

PLYMOUTH AND SOUTH WEST JOINT LOCAL PLAN

Okehampton Local Plan Growth

Prepared for

Highways England

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Acronyms and Abbreviations

JLP	Joint Local Plan
HE	Highways England
SRN	Strategic Road Network
RFC	Ratio of Flow to Capacity
LoS	Level of Service

Introduction

1.1 Background

The Plymouth and South West Devon Joint Local Plan (JLP) form part of the strategic planning process for Plymouth and South West Devon which looks ahead to 2034. The key purpose of the JLP is to establish an over-arching strategic framework for sustainable growth and provides the statutory development plan for Plymouth, South Hams and West Devon.

Okehampton has excellent links to the A30(T), and has strategic links to Exeter in the east, and is identified within the JLP as one of six key towns to deliver growth in. The JLP recognises the strategic location of Okehampton and its importance in delivering employment growth, with the JLP proposing a total of 77,000sqm of employment land use some of which already has planning permission. In addition to this the JLP includes 775 houses to the end of the plan period all of which already has planning permission.

It is crucial therefore that the current junctions on the A30(T) are able to support the increase of traffic as a result of the planned development in the JLP, and to ensure the safe and efficient operation of the SRN. This study has focussed on the eastern most junction with the A30(T).

1.2 Purpose of Report

This report presents the assessment of the proposed local planned growth on the Strategic Road Network in Okehampton. It will outline the assessment methodology, initial findings and proposed mitigation solutions.

1.3 Structure of Report

Following this introduction, the remainder of this report is structured as follows:

- **Section 2:** Local Plan Growth: Describes the planned growth within Okehampton
- **Section 3:** Assessment Methodology: Explains the methodology used to consider the impact of local plan traffic;
- **Section 4:** Modelling Results: Presents the results from the assessment; and
- **Section 5:** Mitigation: Presents the initial mitigation for the local plan growth;
- **Section 6:** Summary and Conclusions: Summarises the findings from the assessments and provides recommendations for additional assessment work.

Local Plan Growth

2.1 Okehampton

Okehampton is the second largest market town in West Devon, and is situated in the north of the borough. The town is located on the northern boundary of the Dartmoor National Park, and is an important gateway to the moor, providing important services and facilities for many of the surrounding rural communities. The Town and neighbouring Okehampton Hamlets parishes have a combined population of 7,792.

The town is well located for easy access to the A30(T) which provides the strategic link from Devon to Cornwall. Okehampton is served by three junctions to the A30(T), with the key junction being the most easterly junction; Tongue End Cross. This is located approximately 1.75 miles east of the main town centre of Okehampton, and comprises of both east and west facing off and on slip roads. There are two further junctions to the west of Okehampton, Meldon and Sourton Cross, which are located approximately 2.5 and 3 miles respectively from the centre of Okehampton.

Exeter is located approximately 20 miles to the east of Okehampton, and with easy access to the A30(T) means it is a popular commuting destination. Furthermore, the access to the A30(T) means Okehampton has good opportunities for business and commercial developments which is reflected in the JLP allocations. Policy TTV16 of the JLP recognises the strategic location of Okehampton for employment growth, and states that the potential of the A30(T) should be maximised. It is therefore crucial that the current junctions to the A30(T) can support the level of growth proposed in the JLP.

2.2 Local Plan Allocations

The following sites have been allocated within the JLP for Okehampton. The total allocation for Okehampton is 775 dwellings and 77,000sqm of Employment land use.

2.2.1 Policy TTV17 – Land at Exeter Road, Okehampton

This site is allocated for employment use, with provision made for 35,000sqm of B1b,c, B2 and B8 Employment uses. The site is considered a key strategic site, and is located to the east of Okehampton close to the A30(T). The site benefits for planning permission under planning reference 00868/2014, which provides a total of 25,000sqm of employment land. The planning application for this site was supported by a transport assessment prepared by Jacobs.

2.2.2 Policy TTV18 – East of Okehampton

This site is allocated for 775 dwellings in the east of Okehampton. This allocation benefits for planning permission for the full 775 dwellings, split across two planning applications. The first permission is under planning reference 01089/2013, and the most recent under planning reference 2731/2015/OPA. This forms an urban extension to Okehampton, and will have an impact on the Tongue End Cross junction.

