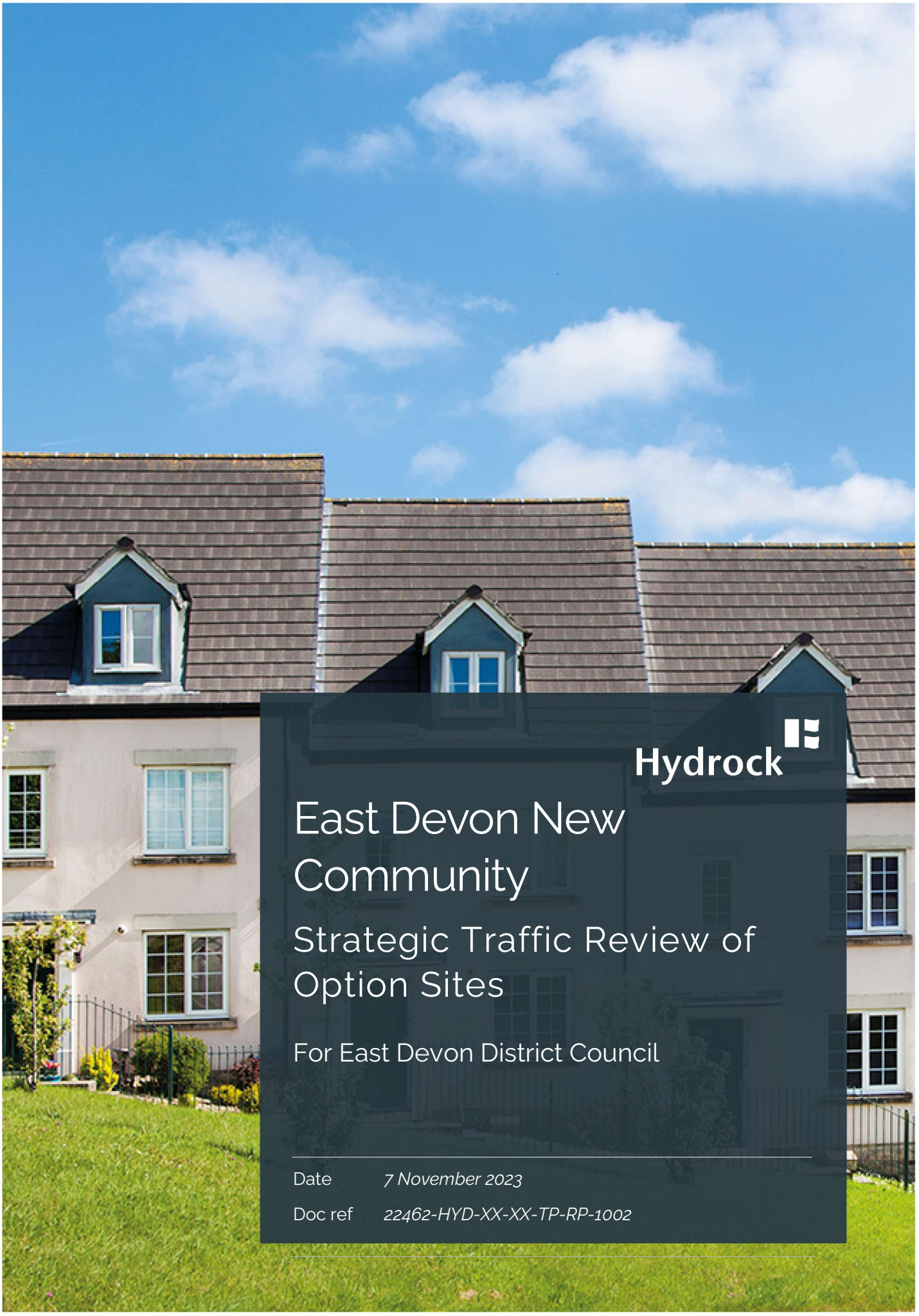


Hydrock

East Devon New Community

Strategic Traffic Review of Option Sites

For East Devon District Council

Date	*7 November 2023*
Doc ref	*22462-HYD-XX-XX-TP-RP-1002*

Document control sheet

Issued by	Hydrock Consultants Limited Ground Floor, Courtleigh House, 74-75 Lemon Street, Truro, Cornwall, TR1 2PN United Kingdom	T +44 (0)1209 719037 E truro@hydrock.com hydrock.com
Client	East Devon District Council	
Project name	East Devon New Community	
Title	Strategic Traffic Review of Option Sites	
Doc ref	22462-HYD-XX-XX-TP-RP-1002	
Project number	22462	
Status	S3	
Date	07/11/2023	

Document production record		
Issue number	P04	Name
Prepared by		Ben Smith-Laing CEng MEng(hons) MCIHT CMILT
Checked by		Huw Robinson BA (Hons)
Approved by		Peter Vooght BA (Hons) MCIHT CMILT

Document revision record			
Issue number	Status	Date	Revision details
P01	S3	10/10/2022	Suitable for review and comment
P02	S3	29/09/2023	Scoring review and update
P03	S3	03/10/2023	Further scoring updates
P04	S3	01/11/2023	Additional detail added to reflect later modelling note
P05	S3	07/11/2023	Scoring updates to remove rounding

Contents

Executive Summary **1**

1. Introduction **2**

1.1 Overview *2*

1.2 Report Structure *2*

1.3 Option Locations *3*

1.4 Local Highway Network *2*

2. Highways Impact **1**

2.1 Introduction *1*

2.2 Option One *2*

2.3 Option Two *2*

2.4 Option Three *3*

2.5 Summary *3*

3. Mitigation Potential **5**

3.1 Overview *5*

3.2 Improvement Options *5*

3.3 Signalisation of Existing Layout *6*

3.4 Signalisation and Use of Throughabout *7*

3.5 Replacement with Signals *7*

3.6 Removal of northern arm *9*

3.7 Westpoint Park and Ride *10*

3.8 Clyst St Mary Roundabout Summary *10*

3.9 East of Exeter Mitigation *10*

3.10 Mitigation Summary *11*

4. Additional Modelling **12**

5. Conclusions **15**

5.2 Next Steps *2*

Tables

Table 2.1: Highways Delay Impact Summary 3

Table 5.1: Highways Delay Impact and Mitigation Summary 1

Figures

Figure 1.1: Option One Location 1

Figure 1.2: Local Highway Network 2

Figure 1.3: Key Junctions 3
Figure 3.1: Existing Clyst St Mary Roundabout Layout 5
Figure 3.2: Signalised Roundabout Option 6
Figure 3.3: Throughabout Option 7
Figure 3.4: Signalised Crossroads Option A 8
Figure 3.5: Signalised Crossroads Option B 8
Figure 6: A376 / Topsham Road Junction Enlargement 11
Figure 4.1: East Devon development location from DCC modelling exercise 12
Figure 4.2: Highway boundary surrounding Airport Junction 13

Appendices

Appendix A WSP Modelling Report

Executive Summary

This Highways Impact Review provides an initial assessment to help shape and inform discussions regarding the location of a potential new community of up to 8,000 new homes in East Devon.

The document is based on traffic modelling by consultants (WSP) acting on behalf of Devon County Council (DCC), this report sits alongside a high-level comparative Sustainable Access Review.

Three location Options have been examined against a range of criteria, focusing on their impact on the local and strategic highway networks, and, where necessary, the potential to mitigate these impacts. This includes consideration of the deliverability of appropriate capacity improvement or demand reduction schemes.

Subsequently, each Option has been provided with a subjective score across key local junctions. with total scores for each option averaged and then factored to a score out of 5.

The table below provides an overview of the highway implication of the three potential Options for a new town in East Devon, and their respective scores.

Assessment Category	Option 1		Option 2		Option 3	
	Impact	Deliverability	Impact	Deliverability	Impact	Deliverability
M5 J29	5	5	5	5	5	5
M5 J30	5	5	4	5	4	5
M5 J31	5	5	5	5	5	5
A30	5	5	5	5	5	5
A3052	4	5	4	5	4	5
A38 & A380	5	5	5	5	5	5
Clyst St Mary junction	3	4	1	4	1	4
East of Exeter Network Impacts	5	5	1	2	5	5
TOTAL	37	39	30	36	34	39
Average	38		33		36.5	
Equivalent Score (1-5)	4.8		4.1		4.6	
Rounded Score	**5**		**4**		**5**	

Based on the above, Option 1 would be most preferred in terms of highways impact, followed by Option 3, with Option 2 being least preferred.

This document now explores the highways impact associated with the three potential locations for a new town in East Devon.

1. Introduction

1.1 Overview

1.1.1 This Strategic Traffic Review document has been prepared by Hydrock on behalf of East Devon District Council (EDDC) as an initial exercise to help shape and inform discussions regarding the location of a potential new community of up to 8,000 new homes in the western part of East Devon, to the east of Exeter.

1.1.2 This document explores the highways impacts associated with three potential locations for the new town. The note concentrates on highways capacity and delay and does not consider matters such as noise or air quality impacts.

1.1.3 The new community will be shaped by a vision which places an emphasis on active travel, greater connectivity and innovative transport technologies, in line with the Exeter Transport Strategy (2021). However, there is still a need to understand the potential impacts that such a development would have on the operation of the local and strategic highway networks. This is a result of the duties set out within Section 16 of the Traffic Management Act 2004:

The network management duty

(1)It is the duty of a local traffic authority [F1or a strategic highways company ("the network management authority")] to manage their road network with a view to achieving, so far as may be reasonably practicable having regard to their other obligations, policies and objectives, the following objectives—

(a)securing the expeditious movement of traffic on the authority's road network; and

(b)facilitating the expeditious movement of traffic on road networks for which another authority is the traffic authority.

(2)The action which the authority may take in performing that duty includes, in particular, any action which they consider will contribute to securing—

(a)the more efficient use of their road network; or

(b)the avoidance, elimination or reduction of road congestion or other disruption to the movement of traffic on their road network or a road network for which another authority is the traffic authority; and may involve the exercise of any power to regulate or co-ordinate the uses made of any road (or part of a road) in the road network (whether or not the power was conferred on them in their capacity as a traffic authority).

1.2 Report Structure

1.2.1 The structure of the report is as follows:

- Section 2: Highways Impact
- Section 3: Mitigation Potential
- Section 4: Conclusions

1.3 Option Locations

1.3.1 The three Option locations are all in the western part of the EDDC area, to the east of Exeter, and are shown indicatively at Figure 1.1.

- **Option One** is located approximately 7km east of Exeter city centre and 3km east of the M5. The A30 is to the north of the Option and the A3052 is to the south of the Option; Exeter Airport is also located less than 500m north of the Option One's northern boundary.
- **Option Two** is located approximately 9km south-east of Exeter city centre and has the potential to be bisected by the A3052. The village of Woodbury Salterton is located south of the Option's indicative boundary, with Greendale Business Park and Greendale Farm shop located within the Option's area.
- **Option Three** is located adjacent to the A376, in between Clyst St George (to the south-west) and Clyst St Mary (to the north-west). Option Three is 2km east of Topsham, which offers a rail link to Exeter and Exmouth via the Avocet Line.

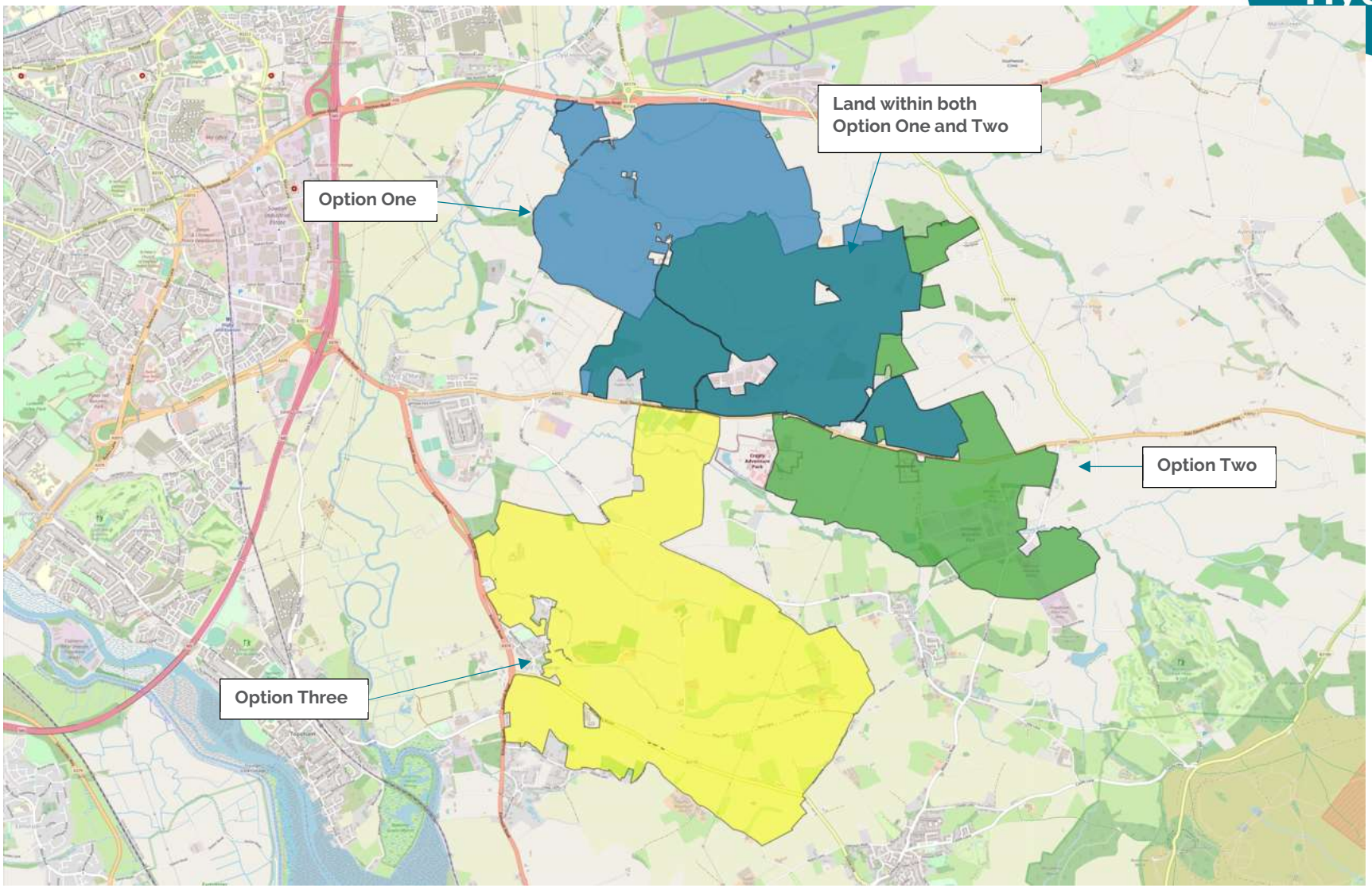


Figure 1.1: Option One Location

1.4 Local Highway Network

1.4.1 The local highway network in the vicinity of the Options is summarised at Figure 1.2, with key junctions highlighted in Figure 1.3.

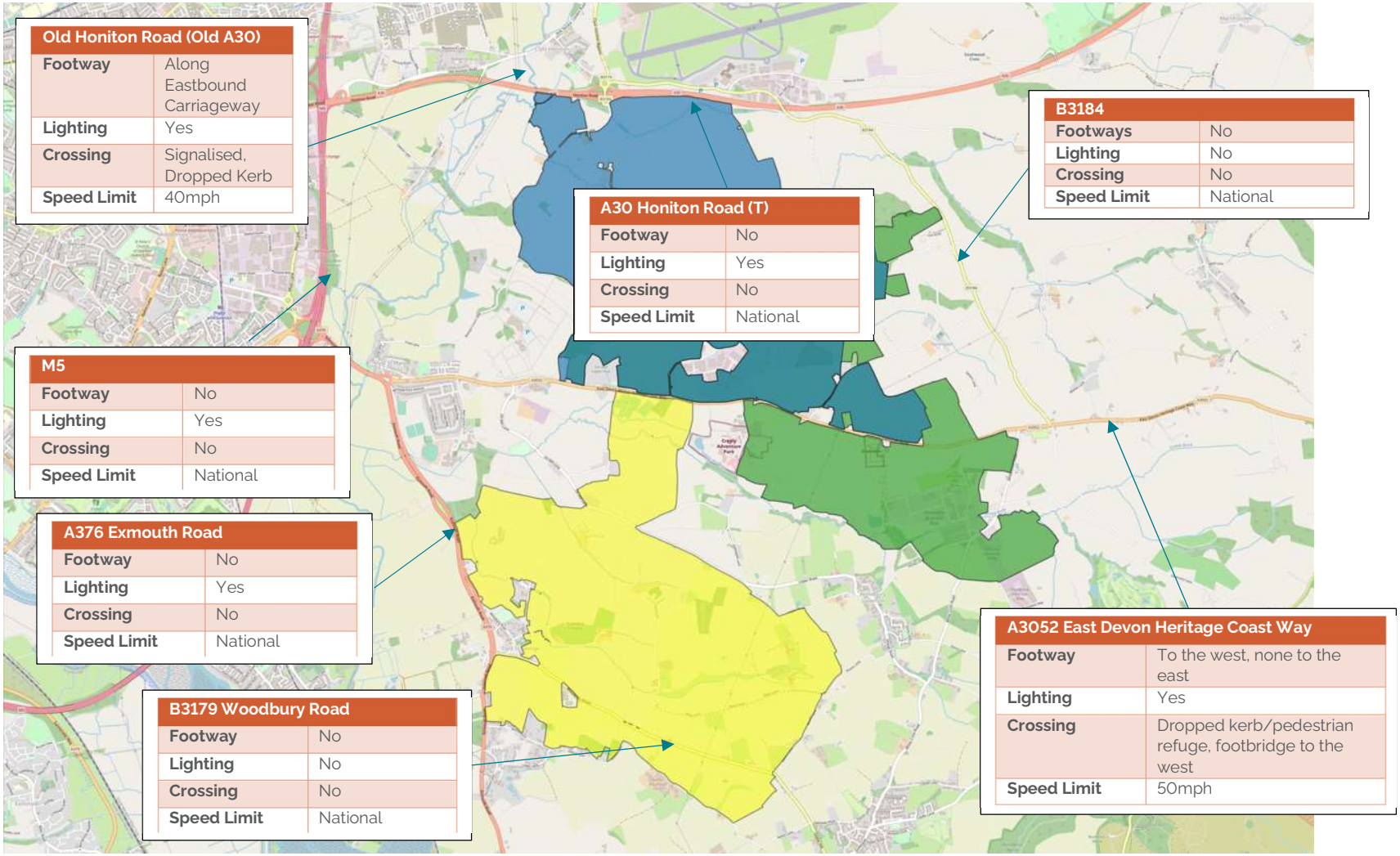


Figure 1.2: Local Highway Network

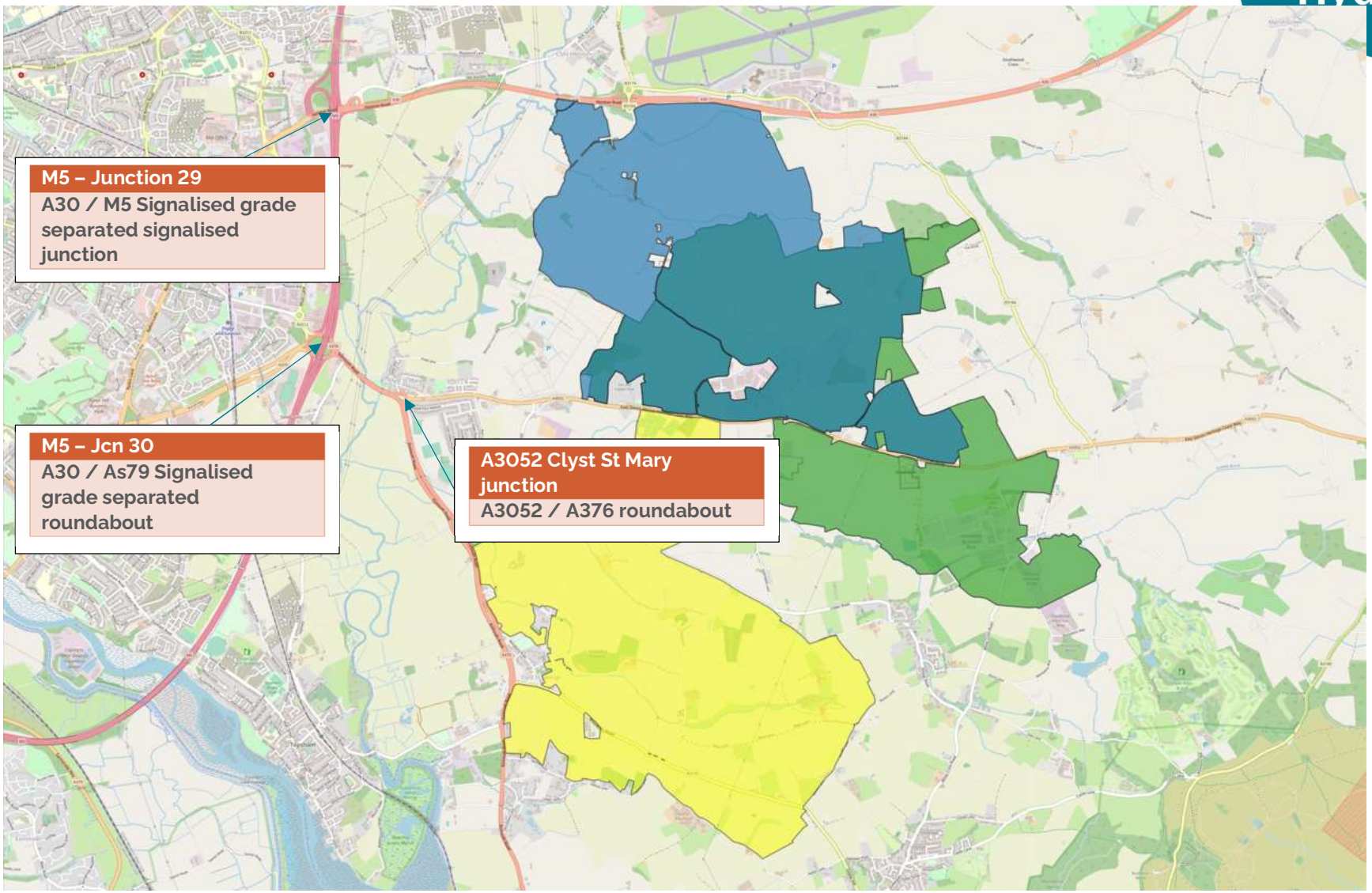


Figure 1.3: Key Junctions

2. Highways Impact

2.1 Introduction

2.1.1 This report is based on a modelling report commissioned by East Devon Council (EDC) from WSP, using the traffic model of the Greater Exeter (GE) area, originally developed by DCC (referred to as the "GE Model") using the SATURN strategic modelling software package. The GE Model area covers the Local Planning Authority (LPA) areas of Exeter, East Devon, Mid Devon, and Teignbridge, which has a combined population of approximately 475,000 people.

