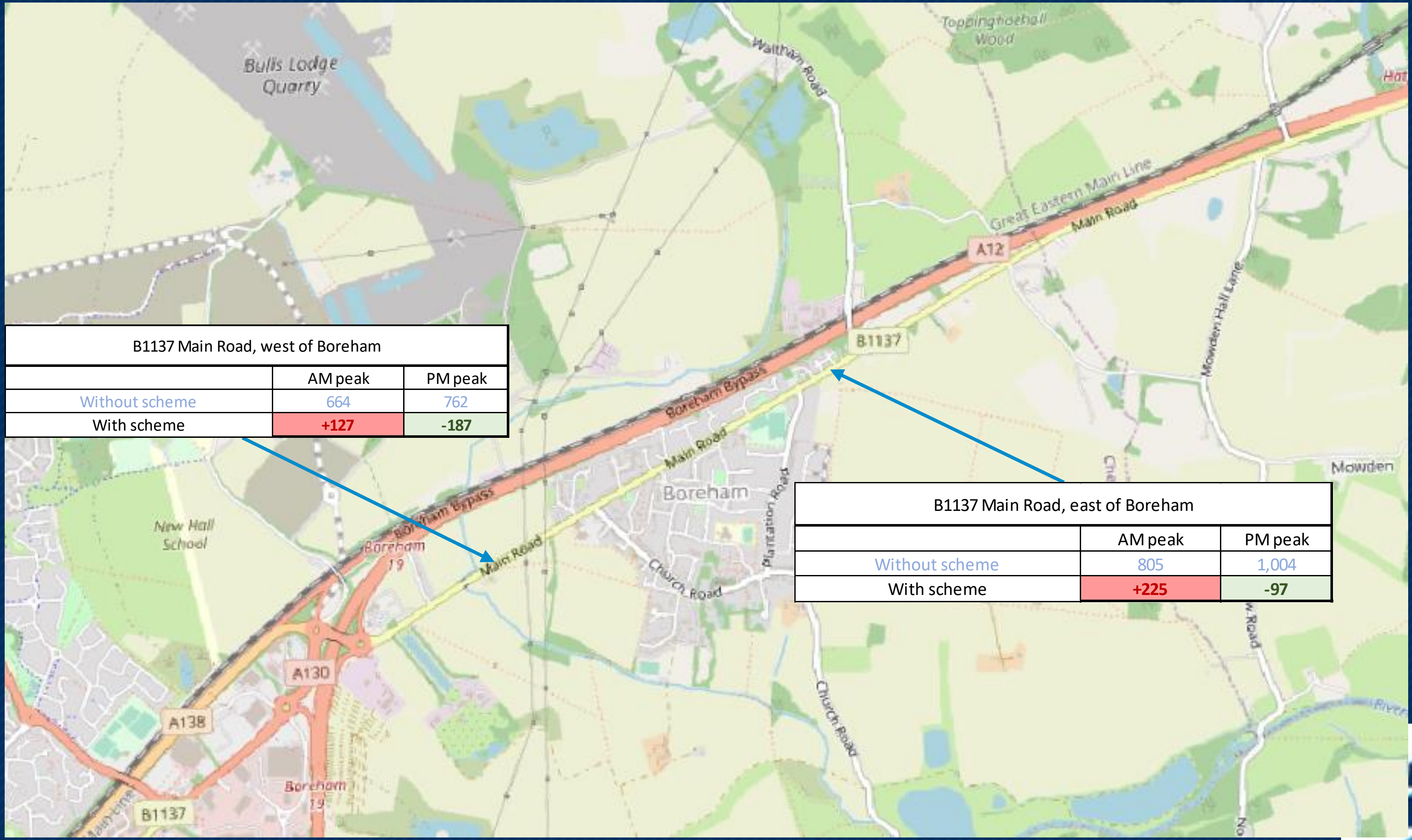


B1137 Main Road, west of Boreham		
	AM peak	PM peak
Without scheme	535	645
With scheme	+184	-93

B1137 Main Road, east of Boreham		
	AM peak	PM peak
Without scheme	457	708
With scheme	+260	-66

Main Road, Boreham

2042 Traffic Flow Comparison

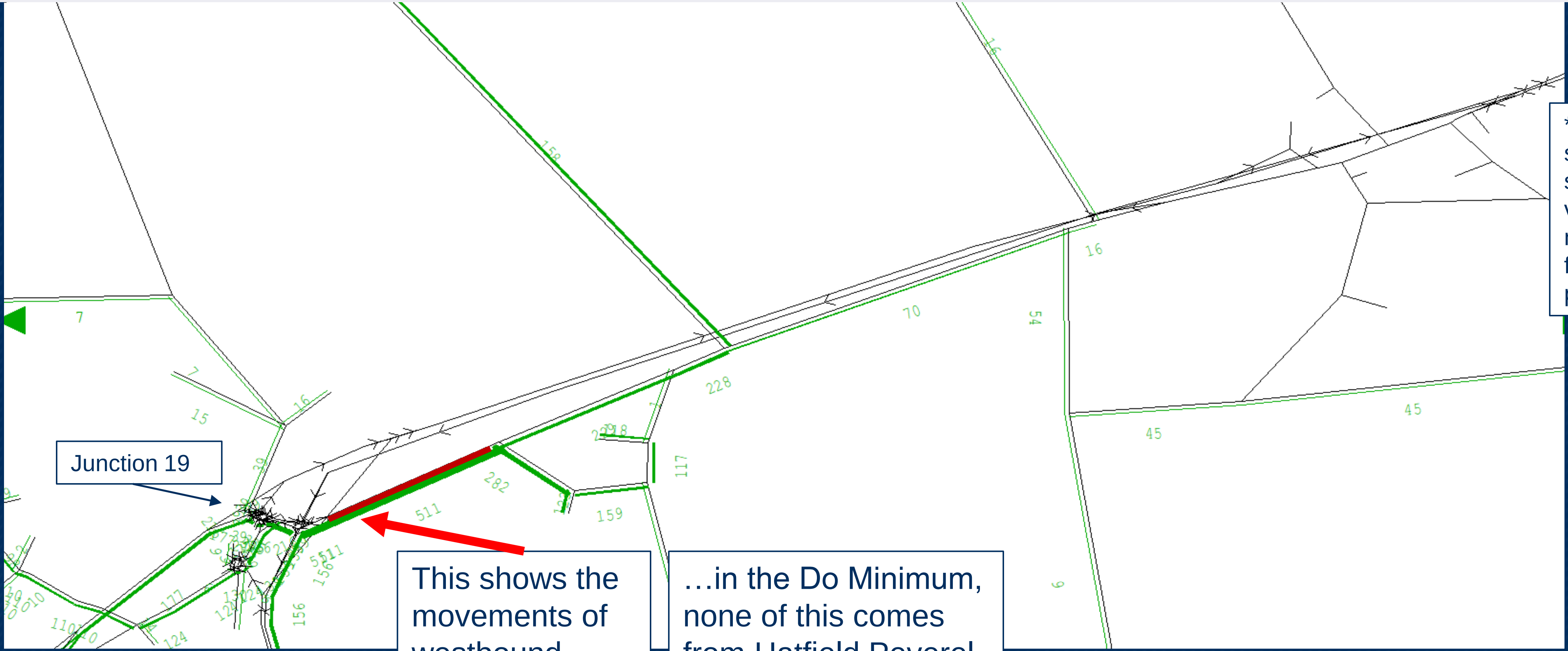


B1137 Main Road, west of Boreham		
	AM peak	PM peak
Without scheme	664	762
With scheme	+127	-187

B1137 Main Road, east of Boreham		
	AM peak	PM peak
Without scheme	805	1,004
With scheme	+225	-97

Main Road, Boreham

2042 AM DM Select Link Analysis – Main Rd Boreham (SB)



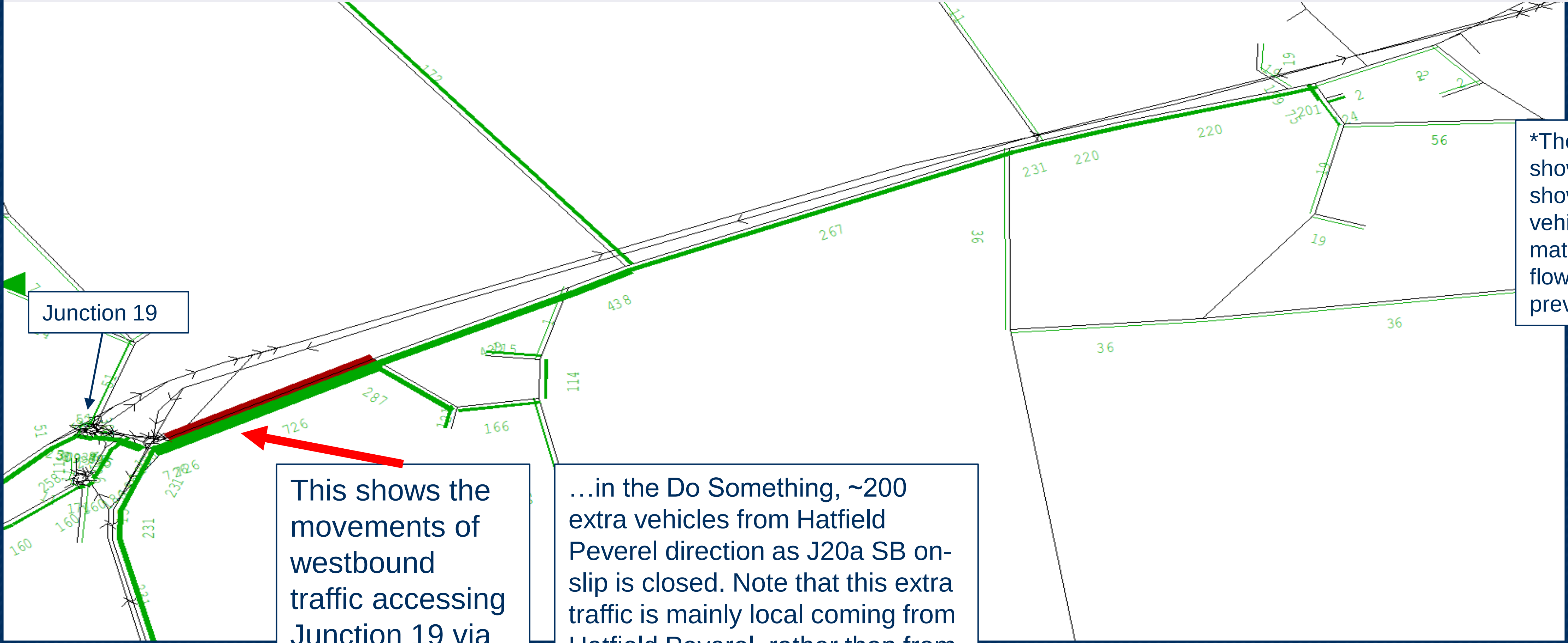
*The numbers shown here are shown in PCUs not vehicles, so do not match exactly to flows shown in the previous slides

This shows the movements of westbound traffic accessing Junction 19 via Boreham…

…in the Do Minimum, none of this comes from Hatfield Peverel – that traffic would use J20a SB on-slip to join A12

Main Road, Boreham

2042 AM DS Select Link Analysis – Main Rd Boreham (SB)



*The numbers shown here are shown in PCUs not vehicles, so do not match exactly to flows shown in the previous slides

This shows the movements of westbound traffic accessing Junction 19 via Boreham…

…in the Do Something, ~200 extra vehicles from Hatfield Peverel direction as J20a SB on-slip is closed. Note that this extra traffic is mainly local coming from Hatfield Peverel, rather than from Maldon. Maldon traffic uses J21.

Main Road, Boreham

- *Junction model results for 2027 and 2042, for three key junctions along Main Road.*
- *Junctions assessed in TA because of traffic increase identified on Main Road on previous slides.*

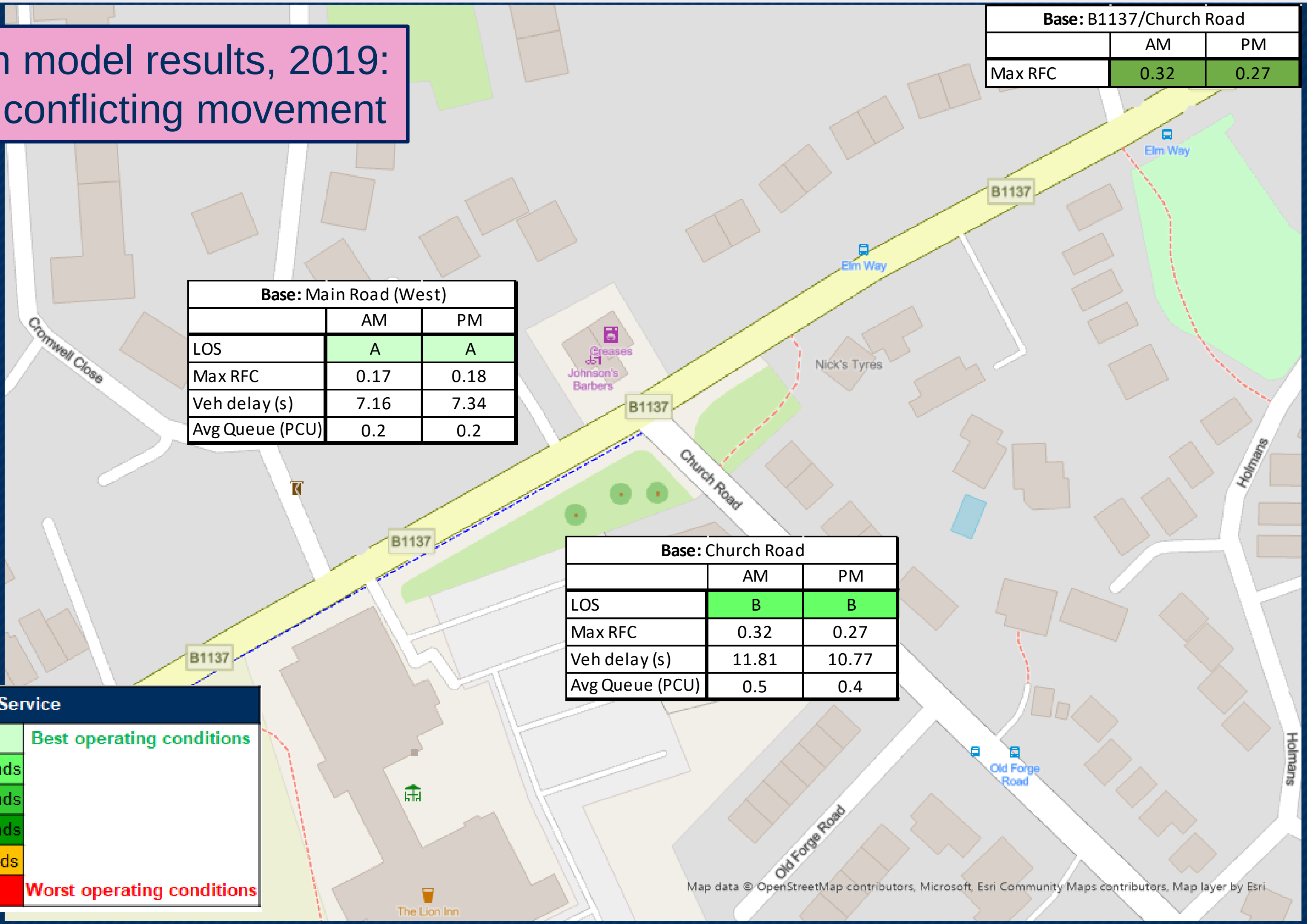
	Max RFC									
	2019 Base		*2027 DM*		*2027 DS*		*2042 DM*		*2042 DS*	
Junction	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
B1137 Main Road/ Church Road (Boreham)	0.32	0.27	0.35	0.30	0.40	0.31	0.41	0.35	0.21	0.23
B1137 Main Road/ Plantation Road (Boreham)	0.43	0.46	0.47	0.51	0.72	0.62	0.55	0.60	0.98	0.70
B1137 Main Road/ Waltham Road (Boreham)	1.47	1.13	0.74	0.48	0.73	0.42	1.87	1.80	1.70	1.16

national highways

Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
  - *B1137 Main Road / Church Road*

PICADY junction model results, 2019: performance by conflicting movement



Base: B1137/Church Road	AM	PM
Max RFC	0.32	0.27

Base: Main Road (West)	AM	PM
LOS	A	A
Max RFC	0.17	0.18
Veh delay (s)	7.16	7.34
Avg Queue (PCU)	0.2	0.2

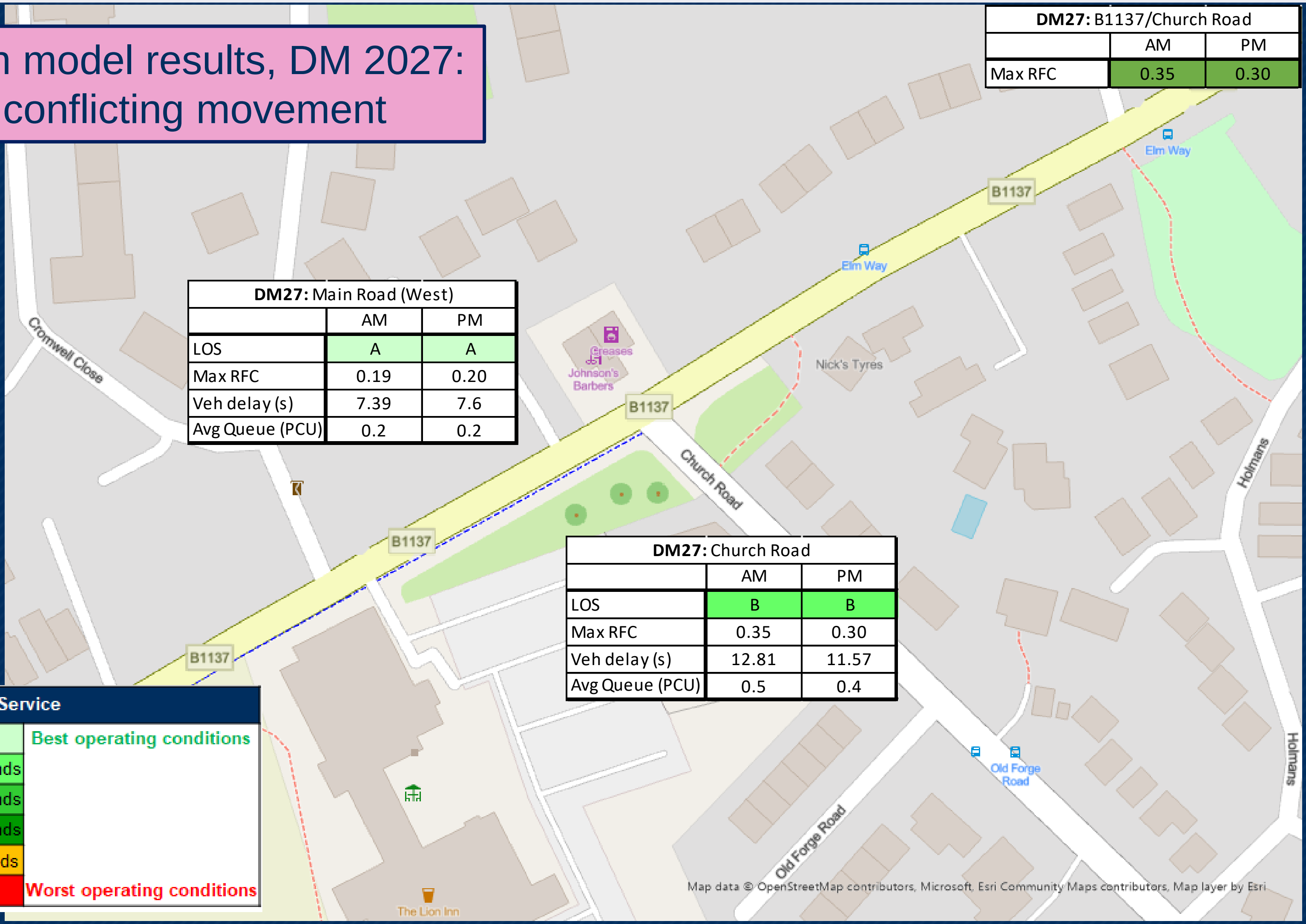
Base: Church Road	AM	PM
LOS	B	B
Max RFC	0.32	0.27
Veh delay (s)	11.81	10.77
Avg Queue (PCU)	0.5	0.4

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
  - *B1137 Main Road / Church Road*

PICADY junction model results, DM 2027: performance by conflicting movement



DM27: B1137/Church Road	AM	PM
Max RFC	0.35	0.30

DM27: Main Road (West)	AM	PM
LOS	A	A
Max RFC	0.19	0.20
Veh delay (s)	7.39	7.6
Avg Queue (PCU)	0.2	0.2

DM27: Church Road	AM	PM
LOS	B	B
Max RFC	0.35	0.30
Veh delay (s)	12.81	11.57
Avg Queue (PCU)	0.5	0.4

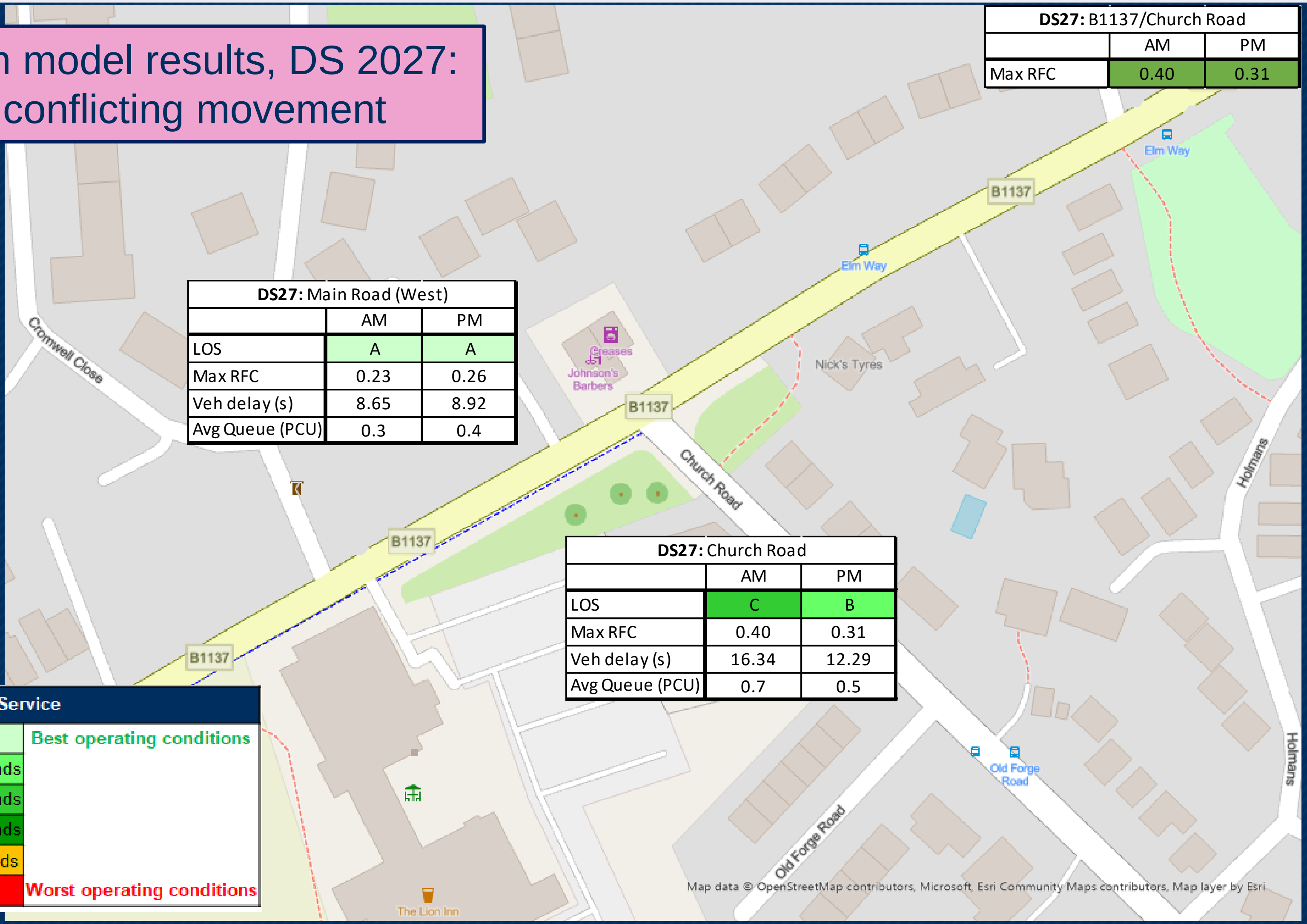
Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
  - *B1137 Main Road / Church Road*

PICADY junction model results, DS 2027: performance by conflicting movement



DS27: B1137/Church Road	AM	PM
Max RFC	0.40	0.31

DS27: Main Road (West)	AM	PM
LOS	A	A
Max RFC	0.23	0.26
Veh delay (s)	8.65	8.92
Avg Queue (PCU)	0.3	0.4

DS27: Church Road	AM	PM
LOS	C	B
Max RFC	0.40	0.31
Veh delay (s)	16.34	12.29
Avg Queue (PCU)	0.7	0.5

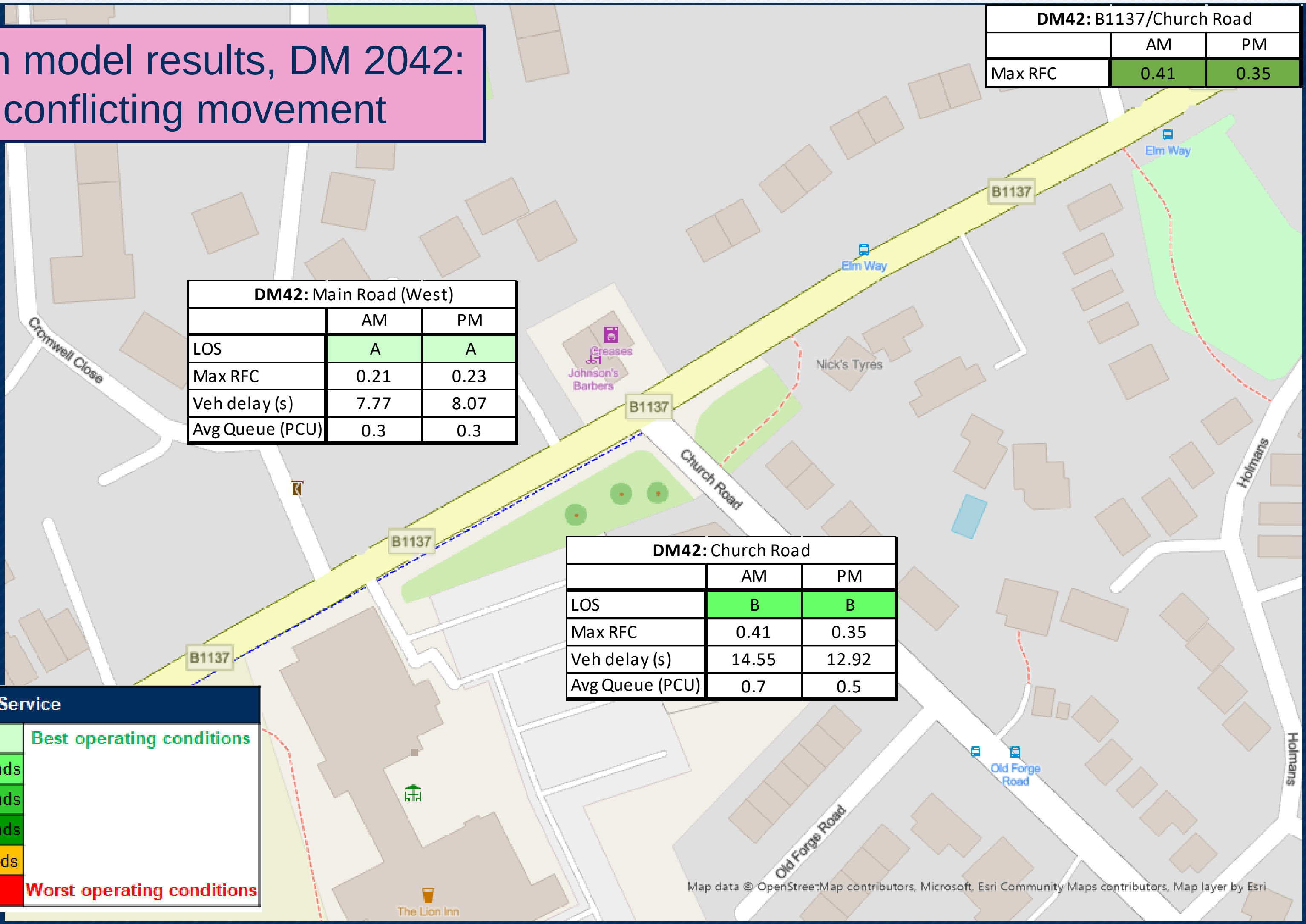
Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
  - *B1137 Main Road / Church Road*

PICADY junction model results, DM 2042: performance by conflicting movement



DM42: B1137/Church Road		
	AM	PM
Max RFC	0.41	0.35

DM42: Main Road (West)		
	AM	PM
LOS	A	A
Max RFC	0.21	0.23
Veh delay (s)	7.77	8.07
Avg Queue (PCU)	0.3	0.3

DM42: Church Road		
	AM	PM
LOS	B	B
Max RFC	0.41	0.35
Veh delay (s)	14.55	12.92
Avg Queue (PCU)	0.7	0.5

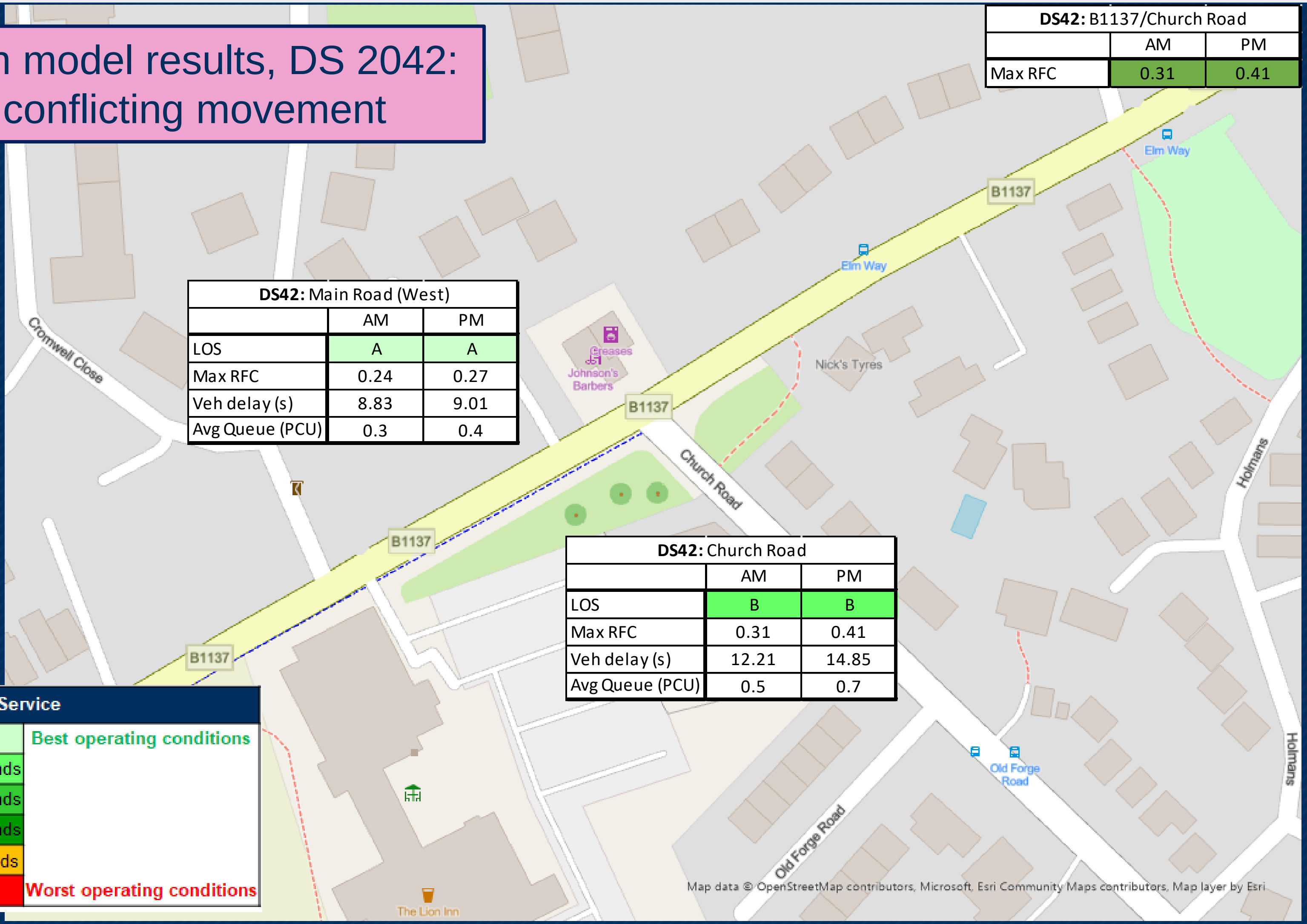
Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
  - *B1137 Main Road / Church Road*

PICADY junction model results, DS 2042: performance by conflicting movement



DS42: B1137/Church Road	AM	PM
Max RFC	0.31	0.41

DS42: Main Road (West)	AM	PM
LOS	A	A
Max RFC	0.24	0.27
Veh delay (s)	8.83	9.01
Avg Queue (PCU)	0.3	0.4

DS42: Church Road	AM	PM
LOS	B	B
Max RFC	0.31	0.41
Veh delay (s)	12.21	14.85
Avg Queue (PCU)	0.5	0.7

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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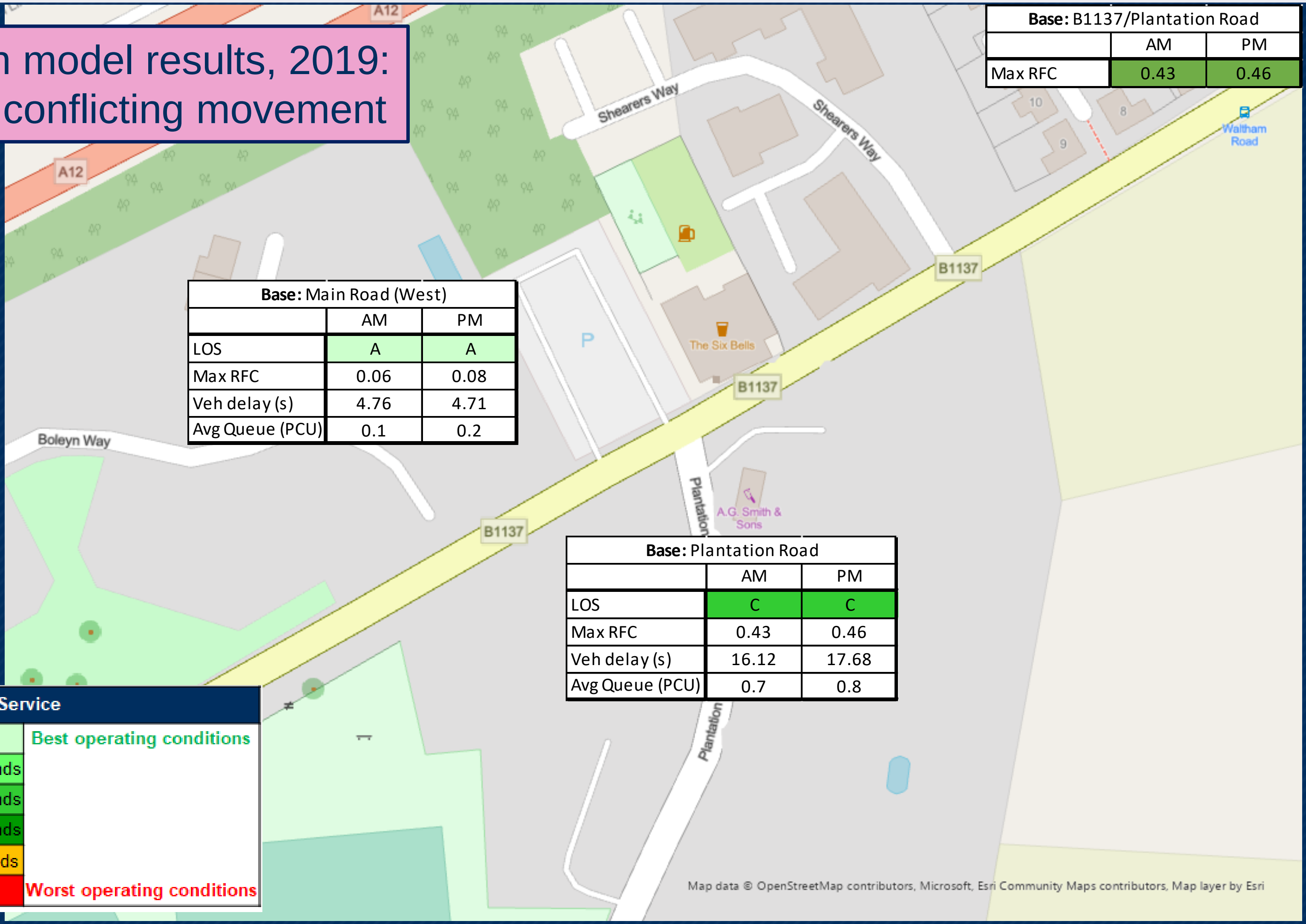
Main Road, Boreham

- Junction model results for 2027 and 2042, for:
  - B1137 Main Road / Plantation Road

PICADY junction model results, 2019: performance by conflicting movement



Base: B1137/Plantation Road		
	AM	PM
Max RFC	0.43	0.46

Base: Main Road (West)		
	AM	PM
LOS	A	A
Max RFC	0.06	0.08
Veh delay (s)	4.76	4.71
Avg Queue (PCU)	0.1	0.2

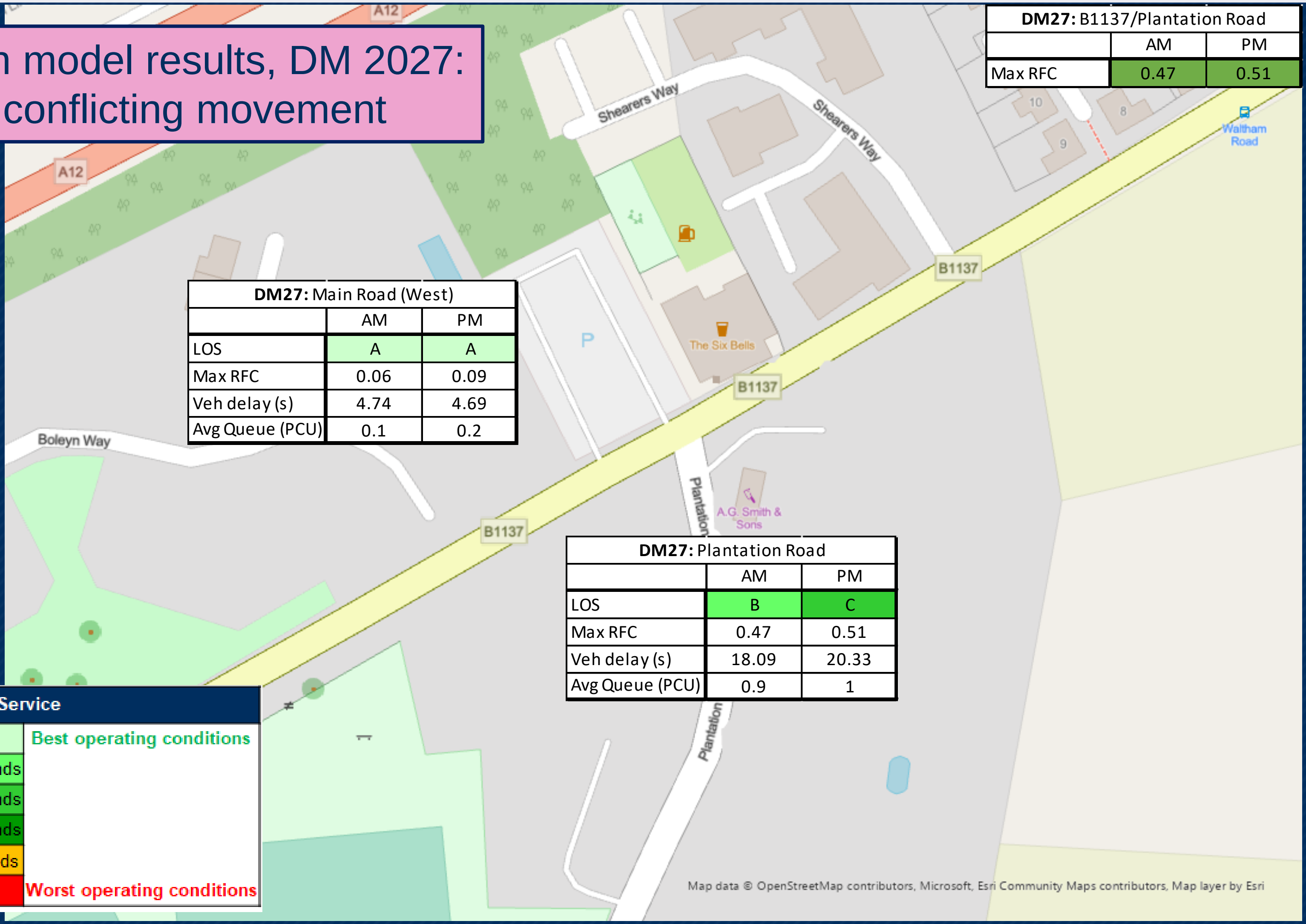
Base: Plantation Road		
	AM	PM
LOS	C	C
Max RFC	0.43	0.46
Veh delay (s)	16.12	17.68
Avg Queue (PCU)	0.7	0.8

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
    - *B1137 Main Road / Plantation Road*

PICADY junction model results, DM 2027: performance by conflicting movement



DM27: B1137/Plantation Road	AM	PM
Max RFC	0.47	0.51

DM27: Main Road (West)	AM	PM
LOS	A	A
Max RFC	0.06	0.09
Veh delay (s)	4.74	4.69
Avg Queue (PCU)	0.1	0.2

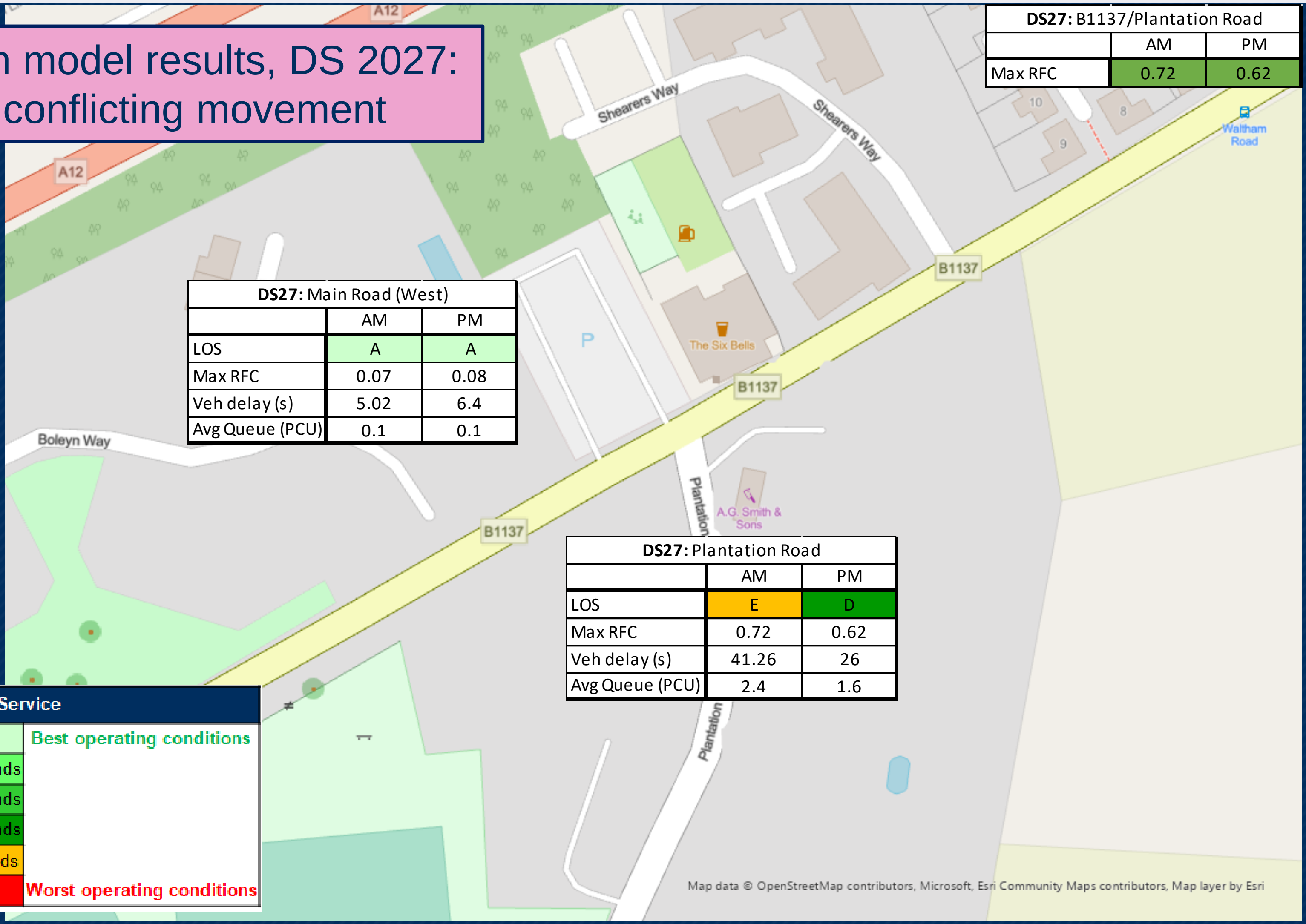
DM27: Plantation Road	AM	PM
LOS	B	C
Max RFC	0.47	0.51
Veh delay (s)	18.09	20.33
Avg Queue (PCU)	0.9	1

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
  - *B1137 Main Road / Plantation Road*

PICADY junction model results, DS 2027: performance by conflicting movement



DS27: B1137/Plantation Road	AM	PM
Max RFC	0.72	0.62

DS27: Main Road (West)	AM	PM
LOS	A	A
Max RFC	0.07	0.08
Veh delay (s)	5.02	6.4
Avg Queue (PCU)	0.1	0.1

DS27: Plantation Road	AM	PM
LOS	E	D
Max RFC	0.72	0.62
Veh delay (s)	41.26	26
Avg Queue (PCU)	2.4	1.6

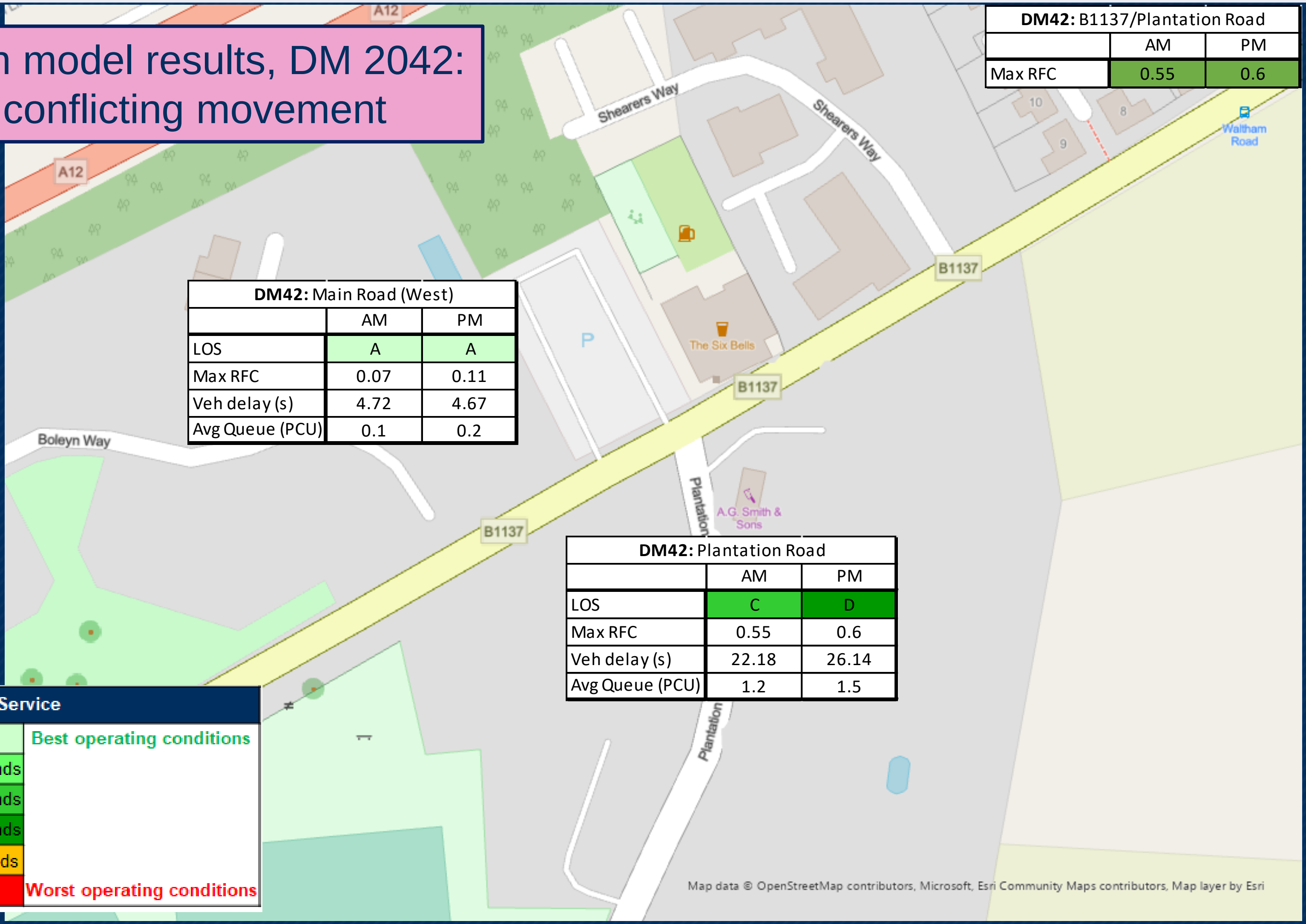
Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
  - *B1137 Main Road / Plantation Road*

PICADY junction model results, DM 2042: performance by conflicting movement



DM42: B1137/Plantation Road	AM	PM
Max RFC	0.55	0.6

DM42: Main Road (West)	AM	PM
LOS	A	A
Max RFC	0.07	0.11
Veh delay (s)	4.72	4.67
Avg Queue (PCU)	0.1	0.2

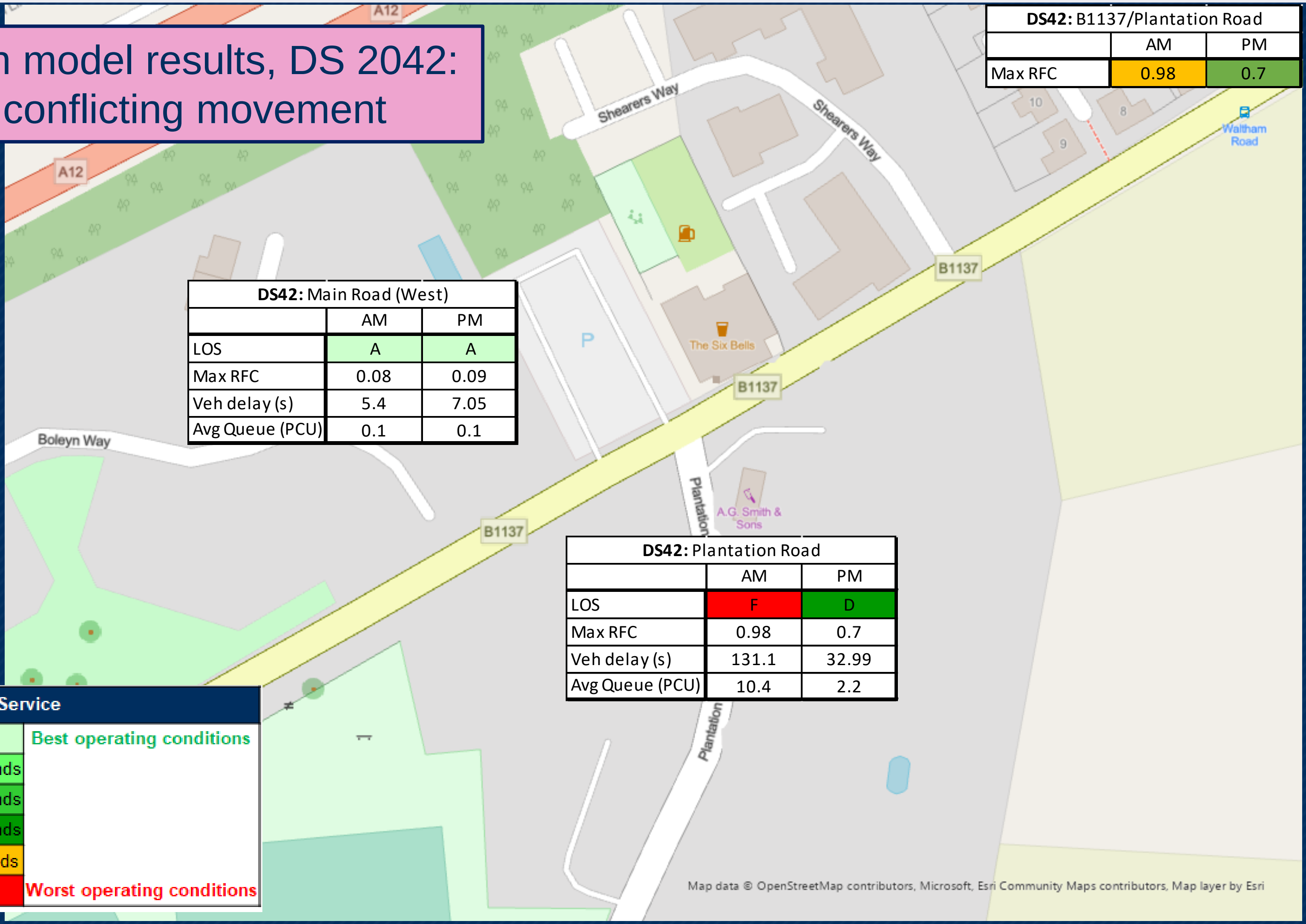
DM42: Plantation Road	AM	PM
LOS	C	D
Max RFC	0.55	0.6
Veh delay (s)	22.18	26.14
Avg Queue (PCU)	1.2	1.5

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
    - *B1137 Main Road / Plantation Road*

PICADY junction model results, DS 2042: performance by conflicting movement



DS42: B1137/Plantation Road	AM	PM
Max RFC	0.98	0.7

DS42: Main Road (West)	AM	PM
LOS	A	A
Max RFC	0.08	0.09
Veh delay (s)	5.4	7.05
Avg Queue (PCU)	0.1	0.1

DS42: Plantation Road	AM	PM
LOS	F	D
Max RFC	0.98	0.7
Veh delay (s)	131.1	32.99
Avg Queue (PCU)	10.4	2.2

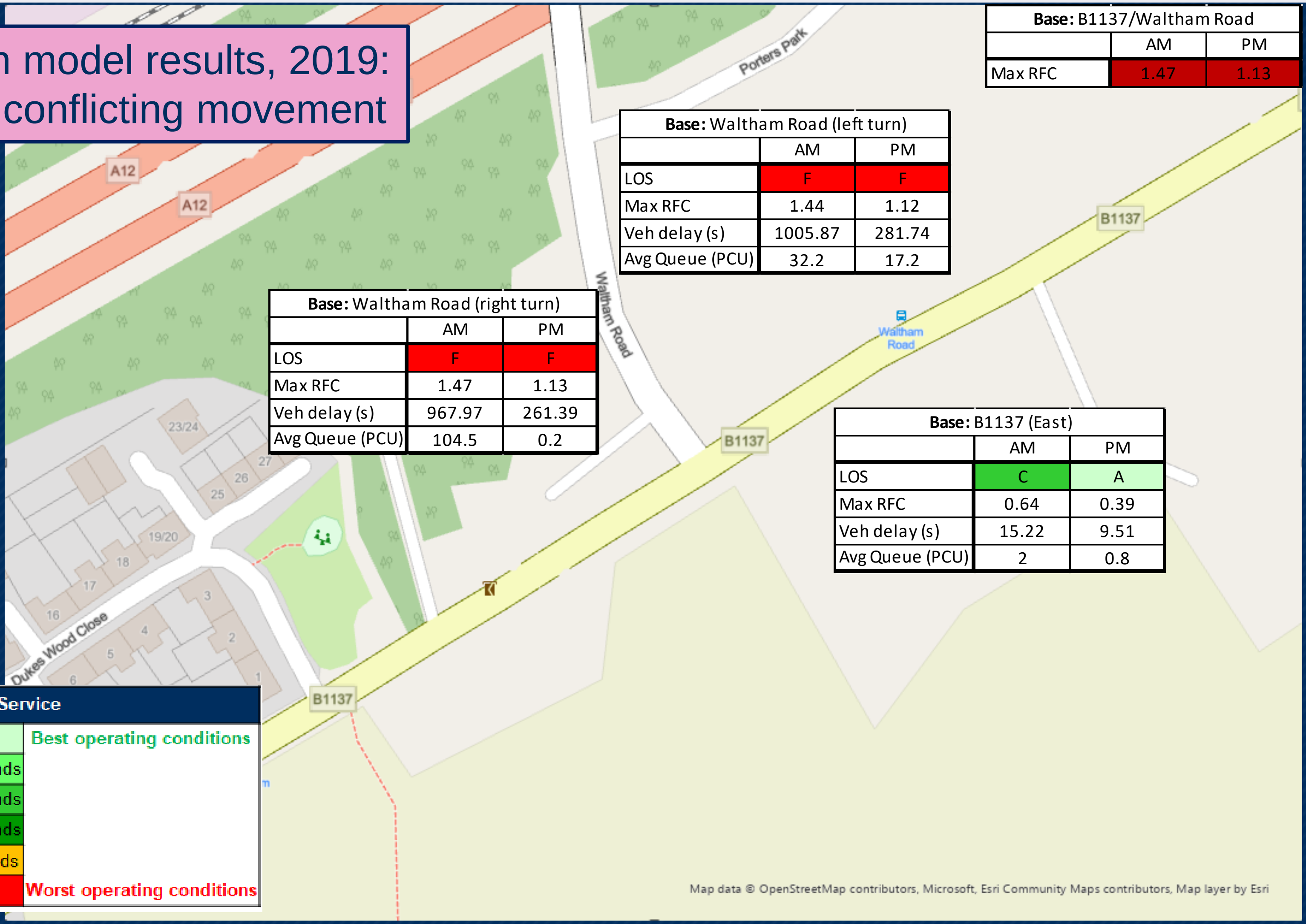
Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
  - *B1137 Main Road / Waltham Road*

PICADY junction model results, 2019: performance by conflicting movement



Base: B1137/Waltham Road		
	AM	PM
Max RFC	1.47	1.13

Base: Waltham Road (left turn)		
	AM	PM
LOS	F	F
Max RFC	1.44	1.12
Veh delay (s)	1005.87	281.74
Avg Queue (PCU)	32.2	17.2

Base: Waltham Road (right turn)		
	AM	PM
LOS	F	F
Max RFC	1.47	1.13
Veh delay (s)	967.97	261.39
Avg Queue (PCU)	104.5	0.2

Base: B1137 (East)		
	AM	PM
LOS	C	A
Max RFC	0.64	0.39
Veh delay (s)	15.22	9.51
Avg Queue (PCU)	2	0.8

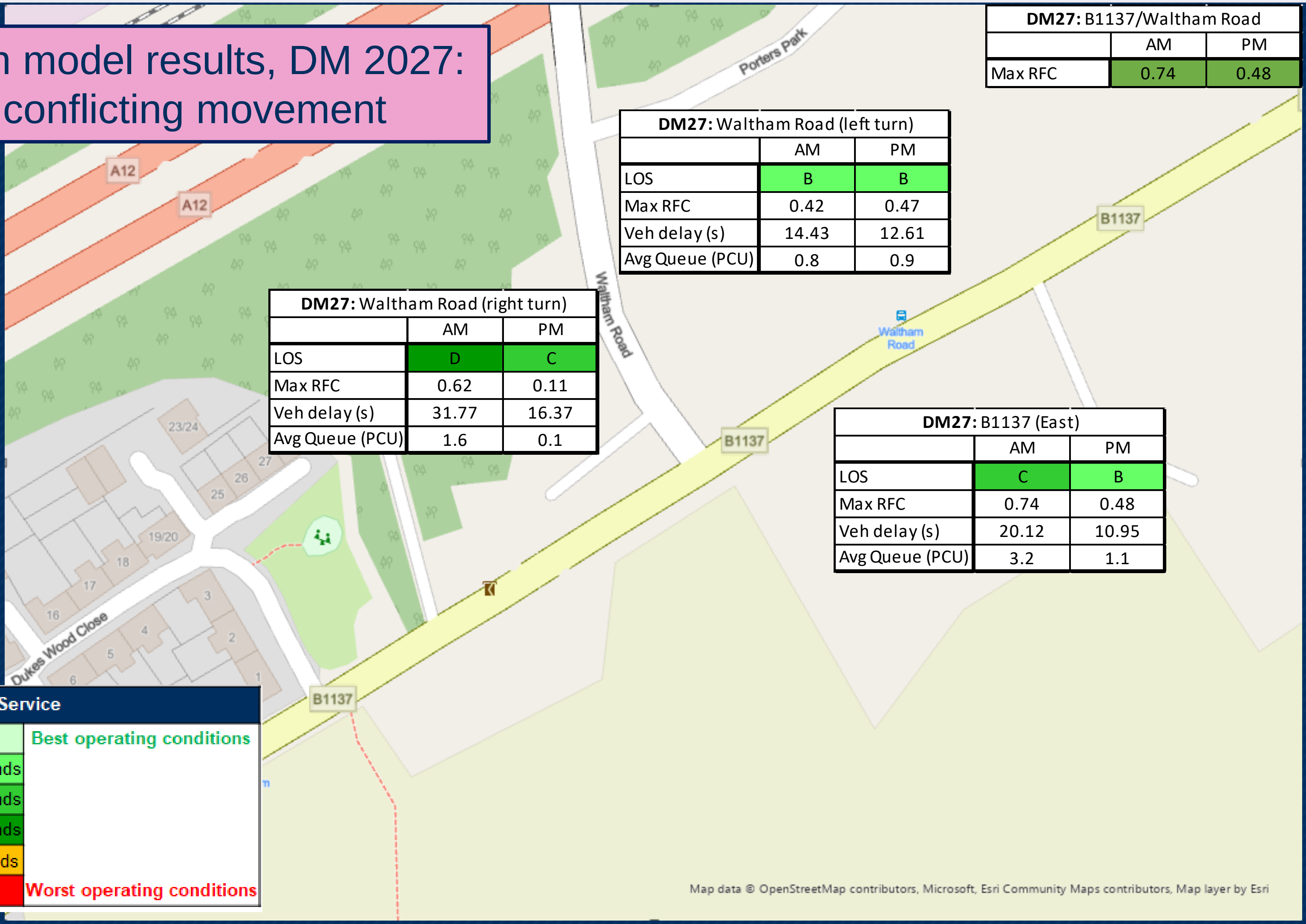
N.B. no observed turning count data available for this junction.

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
  - *B1137 Main Road / Waltham Road*

PICADY junction model results, DM 2027: performance by conflicting movement



DM27: B1137/Waltham Road		
	AM	PM
Max RFC	0.74	0.48

DM27: Waltham Road (left turn)		
	AM	PM
LOS	B	B
Max RFC	0.42	0.47
Veh delay (s)	14.43	12.61
Avg Queue (PCU)	0.8	0.9

DM27: Waltham Road (right turn)		
	AM	PM
LOS	D	C
Max RFC	0.62	0.11
Veh delay (s)	31.77	16.37
Avg Queue (PCU)	1.6	0.1

DM27: B1137 (East)		
	AM	PM
LOS	C	B
Max RFC	0.74	0.48
Veh delay (s)	20.12	10.95
Avg Queue (PCU)	3.2	1.1

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

2027 traffic flows on Waltham Road lower than base – impact of CNEB.

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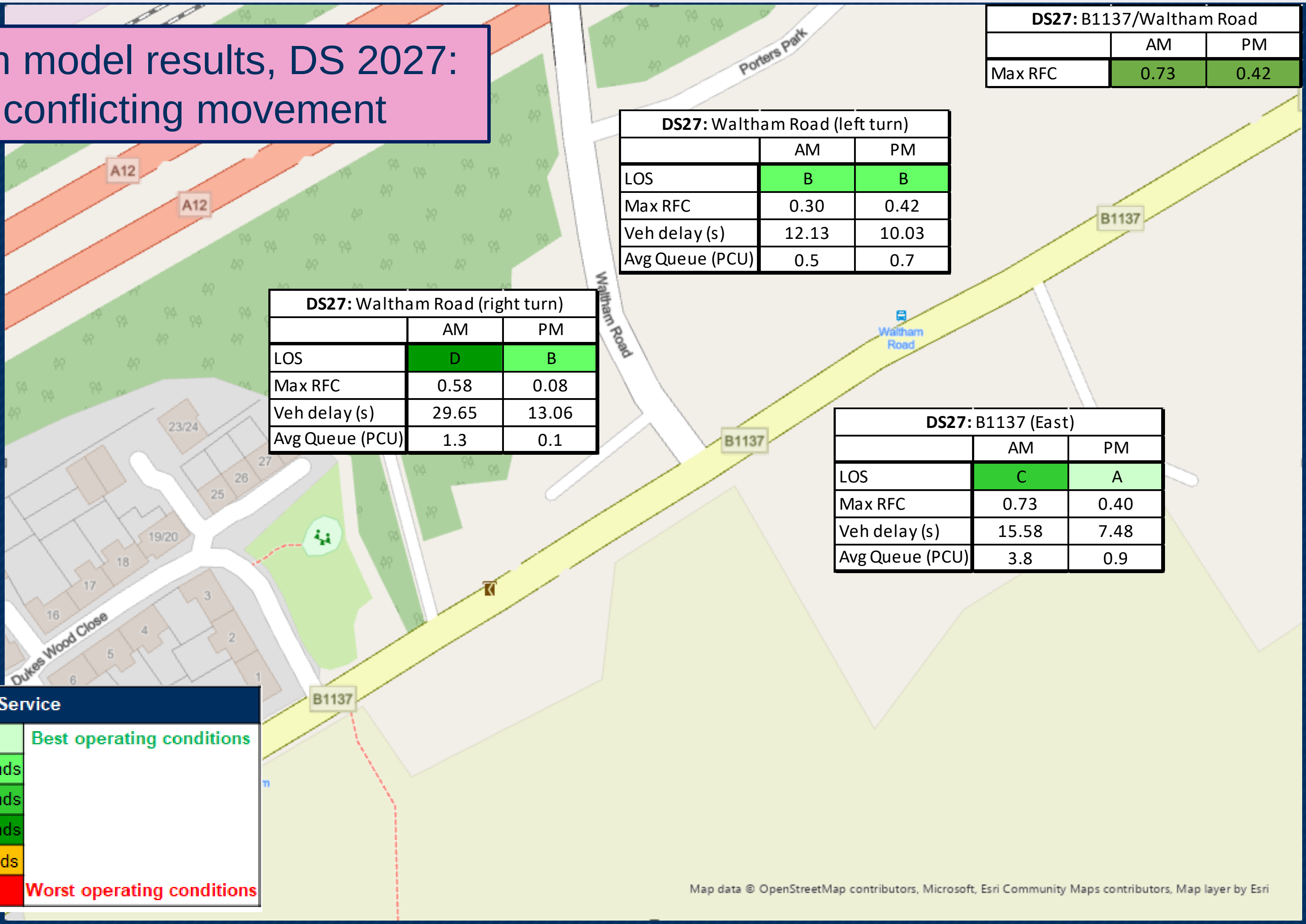
Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
  - *B1137 Main Road / Waltham Road*

PICADY junction model results, DS 2027: performance by conflicting movement



DS27: B1137/Waltham Road		
	AM	PM
Max RFC	0.73	0.42

DS27: Waltham Road (left turn)		
	AM	PM
LOS	B	B
Max RFC	0.30	0.42
Veh delay (s)	12.13	10.03
Avg Queue (PCU)	0.5	0.7

DS27: Waltham Road (right turn)		
	AM	PM
LOS	D	B
Max RFC	0.58	0.08
Veh delay (s)	29.65	13.06
Avg Queue (PCU)	1.3	0.1

DS27: B1137 (East)		
	AM	PM
LOS	C	A
Max RFC	0.73	0.40
Veh delay (s)	15.58	7.48
Avg Queue (PCU)	3.8	0.9

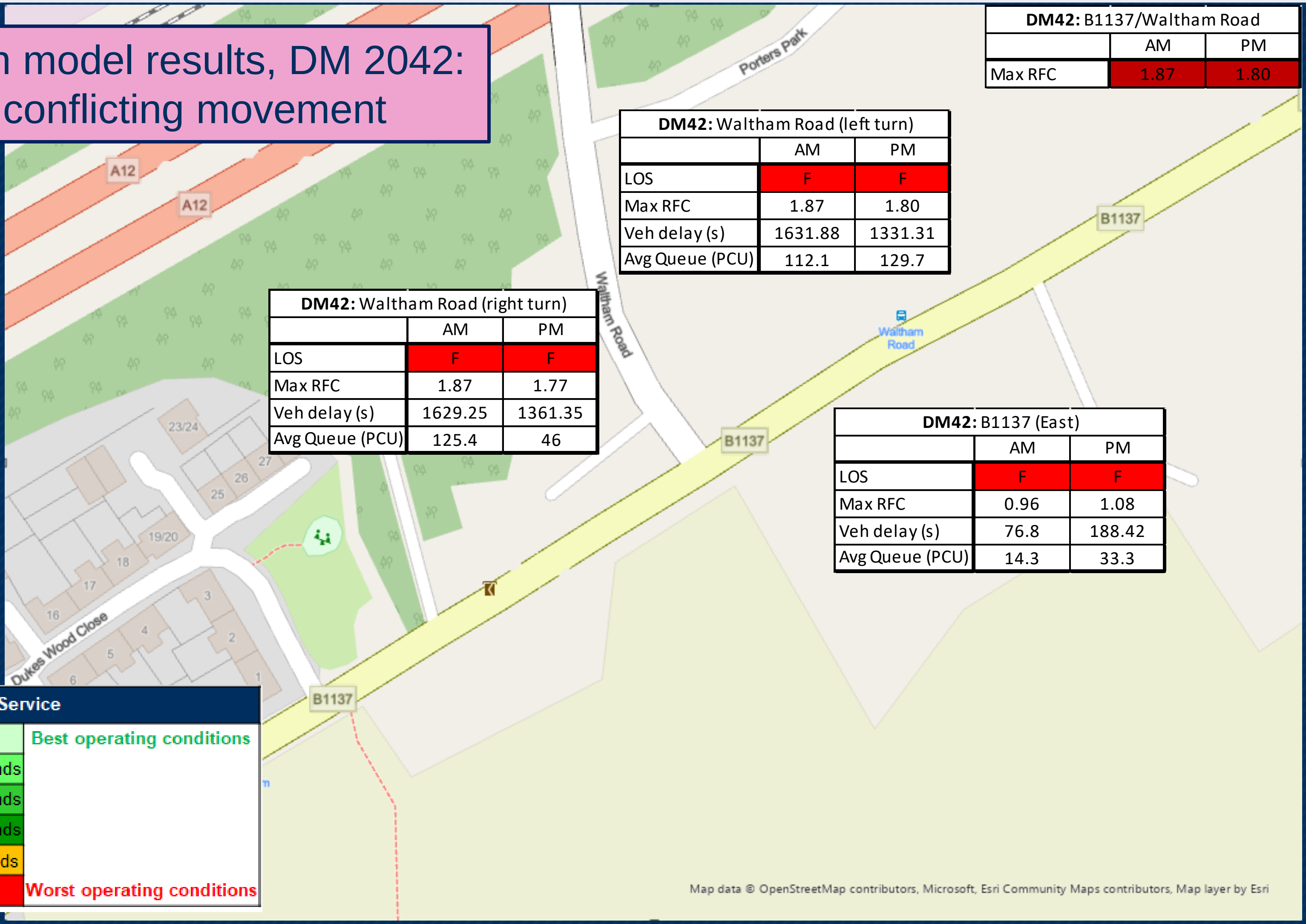
2027 traffic flows on Waltham Road lower than base – impact of CNEB.

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
  - *B1137 Main Road / Waltham Road*

PICADY junction model results, DM 2042: performance by conflicting movement



DM42: B1137/Waltham Road		
	AM	PM
Max RFC	1.87	1.80

DM42: Waltham Road (left turn)		
	AM	PM
LOS	F	F
Max RFC	1.87	1.80
Veh delay (s)	1631.88	1331.31
Avg Queue (PCU)	112.1	129.7

DM42: Waltham Road (right turn)		
	AM	PM
LOS	F	F
Max RFC	1.87	1.77
Veh delay (s)	1629.25	1361.35
Avg Queue (PCU)	125.4	46

DM42: B1137 (East)		
	AM	PM
LOS	F	F
Max RFC	0.96	1.08
Veh delay (s)	76.8	188.42
Avg Queue (PCU)	14.3	33.3

2042 traffic flows on Waltham Road much higher than 2027. Large developments + CNEB reaching its capacity.

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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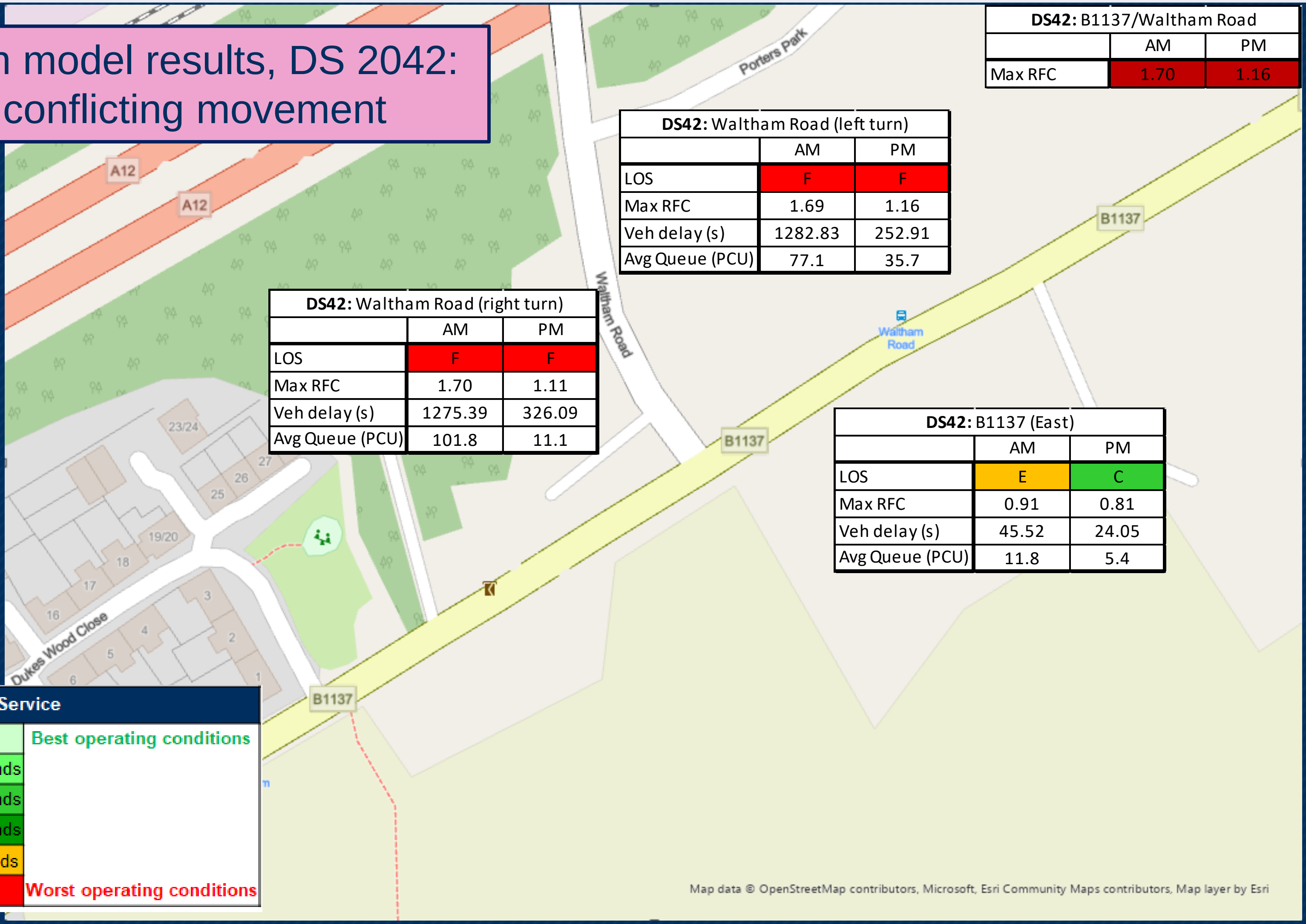
Main Road, Boreham

- *Junction model results for 2027 and 2042, for:*
    - *B1137 Main Road / Waltham Road*

PICADY junction model results, DS 2042: performance by conflicting movement



DS42: B1137/Waltham Road		
	AM	PM
Max RFC	1.70	1.16

DS42: Waltham Road (left turn)		
	AM	PM
LOS	F	F
Max RFC	1.69	1.16
Veh delay (s)	1282.83	252.91
Avg Queue (PCU)	77.1	35.7

DS42: Waltham Road (right turn)		
	AM	PM
LOS	F	F
Max RFC	1.70	1.11
Veh delay (s)	1275.39	326.09
Avg Queue (PCU)	101.8	11.1

DS42: B1137 (East)		
	AM	PM
LOS	E	C
Max RFC	0.91	0.81
Veh delay (s)	45.52	24.05
Avg Queue (PCU)	11.8	5.4

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

2042 traffic flows on Waltham Road much higher than 2027. Large developments + CNEB reaching its capacity.

