Reference: #16S1109000

1 March 2018

Fivex
Level 17, 275 Alfred Street
NORTH SYDNEY NSW 2060

Attention: Mr. Lesli Berger (Managing Director)

Dear Lesli

RE: LETTER ADDENDUM TO ADDRESS COUNCIL COMMENTS 511 PRINCES HIGHWAY, ROCKDALE

This letter provides a response to comments provided by Bayside Council (Council) on the Planning Proposal for the land identified as the 'Transport Interchange Precinct' located on Geeves Avenue, Rockdale.

This letter will form an addendum to the report "Interchange Precinct, Greeves Avenue, Rockdale – Transport Study" (Transport Report) - GTA dated 31 October 2017 and should be read in conjunction with the report.

This letter also provides an update to the land use areas previously provided in the Transport Report and traffic modelling within this addendum is based on the following:

Table 1: Proposed Development

Land use	Total size
Residential	236 apartments
Retail	4,425 m^2 GFA [1]
Commercial	968 m^2 GFA [1]

[1] GFA = Gross floor area

Based on the land use areas in Table 1, parking rates have been recalculated based on Council's Development Control Plan (DCP) and Roads and Maritime Services (Roads and Maritime) rates as shown in Table 2 and Table 3.

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Table 2: DCP Parking requirements

Description	Use	DCP parking rate	507 – 511 Princes Highway		Mid site		End site	
			Units/ GFA	Parking requirement	Units/ GFA	Parking requirement	Units/ GFA	Parking requirement
Residential	Studio	1 space/unit	19	19	22	22	20	20
	1 Bed							
	2 Bed		42	42	44	44	48	48
	3 Bed	2 spaces / unit	12	24	17	34	12	24
	Visitor	1 space / 5 units	73	15	83	17	80	16
	Sub-Total		**100**		**117**		**108**	
Retail / Commercial		1 space/40 m^2 GFA	2,858	72	1,348	34	1,187	30
Individual Total			**172**		**151**		**138**	
Precinct Total			**461**					

Table 3: Roads and Maritime - Residential Parking Requirements

Description	Use	Parking rate	507 – 511 Princes Highway		Mid site		End site	
			Units/ GFA	Parking requirement	Units/ GFA	Parking requirement	Units/ GFA	Parking requirement
Residential	Studio	0.4 spaces /unit	19	8	22	9	20	8
	1 Bed							
	2 Bed	0.7 spaces / unit	42	30	44	31	48	34
	3 Bed	1.2 spaces / unit	12	15	17	21	12	15
	Visitor	1 space per 5 units	73	15	83	17	80	16
Residential Total			**68**		**78**		**73**	
Precinct Residential Total			**219**					

Table 3 indicates that the application of the Roads and Maritime based residential parking rates would equate to a residential parking demand of 219 car spaces across the precinct. This is less than the DCP residential car parking requirement of 325 spaces. Therefore, in accordance with the Apartment Design Guide (ADG), the Roads and Maritime parking provision would be applicable to the proposed residential component of the development.

Including the retail / commercial component this would equate to a total requirement of 356 spaces.

As outlined in the Transport Report, consideration is recommended to remove the retail parking requirement from Site 1 due to its unique ability to connect directly into the station through a pedestrian walkway (overbridge). This would reduce the overall parking by 73 spaces and therefore result in an overall parking requirement of 283 spaces.

Planning Comments

Council's comments relating to Transport and GTA's responses are as follows.

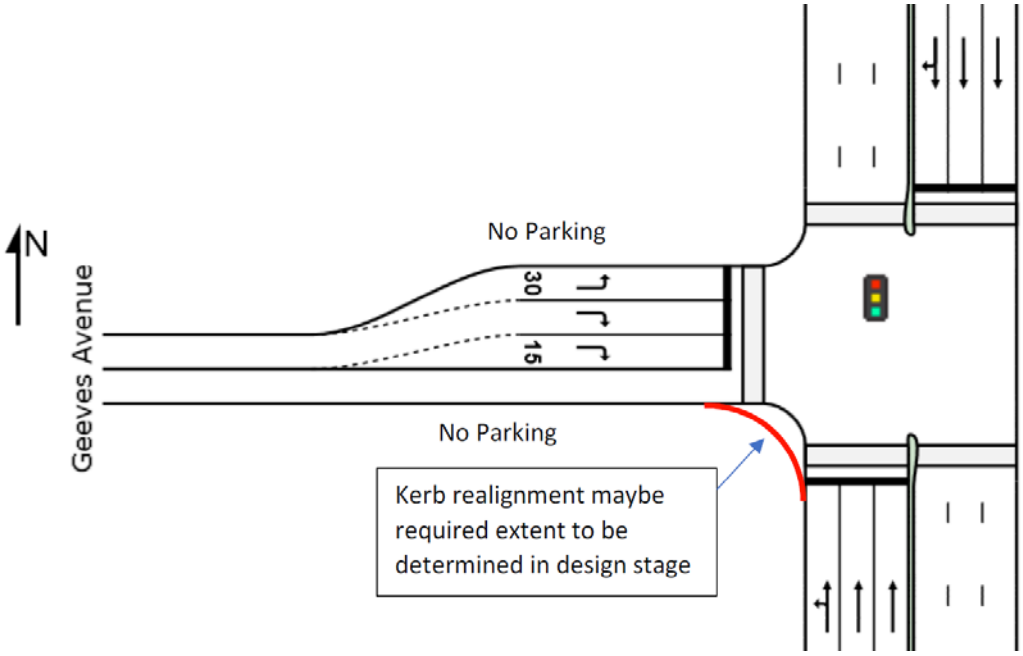
1.8 Geeves Avenue Road Improvements

Please be more descriptive of the 'minor improvements to the lane configuration on the Geeves Avenue approach'.

