Additional Local Junction Modelling for DDC Local Plan

DATE:	24 March 2023	**CONFIDENTIALITY:**	Public
SUBJECT:	Additional Local Junction Modelling for DDC Local Plan		
PROJECT:	Dover Regulation 19 Local Plan	**AUTHOR:**	Katerina Gida
CHECKED:	John Allen	**APPROVED:**	Christine Elphicke

INTRODUCTION

The purpose of this note is to document the additional local junction modelling which has been undertaken since the Dover District Council Local Plan Regulation 19 Transport Modelling Forecasting Report was finalised for public consultation in October 2022. Subsequently Kent Count Council (KCC) have provided Dover District Council with comments and this note provides the response to the following:

- The impacts of KCC's proposed mitigation improvements at the A256/ A258 Deal Road junction and A256 Sandwich Road Bypass/ A257/ Ash Road junction
- The assessment of the A258 Deal Road roundabout

A256/ A258 DEAL ROAD JUNCTION

Input Flows

As this junction lies outside the detailed model area of the DDTM the flows from the static analysis undertaken for this junction as part of Cluster 2.

Junction Modelling

As a priority roundabout, the modelling was undertaken using TRL Junction 10 software, to understand the performance.

Results

Table 1 presents the junction modelling results in the base year for A256/ A258 Deal Road roundabout. The results show that the junction performs within capacity in both time periods with no significant queues or delays.

Table 1: 2015 A256 Sandwich Bypass/A258 Deal Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (NW)	5.3	20.06	0.85	3.7	14.45	0.79
A258 Deal Road (E)	0.7	3.88	0.42	0.4	2.91	0.26
A256 (S)	1.5	7.85	0.61	1.2	6.29	0.55
Sandwich Wildlife Park (W)	0.0	10.54	0.01	0.0	8.47	0.00

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Table 2 presents the junction performance for the 2040 DM scenario. As the table highlights in both the AM and PM peak the Sandwich Bypass arm performance deteriorates with delays increasing and the RFC is 0.96 and 092 in the AM and PM peak which is close to capacity.

Table 2: 2040 DM A256 Sandwich Bypass/A258 Deal Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (NW)	16.7	59.99	0.96	10.0	35.38	0.92
A258 Deal Road (E)	0.7	3.98	0.42	0.7	3.77	0.41
A256 (S)	4.5	17.14	0.82	2.1	9.37	0.68
Sandwich Wildlife Park (W)	0.0	15.26	0.01	0.0	11.44	0.01

Table 3 presents the junction performance for the 2040 DS1 with mitigation scenario. As with 2040 DM the Sandwich Bypass experiences high RFC and delays both peaks which are a similar magnitude to those experienced in the 2040 DM.

Table 3: 2040 DS1 with Mitigation A256 Sandwich Bypass/A258 Deal Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (NW)	7.6	29.02	0.89	13.9	49.05	0.95
A258 Deal Road (E)	0.7	3.87	0.42	0.8	4.03	0.45
A256 (S)	5.4	20.00	0.85	4.4	17.16	0.82
Sandwich Wildlife Park (W)	0.0	16.17	0.01	0.0	15.64	0.01

Overall the A256/ A258 Deal Road junction experiences delays and capacity issues in the DM and DS scenarios. The next steps are to consider junctions improvements for this junction to help improve delays.

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Junction Mitigation

To mitigate the impact of the future traffic flows this junction, KCC have provided junction improvement option, as a larger roundabout to the east of the current junction.
This results in the existing access to Sandwich Wildlife Park to be stopped up and moved further west, set as a separate access off the Sandwich Bypass, rather than directly off the roundabout. However, this new access to Sandwich Wildlife Park will not allow right turn access from A256, directly, with vehicles from the north needing to make a u - turn at the roundabout to turn left into the site.
Additionally, a pedestrian crossing point on A258 Deal Road (E) arm is implemented to link Bridleway with Dover Road and improve pedestrian facilities at the junction. Figure 1 presents a draft layout of the proposed priority roundabout.