2.2.3 Policy TTV19 – Land at Stockley

This site is allocated for 42,700sqm of employment land at Stockley Hamlets, Okehampton. This site is approximately 700 metres from Tongue End Cross Junction. The site is currently agricultural land, and will provide B1, B2 and B8 land uses. There is no current planning application in respect of this allocation.

Assessment Methodology

3.1 Introduction

This section will outline the assessment methodology used within this study to identify the likely impact on the SRN.

3.2 Trip Generation

To predict the likely trip generation of the proposed allocations the industry recognised TRICS database has been used.

3.2.1 Employment Trips

The extant planning permission in respect of site allocation TTV17 sought permission for B1, B2 and B8 employment land use, with an approximate split of 30% B1, 30% B2 and 40% B8. The JLP does not specify the likely breakdown of land uses, so the assumptions from that planning permission have been used for all the employment allocations. The TRICS outputs can be found in Appendix A.

Table 3.1 Employment Trip Generations

Land Use	AM Peak				PM Peak			
	In		Out		In		Out	
	Rate	Trips	Rate	Trips	Rate	Trips	Rate	Trips
B1(a)	1.81	350	0.474	92	0.159	31	1.841	355
B2	0.996	292	0.558	164	0.327	96	0.963	282
B8	0.634	184	0.083	24	0.055	16	0.607	177
Total		826		279		143		814

3.2.2 Residential Trips

Table 3.2 Residential Trip Generations

Land Use	AM Peak				PM Peak			
	In		Out		In		Out	
	Rate	Trips	Rate	Trips	Rate	Trips	Rate	Trips
Residential	0.141	109	0.377	292	0.32	248	0.166	129
Total		109		292		248		129

3.3 Trip Distribution

The proposed distribution of trips from the allocations has been assessed using 2011 census travel to work data. For the employment land uses, the census category ‘WU03EW – Location of usual residence and place of work by method of travel to work (MSOA level)’ for people working in Okehampton usually reside. The results are shown in Table 3.3.

Table 3.3 Employment Trip Distribution

Usual Residency	Percentage of Trips	Car Driver Trips
Cornwall	4%	61
East Devon	1%	18
Exeter	3%	48
Mid Devon	3%	54
North Devon	1%	12
Plymouth	2%	33
Teignbridge	3%	41
Torrige	9%	134
West Devon	74%	1152
Total	100%	1553

For the residential trip rates, again census travel to work data has been used to determine the likely distribution of trips from the proposed residential allocations. The same census category (WU03EW) has been used, but data has been interrogated based on where people living within Okehampton work. The results are shown in Table 3.4.

Table 3.4 Residential Trip Distributions

Area of Workplace	Percentage of Trips	Car Driver Trips
Cornwall	3%	9
Exeter	18%	66
Mid Devon	3%	12
North Devon	1%	5
Plymouth	1%	5
Teignbridge	3%	12
Torrige	3%	12
West Devon	66%	238
Total	100%	359

3.4 Trip Assignment

A first principles assessment of the likely assignment of trips to the network has been used to determine which routes vehicles from the development are likely to take. It is considered that there are six key routes which people are likely to take to reach the destinations outlined within the census data. These are as follows:

- B3215 NE
- B3260 W
- B3217
- A30 W
- A30 E
- Hatherleigh Road.

Trips were then assigned to these six routes based on a first principles assessment of the likely attractiveness of the route. Full census data can be found in Appendix B. As part of the assessment process, it has been identified that the majority of traffic will route via the easterly junction, Tongue End Cross and therefore only the impact at this junction has been considered.

3.5 Traffic Flows and Growth

Traffic counts from a Devon County Council traffic survey completed in 2013 have been used to determine the existing flows at the Tongue End Cross Junction. TEMPRO has been used to growth this traffic from 2013 to a 2018 base year. The TEMPRO rates are shown in table 3.5 below:

Table 3.5 – TEMPRO Growth

Period	AM Peak	PM Peak
2013 - 2018	1.085	1.0883

It has been assumed that between 2018 and 2034, the majority of traffic growth will be from the allocated developments. Therefore, in order to avoid double counting the impact of the allocations TEMPRO has not been used to growth traffic between 2018 and 2034.

