

LinSig and the Planning Process – When are transport impacts ‘severe’?

Paul Lulham BA (Hons) MA (Oxon) MSc CMILT

Associate Director, DHA Transport

(paul.lulham@dhatransport.co.uk)

The National Planning Policy Framework (NPPF) was introduced in 2012 and sets out the Government’s planning policies for England and how they are to be applied by Local Planning Authorities.

Paragraph 32 of the NPPF advises that development plans that would be likely to generate a significant amount of movement should be considered whether:-

- *“the opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;*
- *safe and suitable access to the site can be achieved for all people; and*
- *improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.”*

The question of when the transport impacts of development are “severe” remains unclear, despite it being tested at various planning appeals and inquiries since 2012, and is consequently a subject of considerable debate within the transport planning profession. DHA Transport has nevertheless utilised LinSig to good effect on a number of projects to overcome the objections of Local Planning and Highway Authorities on these grounds, including recent examples in Hawkhurst and Maidstone in Kent.

Land at Highgate Hill, Hawkhurst

Tunbridge Wells Borough Council refused a planning application by Countryside Properties for a development of 62 residential dwellings in Hawkhurst in 2015. There were six grounds for refusal, including the following transport-related grounds:-

- (2) *The proposal is reliant on access by private car. It does not promote and fails to make adequate provision for alternative means of transport. The proposal is not considered to accord with the principles of sustainable development and is contrary to Core Policy 3 of the Core Strategy and paragraphs 17, 29, 32 and 34 of the NPPF.*
- (3) *The proposal fails to make an adequate contribution towards measures to address the highway and sustainable transport needs of the development and would therefore conflict with Core Policy 1 of the Tunbridge Wells Borough Core Strategy 2010 and Policy TP4 of the Tunbridge Wells Borough Local Plan 2006.*

Countryside Properties subsequently lodged an appeal against the Borough Council’s decision and the case was heard at a Planning Inquiry.

During the intervening period, Hawkhurst Parish Council commissioned an independent consultant to produce a report on the operation of the signal junction between the A229 and the A268 in the centre of the village, which experiences peak period traffic congestion. This report was

presented on the opening day of the Inquiry and was not submitted to the Planning Inspectorate or the Appellants beforehand.

The Parish Council's consultant noted that there was no potential to upgrade the junction layout physically, due to highway land constraints, and that the Local Highway Authority – Kent County Council (KCC) – had previously dismissed the option of banning certain turning movements to aid traffic flow. The consultant further noted that they had made contact with the County Council's Traffic Signals Team, which had reported that there would be no viable opportunity to mitigate any additional traffic flows beyond those arising from development sites accounted for within the Tunbridge Wells Borough Local Plan.

DHA Transport's review of the case found no evidence to suggest that KCC had examined the potential to upgrade the traffic signal equipment itself. DHA therefore sought to establish whether such an upgrade would provide any headroom for further traffic growth, with support from JCT.

Site visits were carried out to obtain pedestrian crossing and signal timing data and it was observed on a number of occasions that pedestrians crossed prior to the 'green man' phase, or during traffic intergreens where the pedestrian phase did not follow. These observations led DHA to the conclusion that the junction would benefit from the implementation of pedestrian detection equipment and Puffin facilities, both to aid the needs of pedestrians and to cancel or reduce intergreen time following a pedestrian phase in the event that it is not required.

In order to assess whether Puffin technology would benefit the operation of the junction, a number of tests were carried out looking at a range of intergreen timings that reflected minimum and maximum Puffin outcomes. DHA's observations suggested that, during the peak periods, the majority of pedestrians crossed within the minimum of time (i.e. 5 seconds) and often before the 'green man' had been extinguished. Whilst it was considered likely that longer intergreens (e.g. 10 seconds) would be required for crossings by mobility impaired and elderly pedestrians, these were anticipated to be more frequent during the inter-peak periods of the day when the highway network is under less pressure. In these situations, the proposed pedestrian detection equipment would be able to allow the full amount of time for the crossing movement.

On this basis, the junction operation was assessed by JCT for the morning and evening peak hours and the results are summarised in the table below.

