Technical Note A

Project:	Wisbech Area Transport Study	**To:**	CCC/FDC/AECOM
Subject:	Forecasting Results	**From:**	Atkins
Date:	24th November 2009	**cc:**	

1. Introduction

This technical note summarises the contents of Technical Note B "Analysis of Future Year Assignments", which looked at the effects of a number of Local Development Framework options known as tests 1, 2, 3 and 5, as well as a Do-Minimum case.

The tests were undertaken for a range of future years inline with the current structure plan looking at 2016, 2021 and 2026, based on a 2008 validated base model.

2. Do-Minimum

The results from each forecast year and time period vary in terms of the level of congestion, delay and overall journey time in and around Wisbech, therefore in each case the greatest value has been taken from the AM, IP and PM hours.

The table below summarises the key SATURN statistics as set out in paragraph 2.2 of Technical Note B and repeated here for clarity.

- Transient Queues (in PCU hours) – For example, at traffic signals the transient queue corresponds to the queue that develops during the red phase and then dissipates during the subsequent green phase.
- Over-Capacity Queues (in PCU hours) – These occur only for turning movements in excess of capacity where a permanent queue builds up which in unable to clear in a single cycle.
- Link Cruise Time (in PCU hours) – This is the time spent travelling on links within the model, as distinct from time spent in queues at junctions.
- Total Travel Time (in PCU hours) – This is the sum of Transient Queue time, Over-Capacity Queue time and Link Cruise time.
- Total Distance (in km) – This is the total distance travelled by all vehicles in the network.
- Average Speed (in kph) – This is the average speed of vehicles in the network. (It is simply the Total Distance divided by the Total Travel Time).
- Average Trip Time (in PCU hours) – This is the average length of time taken for each trip. (It is calculated as the Total Travel Time divided by the number of trips.)
- Average Trip Distance (in km) – This is the average distance covered by each trip. (It is calculated as the Total Distance divided by the number of trips.)

Table 1 – Summary of Do-Minimum SATURN Statistics

Indicator	2008	2016	2021	2026
Transient Queues (PCU hrs)	317.8	564.6	597.0	660.5
Over-Capacity Queues (PCU hrs)	20.1	277.1	346.0	492.8
Link Cruise Time (PCU hrs)	1581.6	1944.4	1951.8	2032.8
Total Travel Time (PCU hrs)	1902.8	2786.1	2894.9	3186.2
Total Distance (km)	100951.0	120362.7	120351.5	124231.6
Average Speed (kph)	55.3	47.7	45.6	43.0
Average Trip Time (PCU hrs)	0.169	0.200	0.207	0.218
Average Trip Distance (km)	8.943	8.690	8.875	8.787

The SATURN summary statistics from Table 1 clearly show that as demand increases on the Do-Minimum network from the 2008 base to the forecast years, the level of congestion and delay increases over time as expected. This is reflected in the increase of the Total Travel Time, Transient and Over-Capacity queues, along with the decrease in Average Speed across the network from 55.3 kph in 2008 to 43 kph in 2026.

Key Junctions:

Key junctions within the study area have been identified and have been monitored in terms of delays and flows to provide an indication of the stress at each junction under each scenario. The ten key junctions are set out in paragraph 2.3 of Technical Note 17, but are repeated here for convenience.

- A47/A141 Roundabout
- A47 / B198 Cromwell Road Roundabout
- A47 / A1101 Elm High Road Roundabout
- A47 / B198 Lynn Road Roundabout
- A1101 Leverington Road / B1169 Dowgate Road traffic signals
- Town Bridge traffic signals
- Freedom Bridge Roundabout
- B198 Lynn Road / Mount Pleasant Road traffic signals
- A1101 Elm High Road / Ramnoth Road traffic signals
- B198 Cromwell Road / Weasenham Lane junction.

