DCC/INQ/35

A380 South Devon Link Road (Kingskerswell Bypass)

Public Inquiry

Note on Performance of Kerswell Gardens Junction, Edginswell Junction and Jurys Corner Junction

1 INTRODUCTION

1.1 This note provides an analysis of the existing performance of Kerswell Gardens junction and the performance of the proposed Edginswell Junction (the Displaced Right Turn junction) and Kerswell Gardens signalised junction in the Scheme design year (2028). It is also compares the capacity of the Displaced Right Turn junction to the existing capacity of Jurys Corner.

2 KERSWELL GARDENS JUNCTION

2.1 The existing Kerswell Gardens junction currently operates as an unsignalised roundabout. Following the construction of the Scheme, the existing roundabout would be converted to a signalised junction (Kerswell Gardens signalised junction) and a new signalised junction would be constructed to the west of the existing junction (Edginswell Junction - the Displaced Right Turn junction). The performance of both these junctions is reported in this note.

3 PERFORMANCE OF THE EXISTING KERSWELL GARDENS JUNCTION

3.1 The performance of the existing junction is shown in Table 1 below, in terms of the ratio of flow to capacity (RFC) on each of the approaches to the junction. This analysis has been carried out using a localised junction model.

EXISTING KERSWELL GARDENS – RFCs		
	Base (2008)	
	AM Peak	PM Peak
Kerswell Gardens		
Entry from Torquay	85%	80%
Entry from Kingskerswell	40%	55%
Entry from Ring Road	50%	50%

(Source: Table 6, DCC/P/4)

Table 1 – Performance of Kerswell Gardens in Base Year (RFCs)

3.2 The assessment shows that the junction currently operates within capacity. However, the junction model assesses the performance of the junction in isolation (unlike the Scheme model) and does not incorporate the fact that the northbound exit from the roundabout onto the A380 is currently blocked due to queues emanating from the merge on the A380 to the north of Kerswell Gardens (as detailed in David Black's Proof – **DCC/P/4**, Section 3.8.6). These queues block through the junction and cause the performance of the junction to deteriorate.

3.3 As the junction model does not incorporate the exit blocking effect, existing queues at the junction have been taken from the queue length surveys; the results are shown in Table 2 below. The results indicated thus '**' in Table 2 indicate when the observed queue length exceeded the length that could be measured by the surveyors. It is therefore the case that the actual queues during these periods would exceed those reported in the table. The results show that queues are currently experienced on all approaches to the junction.

EXISTING KERSWELL GARDENS – QUEUES (metres)		
	Base (2008)*	
	AM Peak	PM Peak
Kerswell Gardens		
Entry from Torquay	30	90 **
Entry from Kingskerswell	40 **	20
Entry from Ring Road	100 **	80 **

** Average queue from queue length surveys*

Table 2 – Performance of Kerswell Gardens in Base Year (Queues)

4 PERFORMANCE OF EDGINSWELL JUNCTION (DISPLACED RIGHT TURN) IN 2028

4.1 The Scheme would provide 2 lanes on all exits of the Displaced Right Turn junction. There would be no merge lanes, as opposed to the existing northbound exit from Kerswell Gardens, and hence the existing 2 lane to 1 lane merge would be removed. The exit blocking currently experienced on the northbound exit would therefore be eliminated, and hence the performance of the junction can be assessed using the localised junction model. The results from this model for the 2028 with Scheme scenario are shown in Table 3 below.

EDGINSWELL JUNCTION DISPLACED RIGHT TURN – RFCs		
	2028 With Scheme	
	AM Peak	PM Peak
Displaced Right Turn		
Bypass to Kerswell Gdns	37%	41%
Bypass to Paignton	93%	88%
Kerswell Gdns to Bypass	93%	72%
Kerswell Gdns to Paignton	45%	90%
Paignton to Bypass	69%	81%
Paignton to Kerswell Gdns	89%	81%

(Source: Table 31, DCC/P/4)

Table 3 – Performance of Displaced Right Turn in 2028 (RFCs)

4.2 The assessment shows that the junction would operate within capacity in the Design Year (2028). Some of the approaches would be close to capacity at peak times, but would not be over capacity; this is consistent with the aim of the Scheme to provide sufficient capacity but without over providing.

4.3 The level of queuing at the junction is presented in Table 4 below. The queues shown are those at the end of the green period of the traffic signals.

EDGINSWELL JUNCTION DISPLACED RIGHT TURN – QUEUES (metres)		
	2028 With Scheme**	
	AM Peak	PM Peak
Displaced Right Turn		
Bypass to Kerswell Gdns	0	0
Bypass to Paignton	0	0
Kerswell Gdns to Bypass	0	0
Kerswell Gdns to Paignton	0	0
Paignton to Bypass	0	0
Paignton to Kerswell Gdns	0	0

*** Queue at end of green period from model*

Table 4 – Performance of Displaced Right Turn in 2028 (RFCs)

4.4 The results show that in 2028 with the Scheme in place, the existing queuing experienced at the junction will be eliminated. As the Displaced Right Turn will operate within capacity in 2028, no queues will occur on any approaches at the end of the green period. Whilst queues will form when the traffic signals on any approach are on red, these queues will clear during the green period. Hence, every vehicle will pass through the junction during the green period.

