

Table 55 – Coltishall Percentage Impact Assessment

Ref	Junction	Arm	AM Peak				PM Peak			
			2036 Do Something		2036 Do Something with Mitigation		2036 Do Something		2036 Do Something with Mitigation	
			Veh change	% change	Veh change	% change	Veh change	% change	Veh change	% change
1	Rectory Road / B1150 Norwich Road / Mill Road	Norwich Road (E)	180	23%	180	23%	67	9%	67	9%
		Millfield Road (S)	1	5%	1	5%	0	0%	0	0%
		Norwich Road (W)	60	9%	60	9%	133	17%	131	17%
		Rectory Road (N)	-1	0%	-1	0%	0	0%	0	0%
		Total	240	14%	240	14%	200	12%	198	11%
2	B1150 Norwich Road / B1354 Church Street / High Street / Petrol Station	High Street (N)	195	34%	197	34%	69	14%	67	14%
		B1354 (E)	-2	-1%	-2	-1%	1	0%	1	0%
		Petrol Station (S)	0	0%	0	0%	0	0%	0	0%
		Norwich Road (W)	55	7%	57	7%	159	20%	158	20%
		Total	248	15%	252	15%	229	14%	226	14%
3	High Street / Station Road	Station Road (N)	190	33%	190	33%	71	16%	71	16%
		High Street (S)	67	15%	68	16%	159	28%	159	28%
		Great Hautbois Road (N)	0	0%	0	0%	0	0%	0	0%
		Total	257	25%	258	25%	230	22%	230	22%
4	Church Loke / B1354 / Rectory Road	Rectory Road (N)	2	4%	2	4%	-2	-4%	-2	-4%
		B1354 (E)	-2	-1%	-2	-1%	17	5%	17	5%
		Church Loke (S)	1	17%	1	17%	1	17%	1	17%
		B1354 (W)	-4	-1%	-2	0%	15	5%	15	5%
		Total	-3	0%	-1	0%	31	5%	31	5%

- 8.20 In Coltishall the volume of through traffic on the B1150 is predicted to increase by on average 250 vehicles (two way) in the peak hours which is significant. The impact of this on capacity is considered separately.
- 8.21 From the accident analysis there were no accident clusters or specific road safety issues identified within Coltishall and Horstead, that this traffic increase would exacerbate, although vehicle speeds on entry from the south into Horstead were slightly above the speed limit.
- 8.22 The issue of pedestrian safety is something which the Parish Council have already brought to the attention of NCC and the increase in traffic arising from the proposed development will make it more difficult for pedestrians to cross the B1150. A separate study is underway by NCC examining pedestrian crossing safety in Coltishall on High Street which will look for potential to deliver formal and improved crossing facilities.
- 8.23 The issue of pedestrians crossing the B1150 in Horstead, near the Recruiting Sergeant, and to the north of Coltishall at Ling Way, have been raised as a concern by the Parish Council and should be examined at planning stage.
- 8.24 It should be noted that the traffic volumes assessed are considered a worst-case scenario and test 10% higher development growth than proposed and assume very low levels of home working. Furthermore, the highest level of public transport service from North Walsham is focussed on the desire line of the B1150 through express bus services and the railway line, which has not been reflected in the traffic forecasting on this route. For these reasons, the level of forecast traffic is estimated to be at least 15% more than will be realised.
- 8.25 Bearing in mind the lack of alternative routes for traffic, measures to mitigate the impacts of this growth in Coltishall have been identified:
- The impact on the B1150 and Coltishall is best addressed firstly through minimising the traffic growth on this route. The use of public transport will be actively promoted at the development through the proposed public transport strategy, incorporating a bus interchange for express services, and improved active travel access to North Walsham Station and target led travel planning.
 - At planning stage, the development will contribute towards and deliver proportionate mitigation to address highway impacts in Coltishall and Horstead on pedestrian crossing facilities on High Street, at Ling Way and at the Recruiting Sergeant. It has been agreed with NCC, that following the outcome of their safety study the proposed allocation will look to contribute towards measures identified to mitigate impacts.
 - Creating greater awareness of the village entry and reduced speed limit on the approach to Horstead from the South would help reduce vehicle speeds. At planning stage additional signage should be identified.
- 8.26 Background traffic is also predicted to increase substantially by 2036 and any development growth increasing traffic on the B1150 should be looking at how it can assist NCC in mitigating any potential road safety impacts.

9. Highway Network Assessment

Introduction

- 9.1 This section sets out the results of the highway capacity assessment carried out for North Walsham and Coltishall.

Forecast Modelling

- 9.2 The VISSIM models have assessed the 2036 future year scenarios to test the operation of the network without the development, with the development and further mitigation in place.

Proposed Network Changes

- 9.3 There are changes to the highway network which are either already committed, or which have been identified through this assessment of the proposed allocation, which are reflected in the future year VISSIM models.

Committed Improvements

- 9.4 There is a committed junction improvement scheme at the B1150 Norwich Road / A149 signalised junction which is currently being designed by NCC. The improvement scheme at this junction is coming forward because of the planning consents for the Hopkins Homes and Persimmon Homes developments off B1150 Norwich Road and provides additional capacity. The design improvements also include the provision of two additional signalised pedestrian and cycle crossings on the eastern and southern arms of the junction, which are yet unfunded. The design detail for this junction was provided by NCC for inclusion in the VISSIM model and is included in **Appendix F**. It has been assumed that the proposed allocation would provide funding towards the provision of the additional pedestrian and cycle crossings. The provision of the additional pedestrian and cycle crossings will improve access for pedestrians and cyclists at this key focal point however it should be acknowledged that they will impact on highway capacity at the junction.

Mitigation Measures

- 9.5 The proposed development mitigation package is described in further detail in the next Chapter but for the purposes of understanding the highway assessment findings we have also summarised the measures reflected in the future year modelling here:

North Walsham

- Proposed new link road: New road link between B1150 Norwich and A149 Cromer Road including roundabout junctions on either end, a staggered priority junction with Skeyton Road and a signalised junction with Aylsham Road. Road designed to accommodate HGVs and permit through traffic.
- Aylsham Road traffic management Scheme: Proposed signalised shuttle scheme on Aylsham Road at the railway bridge, incorporating toucan crossings on either end. Skeyton New Road is also closed to through traffic eastbound. This is aimed at allowing road space to be redirected to provided footways, and to discourage through traffic from using Aylsham Road.
- Closure of Green Lane as a through route.

- 9.6 The existing route available north of the railway line along Bradfield Road has been included in the model as an available route, reflecting existing capacity/ physical constraints.

Coltishall

- Proposed Right Turn Lane from B1150 north bound into B1354.
- Proposed replacement of car parking with a Bus Cage at the War Memorial on High Street.

- 9.7 **Table 56** below summarises what is included in which scenario for clarity.

Table 56 – Future Year Highway Network Changes in VISSIM Modelling

Measures	2036 Do Minimum	2036 Do Something	2036 Do Minimum
	AM & PM	AM & PM	AM & PM
North Walsham			
Enhanced signalised junction with ped crossings on three arms at B1150/A149 junction	✓	✓	✓
Proposed new Link Rd from A149 to B1150, intersecting with Aylsham Rd and Skeyton Rd.		✓	✓
Aylsham Rd and Skeyton New Road traffic management & ped safety scheme.		✓	✓
Closure of Green Lane as a through route		✓	✓
Coltishall			
Proposed Right Turn Lane from B1150 north bound into B1354		✓	✓
Proposed replacement of car parking with a Bus Cage at the War Memorial on High Street.		✓	✓

9.8 The 2036 future year traffic flows used for this assessment represent a very robust scenario for the following reasons:

- A total of 2,000 dwellings have been assessed rather than the 1,800 identified within the allocation policy, to allow a conservative estimate of development impacts to be tested;
- No allowance for mode shift in background traffic has been made, despite transport policy being focussed on supporting more sustainable travel patterns and modes;
- Future mode shares at the residential development have been assumed to reflect a reduction of car driver trips by ten percentage points from Census 2011 levels in North Walsham. Bearing in mind the improved level of local public transport provision since 2011 and increased reliance on home working, this is a conservative design case;
- No mode shift has been assumed for employment uses, and local internalisation is assumed to be minimal; and
- The most dominant route for highway traffic from the proposed development has been identified to be along the B1150 towards Norwich. This route also accommodates the most significant public transport services, and the likely higher taken up of public transport along this desire line has not been reflected in the analysis.

9.9 Taking all these factors into account, the forecast traffic flows are considered to have a safety factor of 15% incorporated (i.e., they are 15% higher than they should be in reality). The reason for this is that it is early in the process, and for Local Plan allocation a high-level understanding of the issues to be addressed needs to be fully understood to prove deliverability.

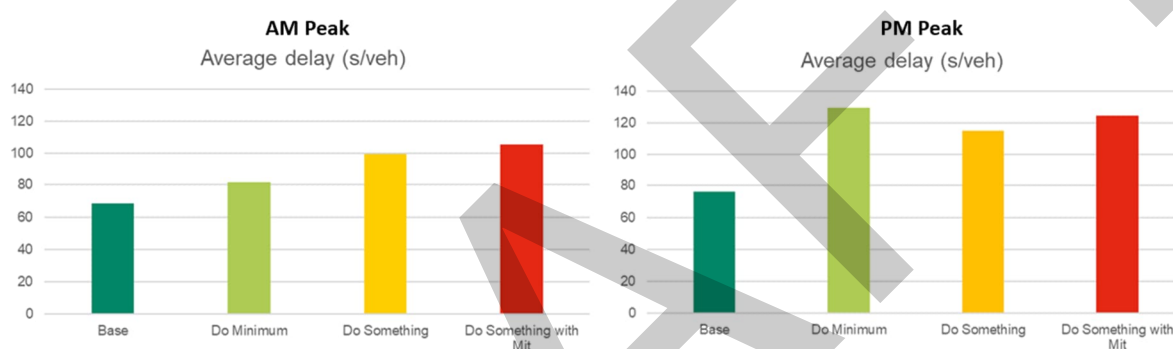
9.10 The results of the VISSIM modelling are summarised in the following sections, with the full results set out in the Forecast Reports included at **Appendix E**.

