

Technical Note

Summary of Sweco Modelling Report – Local Plan Testing

Project	Local Plan Review	
Subject	Traffic Modelling Summary	
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Introduction

- 1.1 Project Centre limited (PCL) have been commissioned by Swale Borough Council (SBC) to review and summarise the modelling report prepared by Sweco for testing the Local Plan development proposals.
- 1.2 This note explains the model in simple terms, looks at the results and makes comment on possible ways forward for consideration / discussion.
- 1.3 The Local Plan Review (LPR) is expected to deliver up to around 17,410 dwellings within the period between 2022 and 2038. The employment land needs for the same period are expected to be around 750,000m² as shown in Table 1. The Swale Highway Model (SHM) was developed with a base year in 2017 to examine the traffic impacts of both future development proposals and transport infrastructure across Swale.
- 1.4 Modelling has been undertaken to compare the Reference Case (RC) and Development Scenarios (DS) for 2038, additionally an interim model for 2027 is developed to understand the effects five years after Local Plan adoption.

Table 1: Development Quanta for Testing

Year	Housing (total number of dwellings)			Employment (total sqm)		
	RC	DS	Change	RC	DS	Change
2027	6,163	8,307	+2,144	69,400	374,305	+304,905
2038	9,225	19,841	+10,616	138,800	748,609	+609,809

- 1.5 RC includes only committed developments and transport schemes in future years, acting as a reference to compare the Local Plan developments against.
- 1.6 DS includes the committed and all additional development (including windfalls) and schemes associated with the LPR, these are detailed in Appendix A of the Sweco report and illustrated in Figure 1 overleaf.
- 1.7 DS also includes planned highway improvements and those to accompany developments. The included highway schemes are shown in Figures 2 and 3.

Figure 1 – Report Extract of RC and DS Housing Developments

Figure 4-1 RC housing developments by the year 2038

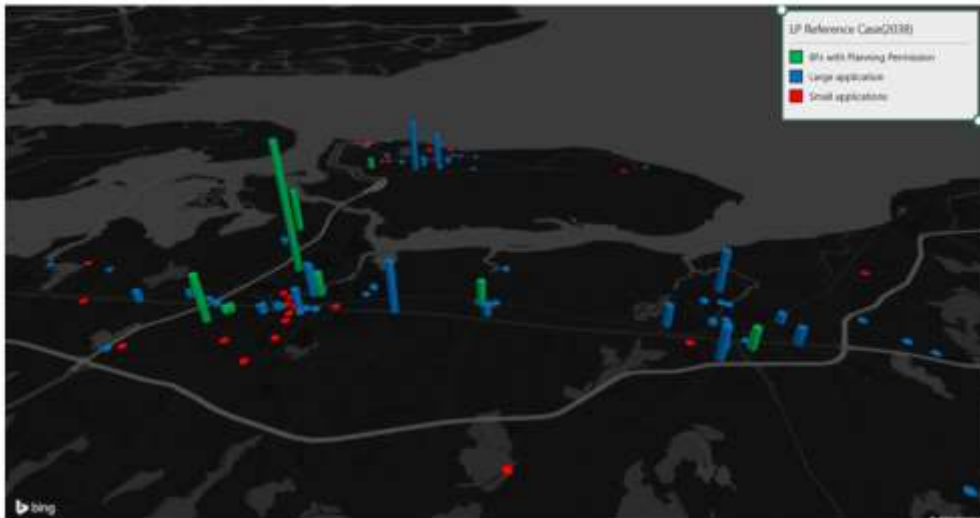


Figure 4-2 DS housing developments by the year 2038



- 1.8 As agreed with KCC, SBC and National Highways (formerly Highways England) Trip rates were calculated using TRICS, with values for town centre and rural locations.
- 1.9 Growth factors were applied to the modelled area based on National Trip Ends Model (NTEM) without any constraint.

Highway / Network Assumptions

- 1.10 The highway network improvements were provided by KCC and include both general highway improvements as well as those related to development proposals. These are shown in the following Figures 2 and 3.

Figure 2 – Report Extract Plan of Highway Network Assumptions

Figure 4-3 – Network Assumptions

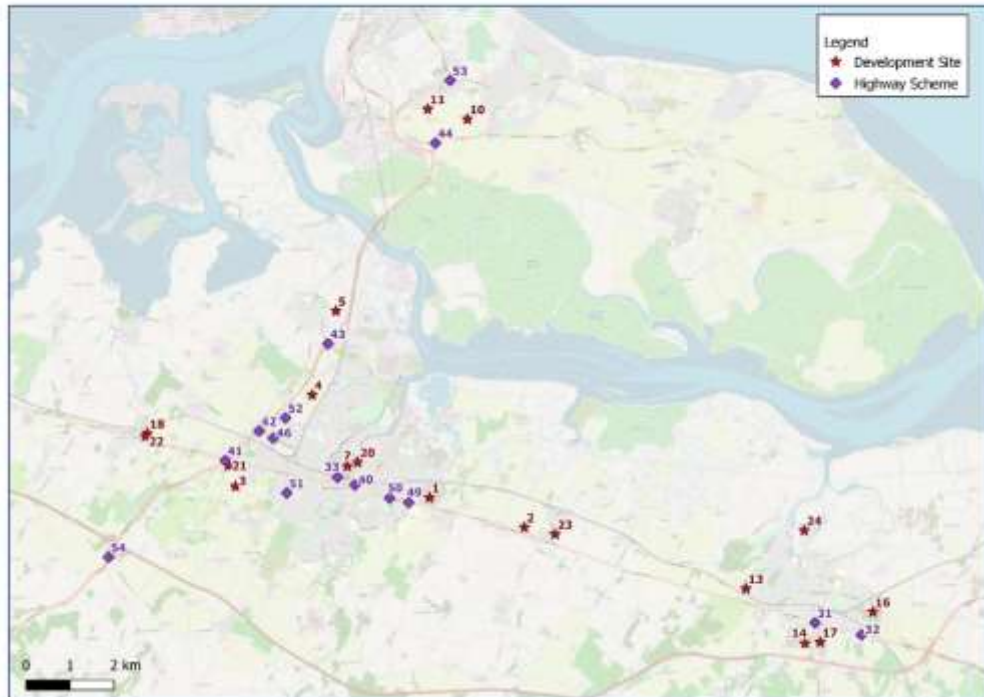


Figure 3 – Report Extract Tables of Highway Network Assumptions

Table 4-6 – Network Assumptions (Development Sites Related)

