

URGENT UPDATE 15/509015 – Land South of Sutton Road**Additional Transport / Highway Information**

Additional highway information was requested by members at the Planning Committee Meeting on 7 July 2016. This note sets out the view of Maidstone Borough Council's independent transport consultant Mott MacDonald on the highway work carried out by the applicant and KCC's responses to the proposals.

This paper also covers bus prioritisation measures and air quality issues, as well as proposing additional conditions and heads of terms.

KCC's comments are very detailed. Except for positively acknowledging the traffic generation assumed by the applicant, no mention is made about either flows or traffic distribution. It is therefore concluded that KCC accept the traffic flow, generation and distribution assumptions that underpin the assessments carried out in the TA.

Discussion of VISUM Modelling*Executive Summary*

The Maidstone VISUM transport model has been used to test the strategic implications of Local Plan growth over the period to 2031 and the package of transport interventions identified in the Integrated Transport Strategy (ITS). **As a strategic model, it is unsuited to considering the local level transport impacts of individual planning applications. Despite this, however, KCC has relied upon the VISUM model outputs in making its objections to these applications.** It is standard practice to assess the local transport impacts of individual planning applications by undertaking detailed junction modelling using the LinSig, ARCADY and PICADY modelling software packages.

The VISUM model covers the Maidstone urban area only. It does not model in detail the rural areas of the Borough nor the M20 junctions and main motorway carriageway. The key data on which the model is based is 15 years old. For these reasons Highways England (HE), the highway authority for England's strategic motorway and trunk road network, has indicated that the VISUM model is unsuitable for use as a tool for assessing the impacts of the Local Plan on the motorway network.

VISUM cannot model the impacts of junction capacity improvements in detail. It can, however, assess how mitigation measures can reassign traffic across the highway network and their effect on travel time delay. In terms of the latter, VISUM predicts an increase in inbound travel time on the A274 Sutton Road corridor of just 1 minute 20 seconds in the year 2031 compared with the existing situation. This cannot be regarded as significant in the context of the variations in traffic conditions that can typically be expected to occur on a day to day basis.

Traffic flows on the A274 Sutton Road in the year 2031 Do Something scenarios are predicted to increase by 400 vehicles during the AM peak relative to the existing situation, an increase of 38%. However, this increase cannot be attributed solely to the traffic generated by the application sites in south east Maidstone – it represents the cumulative impact of the full Local Plan objectively assessed housing need of 18,560 units, together with background traffic growth not associated with the Local Plan. **A comprehensive package of improvements to highway capacity, improvements to the already frequent and high quality bus services and the provision of comprehensive walking and cycling facilities connecting directly with existing routes has been proposed to mitigate the transport impacts of the application sites.**

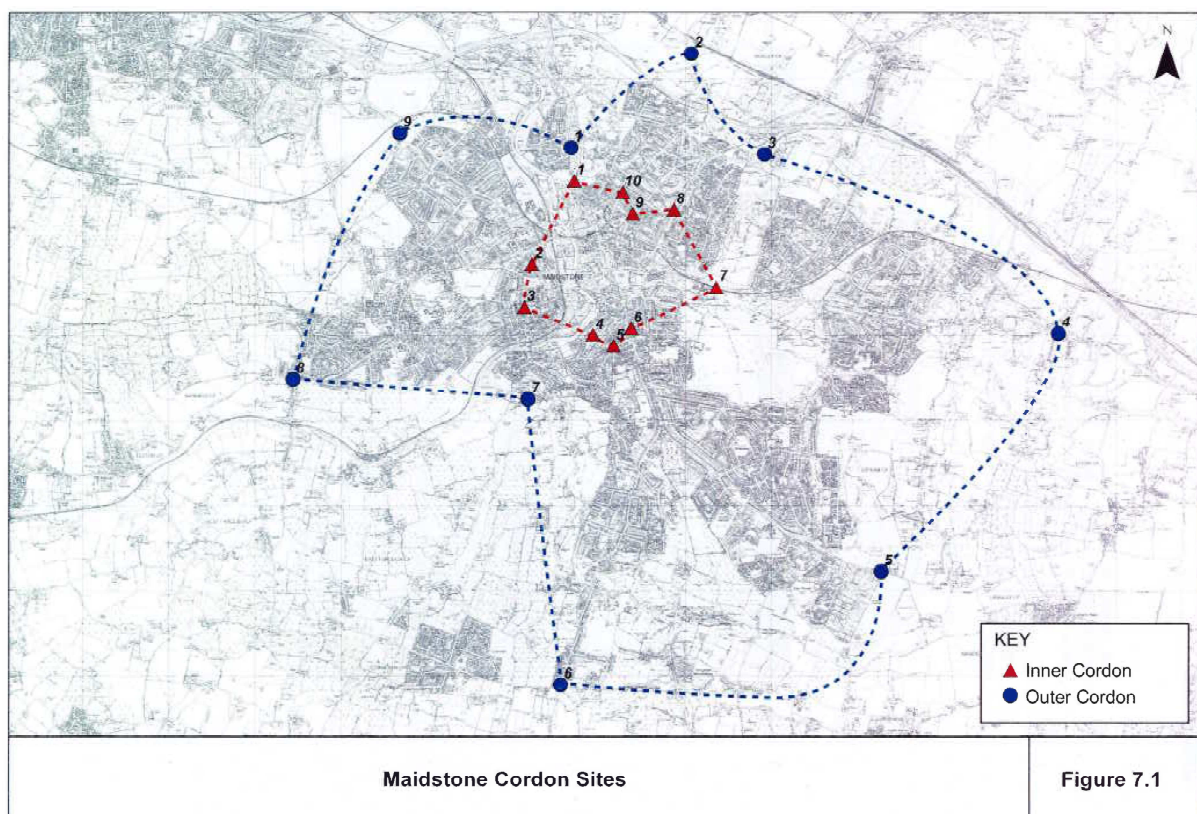
Detailed junction capacity assessments using LinSig, ARCADY and PICADY conclusively demonstrate that the traffic impacts of proposed development in south east Maidstone can be mitigated to a situation where congestion is **lower** than if the developments were **not** built and if the mitigation was **not** implemented. The transport improvements proposed by the applicants will provide benefits to existing transport users on the corridor as well as mitigating the impact of proposed development.

VISUM model runs were also undertaken for the year 2022, including **all development identified for the South East Maidstone Strategic Development Location to the end of the Local Plan period**. In their original report to the 22 February 2016 JTB, KCC noted that the model results “*demonstrate a level of impact on the highway network that cannot be regarded as severe in the context of the National Planning Policy Framework*” (paragraph 5.1).

Overview

The Maidstone VISUM transport model has been used to test the strategic implications of Local Plan growth over the period to 2031 and the package of transport interventions identified in the Integrated Transport Strategy (ITS). Paragraph 3.6 of the joint KCC/MBC report to the Joint Transportation Board (JTB) on 7 December 2015 noted that “*VISUM does not model the impacts of local junction mitigation... It provides a strategic overview of movement patterns on the road network and the context for more detailed modelling at a local level*”.

Only those ITS interventions within the Maidstone urban area have been tested by VISUM. Interventions specific to the Rural Service Centres and Larger Villages have not been tested as they fall outside the outer model cordon. This is shown in the figure below, taken from the *Maidstone Multi Modal Transport Model – Local Model Validation Report* (Jacobs, February 2011). The only trips from the Rural Service Centres and Larger Villages which will have been accounted for in the VISUM model will be those trips to the Maidstone urban area.



Furthermore, VISUM does not fully model the M20 junctions and main motorway carriageway. The trip origin/destination matrices used within the model have been based upon 2001 London Area Transport

Study (LATS) survey data, 2001 Census Journey to Work data and other roadside interview (RSI) data. Due to the age of the original 2007 base VISUM model produced by Jacobs, this was updated by Amey to a 2014 baseline using third party data from Transport Assessments and journey time data, but no new trip origin/destination data was collected. It is possible that this may affect the accuracy of the VISUM forecasts, as trip patterns may have changed in the past 15 years. The DfT's WebTAG guidance advises that any trip origin/destination data over six years old should be replaced.