5 PERFORMANCE OF KERSWELL GARDENS SIGNALISED JUNCTION IN 2028

5.1 The Scheme would provide 2 lanes on the eastbound and westbound exits of the Kerswell Gardens signalised junction and a single lane on the northbound exit to Kingskerswell village (the old A380). No merges would exist on the eastbound and westbound exits and hence no exit blocking would occur. Flows on the northbound exit are small as this traffic is now just local traffic travelling to Kingskerswell which can be accommodated by a single lane exit; hence no exit blocking would occur on this exit.

5.2 As the exit blocking currently experienced on the northbound exit would be eliminated, the performance of the junction can be assessed using the localised junction model. The results from this model for the 2028 with Scheme scenario are shown in Table 5 below.

KERSWELL GARDENS SIGNALISED JUNCTION – RFCs		
	2028 With Scheme**	
	AM Peak	PM Peak
Kerswell Gdns Signalised Junc.		
Entry from Torquay	66%	64%
Entry from Kingskerswell	73%	68%
Entry from Ring Road	61%	69%

(Source: Table 31, DCC/P/4)

Table 5 – Performance of Kerswell Gardens in 2028 (RFCs)

5.3 The results show that the junction would operate within capacity in the Design Year (2028).

5.4 The level of queuing at the end of the green period is shown in Table 6 below.

KERSWELL GARDENS SIGNALISED JUNCTION – QUEUES (metres)		
	2028 With Scheme**	
	AM Peak	PM Peak
Kerswell Gdns Signalised Junc.		
Entry from Torquay	0	0
Entry from Kingskerswell	0	0
Entry from Ring Road	0	0

*** Queue at end of green period from model*

Table 6 – Performance of Kerswell Gardens in 2028 (Queues)

5.5 Again, the results show that there will be no queuing at the junction at the end of the green period. Whilst queues will form on the approaches when the traffic signals are on red, these queues will clear during the green period.

6 CAPACITY OF DISPLACED RIGHT TURN

6.1 The Edginswell Displaced Right Turn junction is a high capacity junction and has been shown above to operate within capacity in peak periods in 2028. The capacities of each of the approaches to the junction taken from the traffic model are shown in Table 7 below:

DISPLACED RIGHT TURN – FLOWS AND CAPACITY (veh/hr)				
	2028 With Scheme Flows		Junction Capacity	
	AM Peak	PM Peak	AM Peak	PM Peak
Bypass to Kerswell Gdns	1069	1091	2890	2660
Bypass to Paignton	1404	1408	1510	1600
Total Capacity From Bypass (North)	**2474**	**2499**	**4400**	**4260**
Kerswell Gdns to Bypass	1525	972	1640	1350
Kerswell Gdns to Paignton	450	828	1000	920
Total Capacity From Kerswell Gardens (East)	**1975**	**1800**	**2640**	**2270**
Paignton to Bypass	1152	1191	1670	1470
Paignton to Kerswell Gdns	534	640	600	790
Total Capacity From Paignton (West)	**1686**	**1831**	**2270**	**2260**
TOTAL	**6135**	**6129**	**9310**	**8790**

Table 7 – Capacity of Displaced Right Turn

7 CAPACITY OF JURYS CORNER

7.1 Jurys Corner junction currently operates as a signalised junction. The existing capacity of the junction is assessed in David Black's Proof of Evidence (**DCC/P/4**, para 3.11.3); this states the existing capacity as between 1,150 and 1,350 vehicles per hour for the A380 approaches. Paragraph 3.11.4 of **DCC/P/4** states that the capacity in the PM peak is predicted to be in the region of 1,200 vehicles.

7.2 The existing flows and capacity of the junction are shown in Table 8 below and shows that the junction is unable to support any additional demand.

JURYS CORNER – FLOWS AND CAPACITY (veh/hr)				
	Base Year (2008) Flows		Junction Capacity	
	AM Peak	PM Peak	AM Peak	PM Peak
A380 North	1120	1200	1200	1200
Coffinswell Lane	100	50	175	175
A380 South	1200	1180	1200	1200
Barnhill Road	150	160	175	175
TOTAL	**2570**	**2590**	**2650**	**2750**

Table 8 – Capacity of Jurys Corner

7.3 The analysis of the existing capacity of Jurys Corner junction and the capacity of the Displaced Right Turn junction in 2028 demonstrates that the total capacity of the Displaced Right Turn at approximately 9,000 veh/hr is more than three times greater than that of the existing Jurys Corner junction, which is approximately 2,700 veh/hr.

8 SUMMARY

8.1 The analysis has demonstrated that the Edginswell (Displaced Right Turn) and Kerswell Gardens signalised junctions would operate within capacity in peak periods in the Design Year (2028) following the construction of the Scheme.

8.2 The Displaced Right Turn junction has been shown to have significantly more capacity than the existing Jurys Corner junction.