

- 3.9.2. The data shows a total of 112 collisions that have occurred over the past five years, of which one collision was classed as 'Fatal', 33 collisions were classified as 'Serious' and the remaining 78 were classified as 'Slight' in terms of severity. In total, seven accidents involved pedestrians, nine involved cyclists and 18 involved a motor cyclist.
- 3.9.3. The data has been split into two sections; the first being the collisions that have occurred at the junctions and the second being the collisions that have occurred on links. These are summarised in **Table 3-9** and **Table 3-10** for junctions and links respectively.

3.10 PERSONAL INJURY COLLISIONS AT JUNCTIONS

Table 3-9 – Summary of PICs at Junctions

Junction	Severity			Type of Vulnerable User		
	Slight	Serious	Fatal	Pedestrian	Cyclist	Motor Cyclist
A27/ Arundel Road/ Fontwell Avenue	9	4	0	0	0	4
A27/ Nyton Road	2	1	0	0	0	0
A29/ Barnham Road	3	1	0	0	2	0
Westergate Street/ B2233 Nyton Road	4	2	0	1	1	1
Fontwell East Roundabout	3	1	0	0	0	0

A27 ARUNDEL ROAD / A29 FONTWELL AVENUE ROUNDABOUT

- 3.10.1. There have been 13 recorded accidents at the roundabout junction of A27/ Arundel Road/ Fontwell Avenue. Of the recorded accidents, four involved motor cyclists, three of which were as a result of driver error and the other was caused by the bike hitting gravel as it braked causing the rider to lose control. Three of these motorcycle accidents were classed as 'Serious' in terms of severity, whilst the four was classified as 'Slight'.
- 3.10.2. The remaining nine accidents were subject to collision between two or more vehicles, out of which eight were classified as 'Slight' in terms of severity and one classed as 'Serious'. During the one serious incident, the driver misjudged the road ahead, failing to slow down earlier enough, going into the back of a stationary vehicle. Streetlights were present and the condition was damp/wet.

A27 / NYTON ROAD PRIORITY JUNCTION

- 3.10.3. There have been three recorded accidents at the priority junction of A27/ Nyton Road. Out of these, one was classified as 'Serious' in terms of severity and the remaining two as 'Slight'.
- 3.10.4. The 'Serious' accidents occurred when the driver of one vehicle moved into the path of another vehicle while negotiating A27 to enter Nyton Road.

A29 / BARNHAM ROAD ROUNDABOUT

- 3.10.5. Four accidents have been recorded at the roundabout junction of A29/ Barnham Road. One was classified as 'Serious' in terms of severity involving pedal cyclist. The accident involving the cyclist occurred when the vehicle travelling south of the roundabout failed to notice the cyclist travelling west of the roundabout and collided with the back wheel of the cycle, causing injury as the rider to fell onto the road.
- 3.10.6. A second accident involving a pedal cyclist was classified as 'Slight' in terms of severity. This was a similar accident to the more serious one in which driver error was the main factor. The remaining two incidents involved the collision of two or more vehicles. None of these accidents involve a vulnerable road user.

WESTERGATE STREET / B2233 NYTON ROAD PRIORITY JUNCTION

- 3.10.7. There have been six recorded accidents in the vicinity of the Westergate Street/ B2233 Nyton Road priority junction, three of which involved a vulnerable road user. An accident involving a pedal cycle classed as 'Slight' in terms of severity, occurred when the cyclist hit a pothole in the road, causing them to lose balance and fall.
- 3.10.8. One of the accidents classified as 'Serious' in terms of severity occurred when a pedestrian crossed the road in front of a motor cyclist. The other serious incident a collision between two vehicles where one of them had crossed the give way line, colliding into a speeding vehicle.

FONTWELL EAST ROUNDABOUT

- 3.10.9. A total of four collisions were recorded at Fontwell East Roundabout, three of which were classified as 'Slight' in terms of severity, and one has been classified as 'Serious'.
- 3.10.10. The serious accident occurred due to the vehicle reaching the roundabout at high speeds, therefore being unable to negotiate the junction properly. Another collision occurred due to the vehicle approaching the roundabout at too high of a speed and not being able to manoeuvre the junction. This incident was classed as 'Slight' in terms of severity.
- 3.10.11. The other two of collisions which occurred during the 5-year period obtained, were both classified as 'Slight' and has been attributed to driver error.
- 3.10.12. No accident involved a vulnerable road user.

PERSONAL INJURY ACCIDENTS ON LINKS

Table 3-10 – Summary of PICs on Links

Link	Severity			Type of Vulnerable User		
	Slight	Serious	Fatal	Pedestrian	Cyclist	Motor Cyclist
A29 Westergate Street/A29 Lindsey Road/A29 Shripney Road	16	7	0	2	2	5
Fontwell Avenue	5	2	0	1	1	0
Nyton Road	4	1	0	0	0	1
Nyton Road link between Westergate and Eastergate	6	0	0	1	0	1
Barnham Road	8	2	0	0	1	1
Arundel Road (west of A27/ Arundel Road/ Fontwell Avenue roundabout)	11	10	1	0	0	2
Arundel Road (east of A27/ Arundel Road/ Fontwell Avenue roundabout)	4	1	0	0	0	0

A29 WESTERGATE STREET/A29 LINDSEY ROAD/A29 SHRIPNEY ROAD

- 3.10.13. There have been 23 personal injury accidents recorded on the A29 Westergate Street. Out of these, 16 were classified 'Slight' in terms of severity and seven were classified as 'Serious'. Of these 23 accidents, five involved motor cyclists, two involved a pedestrian and two involved a pedal cycles.
- 3.10.14. All of the motor cycle PICs were attributed to careless driving, four of which have been classified as 'Slight' in terms of severity, whilst the final one has been classified as 'Serious'.
- 3.10.15. Both incidents involving the pedestrian resulted from careless behaviour from the pedestrian stepping into the carriageway without checking properly. One of these collisions was classified as 'Serious', occurring on the A29 Shripney Road some 150m north of the Aldi roundabout.
- 3.10.16. Of the remaining five 'Serious incidents, all were as a result of driver error. One may have been partially resulting from darkness with no streetlights, however the driver was noted to be impaired from alcohol. Wet conditions could have also been a factor for a second, although speeding was also involved.

- 3.10.17. None of the collisions involving a pedal cycle were classed as 'Serious' and were both due to careless driving, most likely not checking blind spots properly.
- 3.10.18. The remaining accidents classified as 'Slight' in terms of severity occurred either due to reckless driving, loss of control of the vehicle, or vehicle travelling too fast under prevailing conditions.

A29 FONTWELL AVENUE

- 3.10.19. The link connecting A27/ Arundel Road/ Fontwell Avenue Roundabout and B2233 Nyton Road/ Barnham Road has had seven accidents recorded; two of them were classified as 'Serious' in terms of severity, and five classified as 'Slight'.
- 3.10.20. Both 'Serious' accidents involved careless driving, one of the incidents resulted in a child passenger getting injured.
- 3.10.21. One of the seven PICs involved a pedal cycle, and one involved a pedestrian. Both of these were classified as 'Slight' in terms of severity and were as a result of careless driving/driver in a hurry.

B2233 NYTON ROAD

- 3.10.22. The B2233 Nyton Road links the A27 to A29 Westergate Street, where five personal injury accidents have been recorded on the Nyton Road link located west of the Westergate Street/ B2233 Nyton Road Priority junction. There was one accident classified as 'Serious' in terms of severity and four accidents classified as 'Slight' in terms of severity.
- 3.10.23. The accident that has been classified as 'Serious' was the only accident sustained by a vulnerable road user (moped) and was a result of the road user losing control as the moped rode over mud in the road during heavy rain causing the bike to lose grip.
- 3.10.24. The remaining collisions, all classified as 'Slight' in terms of severity, were between two cars and have been documented as driver error.

NYTON ROAD LINK BETWEEN WESTERGATE AND EASTERGATE

- 3.10.25. There have been six accidents recorded on the short link joining Westergate and Eastergate, all classified as 'Slight' in terms of severity. One of these six accident involved a pedestrian and one involved a motor cyclist. All accidents on this corridor were due to driver error.

BARNHAM ROAD

- 3.10.26. There have been 10 recorded accidents on the Barnham Road link, two of which are classified as 'Serious' in terms of severity. Both serious accidents were due to human error, with one of them involving a pedestrian failing to look properly.
- 3.10.27. Of the remaining eight accidents which were all classified as 'Slight', one of them involved motor cyclists and was due to poor speed judgment and sudden braking.

ARUNDEL ROAD (WEST OF A27/ ARUNDEL ROAD/ FONTWELL AVENUE ROUNDABOUT)

- 3.10.28. There have been 22 recorded accidents on the Barnham Road link, 11 are classified as 'Slight' in terms of severity, 10 as 'Serious' and one as 'Fatal'. Of these 22 collisions, two involved vulnerable road users.
- 3.10.29. Of the 10 classified as 'Serious', seven were due to driver error, either speeding or misjudgement of other road users manoeuvres. One of the serious accidents was attributed to heavy rain making it

difficult to see. Another has an unknown cause, with the driver entered a slight bend and lost control for an unknown reason.

- 3.10.30. The fatal accident was due to two vehicles racing resulting in a high-speed collision with other vehicles.

ARUNDEL ROAD (EAST OF A27/ ARUNDEL ROAD/ FONTWELL AVENUE ROUNABOUT)

- 3.10.31. The Arundel Road link east of the A27/ Arundel Road/ Fontwell Avenue roundabout, recorded 5 PICs over the 5-year period covered. There was one accident classified as 'Serious' in terms of severity and four accidents classified as 'Slight' in terms of severity.
- 3.10.32. During the accident which has been classified as 'Serious', the driver states that upon approach to the roundabout, the vehicle failed to slow down after brakes were applied. Heavy rain during this period could have played a role.
- 3.10.33. The four accidents classified as 'Slight' in terms of severity were all a result of driver error, such as misjudging other road user's speed.
- 3.10.34. No accidents were involving vulnerable road users.

3.11 SUMMARY

- 3.11.1. Overall, there are three clusters where PICs have occurred over the five-year period; at A27/Arundel Road / Fontwell Avenue junction, Fontwell East Roundabout and Nyton Road link between Westergate and Eastergate. The main cause of accidents at these locations, with drivers misjudging other vehicles or losing of control of their vehicles. Therefore, it is concluded that there does not exist any operational or safety issues within the local highway network. The proposed development will therefore not result in a severe impact on the safety of the local network.
- 3.11.2. Additionally it is noted that the A27/Fontwell Avenue junction is also proposed to be signalised which should further improve safety at this junction by removing conflicting movements.

3.12 BASELINE TRAFFIC DATA – A29 ATC

An Automatic Traffic Count (ATC) was undertaken on A29 Westergate Street for a 7-day period w/c 28th February 2022 between Pine Close (South) and Oaks Close (North). The ATC survey recorded vehicle speeds and volume. **Table 3-11** summarises the seven-day and five-day average traffic volumes recorded.

Table 3-11 – A29 Westergate Street ATC

	Northbound	Southbound
5-day Average – AM Peak	668	498
5-day Average – PM Peak	385	686
7-day Average – AM Peak	568	423
7-day Average – PM Peak	361	595
5-day Average – 24 hours	6,809	6,758

	Northbound	Southbound
7-day Average – 24 hours	6,404	6,347

- 3.12.1. Reviewing the data in **Table 3-11** this has identified a seven-day average AM peak flow of 568 and 423 vehicles northbound and southbound respectively. In the PM peak this was recorded as 361 and 595 vehicles northbound and southbound respectively. The ATC recorded an average 85th percentile speed of 33mph northbound and 36mph southbound.

3.13 BASELINE JUNCTION CAPACITY ASSESSMENTS

- 3.13.1. Junction assessments have been carried out for the 2019 baseline AM and PM peak periods. Traffic data for these assessments has been derived from the Chichester Area Transport Model (CATM) as agreed with WSCC and National Highways during pre-application scoping discussions. This provides a consistent approach to assessment as uses the same traffic flows as the Transport Assessment completed by Pell Frischmann in support of the planning application BN/11/22/OUT for BEW Parcel SC1. The CATM is a SATURN strategic model that was updated to a base year of 2019 for use within the A29 realignment business case and met relevant DfT WebTAG model validation criteria.
- 3.13.2. Junction assessments have been carried out using the program Junctions 10 developed by Transport Research Laboratory. Junctions 10 includes the ARCADY and PICADY computer modelling software modules which assesses the traffic capacity, queues and delays at roundabouts and priority junctions. Signalised junctions have been assessed using the program LinSig 3 by JCT Consultancy. LinSig provides an assessment of the impact of traffic signals on traffic capacity, queues and delays at a junction.
- 3.13.3. The results of the roundabout and priority junction assessments are expressed in terms of the predicted Ratio of Flow to Capacity (RFC) for each arm of the junction. The RFC provides a numerical indication of the likely performance of a junction. Volume 6 Section 2 of Design Manual for Roads and Bridges (Highways England) contains the document TA23/81 Junctions and Access: Determination of Size of Roundabouts and Major/Minor Priority Junctions, which provides advice on the interpretation of RFC values. The document states that if any arm has an RFC ratio of around 0.85 queuing will theoretically be avoided in five out of six cases. Therefore, an RFC below 0.85 is regarded as demonstrating that the junction would work satisfactorily with minimal delay to vehicular traffic. RFC values over 1.0 indicate that the junction is over design capacity and significant delays are likely to result on at least one arm of the junction.
- 3.13.4. The junction assessments also produce an estimate of the maximum queue lengths for each arm. Queue lengths are expressed in the number of vehicles or Passenger Car Units (PCU).
- 3.13.5. LinSig models provide an indication of the Degree of Saturation (DoS) as a percentage and the Mean Maximum Queue (MMQ) in Passenger Car Units (PCUs) for each junction approach, the average delay per vehicle on each approach, recorded in seconds and the Practical Reserve Capacity (PRC), which is a measure of the junctions total capacity (as a percentage). When reviewing the PRC of a junction the following is considered:
- A positive figure indicates the junction operates with reserve capacity;
 - A negative figure less than -10%, suggests that the junction would be broadly at capacity; and
 - A negative figure more than -10% indicates that the junction cannot accommodate the demand.

3.13.6. For DoS the thresholds can be categorised as follows:

- Less than 90%: Any queues that have built up will be able to disperse during the relevant stage in each cycle;
- 90-100%: Indicates that an arm is close to its theoretical capacity and any queue that has built up does not fully clear within each cycle; and
- More than 100%: Indicates an arm is over its theoretical capacity and significant queues are likely as a result.

3.13.7. Junction geometries have been measured against Ordnance Survey data and aerial photography. The theoretical queue lengths contained within the base model junction assessments have been validated against observed queue length data that was recorded as part of the MCCs conducted in 2016 as part of the Transport Assessment produced in support of the previous planning application for the site (AL/15/17/PL). Given that the layout of the junction assessed has not changed since 2016, this ensures that the assessments are producing an accurate representation of the existing operation of the junction.

3.13.8. This scope of junction assessments completed is as follows:

- A27/A29 Eastern Roundabout
- A27 Arundel Road/A27/Arundel Road/A29 Fontwell Roundabout
- A29/B2233 Barnham Road Roundabout
- A27 Arundel Road/B2233 Nyton Road
- A29 Westergate Street/B2233 Nyton Road Priority Junction (South)
- A29 Westergate Street/B2233 Nyton Road Priority Junction (East)
- A29/A259 Rolls Royce Roundabout; and
- A29 Westergate Street/Meadow Way

3.13.9. The location of these junction is shown in **Figure 3-10** below. Full outputs from all junction capacity assessments are included in **Appendix C**.

