

East Grinstead Transportation Advice – 2nd Stage

Report of Tasks 1 & 2

Final Report

Notice

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1. Introduction

1.1 Background

As part of a study commissioned by the Department for Transport (DfT), Atkins Transport Planning and Management (Atkins) undertook an initial strategic study examining transportation issues relating to the delivery of approximately 2,500 dwellings in East Grinstead. Previous work has shown that a bypass would be required in order to alleviate traffic within the town in order to accommodate increased development traffic. Atkins' study put forward an outline strategy for improving sustainable transport and some suggestions for upgrades to key junctions on the A22 London Road that could be implemented to enable a proportion of development to come forward without the need for a major transportation intervention.

Additional advice and understanding is required by Mid-Sussex District Council on some of the issues raised in the Stage 1 Report of March 2009 (March 2009 Report) to inform decisions on development allocations within its emerging Core Strategy. The Council also requires further clarification of the methodology and assumptions contained within the March 2009 Report to provide greater confidence in the outputs, particularly in relation to the development capacity indicated in the report.

1.2 Methodology

Our proposed methodology is in response to the deliverables set out in the brief that was provided as part of the invitation to tender for the project (Appendix A), and a meeting between Atkins and West Sussex County Council, Mid Sussex District Council and East Grinstead Town Council (The Councils) on the 21st of July 2009.

Task 1

We will provide further clarification of the detailed points (listed below) that have arisen out of our report provided to the Councils in March 2009.

- a) Provide clarification of the assumptions used to derive the levels of new housing (taken from TEMPRO) in Stage 1 and the consistency with the most up to date housing projections published Mid Sussex District Council. We will make a comparison and check the consistency between TEMPRO data for East Grinstead with the proposed level of housing and its geographical distribution identified by Mid Sussex District Council. Where possible we will distribute and assign this traffic where it is likely to impact upon the network. This would be dependant on the TEMPRO dataset being of a sufficient level of detail.
- b) Provision of a justification of the use of a five percent traffic threshold used in the March 2009 report. The justification will take account of proposed local junction improvements on the A22 within the town that are to be provided as part of Task 3 of the commission. Prior to undertaking the detailed junction modelling outlined in Task 3b, we will provide our professional opinion on the likely additional capacity that may be obtained if the improvements outlined in Task 3a were to be implemented.
- c) Provide a written analysis of the potential likely impact upon the analysis within the March 2009 report of not including non-surveyed cross-cordon movements such as Crawley Down Road, Imberhorne Lane, Dunnings Road, and Wilderwick Road. We will provide reference to the likely impact upon these local roads as a result of the growth in traffic and the delivery of additional capacity at the A22 junctions.

- d) Provide evidence to support and demonstrate the achievability of the reduction in vehicular trips that were set out in the March 2009 report. This work will also take into consideration the potential impact of the Thameslink proposals on travel characteristics in East Grinstead.
- e) A written commentary on the likely impacts of a reduction of employment levels in East Grinstead, with specific reference to being able to achieve sustainable patterns of transport. Specifically, we will provide a qualitative assessment of any potential relationship between a reduction in the scale of employment to be provided and the level of internalisation of trips that could be achieved.
- f) Provision of evidence that greater levels of internalisation can be achieved, thus assisting in reducing the vehicular trip rates. This will look at internalisation of trips in the development site and provide evidence and examples, using reasonably comparable towns, where this has been achieved.
- g) Provide evidence to demonstrate how a 10 percent modal shift away from existing vehicular trips might be achieved in East Grinstead. We will provide an outline framework of a sustainable transport strategy for the town that not only will achieve a more sustainable modal share for the strategic development, but that will also deliver modal shift of existing vehicular trips.

Task 2

Where the work within Task 1 results in changes to the original assumptions in the March 2009 Report we will revise the spreadsheet model and update the outputs with regards to the level of strategic housing that can be delivered without the need for a major transport intervention, specifically a bypass of the town.

Task 2 will also be required to be undertaken once the detailed traffic modelling of the junctions as part of Task 3b has been completed to take account of more refined capacity benefits that can be achieved through the improvements.

Task 3

Refine the designs for the proposed improvements to the junctions identified within the March 2009 report. As part of Task 3 we propose to:

Provide one outline design at a scale of 1:500, based upon Ordnance Survey data and onsite inspections, for each of the following junctions:

- A22 (London Road) with A264 (Moat Road);
- A22 (London Road) with A22 (Station Road);
- A22 (London Road) with Lingfield Road;
- A22 (London Road) with A264 (Cophorne Road); and,
- A22 (London Road) with Imberhorne Lane.

We will also provide a written report examining issues in relation to deliverability and provide an outline indicative construction cost for delivering the improvements.

The outline design for the A22 with Lingfield Road junction will also include an indicative alignment for the provision of a pedestrian and cycle bridge parallel to the existing road bridge across the disused railway line.

2. Task 1: Clarification of Stage 1 Report

2.1 Task 1a: Housing Projection Assumptions

2.1.1 Background

Atkins was provided with traffic survey data from the 2006 East Grinstead cordon traffic survey by WSCC. Traffic flows were considered at six key locations around East Grinstead as follows:

- Node 1: A264 Copthorne Road, west of Felbridge;
- Node 2: A22 north of East Grinstead;
- Node 3: A264 Holtye Road, east of East Grinstead;
- Node 5: A22 South of East Grinstead;
- Node 6: Lingfield Road; and
- Node 7: B2110 Turner’s Hill Road.

The AM and PM Peak Hours were first determined by totalling all the traffic passing the six nodes for each hour, then identifying the hourly period with the highest total volume of traffic for the AM and the PM periods. The AM Peak Hour was determined as 0745-0845 hours and the PM Peak Hour was determined as 1800-1900 hours. The AM Peak Hour was found to have the highest volume of vehicles, and thus only the AM Peak Hour was used for the assessment.

A growth rate was obtained from TEMPRO version 5.4 for the East Grinstead (main) zone to increase the 2006 flows to 2021 levels. The level and location of housing provision assumed by TEMPRO for the 2006-2021 period has been investigated as outlined below.

2.1.2 Housing assumptions within TEMPRO

TEMPRO Planning Data Version 5.4 Guidance Note

Firstly, the Department for Transport (DfT)’s “*TEMPRO Planning Data Version 5.4 Guidance Note*” (February 2008) was consulted. Table 4-5 of this document lists the regional planning documents used to produce district dwelling input assumptions. Section D3 of the South East Plan (March 2006) is identified as the planning document used for the South East.

Table H1 within Section D3 of the South East Plan identifies the housing provision and average annual growth rate for 2006-2026 for Mid Sussex as 14,100 and 705 dwellings respectively. However, housing provision for zones within Mid Sussex is not detailed. (It should be noted that the provision of dwellings within Mid Sussex from the March 2006 Draft South East Plan has been revised upwards to 17,100 dwellings as part of the May 2009 adopted South East Plan. However, this increase has not yet been incorporated into TEMPRO).

TEMPRO program

The TEMPRO program itself was therefore interrogated, which revealed housing assumptions for the East Grinstead (main) zone in Table 2.1 below, upon which the growth rate is based.

Table 2.1 – Standard housing assumptions for East Grinstead (main) zone within TEMPRO v5.4

Scenario	No. of households
2006	10,526
2021	12,535
Difference	2,009

No indication is provided regarding where this development is planned within the East Grinstead (main) zone.

2.1.3 Mid Sussex District Council’s Strategic Housing Land Availability Assessment

MSDC’s Strategic Housing Land Availability Assessment (SHLAA) was obtained to understand the latest predictions for planned housing development in East Grinstead in order to provide a robust assessment of the housing assumptions used in TEMPRO.

The growth rate derived from TEMPRO was for the East Grinstead (main) zone, and thus the planned housing development in the five East Grinstead wards identified within the SHLAA has been used to represent an equivalent geographical area. The five wards are as follows:

- East Grinstead Ashplats Ward;
- East Grinstead Baldwins Ward;
- East Grinstead Herontye Ward;
- East Grinstead Imberhorne Ward; and
- East Grinstead Town Ward.

Appendix 3 of the SHLAA (included as Appendix B in this report) provides a schedule of all identified sites considered through the SHLAA and the data is summarised in Table 2.2 below by each of the five wards between 2006 and 2026.

Table 2.2 – Proposed future dwellings within East Grinstead wards from MSDC’s SHLAA

Ward / scenario	Years 1-5	Years 5-10	Years 11+	Total
Ashplats	247	22	0	269
Baldwins	77	210	0	287
Herontye	39	0	0	39
Imberhorne	336	690	0	1026
Town	349	134	75	558
Total	1048	1056	75	2179

In order to consider the capacity for a strategic housing development at the Imberhorne Farm site, the housing provision for this site assumed within the SHLAA has been isolated for removal. The Imberhorne Farm development figures are shown in Table 2.3 below.