Junction 20a

Junction 20a

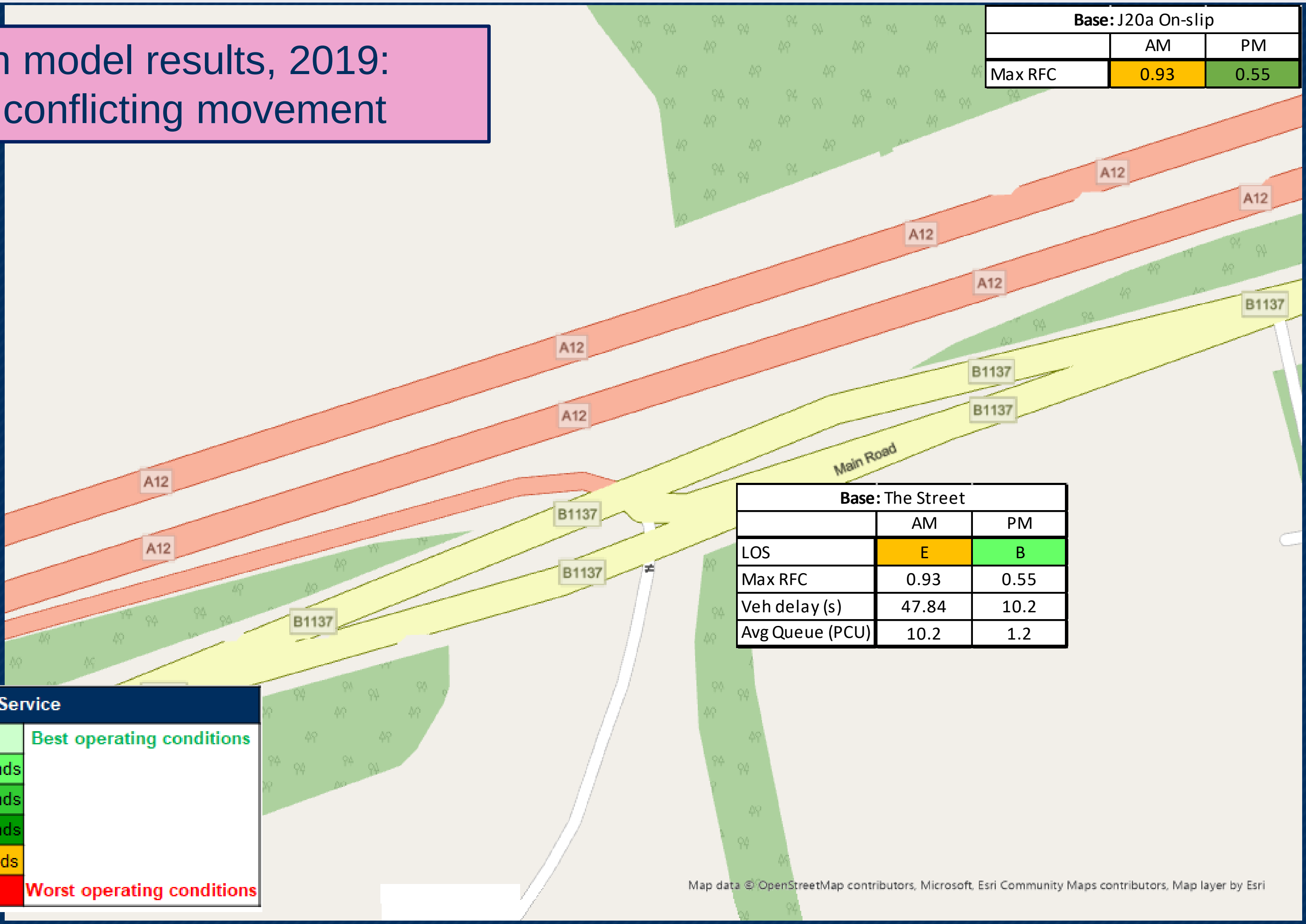
- *Junction model results for 2019, for two junctions along The Street (Hatfield Peverel).*

PICADY	Max RFC	
	2019 Base	
Junction	AM	PM
J20a On-slip	0.93	0.55
J20a Off-slip	0.49	0.90

Junction 20a

- *Junction model results for 2019, for:*
  - *A12 On-slip*

PICADY junction model results, 2019: performance by conflicting movement



Base: J20a On-slip		
	AM	PM
Max RFC	0.93	0.55

Base: The Street		
	AM	PM
LOS	E	B
Max RFC	0.93	0.55
Veh delay (s)	47.84	10.2
Avg Queue (PCU)	10.2	1.2

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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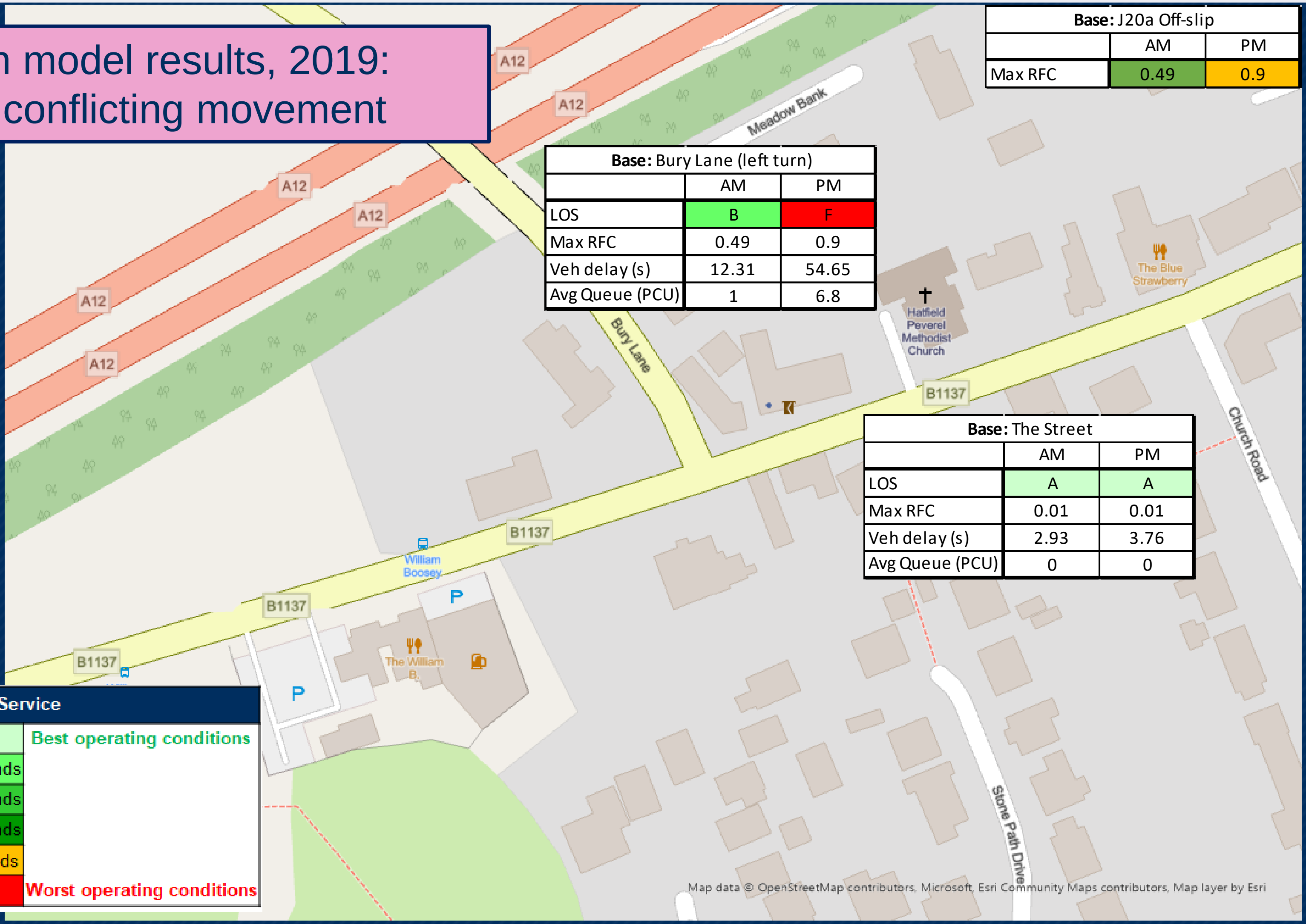
Junction 20a

- *Junction model results for 2019, for:*
  - *A12 Off-slip*

PICADY junction model results, 2019: performance by conflicting movement



Base: J20a Off-slip		
	AM	PM
Max RFC	0.49	0.9

Base: Bury Lane (left turn)		
	AM	PM
LOS	B	F
Max RFC	0.49	0.9
Veh delay (s)	12.31	54.65
Avg Queue (PCU)	1	6.8

Base: The Street		
	AM	PM
LOS	A	A
Max RFC	0.01	0.01
Veh delay (s)	2.93	3.76
Avg Queue (PCU)	0	0

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Junction 21
(Hatfield Peverel)

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Junction 21

Junction 21 (Hatfield Peverel)	**Data**	Modelled data for 2027 and 2042 (with and without DCO scheme), as follows: • Junction model results, in format set out in separate tables below for Maldon Road/The Street junction • Select link analysis of Maldon Road south of the Maldon Road/The Street junction, to be able to identify potential 'in-scope' trips for transfer to other modes

Junction 21 (Essex consultation response)

Traffic flow information for Church Road in Hatfield Peverel has not been provided, but there is a strong possibility that traffic from the B1019 Maldon Road could be using Church Road to access Main Road Boreham, rather than queue at the Duke of Wellington junction to access the new Junction 21.

This would add to the case for the B1019 Link Road, which would enable drivers from Maldon to access Junction 21 without having to get stuck in long delays at the Duke of Wellington junction. There is a reduction in traffic predicted on The Street, in-between Maldon Road and Church Road.

As commented above, this could be an indication of traffic diverting to Church Road, which would add to the case for the B1019 link road to Jn 21 this needs to be investigated further

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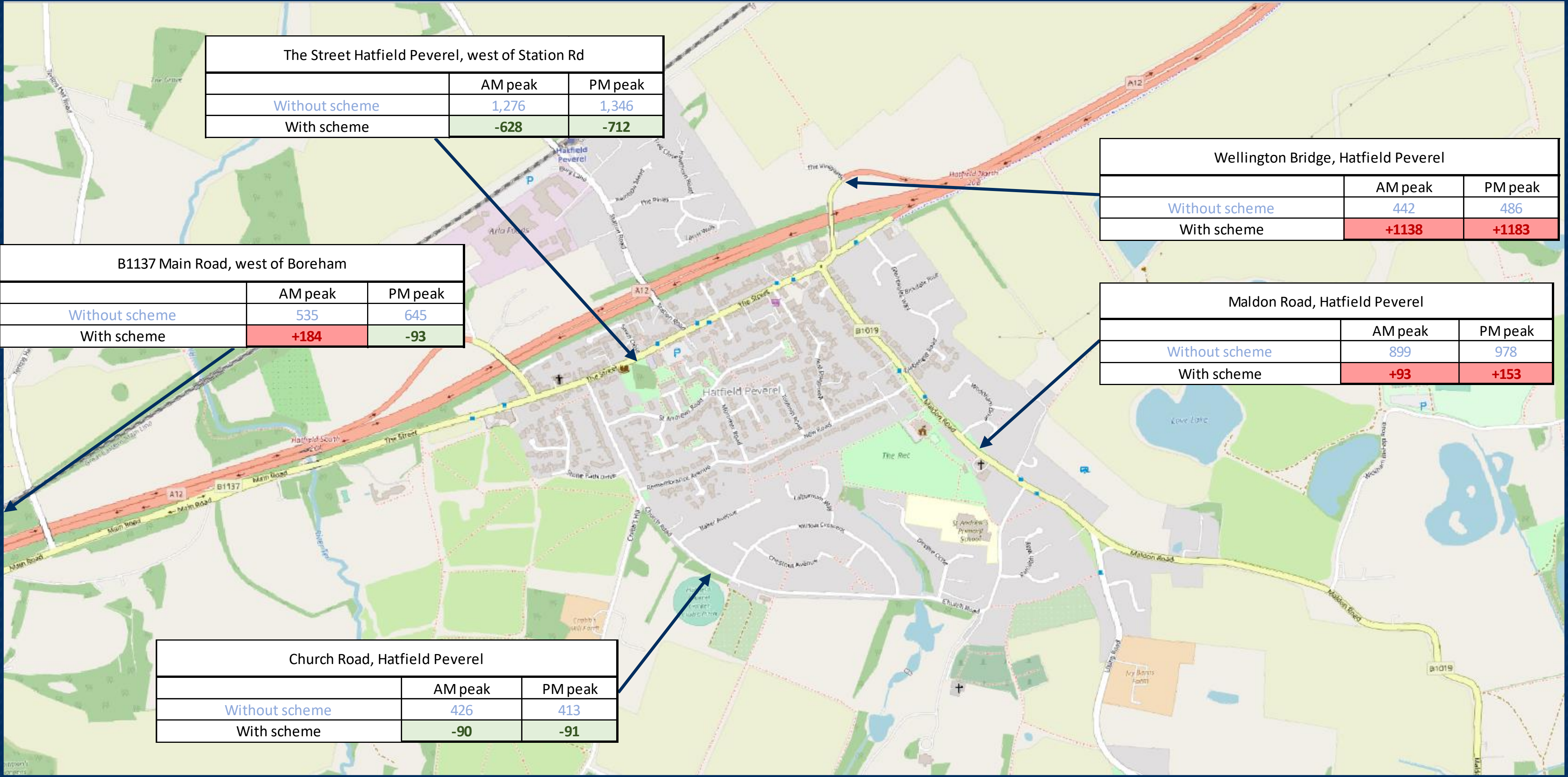
Junction 21 (Essex consultation response)

- The flow difference between the Do-Minimum (DM) and Do-Something (DS) scenario shows that there is decrease in traffic on Church Road in 2027, and a very slight increase in 2042 AM.

- Some traffic from Maldon direction is predicted to use Church Road in the Do Minimum instead of travelling via the Duke of Wellington junction, but this does not increase in Do Something. The majority of traffic goes via the Duke of Wellington junction in both scenarios. Flow difference and Select Link Analysis has been undertaken to demonstrate the findings.

2027 Traffic Flow Comparison



The Street Hatfield Peverel, west of Station Rd		
	AM peak	PM peak
Without scheme	1,276	1,346
With scheme	-628	-712

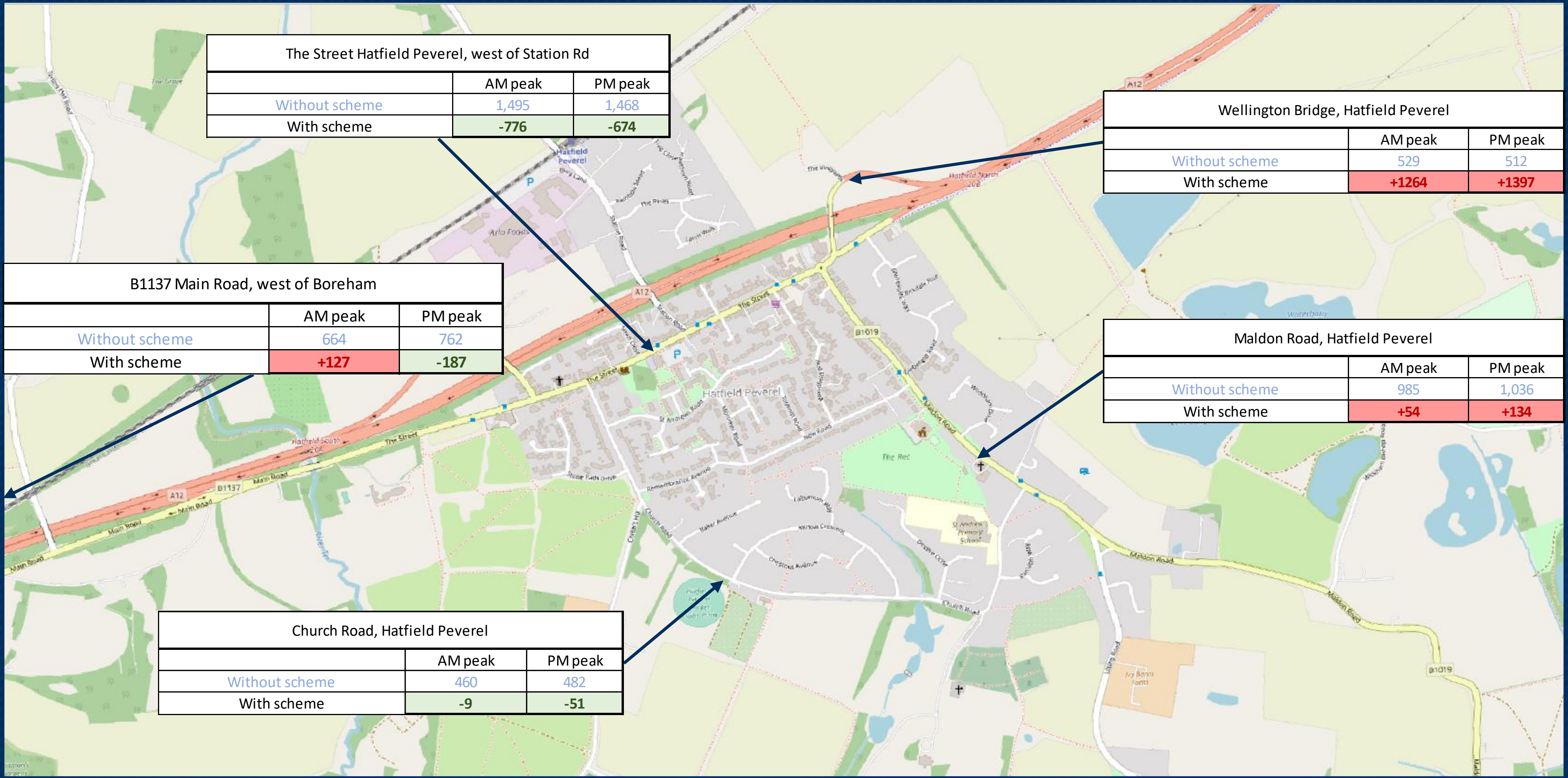
Wellington Bridge, Hatfield Peverel		
	AM peak	PM peak
Without scheme	442	486
With scheme	+1138	+1183

B1137 Main Road, west of Boreham		
	AM peak	PM peak
Without scheme	535	645
With scheme	+184	-93

Maldon Road, Hatfield Peverel		
	AM peak	PM peak
Without scheme	899	978
With scheme	+93	+153

Church Road, Hatfield Peverel		
	AM peak	PM peak
Without scheme	426	413
With scheme	-90	-91

2042 Traffic Flow Comparison



The Street Hatfield Peverel, west of Station Rd		
	AM peak	PM peak
Without scheme	1,495	1,468
With scheme	-776	-674

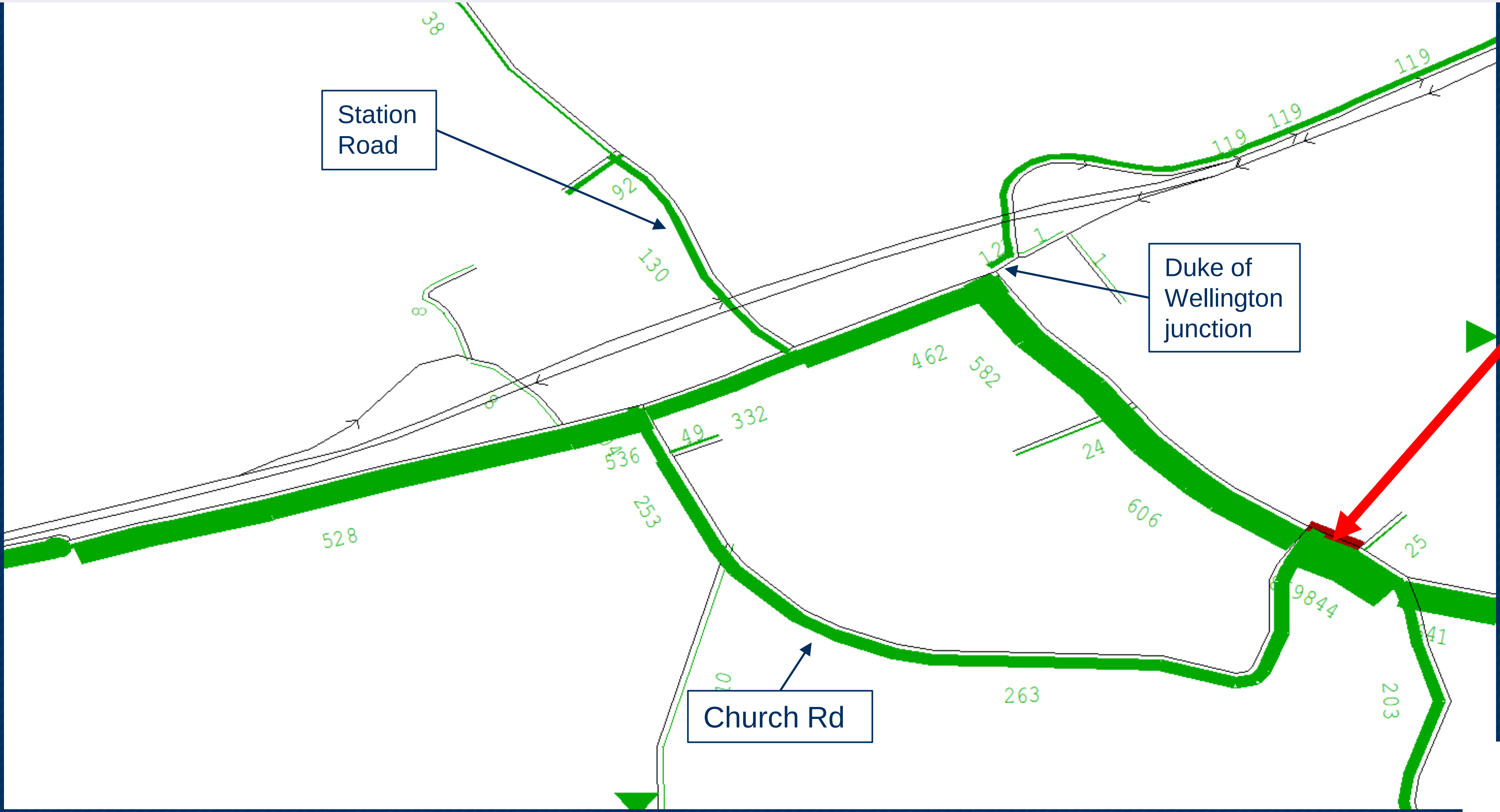
Wellington Bridge, Hatfield Peverel		
	AM peak	PM peak
Without scheme	529	512
With scheme	+1264	+1397

B1137 Main Road, west of Boreham		
	AM peak	PM peak
Without scheme	664	762
With scheme	+127	-187

Maldon Road, Hatfield Peverel		
	AM peak	PM peak
Without scheme	985	1,036
With scheme	+54	+134

Church Road, Hatfield Peverel		
	AM peak	PM peak
Without scheme	460	482
With scheme	-9	-51

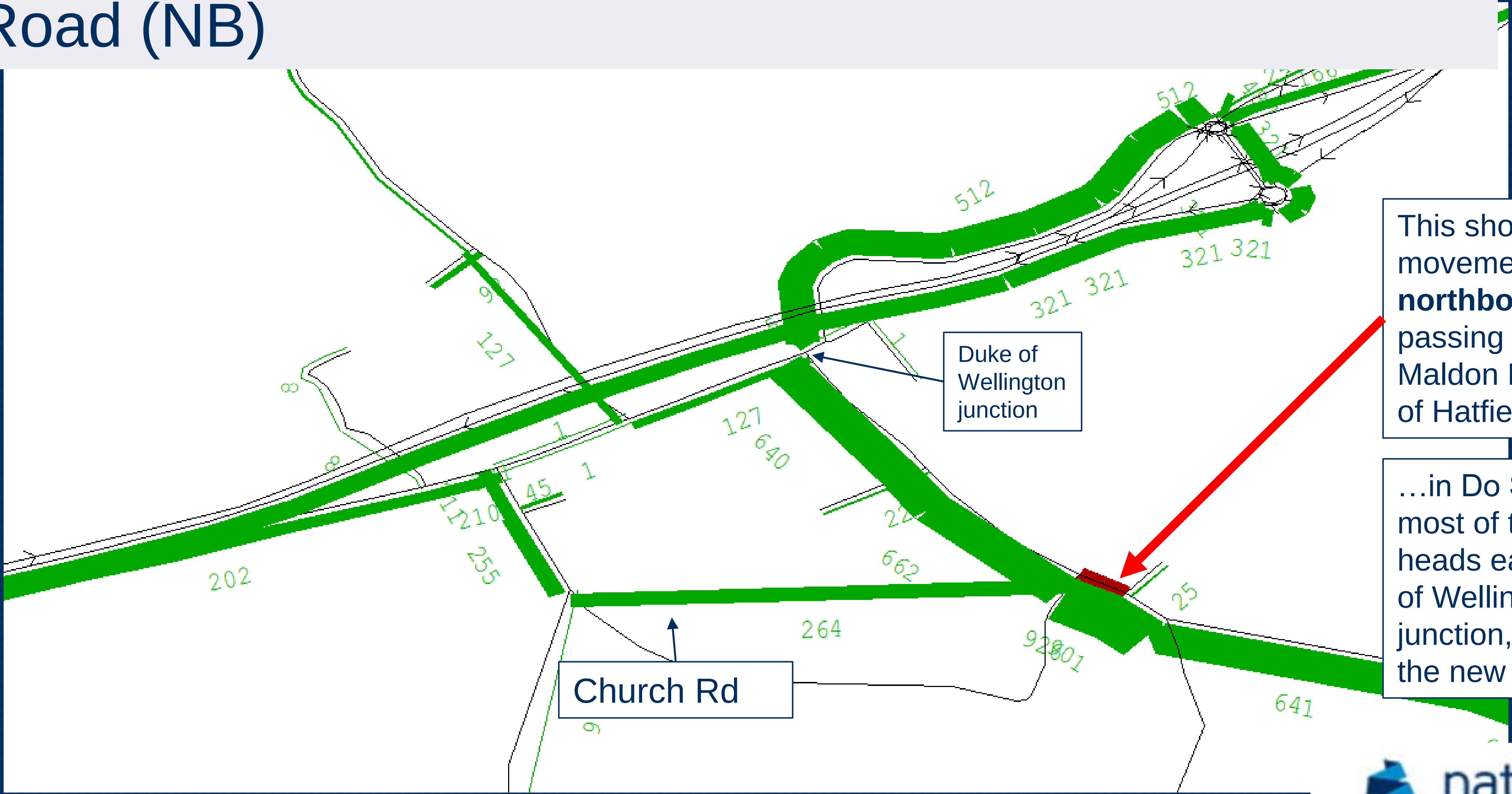
2042 AM Do Min Select Link Analysis – Maldon Road (NB)



This shows the movements of **northbound** traffic passing through Maldon Road south of Hatfield Peverel

…in Do Minimum most of the traffic heads west at Duke of Wellington junction.

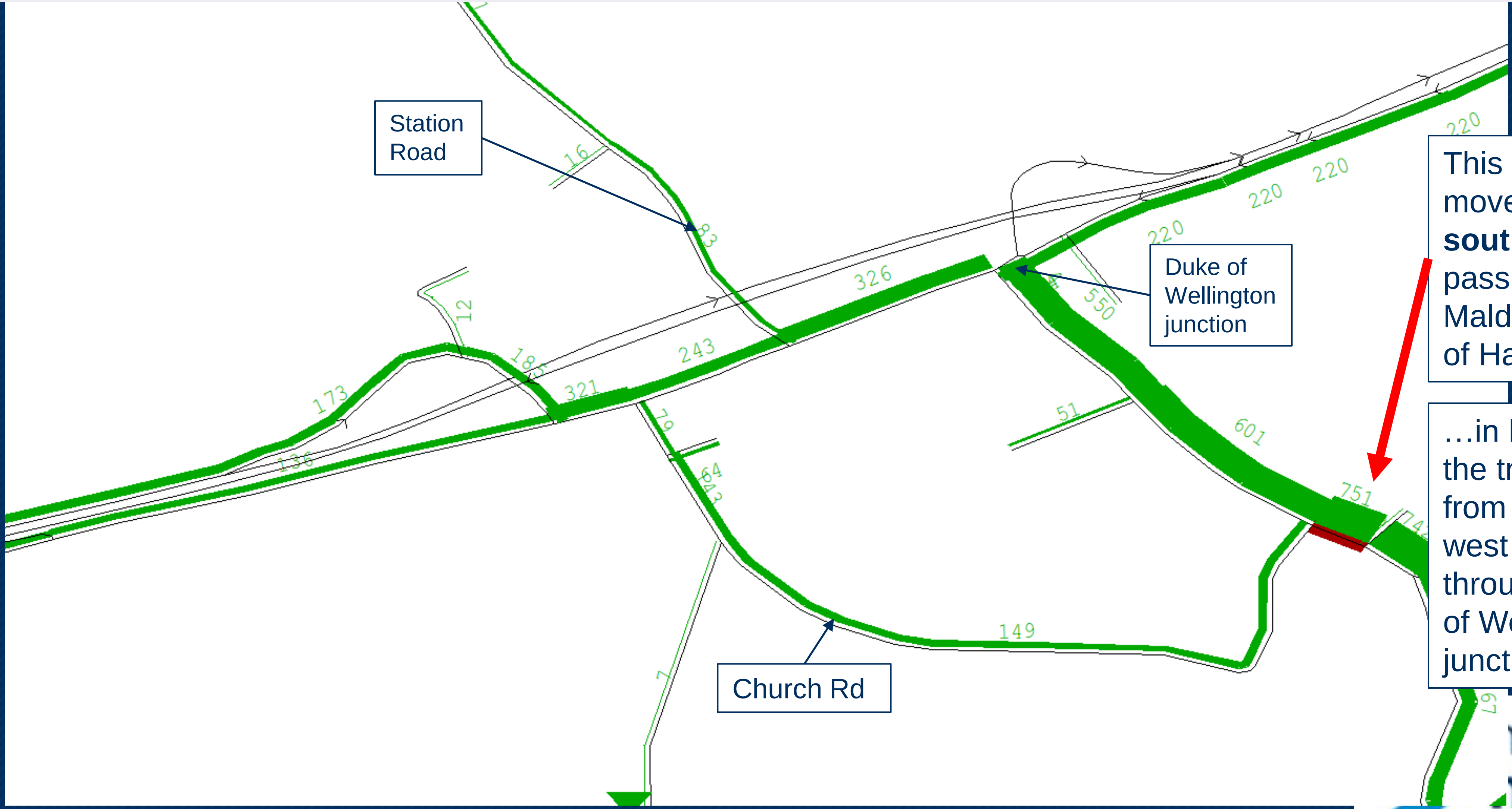
2042 AM Do Something Select Link Analysis – Maldon Road (NB)



This shows the movements of **northbound** traffic passing through Maldon Road south of Hatfield Peverel..

…in Do Something most of the traffic heads east at Duke of Wellington junction, towards the new junction 21

2042 AM Do Minimum Select Link Analysis – Maldon Road (SB)



This shows the movements of **southbound** traffic passing through Maldon Road south of Hatfield Peverel..

…in Do Minimum the traffic comes from both east and west of The Street through the Duke of Wellington junction.

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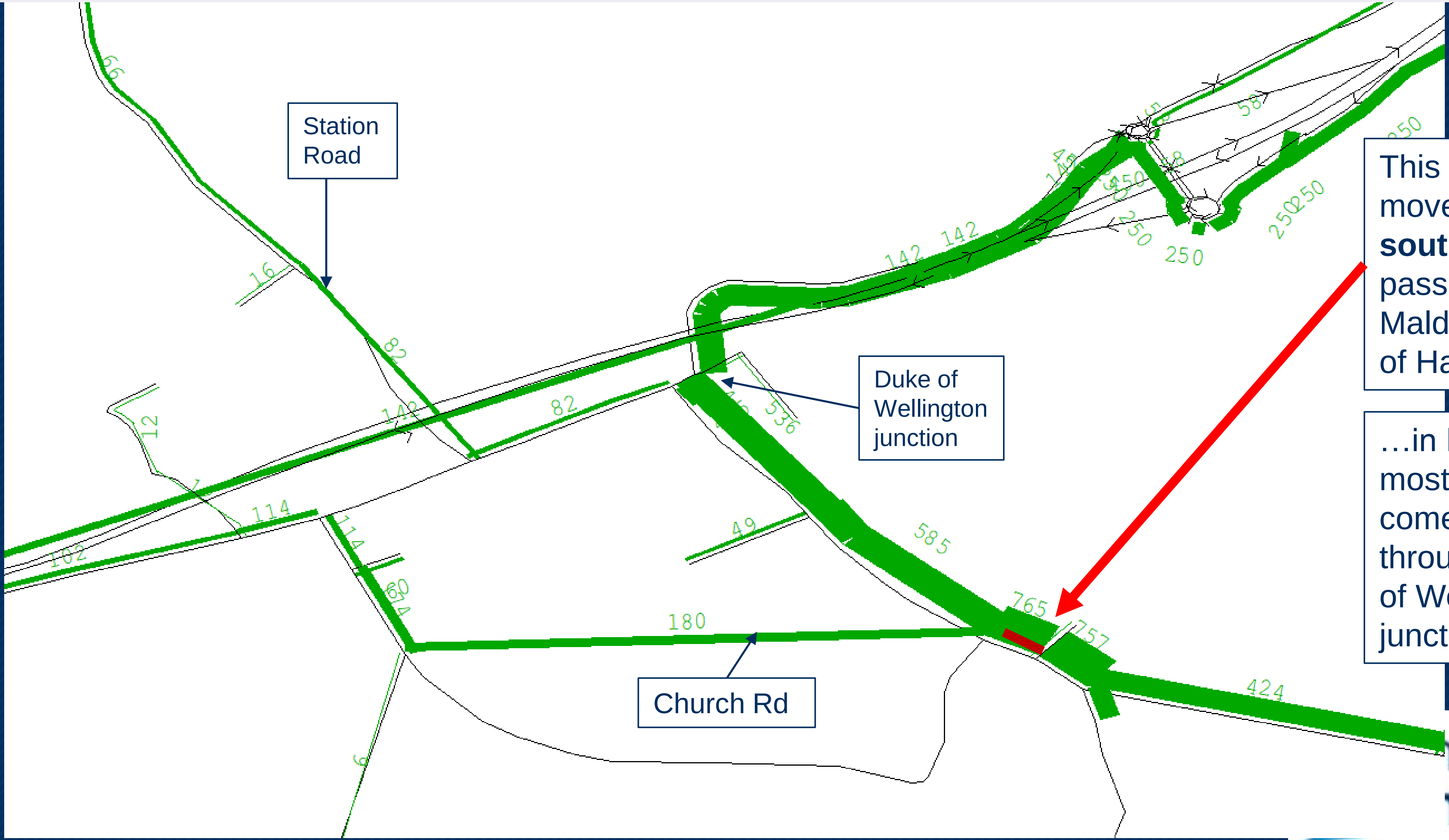
2042 AM Do Something Select Link Analysis – Maldon Road (SB)



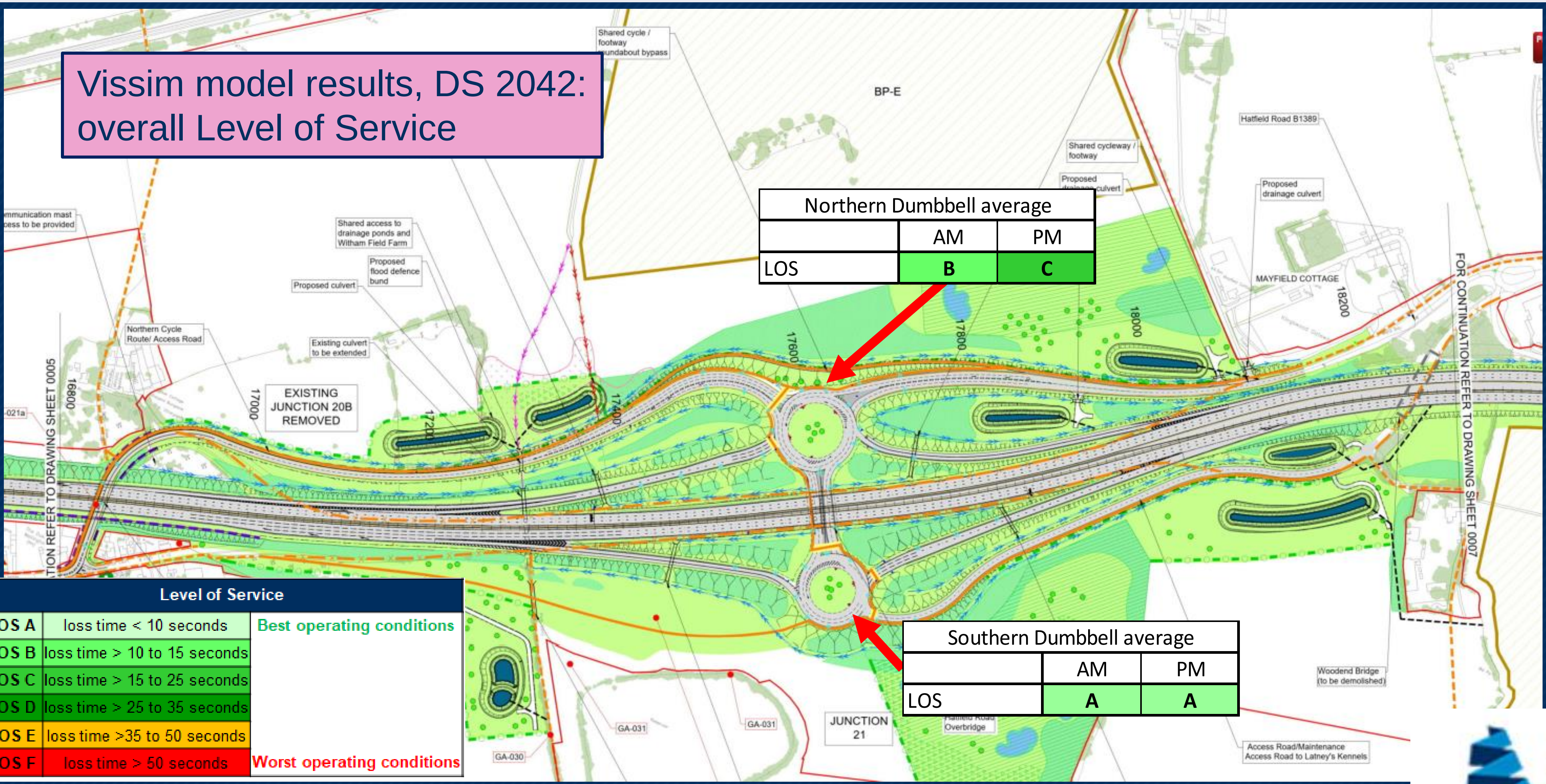
This shows the movements of **southbound** traffic passing through Maldon Road south of Hatfield Peverel..

…in Do Something most of the traffic comes from J21 through the Duke of Wellington junction.

Junction 21

- *New junction to serve traffic from Hatfield Peverel / Maldon & Witham*

Vissim model results, DS 2042: overall Level of Service



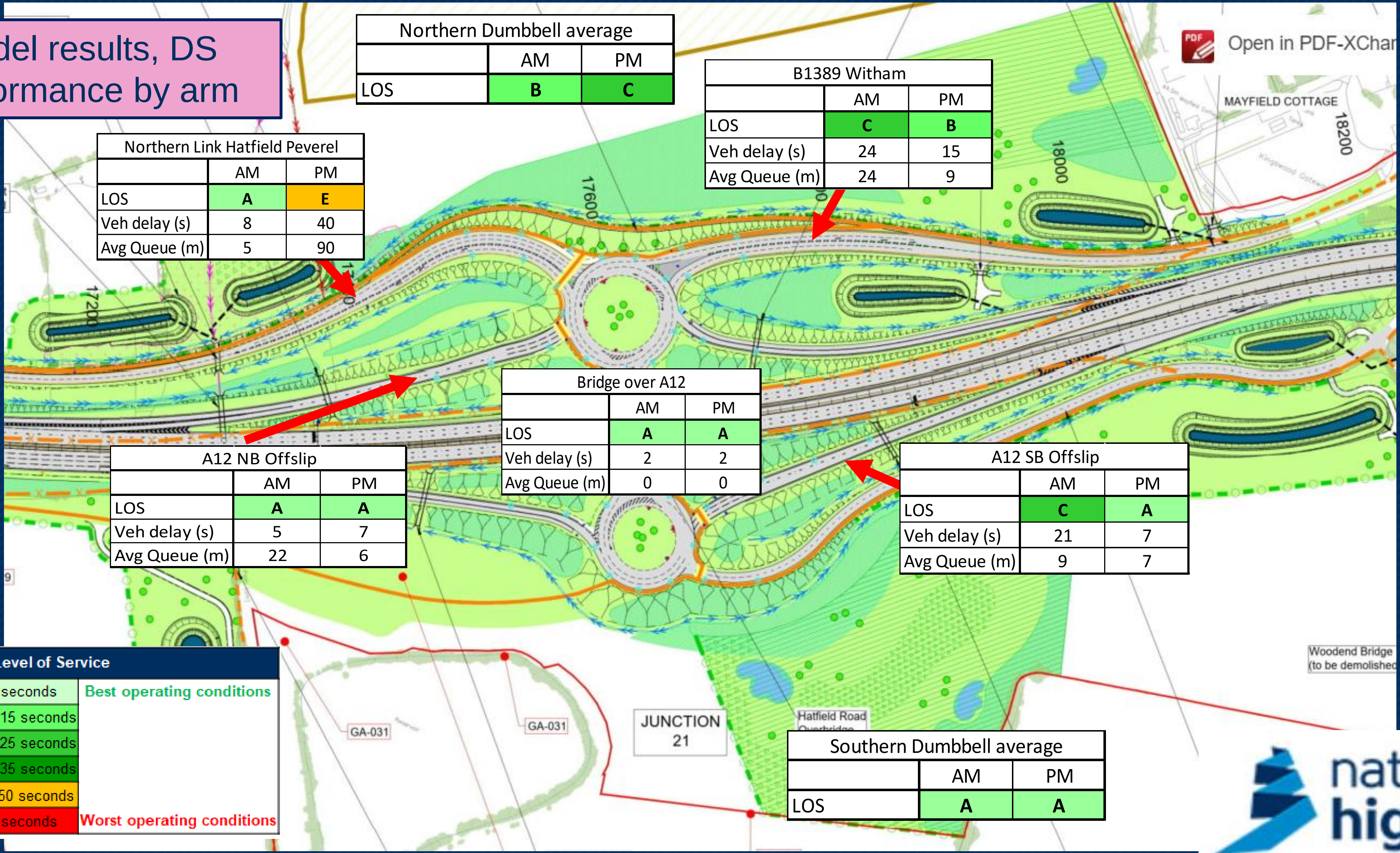
Northern Dumbbell average		
	AM	PM
LOS	B	C

Southern Dumbbell average		
	AM	PM
LOS	A	A

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Junction 21

Vissim model results, DS 2042: performance by arm



Northern Dumbbell average	AM	PM
LOS	B	C

Northern Link Hatfield Peverel	AM	PM
LOS	A	E
Veh delay (s)	8	40
Avg Queue (m)	5	90

B1389 Witham	AM	PM
LOS	C	B
Veh delay (s)	24	15
Avg Queue (m)	24	9

Bridge over A12	AM	PM
LOS	A	A
Veh delay (s)	2	2
Avg Queue (m)	0	0

A12 NB Offslip	AM	PM
LOS	A	A
Veh delay (s)	5	7
Avg Queue (m)	22	6

A12 SB Offslip	AM	PM
LOS	C	A
Veh delay (s)	21	7
Avg Queue (m)	9	7

Southern Dumbbell average	AM	PM
LOS	A	A

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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Junction 21

Vissim model results, DS 2042: average queue lengths

AM peak

PM peak

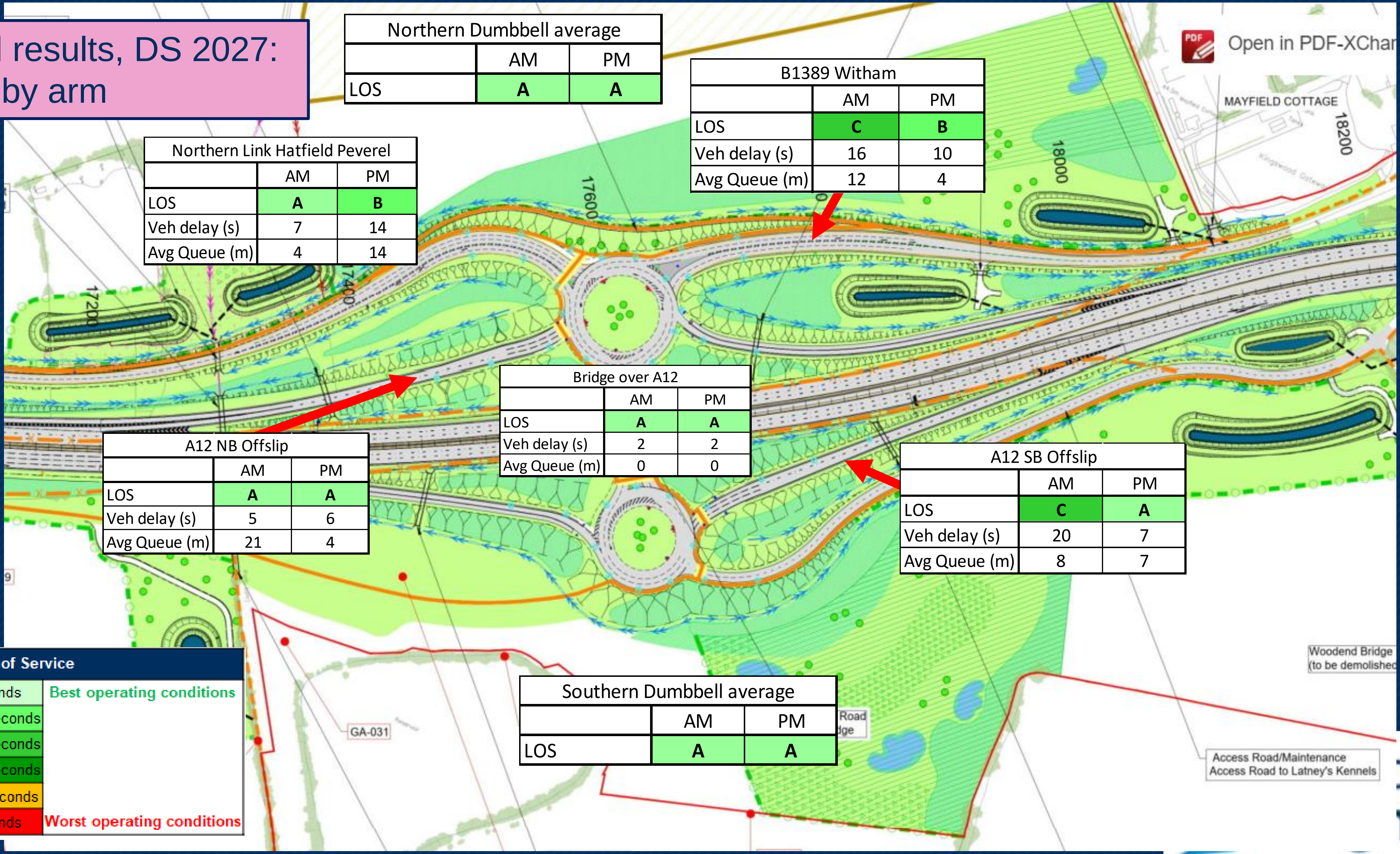
Junction 21

Vissim model results, DS 2042: full results table

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Northern Dumbbell	A12 NB Offslip	Unsignalised	A	702	5	2	22	A	1445	7	6	36
	Northern Link Hatfield Peverel	Unsignalised	A	1104	8	5	40	E	1004	40	90	161
	B1389 Witham	Unsignalised	C	1161	24	24	72	B	881	15	9	44
	Bridge over A12	Unsignalised	A	458	2	0	14	A	425	2	0	9
	Total	**Unsignalised**	**B**	**3425**	**12**			**C**	**3754**	**17**		
Southern Dumbbell	A12 SB Offslip	Unsignalised	C	457	21	9	35	A	426	7	2	19
	Bridge over A12	Unsignalised	A	1228	4	0	4	A	785	2	0	2
	Total	**Unsignalised**	**A**	**1685**	**8**			**A**	**1211**	**4**		

Junction 21

Vissim model results, DS 2027: performance by arm



Northern Dumbbell average		
	AM	PM
LOS	A	A

B1389 Witham		
	AM	PM
LOS	C	B
Veh delay (s)	16	10
Avg Queue (m)	12	4

Northern Link Hatfield Peverel		
	AM	PM
LOS	A	B
Veh delay (s)	7	14
Avg Queue (m)	4	14

Bridge over A12		
	AM	PM
LOS	A	A
Veh delay (s)	2	2
Avg Queue (m)	0	0

A12 NB Offslip		
	AM	PM
LOS	A	A
Veh delay (s)	5	6
Avg Queue (m)	21	4

A12 SB Offslip		
	AM	PM
LOS	C	A
Veh delay (s)	20	7
Avg Queue (m)	8	7

Southern Dumbbell average		
	AM	PM
LOS	A	A

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

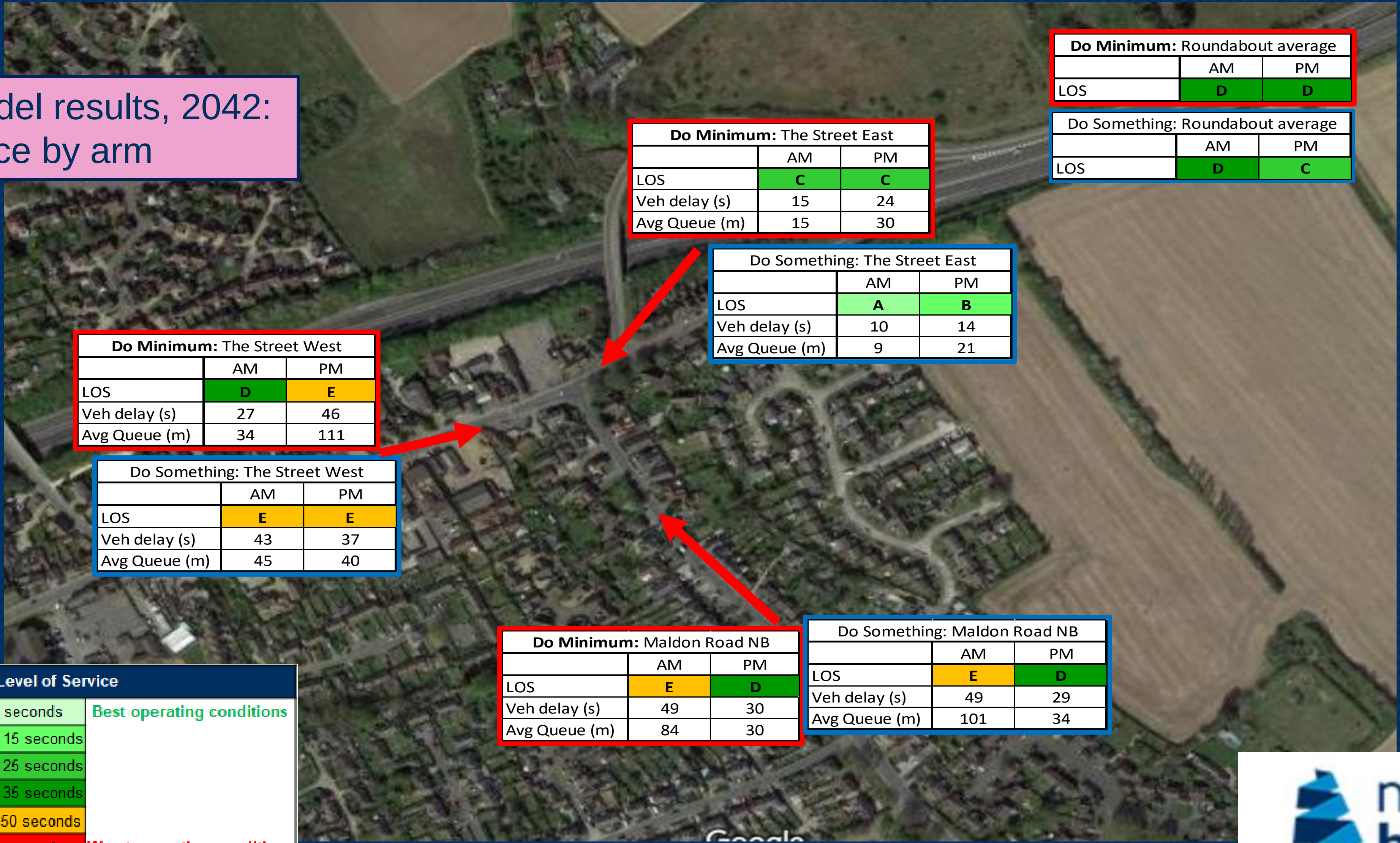
Junction 21

Vissim model results, DS 2027: full results table

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Northern Dumbbell	A12 NB Offslip	Unsignalised	A	680	5	2	21	A	1434	6	4	34
	Northern Link Hatfield Peverel	Unsignalised	A	975	7	4	33	B	842	14	14	59
	B1389 Witham	Unsignalised	C	1052	16	12	54	B	769	10	4	34
	Bridge over A12	Unsignalised	A	411	2	0	12	A	340	2	0	7
	Total	**Unsignalised**	**A**	**3118**	**9**			**A**	**3385**	**8**		
Southern Dumbbell	A12 SB Offslip	Unsignalised	C	413	20	8	33	A	340	7	1	16
	Bridge over A12	Unsignalised	A	1214	4	0	6	A	734	2	0	2
	Total	**Unsignalised**	**A**	**1626**	**8**			**A**	**1074**	**4**		

Maldon Road / The Street

Vissim model results, 2042: performance by arm



Do Minimum: Roundabout average	AM	PM
LOS	D	D

Do Something: Roundabout average	AM	PM
LOS	D	C

Do Minimum: The Street East	AM	PM
LOS	C	C
Veh delay (s)	15	24
Avg Queue (m)	15	30

Do Something: The Street East	AM	PM
LOS	A	B
Veh delay (s)	10	14
Avg Queue (m)	9	21

Do Minimum: The Street West	AM	PM
LOS	D	E
Veh delay (s)	27	46
Avg Queue (m)	34	111

Do Something: The Street West	AM	PM
LOS	E	E
Veh delay (s)	43	37
Avg Queue (m)	45	40

Do Minimum: Maldon Road NB	AM	PM
LOS	E	D
Veh delay (s)	49	30
Avg Queue (m)	84	30

Do Something: Maldon Road NB	AM	PM
LOS	E	D
Veh delay (s)	49	29
Avg Queue (m)	101	34

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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Maldon Road / The Street

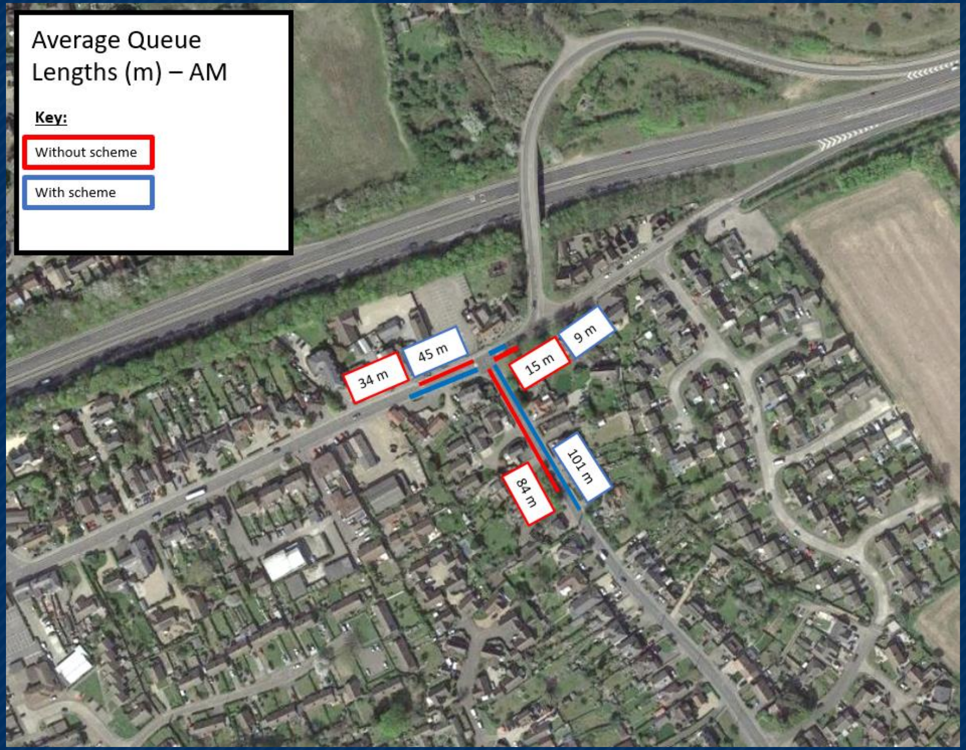
Vissim model results, 2042: full results

Junction	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Do minimum	Maldon Road NB	Unsignalised	E	749	49	84	184	D	634	30	30	106
	The Street West EB (Hat Pev)	Unsignalised	D	794	27	34	140	E	885	46	111	254
	The Street East WB (J21)	Unsignalised	C	631	15	15	79	C	600	24	30	96
	Total	**Unsignalised**	**D**	**2173**	**31**			**D**	**2118**	**35**		
Do something	Maldon Road NB	Unsignalised	E	832	49	101	215	D	736	29	34	124
	The Street West EB (Hat Pev)	Unsignalised	E	512	43	45	112	E	565	37	40	115
	The Street East WB (J21)	Unsignalised	A	803	10	9	69	B	981	14	21	113
	Total	**Unsignalised**	**D**	**2147**	**33**			**C**	**2282**	**25**		

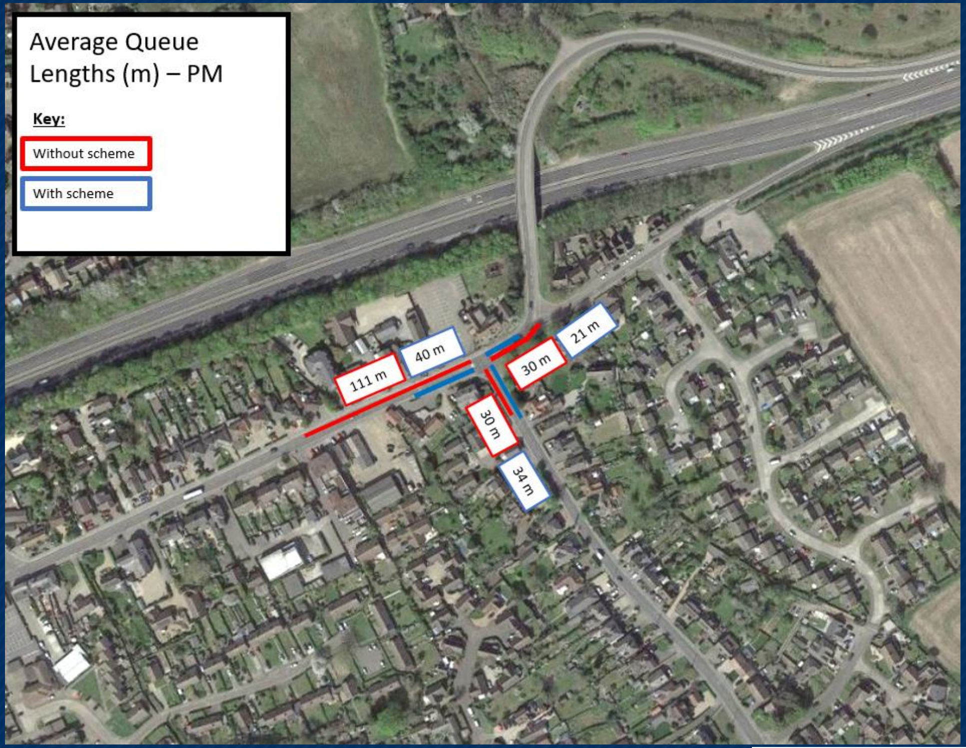
Maldon Road / The Street [updated slide]

Vissim model results, 2042:
average queue lengths

AM peak

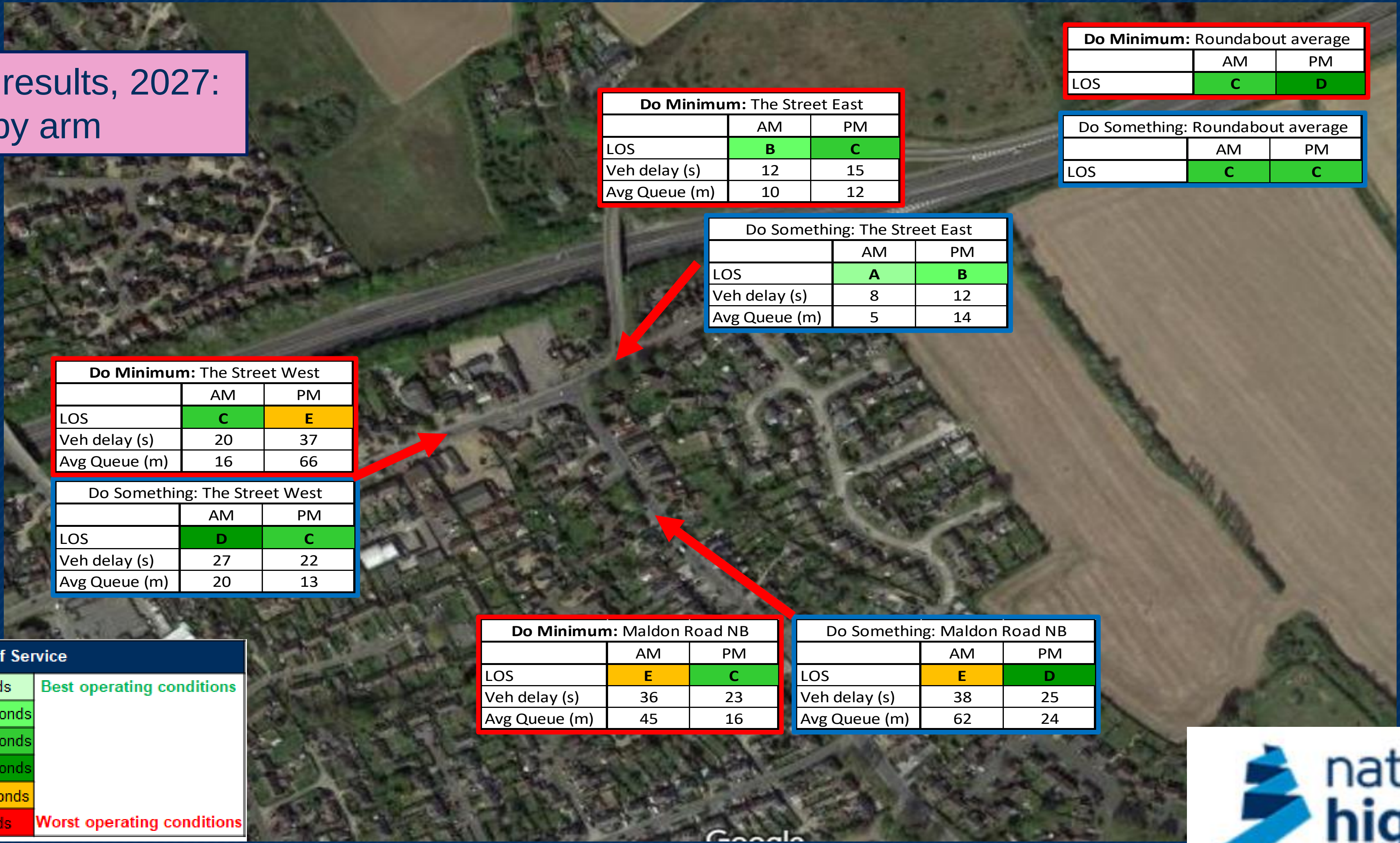


PM peak



Maldon Road / The Street

Vissim model results, 2027: performance by arm



Do Minimum: Roundabout average		
	AM	PM
LOS	C	D

Do Something: Roundabout average		
	AM	PM
LOS	C	C

Do Minimum: The Street East		
	AM	PM
LOS	B	C
Veh delay (s)	12	15
Avg Queue (m)	10	12

Do Something: The Street East		
	AM	PM
LOS	A	B
Veh delay (s)	8	12
Avg Queue (m)	5	14

Do Minimum: The Street West		
	AM	PM
LOS	C	E
Veh delay (s)	20	37
Avg Queue (m)	16	66

Do Something: The Street West		
	AM	PM
LOS	D	C
Veh delay (s)	27	22
Avg Queue (m)	20	13

Do Minimum: Maldon Road NB		
	AM	PM
LOS	E	C
Veh delay (s)	36	23
Avg Queue (m)	45	16

Do Something: Maldon Road NB		
	AM	PM
LOS	E	D
Veh delay (s)	38	25
Avg Queue (m)	62	24

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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Maldon Road / The Street

Vissim model results, 2027:
full results

Scenario	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Do minimum	Maldon Road NB	Unsignalised	E	686	36	45	134	C	589	23	16	86
	The Street West EB (Hat Pev)	Unsignalised	C	667	20	16	100	E	851	37	66	195
	The Street East WB (J21)	Unsignalised	B	606	12	10	67	C	512	15	12	60
	Total	**Unsignalised**	**C**	**1959**	**23**			**D**	**1951**	**27**		
Do something	Maldon Road NB	Unsignalised	E	804	38	62	169	D	699	25	24	109
	The Street West EB (Hat Pev)	Unsignalised	D	441	27	20	77	C	424	22	13	66
	The Street East WB (J21)	Unsignalised	A	701	8	5	52	B	905	12	14	88
	Total	**Unsignalised**	**C**	**1945**	**25**			**C**	**2028**	**18**		

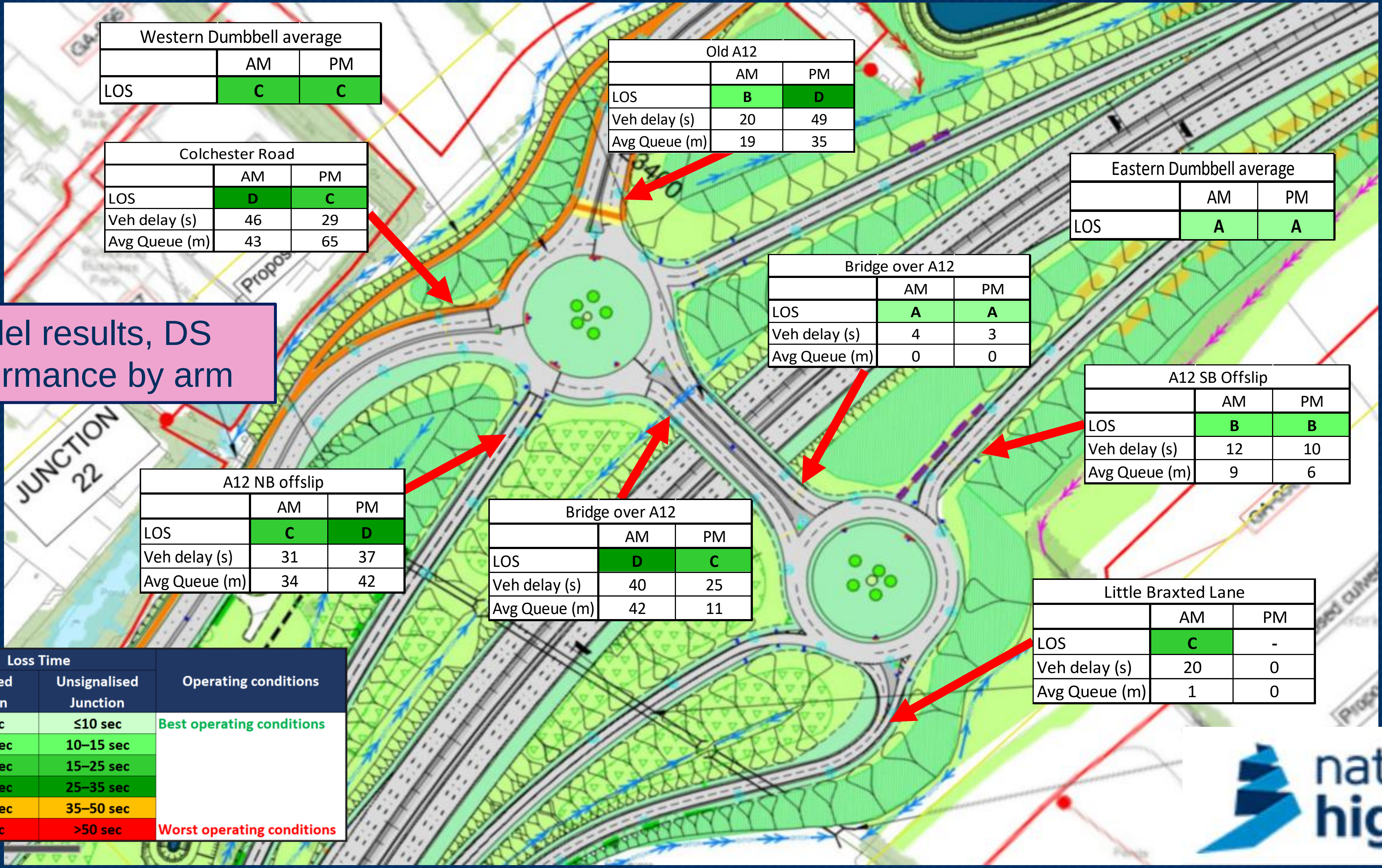
Junction 22 (Witham)

Junction 22

Junction 22 (Witham)	**Data**	Modelled data for 2042 (with DCO scheme), as follows: • Junction model results, in format set out in separate tables below, for Colemans Junction • Hourly traffic flows (and HGV %age) on Little Braxted Lane – if available • Select link Origin-Destination data on Little Braxted Lane – if available

Junction 22

Vissim model results, DS 2042: performance by arm



Western Dumbbell average		
	AM	PM
LOS	C	C

Old A12		
	AM	PM
LOS	B	D
Veh delay (s)	20	49
Avg Queue (m)	19	35

Colchester Road		
	AM	PM
LOS	D	C
Veh delay (s)	46	29
Avg Queue (m)	43	65

Eastern Dumbbell average		
	AM	PM
LOS	A	A

Bridge over A12		
	AM	PM
LOS	A	A
Veh delay (s)	4	3
Avg Queue (m)	0	0

A12 SB Offslip		
	AM	PM
LOS	B	B
Veh delay (s)	12	10
Avg Queue (m)	9	6

A12 NB offslip		
	AM	PM
LOS	C	D
Veh delay (s)	31	37
Avg Queue (m)	34	42

Bridge over A12		
	AM	PM
LOS	D	C
Veh delay (s)	40	25
Avg Queue (m)	42	11

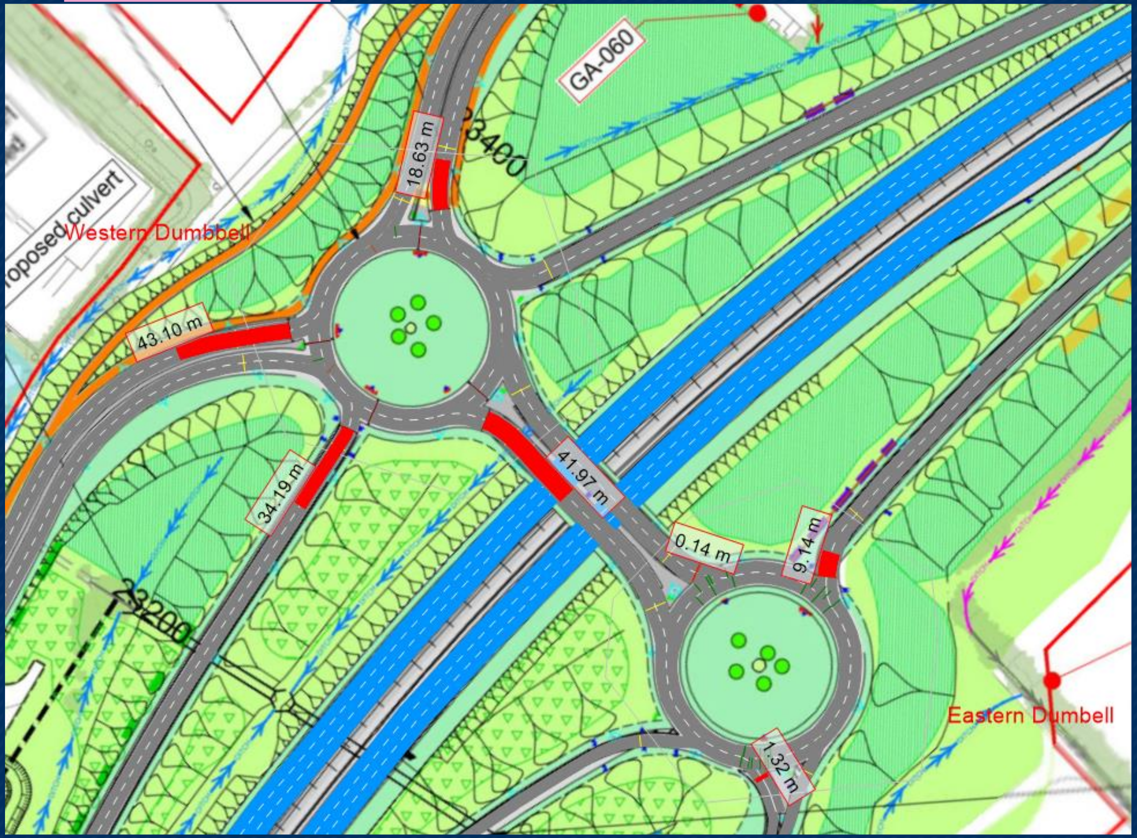
Little Braxted Lane		
	AM	PM
LOS	C	-
Veh delay (s)	20	0
Avg Queue (m)	1	0

Level of Service	Loss Time: Signalised Junction	Loss Time: Unsignalised Junction	Operating conditions
LOS A	≤10 sec	≤10 sec	Best operating conditions
LOS B	10–20 sec	10–15 sec	
LOS C	20–35 sec	15–25 sec	
LOS D	35–55 sec	25–35 sec	
LOS E	55–80 sec	35–50 sec	
LOS F	>80 sec	>50 sec	Worst operating conditions

Junction 22

Vissim model results, DS 2042: average queue lengths

AM peak



PM peak

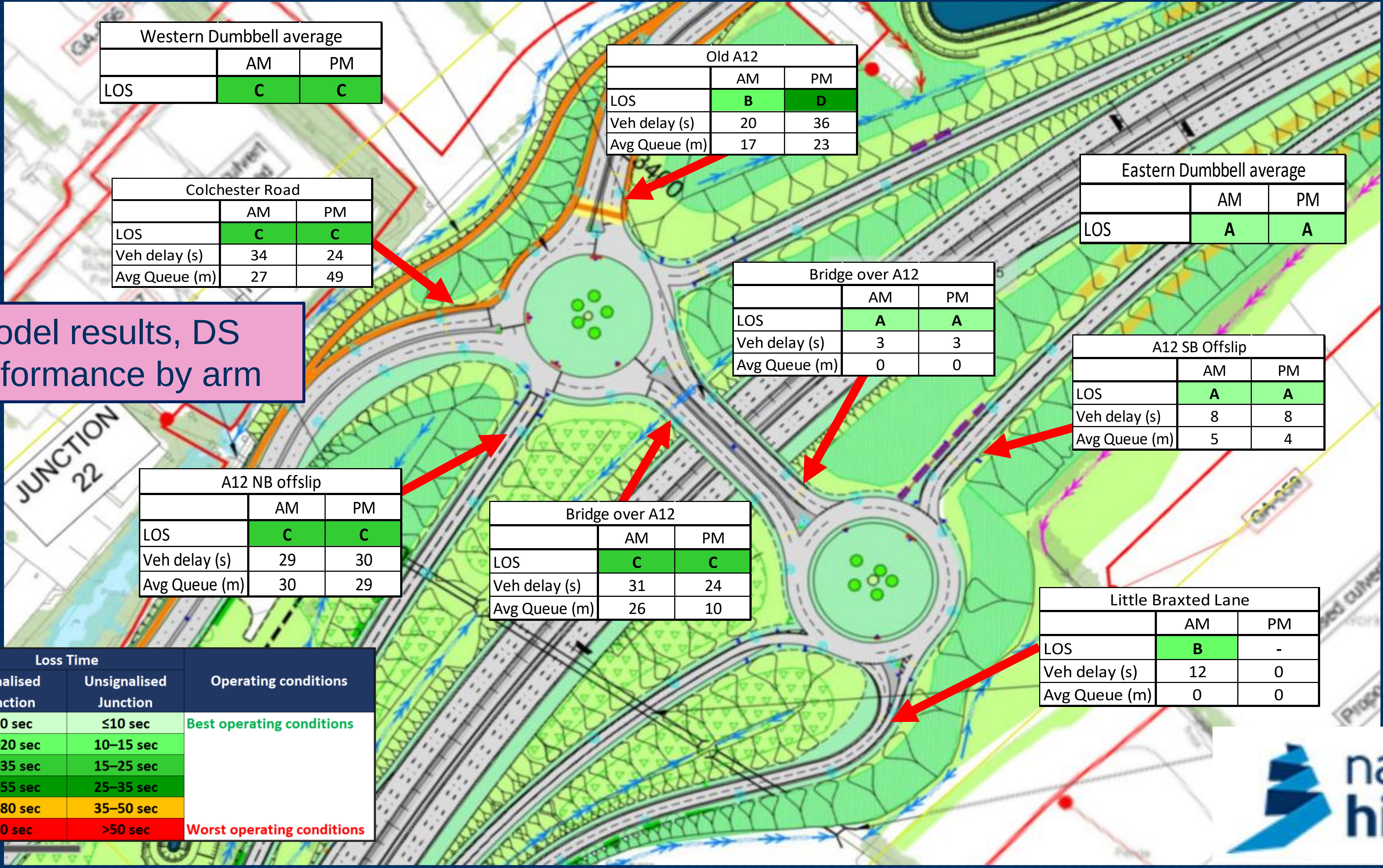
Junction 22

Vissim model results, DS 2042: full results

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Eastern Dumbbell	A12 SB Offslip	Priority	B	903	12	9	44	B	611	10	6	34
	Little Braxted Lane	Priority	C	59	20	1	12	No traffic in Saturn PM model				
	Bridge over A12	Priority	A	837	4	0	8	A	947	3	0	5
	Total	**Priority**	**A**	**1799**	**9**			**A**	**1557**	**6**		
Western Dumbbell	Bridge over A12	Signalised	D	958	40	42	92	C	505	25	11	45
	A12 NB offslip	Signalised	C	858	31	34	91	D	1099	37	42	98
	Colchester Road	Signalised	D	866	46	43	99	C	1849	29	65	168
	Old A12	Signalised	B	1050	20	19	71	D	664	49	35	73
	Total	**Signalised**	**C**	**3731**	**34**			**C**	**4118**	**34**		

Junction 22

Vissim model results, DS 2027: performance by arm



Western Dumbbell average		
	AM	PM
LOS	C	C

Old A12		
	AM	PM
LOS	B	D
Veh delay (s)	20	36
Avg Queue (m)	17	23

Colchester Road		
	AM	PM
LOS	C	C
Veh delay (s)	34	24
Avg Queue (m)	27	49

Eastern Dumbbell average		
	AM	PM
LOS	A	A

Bridge over A12		
	AM	PM
LOS	A	A
Veh delay (s)	3	3
Avg Queue (m)	0	0

A12 SB Offslip		
	AM	PM
LOS	A	A
Veh delay (s)	8	8
Avg Queue (m)	5	4

A12 NB offslip		
	AM	PM
LOS	C	C
Veh delay (s)	29	30
Avg Queue (m)	30	29

Bridge over A12		
	AM	PM
LOS	C	C
Veh delay (s)	31	24
Avg Queue (m)	26	10

Little Braxted Lane		
	AM	PM
LOS	B	-
Veh delay (s)	12	0
Avg Queue (m)	0	0

Level of Service	Loss Time		Operating conditions
	Signalised Junction	Unsignalised Junction	
LOS A	≤10 sec	≤10 sec	Best operating conditions
LOS B	10–20 sec	10–15 sec	
LOS C	20–35 sec	15–25 sec	
LOS D	35–55 sec	25–35 sec	
LOS E	55–80 sec	35–50 sec	
LOS F	>80 sec	>50 sec	Worst operating conditions

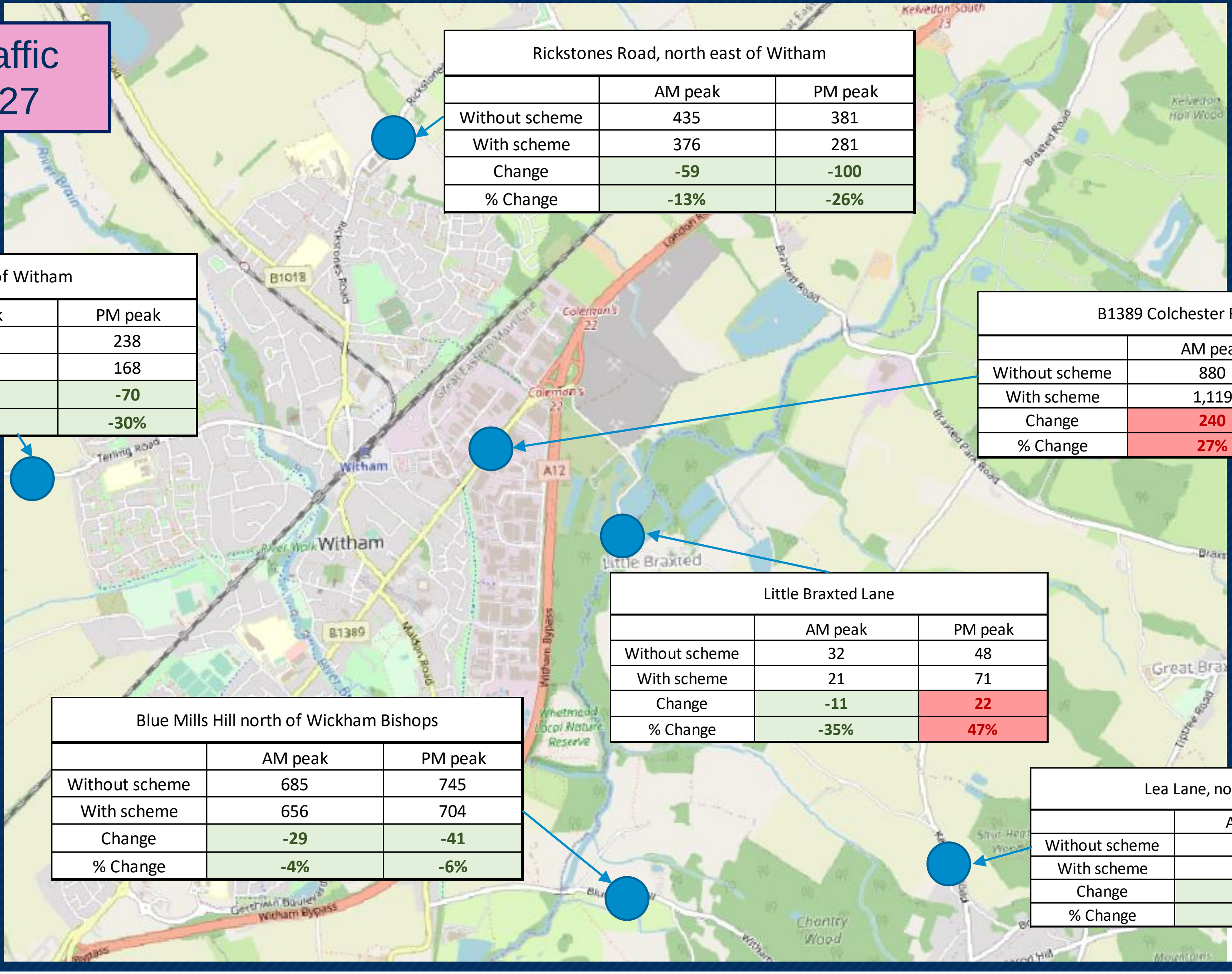
Junction 22

Vissim model results, DS 2027: full results

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Eastern Dumbbell	A12 SB Offslip	Priority	A	788	8	5	34	A	536	8	4	27
	Little Braxted Lane	Priority	B	17	12	0	5	No traffic in Saturn PM model				
	Bridge over A12	Priority	A	729	3	0	4	A	868	3	0	3
	Total	**Priority**	**A**	**1534**	**6**			**A**	**1404**	**5**		
Western Dumbbell	Bridge over A12	Signalised	C	804	31	26	69	C	449	24	10	39
	A12 NB offslip	Signalised	C	816	29	30	85	C	1002	30	29	80
	Colchester Road	Signalised	C	754	34	27	79	C	1770	24	49	144
	Old A12	Signalised	B	997	20	17	67	D	601	36	23	58
	Total	**Signalised**	**C**	**3371**	**28**			**C**	**3821**	**27**		

Junction 22 – local road flow changes

Local road traffic changes - 2027



Rickstones Road, north east of Witham		
	AM peak	PM peak
Without scheme	435	381
With scheme	376	281
Change	-59	-100
% Change	-13%	-26%

Terling Road, west of Witham		
	AM peak	PM peak
DM	195	238
DS	182	168
Change	-12	-70
% Change	-6%	-30%

B1389 Colchester Rd, Witham		
	AM peak	PM peak
Without scheme	880	831
With scheme	1,119	1,086
Change	240	254
% Change	27%	31%

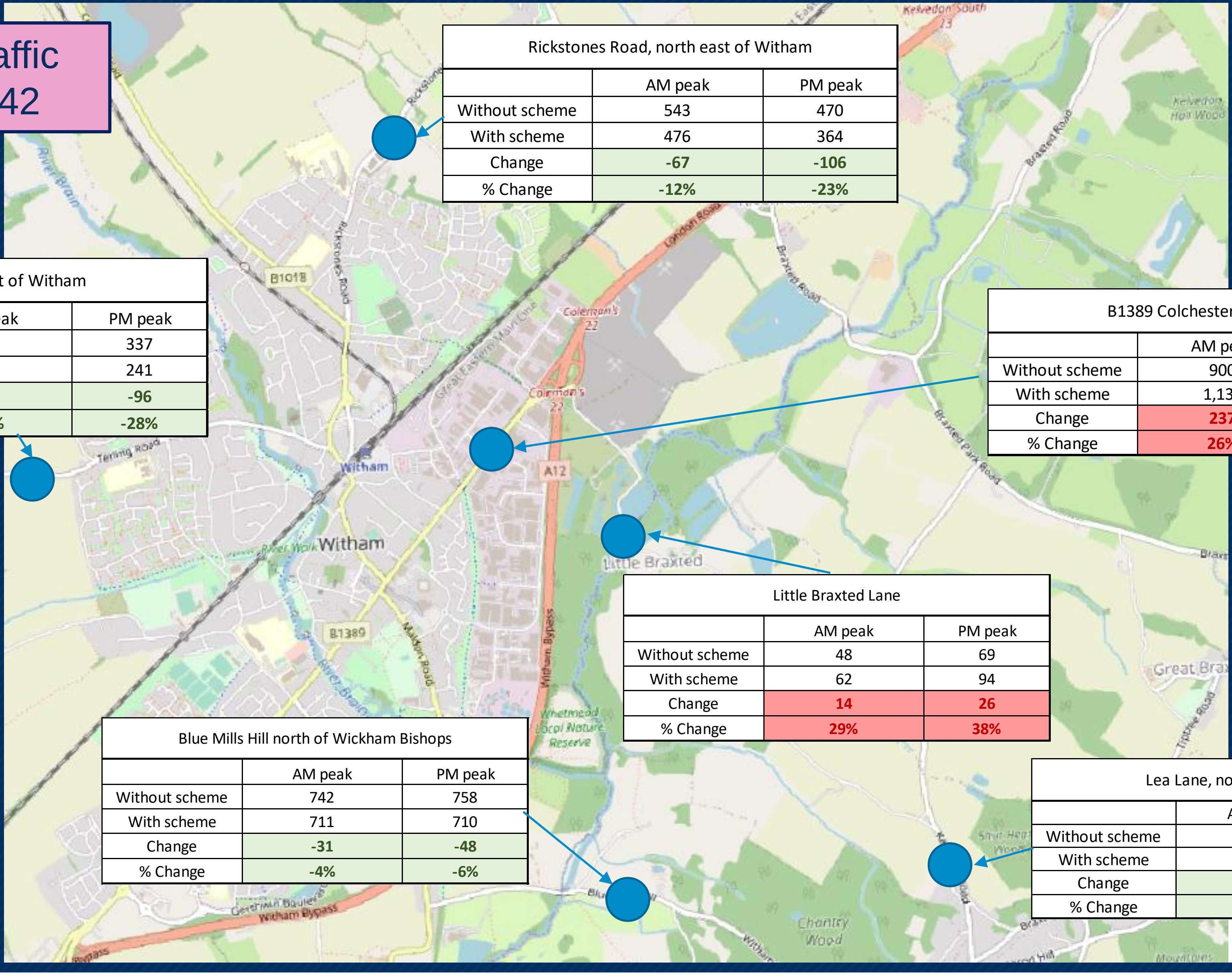
Little Braxted Lane		
	AM peak	PM peak
Without scheme	32	48
With scheme	21	71
Change	-11	22
% Change	-35%	47%

Blue Mills Hill north of Wickham Bishops		
	AM peak	PM peak
Without scheme	685	745
With scheme	656	704
Change	-29	-41
% Change	-4%	-6%

Lea Lane, north of Beacon Hill		
	AM peak	PM peak
Without scheme	380	470
With scheme	338	407
Change	-42	-62
% Change	-11%	-13%

Junction 22 – local road flow changes

Local road traffic changes - 2042



Rickstones Road, north east of Witham		
	AM peak	PM peak
Without scheme	543	470
With scheme	476	364
Change	-67	-106
% Change	-12%	-23%

Terling Road, west of Witham		
	AM peak	PM peak
Without scheme	317	337
With scheme	249	241
Change	-68	-96
% Change	-21%	-28%

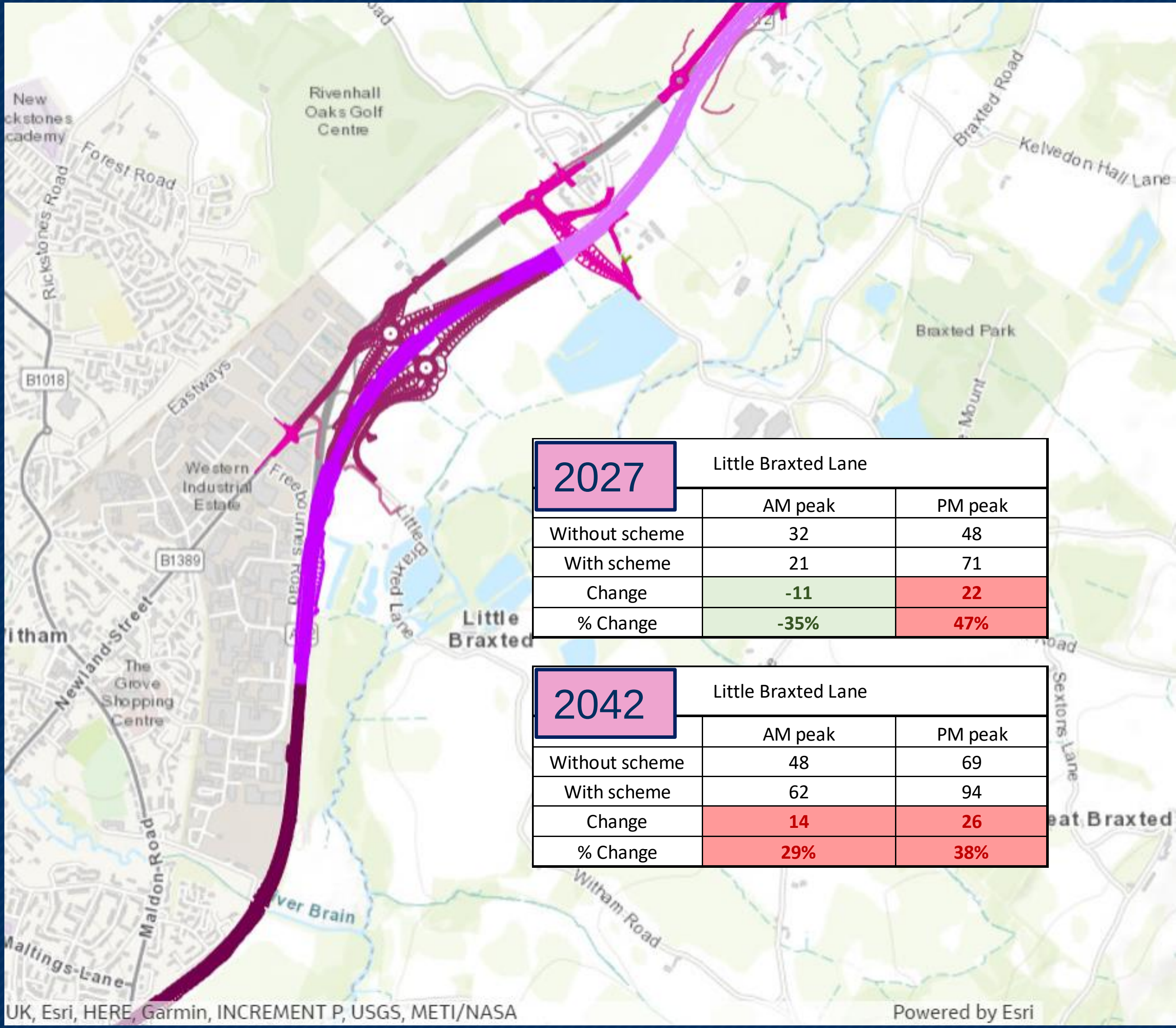
B1389 Colchester Rd, Witham		
	AM peak	PM peak
Without scheme	900	849
With scheme	1,137	1,123
Change	237	274
% Change	26%	32%

Little Braxted Lane		
	AM peak	PM peak
Without scheme	48	69
With scheme	62	94
Change	14	26
% Change	29%	38%

Blue Mills Hill north of Wickham Bishops		
	AM peak	PM peak
Without scheme	742	758
With scheme	711	710
Change	-31	-48
% Change	-4%	-6%

Lea Lane, north of Beacon Hill		
	AM peak	PM peak
Without scheme	470	559
With scheme	395	498
Change	-75	-60
% Change	-16%	-11%

Little Braxted Lane



2027 Little Braxted Lane

	AM peak	PM peak
Without scheme	32	48
With scheme	21	71
Change	-11	22
% Change	-35%	47%

2042 Little Braxted Lane

	AM peak	PM peak
Without scheme	48	69
With scheme	62	94
Change	14	26
% Change	29%	38%

In the updated DCO version of the traffic model, the coding of Little Braxted Lane has been updated to better reflect the narrow, winding road.