2.1.2 The work commissioned included a review of base year and 2030 forecast models, reflecting the current and anticipated highway conditions, review and modification of a forecasting process, and the production of an updated end-of-Plan 2030 scenario.

2.1.3 The GE base model represents a typical weekday in November 2017, covering the following time periods:

- AM Peak: 08:00 – 09:00
- Inter-Peak: Average hour 10:00 – 16:00
- PM Peak: Average hour 16:00 – 18:00

2.1.4 Within the WSP work, the model examines three future development scenarios equivalent to Options 1,2 and 3, with 2,500 dwellings in each scenario. These developments have a modelled year of 2030, which, due to lack of growth on major roads within the model, is stated to be a suitable proxy for 2040, the anticipated completion year of the development options.

2.1.5 The WSP model report sets out the reasoning for modelling 2,500 dwellings at this time, as opposed to the potential full 8,000 homes within the new community. As confirmed by DCC, the reasons for this include:

- The role of this stage of work is to assess the comparative effects of the three option sites – WSP's modelling of the 2,500 homes that are anticipated to be delivered within the new Local Plan period already identifies differences in traffic impact. It is likely that modelling of a higher level of development would largely simply amplify these differences.
- The nature of the DCC model, alongside Local Plan timescales, means that a traditional approach has had to be taken to trip generation, based on typical trip rates for the proposed land-uses. As part of the next stage of work, exploring in more detail the transportation effects of whichever site is preferred by EDDC, the impact of 8,000 homes can be reviewed using a Vision & Validate approach. This would enable greater account to be taken of the trip reduction, mode shift (to sustainable modes) and internalisation effects that can be achieved as part of the overall masterplan – with 'economies of scale' based on the overall quantum of development.
- The existing DCC model has a forecast year of 2030. The timescales for delivering a development of 8,000 new homes are unclear, and the model does not include other future development beyond what is in the current adopted Local Plans for the surrounding districts. Consequently, the simple addition of traffic from an 8,000-home development would not represent the overall future development scenario within East Devon or the wider area, which are currently unknown.
- New national and regional traffic growth projections ('TEMPRO') from the Department for Transport become official in November 2022 and include multiple future scenarios reflecting economic, technological, regional and behavioural metrics. This will replace the current version of TEMPRO. The DCC model would need to be updated to reflect the new version of TEMPRO when it becomes current.

- Notwithstanding that the new DfT traffic projections enable forecasting up to 2061, longer-term forecasts in particular need to be treated with caution given the rapid pace and scale of change in travel behaviours and technologies, as well economic factors.
- The existing model cannot take account of the above, meaning that testing a development of 8,000 homes would currently have the potential to result in unrealistic or unsuitable re-routing of vehicles within the model, unreliable results and the potential design of unwarranted or excessive mitigation infrastructure.

2.1.6 The detailed report prepared by WSP for 2,500 homes is attached as Appendix A. This sets out impacts for each scenario.

2.1.7 It should be noted that this preliminary round of modelling work by WSP includes predictions of the traffic attraction of the new community based on an exercise carried out by DCC to create a set of bespoke car trip rates for new communities within the Greater Exeter area. This was derived from an AM Peak average of five urban survey sites from Greater Exeter Spatial Plan settlements. This was then factored to Inter Peak and PM Peak periods using factors derived from the TRICS database.

2.1.8 This trip prediction methodology implicitly assumes that travel habits at the new community will remain similar to those of recent developments in the Exeter area. However, given the relatively long delivery periods for new housing from planning through to occupation, some of the sustainable travel initiatives at the surveyed sites are unlikely to reflect the latest developments in Transport Planning in terms of encouraging sustainable modal choices (e.g. through provision of electric bike sharing schemes).

2.1.9 The new community will include a range of infrastructure improvements and promotion measures designed to encourage sustainable modal choices and to reduce the use of cars. The community will also be designed to maximise the trip internalisation (i.e. trips that remain within the overall settlement boundary) by providing a range of employment, leisure and retail facilities in tandem with new housing.

2.1.10 As a result, the initial modelling exercise is likely to overestimate the vehicle trips associated with the new community. Over the course of the project, the modelling will be repeated and updated with a finessed set of trip rates. This is discussed with a separate Trip Generation Methodology Note (ref 22462-HYD-XX-XX-RP-TP-1001). The discussion and summary provided below are based on the initial trips rates and are therefore likely to show a robust, worst-case scenario, with some of the identified congestion likely to be mitigated by encouraging a shift towards more sustainable habits.

2.2 Option One

2.2.1 Option 1 shows relatively small changes in traffic on the M5, A30 and A380, resulting in generally small increases in delay. However, M5 J29 sees some increases in delay in the AM and PM models, mostly on the east side of the M5. Clyst St. Mary Roundabout also shows some impacts from the development site, with 33 seconds of extra delay on the westbound approach in the AM model and 35 seconds of extra delay on the eastbound approach in the PM model, plus additional turning delay at the roundabout itself.

2.3 Option Two

2.3.1 Option 2 shows relatively small changes in traffic on the M5, A30, A38, and A380, and minimal changes to delay as a result.

2.3.2 There are however significant impacts at the Clyst St Mary Roundabout. This sees 277 seconds of additional delay on the westbound approach in the morning peaks and 160 second increases on the eastbound approach in the afternoon peak.

2.3.3 In addition, there are increases in delay to the east of Exeter, particularly at Bond's Lane / Woodbury Road junction and at the Topsham Road junction.

2.4 *Option Three*

2.4.1 Option 3 is similar in terms of its impacts in the morning peak, but sees more significant impacts in the afternoon peak.

2.4.2 There are minimal overall changes in delay on the mainline at M5 J29 and J30 and on most of the road network to the east of Exeter. M5 J29 and J30 see some increases in delay in the AM and PM models, focused on the east side of the M5 at J29 and the north side of the junction at J30. Clyst St. Mary Roundabout shows some significant impacts from the development site though, with around 50 seconds of extra delay on both the eastbound and westbound approaches in the AM model and 136 seconds of extra delay on the eastbound approach in the PM model, plus additional turning delay at the roundabout itself.

2.5 *Summary*

2.5.1 Table 2.1 below summarises the delay impacts identified within the WSP modelling, Impacts have been scored from 1 to 5, with minimal adverse impacts scoring 5, minor impacts 4, moderate impacts 3 and significant impacts 1..

Table 2.1: Highways Delay Impact Summary

Assessment Category	Option One	Option Two	Option Three
M5 Junction 29	» Minimal impact (5)	» Minimal impact (5)	» Minimal impact (5)
M5 Junction 30	» Minimal impact (5)	» Minor delay increases (4)	» Minor delay increases (4)
M5 Junction 31	» Minimal impact (5)	» Minimal impact (5)	» Minimal impact (5)
A30	» Minimal impact (5)	» Minimal impact (5)	» Minimal impact (5)
A3052	» Minor delay increases (4)	» Minor delay increases (4)	» Minor delay increases (4)
A38 and A380	» Minimal impact (5)	» Minimal impact (5)	» Minimal impact (5)
Clyst St Mary Junction	» Moderate delay increases (3)	» Significant delay increases (1)	» Significant delay increases (1)
East of Exeter Network Impacts	» Minimal impact (5)	» Significant delay increases (1)	» Minimal impact (5)
Hydrock Scores	**37**	**30**	**34**

2.5.2 Based on the above, Option 1 has the least significant highways impact and it appears that the development could be accommodated without significant highways interventions. Whilst there would be increases in traffic in some areas, the modelling carried out suggests that these would not lead to significant increases in delays. Minor highways mitigation works may be needed and could be reviewed and addressed as part of the normal planning process, with no strategic interventions required.

2.5.3 Option 3 is can also be accommodated with relatively little in term of mitigation works, with only the Clyst St Mary junction anticipated to see significant delay increases. An improvement of this junction or other appropriate mitigation would be required. It should however be noted that, due to the proximity of the Clyst St Mary junction and the M5 Junction 30, there is likely to be interaction between the two, and increasing capacity at the Clyst St Mary junction may have impacts at Junction 30, with traffic arriving at the junction more freely than it does at present. It is therefore likely that any scheme would have to coordinate with changes to Junction 30.

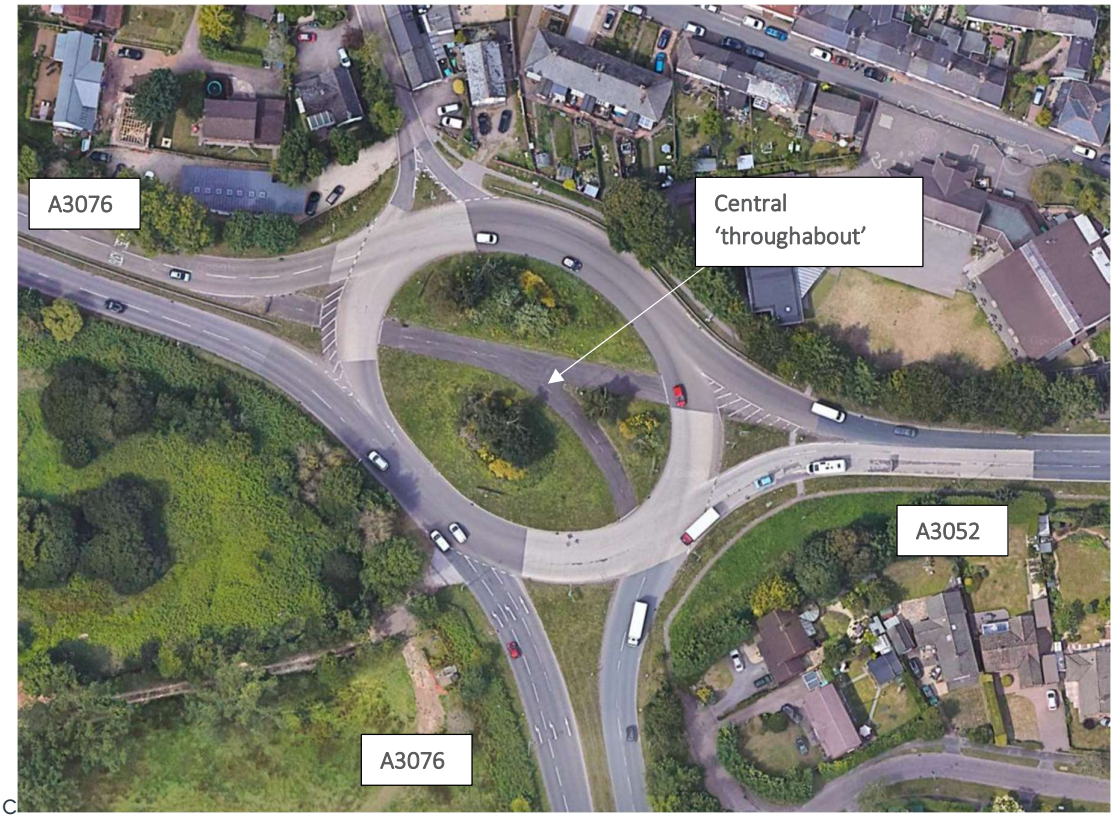
2.5.4 Option 2 can generally be accommodated, but has significant impacts at both Clyst St Mary and the east of Exeter road network, with improvements likely to be required at both locations.

3. Mitigation Potential

3.1 Overview

3.1.1 Table 2.1 sets out the development impact without mitigation (i.e. without making improvements to address the changes to delay). The main individual junction that will require improvement is the Clyst St Mary (CSM) roundabout.

3.1.2 The existing CSM roundabout is a conventional roundabout with two lane entries on the A3076 (west) and A3052 arms, three lanes on the A3076 (south) entry and a single lane on the northern arm. It has a central 'throughabout' lane running from west to east and south. This is not in general use, and is only used under supervision of marshals during events at the nearby Westpoint showground. The junction has an inscribed circle diameter of approximately 80m.



C

Figure 3.1: Existing Clyst St Mary Roundabout Layout

3.2 Improvement Options

Five options for mitigation works at this junction have been considered:

- Signalisation of existing layout
- Signalisation and full use of throughabout
- Replacement with signals
- Removal of northern arm
- Westpoint park and ride

3.2.1 These are discussed in more detail below. It should be noted that none of these schemes has been subjected to detailed modelling and significant scheme development will still be required. However, engineering judgement has been applied to determine if the schemes are likely to succeed.

3.3 Signalisation of Existing Layout

Potential scheme

3.3.1 The modelling does not indicate overall capacity issues, but rather individual arms experiencing delays due to the tidal nature of the traffic flows. The large size of the junction means that it would be possible to part-signalise it to allow flows to be rebalanced.

3.3.2 With four-arm junctions, the most efficient operation is generally achieved by signalising three of the four arms, with the remaining arm operating on a priority basis (as a conventional roundabout). In this instance, it is likely that the northern arm would not be signalised due to its relatively low traffic flows. A sketch of this arrangement is shown below:

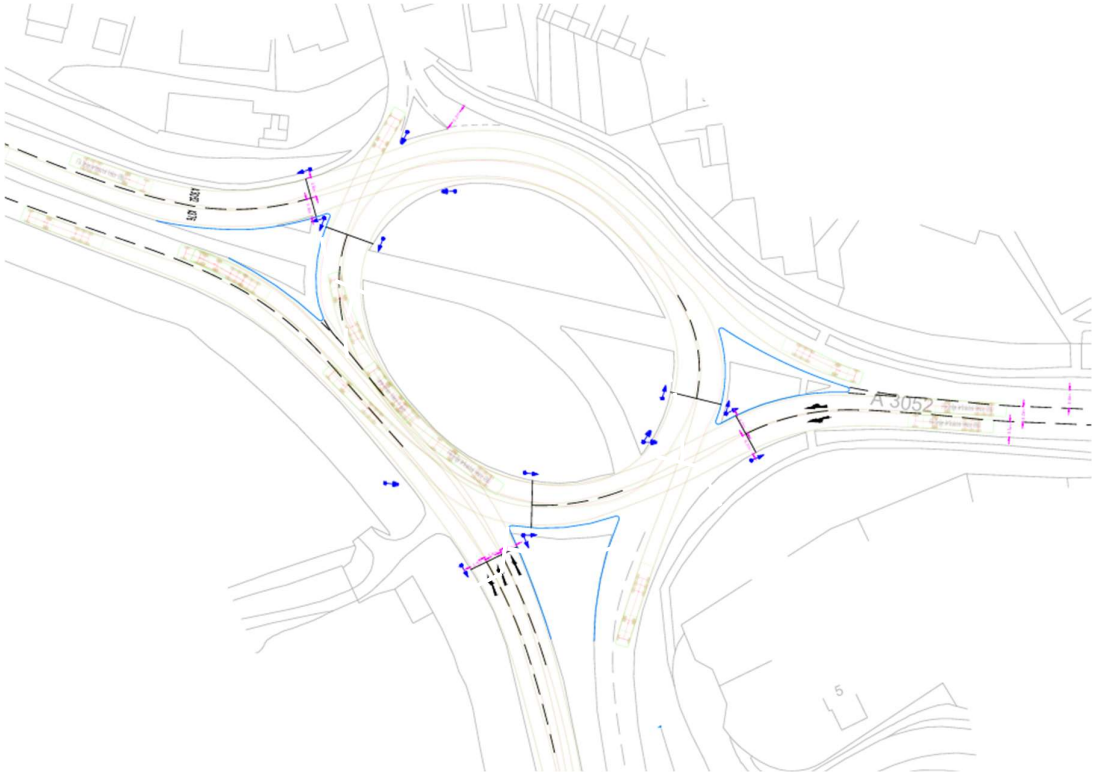


Figure 3.2: Signalised Roundabout Option

Deliverability

3.3.3 A scheme of this nature would allow capacity to be rebalanced to address the tidal nature of the traffic flows and has a high probability of addressing capacity issues. There is also potential to coordinate the traffic signals with Junction 30 and the Clyst Road signals.

3.3.4 The scheme requires relatively minimal physical works and no additional land. It is therefore considered to be highly deliverable.

3.4 Signalisation and Use of Throughabout

Potential scheme

3.4.1 As above, use of the existing throughabout section could help to address the tidal nature of the traffic flows. A sketch of a potential scheme is shown below:

Figure 3.3: Throughabout Option

Deliverability

3.4.2 The size of the junction means that stacking capacity for queues would be limited, and there is unlikely that enough queue storage could be provided on the circulatory, leading the junction to 'lock up'. This is particularly the case on the east and west side of the circulatory. As a result, this is considered to be an unrealistic approach.

3.5 Replacement with Signals

Potential scheme

3.5.1 Under this option, the roundabout would be removed and the junction would become a signalised crossroads. Sketch of potential arrangements are shown overleaf:

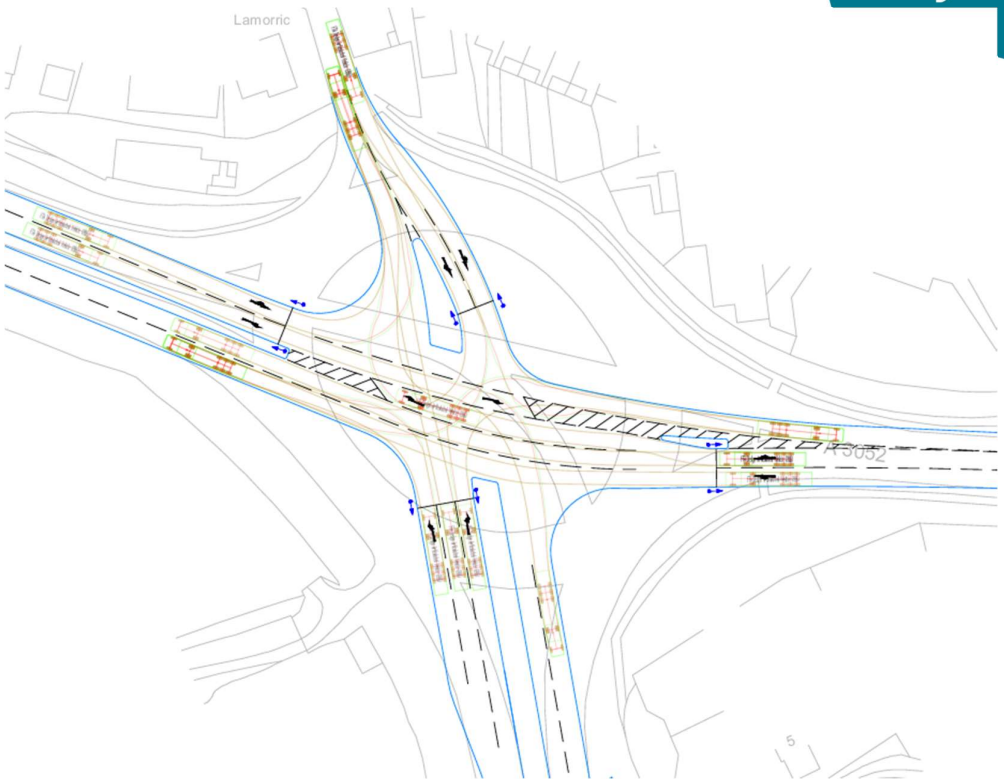


Figure 3.4: Signalised Crossroads Option A

Figure 3.5: Signalised Crossroads Option B

Deliverability

3.5.2 A scheme of this nature would allow capacity to be rebalanced to address the tidal nature of the traffic flows and has a high probability of addressing capacity issues. There is also potential to coordinate the traffic signals with Junction 30 and the Clyst Road signals.

