AQUIND Limited

AQUIND INTERCONNECTOR

Second Written Question Response - Appendix 1 - Technical Note providing a review of collision data at Strategic Road Network junctions (MG2.1.1)

The Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Regulation 8(1)(c)

Document Ref: 7.4.3.1

PINS Ref.: EN020022

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PINS REF.: EN020022

DOCUMENT: 7.4.3.1

DATE: 25 JANUARY 2021

WSP

WSP House

70 Chancery Lane

London

WC2A 1AF

+44 20 7314 5000

www.wsp.com

DOCUMENT

Document	Second Written Question Response - Appendix 1 - Technical Note providing a review of collision data at Strategic Road Network junctions (MG2.1.1)
Revision	001
Document Owner	WSP UK Limited
Prepared By	Chris Williams
Date	25 January 2021
Approved By	Alan Cowan
Date	25 January 2021

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TABLES

1. INTRODUCTION

1.1.1.1. This Technical Note (HE04) has been prepared in response to representations made by Highways England (HE) and Portsmouth City Council (PCC) in relation to the submission documents for the AQUIND Interconnector DCO application ("the Proposed Development"). Comments were made in HE's Deadline 4 Submission – Annex B (REP4-043) entitled 'Aquind Interconnector – Review of Collision Analyses' and in paragraph 96 of PCC's Deadline 4 Submission – Comments on responses to deadline 3 (REP4-036) as well as at a meeting held with the Applicant, Hampshire County Council, PCC and HE on 8th December 2020. These comments refer to the need for a review of collision data to be completed at the following four junctions of the Strategic Road Network (SRN):

- A3(M) Junction 2;
- A3(M) Junction 3;
- Junction of A27 / A2030 Eastern Road; and
- Junction of A27 / A3 / M27 / A397 (Portsbridge Roundabout).

1.1.1.2. Therefore, using recorded collision data provided for this area by Hampshire Constabulary covering a five-year period between 01/10/2014 and 30/09/2019, this Technical Note assesses the following:

- Reported collisions at the above junctions including slip roads and a minimum of 200m on all other approaches;
- Causation factors of the collisions;
- Casualty Types (Pedestrian/Motorcycle/Car etc);
- Severity of collisions;
- Any common patterns of collisions, e.g. intoxication / manoeuvre error / weather / road condition / speeding etc.;
- Any common patterns of collision type, e.g. rear shunt; and
- Any common patterns of location e.g. slip roads.

1.1.1.3. The aim of this assessment is to identify existing accident cluster sites at the four Strategic Road Network (SRN) junctions and if construction of the Proposed Development will exacerbate existing trends as a result of the reassignment of traffic away from traffic management associated with construction of the Onshore Cable Route. All assessments of traffic flow impact at each SRN junction are based on outputs from the Sub-Regional Transport Model (SRTM), which has been used to assess the future year baseline and construction stage impacts of the Proposed Development. In the SRTM modelling, it has been assumed that six 100m sections along the Onshore Cable Corridor will be under construction at any one time. This is in line with the construction programme which assumes a maximum of six sections of the Onshore Cable Route being constructed at any one time, as secured by the draft Development Consent Order; the specific combination of locations was agreed with HCC and PCC as part of the TA scoping exercise.

1.1.1.4. Further details of the SRTM modelling are provided within the Supplementary Transport Assessment (REP1-142) but as a summary the impacts of the proposed traffic management has been modelled across the following scenarios:

- 2026 Do Minimum (DM) Scenario: the future baseline without the Proposed Development;
- 2026 Do Something 1 (DS1) Scenario: traffic management to facilitate the construction of the Onshore Cable Route is in place at the six specified locations but on the A2030 Eastern Road lane closures apply to the southbound carriageway only; and
- 2026 Do Something 2 (DS2) Scenario: traffic management is in place at the six specified locations but with lane closures on the northbound carriageway along the A2030 Eastern Road

1.1.1.5. The 2026 Do Minimum scenario outlines future year traffic conditions without the Proposed Development. In this sense its sole purpose is to provide the baseline for comparison. For the two Do Something Scenarios, 2026 was selected as the forecast year most aligned to the anticipated timescales of the Proposed Development and reflective of available future years of the SRTM.

1.1.2. ADDITIONAL JUNCTION CAPACITY ASSESSMENTS OF A3(M) JUNCTION 2 AND 3

1.1.2.1. Further to the junction capacity assessments included within the STA and as requested by Highways England in Annex D of thier Deadline 1 submission (REP1-208), additional assessments of Junction 2, A3 (M) have been undertaken in Technical Note HE03, which is included in Appendix 2 of the STA Addendum. This Technical Note supersedes paragraphs 1.12.4.7 to 1.12.4.9 of the Transport Assessment (APP-448) and Section 5.3.4 of the STA (REP1-142).

1.1.2.2. For each junction, the following Do-Minimum and Do-Something scenarios have been assessed following on from comments included in (REP1-208) and discussions held between the Applicant and Highways England on the draft version of the TN03:

1. Sensitivity modelling using ARCADY lane simulation;
2. Sensitivity testing without traffic generated from nearby committed development sites and the committed highway mitigation schemes associated with them;
3. Sensitivity testing with the traffic generated from nearby committed development sites and the committed highway mitigation schemes associated with them; and
4. Sensitivity using 2019 traffic survey data with TEMRPO growth applied to estimate 2026 traffic flows in combination with scenarios 2 and 3.

1.1.2.3. HE03 also included details of increased traffic flows at A3 (M) Junction 2 and 3 when comparing 2019 traffic surveys against the 2026 DM, DS1 and DS2 scenarios. This information on traffic flows and updated junction capacity assessments have been taken into account in the assessment of collision data and the potential for the proposed development to exacerbate existing accident trends at these junctions.

1.1.2.4. In consideration of the impacts reported in HE03 it is also noted that the assessments were considered to be very robust because the DS1 and DS2 scenarios used a worst-case scenario for the location of traffic management associated with the Proposed Development (three traffic management locations), the cumulative effect of which leads to a high level of modelled traffic re-assignment onto A3(M) junctions 2 and 3. However this will not occur due to the programme restrictions in the FTMS (REP1-068), which allow only one of the three modelled traffic management locations take place at any one time. These programme restrictions and FTMS are secured via protective provisions contained in the draft Development Consent Order.

1.1.2.5. The remainder of this Technical Note is set-out in the following sections:

- Section 2 reviews the collision data for A3(M) Junction 2;
- Section 3 reviews the collision data for A3(M) Junction 3;
- Section 4 reviews the collision data for the junction of A27 / A2030 Eastern Road;
- Section 5 reviews the collision data for the Portsbridge Roundabout; and
- Section 6 gives a summary and conclusions of the Technical Note.

2. A3(M) JUNCTION 2

2.1. INTRODUCTION

2.1.1.1. This Analysis covers A3(M) Junction 2 which includes A3(M) (North), Dell Piece East B2149, A3(M) (South) and Dell Piece West B2149. The analysis of the data also includes all the slip roads of the A3 (M) which form a part of the junction and a minimum of 200m on all other approaches. Where patterns are identified, these are highlighted for information.

2.2. COLLISION ANALYSIS

2.2.1.1. There has been a total of 25 recorded collisions in this location over a period of five years, of which one was serious, and all others involved only slight injuries. Of the 25 collisions, one involved a motorcycle, one involved an LGV and the remaining collisions all involved only cars. The causes of collisions were as follows (some collisions had more than one cause):

- 24 were due to human error – various factors related to human error that are not separately listed below (e.g. speeding is listed separately as a specific human error);
- Two were due to weather-related factors;
- Two were due to intoxication;
- One was due to speeding;
- One was due to distraction outside the vehicle; and
- One was due to an unspecified cause (which was not clear from collision description).

2.2.1.2. Figure 2 1 shows the location of collisions and Table 2-1 summarises the police collision reports for collisions that resulted in severe injuries. A full summary of accidents recorded is included in Appendix 1 for reference.