Table 2 – Summary of Do-Minimum Key Junction Delay and Flow

Junction		2008	2016	2021	2026
A47 / A141 rnd'bt	Delay	17	20	19	20
	Flow	2757	3204	3133	3223
A47 / B198 Cromwell Road rnd'bt	Delay	19	104	107	134
	Flow	2496	2999	2969	3016
A47 A1101 Elm High Road rnd'bt	Delay	20	101	107	136
	Flow	2894	3517	3441	3468
A47 / B198 Lynn Road rnd'bt	Delay	16	16	16	17
	Flow	2201	2627	2585	2625
A1101 Leverington Road / B1169 Dowgate Road traffic signals	Delay	40	51	86	132
	Flow	1351	1661	1714	1778
Town Bridge Traffic signals	Delay	98	85	91	109
	Flow	1516	1761	1769	1791
Freedom Bridge rnd'bt	Delay	22	34	35	53
	Flow	3128	3480	3544	3661
B198 Lynn Road / Mount Pleasant Road traffic signals	Delay	39	39	42	53
	Flow	1664	1761	1785	1829
A1101 Elm High Road / Ramnoth Road traffic signals	Delay	65	67	73	82
	Flow	1848	2319	2403	2508
B198 Cromwell Road / Weasenham Lane junction	Delay	5	213	232	273
	Flow	1459	1741	1777	1801

In addition to the junctions in Table 2, the Do-Minimum network also experiences congestion at the following junctions:

- A47 / B1187 Gull Road junction near Guyhirn and
- A47 / Broad End Road junction.

As in Table 1 with increased demand across the Do-Minimum network the increase in Transient and Over-Capacity queues is evident in Table 2, particularly at the junction of B198 Cromwell Road / Weasenham Lane junction, the A47 / B198 Cromwell Road roundabout and A47 / A1101 Elm High Road Roundabout.

Conclusion: The Do-Minimum test is the reference case against which each of the tests have been compared in the Forecasting Report. The Do-Minimum test does not include any additional infrastructure other than minor junction changes that are proposed in the future years. As such with the additional demand from both background growth and other proposed developments excluding the LDF allocations the results compared to the existing 2008 base year are as expected.

3. Test 1 (with Infrastructure)

Table 3 – Summary of Test 1 SATURN Statistics

Indicator	2008	2016	2021	2026
Transient Queues (PCU hrs)	317.8	470.4	541.6	672.0
Over-Capacity Queues (PCU hrs)	20.1	222.0	311.5	472.1
Link Cruise Time (PCU hrs)	1581.6	1968.6	2037.8	2195.6
Total Travel Time (PCU hrs)	1902.8	2660.9	2890.8	3339.7
Total Distance (km)	100951.0	121909.3	125112.5	133225.2
Average Speed (kph)	55.3	49.2	46.5	43.9
Average Trip Time (PCU hrs)	0.169	0.191	0.196	0.207
Average Trip Distance (km)	8.943	8.731	8.726	8.561

The SATURN summary statistics from Table 3 as with Table 1 show that as demand increases on the Test 1 network from the 2008 base to the forecast years, the level of congestion and delay increases over time as expected. This is reflected in the increase of the Total Travel Time, Transient and Over-Capacity queues. However the increases are reduced or similar when compared to the Do-Minimum network.

The provision of a Western Relief Road in Test 1 to support the proposed LDF allocation of 2000 dwellings also provides some relief to B198 Cromwell Road, the A47 in a westbound direction and A1101 Elm High Road. There also appears to be some reduction on the minor roads between the outlying villages. This could be due to traffic avoiding the congested A1101 and B198 in the Do-Minimum.

Table 4 – Summary of Test 1 Key Junction Delay and Flow

Junction		2008	2016	2021	2026
A47 / A141 rnd'bt	Delay	17	20	21	26
	Flow	2757	3266	3202	3292
A47 / B198 Cromwell Road rnd'bt	Delay	19	141	180	243
	Flow	2496	3504	3575	3705
A47 A1101 Elm High Road rnd'bt	Delay	20	63	91	146
	Flow	2894	3450	3408	3459
A47 / B198 Lynn Road rnd'bt	Delay	16	17	17	17
	Flow	2201	2658	2688	2764
A1101 Leverington Road / B1169 Dowgate Road traffic signals	Delay	40	36	40	45
	Flow	1351	1357	1403	1463
Town Bridge Traffic signals	Delay	98	69	81	115
	Flow	1516	1533	1595	1652
Freedom Bridge rnd'bt	Delay	22	22	26	46
	Flow	3128	3322	3595	3890
B198 Lynn Road / Mount Pleasant Road traffic signals	Delay	39	43	50	89
	Flow	1664	1849	1925	2058
A1101 Elm High Road / Ramnoth Road traffic signals	Delay	65	62	70	80
	Flow	1848	2012	2177	2317
B198 Cromwell Road / Weasenham Lane junction	Delay	5	196	244	310
	Flow	1459	1601	1673	1718

Table 4 summarises the delay and traffic flows at the key junctions within the study area and as with the Do-Minimum network these junctions experience increased delay over time. However, the A1101 Leverington Road / B1169 Dowgate Road Traffic signals experience far less delay in test 1 than in the DM, there is also reduced delay at the A1101 Elm High Road, Town Bridge and freedom bridge. The reduced delay at these junctions is a reflection of the relief being provided to the central corridors within Wisbech.