3.5.3 The scheme requires relatively minimal physical works and no additional land. It is therefore considered to be highly deliverable. It does also offer the opportunity to reclaim some highway land or to use the space for bus priority or cycle measures.

3.6 Removal of northern arm

Potential scheme

3.6.1 The northern arm of the junction provides access to a relatively small area of housing around Frog Lane. There is alternative access to this area via Bishops Clyst, so the roundabout arm could potentially be removed. This would remove the number of give-way movements at the junction and, depending on the balance of traffic flows, may result in smoother operation. A sketch of this arrangement is shown below:

Deliverability

3.6.2 Removal of the northern arm would be highly deliverable in terms of physical engineering works, but its capacity impacts are unpredictable without modelling. It is also unlikely to be popular with local residents without improvements to the Bishops Clyst junction. Additional traffic would also be forced along Bishops Clyst, which is narrow and goes past a school. As a result, although worthy of further investigation, this scheme is not recommended.

3.7 Westpoint Park and Ride

Potential scheme

3.7.1 The Westpoint Arena lies to the east of the junction and provides a large, open area with a well-developed access junction. It is well located to intercept trips into Exeter from the east and therefore to limit traffic through both the Clyst St Mary junction and M5 junction 30 Junction. There are already park and ride services operating from the Sowton site, so this route could potentially be extended to the Westpoint Arena, minimizing the number of additional vehicles required.

Deliverability

3.7.2 Physical costs should be relatively minimal due to the infrastructure already in place at the Arena. There would however be an ongoing revenue cost in terms of bus operation and lease / rent of the Arena. In addition, consideration would need to be given to how the park and ride service could operate during events such as the Devon County Show. However, the service could also help people to access these events by bus, so there are benefits for both parties.

3.7.3 This scheme is considered to be highly deliverable, and would be fully policy compliant in terms of encouraging use of sustainable modes. It would also benefit M5 Junction 30.

3.8 Clyst St Mary Roundabout Summary

3.8.1 There are a number of potential options for improvement of the junction, the majority of which are likely to be deliverable. Due to the large size of the junction, acquisition of third-part land is unlikely to be required. As with any major highways re-design, utilities within the road are likely to be a major risk item in terms of costs and would need to be clarified as part of the next assessment steps. An improvement scheme requiring minimal physical intervention would reduce this risk, so signalisation of the existing layout or creation of a new park and ride are likely to be preferred ways forward. A new park and ride would also encourage sustainable transport use and have a knock on benefit at Junction 30 due to reduced traffic demand.

3.9 East of Exeter Mitigation

3.9.1 The area to the east and south of Clyst St Mary is only significantly affected by Option 2, particularly around Woodbury Salterton and at the A376 junction with Topsham Road. The Woodbury Salterton impacts are likely to be a result of the section of Option 2 that lies close to the village. Due to their proximity to the site, it is likely that these impacts could be addressed through the planning application process, as the minor local roads are likely to require improvement in any event. It is unlikely that a strategic-level highway improvement would be required. However, these highway improvements would be an additional cost on the development, and may therefore affect viability and / or affordable housing provision.

3.9.2 The A376 / Topsham Road junction is effectively a mini-roundabout, and is closely fronted by third-party land. A straightforward capacity improvement through the creation of additional lanes does not appear to be achievable within the existing highway boundary. On the southwest corner of the junction, there is an open field, and it would need to be confirmed whether it is possible to obtain part of this to provide room to create either a larger roundabout or signalised junction. The levels and vertical alignment of the field also appear to be favourable to achieve this without requiring highways structures. A sketch of a potential roundabout option is provided below.

Figure 6: A376 / Topsham Road Junction Enlargement

3.9.3 In engineering terms, this appears at a high-level to be deliverable, but it would require acquisition of third-party land, which is a risk item. Overall, likely deliverability is considered to be moderate.

3.10 Mitigation Summary

3.10.1 The modelling work undertaken shows that Options 2 and 3 would have traffic impacts at the Clyst St Mary Roundabout, with Option 2 also impacting on surrounding local roads

3.10.2 In terms of their highways impacts, Option 1 would be the preferred development scenario, followed by Option 2 and then Option 3. Option 1 appears to require no strategic-level mitigation measures (other than those that would be addressed as part of the normal planning approval process),

3.10.3 Options 2 and 3 would require improvements at the Clyst St Mary Roundabout, with Option 2 also requiring improvements around Woodbury Salterton and at the A376 / Topsham Lane junction.

4. Additional Modelling

4.1.1 In September and October 2023, Hydrock were supplied with additional modelling work undertaken by WSP and DCC:

- Greater Exeter Strategic Plan - East Devon Local Plan Development Impact (WSP ref. 70105008, August 2023)
- East Devon Local Plan Review Forecasting Technical Note (WSP September 2023)
- Greater Exeter Local Plan Developments Strategic Modelling Report September 2023 (DCC)

4.1.2 These notes examine the combined development impacts across all four of the districts in the Greater Exeter area (Exeter, East Devon, Teignbridge and Mid Devon), with only one development location (broadly equivalent to Option 1) reviewed in East Devon; an extract showing this location is reproduced below:

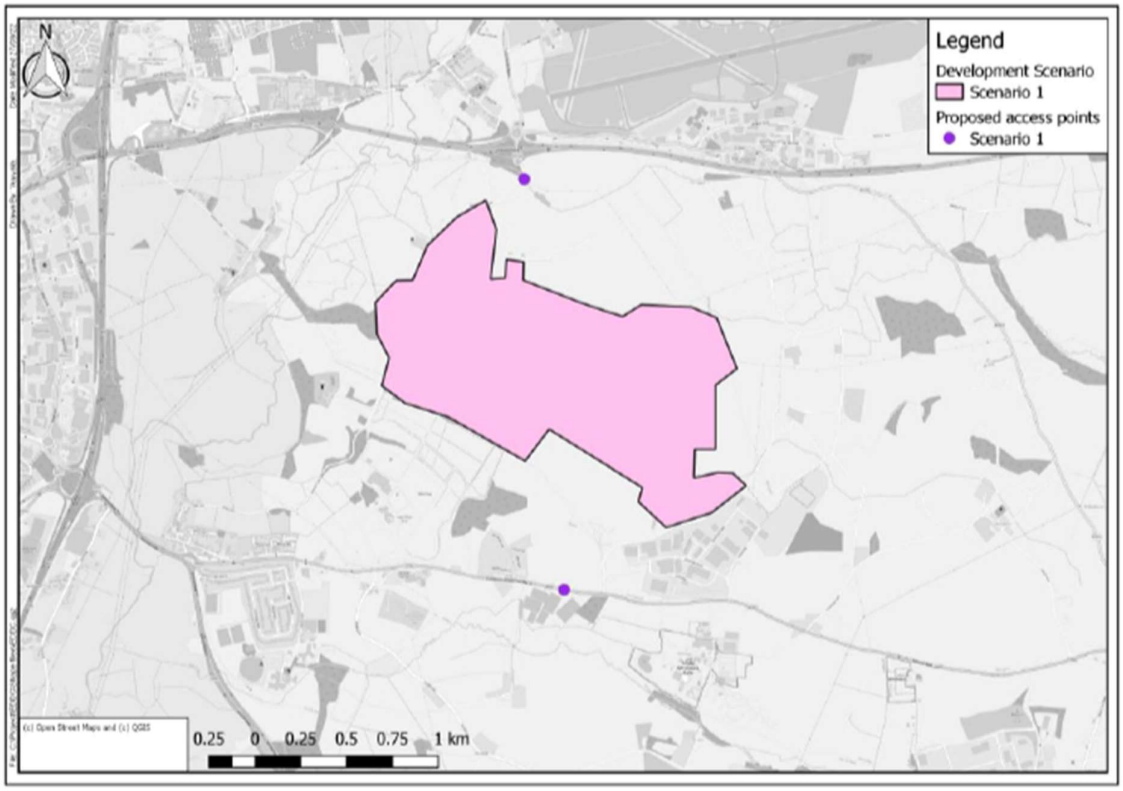


Figure 4.1: East Devon development location from DCC modelling exercise

4.1.3 The DCC note states at paragraphs 2.2.2 and 2.2.4:

The main junctions impacted by the proposed development (difference between 2030 and 2040) are the airport junction onto the A30 and all the way along London Inn Road to Cranbrook. However, this is mainly linked to the Cranbrook development which has been subject to a separate modelling appraisal and the additional development of Cranbrook sits outside of the Local Plan allocation.

The bigger issues are highlighted to be at the airport junction onto the A30 and Clyst St. Mary roundabout. The airport junction issues are caused by an increase in traffic from the New Community to Cranbrook cutting off the eastbound off-slip in the AM and additional delays on Clyst Honiton Bypass approach to the roundabout in the PM peak. This will need to be addressed as part of the planning application for the New Community. Clyst St. Mary is impacted by most of the developments proposed in East Devon as opposed to an individual site.

4.1.4 It should however be noted that this recent round of modelling does not appear to take any specific account of transport planning measures to encourage sustainable travel choices (as discussed in Hydrock's separate note Trip Generation Methodology Note - ref. 22462-HYD-XX-XX-RP-TP-2001). This would offer significant mitigation against the identified impacts.

4.1.5 Potential for improvements to the Clyst St Mary junction are discussed in Section 3 of this note. The Airport Junction is a dumbbell configuration, with a bridge over the A30 with a roundabout at its northern and southern ends. The WSP modelling appears to assume that the East Devon development would be served by two accesses, a new junction to the south onto the A3052 and northern access onto Bishop's Court Lane, the southern arm of the airport junction.

4.1.6 The capacity of roundabouts can be increased by enlarging their size and the number of lanes on entry arms. As a preliminary step of examining if this would be possible, land ownership around the junction has been examined. The following figure shows an extract from the National Highways highway boundary mapping viewer:

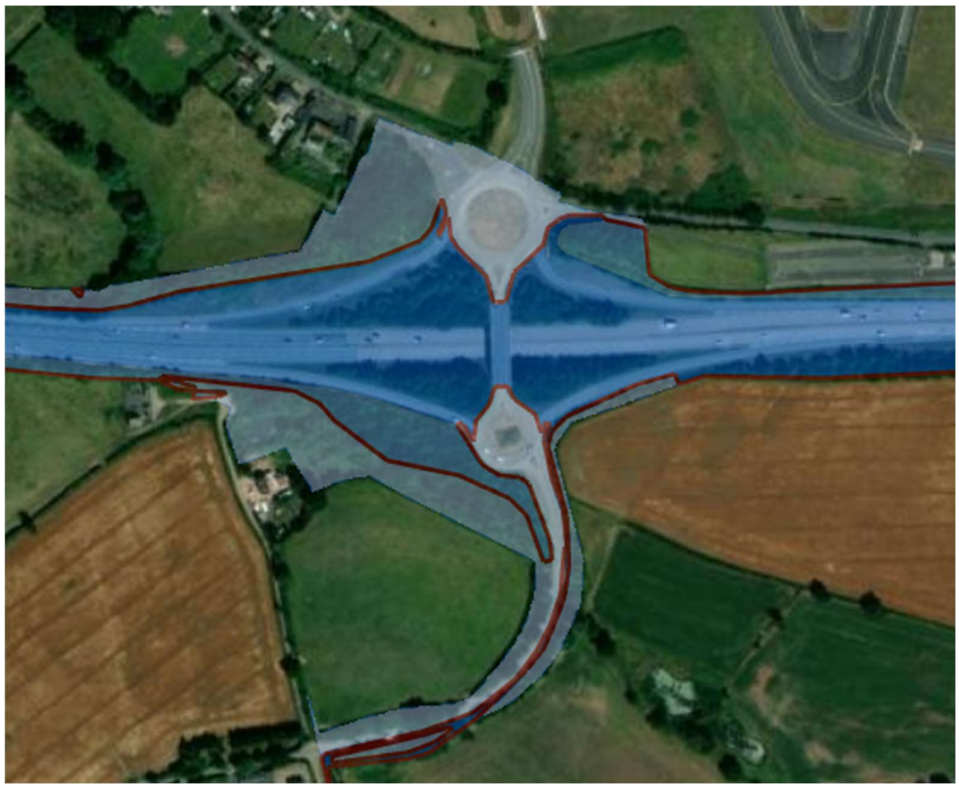


Figure 4.2: Highway boundary surrounding Airport Junction

4.1.7 This indicates that there is significant room to expand the junction if required. The roundabout is on top of a relatively large embankment, but could be enlarged with appropriate engineering works to the embankment. This could be by extending its footprint, increasing its gradient (possibly in combination with soil reinforcement), or replacing it with a retaining wall.

4.1.8 Although there would be a cost associated with these engineering works and junction improvements, they are considered to be highly deliverable. Any of the options examined would require access junctions, which would also have associated costs, so the overall difference between the options is likely to be relatively minimal.

4.1.9 It should be noted that, as with the schemes described above, any improvement would need to be subjected to detailed modelling and significant scheme development will still be required. However, engineering judgement suggests that the scheme is likely to succeed.

4.1.10 Scheme development would be undertaken as part of any formal planning application process, particularly if this junction forms one of the key accesses to the site (as it would for Option 1).

4.1.11 The need for improvements at the Airport Junction has only been reviewed for Option 1. Options 2 and 3 have not been included in the latest round of modelling, so the impact under these scenarios is not known. Engineering judgement suggests that, given the different locations and access arrangements, the impacts at this junction are likely to be reduced for these options.

5. Conclusions

5.1.1 Based on an initial desktop review, it appears that, despite their larger delay impacts, it would be possible to mitigate the impacts of both Option 2 and 3 if these were to be taken forward. This would be through either localised capacity improvements or demand reduction schemes.

5.1.2 As a result, it is concluded that there are no fundamental highways constraints that would prevent any of the development options coming forward based on the results of the DCC model run by WSP, which has tested the effect of 2,500 new homes up to the end of the new Plan period (2040).

5.1.3 The table overleaf summarises development impacts, and the likely deliverability of appropriate improvements. Where no improvements are required, deliverability has been scored a 5-4 depending on likely costs and risks, good deliverability a 3-4, moderate deliverability 2-3, poor deliverability scores 1 and a fundamental highways constraint would score 0.

5.1.4 Note that the Airport Junction (Section 4) has not been included in this table, as it has not been comparatively tested across the options.

Table 5.1: Highways Delay Impact and Mitigation Summary

Assessment Category	Option 1		Option 2		Option 3	
	Impact	Deliverability	Impact	Deliverability	Impact	Deliverability
M5 J29	5	5	5	5	5	5
M5 J30	5	5	4	5	4	5
M5 J31	5	5	5	5	5	5
A30	5	5	5	5	5	5
A3052	4	5	4	5	4	5
A38 & A380	5	5	5	5	5	5
Clyst St Mary junction	3	4	1	4	1	4
East of Exeter Network Impacts	5	5	1	2	5	5
TOTAL	37	39	30	36	34	39
Average	38		33		36.5	
Equivalent Score (1-5)	4.8		4.1		4.6	

5.1.5 Based on the above, Option 1 would be most preferred in terms of highways impact, followed by Option 3, with Option 2 being least preferred.

5.2 Next Steps

5.2.1 Next steps would be to carry out more detailed modelling at the Clyst St Mary Roundabout, the A376 / Topsham Lane junction and the Airport Junction based on the flows predicted by the SATURN modelling. This would allow mitigation schemes to be developed in greater detail to gain an understanding of likely costs and risks. It is also recommended that preliminary discussions are held with the owners of Westpoint Arena to determine the potential to use the site for a park and ride, as this could have wider benefits.

5.2.2 As part of the next steps, a trip forecasting exercise will be undertaken. This will include trip generation taking into consideration travel minimisation and internalisation calculations within an overarching Vision and Validate approach whereby a 20-minute neighbourhood is used to support the default usage of sustainable transport modes. This is addressed in a separate note.

5.2.3 Trip distribution will be reviewed utilising strategic modelling (provided by others), allowing for comparative network impacts.

5.2.4 Overarching commentary will then be provided on the above, alongside a tabular review.

5.2.5 Once a preferred Option has been identified a High-Level Transport Assessment will be undertaken on that particular Option.

Appendix A WSP Modelling Report

DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

INTRODUCTION

WSP have been commissioned to assist Devon County Council (DCC) alongside East Devon District Council (EDDC) in the process of refreshing the adopted Local Plan for EDDC through a 'Local Plan Review' with specific focus around Westpoint. The adopted Local Plan will extend the land use planning strategy in the area to 2030.

Demand for housing is predicted to continue increasing in the future. In order to model the impacts of increased housing and population on the local road network, a traffic model of the Greater Exeter (GE) area was developed by DCC (referred to as the "GE Model") using the SATURN strategic modelling software package. The GE Model area covers the Local Planning Authority (LPA) areas of Exeter, East Devon, Mid Devon, and Teignbridge, which has a combined population of approximately 475,000 people.

DCC commissioned a review of the GE Model to support the preparation of a transport evidence base, with a focus around the Westpoint area located to the east of Exeter. This work includes the review of base year and 2030 forecast models, reflecting the current and anticipated highway conditions, review and modification of a forecasting process, and the production of an updated end-of-Plan 2030 scenario.

This document outlines the forecasting process used to create a 2030 model, including the development around Westpoint.

MODEL OVERVIEW

The GE Model was developed in 2018 using the SATURN strategic traffic modelling software package. The model was developed using the latest version of SATURN at the time of development (11.4.07H, released August 2018).

The GE Model was initially developed based on the Bridge Road Model (BRM), another strategic model developed by DCC. The study area for the BRM was a smaller area focused on Bridge Road and therefore the model network was expanded to include the entirety of Exeter in addition to a large area east of Exeter.

This was then supplemented with more detailed geometries and saturation flows for key junctions from the East of Exeter (EoE) model, which had a specific focus on the M5 Exeter corridor and immediate surrounding area. The EoE model was developed by DCC in partnership with and approved by National Highways.

Modelled Time Periods

As per the GE Traffic Model Local Model Validation Report (LMVR)[1], the model represents a typical weekday in November 2017. In addition to this, there is a 2030 forecast model that includes Local Plan development and committed schemes.

[1] Version 006 October 2021

November was selected due to it being listed as a neutral month in the Department for Transport's (DfT's) Transport Appraisal Guidance (TAG) in addition to data availability and it being post completion of the Bridge Road widening scheme.

The GE Model includes the following three time periods:

- AM Peak: 08:00 – 09:00
- Inter-Peak: Average hour 10:00 – 16:00
- PM Peak: Average hour 16:00 – 18:00

Demand Segmentation

The GE Model comprises of three car User Classes (UCs), segmented by travel purpose, and two goods vehicle UCs as summarised below in Table 1.

Table 1 – GE Model Demand Segmentation

User class	Vehicle Type	Purpose
1	Car	Home Based Work (Commute)
2	Car	Employer's Business
3	Car	Other (Discretionary)
4	Light Goods Vehicle (LGV)	Employer's Business
5	Heavy Goods Vehicle (HGV)	Employer's Business

Generalised Cost Parameters

The Value of Time (VoT) values used in the GE Model were taken from the November 2018 release of the TAG Databook, the most recently available release at the time of the model development. The VoT values used are shown below in Table 2 in Pence Per Minute (PPM) alongside the operating cost values in Pence Per Kilometre (PPK).

DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

Table 2 – Generalised Cost Parameters

UC	User Class	Value of Time (PPM)			Value of Time (PPK)		
		AM	IP	PM	AM	IP	PM
1	Car – Commute	12.3	12.5	12.34	9.84	9.69	9.79
2	Car – Employer's Business	21.82	22.36	22.14	13.74	13.33	13.61
3	Car – Other	8.48	9.04	8.89	9.84	9.69	9.79
4	LGV	15.2	15.2	15.2	14.69	14.7	14.68
5	HGV	15.66	15.66	15.66	33.19	32.02	32.81

DEVELOPMENT SCENARIOS

In order to assess the potential impact of the additional traffic generated by the Local Plan and Westpoint development, three development scenarios have been assessed. Each development scenario represents a different proposed site location (Zone 907), all containing 2,500 dwellings. 2,500 dwellings are being tested as part of the first phase. The full development build out of 8,000 dwellings would amplify the highlighted problems and cause unreasonable and unrealistic rerouting given the strategic nature of the SATURN model.