For these reasons Highways England (HE), the highway authority for England's strategic motorway and trunk road network, has indicated that the VISUM model is unsuitable for use as a tool for assessing the impacts of the Local Plan on the motorway network. HE's Regulation 19 representation therefore objected to the Local Plan. The Borough Council is working towards the agreement of an alternative methodology with HE and KCC involving localised junction modelling at M20 Junctions 5 to 8 using the LinSig, ARCADY and PICADY modelling software packages.

In the context of south east Maidstone, LinSig, ARCADY and PICADY have already been used to assess the detailed impact of development proposals at individual junctions. The use of localised transport models to supplement strategic modelling tools such as VISUM is standard practice (notwithstanding the issues with the age and coverage of the Maidstone VISUM model), to consider junction capacity in detail and to confirm that identified transport mitigation measures will be effective. Results of the LinSig, ARCADY and PICADY modelling for the relevant junctions are presented separately.

Forecast VISUM models were built from the 2014 base model for 2031 (the end of the Local Plan period) and subsequently for an interim forecast year of 2022, at which time the first review of the Local Plan is scheduled to take place.

VISUM Model Outputs

Various scenarios have been tested for the 2031 forecast year, but only the Do Something 4a (DS4a, with the South East Maidstone Strategic Link (SEMSL)) and Do Something 4b (DS4b, without SEMSL) have tested the objectively assessed housing need of 18,560 units. However, the Do Minimum (DM) scenario (i.e. including committed highway schemes only (the Maidstone Bridges gyratory) and not the package of highway, public transport and walking/cycling improvements identified in the ITS) was re-run in June 2016 with the 18,560 housing units. A full report of the DM scenario outputs is awaited from KCC.

With regard to the 2022 forecast year, the Do Minimum and Do Something scenarios have both tested a revised housing target of 14,034 units, adjusted to remove the three broad locations for housing growth towards the end of the Local Plan period (Maidstone town centre, Invicta Park Barracks and Lenham) and the windfall sites expected to come forward between 2022 and 2031. **However, the 2022 target includes all development identified for the South East Strategic Development Location.**

A summary of the travel demand and network performance for the AM peak in each of these scenarios is provided in the table below.

	2014 Base	2022 DM	2022 DS	2031 DM	2031 DS4a (with SEMSL)	2031 DS4b (without SEMSL)
Travel Distance (veh km)	122,000	141,400	132,000	143,900	140,100	135,600
% difference vs 2014		16%	8%	18%	15%	11%
Travel Time (veh hours)	8,300	10,700	9,100	11,000	9,300	9,700
% difference vs 2014		29%	10%	33%	12%	17%
Person Trips	50,300	56,800	56,800	59,100	59,200	59,200

<i>% difference vs 2014</i>		<i>13%</i>	<i>13%</i>	<i>17%</i>	<i>18%</i>	<i>18%</i>
Vehicle Trips	35,500	40,000	37,800	41,500	39,300	39,300
<i>% difference vs 2014</i>		<i>13%</i>	<i>6%</i>	<i>16%</i>	<i>11%</i>	<i>11%</i>

When compared against the 2014 baseline, the results identify an increase in vehicle trips of 6% for the 2022 Do Something scenario. This increase is lower than the 13% predicted for the 2022 Do Minimum scenario, due to the positive effect of the ITS interventions including bus and walking/cycling improvements.

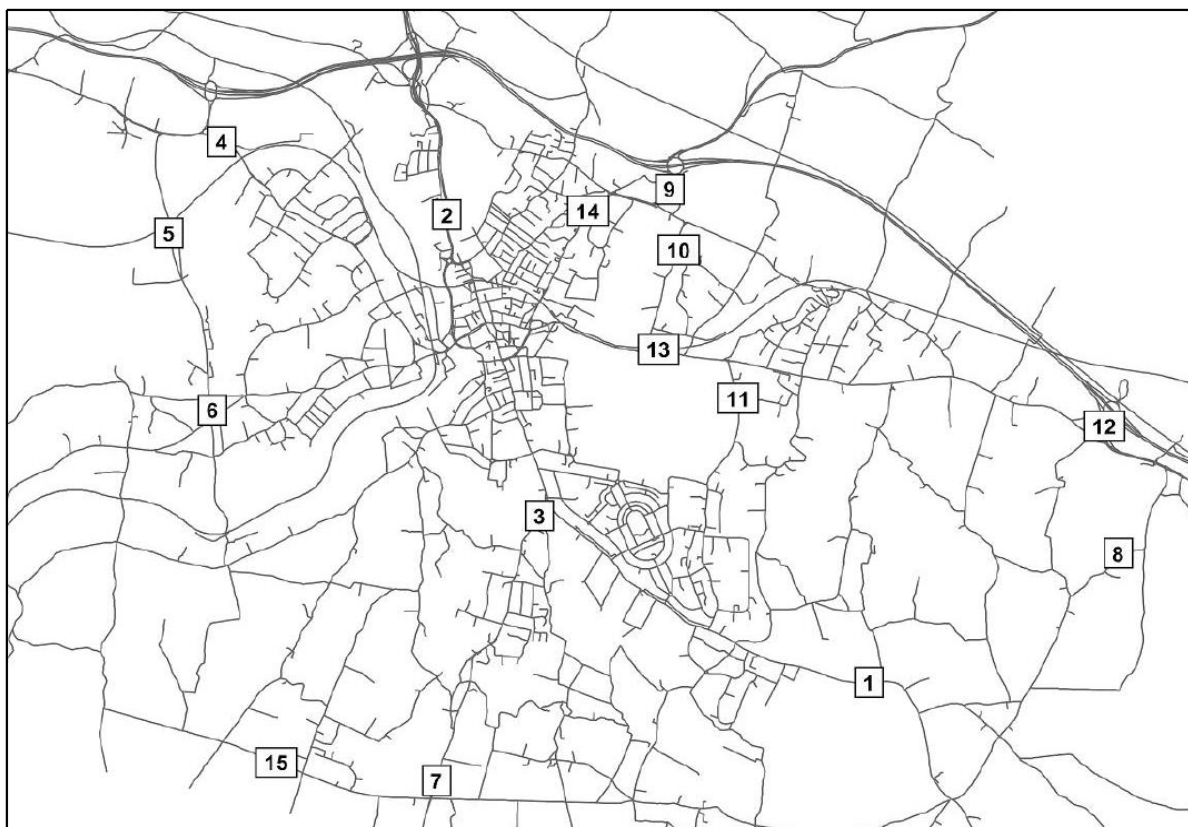
With respect to the 2031 scenarios, the Do Something 4a (with SEMSL) and 4b (without SEMSL) scenarios predict an 11% increase in vehicle trips relative to the 2014 baseline. This is lower than the 16% increase predicted by the Do Minimum scenario, again due to the positive effect of the ITS interventions.

The 6% increase in vehicle trips in the 2022 Do Something scenario is equivalent to an additional 2,300 vehicle trips on the highway network in the AM peak. A further 1,500 vehicle trips are predicted to be added to the highway network during the AM peak between 2022 and 2031. As the 2022 scenarios assume that the South East Maidstone Strategic Development Location and other Local Plan housing and employment allocations are fully built out, this increase can be attributed to traffic generated by the broad housing locations and windfall sites – representing less than 25% of the objectively assessed need of 18,560 housing units – and background traffic growth not associated with Local Plan development.

It is notable that in summarising the results of the 2022 model runs, paragraph 5.1 of KCC's original report to the 22 February 2016 JTB noted that the results *"demonstrate a level of impact on the highway network that cannot be regarded as severe in the context of the National Planning Policy Framework"*.

With respect to the A274 and A229 corridors, analysis of VISUM model outputs has necessarily been confined to the link flows and travel time routes published in Appendix E of the *Maidstone VISUM Transport Model Forecasting Report* (Amey, March 2016). This covers the 2014 base and 2031 Do Something 4a and 4b scenarios only as equivalent data for the updated 2031 Do Minimum (i.e. with the objectively assessed need of 18,560 housing units) and 2022 Do Minimum and Do Something scenarios is awaited from KCC.