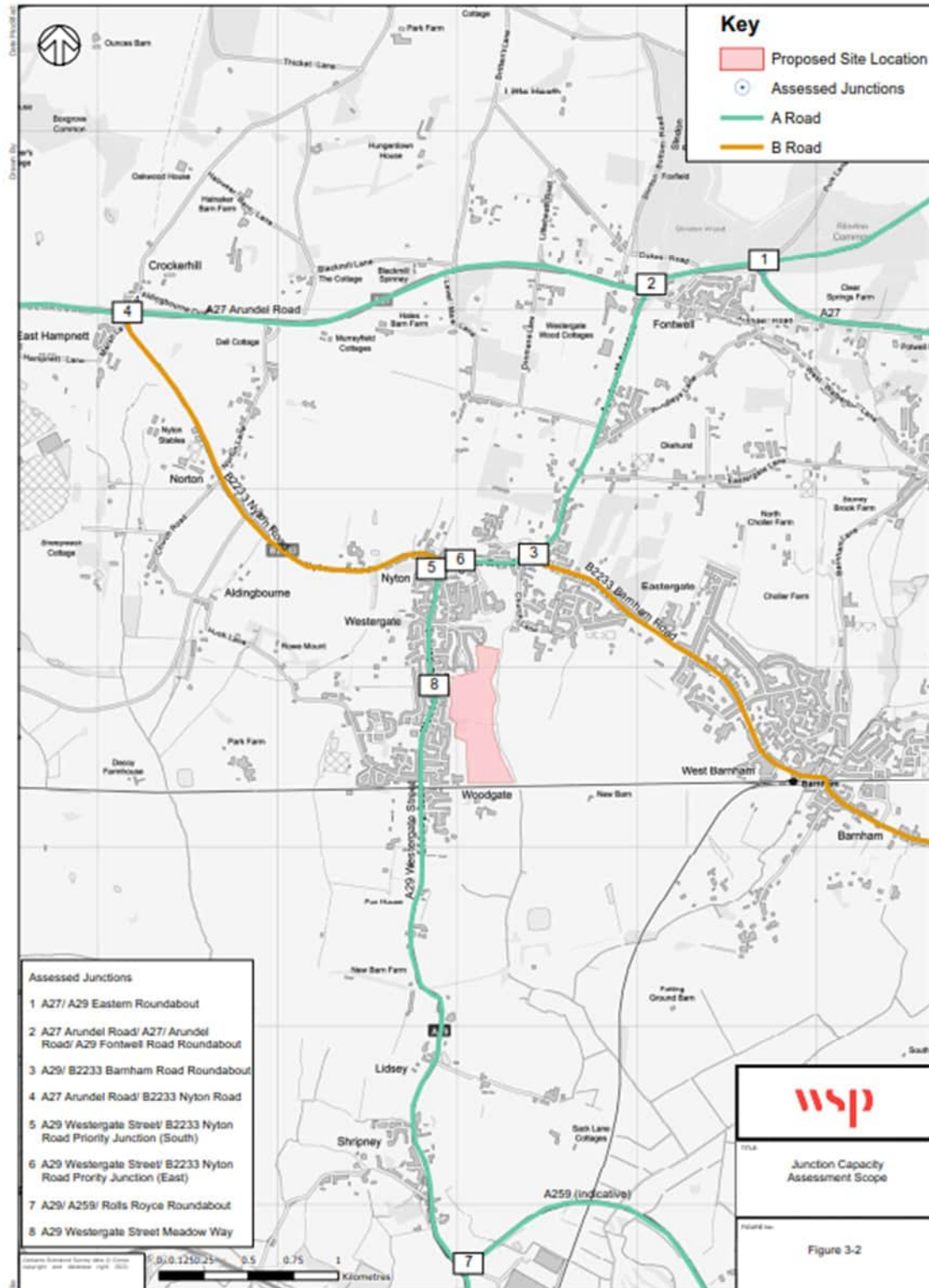


Figure 3-10 – Scope of Junction Capacity Assessments

SITE 1: A27 - A29

3.13.10. The junction of A27/ A29 is a 3-arm roundabout providing access to Arundel to the east and Chichester to the west. There are two lanes on the approach from A29 and A27 (West) and three lanes from the A27 (East); all the approaches are subject to the national speed limit.

3.13.11. **Table 3-12** summarises the baseline modelling results.

Table 3-12 – A27 / A29 2019 Baseline Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A29	0.67	11	2	0.70	11	2
B	A27 (East)	0.62	3	2	0.50	3	1
C	A27 (West)	0.60	3	2	0.54	2	1

3.13.12. The baseline modelling results indicate that the junction will operate within theoretical capacity in the AM and PM peak periods. The maximum RFC of 0.70 is recorded on the approach from the A29 in the PM peak with an associated queue of three vehicles and delay of 11 seconds suggests the junction arm is near capacity.

SITE 2: A27 – ARUNDEL ROAD – A29 FONTWELL AVENUE

3.13.13. The junction of the A27/ Arundel Road/ A29 Fontwell Avenue is a 4-arm roundabout which provides access to Fontwell village to the east. There is a single lane on the approach from Arundel Road, two lanes on the approach from the A29 Fontwell Avenue and A27 (North) and three lanes on the approach from the A27 (West). All arms are subject to a national speed limit.

3.13.14. The baseline modelling results for the roundabout are presented in **Table 3-13**.

Table 3-13 – A27 / Arundel Road / A29 Fontwell Avenue 2019 Baseline Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A27 Arundel Road	0.71	6	3	0.75	5	3
B	A27 (East)	0.78	6	4	0.75	6	3
C	Arundel Road	0.67	29	2	0.47	24	1
D	A29 Fontwell Avenue	0.83	34	5	0.47	10	1

3.13.15. The results summarised in the table above show that the A27 / A29 Fontwell Avenue roundabout is approaching capacity in the AM and PM peaks. In the AM peak the A29 Fontwell Avenue has the highest RFC of 0.83, leading to a delay 34 seconds and queue of five vehicles. In the PM peak both A27 approaches have RFC values of 0.75 leading to a queue of three vehicles

SITE 3: A29 – BARNHAM ROAD

3.13.16. The A29/B2233 Barnham Road is a 3-arm roundabout providing access to Westergate to the west and Barnham train station to the east. All the arms are subject to a 30mph speed limit, with a single lane approach from B2323 Barnham Road and A29 (North) and two lanes on the approach from A29 (West). The base modelling results are shown in **Table 3-14**.

Table 3-14 – A29 / Barnham Road (War Memorial) Roundabout 2019 Baseline Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.58	7	1	0.48	7	1
B	A29 Nyton Road	0.46	3	1	0.39	3	1

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
C	A29 Fontwell Avenue	0.50	7	1	0.76	14	3

3.13.17. The A29/ B2233 Barnham Road modelling results indicates the junction is operating within capacity in the AM and PM peak. The maximum RFC of 0.58 occurs on the approach from Barnham Road with an associated delay of seven seconds and a queue of one vehicle.

SITE 4: A27 - NYTON ROAD

3.13.18. A27/ Nyton Road is a 3-arm priority junction providing access to the A27 Trunk Road. All the approaches are subject to the national speed limit with a right turn lane provided for vehicles entering Nyton Road with queuing for up to 16 vehicles. The baseline modelling results are presented in **Table 3-15**.

Table 3-15 – A27 / Nyton Road 2019 Baseline Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.60	16	2	0.15	7	0
C	A27	0.12	9	0	0.30	9	0

3.13.19. The modelling results summarised above indicates the junction operates within capacity in the AM and PM peaks. The highest RFC of 0.60 occurs on the approach from the A27 Arundel Road (West) with an associated delay of 16 seconds and a queue of two vehicles.

SITE 5: WESTERGATE STREET - NYTON ROAD (EAST JUNCTION)

3.13.20. Westergate Street/ Nyton Road (East Junction) is a 3-arm priority junction in the centre of Westergate. All the approaches are subject to a 30mph speed limit with a right turn lane provided for vehicles turning from Nyton Road (east) to Nyton Road (west). The baseline modelling results are shown in **Table 3.16**.

Table 3-16 –A29 / Nyton Road East 2019 Baseline Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.14	1	1	0.04	1	1
C	Nyton Road A29	0.68	51	3	0.92	82	8

3.13.21. The baseline modelling results indicates the priority junction currently operates within capacity in the AM peak and at capacity in the PM peak. The maximum RFC of 0.92 occurs on the approach from A29 Nyton Road in the AM peak with a total delay of 82 seconds and an associated queue of eight vehicles.

SITE 6: WESTERGATE STREET – NYTON ROAD (SOUTH JUNCTION)

3.13.22. Westergate Street/ Nyton Road (South Junction) is a 3-arm priority junction in the centre of Westergate. All the approaches are subject to a 30mph speed limit. The baseline modelling results are shown in **Table 3-17**.

Table 3-17 –A29 / Nyton Road South 2019 Baseline Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.18	14	0	0.49	21	1
C	Nyton Road A29	0.00	0	0	0.00	0	0

3.13.23. The baseline modelling results indicates the priority junction operates well within at capacity in the AM and PM peak.

SITE 7: WESTERGATE STREET – NYTON ROAD (NORTH JUNCTION)

3.13.24. Westergate Street/ Nyton Road (North Junction) is a 3-arm priority junction in the centre of Westergate. All the approaches are subject to a 30mph speed limit. The baseline modelling results are shown in **Table 3.18**.

Table 3-18 – A29 / Nyton Road North 2019 Baseline Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.60	16	2	0.15	7	0
C	Nyton Road A29	0.12	9	0	0.30	9	0

3.13.25. The modelling results indicates the junction currently operates within capacity. The maximum RFC of 0.60 occurs on the approach from Nyton Road B2233 with a total delay of 16 seconds and a queue of two vehicles.

SITE 8: A29/A259 FELPHAM RELIEF/INDUSTRIAL ESTATE

3.13.26. The junction of A29/ A259 Felpham Relief Road/ Industrial Estate is a 5-arm roundabout providing access to Bognor Regis to the south. There are two lanes on all of the approaches with all the approaches are subject to the national speed limit.

3.13.27. **Table 3-19** summarises the baseline modelling results.

Table 3-19 – A29 / A259 Roundabout 2019 Baseline Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A259	0.59	6	2	0.50	5	1
B	Rolls Royce Access	0.02	6	0	0.05	5	0
C	A29 (South)	0.51	3	1	0.52	3	1
D	Saltbox Road	0.00	0	0	0.00	0	0
E	A29 (North)	0.24	2	0	0.39	3	1

3.13.28. The results of the junction assessment indicate that the existing junction is operating within their theoretical capacity in the AM and PM peak. The maximum RFC of 0.59 occurs on the approach from the A259 approach in the AM peak, leading to a delay of six seconds and queue length of two vehicles.

2019 BASELINE JUNCTION ASSESSMENT SUMMARY

3.13.29. The junction capacity assessments show that all junction operate within capacity in the base year of 2019, although the A27 / A29 Fontwell roundabout (Site 2) and the A29 / Nyton Road priority are approaching capacity. The A27 / A29 Fontwell roundabout is subject to a committed improvement scheme as part of the Arun District Council Transport Study – Stage 3(2016) where the existing junction is to be signalised. This layout has been incorporated into forecast scenario junction capacity assessments included in **Section 7**.

4 DEVELOPMENT PROPOSALS

4.1 DEVELOPMENT DESCRIPTION

- 4.1.1. Cala Homes are proposing to develop the site for residential use to provide a total of 400 dwellings, with associated car parking and a new vehicular and pedestrian site access via a four-arm signalised junction with Meadow Way, Pine Close and A29 Westergate Street. The site forms part of the BEW strategic site which is allocated under policy H SP2c of the Arun Local Plan to provide at least 2,300 dwellings. Further information on the BEW Strategic Site is provided below.
- 4.1.2. The proposed Access, Movement and Street Hierarchy Parameters Plan for the Cala Homes development is shown in **Figure 4-1**.

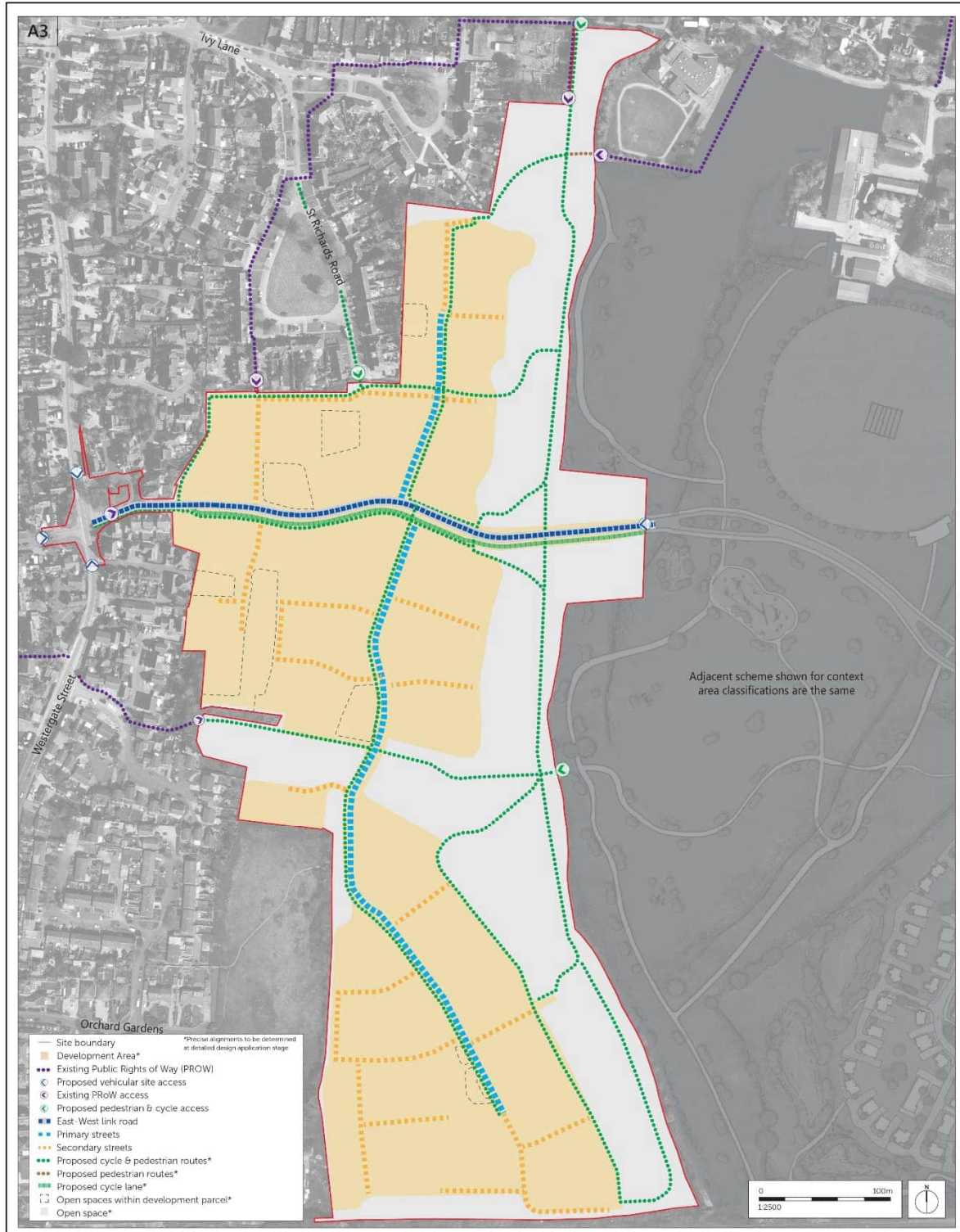


Figure 4-1 - Access, Movement and Street Hierarchy Parameter Plan

4.2 BARNHAM / EASTERGATE / WESTERGATE STRATEGIC DEVELOPMENT SITE

- 4.2.1. An Outline Planning Application with all matters reserved (except for the A29 realignment) to provide up to 1,250 dwelling and associated infrastructure, care home/senior living accommodation, retail

and community facilities, a primary school and open space has been submitted under Planning Application reference BN/11/22/OUT. The Planning Application is currently under review. The proposals include a new A29 alignment link routing north – south through the site boundary and an East-West link through the site, connecting to the Cala site on its Western boundary. It is also proposed that the site will include a Primary School and mixed use local centres.

- 4.2.2. The A29 is being realigned through the development site in a north/south direction. The new connection provided by the spine road will provide a benefit to the highway operation of the local area, in particular the existing A29. The route will be designed in accordance with principles of the Design Manual for Roads and Bridges (DMRB). The northern section of the realigned road is being delivered by WSCC and is proposed as a 30mph single carriageway road. Planning permission for the northern section was granted in June 2021 (ref. WSCC/052/20). The southern section is proposed to be designed to the same principles, with a 30mph speed limit and to be a single carriageway road with localised widening for junctions and crossing points. The A29 realignment south of Barnham Road will be delivered in two-phases aligned with construction of the wider development proposals. The A29 realignment north of the Barnham to Chichester railway line will be delivered as part of phase 1 of Parcel SC1 (1,250 homes) and the realignment south of the railway line will be delivered as part of phase 2 of Parcel SC1 (2,000 homes)
- 4.2.3. The East-West road which will link the existing A29 Westergate Street through the site, to the new realigned A29 and onto B2233 Barnham Road (near Barnham Station). The site access junction and access road for the Cala Homes development forms the western section of the East-West link road.