Response:

The intersection of Geeves Avenue and Princes Highway has been modelled as a network with the intersection to the north and south on the Princes Highway. In isolation this intersection would operate well in the future, however the impact of surrounding intersections needs to be considered. Through removing parking on this section of Geeves Avenue additional traffic lanes can be added on the Geeves Avenue approach to allow more right turning traffic to get through the intersection in the allocated green time. This would result in the loss of around six (time restricted) parking spaces and two loading zones. The parking and loading zone on the southern side would currently be used for the existing development. These modifications would assist to increase the capacity of the right turning vehicles and therefore improve the overall intersection performance as background traffic increases in the future. This proposed intersection layout is shown in Figure 1, please note this is a SIDRA layout representation and not a concept design.

Figure 1 – Proposed Layout Geeves Avenue



Urban Design

2.5 Bicycle parking

The Planning Proposal promotes sustainable transport modes. The proposal incorporates a range of through-site links for pedestrians to and from the station. In table 5 - 1.1.4 it is stated that it will promote walking and cycling in line with Council's strategy active living, however further consideration needs to be undertaken to ensure suitable cycle links (shared or on road) are integrated into the existing Active Transport Network. Any future DA will need to that any bicycle parking provided on site is accessible to residents, workers and the community.

Response:

Section 7.3 of the Transport Report indicates that at least 87 bicycle parking spaces are to be provided for staff, residents and visitors of the site as per the DCP. There are currently no designated bicycle routes immediately surrounding the site on the eastern side of the railway line. The nearest on road facility is located on Railway Street on the western side of the railway line. Access from the site would be through the station or via The Seven Ways road which connects to Railway Street.

Transport

3.1 Temporary/ final vehicle access

The volumes of development-generated traffic expected to be turning into and out of both the temporary and ultimate scenario site accesses have been identified as an issue. There are concerns that access location proposed during the temporary scenario would result in conflicts between development traffic, buses and pedestrians accessing the Rockdale Station Bus Interchange and railway station entrance on Geeves Avenue. A Pedestrian Impact Statement should also be provided.

Response:

Section 5 of the Transport Report covers the site access arrangements, while Table 6.2 sets out the traffic generation estimates of the planning proposal. It is expected that 81 vehicle trips per hour are to be generated by the Planning Proposal for the weekday peak hour. Temporary access to Site 1 would only be provided should Site 1 be developed ahead of Sites 2 and 3. Site 1 would generate around 16 vehicle trips in the peak hour (excluding retail as per Section 5.4).

The current pedestrian activity in and around the site, between the Princes Highway and the station / bus interchange has been surveyed and reported on in Section 2.6 of the Transport Report. The existing pedestrian crossing connecting the station/bus interchange with the sites internal walkway through to Princes Highway will remain as a key pedestrian connection and is why the access location for the completed development is recommended to not be on the western side of the site. The minimal traffic expected from the temporary access to Site 1 is not likely to provide an adverse impact to the interchange or pedestrian movements around the site. In the ultimate scenario the development will provide an opportunity for improved pedestrian facilities through the potential connection to the station over Geeves Avenue.

3.2 Final vehicle access to intersection

There are also concerns that the revised access location for the ultimate scenario is too close to the existing Princes Highway/ Greeves Avenue signalised intersection. It is recommended that the ultimate access be relocated to the western side of the site, given the proximity to the Princes Highway/Geeves Avenue signalised intersection and subsequent sight line limitations. The access should be located to the north of the pedestrian crossing on Geeves Avenue as to reduce traffic volumes travelling over the crossing. Parking removal to accommodate intersection capacity is also a concern.

Response:

Transport for NSW has recommended that the vehicle access be consolidated for all three sites and requested that conflict between motorists and pedestrian/bus movements along the Rockdale Interchange (Geeves Avenue) should be minimised as much as possible. With the requirements of on-site garbage collection, access from the northern side is required to obtain ramp requirements to get trucks to the basement level, this combined with minimising impact with the bus interchange and pedestrian access to the station has resulted in the proposed location on the northern side of the site.

On street parking on the northern section is likely to need to be removed to improve the operation of the Geeves Avenue / Princes Highway intersection to accommodate forecasted growth and

reduce impacts to bus operations from the interchange regardless of the proposed development. The removal of this parking would also provide improved sight lines for the proposed access. There is unlikely to be any queuing because of the development and if it did occur, it would be accommodated within the development and not within Geeves Avenue for both the entry and exit.

3.3 Basement layout

Figure 5.1 of the TIA identifies the site accesses for both the temporary and ultimate scenarios. The internal parking layout for Site 1 appears to be too tight to support service vehicle access. Servicing needs more thought/evidence of ability to achieve success, including swept path checks.

Response:

The basement layout for Site 1 on its own is constrained and intended to be temporary. A detailed design will be prepared for the Development Application.