ID	Title of Development	Details	2027	2038
1	Stones Farm	A2 access only	✓	✓
2	Frognall Lane	A2 access only	✓	✓
3	SW Sittingbourne	Access to Chestnut St, Wises Lane, Borden Lane with link road between	X	✓
4	NW Sittingbourne	Access to Quinton Road and Grovehurst Road with link road between	X	✓
5	Iwade Expansion	Access to Grovehurst Road only	✓	✓
7	Crown Quay Redrow	Access to Crown Quay Lane and Eurolink Way	✓	✓
10	Barton Hill Drive	Access to Lower Road and Barton Hill Drive	✓	✓
11	Land off Belgrave Road	Access to Belgrave Road	✓	✓
24	Oare Gravel Works	Access to Ham Road	✓	✓
13	Osprunge Brickworks	Access to Western Link	✓	✓
14	Perry Court	Access to Brogdale Lane and A251	✓	✓
16	Lady Dane Farm	Access to Graveney Road and Love Lane with connecting link	✓	✓
17	Preston Fields	Access to A2 and A251 with connecting (slow) link	✓	✓
18	High St Newington	Access to A2	✓	✓
5	Pond Farm	Access to Grovehurst Road	✓	✓
20	Crown Quay Bellway	Access to Crown Quay Lane	✓	✓
21	Manor Farm	Access to Chestnut Street	✓	✓
22	Newington Eden Meadows	Access to A2 Newington	✓	✓
23	Teynham Station Road	Access to Statio Rd Teynham	✓	✓

Table 4-7 – Network Assumptions (Highway Schemes)

ID	Location	2027	2038
31	A2/A251 Junction Improvements	✓	✓
32	A2/Love Lane Junction Signalisation	✓	✓
33	Spirit of Sittingbourne TC works	✓	✓
40	St Michaels Road/rown Quay Lane Junction Improvements	✓	✓
41	Key St Roundabout Improvements	✓	✓
42	Bobbing Roundabout Improvements	X	✓
43	Grovehurst Junction Improvements	✓	✓
44	Lower Road/Cowstead Corner Capacity Improvements	✓	✓
46	B2006/Sonora Way Roundabout Capacity Improvements	✓	✓
49	A2/Swanstree Ave Junction Improvements	X	✓
50	A2/Rectory Rd Junction Improvements	X	✓
51	Borden Lane/Homewood Mini Roundabout	X	✓
52	Quinton Road Mini Roundabouts	✓	✓
53	Halfway Road Traffic Lights	✓	✓
54	M2/J5	✓	✓

Network Statistics

- 1.11 The Sweco modelling report includes assessment of the peak hours (AM and PM) and interpeak. As would be expected the impacts in the peaks are higher while the interpeak is less.
- 1.12 For the future years, both AM and PM see reductions in speed across the core area, indicating congestion / less free flowing traffic. The difference is greater for the DS than the RC due to the increase in total distance travelled.

Journey Times

- 1.13 Comparing base year (2017) to future (2027 and 2038) RC, journey times increase on most routes. When comparing DS, the journey times increase further, reflecting the additional demand from the LP developments.
- 1.14 The routes showing heavy delays include the Selling Road, A2 between A249 and M2 through Sittingbourne and Faversham.
- 1.15 There were some improvements / only marginal increases on links from Sheppey to M2 J7 via M2 EB and Sheppey to M20/A249 SB. This is due to the M2 J5 improvement scheme.

Traffic Flows & Delays / Congestion

- 1.16 Future (2027 and 2038) RC traffic flows increase on most roads within the region when compared to the base year. This leads to areas where there are delays / congestion on the network.
- 1.17 There was shown to be some decrease in traffic on the A249 SB from M2 J5 to M20 J7, likely due to traffic rerouting to avoid significant delays at the A249 SB Approach to M20 J7 and the improvements at M2 J5.
- 1.18 The Degree of saturation is the volume over capacity ratio (V/C), essentially the amount of traffic trying to use the junction divided by the actual capacity. V/C's over 80% are considered problematic. The worst affected junctions which show heavy delays and V/Cs over 80% in the DS are;
- Minster Road/ A250 Halfway Road
 - A250 Lower Road/Sheppey Way
 - A2 London Road/Western Link

- M2 Junction 7
- A2/A251 Ashford Road
- A2/Brogdale Road
- A2 Key Street/A249
- A2 Canterbury Road/Murston Road/Rectory Road
- A2 Canterbury Road/Murston Road/Rectory Road
- A249/2500 roundabout
- A2 London Road/Station Road (Teynham)
- A2 London Road/Hempstead Lane

1.19 The following figures 4 and 5 show where V/C on the network exceeds 80% in the AM peak. It can be seen in Figure 4 there are areas that experience issues in the RC, before Local Plan development is added in the DS.

1.20 These are exacerbated in the DS case (2038) as development is added to the network. As can be seen in Figure 5 there are further issues, particularly along the A2 corridor. The PM Peak shows a similar pattern.