The figure below shows the model network and the approximate location of the links for which directional traffic flows have been published in Amey's March 2016 report. Traffic flows for sites 1 and 3 are presented in the following table.

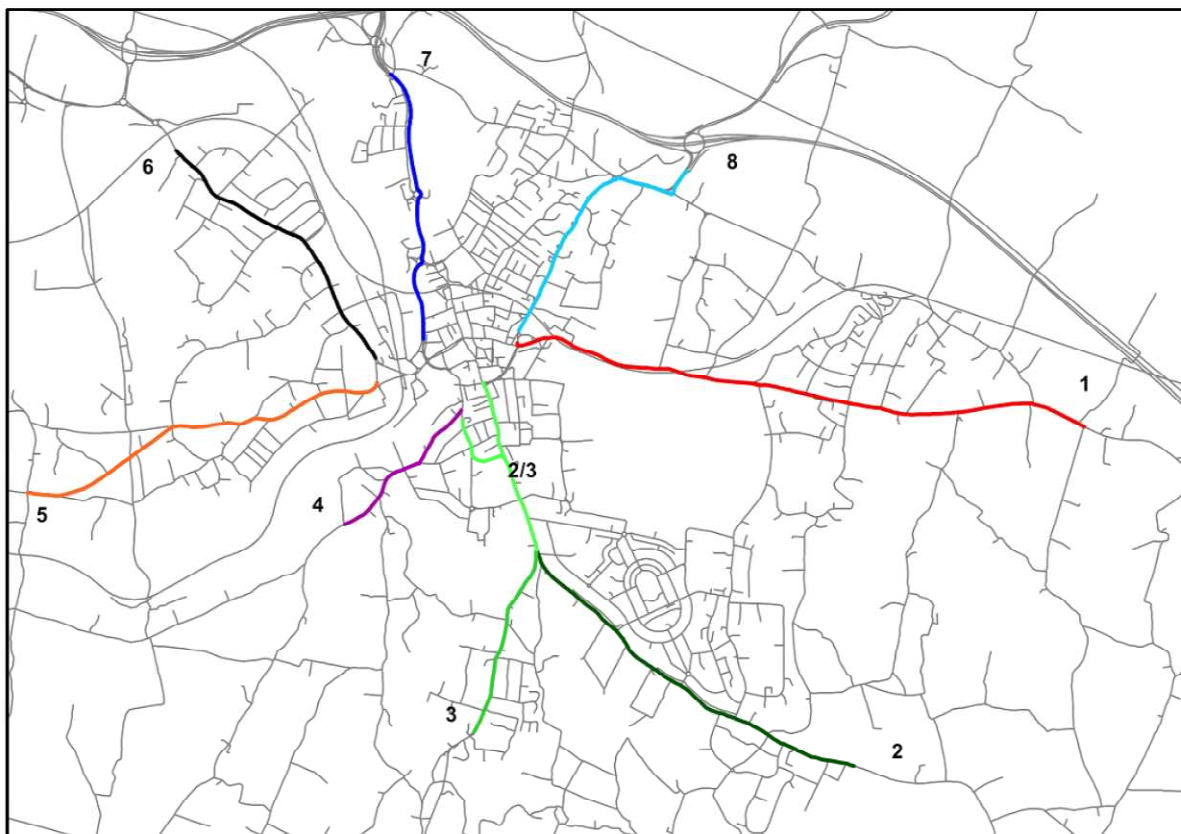


Site	Link	2014	2022 DM	2022 DS	2031 DM	2031 DS4A (with SEMSL)	2031 DS4B (without SEMSL)
1	A274 (W)	1050	<i>Data awaited</i>	<i>Data awaited</i>	<i>Data awaited</i>	1450	1450
3	A229 Loose Road (N)	2600	<i>awaited</i>	<i>awaited</i>	<i>awaited</i>	3000	3200

It can be seen that on the A274 (W) that traffic flows in the 2031 Do Something scenarios are predicted to increase by 400 vehicles relative to the 2014 baseline, an increase of 38%. On the A229 Loose Road (N), the equivalent increase is 400 vehicles for DS4a (with SEMSL) and 600 vehicles for DS4b (without SEMSL), an increase of 15% and 23% respectively. However, **these increases cannot be attributed solely to the traffic generated by the proposed developments in south east Maidstone** – this represents the cumulative impact of the full Local Plan objectively assessed housing need of 18,560 units, together with background traffic growth not associated with the Local Plan.

It must be reiterated that VISUM is a strategic highway model and is unsuited to the assessment of individual junction capacity. This is more robustly undertaken using the LinSig, ARCADY and PICADY modelling software packages, as is industry standard practice. VISUM can, however, model the impacts of mitigation measures to a degree, not to assess individual junction capacity but to assess how these mitigation measures can reassign traffic across the highway network and their effect on travel time delay.

With respect to travel times, Amey's March 2016 report presented forecast travel times from VISUM for eight key radial road corridors as shown in the figure below.



It can be seen from the above figure that travel time route 2 relates to the A274 Sutton Road and, north of the Wheatsheaf junction, the A229 Loose Road into Maidstone town centre. The table below shows the the AM peak inbound and outbound travel times for the A274, for the 2014 baseline and 2031 Do Something 4b scenario.

Travel times in seconds – AM Peak

Route	2014		2031 DS4B (without SEMSL)	
	Inbound	Outbound	Inbound	Outbound
2 - A274 Sutton Road	738	602	818	713
Difference vs 2014	-	-	80	111

The VISUM model predicts an AM peak inbound travel time for route 2 of 12 minutes 18 seconds for the 2014 baseline scenario. This compares with an inbound travel time for scenario 2031 DS4b of 13 minutes 38 seconds. This represents an increase in travel time of 1 minute 20 seconds.

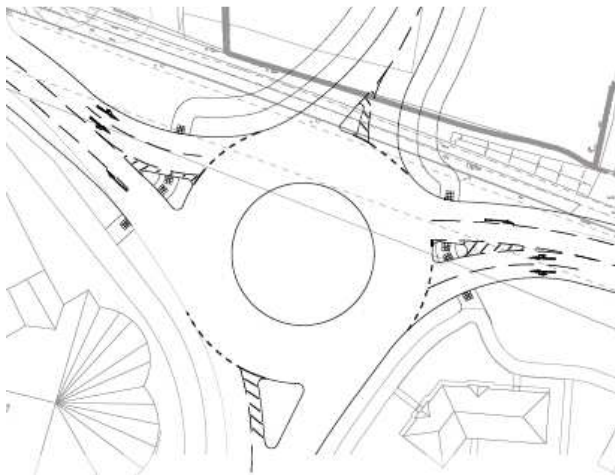
In the outbound direction, VISUM predicts an AM peak travel time of 10 minutes 2 seconds in the 2014 baseline scenario, compared with 11 minutes 53 seconds for scenario 2031 DS4b. This represents an increase in travel time of 1 minute 51 seconds.

The increases in travel time predicted by VISUM in 2031 relative to the 2014 baseline **cannot be regarded as significant in the context of the variations in traffic conditions that can typically be expected to occur on a day to day basis**. Notwithstanding this, it appears from Appendix C of Amey's March 2016 report that the proposed junction capacity improvements at the A229 Loose Road/Armstrong Road/Park Way junction

The eastern access to the development will be for buses only and is proposed as a priority junction. The assessment results for 2029 are presented for the future situation with committed and proposed development only as this junction would not be in place without the proposed development. They show that there would not be any delay to traffic along A274 at all. Buses would be experiencing some very minor delays turning out of the site.

KCC's response dated 1 June 2016 comments as follows: *"Capacity modelling of the eastern site access, which will be dedicated for use only by buses, has been included to confirm that it will operate satisfactorily"*. It identifies the delays to buses and suggests that the views of Arriva should be sought on the acceptability of this arrangement.