Overview of Results – North Walsham

Network Delay

- 9.11 To establish the impact of the allocation on the road network within North Walsham, the VISSIM model has been run for the 2036 Do Minimum and Do Something Development scenarios. This allows a comparison to be undertaken between how the road network would operate in 2036 without and with the development and its associated infrastructure coming forward.
- 9.12 From the VISSIM model, the overall network delay (in terms of seconds per vehicle) can be ascertained for each of the scenarios and peak hours assessed. The results are set out in **Figure 38** below. It should be noted that the Do Minimum, Do Something, and Do Something with Mitigation relates to predicted 2036 conditions. This is the best way to capture the overall highway network impacts, whilst individual junctions' impacts are reported more fully in the forecast VISSIM modelling reports.

Figure 38 – Network Average Delay, AM, and PM Peaks – North Walsham



- 9.13 The figures illustrate:

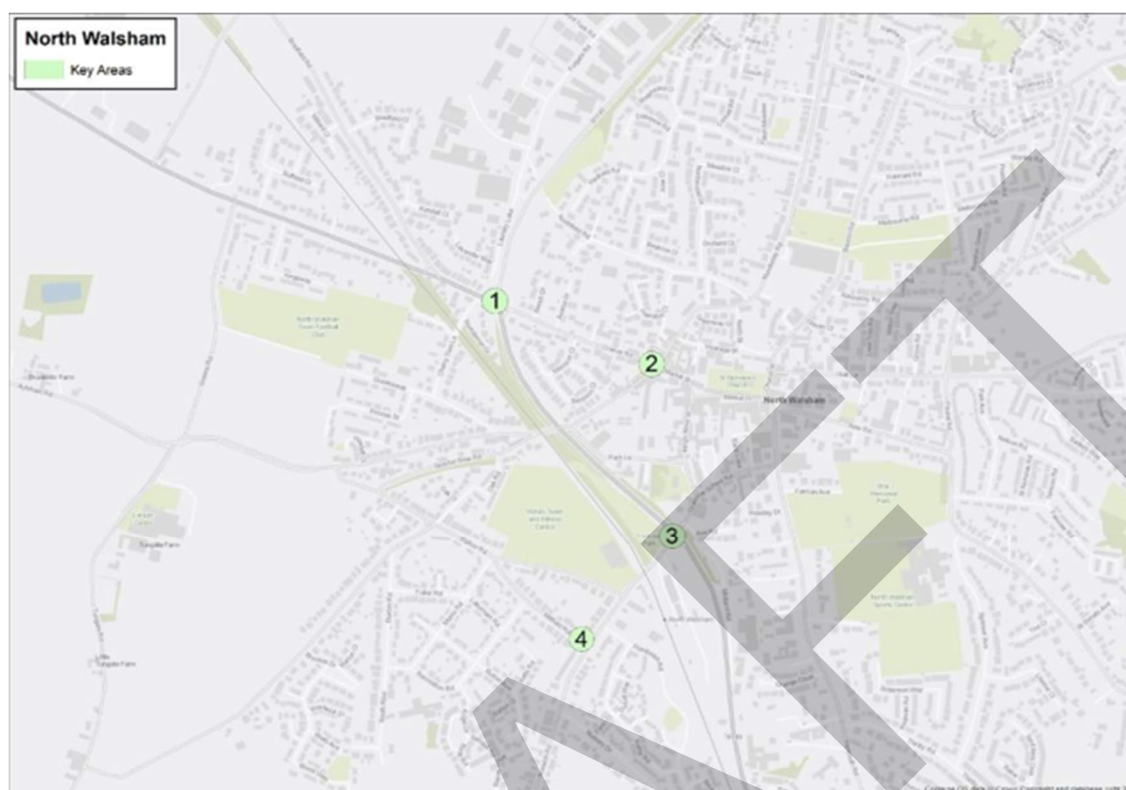
- The PM peak hour is the most critical scenario when delays are predicted to be greatest. During this time overall network delays are expected to increase from existing levels of 76 seconds per vehicle without the proposed development, to 129 seconds on average per vehicle. In the 'Do Something' scenario, where the proposed development and associated link road are added, overall network delays reduce to 115 seconds per vehicle.
- There is a slight increase in delay in the Do Something with Mitigation scenario caused by routing changes in the area due to the traffic management and pedestrian improvements measures on Aylsham Road and Skeyton New Road. Overall network conditions are predicted to be better in the future year with the proposed development and mitigation measures in place.
- In the AM peak, the average delay increases across the network with the proposed development and mitigation in place, however this increase is predicted to be less than all future year PM scenarios and is not considered to be significant.
- Overall network impacts are mitigated by the proposed development.
- It is also reasonable to expect that the significant pedestrian, cycle, and public transport improvements proposed as part of the allocation will impact car driver mode shares for background traffic and development trips, further reducing predicted network delays.

Junction Impact

- 9.14 The modelling identified four locations within the study area which have been identified from the survey data / observations as having the most significant impact on network operation. The four key junctions are:

- 1 – Cromer Road / A149 / B1145 signalised crossroads.
- 2 – Cromer Road / Aylsham Road / Mundesley Road signalised crossroads.
- 3 – B1150 Norwich Road / A149 / Grammar School Road signalised crossroads.
- 4 – Norwich Road / Millfield Road priority junction.

- 9.15 The junctions above are illustrated on **Figure 39** below.

Figure 39 – Key Junctions in North Walsham VISSIM Model

1 – Cromer Road / A149 / B1145

- 9.16 The percentage change assessment illustrates that there would be an increase in peak hour traffic flows of between 4% and 7% in 2036 at this junction once the allocation comes forward. The additional traffic is predicted to result in a small increase in queuing and delay when comparing the Do Minimum and Do Something scenarios. Queuing is shown to increase by a metre with delay increasing by two seconds.
- 9.17 Upon implementation of the mitigation on Aylsham Road, there would be a further slight increase in queues and delay when comparing the Do Minimum and Do Something with Mitigation scenarios. This increases to three metres in terms of queuing and four seconds in terms of delay.
- 9.18 The residual impact of the allocation on the Cromer Road / A149 / B1145 signalised junction is therefore considered to be negligible in both peak hours.

2 – Cromer Road / Aylsham Road / Mundesley Road

- 9.19 The percentage change assessment illustrates that there would be an increase in peak hour traffic flows of between 2% and 3% in 2036 at this junction once the allocation comes forward. The additional traffic would result in a negligible increase in queuing and delay when comparing the Do Minimum and Do Something scenarios. Queuing is shown to increase by a metre with delay increasing by one second.
- 9.20 Upon implementation of the mitigation on Aylsham Road, there would also be slight change queues and delay when comparing the Do Minimum and Do Something with Mitigation scenarios. Generally, there is no significant change in queues and delay with a one metre increase in queuing and one second increase in delay noted on Aylsham Road in the PM peak.
- 9.21 The residual impact of the allocation on the Cromer Road / Aylsham Road / Mundesley Road junction is therefore considered to be negligible in both peak hours.

3 – B1150 Norwich Road / A149

- 9.22 The percentage change assessment identifies that there would be a potential increase of between 9% and 11% in 2036 at this junction once the allocation comes forward.

- 9.23 This junction is predicted to experience delays in the future Do Minimum scenarios, with the proposed improvement scheme with pedestrian crossings in place. Those issues are further exacerbated through the provision of the proposed development and associated mitigation on Aylsham Road which causes traffic to reroute from Aylsham Rd and Millfield Road towards the B1150 Norwich Road. Capacity issues are predicted to be at their worst in the PM peak hour.
- 9.24 There is a predicted increase in delay of approximately 150 seconds in the AM peak when approaching from B1150 Norwich Road South between the Do Minimum and Do Something scenarios. The main capacity issue is the left-turn movement from B1150 Norwich Road to the A149 Northbound. This is creating extensive queuing on this approach blocking the left-turn flare.
- 9.25 As with the increase in delay, there is an increase in queues. The queues reported however are a moving queue created by not all vehicles clearing the junction during the green time. Although the queue length is shown within the model to increase over the peak hour assessed, by the end of the hour, vehicles waiting at the junction can all clear the junction and therefore the capacity issue is expected to be limited to the peak hours.
- 9.26 Further opportunities to increase highway capacity at this junction are limited to refinement of the traffic signal operation, which would be expected to deliver some benefits. The reported capacity issues are because of the capacity implications of providing pedestrian crossings and traffic management measures proposed for safety reasons and to promote sustainable travel, alongside traffic impacts arising from the proposed allocation, based on the worst-case traffic flows predicted.
- 9.27 Whilst highway capacity is not predicted to be mitigated in full at this junction, here are other factors to consider:
- The forecast traffic is overly robust (by an estimated 15%) and so impacts would be proportionally less in reality.
 - The improvements identified by NCC at the A149/ B1150 junction as part of the consented scheme design will improve facilities for pedestrians and cyclists accessing North Walsham Town Centre and railway station but do impact capacity.
 - The traffic management measures and pedestrian and cycle facilities on Aylsham Road will offer a wider benefit to both existing and new residents of North Walsham.
 - The proposed link road will deliver network resilience which does not currently exist which will help cater for the short periods where congestion is expected to occur.
 - Travel behaviour would be expected to alter to avoid these delays through peak hour spreading or travel by other means.
- 9.28 When all these issues are considered it is considered that the reported delays are unlikely to materialise and the wider network benefits arising from the proposals will act to manage future traffic demand through the junction.

4 – B1150 Norwich Road / Millfield Road

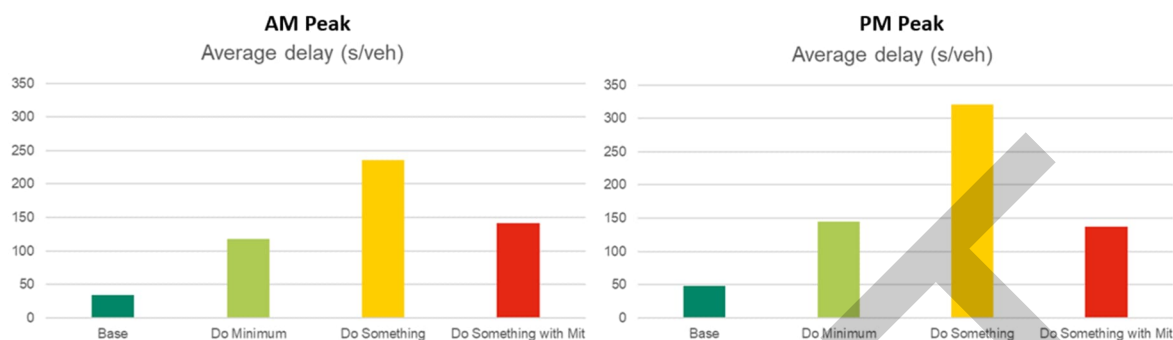
- 9.29 The percentage change assessment illustrates that there would be a change of between -3% and 7% at the junction. Millfield Road, which is currently utilised as the main route from B1150 Norwich Road to A149 Cromer Road by HGVs avoiding the low bridges would see a change of between -11% and -1% when comparing the Do Minimum and Do Something scenarios. This represents a benefit of the link road within the allocation. Once the mitigation on Aylsham Road is implemented, the reduction in traffic on Millfield increases to -14% in the AM peak however there is a small 6% (seven vehicle) increased identified in the PM peak due to some network congestion.
- 9.30 The modelling illustrates negligible changes to the queues and delays at the junction when comparing the different scenarios however there is potential for the junction to be impacted upon by the queues generated at the B1150 Norwich Road / A149 signalised junction.
- 9.31 The impact of the allocation on the B1150 Norwich Road / Millfield Road junction is therefore considered to be negligible in both peak hours, and predicted decreases in traffic flows on Millfield Road, and removal of HGVs would be of significant benefit to safety for residents.