1.21 The tables in Appendix A of this note contain details of V/C for each junction.

Figure 4 – Report Extract V/C 2038 Reference Case

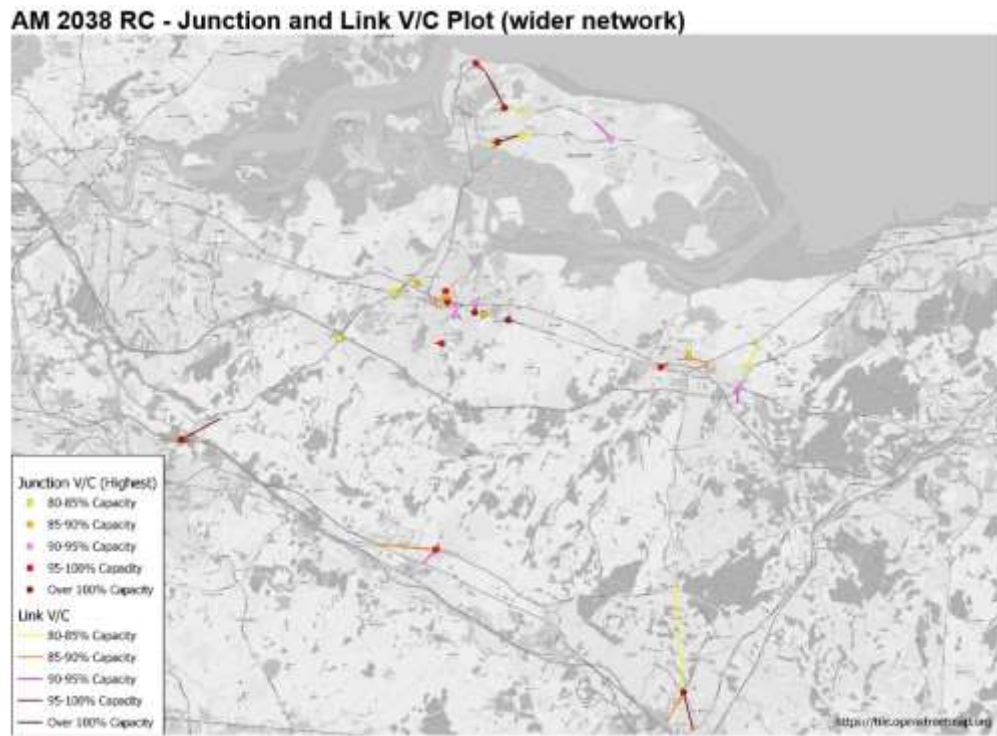
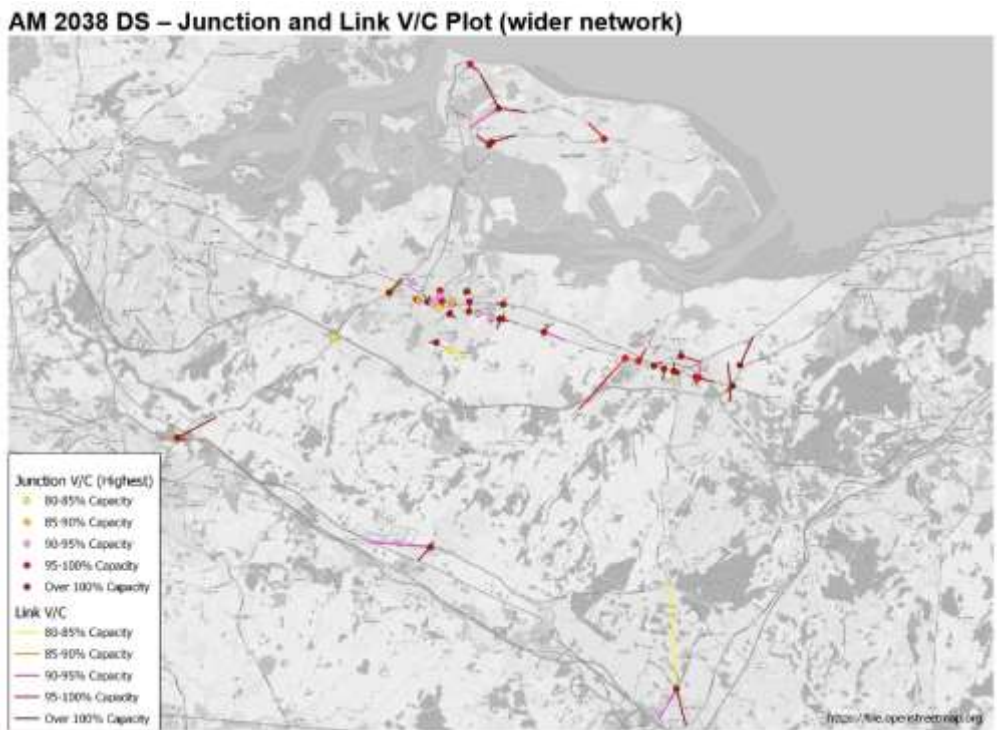


