Graben Pty. Ltd.

Surf Port Douglas

Traffic Impact Assessment

March 2021

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1. Introduction

1.1 Project background

Hunt Design has engaged GHD to prepare a Traffic Impact Assessment (TIA) to accompany a future development application for a proposed Surf Park at Mowbray, just South of Port Douglas. The Surf Park is proposed to provide recreational water sports facilities, hotel accommodation, ancillary retail outlets, food and drink facilities, as well as villa-style and detached dwellings for short-term accommodation.

The proposed location as depicted in Figure 1 has frontage to and will be accessed via the Captain Cook Highway (20A), just south of the Mowbray River Bridge.

Figure 1 Extract from Hunt Design Preliminary Set - Site Location

1.2 Purpose of this report

This Traffic Impact Assessment (TIA) identifies the anticipated traffic volumes, assumptions, traffic modelling, results and analysis to determine the anticipated impacts on the safety and efficiency of the Captain Cook Highway (20A). It will also highlight any mitigation actions that may be required to offset the impact of the proposed development.

1.3 Assumptions

The assumptions made to determine the Traffic Impact Assessment were:

- The development traffic volumes are derived from client-provided data for the development traffic,
- Current traffic volumes were obtained from TMR-provided AADT data for the Captain Cook Highway at Craiglie (closest point) - Site No. 6257,
- No traffic counts were undertaken for this TIA,
- The traffic modelling considers traffic movement during the peak hours for AM and PM for the development peaks and local traffic on-peaks,

- The traffic modelling assesses future growth for local traffic for a 10-year (2033) planning horizon,
- The traffic volumes representing the peak hours are assumed to occur in the peak season for both the local and development traffic to demonstrate the peak traffic conditions and
- Peak day is assumed to be a weekday at the end of July.

1.4 Disclaimers

This report: has been prepared by GHD for Graben Pty. Ltd. and may only be used and relied on by Graben Pty. Ltd. for the purpose agreed between GHD and the Graben Pty. Ltd. as set out in this report.

GHD otherwise disclaims responsibility to any person other than Graben Pty. Ltd. arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

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2. Intersection concept design

2.1 Proposed concept layout

A concept design for the proposed intersection with the new road from the development, to the Captain Cook Highway (20A), has been developed. The intersection design is in accordance with AustRoads Guide to Road Design Part 4: Intersections and Crossings - General.

The design parameters used to determine the intersection geometry were as follows:

- 3.5 m lanes on Captain Cook Highway,
- 100 kph posted speed, 110 kph design speed
- Intersection's purpose is to safely manage traffic in and out of the development

Based on the design parameters the following intersection layout was proposed:

- An unsignalised T-intersection,
- AUL
    - An Auxiliary Left Turn Lane (AUL), with high-angle entry, 135 m
    - Deceleration lane for southbound traffic entering into the development
    - Available traffic storage (excluding tapers) 135 m
    - High-angle entry allows traffic flow for northbound traffic entering the development
    - Dedicated lane allows development traffic to be stored away from through lane and allow safe and efficient traffic flow of the State-Controlled Road
- CHR(S)
    - Channelised right turn lane, short length (CHR(S)), with high-angle entry, 190 m
    - Deceleration lane for northbound traffic entering the development
    - Available traffic storage (excluding tapers) 190 m
    - Dedicated lane allows development traffic to be stored away from through lane and allow safe and efficient traffic flow of the State-Controlled Road
- High-angle left turnout of development allows traffic flow and no restriction by the right-turn movement
- Dedicated left and right-turn lanes out of development provide storage for vehicles exiting the development

This proposed intersection maintains safety functionality for traffic utilising the development. The concept intersection layout is shown in Figure 2 as extracted from the concept sketch.

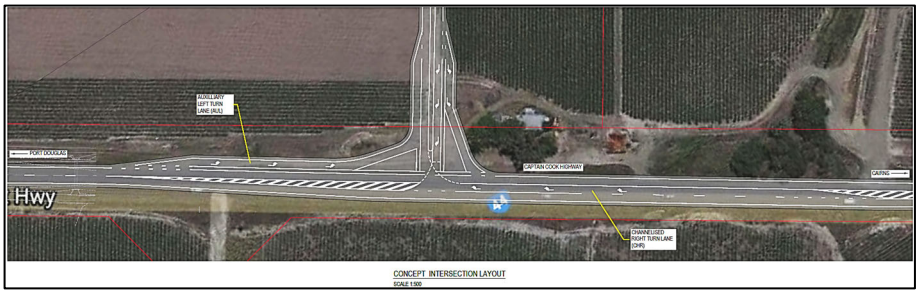


Figure 2 Proposed intersection upgrade concept layout

3. Traffic modelling

3.1 Traffic modelling approach

To demonstrate the impacts of the development on the Captain Cook Highway (20A), two (2) traffic scenarios were modelled for two (2) cases. These were a 'Base Case' and 'Future Case', which allowed a thorough understanding of the initial and future impact of the development as traffic volumes increase. The approach is detailed below in the proceeding sections 3.1.1 and 3.1.2.