The large increases seen at Stat Con (200+ in PM) are now no longer predicted.

HGVs banned on this road in the traffic model.

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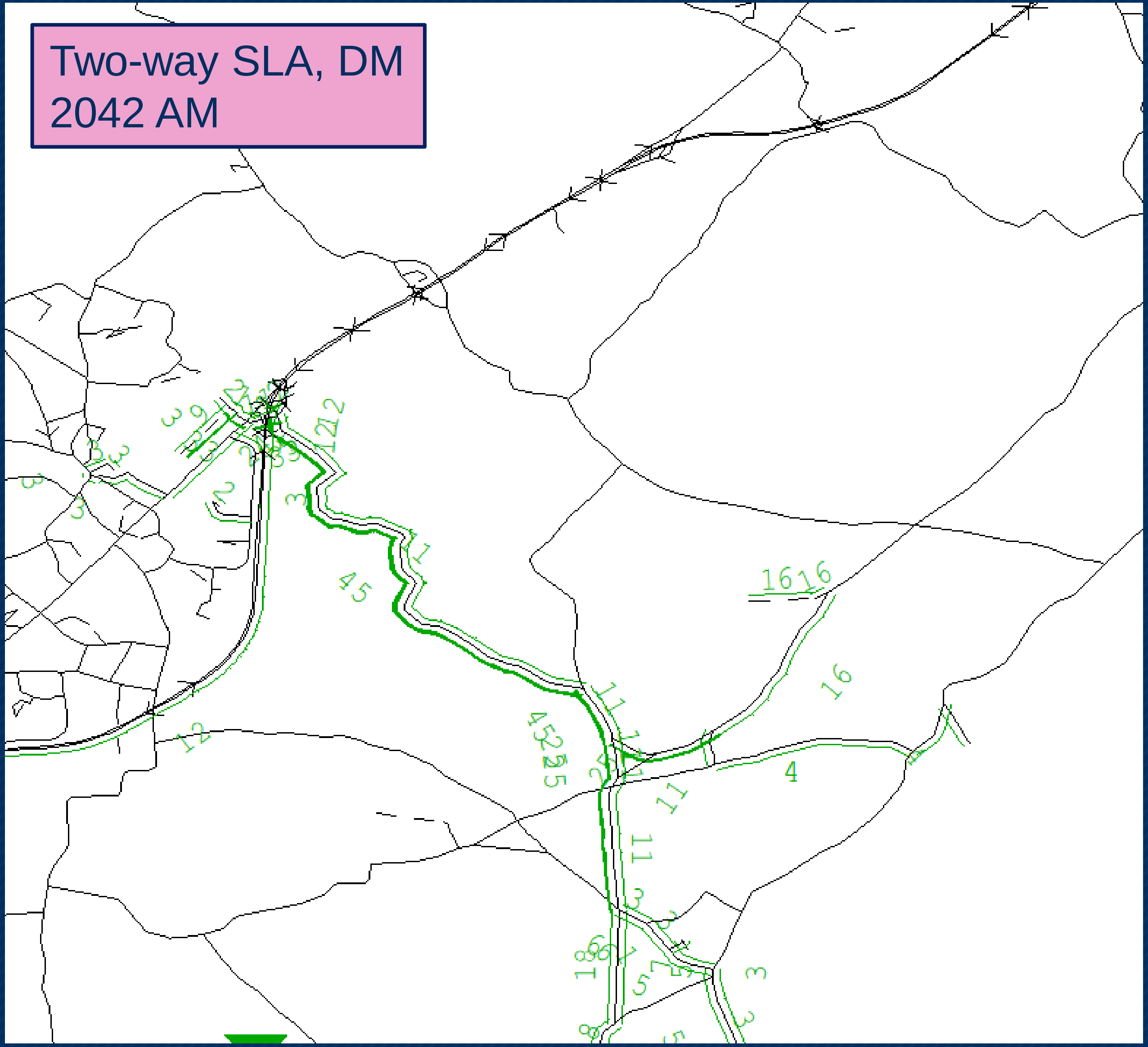
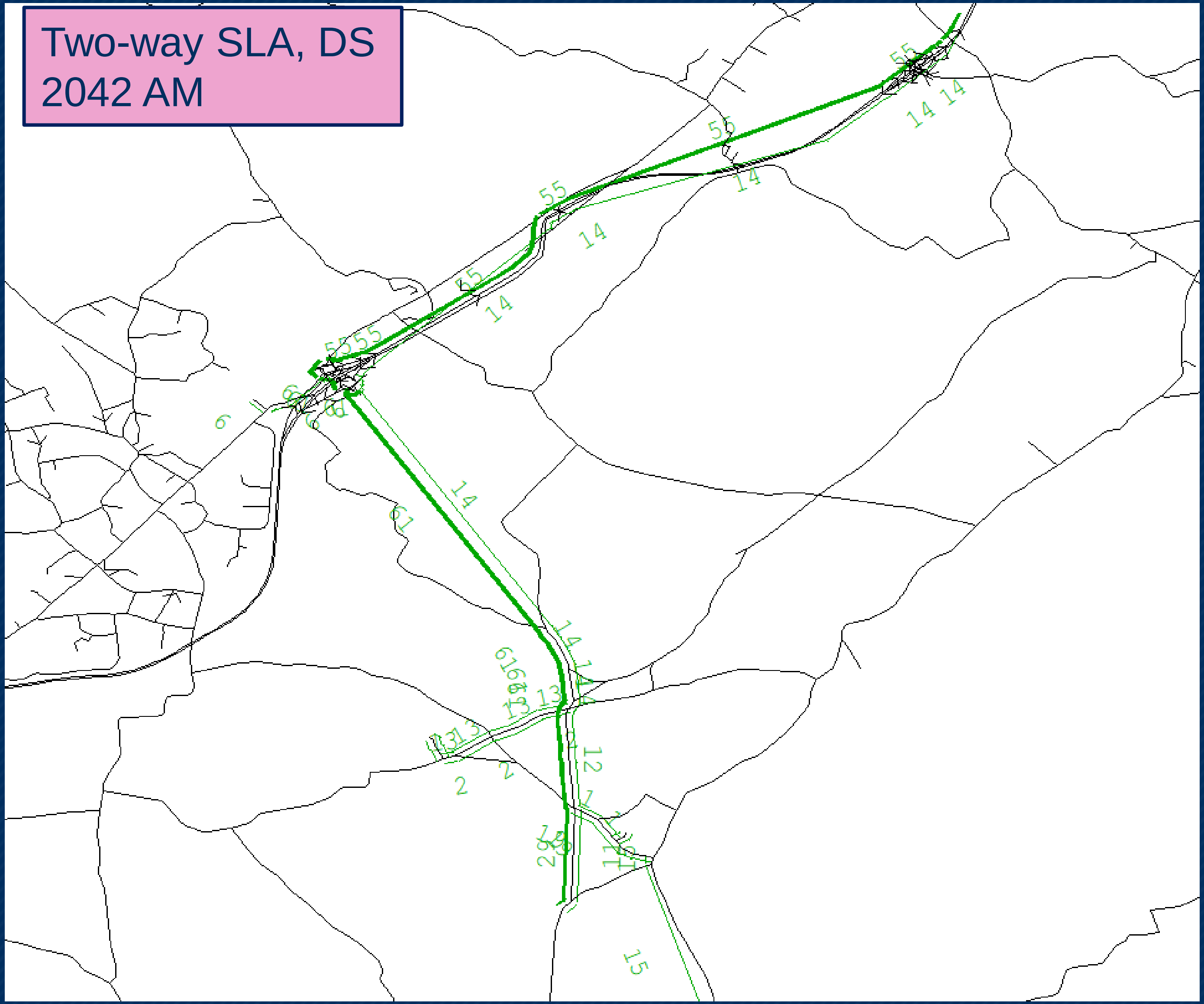
Little Braxted Lane – Select Link Analysis



In Do Minimum, traffic mainly goes to/from Witham in the area around junction 22

Little Braxted Lane – Select Link Analysis

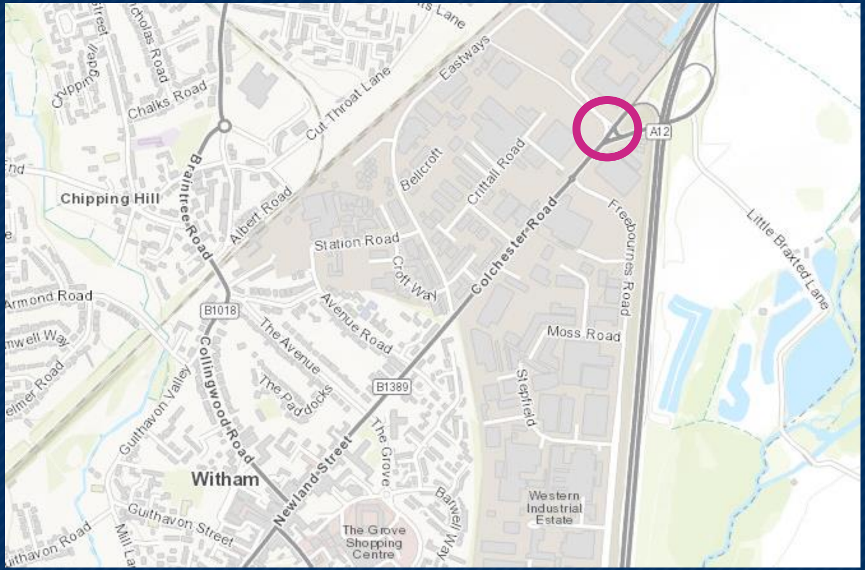


In Do Something, traffic is mainly to/from A12 northbound. Possibly due to movement to A12 north via Rivenhall End becoming longer, as direct access onto A12 is removed. Via Little Braxted Lane is an alternative route.

Eastways, Witham – overall results

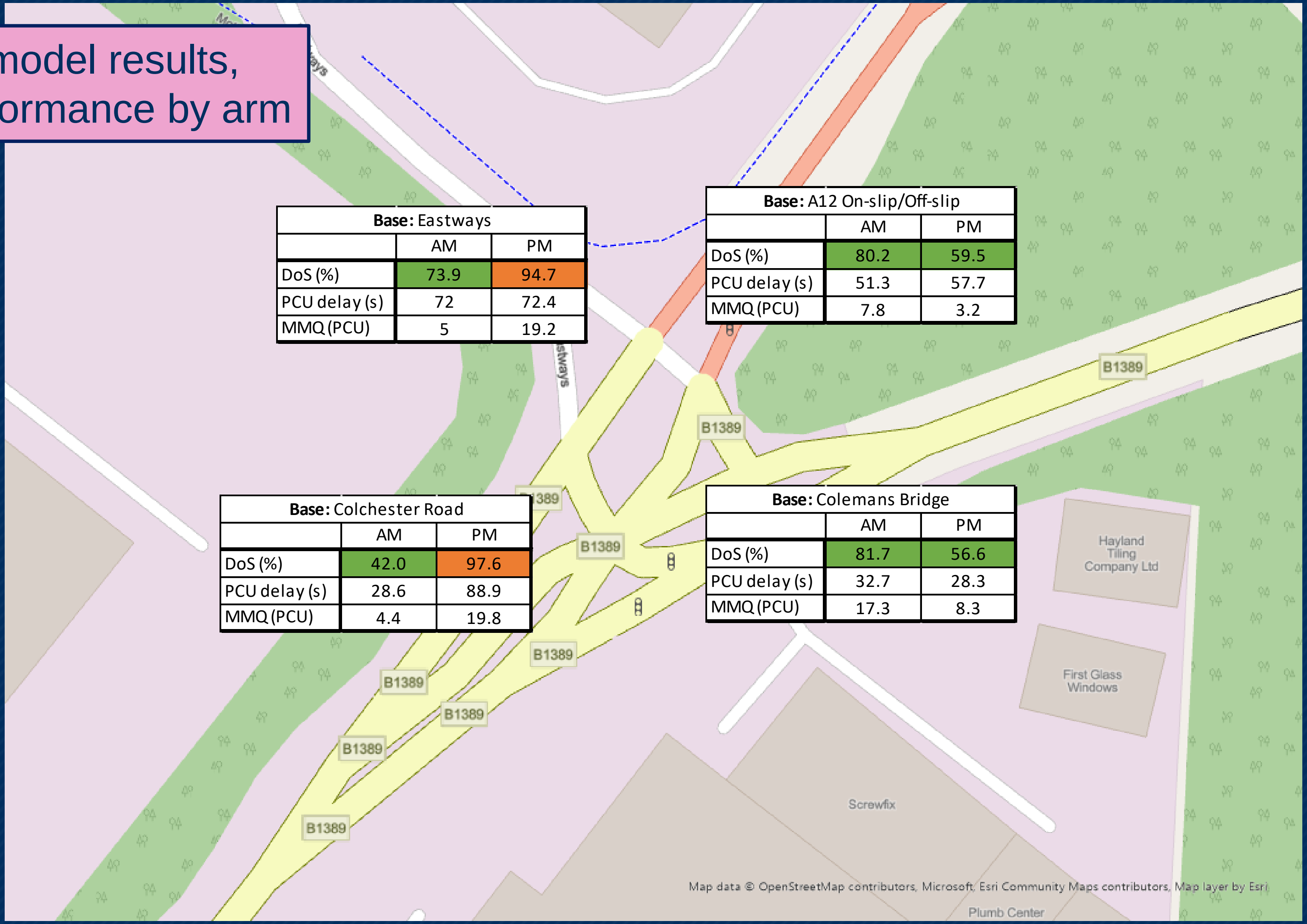
- *Junction model results for 2027 and 2042 – Colchester Road/Eastways.*
- *Junction assessed in TA because of vicinity to A12 and use by construction vehicles.*

	PRC(%)									
	2019 Base		*2027 DM*		*2027 DS*		*2042 DM*		*2042 DS*	
Junction	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
A12 J22 - Eastways	10.2	-8.4	1.7	-33.5	20.0	-12.4	-0.6	-42.9	17.5	-22.4



Eastways, Witham – arm by arm results

LinSig junction model results,
Base 2019: performance by arm



Base: Eastways

	AM	PM
DoS (%)	73.9	94.7
PCU delay (s)	72	72.4
MMQ (PCU)	5	19.2

Base: A12 On-slip/Off-slip

	AM	PM
DoS (%)	80.2	59.5
PCU delay (s)	51.3	57.7
MMQ (PCU)	7.8	3.2

Base: Colchester Road

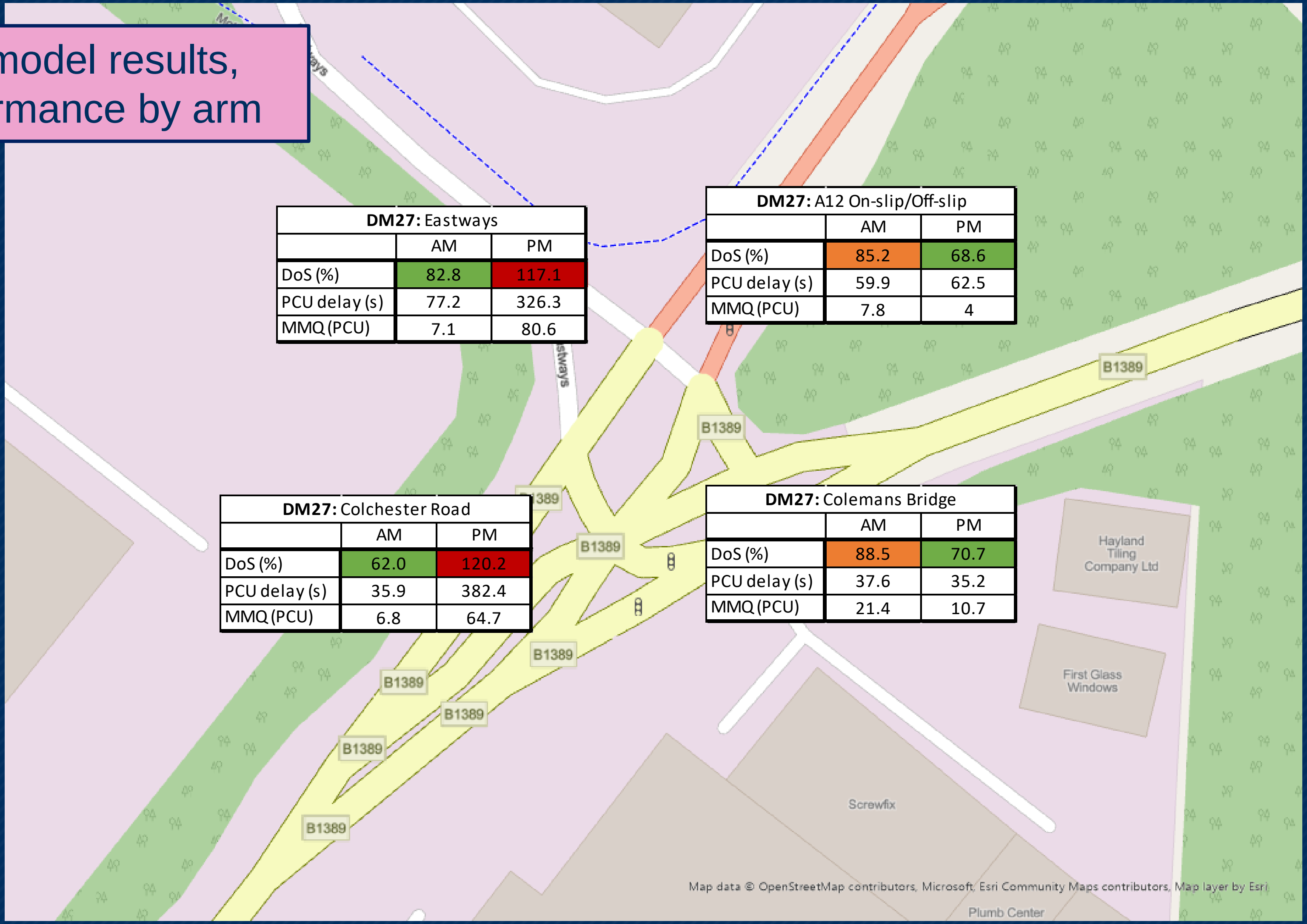
	AM	PM
DoS (%)	42.0	97.6
PCU delay (s)	28.6	88.9
MMQ (PCU)	4.4	19.8

Base: Colemans Bridge

	AM	PM
DoS (%)	81.7	56.6
PCU delay (s)	32.7	28.3
MMQ (PCU)	17.3	8.3

Eastways, Witham – arm by arm results

LinSig junction model results,
DM 2027: performance by arm



DM27: Eastways	AM	PM
DoS (%)	82.8	117.1
PCU delay (s)	77.2	326.3
MMQ (PCU)	7.1	80.6

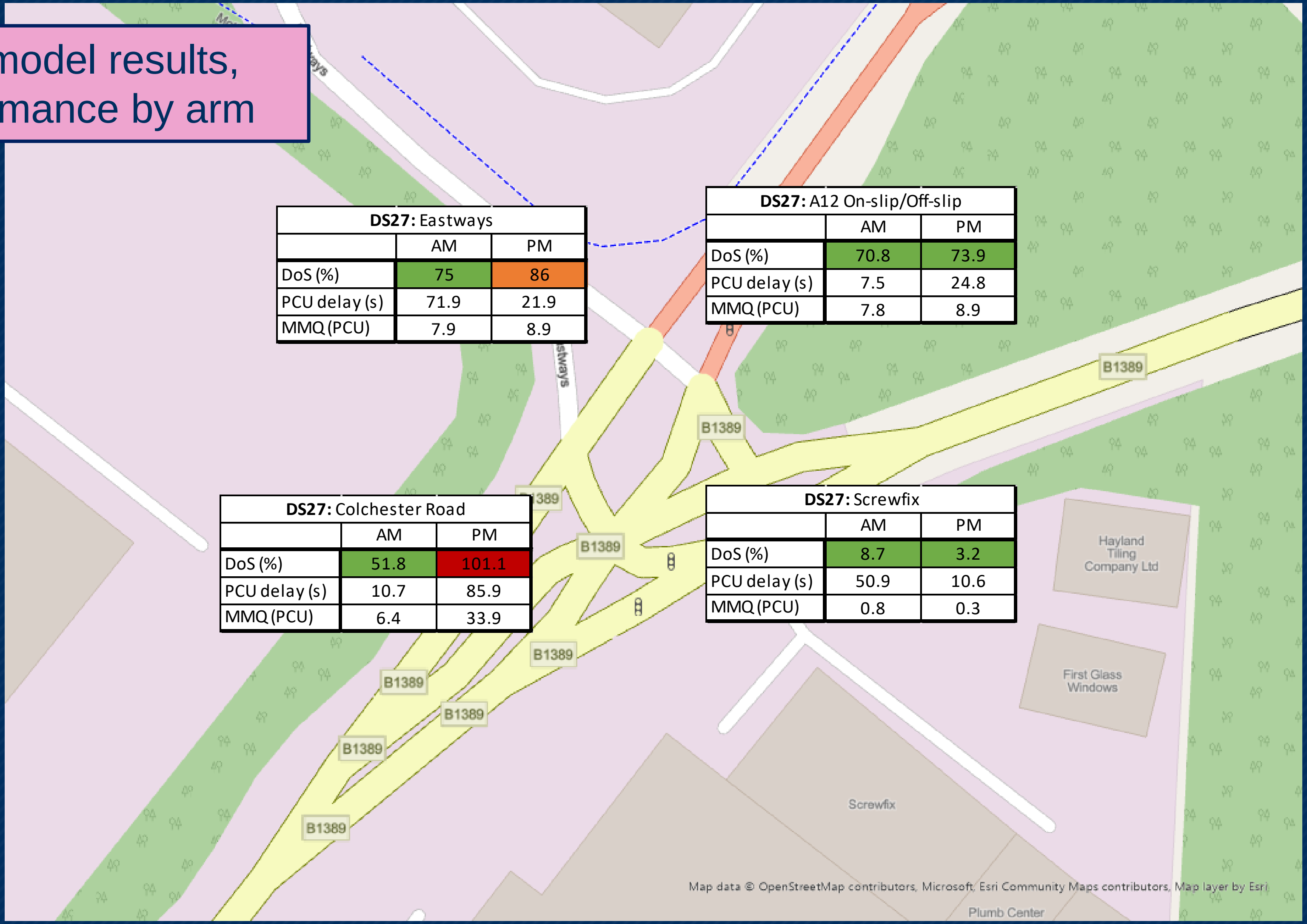
DM27: A12 On-slip/Off-slip	AM	PM
DoS (%)	85.2	68.6
PCU delay (s)	59.9	62.5
MMQ (PCU)	7.8	4

DM27: Colchester Road	AM	PM
DoS (%)	62.0	120.2
PCU delay (s)	35.9	382.4
MMQ (PCU)	6.8	64.7

DM27: Colemans Bridge	AM	PM
DoS (%)	88.5	70.7
PCU delay (s)	37.6	35.2
MMQ (PCU)	21.4	10.7

Eastways, Witham – arm by arm results

LinSig junction model results,
DS 2027: performance by arm



DS27: Eastways

	AM	PM
DoS (%)	75	86
PCU delay (s)	71.9	21.9
MMQ (PCU)	7.9	8.9

DS27: A12 On-slip/Off-slip

	AM	PM
DoS (%)	70.8	73.9
PCU delay (s)	7.5	24.8
MMQ (PCU)	7.8	8.9

DS27: Colchester Road

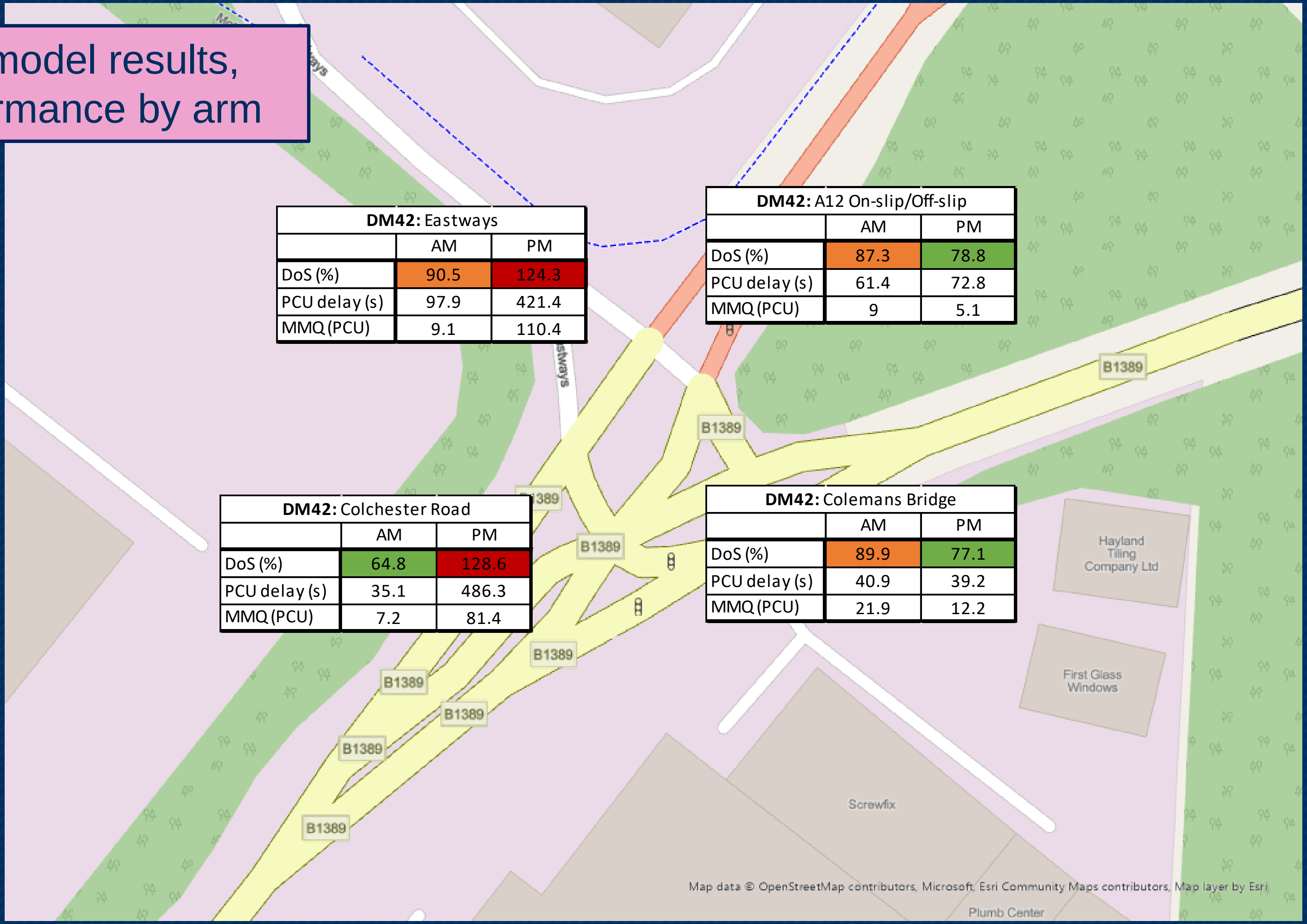
	AM	PM
DoS (%)	51.8	101.1
PCU delay (s)	10.7	85.9
MMQ (PCU)	6.4	33.9

DS27: Screwfix

	AM	PM
DoS (%)	8.7	3.2
PCU delay (s)	50.9	10.6
MMQ (PCU)	0.8	0.3

Eastways, Witham – arm by arm results

LinSig junction model results, DM 2042: performance by arm



DM42: Eastways

	AM	PM
DoS (%)	90.5	124.3
PCU delay (s)	97.9	421.4
MMQ (PCU)	9.1	110.4

DM42: A12 On-slip/Off-slip

	AM	PM
DoS (%)	87.3	78.8
PCU delay (s)	61.4	72.8
MMQ (PCU)	9	5.1

DM42: Colchester Road

	AM	PM
DoS (%)	64.8	128.6
PCU delay (s)	35.1	486.3
MMQ (PCU)	7.2	81.4

DM42: Colemans Bridge

	AM	PM
DoS (%)	89.9	77.1
PCU delay (s)	40.9	39.2
MMQ (PCU)	21.9	12.2

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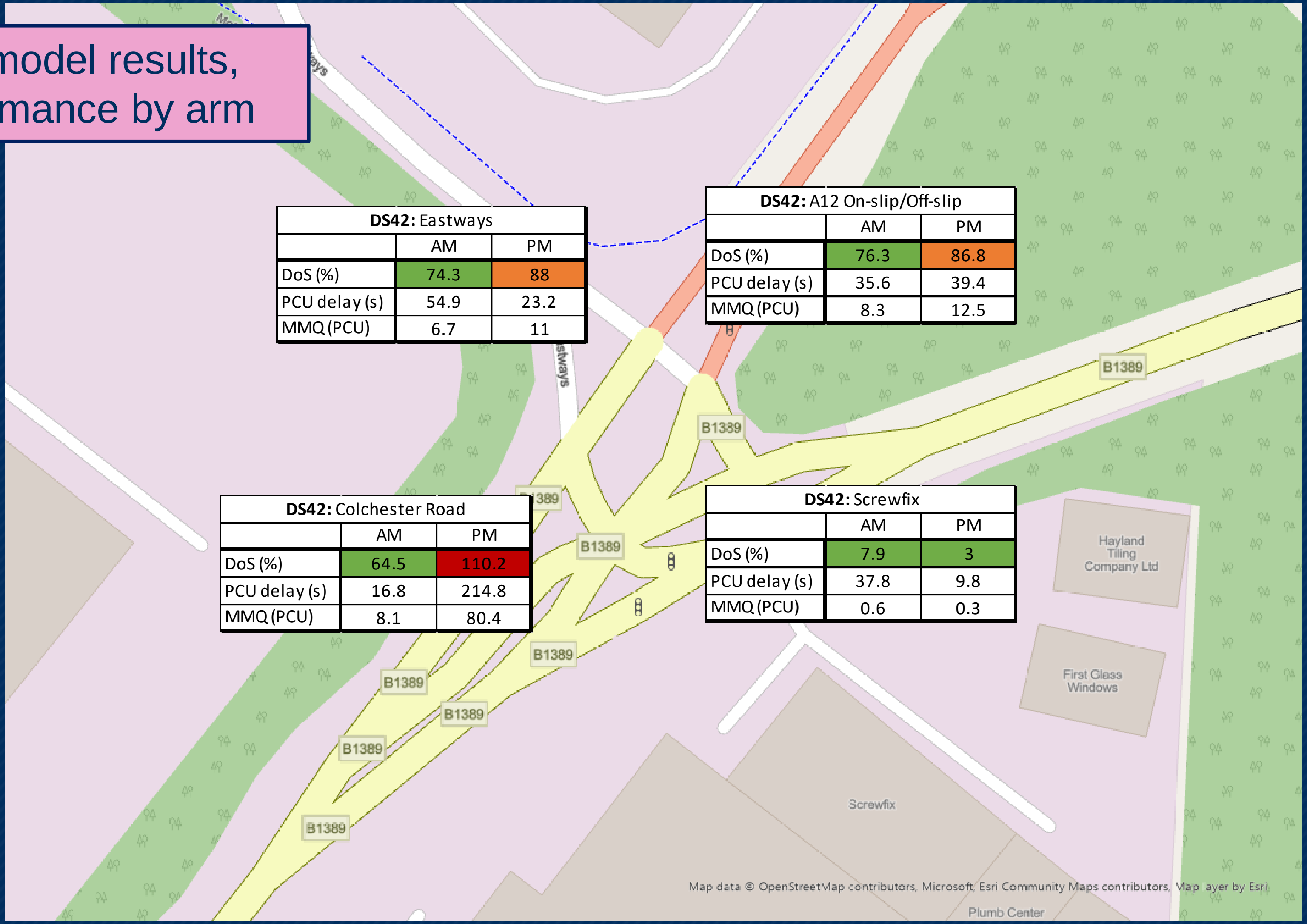
Eastways, Witham – arm by arm results

LinSig junction model results,
DS 2042: performance by arm



DS42: Eastways		
	AM	PM
DoS (%)	74.3	88
PCU delay (s)	54.9	23.2
MMQ (PCU)	6.7	11

DS42: A12 On-slip/Off-slip		
	AM	PM
DoS (%)	76.3	86.8
PCU delay (s)	35.6	39.4
MMQ (PCU)	8.3	12.5

DS42: Colchester Road		
	AM	PM
DoS (%)	64.5	110.2
PCU delay (s)	16.8	214.8
MMQ (PCU)	8.1	80.4

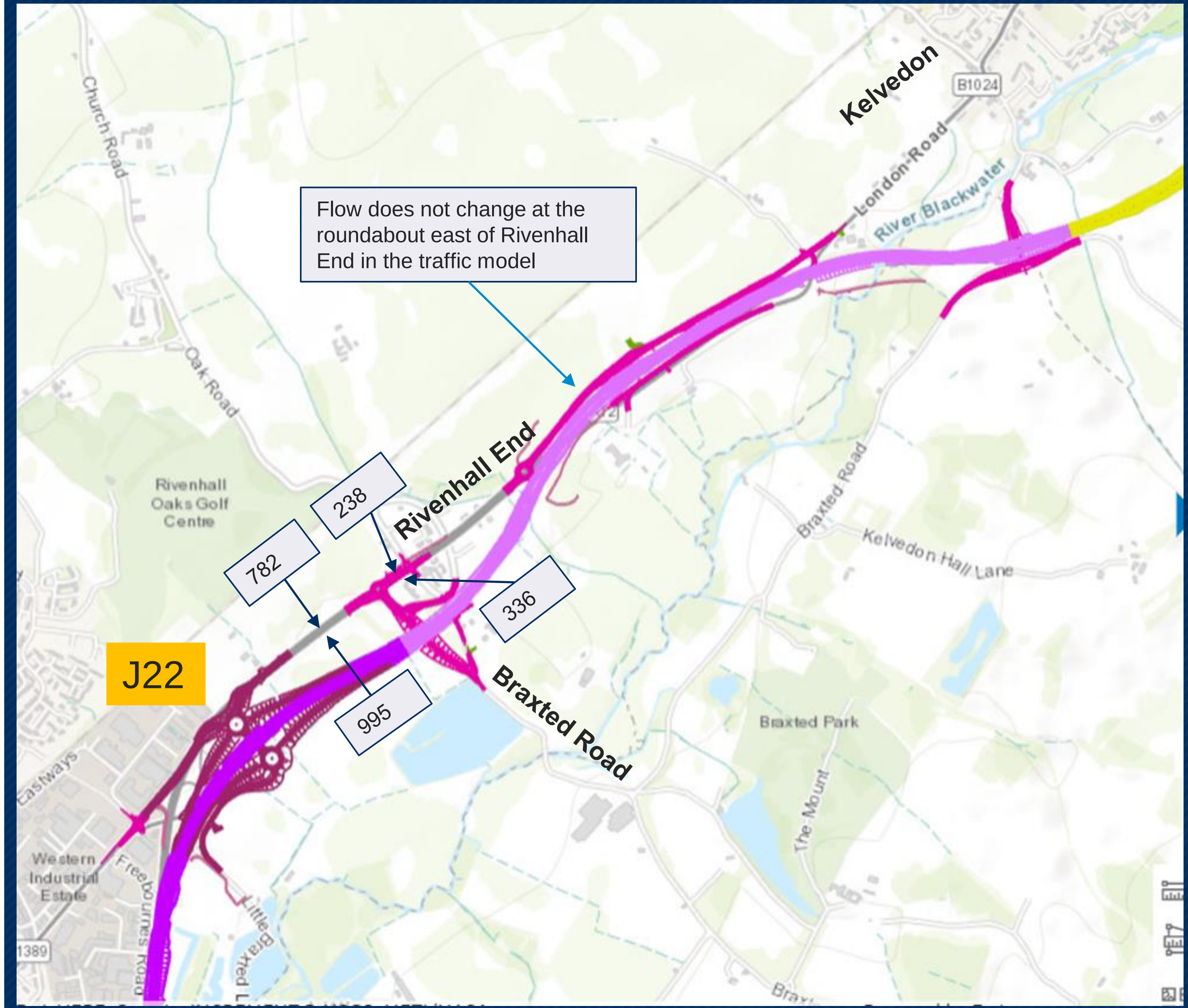
DS42: Screwfix		
	AM	PM
DoS (%)	7.9	3
PCU delay (s)	37.8	9.8
MMQ (PCU)	0.6	0.3

Junction 22 to 23 (De-trunked A12)

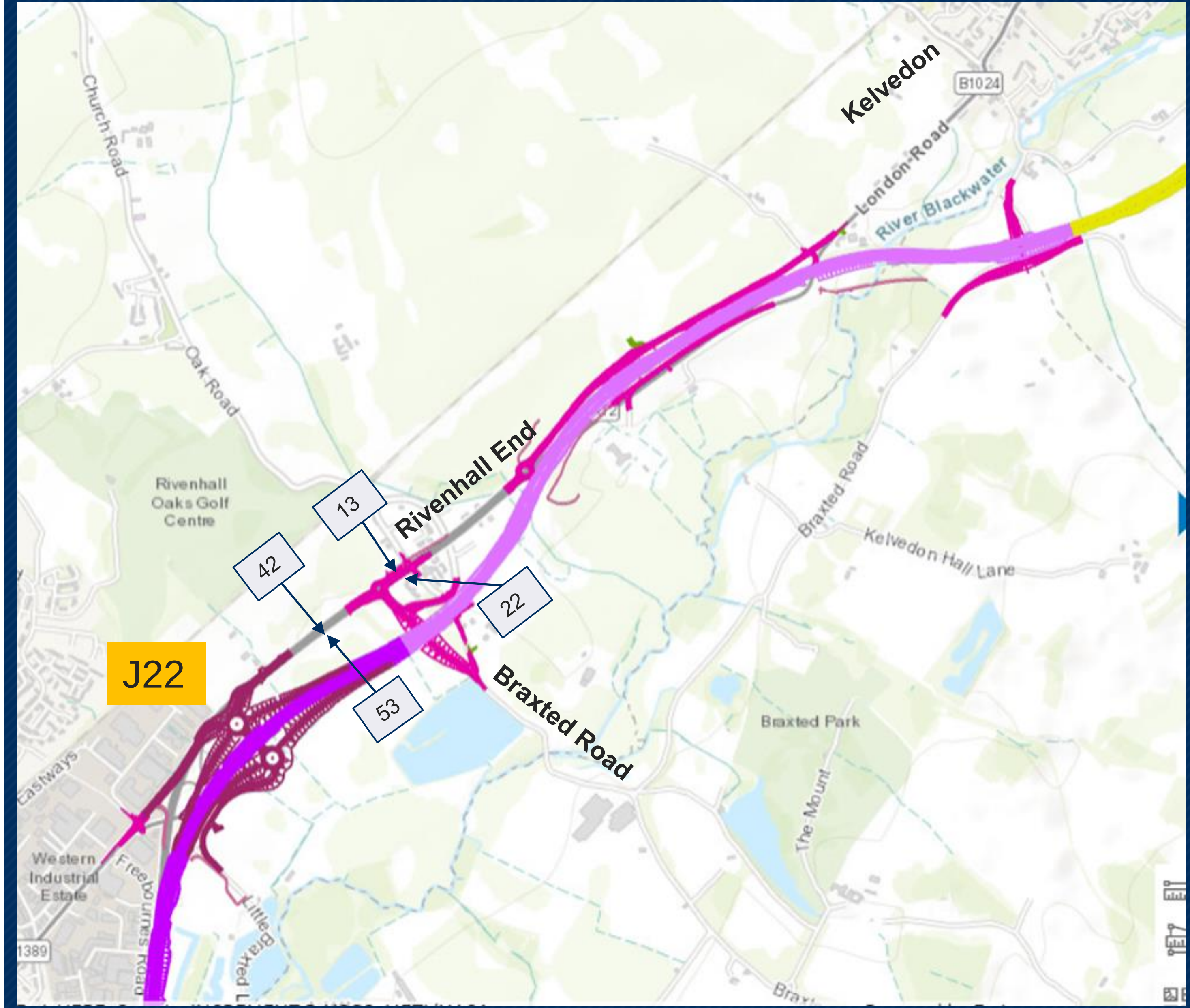
Junction 22 to 23 (de-trunked A12)

Junction 22 to 23 (De-trunked A12)	**Data**	Modelled data for 2042 (with DCO scheme), as follows:
		• AADT and peak hour traffic flows, plus peak hour volume/capacity ratios for each section of old A12:
		  o Junction 22 to Braxted Road
		  o Braxted Road to roundabout East of Rivenhall End
		  o Roundabout East of Rivenhall End to Kelvedon

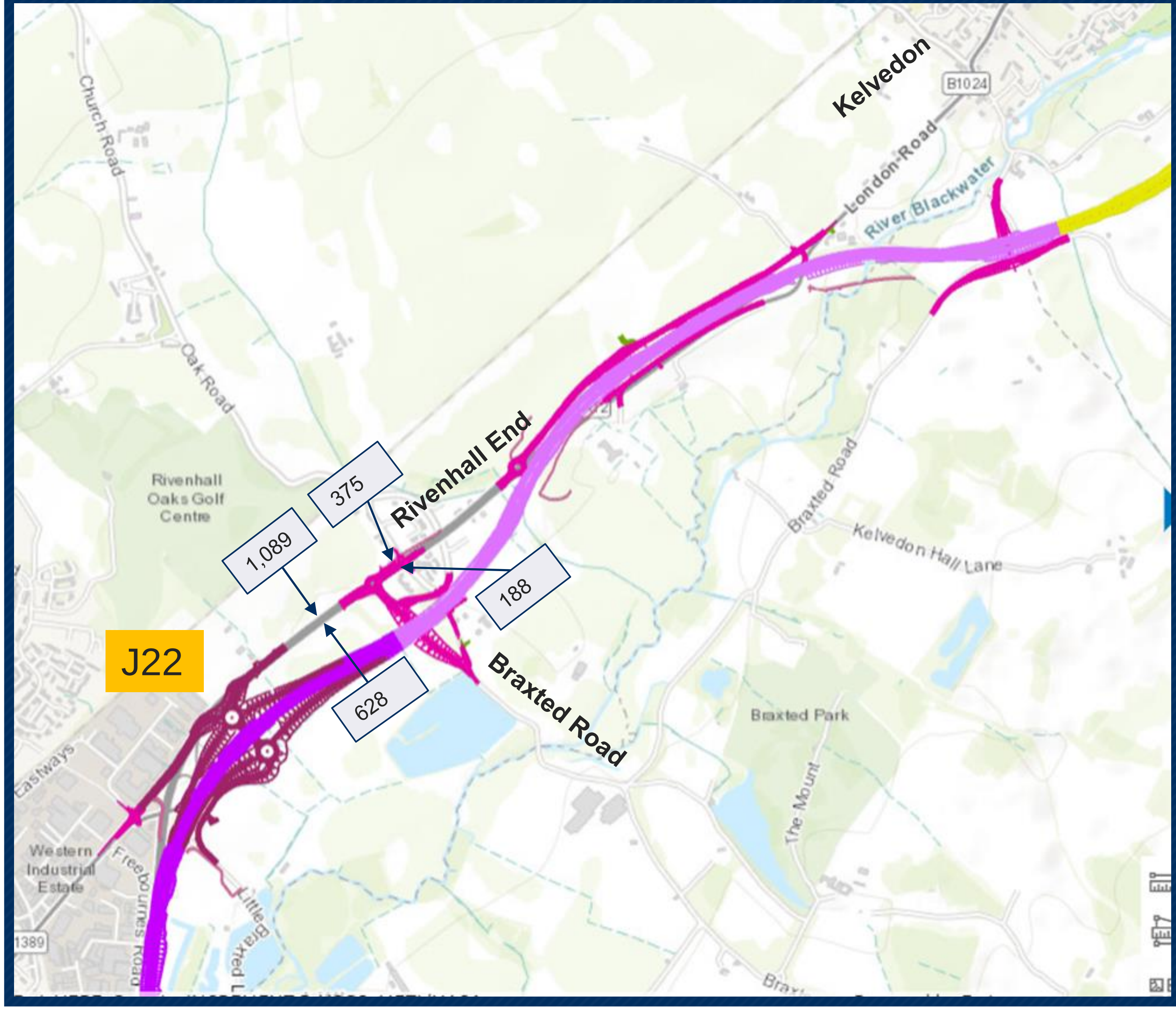
J22 to 23 (de-trunked A12) – 2042 AM Peak Hour flows (veh/hr)



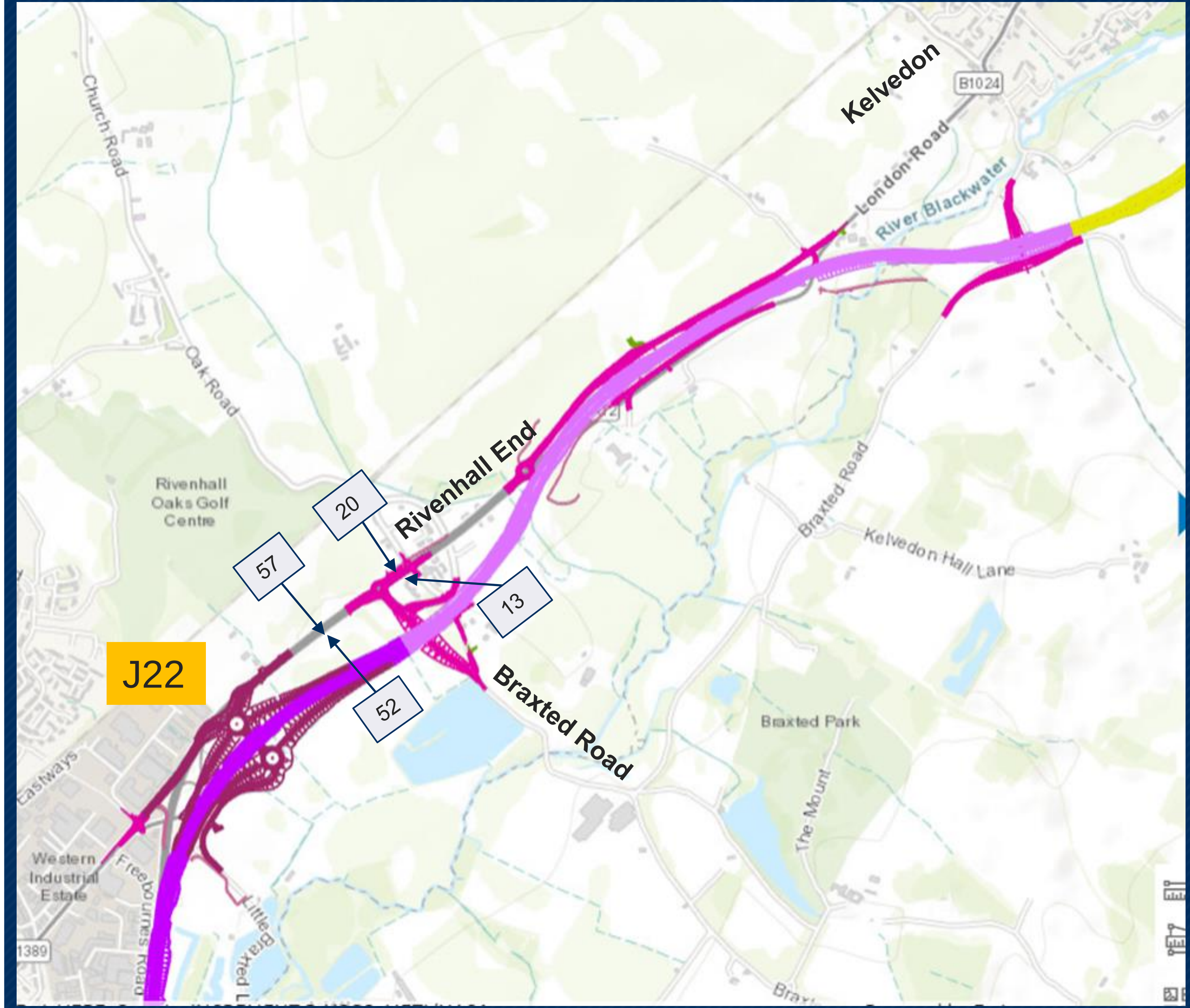
J22 to 23 (de-trunked A12) – 2042 AM V/C (%)



J22 to 23 (de-trunked A12) – 2042 PM Peak Hour flows (veh/hr)



J22 to 23 (de-trunked A12) – 2042 PM V/C (%)



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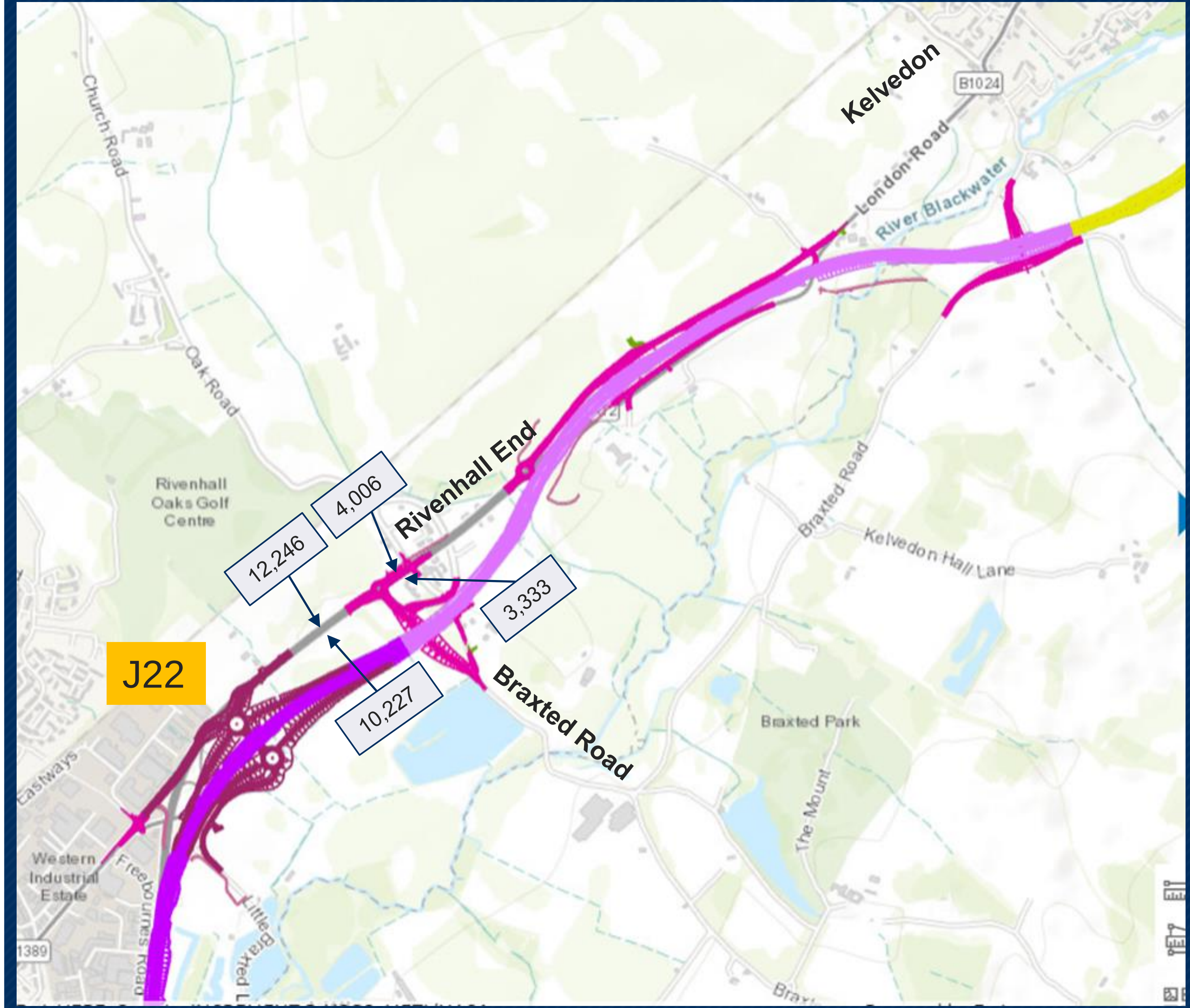
J22 to 23 (de-trunked A12) – 2042 AADT (veh/day)




Colchester A12
Harwich (A120)
Felixstowe (A14)
Hatfield
Peverel
B1137
20A

Junction 24

Junction 24

Junction 24 (Kelvedon North)	**Data**	Junction model results, in format set out in separate tables below, for 2027 and 2042 (with and without DCO scheme) for the following junctions: o Station Road / Feering Hill / High Street (Kelvedon) o Feering Hill / Inworth Road (Feering) Modelled peak hour traffic flows for 2027 and 2042 (with and without DCO scheme), on all approaches to the following junctions: o Kelvedon Road / Maypole Road / Church Road / Maldon Road (Tiptree) o Maldon Road / Station Road (Tiptree) o Station Road / Church Street (Tiptree)

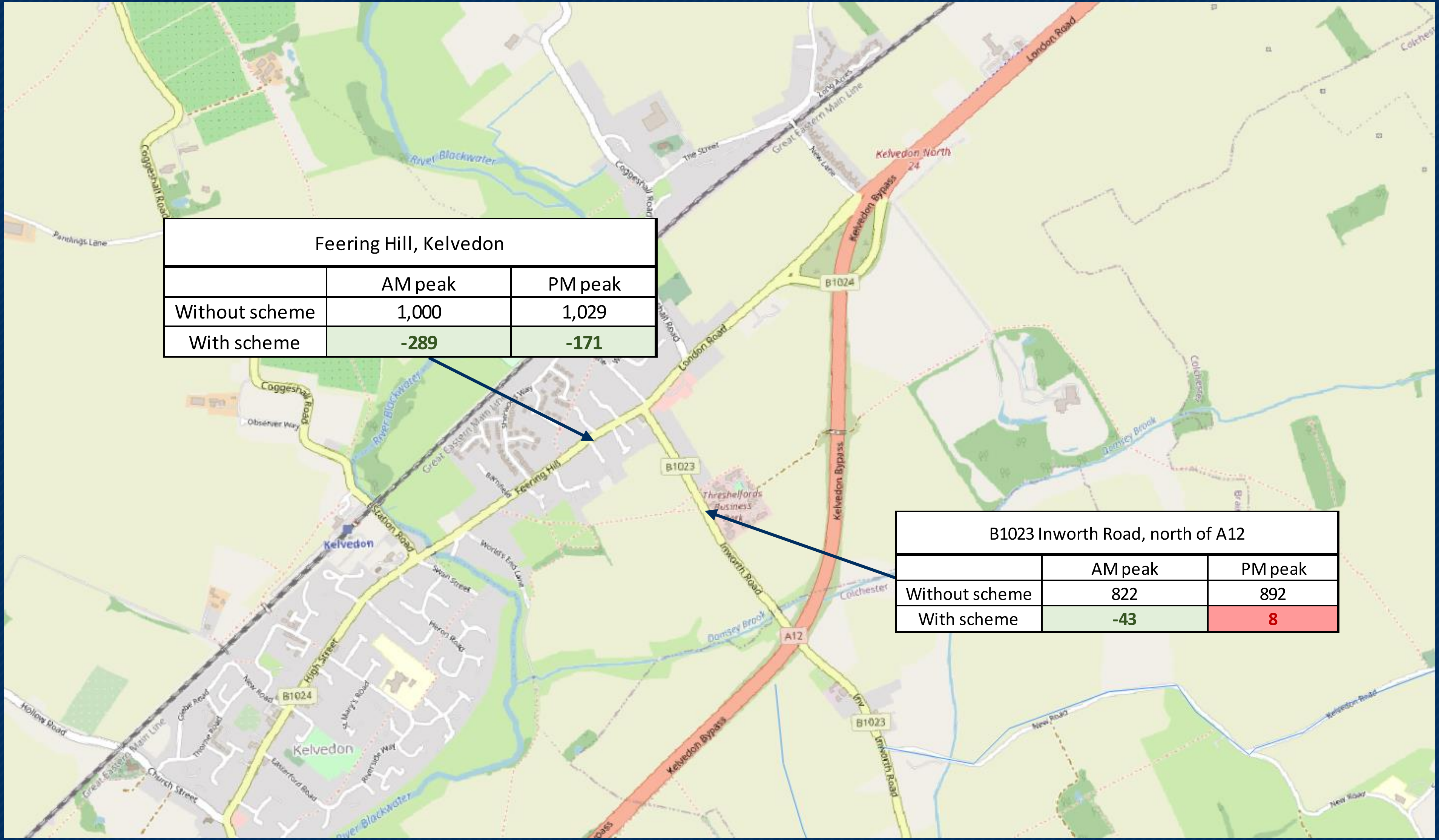
Junction 24

Insufficient information on traffic flows and routings especially since the Crown Estates development proposals will add large amounts of traffic onto the road network and teasing out the routes that will be used to reach J24 from those used by existing traffic will be a complex matter. We do want to see the use of the High Street in Kelvedon as a means of accessing the A12 substantially reduced if not eliminated and this has not yet been demonstrated.

- In the core scenario, only the portion of the Crown Estates development proposal which has submitted planning applications are included in the traffic model. This represents 162 houses.

- The following slides show the level of traffic on Feering Hill and Inworth Road with and without the scheme. Further details will be provided about where this traffic is coming from/to.

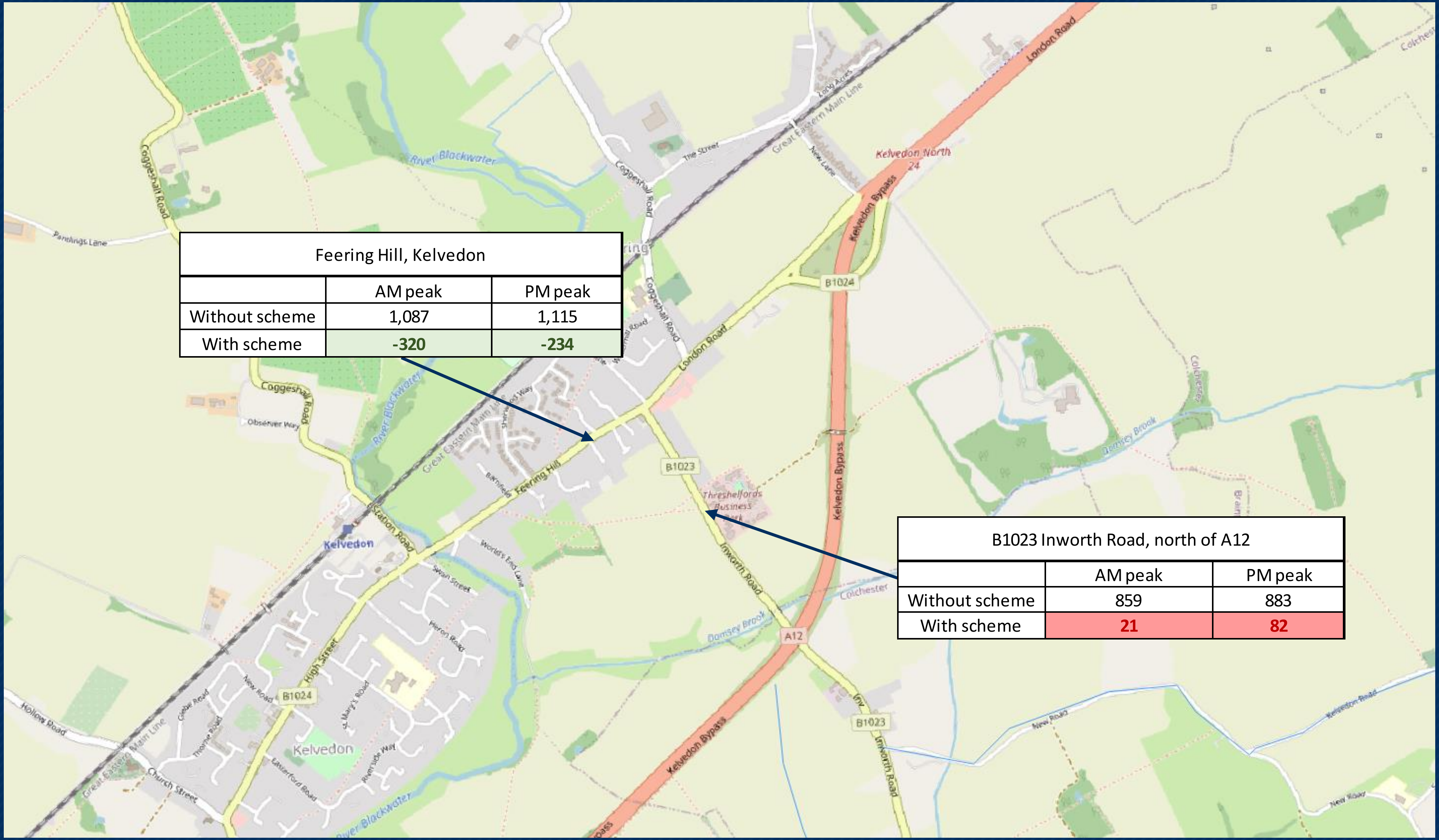
Traffic Flow Difference 2027 Feering



Feering Hill, Kelvedon		
	AM peak	PM peak
Without scheme	1,000	1,029
With scheme	**-289**	**-171**

B1023 Inworth Road, north of A12		
	AM peak	PM peak
Without scheme	822	892
With scheme	**-43**	**8**

Traffic Flow Difference 2042 Feering



Feering Hill, Kelvedon		
	AM peak	PM peak
Without scheme	1,087	1,115
With scheme	**-320**	**-234**

B1023 Inworth Road, north of A12		
	AM peak	PM peak
Without scheme	859	883
With scheme	**21**	**82**

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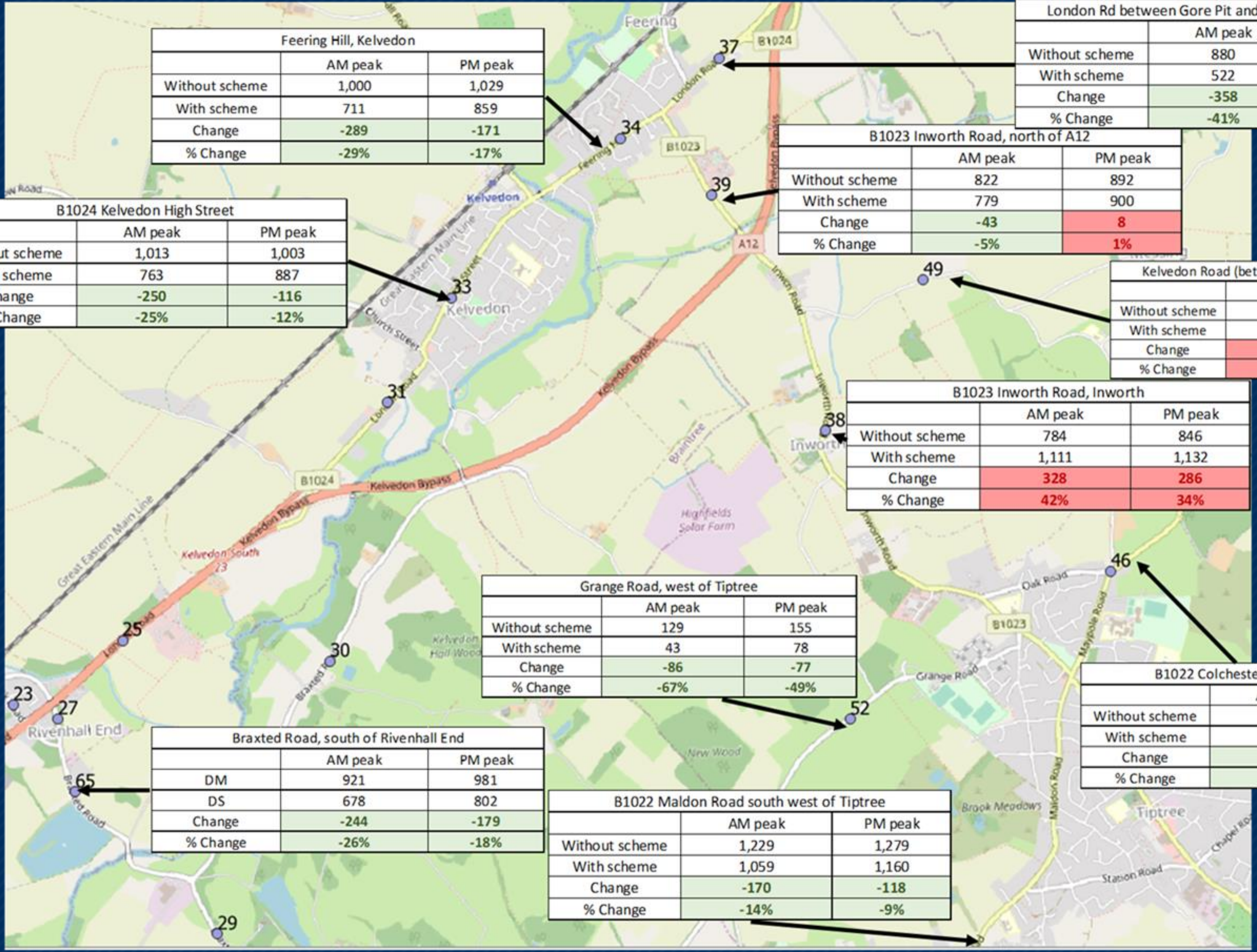
Junction 24

- *Summary map of local road flow changes for 2027*



London Rd between Gore Pit and existing junction 24		
	AM peak	PM peak
Without scheme	880	956
With scheme	522	464
Change	-358	-491
% Change	-41%	-51%

Feering Hill, Kelvedon		
	AM peak	PM peak
Without scheme	1,000	1,029
With scheme	711	859
Change	-289	-171
% Change	-29%	-17%

B1023 Inworth Road, north of A12		
	AM peak	PM peak
Without scheme	822	892
With scheme	779	900
Change	-43	8
% Change	-5%	1%

B1024 Kelvedon High Street		
	AM peak	PM peak
Without scheme	1,013	1,003
With scheme	763	887
Change	-250	-116
% Change	-25%	-12%

Kelvedon Road (between Messing & Inworth Road)		
	AM peak	PM peak
Without scheme	38	45
With scheme	133	109
Change	95	64
% Change	252%	140%

B1023 Inworth Road, Inworth		
	AM peak	PM peak
Without scheme	784	846
With scheme	1,111	1,132
Change	328	286
% Change	42%	34%

Grange Road, west of Tiptree		
	AM peak	PM peak
Without scheme	129	155
With scheme	43	78
Change	-86	-77
% Change	-67%	-49%

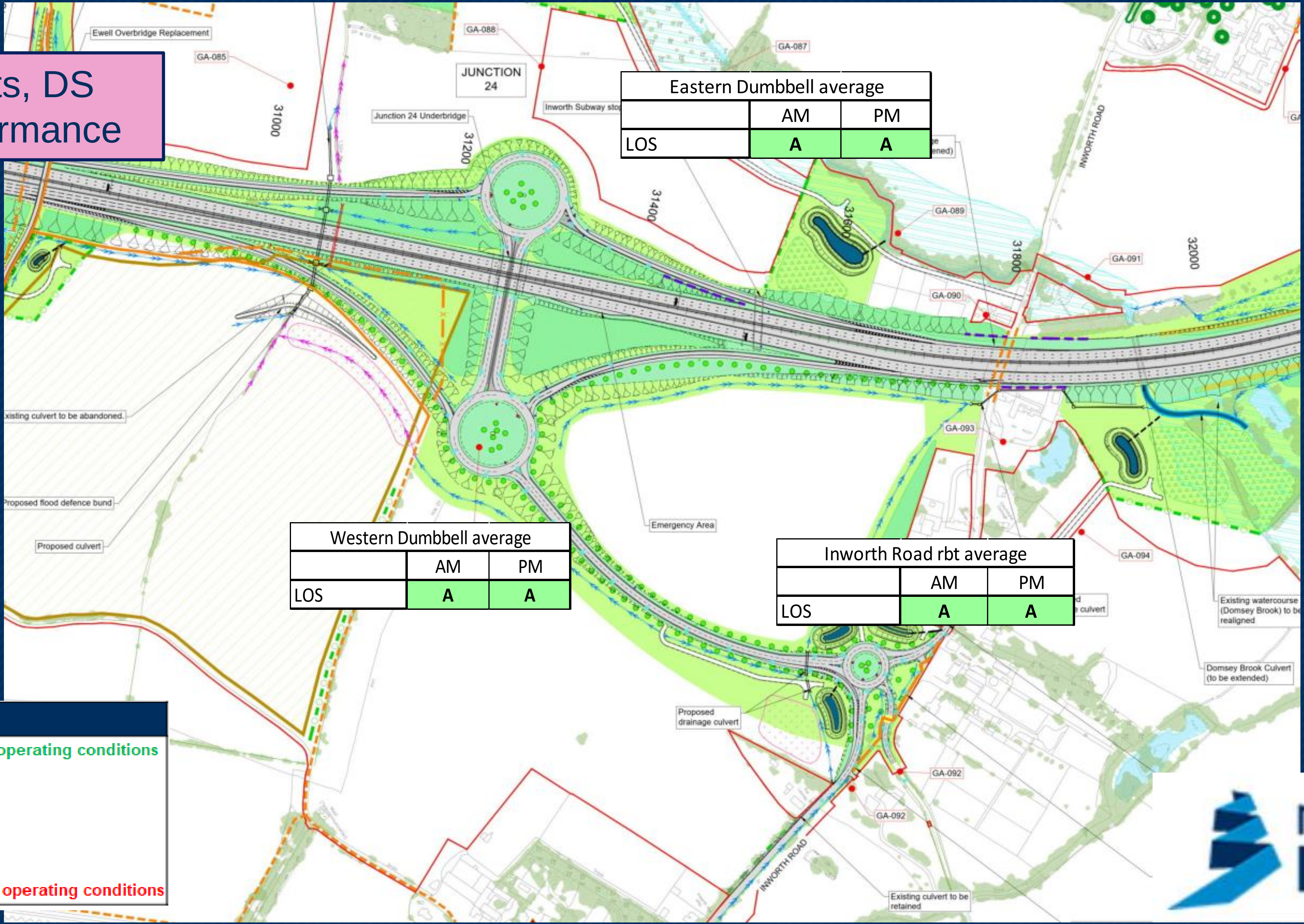
B1022 Colchester Road, east of Tiptree		
	AM peak	PM peak
Without scheme	677	717
With scheme	535	589
Change	-142	-128
% Change	-21%	-18%

Braxted Road, south of Rivenhall End		
	AM peak	PM peak
DM	921	981
DS	678	802
Change	-244	-179
% Change	-26%	-18%

B1022 Maldon Road south west of Tiptree		
	AM peak	PM peak
Without scheme	1,229	1,279
With scheme	1,059	1,160
Change	-170	-118
% Change	-14%	-9%

Junction 24

Vissim model results, DS 2042: Overall performance



Eastern Dumbbell average		
	AM	PM
LOS	A	A

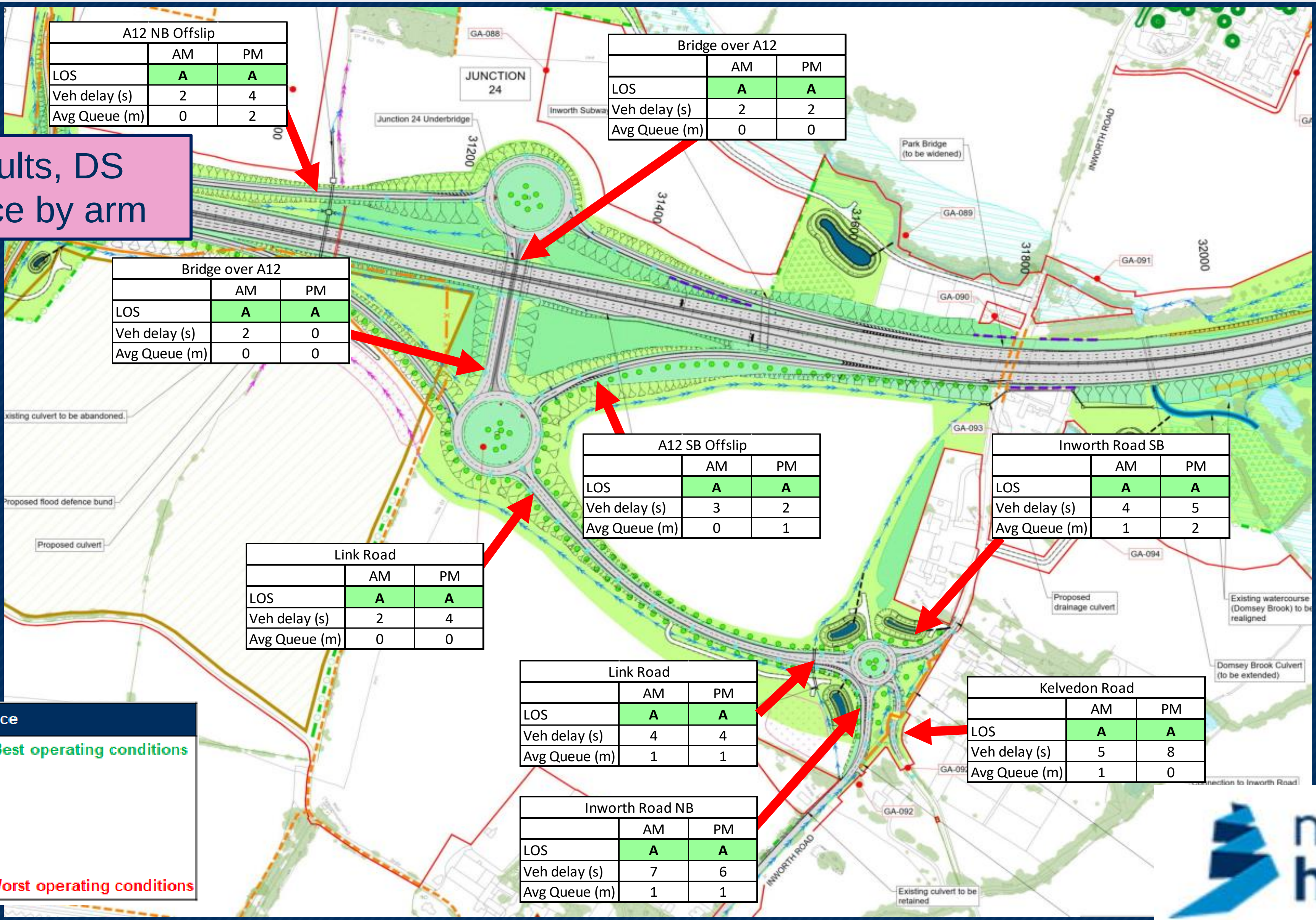
Western Dumbbell average		
	AM	PM
LOS	A	A

