

# Transport and new development in East Grinstead



## Short Report by MTRU for East Grinstead Town Council



**April 2012**

# **MTRU Short Report on Traffic and Development in East Grinstead**

## **Atkins Report Stage 3**

### **1 Summary**

#### **Overview**

Further work has been undertaken by Atkins to design and test junction improvements in detail, using models for each junction separately, and for a short section of the road network through the town. This is well suited to junction testing and design, less so for identifying network wide impacts.

The base year for comparisons has been updated to 2011. The differences between the original base year of 2006 and 2011, in terms of additional development and traffic, are not currently available.

Committed new development of 765 homes (which includes 100 at Imberhorne) has been used to test the junction designs at a “Design Year” of 2021. Three road options were used:

- 1 planned improvements to Imberhorne Lane/A22 + linked signals (Atkins Do Nothing)
- 2 option 1 above + pedestrian facilities and signals at A22/Lingfield Road junction (Atkins Do Minimum)
- 3 option 2 above + widening (Atkins Do Something)
- 4 option 3 above + an additional 190 homes (Atkins Do Something Sensitivity Test)

Looking at the individually modelled junction results, in Option 1 congestion is clearly worse compared to today. In Option 2 some junctions will be less congested than today, some more congested. There is a particularly bad and unusual result at Moat Road which needs further investigation. In Option 3 the road widening reduces congestion significantly at the point of widening.

It must be remembered that the junctions are modelled separately for this first test.

In the small network test (VISSIM) the results are less definitive, showing directional differences which reflect the fact this is for the am peak, but still a lower impact overall, particularly for the major Do Something option. This is entirely logical, since the network wide effects, such as moving a queue from one junction to the next, will begin to show up. It must be remembered that individual junction modelling is important for testing and designing individual junction improvements, but less able by definition to identify impacts across the whole network.

It is also the case that the scale of intervention in the Atkins Do Something is sufficient to cause changes in the level of traffic itself (generated traffic) beyond that from new development. Having discussed this with the County it is clear that traffic growth in the corridor had stabilised even before the recession and this means that significant new capacity such as that in the Do Something would run the risk of recommencing background traffic growth (specifically excluded in this study).

This would have to be considered in any full network modelling to identify the totality of the traffic effects from new development.

This could also cover the new development traffic which, it is assumed in this modelling exercise, will not use the East Grinstead junctions (17%).

It is worth saying that the theoretical capacity of a junction is almost impossible to achieve because congestion will normally start at about 85% of theoretical and, as it rises, it increasingly interferes with the perfect operation assumed for 100%. Broadly speaking the congestion starting point is between 80% and 90% depending on junction specific factors. Atkins have used a “practical capacity” of 90%, whereas this report uses 85% as a congestion point. The conclusions are not significantly affected by this difference.

This report bases its conclusions on the am peak analysis, which is analysed in detail in the later sections.

### ***Conclusions and Recommendations***

- 1 The level of committed development in the area at 765 homes should be considered as an absolute maximum for the foreseeable future. Even with the additional junction improvements (Atkins Do Minimum) congestion overall is predicted to be as high as today, and almost certainly higher than when the strategy baseline was set in 2006.
- 2 Thus the additional junction improvements within highway boundaries should be implemented in order to create enough space for the committed development.
- 3 The additional capacity increases (widening) in the Atkins Do Something reduce congestion in more places than they increase it compared to today, but there is still congestion at 6 of the 12 junctions, even when tested on an individual basis.
- 4 The test for an additional 190 homes, plus the junction widening (Atkins Do Something Sensitivity Test) shows that congestion is still present at the junctions (5 out of 12), although some of the results are odd, with lower congestion despite more traffic. The reason for this needs to be clarified.
- 5 Sustainable measures should be applied to the new development as far as possible to reduce the significant congestion that will result.
- 6 Sustainable measures are likely to be needed more generally in the area in order to help to prevent any resumption of background traffic growth (such growth was specifically excluded from the Atkins study). It is not correct to assume that they would make space for more development in traffic terms.
- 7 The larger scale capacity increases in the Atkins Do Something are likely to cost in excess of the sum estimated because there are various items not yet included, and there are uncertainties over land acquisition.
- 8 These further capacity increases also run the risk of being absorbed at least in part by allowing a resumption of background growth. They would conflict with policies to encourage less car use through sustainable alternatives.

## **2 Options considered in the latest report**

### **Options considered: development**

In the 2009 MTRU report the analysis set out how much development was being considered, and how it would affect traffic conditions. It pointed out that separating out different developments and using the road space from any junction improvements or sustainable transport schemes to cater for traffic twice over (as appeared to be the case) would be a simple case of double counting.

