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4 Leek Street, Newmarket
PO Box 128259, Remuera 1541, Auckland
Ph. 09 869 2825
www.commute.kiwi

Mr R Scott
Scott Wilkinson Planning
PO Box 37-359, Parnell 1151
Auckland

4 August 2022

Copy via email: **robert@scottwilkinson.co.nz**

Dear Robert

301-303 BUCKLAND ROAD- CLAUSE 23 RESPONSE (TRAFFIC ENGINEERS DISCUSSION)

Following production of Clause 23 responses, we have met with Council consultant Traffic Engineer (Mr Wes Edwards form Arrive). Following this meeting, Mr Edward has provided comments on the remaining items. The commentary below relates to the items noted as requiring additional information.

1 ITEM T1: INTENSIVE SCENARIO

You've noted one of the roundabouts may have poor performance and suggested an additional lane could sort that out. It would be good to have a concept design demonstrating that the additional lane is both practicable and effective.

Comment:

As noted in the previous response, with the 100% LFR both roundabouts experience pressure on a Saturday peak with the new PPC / PU-NS-2 Road roundabout just reaching typical capacity levels however the Kitchener Road / Manukau Road roundabout exceeding capacity. In this regard:

- As previously noted, we consider the 100% LFR scenario "highly unlikely". This is reinforced by the economic expert who has stated *"…Within the context of these limitations, a potential outcome for the site would be one third large format retail (near the road), one third industrial (further back from the road) and one third other uses".*
- The 100% LFR scenario has not allowed for multi-purpose / linked trips (those that may also visit other stores on the same Plan Change or other plan Change) or pass-by traffic (ie those vehicles already on the road network that deviate into the site)
- Any future activity would be also subject to E27 E27.6.1. "*Trip generation*" rule of the Unitary Plan. This rule if triggered (which is generally over 100 movements or in the case of retail anything over 1667sqm) requires a further assessment of transport, traffic or trip-generation effects for the activity. If the site is predominantly LFR this rule will be triggered. At this time (Resource Consent) the exact land-use will be known and thus a re-assessment will need to be undertaken.

Regardless of the above **Appendix A** shows the potential for increasing the number of lanes at the two roundabouts. Of note there is not the space for a full two-lane roundabout at Kitchener Road / Manukau Road roundabout.

Appendix A also shows an alternative of a signalised intersection at the Kitchener Road / Manukau Road intersection. A signalised intersection at this location (as shown) would provide considerable

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PO Box 128259, Remuera 1541, Auckland
Ph. 09 869 2825
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additional capacity than a single-lane roundabout. This is evidence in the results of this signalised intersection using the 100% LFR scenario.

ITEM T6: 2036 SCENARIO

Future/ Growth. As discussed, the historical AT traffic counts show growth of around 1.5% pa daily (average) with peak hours at between 1.2% and 3.2%. I can't see why growth over the next 10 years or so would be less than that, so we need to either assume similar growth or have some robust data to indicate why it would be anything different.

Comment:

For the critical Saturday peak period the growth over the last 6-7 years is equivalent to 1.5%. Over 10 years in the future this would add 15% to the existing traffic. We do note that the development of the site itself will contribute to this background growth. The 100% LFR scenario has been tested with this growth and is contained in Table 1 and 2 below. An alternative signalised intersection at Kitchener Road / Manukau Road has also been modelling in Table 3.

Table 1: Proposed performance of the Manukau Road/ Kitchener Road/ Buckland Road roundabout Sat 100% LFR 15% growth

Leg	Movement	Degree of Saturation (v/c)	Average Delay (s)	LOS	95th %ile Queue (m)
Buckland Road (South)	LT	1.149	156	F	855
	TH	1.149	156	F	855
	RT	1.149	162	F	855
Gate 2 (main site access) (east)	LT	0.873	64	E	107
	TH	0.873	64	E	107
	RT	0.873	70	E	107
Manukau Road (north)	LT	1.136	134	F	1114
	TH	1.136	134	F	1114
	RT	1.136	140	F	1114
Kitchener Rd (west)	LT	1.312	329	F	685
	TH	1.312	329	F	685
	RT	1.312	329	F	685

Table 2: Proposed performance of the PU-NS-2 Road / Buckland Road intersection Sat roundabout Sat 100% LFR 15% growth

Leg	Movement	Degree of Saturation (v/c)	Average Delay (s)	LOS	95th %ile Queue (m)
Buckland Road (South)	LT	1.127	146	F	586
	TH	1.127	146	F	586
	RT	1.127	151	F	586
Racecourse Gate	LT	0.138	23	C	8
	TH	0.138	23	C	8
	RT	0.138	28	C	8
Buckland Road (north)	LT	0.980	32	C	311
	TH	0.980	32	C	311
	RT	0.980	37	D	311