Inworth Road rbt average		
	AM	PM
LOS	A	A

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Junction 24

Vissim model results, DS 2042: performance by arm



A12 NB Offslip

	AM	PM
LOS	A	A
Veh delay (s)	2	4
Avg Queue (m)	0	2

Bridge over A12

	AM	PM
LOS	A	A
Veh delay (s)	2	2
Avg Queue (m)	0	0

Bridge over A12

	AM	PM
LOS	A	A
Veh delay (s)	2	0
Avg Queue (m)	0	0

A12 SB Offslip

	AM	PM
LOS	A	A
Veh delay (s)	3	2
Avg Queue (m)	0	1

Inworth Road SB

	AM	PM
LOS	A	A
Veh delay (s)	4	5
Avg Queue (m)	1	2

Link Road

	AM	PM
LOS	A	A
Veh delay (s)	2	4
Avg Queue (m)	0	0

Link Road

	AM	PM
LOS	A	A
Veh delay (s)	4	4
Avg Queue (m)	1	1

Kelvedon Road

	AM	PM
LOS	A	A
Veh delay (s)	5	8
Avg Queue (m)	1	0

Inworth Road NB

	AM	PM
LOS	A	A
Veh delay (s)	7	6
Avg Queue (m)	1	1

Level of Service

LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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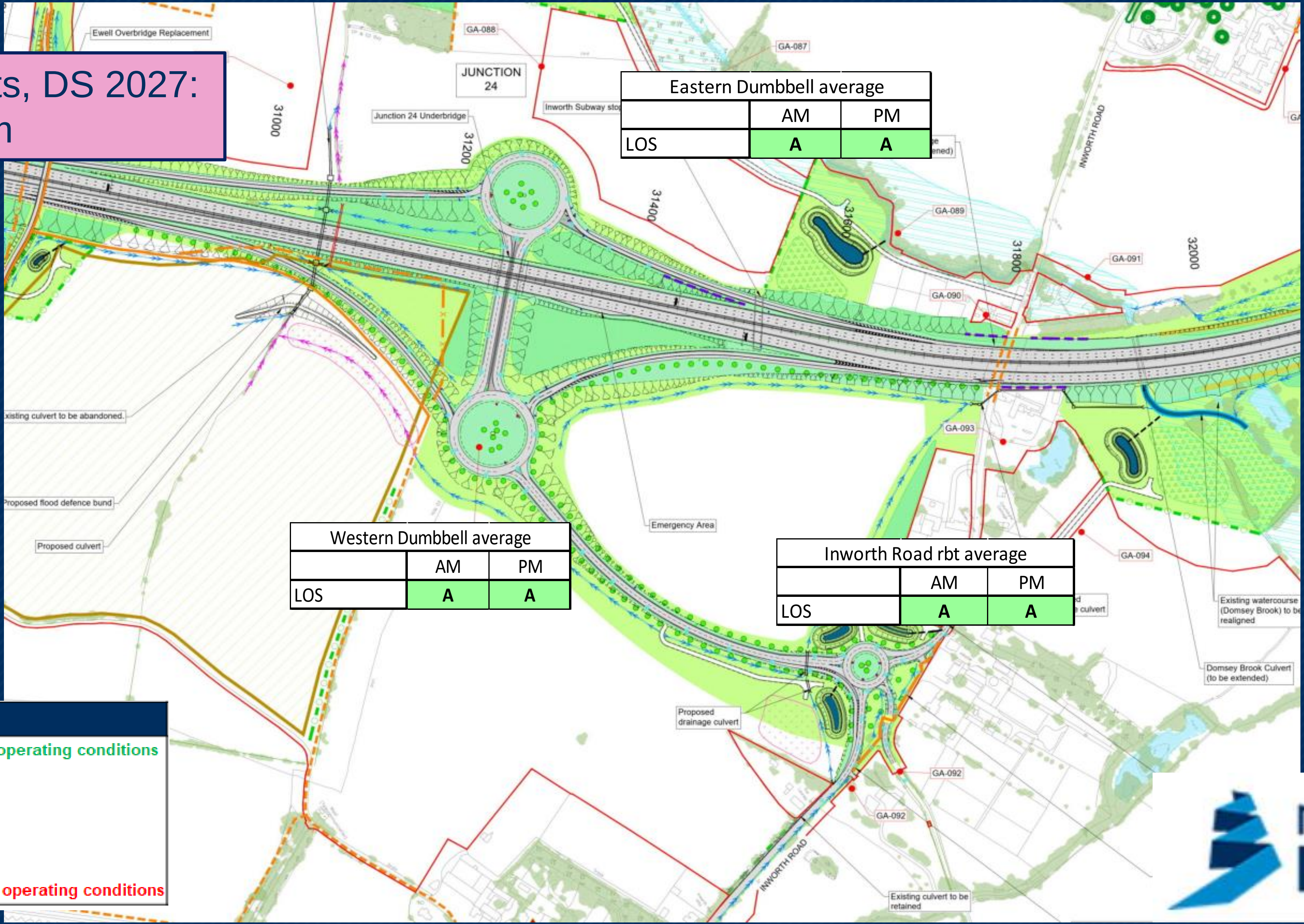
Junction 24

Vissim model results, DS 2042: full results

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Western Dumbbell	A12 NB Offslip	Priority	A	285	2	0	14	A	537	4	2	27
	Bridge over A12	Priority	A	324	2	0	0	A	297	2	0	0
	Total	**Priority**	**A**	**609**	**2**			**A**	**834**	**3**		
Eastern Dumbbell	A12 SB Offslip	Priority	A	300	3	0	12	A	385	5	1	18
	Link Road	Priority	A	913	2	0	9	A	636	2	0	7
	Bridge over A12	Priority	A	286	2	0	0	A	537	3	0	0
	Total	**Priority**	**A**	**1498**	**2**			**A**	**1559**	**3**		
Inworth Road Roundabout	Inworth Road SB	Priority	A	546	4	1	17	A	586	5	2	20
	Kelvedon Road	Priority	A	95	5	1	12	A	32	8	0	8
	Inworth Road NB	Priority	A	242	7	1	19	A	156	6	1	14
	Link Road	Priority	A	585	4	1	20	A	925	4	1	22
	Total	**Priority**	**A**	**2021**	**5**			**A**	**2076**	**5**		

Junction 24

Vissim model results, DS 2027: performance by arm



Eastern Dumbbell average		
	AM	PM
LOS	A	A

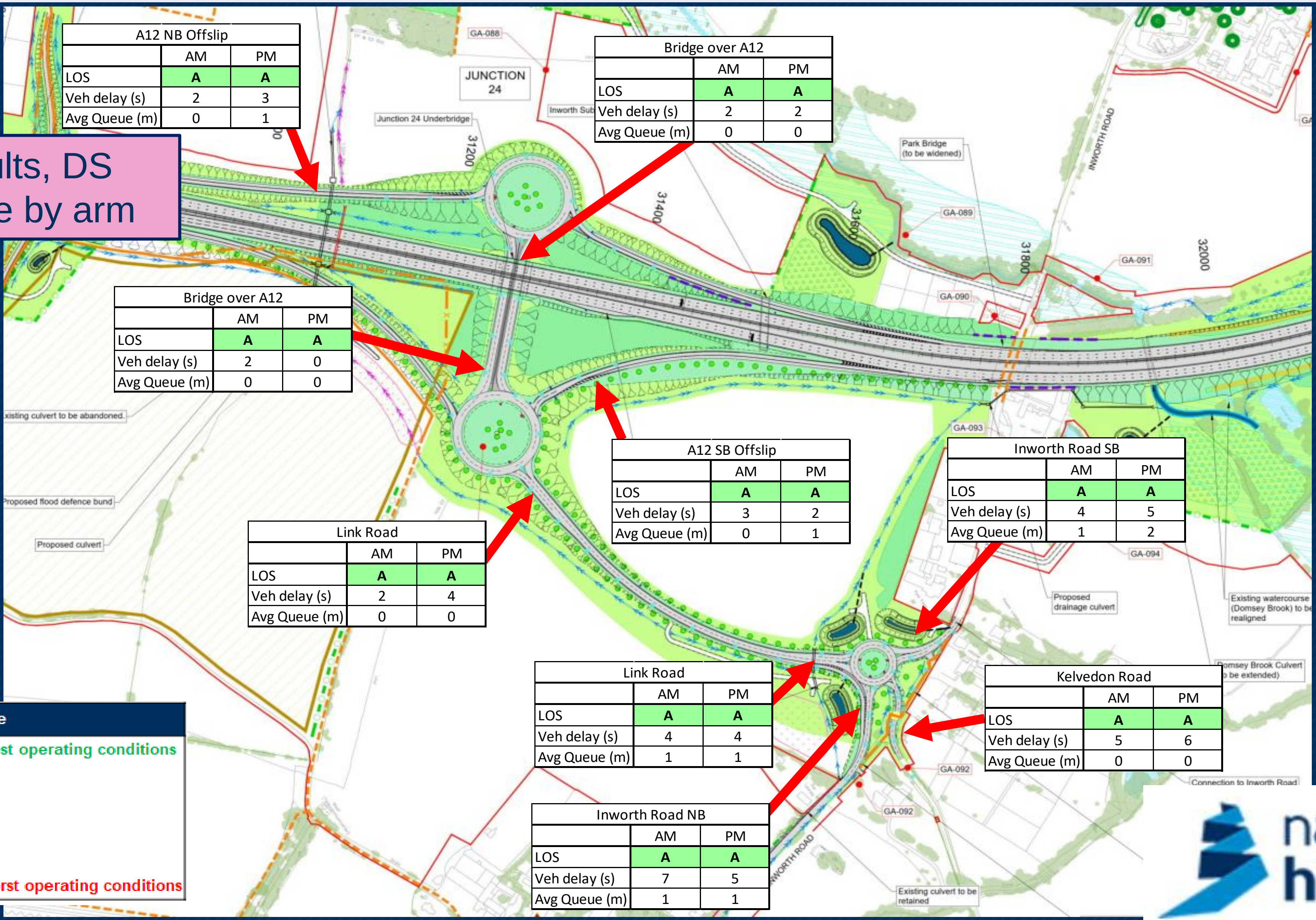
Western Dumbbell average		
	AM	PM
LOS	A	A

Inworth Road rbt average		
	AM	PM
LOS	A	A

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Junction 24

Vissim model results, DS 2027: performance by arm



A12 NB Offslip	AM	PM
LOS	A	A
Veh delay (s)	2	3
Avg Queue (m)	0	1

Bridge over A12	AM	PM
LOS	A	A
Veh delay (s)	2	2
Avg Queue (m)	0	0

Bridge over A12	AM	PM
LOS	A	A
Veh delay (s)	2	0
Avg Queue (m)	0	0

A12 SB Offslip	AM	PM
LOS	A	A
Veh delay (s)	3	2
Avg Queue (m)	0	1

Inworth Road SB	AM	PM
LOS	A	A
Veh delay (s)	4	5
Avg Queue (m)	1	2

Link Road	AM	PM
LOS	A	A
Veh delay (s)	2	4
Avg Queue (m)	0	0

Link Road	AM	PM
LOS	A	A
Veh delay (s)	4	4
Avg Queue (m)	1	1

Kelvedon Road	AM	PM
LOS	A	A
Veh delay (s)	5	6
Avg Queue (m)	0	0

Inworth Road NB	AM	PM
LOS	A	A
Veh delay (s)	7	5
Avg Queue (m)	1	1

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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Junction 24

Vissim model results, DS 2027: full results

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Western Dumbbell	A12 NB Offslip	Priority	A	239	2	0	13	A	439	3	1	20
	Bridge over A12	Priority	A	303	2	0	0	A	288	2	0	0
	Total	**Priority**	**A**	**542**	**2**			**A**	**727**	**3**		
Eastern Dumbbell	A12 SB Offslip	Priority	A	261	3	0	10	A	386	4	1	17
	Link Road	Priority	A	833	2	0	8	A	563	2	0	7
	Bridge over A12	Priority	A	239	2	0	0	A	439	2	0	0
	Total	**Priority**	**A**	**1333**	**2**			**A**	**1387**	**3**		
Inworth Road Roundabout	Inworth Road SB	Priority	A	482	4	1	15	A	543	5	2	19
	Kelvedon Road	Priority	A	91	5	0	12	A	21	6	0	6
	Inworth Road NB	Priority	A	238	7	1	18	A	173	5	1	14
	Link Road	Priority	A	500	4	1	19	A	825	4	1	22
	Total	**Priority**	**A**	**1842**	**5**			**A**	**1923**	**4**		

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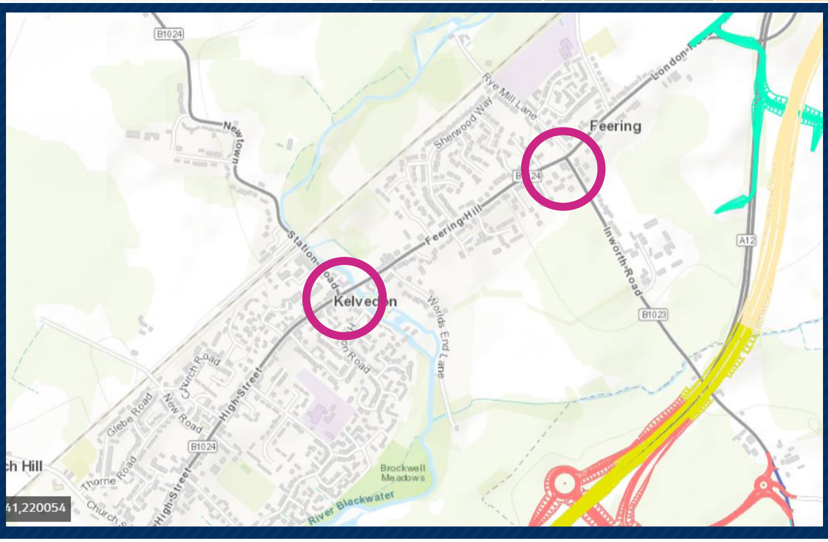
Overall results for local road junctions

- *Junction model results for 2027 and 2042, for:*
  - *Station Road / Feering Hill / High Street (Kelvedon)*
  - *Feering Hill / Inworth Road (Feering)*

Junction	Max RFC									
	2019 Base		*2027 DM*		*2027 DS*		*2042 DM*		*2042 DS*	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
B1023 Inworth Road/ B1024 Feering Hill (Kelvedon)	1.15	0.96	1.46	1.45	0.83	1.18	1.74	1.76	1.12	1.44
B1024 Station Road/ B1024 High Street (Kelvedon)	0.69	0.40	0.91	0.81	0.58	0.67	1.01	0.93	0.64	0.74



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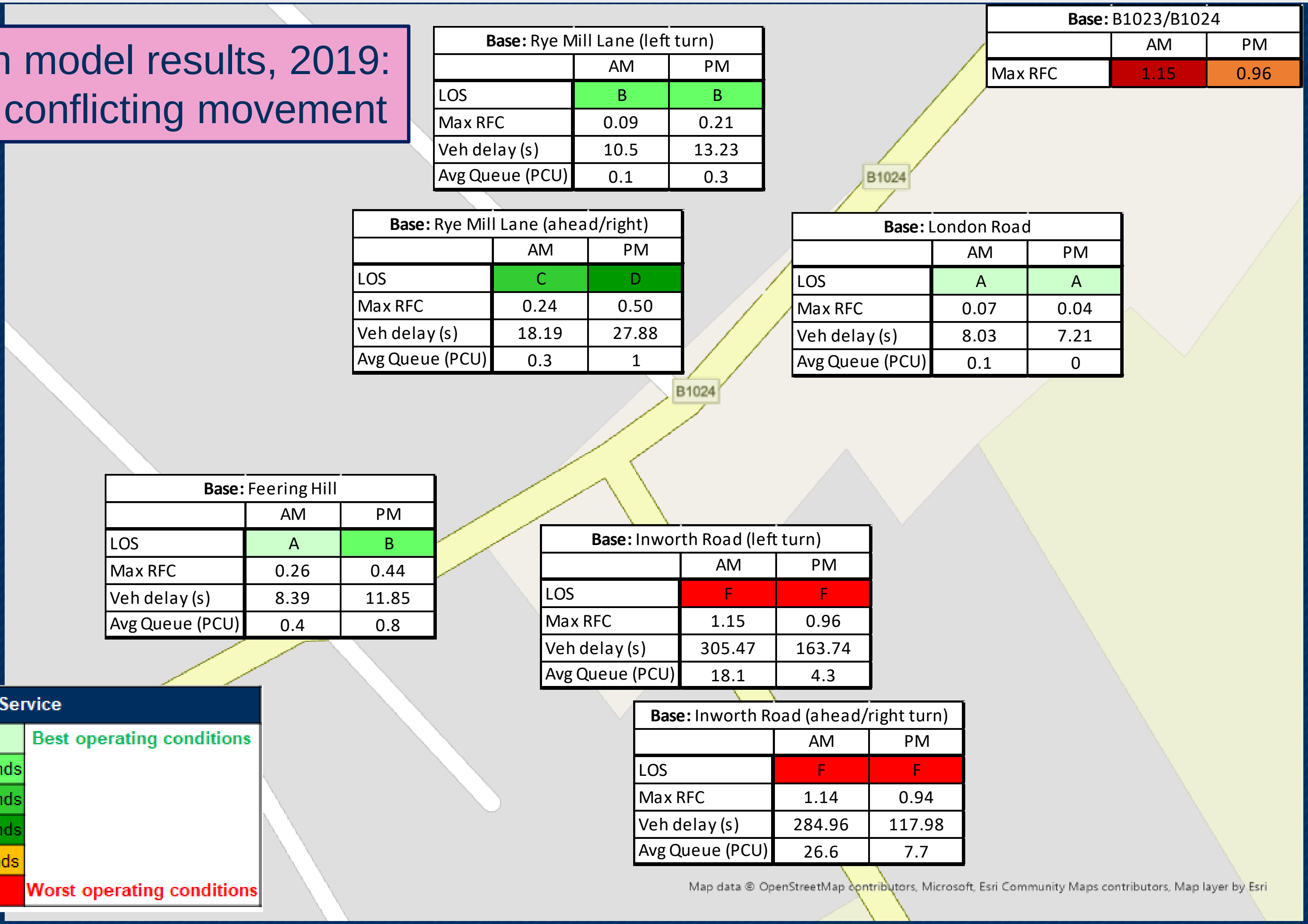
Feering Hill / Inworth Road junction results

- *Junction model results for 2027 and 2042, for:*
    - *Feering Hill / Inworth Road (Feering)*

PICADY junction model results, 2019: performance by conflicting movement



Base: Rye Mill Lane (left turn)		
	AM	PM
LOS	B	B
Max RFC	0.09	0.21
Veh delay (s)	10.5	13.23
Avg Queue (PCU)	0.1	0.3

Base: B1023/B1024		
	AM	PM
Max RFC	1.15	0.96

Base: Rye Mill Lane (ahead/right)		
	AM	PM
LOS	C	D
Max RFC	0.24	0.50
Veh delay (s)	18.19	27.88
Avg Queue (PCU)	0.3	1

Base: London Road		
	AM	PM
LOS	A	A
Max RFC	0.07	0.04
Veh delay (s)	8.03	7.21
Avg Queue (PCU)	0.1	0

Base: Feering Hill		
	AM	PM
LOS	A	B
Max RFC	0.26	0.44
Veh delay (s)	8.39	11.85
Avg Queue (PCU)	0.4	0.8

Base: Inworth Road (left turn)		
	AM	PM
LOS	F	F
Max RFC	1.15	0.96
Veh delay (s)	305.47	163.74
Avg Queue (PCU)	18.1	4.3

Base: Inworth Road (ahead/right turn)		
	AM	PM
LOS	F	F
Max RFC	1.14	0.94
Veh delay (s)	284.96	117.98
Avg Queue (PCU)	26.6	7.7

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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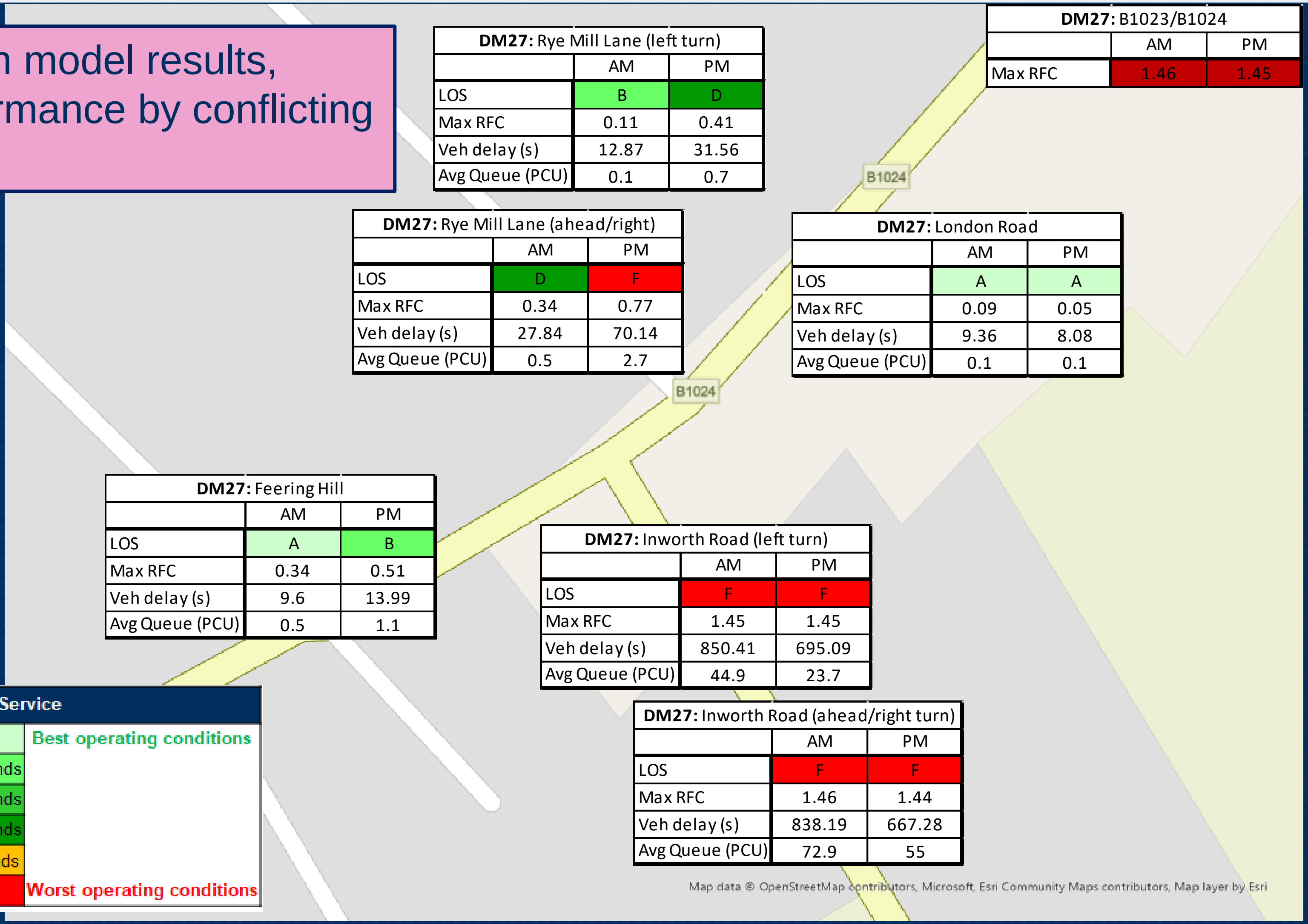
Feering Hill / Inworth Road junction results

- *Junction model results for 2027 and 2042, for:*
  - *Feering Hill / Inworth Road (Feering)*

PICADY junction model results, DM 2027: performance by conflicting movement



DM27: Rye Mill Lane (left turn)		
	AM	PM
LOS	B	D
Max RFC	0.11	0.41
Veh delay (s)	12.87	31.56
Avg Queue (PCU)	0.1	0.7

DM27: B1023/B1024		
	AM	PM
Max RFC	1.46	1.45

DM27: Rye Mill Lane (ahead/right)		
	AM	PM
LOS	D	F
Max RFC	0.34	0.77
Veh delay (s)	27.84	70.14
Avg Queue (PCU)	0.5	2.7

DM27: London Road		
	AM	PM
LOS	A	A
Max RFC	0.09	0.05
Veh delay (s)	9.36	8.08
Avg Queue (PCU)	0.1	0.1

DM27: Feering Hill		
	AM	PM
LOS	A	B
Max RFC	0.34	0.51
Veh delay (s)	9.6	13.99
Avg Queue (PCU)	0.5	1.1

DM27: Inworth Road (left turn)		
	AM	PM
LOS	F	F
Max RFC	1.45	1.45
Veh delay (s)	850.41	695.09
Avg Queue (PCU)	44.9	23.7

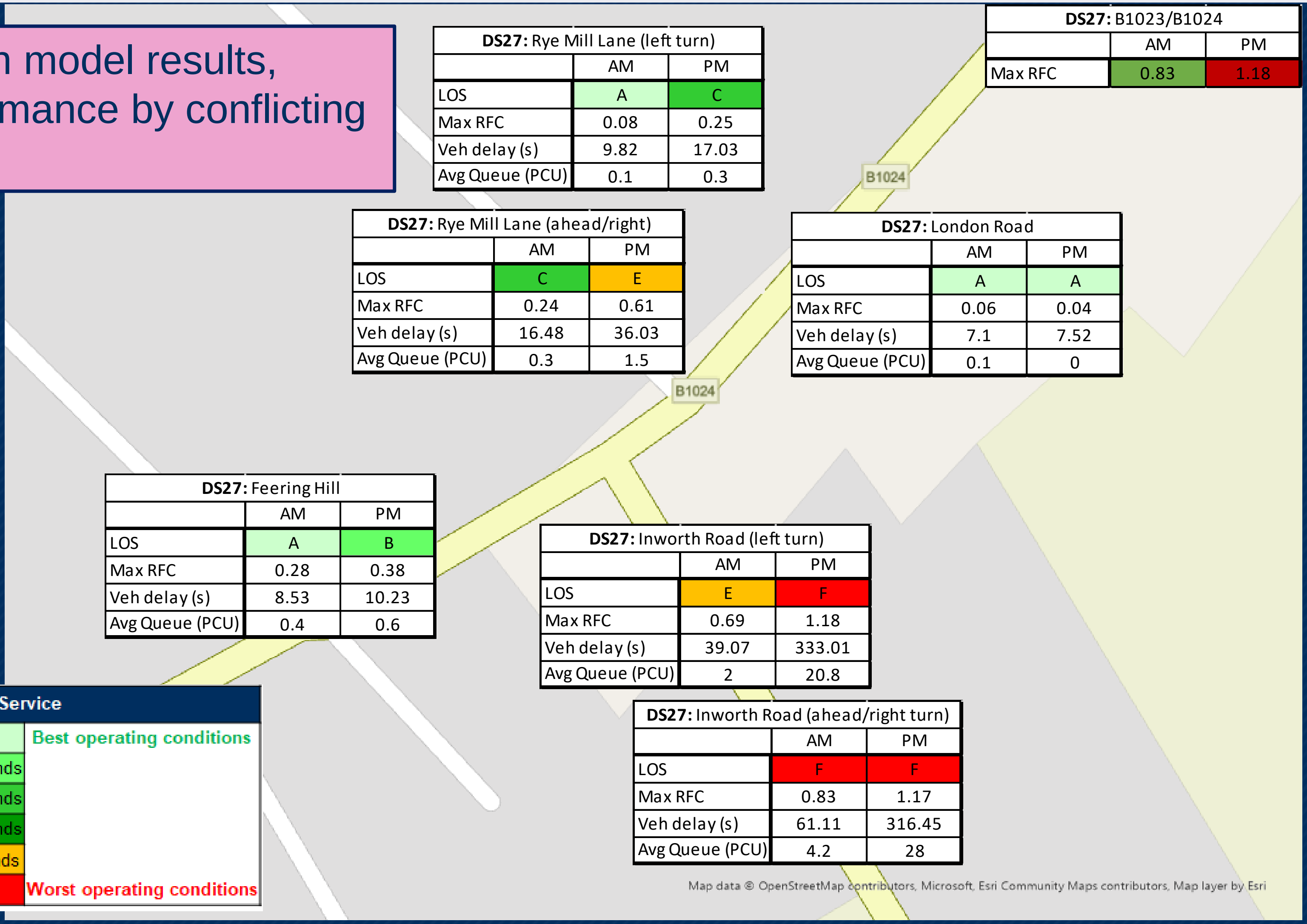
DM27: Inworth Road (ahead/right turn)		
	AM	PM
LOS	F	F
Max RFC	1.46	1.44
Veh delay (s)	838.19	667.28
Avg Queue (PCU)	72.9	55

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Feering Hill / Inworth Road junction results

- *Junction model results for 2027 and 2042, for:*
  - *Feering Hill / Inworth Road (Feering)*

PICADY junction model results, DS 2027: performance by conflicting movement



DS27: Rye Mill Lane (left turn)	AM	PM
LOS	A	C
Max RFC	0.08	0.25
Veh delay (s)	9.82	17.03
Avg Queue (PCU)	0.1	0.3

DS27: B1023/B1024	AM	PM
Max RFC	0.83	1.18

DS27: Rye Mill Lane (ahead/right)	AM	PM
LOS	C	E
Max RFC	0.24	0.61
Veh delay (s)	16.48	36.03
Avg Queue (PCU)	0.3	1.5

DS27: London Road	AM	PM
LOS	A	A
Max RFC	0.06	0.04
Veh delay (s)	7.1	7.52
Avg Queue (PCU)	0.1	0

DS27: Feering Hill	AM	PM
LOS	A	B
Max RFC	0.28	0.38
Veh delay (s)	8.53	10.23
Avg Queue (PCU)	0.4	0.6

DS27: Inworth Road (left turn)	AM	PM
LOS	E	F
Max RFC	0.69	1.18
Veh delay (s)	39.07	333.01
Avg Queue (PCU)	2	20.8

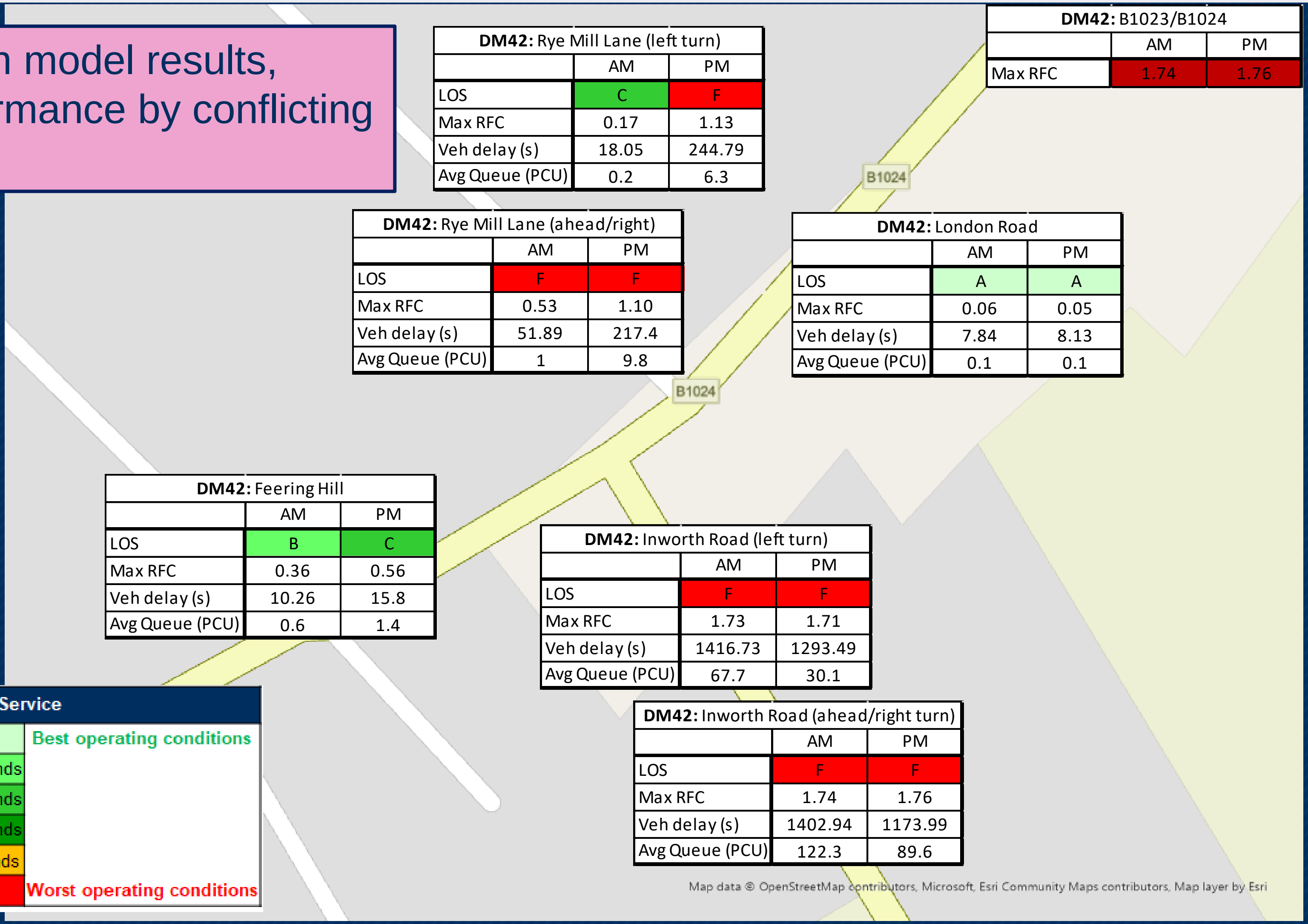
DS27: Inworth Road (ahead/right turn)	AM	PM
LOS	F	F
Max RFC	0.83	1.17
Veh delay (s)	61.11	316.45
Avg Queue (PCU)	4.2	28

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Feering Hill / Inworth Road junction results

- *Junction model results for 2027 and 2042, for:*
  - *Feering Hill / Inworth Road (Feering)*

PICADY junction model results, DM 2042: performance by conflicting movement



DM42: Rye Mill Lane (left turn)		
	AM	PM
LOS	C	F
Max RFC	0.17	1.13
Veh delay (s)	18.05	244.79
Avg Queue (PCU)	0.2	6.3

DM42: B1023/B1024		
	AM	PM
Max RFC	1.74	1.76

DM42: Rye Mill Lane (ahead/right)		
	AM	PM
LOS	F	F
Max RFC	0.53	1.10
Veh delay (s)	51.89	217.4
Avg Queue (PCU)	1	9.8

DM42: London Road		
	AM	PM
LOS	A	A
Max RFC	0.06	0.05
Veh delay (s)	7.84	8.13
Avg Queue (PCU)	0.1	0.1

DM42: Feering Hill		
	AM	PM
LOS	B	C
Max RFC	0.36	0.56
Veh delay (s)	10.26	15.8
Avg Queue (PCU)	0.6	1.4

DM42: Inworth Road (left turn)		
	AM	PM
LOS	F	F
Max RFC	1.73	1.71
Veh delay (s)	1416.73	1293.49
Avg Queue (PCU)	67.7	30.1

DM42: Inworth Road (ahead/right turn)		
	AM	PM
LOS	F	F
Max RFC	1.74	1.76
Veh delay (s)	1402.94	1173.99
Avg Queue (PCU)	122.3	89.6

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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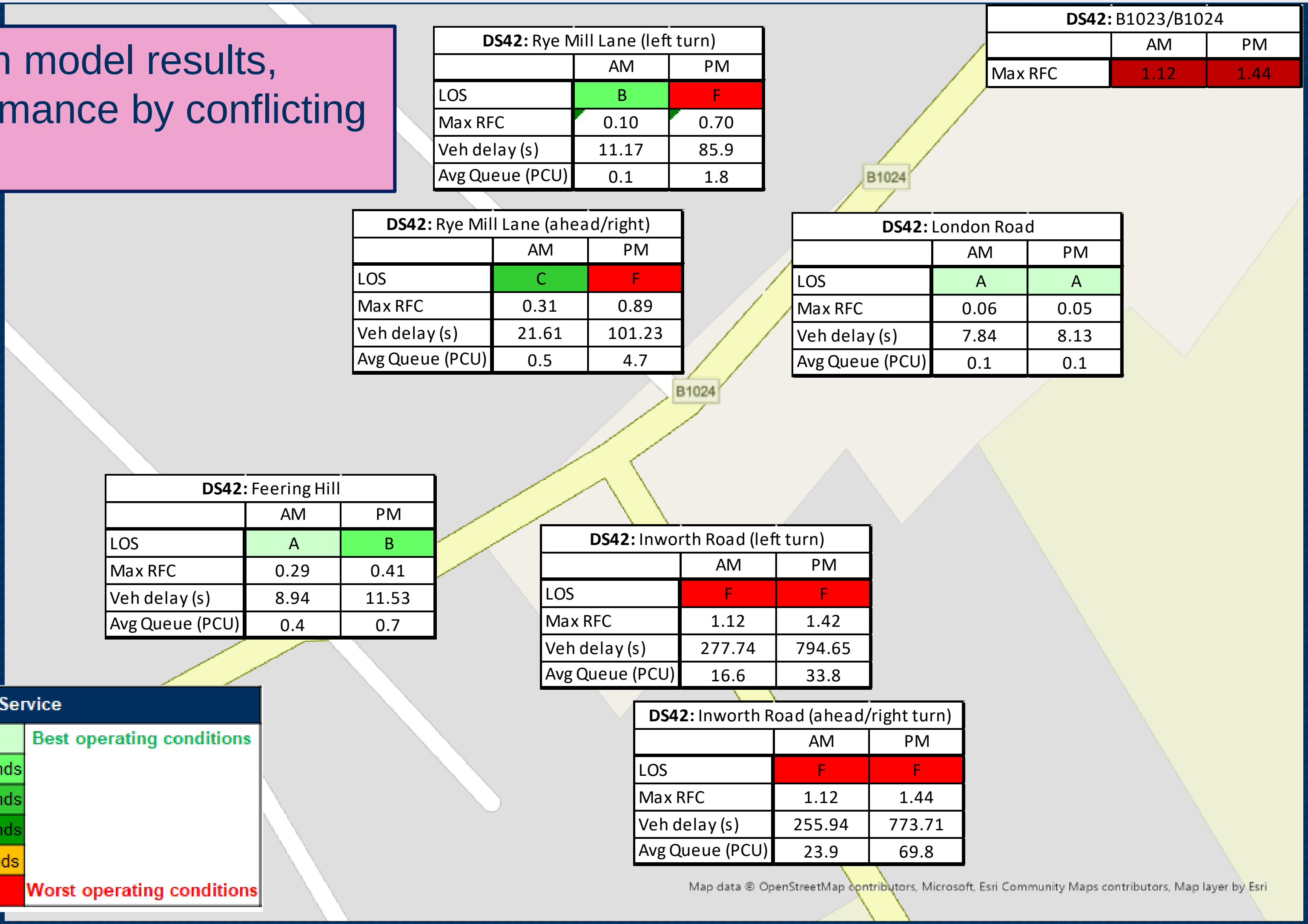
Feering Hill / Inworth Road junction results

- *Junction model results for 2027 and 2042, for:*
  - *Feering Hill / Inworth Road (Feering)*

PICADY junction model results, DS 2042: performance by conflicting movement



DS42: B1023/B1024		
	AM	PM
Max RFC	1.12	1.44

DS42: Rye Mill Lane (left turn)		
	AM	PM
LOS	B	F
Max RFC	0.10	0.70
Veh delay (s)	11.17	85.9
Avg Queue (PCU)	0.1	1.8

DS42: Rye Mill Lane (ahead/right)		
	AM	PM
LOS	C	F
Max RFC	0.31	0.89
Veh delay (s)	21.61	101.23
Avg Queue (PCU)	0.5	4.7

DS42: London Road		
	AM	PM
LOS	A	A
Max RFC	0.06	0.05
Veh delay (s)	7.84	8.13
Avg Queue (PCU)	0.1	0.1

DS42: Feering Hill		
	AM	PM
LOS	A	B
Max RFC	0.29	0.41
Veh delay (s)	8.94	11.53
Avg Queue (PCU)	0.4	0.7

DS42: Inworth Road (left turn)		
	AM	PM
LOS	F	F
Max RFC	1.12	1.42
Veh delay (s)	277.74	794.65
Avg Queue (PCU)	16.6	33.8

DS42: Inworth Road (ahead/right turn)		
	AM	PM
LOS	F	F
Max RFC	1.12	1.44
Veh delay (s)	255.94	773.71
Avg Queue (PCU)	23.9	69.8

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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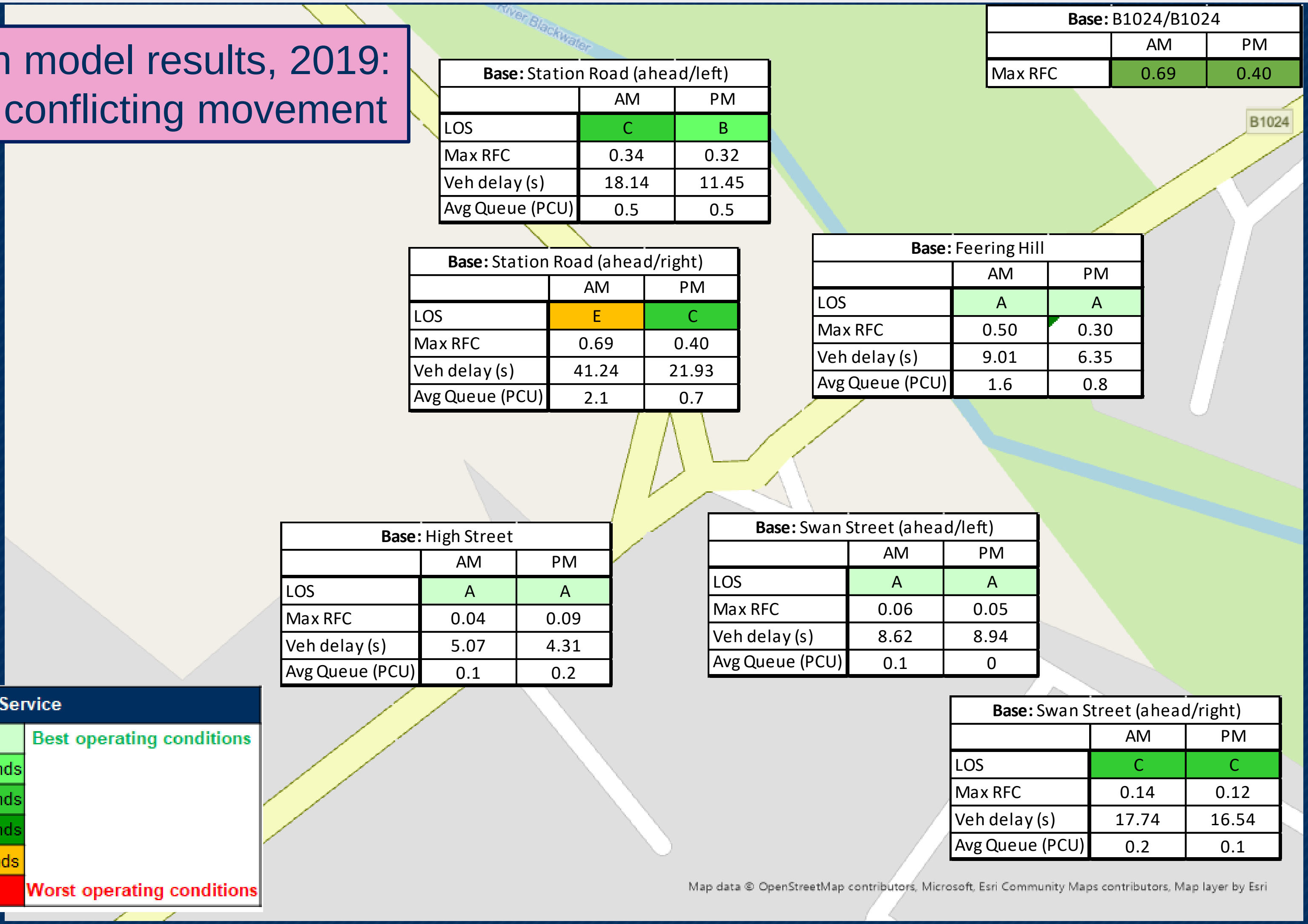
Station Road Kelvedon junction results

- *Junction model results for 2027 and 2042, for:*
    - *Station Road / Feering Hill / High Street (Kelvedon)*

PICADY junction model results, 2019: performance by conflicting movement



Base: B1024/B1024	AM	PM
Max RFC	0.69	0.40

Base: Station Road (ahead/left)	AM	PM
LOS	C	B
Max RFC	0.34	0.32
Veh delay (s)	18.14	11.45
Avg Queue (PCU)	0.5	0.5

Base: Station Road (ahead/right)	AM	PM
LOS	E	C
Max RFC	0.69	0.40
Veh delay (s)	41.24	21.93
Avg Queue (PCU)	2.1	0.7

Base: Feering Hill	AM	PM
LOS	A	A
Max RFC	0.50	0.30
Veh delay (s)	9.01	6.35
Avg Queue (PCU)	1.6	0.8

Base: High Street	AM	PM
LOS	A	A
Max RFC	0.04	0.09
Veh delay (s)	5.07	4.31
Avg Queue (PCU)	0.1	0.2

Base: Swan Street (ahead/left)	AM	PM
LOS	A	A
Max RFC	0.06	0.05
Veh delay (s)	8.62	8.94
Avg Queue (PCU)	0.1	0

Base: Swan Street (ahead/right)	AM	PM
LOS	C	C
Max RFC	0.14	0.12
Veh delay (s)	17.74	16.54
Avg Queue (PCU)	0.2	0.1

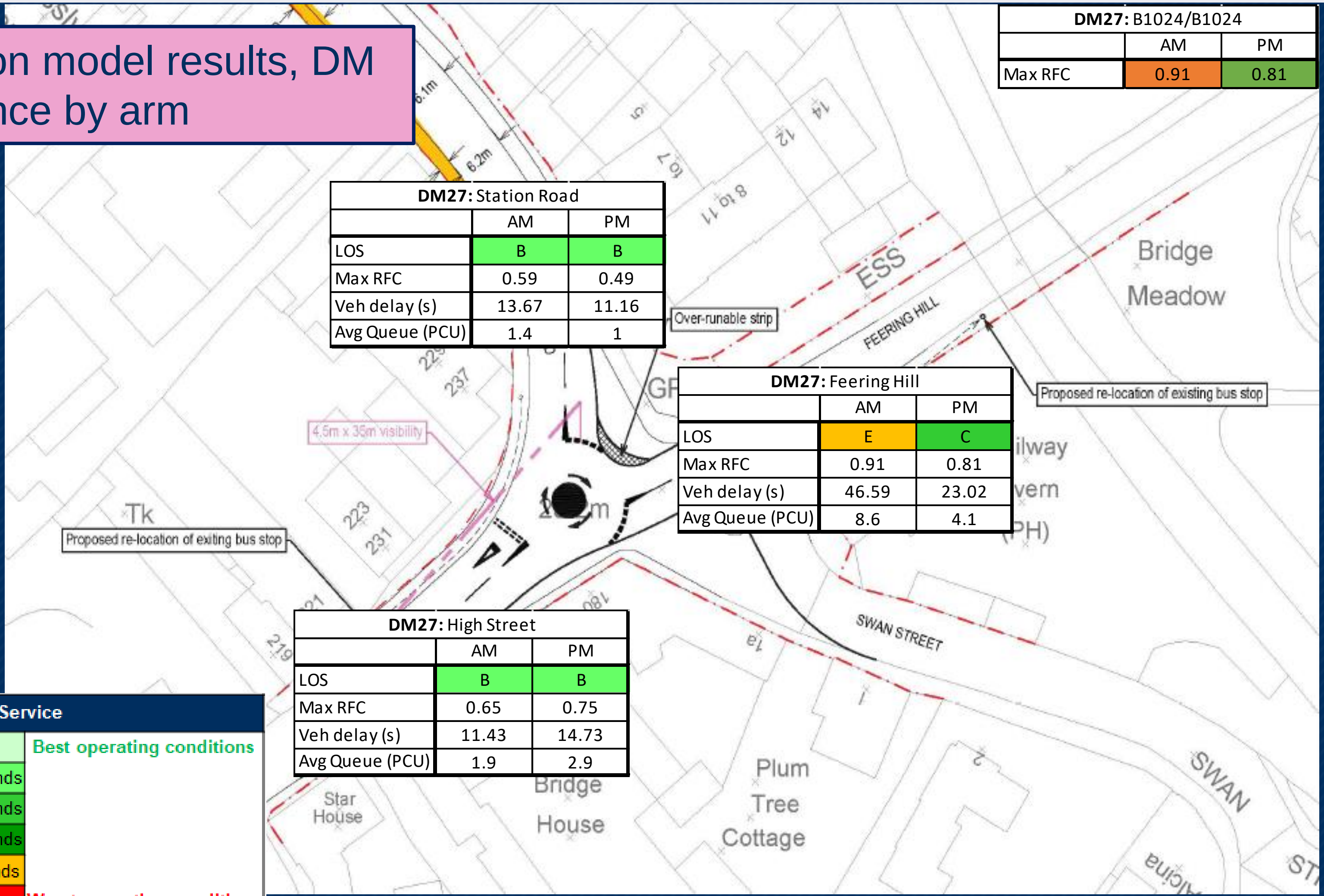
Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Station Road Kelvedon junction results

- *Junction model results for 2027 and 2042, for:*
  - *Station Road / Feering Hill / High Street (Kelvedon)*

ARCADY junction model results, DM 2027: performance by arm



DM27: B1024/B1024	AM	PM
Max RFC	0.91	0.81

DM27: Station Road	AM	PM
LOS	B	B
Max RFC	0.59	0.49
Veh delay (s)	13.67	11.16
Avg Queue (PCU)	1.4	1

DM27: Feering Hill	AM	PM
LOS	E	C
Max RFC	0.91	0.81
Veh delay (s)	46.59	23.02
Avg Queue (PCU)	8.6	4.1

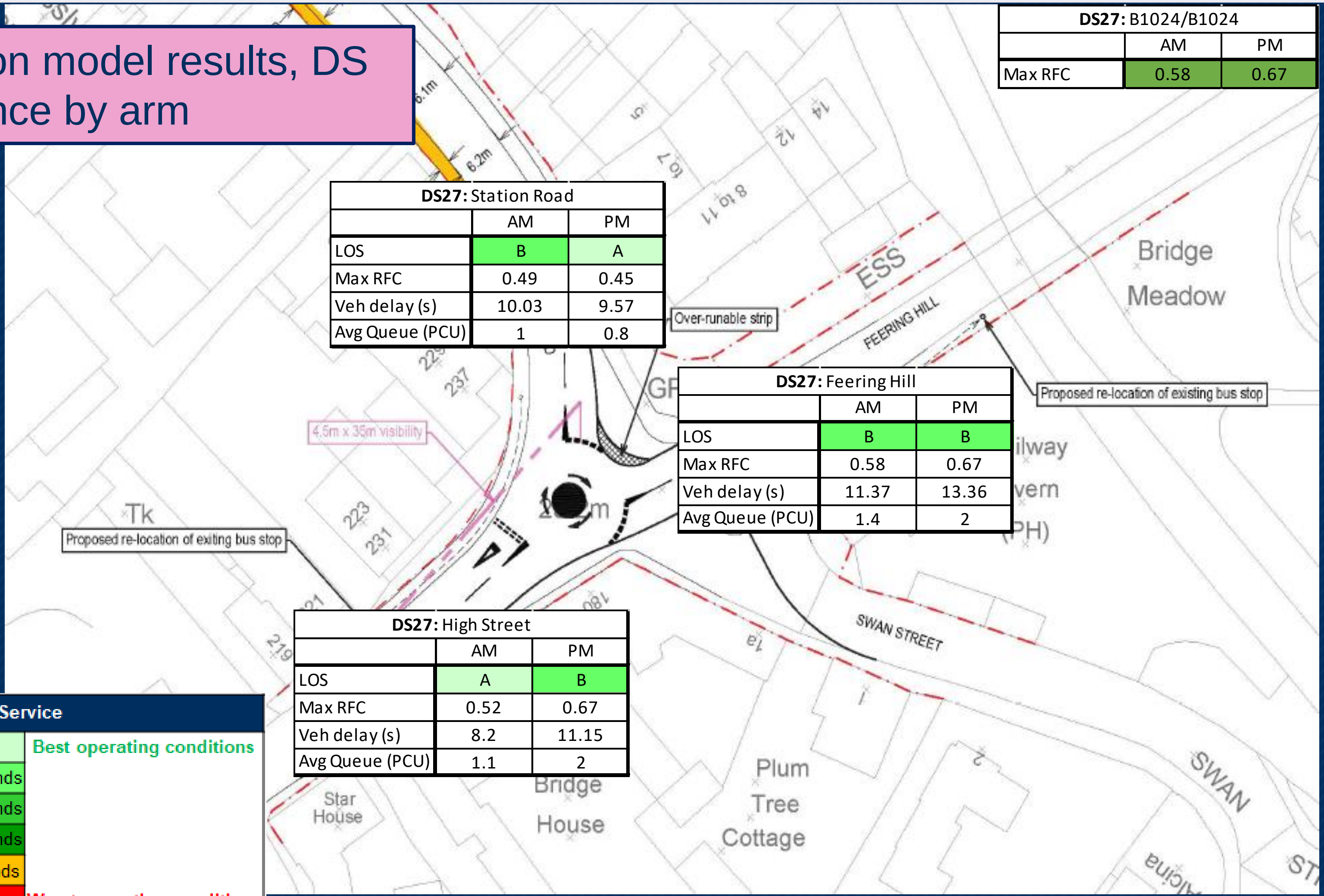
DM27: High Street	AM	PM
LOS	B	B
Max RFC	0.65	0.75
Veh delay (s)	11.43	14.73
Avg Queue (PCU)	1.9	2.9

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Station Road Kelvedon junction results

- *Junction model results for 2027 and 2042, for:*
  - *Station Road / Feering Hill / High Street (Kelvedon)*

ARCADY junction model results, DS 2027: performance by arm



DS27: B1024/B1024	AM	PM
Max RFC	0.58	0.67

DS27: Station Road	AM	PM
LOS	B	A
Max RFC	0.49	0.45
Veh delay (s)	10.03	9.57
Avg Queue (PCU)	1	0.8

DS27: Feering Hill	AM	PM
LOS	B	B
Max RFC	0.58	0.67
Veh delay (s)	11.37	13.36
Avg Queue (PCU)	1.4	2

DS27: High Street	AM	PM
LOS	A	B
Max RFC	0.52	0.67
Veh delay (s)	8.2	11.15
Avg Queue (PCU)	1.1	2

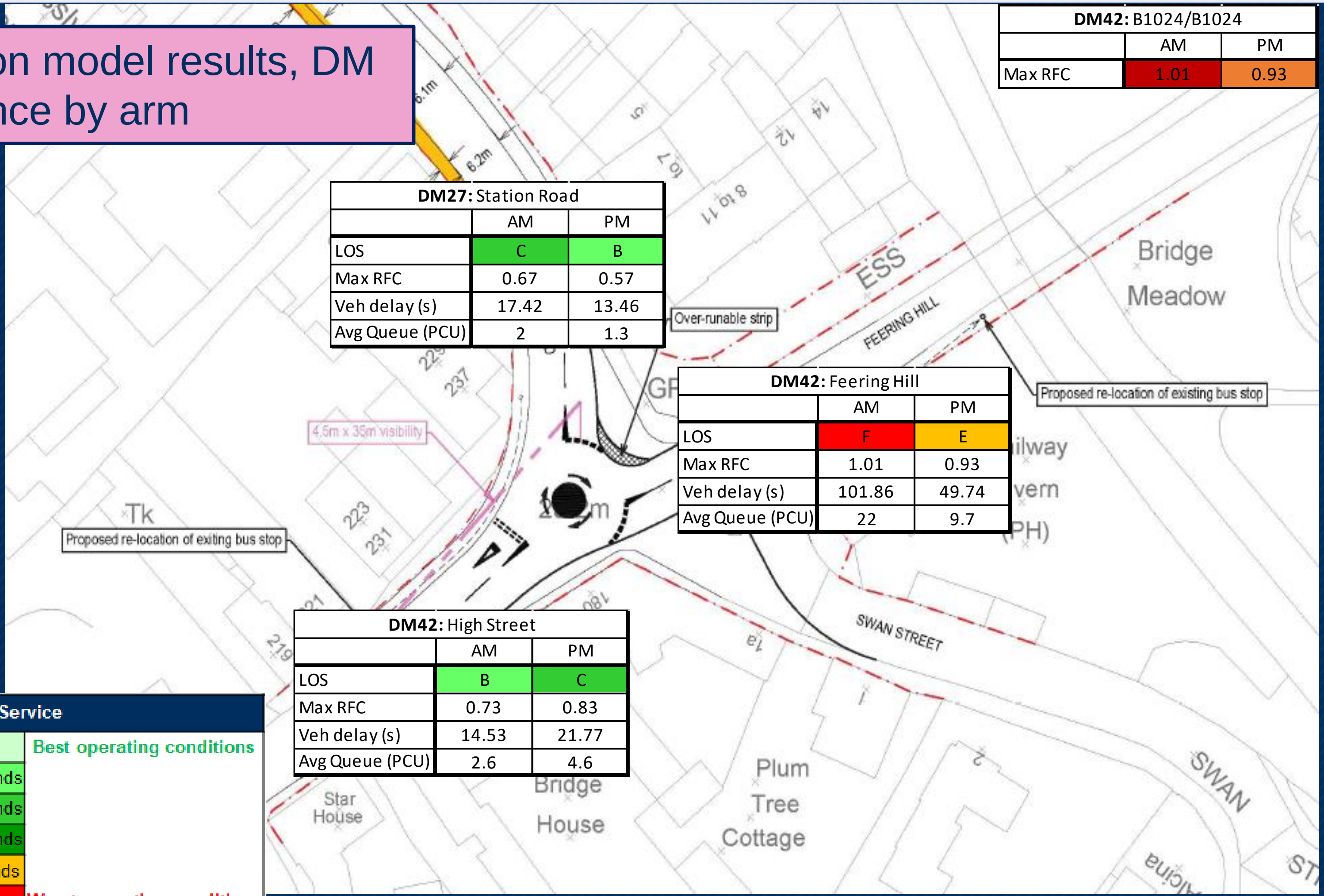
Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Station Road Kelvedon junction results

- *Junction model results for 2027 and 2042, for:*
    - *Station Road / Feering Hill / High Street (Kelvedon)*

ARCADY junction model results, DM 2042: performance by arm



DM42: B1024/B1024	AM	PM
Max RFC	1.01	0.93

DM27: Station Road	AM	PM
LOS	C	B
Max RFC	0.67	0.57
Veh delay (s)	17.42	13.46
Avg Queue (PCU)	2	1.3

DM42: Feering Hill	AM	PM
LOS	F	E
Max RFC	1.01	0.93
Veh delay (s)	101.86	49.74
Avg Queue (PCU)	22	9.7

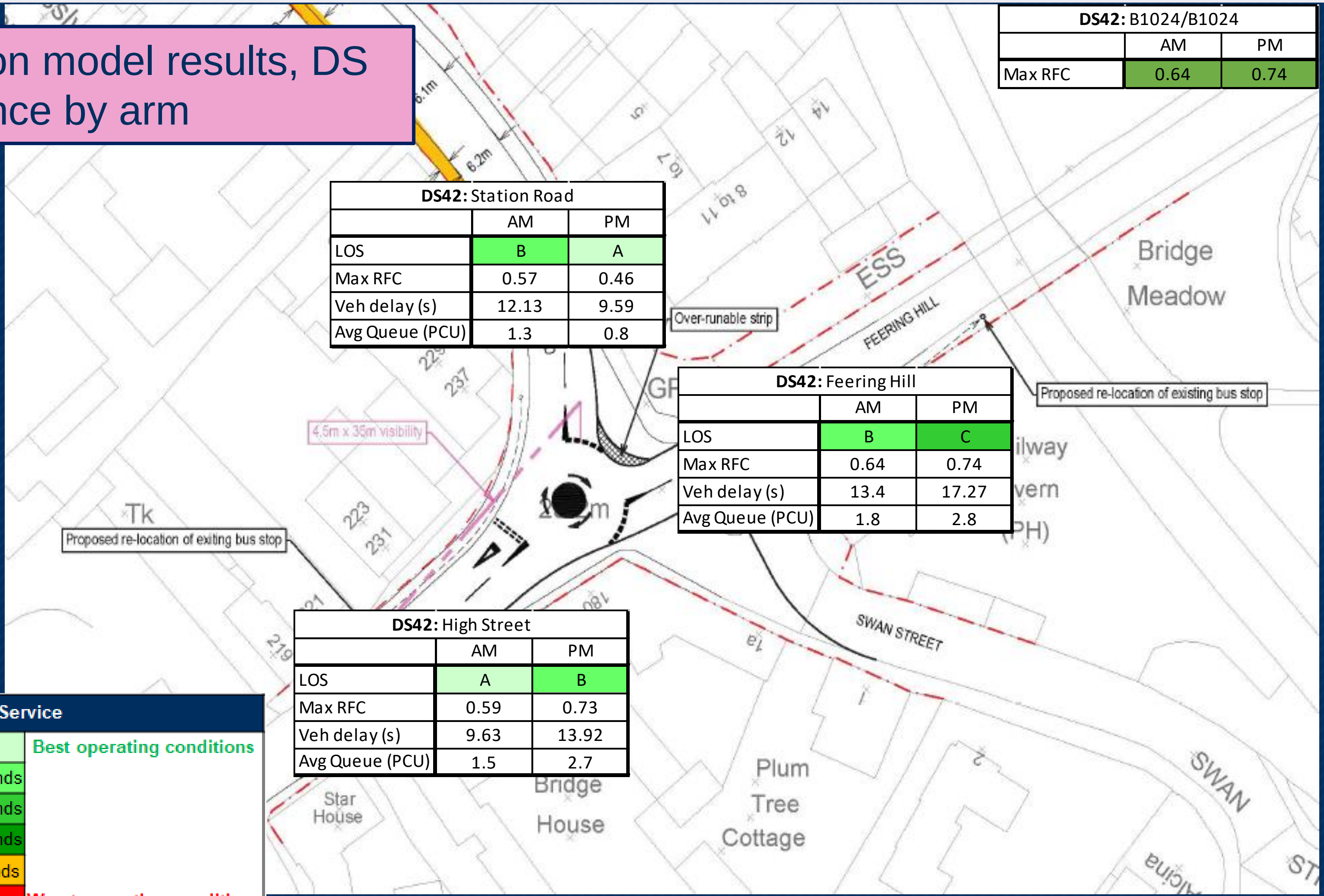
DM42: High Street	AM	PM
LOS	B	C
Max RFC	0.73	0.83
Veh delay (s)	14.53	21.77
Avg Queue (PCU)	2.6	4.6

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Station Road Kelvedon junction results

- *Junction model results for 2027 and 2042, for:*
  - *Station Road / Feering Hill / High Street (Kelvedon)*

ARCADY junction model results, DS 2042: performance by arm



DS42: B1024/B1024	AM	PM
Max RFC	0.64	0.74

DS42: Station Road	AM	PM
LOS	B	A
Max RFC	0.57	0.46
Veh delay (s)	12.13	9.59
Avg Queue (PCU)	1.3	0.8

DS42: Feering Hill	AM	PM
LOS	B	C
Max RFC	0.64	0.74
Veh delay (s)	13.4	17.27
Avg Queue (PCU)	1.8	2.8

DS42: High Street	AM	PM
LOS	A	B
Max RFC	0.59	0.73
Veh delay (s)	9.63	13.92
Avg Queue (PCU)	1.5	2.7

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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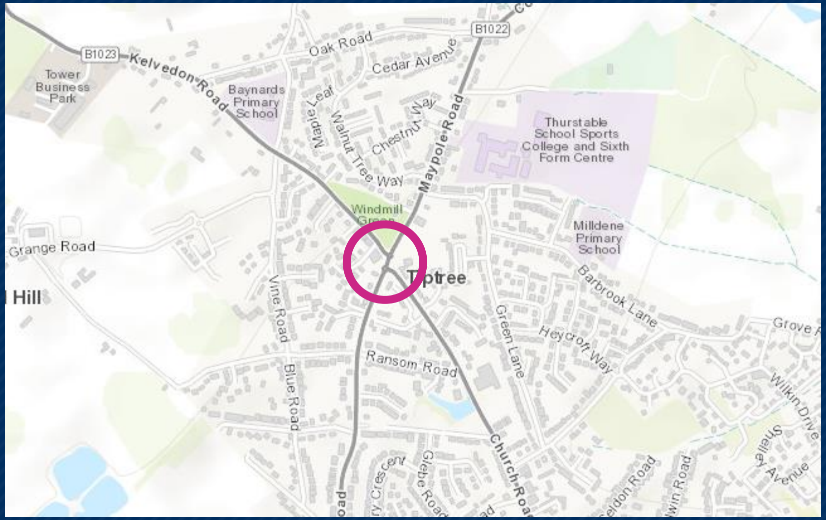
Tiptree double-mini roundabout junction results

- *Junction model results for 2019, 2027 and 2042, for:*
    - *Maldon Road / Kelvedon Road / Church Road (Tiptree)*

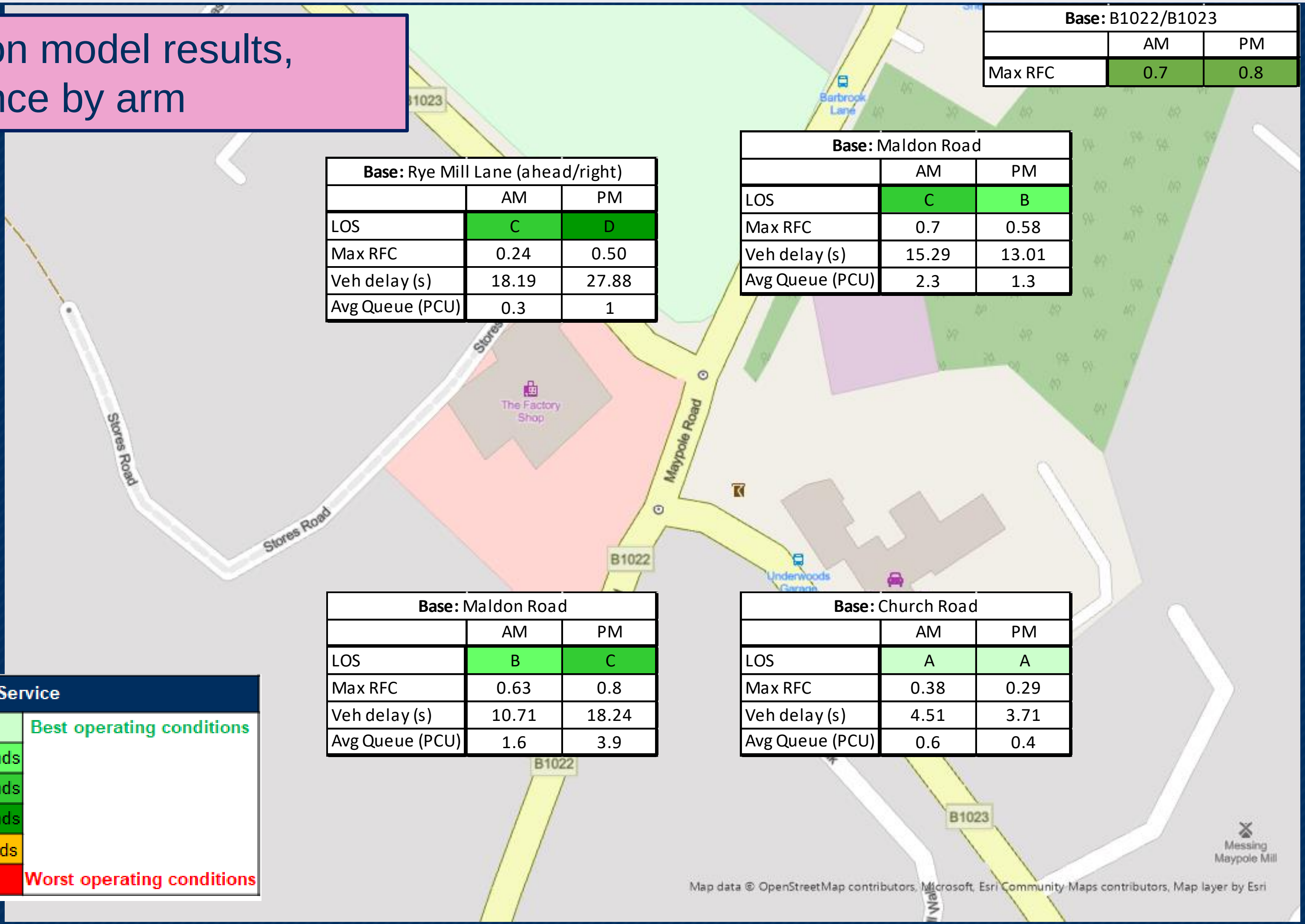
ARCADY	**Max RFC**									
	2019 Base		*2027 DM*		*2027 DS*		*2042 DM*		*2042 DS*	
Junction	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
B1022 / B1023 (Tiptree)	0.70	0.80	0.72	0.94	0.66	0.93	0.79	1.04	0.68	1.03



Tiptree double-mini roundabout junction results

- *Junction model results for 2019, 2027 and 2042, for:*
  - *Maldon Road / Kelvedon Road / Church Road (Tiptree)*

ARCADY junction model results, 2019: performance by arm



Base: B1022/B1023	AM	PM
Max RFC	0.7	0.8

Base: Rye Mill Lane (ahead/right)	AM	PM
LOS	C	D
Max RFC	0.24	0.50
Veh delay (s)	18.19	27.88
Avg Queue (PCU)	0.3	1

Base: Maldon Road	AM	PM
LOS	C	B
Max RFC	0.7	0.58
Veh delay (s)	15.29	13.01
Avg Queue (PCU)	2.3	1.3

Base: Maldon Road	AM	PM
LOS	B	C
Max RFC	0.63	0.8
Veh delay (s)	10.71	18.24
Avg Queue (PCU)	1.6	3.9

Base: Church Road	AM	PM
LOS	A	A
Max RFC	0.38	0.29
Veh delay (s)	4.51	3.71
Avg Queue (PCU)	0.6	0.4

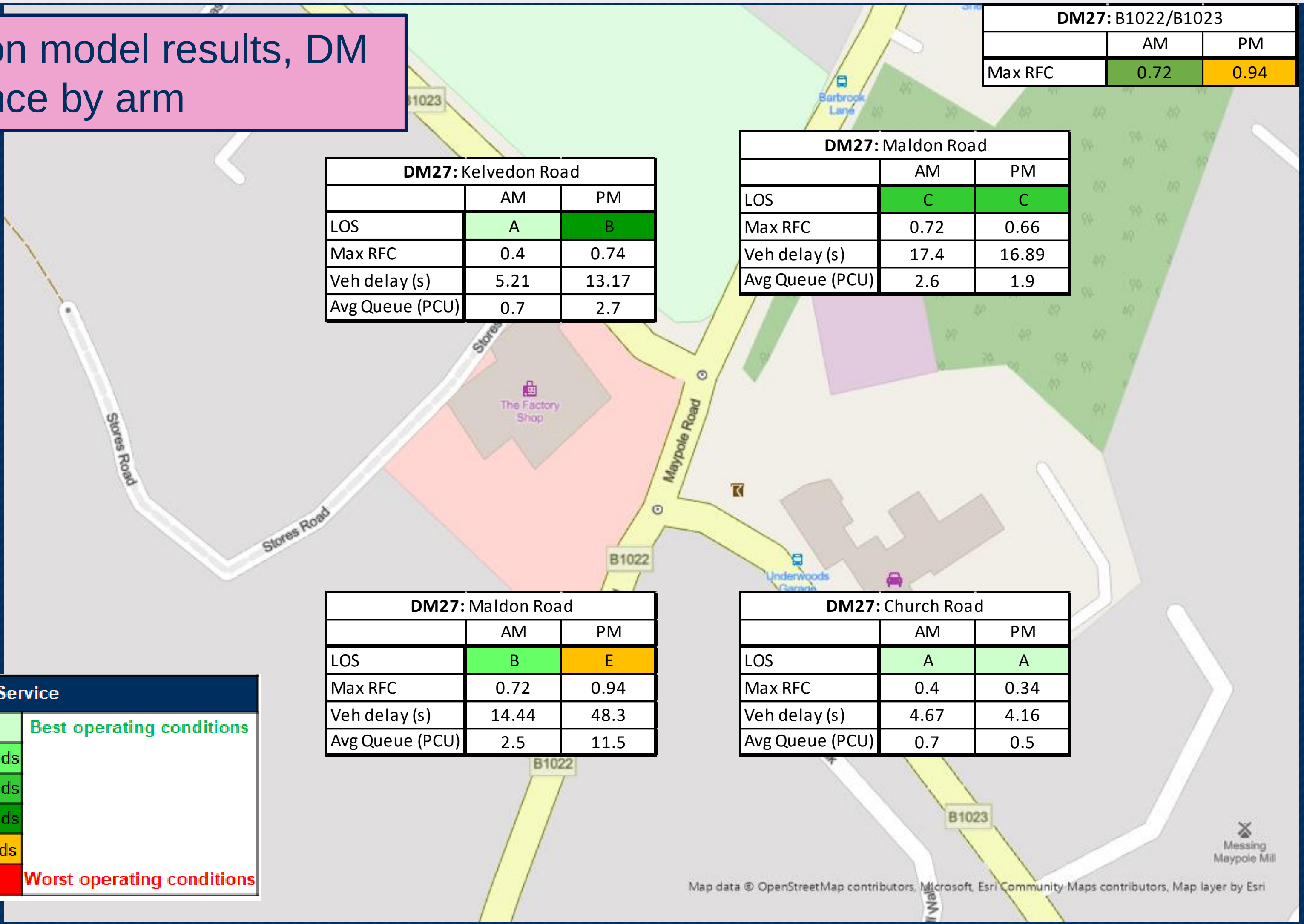
Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Tiptree double-mini roundabout junction results

- *Junction model results for 2019, 2027 and 2042, for:*
  - *Maldon Road / Kelvedon Road / Church Road (Tiptree)*

ARCADY junction model results, DM 2027: performance by arm



DM27: B1022/B1023	AM	PM
Max RFC	0.72	0.94

DM27: Kelvedon Road	AM	PM
LOS	A	B
Max RFC	0.4	0.74
Veh delay (s)	5.21	13.17
Avg Queue (PCU)	0.7	2.7

DM27: Maldon Road	AM	PM
LOS	C	C
Max RFC	0.72	0.66
Veh delay (s)	17.4	16.89
Avg Queue (PCU)	2.6	1.9

DM27: Maldon Road	AM	PM
LOS	B	E
Max RFC	0.72	0.94
Veh delay (s)	14.44	48.3
Avg Queue (PCU)	2.5	11.5

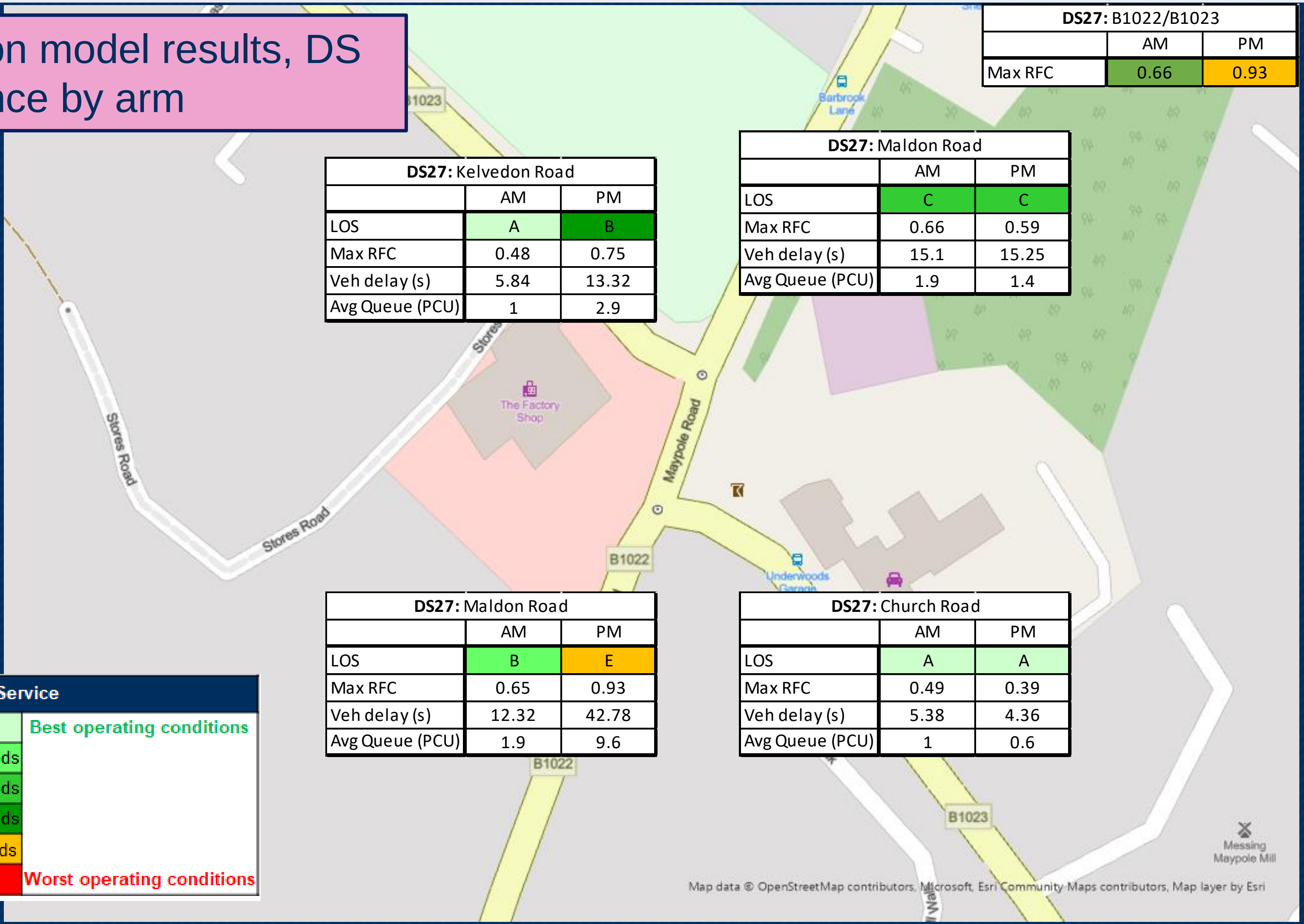
DM27: Church Road	AM	PM
LOS	A	A
Max RFC	0.4	0.34
Veh delay (s)	4.67	4.16
Avg Queue (PCU)	0.7	0.5

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Tiptree double-mini roundabout junction results

- *Junction model results for 2019, 2027 and 2042, for:*
  - *Maldon Road / Kelvedon Road / Church Road (Tiptree)*

ARCADY junction model results, DS 2027: performance by arm



DS27: B1022/B1023		
	AM	PM
Max RFC	0.66	0.93

DS27: Kelvedon Road		
	AM	PM
LOS	A	B
Max RFC	0.48	0.75
Veh delay (s)	5.84	13.32
Avg Queue (PCU)	1	2.9

DS27: Maldon Road		
	AM	PM
LOS	C	C
Max RFC	0.66	0.59
Veh delay (s)	15.1	15.25
Avg Queue (PCU)	1.9	1.4

DS27: Maldon Road		
	AM	PM
LOS	B	E
Max RFC	0.65	0.93
Veh delay (s)	12.32	42.78
Avg Queue (PCU)	1.9	9.6

DS27: Church Road		
	AM	PM
LOS	A	A
Max RFC	0.49	0.39
Veh delay (s)	5.38	4.36
Avg Queue (PCU)	1	0.6

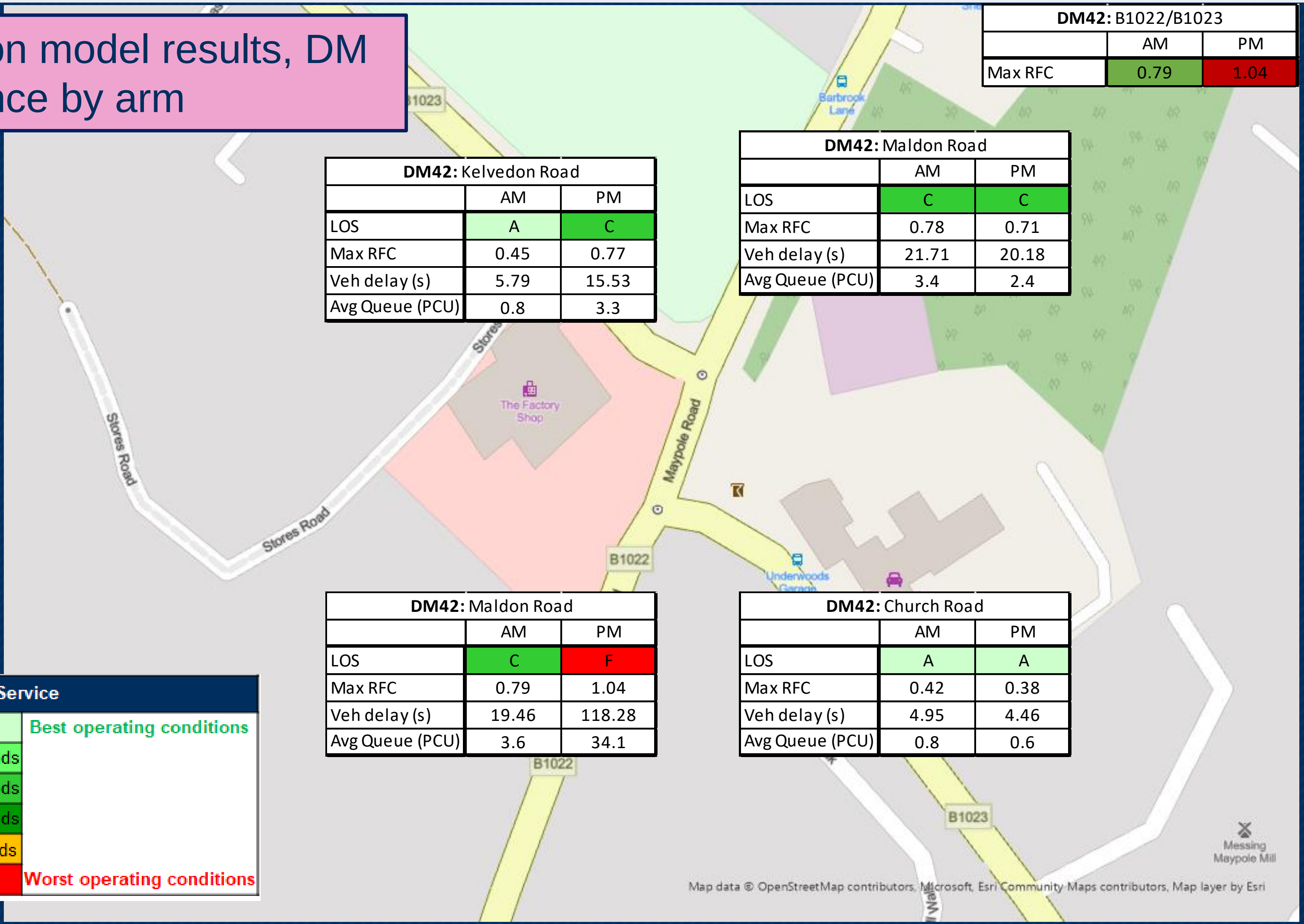
Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Tiptree double-mini roundabout junction results