4.3 SITE ACCESS AND EAST-WEST LINK ROAD

A29 SITE ACCES DESIGN

- 4.3.1. The proposed site access will be achieved via a four-arm signalised junction with Meadow Way, Pine Close and A29 Westergate Street as shown on Drawing LAW-WSP-ZZ-ZZ-C-DR-00006 included in **Appendix D**. The proposed access junction is the same layout which supported the 2017 planning application, which at the time was subject to a Design Statement and Departures from Standards application related to the following aspects:
- Intervisibility between junction stop lines on A29 southern arm, Meadow Way and site access;
 - Forward visibility (SSD) on the A29 northbound approach to the traffic signals; and
 - Forward visibility (SSD) to the back of queuing traffic on the A29 northbound approach to the traffic signals.
- 4.3.2. These Departures from Standards were approved by WSCC as reflected in their 'no objection' response to planning application AL/15/17/PL. However, given that relevant aspects of the DMRB have been updated since submission of the Departures from Standards application in 2017 it has been necessary to complete a review of the design guidance to ensure that all aspects are still applicable to the proposed site access junction.
- 4.3.3. Since 2017, TD50/04 guidance document has been replaced by the CD 123 "Geometric design of at-grade priority and signal-controlled junctions" (November 2021) document whilst the Traffic Signs Manual Chapter 6 (Traffic Control) (2019) also now provides general guidance on the layout of traffic signal junctions with a speed limit of 40mph or below. Following a review of the newly published guidance, it has been determined that the current design standards do not alter the Departure from Standards requirements related to the proposed layout and as such the no objection from the Highway Authority should remain in place.

Road Safety Audit

- 4.3.4. Guidance on the completion of Road Safety Audits has also been published since the 2017 application, making it necessary to undertake a new independent Stage 1 Road Safety Audit (RSA) that aligns with DMRB GG119. This RSA, Designers Response and Decision Log is included in **Appendix E** along with a new Departures from Standard Application taking account of the latest design standards contained within Traffic Signs Manual Chapter 6. The RSA included a number of recommendations which have been taken into account the design of the access junction presented in Drawing LAW-WSP-ZZ-ZZ-C-DR-00006 and the overall access strategy for the site or recommended for inclusion with the detailed design process. These include:
- The provision of yellow box junction markings on the westbound site access approach;
 - The consideration during detailed design of an all red extending loops to ensure the pedestrian crossings are clear before traffic stages commence;
 - Use of MOVA detection to facilitate more accurate traffic staging;
 - Installation of signs to Diagram 543 and 584 of TSGRD on the A29 northbound approach to warn drivers of traffic signals / queueing traffic;
 - The consideration of high coloured surfacing will be reviewed during detailed design;
 - The provision of an offside primary signal head on the A29 northbound approach to maximise visibility to the traffic signals;
 - The consideration of new and enhanced street lighting during the detailed design; and
 - That the Eat-West Link Road does not operate as all vehicle link until the full A29 realignment is complete.
- 4.3.5. One further recommendation was made in relation to the provision of maintenance layby in proximity of site access junction for traffic signal engineers to utilise when undertaking maintenance work. Whilst it was not possible to identify a suitable location where a layby could be provided, it is noted that on-street parking will be available within the northern section of Pine Close and on Meadow Way. Given the infrequent nature of traffic signal maintenance, the use of Pine Close and Meadow Way it is considered that this will not generate a road safety issue.

SITE ACCESS OPERATION

- 4.3.6. It is recommended that the junction will operate with Microprocessor Optimised Vehicle Actuation (MOVA) to minimise vehicle delays on all approaches. The proposed junction will generally operate in three stages with the A29 running together in each direction before Meadow Way and the site access run independently. To aid right turning movements from the A29 ghost-island right turn lanes are provided and northbound traffic will also benefit from the extension of the green phase whilst southbound traffic is held. This will ensure any traffic turning right into the site will clear the junction if they have not found a suitable gap during the normal phase.

EAST-WEST LINK ROAD

- 4.3.7. It is noted that, as part of the BEW strategic development site an East – West Link Road is proposed between the site and the BEW Parcel SC1 that is subject to the BN/11/22/OUT application. A connection to this East-West Link Road from the Cala Homes site will be facilitated by a bridge over the Lindsey Rife which will be constructed as part of the Cala Homes development.
- 4.3.8. As part of pre-application discussion with WSCC, it has agreed that the East-West Link Road bridge will operate as a bus, pedestrian and cycle only route until the full A29 realignment is complete. This strategy mitigates concerns raised by WSP related to the impact of traffic associated with

Parcel SC1 on the operation of the site access junction prior to the full A29 realignment being completed. Further details of this assessment is provided in the Site Access Assessments Technical Note which is appended to the Transport Assessment Scoping Note included in **Appendix A**.

- 4.3.9. The layout of the East-West Link Road with the Cala site is shown on Drawing LAW-WSP-ZZ-ZZ-C-DR-00006 included in **Appendix D**. This consists of a 6.5-7.3m single carriageway road with a 2m footway on the northern side of the link and 2m footway plus an LTN1/20 compliant 3m segregated bidirectional cycle route provided on the southern side of link. Access to the main Cala Home residential parcels will be via a staggered crossroads located approximately 120m east of the centre of the bridge. The design speeds of the East-West Link Road is 50kph.
- 4.3.10. Swept path analysis of a bus and refuse vehicle is shown on Drawings LAW-WSP-ZZ-ZZ-C-DR-00008 and LAW-WSP-ZZ-ZZ-C-DR-00009 included in **Appendix D**.

4.4 PEDESTRIAN AND BICYCLE ACCESS

- 4.4.1. The main access into the site for pedestrians and cyclists will be provided at the main access junction as described above. As part of this junction a pedestrian footway will be provided on the southern side of the site access road to link the existing footway on A29 Westergate Street into the site. From the north pedestrian access will be through Pine Close, which will be closed to through traffic but will remain open for pedestrian access.
- 4.4.2. In addition, the site is well connected via existing footways and enhanced PRow footpaths to surrounding residential areas, schools, village shopping and community facilities. Footpaths that fall within the red line boundary that will be upgraded as part of the development proposals are as follows:
- Footpath 297: routes from the A29 Westergate Street, along Pine Close and connects into St Richard's Road. This will provide connections north to Westergate village centre, Six Villages Sports Centre, Ormiston Six Villages Academy and Eastergate Church of England Primary School;
 - Footpath 298: provides a continuation of Footpath 297 on an east-west alignment connecting on Footpath 296, thereby providing a connection into the north-south routes through the site;
 - Footpath 300: on an east-west alignment and connecting into the north-south routes through site; and
 - Footpath 296 and 317: Provides a north-south connection with Footpath 298 and 300 to provide connections north to Westergate village centre, Six Villages Sports Centre, Ormiston Six Villages Academy and Eastergate Church of England Primary School.
- 4.4.3. Each of these routes, which also link into the wider pedestrian network described in **Section 3.4** will provide pedestrian connections to local facilities thereby removing the need to make trips by private car. Cyclists wishing to reach destinations to the north will be directed via the access onto St Richard's Road shown on Photograph 4, via Ivy Lane and existing shared use path to Church Lane or onto the A29. This will also act as the route to access Barnham village centre and railway station prior to completion of the East-West link road.
- 4.4.4. The proposed site access junction onto A29 Westergate Street described in **Section 4.3** also improves pedestrian access for those wishing to access facilities to the north and west via the A29, through the provision of controlled pedestrian crossings. These destinations include Aldingbourne

Community Sports Centre, Westergate village centre and Aldingbourne Primary School with the benefit of controlled crossing facilities applying to new residents and the existing community.

4.4.5. **Figure 4-2** illustrates the provision of existing walking and cycling connections routing from the site to the wider network.

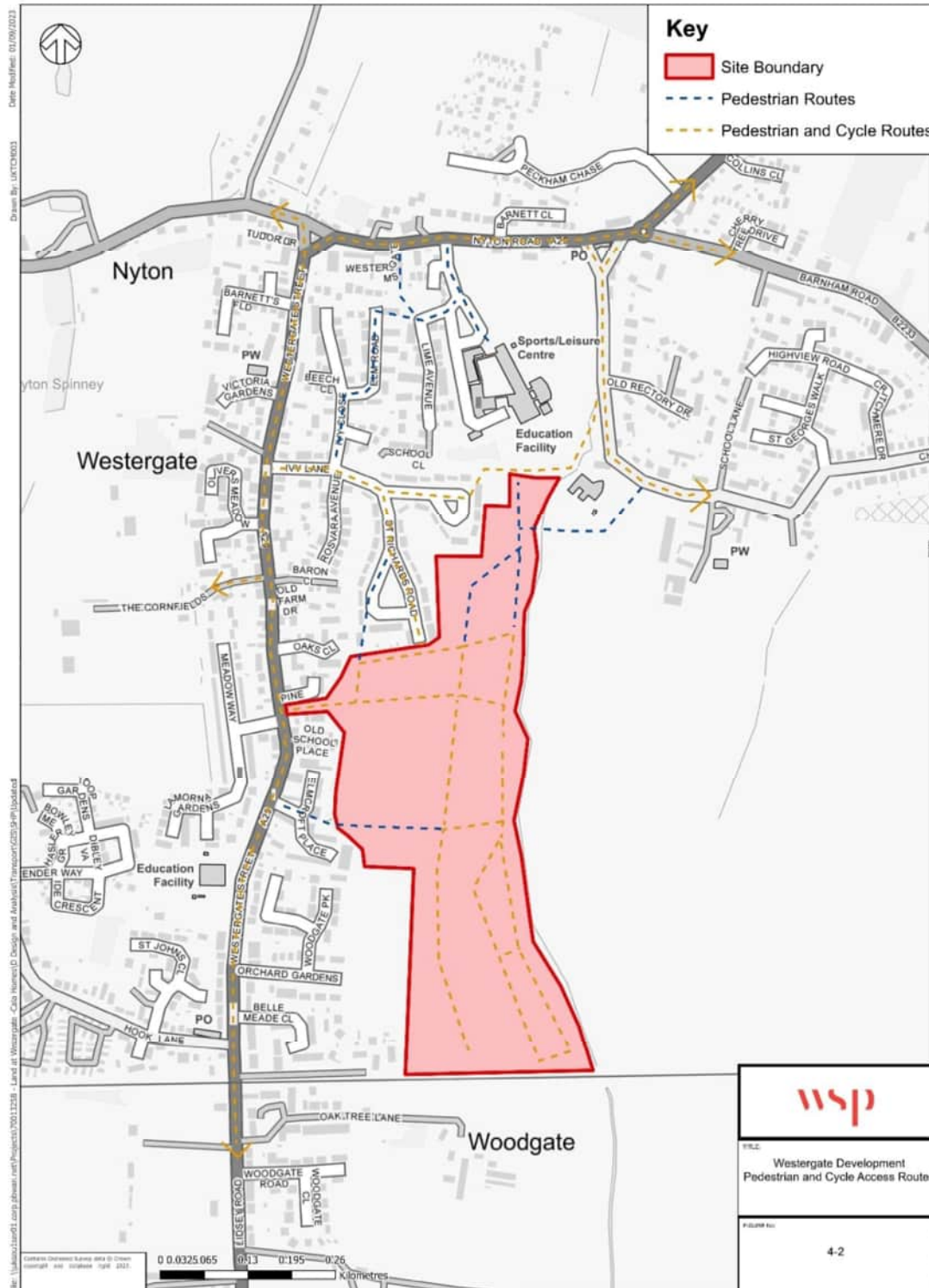


Figure 4-2 - Walking and Cycling Connections

- 4.4.6. The internal road network proposed for the site will follow Manual for Streets principles and guidance. The street network will naturally reinforce low vehicle speeds through design and the streetscape will provide an attractive environment for walking through the site, giving priority to pedestrian and cycle movement over car movements. Existing rights of way through the site will be protected and pedestrian amenity enhanced as described above.
- 4.4.7. The internal road network also forms the first stage of the East-West link road which will provide a link from the existing A29 Westergate Street, through to the realigned A29 and onto B2233 Barnham Road (near Barnham Station). The creation of the East-West link road as part of Parcel SC1 will provide a direct link for pedestrians and cyclists to Barnham Station, proposed local centres within the site and Barnham village centre. To support such cycling trips, the proposed East-West Link Road includes at LTN1/20 compliant bidirectional cycle route adjacent to the southern side of the carriageway.
- 4.4.8. There are no bus stops proposed within the site the nearest bus stops to the site are on A29 Westergate Street near Elmcroft Place or just south of Ivy Lane. These stops can be access via the new site access or via the PRow direct to Elmcroft Place, St Richards Road and Ivy Lane. For the Elmcroft Place bus stops the distance from the furthest point in the masterplan (the south-east corner) is located approximately 680m via the PRow network, or 1,000m via the proposed site access junction. From the north-east corner of the site the Olivers Meadow bus stops are approximately 650m via St Richards Road and Ivy Lane or 770m via the site access junction. To promote trips by public transport, a financial contribution will be made as part of any planning permission to upgrade the southern bus stops on the A29 to include bus shelters. This takes account of existing footway widths on the A29, noting that it is unlikely to be feasible to install bus shelters at the bus stops norther of the site access.

4.5 SERVICING / REFUSE MANAGEMENT

- 4.5.1. It is proposed that the development will be serviced internally through kerbside bin collection with refuse vehicles accessing and egressing the site layout in a forward gear. Turning heads will be provided within the site layout to ensure the safe manoeuvring of refuse vehicles. As part of the future Reserved Matters application, a swept path analysis will be submitted to illustrate a refuse vehicle accessing and egressing the site in a forward gear.

4.6 CAR AND CYCLE PARKING

- 4.6.1. Car and cycle parking will be subject to a Reserved Matters Application. This will be provided in accordance with standards outlined within the West Sussex County Council Guidance on Parking at New Developments (September 2020). This will be inclusive of car, cycle and electric vehicle charging points. As an initial estimate of likely parking provision on site, **Table 4-1** shows car parking demand for the site based upon the Arun District Council parking standards referenced in **Section 2.8**.



Table 4-1 – Car Parking Demand Requirement

Number of Bedrooms	Proposed Number of Units	Car Parking Demand
1	40	80
2	160	320
3	141	281
4+	59	179
Total		860

4.6.2. Cycle parking will be provided in a safe, secure location which is covered and convenient for access.

5 FRAMEWORK TRAVEL PLAN

5.1 INTRODUCTION

- 5.1.1. This section provides a summary of the Framework Travel Plan (FTP) that has been produced to support the development proposals. The FTP has been prepared to complement the transport strategy submitted within this Transport Assessment. It captures current transport and mobility provision around the Site as well as the provision that will be available post-development. These opportunities will be taken as the basis for a detailed Full Travel Plan at the reserved matters stage of the planning process.
- 5.1.2. A Travel Plan involves identifying an appropriate package of measures aimed at promoting sustainable travel, with an emphasis on reducing reliance on single occupancy car journeys. A travel plan should establish a structured strategy with clear objectives and targets, supported by suitable policies and quality measures for implementation. Whilst the location of a development and its proximity to local amenities, facilities and services create underlying conditions to make sustainable travel choices a natural option amongst future users of this Site, it is acknowledged that communicating, incentivising and monitoring uptake of these opportunities is also critical to the success of any Travel Plan.
- 5.1.3. A Travel Plan is essentially a 'living' document requiring ongoing monitoring, review and revision to ensure it remains relevant to the development and those using the Site and provides continuous improvements for its duration. These aspirations and actions should be documented in a Travel Plan, the structure and content of which are dependent upon a range of factors including location, nature of development, the occupiers, and the end-users.
- 5.1.4. The FTP outlines that a Travel Plan Co-ordinator (TPC) will be appointed who will be responsible for the management and ongoing development of the Travel Plan. The TPC will be responsible for developing the following objectives:
- Understand baseline travel patterns for different users of the site, as well as the projected future travel patterns following implementation of the Travel Plan measures;
 - Establish 'inherent' sustainable travel principles for the Proposed Development as a whole;
 - Minimise single occupancy vehicle trips;
 - Facilitate tailored travel information;
 - Encourage healthy and active travel by way of design but also by way of marketing strategies;
 - Reduce local congestion and associated externalities;
 - Support car-free lifestyles;
 - Raise awareness of sustainable modes of transport available for residents and visitors travelling to, from and within the Site;
 - Promote community integration and the use of local services and facilities;
 - Contribute towards protecting and enhancing the environment in and around the site.
- 5.1.5. Baseline Travel Surveys will be undertaken for the proposed development following a minimum 50% unit occupation (although the exact threshold will be subject to discussion and agreement) which will provide a reasonable quantum of data from which the breakdown of baseline travel modes can be established. This will allow for any necessary changes to be made to the Full Travel Plan to ensure that it is fit for purpose. Following the identification of baseline mode share, a series of SMART



(Specific, Measurable, Achievable, Realistic and Time-Bound) targets will be developed to support the Travel Plan.