Summary & Residual Impacts

- 9.32 The impact of the allocation and associated mitigation is considered to have a positive impact on overall highway network delay with improvements in the more critical PM Peak, when comparing both Do Something scenarios with the Do Minimum scenario.
- 9.33 There are capacity issues forecast at the B1150/ A149 signalised junction, which are predicted to worsen with the proposed allocation and associated measures in place however it is expected that these predicted queues are unlikely to materialise because traffic forecasting has been highly conservative (approximately 15% higher than expected in practice). In addition, the development delivers overall betterment through:
- Delivery of a new link road bringing network resilience, and a more suitable route for north south traffic and HGVs on the west side of North Walsham;
 - Removing traffic and HGVs from Station Road, Millfield Road, parts of Aylsham Road and Skeyton New Road; and
 - Delivery of comprehensive pedestrian, cycle and traffic management measures which will not only improve road safety but will encourage more sustainable trips by existing and future residents in North Walsham.
- 9.34 It is important that impacts on the B1150/ A149 junction are minimised through demand management measures and through promoting sustainable travel.
- 9.35 The forecast increase in eastbound traffic on Aylsham Road in the Do Something with Mitigation scenario will be mitigated by discouraging the use of Aylsham Road as a through route into North Walsham for general traffic, by staggering the Aylsham Road junction with the proposed new link road. This will reduce vehicle speeds on entry to Aylsham Road and make the use of this as a through route more difficult. It is also recommended that at planning stage further traffic management measures are explored to minimise the impact of traffic impacts on the narrow 20 mph section, such as designating the route for access only, provision of additional signage and provision of horizontal deflection to impose speed reductions for traffic.
- 9.36 Traffic flows on Skeyton Road are low and are forecast to remain low, but it is a well-used route by pedestrians and cyclists. Given that this is a residential lane, to avoid rat running along it, it is proposed to prevent vehicular traffic access from the proposed link road, and only allowing pedestrian and cycle traffic to cross the Link Road from Skeyton Road.
- 9.37 Furthermore, the promotion of active modes for local trips will be a priority through the investment in addressing gaps in the pedestrian and cycle network, and through delivering a highly accessible development area. Public Transport permeability and enhanced facilities will help drive public transport usage.
- 9.38 It is therefore considered that the allocation will on balance be capable of mitigating transport impacts and will deliver some overall betterment in North Walsham.

Results – Coltishall

- 9.39 To establish the impact of the allocation on the road network within Coltishall, the VISSIM model has been run for the 2036 Do Minimum and Do Something Development scenarios. This allows a comparison to be undertaken between how the road network would operate in 2036 without and with the development and its associated infrastructure coming forward.
- 9.40 From the VISSIM model, the overall network delay (as seconds per vehicle) can be ascertained for each of the scenarios and peak hours assessed. The results are set out in **Figure 40** below. It should be noted that the Do Minimum, Do Something, and Do Something with Mitigation relates to 2036 only.

Figure 40 – Network Average Delay, AM, and PM Peaks – Coltishall

9.41 The figures illustrate:

- Overall network delays in Coltishall are predicted to be slightly higher than average network delays predicted in North Walsham with the PM peak hour being the more critical period for the highway network.
- In the PM peak, existing levels of overall network delay are predicted to increase to almost 150 seconds per vehicle during the PM peak hour. It is however observed that the Do Minimum delay is greater than that identified for the Do Something with Mitigation scenario illustrates that whilst the allocation coming increases delay within Coltishall, the mitigation proposed would result delay be reduced to a level slightly below experienced in the Do Minimum scenario. This illustrates that the mitigation proposed would mitigate the highway capacity impacts on the network within Coltishall.
- In the AM peak, the average delay with the allocation and associated mitigation is higher than the AM Peak 'Do Minimum' scenario, however it is like the predicted residual delay in the PM Peak where impacts are less than the 'Do Minimum' scenario, without the allocation and mitigation in place.
- The conclusion is that whilst traffic growth will cause delays in Coltishall, the development highway capacity impacts are generally mitigated by the proposed improvements.

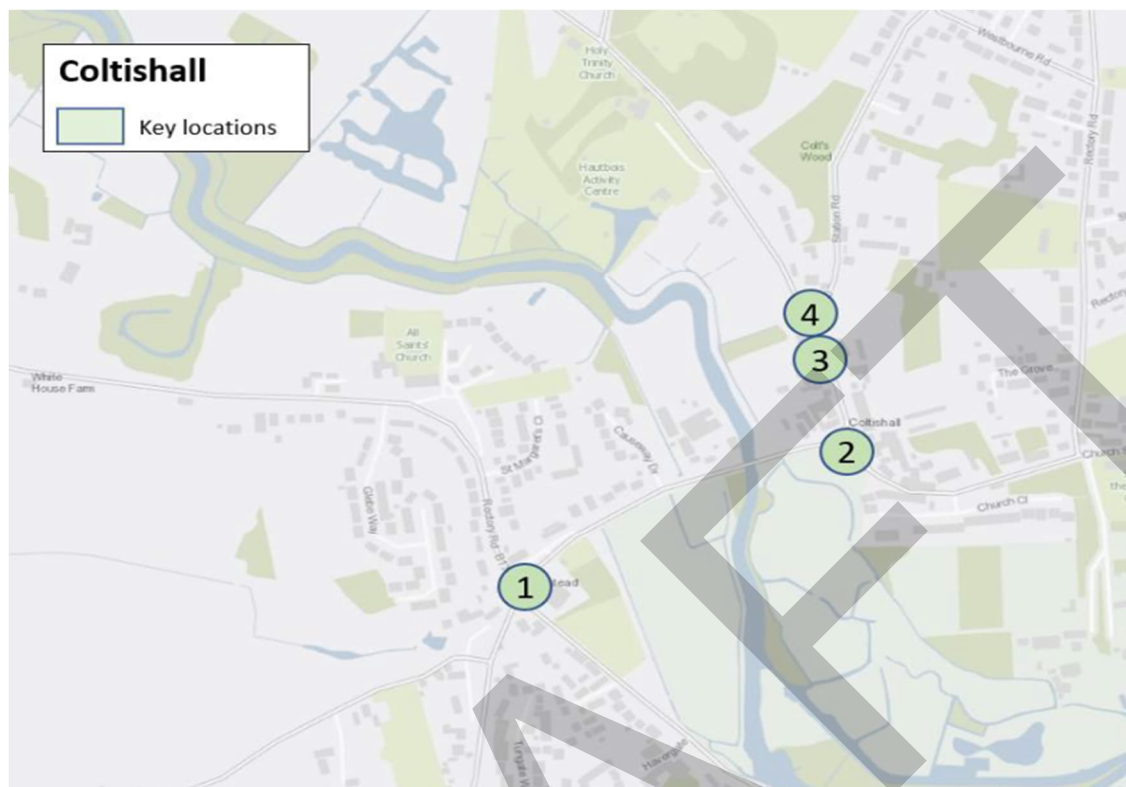
Junction and Link Impact

9.42 The modelling identified four locations within the study area which have been identified from the survey data / observations as having the most significant impact on network operation. The four key junctions and links are:

- 1 – Rectory Road / B1150 Norwich Road three-arm roundabout.
- 2 – B1150 Norwich Road / B1354 Church Street gyratory (PFS island).
- 3 – B1150 High Street.
- 4 – B1150 High Street / B1150 North Walsham Road / Great Hautbois Road priority junction.

9.43 The junctions and link above are illustrated on **Figure 41** below.

Figure 41 – Key Junctions in Coltishall VISSIM Model



1 – Rectory Road / B1150 Norwich Road

- 9.44 The percentage change assessment for the junction indicates that there would be between a 9% and 17% increase in traffic at the junction between the Do Minimum and Do Something scenarios. This remains the same when the mitigation is considered as the improvements are located to the east of this junction and will not impact on traffic flows.
- 9.45 Queues on Rectory Road are shown to be negligible in both peaks in all scenarios with up to one PCU expected. The greatest increases are observed on B1150 Norwich Road where queues and delay are noted when comparing the scenarios. This is due to the main movement of traffic associated with the allocation being between the site and Norwich.
- 9.46 In the AM peak, queues would increase by some five PCUs in both directions whilst in the PM peak queues would increase by 17 PCUs towards Coltishall but only one PCU towards Norwich. In the AM peak the additional queuing would have little or no impact on adjoining roads except for Mill Road. The results for the Mill Road confirm little impact in the terms of queuing however there would be an increase in delay of up to 50 seconds, mainly for those turning right.
- 9.47 In the PM peak, queues are shown to increase such that they extend by up to 28 PCUs from the give way line at the junction along the B1150 Norwich Road. This would impact on the ability for vehicles to utilise the Frettenham Road junction. It is considered that any vehicles queueing would allow those vehicles waiting to turn into or out from the junction the opportunity to do so when there are gaps. A Keep Clear facility would allow vehicles to access Frettenham Road.
- 9.48 The proposed development is predicted to increase queueing at this junction by a maximum of 17 PCUs on the B1150 during peak periods. Whilst this queueing is a significant increase, queues dissipate within the peak hour. To provide additional highway capacity would require use of the adjacent land which operates as a car park for the Recruiting Sergeant pub and restaurant. Whilst the car park appears to be highway land, removal of the car park would lead to unregulated parking on the adjacent roads due to a lack of nearby alternative.