- *Junction model results for 2019, 2027 and 2042, for:*
  - *Maldon Road / Kelvedon Road / Church Road (Tiptree)*

ARCADY junction model results, DM 2042: performance by arm



DM42: B1022/B1023	AM	PM
Max RFC	0.79	1.04

DM42: Kelvedon Road	AM	PM
LOS	A	C
Max RFC	0.45	0.77
Veh delay (s)	5.79	15.53
Avg Queue (PCU)	0.8	3.3

DM42: Maldon Road	AM	PM
LOS	C	C
Max RFC	0.78	0.71
Veh delay (s)	21.71	20.18
Avg Queue (PCU)	3.4	2.4

DM42: Maldon Road	AM	PM
LOS	C	F
Max RFC	0.79	1.04
Veh delay (s)	19.46	118.28
Avg Queue (PCU)	3.6	34.1

DM42: Church Road	AM	PM
LOS	A	A
Max RFC	0.42	0.38
Veh delay (s)	4.95	4.46
Avg Queue (PCU)	0.8	0.6

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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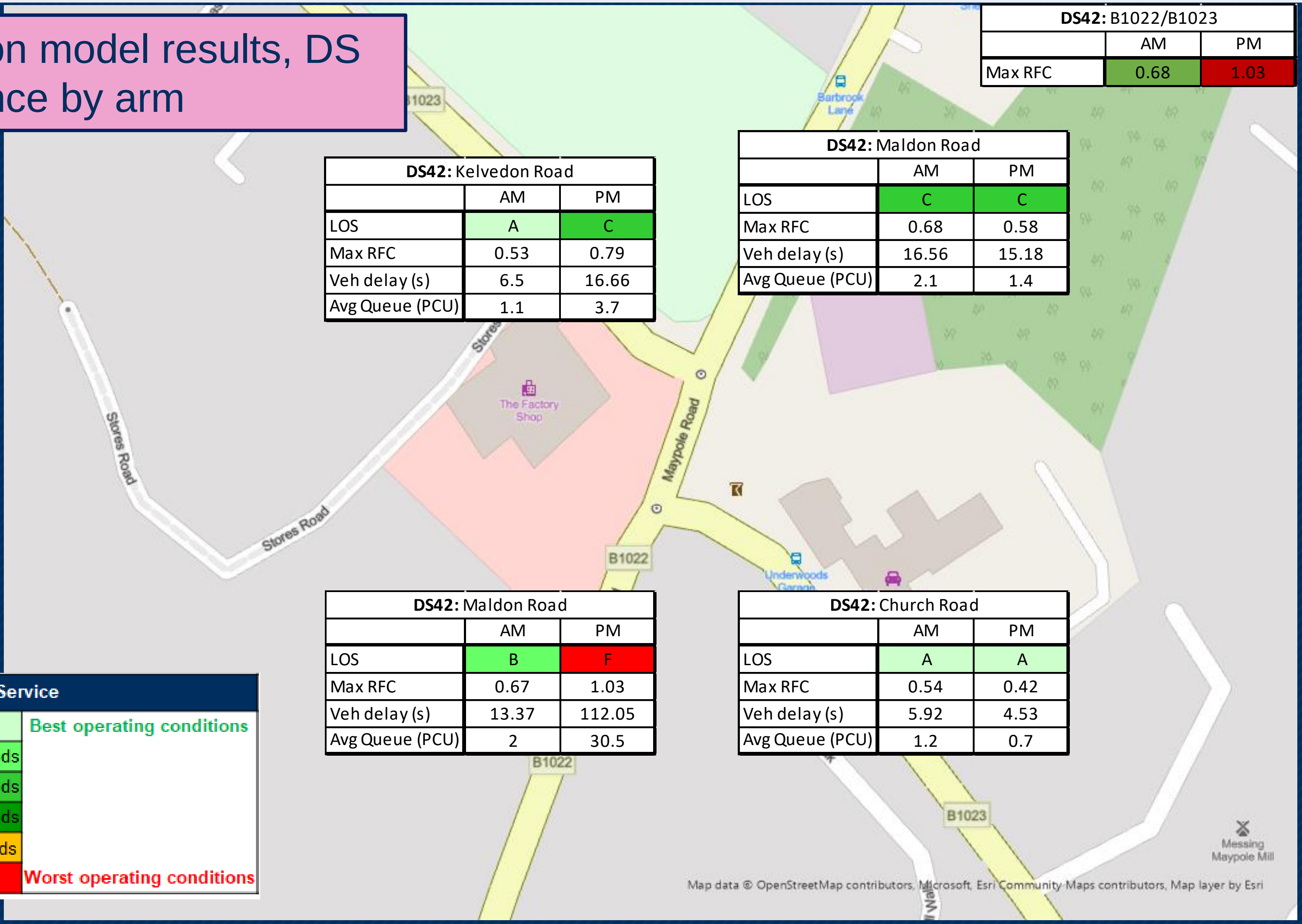
Tiptree double-mini roundabout junction results

- *Junction model results for 2019, 2027 and 2042, for:*
  - *Maldon Road / Kelvedon Road / Church Road (Tiptree)*

ARCADY junction model results, DS 2042: performance by arm



DS42: B1022/B1023	AM	PM
Max RFC	0.68	1.03

DS42: Kelvedon Road	AM	PM
LOS	A	C
Max RFC	0.53	0.79
Veh delay (s)	6.5	16.66
Avg Queue (PCU)	1.1	3.7

DS42: Maldon Road	AM	PM
LOS	C	C
Max RFC	0.68	0.58
Veh delay (s)	16.56	15.18
Avg Queue (PCU)	2.1	1.4

DS42: Maldon Road	AM	PM
LOS	B	F
Max RFC	0.67	1.03
Veh delay (s)	13.37	112.05
Avg Queue (PCU)	2	30.5

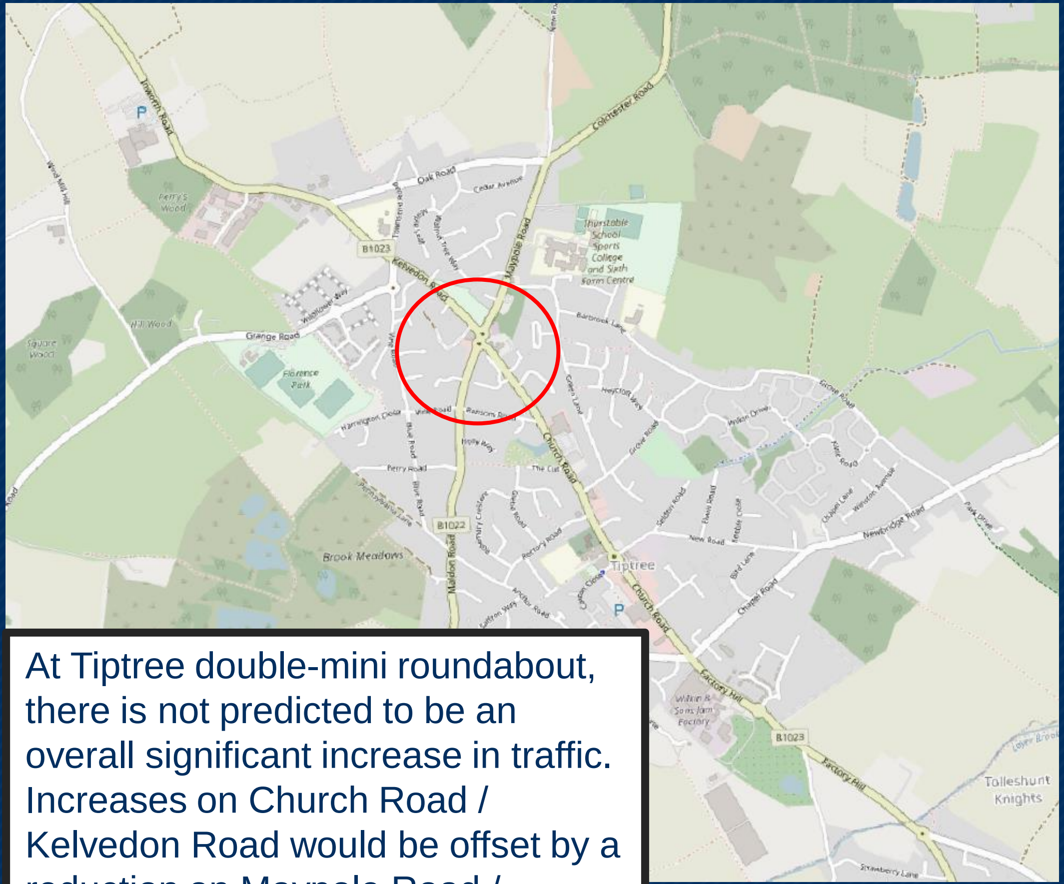
DS42: Church Road	AM	PM
LOS	A	A
Max RFC	0.54	0.42
Veh delay (s)	5.92	4.53
Avg Queue (PCU)	1.2	0.7

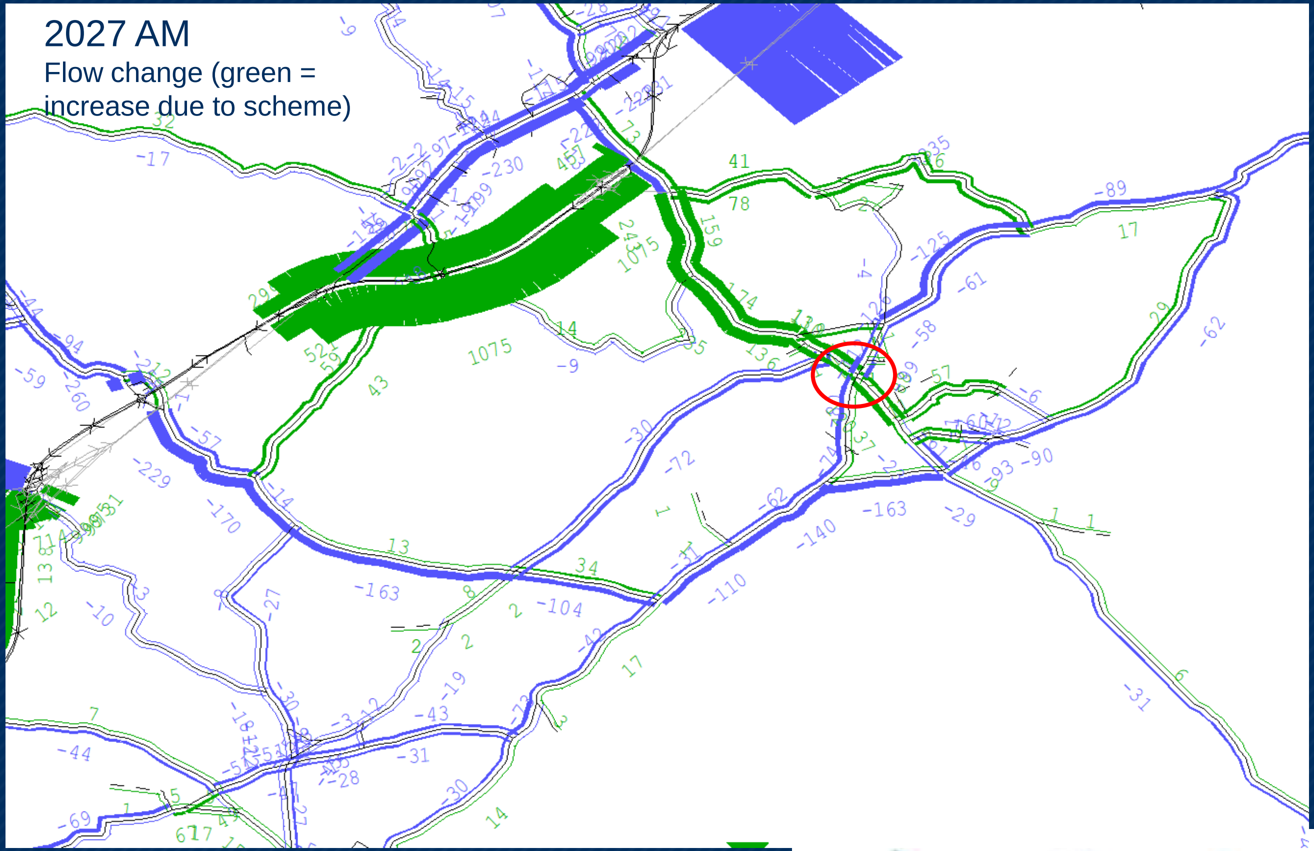
Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Tiptree double-mini roundabout flow changes

- *Modelled peak hour traffic flows for 2027 (with and without DCO scheme), on all approaches to:*
    - *Kelvedon Road / Maypole Road / Church Road / Maldon Road (Tiptree)*

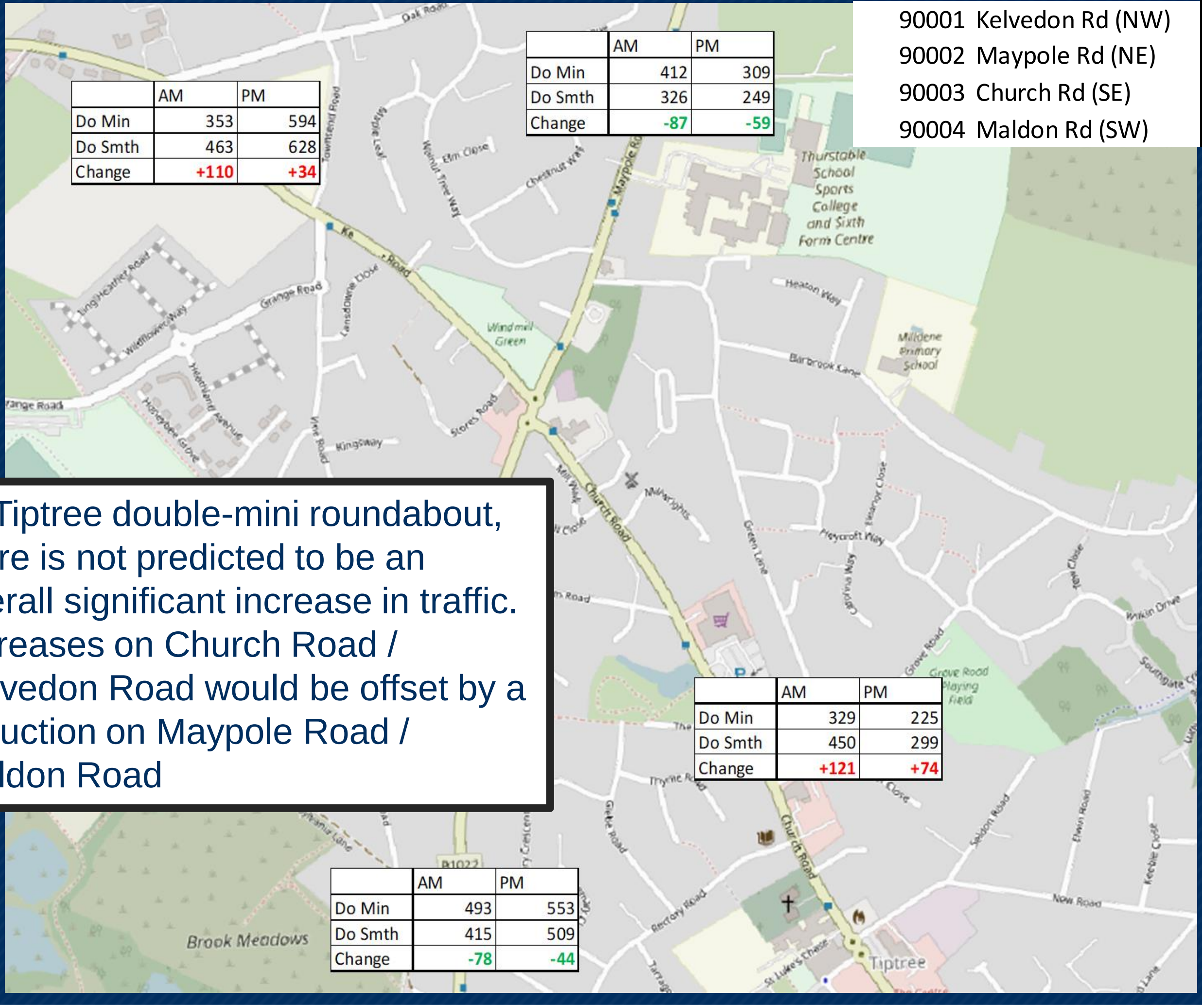




At Tiptree double-mini roundabout, there is not predicted to be an overall significant increase in traffic. Increases on Church Road / Kelvedon Road would be offset by a reduction on Maypole Road / Maldon Road

Tiptree double-mini roundabout flow changes

- *Modelled peak hour traffic flows for 2027 (with and without DCO scheme), on all approaches to:*
    - *Kelvedon Road / Maypole Road / Church Road / Maldon Road (Tiptree)*



	AM	PM
Do Min	353	594
Do Smth	463	628
Change	+110	+34

	AM	PM
Do Min	412	309
Do Smth	326	249
Change	-87	-59

	AM	PM
Do Min	329	225
Do Smth	450	299
Change	+121	+74

	AM	PM
Do Min	493	553
Do Smth	415	509
Change	-78	-44

90001 Kelvedon Rd (NW)
90002 Maypole Rd (NE)
90003 Church Rd (SE)
90004 Maldon Rd (SW)

At Tiptree double-mini roundabout, there is not predicted to be an overall significant increase in traffic. Increases on Church Road / Kelvedon Road would be offset by a reduction on Maypole Road / Maldon Road

From 90001:

	To:	90001	90002	90003	90004	Total
AM	DM	0	16	196	141	353
	DS	0	6	280	177	463
	Change	*0*	*-10*	*84*	*36*	110
PM	DM	0	57	300	238	594
	DS	0	6	399	223	628
	Change	*0*	*-50*	*99*	*-14*	34

From 90002:

	To:	90001	90002	90003	90004	Total
AM	DM	58	0	61	293	412
	DS	5	0	47	274	326
	Change	*-54*	*0*	*-14*	*-19*	-87
PM	DM	13	0	63	232	309
	DS	3	0	42	204	249
	Change	*-11*	*0*	*-21*	*-28*	-59

From 90003:

	To:	90001	90002	90003	90004	Total
AM	DM	265	61	0	2	329
	DS	435	12	0	2	450
	Change	*170*	*-49*	*0*	*0*	121
PM	DM	159	63	0	3	225
	DS	239	57	0	3	299
	Change	*79*	*-6*	*0*	*0*	74

From 90004:

	To:	90001	90002	90003	90004	Total
AM	DM	199	292	3	0	493
	DS	169	243	3	0	415
	Change	*-29*	*-49*	*0*	*0*	-78
PM	DM	189	361	3	0	553
	DS	201	305	3	0	509
	Change	*11*	*-55*	*0*	*0*	-44

Note:

- Flows shown here are one-way flows per peak hour, so may differ from flows shown elsewhere in this slide deck.

- This junction is further outside the core model area, where changes in flows are more accurate than absolute flows. If used in junction assessments, the inputs will be a combination of observed counts and flow changes taken from the model.

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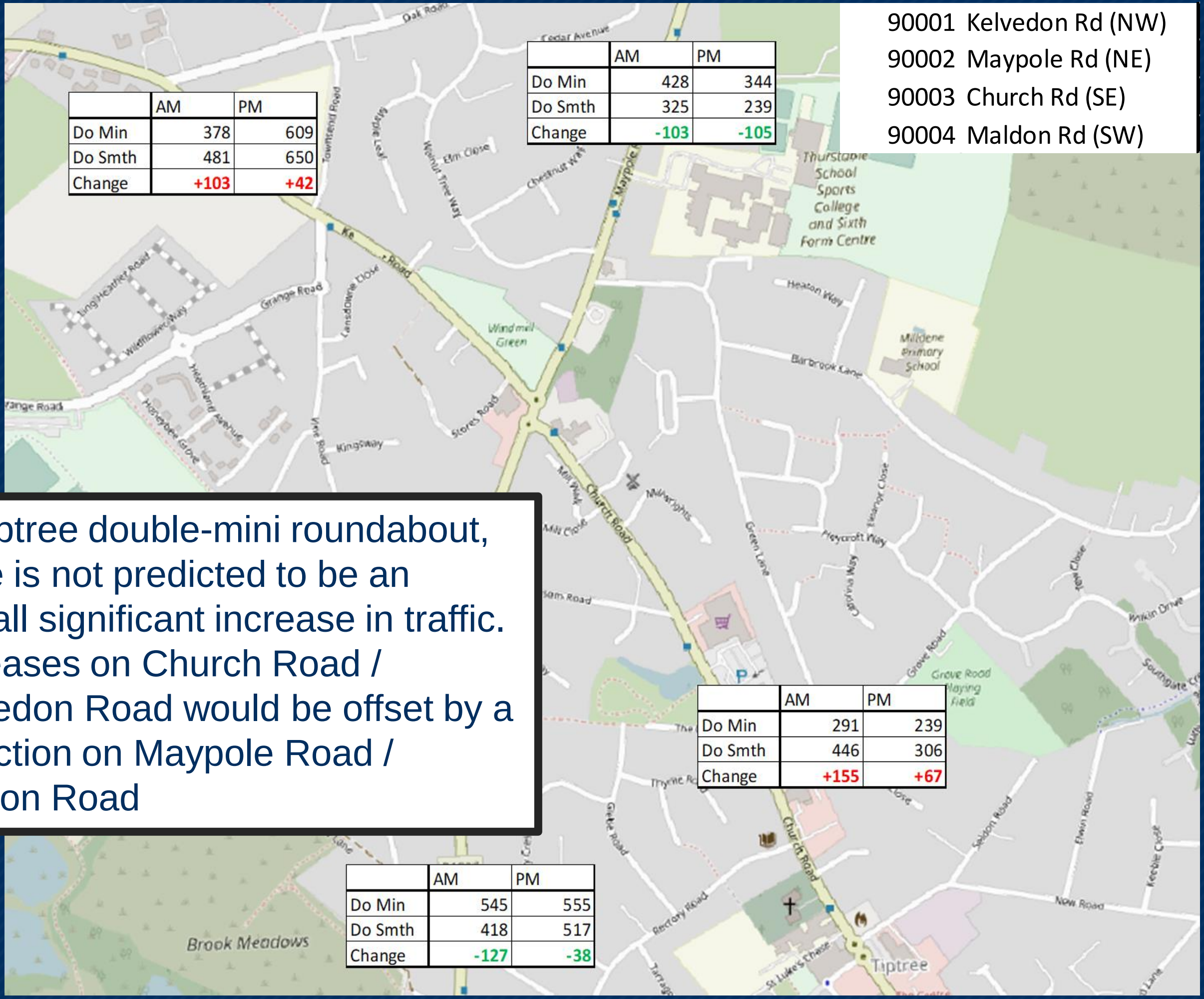
Tiptree double-mini roundabout flow changes

- *Modelled peak hour traffic flows for 2042 (with and without DCO scheme), on all approaches to:*
    - *Kelvedon Road / Maypole Road / Church Road / Maldon Road (Tiptree)*



	AM	PM
Do Min	378	609
Do Smth	481	650
Change	+103	+42

	AM	PM
Do Min	428	344
Do Smth	325	239
Change	-103	-105

	AM	PM
Do Min	291	239
Do Smth	446	306
Change	+155	+67

	AM	PM
Do Min	545	555
Do Smth	418	517
Change	-127	-38

At Tiptree double-mini roundabout, there is not predicted to be an overall significant increase in traffic. Increases on Church Road / Kelvedon Road would be offset by a reduction on Maypole Road / Maldon Road

From 90001:

	To:	90001	90002	90003	90004	Total
AM	DM	0	14	206	158	378
	DS	0	10	298	174	481
	Change	*0*	*-4*	*92*	*16*	103
PM	DM	0	81	287	241	609
	DS	0	17	412	220	650
	Change	*0*	*-63*	*125*	*-20*	42

From 90002:

	To:	90001	90002	90003	90004	Total
AM	DM	72	0	70	286	428
	DS	2	0	54	269	325
	Change	*-70*	*0*	*-17*	*-17*	-103
PM	DM	13	0	81	250	344
	DS	9	0	37	193	239
	Change	*-4*	*0*	*-44*	*-57*	-105

From 90003:

	To:	90001	90002	90003	90004	Total
AM	DM	269	19	0	3	291
	DS	430	14	0	3	446
	Change	*161*	*-5*	*0*	*0*	155
PM	DM	170	66	0	3	239
	DS	244	59	0	3	306
	Change	*74*	*-6*	*0*	*0*	67

From 90004:

	To:	90001	90002	90003	90004	Total
AM	DM	201	341	3	0	545
	DS	168	246	3	0	418
	Change	*-32*	*-95*	*0*	*0*	-127
PM	DM	192	360	4	0	555
	DS	201	312	4	0	517
	Change	*9*	*-48*	*0*	*0*	-38

Note:

- Flows shown here are one-way flows per peak hour, so may differ from flows shown elsewhere in this slide deck.

- This junction is further outside the core model area, where changes in flows are more accurate than absolute flows. If used in junction assessments, the inputs will be a combination of observed counts and flow changes taken from the model.

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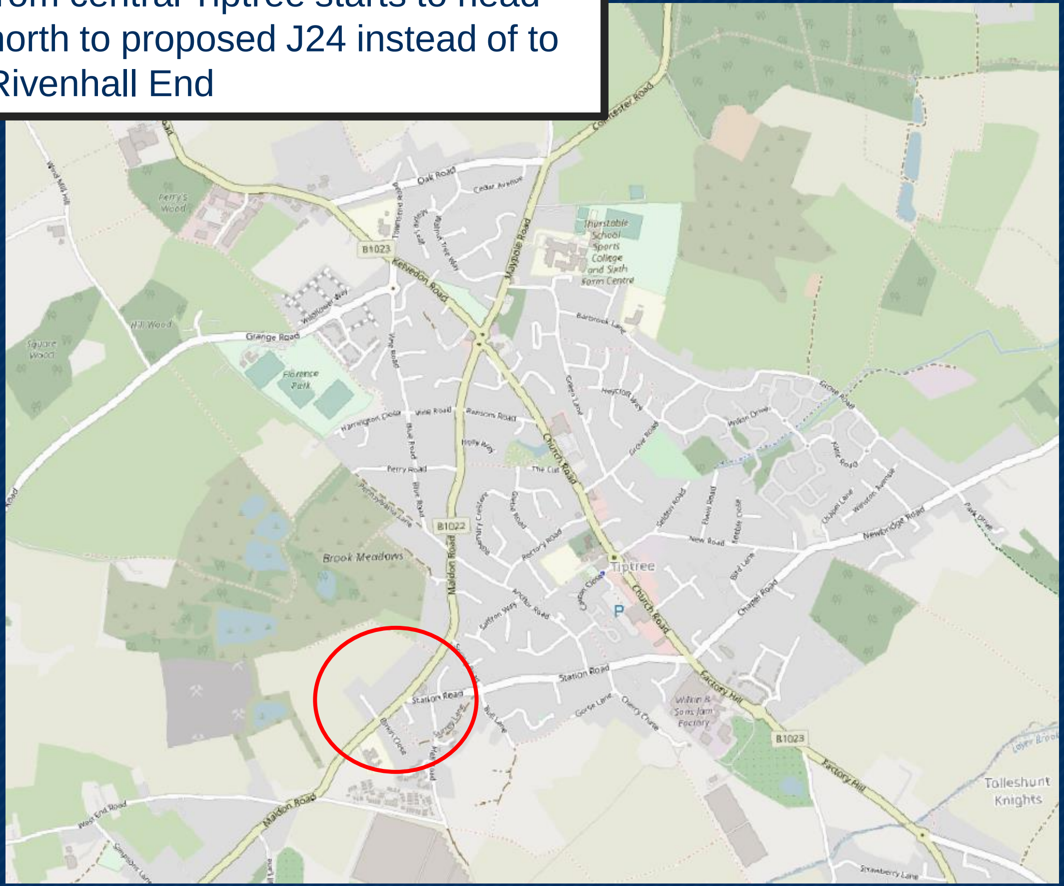
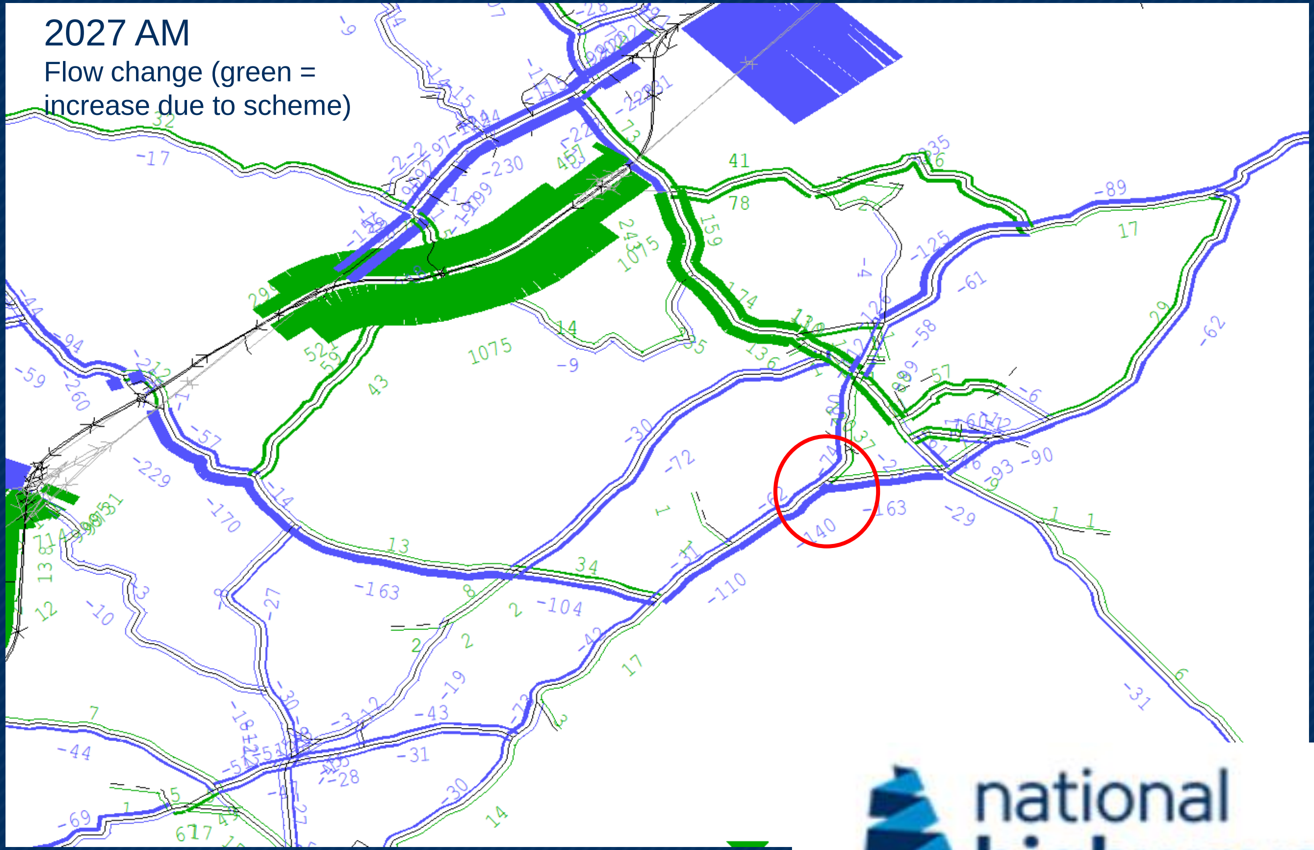
Maldon Road / Station Rd Tiptree flow changes

- *Modelled peak hour traffic flows for 2027 (with and without DCO scheme), on all approaches to:*
    - *Maldon Road / Station Road (Tiptree)*

A reduction in traffic, as more traffic from central Tiptree starts to head north to proposed J24 instead of to Rivenhall End

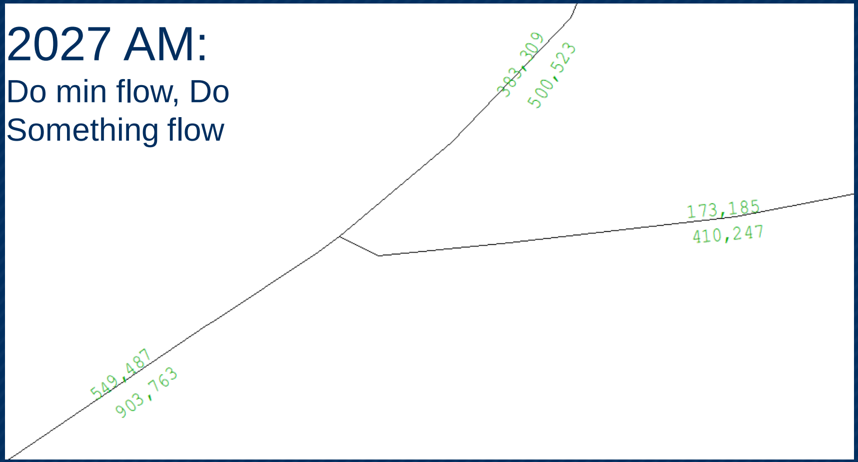




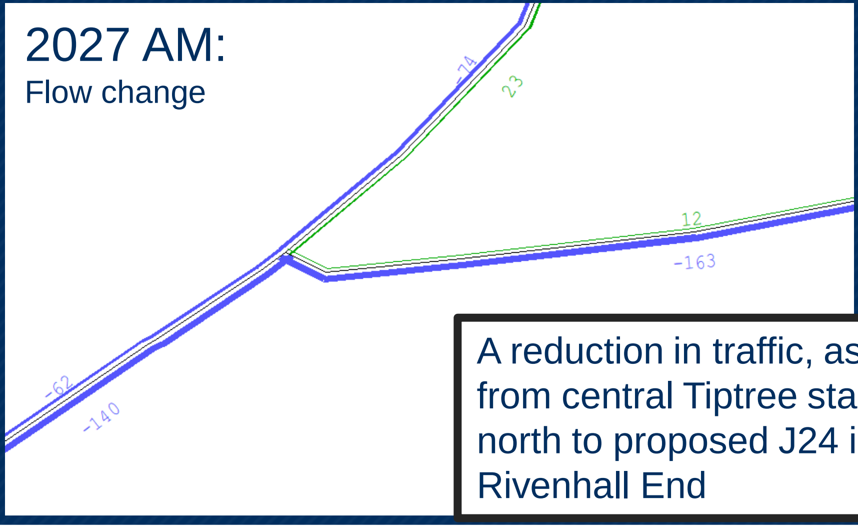
Maldon Road / Station Rd Tiptree flow changes

- *Modelled peak hour traffic flows for 2027 (with and without DCO scheme), on all approaches to:*
    - *Maldon Road / Station Road (Tiptree)*

2027 AM:
Do min flow, Do Something flow

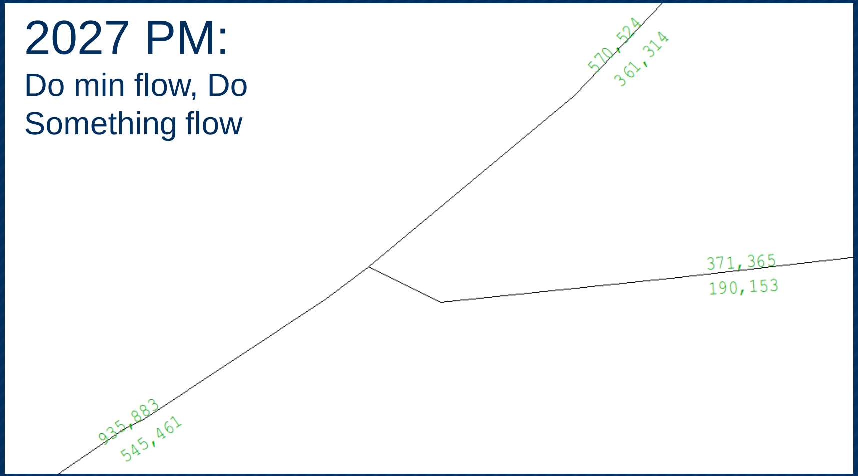


2027 AM:
Flow change

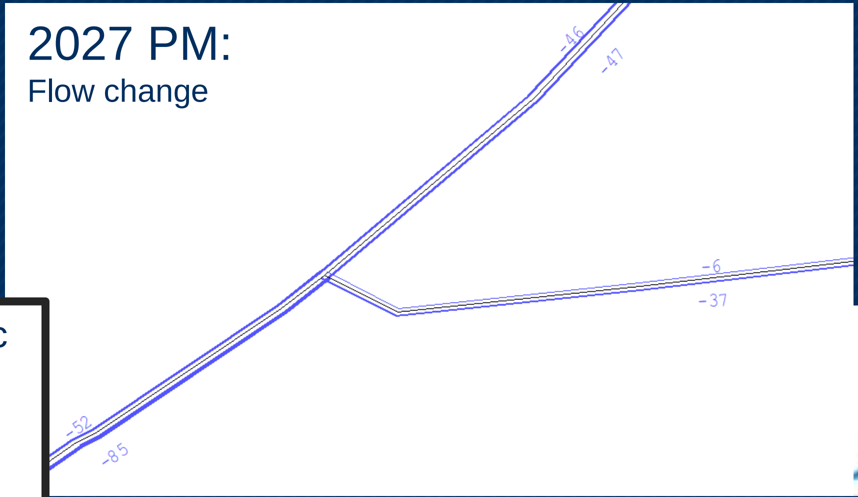


A reduction in traffic, as more traffic from central Tiptree starts to head north to proposed J24 instead of to Rivenhall End

2027 PM:
Do min flow, Do Something flow



2027 PM:
Flow change



Note:

- Flows shown here are direct screenshots from the traffic model, in PCUs/hr.

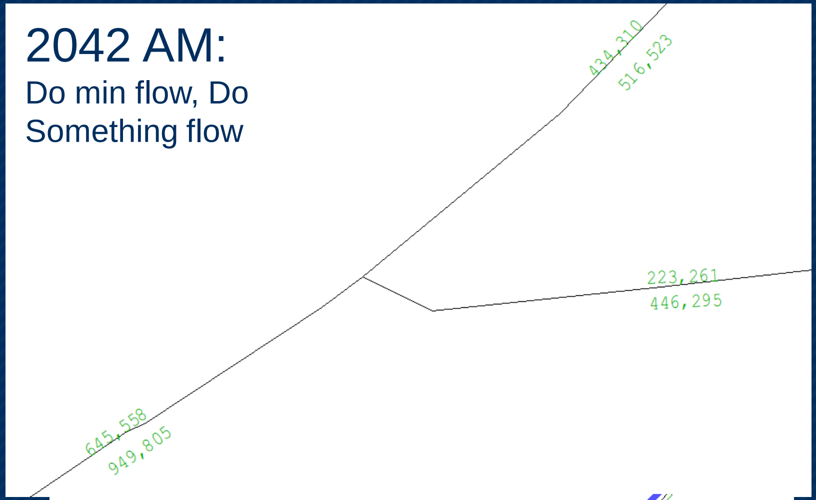
- These flows will be updated in later versions of this slide deck with clearer maps, showing junction turning flows in vehicles per hour.

national highways

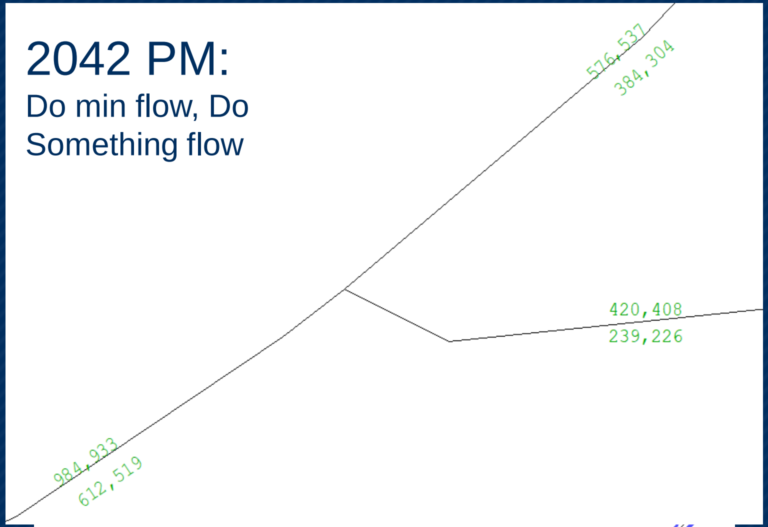
Maldon Road / Station Rd Tiptree flow changes

- *Modelled peak hour traffic flows for 2027 (with and without DCO scheme), on all approaches to:*
  - *Maldon Road / Station Road (Tiptree)*

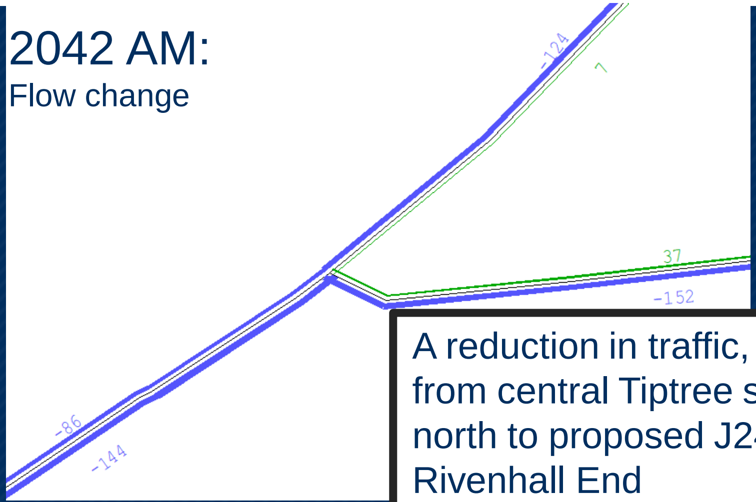
2042 AM:
Do min flow, Do Something flow



2042 PM:
Do min flow, Do Something flow

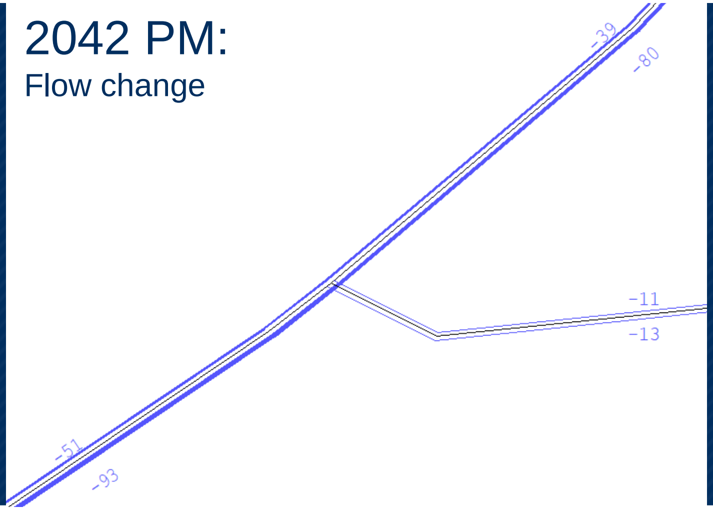


2042 AM:
Flow change



A reduction in traffic, as more traffic from central Tiptree starts to head north to proposed J24 instead of to Rivenhall End

2042 PM:
Flow change



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national highways

Church Road / Station Rd Tiptree flow changes

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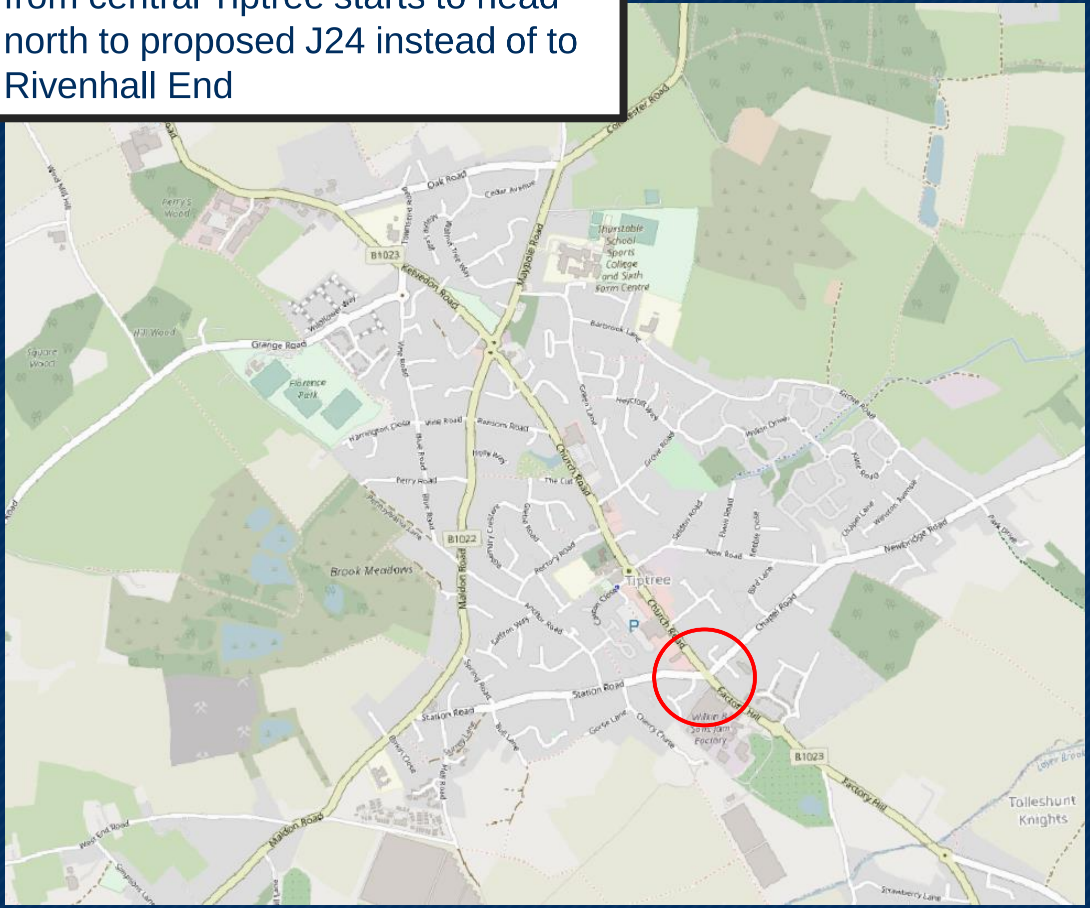
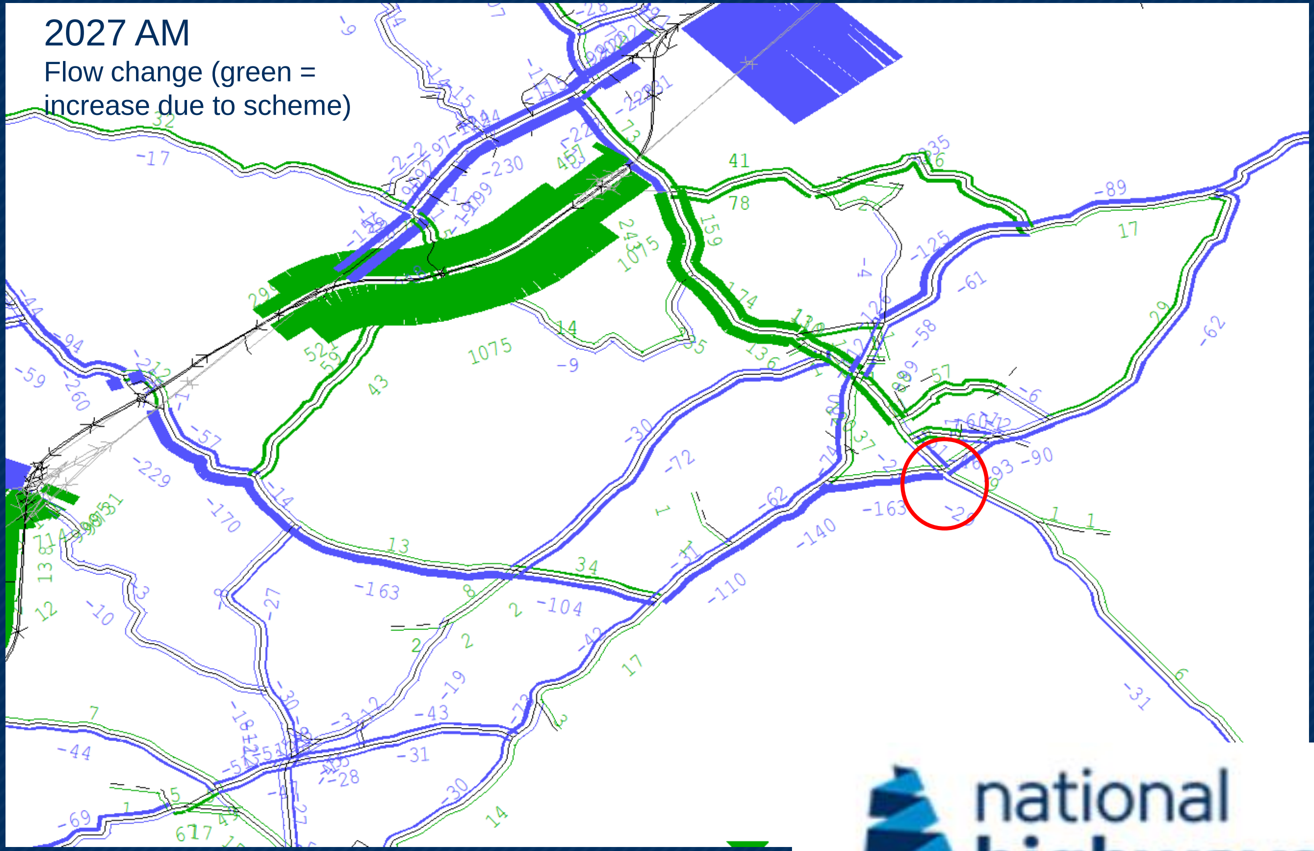
A reduction in traffic, as more traffic from central Tiptree starts to head north to proposed J24 instead of to Rivenhall End





national highways

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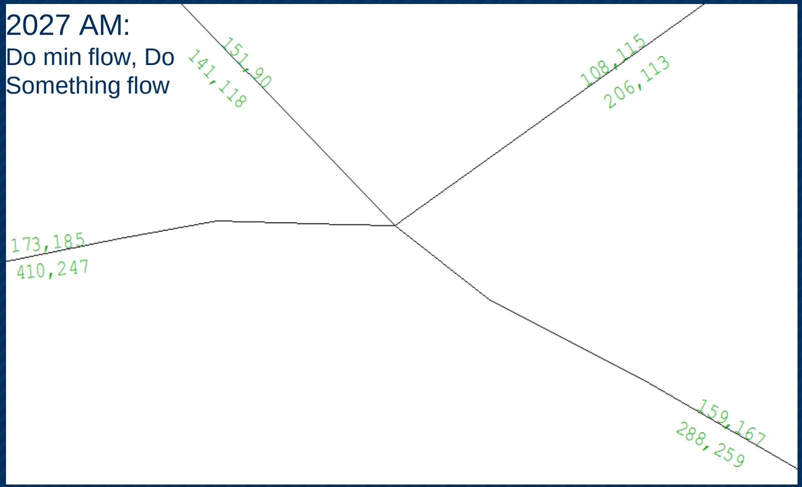
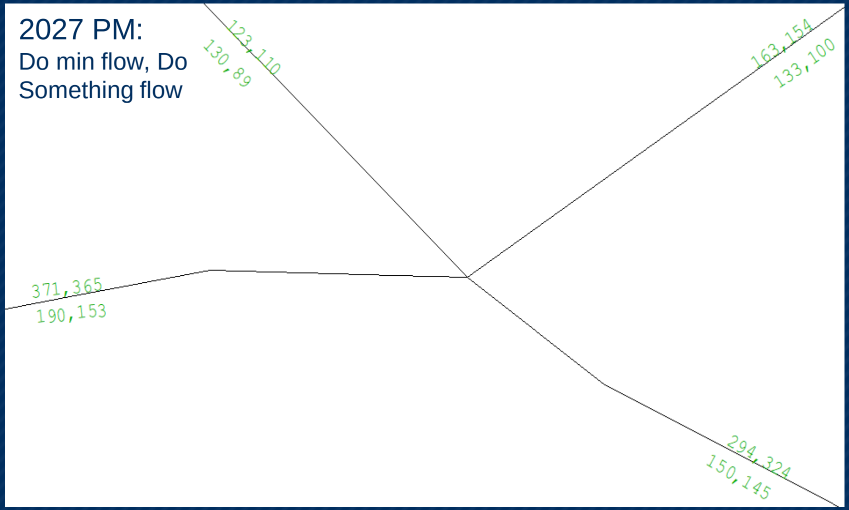
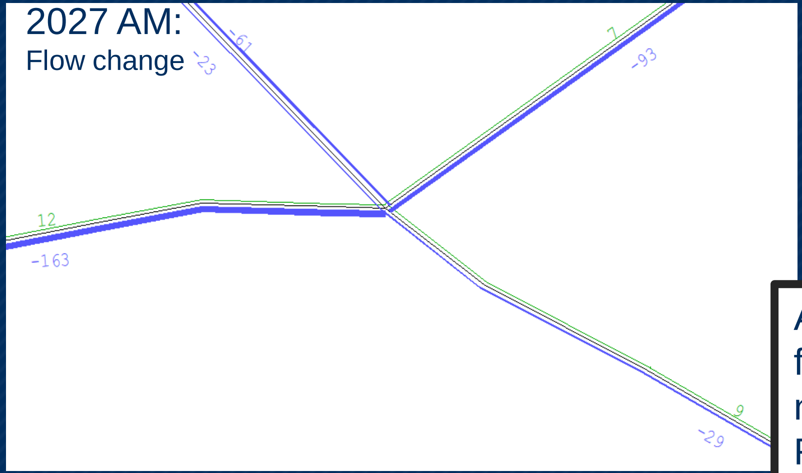
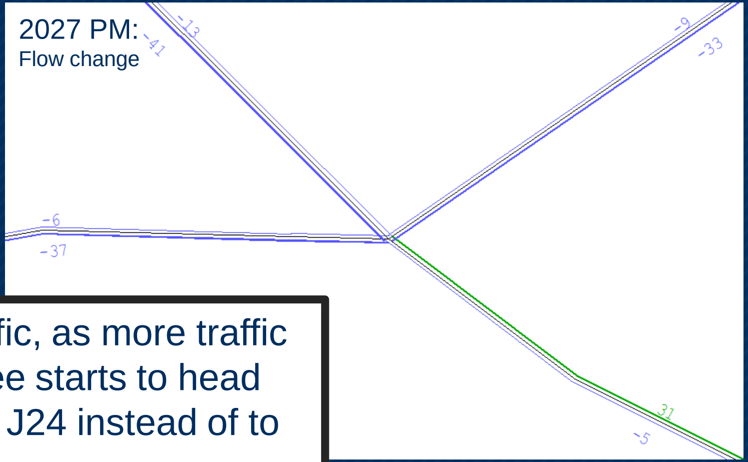
  - *Station Road / Church Road (Tiptree)*









A reduction in traffic, as more traffic from central Tiptree starts to head north to proposed J24 instead of to Rivenhall End

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Church Road / Station Rd Tiptree flow changes

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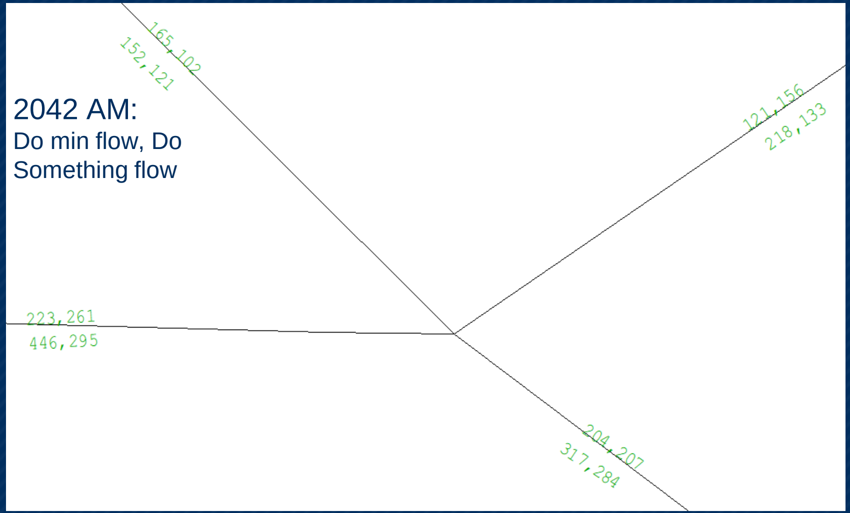

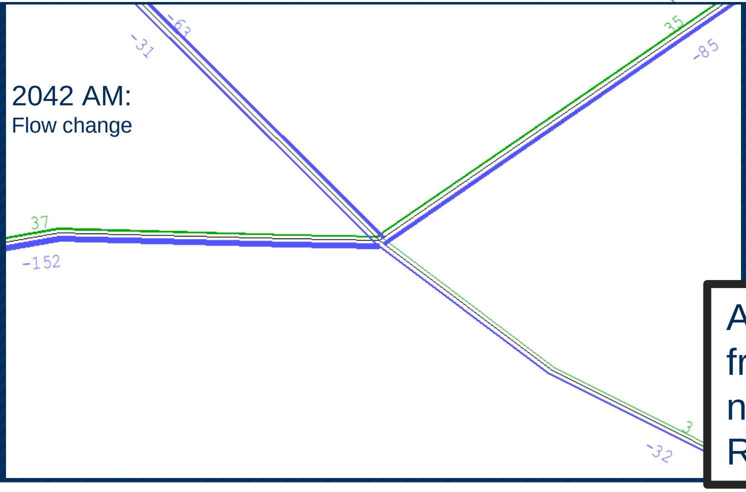

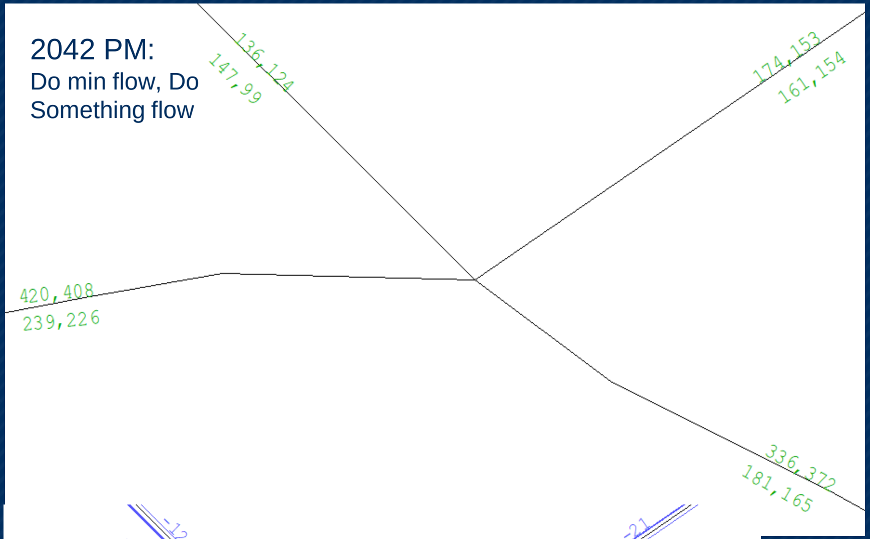

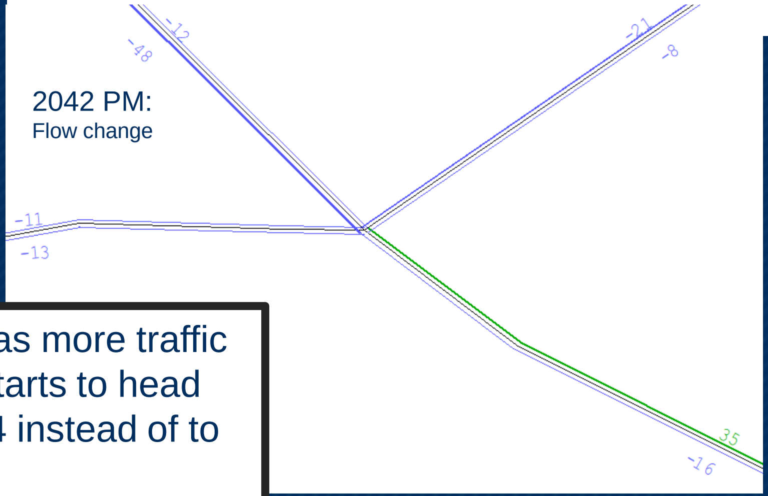

A reduction in traffic, as more traffic from central Tiptree starts to head north to proposed J24 instead of to Rivenhall End

Note:

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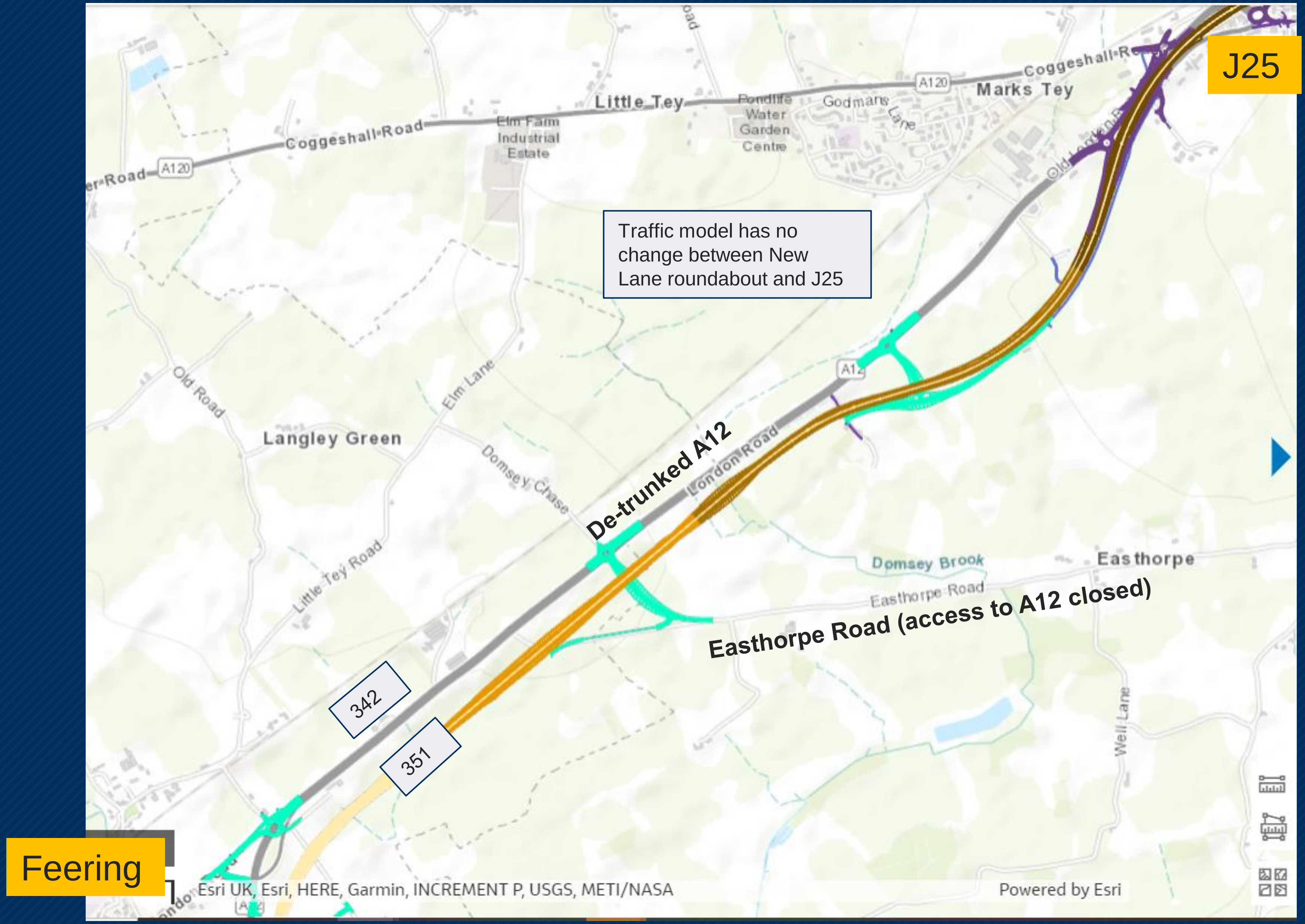
Junction 24-25 (De-trunked A12)

Junction 24-25 (De-trunked A12)

Junction 24 to 25 (De-trunked A12)	**Data**	Modelled data for 2042 (with DCO scheme), as follows: • AADT and peak hour traffic flows, plus peak hour volume/capacity ratios for each section of old A12: o New Lane to Realigned Easthorpe Road o Realigned Easthorpe Road to Wishing Well Farm Roundabout o Wishing Well Farm Roundabout to Junction 25

Junction 24-25 (De-trunked A12) – 2042 AM Peak Hour flows (veh/hr)



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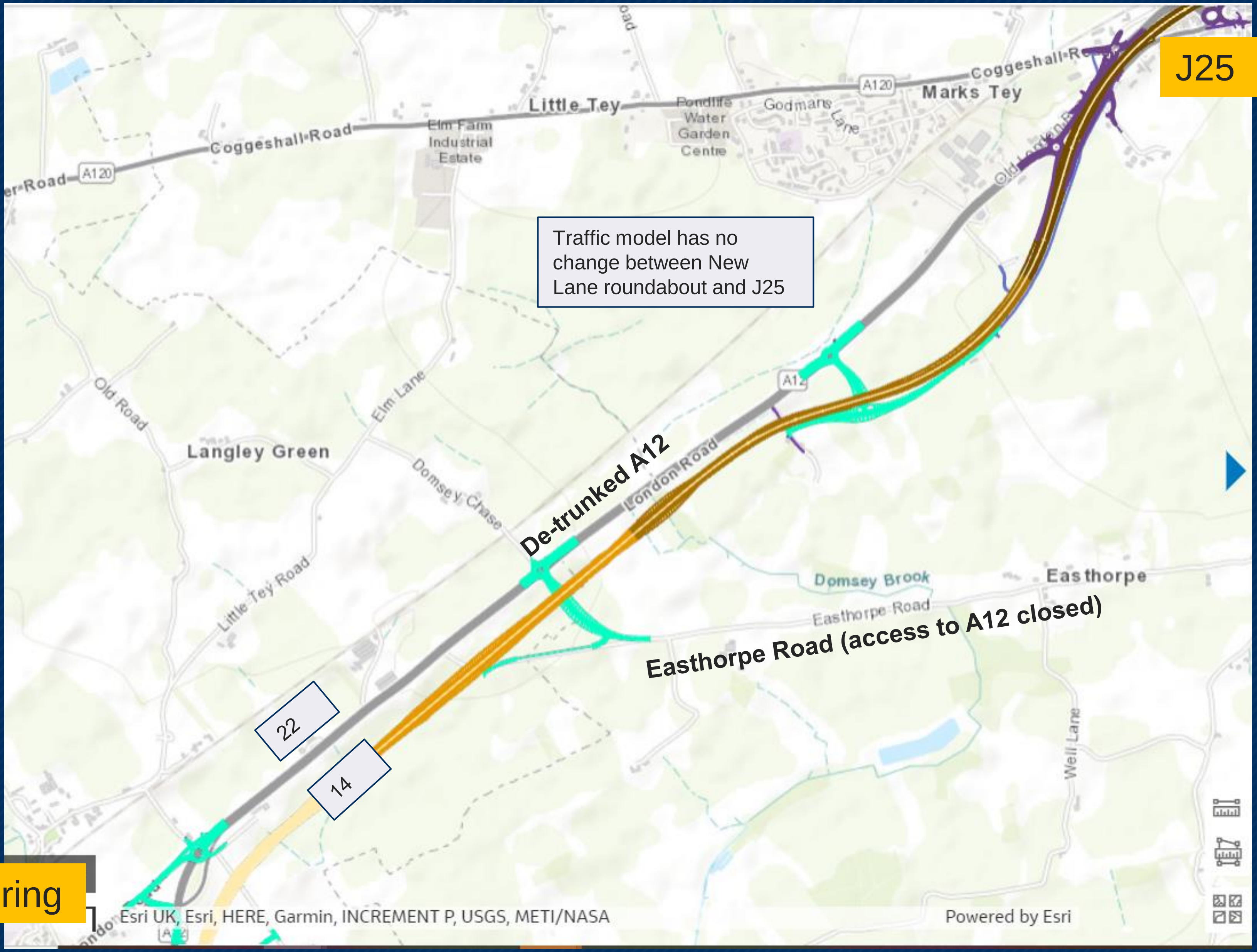
Junction 24-25 (De-trunked A12) – 2042 AM Peak Hour V/C%



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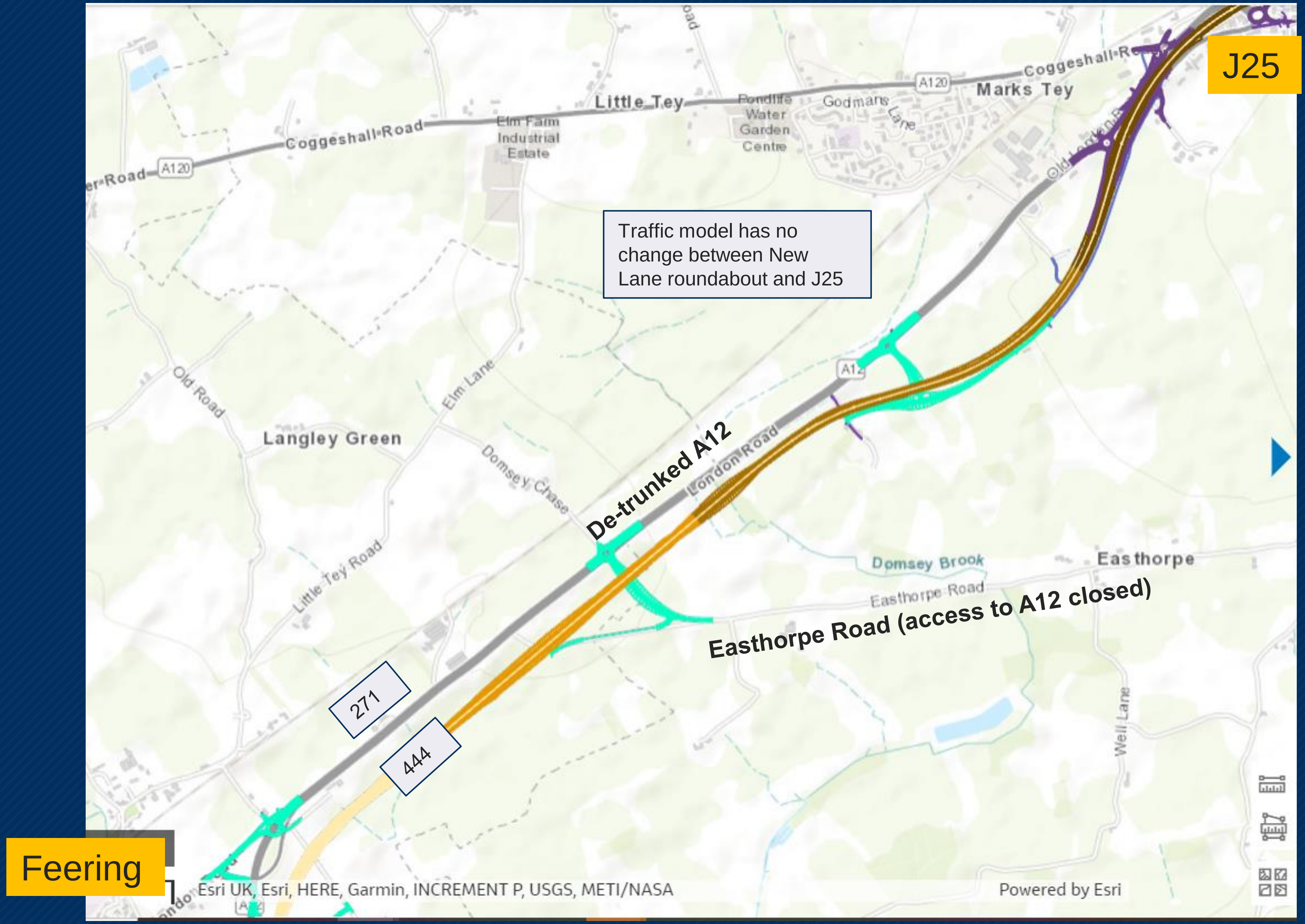
Junction 24-25 (De-trunked A12) – 2042 PM Peak Hour flows (veh/hr)



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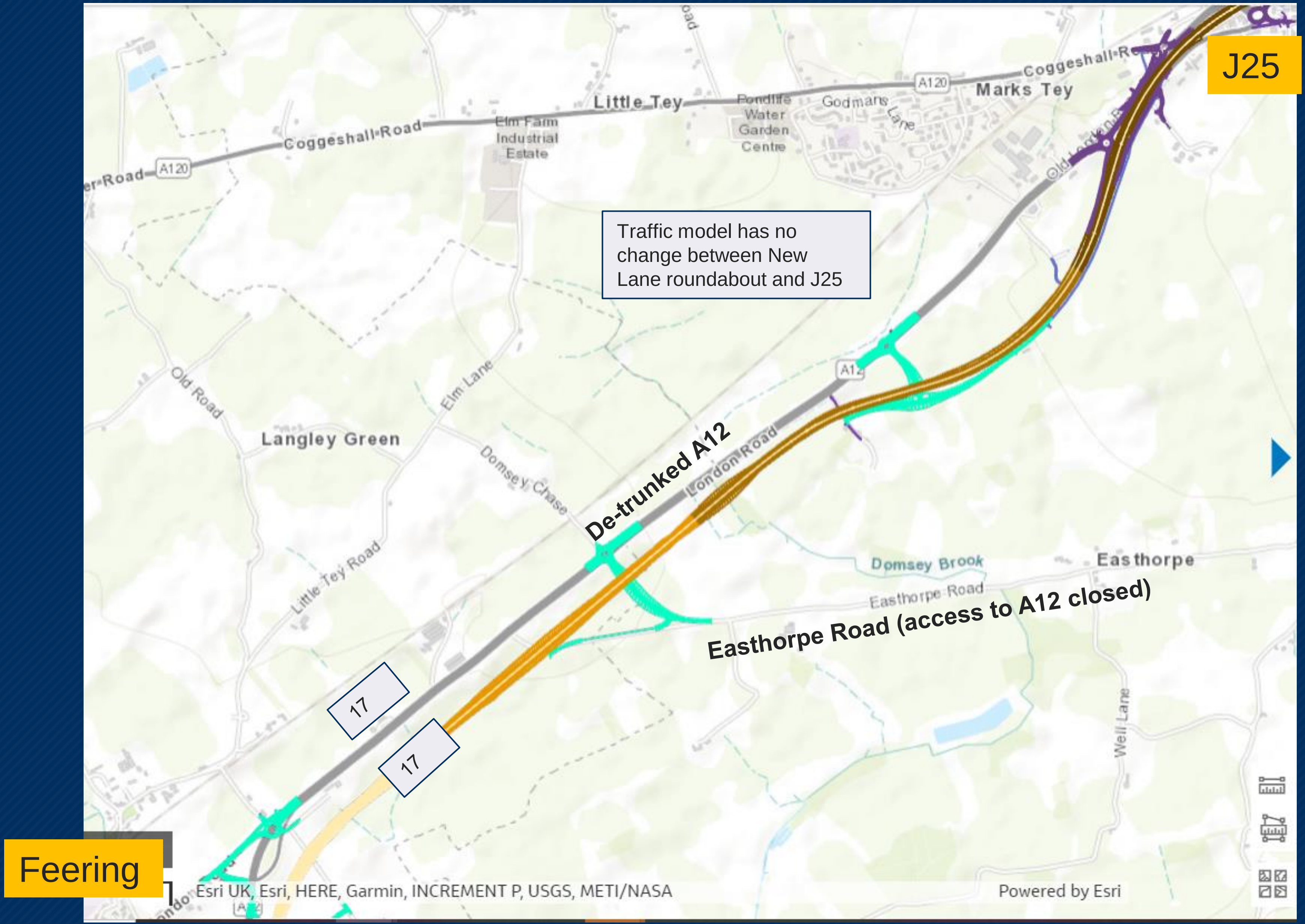
Junction 24-25 (De-trunked A12) – 2042 PM Peak Hour V/C%



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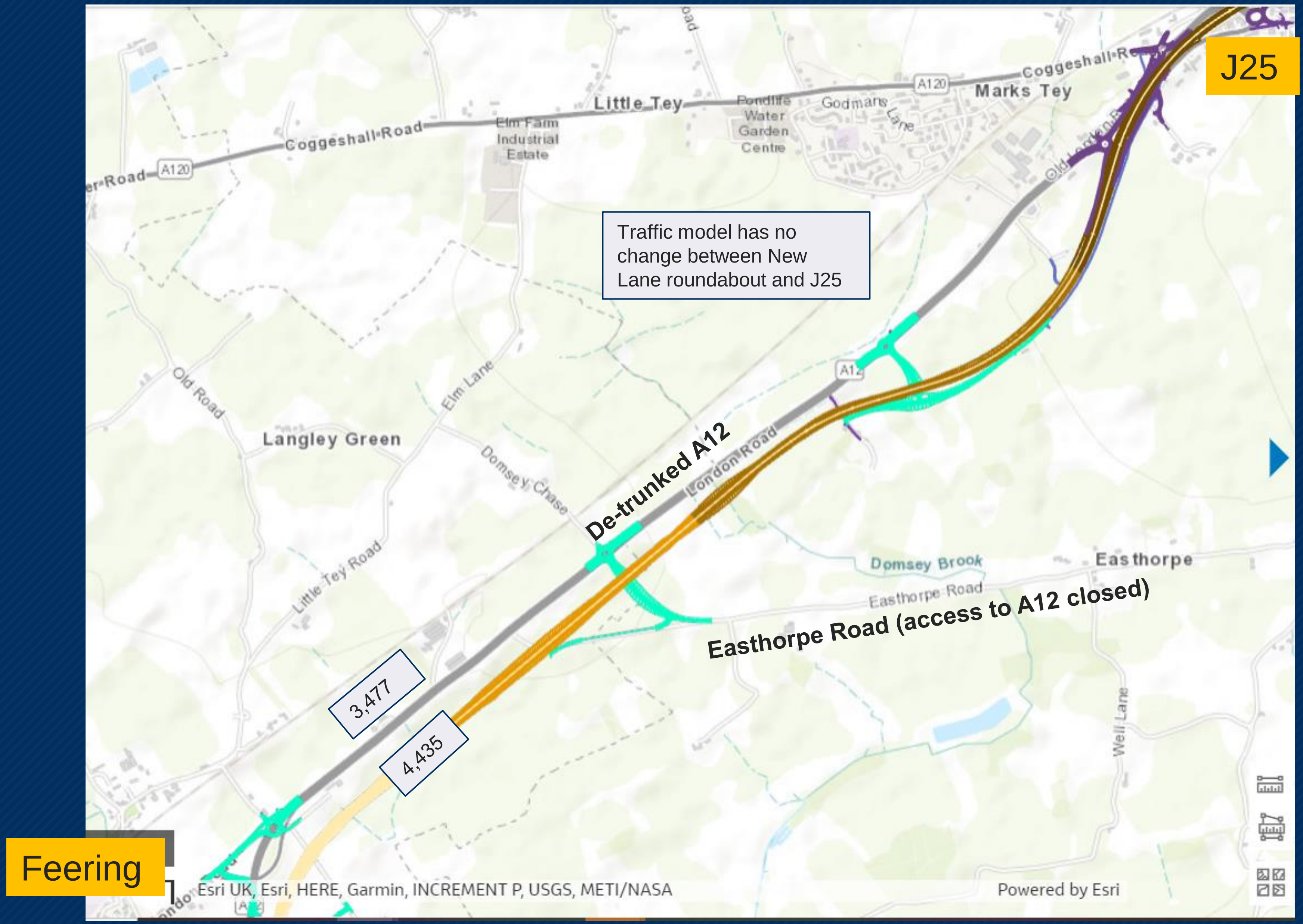
Junction 24-25 (De-trunked A12) – 2042 AADT (vehs/day)



highways england


Colchester A12
Harwich (A120)
Felixstowe (A14)
Hatfield
Peverel
B1137
20A

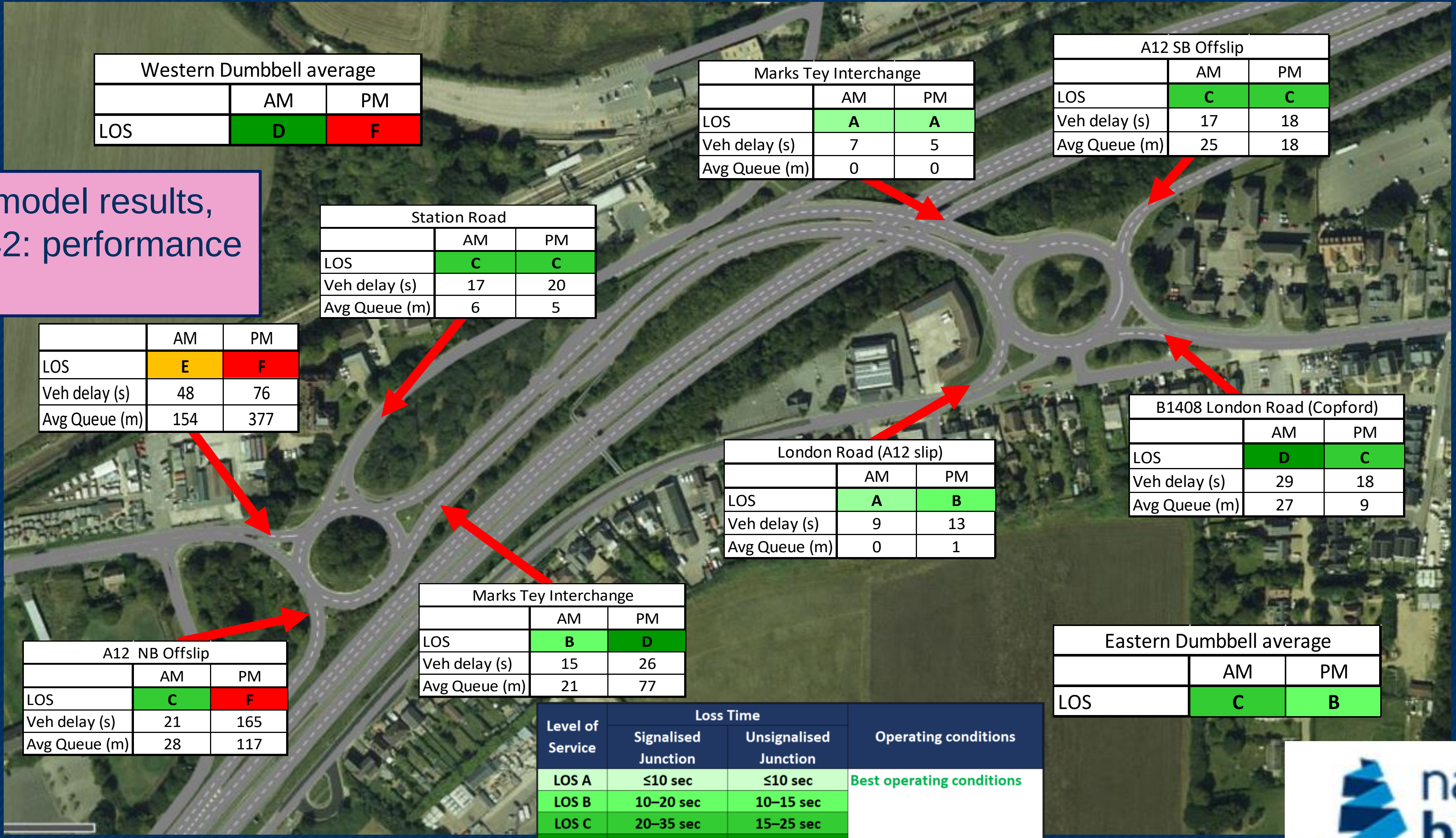
Junction 25

Junction 25

Junction 25 (Marks Tey)	**Data**	• Junction model results, in format set out in separate tables below, for 2027 and 2042 (with and without DCO scheme) for the following junctions: o Station Road Junction o Western Junction 25 roundabout