A274 / Langley Park / Bicknor Farm



Year	Junction Arm	Comm+Dev (Do Minimum)			
		AM		PM	
		RFC	Q	RFC	Q
2029	Sutton Road (E)	0.751	3.1	0.696	2.3
	Langley Park	0.551	1.3	0.292	0.4
	Sutton Road (W)	0.722	2.7	0.883	7.2
	Bicknor Farm	0.207	0.3	0.138	0.2
	Avg Delay (s/pcu)	10.11		14.22	

Table 3-2: A274 Sutton Road / Langley Park / Bicknor Farm Rbt Capacity Modelling Results

The 4-arm roundabout proposed by Bicknor Farm was tested within the transport documents submitted by the Sutton Road development. The results for 2029 are presented for the future situation with committed and proposed development for the 4-arm roundabout only in the submission. They show that the roundabout would operate within capacity with minimal queuing and delays. Queues would be up to 3pcus on the northbound approach in the morning peak and up to 7pcus on the southbound approach in the evening peak.

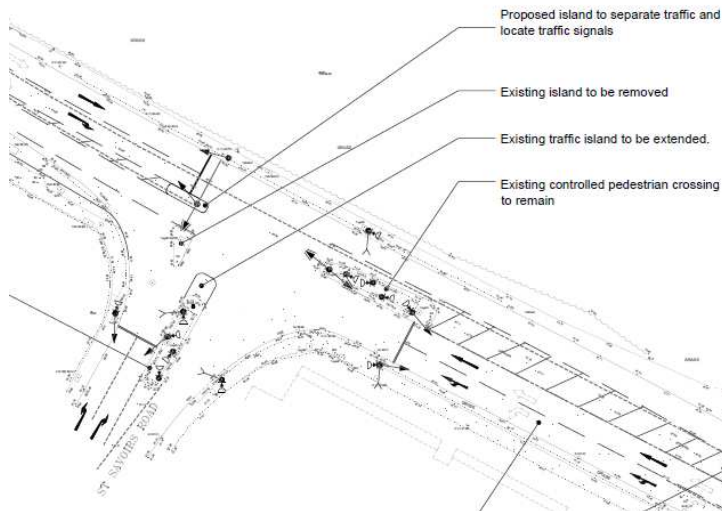
KCC's response comments as follows: *"The results are broadly comparable to those presented in support of the Bicknor Farm application, which indicated that the junction would operate close to capacity in the PM peak by 2027. Whilst these findings support the proposed junction design, they continue to be relevant to the wider concerns expressed by KCC Highways regarding the overall worsening of congestion and delay on the A274 corridor."*

Whilst the transport documentation submitted with this application does not include the modelling of the existing 3-arm roundabout at this location, the Bicknor Farm submission includes such assessment. This clearly shows that the introduction of the 4-arm roundabout significantly reduces queuing and delays when compared to the 3-arm roundabout.

A274 / Willington Street / Wallis Avenue

The robustness of LinSig Modelling is discussed in detail in the appendix to this document. It is our highway consultant's view that LinSig is the industry standard tool to assess signalised junctions. As such, the results of such modelling are acceptable and all the scenarios modelled are comparable.

A274 / St Saviours Road



Period	Comm (Do Nothing)		Comm+Dev (Do Minimum)	
	AM	PM	AM	PM
2014	41.1%	10.9%	-	-
2019	-3.0%	-18.1%	-16.3%	-25.5%
2024	-9.6%	-25.0%	-22.1%	-32.5%
2029	-15.3%	-31.9%	-27.0%	-38.7%

Table 7-9: A274 Sutton Road / St Saviours Road Capacity Modelling Results (PRC%)

Period	Comm+Dev (Do Something)	
	AM	PM
2019	-6.5%	-21.9%
2024	-12.0%	-26.9%
2029	-18.6%	-31.7%

Table 7-10: Do Something A274 Sutton Rd / St Saviours Rd Junction Capacity Modelling Results (PRC%)

Mitigation at this junction is proposed in form of two ahead lanes on A274 northbound with a two to one lane merge on the exit. The results tables show that full mitigation is not quite achieved in the morning peak but that "nil detriment" is achieved in the PM peak. The difference in the morning peak is however small.

KCC comments as follows: *"Updated drawings, which are not supported by updates to capacity modelling analysis, have been included [in the TA Addendum]."* The above has been *"identified in KCC Highways previous consultation comments and formed part of the holding objection raised in the absence of evidence to demonstrate full mitigation of impact. They remain pertinent in view of the worsening severe congestion that will arise at the above junctions on the A229 and A274 corridors and increased propensity for road users to seek alternative routes to avoid delays."*

The results as presented by the applicant are not considered to show a severe impact at this junction. The assessments do not take into consideration any modal shift. Should any modal shift be achieved based on the significant contributions towards public transport improvements, footways and cycleways as well as Travel Plan measures, the results would further improve.

A274 / Horseshoes Lane

Year	Junction Arm	Comm (Do Nothing)				Comm+Dev (Do Minimum)			
		AM		PM		AM		PM	
		RFC	Q	RFC	Q	RFC	Q	RFC	Q
2029	Horseshoes Lane	0.973	9.34	0.687	2.05	1.104	18.96	0.863	4.68
	Sutton Road (N)	0.035	0.05	0.082	0.15	0.037	0.05	0.087	0.17
	Avg Delay (s/pcu)	128.33		33.81		233.96		69.30	

Table 3-5: A274 Sutton Road / Horseshoes Lane Capacity Modelling Results

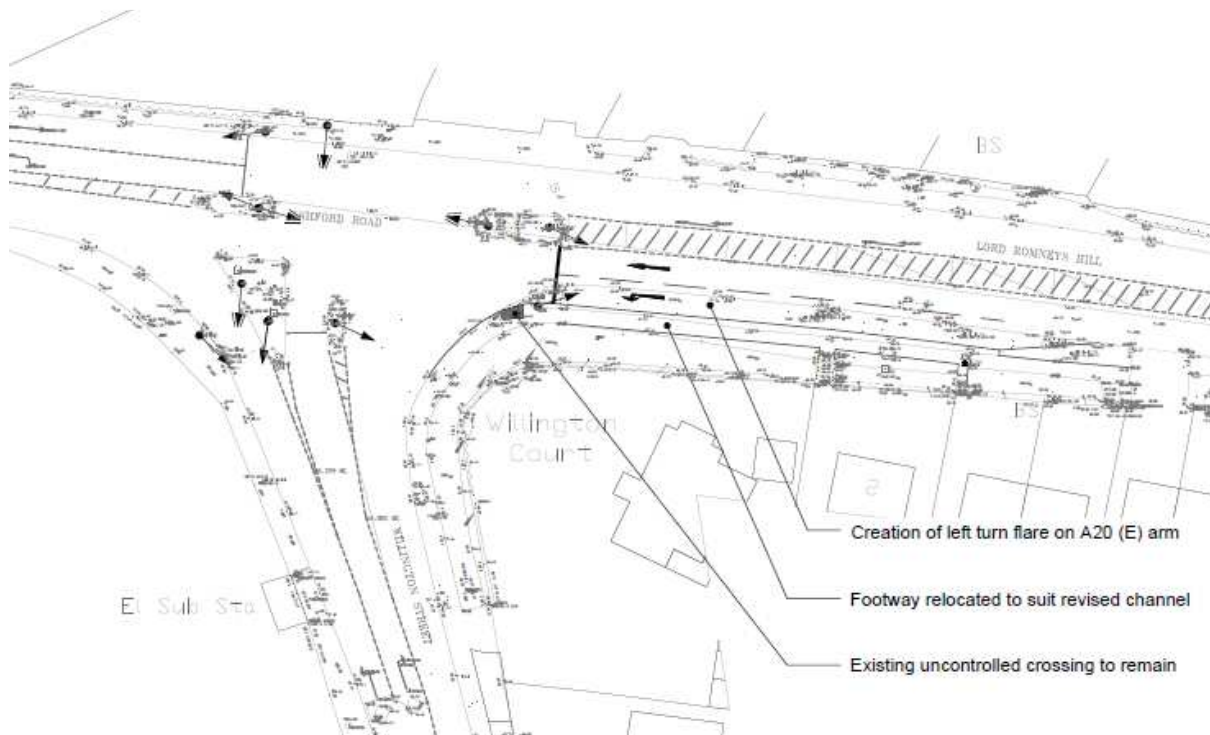
The results for 2029 show that there would be no additional queuing on A274, the addition of the development traffic therefore has no impact on the A274. Although Horseshoes Lane exceed theoretical capacity with the development flows added, the increase in queuing is not significant.

