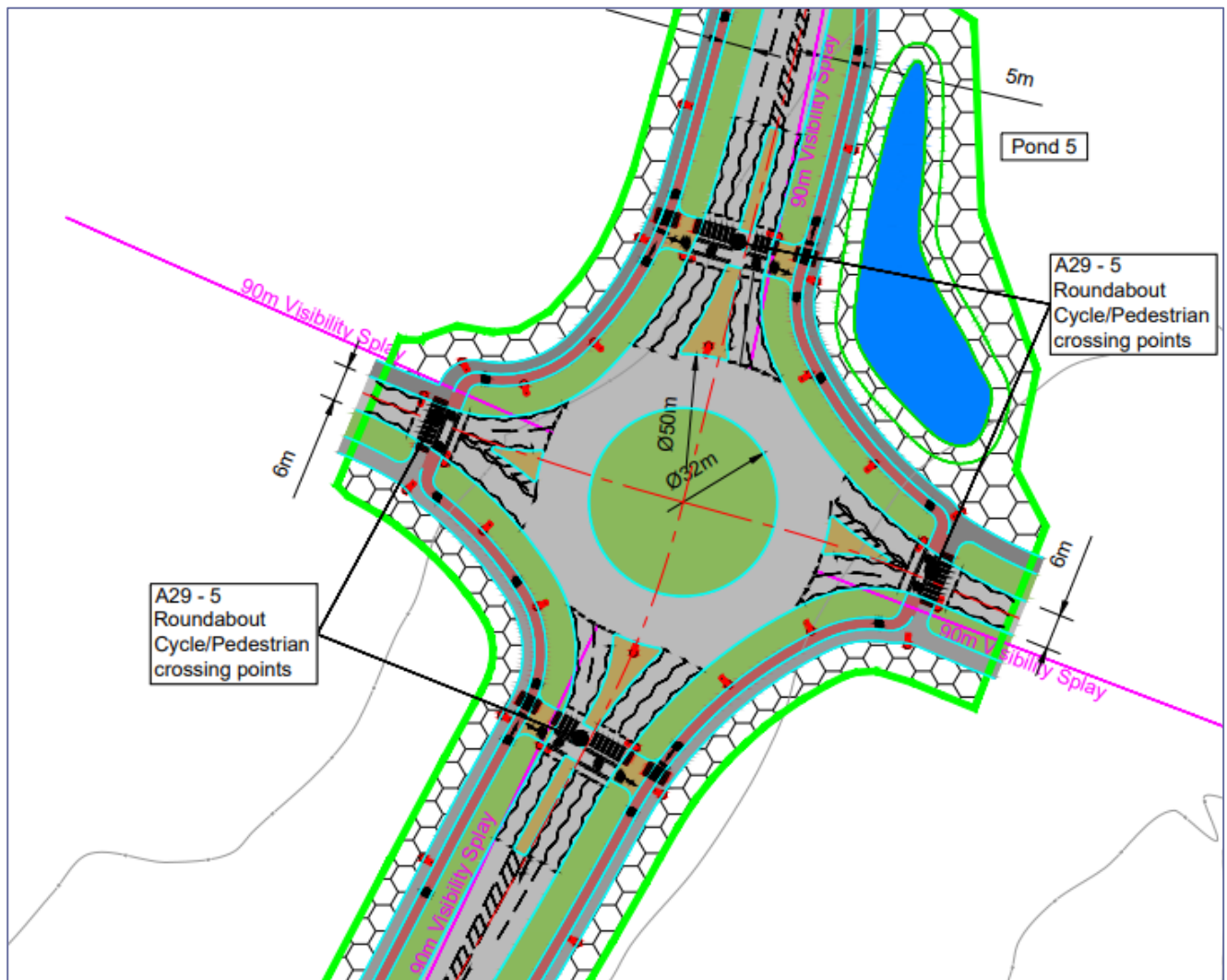
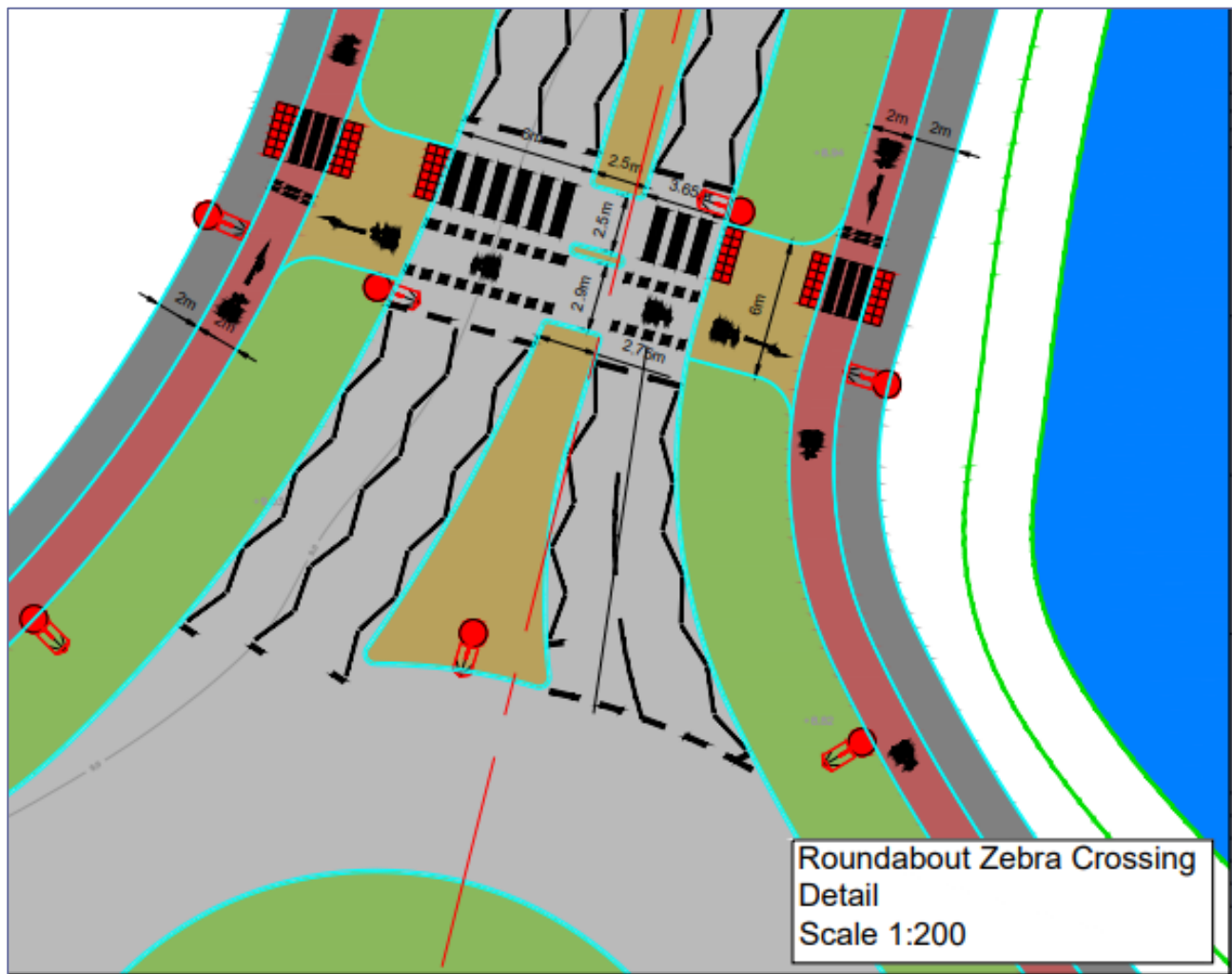


Figure 4.6: Realigned A29 / Link to Woodgate Roundabout A (CD-00103 P03)



An example of the crossing widths is shown in Figure 4.7.

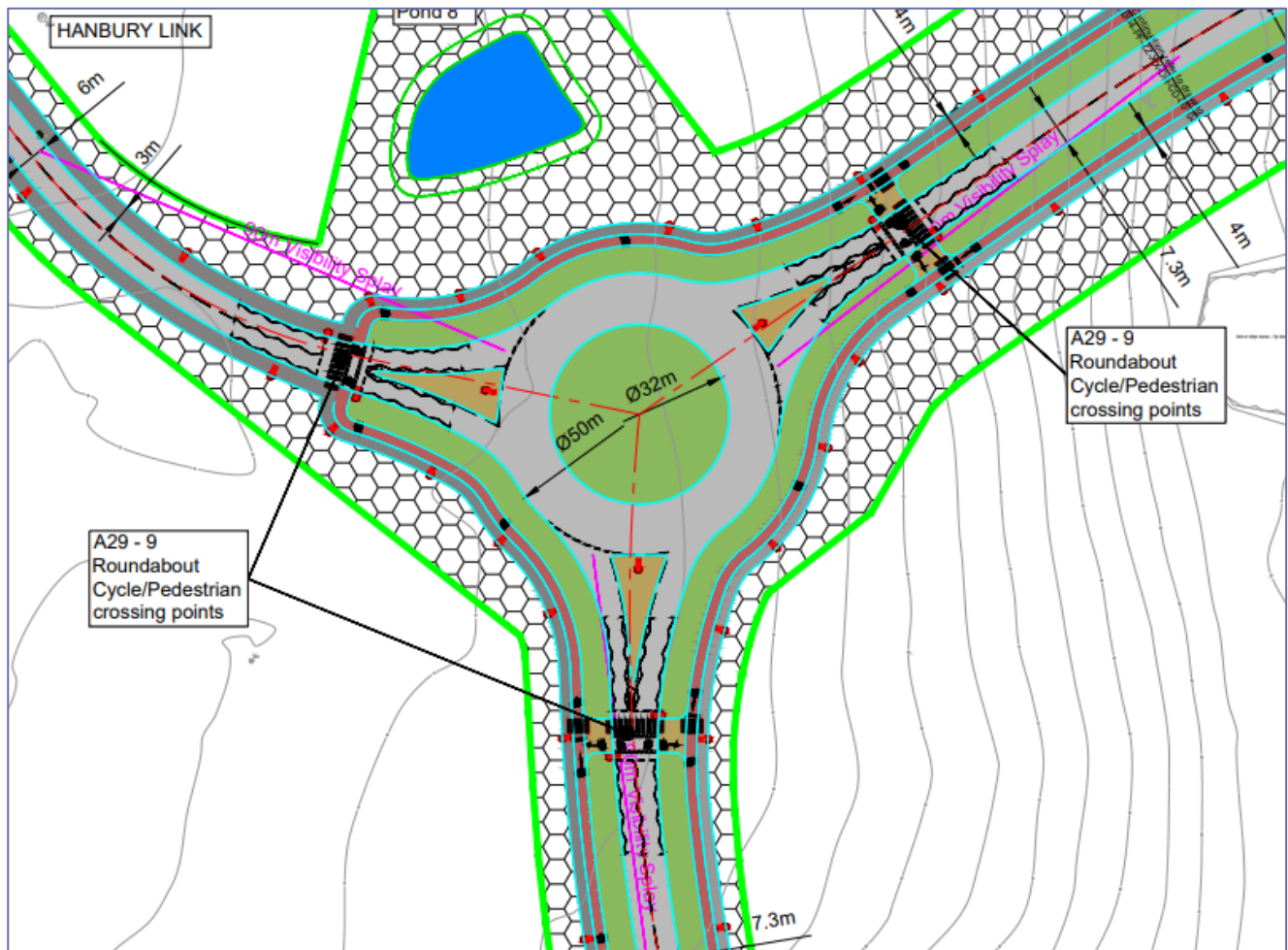
Figure 4.7: Typical roundabout crossing at Realigned A29 / Link to Woodgate Roundabout A (CD 00102 P03)



4.3.1.4 Realigned A29 / Link to Woodgate Roundabout B

This roundabout has one southbound lane and one northbound lane on its northern arm, and one lane in each direction on each of its other two arms. It has an Inscribed Circle Diameter (ICD) of 50 metres. It features parallel (tiger) crossings on each arm, so that cyclists and pedestrians can cross safely, quickly and easily.