Junction 25

Vissim model results, DM 2042: performance by arm



Western Dumbbell average	AM	PM
LOS	D	F

Marks Tey Interchange	AM	PM
LOS	A	A
Veh delay (s)	7	5
Avg Queue (m)	0	0

A12 SB Offslip	AM	PM
LOS	C	C
Veh delay (s)	17	18
Avg Queue (m)	25	18

Station Road	AM	PM
LOS	C	C
Veh delay (s)	17	20
Avg Queue (m)	6	5

	AM	PM
LOS	E	F
Veh delay (s)	48	76
Avg Queue (m)	154	377

B1408 London Road (Copford)	AM	PM
LOS	D	C
Veh delay (s)	29	18
Avg Queue (m)	27	9

London Road (A12 slip)	AM	PM
LOS	A	B
Veh delay (s)	9	13
Avg Queue (m)	0	1

Marks Tey Interchange	AM	PM
LOS	B	D
Veh delay (s)	15	26
Avg Queue (m)	21	77

A12 NB Offslip	AM	PM
LOS	C	F
Veh delay (s)	21	165
Avg Queue (m)	28	117

Eastern Dumbbell average	AM	PM
LOS	C	B

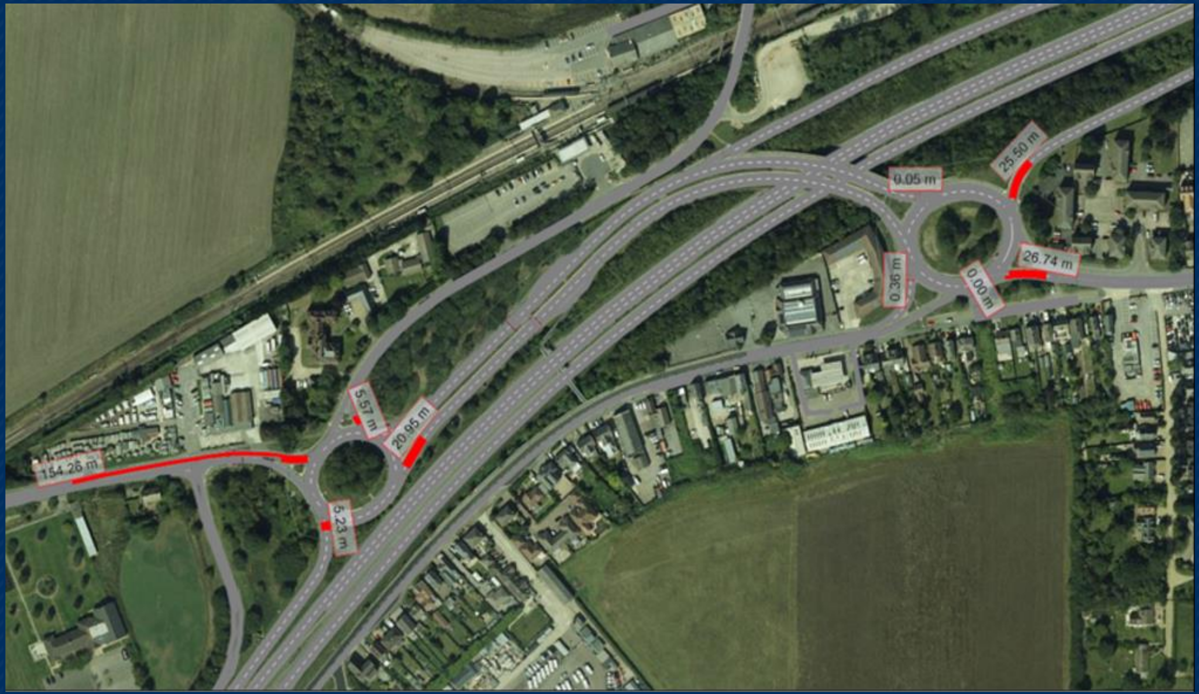
Level of Service	Loss Time: Signalised Junction	Loss Time: Unsignalised Junction	Operating conditions
LOS A	≤10 sec	≤10 sec	Best operating conditions
LOS B	10–20 sec	10–15 sec	
LOS C	20–35 sec	15–25 sec	
LOS D	35–55 sec	25–35 sec	
LOS E	55–80 sec	35–50 sec	
LOS F	>80 sec	>50 sec	Worst operating conditions

national highways

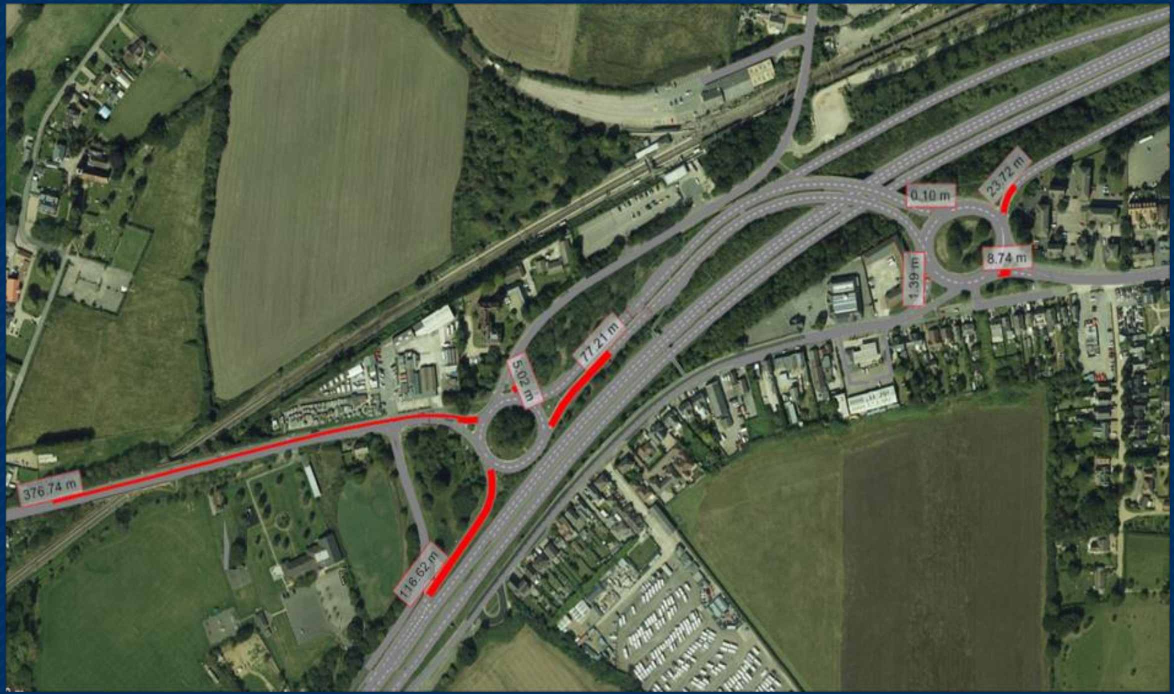
Junction 25

Vissim model results,
DM 2042: average queue lengths

AM peak



PM peak



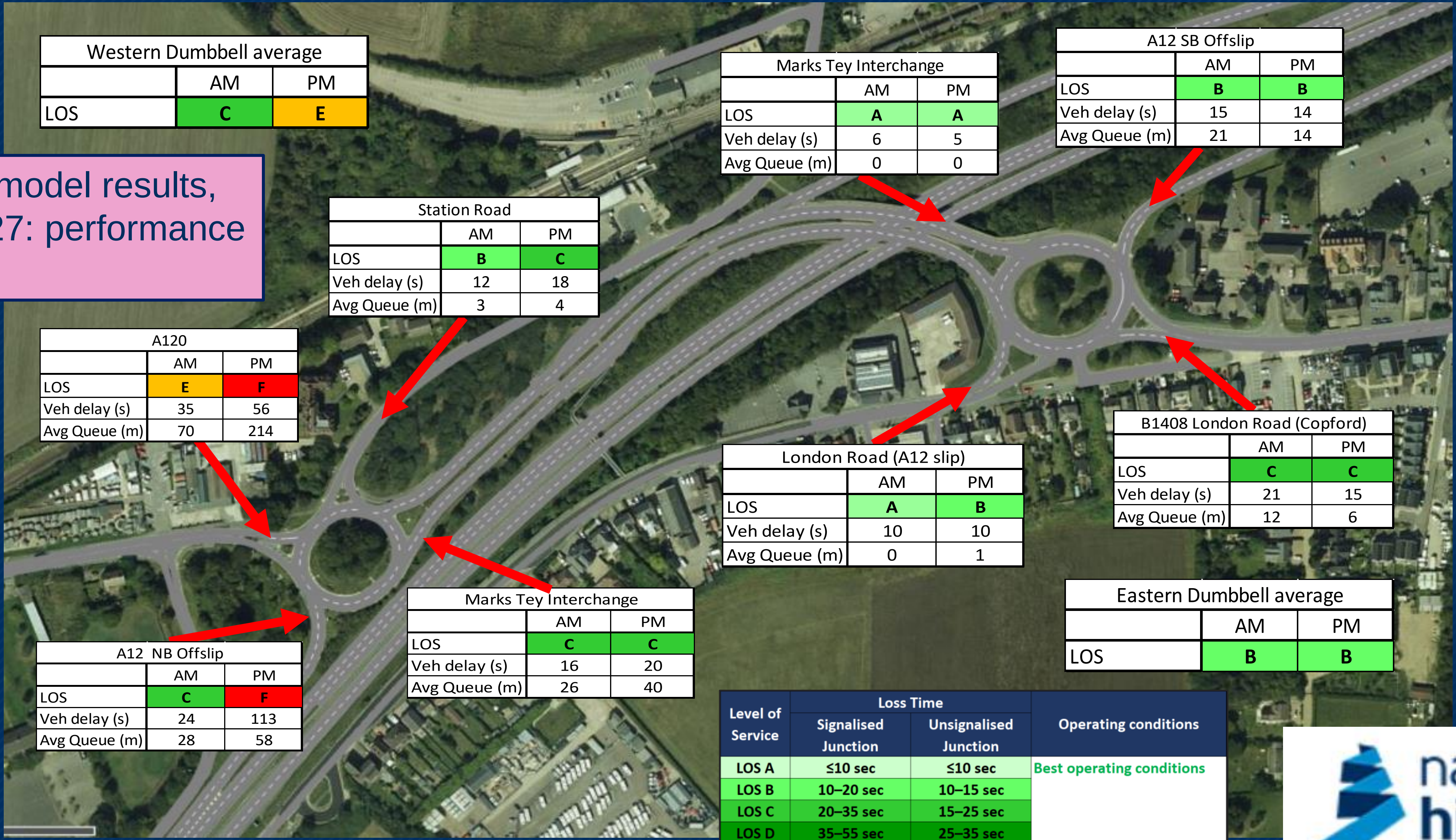
Junction 25

Vissim model results, DM 2042: full results

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Western Roundabout	A12 Offslip	Unsignalised	C	269	21	5	28	F	463	165	117	189
	A120	Unsignalised	E	1212	48	154	335	F	1207	76	377	548
	Station Road	Unsignalised	C	218	17	6	28	C	200	20	5	27
	Marks Tey Interchange	Unsignalised	B	1319	15	21	118	D	1406	26	77	214
	Total	**Unsignalised**	**D**	**3018**	**29**			**F**	**3277**	**64**		
Eastern Roundabout	A12 Offslip	Unsignalised	C	1130	17	25	89	C	1041	18	24	81
	B1408 London Road (Copford)	Unsignalised	D	548	29	27	84	C	452	18	9	47
	London Road (A12 slip)	Unsignalised	A	105	9	0	10	B	139	13	1	15
	Marks Tey Interchange	Unsignalised	A	568	7	0	4	A	608	5	0	6
	Total	**Unsignalised**	**C**	**2350**	**17**			**B**	**2241**	**14**		

Junction 25

Vissim model results, DM 2027: performance by arm



Western Dumbbell average		
	AM	PM
LOS	C	E

A120		
	AM	PM
LOS	E	F
Veh delay (s)	35	56
Avg Queue (m)	70	214

A12 NB Offslip		
	AM	PM
LOS	C	F
Veh delay (s)	24	113
Avg Queue (m)	28	58

Station Road		
	AM	PM
LOS	B	C
Veh delay (s)	12	18
Avg Queue (m)	3	4

Marks Tey Interchange		
	AM	PM
LOS	C	C
Veh delay (s)	16	20
Avg Queue (m)	26	40

Marks Tey Interchange		
	AM	PM
LOS	A	A
Veh delay (s)	6	5
Avg Queue (m)	0	0

London Road (A12 slip)		
	AM	PM
LOS	A	B
Veh delay (s)	10	10
Avg Queue (m)	0	1

A12 SB Offslip		
	AM	PM
LOS	B	B
Veh delay (s)	15	14
Avg Queue (m)	21	14

B1408 London Road (Copford)		
	AM	PM
LOS	C	C
Veh delay (s)	21	15
Avg Queue (m)	12	6

Eastern Dumbbell average		
	AM	PM
LOS	B	B

Level of Service	Loss Time		Operating conditions
	Signalised Junction	Unsignalised Junction	
LOS A	≤10 sec	≤10 sec	Best operating conditions
LOS B	10–20 sec	10–15 sec	
LOS C	20–35 sec	15–25 sec	
LOS D	35–55 sec	25–35 sec	
LOS E	55–80 sec	35–50 sec	
LOS F	>80 sec	>50 sec	Worst operating conditions

national highways

Junction 25

Vissim model results, DM 2027: full results

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Western Roundabout	A12 Offslip	Unsignalised	C	252	24	6	28	F	453	113	58	98
	A120	Unsignalised	E	1153	35	70	219	F	1186	56	214	377
	Station Road	Unsignalised	B	196	12	3	22	C	196	18	4	26
	Marks Tey Interchange	Unsignalised	C	1338	16	26	138	C	1342	20	40	170
	Total	**Unsignalised**	**C**	**2938**	**24**			**E**	**3176**	**46**		
Eastern Roundabout	A12 Offslip	Unsignalised	B	1163	15	21	85	B	1007	14	17	71
	B1408 London Road (Copford)	Unsignalised	C	439	21	12	54	C	394	15	6	41
	London Road (A12 slip)	Unsignalised	A	95	10	0	10	B	128	10	1	13
	Marks Tey Interchange	Unsignalised	A	512	6	0	3	A	596	5	0	6
	Total	**Unsignalised**	**B**	**2208**	**14**			**B**	**2125**	**12**		

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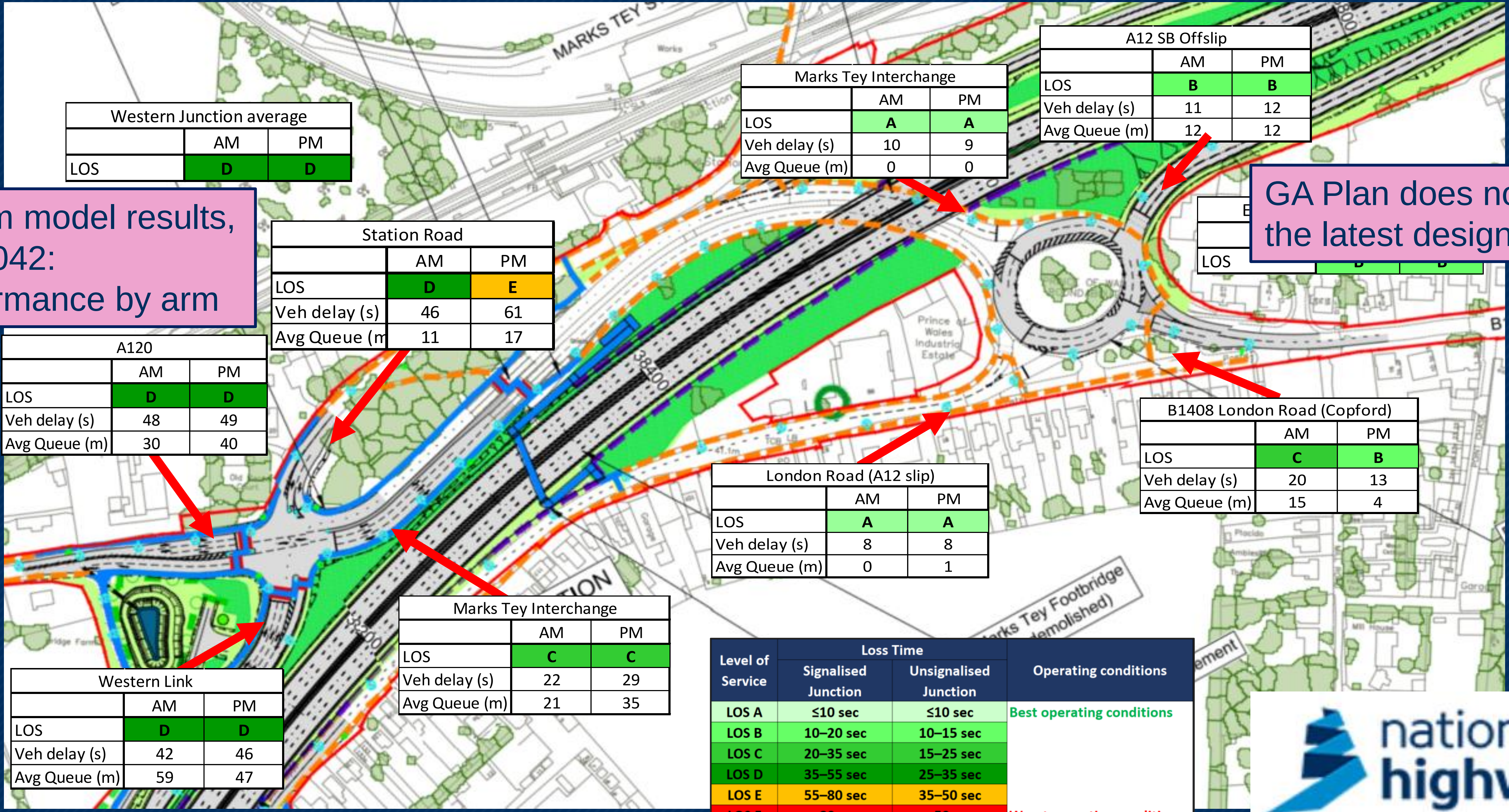
Junction 25



Vissim model results, DS 2042: performance by arm

GA Plan does not reflect the latest design.

Western Junction average	AM	PM
LOS	D	D

Station Road	AM	PM
LOS	D	E
Veh delay (s)	46	61
Avg Queue (m)	11	17

A120	AM	PM
LOS	D	D
Veh delay (s)	48	49
Avg Queue (m)	30	40

Western Link	AM	PM
LOS	D	D
Veh delay (s)	42	46
Avg Queue (m)	59	47

Marks Tey Interchange	AM	PM
LOS	C	C
Veh delay (s)	22	29
Avg Queue (m)	21	35

Marks Tey Interchange	AM	PM
LOS	A	A
Veh delay (s)	10	9
Avg Queue (m)	0	0

A12 SB Offslip	AM	PM
LOS	B	B
Veh delay (s)	11	12
Avg Queue (m)	12	12

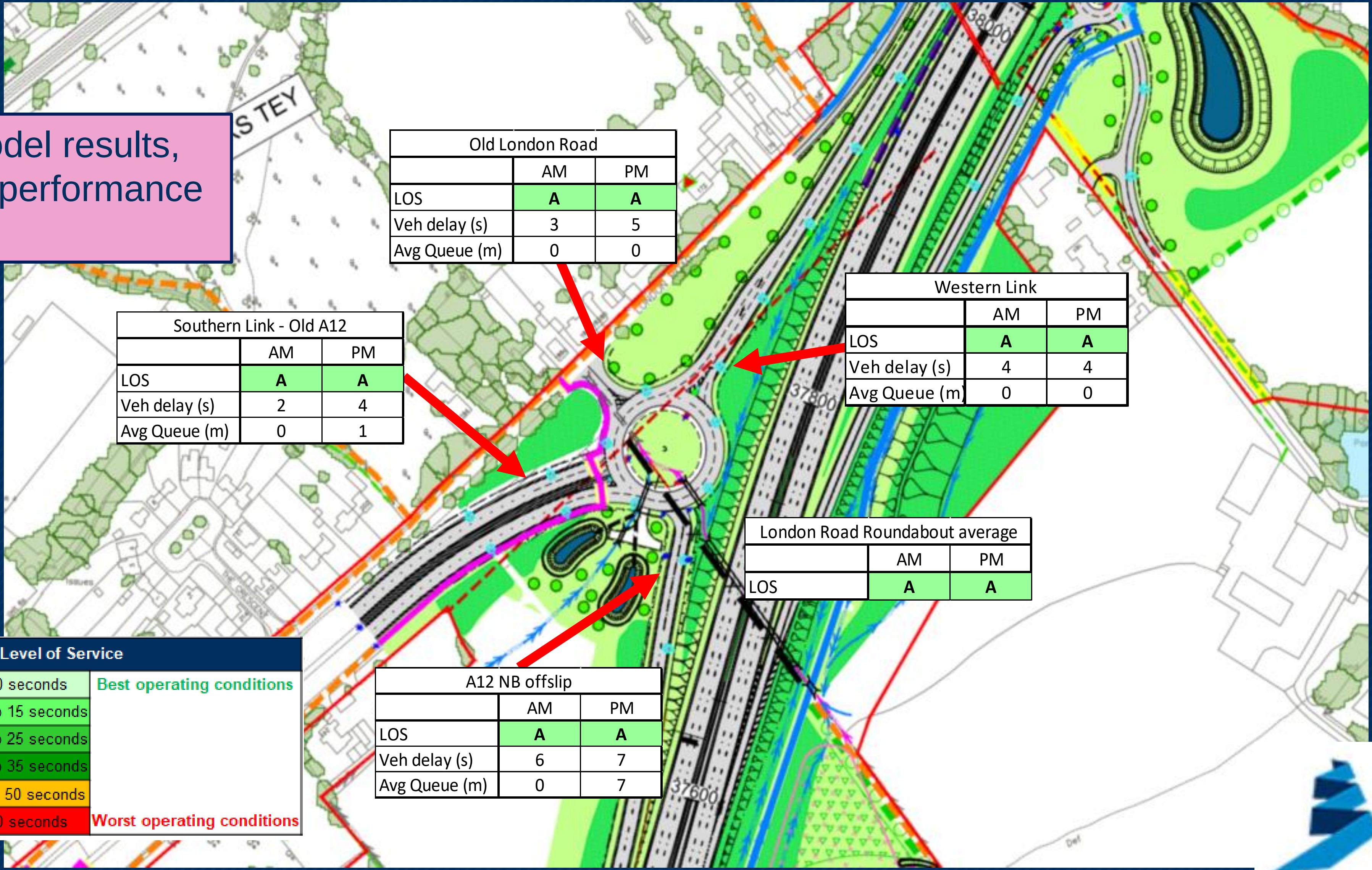
London Road (A12 slip)	AM	PM
LOS	A	A
Veh delay (s)	8	8
Avg Queue (m)	0	1

B1408 London Road (Copford)	AM	PM
LOS	C	B
Veh delay (s)	20	13
Avg Queue (m)	15	4

Level of Service	Loss Time: Signalised Junction	Loss Time: Unsignalised Junction	Operating conditions
LOS A	≤10 sec	≤10 sec	Best operating conditions
LOS B	10–20 sec	10–15 sec	
LOS C	20–35 sec	15–25 sec	
LOS D	35–55 sec	25–35 sec	
LOS E	55–80 sec	35–50 sec	
LOS F	>80 sec	>50 sec	Worst operating conditions

Junction 25

Vissim model results, DS 2042: performance by arm



Old London Road	AM	PM
LOS	A	A
Veh delay (s)	3	5
Avg Queue (m)	0	0

Southern Link - Old A12	AM	PM
LOS	A	A
Veh delay (s)	2	4
Avg Queue (m)	0	1

Western Link	AM	PM
LOS	A	A
Veh delay (s)	4	4
Avg Queue (m)	0	0

London Road Roundabout average	AM	PM
LOS	A	A

A12 NB offslip	AM	PM
LOS	A	A
Veh delay (s)	6	7
Avg Queue (m)	0	7

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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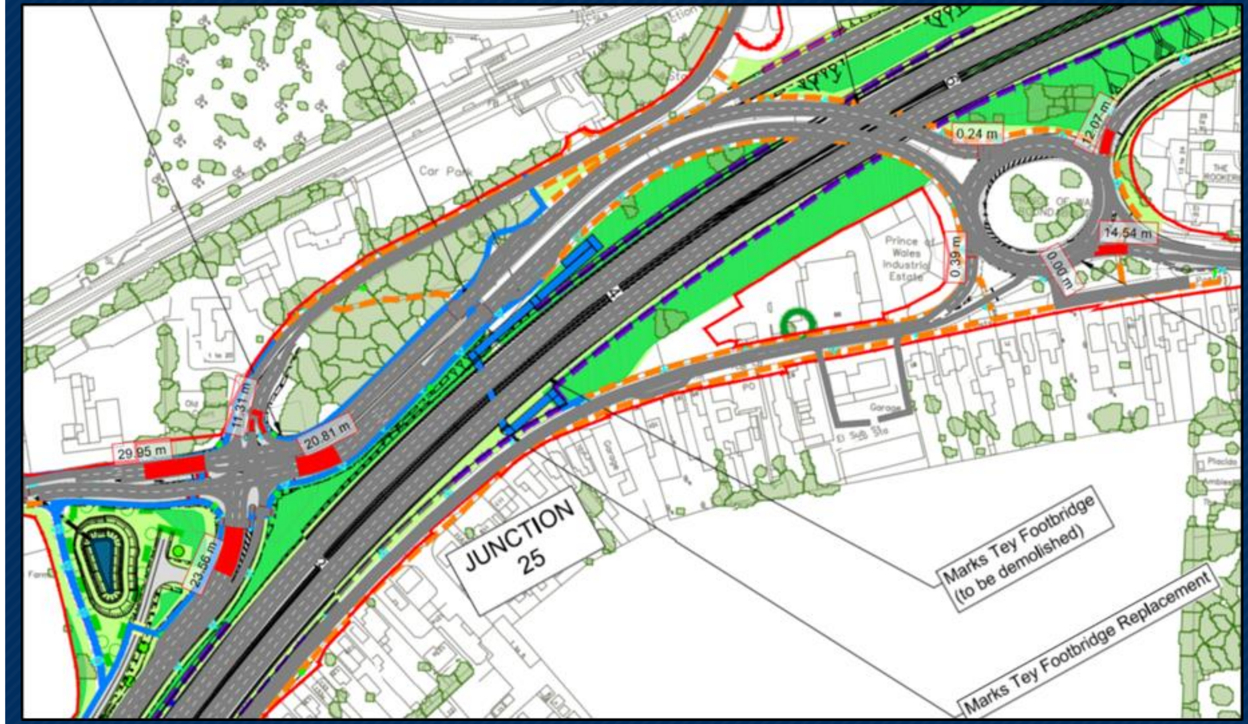
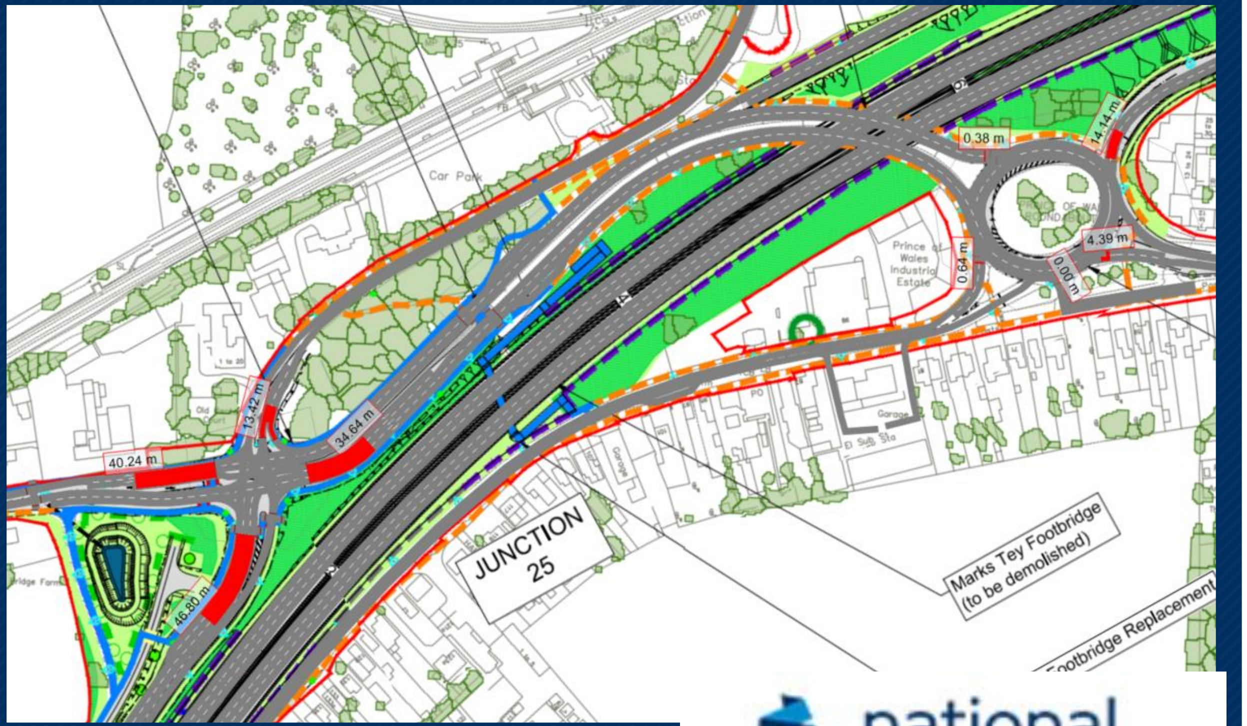
Junction 25

Vissim model results, DS 2042: average queue lengths

AM peak



PM peak



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Junction 25

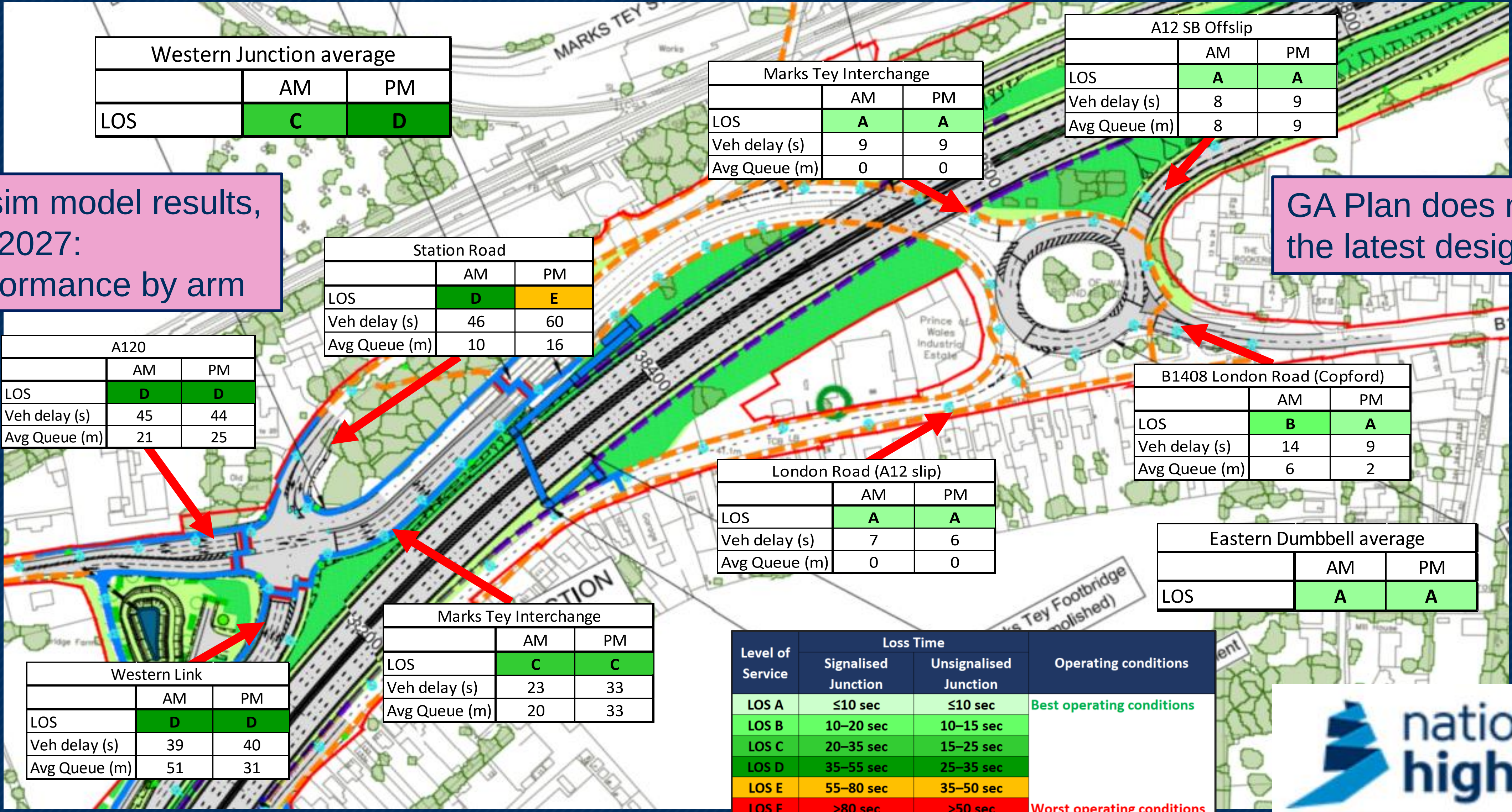
Vissim model results, DS 2042: full results

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Western Junction	Western Link	Signalised	D	683	42	24	59	D	953	46	47	105
	A120 Coggeshall Road	Signalised	D	1176	48	30	105	D	1193	49	40	132
	Station Road	Signalised	D	183	46	11	37	E	218	61	17	45
	Marks Tey Interchange	Signalised	C	1501	22	21	91	C	1616	29	35	111
	Total	**Signalised**	**D**	**3543**	**36**			**D**	**3981**	**41**		
Eastern Roundabout	A12 SB off slip	Unsignalised	B	1240	11	12	66	B	1237	12	14	70
	B1408 London Road (Copford)	Unsignalised	C	660	20	15	67	B	515	13	4	35
	London Road (A12 slip)	Unsignalised	A	99	8	0	10	A	138	8	1	12
	Marks Tey Interchange	Unsignalised	A	667	10	0	10	A	793	9	0	11
	Total	**Unsignalised**	**B**	**2666**	**13**			**B**	**2684**	**11**		
London Road Roundabout	A12 NB offslip	Unsignalised	A	321	6	0	12	A	647	7	1	19
	Southern Link - Old A12	Unsignalised	A	361	2	0	15	A	286	4	1	18
	Western Link	Unsignalised	A	429	4	0	8	A	481	4	0	9
	Old London Road	Unsignalised	A	63	3	0	7	A	68	5	0	9
	Total	**Unsignalised**	**A**	**1173**	**4**			**A**	**1481**	**6**		

Junction 25

Vissim model results, DS 2027: performance by arm

GA Plan does not reflect the latest design.



Western Junction average

	AM	PM
LOS	C	D

Marks Tey Interchange

	AM	PM
LOS	A	A
Veh delay (s)	9	9
Avg Queue (m)	0	0

A12 SB Offslip

	AM	PM
LOS	A	A
Veh delay (s)	8	9
Avg Queue (m)	8	9

Station Road

	AM	PM
LOS	D	E
Veh delay (s)	46	60
Avg Queue (m)	10	16

A120

	AM	PM
LOS	D	D
Veh delay (s)	45	44
Avg Queue (m)	21	25

B1408 London Road (Copford)

	AM	PM
LOS	B	A
Veh delay (s)	14	9
Avg Queue (m)	6	2

London Road (A12 slip)

	AM	PM
LOS	A	A
Veh delay (s)	7	6
Avg Queue (m)	0	0

Eastern Dumbbell average

	AM	PM
LOS	A	A

Marks Tey Interchange

	AM	PM
LOS	C	C
Veh delay (s)	23	33
Avg Queue (m)	20	33

Western Link

	AM	PM
LOS	D	D
Veh delay (s)	39	40
Avg Queue (m)	51	31

Level of Service	Loss Time: Signalised Junction	Loss Time: Unsignalised Junction	Operating conditions
LOS A	≤10 sec	≤10 sec	Best operating conditions
LOS B	10–20 sec	10–15 sec	
LOS C	20–35 sec	15–25 sec	
LOS D	35–55 sec	25–35 sec	
LOS E	55–80 sec	35–50 sec	
LOS F	>80 sec	>50 sec	Worst operating conditions

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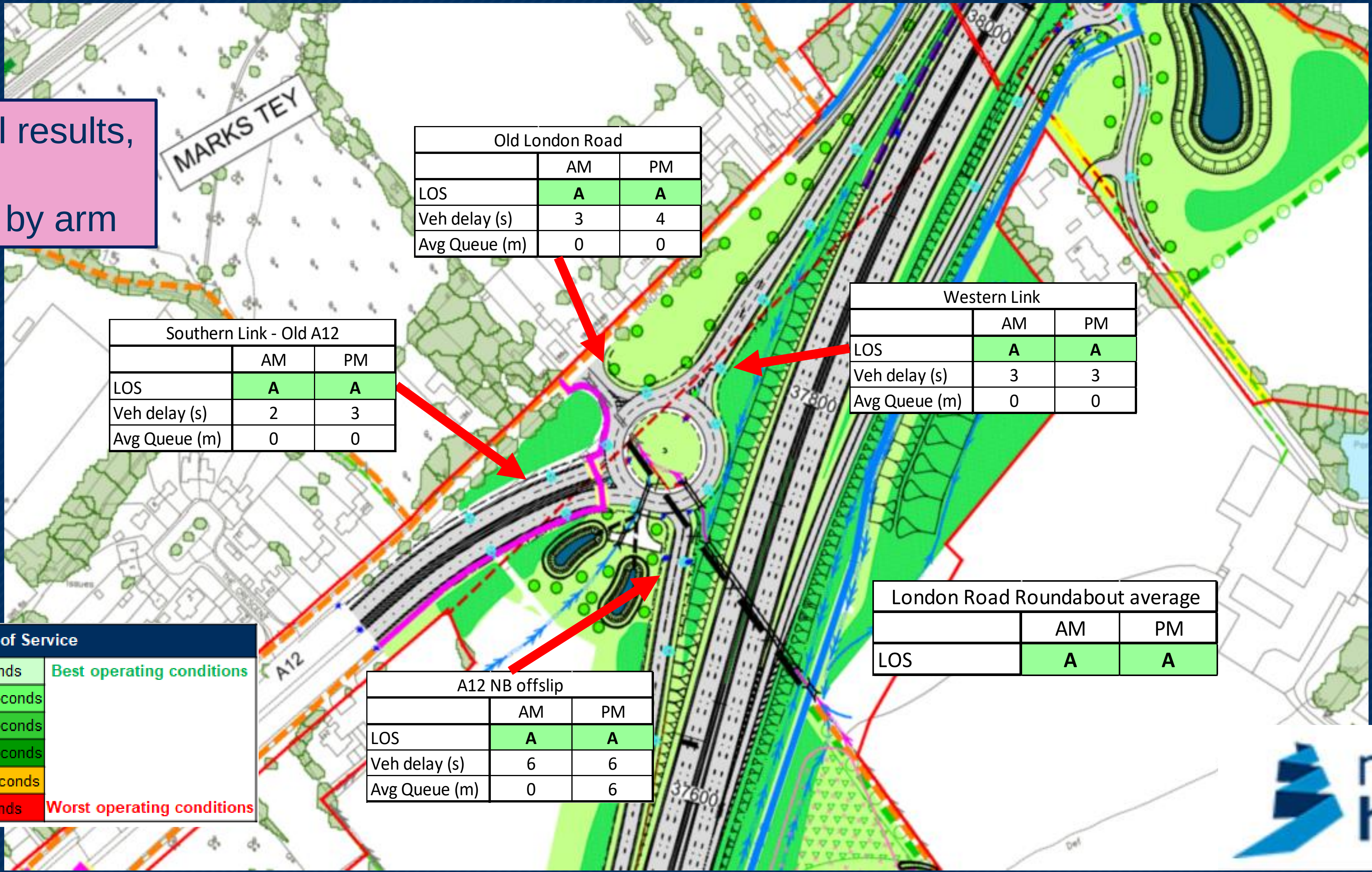
Junction 25

Vissim model results, DS 2027: performance by arm



Old London Road	AM	PM
LOS	A	A
Veh delay (s)	3	4
Avg Queue (m)	0	0

Southern Link - Old A12	AM	PM
LOS	A	A
Veh delay (s)	2	3
Avg Queue (m)	0	0

Western Link	AM	PM
LOS	A	A
Veh delay (s)	3	3
Avg Queue (m)	0	0

London Road Roundabout average	AM	PM
LOS	A	A

A12 NB offslip	AM	PM
LOS	A	A
Veh delay (s)	6	6
Avg Queue (m)	0	6

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Junction 25

Vissim model results, DS 2027: full results

Roundabout	Entry Arm	Control	AM					PM				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Western Junction	Western Link	Signalised	D	575	39	19	51	D	864	40	31	77
	A120	Signalised	D	1146	45	21	90	D	1133	44	25	100
	Station Road	Signalised	D	174	46	10	36	E	200	60	16	42
	Marks Tey Interchange	Signalised	C	1470	23	20	87	C	1463	33	33	92
	Total	**Signalised**	**C**	**3364**	**34**			**D**	**3659**	**39**		
Eastern Roundabout	A12 Offslip	Unsignalised	A	1264	8	8	55	A	1124	9	8	50
	B1408 London Road (Copford)	Unsignalised	B	515	14	6	40	A	406	9	2	25
	London Road (A12 slip)	Unsignalised	A	89	7	0	9	A	123	6	0	11
	Marks Tey Interchange	Unsignalised	A	577	9	0	6	A	702	9	0	7
	Total	**Unsignalised**	**A**	**2445**	**10**			**A**	**2355**	**9**		
London Road Roundabout	A12 NB offslip	Unsignalised	A	250	6	0	10	A	565	6	0	0
	Southern Link - Old A12	Unsignalised	A	308	2	0	12	A	274	3	0	0
	Western Link	Unsignalised	A	300	3	0	4	A	266	3	0	0
	Old London Road	Unsignalised	A	58	3	0	6	A	63	4	0	0
	Total	**Unsignalised**	**A**	**916**	**3**			**A**	**1168**	**4**		

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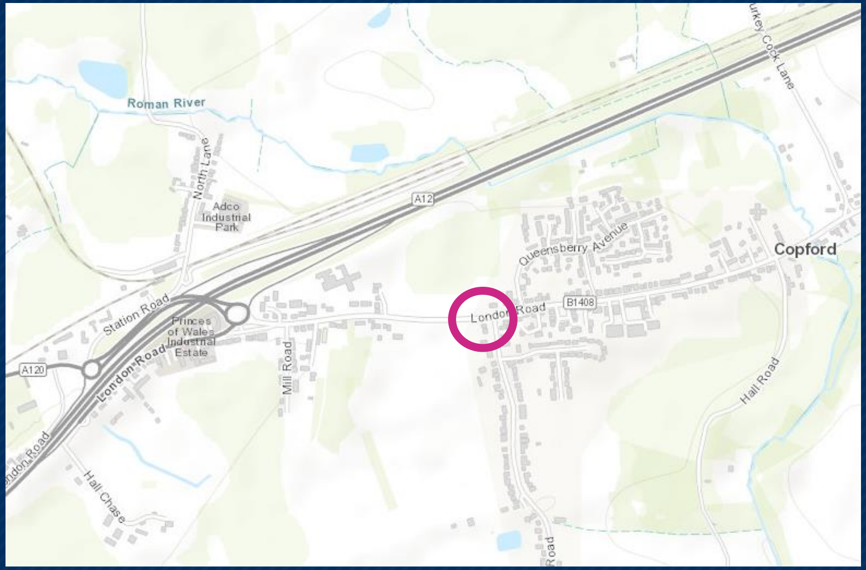
London Road, Copford

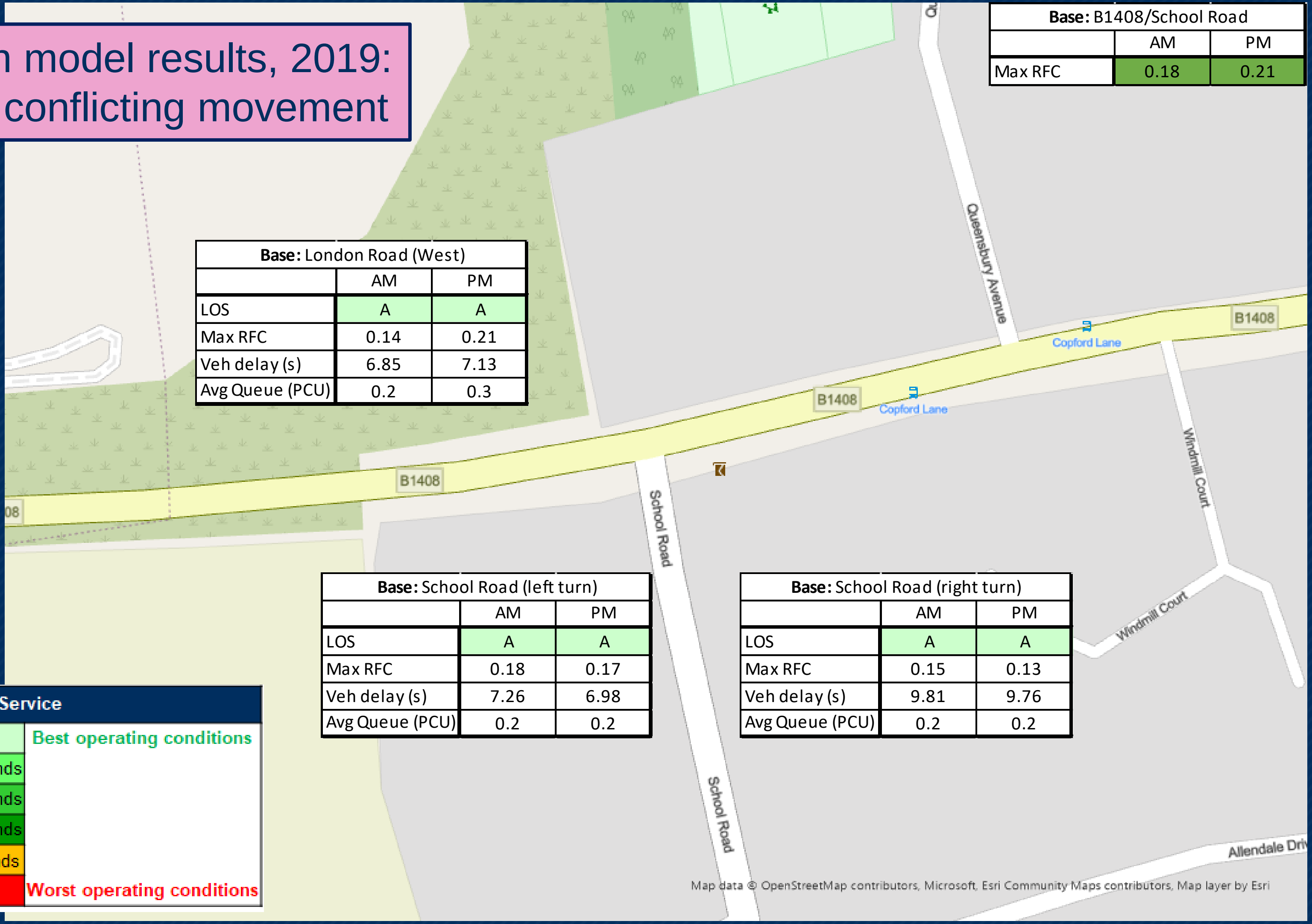
- *Junction model results for 2019, 2027 and 2042, for key junction along London Road.*
- *Junctions assessed in TA because of traffic increase identified on School Road and London Road.*

	Max RFC									
	2019 Base		*2027 DM*		*2027 DS*		*2042 DM*		*2042 DS*	
Junction	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
B1408 London Road/ School Road (Copford)	0.18	0.21	0.20	0.23	0.32	0.26	0.35	0.27	0.39	0.29



B1408 London Road/School Road (Copford)

PICADY junction model results, 2019: performance by conflicting movement



Base: B1408/School Road		
	AM	PM
Max RFC	0.18	0.21

Base: London Road (West)		
	AM	PM
LOS	A	A
Max RFC	0.14	0.21
Veh delay (s)	6.85	7.13
Avg Queue (PCU)	0.2	0.3

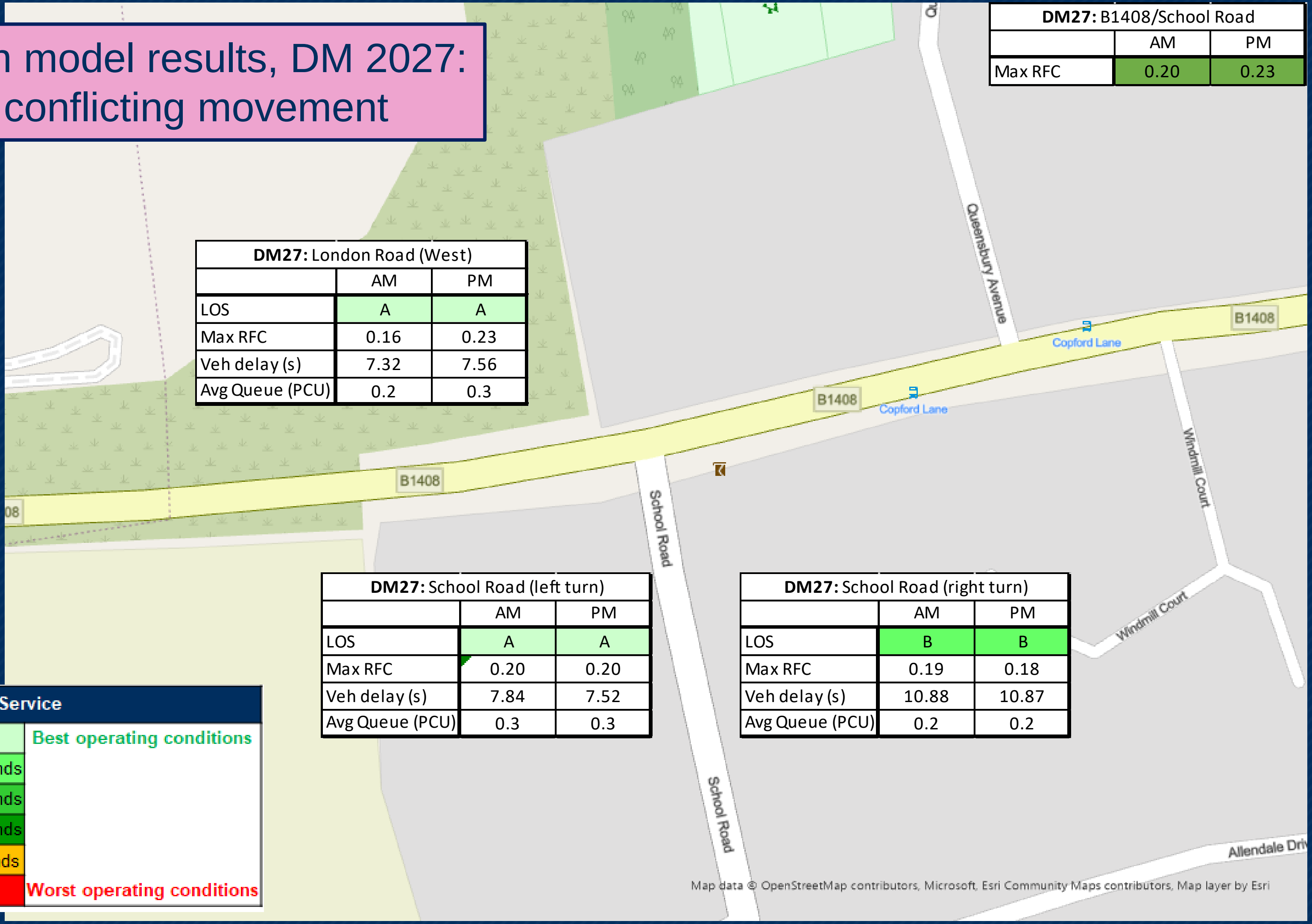
Base: School Road (left turn)		
	AM	PM
LOS	A	A
Max RFC	0.18	0.17
Veh delay (s)	7.26	6.98
Avg Queue (PCU)	0.2	0.2

Base: School Road (right turn)		
	AM	PM
LOS	A	A
Max RFC	0.15	0.13
Veh delay (s)	9.81	9.76
Avg Queue (PCU)	0.2	0.2

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

B1408 London Road/School Road (Copford)

PICADY junction model results, DM 2027: performance by conflicting movement



DM27: B1408/School Road		
	AM	PM
Max RFC	0.20	0.23

DM27: London Road (West)		
	AM	PM
LOS	A	A
Max RFC	0.16	0.23
Veh delay (s)	7.32	7.56
Avg Queue (PCU)	0.2	0.3

DM27: School Road (left turn)		
	AM	PM
LOS	A	A
Max RFC	0.20	0.20
Veh delay (s)	7.84	7.52
Avg Queue (PCU)	0.3	0.3

DM27: School Road (right turn)		
	AM	PM
LOS	B	B
Max RFC	0.19	0.18
Veh delay (s)	10.88	10.87
Avg Queue (PCU)	0.2	0.2

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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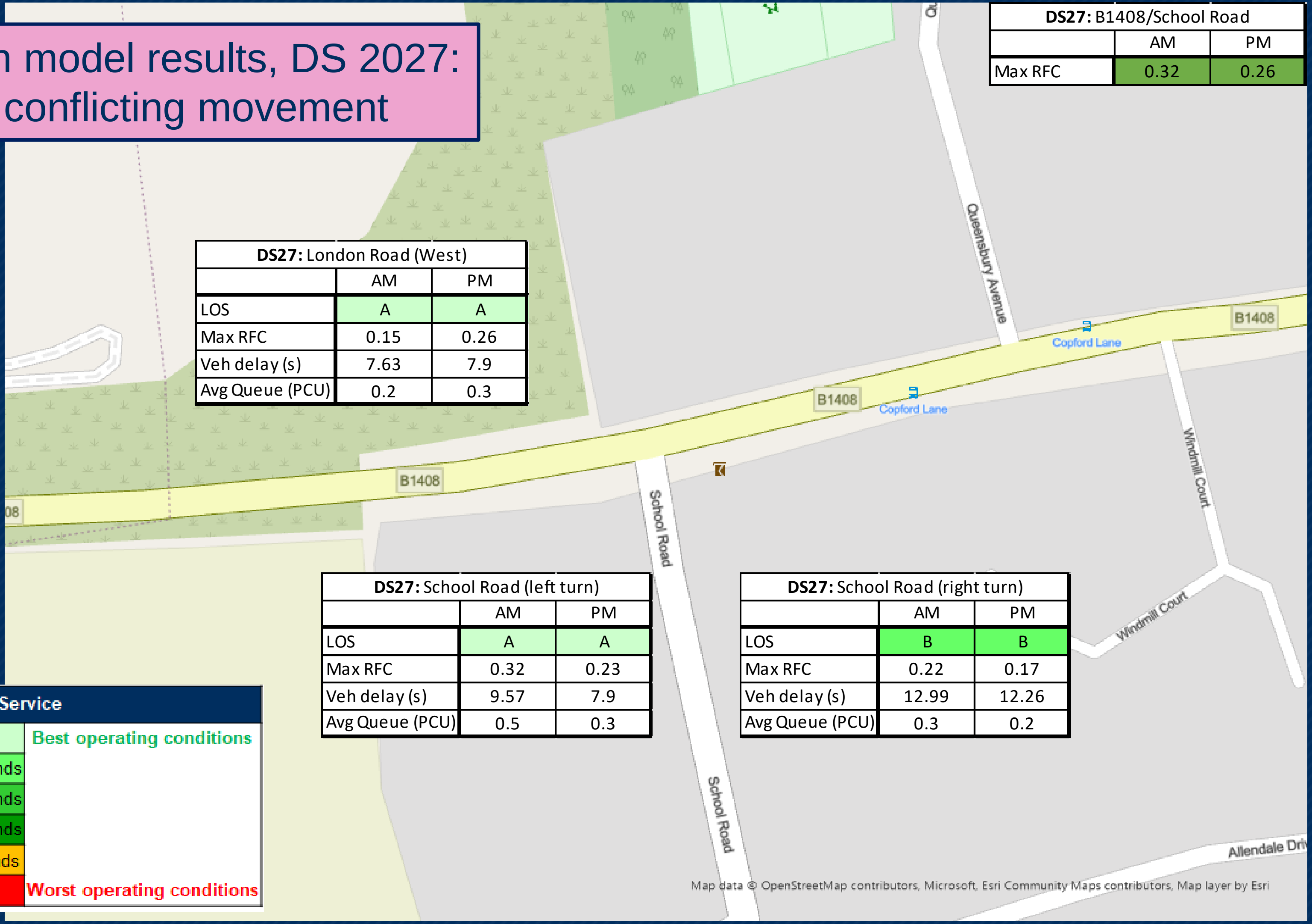
B1408 London Road/School Road (Copford)

PICADY junction model results, DS 2027: performance by conflicting movement



DS27: B1408/School Road		
	AM	PM
Max RFC	0.32	0.26

DS27: London Road (West)		
	AM	PM
LOS	A	A
Max RFC	0.15	0.26
Veh delay (s)	7.63	7.9
Avg Queue (PCU)	0.2	0.3

DS27: School Road (left turn)		
	AM	PM
LOS	A	A
Max RFC	0.32	0.23
Veh delay (s)	9.57	7.9
Avg Queue (PCU)	0.5	0.3

DS27: School Road (right turn)		
	AM	PM
LOS	B	B
Max RFC	0.22	0.17
Veh delay (s)	12.99	12.26
Avg Queue (PCU)	0.3	0.2

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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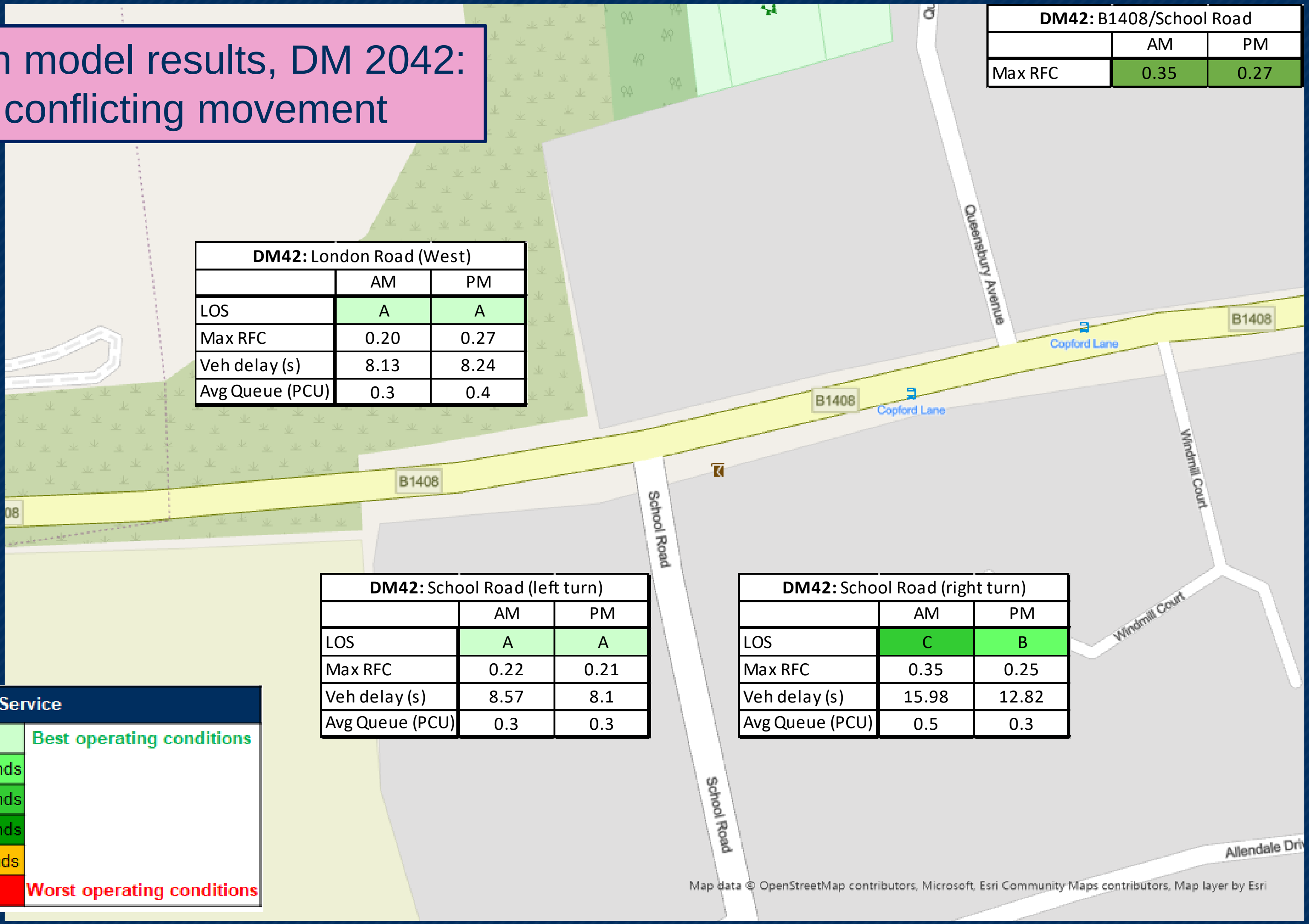
B1408 London Road/School Road (Copford)

PICADY junction model results, DM 2042: performance by conflicting movement



DM42: B1408/School Road		
	AM	PM
Max RFC	0.35	0.27

DM42: London Road (West)		
	AM	PM
LOS	A	A
Max RFC	0.20	0.27
Veh delay (s)	8.13	8.24
Avg Queue (PCU)	0.3	0.4

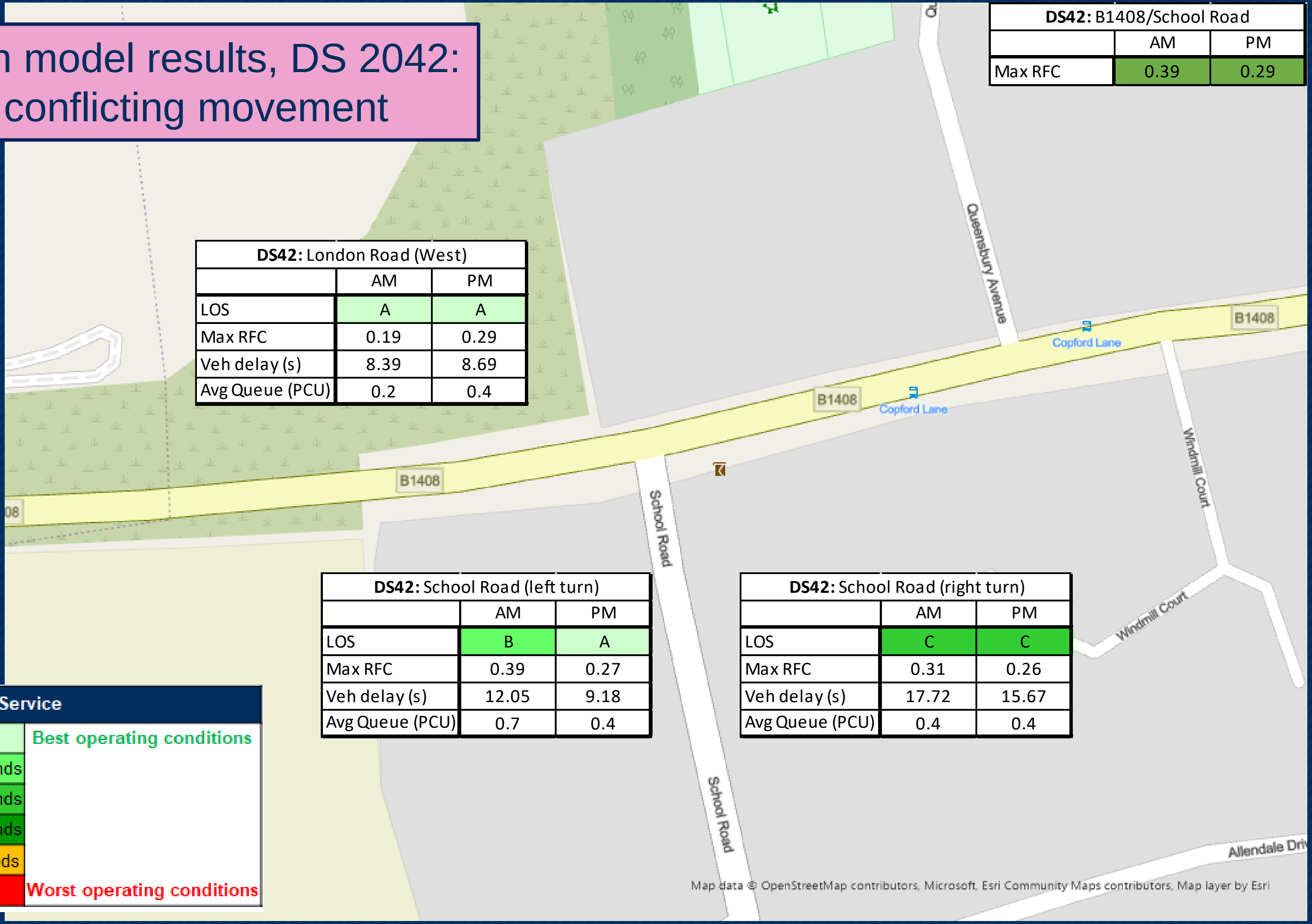
DM42: School Road (left turn)		
	AM	PM
LOS	A	A
Max RFC	0.22	0.21
Veh delay (s)	8.57	8.1
Avg Queue (PCU)	0.3	0.3

DM42: School Road (right turn)		
	AM	PM
LOS	C	B
Max RFC	0.35	0.25
Veh delay (s)	15.98	12.82
Avg Queue (PCU)	0.5	0.3

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

B1408 London Road/School Road (Copford)

PICADY junction model results, DS 2042: performance by conflicting movement



DS42: B1408/School Road		
	AM	PM
Max RFC	0.39	0.29

DS42: London Road (West)		
	AM	PM
LOS	A	A
Max RFC	0.19	0.29
Veh delay (s)	8.39	8.69
Avg Queue (PCU)	0.2	0.4

DS42: School Road (left turn)		
	AM	PM
LOS	B	A
Max RFC	0.39	0.27
Veh delay (s)	12.05	9.18
Avg Queue (PCU)	0.7	0.4

DS42: School Road (right turn)		
	AM	PM
LOS	C	C
Max RFC	0.31	0.26
Veh delay (s)	17.72	15.67
Avg Queue (PCU)	0.4	0.4

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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Updated list of future developments included in the traffic model

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Updated Uncertainty Log

The list of developments included within the traffic model has been updated ahead of DCO submission. The following slides show the updated Uncertainty Log.

Updated Uncertainty Log

Employment Sites

ID	Uncertainty Assigned	Local Authority	Name	X coordinate	Y coordinate	Total GFA (m2)	Estimated number of jobs	% of GFA/Jobs by 2027	% of GFA Jobs by 2042
3	Near Certain	Braintree	Land adjoining Burghey Brook Poultry Farm	583099	216056	16365	355	100%	100%
8	Near Certain	Braintree	Waterside Business Park, Witham	583099	216056	4181	106	100%	100%
10	Near Certain	Braintree	PFE Express, Eastways	583099	216056	15470	392	100%	100%
120	Near Certain	Chelmsford	Rosehart Properties Ltd Blocks B and C Chelmsford Office and Technology Park West Hanningfield Road	572921	204002	-4472	-113	100%	100%
121	Near Certain	Chelmsford	Site at The Warehouse, Hawk Lane	577555	194434	-620	-16	100%	100%
122	Near Certain	Chelmsford	Rivermead Industrial Estate Bishop Hall Lane Chelmsford	570884	207829	780	20	100%	100%
123	Near Certain	Chelmsford	Hanningfield Gate, South Hanningfield Road, South Hanningfield, Chelmsford	574923	197739	245	6	100%	100%
124	Near Certain	Chelmsford	Land At 19 To 21 Woodham Halt, South Woodham Ferrers	580428	197672	-60	-2	100%	100%
125	Near Certain	Chelmsford	Site At Pond View, Banters Lane, Great Leighs, Chelmsford	573651	218133	-109	-3	100%	100%
126	Near Certain	Chelmsford	189 Moulsham Street And Land To The Rear Chelmsford	570793	206311	-114	-3	100%	100%
74	Near Certain	Maldon District Council	Wycke Hill South Maldon	583563	205344	16200	410	50%	100%
161	More than likely	Braintree	Josephs Barn Hatfield Road Witham Essex	580270	213031	1380	106	80%	100%
183	More than likely	Braintree	14 Freebournes Road Witham Essex CM8 3DG	582847	214524	10080	212	80%	100%
197	More than likely	Braintree	12 Freebournes Road Witham Essex CM8 3AH	582886	214690	25300	361	80%	100%
203	More than likely	Braintree	7A - 7B Perry Road Witham Essex CM8 3YZ	582627	213996	675	10	80%	100%
168	More than likely	Colchester	228 Old London Road, Marks Tey CO6 1HD	590834	223208	12517	263	100%	100%
172	More than likely	Colchester	AGM House, 83A London Road, Copford Colchester CO6 1GT	592995	223785	3000	76	100%	100%
4	Reasonably Foreseeable	Braintree	Essex County Fire and Rescue Service Headquarters	584637	216937	21540	546	0%	100%
38	Reasonably Foreseeable	Chelmsford	NE Chelmsford	572140	212363	45000	1140	12%	100%
117	Reasonably Foreseeable	Chelmsford	Remainder of Rivermead Industrial Estate, Bishop Hall Lane, Chelmsford	570884	207829	6220	158	100%	100%
118	Reasonably Foreseeable	Chelmsford	Railway Sidings, Brook Street	571075	207438	7000	177	100%	100%
119	Reasonably Foreseeable	Chelmsford	East of Chelmsford - Land North of Maldon Road	574315	205599	5000	127	100%	100%

Note: The negative job numbers indicate demolitions or change in land use.

Updated Uncertainty Log

Employment Sites

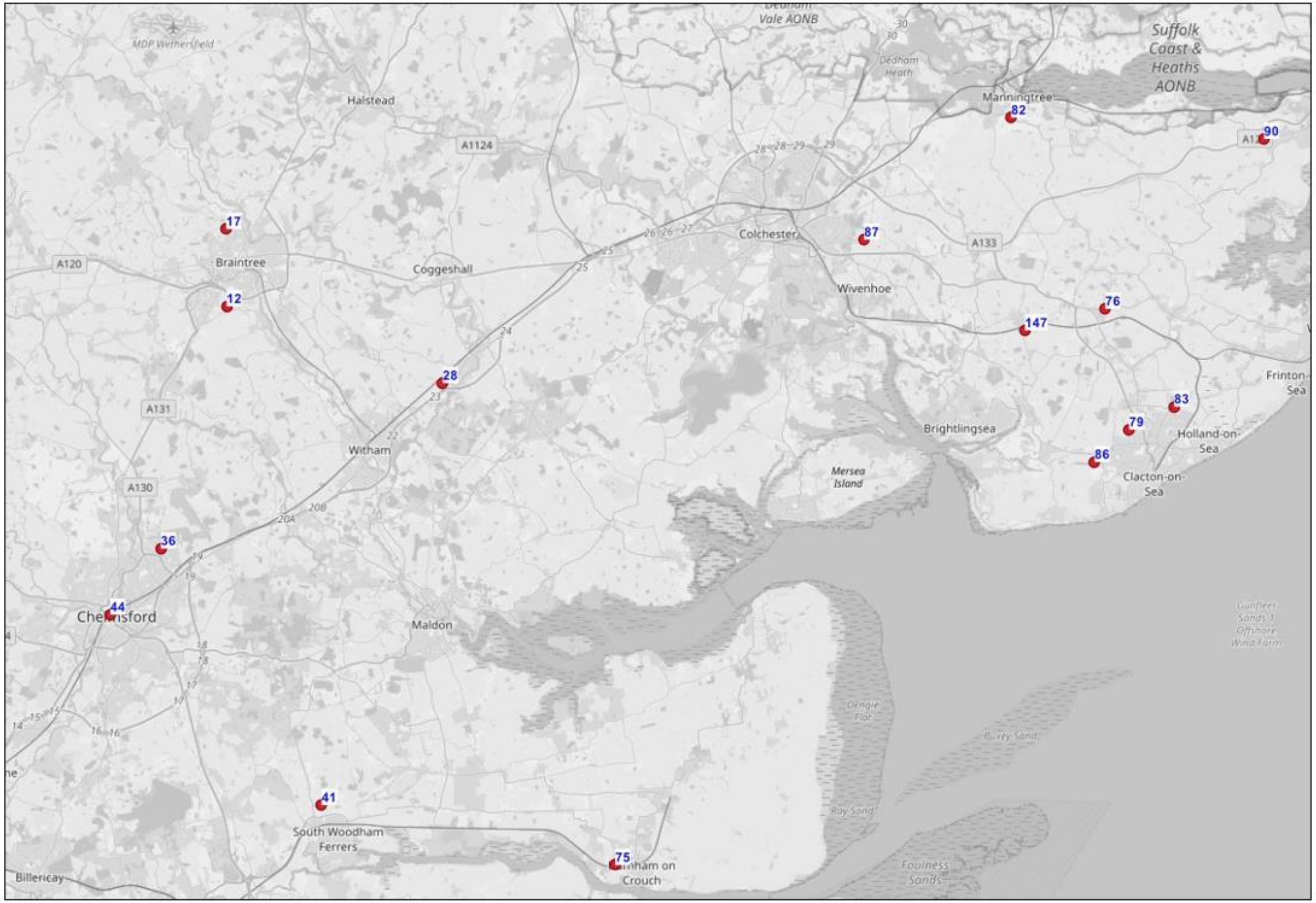
Updated Uncertainty Log

Mixed Use Sites

ID	Uncertainty Assigned	Local Authority	Name	X coordinate	Y coordinate	Estimated number of jobs	Total number of dwellings	% of dwellings built by 2027	% of dwellings built by 2042	% of GFA/Jobs by 2027	% of GFA Jobs by 2042
17	Near Certain	Braintree	Land West of Panfield Lane	575171	224503	241	636	23%	100%	23%	100%
28	Near Certain	Braintree	Land off Cranes Lane Kelvedon Essex	585196	217921	154	125	100%	100%	100%	100%
36	Near Certain	Chelmsford	Greater Beaulieu Park, White Hart Lane, Springfield	572714	210006	3067	3600	54%	100%	54%	100%
44	Near Certain	Chelmsford	University Campus Phase 2 part of Central Park and land at Park Road Chelmsford	570528	206940	135	426	100%	100%	100%	100%
75	Near Certain	Maldon District Council	Corinthian Place, Maldon Road, Burnham-on-Crouch	593828	196445	345	180	100%	100%	50%	100%
76	Near Certain	Tendring District Council	Barleyfields, Weeley	614989	222456	231	280	43%	100%	43%	100%
83	Near Certain	Tendring District Council	Oakwood Park (Phase 1), Clacton on Sea	618291	218185	175	250	100%	100%	100%	100%
90	Near Certain	Tendring District Council	Harwich Valley, Harwich	621818	230414	189	297	27%	100%	27%	100%
147	Near Certain	Tendring District Council	Land at Station Field, Plough Road, Great Bentley	611403	221331	72	150	100%	100%	100%	100%
82	More than likely	Tendring District Council	Long Road, Mistley	610381	230877	101	485	25%	100%	25%	100%
86	More than likely	Tendring District Council	Rouses Farm	614803	215534	18	950	13%	100%	100%	100%
12	Reasonably Foreseeable	Braintree	Land east of Great Notley, Strategic Growth Location	575312	221026	38	2000	16%	100%	37%	100%
41	Reasonably Foreseeable	Chelmsford	North of South Woodham Ferrers	580407	198662	25	1000	41%	100%	41%	100%
79	Reasonably Foreseeable	Tendring District Council	Hartley Gardens, Clacton on Sea	616298	217060	177	1700	0%	44%	0%	100%
87	Reasonably Foreseeable	Tendring District Council	Tendring Colchester Borders Garden Community	603976	225113	608	8000	4%	30%	4%	30%

Updated Uncertainty Log

Mixed Use Sites



Updated Uncertainty Log

Residential Sites

ID	Uncertainty Assigned	Local Authority	Name	X coordinate	Y coordinate	Total number of dwellings	% of dwellings built by 2027	% of dwellings built by 2042
5	Near Certain	Braintree	Former Arla Dairy Site (Hatfield Grove)	578768	212021	145	100%	100%
6	Near Certain	Braintree	Land north east of Inworth Road (Part of Strategic Growth Location Land south of Feering/west of A12)	587407	219587	162	100%	100%
7	Near Certain	Braintree	Land adjacent to Braintree Road	578365	220410	225	100%	100%
14	Near Certain	Braintree	Land north of Colchester Road	585839	223041	300	100%	100%
15	Near Certain	Braintree	Land off Western Road	581440	219370	350	100%	100%
16	Near Certain	Braintree	Land south of Stonepath Drive	578791	211399	120	100%	100%
25	Near Certain	Braintree	Sorrells Field Bury Lane ("Mulberry Green")	578776	211835	50	100%	100%
27	Near Certain	Braintree	Land between London Road, Pods Brook and A120	574812	222182	215	100%	100%
29	Near Certain	Braintree	Land at Flemming Way	582749	216213	222	100%	100%
93	Near certain	Braintree	Willowmead Nursing Home Wickham Bishops Road	580932	211520	25	100%	100%
96	Near certain	Braintree	Land adjacent Watering Farm Coggeshall Road	586242	219574	35	100%	100%
97	Near certain	Braintree	Land South of The Garden Field Western Road	581541	219238	45	100%	100%
99	Near certain	Braintree	Car park at Sheepcotes Lane	581054	219905	15	100%	100%
100	Near certain	Braintree	Land south of Rickstones Road	582168	216656	58	100%	100%
101	Near certain	Braintree	Avondale, Land east of Mill Lane	578089	220371	99	100%	100%
102	Near certain	Braintree	Land at Appletree Farm Polecat Road	578906	220393	78	100%	100%
37	Near Certain	Chelmsford	Land north, south and east of Belsteads Farm Lane, Broomfield (Channels)	572237	210769	750	100%	100%
43	Near Certain	Chelmsford	Runwell Hospital, Runwell Chase, Runwell	576223	195983	575	100%	100%
46	Near Certain	Chelmsford	Great Leighs - Land East of Main Road	573181	217762	100	100%	100%
48	Near Certain	Chelmsford	Land east of Patching Hall Lane, Broomfield	570071	209545	135	100%	100%
49	Near Certain	Chelmsford	St Johns Hospital, Wood Street (North), Chelmsford - Linden Homes	570020	205022	127	100%	100%
50	Near Certain	Chelmsford	St Johns Hospital, Wood Street (South), Chelmsford - Inland Homes	569970	204958	101	100%	100%
51	Near Certain	Chelmsford	Land north of Copperfield Road (East portion) Chelmsford	569222	209373	198	100%	100%
52	Near Certain	Colchester	Chesterwell	598411	227696	1461	100%	100%
53	Near Certain	Colchester	Cowdray Centre	599935	226243	262	100%	100%
54	Near Certain	Colchester	Fiddlers Field, Eight Ash Green	594068	225948	150	100%	100%
56	Near Certain	Colchester	Gosbecks Phase 2	597433	226630	144	96%	100%
58	Near Certain	Colchester	Land adjoining Gables, Kelvedon Road, Tiptree	588629	216942	130	100%	100%
59	Near Certain	Colchester	Land at Grange Farm, Tiptree	588817	216682	103	100%	100%
60	Near Certain	Colchester	Land at Maldon Road, Rear of Peakes Close, Tiptree	588779	215695	255	100%	100%
61	Near Certain	Colchester	Land off Barbrook Lane, Tiptree	589907	216814	200	100%	100%
63	Near Certain	Colchester	Land to the North of London Road, Stanway	593855	224607	636	33%	100%
66	Near Certain	Colchester	Rugby Club (including 260 Extra Care Accomdation)	600148	228845	350	19%	100%
68	Near Certain	Colchester	Tiptree Neighbourhood Plan	589417	216556	150	13%	100%
69	Near Certain	Colchester	Wilkin and Sons Ltd, Factory Hill, Tiptree	590355	215746	126	100%	100%
127	Near Certain	Colchester	Brierley Paddocks, West Mersea	602422	213107	100	100%	100%

Updated Uncertainty Log

Residential Sites (Contd.)