- 5.1.6. The Travel Plan will employ a range of 'Hard' and 'Soft' measures to effectuate a modal shift away from single occupancy car use towards more sustainable modes. Hard measures are engineering measures incorporated into the design of the Proposed Development and Soft measures relate to marketing and management-type strategies which would be implemented so that site users' sustainable travel behaviour is maximised.
- 5.1.7. A programme of monitoring and review will be implemented to generate information by which the success of the Travel Plan will be evaluated. This will help establish whether the agreed objectives and targets are being met and how these could potentially be modified. The TPC will be responsible for monitoring the Travel Plan and for reporting any findings and updates to WSCC/ADC as appropriate. The TPC will report the results of baseline monitoring surveys to WSCC/ADC within three months of receipt of the results.
- 5.1.8. To enable specific actions to be monitored and tracked, an Action Plan will be provided as part of the Full Travel Plan, containing measurable outputs, outlining target dates, funding and responsibility for actions.



6 DEVELOPMENT TRIP GENERATION, DISTRIBUTION AND ASSIGNMENT

6.1 INTRODUCTION

- 6.1.1. This section summarises the derivation of the trip generation, distribution and assignment for the proposed development.

6.2 TRIP GENERATION

- 6.2.1. An estimate of vehicle trip generation for the Cala Homes development has been calculated using residential trip rates derived from a traffic survey of Meadow Way, opposite the proposed site access. This approach has been agreed with WSCC and National Highways as part of pre-application scoping discussions. The traffic flow recorded was divided by the number of properties located within the Meadow Way cul-de-sac to determine the trip rates recorded in **Table 6-1**. This is deemed to be a more representative method than using the TRICS database due to the close proximity of Meadow Way to the proposed site.

Table 6-1 - Vehicle Trip Rates

Time Period	Arrival	Departure	Two-way
AM	0.151	0.382	0.533
PM	0.290	0.142	0.432

- 6.2.2. Person trip rates will be based upon the trip rates shown in Table 5-4 of the Pell Frischmann TA as calculated using 2011 Census data. These trip rates are shown in **Table 6-2** below.

Table 6-2 - Person Trip Rates

Time Period	Arrival	Departure	Two-way
AM	0.163	0.427	0.590
PM	0.411	0.212	0.623

- 6.2.3. The Vehicle and Person Trip Rates illustrated in **Table 6-1** and **Table 6-2** have been factored by the proposed 400-unit development to calculate the Vehicle and Person Trip Generation associated with the proposed development. These are shown in **Table 6-3** and **Table 6-4**.

Table 6-3 - Vehicle Trip Generation

Time Period	Arrival	Departure	Two-way
AM	60	153	213
PM	116	57	173

Table 6-4 - Person Trip Generation

Time Period	Arrival	Departure	Two-way
AM	65	171	236
PM	164	85	249

6.3 TRIP DISTRIBUTION

- 6.3.1. In order to calculate the trip distribution for the proposed development trips, it is considered appropriate to use the previously agreed methodology with WSCC as part of the AL/15/17/PL planning application. This is summarised below for convenience.
- 6.3.2. The residential trip distribution has been calculated using three different journey types; the first being travel to work using 2011 census data and Google map directions from the site illustrating the quickest route to any destination. The second and third relate to education and other trips (inclusive of shopping, leisure and visiting family/friend). The percentage split of each type of trip has been derived from National Travel Survey Table NTS0502.
- 6.3.3. The distribution of education trips has been calculated by the location of nearby primary and secondary schools and colleges in relation to the proposed development site. The shopping trips as part of the 'other' category has been split evenly north and south from the site as Chichester and Bognor Regis retail parks are a similar distance from the site. The trips to see friends and family has been split 50:50 from the site and then split evenly in each direction. The leisure trip distribution is based on residents going to The Six Villages Sports Centre and Aldingbourne Tennis Club.
- 6.3.4. The trip distribution from the proposed development site has been calculated as shown in **Table 6-5**.

Table 6-5 – Overall Trip Distribution

	AM Peak		PM Peak	
	Arrival	Departure	Arrival	Departure
A29 (North)	3.1%	3.1%	4.9%	4.9%
A27 (East)	6.1%	6.1%	9.7%	9.7%
A27 (West)	21.4%	21.4%	39.1%	39.1%
Britten's Lane (to A285)	1.0%	1.0%	1.5%	1.5%

	AM Peak		PM Peak	
	Arrival	Departure	Arrival	Departure
B2233 Barnham Road	18.8%	18.8%	5.2%	5.2%
A259 Felpham Relief Road	4.4%	4.4%	8.3%	8.3%
A29 (South)	17.6%	17.6%	19.6%	19.6%
Around the Six Villages	27.6%	27.6%	11.7%	11.7%

6.3.5. Based upon the overall trip distribution from the proposed development site, the following split has been calculated for vehicles departing and arriving at the site access junction across the AM and PM peaks:

- Departures turning right (northbound) – 70.2%;
- Departures turning left (southbound) – 29.8%;
- Arrivals turning right (northbound) – 29.8%; and
- Arrivals turning left (southbound) – 70.2%.

6.3.6. All vehicle trip generation will access the site via the proposed A29 site access junction given that the East-West Link road will operate as a pedestrian, cycle and bus link until the full A29 realignment is complete.

6.4 TRAFFIC GROWTH AND COMMITTED DEVELOPMENT

6.4.1. All forecast year assessments will use traffic flows derived from the WSCC CATM. The CATM SATURN model has been developed using the following series of inputs to account for background growth, infrastructure changes and committed development growth as detailed below:

- The background growth consists of predicted traffic growth as a result of general increase in driving over time, calculated by taking account of NTEM-adjusted TEMPRO growth, known committed developments, and the allocated sites within adopted local plans.
- The committed developments consist of other developments which have been approved, such as those not contained within the adopted local plan;
- The wider infrastructure changes are schemes that are committed projects; and
- Other local plan developments consist of sites in adopted Local Plan, including developments by Church Commissioners (Parcel SC1), Barratts, Landacre, Boweries and Pye Homes, which make up the rest of the BEW allocation..

6.5 SCOPE OF JUNCTION ASSESSMENTS

6.5.1. Following Scoping discussions with WSCC it was agreed that the same scope of junction capacity assessments will be undertaken for this Transport Assessment as were used to support the 2017 Planning Application for 350 units. This scope includes the following junctions and is visualised in **Figure 3-10:**

- A27/A29 Eastern Roundabout
- A27 Arundel Road/A27/Arundel Road/A29 Fontwell Roundabout
- A29/B2233 Barnham Road Roundabout

- A27 Arundel Road/B2233 Nyton Road
- A29 Westergate Street/B2233 Nyton Road Priority Junction (South)
- A29 Westergate Street/B2233 Nyton Road Priority Junction (East)
- A29/A259 Rolls Royce Roundabout; and
- A29 Westergate Street/Meadow Way/ Site Access junction

6.5.2. Junction assessments will be carried out using the computer program Junctions 10 developed by Transport Research Laboratory. Junctions 10 includes the ARCADY and PICADY computer modelling software modules which assesses the traffic capacity, queues and delays at roundabouts and priority junctions. Signalised junctions will be assessed using the program LinSig 3 by JCT Consultancy. LinSig provides an assessment of the impact of traffic signals on traffic capacity, queues and delays at a junction.

6.6 ASSESSMENT SCENARIOS

6.6.1. All assessments will be completed using the following peak hours:

- AM Peak: 08:00-09:00; and
- PM Peak: 17:00-18:00.

6.6.2. The following Scenario assessments will be undertaken for each of the junction models:

- Scenario 1 – 2031 Do-Minimum (using “2031 do minimum No Cala” scenario from Pell Frischmann TA). This scenario provides an assessment of how the highway network will operate in 2031 without the Cala Homes development or Parcel SC1;
- Scenario 2 – 2031 Do-Something without BEW Parcel SC1 (using “2031 do minimum” scenario from Pell Frischmann TA). This scenario provides an assessment of how the highway network will operate in 2031 with the Cala Homes development but without BEW Parcel SC1;
- Scenario 3 – 2031 Do-Something with Phase 1 of BEW Parcel SC1 but without the East-West link road connection between the Cala Homes site and Parcel SC1. This scenario provides an assessment of how the highway network will operate with the Cala Homes and Parcel SC1 developments with EW link road bridge operating as a pedestrian, cycle and bus link only; and
- Scenario 4 – 2038 Do Something (using “2038 do something” scenario from Pell Frischmann TA). This provides an assessment of the highway network with the Cala Homes development, Phase 1 and 2 of BEW Parcel SC1, full East-West link road and A29 realignment.

6.6.1. **Table 6-6** presents what is included within each of the assessment scenarios, breaking down each of the elements of development and infrastructure improvements likely to occur in the local area.

Table 6-6 – Breakdown of Assessment Scenarios

	Background Growth	Committed Developments	Infrastructure improvements	Cala Development Traffic	BEW Parcel SC1 Phase 1*	East- West Link Road	BEW Parcel SC1 Phase 2**
Scenario 1	✓	✓	✓				
Scenario 2	✓	✓	✓	✓			

	Background Growth	Committed Developments	Infrastructure improvements	Cala Development Traffic	BEW Parcel SC1 Phase 1*	East- West Link Road	BEW Parcel SC1 Phase 2**
Scenario 3	✓	✓	✓	✓	✓		
Scenario 4	✓	✓	✓	✓	✓	✓	✓

*Parcel SC1 Phase 1: 1,200 homes, 61 C2 care home units, 3FE primary school and A29 realignment north of Chichester-Barnham railway line.

**Parcel SC2 Phase 2: Phase 1 + 2,000 homes and full realignment of A29.

- 6.6.2. Traffic flows for Scenario 3 (including BEW Parcel SC1 without East-West Link Road) have been extrapolated using the following scenarios included within the Pell Frischmann TA:
- 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 and No East-West Link Road; and
 - 2031 Do Minimum: background growth + committed developments + wider infrastructure changes + other local plan developments and associated infrastructure.
- 6.6.3. Using a combination of these scenarios will allow an estimate to be made of development traffic flows associated with a scenario whereby the proposed development and BEW parcel SC1 phase 1 are complete but are accessed independently (i.e. without the East-West Link Road providing a connection between the two sites).
- 6.6.4. The traffic flows outputs from the CATM have been input into Junctions 10 / LinSig models to provide a 'Do Minimum' assessment of the junction performance. The trip generation from the proposed Cala development will then provide a 'Do Something' scenario. Traffic flow diagrams for all scenarios are provided in **Appendix F**.

7 JUNCTION CAPACITY ASSESSMENTS

7.1 INTRODUCTION

- 7.1.1. Junction assessments have been carried out using the program Junctions 10 developed by Transport Research Laboratory. Junctions 10 includes the ARCADY and PICADY computer modelling software modules which assesses the traffic capacity, queues and delays at roundabouts and priority junctions. Signalised junctions have been assessed using the program LinSig 3 by JCT Consultancy. LinSig provides an assessment of the impact of traffic signals on traffic capacity, queues and delays at a junction.
- 7.1.2. The results of the roundabout and priority junction assessments are expressed in terms of the predicted Ratio of Flow to Capacity (RFC) for each arm of the junction. The RFC provides a numerical indication of the likely performance of a junction. Volume 6 Section 2 of Design Manual for Roads and Bridges (Highways England) contains the document TA23/81 Junctions and Access: Determination of Size of Roundabouts and Major/Minor Priority Junctions, which provides advice on the interpretation of RFC values. The document states that if any arm has an RFC ratio of around 0.85 queuing will theoretically be avoided in five out of six cases. Therefore, an RFC below 0.85 is regarded as demonstrating that the junction would work satisfactorily with minimal delay to vehicular traffic. RFC values over 1.0 indicate that the junction is over design capacity and significant delays are likely to result on at least one arm of the junction.
- 7.1.3. The junction assessments also produce an estimate of the maximum queue lengths for each arm. Queue lengths are expressed in the number of vehicles or Passenger Car Units (PCU).
- 7.1.4. LinSig models provide an indication of the Degree of Saturation (DoS) as a percentage and the Mean Maximum Queue (MMQ) in Passenger Car Units (PCUs) for each junction approach, the average delay per vehicle on each approach, recorded in seconds and the Practical Reserve Capacity (PRC), which is a measure of the junction's total capacity (as a percentage). When reviewing the PRC of a junction the following is considered:
- A positive figure indicates the junction operates with reserve capacity;
 - A negative figure less than -10%, suggests that the junction would be broadly at capacity; and
 - A negative figure more than -10% indicates that the junction cannot accommodate the demand.
- 7.1.5. For DoS the thresholds can be categorised as follows:
- Less than 90%: Any queues that have built up will be able to disperse during the relevant stage in each cycle;
 - 90-100%: Indicates that an arm is close to its theoretical capacity and any queue that has built up does not fully clear within each cycle; and
 - More than 100%: Indicates an arm is over its theoretical capacity and significant queues are likely as a result.
- 7.1.6. Where junctions were found to be operating at-capacity or over-capacity in the forecast scenarios these have been assessed using DIRECT traffic flow inputs with a flat profile across the peak hour. This is to reflect how junctions operate in congested conditions and applies a consistent approach to the junction capacity assessments by applying the same methodology as Pell Frischmann Transport Assessment completed for BEW Parcel SC1 (BN/11/22/OUT).

7.2 A27 JUNCTION IMPROVEMENTS

- 7.2.1. As part of evidence base for the adopted Arun Local Plan a number of transport studies were completed to confirm improvements that would be needed to support planned growth in the region. These included the 2016 Arun Transport Study, 2017 Enterprise Bognor Regis Transport Review and the WSCC / ADC Local Plan Transport Mitigation Apportionment Study (2020). The first two of these studies identified and refined a transport mitigation package that would support the Local Plan whilst the Apportionment Study detailed how development across the District should contribute towards the cost of such mitigation.
- 7.2.2. The 2017 Enterprise Bognor Regis Transport Review identified mitigation measures for the following junctions included within the scope of this TA:
- A27 / A29 Eastern Roundabout (site 1 in this TA);
 - A27 / A29 Western Roundabout (site 2 in the TA);
 - A27 / B3322 Nyton Road priority junction (site 4 in this TA); and
 - A29 / A259 Felpham / Bognor Regis Relief Road Roundabout (site 8 in this TA).
- 7.2.3. A brief summary of each of these improvements schemes is discussed below.

A27 / A29 EASTERN ROUNDABOUT

- 7.2.4. The proposals identified for this junction involve the widening and signalisation of the A27 approaches as shown in **Figure 7-1** below. As this scheme is yet to be implemented junction capacity assessments for the A27 / A29 junction have been completed in **Section 7.4 to 7.6** with the improvement only where the existing layout is forecast to operate close to capacity or over capacity.