Table 2.3 – Proposed future housing at Imberhorne Farm from MSDC’s SHLAA

Development	Years 1-5	Years 5-10	Years 11+	Total
Imberhorne Farm	180	390	0	570

Table 2.4 then shows the proposed future housing within East Grinstead from the SHLAA without the strategic housing development at Imberhorne Farm, and shows the resulting proportion of development that is due to take place within each ward.

Table 2.4 - Proposed future housing within East Grinstead wards from MSDC’s SHLAA without the strategic housing development at Imberhorne Farm

Ward / scenario	Years 1-5	Years 5-10	Years 11+	Total	% of total
Ashplats	247	22	0	269	16.7%
Baldwins	77	210	0	287	17.8%
Herontye	39	0	0	39	2.4%
Imberhorne (without Imberhorne Farm)	156	300	0	456	28.3%
Town	349	134	75	558	34.7%
Total	868	666	75	1609	100%

2.1.4 Comparison of housing assumptions between the SHLAA and TEMPRO v5.4

It has been assumed that the dwellings scheduled for development in the “Years 11+” column would be in delivered by 2021. This means that the total housing provision for East Grinstead according to the SHLAA for the period 2009-2021 is 1,609 dwellings, which equates to 134 dwellings per year. Using this annual rate derived from the SHLAA means that the equivalent housing provision for the 2006-2021 period is 2,011 dwellings.

This figure is almost identical to the predicted housing provision assumed by TEMPRO v5.4 as shown in Table 2.1 (2,009 dwellings).

Thus the TEMPRO growth rates used in Stage 1 are considered suitable for calculating the growth within East Grinstead without the strategic housing development at Imberhorne Farm. These growth rates are shown in Table 2.5 below.

Table 2.5 – TEMPRO AM Peak Hour growth rates used in Stage 1

Growth Period	Arrivals	Departures
2006-2021	1.17	1.15

As a result, Table 2.6 below shows the overall inbound and outbound flows for the AM peak hour for the 2006 cordon surveys; 2021 flows using the TEMPRO growth rates; and, the difference between them, as used in Stage 1.

Table 2.6 – Overall AM Peak Hour traffic flows for 2006, 2021 and difference between them

Scenario	Direction	Overall traffic flow
2006	Total inbound	3122
	Total outbound	3200
2021	Total inbound	3665
	Total outbound	3680
Difference	Total inbound	543
	Total outbound	480

The “difference” figures show the additional traffic that is expected to be generated by developments in East Grinstead **without** the Imberhorne Farm development and reflects existing travel patterns.

2.1.5 Distribution and assignment of development traffic to road network

Having corroborated the TEMPRO growth rate assumed in Stage 1, the distribution of development traffic has been considered to understand where it is likely to impact upon the network.

This has been done by apportioning the 2006-2021 overall development traffic (without the Imberhorne Farm development) to the road network in proportion to the volume of proposed housing development within each ward, with the resulting figures shown in Table 2.7 below.

Table 2.7 – Apportionment of AM Peak Hour development traffic (minus the Imberhorne Farm development) by ward

Ward	% of total development	Total inbound flow	Total outbound flow
Ashplats	16.7%	91	80
Baldwins	17.8%	97	86
Herontye	2.4%	13	12
Imberhorne	28.3%	154	136
Town	34.7%	188	166
Total	100.0%	543	480

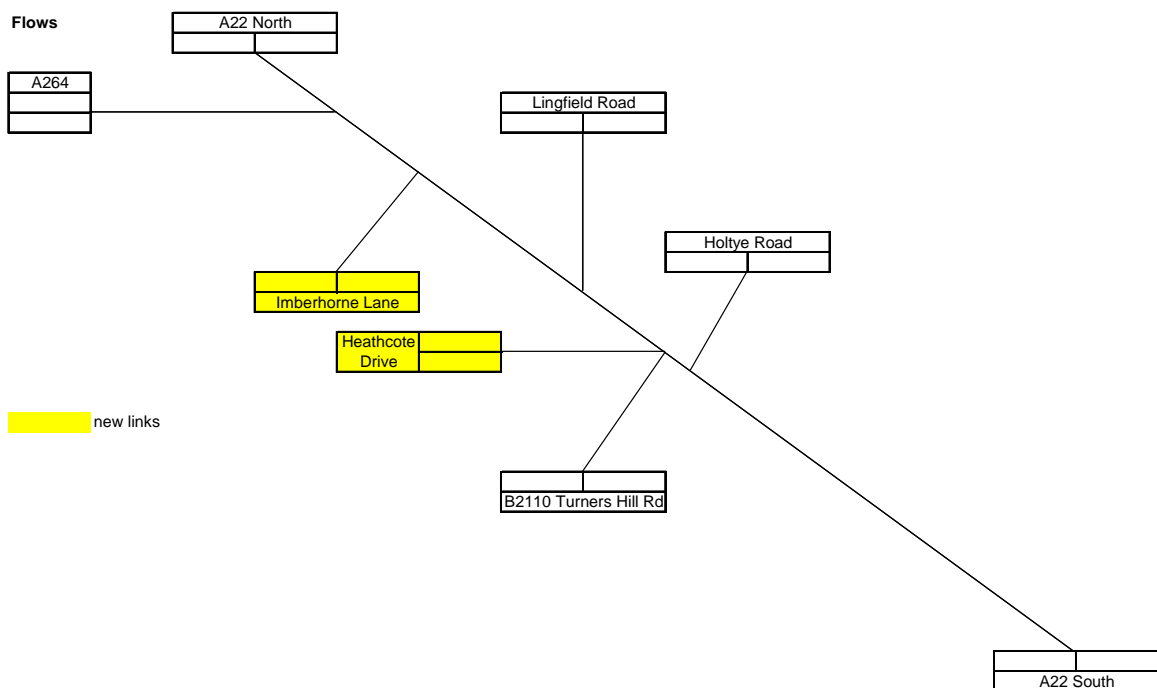
The development traffic for each ward has been assigned to the network using a “first principles” analysis, by identifying, where possible, the most likely node from the 2006 survey that traffic from each ward is likely to use as outlined in Table 2.8 below.

Table 2.8 – Assumed road used by traffic from each ward according to a “First Principles” analysis

Ward	Road
Ashplats	Holtye Road
Baldwins	Lingfield Road
Herontye	50% B2110 Turners Hill Road / 50% Imberhorne Lane
Imberhorne	50% Imberhorne Lane / 50% Heathcote Drive
Town	Distribute between all arms in accordance with proportions from 2006 cordon survey data

It should be noted that Imberhorne Lane and Heathcote Drive did not form part of the 2006 cordon survey, but are the most obvious roads to use to access the A22 for development within the Imberhorne ward. Therefore, two new arms have been added to the network diagrams from Stage 1 as shown in Figure 2.1 below.

Figure 2.1 – Revised road network



In order to distribute development traffic from the town centre, the traffic distribution from 2006 cordon survey data as shown in Table 2.9 below has been used.

Table 2.9 – Distribution of AM Peak Hour traffic using 2006 cordon survey data

Road	Total inbound	Total outbound
A264	15.3%	24.8%
A22 North	15.1%	13.3%
Lingfield Road	10.2%	11.4%
Holtye Road	19.2%	9.1%
A22 South	21.4%	18.8%
B2110 Turners Hill Rd	18.7%	22.5%
Total	100%	100%

Table 2.10 shows the results of distributing traffic in accordance with the principles from Table 2.7, Table 2.8 and Table 2.9.

Table 2.10 – Distribution of AM Peak Hour development traffic without the strategic development at Imberhorne Farm to revised road network

Road	Total inbound	Total outbound	Total
A264	29	41	70
A22 North	28	22	50
Lingfield Road	116	105	221
Holtye Road	127	95	222
A22 South	40	31	71
B2110 Turners Hill Road	42	43	85
Heathcote Drive	77	68	145
Imberhorne Lane	84	74	158
Total	543	480	1023

The flows in Table 2.10 have been added to the 2006 cordon survey flows to show the anticipated traffic flows in 2021 without the strategic development at Imberhorne Farm. Figure 2.2 and Figure 2.3 below compare the anticipated 2021 traffic flows from Stage 1 with those for the revised network diagram without the strategic development at Imberhorne Farm. It should be noted that the traffic flows for the Imberhorne Lane and Heathcote Drive links only consist of development flows without the strategic development at Imberhorne Farm due to the lack of existing survey data on these roads. Likewise, these links did not appear within the Stage 1 network diagrams and thus no comparison can be made between Stage 1 and the revised network for these links.