ID	Uncertainty Assigned	Local Authority	Name	X coordinate	Y coordinate	Total number of dwellings	% of dwellings built by 2027	% of dwellings built by 2042
128	Near Certain	Colchester	Dawes Lane, West Mersea	602206	213634	100	70%	100%
174	Near Certain	Colchester	Land Off, Halstead Road, Eight Ash Green	593259	226436	150	100%	100%
70	Near Certain	Maldon District Council	[South of Limebrook Way, Maldon] eastern parcel = Handley Gardens, Maldon; western parcel = Wycke Place	584060	205164	1000	50%	100%
71	Near Certain	Maldon District Council	Completed LDP allocations, Maldon and Heybridge	585231	208406	320	100%	100%
72	Near Certain	Maldon District Council	Land At Broad Street Green Road And Langford Road And Maypole Road Great Totham Essex [North of Heybridge]	585221	208865	1138	50%	100%
132	Near Certain	Maldon District Council	Grangewood Park, Southminster Rd, Burnham-on-Crouch [North of Burnham-on-Crouch West]	594600	197114	180	100%	100%
133	Near Certain	Maldon District Council	North of Burnham-on-Crouch (East)	595192	197044	90	100%	100%
134	Near Certain	Maldon District Council	Blackwater Reach, Southminster [Theedhams Farm, Southminster]	594809	199939	94	100%	100%
135	Near Certain	Maldon District Council	Barley Fields , Burnham -on-Crouch Land [Land to the east of Pippins Rd Burnham-on-Crouch]	595393	196557	75	100%	100%
136	Near Certain	Maldon District Council	Land west of cemetery chapel, Southminster Road, Burnham-on-Crouch	594627	197773	80	100%	100%
77	Near Certain	Tendring District Council	Finches Park, Frinton on Sea	622300	221220	266	91%	100%
78	Near Certain	Tendring District Council	Hamford Park, Walton on the Naze	625045	221948	216	100%	100%
80	Near Certain	Tendring District Council	Land West of Low Road, Dovercourt	623253	230175	300	57%	100%
81	Near Certain	Tendring District Council	Lawford Green, Lawford	609826	230704	360	57%	100%
85	Near Certain	Tendring District Council	River Reach, Mistley	612633	231365	235	100%	100%
88	Near Certain	Tendring District Council	Turpins Farm, Kirby Le Soken	623590	221594	210	86%	100%
89	Near Certain	Tendring District Council	Brook Park West, Clacton on Sea	616639	217076	200	85%	100%
143	Near Certain	Tendring District Council	'Colne Gardens Phase 2', Brightlingsea	609342	217087	115	100%	100%
145	Near Certain	Tendring District Council	Staunton Gate', Alresford	606329	221655	144	100%	100%
146	Near Certain	Tendring District Council	Land North of Cockaynes Lane, Alresford	606395	221890	84	100%	100%
150	Near Certain	Tendring District Council	'Wellwick Field', The Priory Estate, St Osyth	612142	215737	190	72%	100%
151	Near Certain	Tendring District Council	Henderson Park, Thorpe le Soken	618572	222616	98	100%	100%

Updated Uncertainty Log

Residential Sites (Contd.)

ID	Uncertainty Assigned	Local Authority	Name	X coordinate	Y coordinate	Total number of dwellings	% of dwellings built by 2027	% of dwellings built by 2042
2	More than likely	Braintree	Bury Farm, Bury Lane, Hatfield Peverel	578598	211865	46	100%	100%
11	More than likely	Braintree	Land Between Long Green And Braintree Road	578010	221555	250	50%	100%
18	More than likely	Braintree	Land Adjacent To Lodge Farm Hatfield Road Witham Essex	580719	213366	750	53%	100%
22	More than likely	Braintree	Station Field, Land west of Kelvedon Station Station Road (Monks Farm)	586051	219364	250	84%	100%
24	More than likely	Braintree	Towerlands Park	575054	225227	575	65%	100%
92	More than likely	Braintree	St Andrews Road Hatfield Peverel	579078	211538	25	100%	100%
94	More than likely	Braintree	Land at Wood End Farm	580400	213072	300	65%	100%
103	More than likely	Braintree	Land North Of London Road Kelvedon Essex	585412	218136	250	100%	100%
107	More than likely	Braintree	Land at 14-18 Thorne Road and 1-15 Croft Road Kelvedon	585867	218724	15	100%	100%
164	More than likely	Braintree	Land West Of St Dominics Residential Home & The Cloisters Kelvedon Essex	585823	218348	25	100%	100%
199	More than likely	Braintree	Former Bramston Sports Centre, Bridgestreet, CM8 1BT Witham	581739	214219	58	100%	100%
202	More than likely	Braintree	Land North East Of Gleneagles Way Hatfield Peverel Essex	579714	211906	100	100%	100%
159	More than likely	Braintree	Land off Maldon Road, Hatfield Peverel	579714	211906	130	100%	100%
39	More than likely	Chelmsford	North East Chelmsford	572140	212363	3000	12%	100%
40	More than likely	Chelmsford	Strategic Growth Site North Of Woodhouse Lane Broomfield Chelmsford Essex	570332	211817	450	9%	100%
42	More than likely	Chelmsford	Peninsula Site Chelmer Waterside Development Wharf Road Chelmsford	571628	206292	448	100%	100%
114	More than likely	Chelmsford	Rivermead Bishop Hall Lane Chelmsford	570884	207829	136	100%	100%
154	More than likely	Chelmsford	Site At North Bungalow Elm Way Boreham Chelmsford Essex, CM3 3HB	575141	210078	9	100%	100%
155	More than likely	Chelmsford	Strategic Growth Site 3B West Of Park & Ride Terminus, Maldon Road Strategic Growth Site 3c, East Of Molrams Lane & Strategic Growth Site 3d, East Of Sandford Mill Lane Sandon Chelmsford Essex	573778	207272	205	100%	100%
55	More than likely	Colchester	Former Severalls Hospital	599312	228474	392	100%	100%
57	More than likely	Colchester	Lakelands	594925	224060	254	100%	100%
62	More than likely	Colchester	Land off Dyers Road including Fiveways Fruit Farm	595518	223455	605	20%	100%
64	More than likely	Colchester	Land to the West of Lakelands	594546	224041	150	100%	100%
170	More than likely	Colchester	14 Copford Place, London Road, Copford Colchester CO6 1BG	593334	224138	37	100%	100%
173	More than likely	Colchester	Land to the rear of 306 to, 314 London Road, Stanway Colchester CO3 8LT	593938	224406	31	100%	100%
204	More than likely	Colchester	Land at, Brook Meadows, Tiptree Colchester CO5 0QF	589052	216065	221	100%	100%
73	More than likely	Maldon District Council	Wycke Hill North, Maldon	583823	205815	320	100%	100%
130	More than likely	Maldon District Council	Sharpes Meadow, Heybridge [West of Broad Street Green Road]	586005	209294	145	75%	100%
137	More than likely	Maldon District Council	Land North West Of 2 Maldon Road Burnham-On-Crouch Essex [sometimes referred to as 'Tinkers Hole', from name of adjacent lane]	593294	197824	166	0%	100%
141	More than likely	Tendring District Council	Land North of Sladburys Lane, Clacton on Sea	618940	216638	132	45%	100%
142	More than likely	Tendring District Council	Thorpe Road/Chapel Lane, Frinton on Sea	620776	221065	110	100%	100%
144	More than likely	Tendring District Council	Land to the south of Bromley Road, Ardleigh	603135	226075	145	100%	100%
148	More than likely	Tendring District Council	Land south Weeley Road, Great Bentley	611907	222762	136	88%	100%
149	More than likely	Tendring District Council	Land at The Street, Little Clacton	616305	219465	98	100%	100%

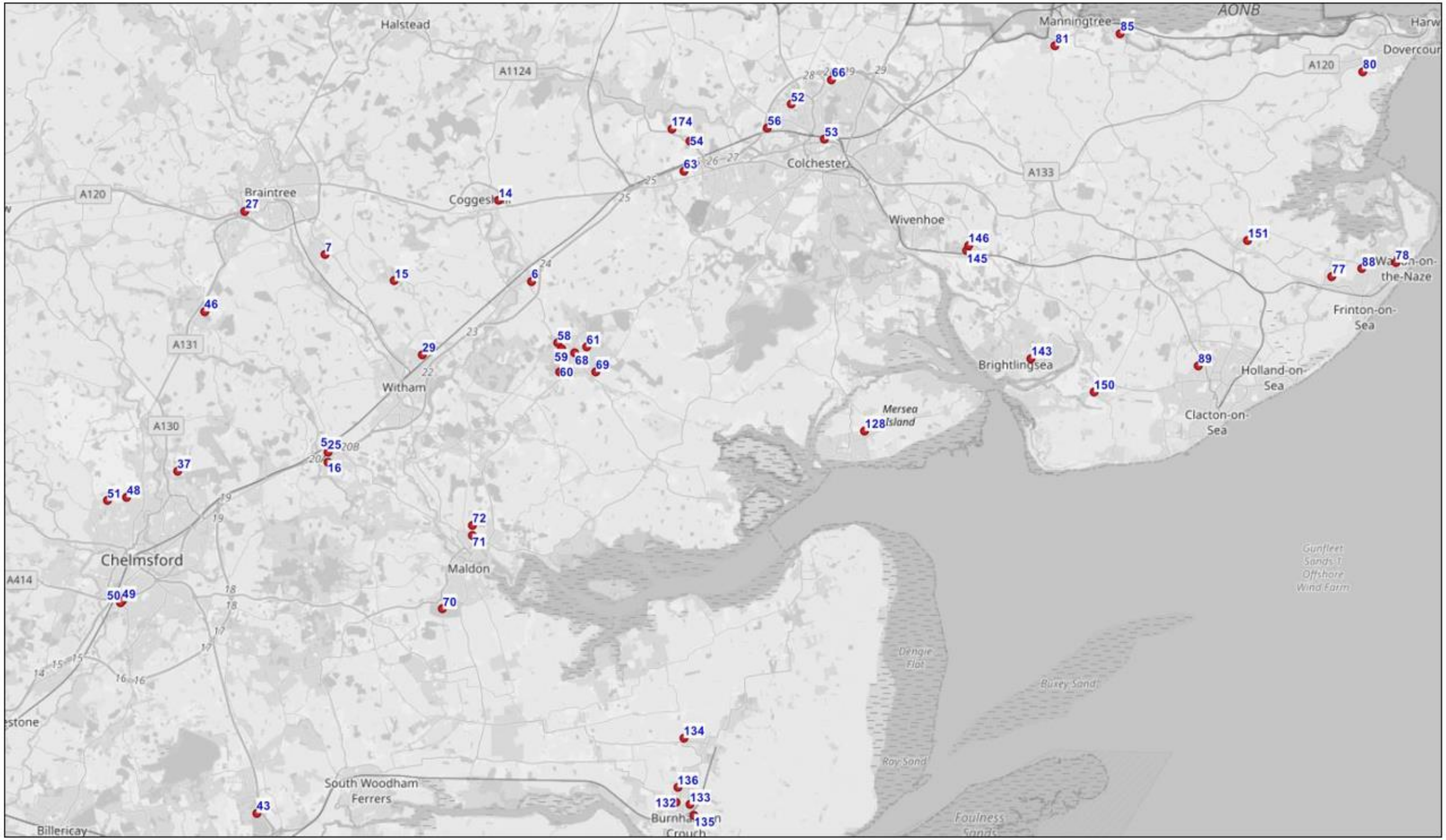
Updated Uncertainty Log

Residential Sites (Contd.)

ID	Uncertainty Assigned	Local Authority	Name	X coordinate	Y coordinate	Total number of dwellings	% of dwellings built by 2027	% of dwellings built by 2042
9	Reasonably Foreseeable	Braintree	Land at Egypts Farm, Silver End	580220	219700	365	40%	100%
13	Reasonably Foreseeable	Braintree	Land east of Silver End	581466	220293	1800	25%	100%
23	Reasonably Foreseeable	Braintree	Strategic Growth Location, Land south of Feering/west of A12	587407	219587	795	8%	100%
26	Reasonably Foreseeable	Braintree	Strategic Growth Location, Land south of Feering/west of A12	587407	219587	40	15%	100%
95	Reasonably Foreseeable	Braintree	Land south of Maltings Lane	581249	213244	63	65%	100%
98	Reasonably Foreseeable	Braintree	Crittall Works site	580083	219575	65	100%	100%
108	Reasonably Foreseeable	Braintree	Land at Newlands Centre Newland Street	582040	214542	15	0%	100%
30	Reasonably Foreseeable	Chelmsford	East Chelmsford - Manor Farm	573578	205591	250	100%	100%
31	Reasonably Foreseeable	Chelmsford	Eastwood House Car Park Glebe Road Chelmsford	570648	207330	231	100%	100%
32	Reasonably Foreseeable	Chelmsford	Former Gas Works Wharf Road Chelmsford	571312	206518	250	0%	100%
33	Reasonably Foreseeable	Chelmsford	Former Royal Mail Premises Victoria Road Chelmsford	571034	207180	203	100%	100%
34	Reasonably Foreseeable	Chelmsford	Great Leighs - Land at Moulsham Hall	573091	218377	750	12%	100%
35	Reasonably Foreseeable	Chelmsford	Great Leighs - Land East of London Road	573496	218450	250	100%	100%
45	Reasonably Foreseeable	Chelmsford	West Chelmsford	568061	207735	800	75%	100%
47	Reasonably Foreseeable	Chelmsford	Great Leighs - Land North and South of Banters Lane	573476	218174	100	100%	100%
110	Reasonably Foreseeable	Chelmsford	Lockside Navigation Road Chelmsford	571590	206486	130	38%	100%
111	Reasonably Foreseeable	Chelmsford	Baddow Road Car Park and Land to the East	571277	206335	190	0%	100%
112	Reasonably Foreseeable	Chelmsford	Riverside Ice and Leisure Land Victoria Road Chelmsford	571133	207016	125	100%	100%
113	Reasonably Foreseeable	Chelmsford	Civic Centre Land Fairfield Road Chelmsford	570340	206938	100	0%	100%
115	Reasonably Foreseeable	Chelmsford	East Chelmsford - Land South of Maldon Road	574067	205323	100	100%	100%
116	Reasonably Foreseeable	Chelmsford	Danbury	580407	198662	100	0%	100%
65	Reasonably Foreseeable	Colchester	Middlewick Ranges	600939	222852	1000	10%	100%
67	Reasonably Foreseeable	Colchester	Tendring/Colchester Borders GC	604151	225678	1250	20%	100%
131	Reasonably Foreseeable	Maldon District Council	Heybridge Swifts, Heybridge	586539	208421	100	0%	100%
138	Reasonably Foreseeable	Maldon District Council	Petticrows Boat Yard, Burnham-on-Crouch	595636	195439	75	10%	100%
84	Reasonably Foreseeable	Tendring District Council	Oakwood Park, Little Clacton	618548	218698	918	4%	100%

Updated Uncertainty Log

Residential Sites – Near Certain



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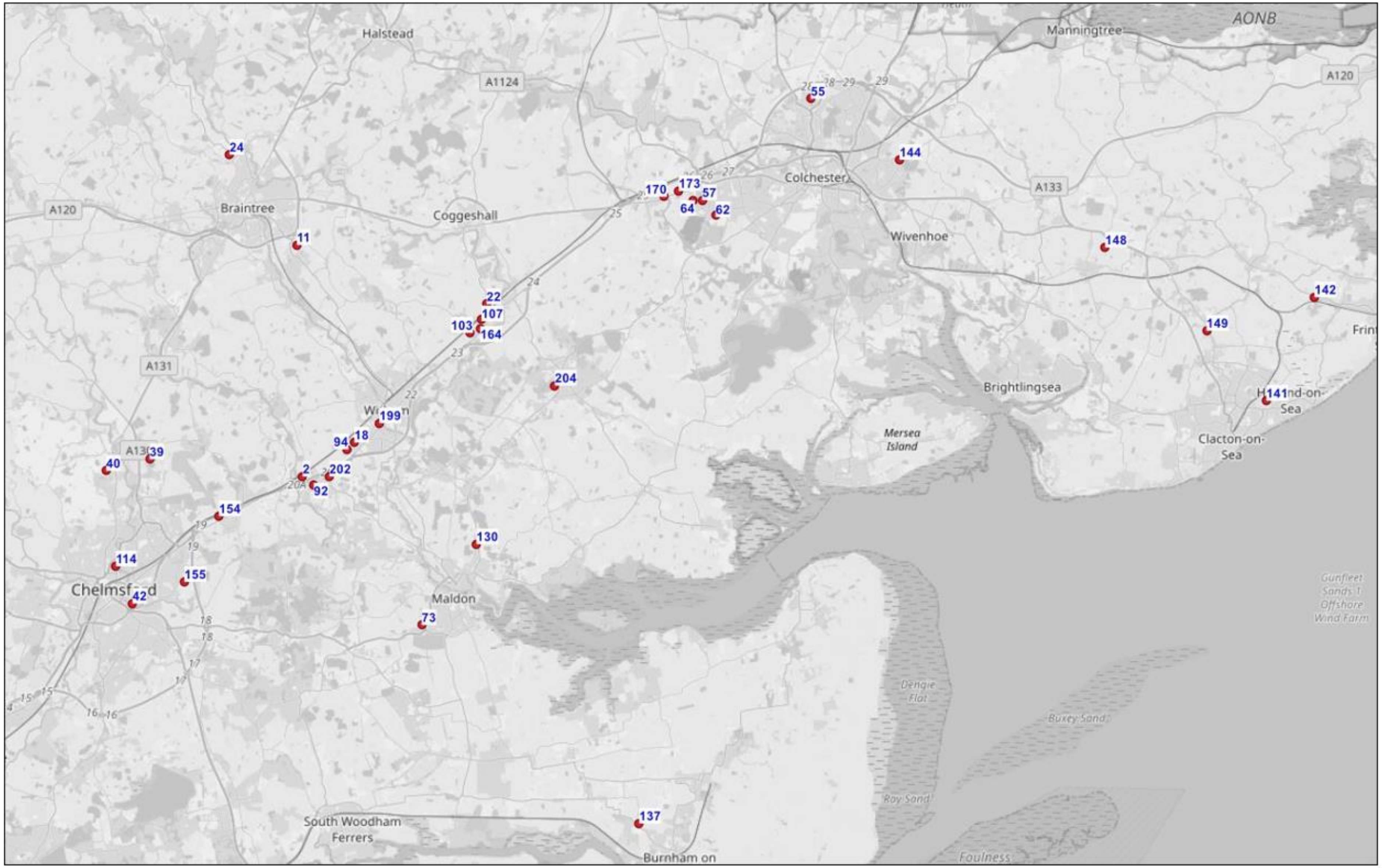
Updated Uncertainty Log

Residential Sites – More than Likely



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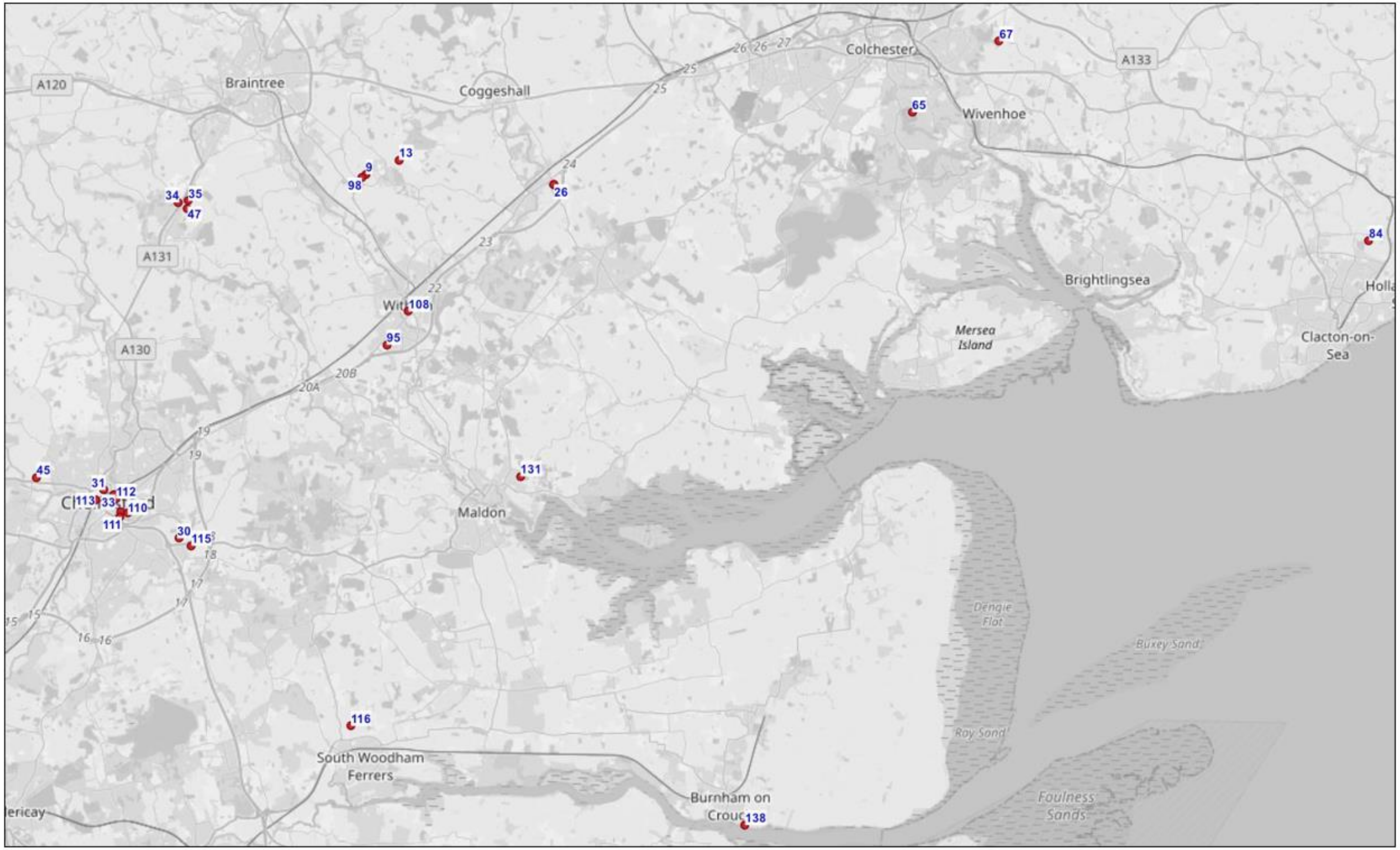
Updated Uncertainty Log

Residential Sites – Reasonably Foreseeable



Transport Assessment - Update

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DCO Transport deliverables

- Transport Assessment
  - Including operational traffic modelling during construction and operation
- Combined Modelling and Appraisal (ComMA) Report
  - Detailed information on the modelling and appraisal process, focussing on strategic modelling and economics rather than operational traffic modelling.

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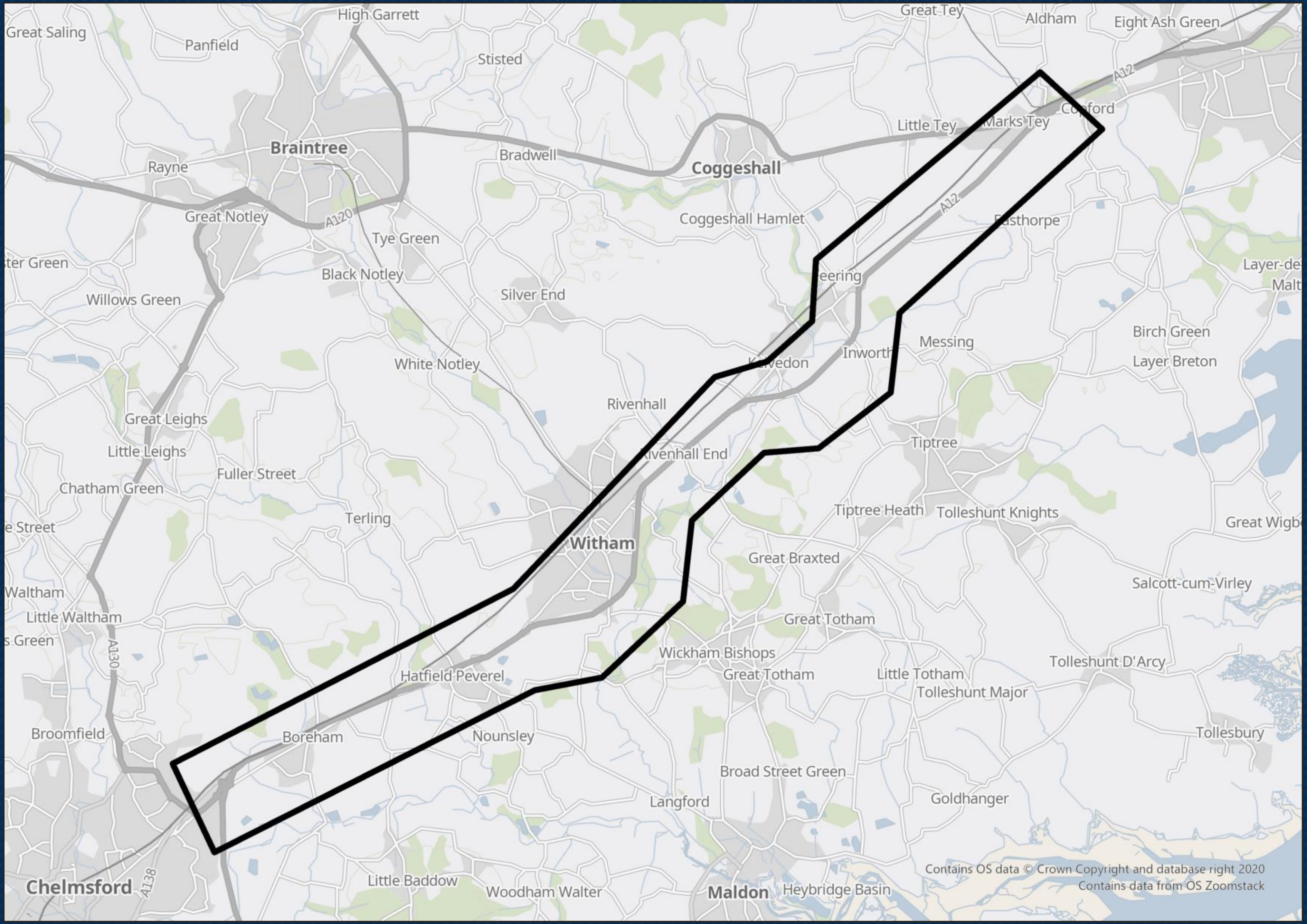
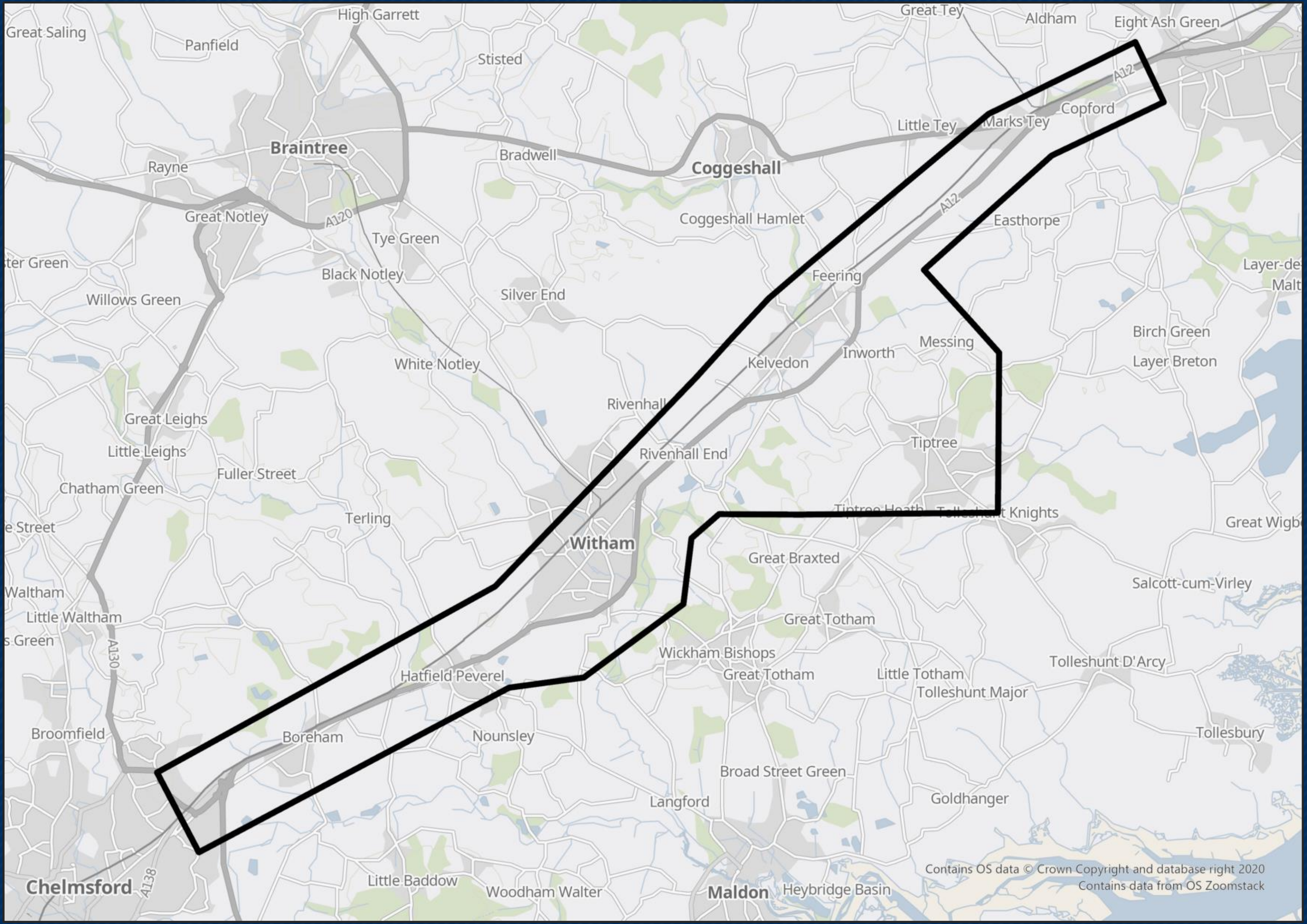
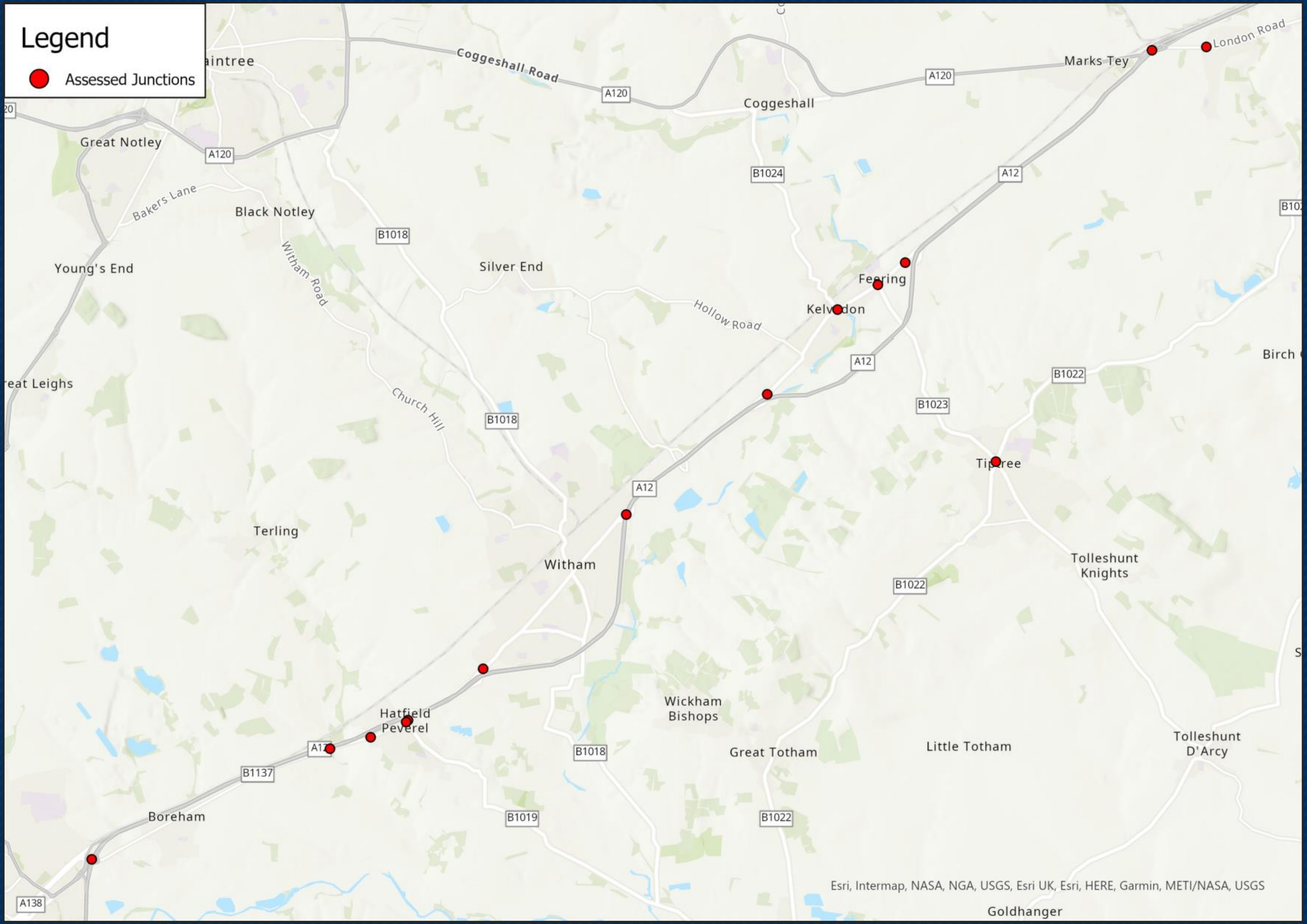
Transport Assessment – Construction Phase Assessment Area



Transport Assessment – Operational Phase Assessment Area



Transport Assessment – Assessed Junctions



Construction traffic

national highways

Maldon Road / The Street

Vissim model results, 2025 DM + const and DM 2027 overall performance

	LOS				
Junction	2025 DM + Const			2027 DM	
	AM	IP	PM	AM	PM
Maldon Road / The street	**D**	**B**	**D**	**C**	**D**

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Maldon Road / The Street

Vissim model results, Construction 2025 performance by arm

Construction: The Street East			
	AM	IP	PM
LOS	D	A	C
Veh delay (s)	32	8	17
Avg Queue (m)	58	3	16

Construction: The Street West			
	AM	IP	PM
LOS	C	B	E
Veh delay (s)	21	15	36
Avg Queue (m)	18	6	63

Construction: Roundabout average			
	AM	IP	PM
LOS	D	B	D

Construction: Maldon Road NB			
	AM	IP	PM
LOS	E	C	C
Veh delay (s)	43	16	23
Avg Queue (m)	64	6	16

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Maldon Road / The Street

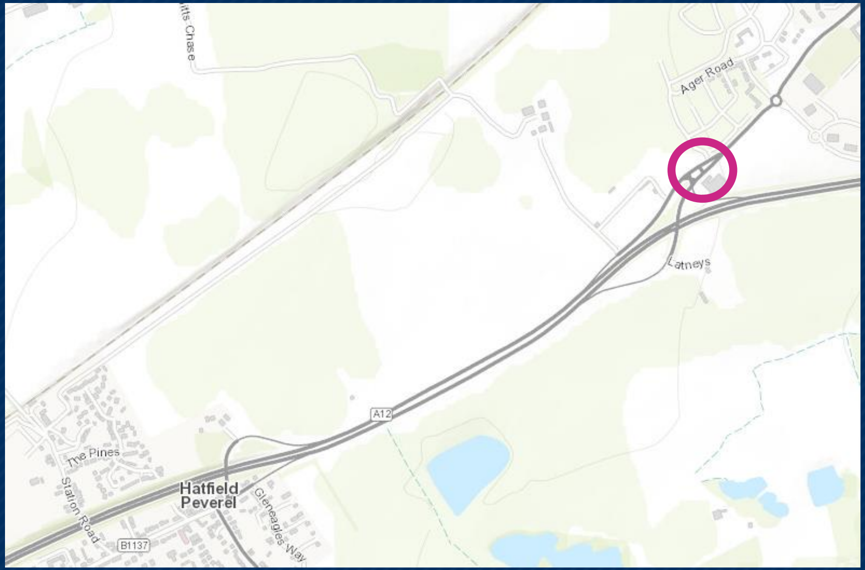
Vissim model results,
Construction 2025: full results

Entry Arm	Control	AM					IP					PM				
		LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Maldon Road NB	Unsignalised	E	710	43	64	156	C	435	16	6	52	C	580	23	16	85
The Street West EB (Hat Pev)	Unsignalised	C	667	21	18	106	B	562	15	6	60	E	845	36	63	188
The Street East WB (J21)	Unsignalised	D	602	32	58	176	A	381	8	3	35	C	550	17	16	74
Total	**Unsignalised**	**D**	**1978**	**32**			**B**	**1378**	**13**			**D**	**1975**	**27**		

Junction 21

- *Junction model results – J21.*
- *Junction assessed in TA because of vicinity to A12 and use by construction vehicles.*

PICADY	**Max RFC**				
	2019 Base		*2025 DM + Construction*		
Junction	AM	PM	AM	IP	PM
J21	n/a	n/a	0.38	0.11	0.40

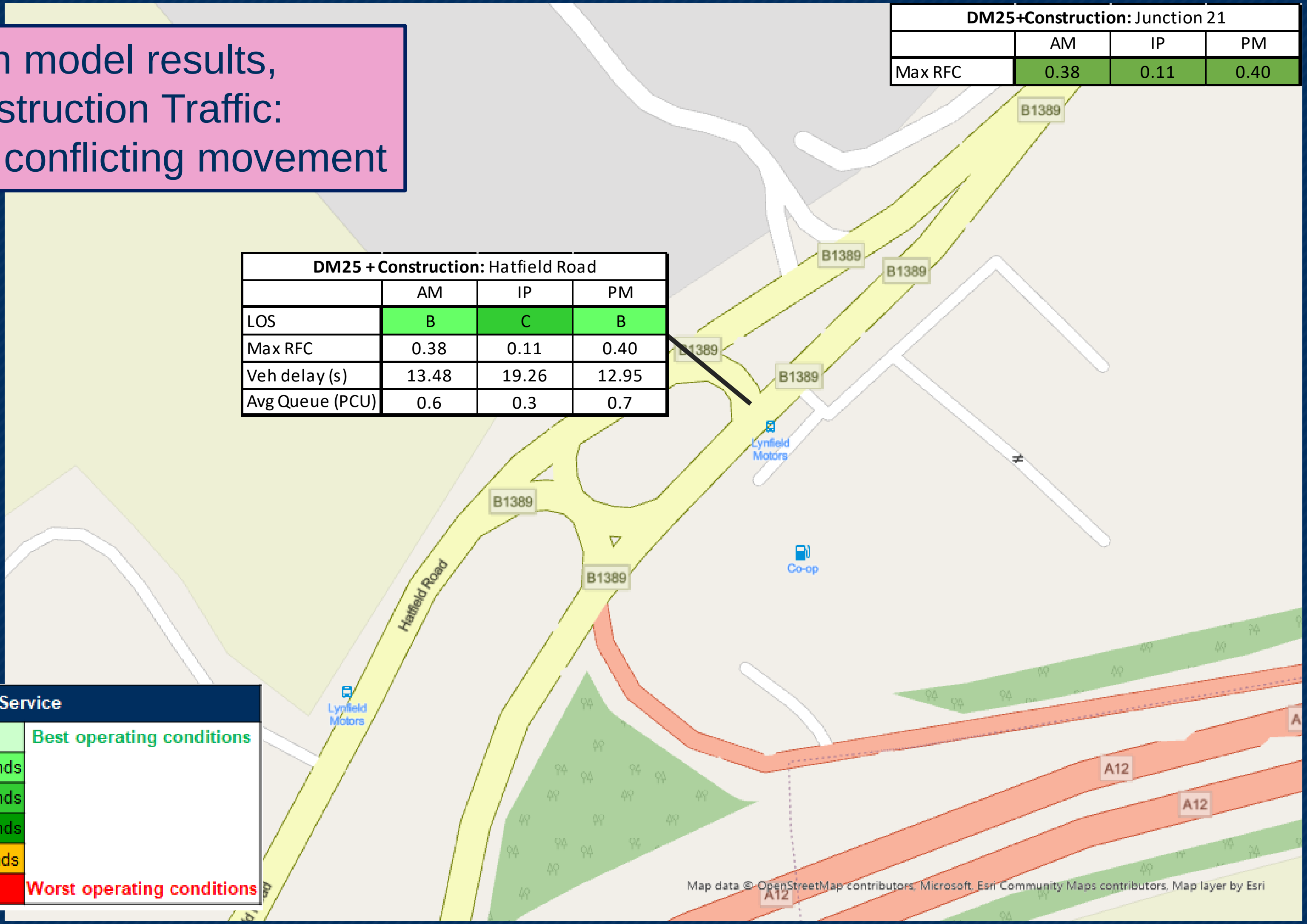


Junction 21

PICADY junction model results,
DM 2025 + Construction Traffic:
performance by conflicting movement

DM25+Construction: Junction 21			
	AM	IP	PM
Max RFC	0.38	0.11	0.40

DM25 + Construction: Hatfield Road			
	AM	IP	PM
LOS	B	C	B
Max RFC	0.38	0.11	0.40
Veh delay (s)	13.48	19.26	12.95
Avg Queue (PCU)	0.6	0.3	0.7



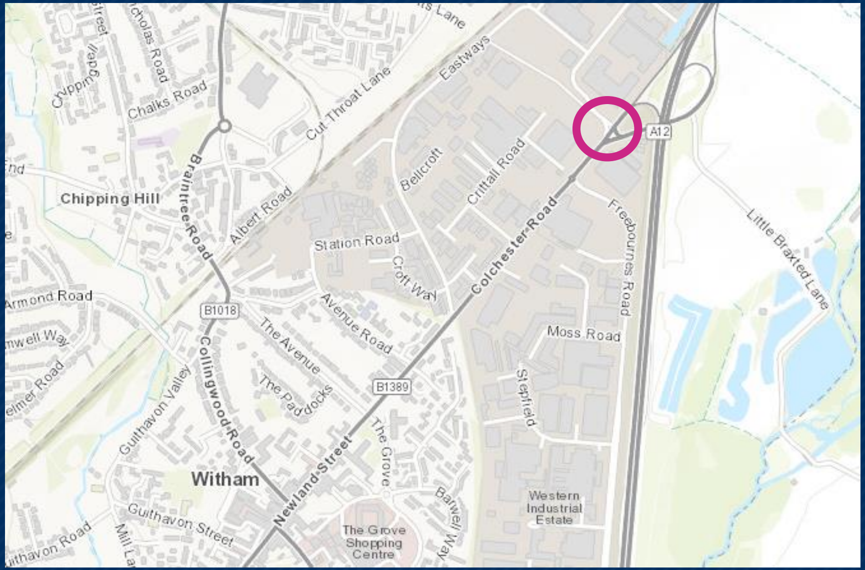
Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

national highways

Eastways, Witham

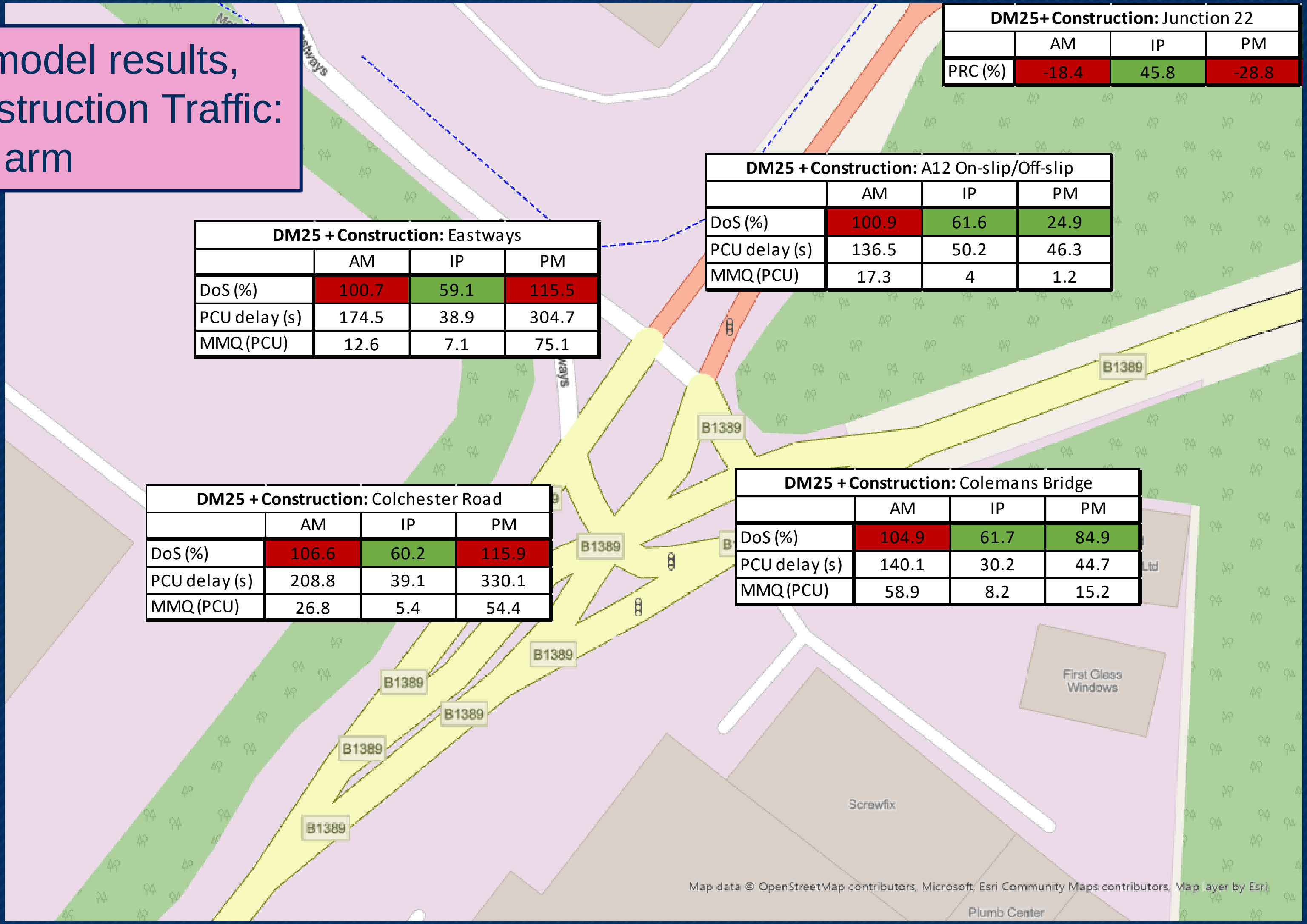
- *Junction model results – Colchester Road/Eastways.*
- *Junction assessed in TA because of vicinity to A12 and use by construction vehicles.*

LINSIG	PRC(%)												
	2019 Base		*2025 DM + Const.*			*2027 DM*		*2027 DS*		*2042 DM*		*2042 DS*	
Junction	AM	PM	AM	IP	PM	AM	PM	AM	PM	AM	PM	AM	PM
A12 J22 - Eastways	10.2	-8.4	-18.4	45.8	-28.8	1.7	-33.5	20.0	-12.4	-0.6	-42.9	17.5	-22.4



Eastways, Witham

LinSig junction model results, DM 2025 + Construction Traffic: performance by arm



DM25+Construction: Junction 22

	AM	IP	PM
PRC (%)	-18.4	45.8	-28.8

DM25 + Construction: A12 On-slip/Off-slip

	AM	IP	PM
DoS (%)	100.9	61.6	24.9
PCU delay (s)	136.5	50.2	46.3
MMQ (PCU)	17.3	4	1.2

DM25 + Construction: Eastways

	AM	IP	PM
DoS (%)	100.7	59.1	115.5
PCU delay (s)	174.5	38.9	304.7
MMQ (PCU)	12.6	7.1	75.1

DM25 + Construction: Colchester Road

	AM	IP	PM
DoS (%)	106.6	60.2	115.9
PCU delay (s)	208.8	39.1	330.1
MMQ (PCU)	26.8	5.4	54.4

DM25 + Construction: Colemans Bridge

	AM	IP	PM
DoS (%)	104.9	61.7	84.9
PCU delay (s)	140.1	30.2	44.7
MMQ (PCU)	58.9	8.2	15.2

Junction 23

- *Junction model results – J23.*
- *Junction assessed in TA because of vicinity to A12 and use by construction vehicles.*

PICADY	**Max RFC**				
	2019 Base		*2025 DM + Construction*		
Junction	AM	PM	AM	IP	PM
J23	n/a	n/a	0.04	0.04	0.55

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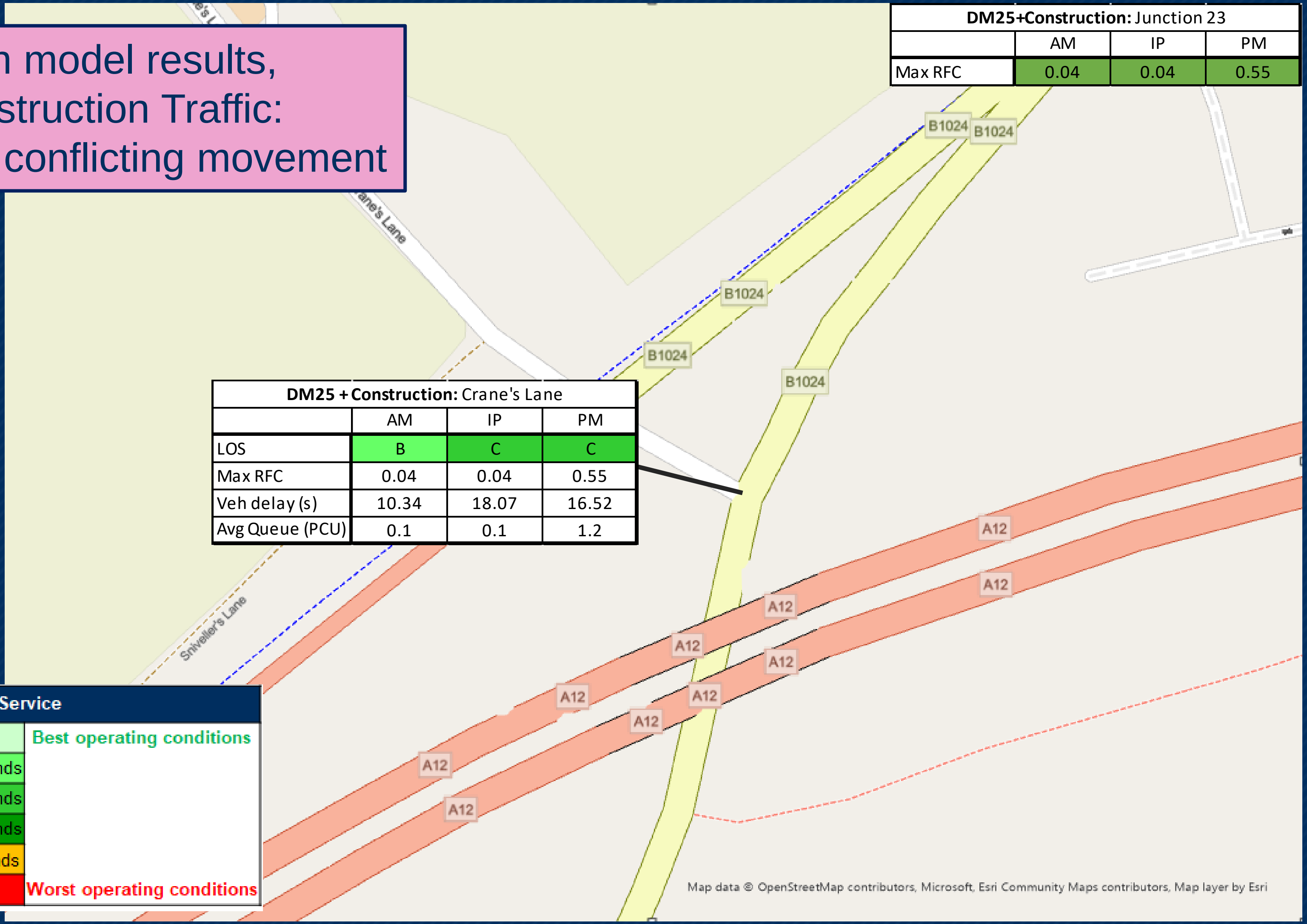
Junction 23

PICADY junction model results, DM 2025 + Construction Traffic: performance by conflicting movement



DM25+Construction: Junction 23			
	AM	IP	PM
Max RFC	0.04	0.04	0.55

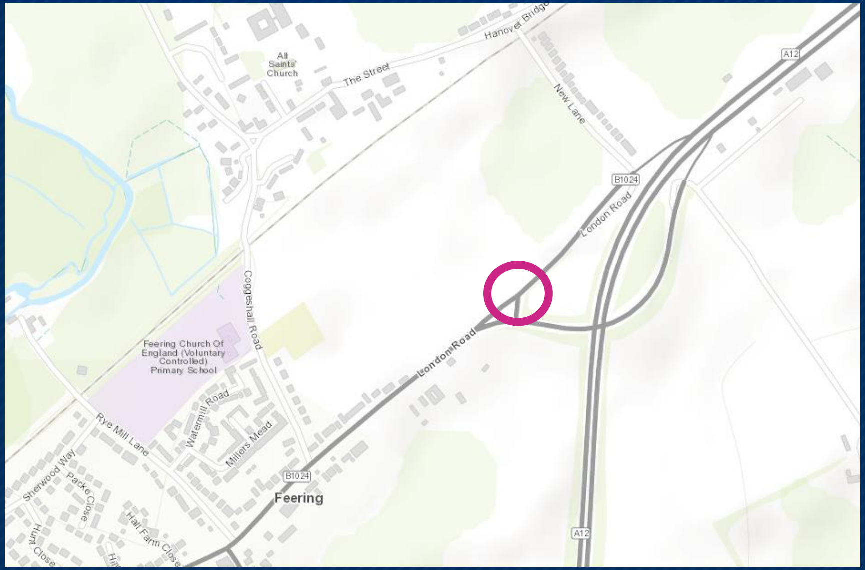
DM25 + Construction: Crane's Lane			
	AM	IP	PM
LOS	B	C	C
Max RFC	0.04	0.04	0.55
Veh delay (s)	10.34	18.07	16.52
Avg Queue (PCU)	0.1	0.1	1.2

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

Junction 24

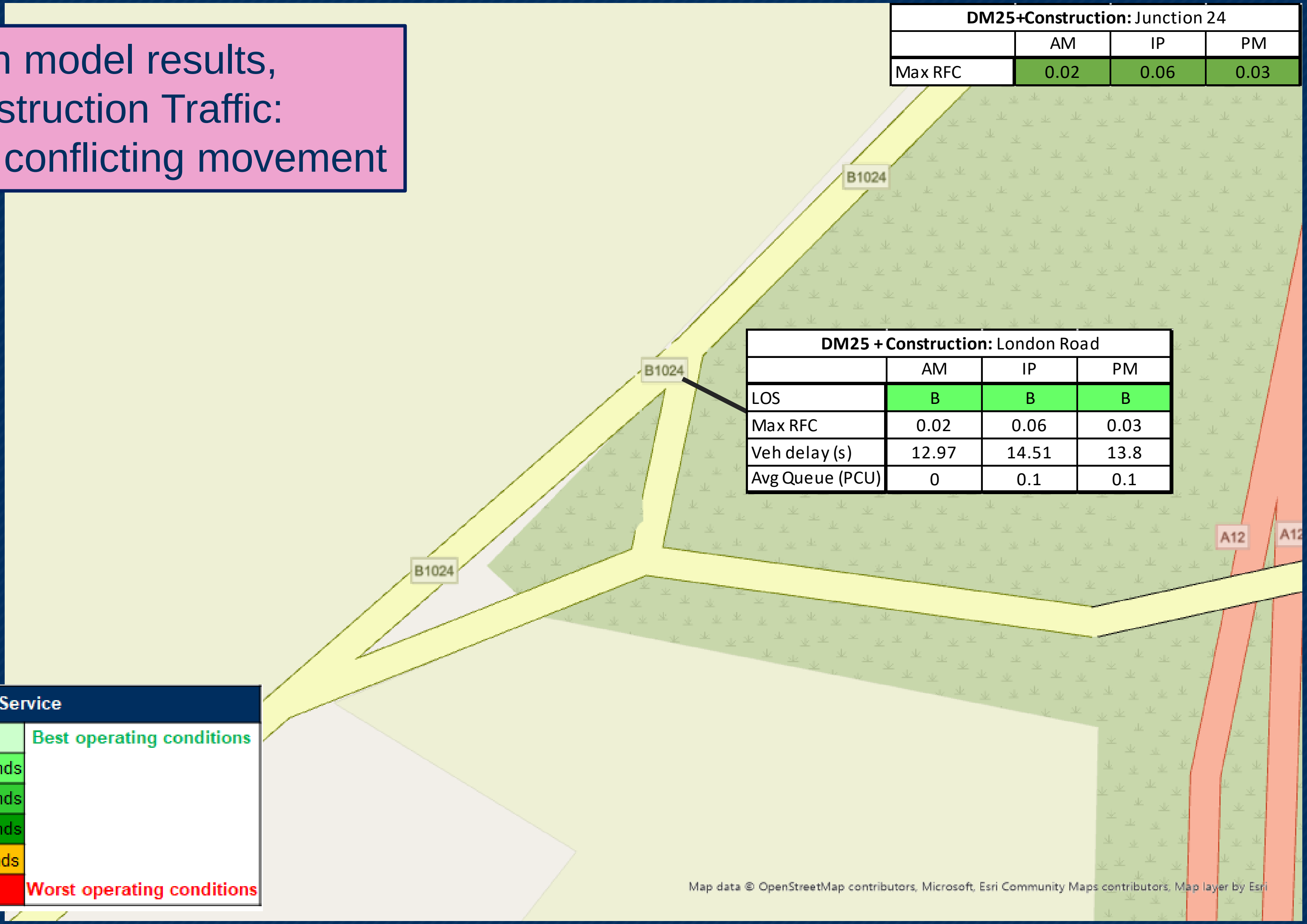
- *Junction model results – J24.*
- *Junction assessed in TA because of vicinity to A12 and use by construction vehicles.*

PICADY	**Max RFC**				
	2019 Base		*2025 DM + Construction*		
Junction	AM	PM	AM	IP	PM
J24	n/a	n/a	0.02	0.06	0.03



Junction 24

PICADY junction model results,
DM 2025 + Construction Traffic:
performance by conflicting movement



DM25+Construction: Junction 24			
	AM	IP	PM
Max RFC	0.02	0.06	0.03

DM25 + Construction: London Road			
	AM	IP	PM
LOS	B	B	B
Max RFC	0.02	0.06	0.03
Veh delay (s)	12.97	14.51	13.8
Avg Queue (PCU)	0	0.1	0.1

Level of Service		
LOS A	loss time < 10 seconds	Best operating conditions
LOS B	loss time > 10 to 15 seconds	
LOS C	loss time > 15 to 25 seconds	
LOS D	loss time > 25 to 35 seconds	
LOS E	loss time >35 to 50 seconds	
LOS F	loss time > 50 seconds	Worst operating conditions

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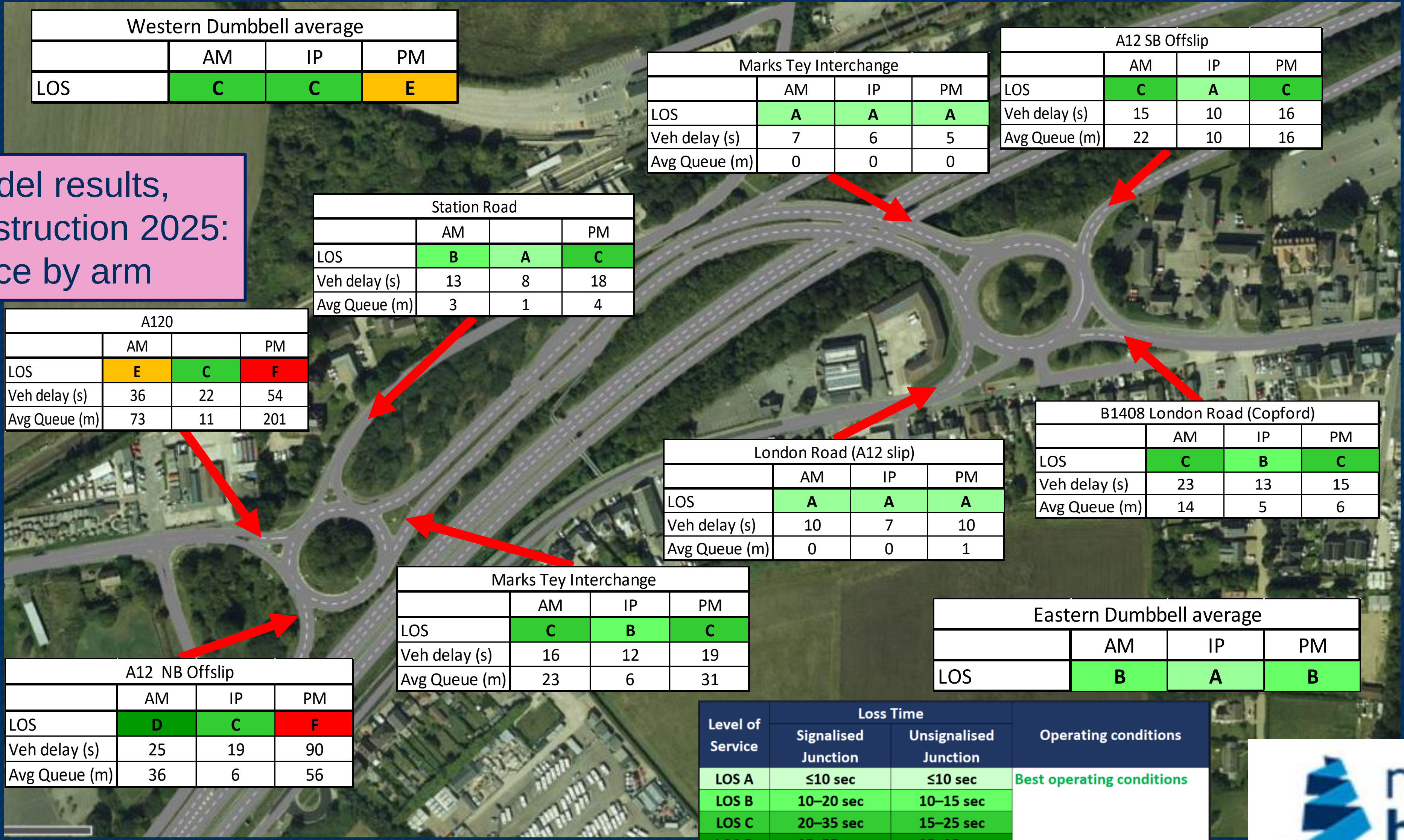
Junction 25

Vissim model results, DM + Construction 2025: performance by arm



Western Dumbbell average	AM	IP	PM
LOS	C	C	E

Marks Tey Interchange	AM	IP	PM
LOS	A	A	A
Veh delay (s)	7	6	5
Avg Queue (m)	0	0	0

A12 SB Offslip	AM	IP	PM
LOS	C	A	C
Veh delay (s)	15	10	16
Avg Queue (m)	22	10	16

Station Road	AM		PM
LOS	B	A	C
Veh delay (s)	13	8	18
Avg Queue (m)	3	1	4

A120	AM		PM
LOS	E	C	F
Veh delay (s)	36	22	54
Avg Queue (m)	73	11	201

B1408 London Road (Copford)	AM	IP	PM
LOS	C	B	C
Veh delay (s)	23	13	15
Avg Queue (m)	14	5	6

London Road (A12 slip)	AM	IP	PM
LOS	A	A	A
Veh delay (s)	10	7	10
Avg Queue (m)	0	0	1

Marks Tey Interchange	AM	IP	PM
LOS	C	B	C
Veh delay (s)	16	12	19
Avg Queue (m)	23	6	31

Eastern Dumbbell average	AM	IP	PM
LOS	B	A	B

A12 NB Offslip	AM	IP	PM
LOS	D	C	F
Veh delay (s)	25	19	90
Avg Queue (m)	36	6	56

Level of Service	Loss Time		Operating conditions
	Signalised Junction	Unsignalised Junction	
LOS A	≤10 sec	≤10 sec	Best operating conditions
LOS B	10–20 sec	10–15 sec	
LOS C	20–35 sec	15–25 sec	
LOS D	35–55 sec	25–35 sec	
LOS E	55–80 sec	35–50 sec	
LOS F	>80 sec	>50 sec	Worst operating conditions

national highways

Junction 25

Vissim model results, 2025 DM + const and DM 2027 overall performance

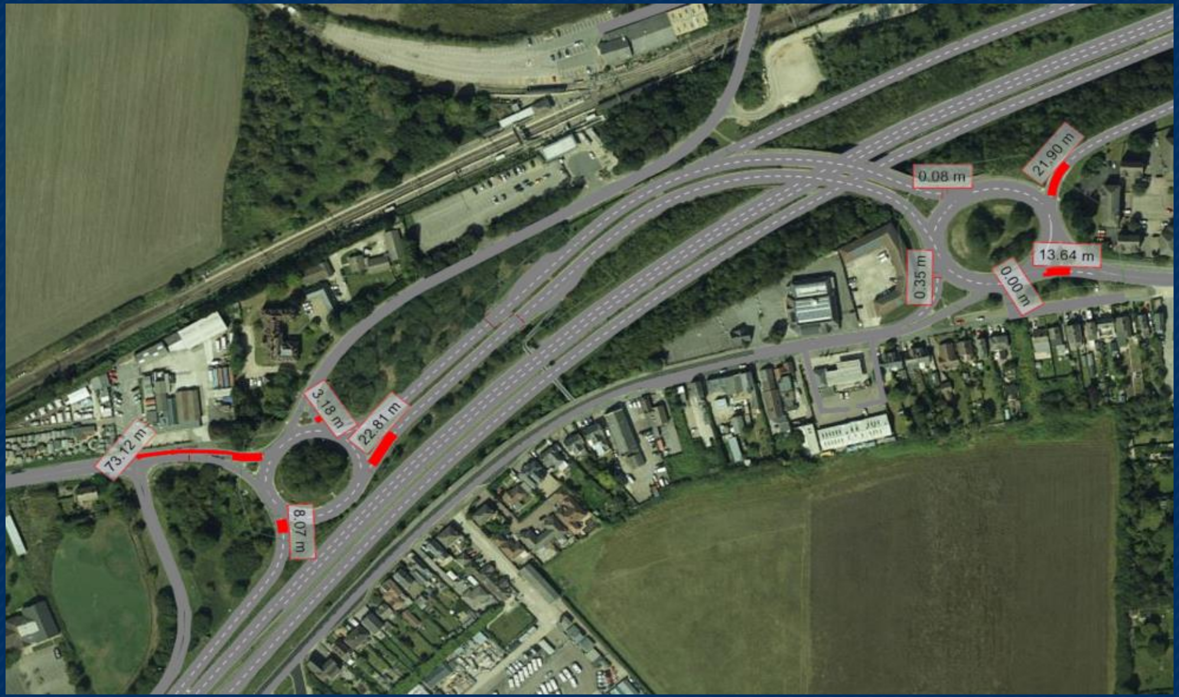
Junction	LOS				
	2025 DM + Const			2027 DM	
	AM	IP	PM	AM	PM
Western Roundaout	C	C	E	C	E
Eastern Roundabout	B	A	B	B	B

Level of Service	Loss Time		Operating conditions
	Signalised Junction	Unsignalised Junction	
LOS A	≤10 sec	≤10 sec	Best operating conditions
LOS B	10–20 sec	10–15 sec	
LOS C	20–35 sec	15–25 sec	
LOS D	35–55 sec	25–35 sec	
LOS E	55–80 sec	35–50 sec	
LOS F	>80 sec	>50 sec	Worst operating conditions

Junction 25

Vissim model results,
DM + Construction 2025:
average queue lengths

AM peak



PM peak

Junction 25

Vissim model results,
DM + Construction 2025:
average queue lengths

Inter peak

Junction 25

Vissim model results, DM + Construction 2025: full results

Roundabout	Entry Arm	Control	AM					PM					IP				
			LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)	LOS	Vehicles	Veh Delay (sec)	Average Queue (m)	Average Maximum Queue (m)
Western Roundabout	A12 Offslip	Unsignalised	D	280	25	8	36	F	492	90	56	105	C	274	19	6	33
	A120	Unsignalised	E	1131	36	73	213	F	1173	54	201	369	C	1028	22	11	83
	Station Road	Unsignalised	B	191	13	3	23	C	193	18	4	26	A	87	8	1	12
	Marks Tey Interchange	Unsignalised	C	1318	16	23	132	C	1319	19	31	141	B	1070	12	6	67
	Total	**Unsignalised**	**C**	**2920**	**24**			**E**	**3177**	**43**			**C**	**2459**	**17**		
Eastern Roundabout	A12 Offslip	Unsignalised	C	1146	15	22	83	C	992	16	20	73	A	868	10	9	57
	B1408 London Road (Copford)	Unsignalised	C	432	23	14	57	C	388	15	6	40	B	379	13	5	38
	London Road (A12 slip)	Unsignalised	A	94	10	0	10	A	126	10	1	12	A	131	7	0	11
	Marks Tey Interchange	Unsignalised	A	533	7	0	5	A	628	5	0	5	A	438	6	0	5
	Total	**Unsignalised**	**B**	**2205**	**14**			**B**	**2134**	**12**			**A**	**1816**	**9**		

Construction

Traffic Management Plan being drafted to accompany DCO

- *Will engage with stakeholders before issue*
- *Key principles will include*
  - *Maintaining traffic on A12*
  - *Minimising desire to divert off of A12*
  - *Communicate local road issues*
  - *Minimising construction road haulage*
  - *Creating direct routes to/from A12 for construction traffic*
    - *Avoid local roads where practical*
  - *Exclude use of some local roads*
  - *Maintain connectivity of WCH routes where safe and practical*

AOB

national highways

AOB

- SOCG
- Replacement Land
- Designated Funds

AOB – Forward look at engagement

AOB – timescales on ECC feedback

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AOB – next meeting date

Appendix C – Essex LIR response – Traffic data pack Feb 2023

A12 Chelmsford to A120 widening

22 Feb 2023

The information shared in this presentation represents the most up to date proposals. This may evolve for several reasons, and as such, may be subject to change.

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Traffic model data requests from ECC

national highways

Additional model data requests

Additional Model Data Requests – A12 Widening (National Highways DCO Submission Models) – 18 November 2022

The list below identifies a number of additional data requests and queries which have resulted from ECC and SYSTRA's analysis of the submitted A12 DCO package of technical information. It is recognised that the DCO package contains substantial detail on a wide range of specific locations, as well as explanation of the modelling methodologies (via the ComMA) report. The additional data requests are primarily made in order to enable ECC and SYSTRA to obtain clarity on certain matters focused on particular locations, including how the models route traffic between particular origins and destinations, and the composition of traffic which is using specific links, junctions or routes.

Proposed Detrunked Sections

Traffic flow data (including HGV percentages) for detrunked sections in the "with scheme" models – this is to provide additional clarity as to the expected mix of traffic on these sections once they pass into ECC control. The data should be provided at multiple points to represent the change in expected flows where traffic joins and leaves these sections from the ECC network (the DCO TA limits this data to a single reference point in most cases).

Journey time data – requested as an "end to end" journey time along the detrunked sections within the current "with scheme" models – this is requested to enable better understanding of anticipated driver behaviour on these sections of road and to demonstrate that the traffic within the model is using these roads in a manner appropriate for their new status

Junction 21 and surrounding network

Journey time and traffic flow comparison between the B1019/Church Road Junction and A12 Junction 19 (Boreham) for the route via new Junction 21 vs. two routes via Main Road, Boreham (Maldon Road/The Street/Main Road and Church Road/The Street/Main Road) for future year with / without A12 widening scenarios. This is to provide additional evidence as to how great the model shows the difference between these routes to be in terms of speed and convenience.

Duke of Wellington junction-specific data from the Strategic Model – there is a concern that the performance of the Duke of Wellington junction within the strategic model could under-estimate the expected delays to traffic (especially traffic approaching the junction from Maldon Road) and that therefore the potential for traffic to seek to "rat run" via Church Road and/or Remembrance Avenue / New Road is also being under-recognised. Journey time data from the strategic model for the journey from Ulting Road/B1019 Maldon Road to the Duke of Wellington junction (including V/C and delay at the junction) is therefore requested for the purposes of comparison with the junction-specific modelling.

Junction 24 and surrounding network

Route from Tiptree to Rivenhall End (via B1022 Maldon Road, Braxted Park Road and Station Road) – a select link analysis is requested to identify volumes, origin and destination points for traffic using the route between Tiptree and Rivenhall End. There is considerable uncertainty around how traffic flows have adjusted between the initial strategic modelling which informed the statutory consultation and the final strategic models used for the DCO submission; stakeholders have queried with ECC how the distribution of trips has changed over time so that the very high initial estimates of traffic on the Inworth Road corridor have reduced materially and the conclusions drawn around this route have in turn become very different.

The locations of the select links should be:

- Braxted Park Road (both directions) - just north of the Braxted Park Road/B1022 Junction
- B1023 Kelvedon Road (both directions) - just north of the B1023/Vine Road Junction

We would like the select link analysis to be carried out for the base model, "without A12 scheme" and "with A12 scheme" in 2027 and 2042.

Journey Times from Tiptree to Jn 22 and Jn 24 – Local stakeholders are concerned that the strategic model might be underestimating the delay experienced by traffic heading from Tiptree to the A12 via Braxted Park Road. We would request journey time data from the strategic model for the routes from the Station Road/Church Road junction to Rivenhall End and Station Road/Church Road junction to the location of the proposed new Jn 24 access roundabout on Inworth Road (base model, "without A12 scheme" and "with A12 scheme" in 2027 and 2042 AM and PM peaks). This should help to provide evidence to support the relative usage of each route in the assessed scenarios.

B1023 Double Roundabout – we would additionally request data from the strategic model to show the performance of the junction in the base year (i.e. to be compared to the junction modelling results within the DCO pack). Local stakeholders currently report considerable congestion and delay in the peak periods which is not evident from the 2019 junction base year models, so we wish to interrogate how the 2019 strategic base models perform. Confirmation of any site-specific validation within the strategic model in this area (rather than the overall global validation statistics) would be appreciated.

Crossings Matrix and Modelling

It is noted that a number of specific requests have been identified by ECC with regard to the analysis of the proposed new crossings; these will need to be addressed in parallel to the requests set out above.

These requests are answered individually through the rest of this slide pack

Detrunked Sections

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Proposed Detrunked Sections

<u>Proposed Detrunked Sections</u>

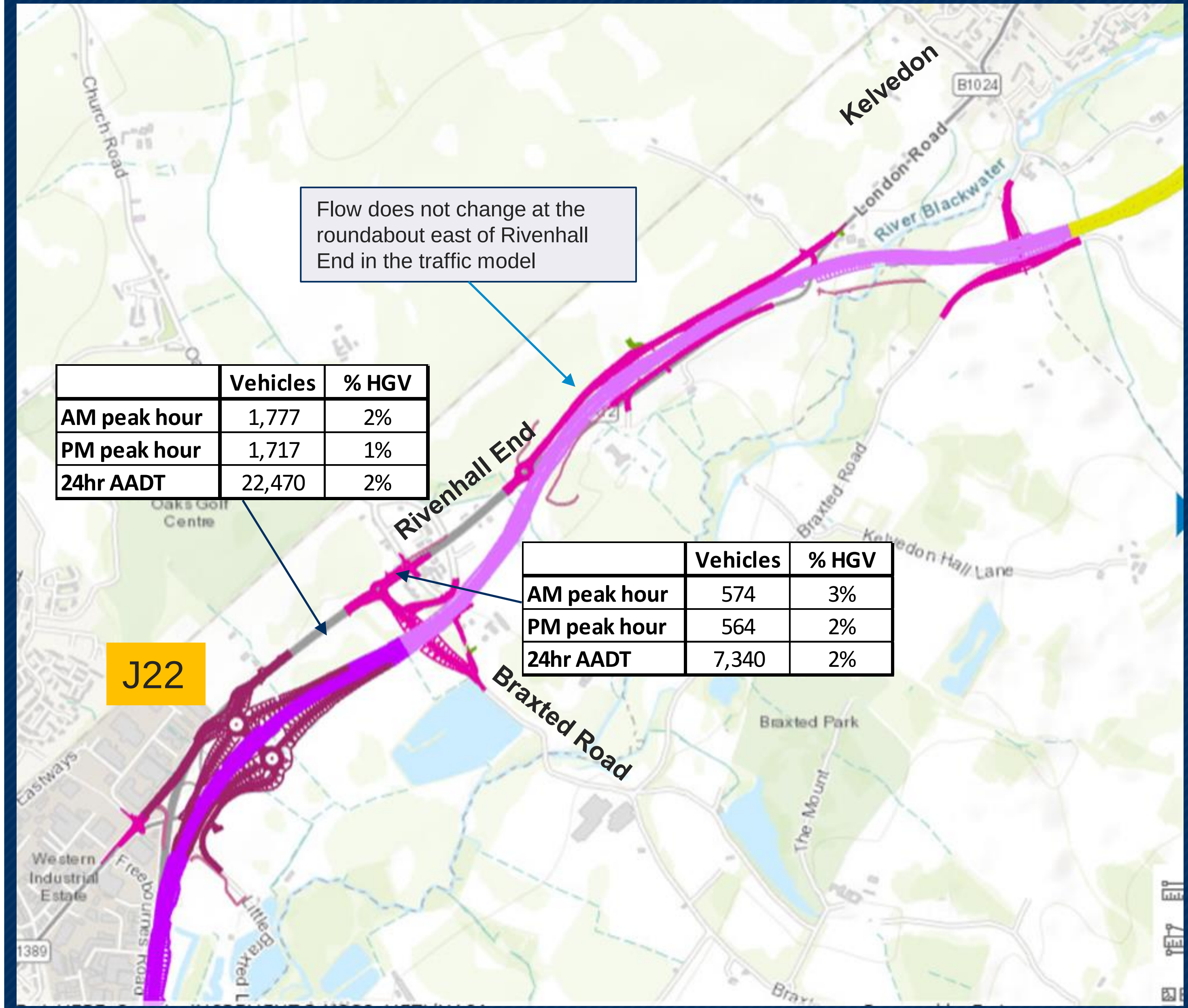
Traffic flow data (including HGV percentages) for detrunked sections in the “with scheme” models – this is to provide additional clarity as to the expected mix of traffic on these sections once they pass into ECC control. The data should be provided at multiple points to represent the change in expected flows where traffic joins and leaves these sections from the ECC network (the DCO TA limits this data to a single reference point in most cases).