Figure 2-1 - Junction 2, A3(M) Collision Plot

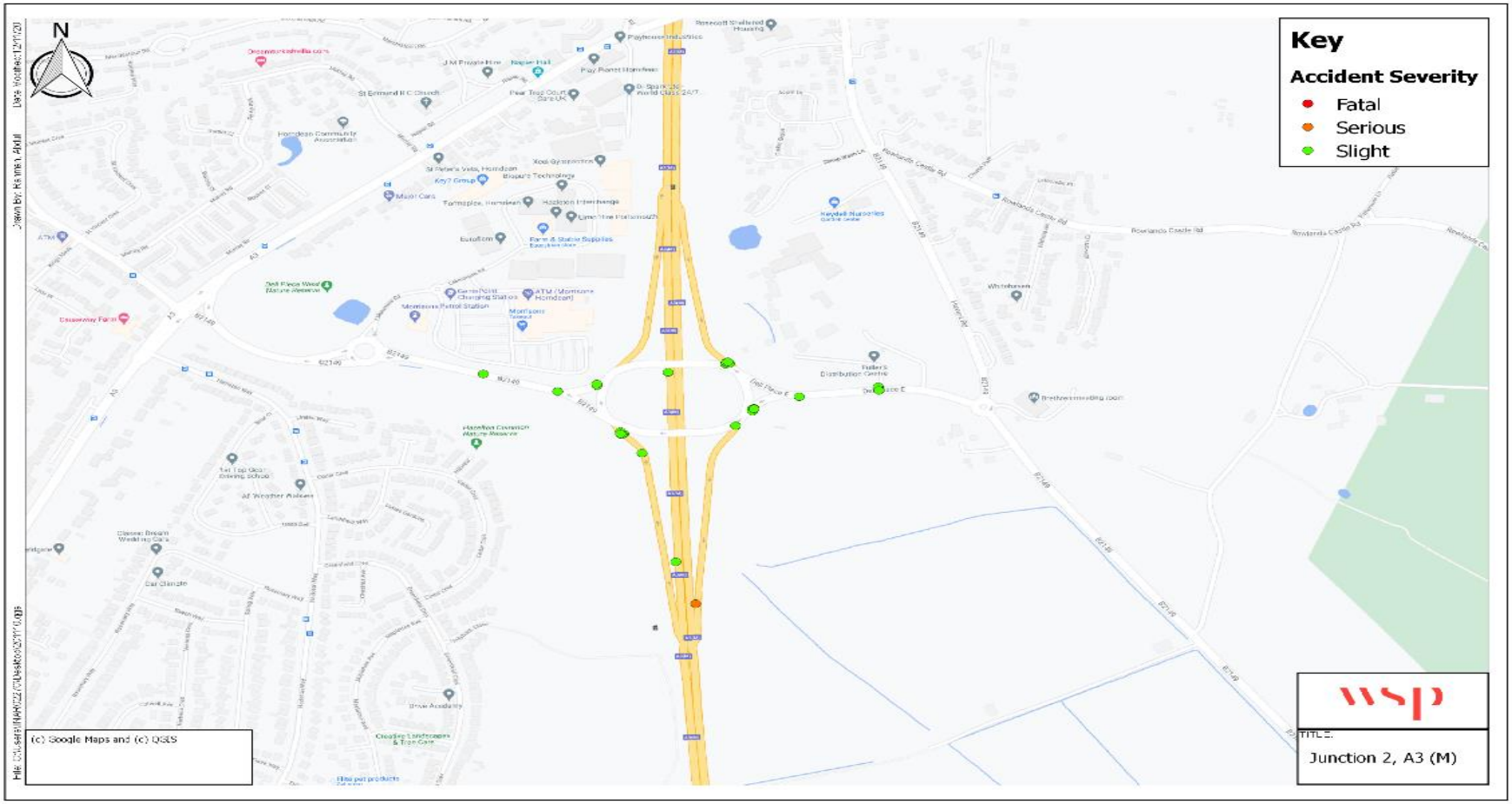

Table 2.1 - Junction 2, A3(M) Collision Reports Summary

Police Ref	Road User Types (other than car or van)	Severity	Description / Causation Factors
44190021102	Motorcycle	Serious	Veh1 M/Cycle) travelling S along A3(M) on-slip joined the main carriageway and collided with the nearside of veh2 (car) travelling S along A3(M) in lane one.

2.2.1.3. The collisions were mostly caused by human error. It is appropriate to consider further if these errors might have been in some way influenced by any location-specific factor such as the design of the junction; so as to determine if reassignment of traffic through this junction could exacerbate existing accident trends. To do this, the types and exact locations of collisions are considered in further detail below.

2.2.1.4. A total of 21 collisions were rear end collisions, of which:

- Nine occurred on the slip roads;
- Six occurred on the approaches to the roundabout from B2149;
- Four occurred elsewhere on B2149; and
- Two occurred on A3(M) mainline carriageway.

2.2.1.5. All nine of the rear-end collisions that occurred on the off-slips were at the location where the off-slips from the A3(M) merge with the roundabout.

2.3. IMPACT OF PROPOSED DEVELOPMENT

2.3.1.1. It can be expected that rear-end collisions would be in the majority at a grade-separated roundabout junction as most traffic does not interact with traffic moving in a different direction; and the wide carriageway space would reduce the likelihood of side-swipe collisions.

2.3.1.2. In terms of locations, the exact locations are fairly evenly distributed with no concentration on any particular part of the junction (such as the slip roads). This therefore corroborates the view that reassignment of traffic to this junction would not be intensifying use of a particularly hazardous junction as the data do not suggest any location-specific factor which might indicate a flaw in the design of part of the junction.

2.3.1.3. However, for completeness, an assessment has been undertaken of the possible impact of traffic flow increases and peak hour at this junction at this

junction, with reference to the submitted technical note HE03. Specifically related to the Highways England SRN, a hazard that could potentially be caused by traffic flow increases at a grade-separated junction such at the A3(M) Junction 2 is increased queuing on the off-slip roads. This could cause fast-moving traffic to join the back of an off-slip road queue and brake too late.

2.3.1.4. While queuing occurs at most junctions during peak hours, there is potentially more of a concern where a slip road leaves a mainline carriageway because only the exiting traffic would be slowing, so such traffic would be less likely to start to decelerate before joining the off-slip.

2.3.1.5. In this case, all of the rear-end collisions that occurred on the off-slips were at the location where the off-slips from the A3(M) merge with the roundabout, so this is not an existing problem at A3M Junction 2. An assessment however has been undertaken to confirm if the Proposed Development may lead to such an issue occurring, using the junction modelling results from HE03.

2.3.1.6. The traffic flow changes at A3M Junction 2 are summarised in Table 4 of Section 2 of HE03; these are reproduced below in Table 2.2. This traffic flow comparison shows that the Proposed Development is anticipated to lead to an overall reduction in traffic using the junction in the AM peak and an slight increase in traffic during the PM peak

Table 2.2 - SRTM Traffic Flows, A3M Junction 2

	2026 Assessed DM Scenario	2026 Assessed DS1 Scenario	2026 Assessed DS2 Scenario
AM Peak	4,007	3,989 (-18 vehicles)	3,985 (-22 vehicles)
PM Peak	3,914	4,097 (+183 vehicles)	4,094 (+180 vehicles)

2.3.2. A3(M) JUNCTION 2 EXISTING LAYOUT

2.3.2.1. The above flows were used in the assessments in Section 3 of HE03 in which lane simulation was used in Arcady to assess the impacts of the Proposed Development on the existing layout of the junction. The results for the 2026 Scenarios are in Tables 8 to 10 of HE03 with predicted queue lengths summarised in Tables 2-3 and 2-4 below.

Table 2.3 - Junction 2, A3 (M) Existing Layout AM Peak Junction Modelling Queue Lengths

Arm	Lane	DM Scenario	DS1 Scenario	DS2 Scenario
		Queue (PCU)	Queue (PCU)	Queue (PCU)
Dell Piece East	1 (left / ahead)	5	5	5
	2 (right / U-turn)	21	12	13
A3 (M) (south)	1 (left)	1	1	1
	2 (ahead / right / U-turn)	1	2	1
B2149 Dell Piece West	1 (left / ahead)	3	2	2
	2 (right / U-turn)	1	1	1
A3 (M) (north)	1 (left)	1	1	1
	2 (ahead / right / U-turn)	8	9	9

Table 2.4 - Junction 2, A3 (M) Existing Layout PM Peak Junction Modelling Queue Lengths

Arm	Lane	DM Scenario	DS1 Scenario	DS2 Scenario
		Queue (PCU)	Queue (PCU)	Queue (PCU)
Dell Piece East	1 (left / ahead)	4	4	3
	2 (right / U-turn)	3	3	2
A3 (M) (south)	1 (left)	2	3	3
	2 (ahead / right / U-turn)	3	3	3
B2149 Dell Piece West	1 (left / ahead)	7	2	2
	2 (right / U-turn)	37	34	40
A3 (M) (north)	1 (left)	1	1	1
	2 (ahead / right / U-turn)	1	1	2

2.3.2.2. The data in the above tables shows that the Proposed Development is not forecast to have material impact on the operation of the junction and forecast queue lengths.