Figure 5 – Report Extract V/C 2038 Development Case

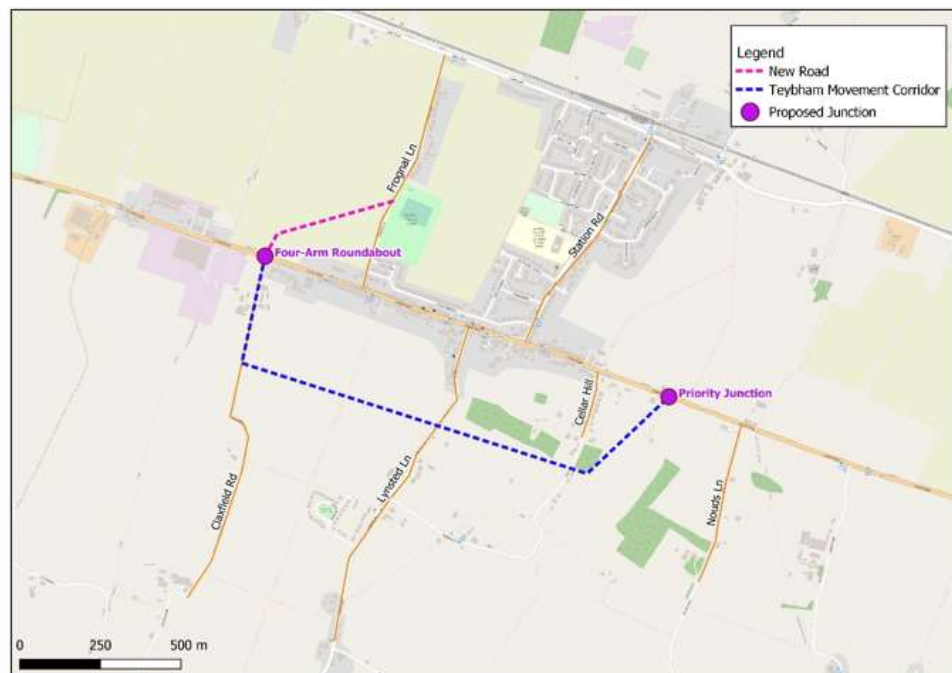


Teynham / Lynsted Sensitivity Test

- 1.22 A sensitivity test has been carried out to understand the effects of a proposed new link road to the south of the A2, aiming to remove traffic and ease congestion, considering the potential development in the area as part of the Local Plan review.
- 1.23 Figure 6 shows this link in blue and the already committed road and four arm roundabout related to the Frogmal Lane development site. This roundabout forms the western junction between the link road and A2. At the eastern end a T junction is created with priority given to traffic from the new link road, meaning eastbound A2 traffic would give way.
- 1.24 Under this test, Lynsted Lane will not have access to the A2.

Figure 6 – Report Extract Sensitivity Test Teynham / Lynsted Link Road

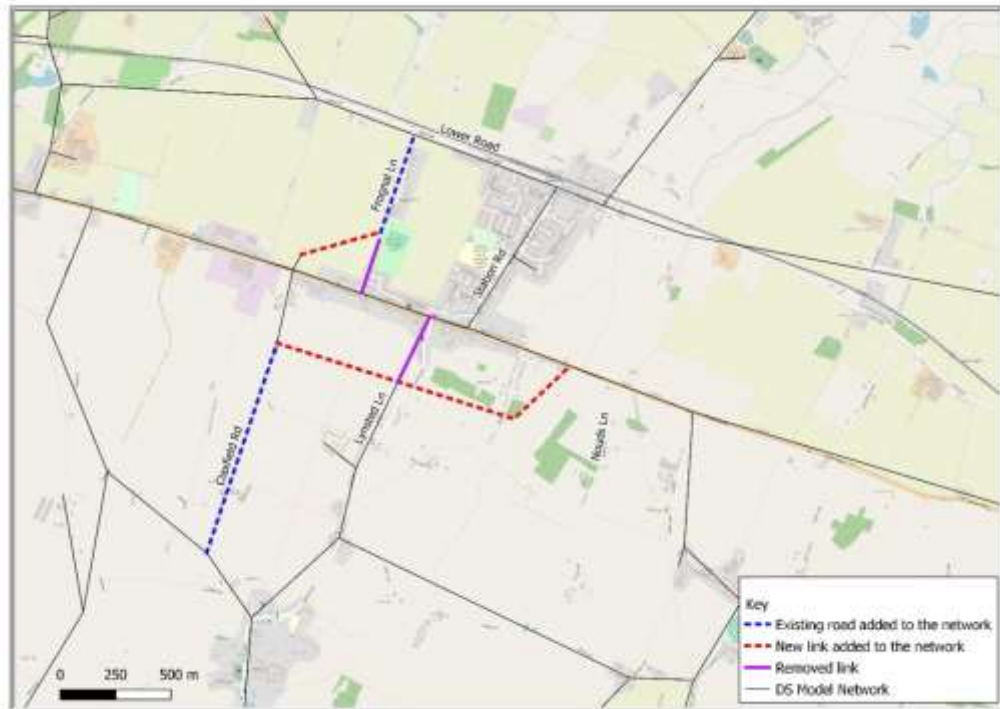
Figure 1-1 Location of Teynham/Lynsted southern link route. Note: location of junction shown purely for modelling purposes



- 1.25 As the SHM is strategic in level, it does not include all roads. For this sensitivity test, new links were added to the model to better understand the local effects. These are not new roads but links in the model. Figure 7 shows the changes to the modelled network.

Figure 7 – Report Extract Sensitivity Test Teynham / Lynsted Link, Network Changes

Figure 2-2 Teynham Sensitivity Test Model Network



- 1.26 The test compared the DS (2038) with the Sensitivity Test to understand the effects of the new link road. These are found to be;
- Decrease in traffic on A2 between Dully Road and the eastern end of the scheme as traffic between northern parts of Sittingbourne and Faversham diverts to the new link road
 - Diversion of traffic between southern Sittingbourne and Faversham to rural roads (Upper Rodmersham Road and Dully Road) to access the new link road
 - Excessive delays on A2 at the eastern junction with the link road, diverting westbound traffic on to Lower Road
- 1.27 The modelled differences in flow are shown in Figures 8 and 9 for the AM and PM peaks respectively. Green showing an increase, blue indicating a decrease in flows.