In the EGTC report to the Three Tiers Meeting on 10<sup>th</sup> February 2009<sup>1</sup>, up to 2050 homes were anticipated across the town between 2006 and 2026. The junction improvements could absorb the extra traffic from about a third of these. This figure was based on Atkins and MTRU work which was pretty much consistent.

Thus Atkins 2009 report said that 570 homes at Imberhorne could be accommodated if junctions were improved. MTRU simply made the point that if the 2050 went ahead as planned, the extra road space from these improvements would be more than used up for them. To avoid increasing congestion it would be necessary for town centre developments to have managed or limited car availability (for example car clubs and low levels of new residential parking spaces).

Since 2006 homes will have been completed and thus traffic conditions may have changed since the baseline used for all the 2009 reports. It is understood from the County that Mid Sussex are not able to provide figures for this. The new modelling work takes it base year as 2011. All comments in this report refer to this as the base for comparison.

Obviously these moving targets make it difficult to anchor our assessment of whether traffic conditions will be better or worse for the different packages of development and road network changes. In order to do so this note has pulled together some of the Atkins work in order to draw some clear conclusions. The Atkins report itself in its draft form is not completely clear and we have had the benefit of discussing the draft with the County so that we can present the findings compared to the present day, rather than theoretical future conditions.

The position is that Mid Sussex identified 617 homes as committed new development in East Grinstead from 2011 to 2021, but this did not include the recently approved 100 homes at Imberhorne. These were added to the 617, and together with small site commitments create a total of 765 homes committed. These 765 are included in all the Atkins modelling work for 2021. One option was considered with an additional 190 homes.

### **Options considered: road network**

Atkins have produced an option which they call "Do Nothing", plus a Do Minimum and Do Something. This is confusing because the Do Nothing has two junction improvements, the A22/Imberhorne improvement (associated with Bridge Park) and some computer linking of these signals (associated with the Crest Nicholson development). By convention this should have been the Do Minimum, with two options for further road network changes. The Atkins Do Minimum contains

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<sup>1</sup> *The Way Forward for East Grinstead*, EGTC responding to the Mid Sussex Core Strategy

further junction improvements within existing highway boundaries, the Do Something contains some significant road widening to increase capacity further.

Apart from signals at Moat Road, the Atkins Do Something is basically the same as the Do Minimum, but with widening. The Do Minimum is basically the Do Nothing but with pedestrian facilities and signals at A22/Lingfield Road junction.

This is set out in the following table reproduced from Atkins.

**Table 27. Highway Network Changes: Summary Comparison of Scenarios**

Location	Street Network Changes	DN	DM	DS
<b>Felbridge Junction</b>	Pedestrian crossing enhancements	x	✓	✓
	Widening	x	x	✓
<b>A22 London Road / Imberhorne Lane</b>	Bridge Park Development Improvements	✓	✓	✓
<b>A22 London Road / Lingfield Road</b>	Pedestrian Crossing enhancements	x	✓	✓
	Widening	x	x	✓
	Signalisation	x	✓	✓
<b>A22 London Road / A22 Station Road</b>	Signalisation	x	x	x
	Widening	x	x	x
<b>A22 London Road / A264 Moat Road</b>	Signalisation	x	x	✓
	Widening	x	x	✓

The costs of the Do Nothing (DN) are already committed from development.

The costs of the Do Minimum (DM) are estimated at £900,000.

The costs of the Do Something (DS) are estimated at £2,850,000.

### **3      *New modelling work***

MTRU summarised the extensive modelling and forecasting work undertaken in the area in its 2009 report. This included an analysis of the data in the Atkins Stage 2 study. There is now a Stage 3 report available which has undertaken more modelling, this time at a very local level, mainly using isolated junction models. Previous studies looked at a wider area of impact using network models. Some are best for signal controlled junctions (such as LinSig – used here) and some better for roundabouts (such as ARCADY and PICADY – used in this case).

Modelling junctions individually is most appropriate when designing and assessing the detailed layouts being considered. In order to take a slightly broader perspective, a small scale network model (VISSIM) was used to look at journey times on the A22 through the town centre. It does not include wider network effects, nor risk of generated traffic over and above that from the new development.

Thus it is important to say that the wider impacts of the new development are not included in these very detailed models.

Atkins present the results of the isolated junction modelling and the small network separately and the two show slightly different pictures of the changes in congestion.

