

New development in East Grinstead

Report by MTRU for East Grinstead Town Council

September 2009

Summary of Findings

Two main elements of new development are considered in this report. The first is a number of sites within the town itself, amounting to about 2,000 homes. The second is possible greenfield development immediately to the West of the town. This has been variously proposed as 2,500 or 1,500 homes plus other uses including a school. The main issue has been to set out in a robust and comprehensible way the traffic effects of such development. In particular a key issue has been whether any small scale greenfield development could be accommodated by the road network.

Following detailed examination of the three sets of traffic data and modelling by Peter Brett Associates, MVA consultancy and Atkins consulting, the conclusion is that:

- 1 Proceeding with development either within the town or on adjacent greenfield sites would result in a significant deterioration in traffic conditions compared to today if no action is taken. The town centre development alone would increase current car journeys by 15% to 18% (Atkins).
- 2 A set of junction improvements could be implemented which would increase capacity by about 5% and this would allow for around 30% of the traffic from the planned "infill" development.
- 3 Further measures could be taken to encourage the use of commuter car sharing, bus, walking or cycling both in East Grinstead as a whole, and in new development, but this would require a fully worked out new initiative.
- 4 Even with such an initiative in place, the additional capacity created is unlikely to provide more than a further 5% capacity.
- 5 To ensure that current levels of congestion do not worsen would thus require at least some of the town development to be low car use or car free.
- 6 These findings would justify retrieving the cost of the junction improvements and travel initiatives from the new development in the town on a tariff basis.
- 7 Putting together all three elements above suggests that the planned town centre development may be able to proceed without increasing current congestion, but this would still require a range of specific transport and planning interventions. Greenfield development could not take place without adding to the significant present day levels of stress on the road network.

1 Introduction and overview

There has been considerable analysis undertaken in relation to proposed developments in East Grinstead and on Greenfield sites to the West of the existing town. MTRU has been asked to advise the town council in relation to the impact of these developments on the basis of the best available evidence.

Two key questions

This report addresses two relatively simple issues:

- 1 How much additional stress would be placed on the local road network, compared to today, by the different levels of development?
- 2 Are there transport interventions (such as junction improvements or demand management) which would allow such development to proceed without such a deterioration?

It is taken as read that there is congestion at the main road junctions through the town and this was observed on the site visits undertaken for this report. Both the modelling results from PBA and MVA show severe stress points on the network through the town (see Annex B).

Obviously it would be possible to introduce transport interventions without new development in order to improve conditions compared to today, but this is more complex. The reason is that traffic is so fluid and variable that it is hard to ensure that action to reduce it will simply be absorbed by other users. This is often referred to as the need to “lock in the benefits”.

In the case where traffic conditions are affected to a small extent, or hardly at all, this effect of eroding benefits is usually ignored.

A draft of the latest study by Atkins is now available (September 2009) and has been used in the preparation of this report. It provides the material to provide answers to the two questions above and these are set out in this report.

Starting from today's conditions

In summary, traffic from the infill town centre development cannot be accommodated by junction improvements alone. It would require active steps to attract people to alternatives such as bus, walking, cycling and car sharing. These would need to be reinforced by planning conditions on at least some of the development proposed in the town, for example car free town centre housing. In turn this needs a town wide parking plan to avoid parking spilling over into existing residential areas.

Any sustainable transport initiatives of this type need a considerable amount of planning and full discussion with local people. The current Atkins study shows the extent of the work required in its Table 2.16, which contains 24

separate measures from cycle routes to stricter controls on parking. This is reproduced as Annex A.

In relation to the second question, there is currently no plan described which would allow for any greenfield development which made provision for car use, if current road conditions are to be no worse than today. These are already serious, and revealed in the modelling both by PBA and MVA (see Annex B).

This is not the same as asking the parallel question of whether road conditions, once they have deteriorated as a result of the town centre developments, could be held at this future, more congested, level even if some greenfield development were to take place. The current Atkins report focuses on this and concludes that 571 greenfield dwellings could be provided.

This interpretation relies on

- 1 accepting that current levels of congestion will not be relieved, and
- 2 that the capacity increase from any junction improvements is **not** used to cater for the town centre developments.