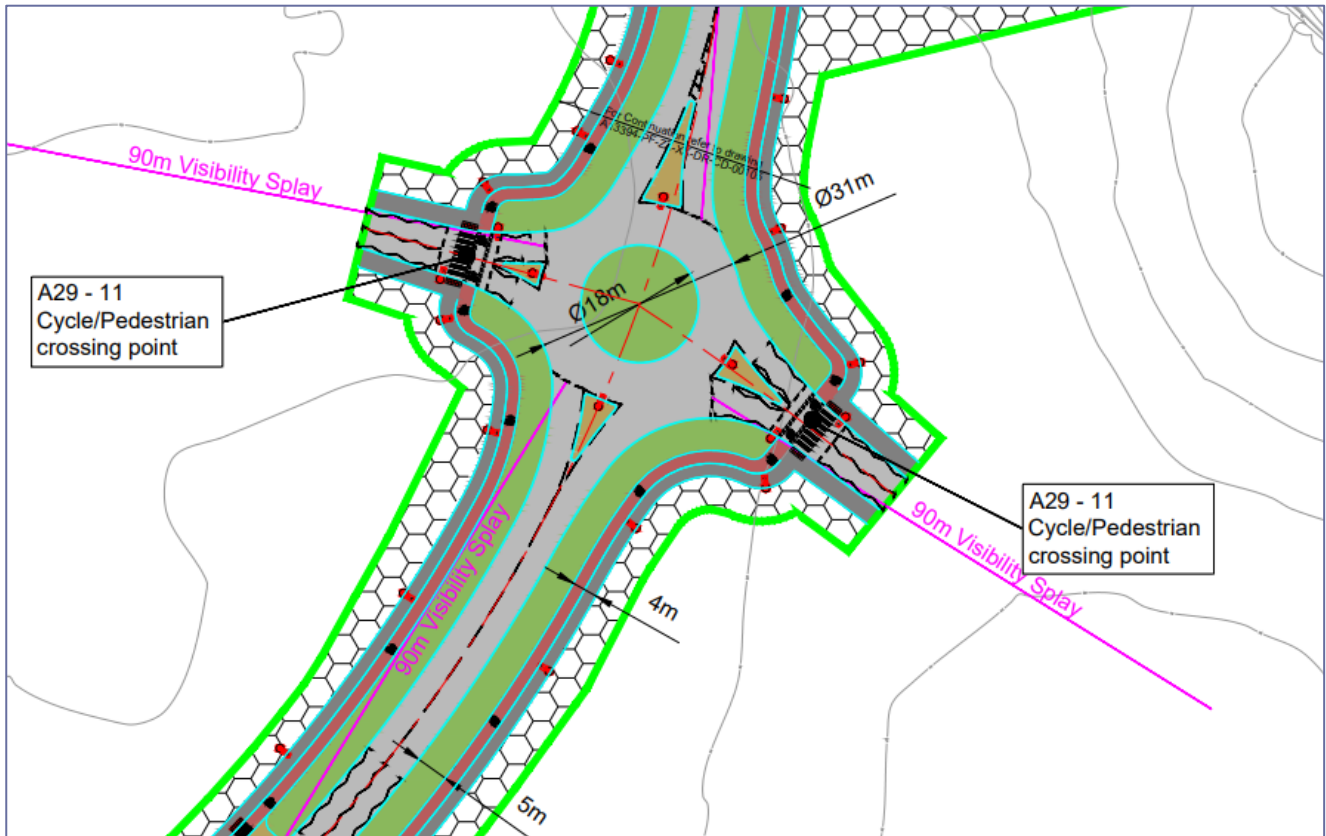
Figure 4.8: Realigned A29 / Link to Woodgate Roundabout B (CD-00105 P03)



4.3.1.5 Realigned A29 / Links to southernmost parcels in the Framework Masterplan

This roundabout has one lane in each direction on its southern and northern arms. It has an Inscribed Circle Diameter (ICD) of 31 metres. It features parallel (tiger) crossings on the east and west arms, so that cyclists and pedestrians can cross over those and travel north and south safely, quickly and easily.

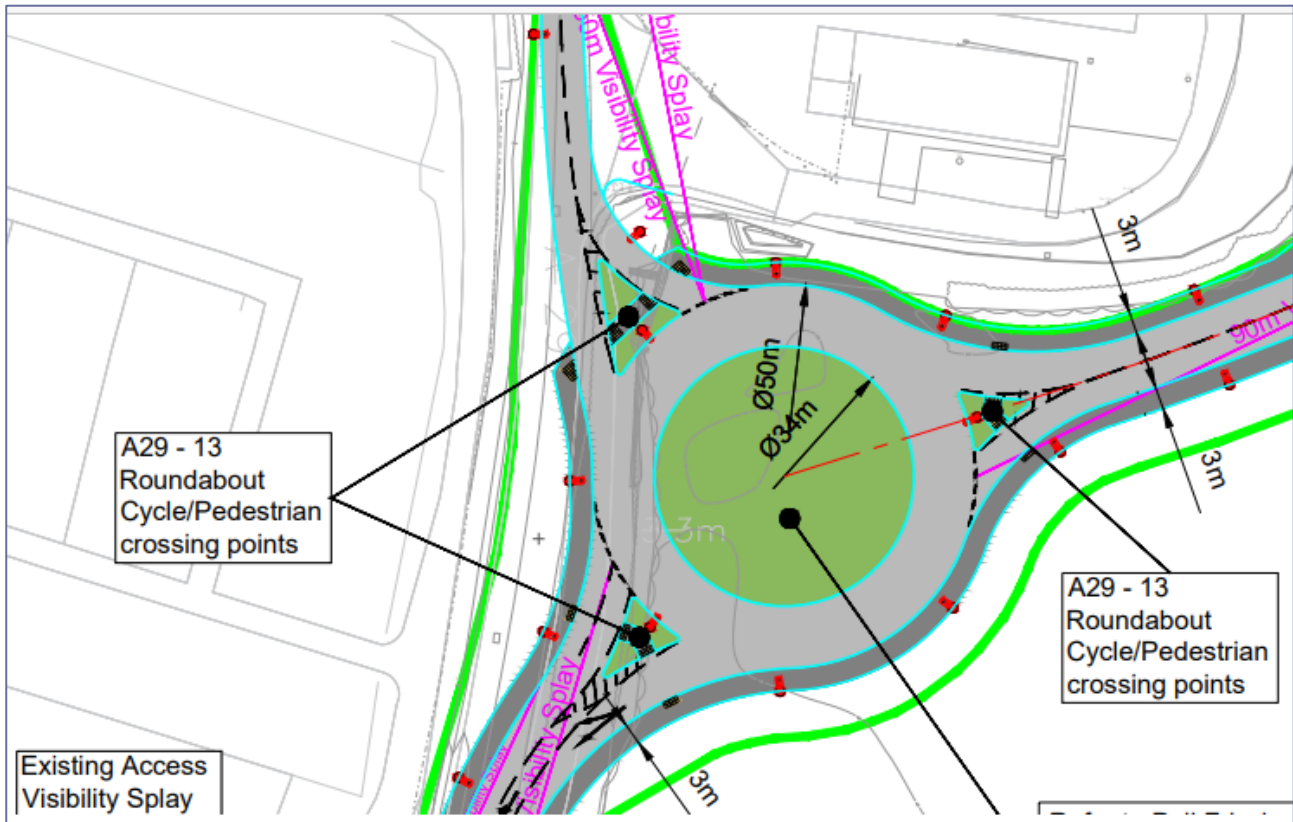
Figure 4.9: Realigned A29 / Links to southernmost parcels (CD-00106 P03)



4.3.1.6 Lidsey Road / A29 Realignment

This roundabout has one southbound lane and two northbound lanes on its northern arm, and two southbound lanes and one northbound lane on its southern arm. It has an Inscribed Circle Diameter (ICD) of 50 metres.

Figure 4.10: Lidsey Road / A29 realignment (CD-00106 P03)



4.3.2 Walking and cycling

The pedestrian links are spread across the Site, as can be seen in blue and green in Figure 4.11 below. The public rights of way (PROWs) across the Site will be accommodated within the masterplan.

The proposed development provides for cycling via the cycle routes throughout the Site. The internal cycle routes will be designed in accordance with LTN 1/20 (coherent, direct, safe, comfortable, and attractive) and the detail will be confirmed as part of reserved matters applications. These cycle and pedestrian routes will connect both east-west and north-south (including the South Downs to Coast route through the Lidsey Rife Linear Park), enabling all homes to have safe and direct access to the amenities and nearby facilities located in section 3.7 above.

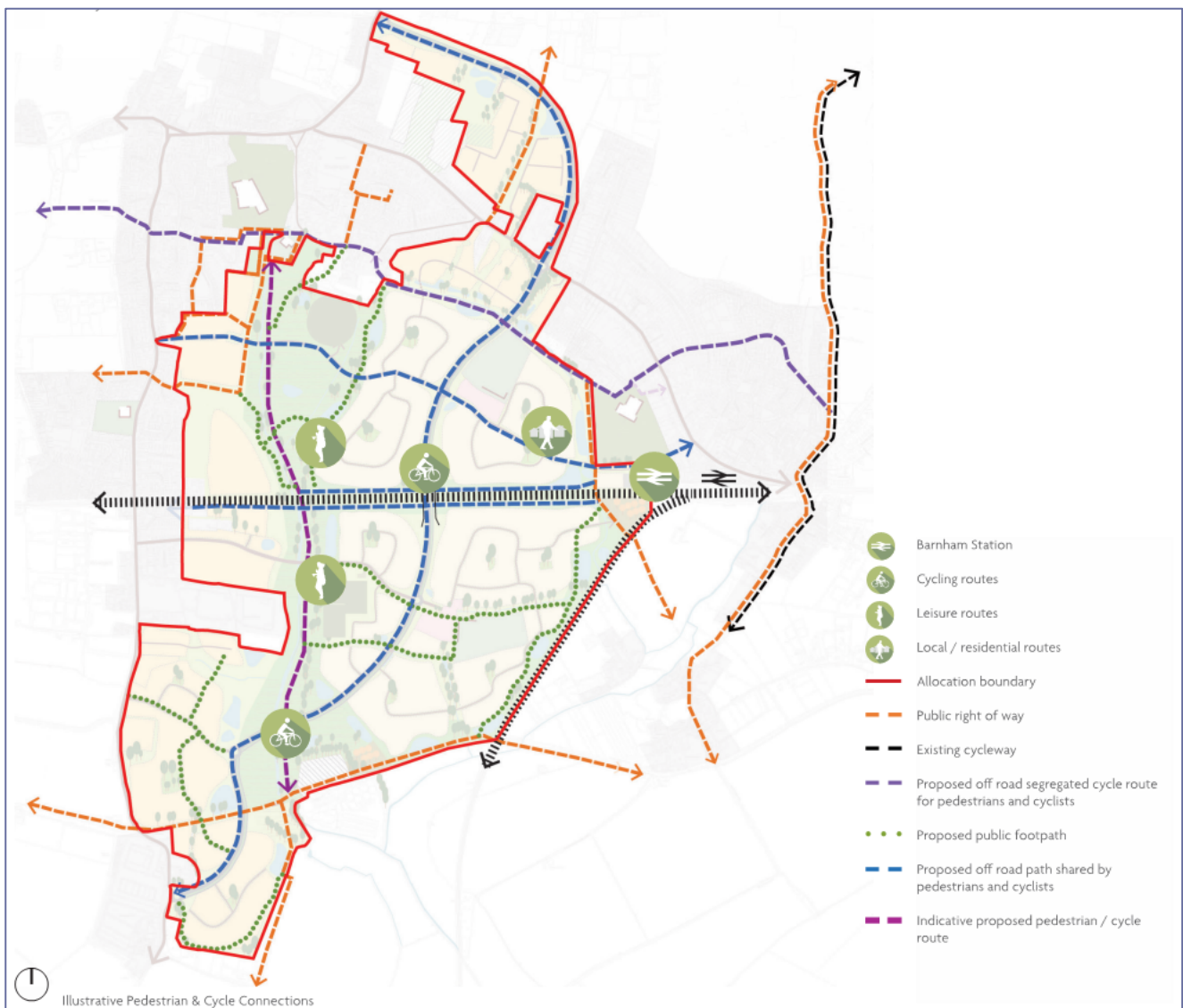
It is proposed that on the main A29, the pedestrian/cycle route is protected from traffic and is 4 metres wide, constructed using a different coloured asphalt. A delineation strip is also proposed, separating the pedestrians from the cyclists. A shared route is shown on the East-west link road which crosses the A29 Strategic Road Corridor, as well as on the Barnham Station Link and the Hanbury Link, and this is proposed to be 3 metres wide.

Pedestrian and cycle crossings of the realigned A29 would be provided both at junctions and mid-block. Pedestrian and cycle links are proposed to continue under the Network Rail bridge and are shown on the bridge drawings. The pedestrian crossing at the northern Green Link has been carefully considered, including the potential for a bridge, and it was decided that an at-grade signalised crossing is the most appropriate preferable option as it is more convenient to use and more desirable from a personal safety point of view. Additionally the DMRB has been used to guide the most appropriate type of crossing and the selection of a signalised crossing is supported by the design approach outlined in TA 91/05.

The proposed development contains a pedestrian/cycle crossing on average every 300m for land north of the West Coastway railway line, and crossings are shown approximately every 150-200m in the middle/southern section (the exact positioning of crossings will be determined as the masterplans for the land parcels south of the West Coastway railway line come forward). These will be a mixture of signalised (toucan) and parallel (pedestrian and cycle) zebra crossings, all at-grade, as per DMRB guidance and pre-application comments received from WSCC. The only parallel zebra crossings are on roundabout arms as this is consistent with the guidance document CD119 Geometric Design of Roundabouts, all other crossings will be signalised. The layouts of these are shown in the design drawings that are included in 0.

Side road crossings are planned to be uncontrolled. 6 metre radii will be introduced on side roads to reduce potential traffic speeds. Raised tables can be considered across side roads to complement the cycle infrastructure but this will need to be aligned with the proposed parcel design.

Figure 4.11: Walking and cycling strategy



In terms of equestrian provision, connections will be explored for the remainder of the Local Plan allocation, which will be delivered as part of later planning applications.

4.3.3 Public transport

Discussions have been held with Stagecoach regarding how a bus service could be provided through the development. They advise that the key destinations would be Chichester and Littlehampton rather than Bognor, and they would propose a new bus service essentially following the B2233 corridor via the Site.

The provision of the bus service is subject to agreement and further discussions during determination. Stagecoach is keen to explore transport interventions to improve bus reliability to and from Chichester, and how a new bus route would interact with other developments coming forward across the area.

In terms of schools transport, secondary school children would initially access the school in Ford through a phased introduction of a school bus service, to accommodate demand in line with buildout of the proposed development. In the longer term, a 'Canal route' cycle route alongside the disused canal between the masterplan and Yapton would be explored as part of the application for the site south of the West Coastway railway line.

4.3.4 Car and cycle parking

The car and cycle parking requirements are set out in the following policy documents:

- West Sussex County Council: Guidance on Parking at New Developments (September 2020)
- Arun District Council – Parking Standards Supplementary Planning Document (January 2020)

The car and cycle parking provision will be confirmed as part of reserved matters applications for the Site.