- 9.49 The level of peak hour queuing predicted is such that it can be accommodated on the road network for short periods of time. When considered on balance, as overall delays are not severe, and the assessment is based on traffic forecasts which are some 15% higher than is expected to be realised. Design highway mitigation to accommodate these robust traffic flows, would have a considerable impact on the existing businesses fronting the junction. The most appropriate way to mitigate impacts should be limit the demand in the first instance and ensure that there are no safety issues arising from the peak hour congestion. Provision of a Keep Clear across the access to Frettenham Road and examining the pedestrian facilities would assist in improving safety and mitigating impacts at this location. It is suggested that at planning stage, the need for capacity improvements within highway land is explored further if required.

2 – B1150 Norwich Road / B1354 Church Road gyratory (PFS Island)

- 9.50 The percentage change assessment illustrates that there would be an increase of between 14% and 15% in 2036 at this junction once the allocation comes forward. This remains the same when the mitigation is considered as the improvements are located to the east of this junction and will not impact on traffic flows.
- 9.51 The additional traffic associated with the allocation would result in an additional delay of approximately 80 seconds on the eastbound approach to the junction in the AM peak with queues extending to some 390 metres. This is a result of traffic wanting to turn right into B1354 Church Street blocking through traffic from travelling northbound whilst also having less gaps in which to turn due to an increase in through traffic travelling southbound.
- 9.52 A right turn lane has therefore been identified, as described in Chapter 10, for implementation at the junction which assist in alleviating the blocking of through traffic by those vehicles waiting to turn right. The queues and delays observed in the Do Something with Mitigation scenario are shown to be like the Do Minimum scenario in the AM peak and significantly better than the Do Minimum (without the North Walsham Development) in the PM Peak.
- 9.53 The mitigation identified would therefore result in a beneficial impact on the junction and wider network within Coltishall by mitigating both the impact of the allocation and providing a small decrease in queuing and delay over what would occur without the allocation coming forward.

3 – B1150 High Street

- 9.54 The modelling results illustrate that in the AM peak there is negligible change in queues and delays on B1150 High Street in any of the scenarios.
- 9.55 Observations from the traffic surveys indicated on-street parking adjacent to the war memorial was impacting traffic flows along B1150 High Street. The carriageway adjacent to the war memorial is not marked as on-street parking and a bus stop is present although no cage is provided. Vehicles parking in this location create a narrowing of the carriageway which restrict vehicles to one-way movements and give-ways in place between drivers. Vehicles are observed to park here for long periods of time, but it does not front a residence and there is alternative parking available for nearby businesses.
- 9.56 In the PM Peak, due to this restriction, queues of between 21 metres and 117 metres occur in the Do Minimum scenario in the northbound and southbound directions respectively. The addition of traffic associated with the allocation increases these queues to 45 metres and 378 metres. This would impact on the Great Hautbois Road and access to residences whilst the northbound queue would impact on pedestrian crossing movements within the village centre.
- 9.57 To mitigate the impact of the allocation on B1150 High Street, it is proposed to provide a bus cage to formalise the existing bus stop and support bus access. This would remove the right to park immediately adjacent to the war memorial where there are no on-street parking bays. The existing marked on-street parking bays would not be impacted by the bus cage. The implementation of the bus cage would remove queuing and delay identified on B1150 High Street with the queuing and delay reduced to negligible levels.
- 9.58 The mitigation identified would therefore result in a beneficial impact on B1150 High Street and the wider network within Coltishall by mitigating both the impact of the allocation and the future increase in background traffic identified in the Do Minimum scenario.

4 – B1150 High Street / B1150 North Walsham Road / Great Hautbois Road

- 9.59 The percentage change assessment for the junction indicates that there would be between a 9% and 17% increase in traffic at the junction between the Do Minimum and Do Something scenarios. This remains the same when the mitigation is considered as the improvements are located to the east of this junction and will not impact on traffic flows.
- 9.60 The modelling illustrates negligible changes to the queues and delays at the junction when comparing the different scenarios with queues reaching a maximum of one PCU and delay increasing by up to seven seconds.
- 9.61 The impact of the allocation on the junction is therefore considered to be negligible in both peak hours.

Summary & Residual Impacts

- 9.62 In Coltishall the volume of through traffic on the B1150 is predicted to increase by on average 250 vehicles (two way) in the peak hours which is significant.
- 9.63 With proposed mitigation measures in place on High Street and at the B1150/ B1354 Junction, the overall network delay decreases in the worst of the two peaks, the PM peak, when comparing both Do Something scenarios with the Do Minimum scenario. It is therefore considered that the allocation can be accommodated with the mitigation proposed for Coltishall with a residual beneficial impact on the network delay.
- 9.64 The proposed development is predicted to increase queueing and delays at the Rectory Road / B1150 Norwich Road junction. Providing additional highway capacity would require use of the adjacent land which operates as a car park for the Recruiting Sergeant pub and restaurant. It should be noted that the traffic volumes assessed are considered a worst-case scenario and test 10% higher development growth than proposed and assume very low levels of home working. Furthermore, the highest level of public transport service from North Walsham is focussed on the desire line of the B1150 through express bus services and the railway line, which has not been reflected in the traffic forecasting on this route. For these reasons, the level of forecast traffic is estimated to be at least 15% more than will be realised.
- 9.65 As traffic forecasts are estimated to be 15% higher than is expected to be realised it is proposed that these impacts are best mitigated in the first instance by limiting the demand and ensure that there are no safety issues arising from the peak hour congestion.
- 9.66 Bearing in mind the lack of alternative routes for traffic measures to mitigate the impacts of this growth in Coltishall have been identified:
- The impact on the B1150 and Coltishall is best addressed firstly through minimising the traffic growth on this route. The use of public transport will be actively promoted at the development through the proposed public transport strategy, incorporating a bus interchange for express services, and improved active travel access to North Walsham Station and target led travel planning.
 - At planning stage, the development will contribute towards and deliver proportionate mitigation to address highway impacts in Coltishall and Horstead on pedestrian crossing facilities on High Street, at Ling Way and at the Recruiting Sergeant.
 - Creating greater awareness of the village entry and reduced speed limit on the approach to Horstead from the South would help reduce vehicle speeds. At planning stage additional signage should be identified.
 - Provision of a Keep Clear across the access to Frettenham Road to enable access in the event of queueing on the B1150 during peak hours.
 - Investigate the need for highway capacity improvements further at the B1150/ Rectory Road junction at planning stage.
- 9.67 Background traffic is also predicted to increase substantially by 2036 and any development growth increasing traffic on the B1150 should be looking at how it can assist NCC in mitigating any potential road safety impacts.

10. Mitigation Summary

Introduction

- 10.1 This chapter sets out the sustainable transport and highway mitigation measures identified as part of the TA of the proposed allocation at North Walsham. These measures support delivery of the proposed allocation in North Walsham and mitigate impacts. Given that the Local Plan allocations are yet to go through the examination process, these proposals are at various stages of detail. Where it was deemed necessary through liaison with the Highway Authority, to investigate some initiatives in further detail to test feasibility, this has been carried out. All proposals identified in this document will be taken forward for further development and implementation at planning stage.

Sustainable Transport Improvements

- 10.2 Given the scale of the allocation, along with ensuring that the proposed allocation provides a Primary School, amenity areas and a local centre on site to serve the needs of the development, it will also be important that this development has a meaningful TP in place to promote sustainable travel.
- 10.3 A TP for the development area will be prepared at planning stage identifying the bespoke measures to be adopted across the site to promote sustainable travel patterns. This will be prepared in line with the most recent NCC TP Guidance (July 2023) and implementation will be fully funded by the development.
- 10.4 To encourage the use of alternative modes to the private car for local trips in North Walsham and to access public transport, several improvements are proposed to the sustainable transport network both within the proposed allocation and off-site. These are detailed in Chapter 5 but in summary:
- 10.5 To deliver safe and convenient routes between the development area and North Walsham Town Centre and North Walsham Railway station focussed improvements where possible to the existing network along three 'Mobility Corridors' have been identified:
- Provide new signalised toucan crossings on Aylsham Road for pedestrians and cyclists to connect with PRow either side of the railway bridge.
 - Provide a new zebra crossing on Park Lane to connect to the existing footway and medical centre.
 - Provide a new footway on the southern side of Aylsham Road under the railway bridge to connect to the existing facilities whilst widening the northern shared footway/cycleway. This has been designed and subject to Road Safety Audit. Further details of this scheme are included in the following section.
 - Upgrade the pedestrian crossing on A149 Cromer Road to a zebra crossing.
 - Install tactile paving to the crossing at the A149 Cromer Road / Bradfield Road priority junction.
 - Close the eastern spur of the A149 Cromer Road / Bradfield Road priority junction and widen the footway to 2.0m.
 - Upgrade Weavers Way, where possible, between the allocation and Station Road in line with LTN 1/20.
 - Improve access from Weavers Way across Station Road. Potential to divert Weavers Way through the car park at Station Road and install a crossing point on Station Road.
 - Upgrade Weavers Way between Station Road and Aylsham Road in line with LTN 1/20, as a shared 3.0m wide pedestrian and cycle facility.
 - Remove the 50m pinch point on Weavers Way at the fenced-in section of Weavers Way next to 40 Oak Road from 2.5m to at least 4.0m to allow for a 3.0m wide pedestrian and cycle facility to be installed.
 - Upgrade PRow from within the allocation to Norwich Road in line with LTN 1/20, with a segregated 3.0m wide cycleway and 2.0m footway. This will be surfaced with asphalt and lighting will be added where sections are currently unlit.

- Upgrade the existing pedestrian crossing on Norwich Road, south of the railway bridge, to a signal-controlled crossing.
- Upgrade the existing shared pedestrian and cycle route between Aylsham Road and Norwich Road in line with LTN 1/20, as a shared 3.0m wide pedestrian and cycle facility. This will be surfaced with asphalt and lighting will be added where sections are currently unlit.
- Install an east-west pedestrian and cycle signalised crossing at the B1150 Norwich Road / A149 signalised junction.
- Provide clear shared pedestrian and cycle route from the B1150/ A149 junction along the B1150 leading to the railway station. This has been designed and subject to Road Safety Audit. Further details of this scheme are included in the following section.
- LTN1/20 compliant pedestrian and cyclist facilities along the length of the link road and throughout the allocation land.
- Provision of a new crossing on the link road for Weavers Way.
- Closure of Skeyton Road, at the point where it crosses the link road for vehicular through traffic but maintaining access for pedestrians and cyclists.
- Install a pedestrian crossing point between the allocation and the existing footway on Greens Road.