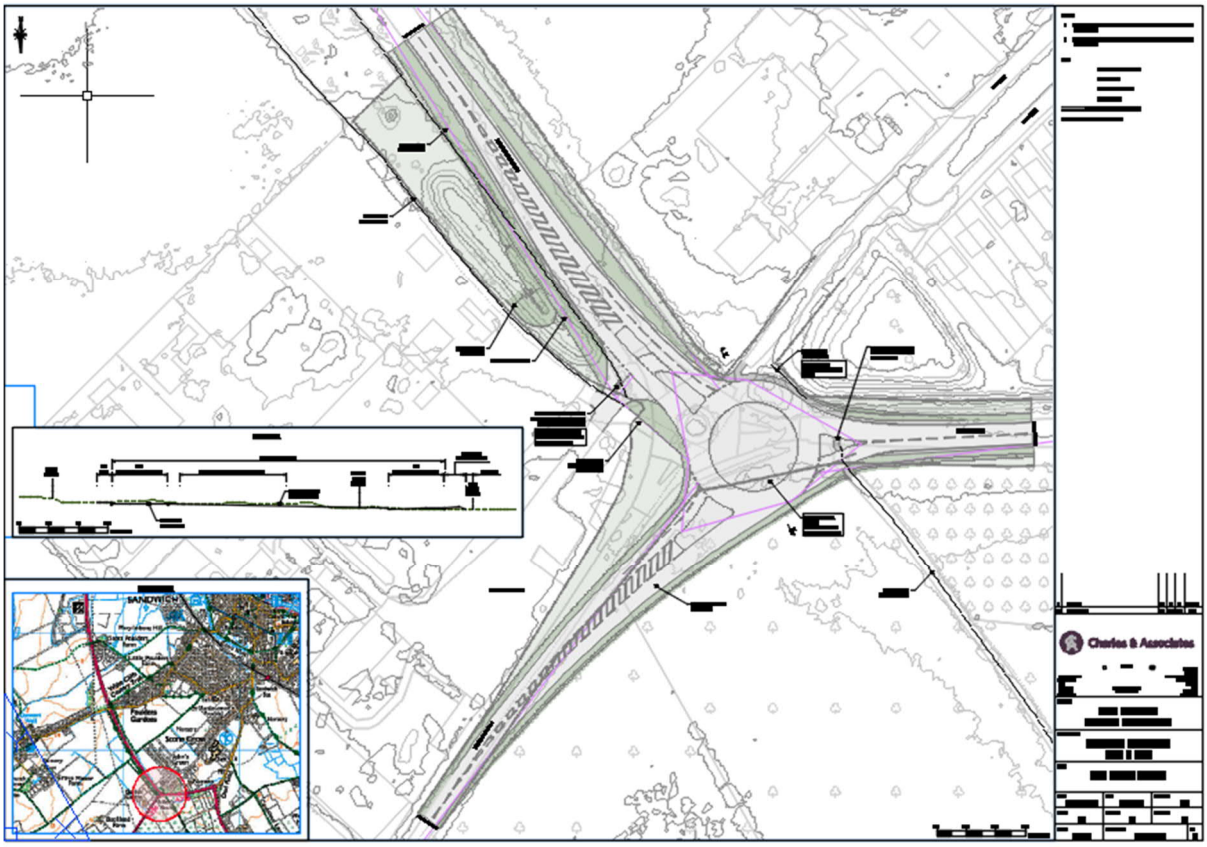

Figure 1: Proposed A256/ A258 Junction Improvement Drawing

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Results

Table 4 presents the junction modelling results in the DS for A256/ A258 Deal Road roundabout. The results show that the junction performs within capacity in both time periods with no significant queues or delays. Indicating that the proposed improvements will reduce delays and improve the RFC.

Table 4: DS1 with mitigation A256 Sandwich Bypass/A258 Deal Road with Junction Improvements

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (NW)	1.6	5.88	**0.62**	1.8	6.05	**0.64**
A258 Deal Road (E)	1.0	5.33	**0.50**	1.1	5.50	**0.53**
A256 (S)	2.3	8.50	**0.70**	2.0	7.53	**0.66**

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A256 SANDWICH ROAD BYPASS/ A257/ ASH ROAD

Input Flows

As this junction lies outside the detailed model area of the DDTM the flows from the static analysis undertaken for this junction as part of Cluster 3.

Junction Modelling

As a priority roundabout, the modelling was undertaken using TRL Junction 10 software, to understand the performance.

Results

Table 5 presents the junction modelling results in the base year for A256 Sandwich Road Bypass/ A257/ Ash Road roundabout. The results show that the junction performs within capacity in both time periods with no significant queues or delays.

Table 5: 2015 A256 Sandwich Road Bypass/A257/ Ash Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (N)	2.5	9.02	0.72	2.6	9.19	0.72
Ash Road (E)	0.4	7.02	0.27	0.2	6.50	0.19
Sandwich Bypass (S)	2.5	9.90	0.72	1.6	7.06	0.62
A257 Each End (W)	1.0	5.19	0.49	0.8	4.50	0.44

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Table 6 presents the junction performance for the 2040 DM scenario. As the table highlights in both the AM and PM peak both Sandwich Bypass arms performance deteriorates with delays increasing and the RFC is over 0.97 in the AM and PM peak which is close to capacity.