Conversely the attractiveness of the Western relief Road results in increased traffic flows and delays at the A47 / B198 Cromwell Road roundabout.

Conclusion: The provision of a western relief Road assists in allowing the LDF allocation to have a reduced level of impact on the overall network, and also provides relief to one of the main corridors into and out of Wisbech, namely B198 Cromwell Road, which will become under severe pressure due to other proposed developments within the corridor. It also provides some relief to the A1101 corridor and therefore leads to reduced traffic flows in the centre of Wisbech.

4. Test 1 (No Infrastructure)

Table 5 – Summary of Test 1 SATURN Statistics

Indicator	2008	2016	2021	2026
Transient Queues (PCU hrs)	317.8	580.2	686.0	780.2
Over-Capacity Queues (PCU hrs)	20.1	306.0	499.0	845.1
Link Cruise Time (PCU hrs)	1581.6	1957.8	2016.1	2147.4
Total Travel Time (PCU hrs)	1902.8	2844.0	3201.1	3772.7
Total Distance (km)	100951.0	121007.1	123378.3	129607.2
Average Speed (kph)	55.3	47.3	42.9	38.4
Average Trip Time (PCU hrs)	0.169	0.204	0.217	0.234
Average Trip Distance (km)	8.943	8.753	8.681	8.378

The SATURN summary statistics from Table 5 show that as demand increases on the Test 1 network with no infrastructure, i.e. no Western Relief Road, the combined effects of background growth and LDF allocation results in the level of congestion and delay increasing significantly. This is reflected in the Transient and Over-Capacity queues, which by 2026 result in higher values than in the Do-Minimum network.

Table 6 – Summary of Test 1 Key Junction Delay and Flow

Junction		2008	2016	2021	2026
A47 / A141 rnd'bt	Delay	17	20	19	20
	Flow	2757	3205	3149	3212
A47 / B198 Cromwell Road rnd'bt	Delay	19	107	122	161
	Flow	2496	3000	2971	3008
A47 A1101 Elm High Road rnd'bt	Delay	20	105	129	185
	Flow	2894	3517	3453	3454
A47 / B198 Lynn Road rnd'bt	Delay	16	16	17	17
	Flow	2201	2637	2650	2748
A1101 Leverington Road / B1169 Dowgate Road traffic signals	Delay	40	62	176	487
	Flow	1351	1671	1773	1704
Town Bridge Traffic signals	Delay	98	86	99	122
	Flow	1516	1797	1802	1798
Freedom Bridge rnd'bt	Delay	22	35	52	86
	Flow	3128	3528	3748	3910
B198 Lynn Road / Mount Pleasant Road traffic signals	Delay	39	39	70	80
	Flow	1664	1786	1850	1907
A1101 Elm High Road / Ramnoth Road traffic signals	Delay	65	69	82	98
	Flow	1848	2361	2479	2589
B198 Cromwell Road / Weasenham Lane junction	Delay	5	227	251	278
	Flow	1459	1745	1779	1794

Table 6 summarises the delay and traffic flows at the key junctions within the study area and as with the Do-Minimum network these junctions experience increased delay over time. However, the A1101 Leverington Road / B1169 Dowgate Road Traffic signals experience a greater delay than in test 1 or the Do-Minimum, this is also true for A47 / Elm High Road roundabout and Town Bridge.

Conclusion: The overall SATURN statistics indicate that the Test 1 No Infrastructure will contribute to increased delay and congestion over both the Do-Minimum and Test 1, highlighting the requirement to provide some form of infrastructure to support the LDF allocation if the network performance in Wisbech is to be maintained at Do-Minimum levels of operation.