2.3.2.3. The A3M junction 2 off-slip roads have lengths of approximately 360 metres and 270 metres, south and north respectively, with the worst-case forecast queue length increase experienced on the A3(M) North approach where it increases from 8 PCUs (48m) to 9 vehicles (54m). As such, the impact of the Proposed Development is not expected to materially change the collision risk at A3M Junction 2 when considering the existing layout.

2.3.3. A3(M) JUNCTION 2 COMMITTED IMPROVEMENT SCHEME

2.3.3.1. Further to the assessment of the existing layout at A3(M) Junction 2, Technical Note HE03 has also assessed the full signalisation of the junction, which is a committed junction improvement scheme associated with the development at Land East of Horndean, Rowlands Castle Road, Horndean, which proposes 800 dwellings and other complimentary uses (55562/005).

2.3.3.2. The Linsig traffic modelling results for the 2026 SRTM Scenarios with this committed junction improvements are in Tables 21 to 23 of HE03 with predicted queue lengths summarised in Tables 2-5 and 2-6 below.

Table 2.5 - Junction 2, A3 (M) Full Signalisation AM Peak Junction Modelling Queue Lengths

Arm	DM Scenario	DS1 Scenario	DS2 Scenario
	Queue (PCU)	Queue (PCU)	Queue (PCU)
Dell Piece East	31	29	29
A3 (M) (south)	7	7	7
B2149 Dell Piece West	11	11	11
A3 (M) (north)	41	20	20
Circulatory (east)	33	29	29
Circulatory (south)	2	3	3
Circulatory (west)	9	10	10
Circulatory (north)	5	15	15

Table 2.6 - Junction 2, A3 (M) Full Signalisation PM Peak Junction Modelling Queue Lengths

Arm	DM Scenario	DS1 Scenario	DS2 Scenario
	Queue (PCU)	Queue (PCU)	Queue (PCU)
Dell Piece East	18	19	18
A3 (M) (south)	8	8	8
B2149 Dell Piece West	69	67	67
A3 (M) (north)	11	10	10
Circulatory (east)	11	14	10
Circulatory (south)	2	2	2
Circulatory (west)	47	46	47
Circulatory (north)	6	8	6

2.3.3.3. The data in the above tables shows that the Proposed Development is not forecast to have material impact on the operation of the junction and forecast queue lengths. As such, the impact of the Proposed Development is not expected to materially change the collision risk at A3M Junction 2 when considering the assessment of the committed junction improvement scheme at this junction with the SRTM traffic flows.

A3(M) Junction 2 committed improvement scheme Alternative Future Year Assessment

2.3.3.4. Further discussions held between the Applicant and HE, at a meeting date 18th November 2020, also led to a request for additional lane simulation assessments to be undertaken calculated on the basis of observed traffic flows for Junction 2 of the A3 (M). These are discussed further in Section 5 of HE03, with the junction modelling results shown in Table 40 and 41, with predicted queue lengths summarised in Tables 2-7 and 2-8 below.

Table 2.7 - Junction 2, A3 (M) Full Signalisation Alternative Scenario AM Peak Junction Modelling Queue Lengths

Arm	DM Scenario	Combined DS Scenario
	Queue (PCU)	Queue (PCU)
Dell Piece East	25	24
A3 (M) (south)	6	6
B2149 Dell Piece West	11	12
A3 (M) (north)	7	7
Circulatory (east)	13	13
Circulatory (south)	5	3
Circulatory (west)	8	10
Circulatory (north)	14	2

Table 2.8 - Junction 2, A3 (M) Full Signalisation Alternative Scenario PM Peak Junction Modelling Queue Lengths

Arm	DM Scenario	Combined DS Scenario
	Queue (PCU)	Queue (PCU)
Dell Piece East	29	19
A3 (M) (south)	10	17
B2149 Dell Piece West	9	7
A3 (M) (north)	12	15
Circulatory (east)	11	12
Circulatory (south)	10	12
Circulatory (west)	11	3

Arm	DM Scenario	Combined DS Scenario
	Queue (PCU)	Queue (PCU)
Circulatory (north)	**1**	**13**

2.3.3.5. The results set out demonstrate that predicted queue lengths are not anticipated to increase significantly except on the A3(M) North approach, which will increase from 10 PCUs (60m) to 17 vehicles (102m) in the PM peak. This queue length however can be easily accommodated within the existing slip-road which is approximately 270m long. As such, the impact of the Proposed Development is not expected to materially change the collision risk at A3M Junction 2.

3. A3(M) JUNCTION 3

3.1. INTRODUCTION

3.1.1.1. This collision analysis covers A3(M) Junction 3 which includes A3(M) (North), Hulbert Road (West), Hulbert Road (East) and A3(M) (South). The analysis of the data also includes all the slip roads of the A3 (M) which form a part of the junction and a minimum of 200m on all other approaches. Where patterns are identified, these are highlighted for information.

3.2. COLLISION ANALYSIS

3.2.1.1. There has been a total of 40 recorded collisions in this location over a period of five years of which five were serious and all others involved only slight injuries. Of the 40 collisions, one involved a pedestrian, one involved a pedal cyclist, four involved motorcycles and the remaining collisions all involved only cars. The causes of collisions were as follows (some collisions had more than one cause):

- 35 were due to human error – various factors related to human error that are not separately listed below (e.g. speeding is listed separately as a specific human error);
- Seven were due to speeding;
- Four were due to illness / disability, fatigue or intoxication;
- Two were due to weather-related factors;
- One was due to road layout;
- One was due to a tyre blowout; and
- One was due to an unspecified cause (which was not clear from collision description).

3.2.1.2. Error! Reference source not found. shows the location of collisions and Error! Reference source not found. summarises the police collision reports for collisions that resulted in severe injuries. A full summary of accidents recorded is included in Appendix 1 for reference.