3.4 Car parking

While the TIA acknowledges the commentary provided in the NSW Department of Planning and Environment's Apartment Design Guide regarding the acceptable levels of car parking provision, parking rates less than those specified in the RMS Guide to Traffic Generating Development (2002) should be considered given the development's unique location. The subject site was identified by Council in the Rockdale Masterplan (2013) as having a crucial role in the overall development of Rockdale's sustainable transport infrastructure. Given no on-site parking is provided for the existing land uses on the site, it is considered appropriate not to provide any retail parking provision for the proposed development.

Response:

The Transport Report tests various development parking scenarios and potential maximum rates. GTA agrees that the proposed development could support reduced parking.

3.5 Existing parking

Table 6.2 of the TIA provides estimated traffic generation for the development. The methodology considers that no on-site parking presently exists and that most of the access to the existing land uses is by pedestrians. As such, the inclusion of existing retail trips in the expected traffic generation should be removed.

Response:

In providing a conservative assessment the modelling in the Transport Report did not reduce the traffic generation by the potential existing traffic generation as outlined in Section 6.3 and Table 6.3.

Table 6.1 of the Transport Report shows a reduction in the existing retail traffic generation to show that there could be some traffic already on the surrounding road network associated with the existing site, that would not be there under the proposed development.

Table 1 provides the traffic generation used in the SIDRA modelling. The retail and commercial areas have been conservatively assessed on gross floor area.

Table 1 Proposed Traffic Generation

Land use	Total size	Size (excl. Site 1 Retail)	Weekday AM		Weekday PM	
			Trip rate	vtph [2]	Trip rate	vtph [2]
Residential	236 apartments	-	0.19 per apartment	45	0.15 per apartment	36
Retail / Commercial	5,393 m² GFA	1,890 m² GFA	23 per 1,000 m² GLFA	81	23 per 1,000 m² [1] GLFA	81
Total				**126**		**117**

[1] 23 trips per 1,000 m² = 46 trips per 1,000 m² x 0.5 (for trip containment)
[2] Vehicle trips per hour (vtph)

3.6 Traffic modelling to 2031

The traffic assessment has only considered the year of opening (i.e. 2021) and has not considered the 10-year design horizon (i.e. year 2031). There should be an estimation of year 2031 (i.e. 10-year design horizon) design traffic volumes and modelling of this scenario in SIDRA intersection.

Response:

Additional modelling has been undertaken to assess the 10-year horizon. Background traffic growth has been obtained from the Sydney Strategic Travel Model (STM) for the years 2016 and 2036 for the three analysed intersections to determine the expected background traffic growth in both the AM and PM peak hour periods. The average compound annual growth rate is about 0.4 per cent.

These intersections have been modelled together as a network. The SIDRA results for the 2031 without and with development are provided in Table 2 and Table 3 respectively.

Table 2 2031 base model (without development)

Intersection	Control	Peak	Degree of saturation	Average delay (sec)	95th percentile queue (m)	LOS
Princes Highway/ Bryant Street	Signalised	AM	0.68	13	136	A
		PM	0.94	47	479	D
Princes Highway/ Geeves Avenue	Signalised	AM	0.91	4	41	A
		PM	1.01	73	122	F
Princes Highway/ Bay Street/ The Seven Ways/ Tramway Arcade	Signalised	AM	1.46	71	482	F
		PM	0.91	44	288	D

Table 2 indicates that in the PM peak particularly the Princes Highway adjacent to the development will be operating near or at capacity in 2031.

The Princes Highway during the AM peak period would operate satisfactorily through the intersections of Bryant Street and Geeves Avenue, however would be operating over capacity through the Bays Street/Seven Ways intersection.

Table 3 2031 base model (with development)

Intersection	Control	Peak	Degree of saturation	Average delay (sec)	95th percentile queue (m)	LOS
Princes Highway/ Bryant Street	Signalised	AM	0.69	13	136	A
		PM	1.05	90	585	F
Princes Highway/ Geeves Avenue	Signalised	AM	1.21	10	105	A
		PM	1.05	102	122	F
Princes Highway/ Bay Street/ The Seven Ways/ Tramway Arcade	Signalised	AM	1.53	80	519	F
		PM	0.92	42	286	C

As the road network is operating near or over capacity without the development, adding any development traffic impacts the operation.

However, it should be noted that the NSW Government is progressing the development of the F6 Extension Stage 1, which will provide connection from Southern Sydney to the wider Sydney network, improving travel times and easing congestion on the local road network. Stage 1 will assist in the reduction of traffic congestion particularly on the Princes Highway through Arncliffe, Rockdale, Banksia and the Grand Parade, Brighton Le Sands. Based on this it is expected that by 2031 traffic volumes on the Princes Highway will have reduced and therefore the road network surrounding the site will be improved from that projected in the modelling results.

I trust this addendum addresses Council's comments regarding the Transport Report for the Planning Proposal stage.

Should you have any queries or require any further information, please do not hesitate to contact me on (02) 8448 1800.