5 Trip Generation and Modal Share

5.1 Introduction

The multi-modal trip generation of the homes associated with the outline application has been forecast using a combination of vehicle trip rates from the WSCC strategic transport model, 2011 Census travel to work statistics, and data from TRICS. For the purposes of reporting the analysis is split by land use. It is noted that it was agreed with WSCC that there would be 100% internalisation of trips associated with local centre land uses and 90% internalisation of trips associated with the primary school.

5.2 Residential

The trip rates used in the assessment of the impact of the development are consistent with those used in the A29 modelling assessment business case. These were discussed and agreed with WSCC during the project scoping. The trip generation of 1,200 homes is shown in Table 5-2 and an additional 61 care home units / senior living beds is covered in Section 5.3.

Table 5-1: Residential vehicle trip rates (per dwelling)

AM peak (8am to 9am)			PM peak (5pm to 6pm)		
Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
0.124	0.324	0.448	0.312	0.161	0.473

Table 5-2: Residential vehicle trip generation

AM peak (8am to 9am)			PM peak (5pm to 6pm)		
Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
149	389	538	374	193	568

For the residential element, Census middle super output area 003, which contains the Site, was used to derive the mode split. The residential mode split calculated from the travel to work data is summarised in Table 5-3. It is noted that the 2011 Census data shows no people working from home. Given that the uptake of home-working is likely to be sustained in part after Covid-19 (thereby reducing trips on the highway network), it is considered that the calculation of the multi-modal trips for the purpose of assessing impact is robust.

Table 5-3: Residential mode split

Method of Travel	Mode share
Work mainly at or from home	0%
Underground, metro, light rail or tram	0%
Train	9%
Bus, minibus or coach	1%
Taxi	0%
Motorcycle, scooter or moped	1%
Driving a car or van	76%
Passenger in a car or van	5%
Bicycle	3%
On foot	6%
Other method of travel to work	0%
Total	100%

The residential people trip rates can also be estimated using the vehicle trip rates and the 2011 Census data. The calculation assumes that the vehicle trip rate and 2011 Census mode share are pegged and the total person trip rate and multi-modal trip generation can be calculated from this. The residential total person trip rates are summarised in Table 5-4. The multi-modal trip generation is shown in Table 5-5.

Table 5-4: Residential total person trip rates

Land Use	Time Period	Arrivals	Departures	Total Two-Way
Residential homes	08:00 – 09:00	0.163	0.427	0.590
	17:00 – 18:00	0.411	0.212	0.623

Table 5-5: Residential multi-modal trip generation

Method of Travel	AM Peak			PM Peak		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Work mainly at or from home	0	0	0	0	0	0
Underground, metro, light rail or tram	0	0	1	0	0	1
Train	19	48	67	47	24	71
Bus, minibus or coach	1	3	4	3	2	5
Taxi	0	0	1	0	0	1
Motorcycle, scooter or moped	2	4	6	4	2	6
Driving a car or van	149	389	538	374	193	568
Passenger in a car or van	9	25	34	24	12	36
Bicycle	5	14	19	13	7	20
On foot	11	28	39	27	14	41
Other method of travel to work	0	0	0	0	0	0
Total	196	512	708	493	255	748

5.3 Care home

The care home's trip rates per bedroom (assuming a single resident per bedroom) for are shown in Table 5-6 and the vehicle trip generation based on 61 rooms is shown in Table 5-7.

Table 5-6: Care home vehicle trip rates (per 100sqm)

AM peak (8am to 9am)			PM peak (5pm to 6pm)		
Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
0.029	0.029	0.058	0.029	0.039	0.068

Table 5-7: Care home vehicle trip generation

AM peak (8am to 9am)			PM peak (5pm to 6pm)		
Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
2	2	4	2	3	5

An indicative mode split has been derived from a review of TRICS, and then categorised to align with the modes listed in the census travel to work statistics. The multi-modal share, person trip generation, and multi-modal trips are shown in Table 5-8, Table 5-9, and Table 5-10 respectively.

Table 5-8: Care home mode split

Method of Travel	Hotel
Work mainly at or from home	0%
Underground, metro, light rail or tram	0%
Train	4%
Bus, minibus or coach	7%
Taxi	3%
Motorcycle, scooter or moped	0%
Driving a car or van	30%
Passenger in a car or van	32%
Bicycle	2%
On foot	22%
Other method of travel to work	0%

Table 5-9: Care home total person trip rates

Time Period	Arrivals	Departures	Total Two-Way
08:00 – 09:00	0.096	0.096	0.191
17:00 – 18:00	0.096	0.128	0.224

Table 5-10: Care home multi-modal trips

Method of Travel	AM (8am to 9am)			PM (5pm to 6pm)		
	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Work mainly at or from home	0	0	0	0	0	0
Underground, metro, light rail or tram	0	0	0	0	0	0
Train	0	0	0	0	0	1
Bus, minibus or coach	0	0	1	0	1	1
Taxi	0	0	0	0	0	0
Motorcycle, scooter or moped	0	0	0	0	0	0
Driving a car or van	2	2	4	2	3	5
Passenger in a car or van	2	2	4	2	3	5
Bicycle	0	0	0	0	0	0
On foot	1	1	3	1	2	3
Other method of travel to work	0	0	0	0	0	0
Total	6	6	12	6	8	14

5.4 Primary School

The school's vehicle trip rates per pupil and level of trip internalisation were agreed with WSCC. The vehicle trip rates and generation are shown in Table 5-11 and Table 5-12.

Table 5-11: School vehicle trip rates (per pupil)

AM peak (8am to 9am)			PM peak (5pm to 6pm)		
Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
0.521	0.428	0.949	0.038	0.065	0.103

Table 5-12: School vehicle trip generation (after 90% internalisation)

AM peak (8am to 9am)			PM peak (5pm to 6pm)		
Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
33	27	60	2	4	6

The school is likely to primarily serve the proposed development and therefore the majority of trips to and from the school could be made by more sustainable modes of transport. At this stage no multi-modal trips are calculated because a school travel plan is proposed to be secured by a condition of the planning permission. It is considered that the walking and cycling infrastructure proposed as part of the development would encourage primary age children to walk, cycle and scoot to school.

5.5 Summary

The multi-modal trip generation has been forecast using a combination of vehicle trip rates from the WSCC strategic transport model, 2011 Census travel to work statistics, and data from TRICS. The vehicle trip rates and generations have been agreed with WSCC and used in the strategic traffic modelling. Further information is included in Chapter 8 of this report.

6 Highway Network Modelling and Junction Assessments

This chapter of the transport assessment sets out the approach to the assessment, strategic modelling, and the results from the junction assessments.

6.1 Strategic modelling

6.1.1 Strategic model update

The CATM is a SATURN model and was recently updated to inform the business case for the A29 realignment scheme which was completed by WSP in February 2019. This model was updated for use by WSP to inform the Barnham Eastergate Westergate Transport Assessment. Henceforth in this report this is referred to as the “updated WSCC A29 CATM model (operated by WSP)”.

6.1.2 Strategic model scenarios and peak hours

The scope of the assessment was discussed and it was agreed with WSCC that the forecast year scenarios would be 2031 and 2038, including:

- 2031 with Cala do minimum
- 2031 with Cala do something
- 2031 without Cala do minimum
- 2031 without Cala do something
- 2038 do minimum
- 2038 do something

The without Cala scheme modelling excludes the Cala development and the east-west connection through the Cala site.

The assessment time periods agreed with WSCC were:

- Weekday AM peak (8am to 9am)
- Weekday PM peak (5pm to 6pm)

6.1.3 Proposed development modelling

The development growth assumption for planning application was that all of the homes within the red line boundary would be built and occupied by 2031. In order to provide a robust assessment of the development’s impacts, the following scale of development was considered:

- 1,200 homes
- 61 C2 care home units
- 3FE primary school

The northern section of the re-aligned A29 (north of the West Coastway railway line) is included in the 2031 do something scenario, and the entire length of the A29 is included in the 2038 do something scenario. In order to robustly test the capacity of the junctions (in other words, to assess the case of the Site allocation being delivered in full) along the realigned A29, an additional 2,000 homes and 3FE school have been included in the 2038 do something scenario.

6.1.4 Summary of strategic model scenarios

The strategic model scenarios are made up of various selections of inputs, as detailed below.

- The **background growth** consists of predicted traffic growth as a result of general increase in driving over time. The strategic modelling includes NTEM-adjusted TEMPRo growth, known committed

developments, and the allocated sites within adopted local plans. This approach was agreed with and informed by WSCC.

- The **committed developments** consist of other developments which have been approved. This method is to ensure that the future scenarios show a realistic, yet robust, prediction of the levels of traffic on the roads.
- The **wider infrastructure changes** are schemes that are committed projects.
- **Other Local Plan Developments** consists of sites in the adopted Local Plan, including developments by Barratts, Landacre, Boweries, Cala, and Pye Homes, which make up the rest of the BEW allocation.

In summary, the following scenarios were considered:

- **2031 do minimum:** background growth + committed developments + wider infrastructure changes + other local plan developments and associated infrastructure
- **2031 do something:** background growth + committed developments + wider infrastructure changes + other local plan developments and associated infrastructure + BEW development + BEW infrastructure
- **2031 do minimum No Cala:** background growth + committed developments + wider infrastructure changes + other local plan developments and associated infrastructure, no Cala development parcel and no East-west link road
- **2031 do something No Cala:** background growth + committed developments + wider infrastructure changes + other local plan developments and associated infrastructure + BEW development + BEW infrastructure no Cala development and no East-west link road
- **2038 do minimum:** background growth + committed developments + wider infrastructure changes + other local plan developments and associated infrastructure
- **2038 do something:** background growth + committed developments + wider infrastructure changes + other local plan developments and associated infrastructure + BEW development + BEW infrastructure

6.2 Trip Distribution and Model Outputs

The trip distribution used in the model for the development was calculated by WSP using donor zones in the model. The outputs of the CATM model were input into the Junctions9 models. The CATM model provided demand flows for the AM and PM peak hour turning movements at the junctions being considered as part of the transport assessment. These are included in 0.

6.3 Junction capacity assessments (overview)

The scope of the junction assessment was discussed and agreed with both WSCC and National Highways. Copies of the correspondence is included in 0. This transport assessment provides analysis of the junctions shown in Table 6-1, and the locations of these are shown in Figure 6.1.

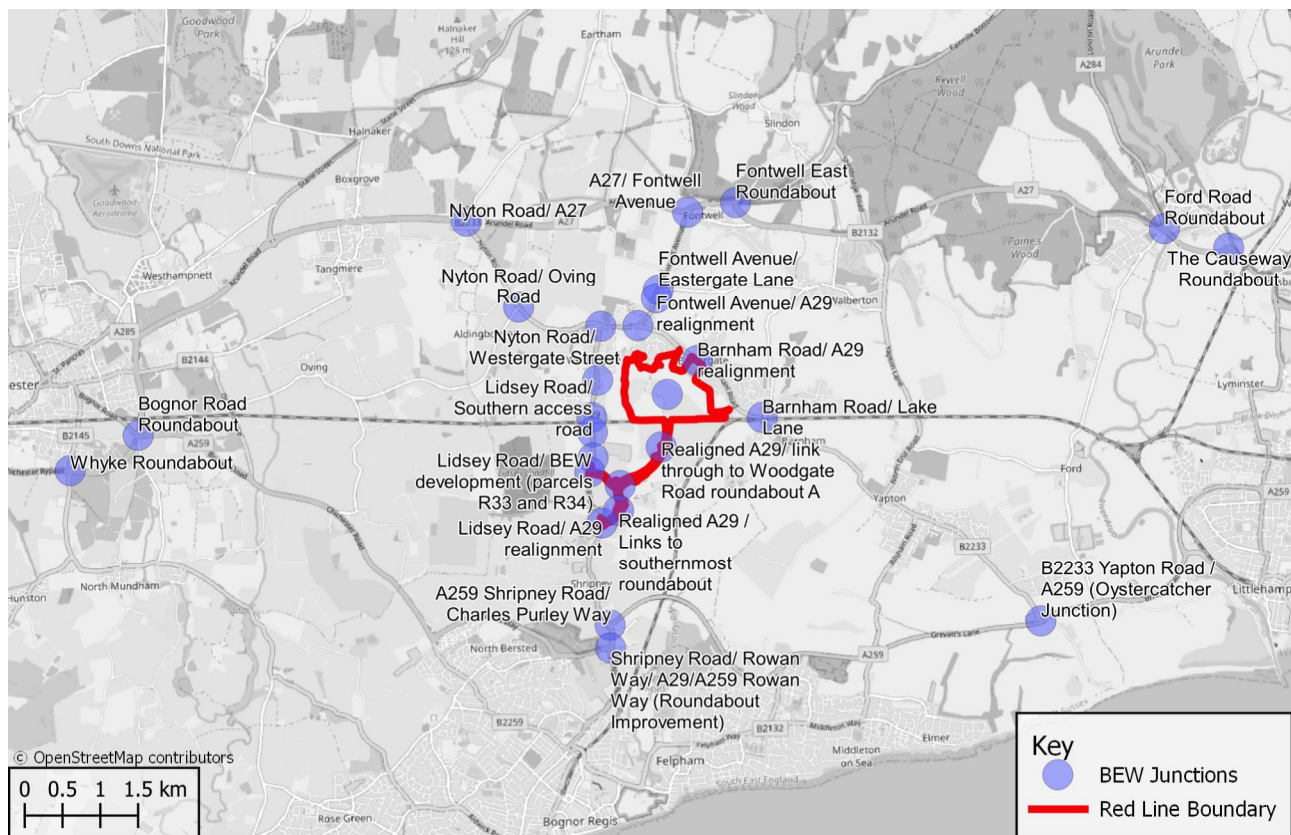
The junction assessments have been undertaken using Junctions9 and LinSig for the base and forecast years. Traffic surveys were undertaken in November 2019 at many of the junctions, but owing to the inability to undertake traffic surveys throughout the majority of 2020 and to date in 2021, efforts have been made to source traffic data from previously submitted planning application for other developments in the area. Where this is not available, WSCC agreed that in the circumstances, modelling the operation of junctions in the forecast year only would be acceptable.