Figure 8 – Report Extract Sensitivity Test Teynham / Lynsted Link, Flow Difference AM Peak

Figure 3-1 Flow Difference between DS and Sensitivity Test – AM peak

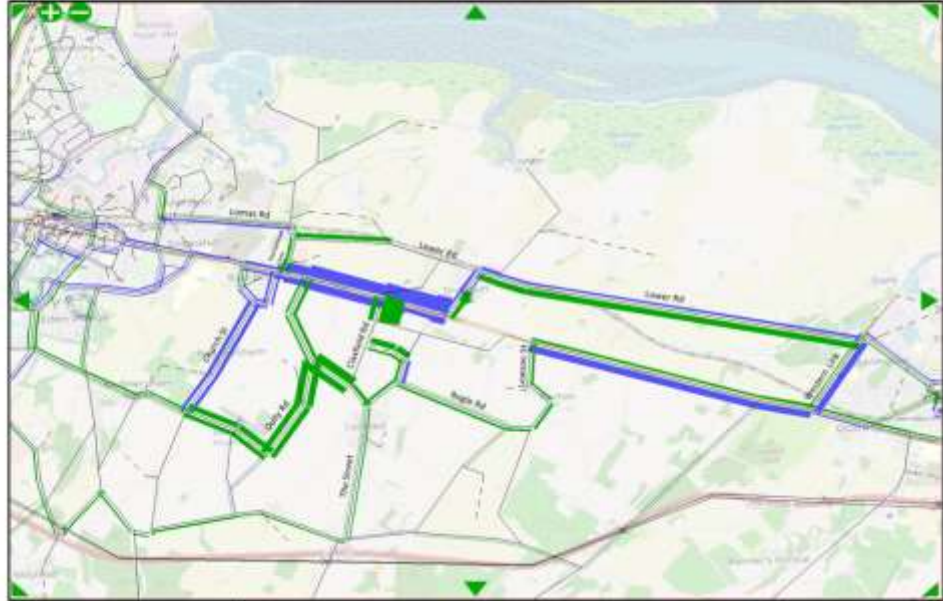
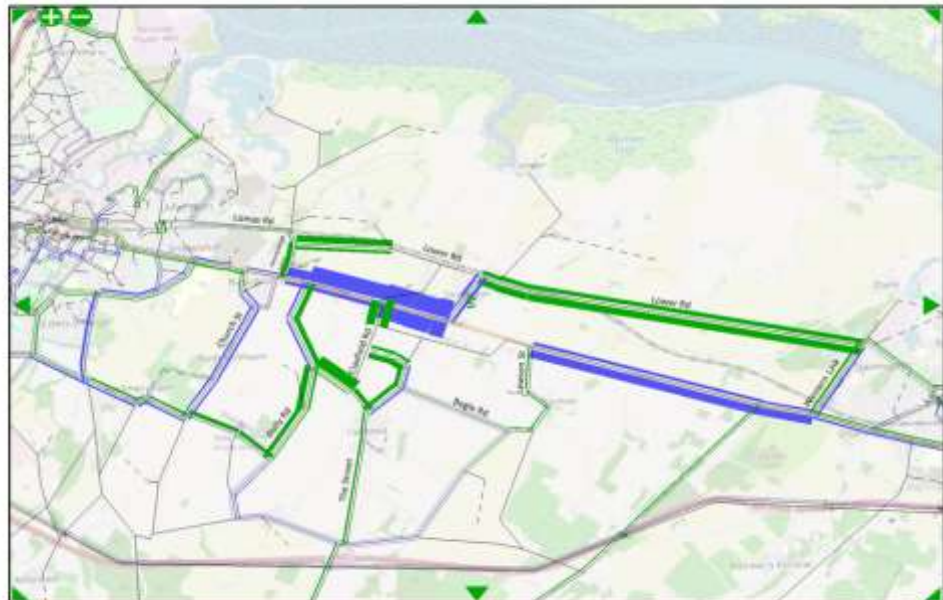


Figure 9 – Report Extract Sensitivity Test Teynham / Lynsted Link, Flow Difference PM Peak

Figure 3-3 Flow Difference between DS and Sensitivity Test – PM peak



- 1.28 When considering the ratio of volume and capacity (V/C), the redistribution of traffic causes the most significant effects on the rural roads to the south of the A2. Traffic diverting to Lower Road has significant effects on Lower Road to the east of Tyneham. Figures 10 and 11 show V/C for the AM and PM Peaks respectively.