Yours sincerely
GTA CONSULTANTS

Karen McNatty
Associate
encl. Attachment A – SIDRA Results

Attachment A

SIDRA Results

MOVEMENT SUMMARY

Site: Princes Hwy/ Bryant St - 2031 Base AM New Layout

Network: 2031 Base AM

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Princes Highway													
8	T1	2729	2.1	2701	2.1	0.677	2.8	LOS A	17.2	122.4	0.19	0.22	52.3
9	R2	163	4.1	161	4.1	0.677	8.5	LOS A	8.1	58.2	0.20	0.37	45.8
Approach		2893	2.2	2863 N1	2.2	0.677	3.2	LOS A	17.2	122.4	0.19	0.23	51.6
East: Bryant Street													
10	L2	134	0.8	134	0.8	0.367	29.5	LOS C	5.9	44.7	0.56	0.68	27.9
12	R2	52	15.2	52	15.2	0.367	63.3	LOS E	5.9	44.7	0.94	0.78	23.3
Approach		185	4.8	185	4.8	0.367	38.9	LOS C	5.9	44.7	0.67	0.71	26.0
North: Princes Highway													
1	L2	5	0.0	5	0.0	0.129	48.9	LOS D	3.2	23.3	0.81	0.64	28.7
2	T1	615	6.7	615	6.7	0.644	49.4	LOS D	18.4	136.3	0.93	0.78	14.9
Approach		620	6.7	620	6.7	0.644	49.4	LOS D	18.4	136.3	0.93	0.78	15.1
All Vehicles		3698	3.1	3668 N1	3.1	0.677	12.8	LOS A	18.4	136.3	0.34	0.35	37.0

Level of Service (LOS) Method: Delay (RTA NSW).
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	East Full Crossing	53	44.9	LOS E	0.2	0.2	0.80	0.80
P1	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	57.8	LOS E			0.91	0.91

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.

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MOVEMENT SUMMARY

Site: Princes Hwy/ Bryant St - 2031 Base PM Clearway

Network: 2031 Base PM

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Princes Highway													
8	T1	1015	2.8	1015	2.8	0.340	1.6	LOS A	5.2	37.0	0.10	0.09	55.7
9	R2	229	2.0	229	2.0	0.733	86.3	LOS F	16.1	114.6	1.00	1.04	16.6
Approach		1244	2.6	1244	2.6	0.733	17.2	LOS B	16.1	114.6	0.27	0.27	33.7
East: Bryant Street													
10	L2	306	2.5	306	2.5	0.918	85.8	LOS F	19.2	137.3	0.98	1.05	15.1
12	R2	94	0.0	94	0.0	0.918	90.4	LOS F	14.2	100.3	1.00	1.04	19.3
Approach		400	1.9	400	1.9	0.918	86.9	LOS F	19.2	137.3	0.99	1.05	16.2
North: Princes Highway													
1	L2	45	0.0	45	0.0	0.913	58.8	LOS E	43.7	309.7	0.96	1.06	26.1
2	T1	1917	1.7	1917	1.7	0.913	47.6	LOS D	62.6	444.6	0.96	1.03	15.3
Approach		1962	1.7	1962	1.7	0.913	47.9	LOS D	62.6	444.6	0.96	1.03	15.7
All Vehicles		3606	2.0	3606	2.0	0.918	41.6	LOS C	62.6	444.6	0.72	0.77	19.9

Level of Service (LOS) Method: Delay (RTA NSW).
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.
The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	East Full Crossing	53	14.2	LOS B	0.1	0.1	0.45	0.45
P1	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	47.6	LOS E			0.79	0.79

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.

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MOVEMENT SUMMARY

Site: Princes Hwy/ Geeves Ave - 2031 Base AM New Layout

Network: 2031 Base AM

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Princes Highway													
1	L2	52	2.0	51	2.0	0.717	4.8	LOS A	2.6	18.2	0.07	0.12	48.6
2	T1	2701	2.1	2657	2.1	0.717	0.8	LOS A	4.8	34.3	0.07	0.08	48.8
Approach		2753	2.1	2707[N1]	2.1	0.717	0.9	LOS A	4.8	34.3	0.07	0.08	48.8
North: Princes Highway													
8	T1	686	7.2	686	7.2	0.394	2.4	LOS A	5.5	41.0	0.15	0.13	41.7
9	R2	62	0.0	62	0.0	0.911	81.8	LOS F	3.5	24.3	0.20	0.86	17.3
Approach		748	6.6	748	6.6	0.911	9.0	LOS A	5.5	41.0	0.15	0.19	27.4
West: Geeves Avenue													
10	L2	56	24.5	56	24.5	0.520	69.5	LOS E	3.8	32.1	0.97	0.78	17.4
12	R2	41	0.0	41	0.0	0.081	61.7	LOS E	1.2	8.6	0.91	0.70	18.8
Approach		97	14.1	97	14.1	0.520	66.2	LOS E	3.8	32.1	0.94	0.75	18.0
All Vehicles		3598	3.4	3552[N1]	3.4	0.911	4.4	LOS A	5.5	41.0	0.11	0.12	33.4

Level of Service (LOS) Method: Delay (RTA NSW).
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	6.0	LOS A	0.1	0.1	0.29	0.29
All Pedestrians		158	44.9	LOS E			0.74	0.74

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.