Table 6-1: Junctions considered in the scope of the assessment

	Junction name
Realigned A29 and site allocation access junctions	Fontwell Avenue / A29 realignment
	Barnham Road / A29 realignment
	Realigned A29 / East-west link road roundabout
	Westergate Street / Northern Access
	Realigned A29 / Link to Woodgate Roundabout A (<i>modelled in 2038 only</i>)
	Lidsey Road / Southern Access

	Lidsey Road / Site Access (parcels R33 and R34) (modelled in 2038 only)
	Realigned A29/ Lidsey Road (Hanbury Link)
	Lidsey Road / Site Access (Parcel R35) (modelled in 2038 only)
	Realigned A29 / Links to southernmost roundabout (modelled in 2038 only)
	Lidsey Road / A29 Realignment (modelled in 2038 only)
Existing A29 junctions	A27 / Fontwell Avenue
	Fontwell Avenue / Eastergate Lane
	Fontwell Avenue / Barnham Road
	Nyton Road / Westergate Street
	Westergate Street / Hook Lane
	Shripney Road / Charles Purley Way
	Shripney Road / Rowan Way
Apportionment Study junctions	Nyton Road / A27
	A27 / A29 (Fontwell Eastern Roundabout)
	B2233 Yapton Road / A259 Crookthorn Lane / Gravatt's Lane (Oystercatcher junction)
Other junctions modelled	B2145 / A27 Whyke Roundabout
	A27 / A259 / Vinnetrow Road (Bognor Road Roundabout)
	Nyton Road / Oving Road
	Barnham Road / Lake Lane
	A27 / A284 Ford Road / Arundel Bypass
	A27 / The Causeway Roundabout, Arundel

Figure 6.1: Scope of the junction assessment



Junction capacity assessment results are presented, for non-signalised junctions, in terms of 'Ratio of Demand Flow to Capacity' ('RFC'), expressed as a factor of 1.00; and for signal-controlled junctions, in terms of 'Degree of Saturation' ('DoS'), expressed as a percentage (%).

For non-signalised junctions, an RFC of less than 0.85 indicates that the junction is operating within its theoretical capacity; an RFC of equal to or greater than 0.85 but less than 1.00 indicates that the junction is approaching its capacity (but remains within capacity); and an RFC of equal to or greater than 1.00 indicates that it has either reached or exceeded its capacity. Once beyond 1.00, delays/queues are shown in the model to increase disproportionately with further increases in demand flow.

For signal-controlled junctions, a DoS of less than 90% indicates that the junction is operating within its theoretical capacity; a DoS of equal to or greater than 90% but less than 100% indicates that the junction is approaching its capacity (but remains within capacity); and a DoS of equal to or greater than 100% Indicates that it has either reached or exceeded its theoretical capacity. Similar to the 1.00 threshold for non-signalised junctions, beyond 100% DoS, queues and delays increase disproportionately with increasing demand flow. In particular regard to signals, queues would begin to not be able to discharge fully within each cycle and delays increase as a result.

For signal-controlled junctions, the 'Practical Reserve Capacity' (PRC) of the junction is also used to assess the impact of traffic. The PRC is calculated from the maximum degree of saturation on a lane controlled by the stage stream; and is a measure of how much additional traffic could pass through a junction controlled by the stage stream whilst maintaining a maximum Degree of Saturation (DoS) of 90% on all lanes. A positive value indicates that a junction has spare capacity, whilst a negative value demonstrates that a junction is either approaching or is already experiencing capacity issues and could be subject to congestion.

6.4 2019 base and 2031 do minimum and do something

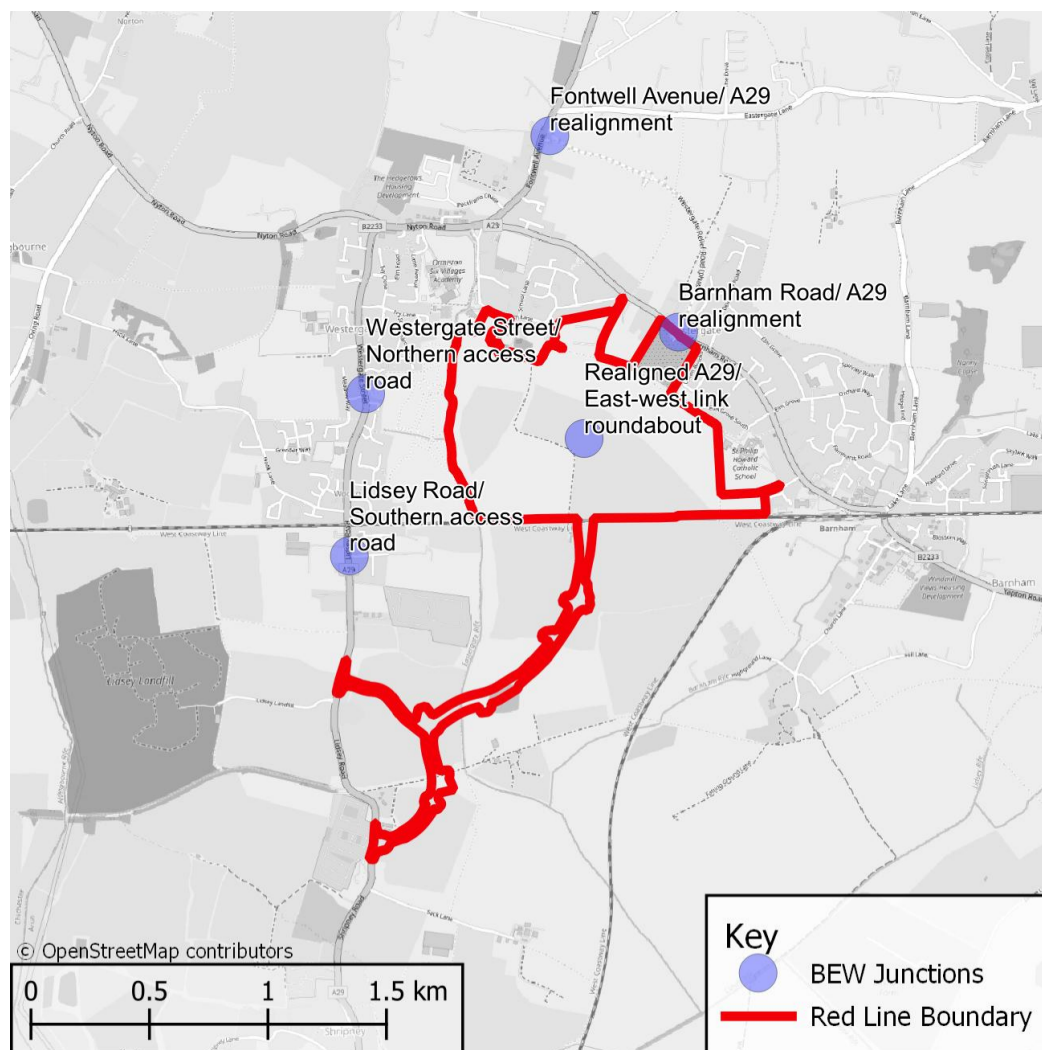
This section contains the Base Year (2019) and 2031 modelling results for each junction within the modelling scope. The section of the report has been structured as follows:

- Realigned A29 and site allocation access junctions
- Existing A29 junctions
- Apportionment Study junctions
- Other junctions

6.4.1.1 Realigned A29 and site allocation access junctions

The junctions considered in this section of the review are shown in Figure 6.2.

Figure 6.2: Realigned A29 and site allocation access junctions (2031 only)



Fontwell Avenue / A29 Realignment

The roundabout junction has been modelled using Junctions 9. The Fontwell Avenue/A29 Realignment will be a new roundabout junction (to be delivered by WSCC as part of the northernmost section of the A29 realignment, north of Barnham Road) and therefore only forecast year models have been developed for this. It was agreed with WSCC that as existing traffic profiles in the surrounding area tend to be or will trend towards being flat that the FLAT data entry methodology is appropriate.

The results from the 2031 do minimum No Cala, 2031 do minimum, 2031 do something No Cala, and 2031 do something are shown in Table 6-2 to Table 6-5 and the output file is included in Appendix F. These results show that the junction is forecast to operate within capacity in all scenarios.

Table 6-2: 2031 do minimum junction modelling results (Fontwell Avenue/A29 Realignment)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Fontwell Ave (N)	0.31	0.5	0.51	1.1
A29 Realignment	0.23	0.3	0.17	0.2
Fontwell Ave (S)	0.52	1.1	0.30	0.4

Table 6-3: 2031 do something junction modelling results (Fontwell Avenue/A29 Realignment)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Fontwell Ave (N)	0.34	0.5	0.56	1.3
A29 Realignment	0.36	0.6	0.18	0.2
Fontwell Ave (S)	0.53	1.1	0.29	0.4

Table 6-4: 2031 do minimum No Cala junction modelling results (Fontwell Avenue/A29 Realignment)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Fontwell Ave (N)	0.31	0.5	0.50	1.0
A29 Realignment	0.23	0.3	0.16	0.2
Fontwell Ave (S)	0.50	1.0	0.30	0.4

Table 6-5: 2031 do something No Cala junction modelling results (Fontwell Avenue/A29 Realignment)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Fontwell Ave (N)	0.35	0.5	0.57	1.3
A29 Realignment	0.39	0.7	0.21	0.3
Fontwell Ave (S)	0.52	1.1	0.30	0.4

Barnham Road / A29 Realignment

The roundabout junction has been modelled using Junctions 9. The Barnham Road/A29 Realignment will be a new roundabout junction and therefore only forecast year models have been developed for this. It was agreed with WSCC that as existing traffic profiles in the surrounding area tend to be or will trend towards being flat that the FLAT data entry methodology is appropriate.

Do minimum

Phase 1 of the A29 realignment will be constructed to meet the northern side of Barnham Road before 2031, and so is included in the 2031 do minimum scenarios.

The results from the 2031 do minimum No Cala, and 2031 do minimum scenarios are shown in Table 6-6 and Table 6-7 and the output file is included in Appendix G . These results show that the junction is forecast to operate within capacity in all scenarios.

Table 6-6: 2031 do minimum junction modelling results (Barnham Road/A29 Realignment)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Realignment	0.11	0.1	0.18	0.2
Barnham Road (E)	0.44	0.8	0.38	0.6
Barnham Road (W)	0.22	0.3	0.27	0.4

Table 6-7: 2031 do minimum No Cala junction modelling results (Barnham Road/A29 Realignment)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Realignment	0.11	0.1	0.18	0.2
Barnham Road (E)	0.45	0.8	0.38	0.6
Barnham Road (W)	0.21	0.3	0.28	0.4

Do something

Phase 2 of the A29 realignment, off the southern side of Barnham Road, will only be built if the development of the Site comes forward. Therefore, the four-arm arrangement is used for the do something scenarios. The Barnham Road/A29 Realignment/Spine Road will be a new roundabout junction and therefore only forecast year models have been developed for this.

It was agreed with WSCC that as existing traffic profiles in the surrounding area tend to be or will trend towards being flat that the FLAT data entry methodology is appropriate. The results from the 2031 do something no Cala, and 2031 do something scenarios are shown in Table 6-8 and Table 6-9 and the output file is included in Appendix G. These results show that the junction is forecast to operate within capacity in all scenarios.

Table 6-8: 2031 do something junction modelling results (Barnham Road/A29 Realignment)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Realignment	0.16	0.2	0.28	0.4
Barnham Road (E)	0.42	0.7	0.44	0.8
Spine Road	0.40	0.7	0.21	0.3
Barnham Road (W)	0.14	0.2	0.23	0.3

Table 6-9: 2031 do something No Cala junction modelling results (Barnham Road/A29 Realignment)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Realignment	0.17	0.2	0.30	0.4
Barnham Road (E)	0.42	0.8	0.47	0.9
Spine Road	0.32	0.5	0.15	0.2
Barnham Road (W)	0.29	0.4	0.36	0.6

Realigned A29 / East-west link road Roundabout

The roundabout junction has been modelled using Junctions 9. The Realigned A29/ East-west link road will be a new roundabout junction and therefore only forecast year do something scenario models have been developed for this.

It was agreed with WSCC that as existing traffic profiles in the surrounding area tend to be or will trend towards being flat that the FLAT data entry methodology is appropriate. The results from the 2031 do something No Cala, and 2031 do something scenarios are shown in Table 6-10 and Table 6-11 and the output file is included in 0. These results show that the junction is forecast to operate within capacity.

Table 6-10: 2031 do something junction modelling results (Realigned A29/ East-west link road Roundabout)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Realigned A29 N	0.09	0.1	0.21	0.3
E Link	0.15	0.2	0.07	0.1
W Link	0.26	0.4	0.18	0.2

Table 6-11: 2031 do something No Cala junction modelling results (Realigned A29/ East-west link road Roundabout)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Realigned A29 N	0.11	0.1	0.21	0.3
E Link	0.15	0.2	0.07	0.1
W Link	0.13	0.1	0.06	0.1

Westergate Street / Northern Access

This junction is the revised access to the Cala site and therefore is only considered in the scenarios that include the Cala development and East-west link road. A planning application was previously submitted for the Cala land parcel and included a bridge over the rife forming part of the East-west link road. Planning permission was refused in March 2020 (ref. AL/15/17/PL). The transport assessment submitted as part of the Cala application shows that the site access junction with Westergate Street would be reconfigured as a signalised junction and therefore this has been modelled using LinSig V3.