Figure 3-1 - Junction 3, A3(M) Collision Plot

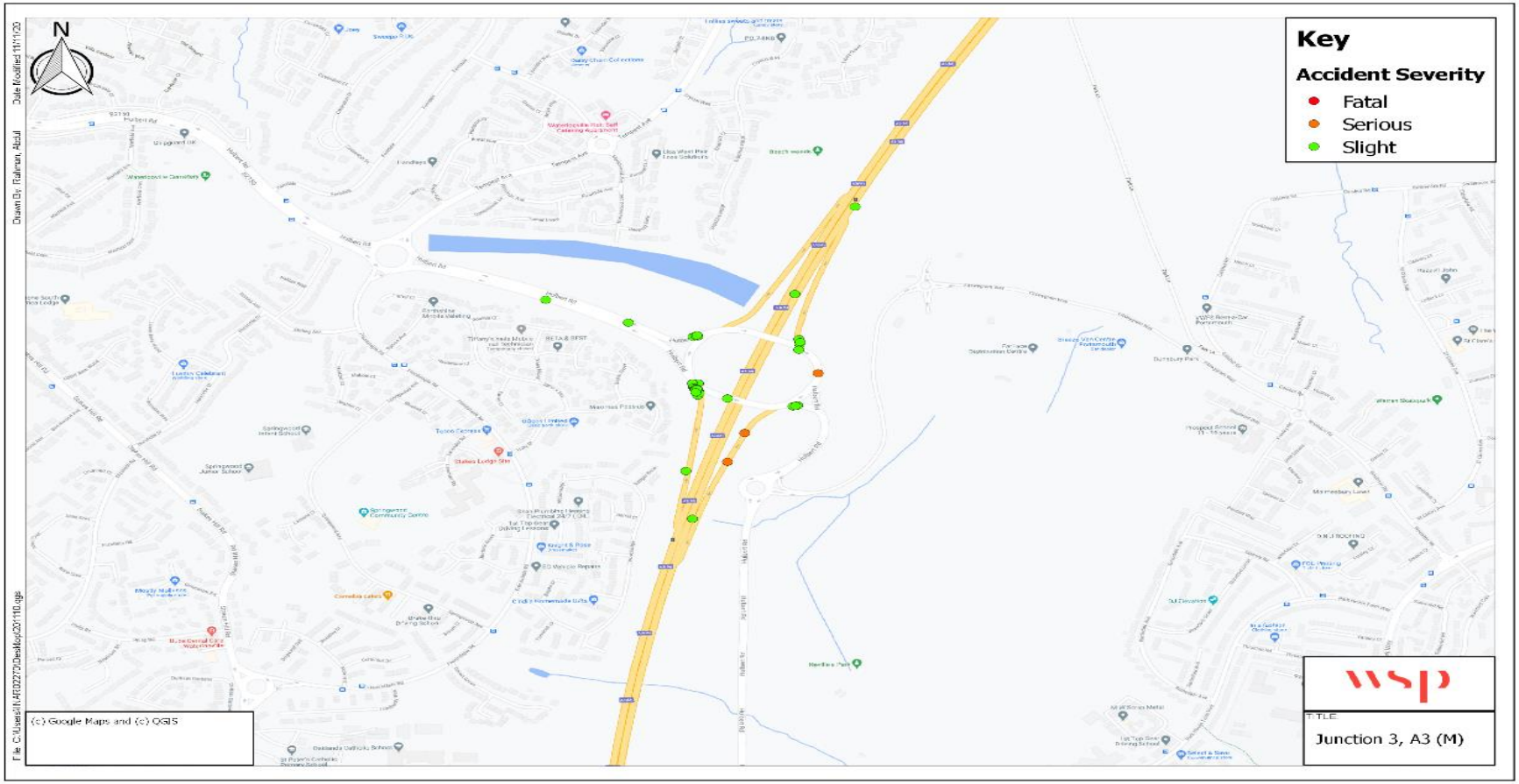

Table 3.1 - Junction 3, A3(M) Collision Reports Summary

Police Ref	Road User Types (other than car or van)	Severity	Description / Causation Factors
150280563	Motorcycle	Serious	Veh 1 (car) travelling SW along A3(M) on-slip when vehicle suffers a blow out causing vehicle to lose control and collide with veh 2 (M/Cycle) before colliding with the barrier. Rider of veh 2 fell off during collision.
140405989		Serious	Veh 1 (car) travelling S along A3(M) southbound junction 3 on-slip lost control and collided with the offside barrier.
140410784		Serious	Veh 2 (car) travelling N along A3(M) off-slip, begins to move onto roundabout but stops again causing following veh 1 (van) to move off and collide with rear of veh 2.
44180376198	Pedestrian	Serious	Veh1 (car) travelling around the roundabout from Hulbert Road to the A3(M) southbound collides with casualty 1 (pedestrian) who was standing in the middle of the carriageway in dark clothing.
150394425		Serious	Veh 1 (car) travelling NW along A3(M) off-slip, at the top of the slip road veh 1 leaves straight ahead at the junction and collides with the barrier and a sign on the roundabout and overturns.

3.2.1.3. The collisions had varied causes thereby not indicating any specific pattern that would indicate a need for mitigation. Furthermore, these causes do not suggest any location-specific factor such as the design of the junction. However, in assessing hazard, it is appropriate to give some consideration also to trends in terms of the types and exact locations of collisions.

3.2.1.4. A total of 31 collisions were rear end collisions, of which:

- 19 occurred on the slip roads;
- Eight occurred on the approaches to the roundabout from Hulbert Road;

- Three occurred on A3(M) mainline carriageway; and
- One occurred on the roundabout circulatory carriageway.

3.2.1.5. From the collision data it could be observed that 18 of the rear end collisions occurred where the off-slips from A3(M) merge with the roundabout and one occurred elsewhere on the off slip.

3.3. IMPACT OF PROPOSED DEVELOPMENT

3.3.1.1. It can be expected that rear-end collisions would be in the majority at a grade-separated roundabout junction as most traffic does not interact with traffic moving in a different direction; and the wide carriageway space would reduce the likelihood of side-swipe collisions.

3.3.1.2. In terms of locations, the exact locations of the rear-end collisions are predominantly at the intersection of the off-slip roads with the circulatory carriageway, which might potentially suggest an existing safety issue, probably due to drivers observing on-coming traffic to their right, then entering the roundabout at speed unaware of the closeness of a vehicle right in front.

3.3.1.3. AS with A3(M) Junction 2, an assessment has been undertaken of the possible impact of traffic flow increases and peak hour at this junction at this junction, with reference to the submitted technical note HE03.

3.3.1.4. The traffic flow changes at A3M Junction 3 are summarised in Table 4 of Section 2 of HE03; these are reproduced below in Table 3.2. This traffic flow comparison shows that the Proposed Development is anticipated to lead to an a slight increase in traffic during the AM peak but a reduction in traffic during the PM peak.

Table 3.2 - Traffic Flows, A3M Junction 3

	2026 Assessed DM Scenario	2026 Assessed DS1 Scenario	2026 Assessed DS2 Scenario
AM Peak	4,535	4,641 (+160 vehicles	4,693 (+158 vehicles)
PM Peak	4,783	4,741 (-42 vehicles	4,747 (-36 vehicles)

3.3.2. A3(M) JUNCTION 3 EXISTING LAYOUT

3.3.2.1. The above flows were used in the assessments in Section 3 of HE03 in which lane simulation was used in Arcady to assess the impacts of the Proposed Development on the existing layout of the junction. The results for the 2026 scenarios are in Tables 12 to 14 of HE03 and are reproduced below in Tables 3-3 to 3-4.

Table 3.3 - Junction 3, A3(M) Existing Layout AM Peak Lane simulation Queue Lengths

Arm	Lane	DM Scenario	DS1 Scenario	DS2 Scenario
		Queue (PCU)	Queue (PCU)	Queue (PCU)
Hulbert Road (east)	1 (left / ahead)	1	1	1
	2 (ahead / right / U-turn)	1	0	1
A3 (M) (south)	1 (left)	2	2	2
	2 (left / ahead / right / U-turn)	2	2	2
Hulbert Road (west)	1 (left /ahead)	96	117	119
	2 (right / U-turn)	1	1	1
A3 (M) (north)	1 (left /ahead)	5	6	5
	2 (right / U-turn)	1	1	1

Table 3.4 - Junction 3, A3 (M) Existing Layout PM Peak Lane simulation Queue Lengths

Arm	Lane	DM Scenario	DS1 Scenario	DS2 Scenario
		Queue (PCU)	Queue (PCU)	Queue (PCU)
Hulbert Road (east)	1 (left / ahead)	1	1	1
	2 (ahead / right / U-turn)	0	0	0
A3 (M) (south)	1 (left)	2	2	2
	2 (left / ahead / right / U-turn)	2	2	2
Hulbert Road (west)	1 (left /ahead)	2	2	2
	2 (right / U-turn)	2	2	2
	1 (left /ahead)	164	163	169

Arm	Lane	DM Scenario	DS1 Scenario	DS2 Scenario
		Queue (PCU)	Queue (PCU)	Queue (PCU)
A3 (M) (north)	2 (right / U-turn)	1	1	1

3.3.2.2. The data in the above tables shows that the maximum predicted queue on an off-slip is 169 PCUs on the A3M north, an increase of PCUs (30m) in comparison with the DM scenario. The north off-slip from the A3M at junction 3 has a length of approximately 270 metres. Therefore, the predicted maximum queue length, of 984m in the DM scenario and 1,014m in the DS2 scenario, would extend considerably into the mainline carriageway. Given that this this queue the Proposed Development is anticipated to increase this queue length by only 30m, it is however considered that the Proposed Development will not have a material impact on the collision risk on this approach.