#### ***Results from the new modelling***

There are a range of different results covering queue lengths, delay time, and a measure of how far traffic flow matches the capacity of the junctions. This is often referred to as “Degree of Saturation” (DoS). Allowing for variations between sites, a 100 match between flow and theoretical capacity will always result in congestion. Thus the practical maximum capacity is reached at around 90%. Congestion occurs well below this figure and anything over 80 is a cause for concern.

In order to give a clear picture of how conditions would change compared to today, the following tables and charts have combined Atkins data. They are use am peak figures and one of the measures (DoS).

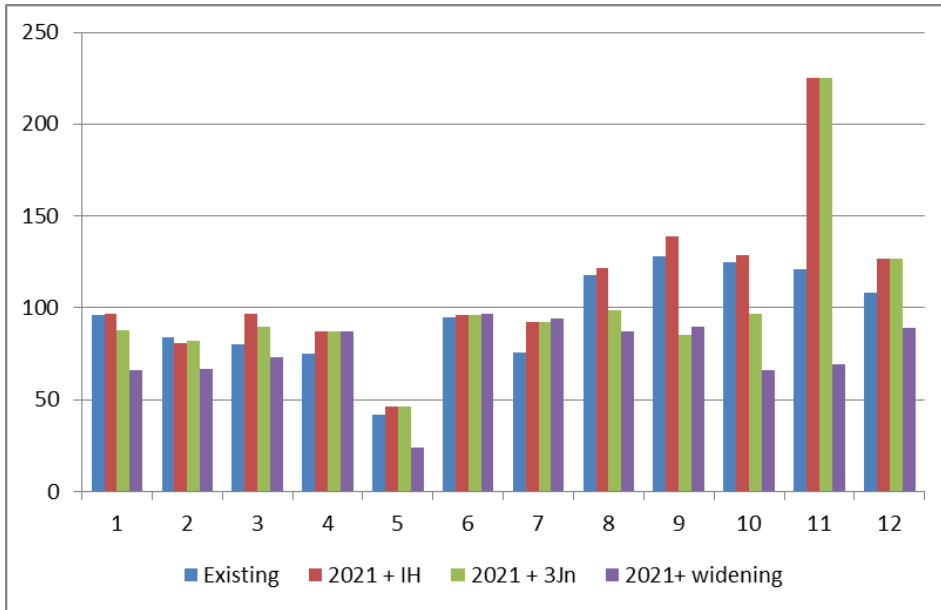
The broad picture shown in Table 1 and Chart 1 below is one in line with previous analyses. Even with the junction improvements currently planned, the 765 homes results in a deterioration in congestion, sometimes quite serious. If further improvements are made, within the highway limits, some junctions will be less congested than today, some more congested. There is a particularly bad and unusual result at Moat Road which needs further investigation. The road widening options reduce congestion at the point of widening. It must be remembered that the junctions are modelled separately for this first test.

**Table 1: Results from separate junction modelling (LinSig, ARCADY, PICADY) am peak**

Degree of Saturation at 12 locations Source: Atkins Tables			Degree of Saturation (100=theoretical maximum; >85=congestion occurs)				
			Existing	Do N	Do M	Do S	DoS+ 190
1	A264	Copthorne Rd	96	97	88	66	67
2	A22	Eastbourne Rd (N)	84	81	82	67	68
3	A22	London Rd (S)	80	97	90	73	75
4	A22	London Rd/ Imberhorne Lane	75	87	87	87	84
5	A22	London Rd (N) Ahead	42	46	46	24	24
6	A22	London Rd (N) RT	95	96	96	97	94
7	A22	London Rd (S)	76	92	92	94	100
8	A22	London Rd/ Lingfield Rd	118	122	99	87	88
9	A22	London Road (N)	128	139	85	90	93
10	A22	London Road (S)	125	129	97	66	67
11	Moat Road		121	225	225	69	71
12	A22	London Road (N)	108	127	127	89	90

Note: Junction flows 1 to 7 are LinSig, 8 to 10 are ARCADY, 11 & 12 are PICADY  
ARCADY and PICADY use Ratio of Flow to Capacity (RFC) which is equivalent to DoS for LinSig

**Chart 2: Results from separate junction modelling (LinSig, ARCADY, PICADY) am peak**



To simplify this, the following chart compares the present day (2012) with the Do Minimum and shows the 85% congestion point. The latter includes 765.