Pedestrian crossings are proposed on all four arms of the junction and therefore an all pedestrian stage is required. Two scenarios have been produced, the first is that the pedestrian stage is called every cycle and the second is that the pedestrian stage is called every other cycle.

Figure 6.3: Method of Control – Pedestrian Stage demanded every cycle

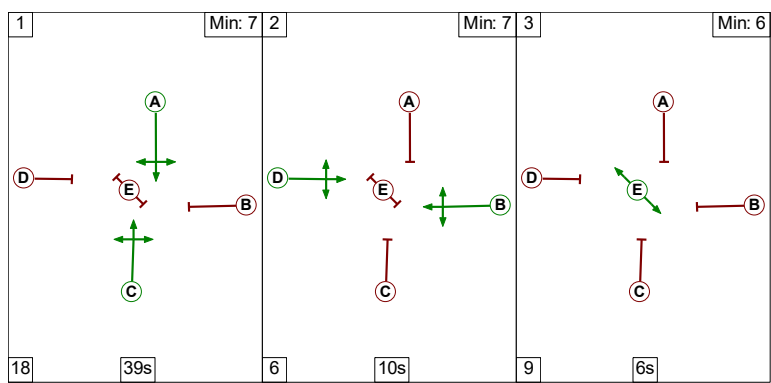
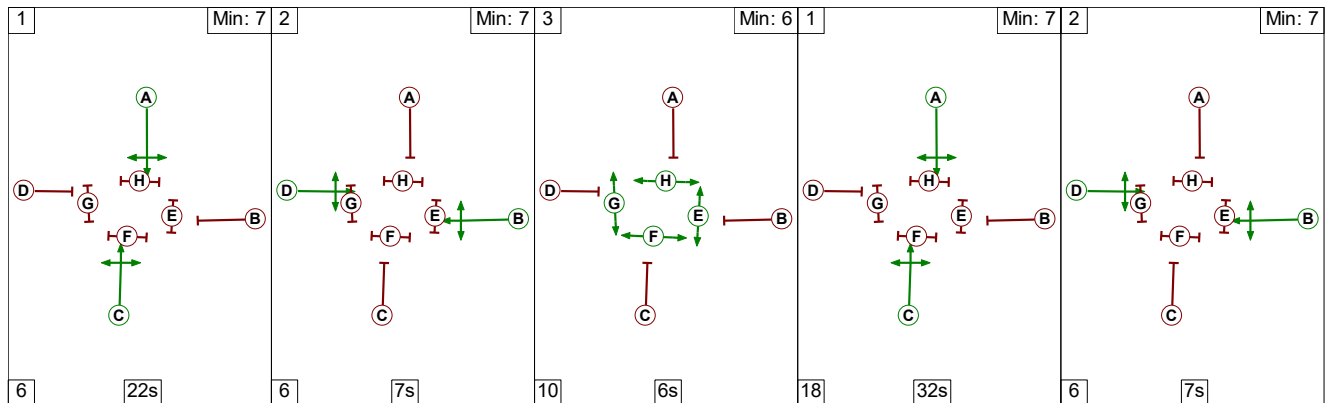


Figure 6.4: Method of Control – Pedestrian Stage demanded every other cycle



The results from the 2031 do minimum and do something scenarios are shown in Table 6-12 and Table 6-13 and the output file is included in Appendix I . These results show that if the pedestrian stage is called every cycle the junction operates within capacity with the exception of the 2031 do something scenario. If the pedestrian stage is demanded every other cycle then the junction is forecast to operate within capacity in all scenarios. It is considered that the latter is the most likely eventuality.

Table 6-12: 2031 do minimum junction modelling results (Westergate Street/Northern Access) for mitigation scheme

Pedestrian Stage demanded every cycle	AM Peak (88CT)		PM Peak (88CT)	
	DoS	MMQ	DoS	MMQ
Westergate Street North	63%	11	77%	16
Northern Access	67%	4	33%	2
Westergate Street South	84%	19	70%	13
Meadow Way	63%	3	49%	2
Overall PRC for junction	7.7%		16.7%	
Pedestrian Stage demanded every other cycle	AM Peak (120CT)		PM Peak (120CT)	
	DoS	MMQ	DoS	MMQ
Westergate Street North	67%	12	83%	18
Northern Access	48%	3	24%	1
Westergate Street South	88%	21	71%	13
Meadow Way	43%	3	34%	2
Overall PRC for junction	2.3%		8.9%	

Table 6-13: 2031 do something junction modelling results (Westergate Street/Northern Access) for mitigation scheme

Pedestrian Stage demanded every cycle	AM Peak (120CT)		PM Peak (120CT)	
	DoS (%)	MMQ	DoS	MMQ
Westergate Street North	52%	12	58%	14
Northern Access	95%	12	95%	12
Westergate Street South	98%	38	100%	38
Meadow Way	49%	4	40%	3
Overall PRC for junction	-8.6%		-11.4%	
Pedestrian Stage demanded every other cycle	AM Peak (180CT)		PM Peak (180CT)	
	DoS (%)	MMQ	DoS	MMQ
Westergate Street North	50%	13	56%	13
Northern Access	87%	10	89%	10
Westergate Street South	90%	34	89%	26
Meadow Way	44%	4	36%	3
Overall PRC for junction	0.4%		0.6%	

Woodgate Road / Lidsey Road / Southern Access

The T-junction has been modelled using Junctions 9. The Lidsey Road/Southern Access will initially provide access to the remainder of the Local Plan allocation (the southern part of the allocation), which will be delivered through applications submitted by another applicant and by later planning applications by The Southern Consortium in 2031, and therefore only forecast year models have been developed for this link (as it does not exist in the baseline 2019 year). It was agreed with WSCC that as existing traffic profiles in the surrounding area tend to be or will trend towards being flat that the FLAT data entry methodology is appropriate.

The results from the 2031 do minimum No Cala, 2031 do minimum, 2031 do something No Cala, 2031 do something are shown in Table 6-14 to Table 6-17 and the output file is included in Appendix J. These results show that the junction is forecast to operate within capacity in all scenarios.

Table 6-14: 2031 do minimum junction modelling results (Lidsey Road/Southern Access) for mitigation scheme

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Site Access	0.34	0.5	0.16	0.2
Westergate Street (S)	0.06	0.1	0.12	0.3

Table 6-15: 2031 do something junction modelling results (Lidsey Road/Southern Access) for mitigation scheme

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Site Access	0.47	0.9	0.21	0.3
Westergate Street (S)	0.08	0.2	0.16	0.5

Table 6-16: 2031 do minimum No Cala junction modelling results (Lidsey Road/Southern Access) for mitigation scheme

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Site Access	0.33	0.5	0.15	0.2
Westergate Street (S)	0.06	0.1	0.11	0.3

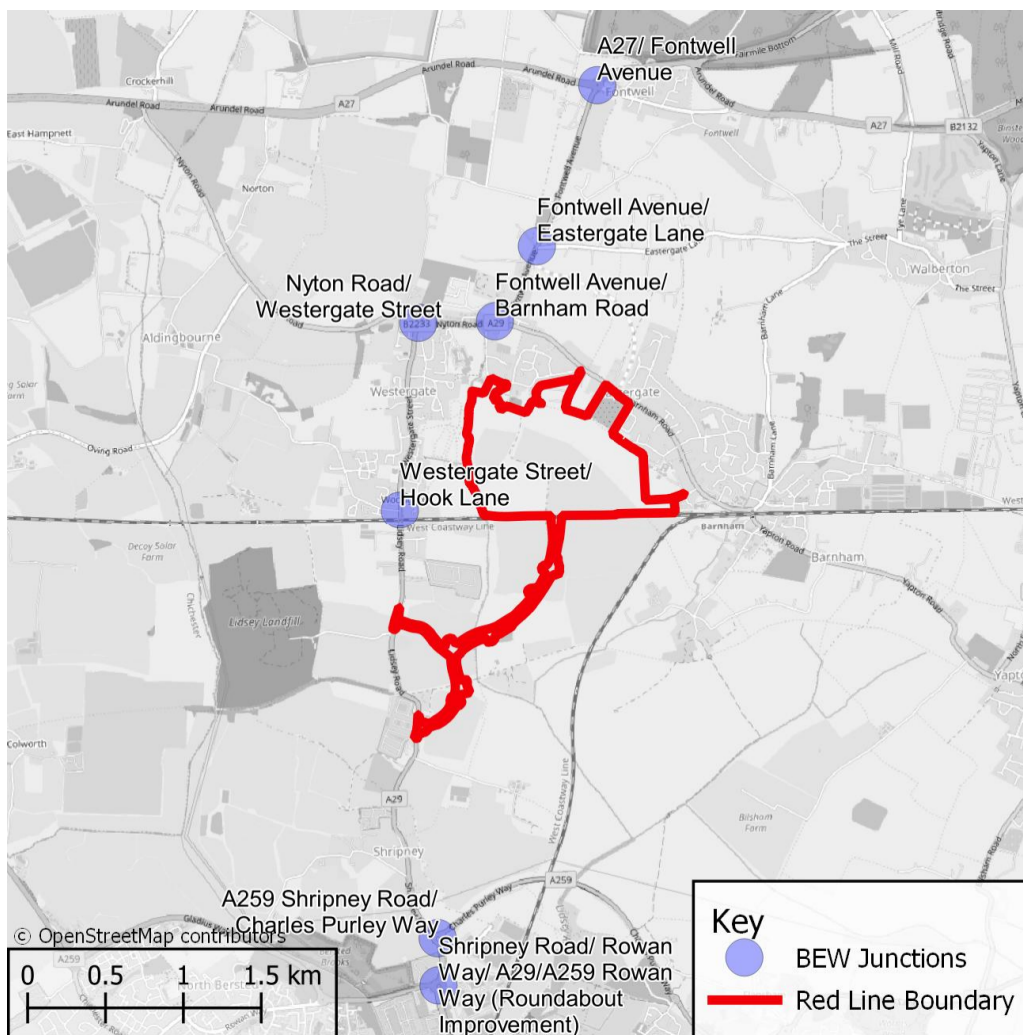
Table 6-17: 2031 do something No Cala junction modelling results (Lidsey Road/Southern Access) for mitigation scheme

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Site Access	0.46	0.8	0.21	0.3
Westergate Street (S)	0.08	0.2	0.16	0.4

6.4.1.2 Existing A29 junctions

The junctions considered in this section of the review are shown in Figure 6.5.

Figure 6.5: Existing A29 and site allocation access junctions



A27/ Fontwell Avenue

The roundabout junction has been modelled using Junctions 9. A traffic survey was undertaken at this junction in November 2019 that included collection of classified turning counts and vehicle queue length surveys. The turning count data was collected in 15 minute intervals which allows the DIRECT data entry methodology to be used. The use of DIRECT was agreed with WSCC.

Initial modelling of this junction returned queues lower than observed queue data, and this required the model to be calibrated given the traffic flows entered are observed data. The video survey that accompanied the traffic data was reviewed for this junction, along with the survey's reported queue lengths.

Comparison between modelled and observed data showed that capacity adjustments were needed to the A27 North arm of the junction in both the AM and PM peak hours. These are summarised in Table 6-18, and the model output files are included in Appendix K. The model calibration has been applied to the forecast year models. These results show that the junction operates within capacity in both peak hours.

Table 6-18: 2019 baseline modelling results and capacity adjustments to calibrate the model (A27/Fontwell Avenue)

AM						
	Queue without intercept (PCU)	RFC without intercept adjustment	Observed queue (PCU)	Intercept Adjustment (%)	Queue after adjustment (PCU)	RFC after intercept adjustment
A27 North	2.7	0.72	7.17	83.0	7.2	0.88
Arundel Road	2.1	0.70	3.75	0.0	1.9	0.68
A29 Fontwell Avenue	12.4	0.95	9.83	0.0	12.3	0.96
A27 Arundel Road W	1.4	0.55	4.42	0.0	1.4	0.55
PM						
	Queue without intercept (PCU)	RFC without intercept adjustment	Observed queue (PCU)	Intercept Adjustment (%)	Queue after adjustment (PCU)	RFC after intercept adjustment
A27 North	1.8	0.64	9.58	75.0	7.8	0.89
Arundel Road	0.4	0.29	1.58	0.0	0.4	0.29
A29 Fontwell Avenue	1.0	0.50	4.17	0.0	1.0	0.49
A27 Arundel Road W	1.4	0.57	4.92	0.0	1.4	0.57

The strategic model outputs provide peak hour turning flows as an hourly figure. It was agreed with WSCC where an observed 15 minute interval profile was available that this should be applied to the forecast year flows, and the data entered using the DIRECT methodology.

The results from the 2031 do minimum No Cala, 2031 do minimum, 2031 do something No Cala, and 2031 do something scenarios are shown in Table 6-19 to Table 6-22 and the output file is included in Appendix K. These results show that the junction is forecast to operate over capacity in the forecast years and therefore mitigation is required.