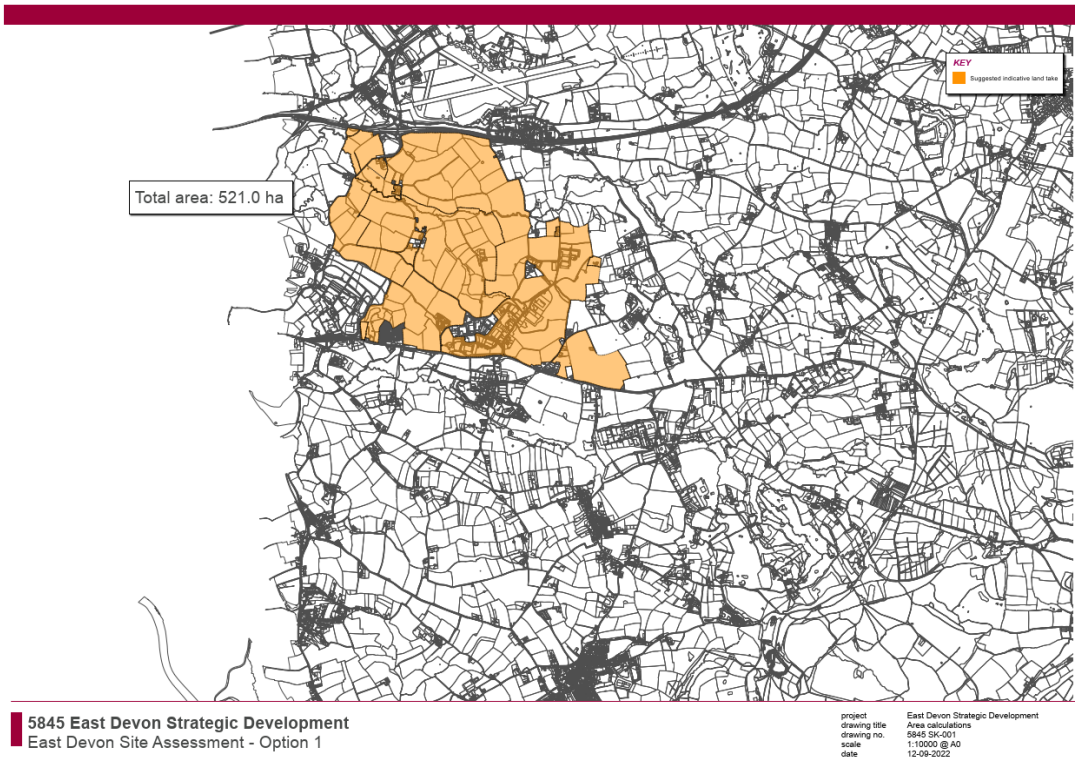
The development forecast scenarios are only to determine where traffic generated by the new sites would travel and do not include additional growth (either from background growth or other development sites likely to come forward in the neighbouring districts) which could impact the performance of the motorway junctions in future. The model doesn't currently include any other development across the area beyond the existing adopted local plans in each of the districts.

DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

Scenario 1

Development scenario 1 includes a 521.0 ha site located between A30 Honiton Road in the north and A3052 East Devon Heritage Coast Way in the south. The location of the proposed development site is shown below in Figure 1.

Figure 1 – Scenario 1 Development Area

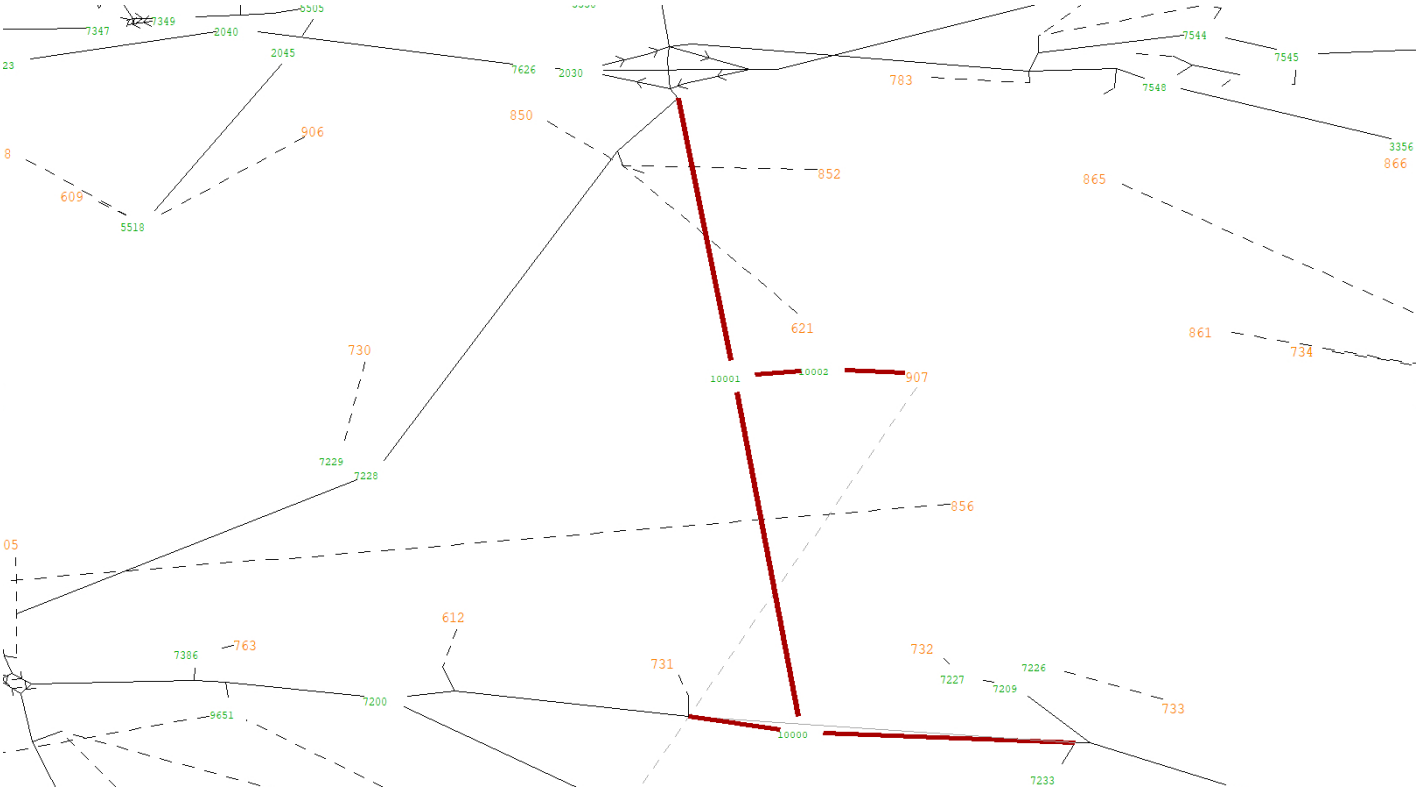


Two access points to the development site are coded as part of this scenario; one in the north providing access to the A30, and one in the south providing access to the A3052. A 2-lane, 20mph through-road connecting the northern and southern access points has been assumed to limit the amount of through routing. The access junctions connecting the through-road to the existing road network are coded as roundabouts with 2-lane approaches on each arm (one lane flaring to two), other than where pre-existing roads have different actual conditions. These approaches have been coded with modified stacking capacities and speed flow curves to imitate a 1-lane with flare approach on each arm.

The SATURN network around the proposed development site in this scenario is shown below in Figure 2, with development access roads highlighted in red.

DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

Figure 2 - Scenario 1 Development Site SATURN Network

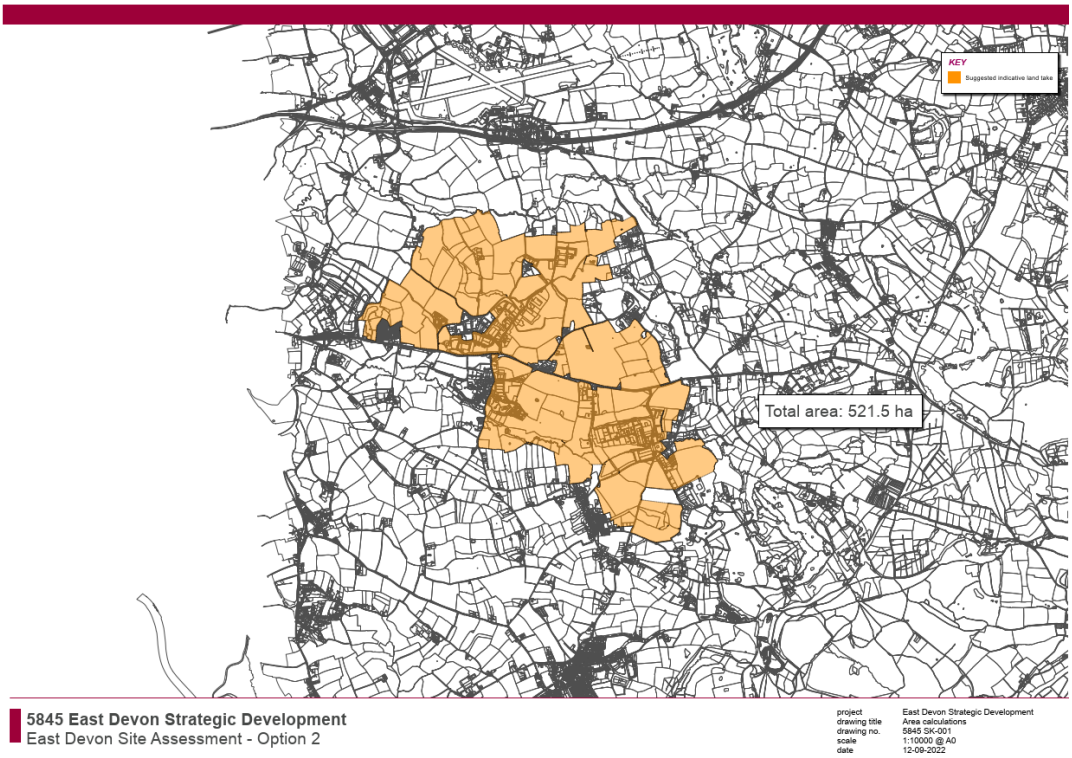


DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

Scenario 2

Development scenario 2 includes a 521.5 ha site located across the A3052. The location of the proposed development site is shown below in Figure 3.

Figure 3 - Scenario 2 Development Area

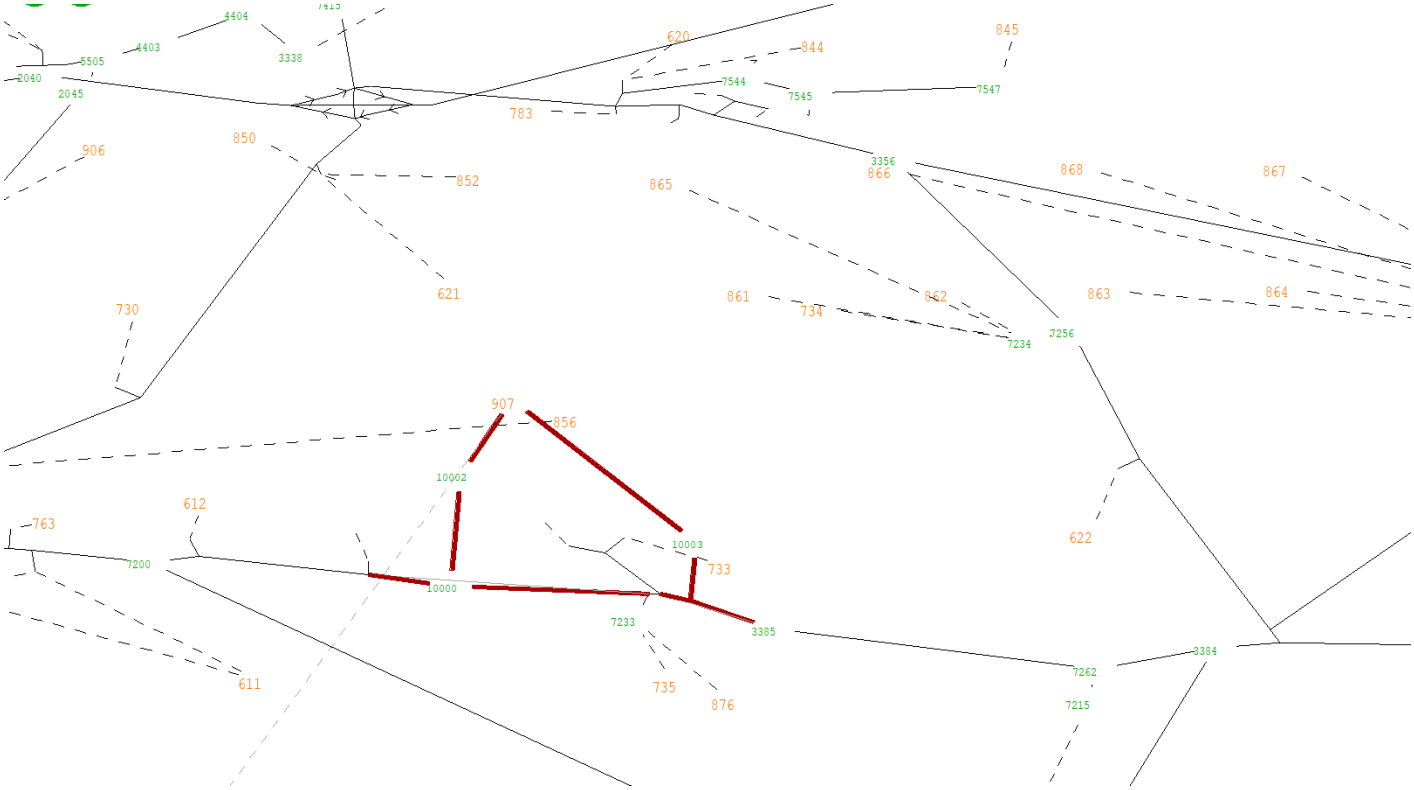


Two access points to the development site have been considered as part of this development scenario, both providing access to the A3052. The access junctions connecting the development site zone to the wider road network are coded as roundabouts with 2-lanes (one lane plus flared approach). These approaches have been coded with modified stacking capacities and speed flow curves to imitate a 1-lane with flare approach on each arm.

The SATURN network around the proposed development site in this scenario is shown below in Figure 4, with development site access roads highlighted in red.

DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

Figure 4 - Scenario 2 Development Site SATURN Network

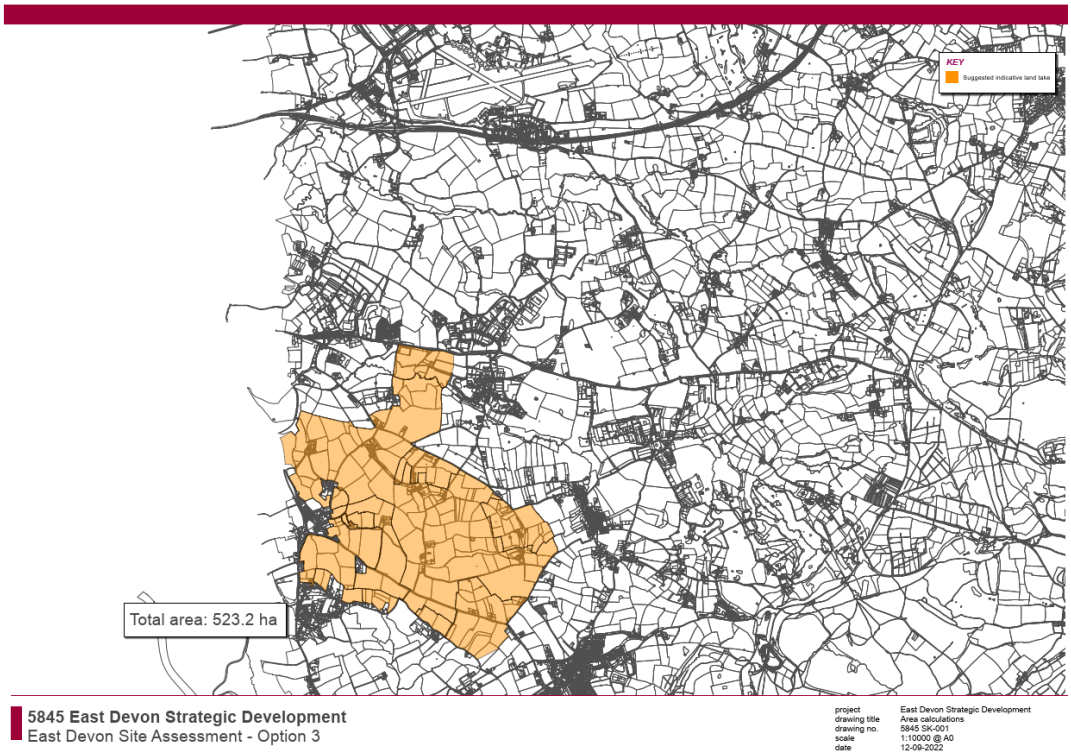


DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

Scenario 3

Development scenario 3 includes a 523.2 ha site located in the vicinity of Woodbury Salterton between A3052 East Devon Heritage Coast Way, B3180, B3179, and A376 Exmouth Road. The location of the proposed development site is shown below in Figure 5.

Figure 5 - Scenario 3 Development Area

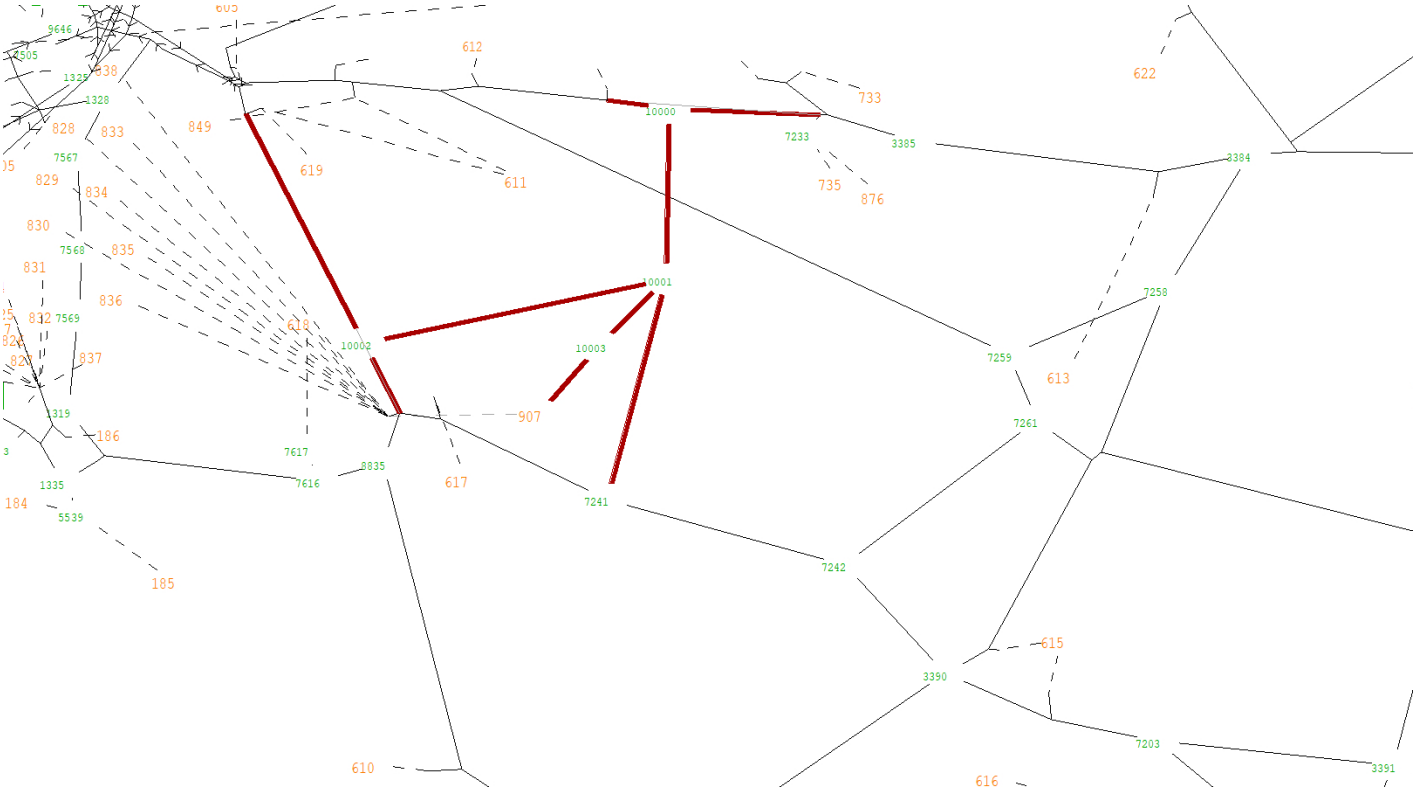


Three access points to the development site have been considered as part of this development scenario: one connecting to the A3052, one connecting to the B3179, and one connecting to the A376. The access junctions connecting the development site to the wider road network are coded as roundabouts with 2-lane (One lane plus flared approach), 20mph approaches on each new arm. These approaches have been coded with modified stacking capacities and speed flow curves to imitate a 1-lane with flare approach on each arm.

The SATURN network around the proposed development site in this scenario is shown below in Figure 6, with development site access roads highlighted in red.

DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

Figure 6 - Scenario 3 Development Site SATURN Network



DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

FORECASTING PROCESS

Trip Generation Methodology

DCC undertook an exercise to create a set of bespoke car trip rates for new communities within the Greater Exeter area[2]. Using an average of five urban survey sites from Greater Exeter Spatial Plan settlements, AM peak vehicle trip rates were calculated with consideration applied to the site location and internalisation by purpose. These are shown in Table 3 below.

Table 3 – AM Trip Rates for New Communities (Per dwelling)

Type	Inbound	Outbound	2-Way
Internal	0.02	0.10	0.12
External	0.07	0.27	0.34
Total	0.09	0.37	0.46

Both internal and external trip rates were provided, but only the external trip rates have been used as the proposed development sites are singular zones for this assessment. No internal trips have been assumed in this modelling. To obtain PM car trip rates, the AM car trip rates identified above have been compared to the AM values in Trip Rate Information Computer System (TRICS) to gain a relative difference. The same relative difference has then been inversed and applied to the PM with trip rates for all other modes coming from TRICS. Trips rates provided in TRICS are detailed below in Table 4. All trip rates for the IP have come directly from TRICS.

Table 4 – TRICS Trip Rates per Dwelling

Vehicle	Peak	Arrival	Departure
Car	AM	0.138	0.409
	IP	0.131	0.129
	PM	0.383	0.164
LGV	AM	0.013	0.018
	IP	0.017	0.018
	PM	0.022	0.014
HGV	AM	0.000	0.000

[2] TR2 – Trip Rates for New Communities

Vehicle	Peak	Arrival	Departure
	IP	0.001	0.001
	PM	0.000	0.000
Total	AM	0.151	0.427
	IP	0.149	0.147
	PM	0.405	0.178

The final development site trip rates once the relative differences have been applied are detailed below, in Table 5.

Table 5 – Final Development Site Trip Rates per Dwelling

Vehicle	Peak	Arrival	Departure
Cars	AM	0.070	0.270
	IP	0.131	0.129
	PM	0.244	0.096
LGV	AM	0.013	0.018
	IP	0.017	0.018
	PM	0.022	0.014
HGV	AM	0.000	0.000
	IP	0.001	0.001
	PM	0.000	0.000
Total	AM	0.083	0.288
	IP	0.149	0.147
	PM	0.266	0.110

Forecasting Process Methodology

The GE Model has a bespoke forecasting process developed by DCC, which has been inherited for this development assessment. High level processes are detailed below, but further information can be found in the Greater Exeter Traffic Model Forecasting Report[3].

[3] Greater Exeter Traffic Model Forecasting Report, October 2021 (GE-FR-06)

The forecasting process starts by factoring the base year matrices to account for local background growth and windfall development up to the year 2030. The matrices generated by this step are referred to as the Local Background Growth 2017 to 2030 (LBG1730) matrices.

The GE Model has a forecast year of 2030, whereas the 2,500 dwellings located at the proposed development sites are due to be completed by 2040. As part of the GE Model forecasting process, major roads in Exeter do not experience any growth in trips during the modelled peak hour(s) due to already being at capacity. Therefore, the calculations for the forecast year of 2030 are deemed to be a suitable proxy for the forecast year of 2040 on the local road network and, with that caveat, the model is considered suitable for the purposes of preliminary testing and comparison of the impacts of the proposed development sites, mindful of the requirement for further and updated modelling as part of the next stages of assessment.

The forecasting process then uses the LBG1730 matrices and Local Plan development up to the year 2030 to create targets for a furnessing process. This is the stage at which the Local Plan Review development trips are inserted into the forecasting process to produce the Do-Something (DS) matrices, or not inserted to produce the Do-Minimum (DM) matrices. The matrices generated by this step are referred to as the Local Plan 2017 to 2030 Pre Park & Change (LP1730_Pre_PC) matrices.

The LP1730_Pre_PC matrices are then assigned to the development scenario networks, and select links are taken from the networks at identified future Park & Change sites. These select link matrices are factored and recombined with the LP1730_Pre_PC matrices to produce the Local Plan 2017 to 2030 (LP1730) matrices.

The next stage of the forecasting process generates and furnesses matrices based on the Road Traffic Forecast (RTF) scenarios, which combines the resulting matrix with the LP1730 matrices to adjust traffic flows on the Strategic Road Network (SRN).

Finally, a series of select links along the M5 are undertaken on the adjusted LP1730. These select links are subsequently factored and combined into the adjusted LP1730 matrices, the final forecast matrices.

The GE Model forecasting process produces two sets of forecast matrices based on different RTF scenarios. For the purposes of this assessment, only the set of matrices based on RTF scenario 1 have been analysed, and a comparison of total matrix trips between the different development scenarios are presented below in Table 6**.**

Table 6 - Matrix Totals Comparison

Scenario	AM	AM Diff. vs Base	IP	IP Diff. vs Base	PM	PM Diff. vs Base
Base	45,697	0.00%	32,612	0.00%	42,041	0.00%
DM	53,289	16.61%	38,195	17.12%	48,480	15.32%
DS Scenario 1	53,710	17.53%	38,545	18.21%	48,909	16.34%

Scenario	AM	AM Diff. vs Base	IP	IP Diff. vs Base	PM	PM Diff. vs Base
DS Scenario 2	53,792	17.71%	38,567	18.26%	48,834	16.16%
DS Scenario 3	53,778	17.68%	38,567	18.26%	48,840	16.17%

This comparison shows that the number of trips added to the network by the development changes between scenarios, despite being based on the same trip rates and number of dwellings. This is due to the stage at which the development trips are inserted into the forecasting process, as noted in the forecasting methodology. Select links are taken from the model, factored, and recombined after the development trips are added, thereby affecting the final matrix totals.

RESULTS

Bespoke models have been created for each development scenario and compared against the DM models produced by the same forecasting process, with a particular focus on effects on and around the M5 from J29 to J31.

To aid this comparison, a set of diagrams showing traffic flows on the M5 from J29 to J31 and parts of the A30, A38, and A380 to the east and west of Exeter have been produced. These diagrams were initially produced by DCC as part of the GE Model development process and have been modified and updated with model data for the DM and three DS development scenarios. However, these diagrams do not include details of the junctions themselves at M5 J29 and J30, or details of Clyst St. Mary Roundabout and the road network immediately to the east of Exeter.

Therefore, for each development scenario, a summary of information included in the diagrams and an investigation of the models at M5 J29 and J30, Clyst St. Mary Roundabout, and areas to the east of Exeter have been provided. Images of the AM and PM models have also been provided for each model investigation, showing demand flow, actual flow, delay, and volume over capacity (V/C) at M5 J29 and J30. In each model image, the demand and actual flows and delay times have been truncated to show only changes of greater than 25 PCUs per hour and five seconds respectively. Anything less than five seconds could be a consequence of model noise rather than actual results.

The full set of diagrams are available in Appendix A. To aid these diagrams, SATURN difference plots are available in Appendix B for each scenario with an additional set of model screenshots of the M5 J29 and J30, A30, A3052, and Clyst St. Mary Roundabout in Appendix C.

Scenario 1

In the AM for Scenario 1, the model shows a slight increase in traffic flows travelling southbound on the M5, westbound on the A30 west of Exeter, and southwest bound on the A38 and A380. However, the model also shows a slight decrease in traffic travelling in the opposite direction. The IP and PM models show

similar slight changes in traffic flow. All models show a slight increase in traffic travelling in all directions on the A30 east of Exeter. This has not had a material impact on delay along the M5, with the largest increase being less than a second.

The SATURN models show an increase in traffic flow but minimal overall changes to delay along the M5 and the surrounding road network to the east of Exeter. Increases in delays at Junction 29 can be seen in the AM and PM models, predominantly on the eastern side of the M5. Clyst St. Mary Roundabout shows an increase in delay, with an additional 33 seconds on the westbound approach in the AM model and 35 seconds on the eastbound approach in the PM model. Subsequently, additional turning delay can be seen on the roundabout itself.

Images of the demand flow, actual flow, delay and volume over capacity in the AM and PM models are shown below, in Figure 7 through to Figure 14.