Analytical context

This report follows on from a previous analysis undertaken for East Grinstead Town Council which considered the traffic impact of new development in the area. This is basically of two types:

- development within the town on a number of smaller sites, amounting to about 2,000 new homes;
- greenfield development including homes and other uses such as businesses and education.

The first represents a significant contribution to the strategic housing allocation and would have a clear impact on the demand for road use. The second was originally proposed to the South and West of the town, conditional upon the provision of a relief road. This latter option is no longer available.

There has been considerable analytical work undertaken for the local authorities by several consultants and this was reviewed in the previous MTRU report (Annex B). This was widely circulated to those involved and provided as input for the most recent transport study by Atkins.

2 Changes resulting from the town centre developments

Atkins have provided estimates of the amount of additional road traffic from the town developments. These amount to just over 2,000 dwellings and are included in nationally provided traffic generation forecasts for future years¹. They then go on to allocate these to entry points to the road network.

Without modelling these in detail, the overall increase in road trips entering the network is 15-18%, depending on time of day. This is significant and could not be accommodated by the 5% increase in capacity envisaged by the junction improvements examined by Atkins. There is thus a serious capacity shortfall if the infill development goes ahead even with the junction improvements.

The details of the increase are set out in the following table, reproduced from the draft Atkins report.

Table: Overall traffic flows for 2006, 2021 and difference between them

Scenario	Time period	Direction	Overall traffic flow
2006	AM	Total inbound	3122
		Total outbound	3200
	PM	Total inbound	2893
		Total outbound	2926
2021	AM	Total inbound	3665
		Total outbound	3680
	PM	Total inbound	3344
		Total outbound	3377
Difference	AM	Total inbound	543
		Total outbound	480
	PM	Total inbound	451
		Total outbound	451