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Site access (PU-NS-2 Road) (west)	LT	1.031	72	F	378
	TH	1.031	72	F	378
	RT	1.031	77	F	378

Table 3: Proposed performance of the Manukau Road/ Kitchener Road/ Buckland Road signals Sat 100% LFR 15% growth

Leg	Movement	Degree of Saturation (v/c)	Average Delay (s)	LOS	95th %ile Queue (m)
Buckland Road (South)	LT	0.077	19	B	18
	TH	0.808	49	D	256
	RT	0.209	70	E	23
Gate 2 (main site access) (east)	LT	0.052	142	D	11
	TH	0.979	105	F	183
	RT	0.979	110	F	183
Manukau Road (north)	LT	0.490	18	B	64
	TH	0.957	82	F	405
	RT	0.973	109	F	150
Kitchener Rd (west)	LT	0.710	29	C	92
	TH	0.961	98	F	107
	RT	0.961	104	F	107

The results shows that the intersections will both be at / slightly over capacity on a Saturday peak period with these assumptions (again considered highly unlikely). The results do however show that the signalised option can cater for the traffic expected. As a result, there are upgrades possible within the road reserve and the site to appropriate serve the Plan Change even if essentially all worst-case scenarios occur (all development is LFR, growth occurs all in addition to the proposal, and no allowance is made for pass-by / multi-purpose trips). Note as per Item T8 below, this alanysis also already includes base survey traffic of Pukekohe Park's busiest horse racing event (Counties Cup).

The exact upgrade should be determined a Resource Consent time when the exact use of the site is known.

2 ITEM T8: PUKEKOHE PARK

Pukekohe Park Events. Pukekohe Park is a "nationally important venue" and we need to make sure it can continue to operate as such with development in place (and also know the proposed development site could operate well when events are on). This issue is made more significant as GBZ is proposed rather than LIZ as assumed previously, and GBZ activities are more likely to overlap with events (or even be busiest when events are on). As events for up to 5000 people are permitted without any TMP, I think we need to evaluate that scenario as a minimum, assuming the crowd is leaving such an event at a time coinciding with a busy period for GBZ activities (eg weekend midday or mid-afternoon).

Comment:

The large events at Pukekohe Park are considered to be infrequent events and are required to be under control of Traffic Management Plans. It should also be noted that the Pukekohe Paerata Structure Plan has identified this area as an area for employment growth to support residential development in Pukekohe and this location is seen as an ideal place to establish employment related activities.

It is however acknowledged that events under 5000 people do not require a TMP. In terms of context:

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- The original 2018 Saturday survey date was especially chosen as Counties Cup day, which from discussion with Counties Racing is currently the busiest day (around 3,500-5000 people).
- In the next 12 months a total of nine "events" are planned at the Racecourse (generally running November to March)
- If these 8 will occur on a Saturday. Given the start and end times of these events (starting at 11am) they most likely crossover is people arriving for the event early afternoon on a Saturday coinciding with retail customers peak.
- Information from Pukekohe Park has the "Counties Cup" as the Largest Horse Racing meeting and has had between 3-5000 over past years. For this event, a number of hospitality area patrons use buses and thus they typically have 10-12 buses onsite for the larger events.

As such having an event at around 5000 people on a Saturday afternoon without needing a TMP is considered a very rare event (maybe once a year at most).

The trip generation has been reviewed based on likely mode split as follows:

- 5,000 people
- Based on the survey information 33% arrive in one peak hour (noting the events tend to last for 6+ hours). This peak hour is assumed to be the same retail peak hour as a worst case.
- 75% arrive by car (50% in private car and 25% drop off such as taxi / uber)
- 20% by bus
- 5% other (walking / cycling)
- Average occupancy of 3 people per vehicle for private car, 2 people for uber, 50 for bus.
- Private car has all cars entering, taxi creates two trips (one entering, one exiting)
- Trip generation of 632 vehicles per hour.
- These vehicles likely to be split over the three entry gates, with the key gate 2 and 3 assumed to cater for 80% of the traffic (40% each) or 252 vph (177 in 75 out)

The 2018 survey as contained in the ITA has a total of 259 vehicles per hour in the peak at Gate 3 (211 in and 48 out). As such the surveyed Raceday is similar to the theoretical model split analysis and all Saturday modelling provided thus already considers a larger horse race event.

As such every other Saturday throughout the year will likely perform significantly better than the modelling results show as the other Horse Racing events will likely be smaller is size (or most likely not occur at all) and the motor racing will also no longer occur[1].

3 ITEM T22: PEDESTRIANS/ CYCLISTS

You have indicated that the roundabouts would have pedestrian crossings on all approaches in line with AT guidance. The AT guidance shows zebra crossings on raised tables which would have a significant effect on the saturation flows at the roundabout and reduce the intersection capacity significantly. I think this aspect needs some additional investigation.