Journey time data – requested as an “end to end” journey time along the detrunked sections within the current “with scheme” models – this is requested to enable better understanding of anticipated driver behaviour on these sections of road and to demonstrate that the traffic within the model is using these roads in a manner appropriate for their new status

Proposed Detrunked Sections

Traffic flow on proposed Detrunked sections

Junction 22 to 23 (de-trunked A12) – 2042 two-way traffic flows



Flow does not change at the roundabout east of Rivenhall End in the traffic model

	Vehicles	% HGV
AM peak hour	1,777	2%
PM peak hour	1,717	1%
24hr AADT	22,470	2%

	Vehicles	% HGV
AM peak hour	574	3%
PM peak hour	564	2%
24hr AADT	7,340	2%

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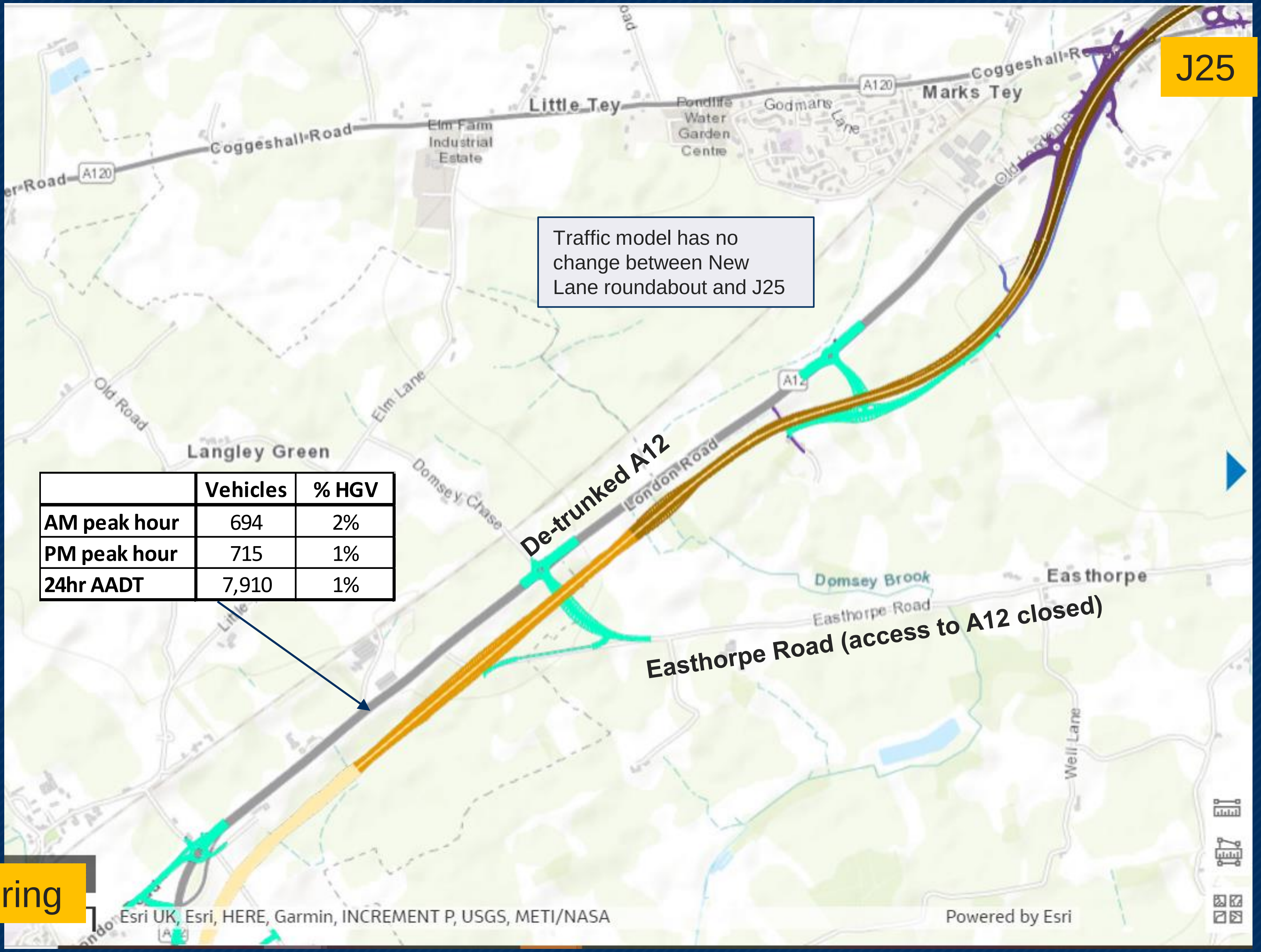
Junction 24-25 (de-trunked A12) – 2042 traffic flows



	Vehicles	% HGV
AM peak hour	694	2%
PM peak hour	715	1%
24hr AADT	7,910	1%

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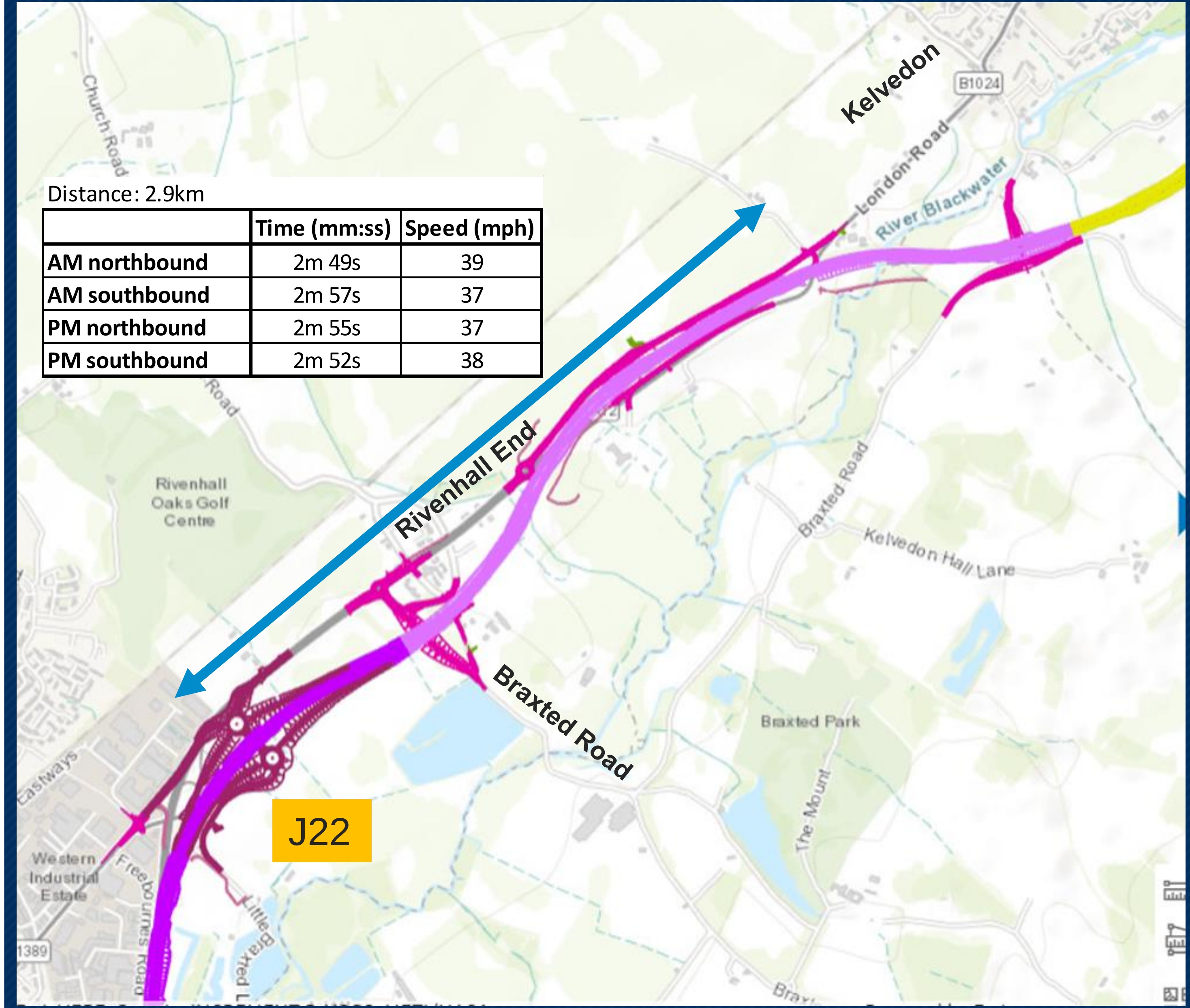
Proposed Detrunked Sections

Journey time data on Detrunked sections

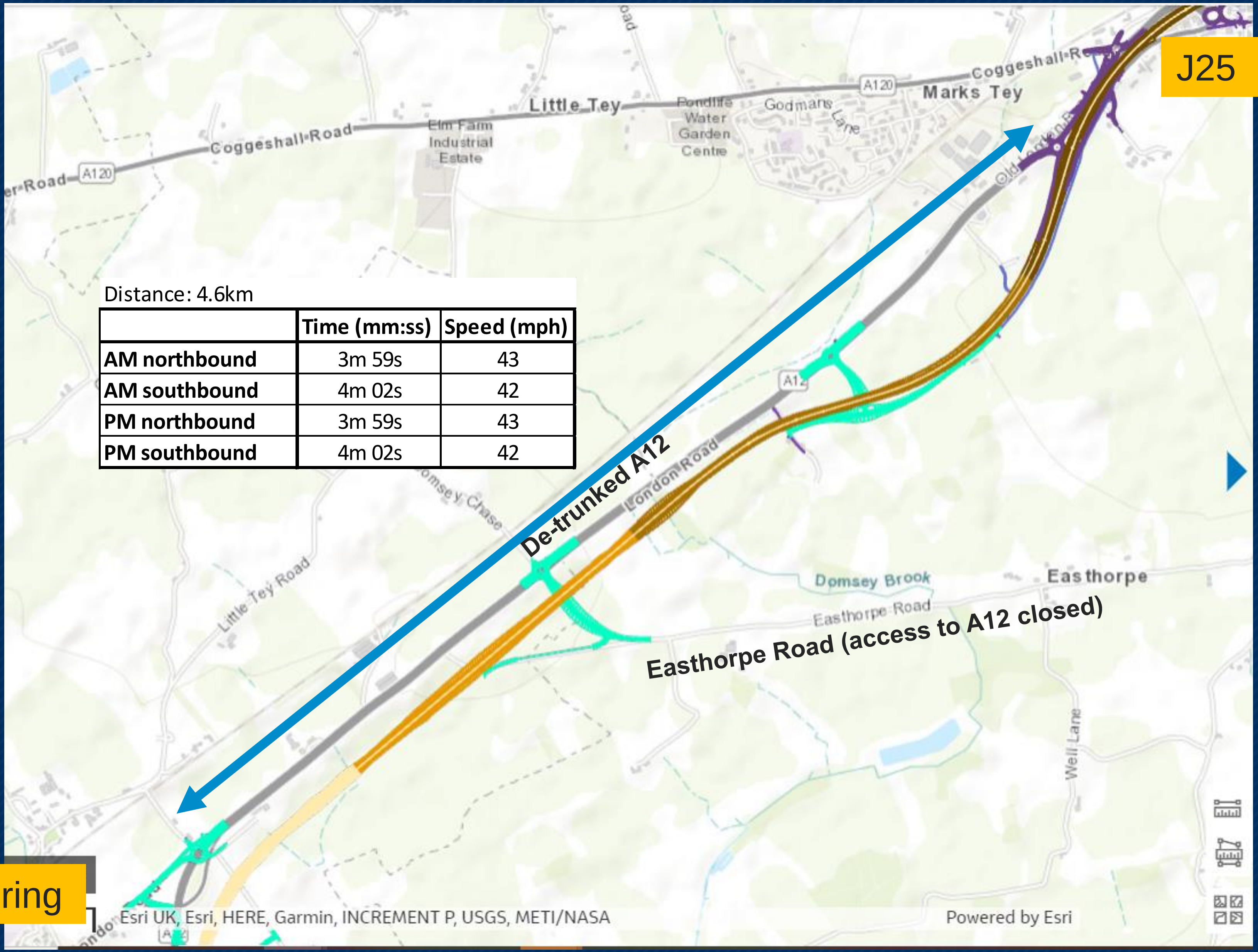
Junction 22 to 23 (de-trunked A12) – 2027 journey times

Distance: 2.9km

	Time (mm:ss)	Speed (mph)
AM northbound	2m 49s	39
AM southbound	2m 57s	37
PM northbound	2m 55s	37
PM southbound	2m 52s	38



Junction 24-25 (de-trunked A12) – 2027 journey times



Distance: 4.6km

	Time (mm:ss)	Speed (mph)
AM northbound	3m 59s	43
AM southbound	4m 02s	42
PM northbound	3m 59s	43
PM southbound	4m 02s	42

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Junction 21 and surrounding network

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Junction 21 and surrounding network

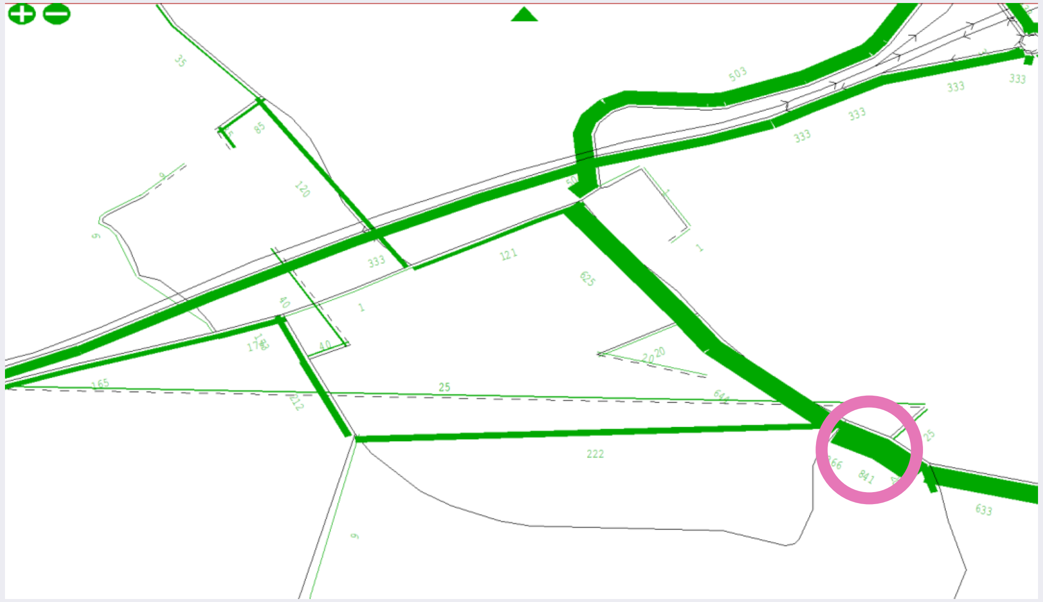
Journey time and traffic flow comparison between the B1019/Church Road Junction and A12 Junction 19 (Boreham) for the route via new Junction 21 vs. two routes via Main Road, Boreham (Maldon Road/The Street/Main Road and Church Road/The Street/Main Road) for future year with / without A12 widening scenarios. This is to provide additional evidence as to how great the model shows the difference between these routes to be in terms of speed and convenience.

Route comparison via Main Road vs J21 / A12

Of traffic approaching the B1019/Church Road junction (i.e. traffic in pink circle below) which is heading towards Chelmsford or the A12 southbound:

In 2027 AM:
88% (333 pcus) travels via J21, with a journey time of 9m59s.
12% (47 pcus) travels via Church Road / Main Road to J19, with a journey time of 11m14s.
No traffic goes via Duke of Wellington junction / Main Road to J19. This would have a journey time of 11m22s.

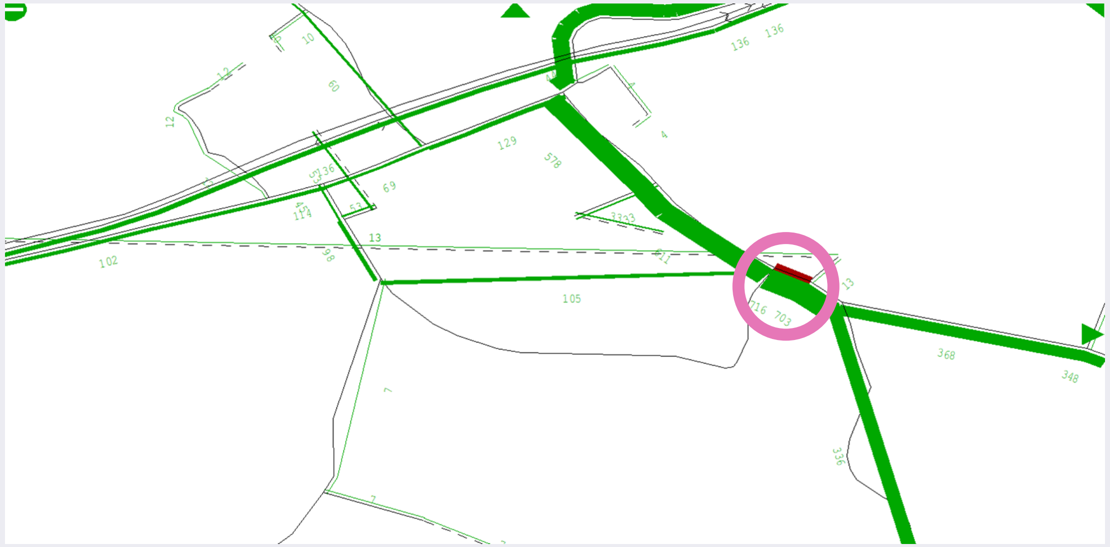
Note that although all the Main Road traffic described above goes via Church Road, there is still an overall reduction in Church Road traffic with the scheme. This is because in the ‘without scheme’ scenario a lot of traffic uses Church Road to travel to J20a SB onslip.



Route comparison via Main Road vs J21 / A12

Of traffic approaching the B1019/Church Road junction (i.e. traffic in pink circle below) which is heading towards Chelmsford or the A12 southbound:

In 2027 PM:
98% (136 pcus) travels via J21, with a journey time of 8m55s.
2% (3 pcus) travels via Main Road to J19, with a journey time of 10m17s.

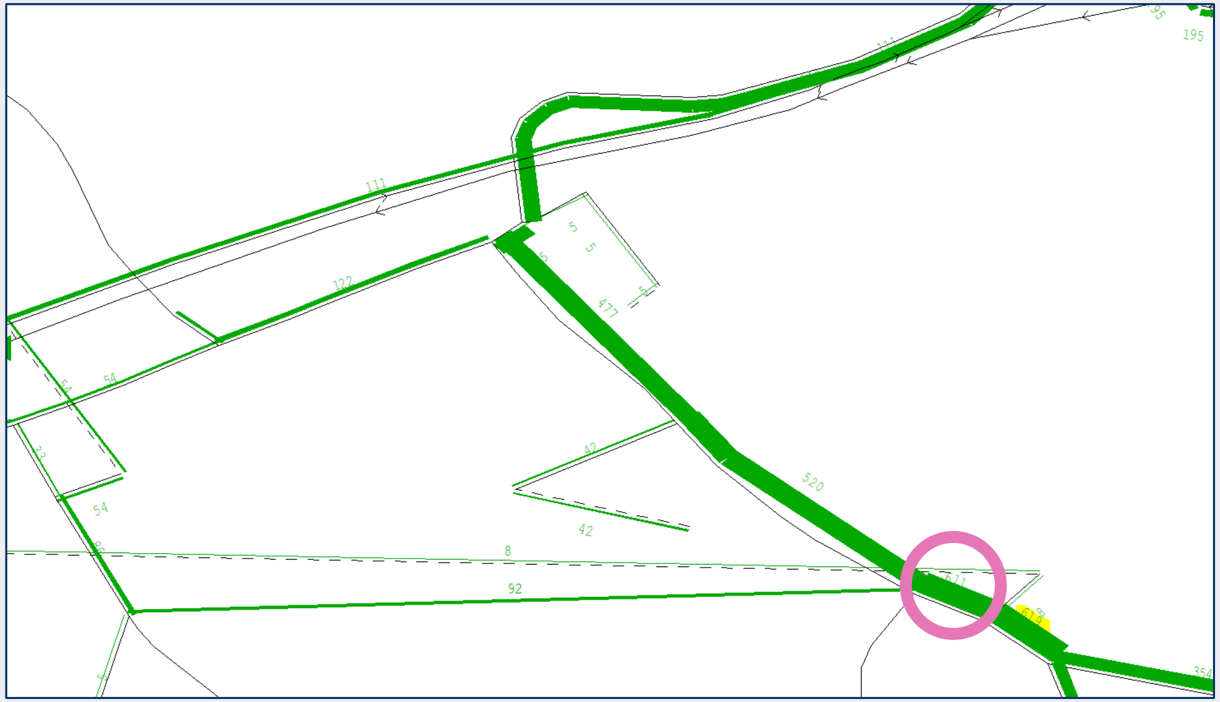


Route comparison via Main Road vs J21 / A12

In the opposite direction, for traffic just after the B1019/Church Road junction heading towards Maldon (i.e. traffic in pink circle below) which leaves the A12 at either junction 19 and junction 21:

In 2027 AM:
99% comes via junction 21
1% comes via junction 19 and Main Road

In 2027 PM:
98% comes via junction 21
2% comes via junction 21 and Main Road



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Junction 21 and surrounding network

Duke of Wellington junction-specific data from the Strategic Model – there is a concern that the performance of the Duke of Wellington junction within the strategic model could under-estimate the expected delays to traffic (especially traffic approaching the junction from Maldon Road) and that therefore the potential for traffic to seek to “rat run” via Church Road and/or Remembrance Avenue / New Road is also being under-recognised. Journey time data from the strategic model for the journey from Ulting Road/B1019 Maldon Road to the Duke of Wellington junction (including V/C and delay at the junction) is therefore requested for the purposes of comparison with the junction-specific modelling.

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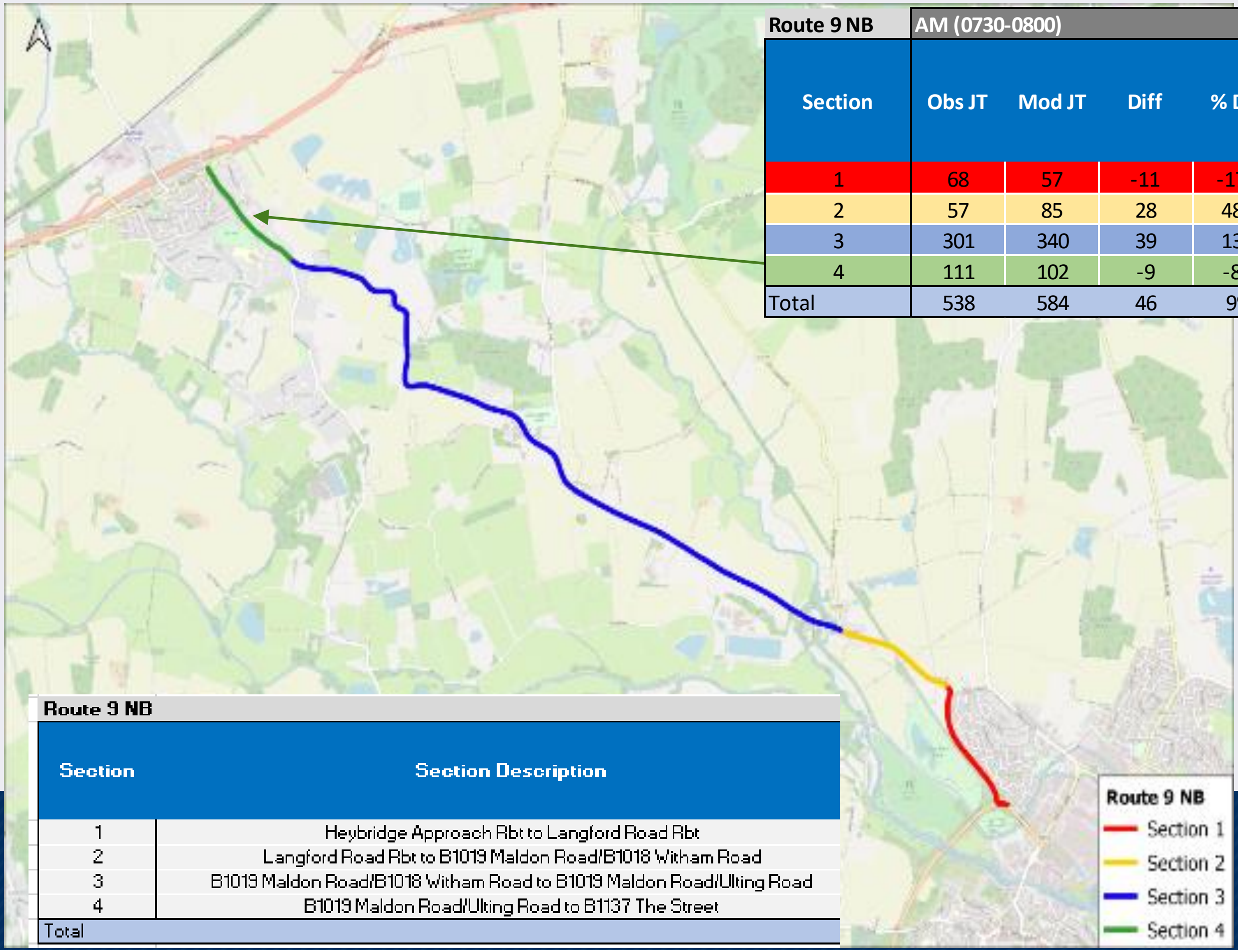
Duke of Wellington junction in strategic model

Comparison of SATURN model vs observed conditions



Route 9 NB	AM (0730-0800)					IP					PM (1700-1800)				
Section	Obs JT	Mod JT	Diff	% Diff	WebTAG Compliant	Obs JT	Mod JT	Diff	% Diff	WebTAG Complia nt	Obs JT	Mod JT	Diff	% Diff	WebTAG Complia nt
1	68	57	-11	-17%	Pass	66	47	-19	-29%	Pass	70	51	-19	-27%	Pass
2	57	85	28	48%	Pass	55	54	-1	-1%	Pass	55	57	2	3%	Pass
3	301	340	39	13%	Pass	298	286	-12	-4%	Pass	286	294	8	3%	Pass
4	111	102	-9	-8%	Pass	76	72	-4	-6%	Pass	80	83	3	4%	Pass
Total	538	584	46	9%	Pass	495	459	-36	-7%	Pass	491	485	-6	-1%	Pass

Route 9 NB	
Section	Section Description
1	Heybridge Approach Rbt to Langford Road Rbt
2	Langford Road Rbt to B1019 Maldon Road/B1018 Witham Road
3	B1019 Maldon Road/B1018 Witham Road to B1019 Maldon Road/Ulting Road
4	B1019 Maldon Road/Ulting Road to B1137 The Street
Total	

Base model journey time validation taken from Transport Model Package appendix. It compares Observed Journey Times to Modelled Journey Times.

This shows that for section 4 (approach to Duke of Wellington junction), the model matches observed journey times well.

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Duke of Wellington junction in strategic model

- Volume vs Capacity (V/C) and delay on the Maldon Road approach to junction, in 2019 base year SATURN model (taken on single 300m link approaching junction):

	AM	PM
V/C %	82%	63%
Delay	21s	14s

Duke of Wellington junction in strategic model

- Volume vs Capacity (V/C) and delay on the Maldon Road approach to junction, in SATURN model (taken on single 300m link approaching junction), and delay in Vissim:

Do Minimum	2027 AM	2027 PM	2042 AM	2042 PM
V/C % in SATURN	89%	70%	99%	80%
Delay in SATURN	25s	16s	42s	20s
Delay in Vissim	36s	23s	49s	30s

Do Something	2027 AM	2027 PM	2042 AM	2042 PM
V/C % in SATURN	95%	77%	100%	85%
Delay in SATURN	34s	20s	57s	24s
Delay in Vissim	38s	25s	49s	29s

- A slight increase in SATURN delay on Maldon Road due to scheme, as Maldon Road traffic increases.

- Generally a good match between SATURN and Vissim results

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Junction 24 and surrounding network

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Junction 24 and surrounding network

Trip patterns in junction 24 area

Junction 24 and surrounding network

Junction 24 and surrounding network

Route from Tiptree to Rivenhall End (via B1022 Maldon Road, Braxted Park Road and Station Road) – a select link analysis is requested to identify volumes, origin and destination points for traffic using the route between Tiptree and Rivenhall End.

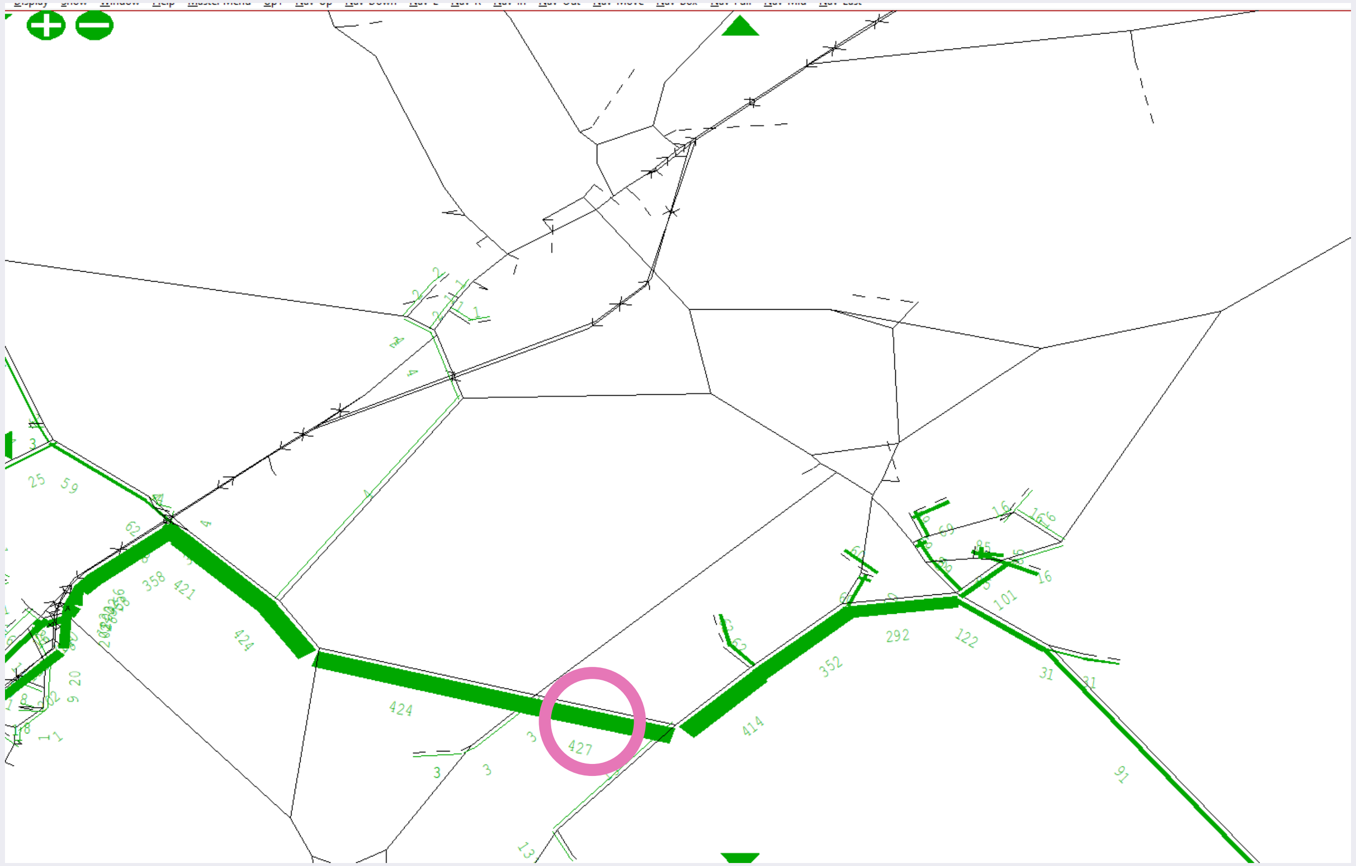
We would like the select link analysis to be carried out for the base model, "without A12 scheme" and "with A12 scheme" in 2027 and 2042.

For ease of display, analysis is only shown for 2027 AM

Junction 24 and surrounding network

<u>Select Link Analysis in 2019 base year model (AM) – on Braxted Park Road northbound</u>

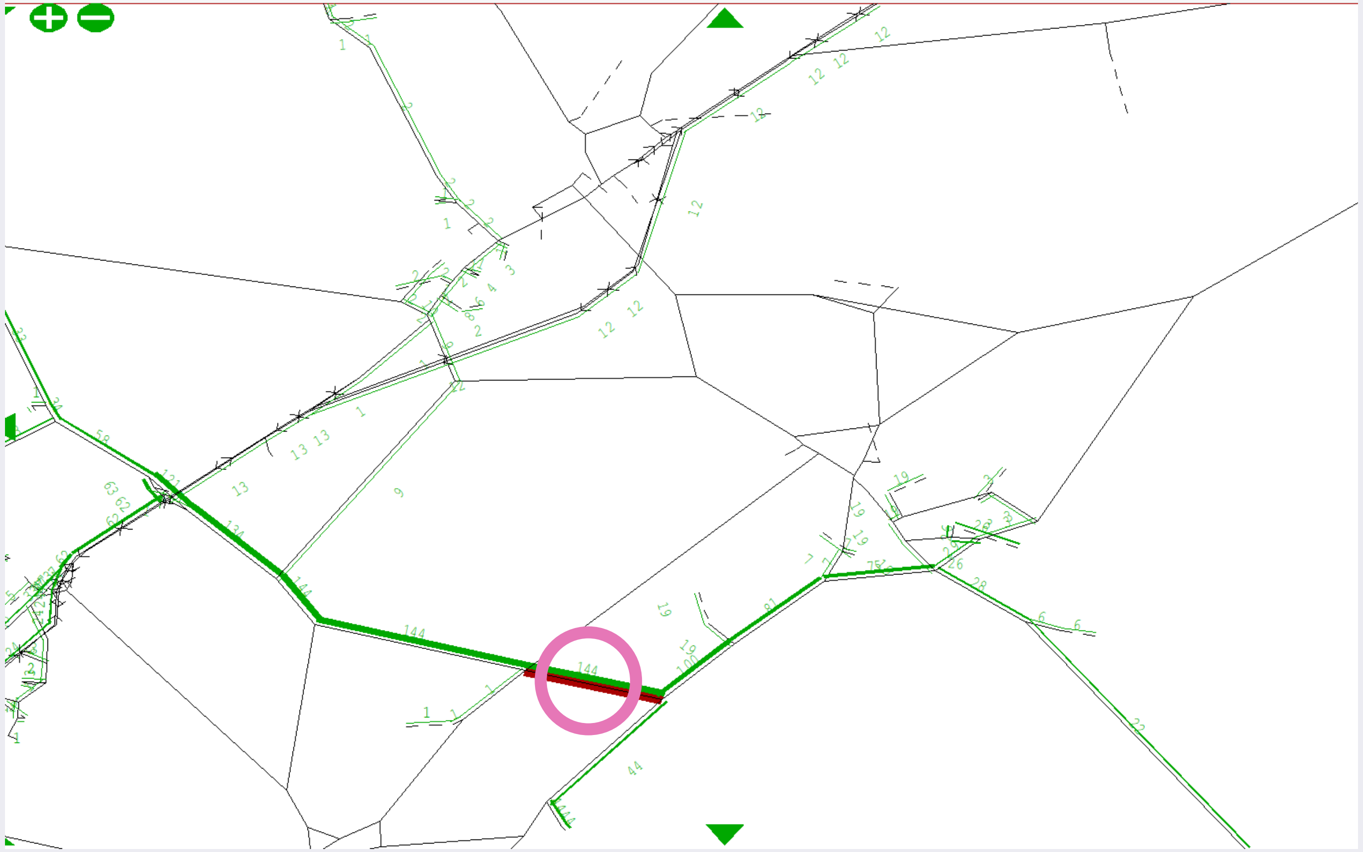
Takes traffic from south side of Tiptree and beyond to join A12 at Rivenhall End. Traffic going to A12 SB or Witham.



Junction 24 and surrounding network

<u>Select Link Analysis in 2019 base year model (AM) – on Braxted Park Road southbound</u>

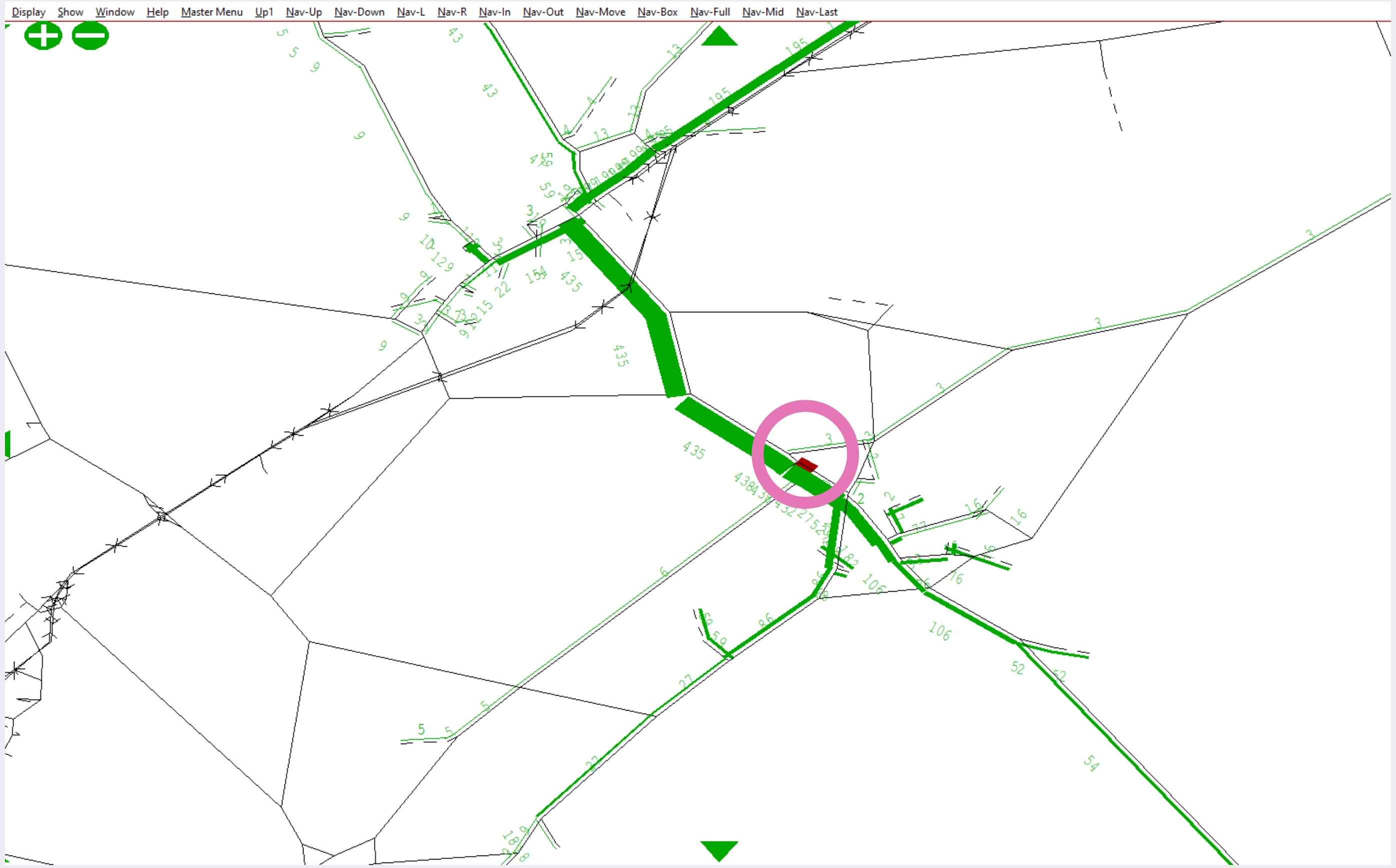
Takes traffic from Rivenhall End to south Tiptree.



Junction 24 and surrounding network

<u>Select Link Analysis in 2019 base year model (AM) – on B1023 Kelvedon Road northbound</u>

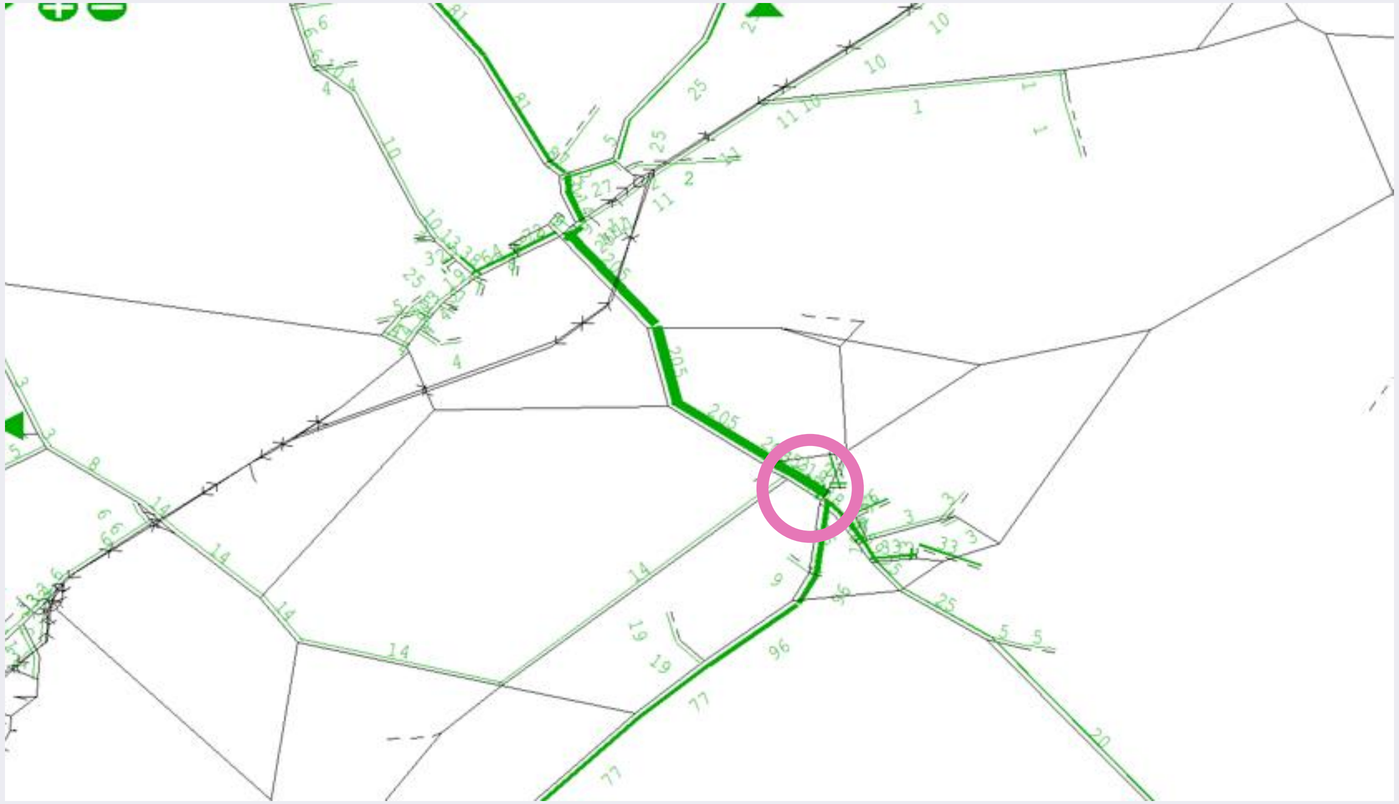
Takes traffic from Tiptree and beyond to join A12 northbound at junction 24 or into Kelvedon / Feering.



Junction 24 and surrounding network

Select Link Analysis in 2019 base year model (AM) – on B1023 Kelvedon Road southbound

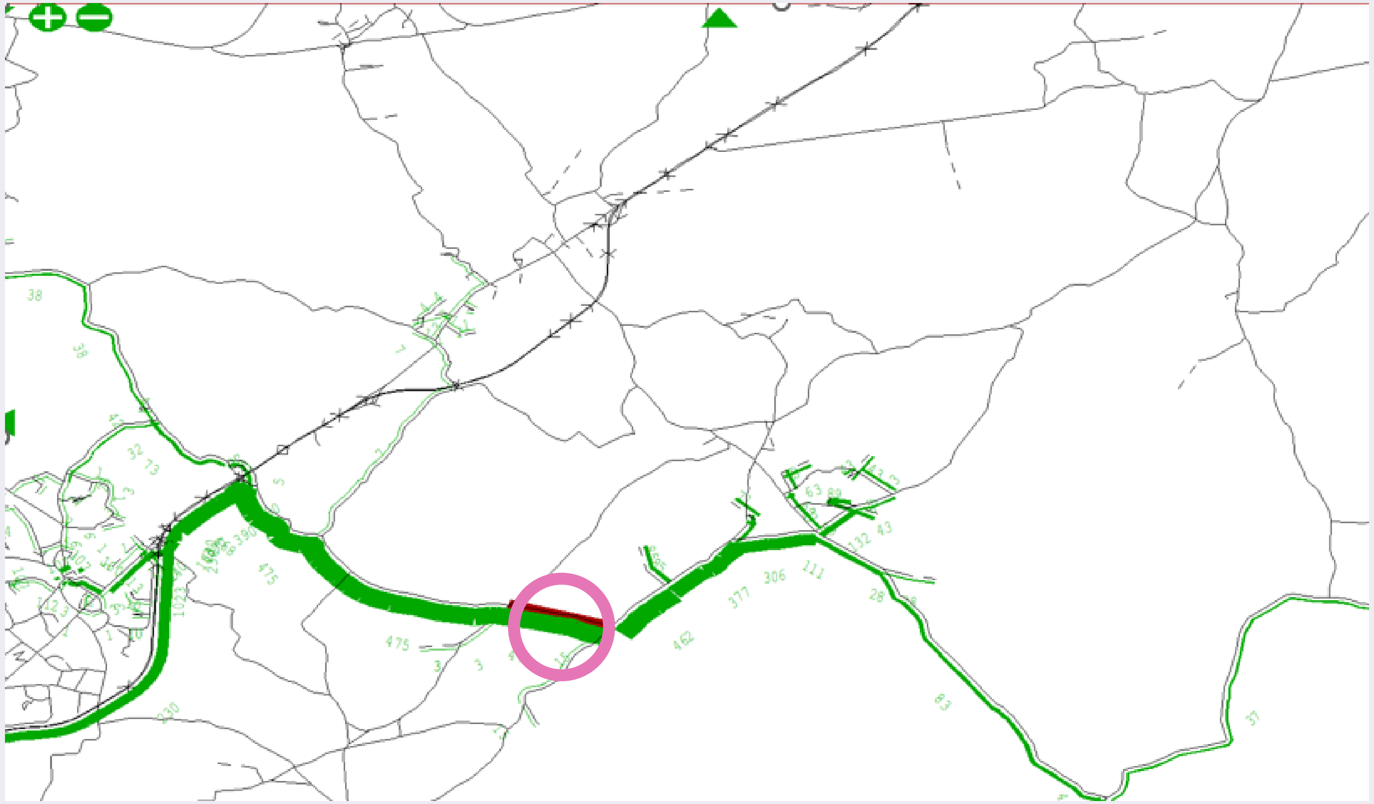
Takes traffic from A12 Southbound at junction 24 or Kelvedon / Feering to Tiptree and beyond.



Junction 24 and surrounding network

Select Link Analysis in 2027 Do Minimum model (AM) – on Braxted Park Road northbound

Similar distribution to the base model this link takes traffic from south side of Tiptree and beyond to join A12 at Rivenhall End. Traffic going to A12 SB or Witham.



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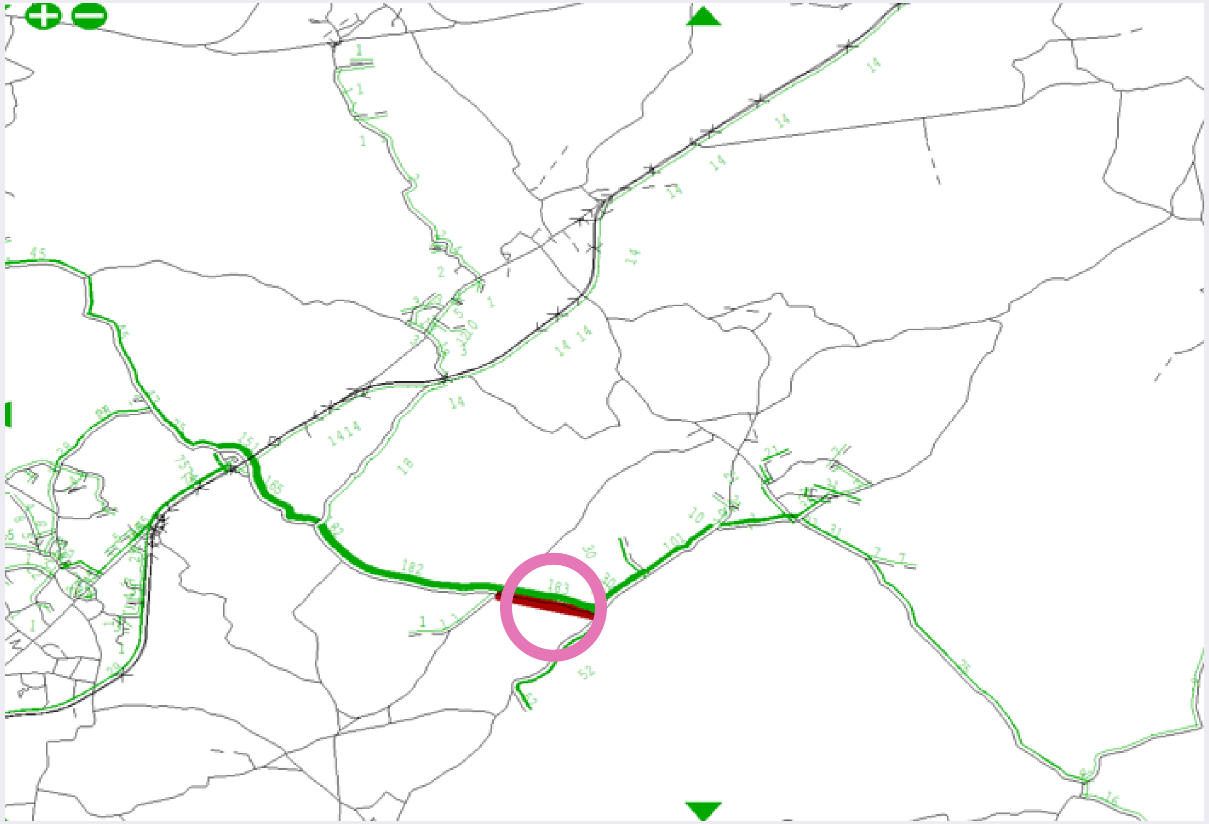
Junction 24 and surrounding network

Select Link Analysis in 2027 Do Minimum model (AM) – on Braxted Park Road southbound

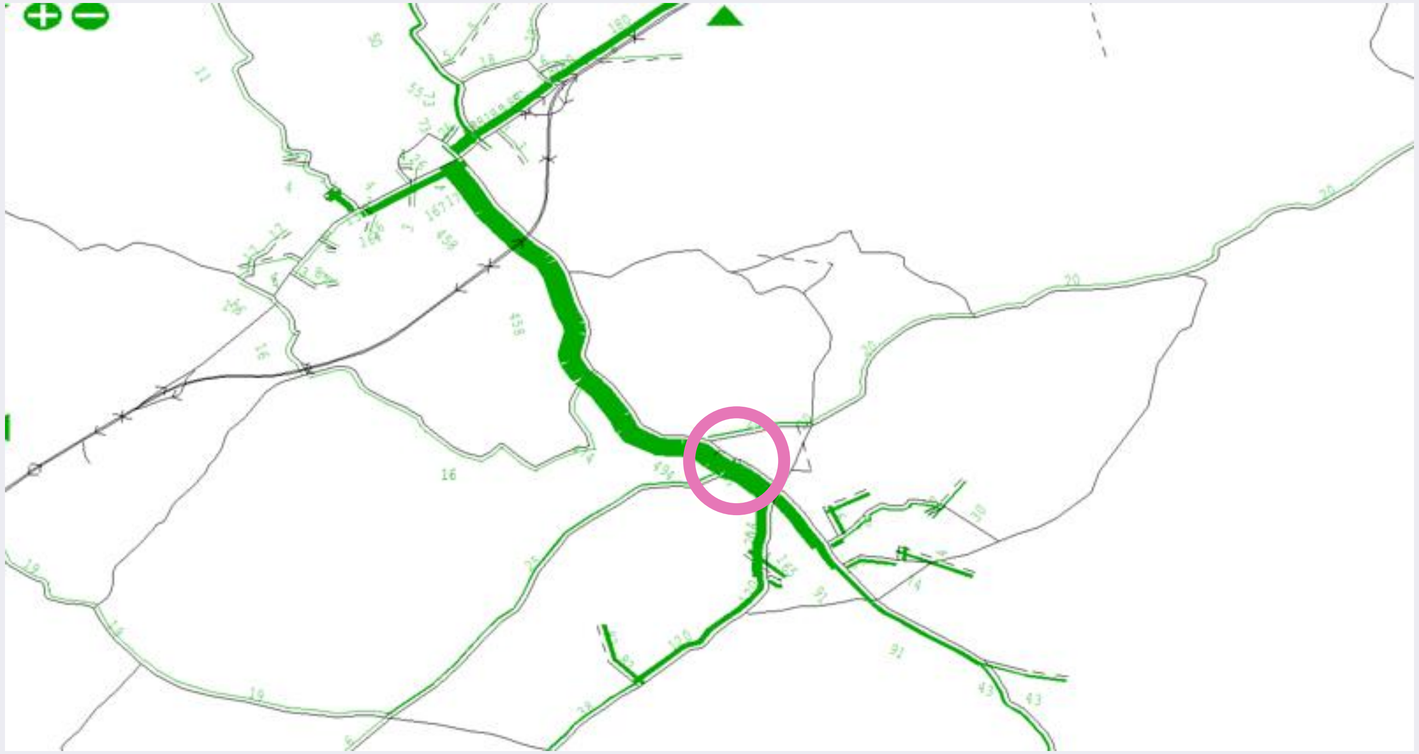
Similar distribution to the base model this link takes traffic from Rivenhall End to south Tiptree.



Junction 24 and surrounding network

<u>Select Link Analysis in 2027 Do Minimum model (AM) – on B1023 Kelvedon Road northbound</u>

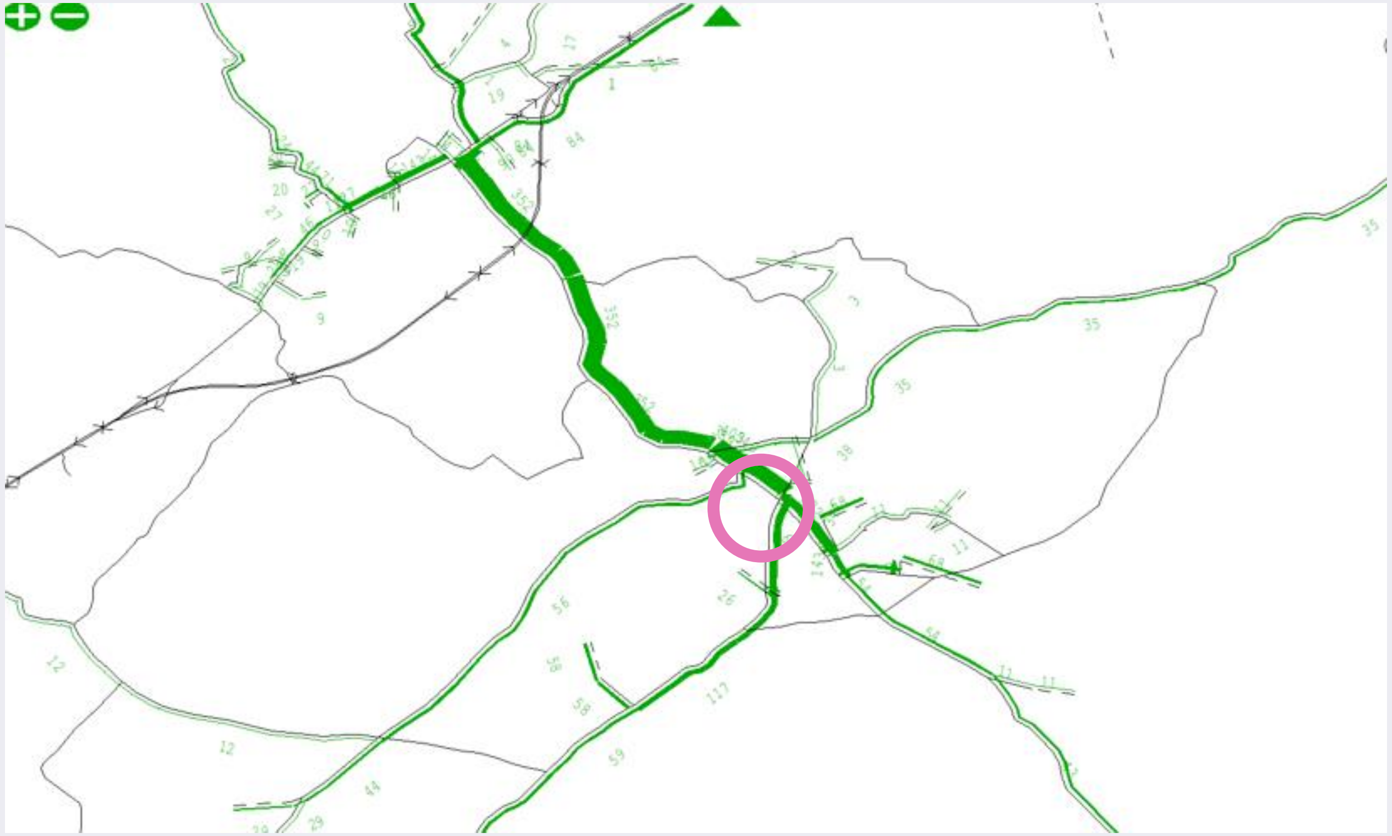
Similar to base model takes traffic from Tiptree and beyond to join A12 northbound at junction 24 or into Kelvedon / Feering.



Junction 24 and surrounding network

Select Link Analysis in 2027 Do Minimum model (AM) – on B1023 Kelvedon Road southbound

Similar to base model takes traffic from A12 Southbound at junction 24 or Kelvedon / Feering to Tiptree and beyond.

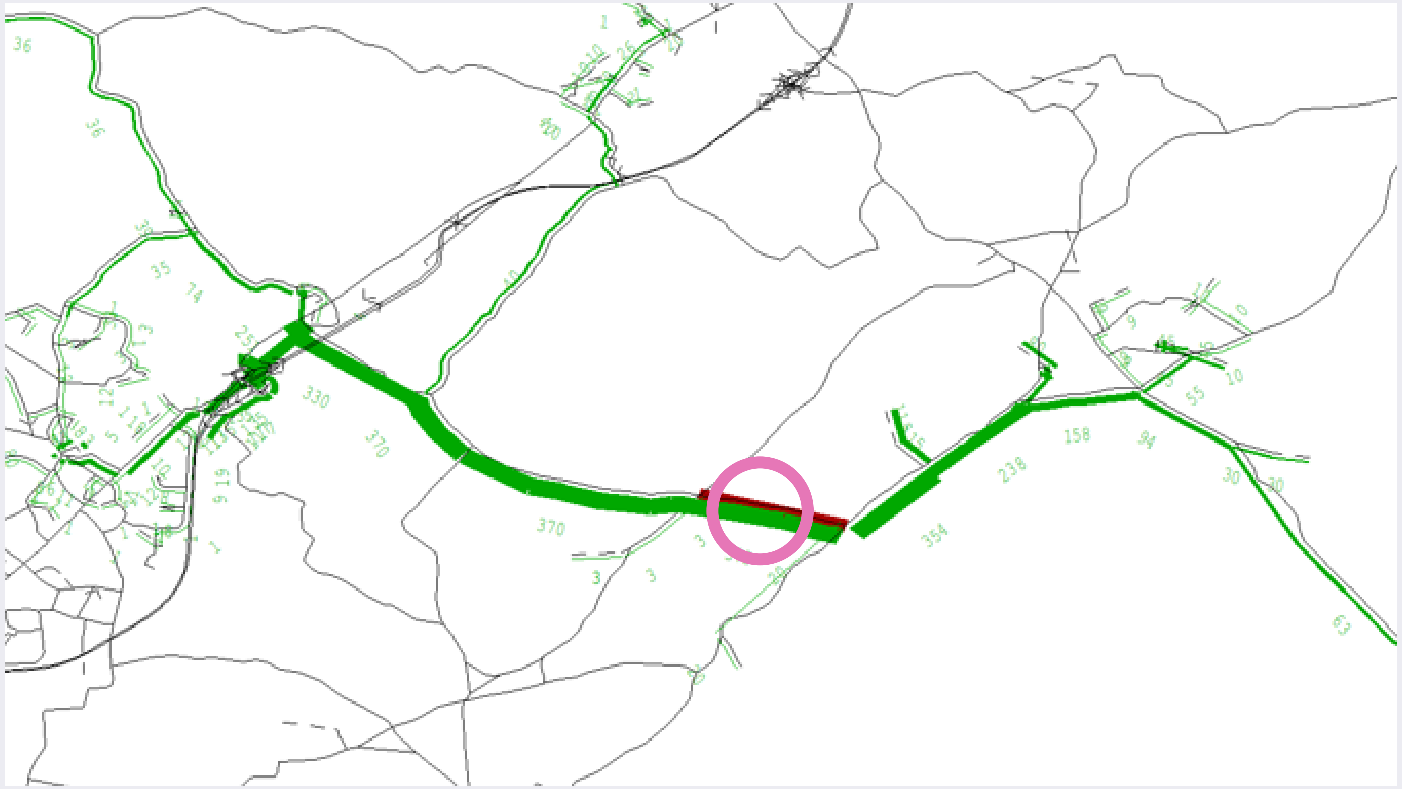


Junction 24 and surrounding network

Select Link Analysis in 2027 Do Something model (AM) – on Braxted Park Road northbound

Takes traffic from south side of Tiptree and beyond to join A12 at Junction 22 .
Traffic going to A12 SB or Witham.

Similar to Do Minimum but with less traffic making this movement.



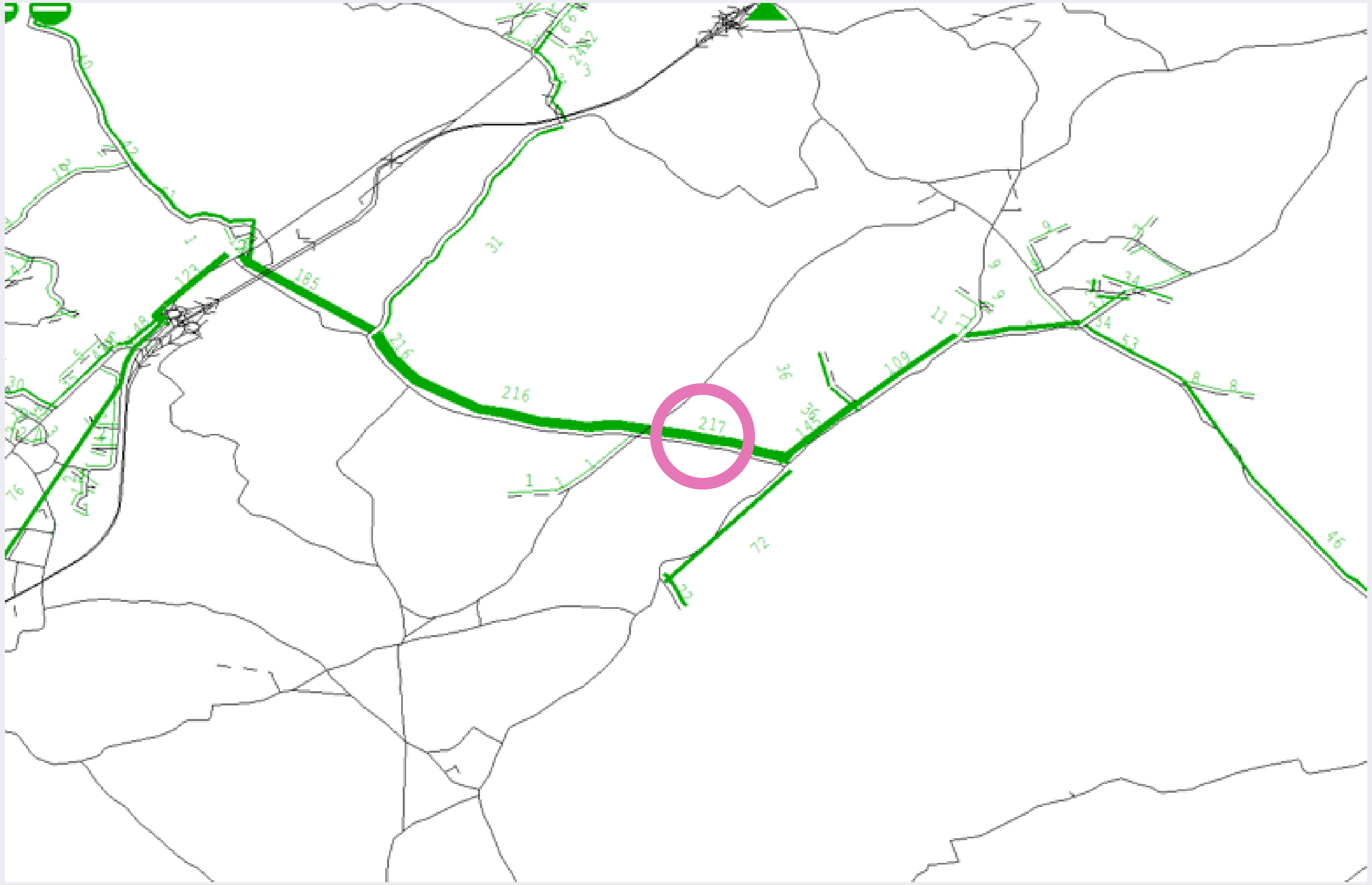
*NB traffic is going to A12 SB, but not shown on this plot due to display limitations within SATURN software

Junction 24 and surrounding network

<u>Select Link Analysis in 2027 Do Something model (AM) – on Braxted Park Road southbound</u>

Takes traffic from Witham, A12 south and Rivenhall End to south Tiptree via Junction 22.

Similar to Do Minimum.



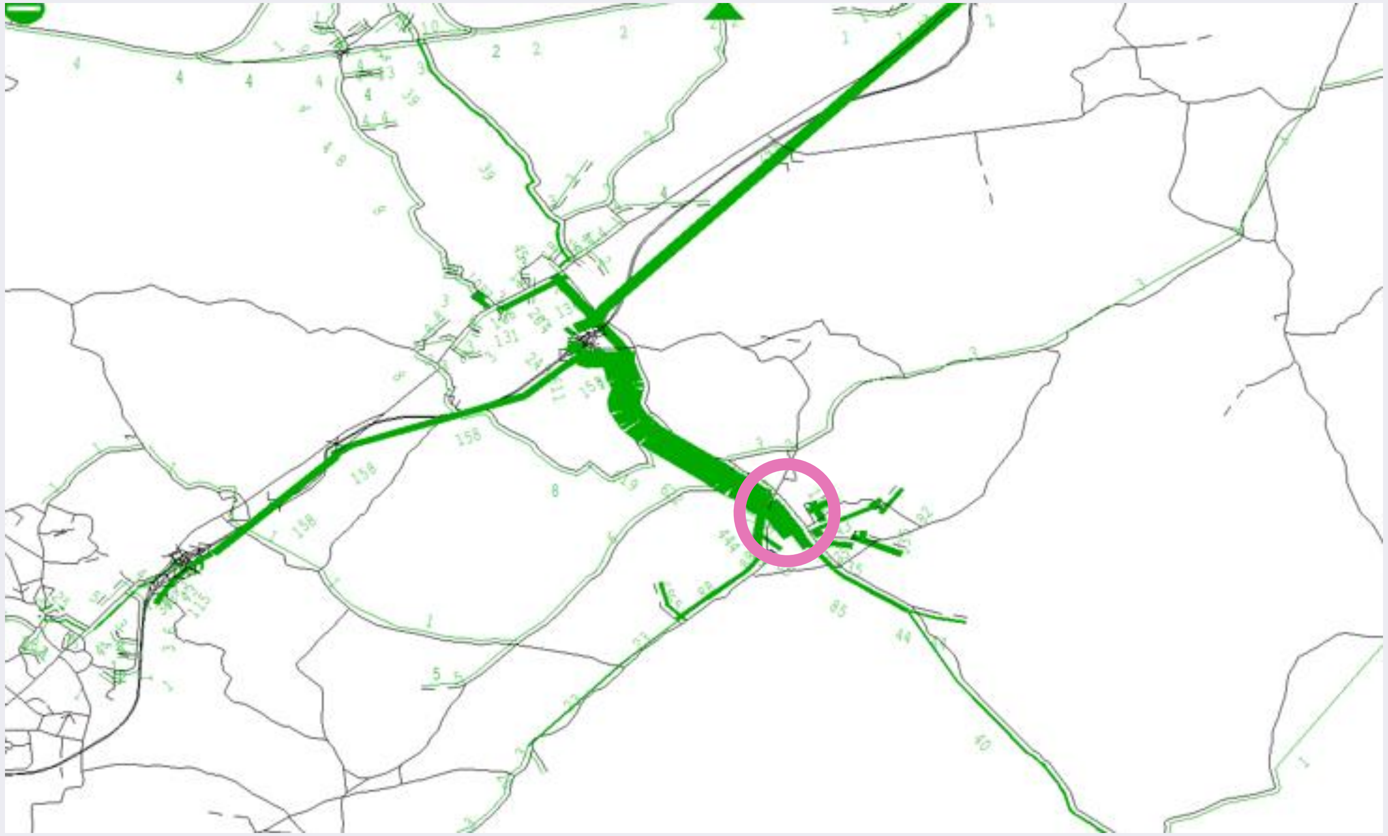
Junction 24 and surrounding network

Select Link Analysis in 2027 Do Something model (AM) – on B1023 Kelvedon Road northbound

Takes traffic from Tiptree and beyond to join A12 northbound **and southbound** at junction 24 or into Kelvedon / Feering.

More traffic making this movement than in Do Minimum, because some Tiptree traffic heading to A12 southbound switches to use J24 instead of via Rivenhall End.

Note no increase in traffic south/east of Tiptree.



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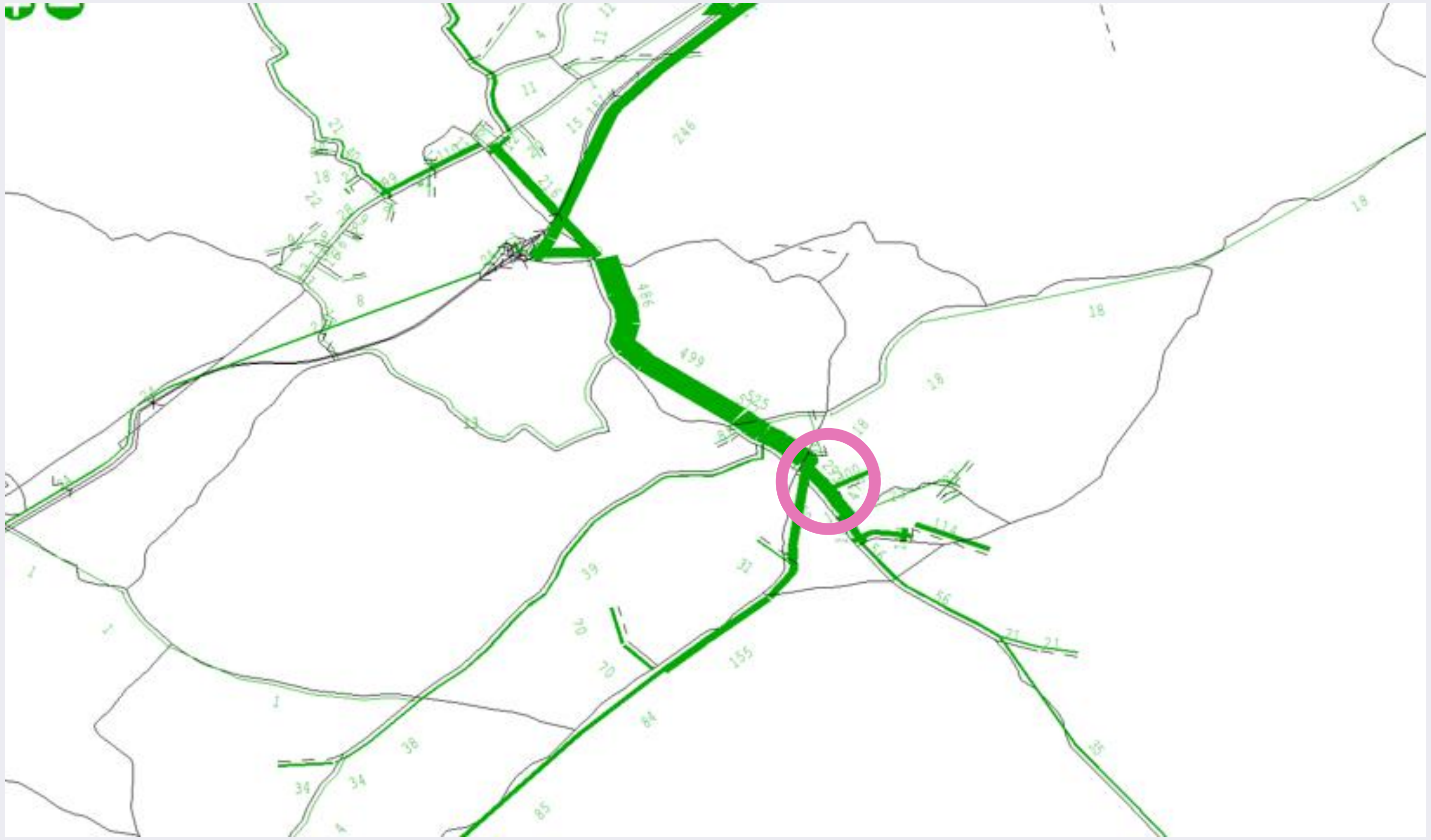
Junction 24 and surrounding network

Select Link Analysis in 2027 Do Something model (AM) – on B1023 Kelvedon Road southbound

Takes Northbound and Southbound A12 traffic at junction 24 or Kelvedon / Feering to Tiptree and beyond.

Similar to Do Minimum, but more traffic which has left the A12 at junction 24 from the north.



Junction 24 and surrounding network

Journey Times from Tiptree to Jn 22 and Jn 24 – Local stakeholders are concerned that the strategic model might be underestimating the delay experienced by traffic heading from Tiptree to the A12 via Braxted Park Road. We would request journey time data from the strategic model for the routes from the Station Road/Church Road junction to Rivenhall End and Station Road/Church Road junction to the location of the proposed new Jn 24 access roundabout on Inworth Road (base model, "without A12 scheme" and "with A12 scheme" in 2027 and 2042 AM and PM peaks). This should help to provide evidence to support the relative usage of each route in the assessed scenarios.

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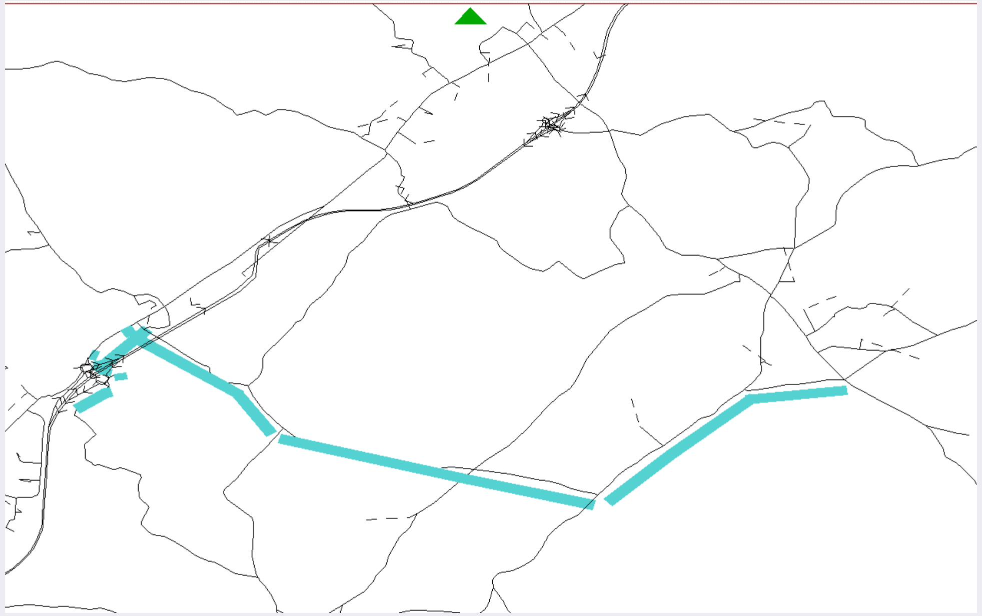
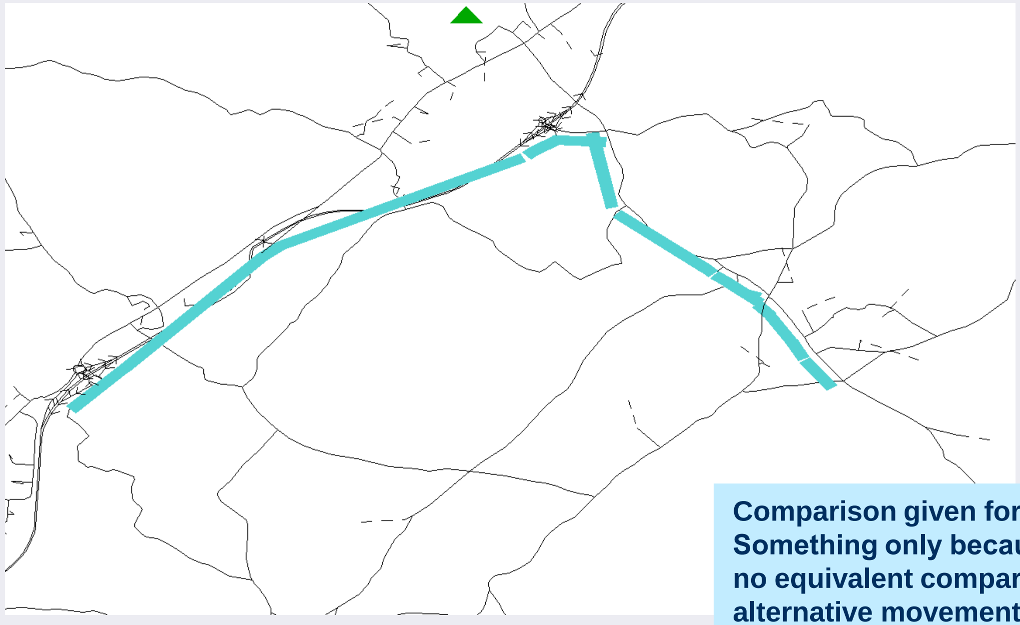
Junction 24 and surrounding network

Comparison of DS modelled Journey times from Tiptree to A12 SB via Braxted Park Road (J22) and Inworth Road (J24)

Journey Time Route Via Braxted Park Road (J22)



Journey Time Route Via Inworth Road (J24)



Year	Time period	Via Braxted Park Road (J22)	Via Inworth Road (J24)	Difference
2027	AM	10 min 58s	12 min 11s	1 min 13s
	PM	9 min 38s	9 min 57s	19s
2042	AM	11 min 25s	12 min 43s	1 min 18s
	PM	9 min 52s	10 min 18s	26s

Comparison given for Do Something only because there's no equivalent comparison of alternative movements in the Do Minimum – traffic from Tiptree would only use Braxted Park Road to join A12 SB

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Junction 24 and surrounding network

Comparison of observed vs modelled journey times from Tiptree to A12 via Braxted Park Road

This route was not included as a journey time route in the traffic model's calibration / validation, so is not reported in existing documentation. However, journey times from the base model have now been extracted and compared to observed Traffic Master data.

Time period	Observed JT	Modelled JT	Difference (seconds)	Difference (%)
AM	9 min 1s	8 min 23s	-38s	-7%
PM	8 min 48s	7 min 34s	-74s	-14%

This route meets TAG criteria of having modelled journey times within 15% of observed, for both AM and PM.

At Appleford Bridge, the model contains a fixed journey-time penalty to represent the additional delay caused at this narrow bridge. This was based on analysis of observed journey time data.

The junction between B1022 Maldon Road and Braxted Park Road is included in the SATURN model, with right-turning traffic from B1022 having to give way to oncoming traffic but in a single lane. The B1022 approach to this junction has 26s delay in the AM base model.

Junction 24 and surrounding network

B1023 Double Roundabout – we would additionally request data from the strategic model to show the performance of the junction in the base year (i.e. to be compared to the junction modelling results within the DCO pack). Local stakeholders currently report considerable congestion and delay in the peak periods which is not evident from the 2019 junction base year models, so we wish to interrogate how the 2019 strategic base models perform. Confirmation of any site-specific validation within the strategic model in this area (rather than the overall global validation statistics) would be appreciated.

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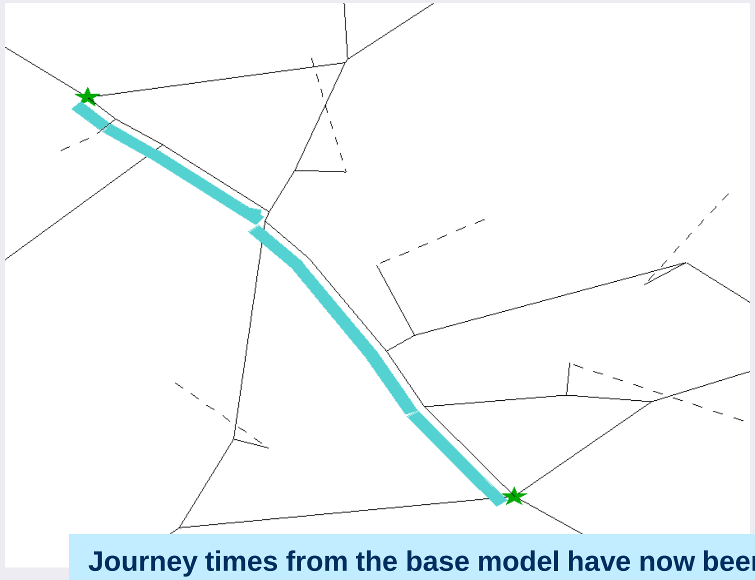
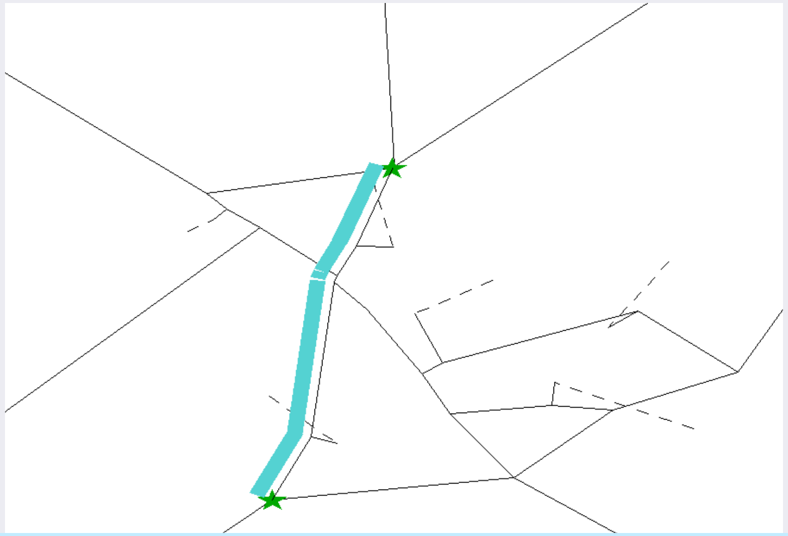
Junction 24 and surrounding network

B1023 Double Roundabout

Section 1 - Station Road/ Church Road to Oak Road/Kelvedon Road



Section 2 - Station Road/Maldon Road to Oak Road/Colchester Road



Journey times from the base model have now been extracted and compared to observed Traffic Master data. This shows a good match.

Section	Direction	AM			PM		
		Obs JT	Mod JT	Diff	Obs JT	Mod JT	Diff
Section 1	NB	192	187	-5	210	175	-35
	SB	173	175	2	169	194	25
Section 2	NB	160	147	-13	156	149	-7
	SB	151	146	-5	162	145	-17

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