10.6 These measures are illustrated **on Figure 32 in Appendix F**.

10.7 A **Public Transport Strategy** has been identified which will include the following measures:

- Provide new bus stops, along with a bus interchange, within the allocation site.
- Divert services through the allocation land. A bus interchange, in the southern area of the allocation land will allow a turning area for the diversion of the X55 service, as well as the extended 33A service. The 33A and 6A services would be diverted along the new link road rather than Greens Road.
- Seek to increase public transport services outside of peak periods.
- Provide additional cycle spaces at the railway station near both platforms.
- Improved access to the railway station for active modes.
- Active promotion of public transport and engagement with the public transport operators through a TP.

10.8 Whilst **Coltishall and Horstead** sit outside of the walking and cycling catchment for the proposed allocation in North Walsham, it is on the bus route and as identified in this assessment the development will increase traffic levels making it more difficult for residents to cross the B1150. This is being addressed in the following ways:

- Promoting sustainable travel at the proposed allocation to reduce demand from traffic on the road network generally, including the B1150 through Coltishall and Horstead. Of relevance are the TP and Public Transport Strategy which will ensure that the public transport network is easily accessible to the proposed site, and actively promoted.
- The existing bus stop at the War Memorial will be formalised, creating a safer stopping arrangement for buses at Coltishall.
- At planning stage, the development will contribute towards and deliver proportionate mitigation to address highway impacts in Coltishall and Horstead on pedestrian crossing facilities on High Street, at Ling Way and at the Recruiting Sergeant.
- Identify further signage and lining to reduce speeds on entry to Horstead from the South along the B1150 to reduce risks for crossing pedestrians.

10.9 The sustainable transport measures identified to serve the proposed allocation will not only benefit the proposed development but will also address existing shortfalls in facilities.

Highway Improvements

10.10 Improvements to the highway network in North Walsham and Coltishall have been identified to address capacity and traffic management issues identified as part of this assessment. These have been tested within the VISSIM modelling set out in **Chapter 9** to ensure that they assist in mitigating the impacts of the allocation and are beneficial to North Walsham and Coltishall. Where necessary these proposals have been designed and subject to Road Safety Audit.

10.11 The proposed improvements in North Walsham and Coltishall are set out in the following sections.

Link Road and Associated Junctions

10.12 The new link road through the allocation will provide a new connection between B1150 Norwich Road and A149 Cromer Road. The design of the link road and associated junctions is set out in **Chapter 4**.

10.13 This route, although residential in nature, has been designed to accommodate HGVs, buses and through traffic. It will not accommodate on street parking with parking needs provided for within the plots. The proposed link road will provide a significantly better route than that utilised at present, along Millfield Road, Station Road, and Greens Road.

10.14 The modelling illustrates that in 2036, some 600 to 700 vehicles would utilise the link road in the peak hours. And that the provision of the link road would mitigate the highway impact of the allocation before traffic management and safety improvements set out in the following sections are implemented.

10.15 Delivery of the new link road will provide greater network resilience in North Walsham, and a more suitable route for north south traffic and HGVs on the west side of North Walsham.

Aylsham Road

10.16 Aylsham Road is a key route within North Walsham for the movement of HGVs due to the railway bridge being 4.8m high and therefore capable of accommodating the largest high sided vehicles that need to traverse the town. This route is also a key corridor for pedestrian and cyclist trips between the town centre and the residential areas to the west including the proposed allocation despite the lack of adequate facilities especially under the railway bridge, where pedestrians were observed walking in the carriageway. Aylsham Road includes a very constrained section west of the railway bridge, where residential properties opening directly onto the road and there are no footpaths.

10.17 Whilst Aylsham Road is required for access and as a through route for higher HGVs and buses, it is not suitable for accommodating high level of traffic. To discourage the use of Aylsham Road wherever possible and to enhance the safety and pedestrian facilities several measures have been identified.

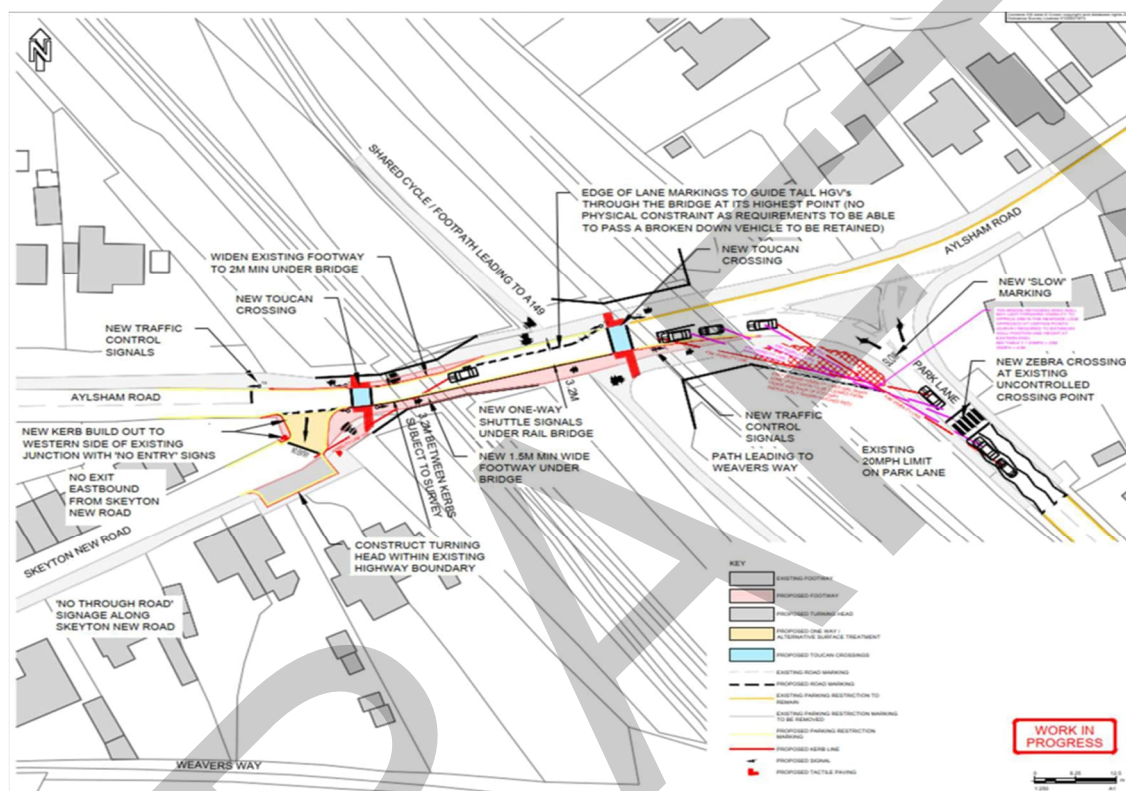
10.18 It is proposed to:

- Provide a signalised shuttle system at the railway bridge whereby one-way movements under the bridge are controlled by traffic signals.
- Enhance the facilities for pedestrians and cyclists through widening of the footway on the northern side to two metres and providing a new 1.5m wide (minimum) footway on the southern side.
- Reduce the width of the carriageway to 3.5 metres under the railway bridge, such that high-side vehicles can easily pass under the centre of the bridge, its highest clearance point and restrict passing of cyclists who would be using the carriageway.
- Provide two signalised crossings to assist pedestrians and cyclists to cross Aylsham Road, at either end of the shuttle system.
- Provide a Zebra crossing on Park Lane at the point where the footway ends to assist pedestrians in crossing and acting as speed calming measure.
- Cut back vegetation located within the visibility splay to assist vehicles travelling along Park Lane to see any queue relating to a red traffic signal.

- Change the access arrangements to Skeyton New Road at its junction with Aylsham Road to entry only, with all vehicles exiting Skeyton New Road via its junction with Station Road. The junction with Aylsham Road will be amended to slow vehicles with signage provided notifying drivers of the access arrangements. A new turning head will be provided on Skeyton New Road to assist larger vehicles in turning.

10.19 The proposed scheme is illustrated on **Figure 42** and included at **Appendix F**.

Figure 42 – Proposed Scheme – Shuttle System and Associated Improvements, Aylsham Road



10.20 The proposed design has been audited by NCC's Road Safety Team and updated to address problems raised. A copy of the Stage 1 Road Safety Audit (RSA) and the Designers Response is included at **Appendix G**. The Designers response has been accepted by NCC.

10.21 The implementation of this scheme results in a slight increase in delay at the B1150 Norwich Road / A149 Norwich Road as vehicles divert to avoid Aylsham Road.

10.22 Furthermore, the proposed link road has been redesigned to discourage the use of Aylsham Road as a through route into North Walsham for general traffic, by staggering the proposed signal-controlled junction with the proposed new link road. This will reduce vehicle speeds on entry to Aylsham Road and make the use of this as a through route less attractive.

10.23 At planning stage further traffic management measures will be explored to minimise the impact of traffic on the narrow 20mph section, such as designating the route for access only, provision of additional signage and provision of horizontal deflection to impose speed reductions for traffic.

B1150 Norwich Road / A149 Junction

10.24 During a site visit with NCC's Road Safety Team, the consented improvements to the B1150 Norwich Road / A149 signalised junction were reviewed. It was identified that the improvements for pedestrians and cyclists on the southern side of the B1150 Norwich Road did not extend to the railway station and that existing facilities in this location were poorly defined for pedestrians and not suitable for cyclists.

10.25 Through liaison with NCC Highways team it was also identified that further pedestrian crossings were required at the signalised junction but had not been secured as part of the consented scheme.