Figure 7 – DM vs DS Scenario 1, AM, Demand Flow

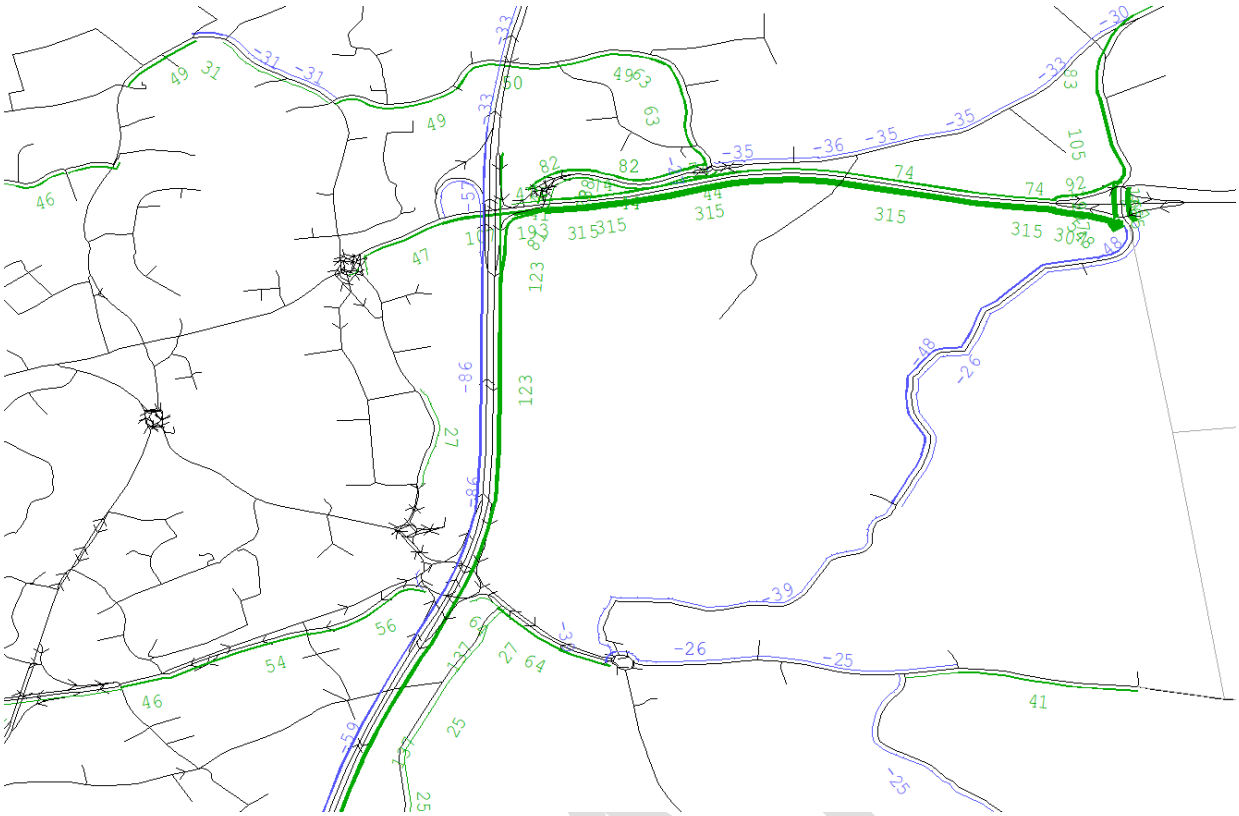


Figure 8 – DM vs DS Scenario 1, AM, Actual Flow

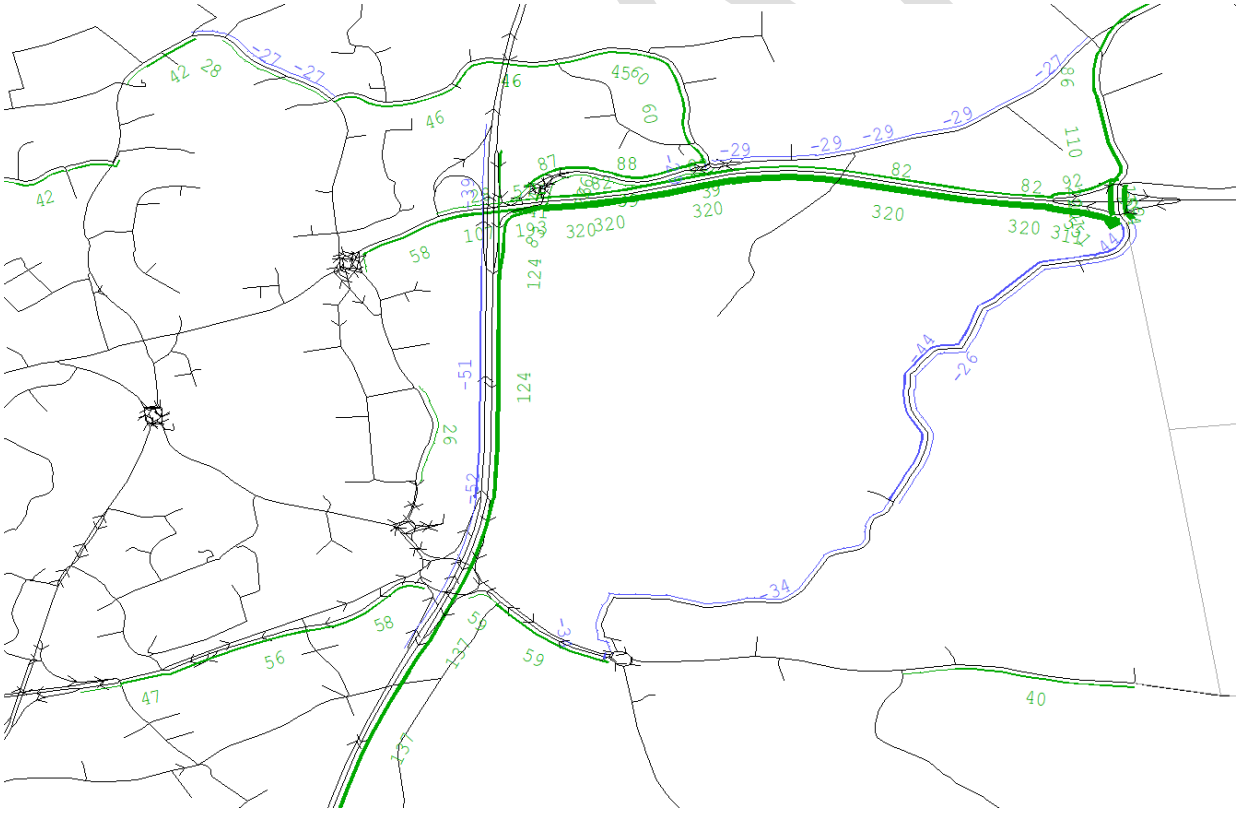


Figure 9 – DM vs DS Scenario 1, AM, Delay

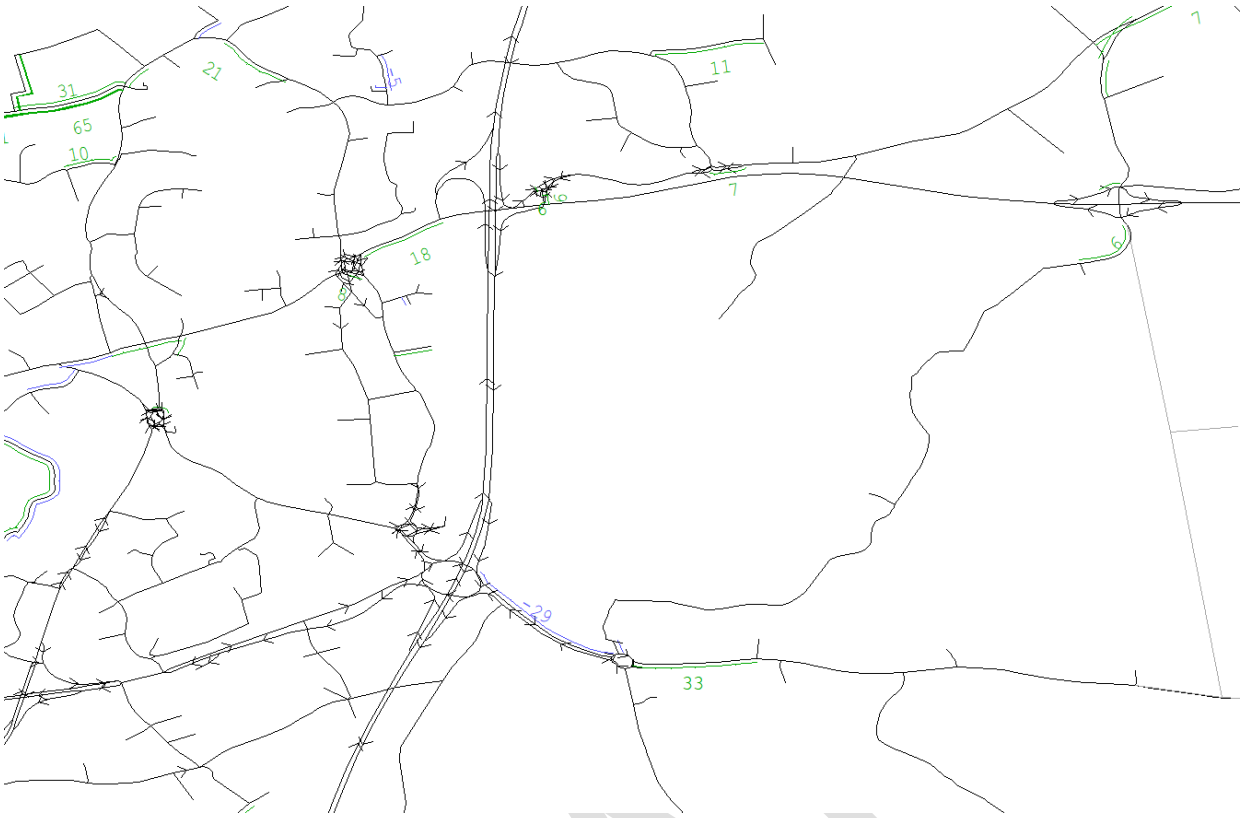


Figure 10 – DM vs DS Scenario 1, AM, V/C

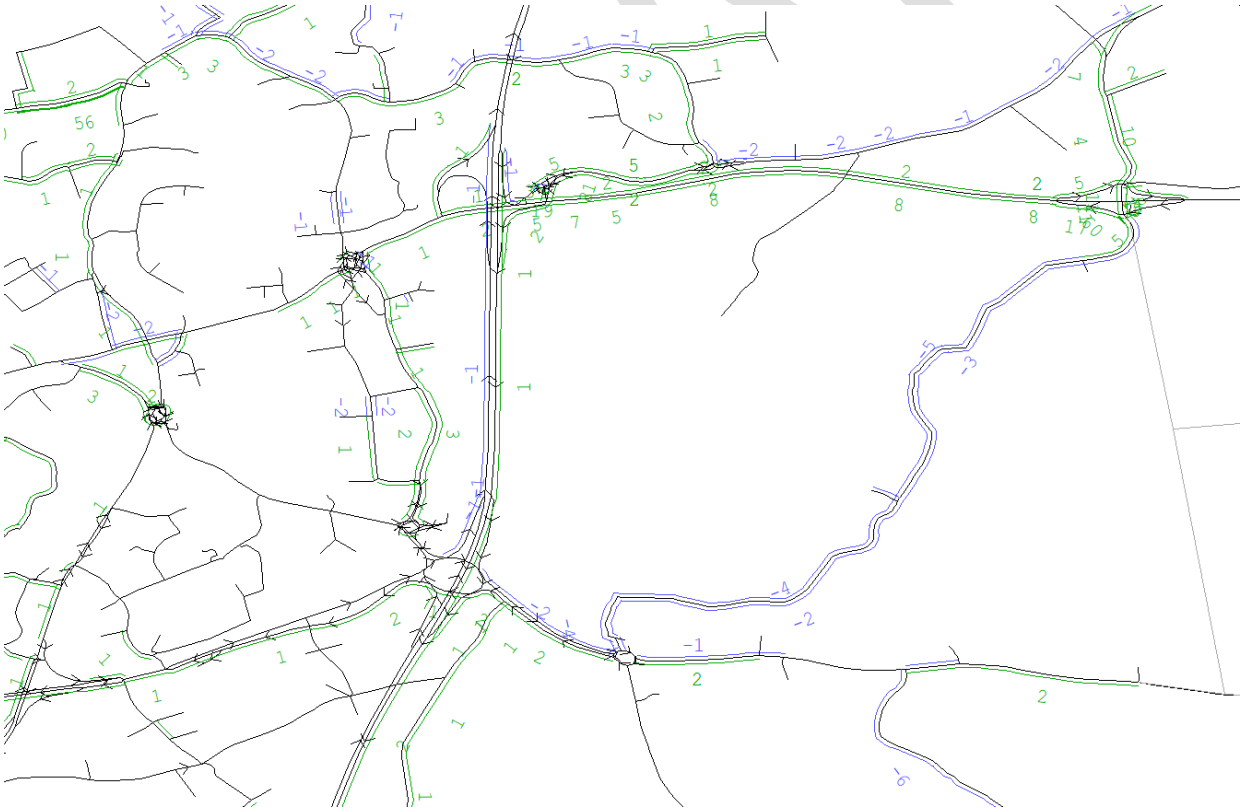


Figure 11 – DM vs DS Scenario 1, PM, Demand Flow

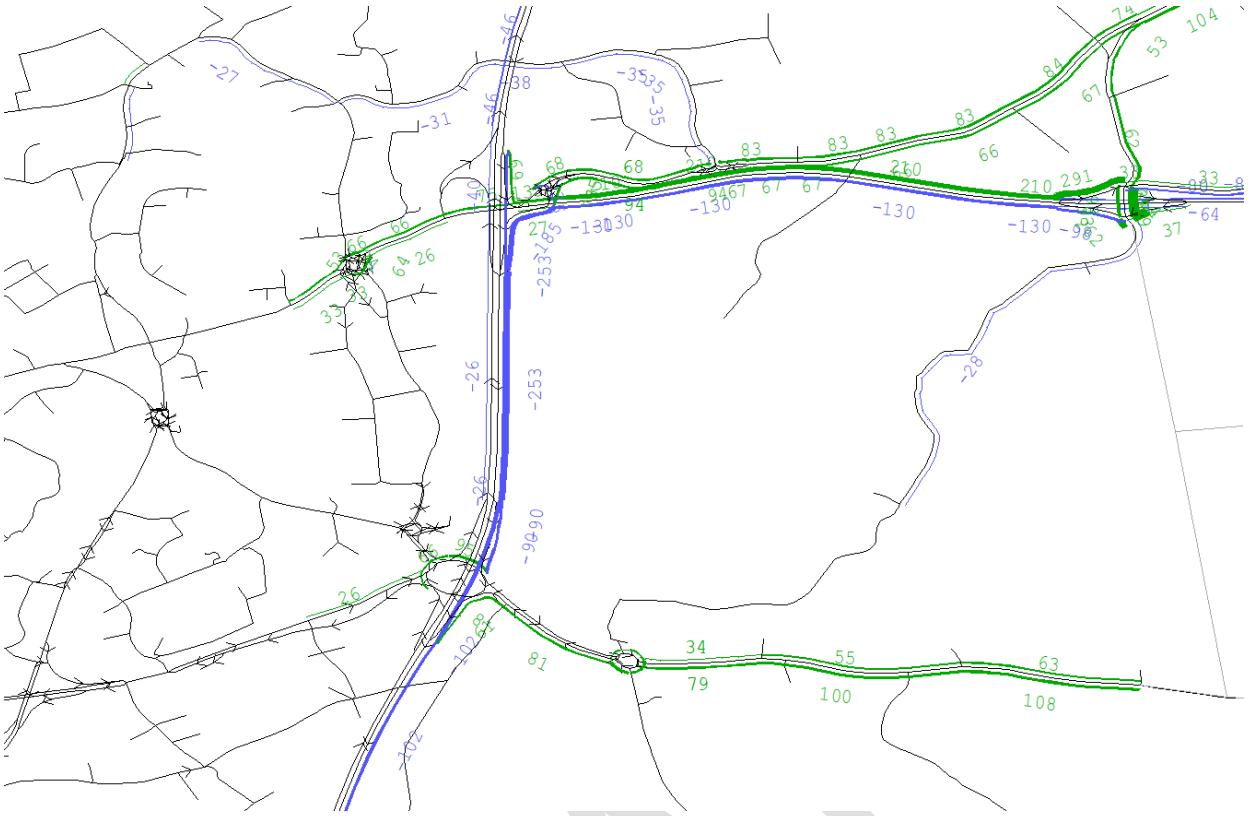


Figure 12 – DM vs DS Scenario 1, PM, Actual Flow

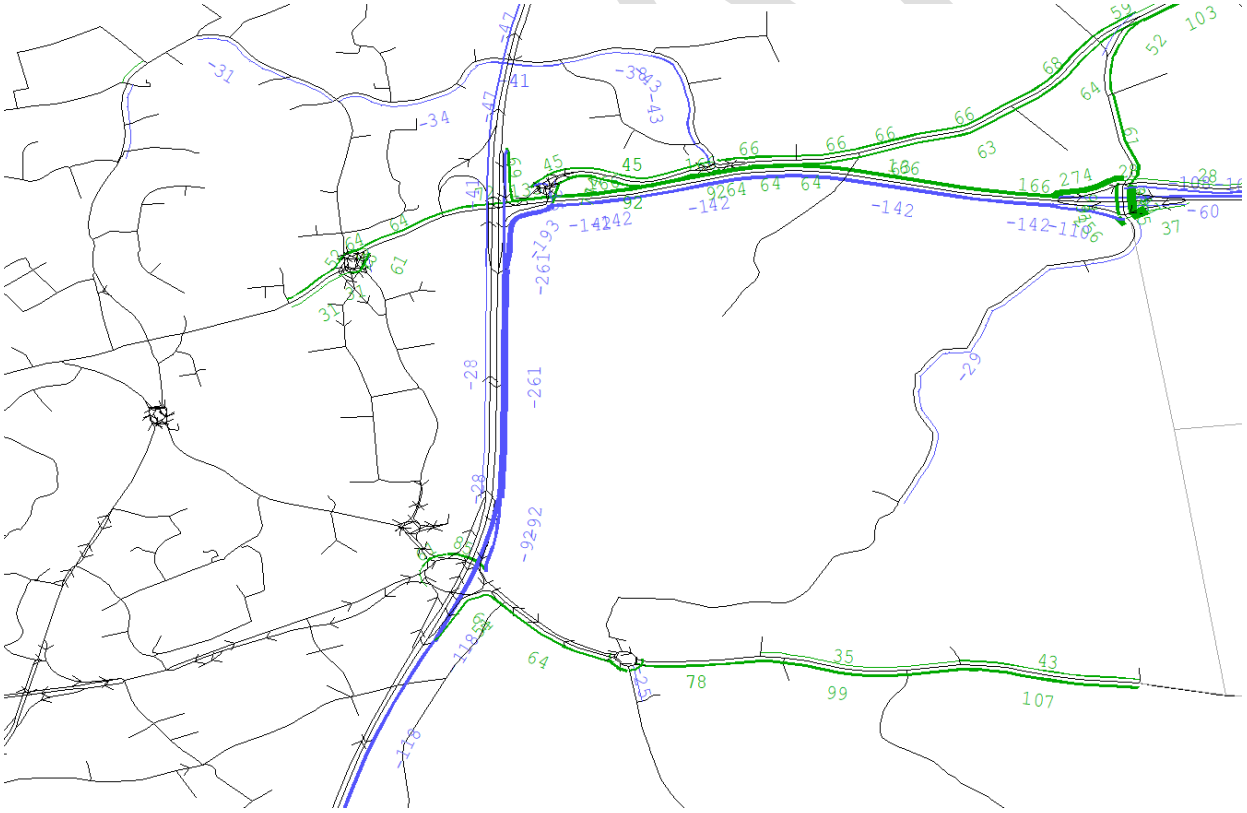
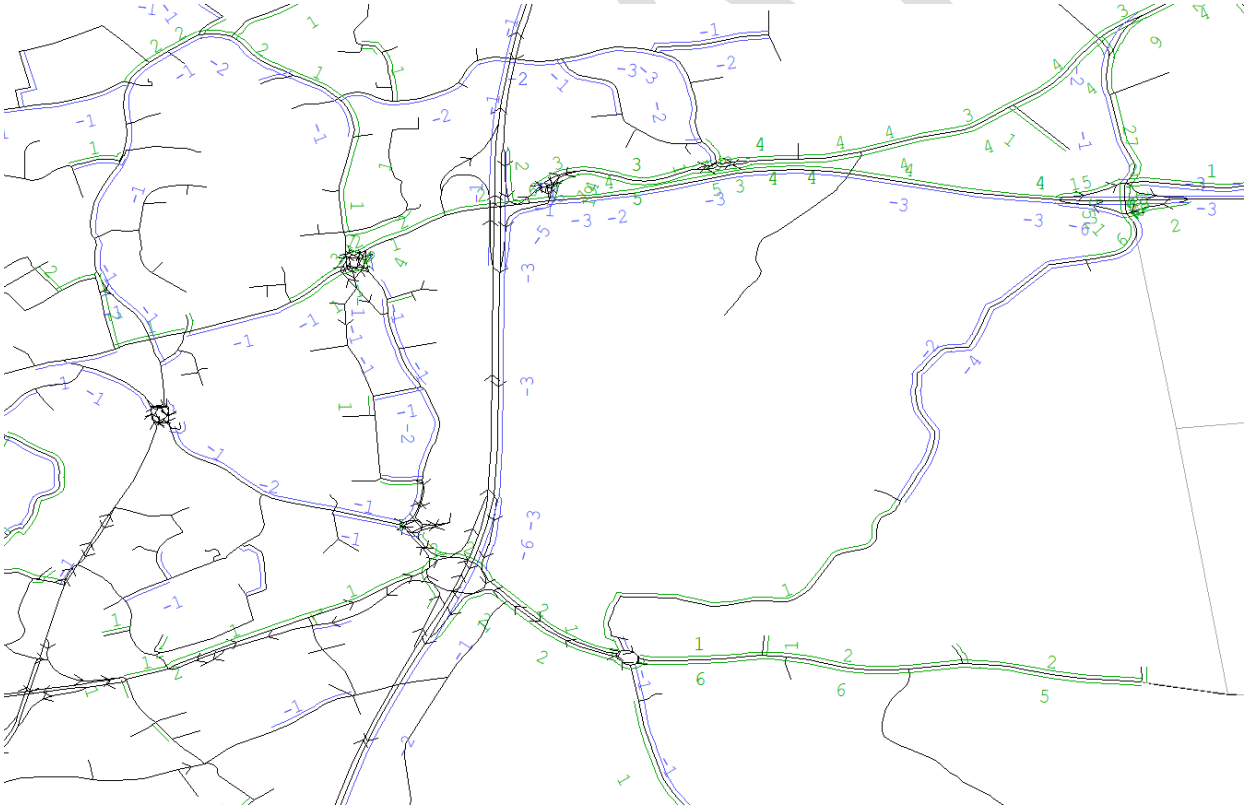


Figure 13 – DM vs DS Scenario 1, PM, Delay

Figure 14 – DM vs DS Scenario 1, PM, V/C



DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

Scenario 2

In the AM and IP models for Scenario 2, there are slight traffic flow changes along the M5, A30, A38, and A380. The PM model similarly shows slight traffic flow changes, however there are some larger differences in flow of up to 130 Passenger Car Units (PCUs). Minimal changes in delay can be seen on the M5 itself, increasing by less than four seconds in any model.

Increased traffic flows can be seen alongside minimal changes in delay along the mainline at M5 Junction 29 and Junction 30 in addition to the road network to the east of Exeter. Junction 29 and 30 along the M5 see some increases in delay in the AM and PM models, focused on the east side of the M5 at Junction 29 and the north side of the junction at Junction 30.

The models show that Clyst St. Mary Roundabout sees a significant increases in delay in Scenario 2, with an increase of 277 seconds of delay on the westbound approach in the AM and 160 seconds additional delay on the eastbound approach in the PM. In addition to this, there is an overall increase in the turning delay on the roundabout itself. Some parts of the road network to the east of Exeter also see large increases in delay. The AM model shows an increase of 227 seconds southbound on Bond's Lane and 90 seconds northbound on Woodbury Road around the combining junction. An increase of 76 seconds can also be seen northbound on the A376 at the junction with Topsham Road.

Images of the demand flow, actual flow, delay and volume over capacity in the AM and PM models are shown below, in Figure 15 through to Figure 22.