5. Test 2 (with Infrastructure)

Table 7 – Summary of Test 2 SATURN Statistics

Indicator	2008	2016	2021	2026
Transient Queues (PCU hrs)	317.8	525.4	602.7	710.8
Over-Capacity Queues (PCU hrs)	20.1	266.0	391.6	602.0
Link Cruise Time (PCU hrs)	1581.6	1950.3	2016.9	2175.7
Total Travel Time (PCU hrs)	1902.8	2741.8	3011.2	3488.5
Total Distance (km)	100951.0	121958.6	125019.7	133050.1
Average Speed (kph)	55.3	48.0	44.7	41.4
Average Trip Time (PCU hrs)	0.169	0.196	0.204	0.218
Average Trip Distance (km)	8.943	8.766	8.473	8.533

The SATURN summary statistics from Table 7 as with Table 1 show that as demand increases on the Test 2 network from the 2008 base to the forecast years, the level of congestion and delay increases over time as expected. This is reflected in the increase of the Total Travel Time, Transient and Over-Capacity queues.

Test 2 consists of the same level of development as in Test 1 of 2000 dwellings but a reduced level of employment of 21 acres compared to that of 100 acres in Test 1, to support the proposed LDF allocation additional infrastructure in the form of a Northern Relief Road is provided.

The provision of a Northern Relief Road has a similar effect on the centre of Wisbech as the Western Relief Road, in that North/South trips are removed from the A1101 corridor. However, unlike Test 1 it does not provide as much relief to the minor roads linking the outlying villages.

Table 8 – Summary of Test 2 Key Junction Delay and Flow

Junction		2008	2016	2021	2026
A47 / A141 rnd'bt	Delay	17	20	19	20
	Flow	2757	3199	3136	3254
A47 / B198 Cromwell Road rnd'bt	Delay	19	93	107	133
	Flow	2496	3004	2981	3051
A47 A1101 Elm High Road rnd'bt	Delay	20	95	127	179
	Flow	2894	3565	3493	3498
A47 / B198 Lynn Road rnd'bt	Delay	16	17	17	18
	Flow	2201	2748	2782	3022
A1101 Leverington Road / B1169 Dowgate Road traffic signals	Delay	40	55	90	179
	Flow	1351	1656	1733	1742
Town Bridge Traffic signals	Delay	98	87	113	139
	Flow	1516	1732	1815	1803
Freedom Bridge rnd'bt	Delay	22	25	32	52
	Flow	3128	3299	3422	3610
B198 Lynn Road / Mount Pleasant Road traffic signals	Delay	39	30	34	36
	Flow	1664	1540	1610	1581
A1101 Elm High Road / Ramnoth Road traffic signals	Delay	65	65	78	93
	Flow	1848	2332	2477	2554
B198 Cromwell Road / Weasenham Lane junction	Delay	5	222	261	315
	Flow	1459	1710	1798	1811

Table 8 summarises the delay and traffic flows at the key junctions within the study area and as with the Do-Minimum network these junctions experience increased delay over time. The level of delay at the key junctions is similar to that within the Do-Minimum for the forecast years 2016 and 2021, but the level of delay in 2026 is greater in the majority of cases than that of the Do-Minimum.

Conclusion: Although Test 2 appears to provide adequate infrastructure to support the LDF allocation up to 2021, by 2026 the network is becoming congested with delays occurring that are greater than in the Do-Minimum case. Therefore one has to question whether the Northern Relief Road infrastructure is in a suitable location to allow the LDF allocation to be provided without having a detrimental impact on Wisbech.

6. Test 2 (No Infrastructure)

Table 9 – Summary of Test 2 SATURN Statistics

Indicator	2008	2016	2021	2026
Transient Queues (PCU hrs)	317.8	580.4	672.9	779.1
Over-Capacity Queues (PCU hrs)	20.1	305.9	492.6	842.3
Link Cruise Time (PCU hrs)	1581.6	1958.2	2015.8	2144.2
Total Travel Time (PCU hrs)	1902.8	2844.2	3181.3	3765.5
Total Distance (km)	100951.0	121020.3	123359.5	1294802.2
Average Speed (kph)	55.3	47.4	43.0	38.5
Average Trip Time (PCU hrs)	0.169	0.204	0.216	0.234
Average Trip Distance (km)	8.943	8.752	8.681	8.371

The SATURN summary statistics from Table 9 as with Table 1 show that as demand increases on the Test 2 network with no infrastructure the level of congestion and delay increases over time as expected. This is reflected in the increase of the Total Travel Time, Transient and Over-Capacity queues.