Modelling and Results

4.1 A30 eastbound off slip with B3260

Testing of this junction has been completed using the PICADY module within Junctions 8. The parameters used in the model to simulate the junction are outlined in table 4.1 below

Table 4.1

A30 eastbound off slip Junction input parameters

Junction arm	Parameter	Input
Major road	Carriageway width	7.1m
	Right turn width	2.2m
	Right turn visibility	145m
	Right turn blocking traffic	No
Minor road	Visibility to left	22m
	Visibility to right	48m
	Lane width	6.7m

The model results established using the parameters in table 4.1 and traffic flows in tables 3.1 and 3.2 are shown in table 4.2 below

Table 4.2

A30 eastbound off slip Junction input parameters

Scenario	Turning movement	RFC	Queue (pcu)	Delay (s)	Level of Service
2018 AM Peak	Stream B-AC	0.23	0.29	8.81	A
	Stream C-B	0.00	0.00	0.00	A
2018 PM Peak	Stream B-AC	0.19	0.24	8.97	A
	Stream C-B	0.00	0.00	0.00	A
2034+Dev AM Peak	Stream B-AC	0.6	1.44	17.67	C
	Stream C-B	0.00	0.00	0.00	A
2034+Dev PM Peak	Stream B-AC	0.34	0.52	11.46	B
	Stream C-B	0.00	0.00	0.00	A

The results indicate that the junction will remain broadly within capacity during the future years when traffic growth and development traffic are applied. However, the beginnings of capacity issues occur during the 2034+Dev AM Peak where the Level of Service (LoS) is graded as C. This indicates that by some measure, most likely delay in this instance, the junction is reaching its capacity.

4.2 A30 westbound off slip with B3260

Testing of this junction has been completed using the PICADY module within Junctions 8. The parameters used in the model to simulate the junction are outlined in table 4.3 below

Table 4.3

A30 westbound off slip Junction input parameters

Junction arm	Parameter	Input
Major road	Carriageway width	7.1m
	Right turn width	2.2m
	Right turn visibility	140m
	Right turn blocking traffic	No
Minor road	Visibility to left	190m
	Visibility to right	24m
	Lane 1 width	6.0m
	Lane 2 width	3.6m

The model results established using the parameters in table 4.3 and traffic flows in tables 3.1 and 3.2 are shown in table 4.4 below

Table 4.4

A30 westbound off slip Junction input parameters

Scenario	Turning movement	RFC	Queue (pcu)	Delay (s)	Level of Service
2018 AM Peak	Stream B-C	0.07	0.07	6.16	A
	Stream B-A	0.45	0.80	13.56	B
	Stream C-B	0.00	0.00	0.00	A
2018 PM Peak	Stream B-C	0.07	0.07	6.16	A
	Stream B-A	0.45	0.80	13.40	B
	Stream C-B	0.00	0.00	0.00	A
2034+Dev AM Peak	Stream B-C	0.08	0.08	7.30	A
	Stream B-A	0.92	7.83	68.67	F
	Stream C-B	0.00	0.00	0.00	A
2034+Dev PM Peak	Stream B-C	0.07	0.08	6.57	A
	Stream B-A	0.65	1.77	21.07	C
	Stream C-B	0.00	0.00	0.00	A

The results indicate that the junction will exceed its capacity in the 2034+Dev AM peak scenario and will also approach it during the PM peak. This conclusion is based not only on the RFCs reported by the model but also the delay and queues which increased markedly as the RFC rises. Such increases in delay

can also lead to road safety issues as drivers lower their gap acceptance and take unnecessary risks to exit the junction. Therefore, mitigation should be provided to reduce these issues.

4.3 Summary

The modelling indicates that while the A30 eastbound offslip will remain generally within capacity, although on the cusp of becoming a problem, its westbound companion shows capacity issues during the future year. Peak RFCs of the westbound offslip were estimated at 0.92 although this was accompanied significant delay of 68.68s per vehicle. The queue of 7.83 pcu generated by this delay will not extend beyond the confines of the offslip. However, the excessive delay at the end of the offslip will likely lead to driver frustration and lower gap acceptance. In turn, this will generate safety issues which are expected to impact upon the operation of the A30 to a greater extent than the raw capacity issues. Thus, mitigation should be provided on this basis.

Mitigation

As identified in the modelling of the existing junction arrangements mitigation is required to reduce the impact of future development on the junction of the westbound A30 offslip and the B3260. Previous assessments of this junction which supported planning applications in the area identified that signalisation of the junction will likely provide sufficient gains to mitigate the impact of development. Thus, an upgrade of the junction to a signalised arrangement has been considered as the most likely solution in this assessment. The following section sets out a concept design layout for such a scheme along with capacity modelling to demonstrate the design performs as expected.