Figure 2.2 – 2021 AM Peak Hour traffic flows from Stage 1

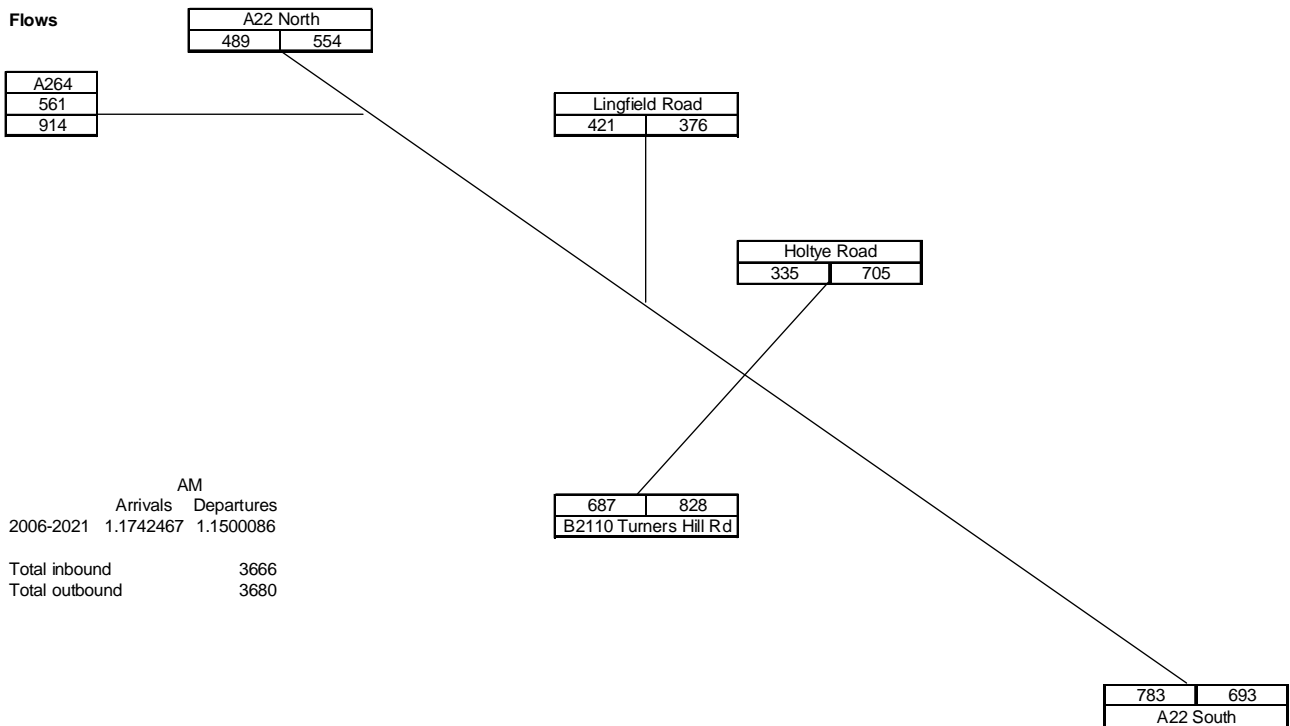


Figure 2.3 – 2021 AM Peak Hour traffic flows using revised network without the strategic development at Imberhorne Farm

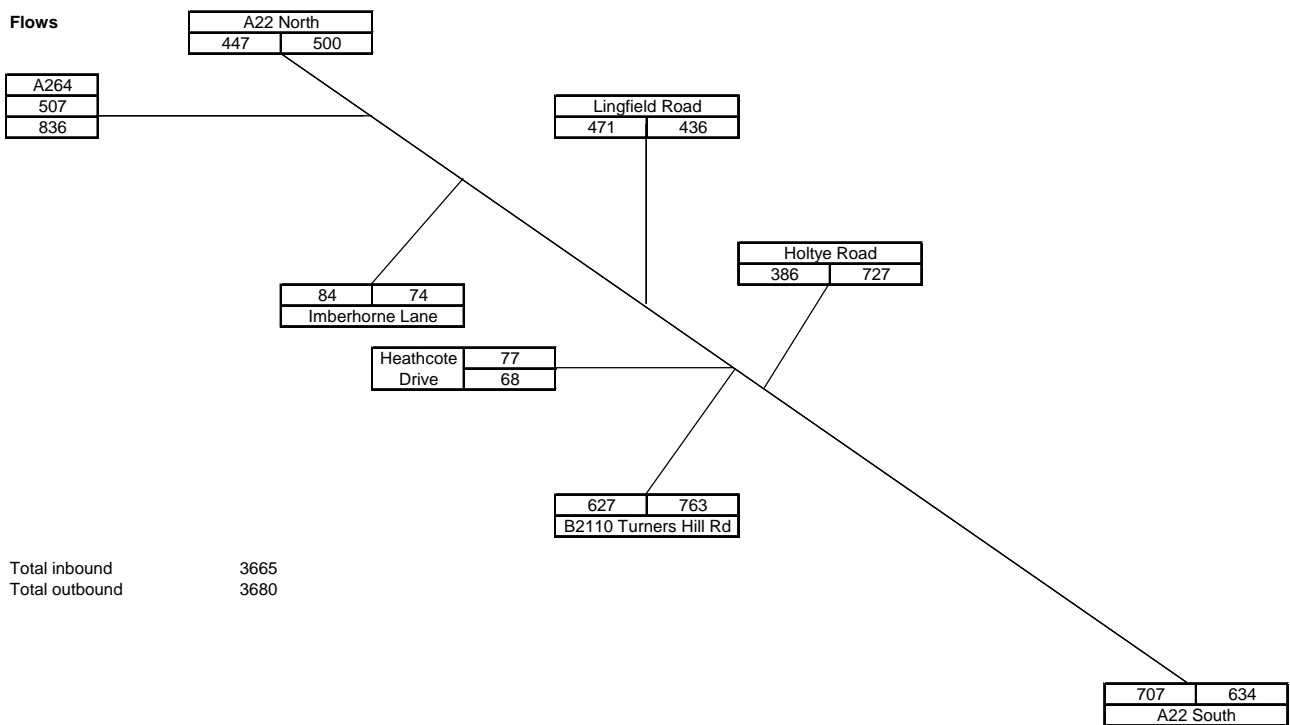


Figure 2.2 and Figure 2.3 above show that in comparison to Stage 1, the revised distribution of traffic shows that traffic flows at the following nodes have reduced:

- A264;
- A22 North;
- A22 South; and
- B2110 Turners Hill Road.

While traffic flows at the following nodes have increased:

- Lingfield Road; and
- Holtye Road.

The decreases can be explained by the revised distribution of traffic and addition of two new links. The Stage 1 flows were purely devised by increasing the flows at each node by the TEMPRO growth rate. The revised distribution considers the location of the development traffic. As a result, little traffic has been assigned to the A264, A22 North, A22 South and B2110 Turners Hill Road links, so that the flows are not as substantial as Stage 1. In addition, the total development traffic is the same as Stage 1, but has now also been assigned to the Imberhorne Lane and Heathcote Drive links.

Figure 2.4 shows the percentage increases associated with each node in comparison to the 2006 survey flows for the AM Peak Hour. It should be noted that no percentage increases are available with the Imberhorne Lane and Heathcote Drive links as these did not form part of the 2006 cordon survey.

Figure 2.4 – 2021 AM Peak Hour increases in traffic without the strategic development at Imberhorne Farm in comparison to 2006 cordon survey flows