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MOVEMENT SUMMARY

Site: Princes Hwy/ Geeves Ave - 2031 Base PM Clearway

Network: 2031 Base PM

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Princes Highway													
1	L2	51	0.0	51	0.0	0.296	4.4	LOS A	0.8	5.9	0.03	0.09	49.0
2	T1	1104	2.3	1104	2.3	0.296	0.5	LOS A	0.8	6.0	0.03	0.05	51.8
Approach		1155	2.2	1155	2.2	0.296	0.6	LOS A	0.8	6.0	0.03	0.05	50.9
North: Princes Highway													
8	T1	2136	1.6	2136	1.6	1.007	104.4	LOS F	17.3	122.4	1.00	1.44	3.0
9	R2	36	0.0	36	0.0	1.007	108.8	LOS F	17.3	122.4	1.00	1.46	14.6
Approach		2172	1.6	2172	1.6	1.007	104.5	LOS F	17.3	122.4	1.00	1.44	3.3
West: Geeves Avenue													
10	L2	45	11.1	45	11.1	0.203	64.4	LOS E	2.8	21.4	0.93	0.74	18.3
12	R2	96	14.6	96	14.6	0.444	69.3	LOS E	3.2	25.4	0.97	0.77	17.5
Approach		141	13.5	141	13.5	0.444	67.8	LOS E	3.2	25.4	0.96	0.76	17.7
All Vehicles		3468	2.3	3468	2.3	1.007	68.4	LOS E	17.3	122.4	0.68	0.95	5.4

Level of Service (LOS) Method: Delay (RTA NSW).
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	50	64.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	50	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	50	5.7	LOS A	0.1	0.1	0.29	0.29
All Pedestrians		150	44.8	LOS E			0.73	0.73

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.

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MOVEMENT SUMMARY

Site: Princes Hwy/ Bay St/ Sevenways/ Tramway Arc - 2031 Base AM New Layout

Network: 2031 Base AM

Princes / Bay / Seven / Tramway
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Princes Highway													
1b	L3	109	7.2	109	7.2	0.903	58.0	LOS E	42.5	310.2	0.94	1.04	20.9
1	L2	12	100.0	12	100.0	0.903	63.2	LOS E	42.5	310.2	0.94	1.04	10.9
2	T1	2549	2.0	2549	2.0	0.903	35.4	LOS C	67.7	481.8	0.95	0.95	17.6
Approach		2671	2.6	2671	2.6	0.903	36.5	LOS C	67.7	481.8	0.95	0.96	17.7
East: Bay Street													
4	L2	27	4.0	27	4.0	0.152	52.6	LOS D	3.4	24.5	0.84	0.73	19.0
4a	L1	306	3.2	306	3.2	0.686	57.0	LOS E	17.0	122.2	0.95	0.82	18.6
5	T1	9	100.0	9	100.0	0.187	92.6	LOS F	0.7	8.9	0.99	0.68	9.0
Approach		343	5.9	343	5.9	0.686	57.6	LOS E	17.0	122.2	0.95	0.81	17.8
North: Princes Highway													
7	L2	58	25.0	58	25.0	0.083	5.3	LOS A	0.2	1.9	0.06	0.39	39.6
8	T1	582	0.0	582	0.0	0.407	1.8	LOS A	3.1	21.5	0.09	0.10	54.3
9a	R1	105	0.0	105	0.0	1.285	343.4	LOS F	14.0	97.9	1.00	1.38	3.1
Approach		745	1.9	745	1.9	1.285	50.3	LOS D	14.0	97.9	0.22	0.30	15.9
SouthWest: The Seven Ways													
30a	L1	244	3.2	244	3.2	1.463	466.1	LOS F	47.8	344.2	1.00	1.59	1.8
32a	R1	418	3.2	418	3.2	0.988	109.4	LOS F	19.8	142.8	1.00	1.17	11.3
32b	R3	78	1.4	78	1.4	0.357	67.0	LOS E	4.9	35.0	0.95	0.77	17.7
Approach		740	3.0	740	3.0	1.463	222.6	LOS F	47.8	344.2	0.99	1.27	5.4
All Vehicles		4499	2.8	4499	2.8	1.463	71.0	LOS F	67.7	481.8	0.83	0.89	12.0

Level of Service (LOS) Method: Delay (RTA NSW).
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	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	12.0	LOS B	0.1	0.1	0.42	0.42
P3	North Full Crossing	53	55.9	LOS E	0.2	0.2	0.89	0.89
P4	West Full Crossing	53	35.1	LOS D	0.1	0.1	0.84	0.84
P8	SouthWest Full Crossing	53	20.1	LOS C	0.1	0.1	0.54	0.54
All Pedestrians		263	37.5	LOS D			0.73	0.73

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.

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Project: P:\16S1100-1199\16S1109000 507-511 Princes Highway Rockdale\Modelling\180226 Sidras - (KM Copy)\180209sid-16S1109000-2031 Base and Base+Dev New Layout2.sip6

