Colston Budd Rogers & Kafes Pty Ltd
as Trustee for C & B Unit Trust
ABN 27 623 918 759

Our Ref: TR/10935/jj

Transport Planning
Traffic Studies
Parking Studies

1 April, 2019

Frasers Property Australia
Level 2
1C Homebush Bay Drive
RHODES NSW 2138

Attention: Mark Cleveland
Email: mark.cleveland@frasersproperty.com.au

Dear Sir,

RE: EASTERN CREEK BUSINESS HUB – MOD 4
RESPONSE TO MATTERS RAISED BY RMS

1. As requested we have reviewed the matters raised by RMS in its letter dated 11 February 2019. We have previously undertaken SIDRA modelling of the traffic effects of Modification 4 (MOD 4) to the approved concept plan for the Eastern Creek Business Hub (traffic assessment dated 12 November 2018). The matters raised by RMS are set out below:

   The proposed roundabout within the site is located some 100 metres east of the intersection of Rooty Hill Road South and Cable Place. As part of the concept approval for the site this intersection will be signalised to provide the main access to the site. The submitted traffic modelling shows a 95% back of queue of some 118 metres. RMS is concerned that queues through the roundabout will result in the roundabout functioning inefficiently and in turn negatively impacting the signalised intersection.

   To address this concern RMS request that:

   - *amended plans which show the roundabout relocated to the east, clear of the 95% queue;*
   - *an updated SIDRA model be submitted taking into account full development of the site and showing that the southern approach to the intersection of Rooty Hill Road/Cable Place performs at an acceptable level of service;*
   - *the updated SIDRA model to include an assessment of weekend traffic conditions; and*
   - *the priorities for the right turn movements along Rooty Hill Road South need to be checked.*

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2. As requested by RMS we have updated the SIDRA model to address the above matters. The results are set out in the following sections.

3. The approved concept plan for Eastern Creek Hub has the following scale of development:

   - Lot 1 – 14,000m^2 GFA large format retail (such as a Bunnings);
   - Lot 2 – 9,5000m^2 GFA convenience retail; and
   - Lot 3 – 29.300m^2 GFA bulky good retail.

4. The approved concept plan was estimated to generate some 1,300 vehicles per hour (two way) in the weekday afternoon peak hour.

5. A DA for Lot 2 has been approved with a similar scale of development as the concept approval. A DA for Lot 1 was submitted at the end of 2018 with a different scale to the concept approval. It comprised some bulky goods (some 9,100m^2), an indoor recreation centre (some 2,800m^2), a small café and provision for a fast food outlet on a pad site. The submitted DA for Lot 2 was estimated to generate some 100 vehicles per hour (two way), less than the large format retail envisaged on Lot 2 in the concept approval.

6. We have updated the SIDRA model with the roundabout located 100 metres east of Rooty Hill Road South and the following traffic flows:

   - traffic generated by the approved DA on Lot 1, submitted DA on Lot 2 and concept approval for Lot 3;
   - weekday PM and Saturday midday traffic flows; and
   - through traffic flows on Rooty Hill Road increased by 25% to allow for 10 years background traffic growth (at 2% per year).

7. For the weekday PM, the site was estimated to generate some 1,200 vehicles per hour (two way). For the Saturday the site was estimated to generate some 1,600 vehicles per hour (two way)

8. Based on the above flows the operation of the roundabout within the site and traffic signals at the intersection of Rooty Hill Road South and Cable Place were reanalysed using SIDRA. The analysis found that with full development of the site and 10 years background traffic growth on Rooty Hill Road South::

   - the intersection of Cable Place/Rooty Hill Road South/Site Access would operate with average delays per vehicle of 30 seconds per vehicle in the weekday afternoon peak hour. This represents level of service C, a satisfactory level of service;

- the proposed roundabout on the Spine Road would operate with average delays per vehicle of less than 15 seconds per vehicle in the weekday afternoon peak hour. This represents level of service A/B a good level of service with spare capacity; and

- the 95% back of queue on the Spine Road does not extend back through the roundabout or to Rooty Hill Road South.