Figure 15 – DM vs DS Scenario 2, AM, Demand Flow

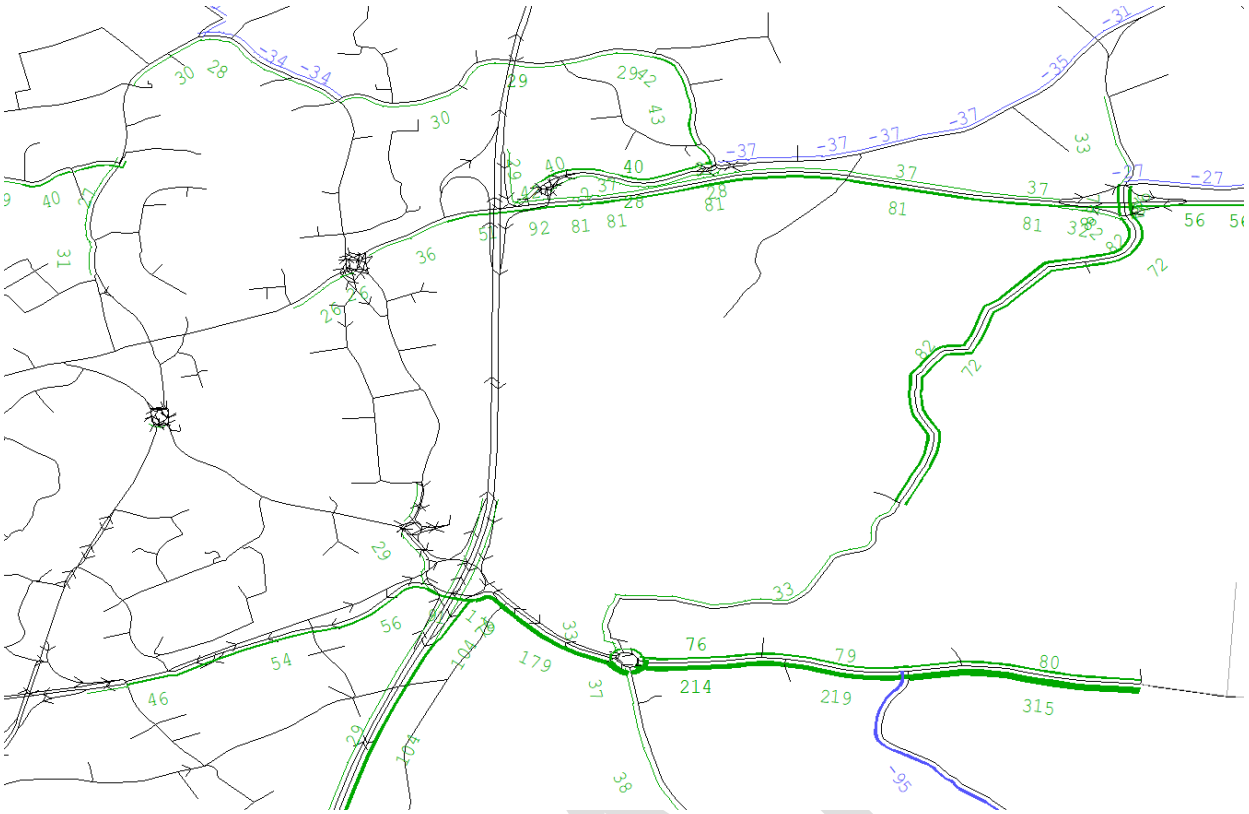


Figure 16 – DM vs DS Scenario 2, AM, Actual Flow

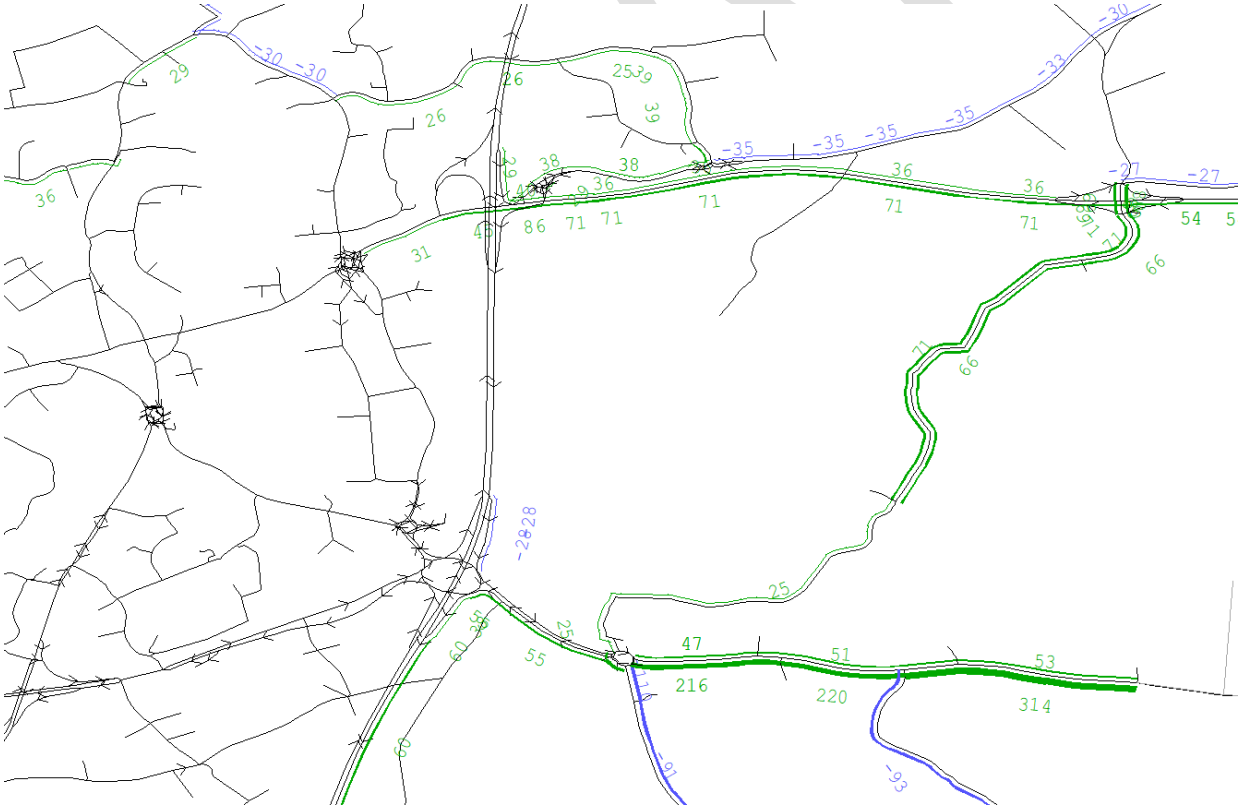


Figure 17 – DM vs DS Scenario 2, AM, Delay

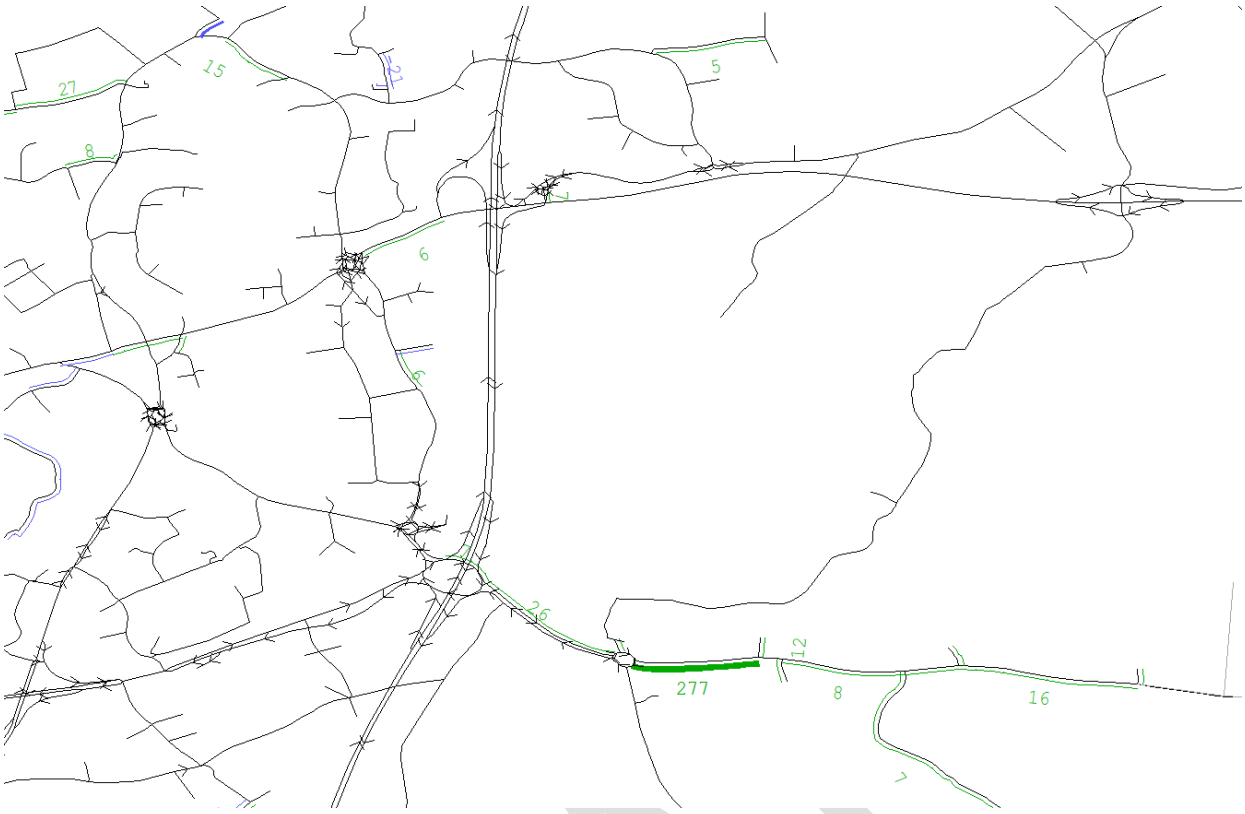


Figure 18 – DM vs DS Scenario 2, AM, V/C

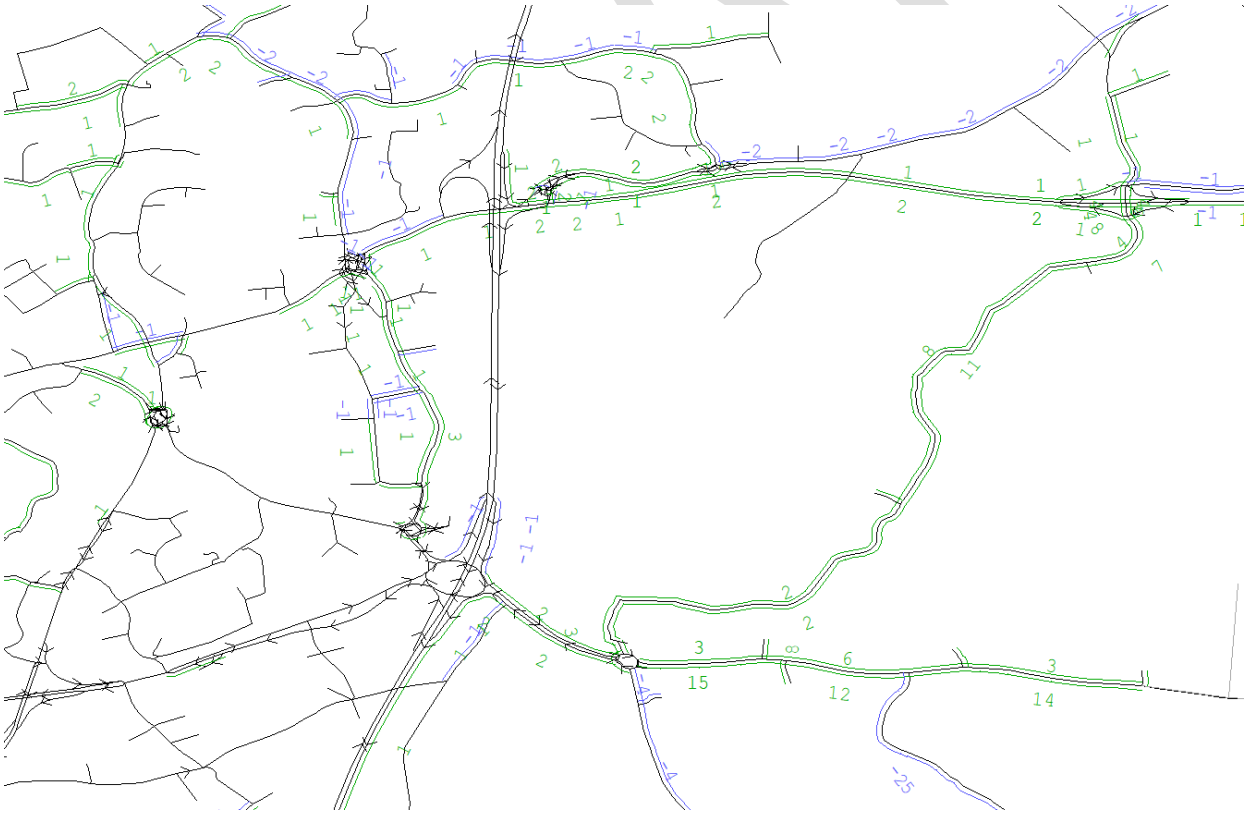


Figure 19 – DM vs DS Scenario 2, PM, Demand Flow

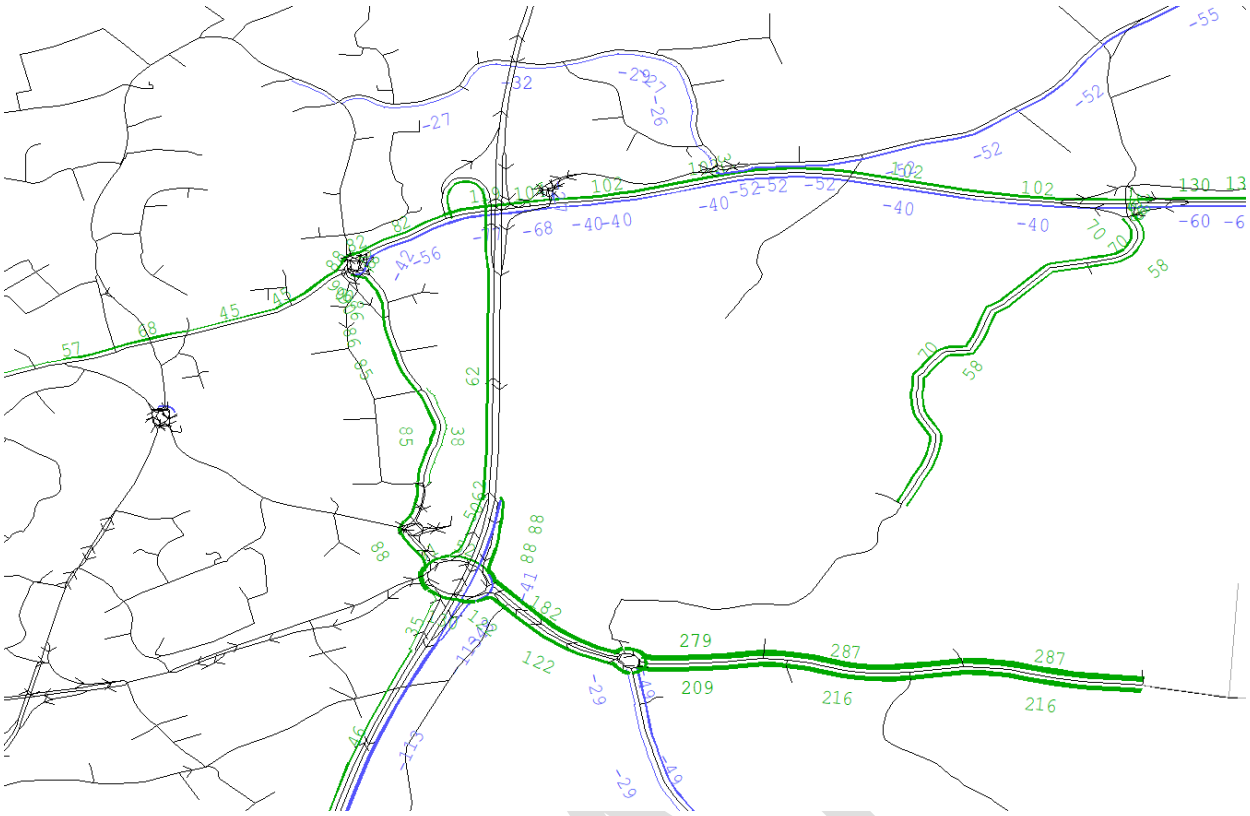


Figure 20 – DM vs DS Scenario 2, PM, Actual Flow

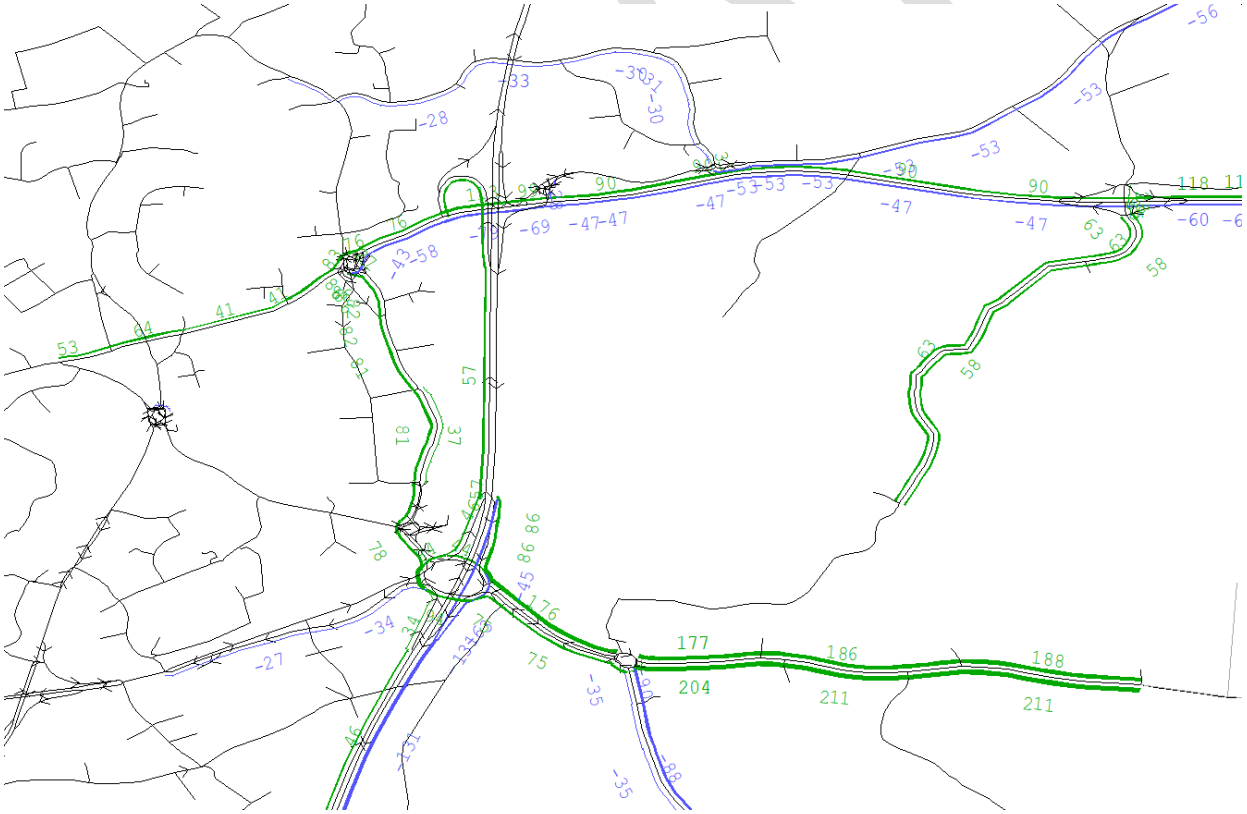
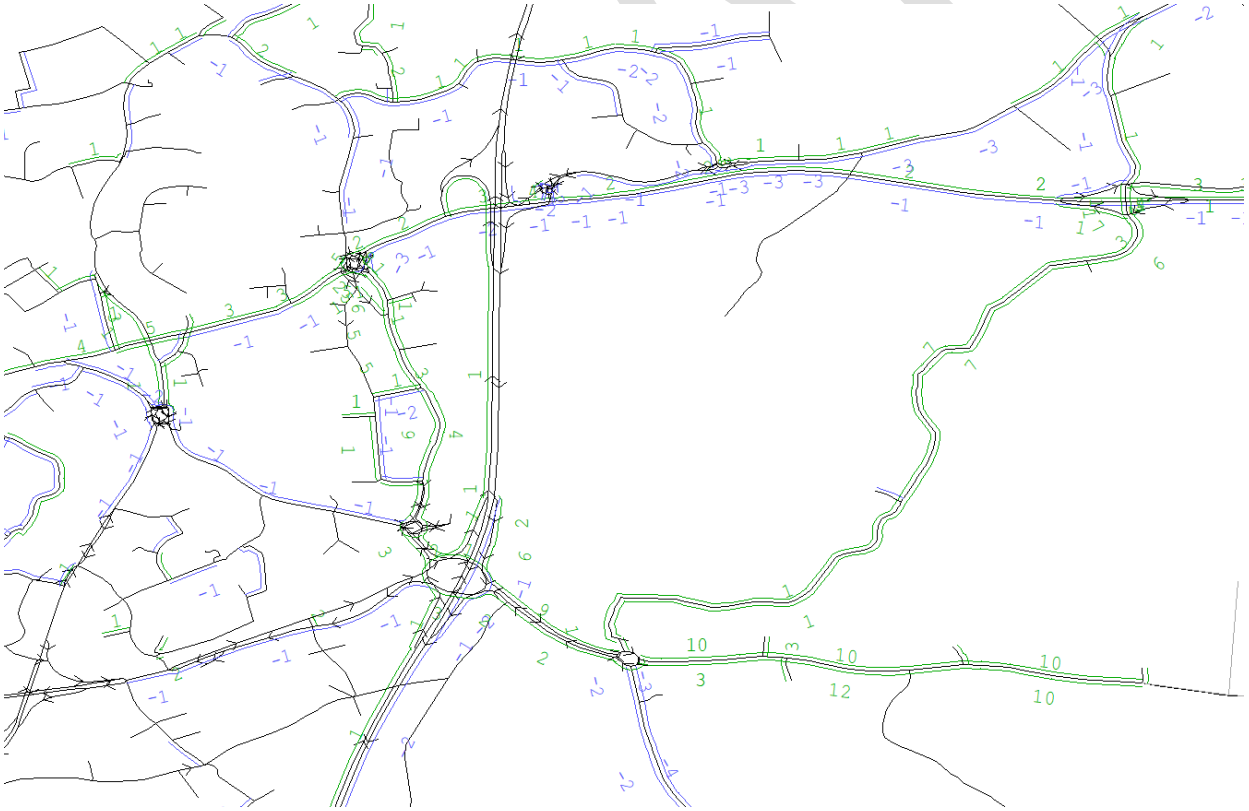


Figure 21 – DM vs DS Scenario 2, PM, Delay

Figure 22 – DM vs DS Scenario 2, PM, V/C



DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

Scenario 3

The AM and IP models for Scenario 3 show slight traffic flow changes along the M5, A30, A38, and A380. However, the PM models show greater traffic differences in comparison to the DM of up to 130 PCUs. Delay is not materially affected by this, with the model showing increases of less than two seconds.

The models show that at M5 Junction 29 and 30 there are increases in delay in the AM and PM, focused on the east side of the M5 at Junction 29 and the north side of the junction at Junction 30. Clyst St. Mary Roundabout shows some significant changes in delay, with an increase of approximately 50 seconds of delay on both the eastbound and westbound approaches in the AM model and 136 seconds of delay on the eastbound approach in the PM model.

Images of the demand flow, actual flow, delay and volume over capacity in the AM and PM models are shown below, in Figure 23 through to Figure 30.