Table 3-1: AM Peak	Existing Layout				Proposed Layout (Puffins) - Survey + D											
	Survey		Survey+D		IG=5		IG=6		IG=7		IG=8		IG=9		IG=10	
	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ
A229 Cranbrook Rd	85.8%	19.3	88.3%	20.1	84.2%	19.0	84.2%	19.0	84.2%	19.0	84.2%	19.0	86.2%	19.5	86.2%	19.5
A268 Rye Rd	86.4%	17.9	86.8%	18.1	82.6%	17.0	82.6%	17.0	84.6%	17.5	84.6%	17.5	84.6%	17.5	84.6%	17.5
A229 Highgate Hill	84.6%	19.6	86.3%	20.7	82.3%	19.8	84.2%	20.2	84.2%	20.2	84.2%	20.2	84.2%	20.2	86.3%	20.7
A268 Northgrove Terrace	61.1%	11.7	62.0%	11.8	58.8%	11.5	58.8%	11.5	60.5%	11.7	60.5%	11.7	60.5%	11.7	60.5%	11.7
PRC	4.2%		1.9%		6.9%		6.8%		6.4%		6.4%		4.4%		4.3%	
Cycle Time	157		157		157		157		157		157		157		157	
File	Hawkhurst Existing.lsg3x				Hawkhurst Proposed.lsg3x											

Table 3-2: PM Peak	Existing Layout				Proposed Layout (Puffins) - Survey + D											
	Survey		Survey+D		IG=5		IG=6		IG=7		IG=8		IG=9		IG=10	
	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ
A229 Cranbrook Rd	94.4%	29.8	99.2%	34.9	93.7%	29.7	95.5%	31.0	95.5%	31.0	95.5%	31.0	97.3%	32.8	97.3%	32.8
A268 Rye Rd	83.5%	19.8	80.5%	19.6	77.4%	18.9	77.4%	18.9	77.4%	18.9	77.4%	18.9	77.4%	18.9	78.9%	19.3
A229 Highgate Hill	96.2%	27.1	98.9%	30.1	94.2%	26.2	94.2%	26.2	96.5%	28.0	96.5%	28.0	96.5%	28.0	96.5%	28.0
A268 Northgrove Terrace	95.7%	26.6	100.3%	31.2	93.3%	25.5	93.3%	25.5	93.3%	25.5	93.3%	25.5	93.3%	25.5	97.9%	28.7
PRC	-6.9%		-11.4%		-4.7%		-6.1%		-7.2%		-7.2%		-8.1%		-8.7%	
Cycle Time	180		180		180		180		180		180		180		180	
File	Hawkhurst Existing.lsg3x				Hawkhurst Proposed.lsg3x											

The results show the impact of a range of variable intergreens following the Puffin phases. It was also assumed that the length of the 'green man' phase could be reduced to 5 seconds from 6. It should be noted that LinSig does not take into account the cancellation of the pedestrian phase due to pedestrians crossing before the stage is called. Therefore, whilst it is the case that the average intergreen when the pedestrian stage is called could be extended beyond 5 seconds, this would likely be offset by the cancellation of the pedestrian stage in other cases. The LinSig results assuming an average intergreen of 5 seconds were thus considered to provide the best representation of the benefits of Puffin technology.

The results of the morning peak modelling showed that the junction operated within capacity in the base year and that the introduction of Puffin technology would fully mitigate the effect of the development traffic in all but one scenario (the 10 second intergreen scenario, which is less likely based on DHA's observations). Indeed, in the case where the intergreens were shortened to 5 seconds, there was shown to be a net benefit to the overall operation of the junction, such that a further 100 dwellings could theoretically be accommodated locally.

In the evening peak, the junction was shown to operate slightly above its theoretical capacity in the base year. Within LinSig3, theoretical capacity is normally reached at 90%, although in congested situations where stop line saturation increases, the actual capacity point is 100%. The junction operation was shown to reach actual capacity on the A268 (west) arm with the addition of the development traffic, with all other arms being below 100%. The addition of Puffin technology in this scenario fully mitigated the development, assuming intergreens of 5 to 8 seconds.

The results of the DHA / JCT assessment were submitted to the Planning Inquiry and in his subsequent Appeal Decision, the Planning Inspector drew the following conclusions:-

"The proposals would be likely to generate an increase in the amount of traffic using the already busy local roads, including the crossroads in the centre of the village which are congested at certain times with lengthy queues on all four approaches..."

However... the appellant's analysis shows that there may be opportunities to improve pedestrian crossing facilities and capacity for vehicles at the junction through the installation of improved traffic signals sufficient to accommodate the increased number of vehicles that would be associated with the proposal.

The NPPF is clear that development should only be prevented on transport grounds where the residual cumulative impacts would be severe. Given that development of the appeal site would lead to only a marginal increase in the amount of traffic using the local road network... it would be unreasonable to prevent the proposals from going ahead on transport grounds".

The appeal was allowed by the Inspector and planning consent was granted for the proposed development.