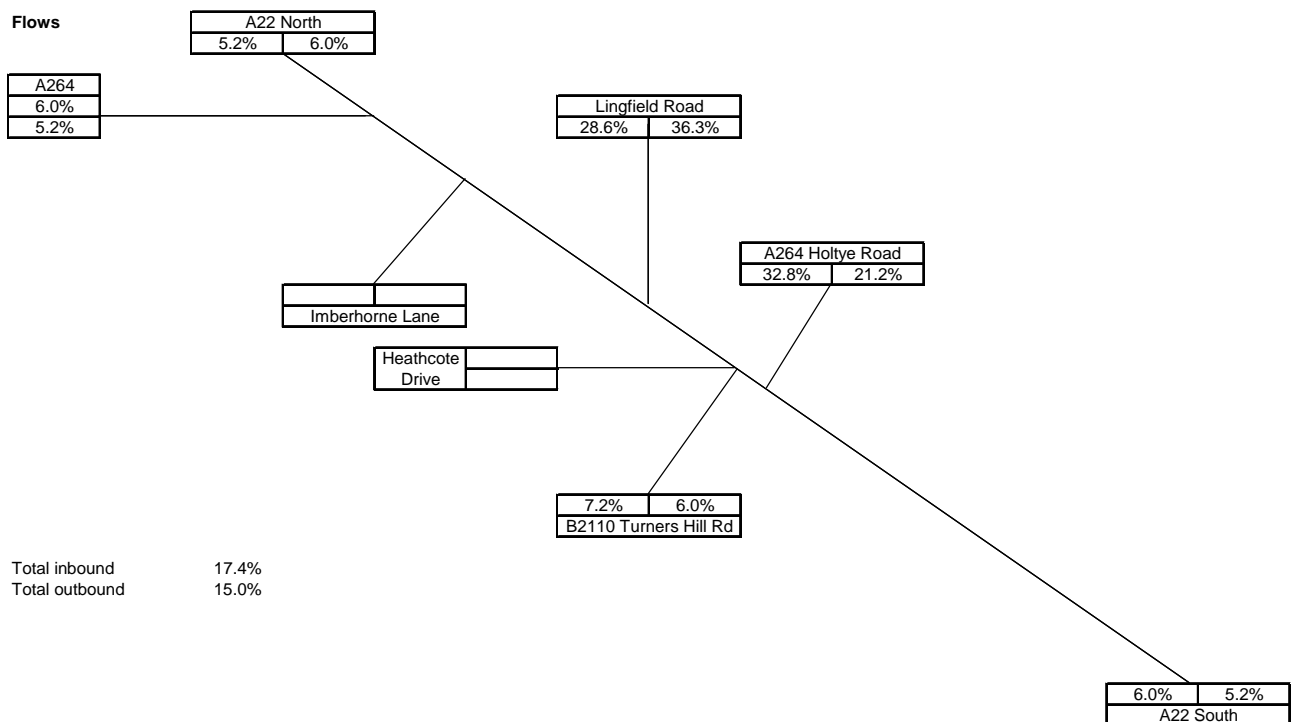


Figure 2.4 shows that overall traffic is anticipated to increase by between 15 and 18 percent, while the largest increases are associated with Lingfield Road, where increases of between 28 and 39 percent are anticipated. Figure 2.4 shows that the forecast percentage increases on the A22 (North and South) and A264 are lower than forecast in the Stage 1 report, while the percentage increases on Lingfield Road, B2110 Turners Hill Road and A264 Holtye Road are generally higher than forecast in the Stage 1 report.

2.2 Task 1b: Traffic Growth Threshold

Task 3 of the assignment involves refining the designs for the proposed improvements to the junctions identified within the March 2009 report - these are five key junctions along the A22 as outlined below.

- **Junction 1:** A22 (London Road) with A264 (Moat Road);
- **Junction 2:** A22 (London Road) with A22 (Station Road);
- **Junction 3:** A22 (London Road) with Lingfield Road;
- **Junction 4:** A22 (London Road) with Imberhorne Lane; and
- **Junction 5:** A22 (London Road) with A264 (Copthorne Road).

A separate technical note and design drawings have been produced for this task, and are included as Appendix C. Table 2.11 below summarises the professional opinion on the additional capacity benefits that are likely to result from these improvement measures. It should be noted that:

- No traffic flow data is available for these junctions and thus the assessment is indicative and based upon experience of the benefits observed from previous similar schemes;
- the potential for capacity increases would be decreased if substantial and consistent blocking-back is currently experienced through the junctions; and
- the estimated additional capacity benefits include the potential gains from linking signals, such as UTC or SCOOT.

Table 2.11 – Professional opinion on likely percentage traffic increases achievable at each of the five junctions as a result of improvements to the junctions

Junction	Improvement measures considered	Likely percentage capacity benefit
Junctions 1 and 2	Adding a 3rd lane through Moat Rd, and a 2nd lane for around 25m on the London Rd (NW) approach to Junction 1	up to 10%
Junction 3	Adding an additional traffic lane across the bridge	Up to 5%*
Junction 4	An additional third lane is proposed on London Rd (E)	At least 10%
Junction 5	Creation of an additional eastbound exit lane and the redesignation of one of the Copthorne Rd entry lanes (thus 2 lanes to be made available for right-turning traffic)	at least 5%

* the likely percentage capacity benefit of up to 5% associated with Junction 3 is in comparison to the existing junction (i.e. before the WSCC proposed improvements have been implemented).

Table 2.11 demonstrates that in the view of Atkins' Highway Engineers, junction capacity and operational efficiency can be increased at each of the junctions by between 5 and 10 percent (subject to detailed modelling) through the implementation of the schemes set out in Table 2.11 and Appendix C.

Therefore, it is considered that the five percent threshold put forward as part of Scenario 4 within our Stage 1 report is robust for the overall network. Higher capacity increases may be possible at individual junctions, such as Junctions 1, 2 and 4 (A22 / A264 Moat Road, A22 London Road / A22 Station Road and A22 / Imberhorne Lane junctions).

2.2.1 Third Party Land Issues

Four of the potential junction capacity and operational efficiency measures identified in the A22 Junction Study Report and summarised above indicate that delivery would potentially require the use of third party land or land not within the public highway. It is worth noting that this report and the A22 junction report are the thoughts of Atkins' Highway Engineers as potential measures and advice to West Sussex County Council. ***WSSC is not contemplating the acquisition of any third party land through negotiation or Compulsory Purchase Order process, in particular where such schemes affect private residential properties.***

Within this context Atkins has also been asked to consider what improvements could be delivered at each junction, and the potential percentage increase in capacity and operation, if the third party land was not utilised. This is considered below.

Junction 1

There is no requirement for third party land or non-highway land at this junction.

Junction 2

If third party land or non-highway land were not available then it would not be possible to deliver an additional straight ahead lane (eastward) outside the fire station. However, the introduction of modern traffic signals and management (UTC or SCOOT), in addition to the ability to deliver an additional lane as part of Junction 1, it is reasonable to conclude that there would still be an increase in capacity/operational efficiency of approximately five percent at this junction.

Junction 3

The third party land and/or non-highway land is required to deliver the pedestrian and cycle bridge, enabling removal of the footway on the northern side of the road bridge, rather than the highway improvements themselves. Without removal of this footway it is not possible to deliver the additional flare lane, reducing the capacity increase to the introduction of modern traffic signals and management (UTC or SCOOT). If the bridge could not be delivered, it is considered that the capacity/operational efficiency improvements are likely to be limited to between one and three percent in comparison to the existing junction (i.e. before the WSSC proposed improvements have been implemented). This could potentially be improved if the junction is linked to the signals that form part of Junctions 1 & 2.

Junction 4

If third party land or non-highway land were not available then it would not be possible to deliver an additional straight ahead lane (eastward). However, with the proposed introduction of modern traffic signals and management (UTC or SCOOT) and its linking to the signals of Junction 5, it is reasonable to conclude that there would be up to a maximum five percent increase in capacity/operational efficiency at this junction, depending upon the balance of traffic flows.

Junction 5

If third party land or non-highway land were not available then it may not be possible to deliver an additional straight ahead lane (eastward) exiting the junction. In that eventuality, and assuming the introduction of modern traffic signals and management (UTC or SCOOT) and its linking to the signals of Junction 4, it is reasonable to conclude that there would be up to a maximum five percent increase in capacity/operational efficiency at this junction, depending upon the balance of traffic flows. It should however be noted that the amount of third party / non-highway land required is very minimal and, at a detailed design stage, it may be possible to introduce all the potential measures within the confines of the public highway.

The potential highway measures are outline designs based upon OS Mapping of the existing situation. More detailed design will be required that will identify the full extent of the highway boundary and it may be possible that the measures identified could be delivered in full or in part

without encroachment onto third party / non-highway land. In addition, more detailed traffic surveys and modelling of these junctions would provide a more refined assessment of the capacity and efficiency improvements that these potential improvements will bring.

2.3 Task 1c: Assessment of Impact on Lower Classification Roads

2.3.1 Background

The 2006 cordon survey provided for use in Stage 1 was undertaken at seven nodes around East Grinstead. Several minor roads were omitted from the surveys. Task 1C involves consideration of the impact of these non-surveyed movements upon the analysis undertaken in Stage 1, with particular regard to Imberhorne Lane, Crawley Down Road, Dunnings Road and Wilderwick Road.

WSCC has indicated that these roads are used as local rat runs, but without proper survey data, it is not possible to draw any firm conclusions regarding the impact of these roads upon the Stage 1 analysis. Nor is it possible to draw any firm conclusions regarding the likely impact on these roads of making improvements to the five A22 junctions and building new housing developments in the vicinity. Thus, the analysis in this section is based on assumptions and a logical analysis of the likely outcomes.

In order to undertake a robust assessment of traffic flows around East Grinstead and to model operation of the existing junctions and proposed improvements to these junctions, a more comprehensive traffic survey would be required.

2.3.2 Effect of additional flow associated with non-surveyed roads

It is feasible that some traffic using Imberhorne Lane was not picked up by the 2006 cordon survey – specifically for developments between the A22 and Heathcote Drive. However, it is likely that the rest of the traffic using Imberhorne Lane would have been picked up by the A22 North and A264 nodes within the 2006 cordon survey due to the orientation of Imberhorne Lane.