Table 6: 2040 DM A256 Sandwich Road Bypass/A257/ Ash Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (N)	29.7	82.13	0.99	20.5	58.74	0.97
Ash Road (E)	0.9	13.87	0.47	0.5	11.33	0.35
Sandwich Bypass (S)	24.3	75.25	0.98	16.3	51.52	0.96
A257 Each End (W)	2.8	11.78	0.74	2.2	9.78	0.69

Table 7 presents the junction performance for the 2040 DS1 with mitigation scenario. As with 2040 DM the Sandwich Bypass arms experiences high RFC and delays in both peaks with all arms exceeding a RFC of 1 indicating they are over capacity.

Table 7: 2040 DS1 with Mitigation A256 Sandwich Road Bypass/A257/ Ash Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (N)	149.5	364.56	1.11	119.2	290.55	1.08
Ash Road (E)	1.0	15.31	0.50	0.6	12.83	0.38
Sandwich Bypass (S)	48.3	136.27	1.02	84.7	222.74	1.06
A257 Each End (W)	4.1	16.01	0.81	3.1	12.90	0.76

Overall, the A256 Sandwich Road Bypass/A257/ Ash Road junction experiences delays and capacity issues in the DM and DS scenarios. The next steps for this junction will be to identify potential improvements for the junction with KCC.

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Junction Mitigation

To mitigate the impact of the future traffic flows this junction, KCC have provided junction improvement option. The new junction layout increases the diameter of the roundabout, shifting this further north-west. Each approach has increased formal lane markings on approach to the roundabout. Whilst the highway alignment has moved, existing accesses have been retained on A257/Ash Road arms. These improvements have been represented in Junctions 10 modelling software by remeasuring the geometric parameters for each arm as a result of the changed layout. Figure 2 presents a draft layout of the proposed priority roundabout.