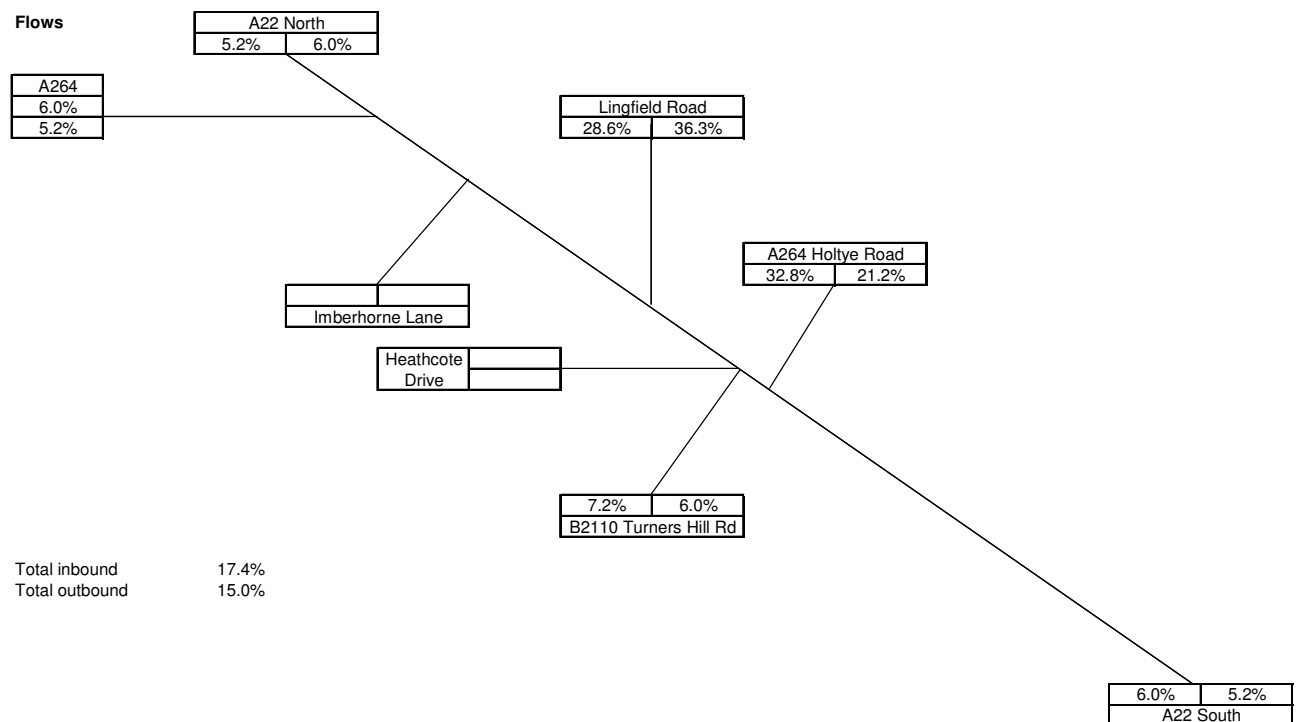
Source: Atkins report

Infill town development included, no Imberhorne development

The way in which these extra flows are distributed is also estimated by Atkins and illustrated in the following chart, again from their draft report. This shows percentage increase in traffic loadings onto the road network. This is not the same as predicting the total traffic effect, but creates a picture of where development traffic is entering the system. There are no percentage figures for Imberhorne Lane and Heathcote Drive because these were not in the original cordon survey.

¹ They use the TEMPRO figures for future housing and traffic generation

Figure: Percentage increase in flows from town centre development AM Peak 2021 compared to 2006



Conclusions from the Atkins data

If the road network capacity could be improved to allow for a 5% increase, about 30% of the town centre housing could be absorbed with little or no overall impact. The 5% figure may be conservative, but is used to illustrate the point. Even a 10% increase in capacity would not absorb all the predicted traffic without some other transport intervention.

Demand management measures which apply to all users (not just to the new development) will be more effective, because they influence the behaviour of more travellers. However, this makes them more difficult to implement. It is not unreasonable to expect that some mode switch in East Grinstead as a whole could be achieved, possibly of the order of a further 5%. In the new development, as Atkins suggest, this figure could be much higher.

If the level of trips for this development were to be reduced by 25%, and this was combined with the junction improvements and sustainable travel policy, around 90% of the town centre development could be accommodated with little additional stress on the road network. This still requires considerable expenditure, planning and effort.

It would require careful design to ensure that measures which increased capacity for road vehicles did not conflict with measures designed to encourage other users such as bus, cycle or pedestrian priority. It is of course a matter of policy to what purpose any additional road capacity, and thus congestion reduction, is put.

3 New Greenfield development in the Imberhorne area

The key finding here is that if the town centre developments are progressed they would absorb the benefits from transport interventions such as those described above. In this case there would be no possibility of a Greenfield development proceeding without creating additional stress on the road network.

In fact, the idea of new development meeting the cost of transport schemes which allow it to proceed without causing an additional burden, is at the heart of securing contributions for such interventions. This is often done through a “tariff” per dwelling.

If one set of developments pays for necessary improvements it is important not to double count. The town developments could provide finance for transport schemes linked to the level of predicted traffic generated. In the case where new housing was car free, the transport “tariff” would be low. In the case of dwellings with private car parking, or permits for on street parking space, the tariff would be higher. Once these improvements have been secured they will not be available for further development.

It should be noted that catering for the town centre development is in itself challenging and would need to be monitored carefully to ensure that the transport interventions were indeed avoiding any increase in congestion.

ANNEX A

Transport Strategy Initiatives

Copy of Table 2.16 from the Atkins draft report

Type of Measure	Specific Measures
Public Transport	<ul style="list-style-type: none"> • Operation of 12-car trains at peak times to East Grinstead which will result in increases to capacity • Incorporation into the Thameslink network • Multi-modal transport interchange at East Grinstead rail station • Enhanced bus services along key routes in the town serving the residential areas and linking into key trip attractors and facilities • Bus priority measures where congestion on the existing road network is likely to challenge the reliability and journey time of services • High quality public transport information, including the provision of real-time information at bus stops and the railway station • Ticketing that is quick and easy to use across operators and/or different public transport modes • High quality and widespread marketing of bus services including simplified timetable and routing information
Walking and Cycling	<ul style="list-style-type: none"> • Provide secure and high quality bike storage at main trip attractors • Signed (and potentially dedicated and traffic-free) cycle and walking routes connecting residential areas to main trip attractors that provide journey time information rather than distance • High quality and widespread marketing of cycling and routes along with incentive schemes/offers/discounts
Streetscape / Public Realm Design	<ul style="list-style-type: none"> • Creation of inclusive street environments that aim to integrate pedestrians, cyclists and motorists. This might include: <ul style="list-style-type: none"> ○ home zones ○ shared space streets and squares
Smarter Choices	<ul style="list-style-type: none"> • Workplace and school Travel Plans – comprehensive programme (with monitoring and enforcement) • Carshare / Car Clubs scheme • Personalised Travel Planning • Area-wide Travel Plans (coordinated and delivered by stakeholders, as opposed to LA-led site specific TPs) <ul style="list-style-type: none"> – joined up initiatives between multiple employment sites to create ‘critical mass’ for sustainable transport measures