Table 6-19: 2031 do minimum junction modelling results (A27/Fontwell Avenue)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A27 North	1.02	36.6	1.15	177.5
Arundel Road	0.76	2.5	0.36	0.5
A29 Fontwell Avenue	2.00	387.6	0.74	2.6
A27 Arundel Road W	0.56	1.3	0.96	15.2

Table 6-20: 2031 do something junction modelling results (A27/Fontwell Avenue)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A27 North	1.02	36.8	1.20	237.0
Arundel Road	0.88	4.1	0.29	0.4
A29 Fontwell Avenue	2.05	408.9	0.71	2.3
A27 Arundel Road W	0.56	1.3	0.99	26.8

Table 6-21: 2031 do minimum No Cala junction modelling results (A27/Fontwell Avenue)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A27 North	1.02	37.1	1.14	170.1
Arundel Road	0.70	2.0	0.35	0.5
A29 Fontwell Avenue	1.98	382.0	0.71	2.3
A27 Arundel Road W	0.57	1.3	0.95	14.2

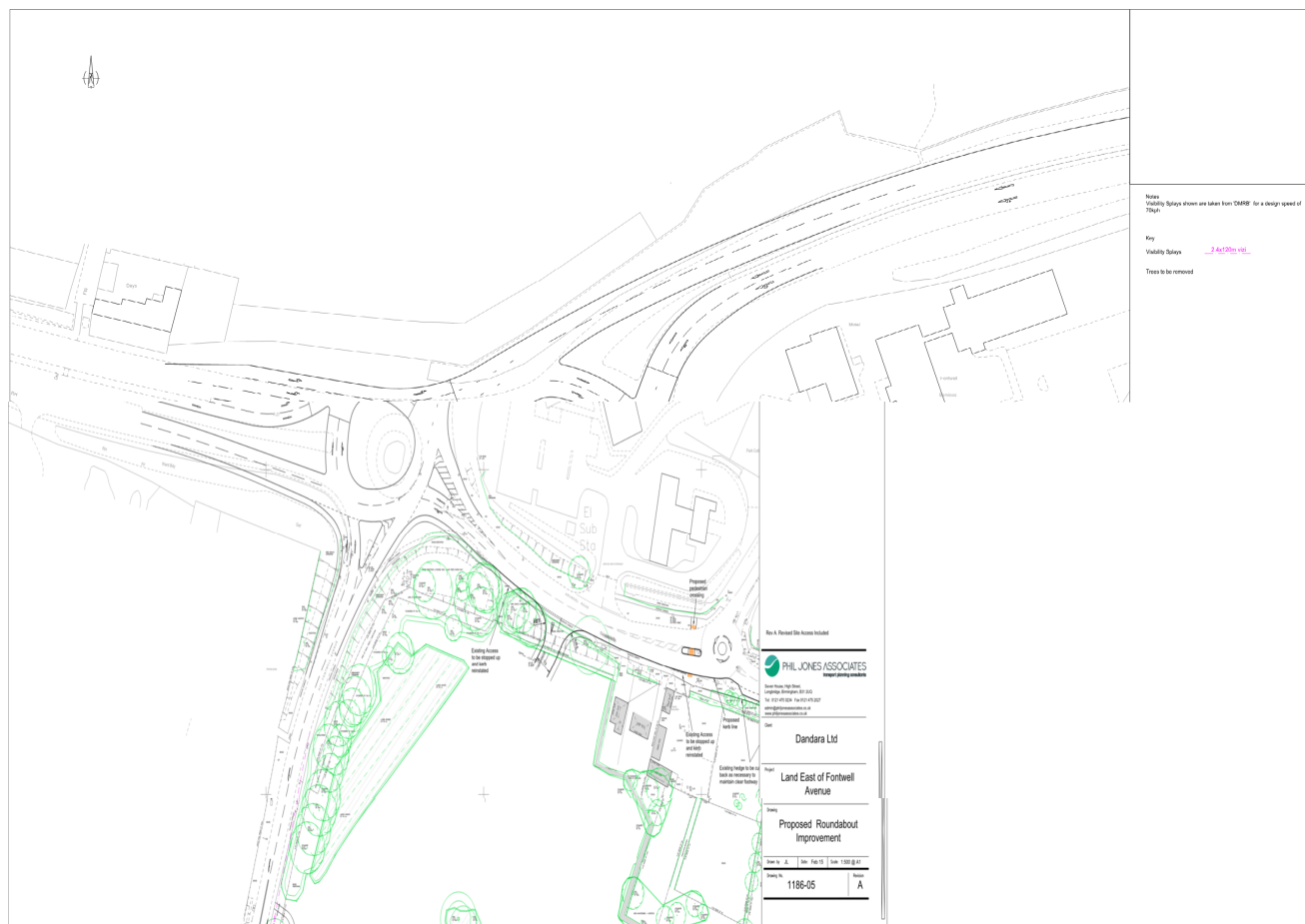
Table 6-22: 2031 something No Cala junction modelling results (A27/Fontwell Avenue)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A27 North	1.02	40.3	1.22	256.5
Arundel Road	0.88	4.0	0.29	0.4
A29 Fontwell Avenue	2.05	407.2	0.78	3.3
A27 Arundel Road W	0.56	1.3	1.01	31.4

Mitigation scheme

The Arun District Transport Study – Stage 3 (2016) includes a mitigation scheme for this junction, which includes signalling the roundabout on the A27 North and Arundel Road West. This is shown in Figure 6.6.

Figure 6.6: Arun District Transport Study – Stage 3 scheme for the A27/ Fontwell Avenue junction



The results from this modelling shows that the mitigation scheme improves the performance of the roundabout with the peak value of the DoS generally being lower than the RFCs reported above. In addition, when the average queues reported in the Junctions 9 model for the existing layout are compared with the mean maximum queues reported in the LinSig modelling, it is observed that there is forecast to be an overall reduction in the number of vehicles reported as queuing across the two peak hours.

Table 6-23: 2031 do minimum No Cala junction modelling results (A27/Fontwell Avenue) with mitigation

	AM Peak		PM Peak	
	DoS (%)	MMQ	DoS	MMQ
A27 North	108%	71	92%	19
Arundel Road	20%	0	18%	0
A29 Fontwell Avenue	107%	51	58%	4
A27 Arundel Road W Left	94%	17	116%	169
A27 Arundel Road W Ahead	44%	4	58%	7
Overall PRC for junction	-20%		-29%	

Table 6-24: 2031 do minimum junction modelling results (A27/Fontwell Avenue) with mitigation

	AM Peak		PM Peak	
	DoS (%)	MMQ	DoS	MMQ
A27 North	119%	120	92%	19
Arundel Road	20%	0	18%	0
A29 Fontwell Avenue	97%	12	60%	4
A27 Arundel Road W Left	81%	11	116%	170
A27 Arundel Road W Ahead	34%	4	59%	7
Overall PRC for junction	-32%		-29%	

Table 6-25: 2031 do something No Cala junction modelling results (A27/Fontwell Avenue) with mitigation

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A27 North	122%	131	99%	29
Arundel Road	23%	0	16%	0
A29 Fontwell Avenue	98%	13	66%	5
A27 Arundel Road W Left	89%	13	123%	223
A27 Arundel Road W Ahead	48%	5	79%	11
Overall PRC for junction	-35%		-37%	

Table 6-26: 2031 do something junction modelling results (A27/Fontwell Avenue) with mitigation

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A27 North	122%	130	103%	41
Arundel Road	23%	0	15%	0
A29 Fontwell Avenue	98%	13	58%	4
A27 Arundel Road W Left	88%	13	118%	187
A27 Arundel Road W Ahead	48%	5	70%	9
Overall PRC for junction	-35%		-31%	

Fontwell Avenue / Eastergate Lane

The crossroad junction has been modelled using Junctions 9. A traffic survey was undertaken at this junction in November 2019 that included collection of classified turning counts and vehicle queue length surveys. The turning count data was collected in 15 minute intervals which allows the DIRECT data entry methodology to be used. The use of DIRECT was agreed with WSCC.

The performance of the base model was considered to reflect the observed conditions and therefore no capacity adjustments were made to calibrate the model. The baseline modelling results are shown below and the output file is included in Appendix L. These results show that the junction is operating within capacity in the base scenario.

Table 6-27: 2019 base junction modelling results (Fontwell Avenue/Eastergate Lane)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Eastergate Lane Left	0.20	0.3	0.12	0.1
Eastergate Lane Right	0.15	0.2	0.08	0.1
Fontwell Avenue North Right	0.00	0.0	0.00	0.0
Northfield Farmhouse	0.02	0.0	0.02	0.0
Fontwell Avenue South Right	0.17	0.2	0.09	0.1

The strategic model outputs provide peak hour turning flows as an hourly figure. It was agreed with WSCC where an observed 15 minute interval profile was available that this should be applied to the forecast year flows, and the data entered using the DIRECT methodology. The results from the 2031 do minimum and do something scenarios are shown in Table 6-24 to Table 6-31 and the output file is included in Appendix L . These results show that the junction is forecast to operate within capacity in all scenarios.

Table 6-28: 2031 do minimum junction modelling results (Fontwell Avenue/Eastergate Lane)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Eastergate Lane Left	0.25	0.3	0.25	0.3
Eastergate Lane Right	0.00	0.0	0.00	0.0
Fontwell Avenue North Right	0.00	0.0	0.00	0.0
Northfield Farmhouse	0.03	0.0	0.02	0.0
Fontwell Avenue South Right	0.10	0.1	0.22	0.4

Table 6-29: 2031 do something junction modelling results (Fontwell Avenue/Eastergate Lane)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Eastergate Lane Left	0.26	0.4	0.28	0.4
Eastergate Lane Right	0.00	0.0	0.00	0.0
Fontwell Avenue North Right	0.00	0.0	0.00	0.0
Northfield Farmhouse	0.04	0.0	0.02	0.0
Fontwell Avenue South Right	0.10	0.1	0.23	0.4

Table 6-30: 2031 do minimum No Cala junction modelling results (Fontwell Avenue/Eastergate Lane)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Eastergate Lane Left	0.25	0.3	0.25	0.3
Eastergate Lane Right	0.00	0.0	0.00	0.0
Fontwell Avenue North Right	0.00	0.0	0.00	0.0
Northfield Farmhouse	0.00	0.0	0.00	0.0
Fontwell Avenue South Right	0.10	0.1	0.22	0.4

Table 6-31: 2031 do something No Cala junction modelling results (Fontwell Avenue/Eastergate Lane)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Eastergate Lane Left	0.27	0.4	0.28	0.4
Eastergate Lane Right	0.00	0.0	0.00	0.0
Fontwell Avenue North Right	0.00	0.0	0.00	0.0
Northfield Farmhouse	0.05	0.0	0.02	0.0
Fontwell Avenue South Right	0.10	0.1	0.24	0.4

Fontwell Avenue / Barnham Road

The roundabout junction has been modelled using Junctions 9. A traffic survey was undertaken at this junction in November 2019 that included collection of classified turning counts and vehicle queue length surveys. The turning count data was collected in 15 minute intervals which allows the DIRECT data entry methodology to be used. The use of DIRECT was agreed with WSCC.

The performance of the base model was considered to reflect the observed conditions and therefore no capacity adjustments were made to calibrate the model. However, lane simulation has been due to lane markings and unequal lane usage on the approach arms to the roundabout. The output results in lane simulation do not provide RFC values therefore Level of Service (LoS) values have been provided instead, alongside the queue length data.

The baseline modelling results are shown below and the output file is included in Appendix M. These results show that the junction is operating with a LoS A in the AM peak hour base scenario and LoS E in the PM peak hour on the Fontwell Avenue arm of the junction.

Table 6-32: 2019 base junction modelling results (Fontwell Avenue/Barnham Road)

	AM Peak			PM Peak		
	LoS	Delay (s)	Queue (PCU)	LoS	Delay (s)	Queue (PCU)
Fontwell Avenue	A	9.88	1.7	E	49.02	11.4
Barnham Road	A	9.92	2.3	A	6.75	1.0
Nyton Road	A	8.98	2.6	A	7.11	1.7

The strategic model outputs provide peak hour turning flows as an hourly figure. It was agreed with WSCC where an observed 15 minute interval profile was available that this should be applied to the forecast year flows, and the data entered using the DIRECT methodology.

The results from the 2031 do minimum and do something scenarios are shown in Table 6-33 to Table 6-36 and the output file is included in Appendix M. These results show that the junction is forecast to operate with an acceptable level of service (LoS) in all of the 2031 forecast year scenarios.

Table 6-33: 2031 do minimum junction modelling results (Fontwell Avenue/ Barnham Road)

	AM Peak			PM Peak		
	LoS	Delay (s)	Queue (PCU)	LoS	Delay (s)	Queue (PCU)
Fontwell Avenue	B	11.63	2.3	C	23.52	4.6
Barnham Road	A	8.11	1.6	A	6.59	0.9
Nyton Road	C	15.76	4.8	A	7.27	2.2

Table 6-34: 2031 do something junction modelling results (Fontwell Avenue/ Barnham Road)

	AM Peak			PM Peak		
	LoS	Delay (s)	Queue (PCU)	LoS	Delay (s)	Queue (PCU)
Fontwell Avenue	A	8.58	1.4	C	16.98	3.0
Barnham Road	A	9.87	2.2	A	5.85	0.5
Nyton Road	B	13.78	3.8	A	6.56	1.6

Table 6-35: 2031 do minimum No Cala junction modelling results (Fontwell Avenue/ Barnham Road)

	AM Peak			PM Peak		
	LoS	Delay (s)	Queue (PCU)	LoS	Delay (s)	Queue (PCU)
Fontwell Avenue	B	11.35	1.5	C	20.21	4.3
Barnham Road	A	8.71	1.9	A	6.5	0.9
Nyton Road	B	13.16	3.8	A	7.21	2.0

Table 6-36: 2031 do something No Cala junction modelling results (Fontwell Avenue/ Barnham Road)

	AM Peak			PM Peak		
	LoS	Delay (s)	Queue (PCU)	LoS	Delay (s)	Queue (PCU)
Fontwell Avenue	B	11.62	2.0	C	24.69	5.6
Barnham Road	B	10.58	1.9	A	6.78	1.1
Nyton Road	B	10.82	3.4	A	8.4	2.5

Nyton Road / Westergate Street

This junction is a triangular junction and made up of three separate T-junctions, therefore three separate models have been created using Junctions 9. A traffic survey was undertaken at this junction in November 2019 that included collection of classified turning counts and vehicle queue length surveys. The turning count data was collected in 15 minute intervals which allows the DIRECT data entry methodology to be used. The use of DIRECT was agreed with WSCC.