**Chart 3: Results from separate junction modelling (LinSig, ARCADY, PICADY) am peak**

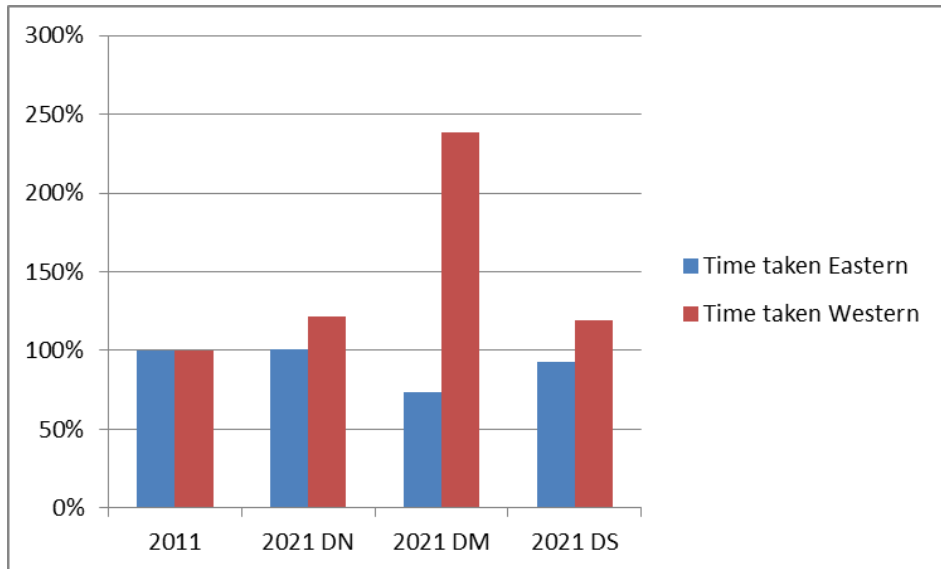




## Annex : VISSIM runs

A chart for the VISSIM modelling shows the same lack of improvement of the Do Nothing over the existing situation. However, the results differ from the pattern in the isolated junction models.

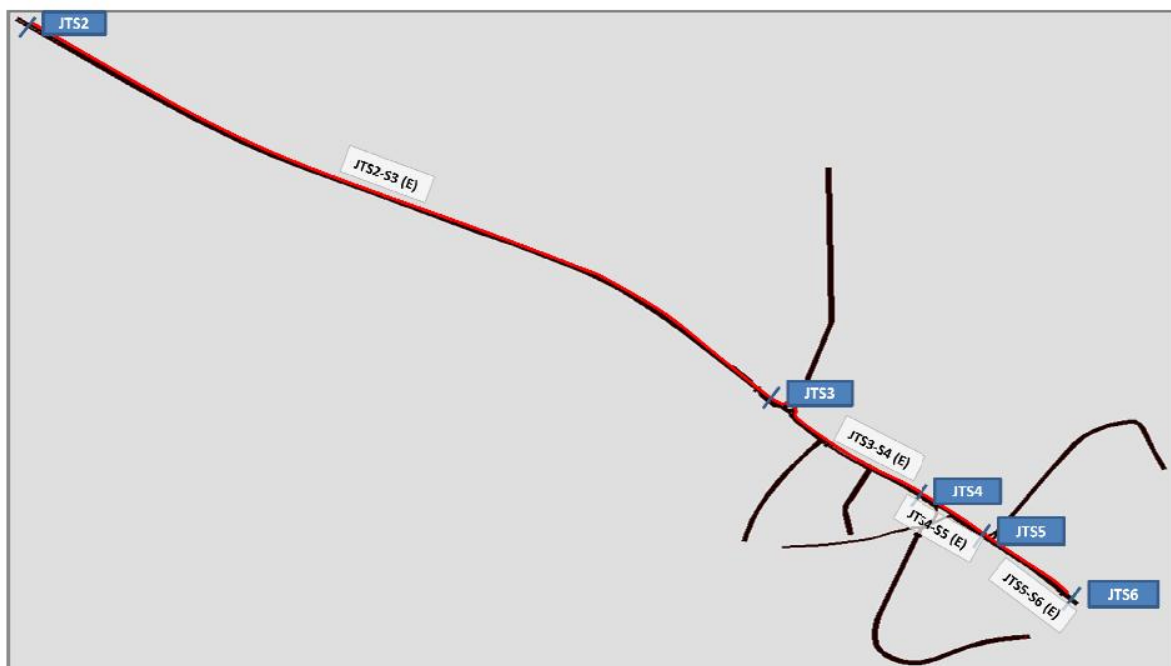
**Chart2: Results from VISSIM model am peak**



Details of the runs are shown in the following diagrams.

### Small network (VISSIM) diagrams

#### 1 Eastern run



2 Western run