MOVEMENT SUMMARY

Site: Princes Hwy/ Bay St/ Sevenways/ Tramway Arc - 2031 Base PM Clearway

Network: 2031 Base PM

Princes / Bay / Seven / Tramway
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Princes Highway													
1b	L3	115	60.0	115	60.0	0.872	75.3	LOS F	25.4	213.8	1.00	1.07	16.2
1	L2	8	100.0	8	100.0	0.872	80.0	LOS F	25.4	213.8	1.00	1.07	10.2
2	T1	941	2.8	941	2.8	0.872	64.2	LOS E	31.3	224.6	0.98	1.01	11.2
Approach		1064	9.7	1064	9.7	0.872	65.6	LOS E	31.3	224.6	0.98	1.02	11.9
East: Bay Street													
4	L2	57	5.8	57	5.8	0.202	55.0	LOS D	4.3	31.2	0.87	0.75	18.2
4a	L1	363	0.9	363	0.9	0.911	78.0	LOS F	27.2	191.5	0.99	1.04	14.9
5	T1	11	100.0	11	100.0	0.186	90.9	LOS F	0.8	10.1	0.99	0.69	9.0
Approach		431	4.1	431	4.1	0.911	75.3	LOS F	27.2	191.5	0.98	0.99	14.8
North: Princes Highway													
7	L2	69	13.6	69	13.6	0.889	56.4	LOS D	13.6	97.9	0.96	0.95	12.8
8	T1	1766	1.8	1766	1.8	0.889	29.6	LOS C	13.8	97.9	0.79	0.77	22.9
9a	R1	360	1.5	360	1.5	0.889	52.9	LOS D	13.7	97.9	0.98	0.94	16.0
9	R2	5	100.0	5	100.0	0.889	57.3	LOS E	13.7	97.9	0.98	0.94	8.9
Approach		2200	2.3	2200	2.3	0.889	34.3	LOS C	13.8	97.9	0.82	0.80	20.8
SouthWest: The Seven Ways													
30a	L1	194	0.5	194	0.5	0.195	15.8	LOS B	5.0	35.2	0.56	0.69	28.9
32a	R1	341	0.6	341	0.6	0.757	59.1	LOS E	15.2	106.9	0.94	0.83	18.0
32b	R3	148	2.9	148	2.9	0.309	47.1	LOS D	7.8	55.8	0.82	0.79	22.3
Approach		683	1.1	683	1.1	0.757	44.2	LOS D	15.2	106.9	0.80	0.78	20.4
All Vehicles		4378	4.1	4378	4.1	0.911	47.5	LOS D	31.3	224.6	0.87	0.87	17.2

Level of Service (LOS) Method: Delay (RTA NSW).
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	50	57.7	LOS E	0.2	0.2	0.91	0.91
P2	East Full Crossing	50	17.0	LOS B	0.1	0.1	0.49	0.49
P3	North Full Crossing	50	46.5	LOS E	0.2	0.2	0.82	0.82
P4	West Full Crossing	50	45.7	LOS E	0.2	0.2	0.81	0.81
P8	SouthWest Full Crossing	50	55.0	LOS E	0.2	0.2	0.89	0.89
All Pedestrians		250	44.4	LOS E			0.78	0.78

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.

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MOVEMENT SUMMARY

Site: Princes Hwy/ Bryant St - 2031 Base AM + Dev + New Layout Network: 2031 Base + Dev AM

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Princes Highway													
8	T1	2745	2.1	2722	2.1	0.694	3.2	LOS A	17.2	122.4	0.21	0.24	51.6
9	R2	163	4.1	162	4.1	0.694	9.1	LOS A	9.0	64.7	0.22	0.40	45.2
Approach		2908	2.2	2883[N1]	2.2	0.694	3.5	LOS A	17.2	122.4	0.21	0.25	50.9
East: Bryant Street													
10	L2	134	0.8	134	0.8	0.379	32.8	LOS C	6.2	46.6	0.61	0.69	26.5
12	R2	52	15.2	52	15.2	0.379	63.4	LOS E	6.2	46.6	0.95	0.78	23.3
Approach		185	4.8	185	4.8	0.379	41.3	LOS C	6.2	46.6	0.71	0.72	25.2
North: Princes Highway													
1	L2	5	0.0	5	0.0	0.134	43.5	LOS D	3.7	27.2	0.77	0.61	30.4
2	T1	633	6.7	633	6.7	0.669	44.6	LOS D	18.3	135.5	0.90	0.77	16.1
Approach		638	6.7	638	6.7	0.669	44.6	LOS D	18.3	135.5	0.90	0.77	16.3
All Vehicles		3732	3.1	3706[N1]	3.1	0.694	12.5	LOS A	18.3	135.5	0.35	0.36	37.3

Level of Service (LOS) Method: Delay (RTA NSW).
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	East Full Crossing	53	39.5	LOS D	0.2	0.2	0.75	0.75
P1	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	56.0	LOS E			0.89	0.89

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: Princes Hwy/ Bryant St - 2031 Base PM + Dev CLEARWAYS Network: 2031 BAse + Dev PM

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	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 per veh	Average Speed km/h
South: Princes Highway													
8	T1	1032	2.8	1032	2.8	0.649	2.4	LOS A	9.0	64.6	0.16	0.15	53.8
9	R2	229	2.0	229	2.0	1.014	64.0	LOS E	17.2	122.4	1.00	0.96	20.1
Approach		1261	2.6	1261	2.6	1.014	13.6	LOS A	17.2	122.4	0.31	0.30	36.9
East: Bryant Street													
10	L2	306	2.5	306	2.5	0.985	115.1	LOS F	21.5	154.1	1.00	1.16	12.2
12	R2	94	0.0	94	0.0	0.985	114.2	LOS F	17.2	121.5	1.00	1.14	16.6
Approach		400	1.9	400	1.9	0.985	114.9	LOS F	21.5	154.1	1.00	1.15	13.3
North: Princes Highway													
1	L2	45	0.0	45	0.0	1.052	137.6	LOS F	82.5	585.2	1.00	1.47	15.0
2	T1	1933	1.7	1933	1.7	1.052	132.7	LOS F	82.5	585.2	1.00	1.49	6.6
Approach		1978	1.7	1978	1.7	1.052	132.8	LOS F	82.5	585.2	1.00	1.49	6.8
All Vehicles		3639	2.0	3639	2.0	1.052	89.5	LOS F	82.5	585.2	0.76	1.04	11.4

Level of Service (LOS) Method: Delay (RTA NSW).
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
P3	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	East Full Crossing	53	11.6	LOS B	0.1	0.1	0.41	0.41
P1	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		158	46.7	LOS E			0.78	0.78

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.