9. As a sensitivity test we have analysed the intersections with 10 years traffic growth to the through traffic flows on Rooty Hill Road South. The analysis found that in the weekday PM peak hour:

- the intersection of Cable Place/Rooty Hill Road South/Site Access would operate with average delays per vehicle of 26 seconds per vehicle in the weekday afternoon peak hour. This represents level of service B an acceptable level of service;

- the proposed roundabout on the Spine Road would operate with average delays per vehicle of less than 15 seconds per vehicle in the weekday afternoon peak hour. This represents level of service A/B a good level of service with spare capacity; and

- the 95% back of queue on the Spine Road does not extend back through the roundabout or to Rooty Hill Road South (longest 95% queue on the Spine Road is 89 metres).

10. In the Saturday midday peak hour, the analysis found that:

- the intersection of Cable Place/Rooty Hill Road South/Site Access would operate with average delays per vehicle of 32 seconds per vehicle in the weekday afternoon peak hour. This represents level of service C, a satisfactory level of service;

- the proposed roundabout on the Spine Road would operate with average delays per vehicle of less than 15 seconds per vehicle in the weekday afternoon peak hour. This represents level of service A/B a good level of service with spare capacity; and

- the 95% back of queue on the Spine Road does not extend back through the roundabout or to Rooty Hill Road South (longest 95% queue on the Spine Road is 80 metres).

11. We note that it is not possible to relocate the roundabout to the east (further from Rooty Hill Road South) due to environmental constraints. Locating the

roundabout further to the east would also result in there being no connection between Lots 1 and 2

12. With regards to the other matters raised by RMS, we note that:

- in both the weekday PM peak hour and Saturday midday peak hour the updated SIDRA analysis found that the southern approach to the Rooty Hill Road/Cable Place intersection would operate at level of service B, and acceptable level of service; and

- we have checked the priorities for the right turn movements along Rooty Hill Road South. These operate within separate right turn phases and the right turn on the Rooty Hill Road South southern approach has priority over the free left turn on the Rooty Hill Road South northern approach.

13. Thus in summary the updated SIDRA analysis has found that with the proposed roundabout on the Spine Road the intersections will perform at acceptable levels of service, can satisfactorily accommodate traffic generated by approved/proposed development on the site and addressed the matters raised by RMS. Copies of the SIDRA movement summaries are attached.

14. We trust the above provides the information you require. Finally, if you should have any queries, please do not hesitate to contact us.

Yours faithfully,
COLSTON BUDD ROGERS & KAFES PTY LTD

Tim Rogers
Director

MOVEMENT SUMMARY

Site: 102 [Site Access - Rooty Hills Road (Full Development) SAT+ Mod 4 + 10 years]

Network: N101 [Eastern Creek Mod 4 + 10 years SAT Stage 3]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Rooty Hill Road (south)														
1	L2	5	3.0	5	3.0	0.387	15.5	LOS B	4.6	33.0	0.42	0.37	0.42	48.3
2	T1	795	3.0	795	3.0	0.387	10.0	LOS A	4.6	33.0	0.42	0.37	0.42	48.7
3	R2	553	3.0	553	3.0	0.868	43.6	LOS D	16.8	120.4	0.96	0.94	1.10	18.3
Approach		1353	3.0	1353	3.0	0.868	23.7	LOS B	16.8	120.4	0.64	0.60	0.70	35.0
East: Spine Road														
4	L2	553	3.0	553	3.0	0.521	13.3	LOS A	5.8	41.5	0.52	0.77	0.66	38.4
5	T1	5	3.0	5	3.0	0.013	32.5	LOS C	0.1	0.9	0.80	0.53	0.80	32.1
6	R2	300	3.0	300	3.0	0.911	64.9	LOS E	11.1	79.7	1.00	1.04	1.43	19.2
Approach		858	3.0	858	3.0	0.911	31.5	LOS C	11.1	79.7	0.69	0.86	0.93	27.5
North: Rooty Hill Road (north)														
7	L2	300	3.0	300	3.0	0.351	14.1	LOS A	4.2	29.9	0.56	0.73	0.56	38.5
8	T1	832	3.0	832	3.0	0.887	50.5	LOS D	14.4	103.4	1.00	1.05	1.28	27.6
9	R2	5	3.0	5	3.0	0.048	55.6	LOS D	0.2	1.1	0.97	0.65	0.97	29.3
Approach		1137	3.0	1137	3.0	0.887	40.9	LOS C	14.4	103.4	0.88	0.97	1.09	29.0
West: Cable Place														
10	L2	5	3.0	5	3.0	0.024	36.6	LOS C	0.2	1.7	0.79	0.61	0.79	36.4
11	T1	5	3.0	5	3.0	0.024	31.0	LOS C	0.2	1.7	0.79	0.61	0.79	28.8
12	R2	5	3.0	5	3.0	0.016	38.4	LOS C	0.1	0.9	0.80	0.65	0.80	33.0
Approach		16	3.0	16	3.0	0.024	35.3	LOS C	0.2	1.7	0.79	0.62	0.79	33.2
All Vehicles		3363	3.0	3363	3.0	0.911	31.6	LOS C	16.8	120.4	0.73	0.79	0.89	30.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	43.3	LOS E	0.1	0.1	0.93	0.93
P2	East Full Crossing	53	35.4	LOS D	0.1	0.1	0.84	0.84
P3	North Full Crossing	53	43.3	LOS E	0.1	0.1	0.93	0.93
P4	West Full Crossing	53	33.7	LOS D	0.1	0.1	0.82	0.82
All Pedestrians		211	38.9	LOS D			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Site Access Roundabout (Full Development) SAT - Mod 4 + 10 years]