	<ul style="list-style-type: none"> – joined up initiatives between multiple occupiers of mixed use sites • Establish Transport Management Associations (TMAs) to develop public/private partnerships to coordinate the delivery of area-wide Travel Plans • Appointment of team of sustainable transport champions to deliver county-wide travel and residential Travel Planning initiatives and work in partnership with District Councils • Appointment of sustainable transport champion in all new developments over minimum threshold • Securing robust remedial measures and sanctions for Travel Plan performance • Agree remedial strategies for failure of Travel Plan against agreed mode share or trip generation targets • Financial bonds, sanctions and penalties through S106 agreements relating to sustainable transport contributions
Parking Management	<ul style="list-style-type: none"> • Limit car parking supply at employment and at trip attractors • Introduce parking restrictions/charges that discourage long stay commuter parking

Annex B

Working Draft April 2009 East Grinstead Housing Developments

Introduction

The key task of the work MTRU is undertaking for East Grinstead Town Council is to provide clear evidence concerning the ability of the local transport networks to absorb additional traffic generated by new development. This includes consideration of housing locations and network improvements, especially those which might reduce road congestion.

Site visits have been undertaken, and a significant amount of modelling data is already available. This is considered in more detail later in this report. Before doing so, it is worth making the observation that the current main route through East Grinstead is subject to congestion even outside the peak hour. Some longer distance routeings necessitate lane weaving movements on the town centre gyratory. This already has a one way system and link road in place. The uncontrolled junctions to the North are clearly subject to serious congestion and this is confirmed in all the modelling. There are some turning movements just beyond the junction exits which may add to this.

Even at first sight, the introduction of traffic signal control on the key junctions on the A22, and linking them together to minimise queue lengths, is an obvious way to improve traffic conditions. This would create an urban traffic control (UTC) area package. Having now considered the work of previous consultants, there is support for this view and the potential benefits from this source are included in the analysis for this report.

Finally, the issue of a new road to the West of the town, funded by the building of 2,500 new homes, is not considered here. There were important issues concerning how much relief the road plus development would or would not have given to existing roads. There were also serious environmental consequences. However, it is understood that the bypass proposal is no longer viable. It is clear from local modelling that a greenfield development of 1,500 homes, with an access road using part of the route of the proposed bypass, would cause major traffic problems for the town.

How much strategic development is planned for East Grinstead?

As well as setting out the evidence base which would allow the level of new housing development to be considered, there is an important issue regarding the planned development to meet strategic targets within the town itself (approximately 2000 homes) and its relationship with the possible off centre development (currently modelled at 1,500 homes on greenfield sites to the West). Together this would represent 23% of all the housing required in Mid Sussex by the Structure Plan. Any realistic analysis must assess their combined impact compared to the present day, since this is what people will experience on the transport networks, in particular their local streets.

Data sources

Two sets of modelling results have been interrogated for this report: the 2007 Peter Brett (PBA) work undertaken for West Sussex in relation to the proposed Western strategic development, and the 2008 MVA work undertaken for Mid Sussex for their Local Development Framework (LDF).

Peter Brett Associates

The PBA study is mainly focussed on development in association with the previous road proposal. However, it does contain a package of junction improvements, including a safety objective, which is tested without the Western development. There is also a test without the junction improvements. Both include the town based development package and thus have the same amount of new housing in the same places. It has thus been very useful in testing the potential benefits of a route management approach.

Its future year for assessment is 2021, and it provides comparative data for a base year of 2006. It models both AM and PM peak hours.

The PBA model is also useful because it models the junctions separately from the road links in between. This allows a better appreciation of congestion, and its effects, including traffic re-routeing to avoid it.