The developer has tested the widening of Horseshoes Lane immediately at the junction with a flare to allow separate left and right turning lanes at the stopline as a possible mitigation measure. This would reduce overcapacity to below the desired level on Horseshoes Lane.

KCC's comments are as follows: *"In order to address the concerns previously raised regarding congestion at this junction, the applicant has proposed mitigation in the form of the widening of the Horseshoes Lane carriageway to form two approach lanes. This will require the removal of part of the existing hedgerow and a reconfigured footway arrangement. The submitted swept path analysis indicates that a pantechicon vehicle could be prevented from completing a left a turn manoeuvre into Horseshoes Lane in the event that vehicles are queued at the Horseshoes Lane exit. This is not dissimilar to the current situation. Capacity modelling analysis has demonstrated that this improvement would satisfactorily mitigate the impact by enabling the junction to operate within capacity during both peak periods."*

It is considered that such an improvement could lead to induced demand along this lane which would not be desirable due to the type of road and its width restrictions. No mitigation at this junction is therefore suggested but a solution would be possible should members wish so.

A20 Ashford Road / Willington Street



Period	Comm (Do Nothing)		Comm+Dev (Do Minimum)	
	AM	PM	AM	PM
2014	-9.8%	-7.0%	-	-
2019	-21.1%	-35.3%	-26.1%	-42.1%
2024	-28.0%	-43.3%	-33.0%	-50.9%
2029	-35.2%	-51.8%	-38.3%	-57.1%

Table 7-15: A274 Sutton Road / Willington Street Capacity Modelling Results (PRC%)

Period	Comm+Dev (Do Something)	
	AM	PM
2019	-18.8%	-26.9%
2024	-27.5%	-33.0%
2029	-33.1%	-39.2%

Table 7-16: Do Something A20 Ashford Road / Willington Street Capacity Modelling Results (PRC%)

The proposal for this junction put forward by the developer is identical to the latest scheme drawing produced by KCC's consultant Amey. It contains a left turn flare on the A20 eastbound approach.

The results show all three scenarios to be significantly over capacity. They also show the third scenario to perform significantly better than both the first and second scenario. This demonstrates that by introducing the mitigation and adding development flows, the junction would operate significantly better than without mitigation and without development flows. The mitigation would entirely mitigate the development's impact at this junction leading to overall significantly lower average delays.

KCC's response comments as follows: *"The TA Addendum has provided further clarifications regarding the applied approach to the capacity modelling, although no updated modelling has been undertaken due to the limited arising changes in traffic volumes. Whilst it is acknowledged that there is scope to improve traffic flow in this location, the previous comments of KCC Highways regarding the high levels of congestion at this junction and uncertainties regarding full mitigation of impact remain pertinent."*

The robustness of LinSig Modelling is discussed in detail in the appendix to this document. It is our highway consultant's view that LinSig is the industry standard tool to assess signalised junctions. As such, the results of such modelling are acceptable and all the scenarios modelled are comparable.

A274 Wheatsheaf Junction

The developer originally put forward an identical scheme to that promoted at the time by KCC which included the closure of the exit of Cranbourne Avenue. Following the rejection of this scheme, alternatives have been considered.

Given how constrained this junction is, an alternative layout would not appear to be possible. Other measures were therefore considered that would mitigate the impact of the development.

- Signal optimisation in form of phase delays: This means that if both a vehicular phase and a pedestrian phase occur during the same stage of a cycle (in the same green), the pedestrian phase usually takes longer to clear the junction (crossing) than the vehicular phase due to the lower speed of pedestrians. With phase delays introduced, the vehicular phase can be extended to make full use of its shorter clearance time without extending the duration of this stage (i.e. without taking green away from other approaches). The vehicular phase thereby gains some additional green time in every cycle.

For the Wheatsheaf junction with signal optimisation, the southern approach on the A229 can run for an additional 3 seconds every cycle and Cranbourne Avenue can run for an additional 2 seconds every cycle. For this junction which has been modelled with a cycle time of 150 seconds, this would equate to approximately an additional 60pcus per hour.

- Allow for modal shift in the traffic flows: as stated earlier, the flows used for the assessments do not take into consideration any modal shift. The assessments for this junction were run with an assumed 3% modal shift away from car driver. This is considered a conservative assumption given the Integrated Transport Strategy contains a target of 7.3% decrease in car driver mode share for all work trips by 2031.

The two above measures would lead a to a "nil detriment" situation with the development flows added.

	Base +Committed / present signal control		Base +Committed + Development / signal optimisation and 3% lower traffic	
	AM 2029	PM 2029	AM 2029	PM 2029
Queues in pcu				
A229 N right	103	126	102	128
A229 N ahead	38	55	32	54
A274	114	120	122	121
Cranbourne	20	23	23	20
PRC	-31.8%	-40.1%	-32.8%	-35.7%

The table above shows the practical reserve capacity in the morning to be very slightly worse with development and improved in the evening peak. Queues are shown to be very similar in both scenarios with the biggest decrease being 6pcus on A229 southbound and the biggest increase being 8pcus on A274 in the morning peak. This change is not considered severe.

KCC's comments to this junction entirely relate to the scheme presented in the TA Addendum that included the closure of Cranbourne Avenue. They are as follows: *"Further analysis of capacity modelling outputs has been provided in order to quantify the effects of the previous mitigation proposal, which included closure of the Cranbourne Avenue egress."*

The analysis has indicated that such a closure could enable an additional 569 Passenger Car Units (PCUs) to move through the junction in each peak period. This figure is substantially higher than KCC Highways estimate of 340 vehicles that had been reported to the JTB on 22nd February 2016.

The relevant LinSig analysis has been submitted to substantiate the applicants' prediction. KCC Highways would acknowledge that a more optimistic projection may be achievable in the event that efficiencies in lane usage and movement through the junction are maximised. It is maintained however, that a more conservative estimate is likely to be appropriate in view of the uncertainties over whether such conditions could materialise in practice.

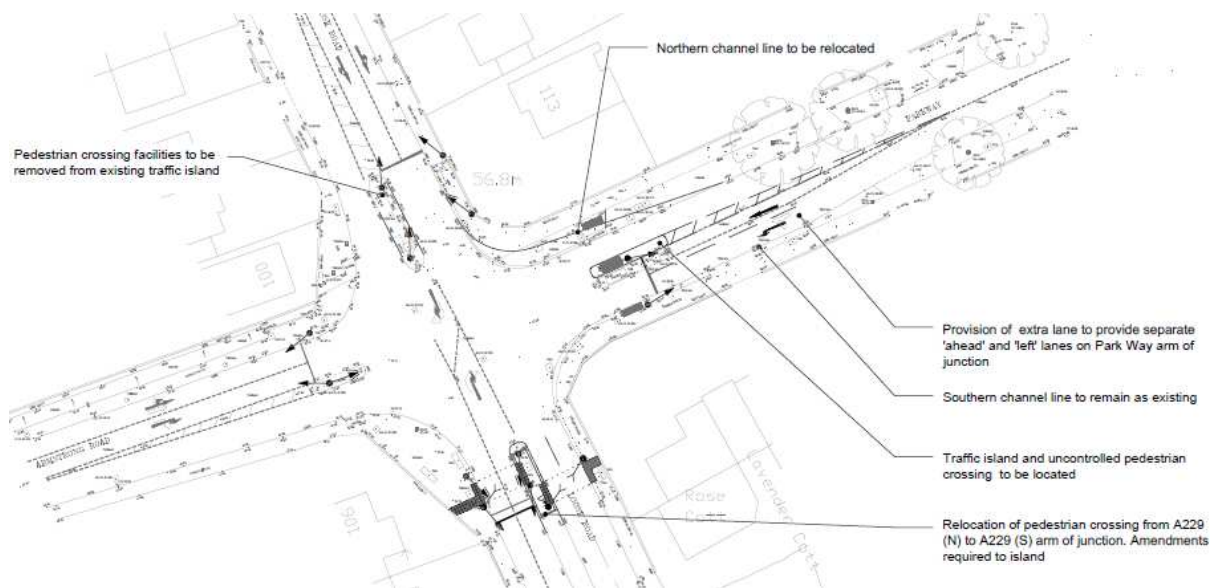
It is also important to note that at the JTB meeting held on 22nd February 2016, members resolved to reject a proposal to close the Cranbourne Avenue egress. This was primarily due to objections raised by local residents and concerns over potential impacts on other nearby local roads.