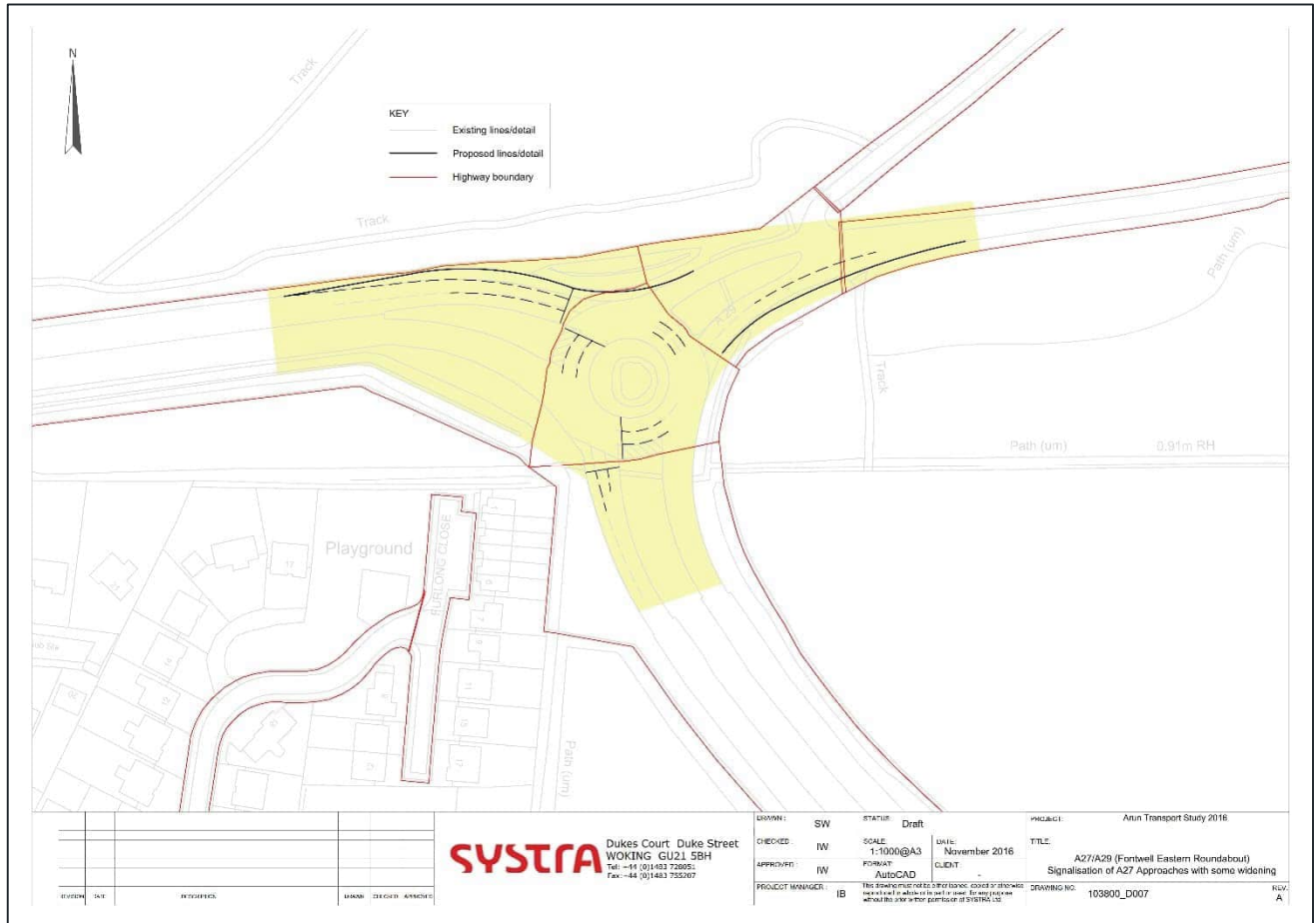


Figure 7-1 - A27/ A29 Eastern Roundabout Improvement Scheme

A27 / A29 WESTERN ROUNDABOUT

- 7.2.5. The committed scheme to convert the A27/ Arundel Road/ A29 Fontwell Avenue roundabout into a signalised roundabout was completed in summer 2023. The improvement scheme was delivered through the Land East of Fontwell Avenue Planning application and is designed to accommodate the developments in the Arun Local Plan and the realignment of the A29.
- 7.2.6. This scheme has signalised the A27 approaches from the west and the north and on the corresponding circulatory arms. **Figure 7-2** below.



Figure 7-2 - A27/ A29 Western Roundabout Improvement Scheme

- 7.2.7. As this scheme is already operational it has been used within all junction capacity assessments for the A27/ Arundel Road/ A29 Fontwell Avenue roundabout in **Section 7.3 to 7.6** with and without the improvements.

A27 / B3322 NYTON ROAD PRIORITY JUNCTION

- 7.2.8. The 2017 Enterprise Bognor Regis Transport Review considered mitigation for this junction that including lengthening the acceleration / auxiliary lane for the left turn from the Nyton Road and removing the A27 eastbound right turn from Nyton Road. However, it was noted that this scheme was unable to mitigate 'severe' impacts at this junction and therefore the preferred approach was to close the right the right turn from the A27 without implementing any changes to Nyton Road.
- 7.2.9. This was confirmed during pre-determination discussions with National Highways as part of planning application AL/15/17/PL. However, as a timeframe for this closure has not been confirmed all junction capacity assessments included in **Section 7.4 to 7.6** assume that the right turn remains open.

A29 / A259 FELPHAM / BOGNOR REGIS RELIEF ROAD ROUNDABOUT

- 7.2.10. The identified mitigation scheme for this junction involving the widening of the northbound, westbound and southbound approaches to the roundabout to increase traffic flow through the junction. This is shown on **Figure 7-3** below.

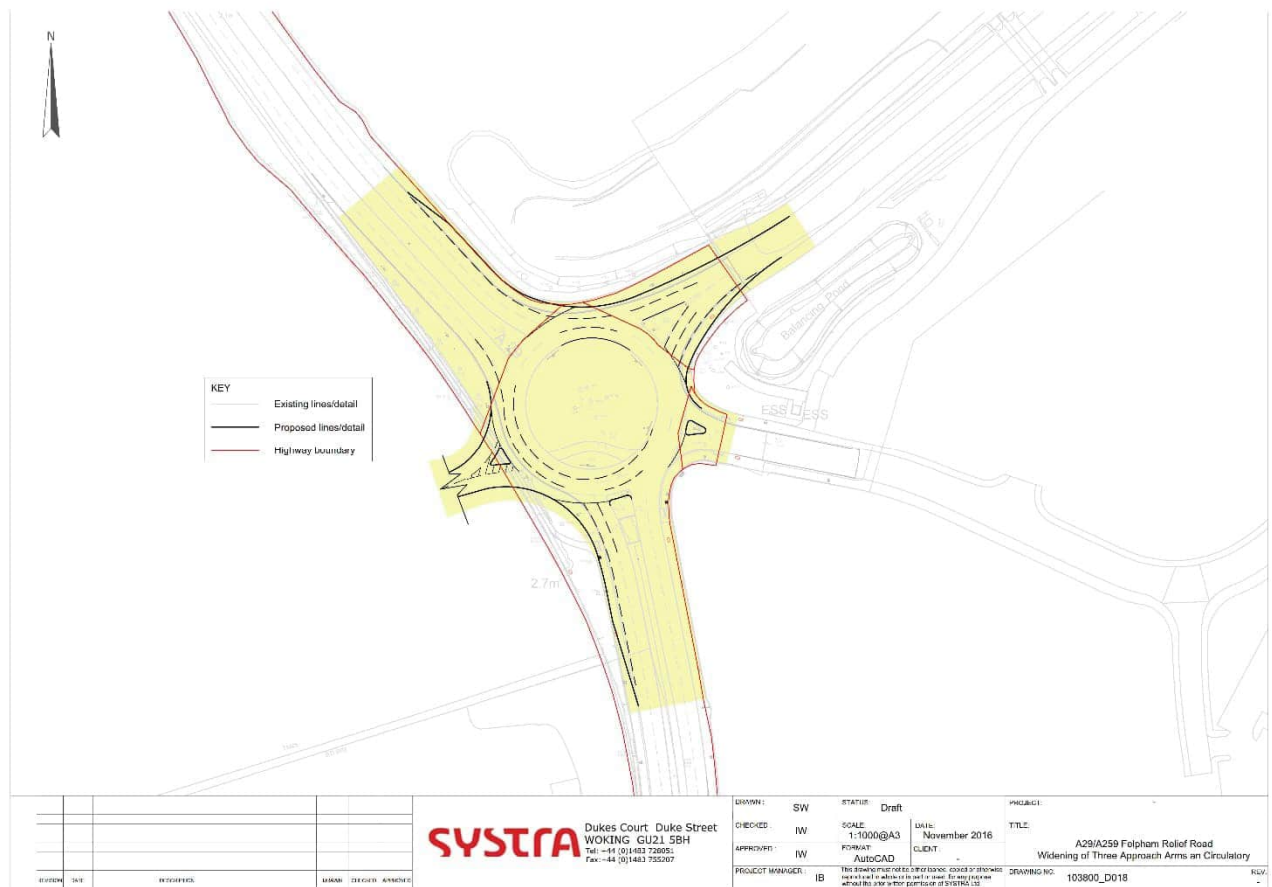


Figure 7-3 - A29 / A259 Felpham / Bognor Regis Relief Road Improvement Scheme

7.2.11. As this scheme is yet to be implemented junction capacity assessments for the A29 / A259 junction have been completed using the improvement scheme only where the junction is forecast to operate close to capacity or over capacity.

7.3 SCENARIO 1 – 2031 DO MINIMUM

SITE 1: A27 – A29

7.3.1. **Table 7-1** summarises the Scenario 1 modelling results for the A27/ A29 roundabout for Scenario 1. This scenario provides an assessment of how the highway network will operate in 2031 without the Cala Homes development or Parcel SC1. Full junction capacity outputs are provided in **Appendix C**.

Table 7-1 – A27 / A29 Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A29	0.58	8	2	0.78	18	4

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	A27 (East)	0.57	3	2	0.46	3	1
C	A27 (West)	0.53	3	2	0.59	3	2

- 7.3.2. The Scenario 1 modelling results indicate that the junction will operate within theoretical capacity in the AM peak and PM peak period. The maximum RFC of 0.73 is recorded on the approach from the A29 in the PM peak with an associated queue of 4 vehicles and delay of 18 seconds suggests the junction arm is at capacity.

SITE 2: A27 – ARUNDEL ROAD – A29 FONTWELL AVENUE

- 7.3.3. The 2031 Scenario 2 modelling results for the roundabout are presented in **Table 7-2**.

Table 7-2 – A27 / Arundel Road / A29 Fontwell Avenue Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak				PM Peak			
		DoS %	Av Delay	MMQ	UQ ED	DoS %	Av Delay	MMQ	UQ ED
A	A27 (East)	72	10	13	5	80	19	15	7
B	Arundel Road	10	2	0	-	9	2	0	-
C	A29 Fontwell Avenue	93	30	14	-	47	6	3	-
D	A27 Arundel Road	67	15	4	3	94	17	15	4
E	Northern Circ	84	55	8	5	83	30	12	6
F	Western Circ	41	17	4	3	49	37	3	2
Overall PRC/ Cycle Time		-2.8% PRC and 60s Cycle Time				-4% PRC and 60s Cycle Time			

- 7.3.4. The modelling results for the signalised roundabout forecasts that the junction will operate at capacity in both the AM and PM peak. The maximum Degree of Saturation is 94% on the approach from the A27 Arundel Road in the PM peak, this equates to a delay of 17 seconds with a mean max queue of 15PCUs and 4PCUs at the back of a uniform queue at the end of a red phase.

SITE 3: A29 – BARNHAM ROAD

- 7.3.5. The modelling results from the A29/ Barnham Road roundabout for Scenario 1 is presented in **Table 7-3**.

Table 7-3 - A29 / Barnham Road (War Memorial) Roundabout Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.53	7	2	0.40	6	1
B	A29 Nyton Road	0.52	4	2	0.45	4	1
C	A29 Fontwell Avenue	0.52	8	2	0.65	10	2

- 7.3.6. The A29/ B2233 Barnham Road modelling results indicates that the junction will operate within capacity in the AM and PM peak. The maximum RFC of 0.65 occurs on the approach from Barnham Road with an associated delay of ten seconds and a queue of two vehicles.

SITE 4: A27 - NYTON ROAD

- 7.3.7. **Table 7-4** presents the modelling results from Scenario 1 for the A27/ Nyton Road priority junction.

Table 7-4 - A27 / Nyton Road Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.13	1	1	0.15	1	1
C	A27 (West)	0.39	17	1	0.43	19	2

- 7.3.8. The modelling results summarised above indicates that the junction will operate within capacity in the AM peak and PM peak. The maximum RFC of 0.43 occurs in the PM peak on the approach from the A27 (west) with an associated delay of 19 seconds and a queue of two vehicles, which highlights that the arm is at capacity.

SITE 5: WESTERGATE STREET - NYTON ROAD (EAST JUNCTION)

- 7.3.9. The modelling results from Westergate Street/ Nyton Road (East Junction) priority junction for Scenario 1 is presented in **Table 7-5**.

**Table 7-5 –A29 / Nyton Road East Scenario 1 Junction Capacity Assessment**

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.46	14	1	0.58	15	2
C	Nyton Road A29	0.80	36	4	0.33	11	1

- 7.3.10. The Scenario 1 modelling results forecasts the priority junction operates within capacity in the AM and PM peaks. The maximum RFC of 0.80 occurs on the approach from A29 Nyton Road in the AM peak with a total delay of 36 seconds and an associated queue of four vehicles.

SITE 6: WESTERGATE STREET – NYTON ROAD (SOUTH JUNCTION)

- 7.3.11. **Table 7-6** presents the modelling results from Scenario 1 for Westergate Street/ Nyton Road (South Junction) priority junction.

Table 7-6 –A29 / Nyton Road South Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.3	20	1	0.53	23	2
C	Nyton Road A29	0.0	0	0	0.0	0	0

- 7.3.12. The Scenario 1 modelling results indicates the priority junction will operate within capacity in the AM and PM peaks. The maximum RFC of 0.53 occurs on the approach from B2233 Nyton Road in the PM peak with a total delay of 23 seconds and an associated queue of two vehicles.

SITE 7: WESTERGATE STREET – NYTON ROAD (NORTH JUNCTION)

- 7.3.13. Westergate Street/ Nyton Road (North Junction) modelling results for Scenario 1 are presented in **Table 7-7**.

Table 7-7 –A29 / Nyton Road North Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.48	13	1	0.28	8	1
C	Nyton Road A29	0.16	9	1	0.31	10	1

- 7.3.14. The modelling results forecasts the junction operates within capacity in the AM and PM peaks. The maximum RFC of 0.48 is forecast on the approach from the B2233 Nyton Road in the AM peak with an associated delay 13 seconds and a queue of a single vehicle.

SITE 8: A29/A259 FELPHAM RELIEF/INDUSTRIAL ESTATE

- 7.3.15. The junction modelling for Scenario 1 of A29/ A259 Felpham Relief Road/ Industrial Estate is presented in **Table 7-8**.

Table 7-8 – A29 / A259 Roundabout Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A259	0.84	20	6	0.63	10	2
B	Rolls Royce Access	0.41	9	1	0.69	16	3
C	A29 (South)	0.69	6	3	0.64	5	2
D	Saltbox Road	0.05	3	1	0.32	6	1
E	A29 (North)	0.38	3	1	0.53	5	2

- 7.3.16. The Scenario 1 modelling results forecasts the five-arm roundabout operates within capacity in the AM and PM peaks. The maximum RFC of 0.84 occurs on the approach from A259 in the AM peak with a total delay of 20 seconds and an associated queue of six vehicles.

SCENARIO 1 JUNCTION ASSESSMENT SUMMARY

- 7.3.17. The junction capacity assessments highlights that the following junction are forecast to operate at capacity in Scenario 1:

- Site 2: A27 / Arundel Road / A29 Fontwell Signalised Roundabout.

- 7.3.18. None of the junctions are forecast to over their theoretical capacity in the 2031 Do-Minimum scenario.

7.4 SCENARIO 2 – 2031 DO SOMETHING

- 7.4.1. The results from the junctions are shown below with Scenario 2 being 2038 do minimum AM and PM peaks. This scenario provides an assessment of how the highway network will operate in 2031 with the Cala Homes development but without BEW Parcel SC1. Full junction capacity outputs are provided in **Appendix C**.

SITE 1: A27 – A29

- 7.4.2. **Table 7-9** summarises the Scenario 2 modelling results for the A27 A29 roundabout for Scenario 2.

Table 7-9 – A27 / A29 Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A29	0.58	8	2	0.78	22	4
B	A27 (East)	0.57	3	2	0.46	3	1
C	A27 (West)	0.53	3	2	0.59	3	2

- 7.4.3. The Scenario 2 modelling results indicate that the junction will operate within theoretical capacity in the AM peak and PM peak period. The maximum RFC of 0.78 is recorded on the approach from the A29 in the PM peak with an associated queue of four vehicles on the A29 approach. The development proposals increase traffic delay by a maximum of one second in comparison with the 2031 Do Minimum scenario.
- 7.4.4. As the junction is forecast to operate within capacity the proposed identified improvements scheme does not need to be implemented in the 2031 Do Something scenario.

SITE 2: A27 – ARUNDEL ROAD – A29 FONTWELL AVENUE

- 7.4.5. The junction modelling for Scenario 2 of A27/ Arundel Road/ A29 Fontwell Avenue signalised roundabout is presented in **Table 7-10**.

Table 7-10 – A27 / Arundel Road / A29 Fontwell Avenue Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak				PM Peak			
		DoS %	Total Delay	MMQ	UQ ED	DoS %	Total Delay	MMQ	UQ ED
A	A27 (East)	72	10	13	5	80	19	14	7
B	Arundel Road	9	2	0	-	9	2	0	-
C	A29 Fontwell Avenue	93	31	14	-	46	6	3	-
D	A27 Arundel Road	61	11	7	4	94	17	15	4
E	Northern Circ	85	48	8	4	83	31	12	7
F	Western Circ	51	19	5	3	49	36	3	2
Overall PRC/ Cycle Time		-3.1% PRC and 60s Cycle Time				-3.9% PRC and 60s Cycle Time			

- 7.4.6. The modelling results for the signalised roundabout forecasts that the junction will operate at capacity in both the AM and PM peak. The results present that the development traffic will have a negligible impact on the operation of the signalised roundabout in the AM and PM peak. The

approach that operates with the highest Degree of Saturation continues to be The A27 Arundel Road approach in Scenario 2 during the PM peak but has no impact on delay or forecasting queueing.