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MOVEMENT SUMMARY

Site: Princes Hwy/ Geeves Ave - 2031 Base AM + Dev + New Layout

Network: 2031 Base + Dev AM

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Princes Highway													
1	L2	105	2.0	104	2.0	0.728	4.8	LOS A	2.8	19.9	0.08	0.16	48.2
2	T1	2701	2.1	2668	2.1	0.728	0.9	LOS A	5.1	36.1	0.08	0.09	48.1
Approach		2806	2.1	2772[N1]	2.1	0.728	1.0	LOS A	5.1	36.1	0.08	0.09	48.1
North: Princes Highway													
8	T1	686	7.2	686	7.2	0.394	2.5	LOS A	5.7	42.5	0.15	0.14	41.3
9	R2	80	0.0	80	0.0	1.205	285.9	LOS F	15.0	105.1	1.00	1.48	6.5
Approach		766	6.4	766	6.4	1.205	32.1	LOS C	15.0	105.1	0.24	0.28	12.5
West: Geeves Avenue													
10	L2	72	24.5	72	24.5	0.667	73.1	LOS F	5.1	43.2	1.00	0.86	16.9
12	R2	88	0.0	88	0.0	0.175	62.8	LOS E	2.7	18.9	0.92	0.74	18.6
Approach		160	11.0	160	11.0	0.667	67.4	LOS E	5.1	43.2	0.96	0.79	17.8
All Vehicles		3733	3.4	3699[N1]	3.4	1.205	10.3	LOS A	15.0	105.1	0.15	0.16	23.4

Level of Service (LOS) Method: Delay (RTA NSW).
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	53	6.0	LOS A	0.1	0.1	0.29	0.29
All Pedestrians		158	44.9	LOS E			0.74	0.74

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.

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MOVEMENT SUMMARY

Site: Princes Hwy/ Geeves Ave - 2031 Base PM + Dev + New Layout

Network: 2031 BAse + Dev PM

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Princes Highway													
1	L2	94	0.0	94	0.0	0.086	4.3	LOS A	0.2	1.3	0.02	0.43	46.3
2	T1	1104	2.3	1104	2.3	0.430	0.5	LOS A	1.5	10.6	0.04	0.05	51.8
Approach		1198	2.1	1198	2.1	0.430	0.8	LOS A	1.5	10.6	0.04	0.08	49.4
North: Princes Highway													
8	T1	2136	1.6	2136	1.6	1.047	159.5	LOS F	17.3	122.4	1.00	1.71	2.0
9	R2	51	0.0	51	0.0	1.047	166.2	LOS F	17.3	122.4	1.00	1.72	10.5
Approach		2187	1.6	2187	1.6	1.047	159.6	LOS F	17.3	122.4	1.00	1.71	2.2
West: Geeves Avenue													
10	L2	61	11.1	61	11.1	0.276	65.2	LOS E	3.8	29.4	0.94	0.76	18.2
12	R2	143	14.6	143	14.6	0.860	86.8	LOS F	5.7	44.5	1.00	1.05	15.0
Approach		204	13.5	204	13.5	0.860	80.3	LOS F	5.7	44.5	0.98	0.96	15.8
All Vehicles		3589	2.5	3589	2.5	1.047	102.1	LOS F	17.3	122.4	0.68	1.12	4.2

Level of Service (LOS) Method: Delay (RTA NSW).
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	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	64.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	50	64.3	LOS F	0.2	0.2	0.96	0.96
P4	West Full Crossing	50	5.7	LOS A	0.1	0.1	0.29	0.29
All Pedestrians		150	44.8	LOS E			0.73	0.73

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.

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MOVEMENT SUMMARY

Site: Princes Hwy/ Bay St/ Sevenways/ Tramway Arc - 2031 Base AM + Dev + New Layout