The other three roads essentially join the East Grinstead road network within the cordon boundary and thus could feasibly add additional traffic to the network. This would mean that the overall traffic flows analysed in Stage 1 are likely to have a degree of underestimation.

However, the estimation of housing quantum that could be provided at the Imberhorne Farm site was based upon a five percent increase threshold in traffic flows crossing the survey cordon. Using this method, if additional flows were included from the four roads, the volume of trips that could be accommodated would be higher and thus it would be possible to develop more housing in East Grinstead using the spreadsheet analysis technique undertaken by Atkins. This is the limitation with this method. Without more detailed traffic survey data for the five junctions and associated modelling, it is not possible to ascertain the spare capacity in terms of traffic flows and hence develop a more accurate prediction of the scale of housing that could be developed on the Imberhorne Farm site based upon actual flows and capacities.

Making improvements to the five A22 junctions could reduce the incidence of rat running because more capacity would be provided along the A22 so not as much traffic would avoid it. However, by providing further housing within the vicinity, the resulting increase in traffic could negate the capacity increases of making junction improvements along the A22, and thus incidences of rat running could recur. The effects of this situation could be reduced by maximising sustainable mode share and internalisation associated with the new developments – a matter that is dealt with in tasks 1d and 1f respectively. Similarly, incidences of rat running could be discouraged by developing traffic calming/management measures along such roads.

2.3.3 Effects of housing development on non-surveyed roads

Table 2.12 shows the percentages of development associated with each ward within East Grinstead including the Imberhorne Farm development from the SHLAA.

Table 2.12 – Proportion of development in East Grinstead by ward including the Imberhorne Farm development

Ward	Proportion of development in East Grinstead
Ashplats	12.3%
Baldwins	13.2%
Herontye	1.8%
Imberhorne	47.1%
Town	25.6%
Total	100.0%

The greatest proportion of development is associated with the Imberhorne ward (47.1 percent) and thus it is likely that the greatest impact upon the four aforementioned roads will be associated with Imberhorne Lane in particular, but also with Crawley Down Road.

The second greatest proportion of development is associated with the Town ward (25.6 percent). However, this is likely to mainly affect the roads already included in the cordon survey.

Wilderwick Road joins Holtye Road, which runs through the Ashplats ward. The effect on this road is thus anticipated to be less than on Imberhorne Lane and Crawley Down Road, as the Ashplats ward represents 16.7 percent of future development in East Grinstead, while Wilderwick Road does not provide an obvious alternative route.

Dunnings Road leads to the Herontye ward, but this represents the smallest scale proportion of future development in East Grinstead (2.4 percent) and thus the impact on this road is anticipated to be the smallest of all four roads.

2.4 Task 1d: Evidence Supporting Levels of Reduced Vehicular Mode Share

Stage 1 involved a scenario (Scenario 2) whereby vehicle trip rates were reduced on the assumption that the mode share for sustainable modes could be increased. This section provides evidence for the proposed shift to sustainable modes.

Table 2.13 below summarises the existing modal split for employment journeys of residents based in the East Grinstead South and West wards (source: 2001 Census Journey to Work data) and the proposed modal split under the Increased Sustainable Mode Share Scenario (from the Stage 1 Report).

Table 2.13 – Mode share from 2001 census and Scenario 2 mode share from Stage 1 report

Mode of Transport	2001 census	Scenario 2 modal share
Train	9.8%	10%
Bus, minibus or coach	1.1%	10%
Passenger in a car or van	5.5%	5%
Bicycle	1.9%	5%
On foot	14.9%	15%
Driving a car or van	65.5%	55%
Motorcycle, scooter or moped	0.9%	0%
Taxi or minicab	0.5%	0%
Total	100%	100%

N.B. Journeys to work made by taxi and motorcycle have not been calculated as they are considered minimal

Case study evidence is provided below of mode shift achievements from new transport interventions and new developments which have integrated sustainable transport into their design.

2.4.1 Queen Elizabeth Park development in Guildford, Surrey

Queen Elizabeth Park in Guildford, Surrey, is a 23ha residential-led mixed use site and provides an example of how bus patronage can be maximised for new developments within the context of wider residential travel planning initiatives.

A reported 12 percent bus mode share has been achieved. At the time of planning, a ‘bespoke’ bus service was considered but rejected in favour of implementing a minor diversion to an existing bus route. This gave good access to key sites and trip attractors around Guildford (not just the town centre), and increased the frequency from one bus per hour to three buses per hour, while introducing new services during the evenings and on Sundays.

This provides a good example within close proximity of East Grinstead of bus mode share achievement for a major residential-led site, where a substantial proportion of trips are external to the development, and has been taken from the DfT’s “Making residential travel plans work: guidelines for new development” publication from September 2005 (link provided below):

<http://www.dft.gov.uk/pgr/sustainable/travelplans/rpt/makingresidentialtravelplans5775>

2.4.2 High Quality Bus Services

Table 2.14 presents case study evidence of the impacts of quality bus partnerships (essentially a high quality bus service offering) on increasing patronage, as reported in Table 6.2 in the DfT's "Smarter Choices" Report (link provided below).

<http://www.dft.gov.uk/pgr/sustainable/smarterchoices/ctwwt/ter6publictransportinfor5768.pdf>

Table 2.14 – Bus Patronage Increase (Case Study Evidence)

Location	Description	Short term patronage increase	Medium term patronage increase	% Switched from Car	Source
Review of 11 quality bus partnerships	Bus lanes, low floor buses, more frequent services, real time information, marketing		Most in range 7 – 30% (Guided bus way 90%; one scheme only 4%)	Estimate 10%	LEK / CfIT (2002)
Birmingham	Line 33	20%	40%	10%	TAS (2001)
Hertfordshire	Elstree and Borehamwood Network		20%	3%	TAS (2001)
London	Route 220 (Harlesden – Wandsworth)		Approx 30%		Daugherty et al. (1999)
Leeds First	Scott Hall Road (guided busway)		75%	20%	CPT (2002)
Portsmouth	Portsmouth – Leigh Park service	25%			Stagecoach in CPT (2002)
Woking	Route 91		22%		
AVERAGE (based on Smart Choices Research)		18%	36%		

This evidence suggests that, on average, investment in quality bus partnerships can lead to patronage increases of 20-40% in the medium term. The construction of dedicated guided busways leads to the greatest patronage increases (+75%). There is limited evidence as to whether these patronage increases were sustained in the long term.

Increases in patronage occurred as a result of a package of improvements to vehicles (low floor buses), services (increased bus frequencies) and supporting highway infrastructure (bus priority), plus "soft" measures such as a simplified fares structure and marketing campaigns. Other external, indirect influences such as city/ town centre parking charges can also have an impact on patronage. It can be concluded that the mix of infrastructure and smarter choice measures together is highly effective in increasing bus use.

2.4.3 Dedicated Walking and Cycling Infrastructure

The evidence base for mode shift achievements from the provision of dedicated walking and cycling infrastructure is limited, although a selection of case study and research findings are presented in the paragraphs below. This covers both recreational and utilitarian (commuter) cycle and walking trip generation.

Ouse Estuary Cycle Track, East Sussex

This is comprised of a new cycle route which links other paths on the National Cycle Network between Newhaven and Seaford. Between 2005 (opening year) and 2007 (monitoring year), the number of cycling trips between Newhaven and Seaford has increased by 200 percent.

Lincoln to Skellingthorpe Traffic-Free Path, Lincolnshire

A new three mile traffic-free route between Lincoln city centre and the village of Skellingthorpe was opened in June 2003. Prior to the implementation there were around 2,000 trips per day and after opening this rose to over 9,000 (i.e. a 350 percent increase).

Research Studies

- Work by Wardman et. al. (1997) suggested that a trebling in cycle mode share could be achieved with wholly segregated facilities;
- Forecasting work of Parkin et. al. (2007) indicates that the provision of traffic free radial routes along desired corridors might produce an increase in cycling between 17 percent and 101 percent with the lowest increase being in the hilliest area;
- Routes with more traffic lead to less cycling as do poorly maintained highways (Parking et. al. and Guthrie et al 12). Similarly the provision of off-road routes lead to more cycling to work; and
- Disaggregate modelling undertaken by Wardman et al. (2007) forecasts that a complete network of segregated cycle routes, even if unfeasible, could increase commuter cycling by 55 percent.

Residential Travel Planning Research

Residential Travel Plan case study evidence points to mode share achievements of 8-10 percent for walking and cycling from investment in a high quality package of walking and cycling measures for new residential and mixed use developments, comprised of the following:

- Dedicated walking and cycling linkages (specifically direct linkages to employment sites and other journey attractors e.g. PT interchanges);
- High quality supporting infrastructure incorporating cycle parking provision for residential properties and community facilities, adequate crossing points and signage;
- Information provision and marketing incorporating residents' welcome packs, walking and cycling maps;
- Personalised Travel Planning programmes;
- Cycle training programmes; and
- Dedicated walking and cycling Champion.