The performance of the base model was considered to reflect the observed conditions and therefore no capacity adjustments were made to calibrate the model. The baseline modelling results are shown in Table 6-37 and the output file is included in Appendix N. These results show that the junction is operating within capacity in the base scenario.

Table 6-37: 2019 base junction modelling results (Nyton Road/Westergate Street North)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
North Junction				
Nyton Road West Left	0.47	1.0	0.75	2.8
Nyton Road West Right	0.00	0.0	0.00	0.0
Nyton Road East	0.90	6.4	0.41	0.7
West Junction				
Nyton Road South Left	0.62	1.6	0.19	0.2
Nyton Road South Right	0.02	0.0	0.01	0.0
Nyton Road East	0.01	0.0	0.01	0.0
Local Access	0.01	0.0	0.01	0.0
Nyton Road West	0.23	0.5	0.57	1.9
South Junction				
Nyton Road North Left	0.00	0.0	0.00	0.0
Nyton Road North Right	0.27	0.4	0.58	1.4
Westergate North	0.00	0.0	0.00	0.0

The strategic model outputs provide peak hour turning flows as an hourly figure. It was agreed with WSCC where an observed 15 minute interval profile was available that this should be applied to the forecast year flows, and the data entered using the DIRECT methodology.

The results from the 2031 do minimum and do something results are shown in Table 6-38 to Table 6-41 and the output file is included in Appendix N . These results show that the junction is forecast to operate within capacity in all of the scenarios.

Table 6-38: 2031 do minimum junction modelling results (Nyton Road/Westergate Street)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
North Junction				
Nyton Road West Left	0.57	1.3	0.75	2.7
Nyton Road West Right	0.00	0.0	0.00	0.0
Nyton Road East	0.75	2.8	0.34	0.5
West Junction				
Nyton Road South Left	0.51	1.0	0.33	0.5
Nyton Road South Right	0.02	0.0	0.01	0.0
Nyton Road East	0.01	0.0	0.01	0.0
Local Access	0.01	0.0	0.01	0.0
Nyton Road West	0.24	0.5	0.42	1.0
South Junction				
Nyton Road North Left	0.00	0.0	0.00	0.0
Nyton Road North Right	0.31	0.4	0.51	1.0
Westergate North	0.00	0.0	0.00	0.0

Table 6-39: 2031 do something junction modelling results (Nyton Road/Westergate Street)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
North Junction				
Nyton Road West Left	0.57	1.3	0.82	3.9
Nyton Road West Right	0.00	0.0	0.00	0.0
Nyton Road East	0.87	5.1	0.42	0.7
West Junction				
Nyton Road South Left	0.53	1.1	0.35	0.5
Nyton Road South Right	0.02	0.0	0.01	0.0
Nyton Road East	0.01	0.0	0.01	0.0
Local Access	0.01	0.0	0.01	0.0
Nyton Road West	0.26	0.6	0.49	1.5
South Junction				
Nyton Road North Left	0.00	0.0	0.00	0.0
Nyton Road North Right	0.28	0.4	0.48	0.9
Westergate North	0.00	0.0	0.00	0.0

Table 6-40: 2031 do minimum No Cala junction modelling results (Nyton Road/Westergate Street)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
North Junction				
Nyton Road West Left	0.57	1.3	0.79	3.2
Nyton Road West Right	0.00	0.0	0.00	0.0
Nyton Road East	0.77	3.1	0.36	0.6
West Junction				
Nyton Road South Left	0.43	0.7	0.30	0.4
Nyton Road South Right	0.02	0.0	0.01	0.0
Nyton Road East	0.01	0.0	0.01	0.0
Local Access	0.01	0.0	0.01	0.0
Nyton Road West	0.22	0.5	0.39	1.0
South Junction				
Nyton Road North Left	0.00	0.0	0.00	0.0
Nyton Road North Right	0.27	0.4	0.51	1.0
Westergate North	0.00	0.0	0.00	0.0

Table 6-41: 2031 do something No Cala junction modelling results (Nyton Road/Westergate Street)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
North Junction				
Nyton Road West Left	0.58	1.4	0.83	4.0
Nyton Road West Right	0.00	0.0	0.00	0.0
Nyton Road East	0.82	4.0	0.36	0.6
West Junction				
Nyton Road South Left	0.44	0.8	0.32	0.5
Nyton Road South Right	0.02	0.0	0.01	0.0
Nyton Road East	0.01	0.0	0.01	0.0
Local Access	0.01	0.0	0.01	0.0
Nyton Road West	0.22	0.5	0.35	0.8
South Junction				
Nyton Road North Left	0.00	0.0	0.00	0.0
Nyton Road North Right	0.29	0.4	0.44	0.8
Westergate North	0.00	0.0	0.00	0.0

Westergate Street / Hook Lane

The T-junction has been modelled using Junctions 9. A traffic survey was undertaken at this junction in November 2019 that included collection of classified turning counts and vehicle queue length surveys. The turning count data was collected in 15 minute intervals which allows the DIRECT data entry methodology to be used. The use of DIRECT was agreed with WSCC.

The performance of the base model was considered to reflect the observed conditions and therefore no capacity adjustments were made to calibrate the model. The baseline modelling results are shown in Table 6-42 and the output file is included in Appendix O. These results show that the junction is operating within capacity in the base scenario.

Table 6-42: 2019 base junction modelling results (Westergate Street/Hook Lane)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Hook Lane	0.26	0.4	0.28	0.4
Westergate Street	0.09	0.2	0.11	0.2

The strategic model outputs provide peak hour turning flows as an hourly figure. It was agreed with WSCC where an observed 15 minute interval profile was available that this should be applied to the forecast year flows, and the data entered using the DIRECT methodology.

The results from the 2031 do minimum and do something scenarios are shown in Table 6-43 to Table 6-46 and the output file is included in Appendix O. These results show that in the junction is forecast to operate within capacity.

Table 6-43: 2031 do minimum junction modelling results (Westergate Street/Hook Lane)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Hook Lane	0.51	1.0	0.83	3.6
Westergate Street	0.15	0.4	0.15	0.4

Table 6-44: 2031 do something junction modelling results (Westergate Street/Hook Lane)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Hook Lane	0.53	1.1	0.90	4.9
Westergate Street	0.20	0.6	0.11	0.3

Table 6-45: 2031 do minimum No Cala junction modelling results (Westergate Street/Hook Lane)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Hook Lane	0.50	1.0	0.70	2.1
Westergate Street	0.14	0.4	0.13	0.3

Table 6-46: 2031 do something No Cala junction modelling results (Westergate Street/Hook Lane)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Hook Lane	0.51	1.0	0.87	4.2
Westergate Street	0.15	0.4	0.09	0.2

Shripney Road / Charles Purley Way

The junction has been modelled using Junctions 9. A traffic survey was undertaken at this junction in November 2019 that included collection of classified turning counts and vehicle queue length surveys. The turning count data was collected in 15 minute intervals which allows the DIRECT data entry methodology to be used. The use of DIRECT was agreed with WSCC.

The performance of the base model was considered to reflect the observed conditions and therefore no capacity adjustments were made to calibrate the model. The baseline modelling results are shown in Table 6-47 and the output file is included in Appendix P. These results show that the junction is operating within capacity in the base scenario.

Table 6-47: 2019 base junction modelling results (Shripney Road/ Charles Purley Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A259 Felpham Relief Road	0.73	2.8	0.74	2.8
David Purley Memorial	0.04	0.1	0.15	0.2
A29 Shripney Road South	0.68	2.2	0.75	3.0
A29 Shripney Road North	0.32	0.5	0.42	0.7

The strategic model outputs provide peak hour turning flows as an hourly figure. It was agreed with WSCC where an observed 15 minute interval profile was available that this should be applied to the forecast year flows, and the data entered using the DIRECT methodology. The results from the 2031 do minimum and do something scenarios are shown in Table 6-48 to Table 6-51.

These results show that the junction is forecast to operate within capacity in all scenarios.

Table 6-48: 2031 do minimum junction modelling results (Shripney Road/ Charles Purley Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A259 Felpham Relief Road	1.01	20.1	0.98	9.7
David Purley Memorial	0.62	1.6	1.06	22.5
A29 Shripney Road South	0.97	14.1	1.12	59
A29 Shripney Road North	0.47	0.9	0.71	2.4

Table 6-49: 2031 do something junction modelling results (Shripney Road/ Charles Purley Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A259 Felpham Relief Road	1.03	24	1.01	13.7
David Purley Memorial	0.64	1.8	1.09	27
A29 Shripney Road South	0.98	17.1	1.14	64.2
A29 Shripney Road North	0.52	1.1	0.71	2.4

Table 6-50: 2031 do minimum No Cala junction modelling results (Shripney Road/ Charles Purley Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A259 Felpham Relief Road	1.0	17.5	0.96	9.7
David Purley Memorial	0.6	1.5	1.05	20.7
A29 Shripney Road South	0.96	13.3	1.1	51.2
A29 Shripney Road North	0.46	0.8	0.69	2.2

Table 6-51: 2031 do something No Cala junction modelling results (Shripney Road/ Charles Purley Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A259 Felpham Relief Road	1.03	23.3	0.96	9.7
David Purley Memorial	0.64	1.7	1.06	22.5
A29 Shripney Road South	0.98	17.4	1.12	59
A29 Shripney Road North	0.51	1.0	0.71	2.4

Figure 6.8: Masterplan for the Saltbox site

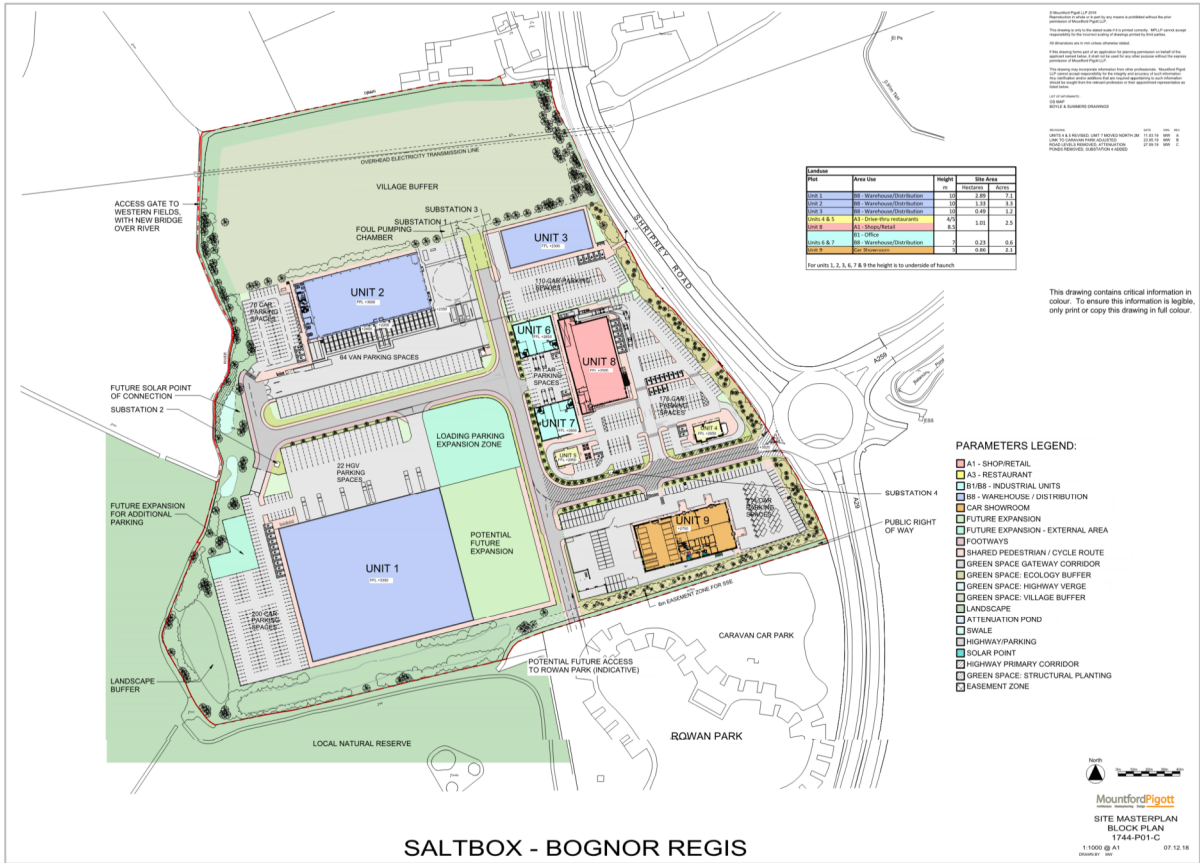


Figure 6.9: Saltbox site AM and PM peak hour development flows

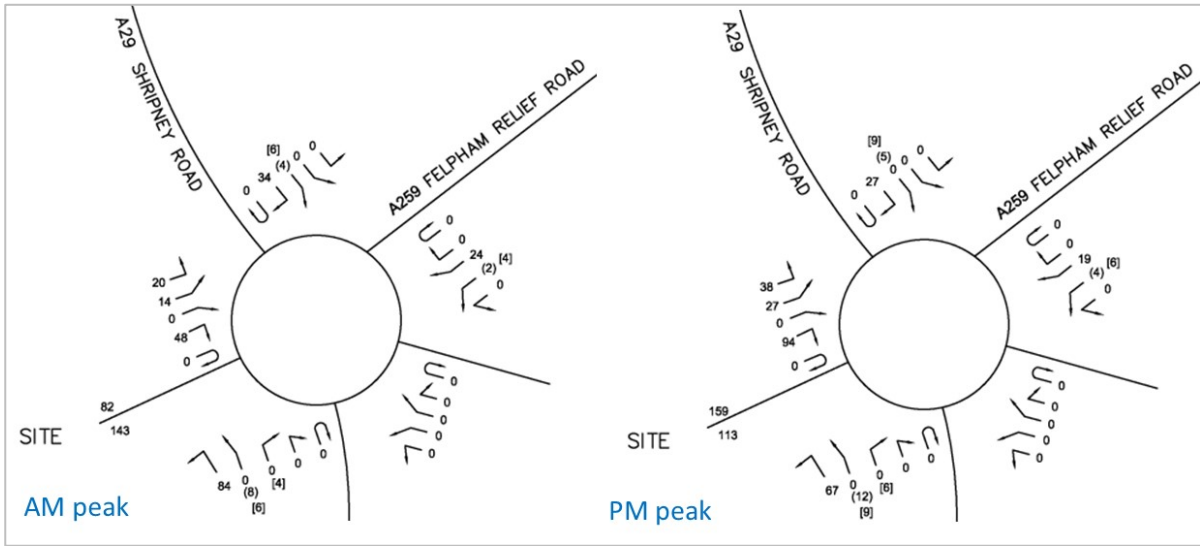


Table 6-52: 2031 do minimum No Cala junction modelling results (Shripney Road/Charles Purley Way) for mitigation scheme