Network: 2031 Base + Dev AM

Princes / Bay / Seven / Tramway
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Princes Highway													
1b	L3	109	7.2	109	7.2	0.918	63.4	LOS E	45.5	331.9	0.96	1.08	19.6
1	L2	12	100.0	12	100.0	0.918	68.6	LOS E	45.5	331.9	0.96	1.08	10.7
2	T1	2593	2.0	2593	2.0	0.918	39.7	LOS C	72.9	518.7	0.97	0.99	16.3
Approach		2714	2.6	2714	2.6	0.918	40.9	LOS C	72.9	518.7	0.97	0.99	16.4
East: Bay Street													
4	L2	27	4.0	27	4.0	0.152	52.6	LOS D	3.4	24.5	0.84	0.73	19.0
4a	L1	306	3.2	306	3.2	0.686	57.0	LOS E	17.0	122.2	0.95	0.82	18.6
5	T1	9	100.0	9	100.0	0.187	92.6	LOS F	0.7	8.9	0.99	0.68	9.0
Approach		343	5.9	343	5.9	0.686	57.6	LOS E	17.0	122.2	0.95	0.81	17.8
North: Princes Highway													
7	L2	58	25.0	58	25.0	0.088	5.3	LOS A	0.3	2.1	0.06	0.37	39.9
8	T1	620	0.0	620	0.0	0.431	1.8	LOS A	3.2	22.5	0.09	0.10	54.4
9a	R1	115	0.0	115	0.0	1.400	447.1	LOS F	14.0	97.9	1.00	1.53	2.4
Approach		793	1.8	793	1.8	1.400	66.5	LOS E	14.0	97.9	0.22	0.33	12.9
SouthWest: The Seven Ways													
30a	L1	256	3.2	256	3.2	1.532	528.3	LOS F	53.2	382.8	1.00	1.65	1.6
32a	R1	418	3.2	418	3.2	0.990	110.4	LOS F	20.0	143.7	1.00	1.18	11.2
32b	R3	78	1.4	78	1.4	0.357	67.0	LOS E	4.9	35.0	0.95	0.77	17.7
Approach		752	3.0	752	3.0	1.532	248.1	LOS F	53.2	382.8	0.99	1.30	4.9
All Vehicles		4601	2.8	4601	2.8	1.532	80.4	LOS F	72.9	518.7	0.84	0.91	10.8

Level of Service (LOS) Method: Delay (RTA NSW).
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	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	64.3	LOS F	0.2	0.2	0.96	0.96
P2	East Full Crossing	53	12.0	LOS B	0.1	0.1	0.42	0.42
P3	North Full Crossing	53	55.9	LOS E	0.2	0.2	0.89	0.89
P4	West Full Crossing	53	35.1	LOS D	0.1	0.1	0.84	0.84
P8	SouthWest Full Crossing	53	20.1	LOS C	0.1	0.1	0.54	0.54
All Pedestrians		263	37.5	LOS D			0.73	0.73

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.

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Project: P:\16S1100-1199\16S1109000 507-511 Princes Highway Rockdale\Modelling\180226 Sidras - (KM Copy)\180209sid-16S1109000-2031 Base and Base+Dev New Layout2.sip6

MOVEMENT SUMMARY

Site: Princes Hwy/ Bay St/ Sevenways/ Tramway Arc - 2031 Base PM + Dev + New Layout

Network: 2031 BAse + Dev PM

Princes / Bay / Seven / Tramway
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (Network Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	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	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Princes Highway													
1b	L3	115	60.0	115	60.0	0.222	21.0	LOS B	3.8	40.4	0.59	0.74	30.0
1	L2	8	100.0	8	100.0	0.222	25.6	LOS B	3.8	40.4	0.59	0.74	12.6
2	T1	976	2.8	976	2.8	0.885	58.8	LOS E	39.8	285.6	0.97	1.00	12.1
Approach		1099	9.5	1099	9.5	0.885	54.7	LOS D	39.8	285.6	0.93	0.97	13.6
East: Bay Street													
4	L2	57	5.8	57	5.8	0.154	47.0	LOS D	3.9	28.4	0.80	0.74	20.2
4a	L1	363	0.9	363	0.9	0.696	52.4	LOS D	20.9	147.3	0.94	0.83	19.8
5	T1	11	100.0	11	100.0	0.163	89.1	LOS F	0.8	10.0	0.98	0.70	9.1
Approach		431	4.1	431	4.1	0.696	52.6	LOS D	20.9	147.3	0.92	0.82	18.9
North: Princes Highway													
7	L2	69	13.6	69	13.6	0.863	41.7	LOS C	13.6	97.9	0.90	0.87	16.2
8	T1	1804	1.8	1804	1.8	0.863	21.9	LOS B	13.8	97.9	0.73	0.70	27.3
9a	R1	370	1.5	370	1.5	0.863	56.8	LOS E	13.7	97.9	0.98	0.93	15.1
9	R2	5	100.0	5	100.0	0.863	61.2	LOS E	13.7	97.9	0.98	0.93	8.7
Approach		2248	2.3	2248	2.3	0.863	28.3	LOS B	13.8	97.9	0.78	0.74	23.5
SouthWest: The Seven Ways													
30a	L1	203	0.5	203	0.5	0.237	20.1	LOS B	6.3	44.2	0.65	0.72	25.3
32a	R1	341	0.6	341	0.6	0.920	77.2	LOS F	18.7	131.7	0.98	0.99	14.8
32b	R3	148	2.9	148	2.9	0.541	64.6	LOS E	9.4	67.5	0.96	0.81	18.2
Approach		692	1.1	692	1.1	0.920	57.8	LOS E	18.7	131.7	0.88	0.87	17.0
All Vehicles		4470	4.1	4470	4.1	0.920	41.7	LOS C	39.8	285.6	0.84	0.82	18.7

Level of Service (LOS) Method: Delay (RTA NSW).
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.
The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	50	62.4	LOS F	0.2	0.2	0.94	0.94
P2	East Full Crossing	50	15.1	LOS B	0.1	0.1	0.47	0.47
P3	North Full Crossing	50	49.8	LOS E	0.2	0.2	0.84	0.84
P4	West Full Crossing	50	49.8	LOS E	0.2	0.2	0.84	0.84
P8	SouthWest Full Crossing	50	47.3	LOS E	0.2	0.2	0.82	0.82
All Pedestrians		250	44.9	LOS E			0.78	0.78

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.