An option for a Western development of 1,500 homes, without the full road proposal, was also tested.

The strength of the PBA model is in how it represents junctions and journey times locally. It is less well suited to assessing the impact of different locations for development across a wider area, partly due to the way in which it reallocates traffic from new developments.

MVA

On the other hand, the MVA model has been used to consider alternative locations for development across Mid Sussex and is thus at a more strategic level. However, it only covers the AM peak and does not model junctions separately. Instead, the speeds on the road links between junctions are adjusted so that they fall more rapidly as flow increases to allow for junction delays. This process is usually referred to as adjusting the speed flow curves.

Such an approach is useful for indicating where stress occurs on the wider road network but not so suitable for assessing changes which affect individual journey timings, and less likely to give an accurate picture of the traffic re-routeing across the area to avoid congestion.

The MVA future year is 2026 and some data is provided on the number of trips in the base year of 2006 compared to 2026. There are some issues concerning the base year figures, but these do not affect the comparisons between locations.

Unfortunately, the location of 55-60% of the planned housing development is treated as fixed in 2026, and thus data is not provided which enables a full comparison with conditions today. The PBA model can, however, be used to fill this gap for East Grinstead in relation to the town based development. The MVA approach differs from PBA in that trips associated with the remaining new development (6,600 homes) are removed from the model to provide the baseline results. They are then added back in the different locations.

This should provide a better indication of the impact of different sites, although the use of a minority of the strategic allocation means that the effects will appear relatively smaller. Thus there are 168,000 car trips in the morning peak hour in the model base year (2001) rising to 194,000 by 2026. Within this total, the 6-7000 homes are predicted to only produce between 1,381 and 1,723 car trips in 2026.

To summarise, the MVA scenarios tested provide an interesting view of how changes in the location of a minority of the planned housing development would affect the network. Data is presented for seven options for location of 6-7,000 homes. This is slightly unfortunate since the option which produces the least traffic has the least number of houses. However, this effect is probably limited in its extent.

Maps have been produced by MVA which show the stress level on the Mid Sussex road network for the various scenarios. This is measured by the ratio of traffic demand (Volume) to road Capacity – the V/C ratio. This does not include a present day stress map or one for a no development scenario for 2026.

The lack of junction modelling means that it is not really appropriate to use the model to assess what the impact would be of network improvements such as the linked signals package discussed earlier.

In addition, the lack of a base year assessment and a more realistic 2026 Do Minimum creates problems for local people and their representatives when they come to judge the full impact of the changes proposed. Data for 2026 with no strategic development would be useful.

Results from the model data

Conditions in East Grinstead with 2000 strategic allocation in the town

Both models agree that future conditions on the local road network within the town will be significantly worse than today if in town development goes ahead without local traffic management on the A22.

MTRU's initial appraisal was that there were existing problems and that it was clear that a system of linked signals could provide significant benefits on the A22 corridor with or without development. Such a scenario was in fact tested by PBA, although not by MVA. This is understandable since, as explained previously, the MVA model does not explicitly model junctions.

Results from the PBA model

In broad terms the PBA analysis shows that a comprehensive package would allow conditions in 2021 to be no worse than today with new development in the town to the level currently envisaged (around 2,000 homes). In addition there would be less re-routing through rural areas to avoid the town. Key journey times from the PBA results for the town based development with and without the traffic scheme are reproduced below in Table 1. Journey timings for the present day (2006) are also given for comparative purposes. The details of the scenarios are as follows:

Do Minimum 2021

Development:

Town based (2,000)

Junction improvements:

- M23: minor improvements to slip roads with A264
- A264: Eastbound capacity improvement.