3.3.3. A3(M) JUNCTION 3 COMMITTED IMPROVEMENT SCHEME

3.3.3.1. Further to the assessment of the existing layout at A3(M) Junction 3, Technical Note HE03 has also assessed the part signalisation of the junction, which is a committed junction improvement scheme associated with the development at Old Park Farm Development (05/0500)/OUT, Waterlooville. This junction improvement, which signalises the southern off-slip of the junction is expected to be implemented prior to construction of the Proposed Development

3.3.3.2. The Linsig traffic modelling results for the 2026 SRTM Scenarios with this committed junction improvements are in Tables 27 to 29 of HE03 with predicted queue lengths summarised in Tables 3-5 and 3-6 below.

Table 3.5 - Junction 3, A3 (M) Part Signalisation AM Peak Junction Modelling Queue Lengths

Arm	DM Scenario	DS1 Scenario	DS2 Scenario
	Queue (PCU)	Queue (PCU)	Queue (PCU)
Hulbert Road (east)	1	1	1
A3 (M) (south)	6	7	7
Hulbert Road (west)	106	103	104

Arm	DM Scenario	DS1 Scenario	DS2 Scenario
	Queue (PCU)	Queue (PCU)	Queue (PCU)
A3 (M) (north)	2	2	2
Circulatory (south)	10	10	11

Table 3.6 - Junction 3, A3 (M) Part Signalisation PM Peak Junction Modelling Queue Lengths

Arm	DM Scenario	DS1 Scenario	DS2 Scenario
	Queue (PCU)	Queue (PCU)	Queue (PCU)
Hulbert Road (east)	1	1	1
A3 (M) (south)	6	7	7
Hulbert Road (west)	5	6	6
A3 (M) (north)	138	148	150
Circulatory (south)	11	12	12

3.3.3.3. The data in the above tables shows that the Proposed Development is generally not forecast to have material impact on the operation of the junction and forecast queue lengths, with the exception A3(M) North (unsignalized) off-slip. The Proposed Development is anticipated to increase the forecast queue lengths on this approach from 138 PCU (828m) in the DM scenario to 148 PCU (888m) in DS1 and 150 (900m). In all cases this will extend onto the A3(M) mainline and the maximum queue length increase of 72m caused by the Proposed Development is not expected to materially change the collision risk at this location.

A3(M) Junction 3 committed improvement scheme Alternative Future Year Assessment

3.3.3.4. Further discussions held between the Applicant and HE, at a meeting date 18th November 2020, also led to a request for additional lane simulation assessments to be undertaken calculated on the basis of observed traffic flows of Junction 3 of the A3 (M). These are discussed further in Section 5 of HE03, with the junction modelling results shown in Table 48 and 49, with predicted queue lengths summarised in Tables 3-7 and 3-8 below.

Table 3.7 - Junction 3, A3 (M) Part Signalisation Alternative Scenario AM Peak Junction Modelling Queue Lengths

Arm	Lane	DM Scenario	Combined DS Scenario
		Queue (PCU)	Queue (PCU)
Hulbert Road (east)	1 (left / ahead)	1	1
	2 (ahead / right / U-turn)	0	0
A3 (M) (south)	1 (left)	1	1
	2 (left / ahead / right / U-turn)	1	2
Hulbert Road (west)	1 (left /ahead)	2	2
	2 (right / U-turn)	41	33
A3 (M) (north)	1 (left /ahead)	1	1
	2 (right / U-turn)	1	1

Table 3.8 - Junction 3, A3 (M) Part Signalisation Alternative Scenario PM Peak Junction Modelling Queue Lengths

Arm	Lane	DM Scenario	Combined DS Scenario
		Queue (PCU)	Queue (PCU)
Hulbert Road (east)	1 (left / ahead)	1	1
	2 (ahead / right / U-turn)	0	1
A3 (M) (south)	1 (left)	2	3
	2 (left / ahead / right / U-turn)	2	3
Hulbert Road (west)	1 (left /ahead)	1	1
	2 (right / U-turn)	2	2
A3 (M) (north)	1 (left /ahead)	1	1
	2 (right / U-turn)	2	2

3.3.3.5. The results set out demonstrate that the Proposed Development is not forecast to lead to significant queue length in either of the AM or PM peaks and that all queues can be easily accommodated within the A3(M) off-slips and other approaches without blocking upstream junctions. It can be concluded therefore that the Proposed Development will not have a material impact on the collision risk at this junction.

4. A27/A2030 EASTERN ROAD JUNCTION

4.1. INTRODUCTION

4.1.1.1. This analysis covers the roundabout junction of A27 and A2030 Eastern Road which includes A2030 Eastern Rd(N), A27 Havant Bypass(E), A2030 Eastern Road(S) and A27 Havant Bypass(W). The analysis of the data also includes all the slip roads of the A3 (M) which form a part of the junction and a minimum of 200m on all other approaches. Where patterns are identified, these are highlighted for information.

4.2. COLLISION ANALYSIS

4.2.1.1. There has been a total of 52 recorded collisions in this location over a period of five years of which nine were serious and all others involved only slight injuries. Of the 52 collisions, one involved a pedestrian, eight involved motorcycles, 10 involved cyclists and the remaining collisions all involved only cars. The causes of collisions were as follows:

- 47 were due to human error – various factors related to human error that are not separately listed below (e.g. speeding is listed separately as a specific human error);
- Three were due to weather-related factors;
- Two were due to speeding;
- Two were due to vehicle defects;
- One was due to intoxication;
- One was due to road layout;
- One was due to distraction outside vehicle;
- One was due to defective traffic signals;
- One was due to vision obstruction from vegetation; and
- One was due to an unspecified cause (which was not clear from collision description either).

4.2.1.2. Error! Reference source not found. shows the location of collisions and Error! Reference source not found. summarises the police collision reports for collisions that resulted in severe injuries. A full summary of accidents recorded is included in Appendix 1 for reference.