5.1 Scheme Description

Drawing 679475.ST.17.55.44.001 in Appendix C show a concept design of potential improvements at the junction of the A30 westbound offslip and the B3260. Its main features are:

- Signalisation of all three arms
- Widening of the northern side of the B3260
- Widening of the eastern side of the A30 offslip
- New road markings along all three arms

5.2 Scheme Modelling

This section sets out a preliminary LinSig model based on the concept design discussed in section 2.1 and set out on drawing 679475.ST.17.55.44.001. The results of the modelling for the AM and PM peaks are set out in tables 5.1 and 5.2 respectively below while the full model output file can be found in Appendix D.

Table 5.1
A30 WB Offslip signalised arrangement AM Peak

Lane reference	Lane name	Degree of saturation (%)	Mean max queue (pcu)	Delay (s)
1/1	B3260 WB Ahead	42.1%	3.9	20.3
2/1	B3260 EB Ahead	29.8%	2.6	18.8
3/1	A30 WB Offslip Left	4.0%	0.3	10.2
3/2	A30 WB Offslip Right	42.0%	4.6	13.3

PRC: 113.7%

Table 5.2
A30 WB Offslip signalised arrangement PM Peak

Lane reference	Lane name	Degree of saturation (%)	Mean max queue (pcu)	Delay (s)
1/1	B3260 WB Ahead	29.1%	2.9	12.0
2/1	B3260 EB Ahead	20.6%	2.0	11.3

Table 5.2*A30 WB Offslip signalised arrangement PM Peak*

Lane reference	Lane name	Degree of saturation (%)	Mean max queue (pcu)	Delay (s)
3/1	A30 WB Offslip Left	5.8%	0.5	16.6
3/2	A30 WB Offslip Right	29.9%	2.6	18.7

PRC: 200.8%

The modelling for both scenarios indicates that the proposed scheme will provide sufficient capacity for the planned local plan growth. Beyond this it delivers an element of future proofing through the additional capacity above that required by the Local Plan. The surplus capacity will also enable the inclusion of pedestrian phases should they be required in the future.

5.3 Scheme Costing

The costs associated with this mitigation scheme on drawing 679475.ST.17.55.44.001 have been estimated using experience of past schemes. Included in this cost is an optimism bias of 44% based on the significant unknowns at this time such as ground conditions, utility services, electrical connections and design progress.

Table 5.3*Estimated costs for signalised improvement scheme*

Item no.	Description	Unit	Quantities	Rate	Cost
1	Traffic signal equipment and installation	Per arm	3	£25,000	£75,000.00
2	Carriageway widening	m ²	185	£220	£40,700.00
3	Traffic islands	Per island	2	£10,000	£20,000.00
4	Traffic signs and road markings	Estimate			£10,000.00
	Subtotal				£145,700.00
5	Professional services			20%	£25,140.00
	Subtotal				£170,840.00
6	Temporary traffic management			20%	£25,140.00
	Subtotal				£195,980.00
7	Optimism bias			44%	£86,231.20
	Total				£ 282,211.20

The scheme cost should be revisited as further details become available. This will lead to a more accurate costing with a stronger evidence base and thus more defensible to prospective developers.

Summary and Conclusions

6.1 Summary

This report has presented the process employed in testing the impact of the site allocations included within the Plymouth and South West Devon Joint Local Plan on the operation of the SRN around Okehampton. The report has described the methodology used to determine the likely traffic from the JLP allocations and sets out the data assumptions used in this assessment. It has presented the results of the modelling completed for Tongue End Cross junction, as well as recommending mitigation and indicative costs for this mitigation at this junction. The assessment shows that the other two A30 junctions in the vicinity of Okehampton, Meldon and Sourton Cross, will be largely unaffected by the JLP allocations.

6.2 Conclusions

The modelling has indicated that in 2034 with the inclusion of JLP traffic, the westbound off-slip of the A30(T) at Tongue End Cross junctions will be over capacity with an RFC of 0.92, with significant increases in delay for vehicles on this arm. A signalised option for this junction has been considered, which provides sufficient capacity for this junction, with reductions in both queuing and delay. It is therefore concluded that this scheme is necessary in order to offset the unacceptable traffic related impacts of the development included within the JLP as identified through the highway assessment process.

Appendix A

TRICS Outputs

Appendix B

Census Outputs

Appendix C
Proposed Scheme Drawing

Appendix D

Modelling Outputs