Test 2 without the Northern Relief Road, performs in a similar way to Test 2 with the Northern Relief Road until 2026, at which point the reduced infrastructure is having a negative effect on the overall Average Speed across the network and produces similar results to Test 1 with no infrastructure.

Without the provision of a Northern Relief Road the relief seen to the centre of Wisbech with the Northern Relief Road is not evident, with reduced level of decreased traffic flows.

Table 10 – Summary of Test 2 Key Junction Delay and Flow

Junction		2008	2016	2021	2026
A47 / A141 rnd'bt	Delay	17	20	19	20
	Flow	2757	3206	3149	3242
A47 / B198 Cromwell Road rnd'bt	Delay	19	106	124	162
	Flow	2496	3005	2972	3009
A47 A1101 Elm High Road rnd'bt	Delay	20	106	131	187
	Flow	2894	3522	3453	3458
A47 / B198 Lynn Road rnd'bt	Delay	16	16	17	17
	Flow	2201	2636	2650	2748
A1101 Leverington Road / B1169 Dowgate Road traffic signals	Delay	40	54	169	489
	Flow	1351	1671	1777	1706
Town Bridge Traffic signals	Delay	98	89	103	127
	Flow	1516	1764	1797	1828
Freedom Bridge rnd'bt	Delay	22	33	50	88
	Flow	3128	3520	3753	3912
B198 Lynn Road / Mount Pleasant Road traffic signals	Delay	39	39	72	76
	Flow	1664	1775	1832	1905
A1101 Elm High Road / Ramnoth Road traffic signals	Delay	65	70	83	98
	Flow	1848	2373	2484	2586
B198 Cromwell Road / Weasenham Lane junction	Delay	5	230	251	275
	Flow	1459	1689	1745	1797

Table 10 summarises the delay and traffic flows at the key junctions within the study area and as with the Do-Minimum network these junctions experience increased delay over time. When compared to Test 2 with the provision of the Northern Relief Road the junctions of A47 / Cromwell Road roundabout, A1101 Leverington Road / B1169 Dowgate Road traffic signals, Freedom Bridge roundabout and B198 Lynn Road / Mount Pleasant Road traffic signals all suffer from increased delays, particularly by 2026.

Conclusion: The overall SATURN statistics indicate that the Test 2 No Infrastructure will contribute to increased delay and congestion over both the Do-Minimum and Test 2, highlighting the requirement to provide some form of infrastructure to support the LDF allocation if the network performance in Wisbech is to be maintained at Do-Minimum levels of operation or better.

7. Test 3 (with Infrastructure)

Table 11 – Summary of Test 3 SATURN Statistics

Indicator	2008	2016	2021	2026
Transient Queues (PCU hrs)	317.8	582.6	669.0	772.0
Over-Capacity Queues (PCU hrs)	20.1	302.4	492.8	838.2
Link Cruise Time (PCU hrs)	1581.6	1962.4	2019.6	2150.9
Total Travel Time (PCU hrs)	1902.8	2847.4	3181.4	3761.1
Total Distance (km)	100951.0	121289.1	123606.9	129886.1
Average Speed (kph)	55.3	47.5	43.1	38.5
Average Trip Time (PCU hrs)	0.169	0.204	0.216	0.234
Average Trip Distance (km)	8.943	8.761	8.691	8.382

The SATURN summary statistics from Table 11 as with Table 1 show that as demand increases on the Test 2 network from the 2008 base to the forecast years, the level of congestion and delay increases over time as expected. This is reflected in the increase of the Total Travel Time, Transient and Over-Capacity queues.

Test 3 consists of the same level of residential development as in Test 1 and 2 of 2000 dwellings and the same level of employment of 21 as in Test 2. To support the proposed LDF allocation, additional infrastructure in the form of a Northern Local Road is provided.

Test 3 with the provision of a Northern Local Road does not provide the relief to the centre of Wisbech in a similar way as Tests 1 and 2. This is reflected in the overall summary statistics where the average speeds are reduced when compared to Tests 1 and 2, as are the Transient and Over-capacity Queues.