The findings of the applicants' analysis, irrespective of any capacity gains that could be realised, do not address the concerns that underpinned the JTB resolution. This makes it highly unlikely that the requisite Traffic Regulation Order would be approved by the JTB. The deliverability of the proposed form of junction improvement is therefore highly uncertain.

On this basis KCC Highways must maintain the previously raised objection to the development on account of the unacceptably severe impact that will arise in the absence of suitable mitigation."

Whilst the above is not relevant to the latest mitigation proposal put forward, it should be noted in relation to the LinSig discussion elsewhere in this paper, that KCC acknowledge that "a more optimistic projection may be achievable".

A229 / Armstrong Road / Park Way



Period	Comm (Do Nothing)		Comm+Dev (Do Minimum)	
	AM	PM	AM	PM
2019	-28.9%	-9.2%	-38.4%	-14.6%
2024	-35.2%	-18.6%	-44.8%	-24.0%
2029	-41.2%	-24.8%	-50.6%	-29.5%

Table 7-3: Optimised Do Nothing and Do Minimum A229 Loose Rd / Park Way / Armstrong Rd Capacity Modelling Results (PRC%)

Period	Comm+Dev (Do Something)	
	AM	PM
2019	-18.5%	3.7%
2024	-25.0%	-2.9%
2029	-30.1%	-9.1%

Table 7-4: Optimised Do Something A229 Loose Rd / Park Way / Armstrong Rd Capacity Modelling Results (PRC%)

The proposal for this junction put forward by the developer includes the relocation of the pedestrian crossing from the A229 northern arm to the southern arm which allows for one stage to be removed from the signal cycle, and the provision of separate left and ahead lanes from Park Way.

The results show all three scenarios to be significantly over capacity in 2029. They also show the third scenario to perform significantly better than both the first and second scenario. This demonstrates that by introducing the mitigation and adding development flows, the junction would operate significantly better than without mitigation and without development flows. Whilst the mitigation would not resolve existing congestion, the mitigation would entirely mitigate the development's impact at this junction leading to overall significantly lower average delays.

KCC have not specifically commented on this junction in their latest response dated 1 June 2016. Their previous response dated 22 December 2015 contained the following comments: *"The modelling indicates that the junction already operates over capacity in both peak periods."*

The modelling of future conditions has been based on assumptions identical to those applied at the Wheatsheaf junction. The above comments also therefore apply to this junction.

The TA proposes further mitigation in the form of the reallocation of lanes on the Park Way arm, relocation of the existing pedestrian crossing (including the installation of puffin technology) and provision of a new pedestrian crossing further to the north.

The findings of the additional modelling undertaken to show the effects of this mitigation are considered by KCC Highways to be unreliable, as per the Wheatsheaf. Accordingly, the TA has not satisfactorily demonstrated that the worsening congestion and delays caused by development traffic will be fully mitigated. An objection is therefore raised on account of the unacceptably severe impact."

The robustness of LinSig Modelling as discussed in detail in the appendix to this document, is pertinent to this junction and KCC's comments made in their previous response.

'Rat Running'

At the Planning Committee Meeting of 7 July 2016, a survey demonstrating "100,000 vehicles rat running along the lanes" was cited by members. To date, we have not had sight of this survey and therefore are not able to comment on the survey.

The applicant in their original TA dated October 2015 considered the potential for rat running along Gore Court Road and the B2163 through Leeds village. The relevant paragraphs for Gore Court Road are as follows:

Paragraph 5.2.6: *"As can be seen from Table 5-2 the traffic flows on Gore Court Road can be considered relatively light, with no more than 118 vehicles in the morning peak hour travelling southbound and 84 vehicles travelling northbound. This equates to an average of no more than two vehicles per minute in either direction, which suggests that the route is of limited attractiveness as a 'rat-run'."*

Paragraph 5.2.7: *"Traffic speed was also recorded by the ATC, and this shows vehicles entering the urban area travelling at 34.61mph (85th percentile) and heading north away from the urban area at 35.21mph (85th percentile), which reflects Gore Court Road's limited width and restricted forward visibility. It should be noted that Gore Court Road is subject to a 60mph speed limit at this location."*

Given the significant highway improvements proposed by the applicant and the junction assessment results presented in this paper which show improved junction performance or "nil detriment" at the key junctions, is considered unlikely that the development would result in rat running along the lanes to the north of Sutton Road. This is supported by the applicant's highway consultant's statement that the *"traffic distribution analysis carried out using web based journey time / travel tools confirmed that principal routes offered the shortest journey time and distance in all cases."*

Notwithstanding the above, an additional Section 106 Heads of Terms is suggested to monitor and if necessary mitigate any impact in respect of rat running.

Public transport improvements and Modal Shift

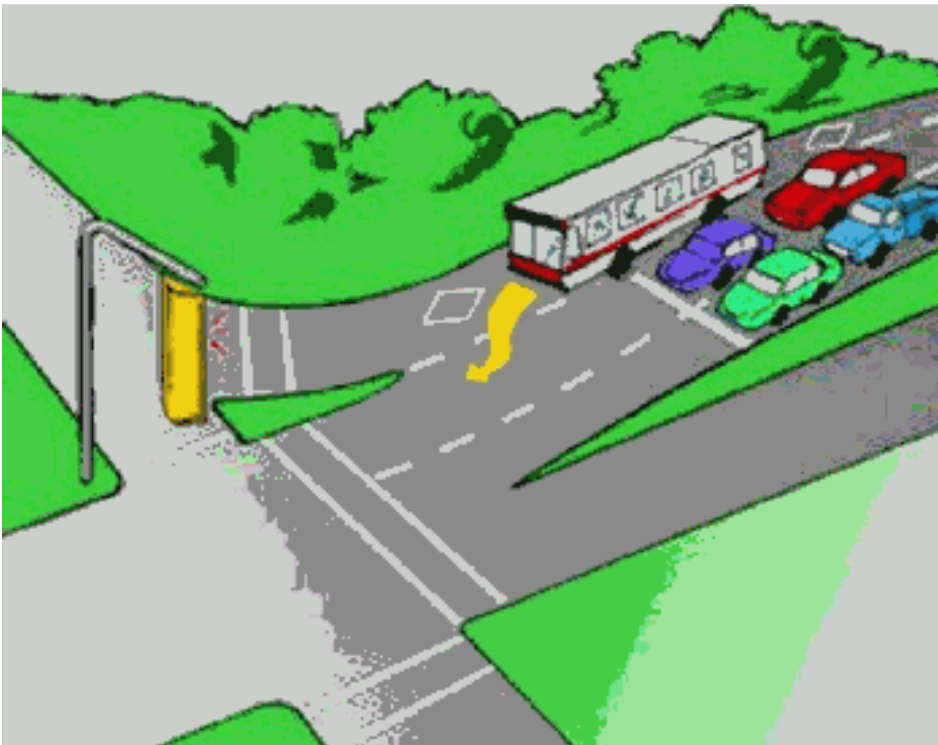
Public transport improvements, including bus prioritisation are put forward as part of the highways mitigation for housing proposals on the A274. Such improvement will assist in encouraging modal shift: the change from the use of the private car to other forms of transport. Such improvements include:

- **Bus improvements** Including
 - bus prioritisation at key junctions on the A274,
 - prioritisation of individual buses via transponders,
 - bus stop improvements including real time information systems and shelters,
 - improvements to ticketing (such as smart ticketing).
- **Improving walking and cycling** improving access to bus stops and to provide alternatives to the private car.
- **Increasing bus** frequency from 12 minutes to 6 minutes overall.