SITE 3: A29 – BARNHAM ROAD

- 7.4.7. The modelling results from the A29/ Barnham Road roundabout for Scenario 2 is presented in **Table 7-11**.

Table 7-11 A29 / Barnham Road (War Memorial) Roundabout Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.55	8	2	0.41	6	1
B	A29 Nyton Road	0.55	5	2	0.46	4	1
C	A29 Fontwell Avenue	0.54	8	2	0.68	11	3

- 7.4.8. The A29/ B2233 Barnham Road modelling results for Scenario 2 indicates the junction is operating within capacity in the AM and PM peak. The maximum RFC of 0.68 occurs on the approach from Barnham Road with an associated delay of 11 seconds and a queue of three vehicles.

SITE 4: A27 – NYTON ROAD

- 7.4.9. **Table 7-12** presents the modelling results from Scenario 2 for the A27/ Nyton Road priority junction.

Table 7-12 - A27 / Nyton Road Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	B2233 Nyton Road	0.15	1	1	0.08	1	1
C	A27 (West)	0.43	18	1	0.66	23	2

- 7.4.10. The modelling results summarised above indicates that the junction will operate within capacity in the AM and PM peak. The maximum RFC of 0.66 occurs in the PM peak on the approach from the A27 (west) with an associated delay of 23 seconds and a queue of two vehicles. Whilst traffic associated with the proposed development is forecast to increase delay by four seconds the queue length remains at two vehicles.

SITE 5: WESTERGATE STREET – NYTON ROAD (EAST JUNCTION)

- 7.4.11. The modelling results from Westergate Street/ Nyton Road (East Junction) priority junction for Scenario 2 is presented in **Table 7-13**.

Table 7-13 - A29 / Nyton Road East Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	B2233 Nyton Road	0.48	15	1	0.58	15	2
C	A29 Nyton Road	0.83	43	5	0.33	11	1

- 7.4.12. The Scenario 2 modelling results forecasts the priority junction operates within capacity in the AM and PM peaks. The maximum RFC of 0.83 occurs on the approach from A29 Nyton Road in the AM peak with a total delay of 43 seconds and an associated queue of five vehicles. In comparison with the 2031 Do Minimum scenario, the development traffic is predicted to increase delay by seven seconds with a queue length increase by a single vehicle.

SITE 6: WESTERGATE STREET – NYTON ROAD (SOUTH JUNCTION)

- 7.4.13. **Table 7-14** presents the modelling results from Scenario 2 for Westergate Street/ Nyton Road (South Junction) priority junction.

Table 7-14 – A29 / Nyton Road South Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.39	25	1	0.71	38	3
C	Nyton Road A29	0.00	0	0	0.00	0	0

- 7.4.14. The Scenario 2 modelling results indicates the priority junction operates well within at capacity in the AM and PM peak. The maximum RFC of 0.71 occurs on the approach from the B2233 Nyton Road with a total delay of 38 seconds and a queue of three vehicles. The proposed development is forecast to have a negligible impact on the operation of this junction.

SITE 7: WESTERGATE STREET – NYTON ROAD (NORTH JUNCTION)

- 7.4.15. Westergate Street/ Nyton Road (North Junction) modelling results for Scenario 2 are presented in **Table 7-15**.

Table 7-15 – A29 / Nyton Road North Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.54	14	2	0.32	9	1
C	Nyton Road A29	0.19	10	1	0.39	11	1

- 7.4.16. The modelling results indicates the junction operates within capacity in the AM and PM Peaks. The maximum RFC of 0.54 occurs on the approach from the B2233 Nyton Road with a total delay of 14 seconds and a queue of two vehicles. The proposed development is forecast to have a negligible impact on the operation of this junction.

SITE 8: A29 - A259 FELPHAM RELIEF/INDUSTRIAL ESTATE

- 7.4.17. The junction modelling for Scenario 2 of A29/ A259 Felpham Relief Road/ Industrial Estate is presented in **Table 7-16**.

Table 7-16 – A29 / A259 Roundabout Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A259	0.86	22	6	0.65	11	2
B	Rolls Royce Access	0.42	9	1	0.71	17	3
C	A29 (South)	0.70	6	3	0.65	5	2
D	Saltbox Road	0.05	4	1	0.32	6	1
E	A29 (North)	0.40	4	1	0.54	5	2

- 7.4.18. The Scenario 2 modelling results indicates the five-arm roundabout is approaching capacity in the AM peak and operates within capacity in the PM peaks. The maximum RFC of 0.86 occurs on the approach from A259 in the AM peak with a total delay of 22 seconds which is an increase two seconds compared to Scenario 1 and an associated queue of six vehicles which does not increase compared to Scenario 1.

SITE 9: A29 WESTERGATE STREET/ MEADOW WAY/ ACCESS ROAD (ACCESS JUNCTION)

- 7.4.19. The modelling results for the Site Access junction are presented in **Table 7-17** below.

Table 7-17 – A29 Westergate Street/ Meadow Way/ Access Road Scenario 2 Junction Capacity Assessment.

Arm	Approach	AM Peak			PM Peak		
		DoS %	Av Delay (s)	MMQ	DoS %	Av Delay (s)	MMQ
A	A29 Westergate Street (North)	84	44	19	86	41	26
B	Site Access	82	101	7	50	85	3
C	A29 Westergate Street (South)	79	34	23	56	22	13
D	Meadow Way	79	116	5	72	109	4
Overall Junction		PRC: 7.9% Cycle Time: 120s			PRC: 5.7% Cycle Time: 120s		

- 7.4.20. The junction modelling results forecast that the site access junction will operate within capacity in the AM and PM peak. The maximum Degree of Saturation is 86% on the approach from the A29 Westergate Street (North) in the PM peak, this equates to a delay of 41 seconds with a mean max queue of 26PCUs. The forecast queue lengths will not block back to the A29 level crossing.

SCENARIO 2 JUNCTION ASSESSMENT SUMMARY

- 7.4.21. The junction capacity assessments highlight that all of the junctions operate either within or at capacity with the proposed development traffic included.

7.5 SCENARIO 3 – 2031 DO SOMETHING + BEW DEVELOPMENT

- 7.5.1. The results from the junctions are shown below with Scenario 3 – 2031 Do Something with the BEW Development for the AM and PM peaks. This scenario provides an assessment of how the highway network will operate with the Cala Homes and Parcel SC1 developments with EW link road bridge operating as a pedestrian, cycle and bus link only. Full junction capacity outputs are provided in **Appendix C**.

SITE 1: A27 – A29

- 7.5.2. **Table 7-18** summarises the Scenario 3 modelling results for the A27 A29 roundabout for Scenario 3.

Table 7-18 – A27 / A29 Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A29	0.57	8	2	0.82	22	5
B	A27 (East)	0.59	3	2	0.45	3	1
C	A27 (West)	0.53	3	2	0.49	3	2

- 7.5.3. The Scenario 3 modelling results indicate that the junction will operate within theoretical capacity in the AM peak and is approaching capacity in the PM peak period. The maximum RFC of 0.82 is recorded on the approach from the A29 in the PM peak with an associated queue of five which is an increase of one vehicle compared to Scenario 2 and delay of 22 seconds which is an increase of four seconds compared to Scenario 2.
- 7.5.4. As the junction is forecast to operate within capacity the proposed identified improvements scheme does not need to be implemented in the 2031 Do Something + BEW Development scenario.

SITE 2: A27 – ARUNDEL ROAD – A29 FONTWELL AVENUE

- 7.5.5. The junction modelling for Scenario 3 of A27/ Arundel Road/ A29 Fontwell Avenue signalised roundabout is presented in **Table 7-19**.

Table 7-19 – A27 / Arundel Road / A29 Fontwell Avenue Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak				PM Peak			
		DoS %	Total Delay	MMQ	UQ ED	DoS %	Total Delay	MMQ	UQ ED
A	A27 (East)	73	11	13	6	84	23	16	8
B	Arundel Road	11	2	0	-	6	2	0	-
C	A29 Fontwell Avenue	96	40	18	-	45	6	2	-
D	A27 Arundel Road	65	14	8	5	94	16	15	4
E	Northern Circ	88	57	9	6	87	31	14	7
F	Western Circ	40	17	4	3	51	38	3	2
Overall PRC/ Cycle Time		-6.2% PRC and 60s Cycle Time				-3.5% PRC and 60s Cycle Time			

- 7.5.6. The modelling results for the signalised roundabout forecasts that the junction will operate at capacity in both the AM and PM peak. The results show that the addition of the BEW development traffic will have slight negative impact on the roundabout operation in the AM peak and a negligible impact in the PM peak. The approach that operates with the highest Degree of Saturation in the A29 Fontwell Avenue with a DoS of 96% in Scenario 2 during the AM peak, with associated delay of 40 seconds and a MMQ of 18PCUs. This means that queuing built up during the red stage will not fully disperse during the greens stage for A29 Fontwell Avenue but this is not an uncommon situation during peak traffic periods.

SITE 3: A29 – BARNHAM ROAD

- 7.5.7. The modelling results from the A29/ Barnham Road roundabout for Scenario 3 is presented in **Table 7-20**.

Table 7-20 - A29 / Barnham Road (War Memorial) Roundabout Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.70	11	3	0.51	7	1
B	A29 Nyton Road	0.55	5	2	0.54	4	2
C	A29 Fontwell Avenue	0.55	8	2	0.70	13	3

- 7.5.8. The A29/ B2233 Barnham Road modelling results forecasts the junction is operating within capacity in the AM and PM peak. The maximum RFC of 0.70 occurs on the approach from the A29 Fontwell Avenue with an associated delay of 13 seconds and a queue of three vehicles.

SITE 4: A27 - NYTON ROAD

- 7.5.9. Table 7-21 presents the modelling results from Scenario 3 for the A27/ Nyton Road priority junction.

Table 7-21 –A27 / Nyton Road Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	B2233 Nyton Road	0.16	1	1	0.07	1	1
C	A27 (West)	0.42	18	1	0.70	26	3

- 7.5.10. The modelling results summarised above indicates that the junction will operate within capacity in the AM and PM peak. The maximum RFC of 0.70 occurs in the PM peak on the approach from the A27 (west) with an associated delay of 26 seconds and a queue of three vehicles.

SITE 5: WESTERGATE STREET - NYTON ROAD (EAST JUNCTION)

- 7.5.11. The modelling results from Westergate Street/ Nyton Road (East Junction) priority junction for Scenario 3 is presented in **Table 7-22**.

Table 7-22 –A29 / Nyton Road East Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue

B	B2233 Nyton Road	0.52	15	2	0.72	23	3
C	A29 Nyton Road	1.03	229	32	0.45	13	1

- 7.5.12. The Scenario 3 modelling results indicates the priority junction operates overcapacity in the AM peak and within capacity in the PM peak. The maximum RFC of 1.03 occurs on the approach from A29 Nyton Road for the right turn movement into the B2233 Nyton Road in the AM peak with a total delay of 229 seconds and an associated queue of 32 vehicles. This is a significant increase in comparison with 2031 Do-Minimum scemarop. This reflects the additional traffic associated with Parcel SC1 using the A29 to access the A27 (departures) but also the traffic that now has to route past this junction as a result of the East-West Link Road being closed to through traffic between the Cala site and Parcel SC1.

SITE 6: WESTERGATE STREET – NYTON ROAD (SOUTH JUNCTION)

- 7.5.13. **Table 7-23** presents the modelling results from Scenario 3 for Westergate Street/ Nyton Road (South Junction) priority junction.

Table 7-23 –A29 / Nyton Road South Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.38	25	1	0.74	46	3
C	Nyton Road A29	0.00	0	0	0.00	0	0

- 7.5.14. The Scenario 3 modelling results indicates the priority junction operates well within at capacity in the AM and PM peak.

SITE 7: WESTERGATE STREET – NYTON ROAD (NORTH JUNCTION)

- 7.5.15. Westergate Street/ Nyton Road (North Junction) modelling results for Scenario 3 are presented in **Table 7-24**.

Table 7-24 –A29 / Nyton Road North Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.52	14	2	0.31	9	1
C	Nyton Road A29	0.19	10	1	0.38	11	1

- 7.5.16. The modelling results forecast the junction operates within capacity in the AM and PM Peaks. The maximum RFC of 0.52 occurs on the approach from the B2233 Nyton Road with a total delay of 14 seconds and a queue of two vehicles.

SITE 8: A29/A259 FELPHAM RELIEF/INDUSTRIAL ESTATE

7.5.17. The junction modelling for Scenario 3 of A29/ A259 Felpham Relief Road/ Industrial Estate is presented in **Table 7-25**.

Table 7-25 – A29 / A259 Roundabout Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A259	0.87	28	7	0.81	22	5
B	Rolls Royce Access	0.48	12	1	0.90	57	8
C	A29 (South)	0.75	7	4	0.73	6	5
D	Saltbox Road	0.06	4	1	0.39	8	1
E	A29 (North)	0.58	5	2	0.70	7	3

7.5.18. The Scenario 3 modelling results forecasts the five-arm roundabout is approaching capacity in the AM and PM peaks. The maximum RFC of 0.90 occurs on the approach from A259 in the AM peak with a total delay of 57 seconds which is an increase 40 seconds compared to Scenario 1 and an associated queue of eight vehicles which is an increase five vehicles compared to Scenario 1.

SITE 9: A29 WESTERGATE STREET/ MEADOW WAY/ ACCESS ROAD (ACCESS JUNCTION)

7.5.19. The modelling results for the Site Access junction are presented in **Table 7-26** below.

Table 7-26 – A29 Wester gate Street/ Meadow Way/ Access Road Scenario 3 Junction Capacity Assessment.

Arm	Approach	AM Peak			PM Peak		
		DoS %	Av Delay (s)	MMQ	DoS %	Av Delay (s)	MMQ
A	A29 Westergate Street (North)	89	50	23	92	50	30
B	Site Access	83	102	8	56	88	3
C	A29 Westergate Street (South)	83	36	25	65	25	17
D	Meadow Way	89	157	6	73	109	4
Overall Junction		PRC: 1.1% Cycle Time: 120s			PRC: -1.4% Cycle Time: 120s		

- 7.5.20. The junction modelling results forecast that the site access junction will operate within capacity in the AM and at capacity in the PM peak. The maximum Degree of Saturation is 92% on the approach from the A29 Westergate Street (North) in the PM peak, this equates to a delay of 50 seconds which is an increase of nine seconds compared to Scenario 2 with a mean max queue of 30PCUs which is an increase of four PCUs compared to Scenario 2.

SCENARIO 3 JUNCTION ASSESSMENT SUMMARY

- 7.5.21. The junction capacity assessments within Scenario 3 highlight that several the junctions operate close to capacity or at capacity with the proposed development traffic and the phase one of Parcel SC1. The A29 / Nyton Road (East) junction also operates just over capacity in this scenario. This highlights the impact of Phase 1 of the BEW development on the local highway network. It is also noted that Scenario 3 provides an interim assessment as represents a position before the full A29 is complete and before the East-West Link Road is open to all traffic.

7.6 SCENARIO 4 – 2038 DO SOMETHING

- 7.6.1. The results from the junctions are shown below with Scenario 4 - 2038 Do Something AM and PM peaks. This provides an assessment of the highway network with the Cala Homes development, Phase 1 and 2 of BEW Parcel SC1, full East-West link road and A29 realignment. Full junction capacity outputs are provided in **Appendix C**.

SITE 1: A27 – A29

- 7.6.2. **Table 7-27** summarises the Scenario 4 modelling results for the A27 A29 roundabout for Scenario 4.

Table 7-27 – A27 / A29 Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A29	0.63	10	2	0.92	48	11
B	A27 (East)	0.66	4	2	0.50	4	2
C	A27 (West)	0.59	3	2	0.62	3	2

- 7.6.3. The Scenario 4 modelling results indicate that the junction will operate within theoretical capacity in the AM peak and approaching capacity in the PM peak period. The maximum RFC of 0.92 is recorded on the approach from the A29 in the PM peak with an associated queue of 11 vehicles which is an increase of six vehicles compared to Scenario 3 and delay of 48 seconds which is an increase of 26 seconds compared to Scenario 3.
- 7.6.4. Taking account of these results a further junction capacity assessment has been completed using the identified improvement scheme discussed in **Section 7.2**. **Table 7-28** below summarises the results of the LinSig assessment completed for the junction.