Table 12– Summary of Test 3 Key Junction Delay and Flow

Junction		2008	2016	2021	2026
A47 / A141 rnd'bt	Delay	17	20	19	20
	Flow	2757	3208	3149	3245
A47 / B198 Cromwell Road rnd'bt	Delay	19	106	125	160
	Flow	2496	3008	2972	3016
A47 A1101 Elm High Road rnd'bt	Delay	20	106	132	187
	Flow	2894	3535	3458	3460
A47 / B198 Lynn Road rnd'bt	Delay	16	16	17	17
	Flow	2201	2644	2652	2762
A1101 Leverington Road / B1169 Dowgate Road traffic signals	Delay	40	55	169	491
	Flow	1351	1674	1776	1706
Town Bridge Traffic signals	Delay	98	88	101	122
	Flow	1516	1769	1811	1827
Freedom Bridge rnd'bt	Delay	22	34	51	83
	Flow	3128	3509	3745	3903
B198 Lynn Road / Mount Pleasant Road traffic signals	Delay	39	40	61	73
	Flow	1664	1748	1820	1866
A1101 Elm High Road / Ramnoth Road traffic signals	Delay	65	73	81	97
	Flow	1848	2354	2482	2591
B198 Cromwell Road / Weasenham Lane junction	Delay	5	230	250	281
	Flow	1459	1705	1747	1794

Table 12 summarises the delay and traffic flows at the key junctions within the study area and as with the Do-Minimum network these junctions experience increased delay over time. The level of delay at the key junctions in Test 3 when compared to all the other tests shows an increase at all junctions across all years, with the exception of the A47 / A141 roundabout and the A47 / B198 Lynn Road roundabout.

Conclusion: Test 3 does not provide the relief to the centre of Wisbech as with Tests 1 and 2, and in fact has increased levels of delay at the majority of the key junctions. The Northern Local Road infrastructure does not appear to be providing the same level of relief as either the Western Relief Road or the Northern Relief Road, or providing improved network operation.

8. Test 3 (No Infrastructure)

Table 13 – Summary of Test 3 SATURN Statistics

Indicator	2008	2016	2021	2026
Transient Queues (PCU hrs)	317.8	580.4	671.4	774.2
Over-Capacity Queues (PCU hrs)	20.1	304.5	493.1	848.3
Link Cruise Time (PCU hrs)	1581.6	1959.2	2016.0	2143.0
Total Travel Time (PCU hrs)	1902.8	2844.1	3180.5	3765.5
Total Distance (km)	100951.0	121051.9	123345.1	129386.4
Average Speed (kph)	55.3	47.4	43.1	38.5
Average Trip Time (PCU hrs)	0.169	0.204	0.216	0.234
Average Trip Distance (km)	8.943	8.751	8.681	8.369

The SATURN summary statistics from Table 13 as with Table 1 show that as demand increases on the Test 3 network with no infrastructure the level of congestion and delay increases over time as expected. This is reflected in the increase of the Total Travel Time, Transient and Over-Capacity queues.

Test 3 without the Northern Local Road, performs very closely to Test 3 with the Northern Local Road provided. This is reflected in the similarity between the overall summary statistics of each test.

Table 14 – Summary of Test 3 Key Junction Delay and Flow

Junction		2008	2016	2021	2026
A47 / A141 rnd'bt	Delay	17	20	19	20
	Flow	2757	3207	3149	3246
A47 / B198 Cromwell Road rnd'bt	Delay	19	107	126	162
	Flow	2496	3004	2971	3013
A47 A1101 Elm High Road rnd'bt	Delay	20	106	129	186
	Flow	2894	3527	3452	3456
A47 / B198 Lynn Road rnd'bt	Delay	16	16	17	17
	Flow	2201	2634	2648	2747
A1101 Leverington Road / B1169 Dowgate Road traffic signals	Delay	40	55	166	489
	Flow	1351	1673	1778	1705
Town Bridge Traffic signals	Delay	98	86	100	126
	Flow	1516	1762	1798	1809
Freedom Bridge rnd'bt	Delay	22	35	51	87
	Flow	3128	3515	3754	3902
B198 Lynn Road / Mount Pleasant Road traffic signals	Delay	39	41	70	79
	Flow	1664	1776	1835	1905
A1101 Elm High Road / Ramnoth Road traffic signals	Delay	65	72	83	97
	Flow	1848	2355	2484	2582
B198 Cromwell Road / Weasenham Lane junction	Delay	5	228	251	277
	Flow	1459	1745	1786	1796

Table 14 summarises the delay and traffic flows at the key junctions within the study area and as with the Do-Minimum network these junctions experience increased delay over time. When compared to Test 3 with the provision of the Northern Local Road the levels of delay are very similar in all cases across all years, with only minor differences between the two tests.