Comment:

We agree with the comment that zebra crossings at the roundabout would potentially reduce capacity at the roundabout. However, in terms of the Plan Change crossing facilities:

[1] https://i.stuff.co.nz/sport/motorsport/300641696/motorsport-to-end-at-pukekohe-raceway-after-60-years-making-way-for-horse-racing

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PO Box 128259, Remuera 1541, Auckland
Ph. 09 869 2825
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- The exact pedestrian location / design can only be determined at future stages when lot / building layouts are known and thus pedestrian desire lines are able to be determined.
- As such the exact level of effect of pedestrians on the performance of the roundabout is difficult to accurately replicate at Plan Change level.
- Again, it is noted that all the above would be subject to further detailed design / Auckland Transport approval.
- The option of a signalised intersection at the Kitchener Road / Manukau Road intersection as modelled does have pedestrian phases included.
- There is the potential of a mid-block signalised pedestrian crossing.

Yours sincerely

Commute Transportation Consultants

Leo Hills

Director

Leo@commute.kiwi

4 Leek Street, Newmarket
PO Box 128259, Remuera 1541, Auckland
Ph. 09 869 2825
www.commute.kiwi

APPENDIX A: ROUNDABOUT ALTERNATIVE + SIGNALS

Revision notes:

Rev:	Date:	Notes:

Drawn by:
LH
J002101 - 301-303 Buckland

Client:

Project:
301-303 BUCKLAND ROAD, PUKEKOHE
PROPOSED PRIVATE PLAN CHANGE

Drawing Title:
INDICATIVE SIGNALS OPTION

Date:
7 July 2022

Scale @ A3:
1:2000 @ A3

Revision:
0 - FOR DISCUSSION

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Figure:
1

Revision notes:

Rev:	Date:	Notes:

Drawn by:
LH
J002101 - 301-303 Buckland

Client:

Project:
301-303 BUCKLAND ROAD, PUKEKOHE
PROPOSED PRIVATE PLAN CHANGE

Drawing Title:
INDICATIVE ROUNDABOUT / ROAD LAYOUT
Alternative left turn lanes

Date:
4 August 2022

Scale @ A3:
1:2000 @ A3

Revision:
0 - FOR DISCUSSION

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Figure:
1

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PO Box 128259, Remuera 1541, Auckland
Ph. 09 869 2825
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APPENDIX B: SIDRA RESULTS