Figure 4-1 - A27/A2030 Eastern Road Junction Collision Plot

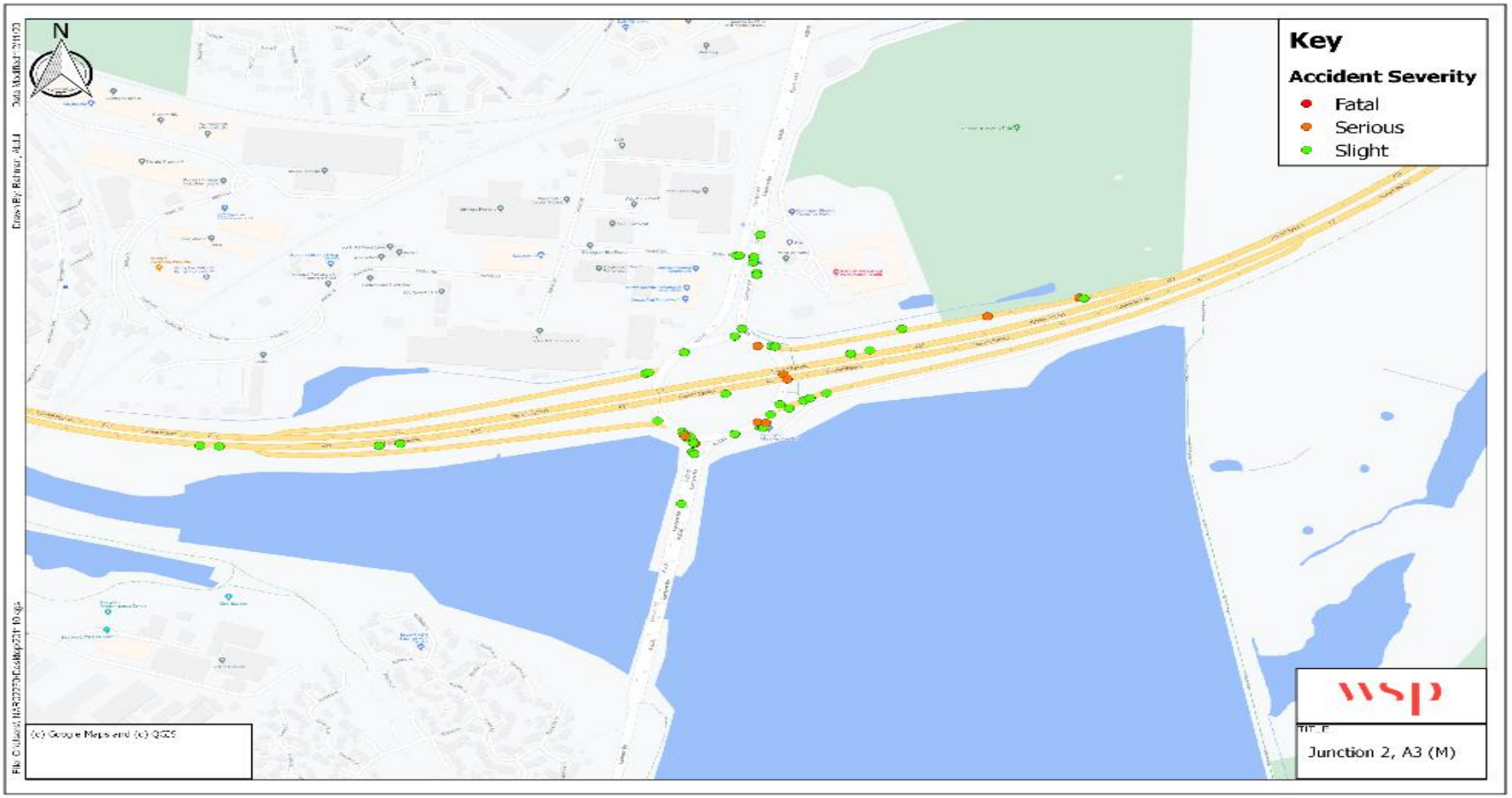

Table 4.1 - A27/A2030 Eastern Road Junction Collision Reports Summary

Police Ref	Road User Types (other than car or van)	Severity	Description / Causation Factors
160011278		Serious	Veh 1 (car) travelling S along A2030 Eastern road entered the roundabout intending to join A27 eastbound. Shortly after veh 1 entered the roundabout, veh 2 (car) collided with the offside of veh 1.
160016399	Motorcycle	Serious	Veh 1 (M/Cycle) travelling N along A2030 Eastern road attempted to beat traffic lights turning red, travelling between 50-60mph. Veh 1 hits offside kerb causing veh to collide with roundabout island.
160028173	Motorcycle	Serious	Veh 2 (M/Cycle) travelling S around A2030 Eastern road roundabout from green traffic lights overreacts to veh 1 (van) turning left out of Farlington Marsh car park onto A2030 Eastern road roundabout. Veh 1 had not entered the same lane as veh 2.
44170477965	Motorcycle	Serious	Veh 1 (M/Cycle) travelling S around A2030 Eastern road roundabout loses control due to ice.
44180240528		Serious	Veh1 (car) travelling NE along the A27 on-slip from the A2030 stops at the end of the on-slip road before the main carriageway. Veh2 (car) travelling NE along the A27 on-slip collides with the rear of veh1.
44180342530	Motorcycle	Serious	Veh1 (M/Cycle) travelling E along A27 on-slip in lane 2, travels too close to the offside and mounts the kerb. The rider is flung from the vehicle and bands on the armco barrier.
44180362828	Pedal Cycle	Serious	Veh1 (P/Cycle) travelling SW around roundabout in cycle lane. Veh2 (P/Cycle) travelling NE around roundabout in cycle lane. The two vehicles fail to see each other and collide head on.

Police Ref	Road User Types (other than car or van)	Severity	Description / Causation Factors
44180373796		Serious	Veh2 (car) travelling N along A2030 Eastern road. The ATS are not working. Veh2 edges out onto the roundabout, but drives too far and collides with veh1 (car) already on the roundabout.
44190179756	Pedal Cycle	Serious	Veh1 (P/Cycle) travelling S around the A2030 Eastern road roundabout in lane 2. Veh2 (van) travelling S in lane 1. As veh2 passed veh1 the racking on the side of the van caught the front wheel of veh1 causing rider to fall off.

4.2.1.3. The collisions were mostly caused by human error. It is appropriate to consider further if these errors might have been in some way influenced by any location-specific factor such as the design of the junction' to determine if reassignment of traffic through this junction could exacerbate existing accident trends. To do this, further consideration of the types and exact locations of collisions is provided below.

4.2.1.4. A total of 17 collisions were rear end collisions, of which:

- Six occurred on the slip roads;
- Five occurred on A27;
- Four occurred on the approaches to the roundabout from A2030
- One occurred elsewhere on A2030; and
- One occurred on the roundabout circulatory carriageway.

4.2.1.5. From the collision data it could be observed that four of the collisions occurred where the off-slips from the A27 merge with the roundabout and two occurred on the on-slip road approaching A27.

4.3. IMPACT OF PROPOSED DEVELOPMENT

4.3.1.1. As already noted, the majority of collisions were caused by human error. Also, the exact locations are fairly evenly distributed with no concentration on any particular part of the junction (such as the slip roads). These two points together suggest that reassignment of traffic to this junction would not be

intensifying use of a particularly hazardous junction as the data do not suggest any location-specific factor which might indicate a flaw in the design of part of the junction.

4.3.1.2. Furthermore, while construction of the Proposed Development is taking place on the A2030 Eastern Road, there is a predicted decrease in traffic flows through this junction. SRTM flows in the DM, DS1 and DS2 scenarios on each arm of the junction are illustrated in Tables 4.2 and 4.3 below.

4.3.1.3. In the DS1 scenario, overall traffic flows across the junction decrease in both the AM and PM peaks compared to the DM scenario, although the A2030 South experiences very slight increases of 5 and 1 vehicles per hour, which are more than offset by the decreases on other arms.

4.3.1.4. In the DS2 scenario, overall traffic flows across the junction decrease in both the AM and PM peaks compared to the DM scenario, although the A27 East experiences a slight increase of 20 vehicles per hour in the PM peak, which is more than offset by the decreases on other arms.

Table 4.2 - A27/A2030 Eastern Road SRTM Flows: AM Peak

Arm	Direction	DM	DS1	Change: DS1 from DM	DS2	Change: DS2 from DM
A27 East	Westbound	1,767	1,745	- 22	1,754	-13
A2030 South	Northbound	2,091	2,096	5	2,045	-46
A27 West	Eastbound	1,185	1,168	-17	1,174	-11
A2030 North	Southbound	1,317	1,267	-50	1,303	-14

Table 4.3 - A27/A2030 Eastern Road SRTM Flows: PM Peak

Arm	Direction	DM	DS1	Change: DS1 from DM	DS2	Change: DS2 from DM
A27 East	Westbound	1,581	1,492	-89	1,601	20
A2030 South	Northbound	2,230	2,231	1	2,188	-42
A27 West	Eastbound	1,002	933	-69	965	-36
A2030 North	Southbound	1,682	1,567	-115	1,628	-54

4.3.1.5. Taking account of the analysis completed of existing accident data and reduction in traffic flow it is not anticipated that the Proposed Development will have a material impact on the collision risk at this junction.

5. PORTSBRIDGE ROUNDABOUT

5.1. INTRODUCTION

5.1.1.1. This analysis covers the roundabout junction of the A27, the A3, the M27 and the A397 (the Portsbridge Roundabout). The analysis of the data also includes all the slip roads of the M27/A27 which form a part of the junction and a minimum of 200m on all other approaches. Where patterns are identified, these are highlighted for information.

5.2. COLLISION ANALYSIS

5.2.1.1. There has been a total of 112 recorded collisions in this location over a period of five years of which two were fatal, 16 were serious and all others involved only slight injuries. Of the 112 collisions, five involved pedestrians, 31 involved motorcycles, 15 involved cyclists, five involved buses, eight involved goods vehicles/lorries and the remaining collisions all involved only cars. The causes of collisions were as follows (some collisions had more than one cause):

- 107 were due to human error – various factors related to human error that are not separately listed below (e.g. speeding is listed separately as a specific human error);
- Eight were due to speeding;
- Eight were due to weather factors (including dazzled by sun, other vision hindrances, slippery road surface, other weather-related factors);
- Four were due to illness / disability, fatigue or intoxication;
- Three were due to distraction outside vehicle;
- Two were due to pedestrian crossing road masked by stationary vehicle;
- Two were due to animal or object in carriageway;
- Two were due to deposit on road (e.g. oil, mud, chippings);
- Two were due to vehicle defects;
- Two were due to unclear causes: cause unspecified and no indication from collision description; and
- One was due to road layout.