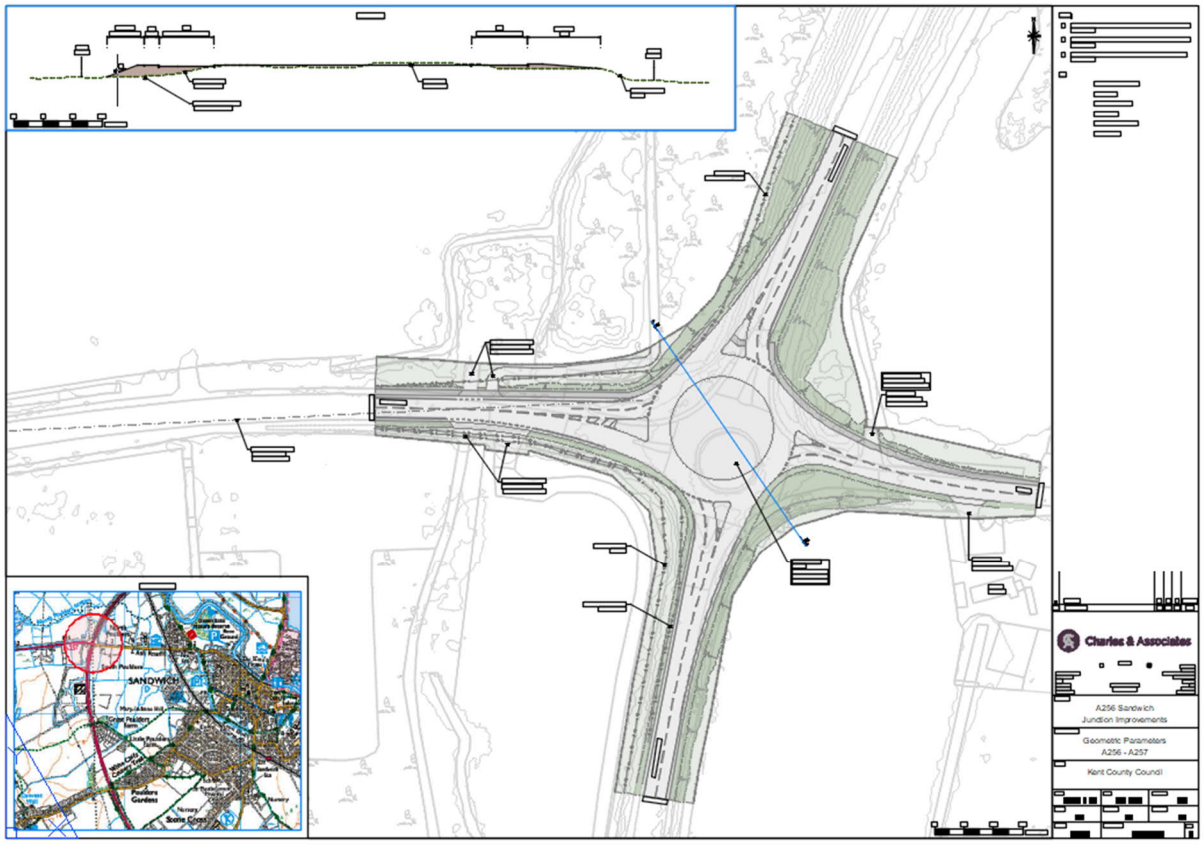

Figure 2: Proposed A256 Sandwich Road Bypass/ A257/ Ash Road Improvement Drawing

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Results

Table 9 shows the junction performance for the DM with mitigation scenario. As modelled, the Each End arm experiences high RFC and delays in both peaks and is close to capacity. In the AM Peak, RFC value on this arm is 0.94 and in the PM Peak it's 0.87. However, the remaining arms are below an RFC of 0.85 which indicate they operate with spare capacity.

Table 8: DM with Mitigation A256 Sandwich Road Bypass/A257/ Ash Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (N)	3.1	8.48	0.76	2.9	7.94	0.74
Ash Road (E)	0.5	7.15	0.31	0.3	6.37	0.23
Sandwich Bypass (S)	3.2	9.50	0.76	2.9	8.64	0.74
A257 Each End (W)	12.4	53.76	0.94	6.2	28.55	0.87

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Table 9 presents the junction performance for the DS with mitigation scenario. As shown, the additional traffic flow within the DS scenario pushes the junction over capacity, notably on the Each End arm. The highest RFC values are observed on the A257 Each End arm, in the AM Peak, at 1.04, whereas in the PM Peak it's equal to 1. This is a result of increased traffic using the Sandwich Bypass south to north decreasing the gaps for traffic from this approach to get out of the roundabout.

Possible design changes which could improve the performance of the A257 arm which could be considered is the signalisation of the roundabout, a dedicated filter lane from A257 Est End (W) to Sandwich Bypass (N) or potentially widen the approach arms to three lanes. The remaining arms do not exceed an RFC of 0.85 which indicate they operate within capacity.

Table 9: DS with Mitigation A256 Sandwich Road Bypass/A257/ Ash Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (N)	5.2	12.99	**0.84**	4.7	11.86	**0.83**
Ash Road (E)	0.6	9.03	**0.37**	0.4	7.86	**0.28**
Sandwich Bypass (S)	4.0	11.61	**0.80**	4.8	13.31	**0.83**
A257 Each End (W)	51.1	193.58	**1.04**	28.7	121.22	**1.00**

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A258 DEAL ROAD ROUNDABOUT LOCAL JUNCTION MODELLING

Input Flows

As this junction lies outside the detailed model area of the DDTM the flows from the static analysis undertaken for this junction as part of Cluster 3.

Junction Modelling

As a priority roundabout, the modelling was undertaken using TRL Junction 10 software, to understand the performance.

Results

Table 10 presents the junction modelling results in the base year for A258 Deal Road roundabout. The results show that the junction performs within capacity in both time periods with no significant queues or delays.

Table 10: 2019 Base A258 Deal Road Roundabout

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Deal Road (W)	1.4	6.65	0.58	1.0	4.76	0.51
Deal Road (E)	1.0	6.42	0.51	0.8	6.04	0.44
Deal Road (S)	2.5	9.95	0.72	0.5	4.03	0.34

Table 11 presents the junction performance for the 2040 DM scenario. As the table highlights in both the AM and PM peak, all arms operate within capacity with RFC values slightly higher than the base ones, but within theoretical capacity.

Table 11: 2040 DM A258 Deal Road Roundabout

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Deal Road (W)	1.6	7.18	0.62	1.7	6.66	0.63
Deal Road (E)	1.1	6.74	0.52	1.7	9.90	0.64
Deal Road (S)	2.4	9.80	0.71	1.2	5.95	0.54

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Table 12 presents the junction performance for the 2040 DS1 with mitigation scenario. As with 2040 DM, all arms operate well within capacity, with low RFC and delays in both peaks.

Table 12: 2040 DS1 with Mitigation A258 Deal Road Roundabout

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Deal Road (W)	1.5	6.99	0.60	2.1	7.78	0.68
Deal Road (E)	1.3	7.25	0.56	2.3	12.17	0.70
Deal Road (S)	2.2	9.42	0.69	1.4	6.58	0.58

Overall, the A258 Deal Road roundabout does not experience high delays and capacity issues in the Base, DM and DS scenarios, with negligible impacts between the DM and DS scenarios, with the junction showing minimal queues and delays. No further potential improvements for the junction with KCC will need to be identified.