Figure 23 – DM vs DS Scenario 3, AM, Demand Flow

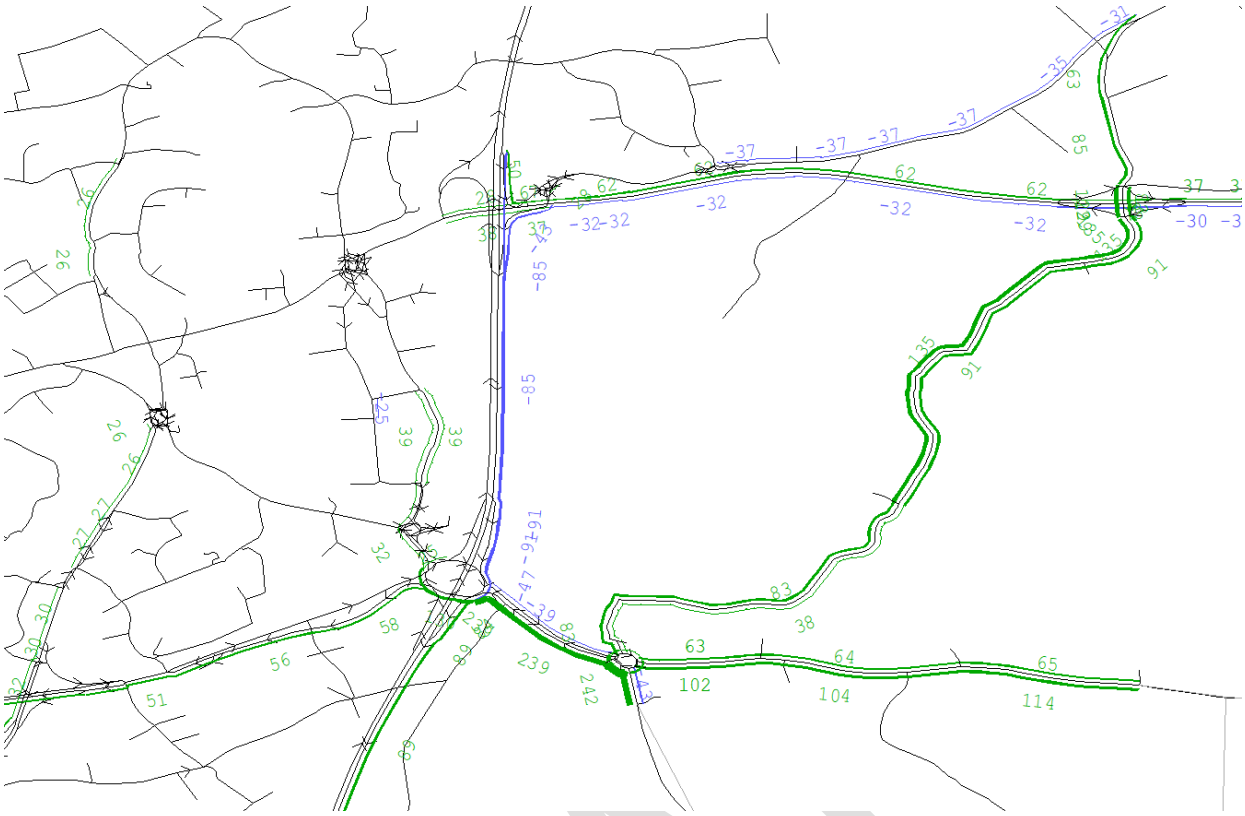


Figure 24 – DM vs DS Scenario 3, AM, Actual Flow

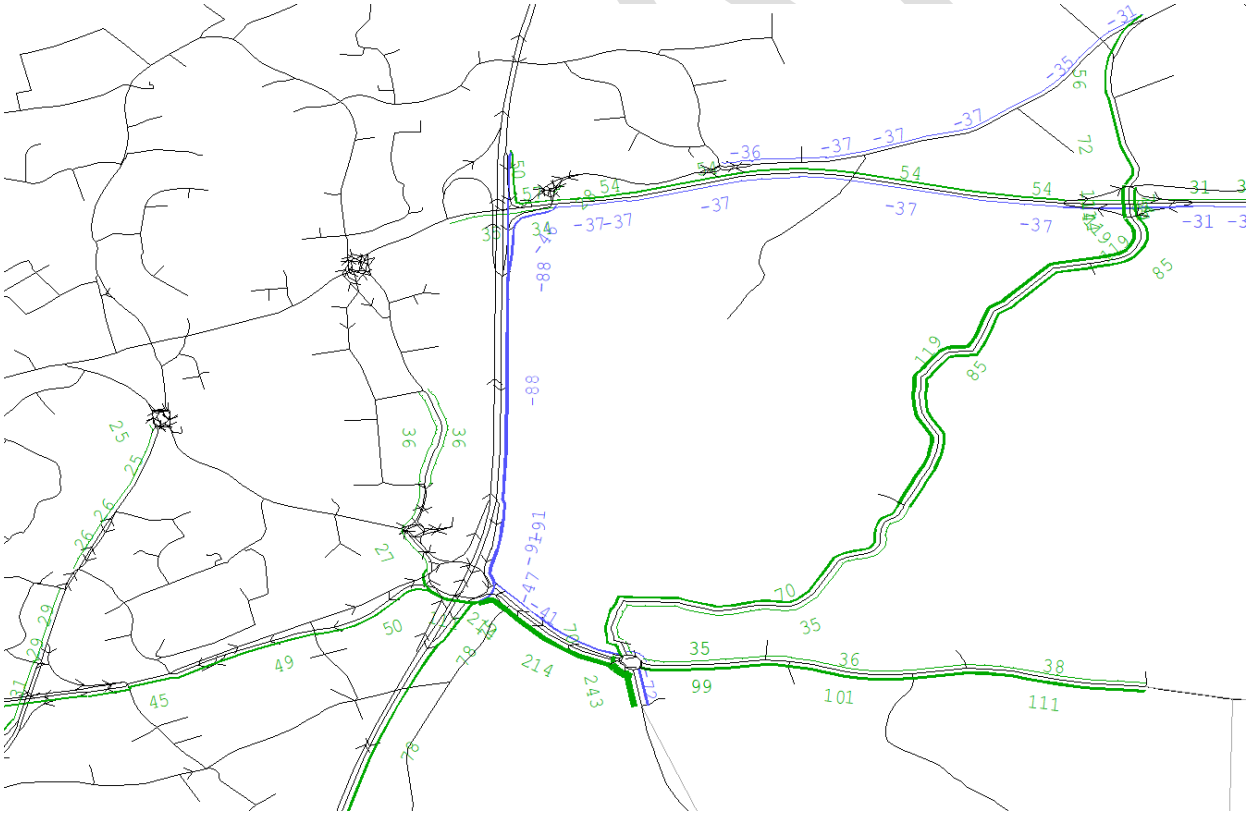


Figure 25 – DM vs DS Scenario 3, AM, Delay

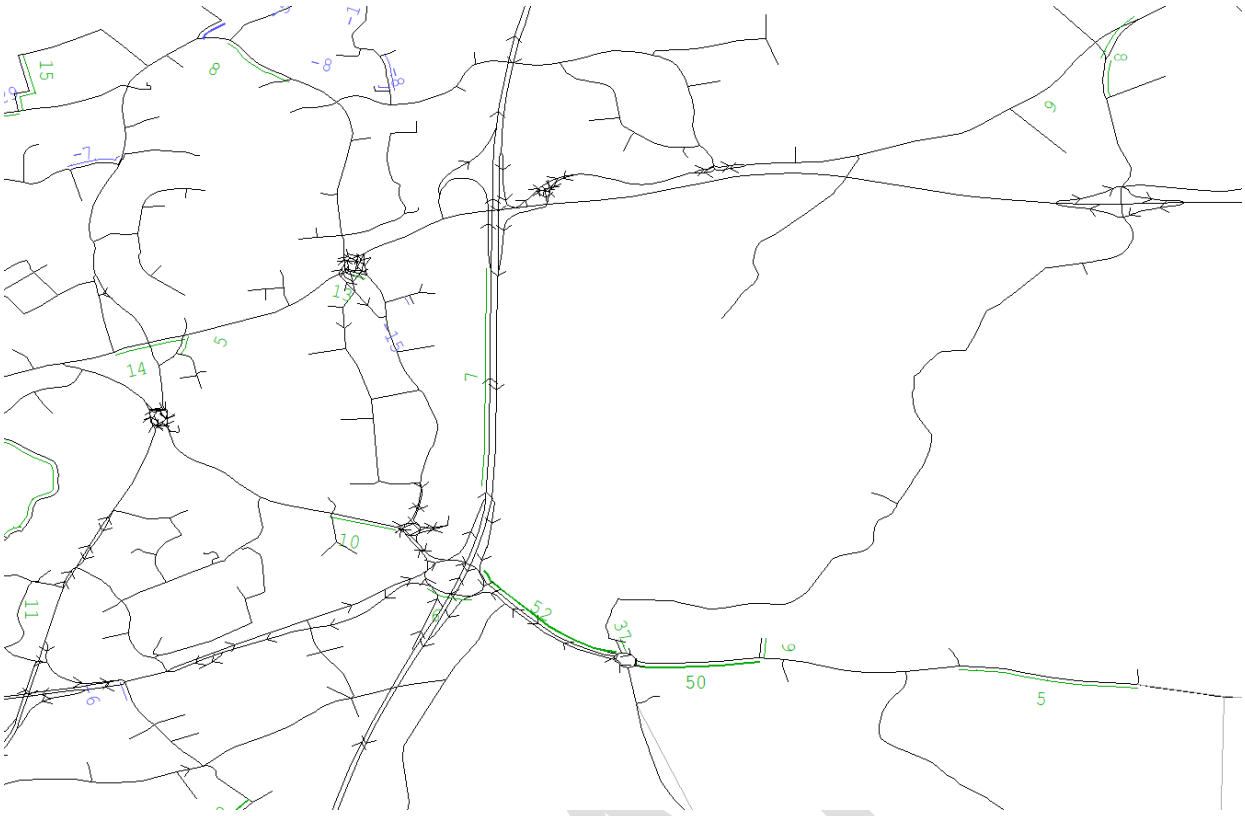


Figure 26 – DM vs DS Scenario 3, AM, V/C

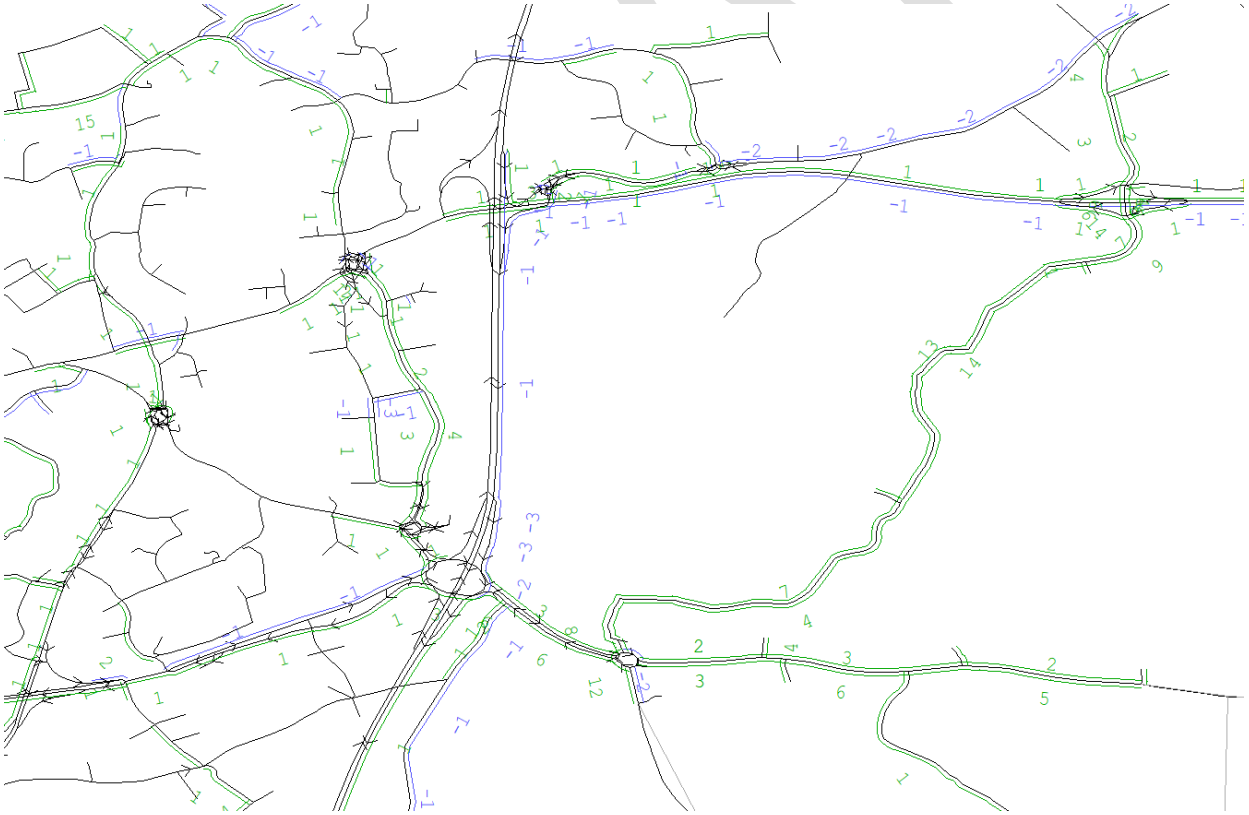


Figure 27 – DM vs DS Scenario 3, PM, Demand Flow

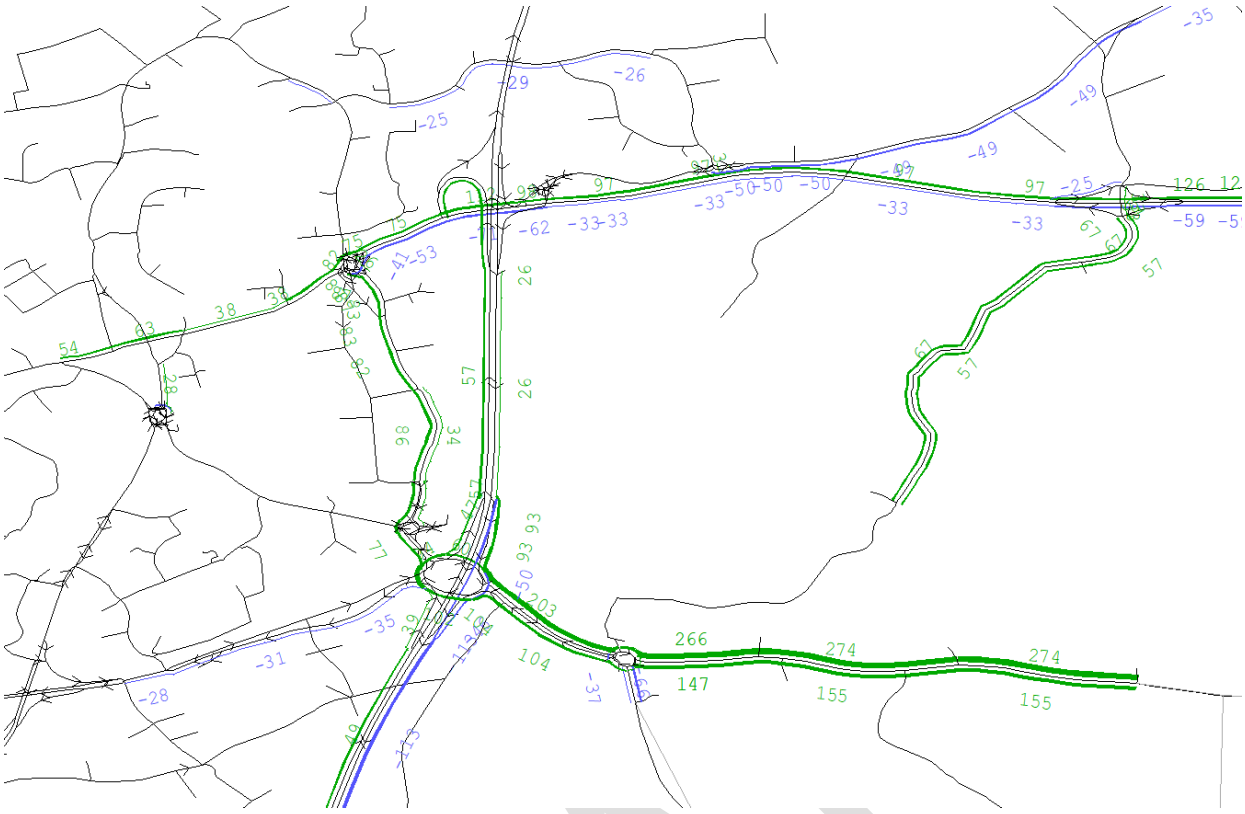


Figure 28 – DM vs DS Scenario 3, PM, Actual Flow

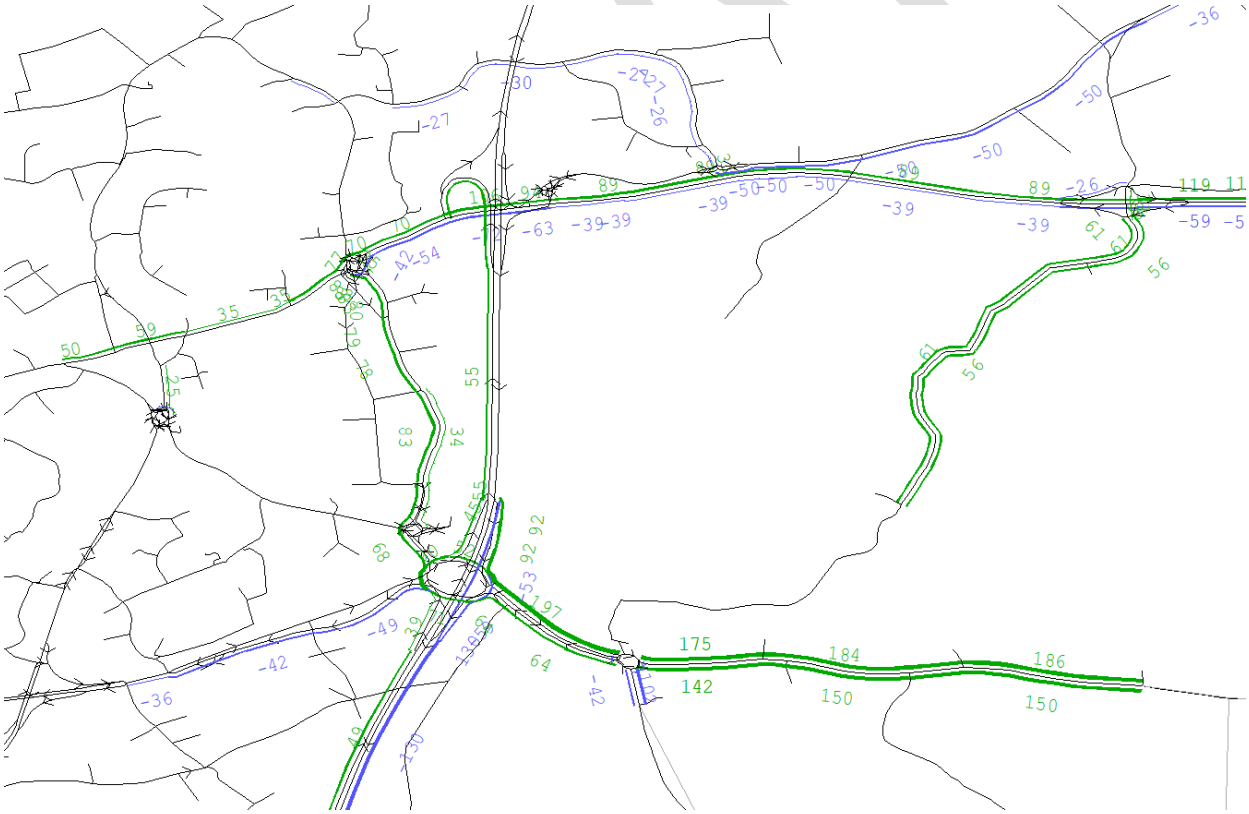
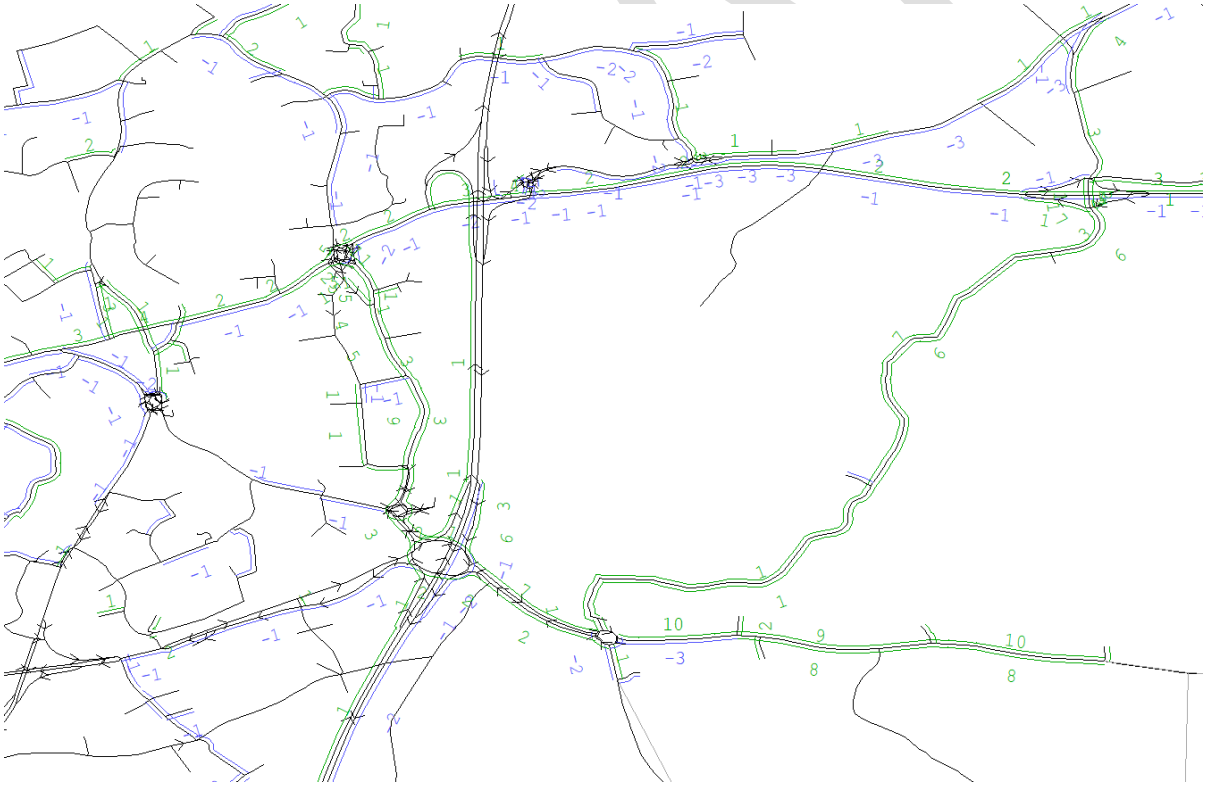


Figure 29 – DM vs DS Scenario 3, PM, Delay

Figure 30 – DM vs DS Scenario 3, PM, V/C



DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

CONCLUSION

This technical note has detailed the background of the Local Plan Review commissioned by DCC alongside EDDC, looking at the proposed development scenarios, trip generation, forecasting process methodology, and a comparison of the resultant traffic models.

The model comparisons highlight that the additional traffic generated by the development has minimal effects on traffic flows and delays on the M5, A30, A3052, A38, and A380 around Exeter. However, Clyst St. Mary Roundabout is negatively affected in all three development scenarios and the road network to the east of Exeter is negatively affected in two out of three scenarios (Scenarios two and three).

The impacts of the three development scenarios on various key parts of the road network around Exeter have been compared to the DM models and summarised below in Table 7.

Table 7 - Development Scenario Impacts Summary

Area	Scenario 1	Scenario 2	Scenario 3
M5 J29 to J31 Mainline	Some increase in overall traffic flows, but minimal change in delay.	Minimal increases in overall traffic flows and delay.	Some increase in overall traffic flows, but minimal change in delay.
M5 J29	Increases in overall traffic flows across all peaks. Minimal delay increases in IP models, but small, tidal delay increases in AM and PM models.	Increases in overall traffic flows across all peaks. Minimal delay increases in IP models, but small, tidal increases in AM and PM models.	Increases in overall traffic flows across all peaks. Minimal delay increases in IP models, but small, tidal increases in AM and PM models.
M5 J30	Increases in overall traffic flows across all peaks, but minimal increases in delay.	Increases in overall traffic flows across all peaks. Minimal delay increases in IP models, but some delay increases in AM and PM models. Largely being affected by the tidal flow of traffic with larger increases westbound in the AM and eastbound in the PM.	Increases in overall traffic flows across all peaks. Minimal delay increases in IP models, but some delay increases in AM and PM models. Largely being affected by the tidal flow of traffic with larger increases westbound in the AM and eastbound in the PM.
M5 J31	Some increase in overall traffic flows, but minimal change in delay.	Some increase in overall traffic flows, but minimal change in delay.	Some increase in overall traffic flows, but minimal change in delay.

DATE:	18 October 2022	**CONFIDENTIALITY:**	Confidential
SUBJECT:	East Devon Local Plan Review Forecasting Technical Note		
PROJECT:	East Devon Local Plan Review	**AUTHOR:**	Henry Dixon
CHECKED:	Tom Holian	**APPROVED:**	Matthew Turner

Area	Scenario 1	Scenario 2	Scenario 3
A30	Large increases in traffic to the east of Exeter but minimal increases in delay on the mainline. Minimal changes to the west of Exeter	Some increases in traffic to the east of Exeter but minimal increases in delay on the mainline. Minimal changes to the west of Exeter	Minimal changes in traffic flows and delay both to the east and west of Exeter.
A3052	Small increases in traffic flows in both directions of travel. Minimal changes in delay on the mainline, but minor levels of additional delay at junctions.	Large increases in traffic flows in both directions of travel. Minimal changes in delay on the mainline, but minor levels of additional delay at junctions.	Some increase in traffic flows in both directions of travel. Minimal changes in delay on the mainline, but minor levels of additional delay at junctions.
A38 & A380	Minimal changes in traffic flows and delay.	Minimal changes in traffic flows and delay.	Minimal changes in traffic flows and delay.
Clyst St. Mary Roundabout	Least impact of the scenarios. Minimal increases in traffic flows and delay westbound in the AM model and eastbound in the PM model. Slight additional turning delay at the roundabout itself in all models.	Second highest impact of the scenarios. Significant increases in delay westbound in the AM model and eastbound in the PM model. Moderately high levels of additional turning delay at the roundabout itself in all models.	Highest impact of the scenarios. Large increases in delay eastbound and westbound in the AM model and eastbound in the PM model. High levels of additional turning delay at the roundabout itself in all models.
East of Exeter	Minimal changes in traffic flows and delay.	Large increases in delay on the road network near Woodbury Salterton and at the A376 junction with Topsham Road.	Some increase in overall traffic flows, but minimal change in delay.