5.2.1.2. **Figure 5-1** shows the location of collisions and **Table 5-1** summarises the police collision reports for collisions that resulted in severe and fatal injuries. A full summary of accidents recorded is included in Appendix 1 for reference.

Figure 5-1 - Portsbridge Roundabout Collision Plot

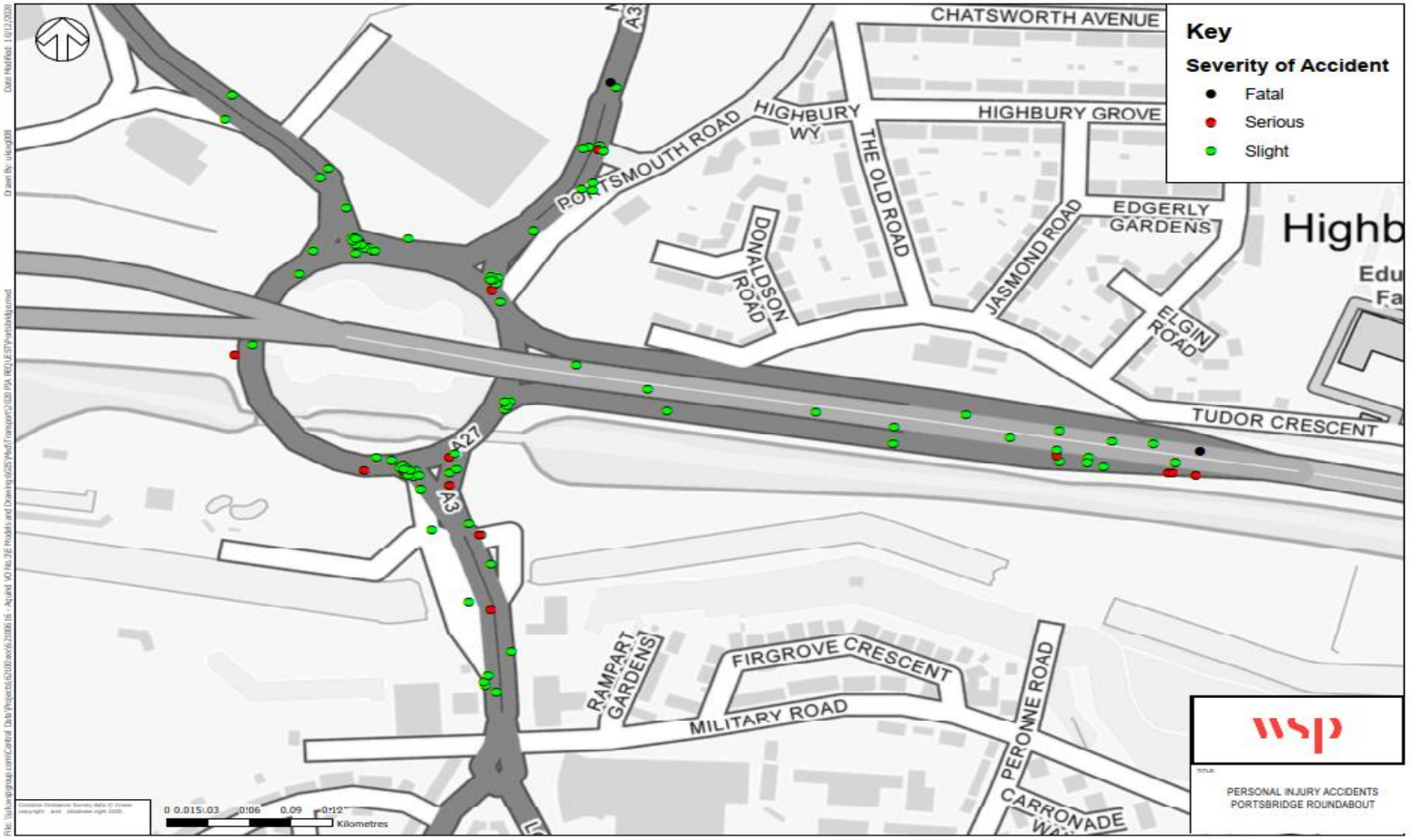

Table 5-5.1 – Portsbridge Roundabout Collision Reports Summary

Police Ref	Road User Types (other than car or van)	Severity	Description / Causation Factors
150179272	Motorcycle	Serious	Veh 1 (m/cycle) travelling N behind veh 2 (car) in outside lane of A3 London Road. Veh 2 indicated and began changing lanes to left. Veh 1 started overtaking. Veh 2 then moved back into outisde lane without indicating and collided with offside of veh 1. Occurred on A3 London Road 61 metres north of Shell petrol station, Portsmouth, Hampshire
150289979	Motorcycle	Serious	Veh 1 (m/cycle) travelling S along A3 London Road loses control after applying too much throttle whilst changing lanes to the right and collides with the central reservation. Occurred on A3 London Road 27 metres south of M27 westbound junction 12 offslip, Portsmouth, Hampshire
150365559	Lorry; Motorcycle	Serious	Veh 1 (lorry) travelling W along A27 indicated left whilst alongside veh 2 (m/cycle). Veh 2 then reacted and lost control on the slippery road surface, causing the rider to fall. Occurred on A27 westbound at junction with A3 London Road, Cosham, Hampshire
150406309	Motorcycle	Serious	Veh 1 (car) travelling NE along A397 Northern Road turns right onto Portsmouth Road across the path of veh 2 (m/cycle) travelling SW long A397 Northern Road and collides. Occurred on A397 Northern Road at junction with Portsmouth Road, Cosham, Hampshire
150419652	Motorcycle	Serious	Veh 1 (car) travelling S along A397 Northern Road entered A27 Western Road

Police Ref	Road User Types (other than car or van)	Severity	Description / Causation Factors
			Portsbridge Rbt and collided with veh 2 (m/cycle) travelling SE along A27 Western Road around Rbt. Occurred on A27 Western Road at junction with A397 Northern Road, Cosham, Hampshire
160042204		Serious	Veh 2 (car) travelling W along A27 exited onto A27 offslip and collided with rear of veh 1 (van) stationary in traffic facing W along A27 offslip. Occurred on A27 westbound offslip at junction with A27 westbound, Cosham, Hampshire
160175407	Bus; pedal cycle	Serious	Veh 1 (bus) travelling W around Portsbridge Rbt having entered from A397 Northern Road in bus lane and moves over into lane 1 failing to see veh 2 (p/cycle) travelling in the same direction and collides. Occurred on A3 London Road rbt 23 metres west of A397 Northern Road, Portsmouth, Hampshire
160250894	Motorcycle	Serious	Veh 1 (car) travelling S along A27 Western Road began moving off at the Portsbridge Rbt and collided with the rear of veh 2 (m/cycle) which was still stationary. Occurred on A27 Western Road at junction with A3 London Road, Cosham, Hampshire
160255242	Motorcycle	Serious	Veh 1 (car) travelling NW along A3 London Road moves off to enter rbt and collides with the rear of veh 2 (m/cycle) stationary waiting to enter rbt. Occurred on A3 London Road at junction with A27, Portsmouth, Hampshire
160267669	Motorcycle	Serious	Veh 1 (m/cycle) travelling S along A27 Western Road moved from lane 2 to lane 1

Police Ref	Road User Types (other than car or van)	Severity	Description / Causation Factors
			and collided with the offside of veh 2 (car) in lane 1. Occurred on A27 Western Road at junction with A397 Northern Road, Cosham, Hampshire
44170160985	Motorcycle	Fatal	Veh 1 (car) travelling E along A27 after joining from the A27 eastbound onslip, moved into lane 3 and into path of veh 2 (m/cycle) travelling in lane 3. This manoeuvre caused rider of veh 2 to fall off. Unknown if any contact between vehs. Occurred on A27 eastbound at junction with A27 eastbound onslip, Cosham, Hampshire
44170271124	Motorcycle	Serious	Veh 1 (m/cycle) travelling S around Rbt, exits onto A3 London Road in outside lane, loses control and collides with raised kerb and railings on the offside. Occurred on A3 London Road at junction with M27 westbound junction 12 offslip, Portsmouth, Hampshire
44170304499	Motorcycle	Serious	Veh 1 (m/cycle) travelling W along A27 offslip fails to stop in time and collides with rear of veh 2 (car) stopped in traffic. Occurred on A27 westbound at junction with A27 westbound offslip, Portsmouth, Hampshire
44170454388	Motorcycle	Serious	Veh 2 (m/cycle) travelling W along A27 in lane 2 moves into lane 1 and then onto the A27 westbound offslip and collides with rear of veh 1 (car) stationary on A27 westbound offslip facing W. Veh 2 view obscured by a HGV in lane 1. Occurred on A27 westbound offslip at junction with A27 westbound, Cosham, Hampshire
44180104677	Pedestrian	Serious	Veh1 (car) travelling N along Northern Road. Cas1 (pedestrian) has attempted to