Conclusion: The overall SATURN statistics indicate that the Test 3 No Infrastructure performs in a similar manor to Test 3 with the Northern Local Road provided, also the level of delay reported between the two tests are also very similar. This would seem to indicate that the Northern Local Road is in fact not really contributing towards reducing the level of impact of the LDF allocation on the town centre. As already mentioned the level of delay at the key junctions in Test 3 is not as good as Tests 1 and 2 and therefore these tests should be considered a better option in allowing LDF allocation to be accommodated within Wisbech.

9. Test 5 (with Infrastructure)

Table 15 – Summary of Test 5 SATURN Statistics

Indicator	2008	2016	2021	2026
Transient Queues (PCU hrs)	317.8	566.8	657.9	751.1
Over-Capacity Queues (PCU hrs)	20.1	264.2	410.7	669.7
Link Cruise Time (PCU hrs)	1581.6	1952.5	2008.0	2128.7
Total Travel Time (PCU hrs)	1902.8	2783.4	3076.6	3549.6
Total Distance (km)	100951.0	120861.8	123003.0	128656.1
Average Speed (kph)	55.3	48.4	45.0	41.0
Average Trip Time (PCU hrs)	0.169	0.200	0.211	0.226
Average Trip Distance (km)	8.943	8.761	8.774	8.568

The SATURN summary statistics from Table 15 as with Table 1 show that as demand increases on the Test 5 network from the 2008 base to the forecast years, the level of congestion and delay increases over time as expected. This is reflected in the increase of the Total Travel Time, Transient and Over-Capacity queues.

Test 5 consists of 1900 dwellings and 3.7 acres of employment, unlike the previous tests there is no proposals for any additional infrastructure to support the LDF allocation in this test other than access.

The overall performance of the network in Test 5 is not as good as the Do-Minimum, as would be expected with the LDF allocation being applied. The major difference between Test 5 and the other tests, apart form a lack of supporting infrastructure, is the development associated with the LDF is on the Eastern side of Wisbech as opposed to having been on the Western side in all the previous tests. Test 5 performs very similarly to Test 2 (with infrastructure) in terms of overall summary statistics, but not quite as well as Test 1 (with infrastructure).

Table 16 – Summary of Test 5 Key Junction Delay and Flow

Junction		2008	2016	2021	2026
A47 / A141 rnd'bt	Delay	17	20	19	21
	Flow	2757	3203	3154	3254
A47 / B198 Cromwell Road rnd'bt	Delay	19	99	130	173
	Flow	2496	2985	2963	3025
A47 A1101 Elm High Road rnd'bt	Delay	20	99	128	185
	Flow	2894	3506	3454	3444
A47 / B198 Lynn Road rnd'bt	Delay	16	16	17	17
	Flow	2201	2645	2642	2742
A1101 Leverington Road / B1169 Dowgate Road traffic signals	Delay	40	56	127	176
	Flow	1351	1666	1762	1846
Town Bridge Traffic signals	Delay	98	80	83	107
	Flow	1516	1748	1768	1871
Freedom Bridge rnd'bt	Delay	22	33	45	74
	Flow	3128	3526	3692	3813
B198 Lynn Road / Mount Pleasant Road traffic signals	Delay	39	42	44	67
	Flow	1664	1745	1831	1897
A1101 Elm High Road / Ramnoth Road traffic signals	Delay	65	70	89	97
	Flow	1848	2574	2740	2577
B198 Cromwell Road / Weasenham Lane junction	Delay	5	202	247	316
	Flow	1459	1730	1771	1804

Table 16 summarises the delay and traffic flows at the key junctions within the study area and as with the Do-Minimum network these junctions experience increased delay over time. The level of delay at the key junctions in test 5 when compared to the Do-Minimum show an increased level of delay as would be expected. There are improvements to the level of delay in Test 5 to a number of the key junctions in the West when compared to Tests 1 and 2, again this would be expected given the development in Test 5 is located in the East of Wisbech. Conversely the A1101 corridor shows an increase in junction delay due to the effect of the development traffic having to access the network through the A1101 corridor.

Conclusion: Test 5 does not provide the relief to the centre of Wisbech as with Tests 1 and 2, there are also increased traffic flows on the eastern side of Wisbech, reflecting the development traffic accessing the network via existing links and adding to the level of delay on the A1101 corridor.