Table 7-28 – A27 / A29 Scenario 4 Improvement Scheme Junction Capacity Assessment

Arm	Approach	AM Peak				PM Peak			
		DoS %	Total Delay	MMQ	UQ ED	DoS %	Total Delay	MMQ	UQ ED
A	A29	61	10	3	-	92	47	11	-
B	A27 (East)	87	19	17	5	64	16	8	5
C	A27 (West)	70	10	6	4	80	10	9	4
D	Southern Circ	80	42	8	5	66	31	8	6
E	Western Circ	65	28	5	3	16	35	1	1
Overall PRC/ Cycle Time		3.9% PRC and 60s Cycle Time				-1.7% PRC and 60s Cycle Time			

7.6.5. The results show that with the mitigation in place the junction will operate within capacity in the AM peak and at capacity in the PM peak. The approach with the highest degree of saturation is the A29 uncontrolled approach with an associated delay of 47 seconds and a MMQ of 11 vehicles in the PM peak.

SITE 2: A27 – ARUNDEL ROAD – A29 FONTWELL AVENUE

7.6.6. The junction modelling for Scenario 4 of A27/ Arundel Road/ A29 Fontwell Avenue signalised roundabout is presented in **Table 7-29**. This provides an assessment of the highway network with the Cala Homes development, Phase 1 and 2 of BEW Parcel SC1, full East-West link road and A29 realignment.

Table 7-29 – A27 / Arundel Road / A29 Fontwell Avenue Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak				PM Peak			
		DoS %	Total Delay	MMQ	UQ ED	DoS %	Total Delay	MMQ	UQ ED
A	A27 (East)	87	20	19	8	95	42	24	9
B	Arundel Road	12	2	0	-	7	2	0	-
C	A29 Fontwell Avenue	88	23	11	-	57	8	4	-
D	A27 Arundel Road	61	10	7	4	97	25	20	5
E	Northern Circ	79	33	6	4	96	48	48	8
F	Western Circ	68	32	7	6	55	35	4	3
Overall PRC/ Cycle Time		3.1% PRC and 60s Cycle Time				-7.3% PRC and 60s Cycle Time			

- 7.6.7. The results present that in 2038 following the completion of the entire BEW development and the realignment of the A29, that the signalised roundabout is forecasts to operate within capacity in the AM peak and at capacity in the PM peak. In the AM peak, the approach at the highest level of Degree of Saturation is the A29 Fontwell Avenue, which has an associated delay of 23 seconds and a MMQ of 11. In the PM peak, the approach closest to capacity is the A27 Arundel Road, which has an associated delay of 25 seconds, a MMQ of 20PCUs and UQ ED of 5PCUs.

SITE 3: A29 – BARNHAM ROAD

- 7.6.8. The modelling results from the A29/ Barnham Road roundabout for Scenario 4 is presented in **Table 7-30**.

Table 7-30 – A29 / Barnham Road (War Memorial) Roundabout Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.51	6	2	0.32	5	1
B	A29 Nyton Road	0.31	3	1	0.32	3	1
C	A29 Fontwell Avenue	0.24	5	1	0.37	6	1

- 7.6.9. The A29/ B2233 Barnham Road modelling results indicates the junction is operating within capacity in the AM and PM peak. The maximum RFC of 0.51 occurs on the approach from the B2233 Barnham Road with an associated delay of six seconds and a queue of two vehicles.

SITE 4: A27 – NYTON ROAD

- 7.6.10. **Table 7-31** presents the modelling results from Scenario 4 for the A27/ Nyton Road priority junction.

Table 7-31 –A27 / Nyton Road Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	B2233 Nyton Road	0.20	1	1	0.10	1	1
C	A27 (West)	0.48	20	1	0.70	27	3

- 7.6.11. The modelling results summarised above indicates the junction operates within capacity in the AM and PM peak. The maximum RFC of 0.70 occurs in the PM peak on the approach from the A27 (west) with an associated delay of 27 seconds and a queue of three vehicles.

SITE 5: WESTERGATE STREET – NYTON ROAD (EAST JUNCTION)

- 7.6.12. The modelling results from Westergate Street/ Nyton Road (East Junction) priority junction for Scenario 4 is presented in **Table 7-32**.

Table 7-32 –A29 / Nyton Road East Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.38	10	1	0.65	15	2
C	Nyton Road A29	0.97	111	18	0.44	11	1

- 7.6.13. The Scenario 4 modelling results indicates the priority junction operates at capacity in the AM peak and within capacity in the PM peak. The maximum RFC of 0.97 occurs on the approach from A29 Nyton Road in the AM peak with a total delay of 111 seconds a decrease of 118 seconds compared to Scenario 3 and an associated queue of 18 vehicles which is a decrease of 15 vehicles compared to Scenario 3.

SITE 6: WESTERGATE STREET – NYTON ROAD (SOUTH JUNCTION)

- 7.6.14. **Table 7-33** presents the modelling results from Scenario 4 for Westergate Street/ Nyton Road (South Junction) priority junction.

Table 7-33 –A29 / Nyton Road South Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	B2233 Nyton Road	0.21	11	1	0.44	13	1
C	A29 Nyton Road	0.00	0	0	0.00	0	0

- 7.6.15. The Scenario 4 modelling results indicates the priority junction operates well within at capacity in the AM and PM peak.

SITE 7: WESTERGATE STREET – NYTON ROAD (NORTH JUNCTION)

- 7.6.16. Westergate Street/ Nyton Road (North Junction) modelling results for Scenario 4 are presented in **Table 7-34**.

Table 7-34 – A29 / Nyton Road North Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	B2233 Nyton Road	0.66	21	2	0.33	9	1
C	A29 Nyton Road	0.21	11	1	0.43	12	1

7.6.17. The modelling results forecast the junction operates within capacity in the AM and PM Peaks. The maximum RFC of 0.66 occurs on the approach from the B2233 Nyton Road with a total delay of 21 seconds and a queue of two vehicles.

SITE 8: A29/A259 FELPHAM RELIEF/INDUSTRIAL ESTATE

7.6.18. The junction modelling for Scenario 4 of A29/ A259 Felpham Relief Road/ Industrial Estate is presented in **Table 7-35**.

Table 7-35 – A29 / A259 Roundabout Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A259	1.03	109	32	0.99	84	18
B	Rolls Royce Access	0.59	16	2	1.17	252	46
C	A29 (South)	0.83	10	5	0.80	8	5
D	Saltbox Road	0.07	4	1	0.50	11	1
E	A29 (North)	0.65	6	2	0.80	11	4

7.6.19. The Scenario 4 modelling results forecasts the five-arm roundabout operates at capacity in the AM and PM peaks. The maximum RFC of 1.17 occurs on the approach from Rolls Royce Access in the PM peak with a total delay of 252 seconds which is an increase 213 seconds compared to Scenario 3 and an associated queue of 46 vehicles which is an increase 40 vehicles compared to Scenario 3. The significant worsening performance of the roundabout in the AM and PM peaks is likely due to the completion of the BEW scheme and realignment of the A29 and should not be attributed solely to the Cala Homes proposed development.

7.6.20. Taking account of these results a further junction capacity assessment has been completed using the identified improvement scheme discussed in **Section 7.2**. **Table 7-36** below summarises the results of the LinSig assessment completed for the junction.

Table 7-36 – A29 / A259 Roundabout Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A259	0.64	8	2	0.57	8	2
B	Rolls Royce Access	0.44	10	1	0.82	31	5
C	A29 (South)	0.59	4	2	0.57	3	2
D	Saltbox Road	0.10	7	1	0.60	17	2
E	A29 (North)	0.42	3	1	0.52	4	2

- 7.6.21. The table above shows that the mitigation scheme forecasts a significant improvement to the roundabout operation. The roundabout will operate within capacity in the AM and PM peaks. The maximum RFC of 0.82 occurs on the approach from Rolls Royce in the PM peak with an associated delay of 31 seconds and a queue of five vehicles. This demonstrates a reduction of delay of 221 seconds and the queue reduces by 41 vehicles.

SITE 9: A29 WESTERGATE STREET/ MEADOW WAY/ ACCESS ROAD (ACCESS JUNCTION)

- 7.6.22. The modelling results for the Site Access junction are presented in **Table 7-37** below.

Table 7-37 – A29 Westergate Street/ Meadow Way/ Access Road Scenario 4 Junction Capacity Assessment.

Arm	Approach	AM Peak			PM Peak		
		DoS	Av Delay (s)	MMQ	DoS	Av Delay (s)	MMQ
A	A29 Westergate Street (North)	55	47	6	46	30	9
B	Site Access	57	54	7	45	78	3
C	A29 Westergate Street (South)	59	37	12	42	27	8
D	Meadow Way	56	74	4	44	64	4
Overall Junction		PRC: 54.2% Cycle Time: 120s			PRC: 96.6% Cycle Time: 120s		

- 7.6.23. The junction modelling results forecast that the site access junction will operate well within capacity in the AM and PM peaks. The maximum Degree of Saturation is 59% on the approach from the A29 Westergate Street (South) in the AM peak, this equates to a delay of 37 seconds, with a mean max queue of 12PCUs. These results show a significant improvement in junction capacity. This is a

result of the reduction in traffic flows on the A29 associated with completion of the full A29 realignment.

SCENARIO 4 JUNCTION ASSESSMENT SUMMARY

- 7.6.24. The junction capacity assessments within Scenario 4 highlight that that several the junctions operate close to capacity or at capacity with the proposed development traffic and the completed BEW development and associated infrastructure, in either the AM or PM peak. Improvements schemes identified to accommodate development associated with the Local Plan mitigate these impacts.
- 7.6.25. The site access junction to the Cala Homes development will operate well within capacity. The impact of the proposed development is minimal across the network compared to the adjacent BEW scheme.

7.7 INTERIM SCENARIOS

- 7.7.1. An interim assessment has also been undertaken to understand that the how many units could be occupied on the Cala Homes site prior to completion of the first phase of the A29 realignment (between A29 Fontwell Avenue and B2233 Barnham Road), which is due to be completed in Spring 2026. Phase 1 of the A29 realignment will provide a route that bypasses the A29 / Barnham Road (War Memorial) roundabout whilst also having the potential to remove traffic from the A29 / Nyton Road priority junctions due to it offering a more direct route to the A27.
- 7.7.2. Taking this into account and Cala Homes' anticipated build-out rate, interim junction capacity assessments have been completed for the A29 / Barnham Road (War Memorial) roundabout and A29 / Nyton Road priority junctions for the following scenarios:
 - 2026 with 200 units occupied on the Cala Homes development; and
 - 2028 with 300 units occupied on the Cala Homes development.
- 7.7.3. **Figure 7-4** below, taken from the WSCC website, shows the proposed extend of phase in comparison with the full A29 realignment.

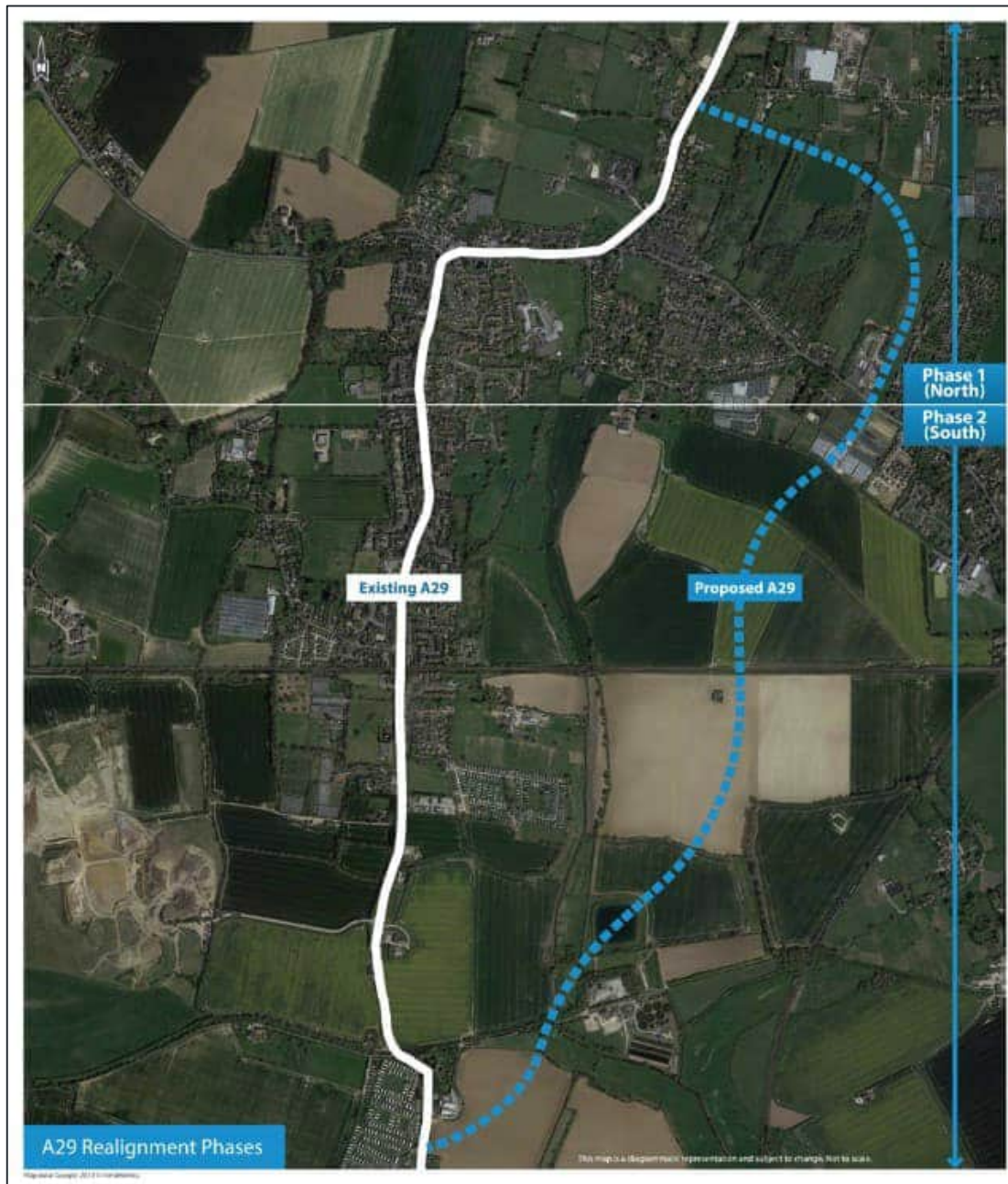


Figure 7-4 – A29 Realignment Phase 1 and Phase 2

- 7.7.4. The 2026 and 2028 traffic flows has been generated by providing a TEMPRO growth factor to the 2019 baseline and adding a 50% and 75% of the development trip generation calculated in **Section 6**. The use of TEMPRO is deemed appropriate as it will account for all the forecast local plan development in the vicinity of the site. **Table 7-38** and **Table 7-39** presents the 2026 baseline and 2026 baseline with 50% development modelling results respectively. Full junction capacity outputs are provided in **Appendix C**.

2026 ASSESSMENT (200 UNITS)

- 7.7.5. **Tables 7-38** shows how the A29 / Barnham Road roundabout will operate in 2026 with 200 units occupied on the proposed development site.

Table 7-38 – A29 / Barnham Road (War Memorial) Roundabout 2026 Baseline + 50% Development Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.66	9	2	0.56	9	2
B	A29 Nyton Road	0.53	4	2	0.50	5	1
C	A29 Fontwell Avenue	0.58	9	2	0.87	27	7

7.7.6. The A29/ B2233 Barnham Road interim scenario modelling results indicates the junction is operating within capacity in the AM peak and at capacity in the PM peak with the development. The maximum RFC of 0.87 occurs on the approach from the A29 Fontwell Avenue with an associated delay of 27 seconds. This demonstrates that the junction can accommodate the traffic generated from half of the development in 2026 alongside the baseline traffic growth.

7.7.7. **Table 7-39** and **Table 7-40** presents how the A29 / Nyton Road (East) junction will operate in 2026 with and without 200 units occupied on the proposed development site.

Table 7-39 – A29 / Nyton Road East 2026 Baseline + 50% Development Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.44	13	1	0.56	14	2
C	Nyton Road A29	0.98	138	19	0.36	11	1

Table 7-40 – A29 / Nyton Road East 2026 Baseline + 50% Development Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.44	13	1	0.57	15	2
C	Nyton Road A29	1	165	23	0.37	11	1

- 7.7.8. **Table 7-39** and **Table 7-40** above forecasts that in the AM peak the junction is at its theoretical capacity with and with development traffic and in the PM peak the junction is within capacity. The development traffic is forecast to increase the total delay by 28 seconds and increase the queue by four vehicles. It is worth noting that the development traffic flows through the junction only increase the overall flow by just under 2.5%.

2028 ASSESSMENT (300 UNITS)

- 7.7.9. **Tables 7-41** shows how the A29 / Barnham Road roundabout will operate in 2026 with 300 units occupied on the proposed development site.