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A259 Felpham Relief Road	0.60	1.5	0.54	1.2
David Purley Memorial	0.59	1.4	1.07	23.2
A29 Shripney Road South	0.56	1.3	0.63	1.7
Saltbox Road	0.13	0.2	0.34	0.5
A29 Shripney Road North	0.59	1.3	0.98	14.3

Table 6-53: 2031 do minimum junction modelling results (Shripney Road/Charles Purley Way) for mitigation scheme

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A259 Felpham Relief Road	0.61	1.6	0.55	1.2
David Purley Memorial	0.60	1.5	1.08	25.1
A29 Shripney Road South	0.57	1.3	0.64	1.8
Saltbox Road	0.14	0.2	0.34	0.5
A29 Shripney Road North	0.59	1.4	0.99	16.4

Table 6-54: 2031 do something No Cala junction modelling results (Shripney Road/Charles Purley Way) for mitigation scheme

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A259 Felpham Relief Road	0.62	1.6	0.54	1.2
David Purley Memorial	0.61	1.6	1.08	25.1
A29 Shripney Road South	0.58	1.4	0.64	1.8
Saltbox Road	0.14	0.2	0.35	0.5
A29 Shripney Road North	0.63	1.7	0.99	16.5

Table 6-55: 2031 do something junction modelling results (Shripney Road/Charles Purley Way) for mitigation scheme

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A259 Felpham Relief Road	0.62	1.6	0.57	1.3
David Purley Memorial	0.62	1.6	1.12	30.4
A29 Shripney Road South	0.58	1.4	0.65	1.9
Saltbox Road	0.14	0.2	0.37	0.6
A29 Shripney Road North	0.63	1.8	0.99	16.4

The results from this modelling of the mitigation scheme show the following:

- The junction is forecast to operate within capacity in the 2031 do minimum and do something scenarios in both the AM and PM peak hours, with the exception of the David Purley Memorial arm of the junction in the PM peak hour.
- There is a significant improvement in the performance of the A259 Felpham Relief Road and A29 Shripney Road South arms of the junction in all scenarios as a result of the mitigation scheme.

Further discussion of this junction's performance both without and with mitigation in 2038 is available in sections later in this TA.

It is observed that the traffic flows from the David Purley Memorial arm increase significantly from those recorded in the 2019 survey as a result of the traffic generated by the Oldlands Farm site. A comparison between the scenarios is shown in Table 6-56, and this indicates that the change in RFC on the David Purley Memorial arm is considered to be due to the additional traffic generated by the Oldlands Farm site, and therefore not attributable to the scale of development proposed in the Southern Consortium's outline planning application for up to 1,250 homes.

Table 6-56: PM peak hour flows (PCUs) exiting the David Purley Memorial Arm of the junction

	2019	2031 do minimum	2031 do something	2038 do minimum	2038 do something
PCUs (in hour)	62	536	537	543	544

Shripney Road / Rowan Way

The roundabout junction has been modelled using Junctions 9. A traffic survey was undertaken at this junction in November 2019 that included collection of classified turning counts and vehicle queue length surveys. The turning count data was collected in 15 minute intervals which allows the DIRECT data entry methodology to be used. The use of DIRECT was agreed with WSCC.

The performance of the base model was considered to reflect the observed conditions and therefore no capacity adjustments were made to calibrate the model. The baseline modelling results are shown in Table 6-57 and the output file is included in Appendix Q. These results show that the junction is operating within capacity in the base scenario.

Table 6-57: 2019 base junction modelling results (Shripney Road/ Rowan Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Shripney Road North	0.60	1.6	0.74	2.8
Steyning Way	0.22	0.3	0.65	1.8
A29 Shripney Road South	0.57	1.3	0.73	2.6
Rowan Way	0.59	1.5	0.65	1.9

The strategic model outputs provide peak hour turning flows as an hourly figure. It was agreed with WSCC where an observed 15 minute interval profile was available that this should be applied to the forecast year flows, and the data entered using the DIRECT methodology.

The results from the 2031 do minimum and do something scenarios are shown in Table 6-58 to Table 6-61 and the output file is included in Appendix Q. These results show that the junction is forecast to operate within capacity in all of the forecast year scenarios.

Table 6-58: 2031 do minimum junction modelling results (Shripney Road/ Rowan Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Shripney Road North	0.77	3.3	0.86	6.0
Steyning Way	0.25	0.4	0.72	2.5
A29 Shripney Road South	0.70	2.3	0.74	2.7
Rowan Way	0.80	3.8	0.89	6.7

Table 6-59: 2031 do something junction modelling results (Shripney Road/ Rowan Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Shripney Road North	0.78	3.5	0.87	6.1
Steyning Way	0.26	0.4	0.73	2.6
A29 Shripney Road South	0.70	2.4	0.75	2.8
Rowan Way	0.79	3.7	0.89	6.6

Table 6-60: 2031 do minimum No Cala junction modelling results (Shripney Road/ Rowan Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Shripney Road North	0.76	3.1	0.86	5.9
Steyning Way	0.25	0.4	0.72	2.4
A29 Shripney Road South	0.70	2.3	0.73	2.6
Rowan Way	0.80	3.9	0.88	6.3

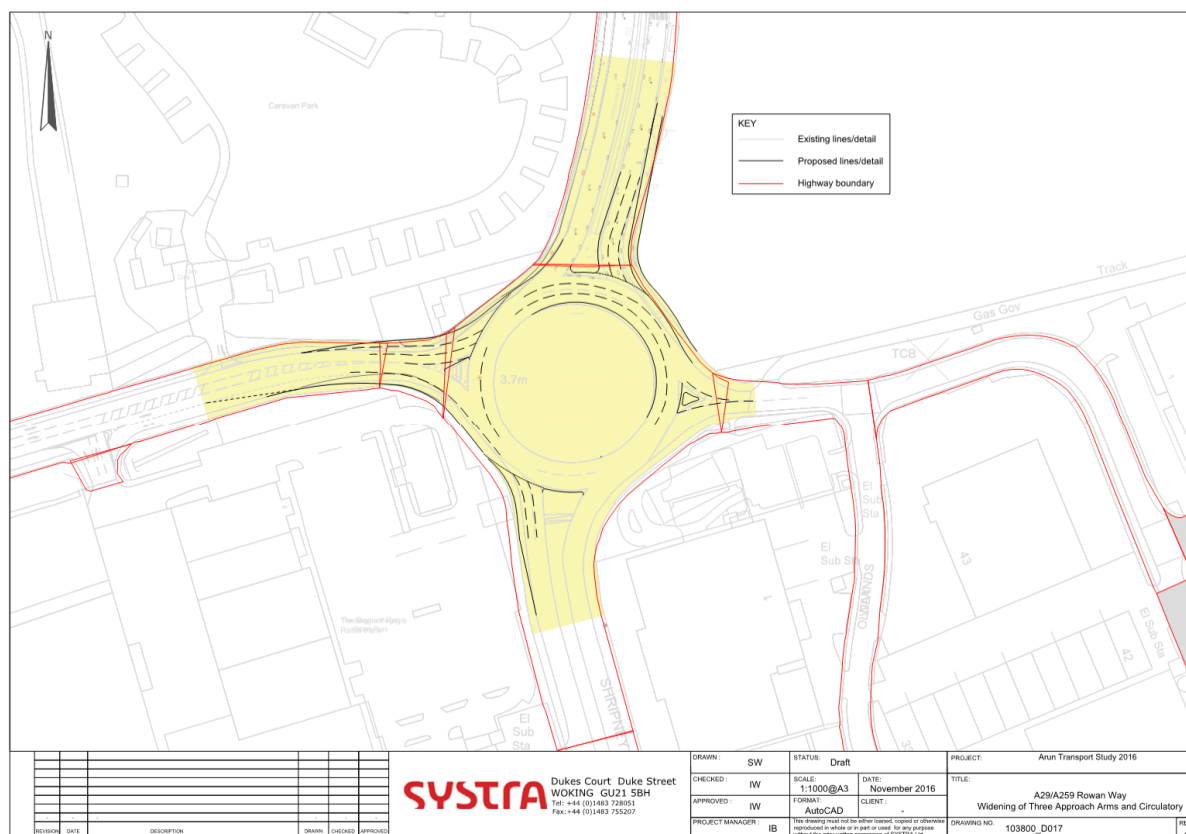
Table 6-61: 2031 do something No Cala junction modelling results (Shripney Road/ Rowan Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Shripney Road North	0.78	3.5	0.87	6.2
Steyning Way	0.26	0.4	0.73	2.5
A29 Shripney Road South	0.70	2.3	0.75	2.8
Rowan Way	0.79	3.7	0.89	6.9

Mitigation scheme

ADC has undertaken several studies to determine mitigation schemes. The Arun Transport Study Stage 3 Report and the Enterprise Bognor Regis Transport Review (2017) both reference the same mitigation scheme at the A29/ A259 Rowan Way/ Shripney Road Roundabout.

Figure 6.10: A29/ A259 Rowan Way/ Shripney Road Roundabout mitigation scheme



Source: Enterprise Bognor Regis Transport Review (2017) and Arun District Council Phase 3 Study (2016)

The mitigation scheme includes widening the northern, western and southern arms of the junction. This junction has been modelled using Junctions 9 and the results for the forecast years are presented in Table 6-62 to Table 6-65. The model output file is included in Appendix Q. The results from this modelling shows that the junction is forecast to operate within capacity in all scenarios.

Table 6-62: 2031 do minimum junction modelling results (Shripney Road/ Rowan Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Shripney Road North	0.65	1.8	0.73	2.6
Steyning Way	0.30	0.5	0.89	5.8
A29 Shripney Road South	0.56	1.3	0.58	1.4
Rowan Way	0.59	1.4	0.66	1.9

Table 6-63: 2031 do something junction modelling results (Shripney Road/ Rowan Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Shripney Road North	0.66	1.9	0.73	2.7
Steyning Way	0.31	0.5	0.90	6.1
A29 Shripney Road South	0.57	1.3	0.59	1.4
Rowan Way	0.59	1.4	0.66	1.9

Table 6-64: 2031 do minimum No Cala junction modelling results (Shripney Road/ Rowan Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Shripney Road North	0.64	1.8	0.73	2.6
Steyning Way	0.30	0.5	0.88	5.5
A29 Shripney Road South	0.56	1.3	0.58	1.4
Rowan Way	0.59	1.4	0.65	1.9

Table 6-65: 2031 do something No Cala junction modelling results (Shripney Road/ Rowan Way)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Shripney Road North	0.66	1.9	0.73	2.7
Steyning Way	0.31	0.5	0.90	6.1
A29 Shripney Road South	0.56	1.3	0.59	1.4
Rowan Way	0.59	1.4	0.66	1.9

The results from this modelling of the mitigation scheme shows that:

- The junction is forecast to operate within capacity in the 2031 do minimum and do something scenarios in both the AM and PM peak hours.
- The A29 Shripney Road North and South, and Rowan Way arms of the junction are forecast to operate with additional spare capacity in all of the modelling scenarios.

The roundabout junction has been modelled using Junctions 9 and the results from the with and without mitigation scenarios are presented. Whilst there is a mitigation scheme identified in the Arun District Council Stage 3 Study, these results show that the existing junction layout is forecast to operate within capacity in all of the forecast year scenarios. Therefore, based on this it is considered the impact of the BEW Parcel SC1 development does not require further mitigation.

The results from this modelling of the mitigation scheme shows that the junction is forecast to operate within capacity in the 2031 do minimum and do something scenarios, the A29 Shripney Road North and South, and Rowan Way arms of the junction are forecast to operate with additional spare capacity in all of the modelling scenarios. Whilst the RFC on the Steyning Way arm of the junction increases in the 2038 do something scenario (see below sections of this TA), it is considered there is spare capacity across the hour to accommodate the traffic, and there would be a reduction in the total overall delay to drivers using the junction after the mitigation scheme is in place.

Further discussion of this junction's performance both without and with mitigation in 2038 is available in sections later in this TA.

Notwithstanding the above, the scope of the planning application is for 1,250 homes and therefore the focus of the review of the impact of these should be on the 2031 forecast year modelling results. The additional 2,000 homes south of the West Coastway railway line are considered a sensitivity test for the purpose of this TA and would be the subject of a future planning application and transport assessment. Therefore additional mitigation (if required) would be addressed as part of a subsequent planning application.