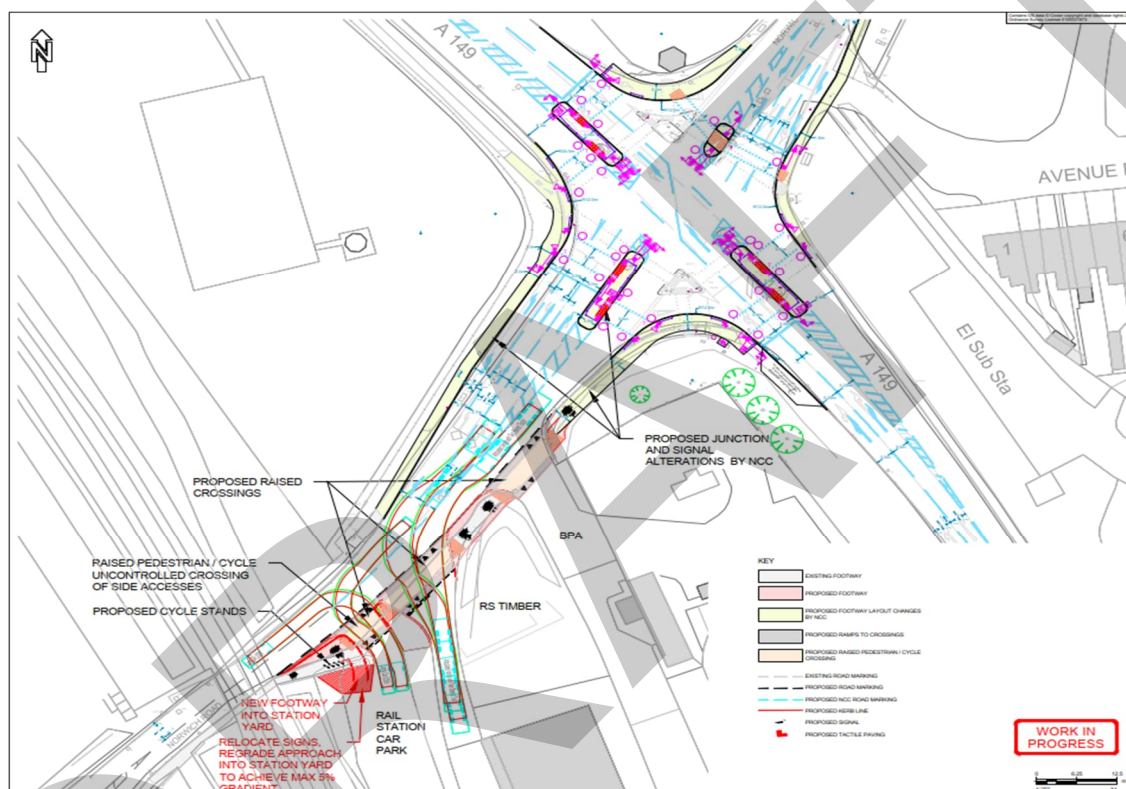
10.26 It is therefore proposed to extend the proposed widening of the existing footway along the southern of the B1150 from the end of the consented scheme to the railway bridge.

10.27 This would include:

- Widening the existing footway to three metres to allow for cyclist use.
- Provide raised crossings at the vehicular access points to indicate priority for pedestrians and cyclists.
- Provide tactile paving at point between the accesses to assist the visually impaired.
- Regrade the approach to the station by the junction with B1150 Norwich Road to achieve a maximum gradient of 5% and provide a new footway to reduce conflict with vehicles.

10.28 The proposed scheme is illustrated on **Figure 43** and included at **Appendix F**.

Figure 43 – Proposed Scheme – Pedestrian and Cyclist Improvements, B1150 Norwich Road



10.29 The proposed design has been audited by NCC's Road Safety Team and updated to reflect the issues raised. A copy of the Stage 1 Road Safety Audit (RSA) and the Designers Response is included at **Appendix G**.

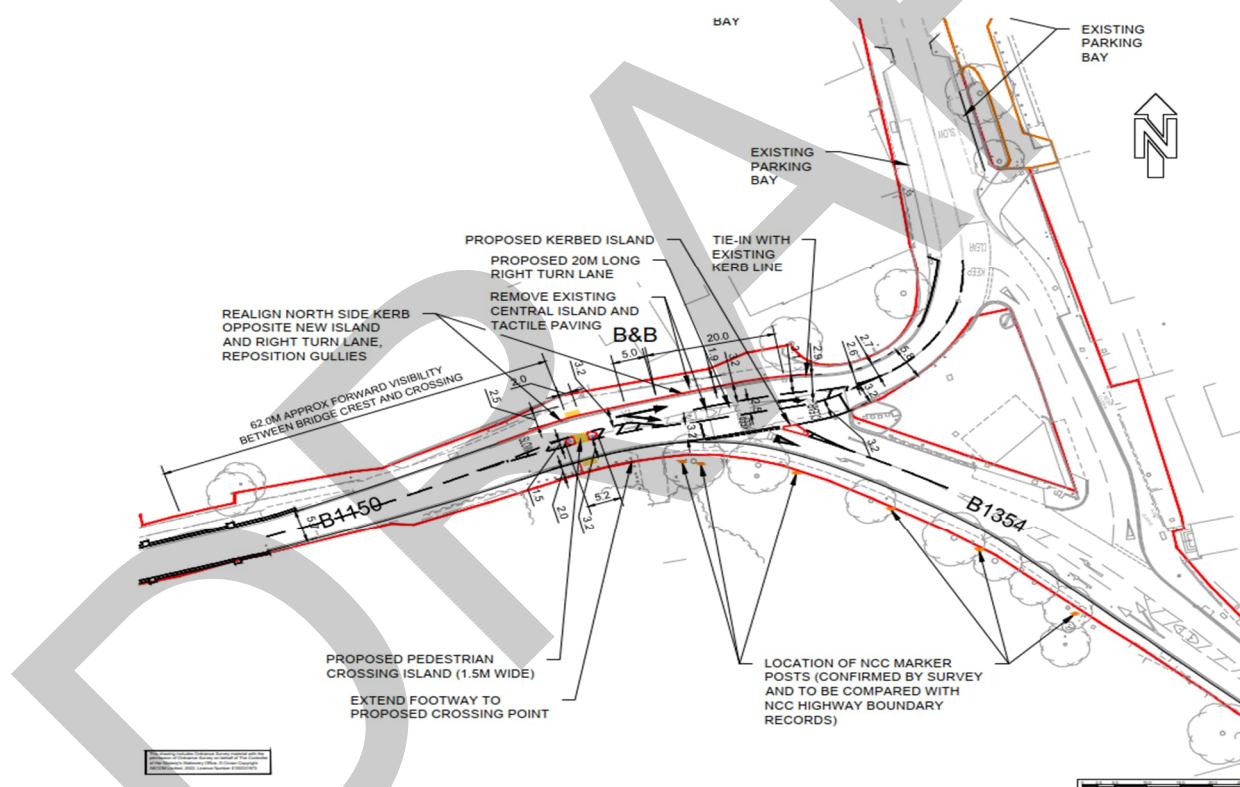
10.30 It should be noted that the drawing illustrating the improvements proposed as part of the allocation also illustrates the current consented improvement scheme for the B1150 Norwich Road / A149 signalised junction which is being brought forward by NCC as part of the consent for planning application PF/13/0866. This includes the additional signalised crossings on the B1150 south and the A149 west arms, which the proposed allocation will contribute towards.

B1150 Norwich Road / B1354 Church Road, Coltishall

10.31 The VISSIM modelling undertaken for Coltishall illustrated that queuing was occurring at the B1150 Norwich Road / B1354 Church Road junction in all scenarios assessed however it significantly increased when the allocations traffic was added to the network. This was identified as occurring due to vehicles turning right into B1354 blocking through traffic from continuing northbound. To resolve the blocking of through traffic and alleviate queuing in this area of Coltishall, a right turn lane is proposed.

- 10.32 A right turn lane is proposed which would be approximately 20 metres long and 2.5 metres wide and would result in the relocation of the existing pedestrian island and tactile paving. The pedestrian island would be relocated to the west of the right turn lane, avoiding the accesses to the Anglian Water pump house and the property, identified as 'Bridge House B&B'. Vehicular tracking of the accesses with the new pedestrian island in place has been undertaken and confirms that both accesses would continue to operate as at present. The new pedestrian island would be located some 62 metres from the crest of the river bridge which accords with the standards as set out within DMRB for forward visibility.
- 10.33 As requested by NCC's Road Safety Team, in addition to the 2.5-metre-wide right turn lane, the through lanes in this area will be provided at 3.2 metres to ensure that HGV movements can be made without encroaching on vehicles waiting to turn. To accommodate this the kerb line on the northern side of the carriageway would need to be realigned slightly.
- 10.34 Due to the constrained location, the design for this proposal has been undertaken using topographical survey information and validated highway boundaries to ensure deliverability.
- 10.35 The proposed scheme is illustrated on **Figure 44** and included at **Appendix F**. The red line on the figure illustrates the highway boundary information obtained from the NCC.

Figure 44 – Proposed Scheme – Right Turn Lane, B1150 Norwich Road / B1354 Church Road, Coltishall

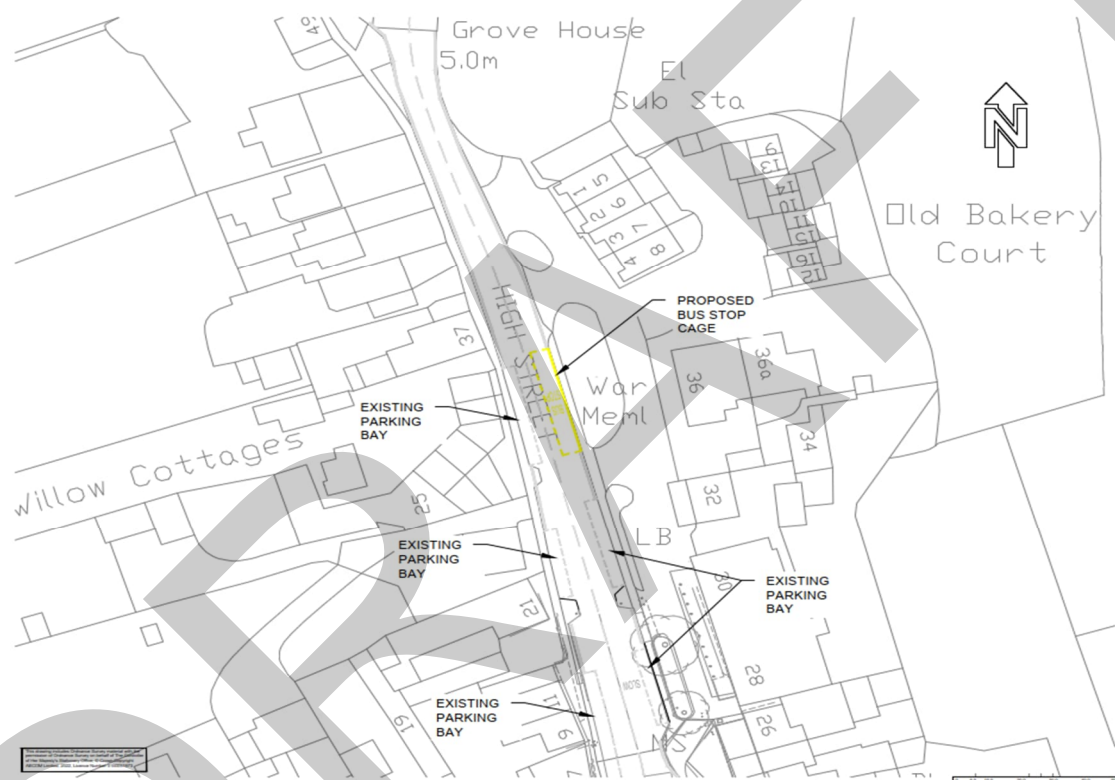


- 10.36 The proposed design has been audited by NCC's Road Safety Team and updated to reflect the issues identified. A copy of the Stage 1 Road Safety Audit (RSA) and the Designers Response is included at **Appendix G**. The Designers Response has been accepted by NCC.
- 10.37 The implementation of this scheme would result in a significant improvement to queuing at the junction such that the proposed improvement would result in mitigating the increase in queuing created by the allocation to levels estimated to occur in the Do Minimum scenario. It is therefore considered that the proposed right turn lane would be beneficial to the operation of the road network within Coltishall and would mitigate the development impacts.