2.4.4 Sustainable Travel Demonstration Towns (Darlington, Peterborough and Worcester)

The Sustainable Travel Demonstration Towns secured DfT funding for investment in walking and cycling infrastructure, supported by marketing and promotional initiatives.

At the end of the five-year project:

- Car use had fallen by up to nine percent across the three towns;
- Levels of walking increased by more than 10 percent in each location, while bus use grew by more than a third in Peterborough and by a fifth in Worcester; and
- There had been a 12 percent increase in cycling in Peterborough and a 19 percent increase in Worcester. Darlington, which received further Government cash to improve facilities for cyclists, saw levels of cycling more than double over the same period.

2.4.5 Personalised Travel Planning Mode Shift Evidence

Personal Travel Planning (PTP) is a technique that delivers information, incentives and motivation to individuals to help them voluntarily make sustainable travel choices. It seeks to overcome habitual use of the car, enabling more journeys to be made on foot, by bike, bus, train or in shared cars.

<http://www.dft.gov.uk/pgr/sustainable/travelplans/ptp/makingptpworkcase.pdf>

Cairns et al. (2004) in reviewing a wide selection of projects for the DfT *Making Smarter Choices Work* report state that 'results so far available suggest that Personal Travel Planning may lead to reductions in car driver trips of 7–15 percent amongst targeted populations in urban areas'

<http://www.dft.gov.uk/pgr/sustainable/smarterchoices/casestudy/terchoiceschangingtheway5765.pdf>

Case study evidence from 14 PTP pilot studies part funded by DfT identifies single occupancy car mode share reductions in the region of 3-6 percent (as shown below). This is taken from the following link:

<http://www.dft.gov.uk/pgr/sustainable/travelplans/ptp/personalisedtravelplanningev5774>

2.4.6 Thameslink

As part of the Thameslink Programme, East Grinstead will become part of the Thameslink network by the end of 2015. A full 12-carriage timetable will be in operation by the end of 2015 and thus the platforms at East Grinstead will need to be extended.

As East Grinstead is incorporated into the Thameslink network, there will be an increase in passenger capacity and more destinations will be available to East Grinstead residents, which is likely to attract more residents to the town and could increase mode share for rail.

It should be borne in mind that more journeys are likely to be created to and from the station. This could create two problems:

- An increase in congestion caused by more traffic travelling to and from the station; and
- An increased demand for parking, which could lead to overspill onto the surrounding roads.

As such, it is important that sustainable transport opportunities are maximised to East Grinstead station, which will involve developing a public transport interchange with better integration into the bus network, improving walking and cycling routes to the station, and improving cycle parking facilities at the station. This approach would minimise the amount of extra parking that would need to be provided at the station.

2.4.7 Conclusion

It should be borne in mind that the Scenario 2 modal shares have only been applied to the strategic development at Imberhorne Farm, while travel patterns of the background traffic have not been altered. It could be considered that influencing residents' travel patterns at the new development will be more effective than existing residents, who may have become used to a particular mode of transport.

Based on the above, it is believed that a 10 percent mode share for buses is achievable and such a percentage should be set as the objective for the strategic development at Imberhorne Farm.

The Scenario 2 mode share proposed a 15 percent share for walking, which is only a marginal increase on the existing pattern (14.9 percent) and is thus considered realistic.

The Scenario 2 mode share proposed an increase from 1.9 to 5 percent for cycling, which based on the above is considered achievable and such a percentage should be set as the objective for the strategic development at Imberhorne Farm.

The Scenario 2 mode share proposed a 10 percent share for train journeys, which is only a marginal increase on the existing pattern (9.8 percent) and is thus considered realistic if not conservative based on the future incorporation of East Grinstead into the Thameslink network.

The mode share for car passengers is consistent with the present pattern (although this could be increased by promoting car sharing at the Imberhorne Farm development).

In conclusion, the mode shares proposed as part of Scenario 2 are considered achievable and such a pattern should be set as the objective for the strategic development at Imberhorne Farm.

2.5 Task 1e: Impact of Reduced Employment on Internalisation & Mode Choice

Transport is a means of travelling between two geographical points by a particular mode. Current transportation policy seeks to influence people's modal choice to travel between locations with an emphasis on trying to reduce firstly the need to travel and secondly the mode by which the journey is made.

By locating land uses that people travel between within close proximity (relatively) to each other, it is possible to not only minimise the need to travel, but it can also influence how people travel. Through the location of employment, leisure, retail etc. within close proximity, or even within residential developments, it is possible to facilitate living and working within the same neighbourhood and, as the distance between the two are likely to be small, encourage sustainable travel choices. Locating appropriate employment opportunities within a residential area creates the opportunity to internalise commuter trips within the confines of a development site and for those trips to be made by non-car modes.

The greater the quantum and diversity of the employment opportunities, the greater the likelihood that jobs will be taken by local residents. However, if employment opportunities are reduced or restricted to a particular type then the likelihood of successfully maximising internalisation may reduce. This could not only be in total numbers but also as a proportion of all employment trips generated by the new housing.

In order to reduce the reliance upon the car the Councils should maximise the opportunities for employment and other services within East Grinstead and in particular the new strategic development of Imberhorne Farm. The employment land use mix and opportunities should reflect the predicted demographic make up of the new development in order to maximise further the successful delivery of internalisation.

It is worth noting that to maximise travel by sustainable modes, linking land uses is crucial, but this needs to be complemented by public transport provision, cycle and pedestrian routes and most importantly a reduction in the number of opportunities to park at or near destinations.

2.6 Task 1f: Evidence Supporting Levels of Internalisation and Reduced Vehicular Trips

By creating new employment opportunities within East Grinstead, there is a strong potential to maximise trips within the site (internalised trips). As part of Stage 1, Scenario 2 was further developed by increasing the internalisation of trips to create Scenario 3 as shown in Table 2.15 below.

Table 2.15 - Internalisation factors (presented in the Stage 1 Report)

Land Use	Internalisation factor	
	Scenario 1 and 2	Scenario 3
New housing	20%	20%
Primary school	70%	90%
Secondary school	50%	80%
Offices	10%	20%
Industrial estate	10%	20%

Case study evidence is provided below as justification for the assumed levels of internalised trips. This evidence is based on robust forecasts (rather than actual observed figures). At present little (if any) academic research is available which examines the levels of trip internalisation within developments. Monitoring of mode share and/or trip generation of new developments is often now required through the travel planning process. Therefore in the future, there may be more data available on levels of internalised trips, particularly if this requirement is stipulated within planning conditions and obligations or if there are penalties for exceeding a number or proportion of external trips.

2.6.1 Northstowe, Cambridgeshire – Internalised Trip Forecasts

Northstowe is a proposed new town, located 8km to the North West of Cambridge City Centre. It is expected to be "an exemplar of sustainability in the use of renewable energy resources and reducing carbon emissions".

The Transport Assessment prepared to support the planning submission presents a strong case for "trip containment / internalisation", based on Northstowe's mixed used service offering. This level of trip internalisation is predicted to increase over time (up to a ceiling) as the development becomes established and the range and strength of mixed use service offering is maximised.

The following basis was used to calculate the level of containment forecasted by the Transport Assessment:

- The quantum of commuting trips which will be internal was determined by appraising census data for a range of comparable locations that offer a significant level of job opportunities alongside residential development;
- The level of retail trips likely to be satisfied by outlets within the new centre has been estimated;
- Pupil leakage figures have been used to estimate number of children that will be educated within the new schools; and
- Containment of leisure trips has been identified using data in National Travel Survey.

The key "internalisation" headlines are as follows:

- 50 percent of total trips are predicted to be internal (for all journey purposes);
- 52 percent of trips for leisure / social purposes are predicted to be internal; and
- 10 percent of employment trips are predicted to be internal (although it is acknowledged that this proportion is likely to increase with time as employment opportunities become established within the development).

2.6.2 Middle Quinton, Warwickshire – Internalised Trip Forecasts

Again given the mixed use nature of the proposed development, a considerable number of internalised trips are forecast (the exact levels dependent upon the specific nature of service offering within the development). The quantum of trip containment that is likely to be achieved is based on:

- Education trips - using typical figures for England, it can be demonstrated that approximately 95 percent of the resident pupils will be educated within the town;
- Commuting trips - based on travel patterns that exist elsewhere in England, the level and mix of jobs that would be available locally could result in approximately 20 percent to 25 percent of the resident work force finding employment within the new development;
- Retail trips - The proposed food store would cater for almost all of the new residents' convenience shopping needs. It is estimated that the comparison shopping and other ancillary retail uses would also cater for a large proportion of the non food retail trips undertaken by the new residents.