Network: N101 [Eastern Creek Mod 4 + 10 years SAT Stage 3]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Lot 1														
1	L2	205	3.0	205	3.0	0.403	3.5	LOS A	0.8	6.0	0.66	0.73	0.71	21.5
2	T1	53	3.0	53	3.0	0.403	3.5	LOS A	0.8	6.0	0.66	0.73	0.71	20.7
3	R2	53	0.0	53	0.0	0.403	12.2	LOS A	0.8	6.0	0.66	0.73	0.71	31.5
Approach		311	2.5	311	2.5	0.403	4.9	LOS A	0.8	6.0	0.66	0.73	0.71	23.1
East: Spine Road (E)														
4	L2	53	0.0	53	0.0	0.254	7.0	LOS A	0.8	5.8	0.73	0.66	0.73	52.2
5	T1	347	0.0	347	0.0	0.254	7.2	LOS A	0.8	5.8	0.73	0.68	0.73	47.1
6	R2	53	0.0	53	0.0	0.254	12.2	LOS A	0.6	3.9	0.71	0.72	0.71	52.7
Approach		453	0.0	453	0.0	0.254	7.8	LOS A	0.8	5.8	0.72	0.68	0.72	49.0
North: Lot 2														
7	L2	53	0.0	53	0.0	0.585	10.6	LOS A	2.0	14.5	0.86	0.77	0.95	29.4
8	T1	53	3.0	53	3.0	0.585	6.8	LOS A	2.0	14.5	0.86	0.77	0.95	20.1
9	R2	305	3.0	305	3.0	0.585	6.8	LOS A	2.0	14.5	0.86	0.77	0.95	20.2
Approach		411	2.6	411	2.6	0.585	7.3	LOS A	2.0	14.5	0.86	0.77	0.95	21.5
West: Spine Road (W)														
10	L2	305	3.0	305	3.0	0.254	6.5	LOS A	0.5	3.9	0.28	0.58	0.28	21.4
11	T1	347	0.0	347	0.0	0.364	4.9	LOS A	0.9	6.6	0.29	0.57	0.29	51.1
12	R2	205	3.0	205	3.0	0.364	11.0	LOS A	0.9	6.6	0.29	0.57	0.29	21.8
Approach		858	1.8	858	1.8	0.364	6.9	LOS A	0.9	6.6	0.29	0.57	0.29	28.3
All Vehicles		2032	1.7	2032	1.7	0.585	6.9	LOS A	2.0	14.5	0.56	0.66	0.58	28.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Site Access - Rooty Hills Road (Full Development) PM + Mod 4 + 10 years]