Land South of Sutton Road, Langley, Maidstone

DHA Transport prepared a Transport Assessment (TA) on behalf of Countryside Properties in relation to a proposed development of up to 800 residential dwellings, together with a primary school and local centre, to the south east of Maidstone, in 2015. The TA proposed mitigation to a number of traffic signal controlled junctions in the vicinity of the site, which was identified in collaboration with JCT. Following the submission of the planning application, KCC Highways and Transportation raised an objection on the grounds that:-

"The improvements involve modifications to the existing junction layouts and traffic signal operations. In most cases the junctions would continue to operate over capacity with the improvements in place and, as the modelling outputs are likely to have been distorted by the extent to which capacity is exceeded, there is no certainty that such provision can achieve the minimum requirement of mitigating the impact of the additional development traffic. This results in a level of impact that is unacceptably severe and KCC Highways strongly object to the development proposals on this basis."

DHA discussed this statement with JCT, who agreed that KCC's comment regarding the potential distortion of the LinSig model outputs in over-capacity situations was at best misleading. Whilst it is the case in some situations that high levels of congestion in traffic models can distort results if it is not suitably identified and addressed, in most cases a well constructed traffic model should be capable of forecasting the relative performance of development and highway mitigation options, even where over-saturation occurs. Indeed, in many cases, a model operating over capacity will be more stable than a model operating at capacity, as the otherwise random nature of arriving traffic will have less of an effect.

In respect to one particular signal junction in the TA study area, it was evident to DHA and JCT that KCC had implemented a 'gating' strategy to manage the flow of traffic entering the Maidstone Town Centre Gyratory system during peak periods. In its response to the planning application, the County Council denied this, claiming that:-

"...KCC Highways have already configured the signal operation to optimise traffic flow conditions in order to minimise the effects of road congestion at this busy interchange. The application of this incorrect assumption has meant that the modelling results are not representative of the current regime or the associated operational constraints."

Yet LinSig has the capability to introduce an optimised junction management strategy for a signalised intersection. In the case of the junction in question, the LinSig modelling presented in the TA identified that this strategy would significantly enhance its performance in the base year, which strongly indicated that KCC had in fact not configured it to its optimum extent.

In its corporate responses to public consultation exercises on the emerging Maidstone Local Plan, KCC referred to the outputs of strategic VISUM modelling in stating that the quantum and spatial distribution of development proposed by the Plan would have an *"unacceptably severe impact"* on the transport network. Yet by the County Council's own admission during subsequent correspondence, VISUM cannot effectively model the impacts of local junction mitigation such as that proposed in the TA for Land South of Sutton Road. It simply provides a strategic overview of movement patterns on the highway network to support macro-level land-use planning decisions and the context for more detailed modelling at the micro level.

Due to the wider politically-driven debate between the County and Borough Councils over the Maidstone Local Plan and proposed residential site allocations in South East Maidstone in particular, Maidstone Borough Council (MBC) appointed its own independent transport consultants to review DHA's TA. Following some minor revisions, MBC's consultants accepted the LinSig modelling results presented in the TA and concluded that with the proposed mitigation schemes in place, all but one junction would perform comparatively better than with their existing layouts and without development traffic. In the Planning Committee report, the case officer summarised the position thus:-

“Overall (MBC’s consultant) ...concludes that with the appropriate mitigation measures, the impact of the proposed development is mitigated and therefore cannot be considered severe. As a consequence, it is considered that the proposal does not contravene NPPF Paragraph 32.

...KCC Highways fails to demonstrate by reference to relevant and reliable evidence that granting permission for the amended proposal would cause any adverse impacts that would significantly and demonstrably outweigh the benefits of the proposal and that the residual cumulative impacts of development are severe”.

A Resolution to Grant outline planning consent for the proposed development at Land South of Sutton Road was subsequently granted by MBC in July 2016.

Summary and Conclusion

In the context of a continuing national housing shortage and the sweeping changes to planning policy brought about by the NPPF, it is clear that Local Planning and Highway Authorities need to make a concerted effort to overcome the infrastructure barriers to the delivery of new homes.

Rightly or wrongly, those opposed to new development routinely identify highway capacity constraints as a reason for objection, arguing that proposals contravene the NPPF Paragraph 32 ‘severity test’. Yet where signal junctions are concerned, there are now a wide range of tools available to local authorities to mitigate the impact of development traffic, many of which are evidently not being taken up to the extent required. In some cases, this may reflect a lack of resource availability, in others it may arise from a political desire to resist development.

LinSig is an increasingly powerful and well-regarded tool in this respect, providing the means to take the ‘noise’ out of the planning debate and to provide an objective representation of the various physical and technological mitigation options. As such, there should be very few circumstances in which residual development effects on signal junctions can be classed ‘severe’.