B1150 High Street, Coltishall

- 10.38 It was observed during the traffic surveys carried out in November 2022 and on-site observations that vehicles currently park on B1150 High Street adjacent to the war memorial restricting access to the bus stop and impeding traffic flow.
- 10.39 To enable buses to utilise the bus stop safely, as well as aid with traffic movements through Coltishall, it is proposed to provide a bus stop cage on the carriageway adjacent to the war memorial. The provision of the bus cage as shown by the VISSIM modelling would result in a significant improvement in vehicular movements along the B1150 High Street during the peak hours with the queuing dissipating to negligible levels.
- 10.40 The proposals are illustrated on **Figure 45** and included at **Appendix F**.

Figure 45 – Proposed Scheme – New Bus Stop Cage, B1150 High Street, Coltishall



- 10.41 The proposed design has been audited by NCC's Road Safety Team and updated to reflect the problems identified. A copy of the Stage 1 Road Safety Audit (RSA) and the Designers Response is included at **Appendix G**.

Further Mitigation

- 10.42 Traffic flows on Skeyton Road are low and are forecast to remain low, but it is a well-used route by pedestrians and cyclists. Given that this is a residential lane, to avoid rat running along it, it is proposed to prevent vehicular traffic access from the proposed link road, and only allowing pedestrian and cycle traffic to cross the Link Road from Skeyton Road.
- 10.43 Provision of a Keep Clear across the access to Frettenham Road to enable access in the event of queuing on the B1150 during peak hours.
- 10.44 Investigate the need for highway capacity improvements further at the B1150/ Rectory Road junction at planning stage.

Phasing

- 10.45 As the phasing strategy for the proposed allocation is developed, the phasing for the associated mitigation measures will need to be defined.
- 10.46 There are views that the proposed link road should come forward as early as possible within the delivery horizon, however this needs to be balanced against funding availability and need. From both a capacity perspective and an access perspective.
- 10.47 Some key considerations in developing the phasing strategy will be:
- It is important that the first residents are encouraged to use sustainable travel in the first instance and for this reason safety measures and sustainable access measures should be delivered to address the needs of each phase as they come forward.
 - Delivery of the link road between B1150 and Aylsham Road should come forward earlier to avoid increased HGV traffic on Station Road and Millfield Road during construction and early phases.
 - Bus routing will need to be phased in accordance with the development build out programme and available routes.
 - Construction traffic should be accommodated on site, potentially through temporary haul routes until the link road is in place, to minimise impacts local residential roads.

Summary

- 10.48 A comprehensive package of mitigation measures have been identified in response to consultation and the detailed assessments undertaken. Where necessary deliverability has been interrogated through design and safety reviews.
- 10.49 The sustainable transport and highways improvements have been discussed with the highway officers at NCC with the highway improvements also have been through a Stage 1 RSA with NCC's Road Safety Team.
- 10.50 The proposals set out are considered to mitigate the impact of the allocation, are deliverable, and will provide beneficial enhancements to the existing network.

11. Construction

Introduction

- 11.1 This chapter sets out the potential mitigation measures which could be included in a full Construction Traffic Management Plan (CTMP), to help reduce the construction impacts on the surrounding highway network during the construction phase of the allocation.

Construction Impacts

- 11.2 At this stage it is considered premature to undertake a detailed assessment of construction vehicle impact, given that any such impact is largely dictated by the phasing and build programme of the allocation itself, which is currently unknown.
- 11.3 It is considered that the impact of construction traffic on the capacity of the local road network is anticipated to be relatively small overall. HGV movements would occur throughout the day, with a view to avoid peak times, and therefore would not add to peak hour traffic. The most significant impact would therefore be the journeys of construction workers travelling on the local road network. Despite this, construction hours are likely to dictate that staff are required to be at the site prior to the AM peak and leave after the PM peak.

Construction Traffic Management Plan

- 11.4 As a result of the sensitivities which surround construction vehicles and their impact, a CTMP could be developed and implemented during the entire construction period to mitigate any construction traffic impacts resulting from construction traffic relating to the allocation. If provided, the CTMP would provide a framework to sensitively manage all types of vehicle movement to and from the construction site.
- 11.5 The main aims of a CTMP are to ensure that there is no disruption to the local highway network, to spread deliveries throughout the day to avoid peaking of deliveries, and to restrict the number / volume of service vehicle movements during the morning and evening peak periods.
- 11.6 There are several potential mitigation measures that could be implemented during the construction period to mitigate any detrimental impact of construction vehicles on the surrounding highways network. Potential mitigation measures could include the following:
- Early delivery of phases of the link road to remove construction traffic from local roads where possible.
 - Use of sufficient clear signage to ensure that construction vehicles use only designated routes.
 - Routing of HGVs on main roads away from sensitive areas such as schools, residential areas, and areas sensitive in terms of air quality.
 - All heavy vehicle access to the allocation to be from the B1150 Norwich Road, B1145 Aylsham Road, or A149 Cromer Road with heavy vehicle movements through North Walsham or local roads being discouraged.
 - Time slots for bulk deliveries to ensure that convoys of vehicles do not arrive simultaneously.
 - Provision of holding spaces to avoid congestion on the local road network by waiting vehicles.
 - Coordination of abnormally large loads.
 - Scheduling of deliveries / collections away from peak hours, either before the AM peak or during the inter-peak daytime period.
 - Encouraging construction hours to avoid the AM and PM peak traffic periods for construction workers.
 - On-site recycling of materials to reduce export and import vehicle movements, including stockpiling topsoil for landscape works, or crushing existing hard standing material for engineering fill.
 - Keeping the access routes clear of mud using a road sweeper.
 - Implementation of wheel washing facilities to prevent debris being deposited on the highway network.
 - Implementation of appropriate traffic management to ensure that construction of the site access junctions does not give rise to undue disruption.

- Staff travel plan for construction workers, where possible using public transport/ car sharing to access the site.
- 11.7 It is considered that a CTMP could be conditioned as part of any planning permission. The CTMP would be tailored to the allocation to ensure that specific issues are identified and covered. The CTMP would be approved by the local authorities prior to implementation.
- 11.8 The impact of construction traffic on the capacity of the local highway network is anticipated to be relatively small overall as most HGV movements would occur through the day away from the peak periods and would not affect congestion on the surrounding highway network. Potentially the most significant impact could be the journeys of construction workers travelling to and from the construction site. However, this could be managed by ensuring construction hours are outside of the peak AM and PM periods.

DRAFT

12. Summary and Conclusions

Summary

- 12.1 This report has been prepared by AECOM to present the findings of a Transport Assessment (TA) undertaken to accompany the Local Plan evidence application for a proposed mixed-use development on land west of North Walsham, Norfolk. The principal findings of the TA are summarised in the following paragraphs.
- 12.2 The allocation, identified in the Regulation 19 version of the NNDC Local Plan 2016-2036 as 'Land West of North Walsham (NW62/A)', is expected to deliver:
- Approximately 1,800 dwellings.
 - 7ha of serviced employment land.
 - Green infrastructure.
 - Community facilities, including a new primary school.
 - A road linking Norwich Road, Cromer Road, and the industrial estate.
 - Other required infrastructure improvements and mitigation including, but not limited to, health services, drainage, and power.
- 12.3 The allocation has been reviewed against National, Regional, and Local policy to ensure that the site is compliant. This has included a review against NPPF, NPPG, the existing North Norfolk Local Plan, the emerging Local Plan as well as transport policy adopted by NCC and Active Travel England. The allocation accords with the policies based on its sustainable location and being close to existing good quality public transport and in being a mixed development allows trips to be within the site reducing the impact on the wider network.
- 12.4 The site is located within reasonable walking distance of most amenities and facilities in North Walsham. As such, the site is well located in terms of opportunities for education, retail, and employment. The Weavers' Way footpath runs through the allocation, connecting to existing infrastructure to the west of the railway line. There are some areas in North Walsham where pedestrian and cycling facilities are poor and require improvement.
- 12.5 The allocation also benefits from already being well serviced with most of the allocation within 400 metres of an existing bus stop. The bus network in North Walsham provides good access to the Norfolk coast and Norwich, as well as a circular route around North Walsham. Visitors and residents of the allocation will also benefit from being closely located to North Walsham Train Station which provides regular services to Norwich and Sheringham. The journey time by rail to Norwich is faster than by road. The station at Norwich allows for wider regional/national travel, which provides a suitable alternative to using a private car. It is noted that travel outside of the peak periods is somewhat limited and therefore it is anticipated that the increase in patronage brought forward by the allocation will assist in allowing further services outside of the peak periods to be provided.
- 12.6 In terms of the local highway network, the allocation benefits from being located close to some of the main roads into and out of North Walsham avoiding reliance on routing through the town centre.
- 12.7 The railway line crosses the highway network in North Walsham on four occasions and restricts the movement of high sided HGVs and PSVs to certain routes within the town. Analysis shows that the dominant HGV route west to east is via the A149 Cromer Road with a small number higher sided vehicles and buses using Aylsham Road.
- 12.8 The B1150 is a dominant desire line for travel towards Norwich and there are existing constraints as it passes through Coltishall and Horstead.