MOVEMENT SUMMARY

Site: 102v [Manukau Rd/ Kitchener Rd/ Buckland Rd intersection Proposed SAT - 100% lfr 15%]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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 per veh	Average Speed km/h
South: Buckland Rd (south)											
1	L2	82	5.0	1.149	156.3	LOS F	117.2	855.9	1.00	4.14	17.1
2	T1	965	5.0	1.149	156.4	LOS F	117.2	855.9	1.00	4.14	17.3
3	R2	47	5.0	1.149	162.1	LOS F	117.2	855.9	1.00	4.14	17.3
Approach		1095	5.0	1.149	156.6	LOS F	117.2	855.9	1.00	4.14	17.2
East: Gate 2 (site main access)											
4	L2	31	5.0	0.873	63.9	LOS E	14.7	107.0	1.00	1.51	29.0
5	T1	69	5.0	0.873	64.1	LOS E	14.7	107.0	1.00	1.51	29.5
6	R2	196	5.0	0.873	69.7	LOS E	14.7	107.0	1.00	1.51	29.6
Approach		296	5.0	0.873	67.8	LOS E	14.7	107.0	1.00	1.51	29.5
North: Manukau Rd (north)											
7	L2	327	5.0	1.136	134.3	LOS F	152.7	1114.6	1.00	3.10	18.9
8	T1	953	5.0	1.136	134.5	LOS F	152.7	1114.6	1.00	3.10	19.1
9	R2	221	5.0	1.136	140.2	LOS F	152.7	1114.6	1.00	3.10	19.2
Approach		1501	5.0	1.136	135.3	LOS F	152.7	1114.6	1.00	3.10	19.1
West: Kitchener Rd (west)											
10	L2	334	5.0	1.312	328.9	LOS F	93.8	684.9	1.00	4.00	9.4
11	T1	93	5.0	1.312	329.0	LOS F	93.8	684.9	1.00	4.00	9.5
12	R2	74	5.0	1.312	334.7	LOS F	93.8	684.9	1.00	4.00	9.5
Approach		500	5.0	1.312	329.8	LOS F	93.8	684.9	1.00	4.00	9.4
All Vehicles		3392	5.0	1.312	165.0	LOS F	152.7	1114.6	1.00	3.43	16.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 102v [Manukau Rd/ PPC Road intersection SAT - 100% +15%]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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 per veh	Average Speed km/h
South: Buckland Rd (south)											
1	L2	246	5.0	1.127	146.4	LOS F	80.3	586.3	1.00	3.50	17.7
2	T1	522	5.0	1.127	146.7	LOS F	80.3	586.3	1.00	3.50	17.8
3	R2	11	5.0	1.127	151.4	LOS F	80.3	586.3	1.00	3.50	17.8
Approach		779	5.0	1.127	146.7	LOS F	80.3	586.3	1.00	3.50	17.8
East: Gate 3											
4	L2	11	5.0	0.138	23.1	LOS C	1.1	7.9	1.00	0.91	42.5
5	T1	11	5.0	0.138	23.4	LOS C	1.1	7.9	1.00	0.91	43.3
6	R2	11	5.0	0.138	28.0	LOS C	1.1	7.9	1.00	0.91	43.2
Approach		32	5.0	0.138	24.8	LOS C	1.1	7.9	1.00	0.91	43.0
North: Bucklend Rd (north)											
7	L2	11	5.0	0.980	31.7	LOS C	42.6	310.8	1.00	1.39	38.4
8	T1	482	5.0	0.980	32.0	LOS C	42.6	310.8	1.00	1.39	39.1
9	R2	575	5.0	0.980	36.7	LOS D	42.6	310.8	1.00	1.39	39.0
Approach		1067	5.0	0.980	34.5	LOS C	42.6	310.8	1.00	1.39	39.0
West: PPC Road											
10	L2	575	5.0	1.031	71.5	LOS F	51.7	377.5	1.00	2.34	27.3
11	T1	11	5.0	1.031	71.8	LOS F	51.7	377.5	1.00	2.34	27.6
12	R2	246	5.0	1.031	76.5	LOS F	51.7	377.5	1.00	2.34	27.6
Approach		832	5.0	1.031	73.0	LOS F	51.7	377.5	1.00	2.34	27.4
All Vehicles		2709	5.0	1.127	78.5	LOS F	80.3	586.3	1.00	2.28	26.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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: 102vv [Manukau Rd/ Kitchener Rd/ Buckland Rd intersection Proposed SAT - 100% lfr - signals +15%]

New Site
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand 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 per veh	Average Speed km/h
South: Buckland Rd (south)											
1	L2	82	5.0	0.077	19.2	LOS B	2.5	18.1	0.45	0.68	44.6
2	T1	965	5.0	0.808	49.4	LOS D	35.2	256.7	0.95	0.87	33.1
3	R2	47	5.0	0.209	69.7	LOS E	3.2	23.0	0.94	0.75	27.6
Approach		1095	5.0	0.808	48.0	LOS D	35.2	256.7	0.92	0.85	33.5
East: Gate 2 (site main access)											
4	L2	31	5.0	0.052	42.1	LOS D	1.5	10.9	0.71	0.70	34.9
5	T1	69	5.0	0.979	105.2	LOS F	25.1	183.3	1.00	1.12	21.5
6	R2	196	5.0	0.979	110.9	LOS F	25.1	183.3	1.00	1.12	21.4
Approach		296	5.0	0.979	102.4	LOS F	25.1	183.3	0.97	1.07	22.3
North: Manukau Rd (north)											
7	L2	327	5.0	0.490	18.4	LOS B	8.8	64.0	0.65	0.76	45.0
8	T1	953	5.0	0.957	82.0	LOS F	55.5	405.3	0.95	1.09	25.5
9	R2	221	5.0	0.973	109.8	LOS F	20.6	150.6	1.00	1.04	21.2
Approach		1501	5.0	0.973	72.2	LOS E	55.5	405.3	0.89	1.01	27.3
West: Kitchener Rd (west)											
10	L2	334	5.0	0.710	29.1	LOS C	12.7	92.7	0.86	0.81	39.8
11	T1	93	5.0	0.961	98.5	LOS F	14.7	107.0	0.91	1.07	22.7
12	R2	74	5.0	0.961	104.2	LOS F	14.7	107.0	0.91	1.07	22.5
Approach		500	5.0	0.961	53.0	LOS D	14.7	107.0	0.88	0.90	31.7
All Vehicles		3392	5.0	0.979	64.2	LOS E	55.5	405.3	0.91	0.95	29.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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 per ped
P1	South Full Crossing	53	68.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	39.0	LOS D	0.2	0.2	0.72	0.72
P3	North Full Crossing	53	60.9	LOS F	0.2	0.2	0.90	0.90
P4	West Full Crossing	53	39.0	LOS D	0.2	0.2	0.72	0.72
All Pedestrians		211	51.8	LOS E			0.83	0.83

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.