Table 7-41 – A29 / Barnham Road (War Memorial) Roundabout 2028 Baseline + 75% Development Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.68	10	3	0.58	9	2
B	A29 Nyton Road	0.54	5	2	0.51	5	2
C	A29 Fontwell Avenue	0.59	10	2	0.90	32	8

- 7.7.10. The A29/ B2233 Barnham Road 2028 interim scenario modelling results forecasts the roundabout to operate within capacity in the AM peak and at capacity in the PM peak with the development. The maximum RFC of 0.90 occurs on the approach from the A29 Fontwell Avenue with an associated delay of 42 seconds. This demonstrates the occupation of 300 units can be completed without the leading to the junction operating over capacity.
- 7.7.11. **Table 7-42** and **Table 7-43** presents how the A29 / Nyton Road (East) junction will operate in 2026 with and without 300 units occupied on the proposed development site.

Table 7-42 – A29 / Nyton Road North 2028 Baseline Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.44	13	1	0.57	14	2
C	Nyton Road A29	1.00	170	24	0.36	11	1

Table 7-43 –A29 / Nyton Road North 2028 Baseline + 75% Development Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.45	14	1	0.58	15	2
C	Nyton Road A29	1.03	220	31	0.37	11	1

- 7.7.12. The tables above shows that the priority junction will operate at capacity in the AM peak without the development and over capacity with the development traffic, whilst in the PM peak the junction will operate within capacity with and without the development. The development traffic is forecast to increase the total delay by 50 seconds and increase the queue by seven vehicles. It is worth noting that the development traffic flows through the junction only increase the overall flow by just under 4% in this scenario.

SUMMARY OF INTERIM SCENARIO

- 7.7.13. The capacity assessments from the interim scenario present that the A29 / Barnham Road roundabout accommodate 200 and 300 units of the development in 2026 and 2028. The A29/ Nyton Road junction is forecast to operate over capacity with 300 units, before the realignment of Phase 1 of the A29, but the impact of the additional traffic is not significant when considered against the 2028 baseline position.

8 A29 LEVEL CROSSING ASSESSMENT

8.1 INTRODUCTION

- 8.1.1. This section provides an assessment of the impact of the proposed development on traffic flows on the highway network surrounding the development, focusing on the operation of the Woodgate level crossing as associated traffic and traffic levels on the A29.

8.2 A29 WOODGATE LEVEL CROSSING

- 8.2.1. The level crossing of the A29 at Westergate Street approximately 550m south of the site entrance has been assessed in the future year scenarios. An assumption has been made that train times remain the same and as such occurrences of the closure of the road will be the same in future years as the observed base year.

IMPACT OF PROPOSED DEVELOPMENT ON LEVEL CROSSING QUEUE LENGTHS

- 8.2.2. Taking account of the survey described above this section provides an assessment of the impact of the proposed development in relation to queue lengths associated with the A29 level crossing. For assessment purposes it is assumed that train times remain the same and, as such, occurrences of the closure of the road will be the same in future years as the observed base year.

Development Traffic Impact

- 8.2.3. The proposed development will result in an increase in the arrival rate of vehicles that approach the level railway crossing per hour but the service rate of the level railway crossing (the amount of traffic that can pass through the level railway crossing in any given hour) will remain the same given the assumptions above. As such, vehicle queues associated with closure times at the level railway crossing are expected to increase as traffic volumes increase on A29 Westergate Street.
- 8.2.4. A traffic queue survey was undertaken of the level crossing on the 1st March 2022 to ascertain a baseline operation of the crossing. The survey identified a maximum queue of 96 PCU in the AM peak at the crossing, and a maximum queue of 127 PCU in the PM peak during the barrier closure period.
- 8.2.5. For the proposed development only, the increases shown in **Table 8-1** would be observed at the level crossing. Note that numbers presented are in PCU.

Table 8-1 – Increase in Traffic at the Level Crossing (Development Traffic Only)

Time	Northbound Increase at level crossing	Southbound Increase at level crossing	Southbound Increase north of junction (at site access junction)
AM Peak Hour	22	55	39
PM Peak Hour	39	19	77

- 8.2.6. This shows that, at most, this is the equivalent to an additional 55 vehicles in the southbound direction during the AM peak.

Impact on A29 Northbound Level Crossing Queueing

- 8.2.7. For the northbound direction approach to the level crossing, it is noted that the street function is different to the southbound direction. The road streetscape is more rural in nature, with limited properties fronting the road. There is a lower number of junctions south of the railway line and the nearest major junction control is a considerable distance away (2.8km) at the junction of A29 and A259 relief road. As such, it is considered no assessment is required for the northbound direction (south of the level railway crossing) as there is adequate capacity for queueing vehicles.

Impact on A29 Southbound Level Crossing Queueing

- 8.2.8. In the southbound direction, existing queues created by the level crossing barrier closure that do not extend past the proposed access junction (less than 550 metres) will increase only as a result of southbound traffic leaving the site. Existing queues that extend past the access junction will increase by a larger amount as a result of the additional traffic which is accessing the development from the north as well as the traffic leaving the site heading south.
- 8.2.9. To assess the impact of the proposed development an assumption has been made that development traffic will depart or arrive on a uniform basis across the peak hour based upon the additional vehicles presented in **Table 8-2**.

Table 8-2 – Impact of Development Traffic on Level Crossing Queue Lengths

Time Period	Average Closure Time	Development Traffic Arrival / Departure Rate	Increase in Queue Length	Maximum Closure Time	Development Traffic Arrival / Departure Rate (North of Access)	Increase in Queue Length
08:00-09:00	00:02:53	0.9 per minute	+3 PCU (18m)	00:06:27	0.65 per minute	+4 PCU (24m)
17:00-18:00	00:02:24	0.3 per minute	+1 PCU (6m)	00:03:48	1.3 per minute	+5 PCU (30m)

- 8.2.10. **Table 8-2** shows that during the average closure times experienced during the AM and PM peak hours, the proposed development will increase queue lengths by 6-18m. This assumes that during an 'average' barrier closure queue lengths do not extend past the site access junction as is the case the vast majority of barrier closures surveyed. For the maximum barrier closures recorded, it is

predicated that the proposed development would increase queue lengths by 24m during the AM and 30m during the PM peak hour, this is based on development traffic travelling southbound north of the site access. This represents a 4.2% increase in the maximum queue length recorded in the AM peak and a 3.9% increase in the PM peak.

- 8.2.11. It is therefore considered that the proposed development would not result in a severe impact upon the operation or capacity of the A29 Level Crossing as shown within the 2031 future year assessment scenario.

Impact of the A29 / Meadow Way / Site Access Junction

- 8.2.12. In order to deal effectively with the potential for a large platoon of traffic approaching the junction from the upstream level crossing, a MOVA control system is proposed for the signalised site access junction. Once MOVA control has been set up successfully, the system will generate its own signal timings cycle-by-cycle, varying continuously with traffic conditions to offer full flexibility in traffic management. The timings under this system are optimised both in the short term (hour to hour, day to day for events like level crossing releases) and in the long term following annual trends and longer term traffic growth.
- 8.2.13. MOVA has two operational modes; the first deals with uncongested conditions, the second with situations when the junction becomes overloaded/congested with large queues on one or more approaches. MOVA determines which mode is appropriate and which approach(es), if any, are overloaded. In the uncongested mode, MOVA seeks to disperse any queue which has built up on red, and then carries out a delay-and-stops minimising procedure every half second. If there would be a benefit from extending the green, then the green would continue and the calculations repeated. If no benefit were predicted, the signals would change to the next stage. In the congested mode, MOVA operates a capacity-maximising routine. This routine takes into account which approaches are overloaded, the efficiency of green use, and determines the signal timings which will maximise the junction throughput under the actual flow conditions prevailing.
- 8.2.14. Therefore by using MOVA, a queue clearing sequence will include additional green time signal phase for A29 Westergate Street northbound traffic to reduce the instances of stopping twice at the level crossing and at the signalised access junction. In addition, the assessment of the operation of the traffic signals in future years does not predict a queue length for northbound vehicles that would extend to the level railway crossing.
- 8.2.15. MOVA control is considered the optimum control method for this site. The system will detect the surge in traffic from the level crossing and deal with throughput as efficiently as possible.
- 8.2.16. The introduction of an additional queue clearing sequence at the signalised access point will result in the skipping of the east-west phase, which will reduce the ability for traffic exiting the site to clear the junction. Whilst queues may extend past the junction of the access road with Pine Close, and it is proposed to provide line-marking Diagram 1026 'KEEP CLEAR' across this junction to assist in side road access.

9 SUMMARY AND CONCLUSIONS

9.1 SUMMARY

- 9.1.1. WSP have been appointed by Cala Homes to provide transportation and highways advice in support of a planning application for the development on land at Westergate, West Sussex. The proposed development will provide up to 2,300 dwellings. Pre-Application discussion has been undertaken with West Sussex County Council and National Highways and has influenced the production of the Transport Assessment.

EXISTING CONDITIONS

- 9.1.2. The site will be accessed via A29 Westergate Street which provides a link from Fontwell onto Bognor Regis to the south. In the vicinity of the site the A29 has a posted speed limit of 30mph and street lighting. A29 Westergate Street has a level crossing to the south of Hook Lane approximately 550 metres from the site entrance.
- 9.1.3. The existing Public Rights of Way network provides links to St Richards Road and Ivy Lane, Ormiston Six Villages Academy School, Eastergate Church of England School, and Aldingbourne Primary School via Elmcroft Place. There is no existing dedicated cycle network in the vicinity of the development. The nearest NCN route is found along A259 linking Chichester to Bognor Regis, There is a shared-use path that routes along the northern boundary of the development site, which connects Ivy Lane and Church Lane and provides access to Six Villages Sports Centre and Ormiston Six Villages Academy and Eastergate Church of England Primary School.
- 9.1.4. The closest bus stop is 150 metres to the south of the access point along A29 Westergate Street. There are both northbound and southbound bus stops in this location. The stops are served by bus Route 66 provided by Compass Bus which travels from Bognor Regis to Yapton via Barnham as a loop service. The closest rail station is located at Barnham Station which is located two miles along the road network from the site and is serviced by the West Coastway line which runs between Southampton and Brighton, and a spur line to Bognor Regis.
- 9.1.5. Personal Injury Collision (PIC) data has been obtained from the WSCC recorded by Sussex Police for the previous five years for a three kilometre radius around the site. The data showed a total of 112 collisions that has occurred during the past five years of which one was classified as fatal, 33 collisions were classified as serious and the remaining 78 were classified as slight in terms of severity. The PIC records indicate that driver behaviour is the main cause of crashes at these locations, with drivers misjudging other vehicles or losing of control of their vehicles.
- 9.1.6. To determine the level of accessibility (with regard to public transport, cycling and walking) TRACC and ACCESSION GIS modelling has been undertaken to determine and calculate journey times and distances for all modes of transport. This showed that the villages of Eastergate, Woodgate and Westergate (and their associated facilities) can be reached within a 30 minute walk. Barnham and Barnham Station are accessible within a 10 minute cycle journey and all of Bognor Regis, plus the majority of Felpham and the outskirts of Arundel and Chichester within 30 minutes.

DEVELOPMENT PROPOSALS

- 9.1.7. Cala Homes is submitting an application to develop the site for residential use in the order of 400 dwellings with access via a new all moves traffic signal junction located at A29 Westergate Street /

Pine Close / Meadow Way junction, to the south of Pine Close. It is proposed that the junction will operate with Microprocessor Optimised Vehicle Actuation (MOVA) to minimise vehicle delays on all approaches.

- 9.1.8. The site will form the first phase of the Barnham / Eastergate / Westergate strategic development site, which is allocated for at least 2,300 dwellings as part of the draft Local Plan. Proposals for the strategic development site include the realignment of the A29 and the provision of an East-West Link Road which will link the existing A29 Westergate Street onto B2233 Barnham Road (near Barnham Station). The site access junction and access road proposed as part of this development application forms the first stage of the East-West Link Road. A connection to this East-West Link Road from the Cala Homes site will be facilitated by a bridge over the Lindsey Rife which will be constructed as part of the Cala Homes development.
- 9.1.9. As part of pre-application discussion with WSCC, it has agreed that the East-West Link Road bridge will operate as a bus, pedestrian and cycle only route until the full A29 realignment is complete. This strategy mitigates concerns raised by WSP related to the impact of traffic associated with the current planning application on Parcel SC1 located adjacent and to the east of the site on the operation of the site access junction prior to the full A29 realignment being completed.
- 9.1.10. As part of pre-application discussion with WSCC, it has agreed that the East-West Link Road bridge will operate as a bus, pedestrian and cycle only route until the full A29 realignment is complete.
- 9.1.11. The proposed site access junction has been designed in accordance with standards contained in the Traffic Signs Manual Chapter 6 (Traffic Control) (2019). Access into the site for pedestrians and cyclists will be provided at the main access junction as described above plus through a number of existing PRow connecting into the site. As part of this junction a pedestrian footway will be provided on the southern side of the site access road to link the existing footway on A29 Westergate Street into the site. From the north pedestrian access will be through Pine Close, which will be closed to through traffic.
- 9.1.12. To promote trips by public transport, a financial contribution will be made as part of any planning permission to upgrade the southern bus stops on the A29 to include bus shelters.

DEVELOPMENT TRIP GENERATION AND DISTRIBUTION

- 9.1.13. The trip rate for the Development has been calculated using traffic surveys undertaken on Ivy Lane and Meadow Way. The total number of trips associated with the development is 213 two-way trips in the AM peak and 173 PM peak. The residential trip distribution has been calculated using three different journey types; the first being travel to work using 2011 census data and Google map directions from the site illustrating the quickest route to any destination. The second journey type is education trips and the third trip type is 'other' this includes shopping, leisure and trips to see friends and family.

DEVELOPMENT IMPACT ASSESSMENT

- 9.1.14. To assess the impact of the development a series of junction assessments have been carried out for the AM and PM peak periods for the following scenarios:
 - 2019 Base Year;
 - 2031 Do-Minimum. This scenario provides an assessment of how the highway network will operate in 2031 without the Cala Homes development or Parcel SC1;
 - 2031 Do-Something;

- Scenario 3 – 2031 Do-Something with Phase 1 of BEW Development; and
- 2038 Do Something.

- 9.1.15. The assessment showed that traffic associated with the proposed development can be accommodated on the local highway network in 2031 without any leading to any junctions operating over capacity. In 2038, when assessed with Phase 1 and 2 of BEW Parcel SC1, the A27 / Arundel Road / A29 Fontwell Avenue roundabout operates at capacity whilst the A27 / A29 roundabout and A29 / A259 roundabout are forecast to operate close to capacity. The improvements schemes identified to support the Arun Local Plan however provide suitable mitigation measures.
- 9.1.16. The traffic queue survey completed in 2022 at the Woodgate level crossing identified a maximum queue of 576m in the AM peak at the crossing, and a maximum queue of 762m in the PM peak during the barrier closure period. Average queue lengths were recorded at 328m for the AM peak and 388m for the PM peak. Taking account of the trip generation associated with the proposed development, it is predicated that during the maximum barrier closures recorded the recorded queue lengths would increase queue lengths by 24m during the AM and 30m during the PM peak hour. During the average closure times experienced during the AM and PM peak hours, the proposed development will increase queue lengths by 6-18m. For the vast majority of time, the southbound queue length will not extend back to the site access junction.
- 9.1.17. In order to deal effectively with the potential for a large platoon of traffic approaching the site access junction from the upstream level crossing, a MOVA control system is proposed for the signalised site access junction. This will include a queue clearing sequence that will provide additional green time signal phase for A29 Westergate Street northbound traffic to reduce the instances of stopping twice at the level crossing and at the signalised access junction.

9.2 CONCLUSION

- 9.2.1. This TA has considered the development of 400 dwellings on land east of Westergate, which will be accessed via a new traffic signal junction at the A29 / Meadow Way / Pine Close. The Transport Assessment has demonstrated that the local and strategic highway network can accommodate the proposed development, once improvement measures identified to support the Arun Local Plan have been implemented.
- 9.2.2. For trips being made by alternative modes of transport the site is well located to make use of the existing PRoW and pedestrian network that will be enhanced as it crosses the site, providing routes to local schools and services, Eastergate and Barnham. In addition the proposed development also provides an LTN1/20 compliant bidirectional cycle route which will connect into the wider BEW development and associated facilities, Barnham village and railway station. This network will allow a number of trips to be made without accessing the A29 and will also reduce the dependence on car travel for short distance trips. The Framework Travel Plan accompanying this TA will also encourage trips by sustainable modes of transport.
- 9.2.3. Paragraph 111 of the National Planning Policy Framework states that, “development should only be prevented or refused on highway grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe”. Taking this into account and the conclusions of this TA, there are no reasons why the planning application should be refused on highways and transport grounds, as the impact of the development is not deemed to cause a severe impact.



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