The effect of the internalisation of trips described above is that more than half of total peak hour trips generated by the development would be contained within Middle Quinton.

2.6.3 Conclusion

As previously stated there is a lack of monitoring information regarding whether the level of internalisation outlined above has been achieved. Nevertheless, the internalisation factors used in Scenario 3 in Stage 1 are considered consistent with the above examples as follows:

- 95 percent of resident pupils in the Middle Quinton development are predicted to be educated within the town. Scenario 3 proposed that 90 percent of primary school trips and 80 percent of secondary school trips could be internal, giving an average of less than 90 percent;
- The Middle Quinton example states that 20 percent to 25 percent of the resident work force could find employment within the new development, which is consistent with the 20 percent that was assumed for scenario 3.

In conclusion, the internalisation factors proposed as part of Scenario 3 are considered achievable and such a pattern should be set as the objective for the strategic development at Imberhorne Farm.

2.7 Task 1g: Outline Framework for East Grinstead Transport Strategy

Task 1g involved providing evidence to demonstrate how a 10 percent modal shift away from existing vehicular trips might be achieved in East Grinstead and to provide an outline framework of a sustainable transport strategy for the town. The former was addressed in task 1d and thus this section will concentrate on developing the evidence from the previous section into an outline framework of a sustainable transport strategy for the town. Table 2.16 below provides recommendations for initiatives to incorporate into an outline transport strategy for East Grinstead to achieve a single occupancy car mode share reduction potentially in the order of 10 percent.

Table 2.16 – Transport Strategy Initiatives

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

<p>Smarter Choices</p>	<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 – 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
<p>Parking Management</p>	<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

Table 2.17 below provides additional measures which should be incorporated into new developments within East Grinstead.

Table 2.17 – Additional measures to be incorporated into new developments

Type of Measure	Specific Measures
Streetscape / Public Realm Design	Features to be incorporated at design stage: <ul style="list-style-type: none"> • Safe, attractive, and ‘permeable’ networks for walkers and cyclists • Walkable neighbourhoods - range of facilities within 10 minutes’ walking distance (around 800m) • ‘Legible’ development design • Car free or car reduced residential developments • Sales of car parking spaces separate from sale of residential units, linked to management of on-street parking • Home zones (either comprehensive home zones principles or at minimum ‘quasi home zone’ principles – see Manual for Streets Guidance)
Promoting active modes	<ul style="list-style-type: none"> • Provide secure bike storage at dwellings and at main trip attractors • Signed cycle and walking routes connecting new developments to existing developments
Public Transport	<ul style="list-style-type: none"> • Providing bus services: <ul style="list-style-type: none"> ○ within new developments and ○ beyond the development to connect with existing developments in East Grinstead and further afield
Technological Solutions	<ul style="list-style-type: none"> • Technological solutions to influence travel behaviour in new employment, residential and mixed use developments : <ul style="list-style-type: none"> - Integrated office space / broadband in new homes - Marketing of new homes as ‘live-work’ units • Real time public transport information into new homes or public transport information hubs into new developments
Smarter Choices	<ul style="list-style-type: none"> • Personalised Travel Planning for new residents • Financial incentives: taster tickets for buses, discounts on cycles • Travel Training Programme for new residents

3. Task 2: Revised Housing Capacity Modelling

Task 2 involves assessing the spreadsheet modelling undertaken in Stage 1 to see if changes are required following work undertaken in Task 1 – specifically Tasks 1a, 1b, 1d and 1f.

3.1.1 Scale of strategic development at Imberhorne Farm

Task 1a has proved that by removing the strategic development at Imberhorne Farm from the TEMPRO assumptions, the growth rates used in Stage 1 are robust (i.e. the standard TEMPRO growth rate appears to be a conservative estimate for traffic growth).

Task 1b has involved an initial analysis and professional opinion on whether the five percent capacity increase for the network is achievable and has shown that it is likely to be a conservative estimate for capacity improvements at the five A22 junctions. The limitations of the data available and resulting methodology has also been highlighted because the volume of trips that could be accommodated by the network with a five percent increase in capacity would be higher if additional flows are included from non-surveyed flows. As a result it would be possible to develop more housing in East Grinstead using the spreadsheet analysis technique undertaken by Atkins.

Task 1d and 1f have provided evidence that the mode share and internalisation factors used in Scenarios 2 and 3 from Stage 1 respectively is considered achievable and such a pattern should be set as the objective for the strategic development at Imberhorne Farm.

As a result, it is considered that the end result and overall level of housing that could be provided at the strategic development at Imberhorne Farm predicted in the Stage 1 report is robust using the data available to us and resulting methodology. Table 3.1 below shows the maximum scale of development using the ratios of land use reported in the Peter Brett Associate (PBA)’s Local Model Validation Report (LMVR).

Table 3.1 - Maximum Scale of Development using ratios of land use from PBA’s LMVR

Land use	Max Scale of development
New Housing (households)	571
Primary School (pupils)	140
Secondary School (pupils)	122
Offices (employees)	198
Industrial estate (employees)	143

Thus, Table 3.1 demonstrates that 571 dwellings and 341 jobs could be provided at the strategic development at Imberhorne Farm within the five percent growth ceiling.

3.1.2 Distribution of traffic flows from strategic development at Imberhorne Farm

As part of Task 1a, the distribution of development traffic has been considered in more detail and thus it has been possible to provide a more detailed prediction of where the impacts of the development will occur. These are shown in Figure 2.3. Figure 3.1 below shows the traffic flows associated with strategic development at Imberhorne Farm for the AM Peak Hour. Figure 3.2 shows the traffic flows for 2021 including the flows associated with strategic development at Imberhorne Farm for the AM Peak Hour.

Figure 3.1 – AM Peak Hour flows associated with strategic development at Imberhorne Farm