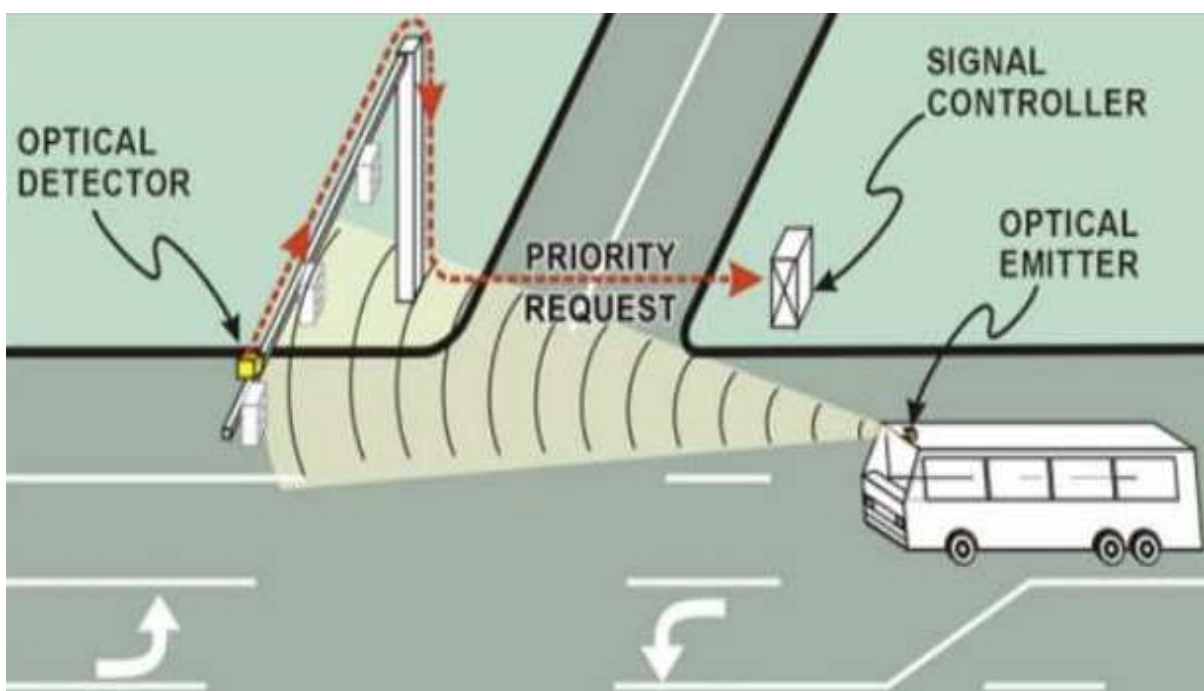
The housing proposals include Section 106 contributions to provide for the above improvements. The Transport Assessment of the applications make no assumption about modal shift, apart from the alternative solution for the Wheafsheaf junction where a conservative 3% modal shift is assumed.

Examples of bus prioritisation

Pre-signals to allow buses to pull ahead of traffic in advance of a signalised junction



Bus prioritisation via transponder, which allows the bus to communicate to the signal ahead, altering the signal to prioritise the bus at the junction



Bus Stop pull-out priority, allowing buses priority to pull out of bus stops



Transport Conclusions

The proposed housing allocations at the south east strategic development location are well related to existing development and existing bus routes and walking and cycling facilities. The transport improvements proposed by the developers consist not just of junction capacity improvements, but improvements to the 82 bus service to Maidstone town centre (this is already high quality with frequencies of up to every 8 minutes, low emission vehicles and on board WiFi), together with the provision of walking and cycling routes and crossing facilities to connect seamlessly with existing infrastructure and provide an attractive choice of travel modes for work, education, business and leisure purposes.

The above directly contributes to the delivery of the balanced package of transport interventions set out in the Integrated Transport Strategy . The 2022 Do Something and 2031 Do Something 4b VISUM models have tested these interventions. The model outputs demonstrate that the transport impacts of the proposed development in the south east area (as well as across the whole Maidstone urban area) can be mitigated to a level where the residual impact is less than severe. Furthermore, KCC have themselves acknowledged in summarising the results of the 2022 model runs, which included all development identified for the South East Strategic Development Location to the end of the Local Plan period, that the results *“demonstrate a level of impact on the highway network that cannot be regarded as severe in the context of the National Planning Policy Framework”* (paragraph 5.1 of the original report to the 22 February 2016 JTB).

The detailed junction modelling undertaken using LinSig, ARCADY and PICADY conclusively demonstrates that the traffic impacts of proposed development in south east Maidstone can be mitigated to a situation

where congestion is **lower** than if the developments were **not** built and if the mitigation was **not** implemented.

The level of impact on the highway network of the planned developments in south east Maidstone, following mitigation, cannot therefore be regarded as severe in the context of the National Planning Policy Framework. As well as mitigating the impact of proposed development, the transport improvements proposed by the developer will provide benefits to existing transport users on the corridor.

Air Quality Issues

Introduction

As part of the submission an Air Quality Assessment (AQA) was submitted by the developers which assessed the impact of the proposal in terms of air quality.

The AQA made the following points regarding the impact on air quality:

Effect Significance

10.5.10 The air quality effects of road traffic generated by the Proposed Development are considered to be not significant for human health receptors. This judgement has been made based on criteria set out in paragraph 10.3.13, in particular, that the majority of impacts are negligible with only slight adverse impacts at worst. The Proposed Development does not lead to any exceedances of air quality strategy objectives. In addition, the air quality for future residents of the Proposed Development is acceptable.

Mitigation from Completed Development Effects

10.6.3 The Proposed Development is judged not to have a significant effect on air quality at existing receptor locations. As air quality for the future residents of the Proposed Development is predicted to be below air quality objectives, no additional on-site mitigation is required to specifically address air quality within the Site.

The Environmental Health Officer had the following comments:

An Air Quality Assessment has been carried out, by dha environment, it considers potential effects of Nitrogen dioxide and small particles (PM10) and considers the effects of road traffic generated by the proposed Development not to be significant for human health receptors.

With regard to the scale and nature of the construction works it states that the standard mitigation measures (such as wheel washing and dampening of soil stock piles) outlined in the Construction Environmental Management Plan (CEMP) will result in the remaining effect being insignificant.

The site is outside the Maidstone Town Air Quality Management Area, but Environmental Health do consider the scale of this development and/or its site position warrant consideration of the impacts of the proposed development on local air quality during its operation, and feel that despite the negligible effects on receptors assessed in the AQ assessment (chapter 10 of the ES); there should be conditions attached to any planning permission granted regarding installation of electric vehicle charge points and sustainable travel plans.

Commentary and assessment

Air Quality Assessment

Maidstone has an Air Quality Management Area (AQMA) seeking to address air quality issues in the centre of Maidstone. The hot spots are areas where the air quality objective for NO₂ is known to be exceeded. They are at:-

- Well Road/Boxley Road
- Tonbridge Road/Fountain Lane
- High Street

- Upper Stone Street
- The Wheatsheaf Junction

Impact of the proposal upon the AQMA

The Air Quality Assessment (AQA) accompanying the application has modelled this of the impact on the Wheatsheaf junction, more than 3km away from the site. It concludes that that there would be an insignificant impact of air quality of roughly $0.5\mu\text{gm}^{-3}$ of NO_2 for the annual average, an increase in the region of 1.25%, by 2029, the estimated year of completion of the development. It should be noted that the NO_2 measuring points are located very close to the carriageway and residential properties are commonly set back several metres from the emission source: the impact of emissions drops off very sharply the further away from the source one is.

Secondly the AQA predicts general improvements in air quality, due to measures such as low emission vehicles and general improvements in vehicle technology by 2029. These improvements are modelled using emissions factors provided by DEFRA Even if these general improvements turn out to be optimistic the EHO considered that the potential increases in NO_2 which would occur as a result of this development would be too small to provide grounds to object to the application.