Network: N101 [Eastern Creek Mod 4 + 10 years]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Rooty Hill Road (south)														
1	L2	5	3.0	5	3.0	0.694	15.9	LOS B	15.7	112.6	0.61	0.55	0.61	48.0
2	T1	1421	3.0	1421	3.0	0.694	10.3	LOS A	15.7	112.6	0.61	0.55	0.61	48.3
3	R2	442	3.0	442	3.0	0.884	44.6	LOS D	19.2	138.0	1.00	0.98	1.26	18.0
Approach		1868	3.0	1868	3.0	0.884	18.5	LOS B	19.2	138.0	0.70	0.65	0.76	40.2
East: Spine Road														
4	L2	442	3.0	442	3.0	0.475	15.0	LOS B	8.0	57.6	0.61	0.79	0.75	36.8
5	T1	5	3.0	5	3.0	0.017	30.5	LOS C	0.2	1.2	0.86	0.57	0.86	33.0
6	R2	242	3.0	242	3.0	0.929	60.4	LOS E	12.4	88.8	1.00	1.11	1.64	20.1
Approach		689	3.0	689	3.0	0.929	31.1	LOS C	12.4	88.8	0.75	0.90	1.07	27.7
North: Rooty Hill Road (north)														
7	L2	242	3.0	242	3.0	0.242	10.8	LOS A	3.6	25.7	0.48	0.69	0.48	42.0
8	T1	1121	3.0	1121	3.0	0.889	38.8	LOS C	26.2	188.0	1.00	1.08	1.29	31.5
9	R2	5	3.0	5	3.0	0.039	44.3	LOS D	0.2	1.4	0.95	0.64	0.95	32.6
Approach		1368	3.0	1368	3.0	0.889	33.9	LOS C	26.2	188.0	0.91	1.01	1.14	32.5
West: Cable Place														
10	L2	5	3.0	5	3.0	0.030	34.4	LOS C	0.3	2.4	0.84	0.63	0.84	37.3
11	T1	5	3.0	5	3.0	0.030	28.8	LOS C	0.3	2.4	0.84	0.63	0.84	29.8
12	R2	5	3.0	5	3.0	0.020	36.3	LOS C	0.2	1.3	0.86	0.65	0.86	33.8
Approach		16	3.0	16	3.0	0.030	33.2	LOS C	0.3	2.4	0.85	0.63	0.85	34.0
All Vehicles		3942	3.0	3942	3.0	0.929	26.1	LOS B	26.2	188.0	0.78	0.82	0.95	34.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
P2	East Full Crossing	53	24.1	LOS C	0.1	0.1	0.78	0.78
P3	North Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
P4	West Full Crossing	53	22.5	LOS C	0.1	0.1	0.75	0.75
All Pedestrians		211	28.8	LOS C			0.85	0.85

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Site Access Roundabout (Full Developmnet) PM - Mod 4 + 10 years]

Network: N101 [Eastern Creek Mod 4 + 10 years]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Lot 1														
1	L2	147	3.0	147	3.0	0.306	2.6	LOS A	1.5	10.4	0.59	0.61	0.59	22.2
2	T1	53	3.0	53	3.0	0.306	2.6	LOS A	1.5	10.4	0.59	0.61	0.59	21.1
3	R2	53	0.0	53	0.0	0.306	11.4	LOS A	1.5	10.4	0.59	0.61	0.59	32.3
Approach		253	2.4	253	2.4	0.306	4.5	LOS A	1.5	10.4	0.59	0.61	0.59	24.0
East: Spine Road (E)														
4	L2	53	0.0	53	0.0	0.157	6.4	LOS A	1.1	7.8	0.64	0.60	0.64	52.7
5	T1	226	0.0	226	0.0	0.157	6.6	LOS A	1.1	7.8	0.64	0.63	0.64	47.6
6	R2	53	0.0	53	0.0	0.157	11.5	LOS A	1.0	7.2	0.64	0.67	0.64	53.0
Approach		332	0.0	332	0.0	0.157	7.3	LOS A	1.1	7.8	0.64	0.63	0.64	49.9
North: Lot 2														
7	L2	53	0.0	53	0.0	0.395	7.0	LOS A	3.3	23.9	0.69	0.52	0.69	30.2
8	T1	53	3.0	53	3.0	0.395	3.2	LOS A	3.3	23.9	0.69	0.52	0.69	20.5
9	R2	305	3.0	305	3.0	0.395	3.2	LOS A	3.3	23.9	0.69	0.52	0.69	21.0
Approach		411	2.6	411	2.6	0.395	3.7	LOS A	3.3	23.9	0.69	0.52	0.69	22.2
West: Spine Road (W)														
10	L2	305	3.0	305	3.0	0.241	6.4	LOS A	1.3	9.0	0.27	0.58	0.27	21.4
11	T1	226	0.0	226	0.0	0.248	4.8	LOS A	1.4	9.5	0.26	0.57	0.26	51.1
12	R2	147	3.0	147	3.0	0.248	10.9	LOS A	1.4	9.5	0.26	0.57	0.26	21.8
Approach		679	2.0	679	2.0	0.248	6.8	LOS A	1.4	9.5	0.27	0.57	0.27	26.8
All Vehicles		1674	1.8	1674	1.8	0.395	5.8	LOS A	3.3	23.9	0.49	0.58	0.49	27.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.