Figure 10 – Report Extract Sensitivity Test Teynham / Lynsted Link, V/C AM Peak

Figure 3-7 WC ratios (%) on key roads in Teynham/Lynsted area – AM peak

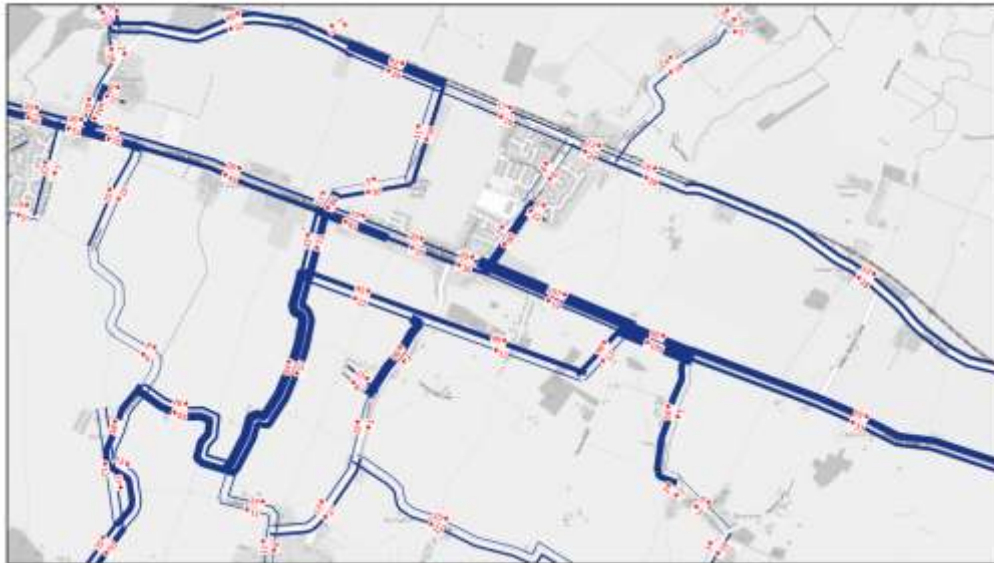
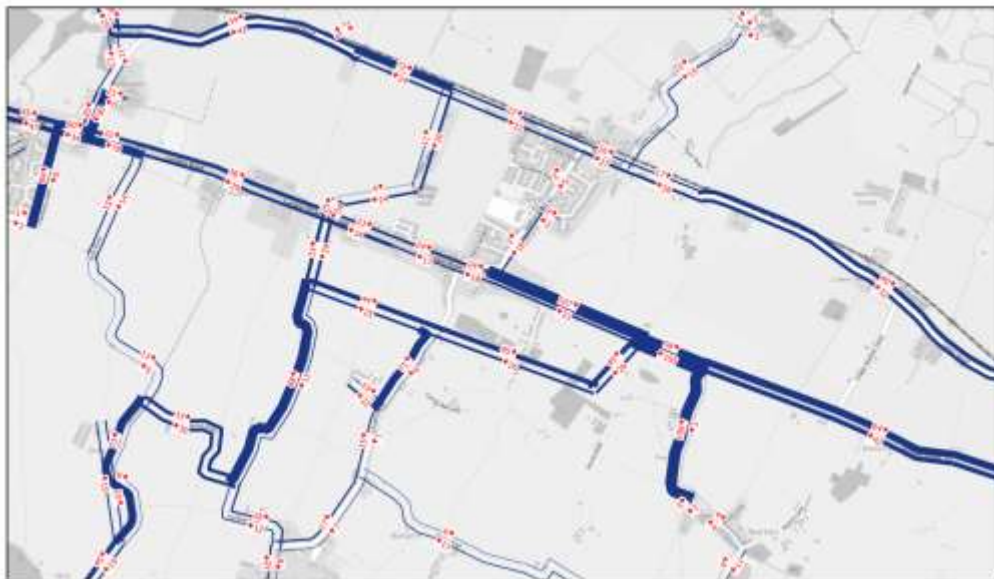


Figure 11 – Report Extract Sensitivity Test Teynham / Lynsted Link, V/C PM Peak

Figure 3-9 WC ratios (%) on key roads in Teynham/Lynsted area – PM peak



- 1.29 There may be measures that could be considered to alleviate the traffic diversions on to these rural roads, such as reducing the delays at the eastern end of the link road, however this was outside of the scope of the sensitivity test but could form part of future testing.

Possible Mitigation / Strategy

- 1.30 It is highly unlikely that any highways schemes can fix all the congested points on the network. A nil detriment case would be the only possible approach. However, it is unknown if this is actually possible within the highway boundary / land owned by developers.
- 1.31 The problem junctions / links should be reviewed for potential improvement and dialogue with KCC and National Highways is underway to review the key areas.
- 1.32 Within Swale, car commuting is 70% so this represents a challenge. Mode share targets for development must encourage more sustainable travel, cycling and walking. Significant contributions would be needed to fund measures to get worthwhile, meaningful shift. KCC have commented that there is a limit to what can be achieved given the Kent average of 9% of total journeys being within reasonable cycle and walk distances.
- 1.33 The existing congestion on the network can act as a deterrent to additional traffic movements and may encourage mode shift for those with the option to do so.
- 1.34 The modelled unconstrained growth predictions may be too high and could be lower in practice as the network is already congested, potentially discouraging such growth in vehicle traffic.
- 1.35 There is a potential scheme for M2 J7 / A2 Brenley Corner which is not committed and therefore not included in the model testing. It may be that if this were progressed and included within the model it could reduce congestion. However, this is likely to be beyond the timescale for the LPR, given the current stage of the project.
- 1.36 Nationally, in response to the Covid pandemic, there has been a move to more home / hybrid working which has changed travel patterns, particularly in peak hours. It is understood that the employment in the area does not
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facilitate high levels of home / hybrid working which could reduce traffic flows / congestion on the network. However, there may be effects on traffic through the area which could alleviate the effects on capacity. Undertaking traffic surveys to allow a check of traffic data in comparison to that predicted in the model will help to understand this.

Appendix A – Junction Volume / Capacity Tables
(Modelling Report Extract)

Table Error! No text of specified style in document.-2 Summary of the cc

Key	
 	Overloaded (>100%)
 	Above practical capacity (95-100%)
 	At practical capacity (90-95%)
 	Exceeding capacity threshold (85-90%)
 	Approaching capacity threshold (80-85%)
 	Below 80% capacity