Police Ref	Road User Types (other than car or van)	Severity	Description / Causation Factors
			cross the road from E to W between traffic. Cas1 is clipped by veh1's nearside wing mirror causing cas 1 to fall to the ground. Occurred on A397, Northern Road, outside bowling green, Cosham, Hampshire
44180234974	Bus; pedal cycle	Fatal	Veh1 (p/cycle) joins the A397 Northern Road at pedestrian crossing to travel N. The rider falls from veh and is struck by veh2 (bus) travelling N along A397 Northern Road. Occurred on A397 Northern Road, 50 meters N of junction with Portsmouth Road, Portsmouth, Hampshire.
44190190261	Motorcycle	Serious	Veh 1 (m/cycle) travelling S along A3 London Road and veh 2 (van) travelling in the same direction entering from the rbt. Unclear who collided with who. Occurred on A3 London Road 76 metres south of M27 westbound junction 12 offslip, Portsmouth, Hampshire
44190245354	Pedal cycle	Serious	Veh1 (p/cycle) travelling NB around A27 Portsbridge Roundabout on cycle path hits an object on the path causing veh1 to collide with a lamp post knocking the rider off. Occurred on A27 Portsbridge Roundabout under M27 underpass, Hilsea, Hampshire

5.2.1.3. The collisions were almost all caused by human error; and the road layout was only noted as a cause in one collision. Nevertheless, it is appropriate to consider further if these errors might have been influenced by any location-specific factor such as the design of the junction; so as to determine if reassignment of traffic through this junction could exacerbate existing accident trends. To do this, further analysis of the types and exact locations of collisions is provided below.

5.2.1.4. A total of 46 collisions were rear end collisions, of which:

- Seven occurred on the A27 Western Road approach to the roundabout;
- Eight occurred on the A3 approach to the roundabout;
- Nine occurred on the A397 approach to the roundabout;
- Two occurred on the A397 heading away from the roundabout;
- Eight occurred on the mainline carriageways;
- Five occurred on the off-slips, including one on the intersection between the off-slip and the mainline carriageway; and
- Seven occurred on the roundabout circulatory carriageway.

5.3. IMPACT OF PROPOSED DEVELOPMENT

5.3.1.1. As already noted, the vast majority of these collisions were caused by human error. Also, the exact locations are fairly evenly distributed with no concentration on any particular part of the junction (such as the slip roads). These two points together suggest that reassignment of traffic to this junction would not be intensifying use of a particularly hazardous junction as the data do not suggest any location-specific factor which might indicate a flaw in the design of part of the junction.

5.3.1.2. Notwithstanding the above, Figure 5.1 shows a small cluster of collisions at the intersection of the A27 off-slip with the roundabout's circulatory carriageway, which has previously been raised by PCC as a concern. From reviewing the descriptions of these collisions in Table 5.1, there does not appear to be a particular cause related to the road layout. However, as noted in the review of A3M junction 3 in Chapter 3, collisions at the intersection of an off-slip road with a circulatory carriageway might suggest a hazard of drivers observing on-coming traffic to their right, then entering the roundabout at speed unaware of the closeness of a vehicle right in front. It is therefore worth considering if there will be increases in traffic flow as a result of the Proposed Development.

5.3.1.3. The Applicant's Transcript of Oral Submissions from Issue-Specific Hearing 2 of 14 December 2020 (REP5-061) includes discussion of the predicted changes in flows through the Portsbridge Roundabout as a result of the Proposed Development.

5.3.1.4. In Paragraphs 3.30 to 3.32 of REP5-061, the Applicant accepted that when using the SRTM outputs the Do-Minimum scenario results for the junction capacity analysis do not reflect the existing situation where traffic queues are known to extend back from the westbound A27 off-slip onto the A27 mainline in the peak hours. The Applicant therefore completed further analysis of traffic flows comparing the outputs of the Do Something 1 and 2 Scenarios with the Do Minimum Scenarios.

5.3.1.5. This analysis showed – as summarised in REP5-061 paragraph 3.30 – that the Do-Something scenarios lead either to a decrease in traffic flow or an increase of 30 to 40 vehicles across the entire junction in the AM and PM peak hours. In addition, the A27 Westbound off-slip experiences a maximum increase of nine vehicles in the PM peak Do-Something 1 scenario and a decrease in traffic in all other scenarios. This is despite the junction operating in the SRTM with a lower level of delay than the existing baseline, with traffic instead using alternative routes such as the M275 to avoid construction works on the A2030 Eastern Road.

5.3.1.6. The comparative assessment results are summarised in Table 5.2 below, to show the changes arising from traffic reassignment by virtue of construction of the Proposed Development.

Table 5.2 - Portsbridge Roundabout Comparative Assessment

	AM Peak	PM Peak
Portsbridge Roundabout DS 1 Net Traffic Flow Changes compared to DM Scenario	+8	+34
A27 Westbound Off-Slip DS 1 Net Traffic Flow Changes compared to DM Scenario	-10	+9
Portsbridge Roundabout DS 2 Net Traffic Flow Changes compared to DM Scenario	-18	+36
A27 Westbound Off-Slip DS 2 Net Traffic Flow Changes compared to DM Scenario	-6	-8

5.3.1.7. As such, the traffic and collision risk impact of the Proposed Development on Portsbridge Roundabout will be negligible.

5.3.1.8. Furthermore, the impact will be temporary and only occur when works are taking place on A2030 Eastern Road. This will be limited to seven weeks per circuit, and only during school holidays, June and July (due to FTMS programme restrictions). Compared with this, the modelling assesses neutral months, when flows would typically be higher. Therefore, any impact would be expected to be lower than the modelled impacts, as public travel would also be lower for much of this period.

6. SUMMARY AND CONCLUSIONS

6.1. SUMMARY

6.1.1.1. Based on the collision data received from Hampshire Constabulary the collision risk was assessed at the following three junctions of the Strategic Road Network (SRN):

- Junction 2 of the A3(M);
- Junction 3 of the A3(M);
- Junction of A27 / A2030 Eastern Road;
- Junction of A27 / A3 / M27 / A397 (Portsbridge Roundabout).

6.1.1.2. These have been assessed against existing accident data and traffic modelling using the SRTM and observed traffic flows.

6.2. CONCLUSIONS

6.2.1.1. At the junction of the A27 / A2030, at the Portsbridge Roundabout and at Junction 2 of the A3(M), the collision data do not show that reassignment of traffic to these junctions would intensify use of particularly hazardous junctions, as the data do not suggest any location-specific factors which might indicate flaws in the designs of parts of the junctions.

6.2.1.2. At Junction 3 of the A3(M), the predominance of the rear-end collisions at the intersection of the off-slip roads with the circulatory carriageway might potentially suggest an existing safety issue, probably due to drivers observing on-coming traffic to their right, then entering the roundabout at speed unaware of the closeness of a vehicle right in front.

6.2.1.3. At Junction 3 of the A3M, the mitigation measures proposed to be implemented alongside the committed Old Park Farm development include signalisation of the northbound off-slip of the A3 (M) and the corresponding circulatory. Such a scheme will very likely address this type of collision by removing the need for approaching drivers to look to their right as they enter the roundabout. Furthermore, traffic modelling completed in HE03 shows that the Proposed Development is not predicted to have a material impact on queue lengths on this approach during the AM and PM peak periods.

6.2.1.4. Overall, the Proposed Development is not expected to materially worsen the collision risk on the SRN at either of these four junctions.