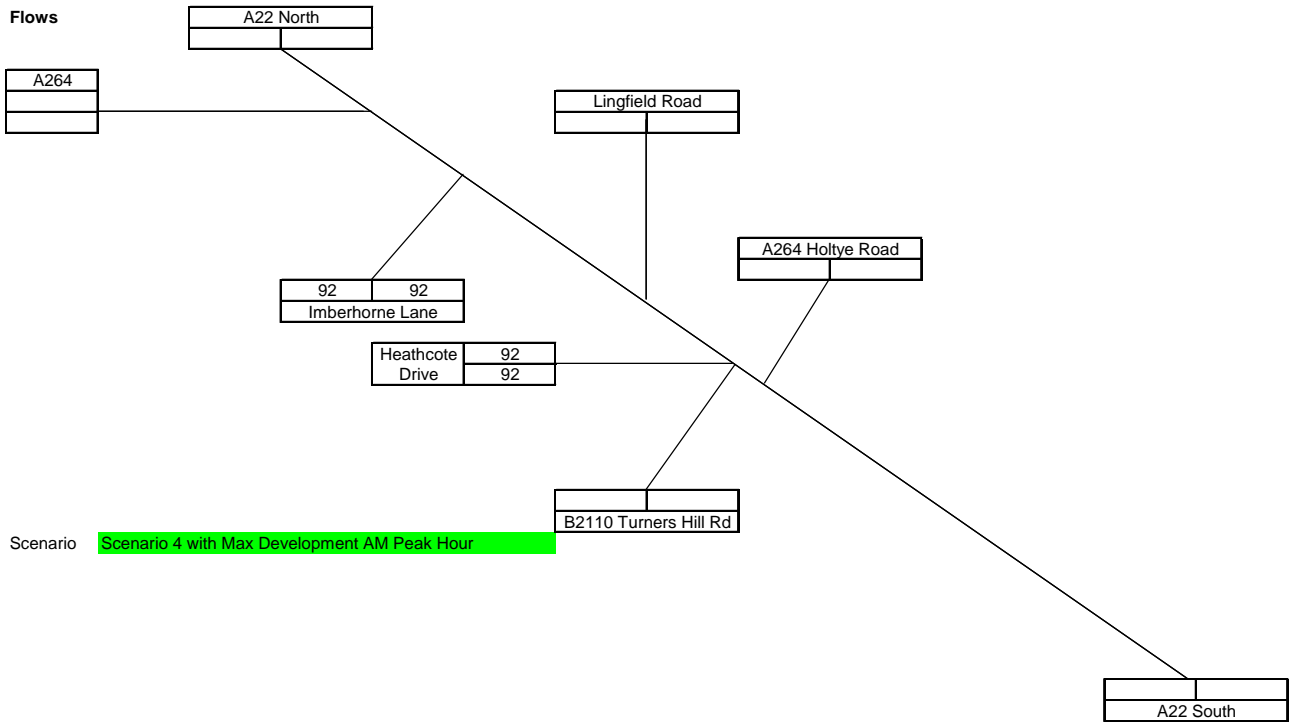
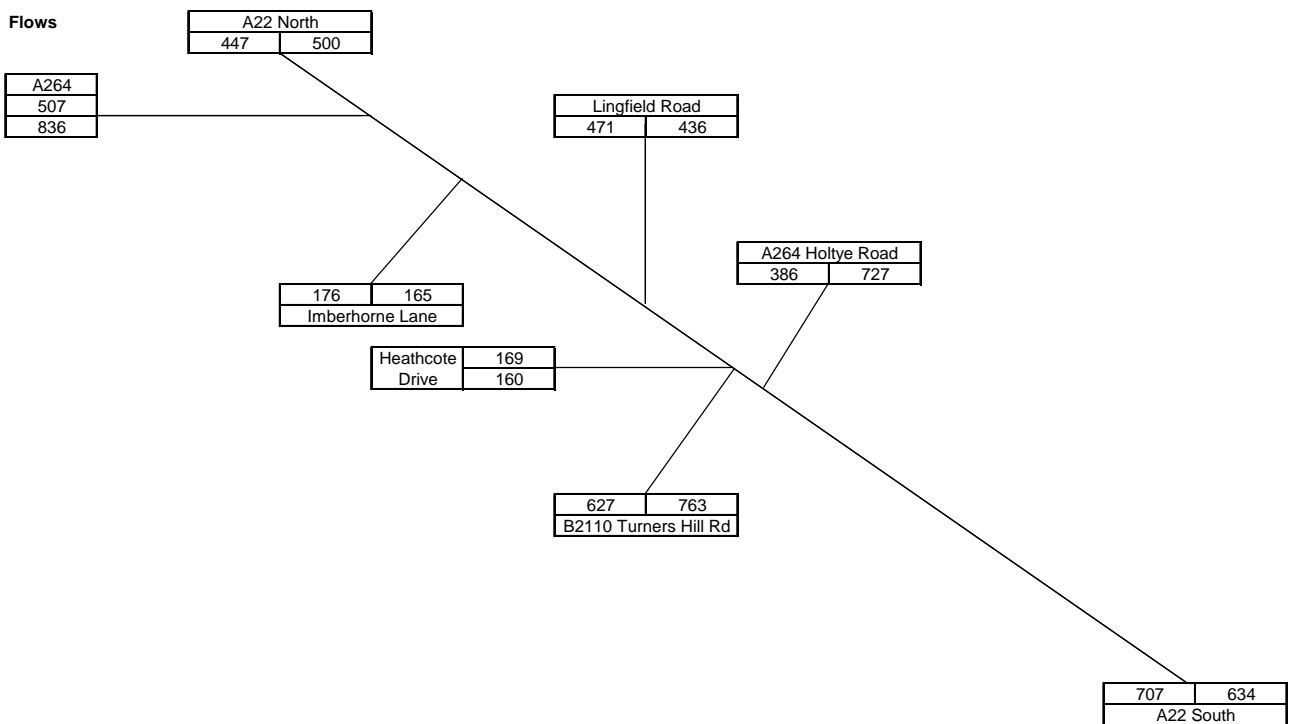


Figure 3.2 – AM Peak Hour flow for 2021 including flows associated with strategic development at Imberhorne Farm



Comparison with Stage 1

Task 1a compared the anticipated 2021 traffic flows from Stage 1 with those for the revised network diagram without the strategic development at Imberhorne Farm. This comparison remains unchanged with the addition of traffic flows from the strategic development at Imberhorne Farm, as these have been assigned to the Imberhorne Lane and Heathcote Drive links, which did not appear in the Stage 1 network. Thus, in comparison to Stage 1, the revised distribution of traffic has resulted in lower traffic flows at the following nodes:

- A264;
- A22 North;
- A22 South; and
- B2110 Turners Hill Road.

While traffic flows at the following nodes have increased:

- Lingfield Road; and
- Holtye Road.

3.1.3 Distribution of overall development traffic including strategic development at Imberhorne Farm

Table 3.2 shows the scale of development flows associated with each road to show where the greatest impacts in terms of volume of traffic are likely to occur.

Table 3.2 – AM Peak Hour Development flows by road including strategic development at Imberhorne Farm

Road	Arrivals	Departures	Total
A264	29	41	70
A22 North	28	22	50
Lingfield Road	116	105	221
Holtye Road	127	95	222
A22 South	40	31	71
B2110 Turners Hill Road	42	43	85
Heathcote Drive	169	160	329
Imberhorne Lane	176	166	342
Total	727	663	1390

Table 3.2 shows that the greatest impacts are anticipated on Heathcote Drive and Imberhorne Lane, with over 50 percent of forecast development traffic on these roads due to result from the strategic development at Imberhorne Farm. The next highest flows are anticipated on Lingfield Road and Holtye Road.

It should be noted that while the traffic generated from the strategic development at Imberhorne Farm represents a five percent increase on overall traffic in 2021, it is likely to represent a higher percentage increase on Imberhorne Lane and Heathcote Drive, as these are the only two links where this development traffic has been assigned. The exact scale of increase is not known as there is no existing traffic flow data for these links. Although the development traffic could result in percentage increases of more than five percent, Task 1b demonstrated that capacity could be

increased at the junctions closest to the Imberhorne Farm development (A22 / Imberhorne Lane and A22 London Road / A22 Station Road junctions), which would mitigate this.

3.1.4 Conclusion and Next steps

The work undertaken in Task 1 of this Stage 2 report has supported the results and conclusions of the Stage 1 work (which showed that 571 dwellings and 341 jobs could be provided at the Imberhorne Farm site within the five percent growth ceiling) is robust using the information available. A more detailed distribution of the development traffic has been considered within this report, which has shown that the greatest flows from all developments combined are expected to be on Imberhorne Lane and Heathcote Drive, with next greatest on Lingfield Road and Holtye Road, while the impacts on the A22 North and South, Turners Hill Road and A264 cordon locations are significantly lower.

It is recommended that the next step would be to undertake junction modelling of the existing and future situations at the five A22 junctions to provide a more accurate indication of spare capacity and thus how much more traffic could be absorbed by the existing network. This would require classified turning counts at each of the junctions. The conclusions of the Stage 1 and 2 studies, and hence the scale of development that can be achieved at the Imberhorne Farm site, can then be reviewed, once the results of the more detailed modelling of the A22 junctions become available.

Appendix A

Brief from West Sussex County Council

A.1 Brief

Advice upon East Grinstead's transport issues is needed to inform Mid Sussex District Council's decisions on development allocations within its emerging Core Strategy. Whatever conclusion is reached on the amount of strategic housing that East Grinstead can accommodate will clearly affect the amount of development required in other areas of the District.

The Stage 1 studies undertaken by Atkins in March 2009 highlighted a range of proposed measures, surveys and study work that deserve consideration. There is an immediate need, however, for further work to provide better understanding of and increased confidence in Atkins' initial development capacity estimates. Clarification is also required of certain aspects of their methodology and some of the assumptions made. These requirements are set out in more detail below.

Deliverables

Task 1

Provide further clarification of points arising from Atkins' March 2009 studies (listed in descending order of importance):

- h) Levels of new housing and employment (from TEMPRO growth forecasts). What is the basis for the assumptions in Stage 1 and are these consistent with Mid Sussex District Council projections?
- i) Basis of 5 percent traffic growth ceiling Evidence required showing that this is consistent with maximum mitigation expected from local improvements?
- j) Impact of non-surveyed cross-cordon movements upon analysis Several minor roads/rat runs were omitted from the 2006 surveys i.e. Crawley Down Road/Imberhorne Lane/Dunnings Road/Wilderwick Road
- k) Achievability of reduced vehicle trip rates through increased sustainable mode share Evidence needed that identified improvements could deliver suggested reductions. Consider future impact of Thameslink.
- l) Potential impact of reduced employment levels upon mode shift. Would less employment hamper efforts to increase sustainable mode share?
- m) Achievability of reduced vehicle trip rates through increased internalisation Evidence needed that internalisation could deliver suggested reductions
- n) Achievability of 10 percent mode shift for all vehicle trips. Evidence that such a significant mode shift could be achieved in East Grinstead?

Task 2

Refine mode share predictions for new and existing development as necessary in the light of any modified assumptions or new information.

Task 3

Refine capacity estimates for strategic housing development without a relief road as necessary to strengthen evidence base supporting the Submission Mid Sussex Core Strategy.

Task 4

Refine and test proposed improvements to key A22 junctions, including consideration of traffic capacity, cost and deliverability.

Appendix B

Schedule of Sites Considered through the Mid Sussex Strategic Housing Land Availability Assessment

Appendix C

A22 junctions report