		Highest Junction V/C									
JunctionID	Description	Base Year		2027RC		2027DS		2038RC		2038DS	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Minster Road/ A250 Halfway Road	104.7	94.2	104.3	99.8	104.5	100.2	103.9	107.1	104.4	104.4
2	A250 Lower Road/Sheppey Way	93.5	56.9	103.2	89.8	104.6	95.2	109.8	106.2	118.4	119.6
3	A2 London Road/Western Link	57.2	62.8	66.3	72.9	71.2	83.4	66.7	74.9	95.8	99.1
4*	M2 Junction 7	101.3	103.0	97.7	105.3	96.3	105.1	91.3	103.8	107.7	110.5
5	A2/A251 Ashford Road	77.1	48.2	68.7	66.5	81.0	85.4	73.2	70.3	104.4	107.5
6	A2/Brogdale Road	49.2	51.8	48.8	49.8	54.5	61.9	50.1	52.1	108.7	111.5
7	B2006 Eurolink Way/Crown Quay Lane	73.0	73.0	77.5	74.6	79.5	79.9	78.4	74.8	87.9	91.1
8*	Grovehurst/ Swale Way/B2005	86.4	90.0	34.2	40.1	34.9	48.6	43.5	44.3	49.9	59.3
9*	M2 Junction 5	110.6	103.2	45.3	48.1	50.2	52.4	49.4	61.5	67.8	89.2
10*	A2 Key Street/A249	68.2	103.7	69.0	89.0	76.2	94.6	82.9	98.2	101.3	107.3

11*	A249/B2006	61.5	61.5	68.8	75.2	81.8	81.8	59.1	70.6	75.0	95.4
12	A2 Canterbury Road/Murston Road/Rectory Road	96.4	95.2	102.5	101.1	105.0	102.6	101.0	98.8	109.9	105.7
13	A2 Dover Street/Milton Road	49.2	68.3	95.9	91.4	96.5	92.4	95.3	89.2	99.8	96.5
14	A2 Canterbury Road/Swanstree Avenue	84.8	71.8	87.0	82.3	87.9	87.4	86.9	88.4	92.1	101.0
15	A2042 Faversham Road/Trinity Road	106.3	93.8	122.1	100.2	122.0	100.3	136.6	110.3	136.5	111.4
16	A299 Thanet Way/Staple St	47.7	55.6	53.4	64.1	55.0	66.5	60.7	70.1	62.6	76.7
17	Tunstall Rd/Woodstock Rd	66.3	37.6	91.6	68.0	93.4	73.7	95.1	70.9	101.6	85.5
18	A2 London Road/Wises Lane	81.9	68.2	71.1	67.0	70.3	62.6	74.0	70.4	75.3	65.6
19	B2006/ B2005	91.9	90.6	97.3	94.5	97.8	95.1	98.3	97.2	99.0	99.0
20	A2 St Michael's Road/East Street	57.9	65.6	64.2	68.3	65.7	74.7	66.6	63.2	76.8	71.8
21	A250 Millenium Way/High Street	90.4	80.6	95.2	92.4	95.5	93.4	95.8	99.9	95.5	97.6
22	A249 Brielle Way /B2007	38.6	89.5	47.4	77.3	47.4	75.2	47.7	80.0	48.2	81.9
23	A249/A2500	94.9	77.2	86.1	102.7	89.5	103.5	87.9	110.5	103.6	114.0
24	Lower Road/East Church Road	66.9	74.3	80.3	65.1	82.4	68.9	91.2	66.6	96.2	67.5

25	B2006 Staplehurst Road/Chalkwell Road	65.9	70.5	73.6	73.7	75.7	74.2	74.4	78.5	72.3	87.2
26	A2 London Road/Hempstead Lane	73.7	78.7	100.6	96.0	101.1	100.4	100.4	97.9	109.6	101.9
27	A2 London Road/Station Road (Teynham)	46.1	36.1	49.9	49.5	77.5	71.5	50.7	45.4	101.7	100.3
28	A2 London Road/Faversham Road	39.7	50.2	53.4	65.9	63.7	89.6	53.3	67.8	95.1	104.3
29	A2 Canterbury Road/Selling Road	37.4	47.1	23.7	30.5	55.5	64.2	31.2	35.1	108.1	107.2
30	A299 Thanet Way/Clapham Hill	14.4	15.1	16.2	17.4	17.2	17.9	17.1	19.0	20.0	20.7
31*	M20 Junction 7	111.1	112.5	120.0	120.0	121.0	119.9	121.1	120.2	124.7	120.7
32	M20J7 Onslip WB	86.5	69.2	65.5	58.1	65.5	58.6	68.0	61.5	68.2	61.7
33	M20J7 Offslip EB	70.4	97.1	78.7	99.8	78.6	100.0	85.3	100.0	85.5	100.0
34	Gore Court Road/Bell Road/Park Avenue	52.5	39.0	62.1	49.2	65.5	52.3	64.9	52.3	74.7	67.2
35	Bell Road/Capel Road/Brenchley Road	54.6	43.3	66.4	49.7	69.9	52.4	66.8	50.5	79.3	57.3
36	A299 Thanet Way/Whitstable Road	81.7	81.5	45.5	54.7	48.6	56.4	51.0	54.1	67.8	63.7
37	A2500 Lower Road/Barton Hill Drive	91.6	101.3	83.2	97.0	82.4	97.4	82.4	103.5	78.2	93.9
38	A2 High Street/Church Lane (Newington)	42.4	43.8	51.9	92.8	55.3	95.1	55.8	90.9	78.8	88.2