12.9 A comprehensive assessment has been undertaken including surveys recording traffic volumes, composition, turning movements, speeds, journey times and routes. Accident data has also been gathered and analysed to understand any key issues on the receiving highway network. The assessment scope has been developed in liaison with NCC and has been informed by Microsimulation models of both North Walsham and Coltishall.

What are the Transport Impacts?

12.10 Assessment of the proposed allocation transport impacts remains underway informed by extensive surveys, and Microsimulation models of North Walsham and Coltishall developed in consultation with NCC. Findings to date have shown that the proposed allocation can be delivered without severe impacts. Any offsite impacts will be mitigated in full through an integrated multi modal access strategy and off-site capacity improvements.

12.11 The trip generation for the proposed allocation has been determined for all modes and for all uses. This process has made a series of conservative assumptions to add robustness to the assessment.

12.12 Future year flows have been identified by applying TEMPro growth factors to the 2022 traffic count data to reflect future background growth which includes the traffic associated with the proposed 343 dwellings at the Hopkins Homes development in North Walsham and the Scottow Business Park development near Coltishall.

12.13 The 2036 future year traffic flows used for this assessment represent a very robust scenario for the following reasons:

- A total of 2,000 dwellings have been assessed rather than the 1,800 identified within the allocation policy, to allow a conservative estimate of development impacts to be tested;
- No allowance for mode shift in background traffic has been made, despite transport policy being focussed on supporting more sustainable travel patterns and modes;
- Future mode shares at the residential development have been assumed to reflect a reduction of car driver trips by ten percentage points from Census 2011 levels in North Walsham. Bearing in mind the improved level of local public transport provision since 2011, increased reliance on home working, changing travel patterns this is a conservative design case;
- No mode shift has been assumed for employment uses, and local internalisation is assumed to be minimal; and
- The most dominant route for highway traffic from the proposed development has been identified to be along the B1150 towards Norwich. This route also accommodates the most significant public transport services, and the likely higher take up of public transport along this desire line has not been reflected in the analysis.

12.14 Taking all these factors into account, the forecast traffic flows are considered to have a safety factor of 15% incorporated (i.e., they are 15% higher than they are expected to be in reality). The reason for this is that it is early in the process, and for Local Plan allocation a high-level understanding of the issues to be addressed needs to be understood to prove deliverability.

12.15 To determine the impact of the allocation, four separate AM and PM peak scenarios have been assessed. These include:

- Base – 2022 Surveyed traffic flows.
- Do Minimum – Base flows growthed to 2036, with the existing highway network and the consented improvement scheme at the A149 / B1150 signalised junction.
- Do Something – Trip generation for the allocation added to the Do Minimum traffic flows.
- Do Something with Mitigation – Do Something traffic flows and the mitigation proposals included in the VISSIM models.

- 12.16 A percentage change impact assessment was undertaken to identify the change in traffic at the junctions within the VISSIM models in both North Walsham and Coltishall. This identified that, generally, there is an increase in traffic at each of the key junctions assessed. The increase in traffic on junction approaches in North Walsham is generally less than 60 vehicles per hour in all periods, except for B1150 Norwich Road where the residual % impact reaches 20%. This is largely because the proposed link road allows traffic to redistribute more efficiently and caters for the growth in traffic. On Norwich Road capacity improvements at the B1150/ A149 junction which are committed and under design by NCC provide for traffic growth and allow traffic to be attracted to this route.
- 12.17 Traffic is however predicted to decrease on Greens Road, Station Road, Millfield Road, and Skeyton New Road because of the allocation.
- 12.18 In Coltishall, traffic volumes will increase, and this is due to the lack of alternative routes. This impact needs to be considered in terms of both highway capacity and pedestrian crossing activity.
- 12.19 The forecast results for network delay in North Walsham illustrate that in the PM peak, the most critical time on the network, the average delay is greatest in the Do Minimum scenario in the PM peak, i.e., without the proposed allocation in place, but with developments such as Scottow Business Park and the Hopkins Homes site in North Walsham. The allocation and its associated mitigation therefore results in a betterment in terms of network delay in North Walsham over that which would occur if the allocation were not to come forward.
- 12.20 The assessment of individual junction impacts highlight that the B1150 / A149 signalised junction in North Walsham suffers an increase in queueing and delay in all scenarios even with the capacity improvements coming forward. The queues increase over the hour however by the end of the time, the queues have cleared the junction, limiting this to a peak hour impact. It should be noted that these delays are caused in part by enhanced crossing facilities for pedestrians and cyclists and traffic management measures on Aylsham Road, which cause traffic to re-route. Given the fact that traffic forecasts are very robust, and that whilst peak hours only were assessed, in practice peak hour spreading and mode choice would be expected to avoid this network constraint, delays are unlikely to materialise, and the betterment for active modes and safety outweigh the need to increase vehicular capacity.
- 12.21 In Coltishall, the modelling illustrates similarly to North Walsham, the greatest average delay occurs in the PM peak. This results also illustrates that once the mitigation proposed as part of the allocation would have a beneficial impact on network delay reducing it to lower levels than would be experienced in the Do Minimum scenario. Mitigation on High Street and at the B1150/ B1345 junction has been identified to successfully ease network constraints but there are residual delays predicted at the Rectory Road/ B1150/ Mill Road junction. There is potential for further improvements to be investigated at this junction at planning stage, but this will need to be balanced against the needs of pedestrians and the adjacent Recruiting Sergeant. As with North Walsham, the modelled forecast traffic flows are very robust, some 15% higher than anticipated in practice. The residual impacts are not considered to be severe.
- 12.22 The volumetric increase in through flows in Coltishall and Horstead is significant enough to impact on pedestrian crossing activity and safety. As such it has been identified that proportionate contributions towards improvements to pedestrian crossing facilities on High Street at Ling Way and in Horstead will be required at planning stage and following the outcome of safety review work underway by NCC.

What will the allocation deliver?

- 12.23 The proposed allocation will deliver a comprehensive package of measures to provide safe and sustainable access to the development and to mitigate development impacts along with proportionate contributions. These will be phased as the allocation comes forward, however the precise details of the phasing is still to be determined. The following measures have been identified:

- A funded, target led **TP** to promote sustainable travel at the proposed allocation land, in accordance with the most recent NCC guidance.

Walking & Cycling

- A network of interconnected streets, squares, green corridors, and public spaces which prioritise moving around on foot and by cycle over the use of private motor vehicles;
- Attractive and convenient connections for walking and cycling to adjacent areas;

- Enhancement of existing PROWs through the site, including Weavers Way;
- Provision of extensive off-site pedestrian and cycle route improvements to the town centre, key services, and railway station focused on the three key 'Mobility Corridors' between the development, the Town Centre, and Railway Station; and
- Increased cycle parking at NW Railway Station, on site Travel Hub and at all public spaces on site.

Public Transport

12.24 Public transport measures on site providing facilities and regular services to/from the town and key services including:

- On-site travel hub for bus/ travel interchange, to attract express services into the site;
- Permeability of the site to bus services along the development Link Road;
- Provision of bus stops along development frontage and within the site with high quality facilities;
- Diversion of services through the site and service enhancements, outside peak periods; and
- Access to rail supported through 'Mobility Corridor' cycle improvements and enhanced station cycle parking.

Traffic Management

12.25 Delivery of a new road designed as an attractive main residential street through the development with mixed-use frontage usages and segregated cycle paths and footways. This new road will be suitable for HGV traffic (including high sided vehicles) and will connect Norwich Road to Cromer Road via two new roundabouts and will form a signalised junction with Aylsham Road.

12.26 The Access Road will:

- ✓ deliver greater network resilience in North Walsham;
- ✓ mitigate the development impacts, other than some predicted congestion on B1150 Norwich Road at the junction with the A149;
- ✓ lead to a substantial reduction in traffic on Station Rd, parts of Aylsham Rd, Green Rd, Millfield Road, Tungate Road, Skeyton Road, and Skeyton New Road of between 10-30%;
- ✓ result in traffic reductions on the A149 between Norwich Rd and Cromer Rd;
- ✓ accommodate more efficient HGV routing, reducing HGV traffic on Station Road;
- ✓ manage the use of Aylsham Road with traffic signals and breaking the through route across the link road;
- ✓ no significant increase in traffic on Bradfield Road, north of the railway, with only the residential uses north of the railway adding light vehicles;
- ✓ Green Rd will be stopped up and access to the Football Club will be improved; and,
- ✓ Close Skeyton Road and Skeyton New Road to through traffic.

12.27 A signalised shuttle one-way system is proposed at the Aylsham Road railway bridge to manage traffic demand and improve safety for pedestrians and cyclists.

12.28 Off-site capacity improvements are identified in Coltishall with a Bus Cage on high street preventing obstructive parking, and a new right turn lane arrangement with associated pedestrian facilities at the B1150/B1354 junction in Coltishall.

12.29 Car parking, Blue Badge Holder car parking, and cycle parking will be provided in line with the standards applicable at the time of any application. The current standard applicable are set out in NCC Parking Provision Guidance 2022. No parking will be provided along the link road, with all parking requirements provided for on plot.

12.30 The improvements proposed to the highway have been subject to a Stage 1 Road Safety Audit undertaken by the NCC Road Safety Team. Audit reports and Designers Responses have been prepared and agreed with NCC.

Northern Link

- 12.31 Due to the uncertainty regarding the proposed northern extension of the link road along Bradfield Road and into Folgate Road through the industrial area north of North Walsham, and since it is not within the control of the proposed allocation landowners to deliver, the Northern Link does not currently form part of the proposals and this assessment has been completed assessing the development impacts in the absence of a Northern Link. Further transport justification for this position is set out in the AECOM Technical Note 'Assessment of need for Northern Extension of Western Link Road to support the Western Urban Extension of North Walsham'. The proposed allocation will allow for future provision of this link if it comes forward through the allowance for land for future upgrades to Bradfield Road.
- 12.32 Construction of the allocation will be considered at detail in future planning application but for the purposes of this TA, potential mitigation measures have been identified to be implemented through a Construction Traffic Management Plan.

Conclusion

- 12.33 In conclusion, it is considered that the transport impact of the proposed allocation for housing west of North Walsham can be mitigated through the provision of improvements to both the sustainable transport and highway network. The assessment undertaken includes a high level of robustness and the mitigation measures identified have been tested and illustrated to be deliverable. Any residual impacts are not considered severe in the context of paragraph 111 of the NPPF and are outweighed by the positive impacts of the proposals this development will bring forward.

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