Thirdly conditions and Section 106 requirements are suggested to mitigate the impact of the development on emissions and improve air quality. In particular additional conditions are suggested to off-set emissions (which calculates an amount of money to go towards mitigation), and to safeguard the proposed public open space in perpetuity:

Previously proposed conditions, Heads of Terms and relevant scheme elements

- bus priority (proposed S106 heads of terms)
- bus revenue (proposed S106 heads of terms)
- Tree planting and landscaping (reserved matter condition)
- Landscape management (condition)
- Hedge retention (condition)
- 30 metre landscape buffer proposed between the development and the A274. (proposed as part of the development)
- Provision of 19.77 hectares of public open space (proposed as part of the development)
- Electric Vehicle charging points (condition)
- 10% renewables (condition)
-

Conclusion

The impact of the proposal upon air quality has been assessed and is considered to be minimal, even if a number of mitigating factors are discounted. Additional conditions are suggested to boost the ability of the scheme to improve air quality. On this basis the impact of the proposal upon air quality is therefore considered acceptable.

Proposed Additional Conditions

1. AIR QUALITY RE OFFSETTING EMISSIONS (Calculation of Mitigation/Compensation)

Due to the scale of this proposal, a calculation of pollutant emissions costs from the vehicular traffic generated by the development should be carried out, utilising the most recent DEFRA Emissions Factor Toolkit and the latest DEFRA IGCB Air Quality Damage Costs for the pollutants considered, to calculate the resultant damage cost.

The calculation should include:

- Identifying the additional trip rates generated by the proposal (from the Transport Assessment);
- The emissions calculated for the pollutants of concern (NO_x and PM₁₀) [from the Emissions Factor Toolkit];
- The air quality damage costs calculation for the specific pollutant emissions (from DEFRA IGCB);
- The result should be totalled for a five year period to enable mitigation implementation.
- The calculation is summarised below:

$$\text{Road Transport Emission Increase} = \text{Summation} [\text{Estimated trip rate for 5 years} \times \text{Emission rate per 10 km per vehicle type} \times \text{Damage Costs}]$$

The pollution damage costs will determine the level of mitigation/compensation required to negate the impacts of the development on local air quality.
- No development shall commence until the developer has developed a scheme detailing and where possible quantifying what measures or offsetting schemes are to be included in the development which will reduce the transport related air pollution of the development during construction and when in occupation. The report should be submitted to and approved by the Local Planning Authority, prior to development. [The developer should have regard to the DEFRA guidance from the document *Low Emissions Strategy -using the planning system to reduce transport emissions January 2010.*]

Reason: to ensure the impact of the proposal upon air quality is mitigated.

2. Retention of Public Open Space

The public open space hereby approved shall be retained as such in perpetuity.

Reason: In order to safeguard the open space provided by the development.

Further Proposed Additional Condition

3. No development east of PROW 369

No built development is permitted east of the Public Right of Way 369.

Reason: in order to mitigate the visual impact of the proposal and ensure it accords with the H1 (10) policy designation.

Additional Heads of Terms

‘Rat Running’ Monitoring

Within six months of the first occupation of any development within sites designated by policies H1(7); H1(8); H1(9) or H1(10) the respective applicants shall commence ‘rat running’ monitoring of the highway routes to the north of A274 Sutton Road linking with the A20 Ashford Road. Three Automatic Traffic Count (ATC) survey points shall be undertaken for a period of one week, 24 hours a day, at locations to be agreed by the Council, in the same week every year for a period of 5 years beyond the first commencement of each of the abovementioned sites. A Monitoring Report will be produced within four weeks of the completion of each annual survey and submitted to the Council for review and agreement. It will incumbent upon the Council to respond to this data within a 28 day period.

Should the Monitoring Report identify significant adverse traffic flow conditions (a quantum to be determined) arising from 'rat running' activity, as decided by the Borough Council, then the Council will enact the Trigger to release the S106 Contribution sum of Two Hundred Thousand Pounds (£200,000) to be paid towards suitable mitigation.

The 'rat running' mitigation scheme will be devised by the Council and Highway Authority and implemented by the Highway Authority.

'Rat Running' Mitigation Sum

The Rat Running Mitigation Sum is Two Hundred Thousand Pounds (£200,000) to be split proportionately between sites H1(7), H1(8), H1(9) and H1(10) on the basis of housing unit numbers.

The recommendation remains unchanged.

APPENDIX

Traffic Flows / Traffic Generation / Traffic Distribution

Existing flows are based on traffic surveys that were undertaken in July and December 2014. Traffic surveys carried out within 3 years of an application being submitted are usually considered up to date enough to be valid to establish an existing traffic situation.

Background growth to the future years has been applied using TEMPro (Trip End Model Presentation Program) which is based on the National Trip End Model (NTEM), the DfT's model used in transport planning which includes forecasts on population, employment, households by car ownership, trip ends and simple traffic growth factors. Committed development has also been included. This is the standard approach taken in Transport Assessments.

Development flows were calculated based on TRICS, the tool used nationally to calculate traffic generation of developments. It is based on surveys at various different development types across the UK and Ireland. The traffic generation for the various use classes proposed are presented in the TA. It should be noted that the TRICS data has not been adjusted to allow for any modal shift from either the significant investment in public transport, footways and cycleways proposed by the developer or the travel plan measures. KCC confirmed in their response dated 1 June 2016 accepts the traffic generation assumptions.

The traffic distribution is presented in the TA. It is assumed that approximately three quarters of all trips turn north along the A274, with a third of all trips arriving at the Wheatsheaf junction. KCC have not commented in any way on those assumptions which were clearly put in front of them.

Given KCC's responses were very detailed, and except for positively acknowledging the traffic generation assumed by the applicant, don't make any mentioning with regards to either flows or traffic distribution, it can therefore be concluded that KCC accept the traffic flow, generation and distribution assumptions that underpin the assessments carried out in the TA.

Robustness of LinSig Modelling

KCC stated during the meeting on 7 July 2016 that officers had undertaken detailed assessments of the A274 / Willington Street / Wallis Avenue junction. In a meeting involving all parties (KCC, MBC, developer) in February 2016, the LinSig modelling and KCC's assertion that the models would "become unstable" with "lower levels of confidence" and the results would likely be "distorted" was discussed. Clarification was requested and liaison between the applicant's transport consultant and KCC's Traffic Signal Team was suggested. No further information, nor alternative modelling of this junction has been received from KCC since then that would further substantiate their assertion that the numbers would be "unstable" or "distorted".

JCT Consultancy Ltd who produced the LinSig modelling responded to KCC's response as follows:

"It is over generalised to say that model results will always be unacceptably distorted in cases where the highway network being modelled is over capacity. In some cases, high levels of congestion in traffic models can distort results if not suitably identified and addressed; however, in most cases a well constructed traffic model should be capable of forecasting the relative performance of development and highway mitigation options even where oversaturation occurs. In any event, it would not be correct to dismiss modelling as flawed simply because over capacity exists without identifying specific issues with the model and demonstrating that any issue will actually lead to distortions in the comparison of options. Depending on the circumstances, in many cases a model operating over capacity will be more stable than a model operating at capacity as the random effect of arriving traffic will have less of an effect"

Recent Local Growth Fund business case submission to the South East Local Enterprise Partnership (SELEP) in respect to Phase 1 of the Maidstone Integrated Transport Package includes similar junction improvements at this junction. The following statements in this document should be considered in relation to the differing views with regards to the LinSig modelling carried out in the TA:

- *“A main objective of the Willington Street junction improvements is to reduce delay and congestion on the A274 and A20 corridors and on Willington Street. This will allow the existing network to operate more efficiently and also present some potential capacity to accommodate the future trip growth arising from new development in and around Maidstone”* (Page 22);
- *“LinSig is assumed to be a robust tool for this assessment”* (Page 27)

In conclusion, LinSig is the industry-standard tool to assess signalised junctions. There is no evidence to suggest that results would be “distorted” or “unstable” in oversaturated conditions. It is correct that modelling is never perfect and always ever a best approximation. Modelling is based on a layout and input flows. Given the proposed layouts can be achieved within the highway boundary and there is no objection in principle to such improvements, the same levels of confidence should be applied to both layouts tested (Do Nothing / Do Something). KCC have not objected to the flows (existing / future / development) in any of their responses, these being the other key element to a LinSig model. With both input elements to the LinSig models being clearly defined, there is therefore no reason to suggest that the model results should lack in confidence.