39	B2006 Mill Way/ExitCarpark	83.7	96.1	82.7	98.1	84.8	98.5	85.7	99.1	93.2	102.1
40	Church Road/Lomas Road	42.5	77.5	48.5	89.1	62.9	101.6	53.2	90.1	100.3	112.1
41	Bell Road/Stanhope Avenue	93.8	90.5	93.4	94.0	94.9	94.7	94.3	95.4	100.3	99.4
42	A2 London Road/Adelaide Drive	62.4	53.2	70.8	55.6	77.3	59.3	73.2	60.7	86.7	76.7
43	B2006/Sonora Way	65.4	78.4	76.0	88.7	77.2	88.4	88.6	92.3	93.3	100.2
44	Borden Lane/Homewood Avenue	75.4	67.9	78.6	67.3	80.4	70.6	56.5	52.5	62.9	68.4
45	Cromer Road/Highsted Road	56.3	40.5	59.8	56.6	65.3	64.3	63.2	62.5	83.9	99.4
46	A2 Canterbury Road/B2041	102.1	85.1	65.7	57.5	83.3	66.5	67.2	64.7	111.6	95.3
47	A2 St Michael's Road/Crown Quay Lane	89.0	83.1	90.5	77.8	92.6	77.6	92.3	80.1	94.0	82.3
48	A2 London Road/Hawthorn Road	94.0	67.1	65.3	60.2	70.1	60.4	68.1	62.0	79.7	63.9
49	East Street/B2040 (Faversham)	71.1	72.2	79.9	92.9	91.1	100.4	88.0	96.4	100.6	119.1
50	A2/Westlands Avenue	46.4	53.0	61.6	51.9	59.4	52.0	63.6	51.1	53.3	53.9
51	A2/Chalkwell Road	68.8	40.4	90.8	43.2	95.4	45.1	91.9	45.2	101.5	57.8
52	A2/Burley Road	70.1	63.3	88.0	57.7	92.6	62.9	89.7	59.7	92.5	71.2
53	A2/School Lane	50.5	66.9	73.8	70.2	75.3	74.5	77.7	69.8	90.3	104.2

54	A2/B2040 South Road	58.4	76.0	95.9	98.2	92.6	95.1	95.3	97.4	102.9	90.3
55	Sheppey Way/Grovehurst Road	28.4	21.8	25.2	15.3	27.4	16.0	32.1	20.7	36.7	18.9
56	A20 Ashford Road/Hubbards Hill	37.1	35.9	39.7	40.2	40.3	40.7	43.0	43.0	45.7	44.7
57	Invicta Road/Cavour Rd Sheppey	17.1	27.3	17.0	29.9	17.0	29.8	17.0	29.8	17.8	27.9
58	Western Link Road/Bysing Wood Road	32.3	33.0	41.6	41.8	40.4	41.9	41.7	40.7	58.1	44.6
59	Cavour Road/Alma Road Sheppey	15.9	28.9	7.1	33.0	7.3	32.3	7.1	32.5	7.8	27.2
60	Minster Road/Back Lane Sheppey	34.9	17.7	50.7	23.0	54.0	23.2	60.0	26.7	66.2	25.4
61	Barton Hill Drive/Plover Road	44.5	29.1	53.9	51.3	53.7	51.1	42.2	48.3	37.7	43.6
62	Chequers Road/Elm Lane	23.8	19.6	33.6	25.3	33.4	26.0	37.4	29.1	43.7	27.7
63	A250/Queenborough Road	32.8	31.4	38.0	44.8	35.0	46.3	42.0	42.7	65.7	48.6
64	M2J5 on-slip NB	75.1	93.5	78.0	86.9	77.1	89.0	83.4	89.2	82.5	91.2
65	A2/Sandford Road	54.2	64.8	59.2	63.2	59.4	63.2	61.2	61.3	63.8	61.0
66	A2/Staplehurst Road	60.8	45.6	74.3	45.4	76.0	45.4	74.3	47.3	96.9	60.9
67	Staplehurst Road/Gadby Road	27.9	12.5	26.5	12.4	28.0	12.1	26.8	12.6	33.7	13.6
68	Chequers Road/East Church Road	23.7	20.1	33.4	25.9	33.3	26.6	37.3	29.8	43.6	28.4
69	A2/Panteny Road	37.4	39.0	52.7	77.7	71.1	86.7	59.5	84.8	100.7	106.9

70	A2/Lynsted Lane	43.2	46.2	45.5	40.3	45.3	51.8	44.5	52.0	71.8	99.8
71	Whitstable Road/Head Hill	78.2	48.0	77.1	60.5	101.0	70.6	83.6	62.8	175.0	118.1
72	A2/Love Lane	35.9	51.1	62.2	54.3	63.5	59.4	58.1	61.8	96.0	99.8
73	Church Street/Connecting Road	30.8	21.3	33.1	28.5	33.7	32.2	34.4	31.3	44.0	66.7
74	The Crescent/Conyer Road	10.4	9.5	10.7	10.3	13.7	11.4	10.8	11.1	19.5	15.2
75	Western Link/Bysing Wood Road W	21.5	19.7	18.5	18.6	17.2	18.6	18.6	17.7	69.7	22.0
76	A2/Lewson Street	34.2	37.5	44.4	58.8	56.8	86.4	46.5	67.3	79.0	108.3
77	Tonge Road/Church Road	58.9	40.3	84.9	45.8	100.3	51.0	90.3	52.1	101.2	91.1
78	Castle Road/Dolphin Road	50.3	69.6	66.8	83.7	83.0	91.9	71.8	92.0	104.6	102.6
79	Eurolink Way/Milton Road	90.8	83.9	88.9	87.9	89.7	87.8	88.8	86.8	94.7	88.9
80	Park Road/Albany Road	54.4	57.3	70.7	63.1	78.8	65.3	78.9	65.6	80.5	76.1
81	Sheppey Way/Old Ferry Road	19.1	35.4	23.2	39.1	26.3	39.8	26.4	48.0	39.4	50.8
82	A249/S Green	89.5	72.7	57.9	86.0	58.0	87.6	62.2	88.4	62.5	89.1
83	A20 Ashford Road/ Faversham Road	68.1	72.7	98.0	78.8	95.9	80.7	98.8	91.7	103.6	99.9
84	A2/Rook Lane	42.4	44.2	42.1	55.1	44.9	55.7	47.5	57.4	54.8	52.9
85	A2/Bull Lane	41.3	40.7	40.0	52.6	42.7	56.5	45.0	58.1	53.1	61.3



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