Public transport:

No change

Do Something 2021 (DS)

Development:

Town based (2,000)

Junction improvements:

As above, plus:

- M23: further J10 access improvement
- A264/A2220 Copthorne: roundabout replaced by traffic signals, including bus priority
- A264/A22 Felbridge: capacity and traffic signal improvements
- A22/Imberhorne Lane: capacity and traffic signal improvements
- A22/Lingfield Road: roundabout replaced by traffic signals and wider entry
- A22/Station Road: signalisation of existing priority junction
- A22/A264 Moat Road: signalisation of existing priority junction
- A22/Herontye Drive: existing priority junction replaced by roundabout
- Signals to be computer linked in full UTC system

Public transport:

- New shuttle bus in the town, linking station, town centre and residential areas
- Inter-urban bus linking East Grinstead to Crawley via Crawley Down

Table 1
Comparative journey times for town development with and without corridor improvements

	Time (minutes)					
	AM Peak			PM Peak		
	2006	DM	DS	2006	DM	DS
A22 Northbound	9.78	12.91	11.20	9.26	9.06	10.38
A22 Southbound	14.22	22.05	13.48	15.18	20.01	18.94
Northbound to Copthorne	26.57	27.18	25.60	25.11	27.92	25.31
Southbound from Copthorne	29.66	27.47	29.25	29.93	34.70	30.42
Northbound to A22 Felbridge	21.26	21.92	20.35	19.99	22.82	19.93
Southbound from A22 Felbridge	25.74	22.62	23.16	25.61	26.23	24.04

Source: PBA Full Appraisal Report, Table 4.2

Conclusion from the PBA results

It is clear that if the town based developments go ahead, comprehensive action will be required to hold congestion at around its current level. This includes computer linked traffic signals and a new town shuttle bus. The latter needs further work on its route design, cost and effectiveness.

Without such action road conditions around East Grinstead will worsen considerably and traffic will divert to other rural roads.

Results from the MVA model

Road network

The MVA model deals with one of the problems with the PBA model, which tended to underestimate the impact of the different locations for new development. This was a complex technical issue concerning how new traffic from such development caused reduced traffic in surrounding areas.

The MVA model approaches this by being more specific about where all the future strategic development is placed. However, this does not have a “Do Nothing” baseline which could represent the present day, and treats a significant amount of development (9,000 homes - about 60%) as fixed. This amount includes the 2,000 town based developments in East Grinstead, plus 3,000 at Burgess Hill and 4,000 at Haywards Heath. The development to the West of East Grinstead (WEG) is included in the variable element.

Thus the model does not allow variations in a majority of the housing allocation, nor does it allow an assessment of the local impact of the fixed allocations.

In overall terms, the road network in and around East Grinstead, including the town development, has serious congestion problems by 2026. This is measured by the ratio of traffic demand to road capacity – the V/C ratio. Stress is usually held to be present when demand reaches 80% of capacity. It is also clear that in East Grinstead, congestion on the local network after the fixed allocations is generally worse than either Burgess Hill or Haywards Heath.

These results should be treated with some caution, since the MVA model almost certainly underestimates congestion, particularly from queues at busy junctions. This effect will, however, be applicable in all the locations including East Grinstead.

Even on the base assumption, without the WEG development, there is a particularly severe problem on the A22 North of the town. This appears to have the worst V/C ratio in the whole model at 206%. However, this figure does not appear to be the same on the stress maps. Other key examples are Imberhorne Lane Northbound, which has a V/C ratio of 139%, and the B2110 into the town has a V/C of 121%.

Public transport

The MVA model shows that there are relatively small differences in terms of rail or bus mode share wherever the new development is located. However, four of the seven options (2, 5, 6, and 7) for location include 1500 dwellings on land to the West of East Grinstead and these are also the worst performers in terms of public transport use. This is shown in Table 1 below.

**West Sussex County Transport Model
AM peak change from proposed additional housing**

	1	2	3	4	5	6	7
Number of extra dwellings	6700	7400	7500	6600	6400	6400	6000
Total extra trips	1891	2067	2121	1863	1787	1787	1680
% of above bus/rail	19.3	16.7	19.4	19.3	17.1	16.5	17.9
% of new trips bus only	3.17	4.06	4.76	3.17	4.24	4.14	4.46

Source: Tables 3.6 and 3.8, MVA report

As might be expected from the availability of local public transport, the best performers are the two options including Crabbet Park, and one without Crabbet Park but with a focus on Haywards Heath.

Conclusion from the MVA results

Because of the way that congestion is represented (on links not junctions) there are some local flows and capacities in East Grinstead that need further checking.

However, in line with PBA's findings, future conditions with the town based development alone are heavily congested in the MVA model. It does not assess any transport management scheme such as that proposed in this report and by PBA.

MTRU - Metropolitan Transport Research Unit
September 2009
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