3.1.1 Base case (2023) assessment

- Traffic data reflective of the year 2023 to align with the anticipated completion year of the development
- Scenario 1 – Captain Cook Highway traffic coincident with the Development Peak Periods
- Scenario 2 – Development traffic coincident with Captain Cook Highway Peak Periods

3.1.2 Future case (2033) assessment

- Traffic data reflective of the year 2033 to align with a 10-year planning horizon.
- Scenario 1 – Captain Cook Highway traffic coincident with the Development peak periods
- Scenario 2 – Development traffic coincident with Captain Cook Highway peak periods

3.2 Local traffic

3.2.1 Provided data review

TMR provided traffic information on the Captain Cook Highway (20A) at Site 110022 – Craiglie, 800 m South of Port Douglas Rd. A review of the data identified the following:

- 2019 bidirectional AADT is 6,257
- 10-year growth in AADT is 1.5%
- 2022 bidirectional AADT was calculated as 6,543
- The peak time of the year is the End of June to End of July
- Friday is the busiest day of the week in terms of traffic volumes
- Monday through to Thursday show consistent morning and afternoon peaks:
  - On peak AM: 8:00-9:00 AM
  - On peak PM: 4:00-5:00 PM
  - -Corresponding percentage of bidirectional AADT is 8% for both AM and PM peaks.
- The percentage of the daily bidirectional AADT for potential off-peak periods are:
  - 9:00 – 10:00 AM is 7.25% AADT
  - 3:00 – 4:00 PM is 7.4% AADT

3.2.2 Assumptions for traffic volumes

The following assumptions were made to determine the traffic volume inputs for the local traffic.

- Bi-directional AADT (2023) can be split 50/50 for the northbound and southbound through traffic on Captain Cook Highway due to a marginal difference in traffic of the gazettal and against gazettal lanes
- AADT was taken from a weekday AADT average to align with regular local traffic movements
- Development peaks to be 9:00-10:00 AM and 3:00 – 4:00 PM.

Table 1 Peak volumes for local traffic based on AADT (2023)

Peak	% AADT	Two-way	One-way
9:00-10:00 AM (Development Peak)	7.25% AADT	474	237
3:00-4:00 PM (Development Peak)	7.4% AADT	484	242
8:00-9:00 AM (CCH Peak)	8% AADT	523	262
4:00-5:00 PM (CCH Peak)	8% AADT	523	262

3.3 Development traffic

The client provided a detailed breakdown of the seasonal use of the development elements to determine the traffic generation. In cases where more information was required to determine the traffic generation, the 'RTA Guide to Traffic Generating Development' was referred to, specifically, 'Section 3 – Land Use Traffic Generation'. This provided peak hour rates that were used in the traffic generation.

The client provided data and corresponding movement assumptions have been detailed in the following tables.

Table 2 Client provided data breakdown

User / Area and Assumptions	Total type	Peak Hr Rate (RTA or Assumed)	No. peak hour trips	Peak hour split assumptions	Percentage assumption	Movements	AM Peak Movement Distribution	PM Peak Movement Distribution
Hotel 8 x Family Room 131 Single Rooms 21 Other Rooms (JS, KS, PWD)	160	0.5	80	25% arrive to check in AM peak	0.25	20	80% right in 20% left in	
				25% exit to go on day trip in AM peak	0.25	20	70% right out 30% left out	
				25% exit to check out in PM peak	0.25	20		80% left out 20% right out
				25% arrive back from day trip in PM peak	0.25	20		70% left in 30% right in
Residential 30 x Detached dwellings Low-Med density	30	0.6	18	50% exit in AM peak	0.5	9	70% left out 30% right out	
				50% enter in PM peak	0.5	9		70% right in 30% left in
Villas 50 Villas	50	0.5	25	50% exit in AM peak	0.5	12.5	50% left out 50% right out	
				50% enter in PM peak	0.5	12.5		50% left in 50% right out

User / Area and Assumptions	Total type	Peak Hr Rate (RTA or Assumed)	No. peak hour trips	Peak hour split assumptions	Percentage assumption	Movements	AM Peak Movement Distribution	PM Peak Movement Distribution
Outdoor Recreation Facilities 160 visitor car parks (50 and 80 recreational patrons at maximum - 80% car park for recreational facilities) 130 car parks dedicated to rec. Assume 85% capacity of the car park in the middle of the day (off-peak)	130	0.5	65	50% enter in AM peak	0.5	32.5	40% left in 60% right in	
Assume 50% capacity of carpark in both peak hours				50% leave in PM peak	0.5	32.5		40% right out 60% left out
Retail Outlet 1 80 pax Casual visitors 60% Assume casual visitor peak hour rate 0.5	48	0.1	4.8	50% arrive in AM peak	0.5	2.4	70% left in 30% right in	
				50% exit in PM peak	0.5	2.4	70% right out 30% left out	
Outlet 2 200 pax Casual visitors 70% Assume casual visitor peak hour rate 0.5	140	0.1	14	60% arrive in AM peak	0.6	8.4	70% left in 30% right in	
				40% exit in PM pea	0.4	5.6		70% right out 30% left out
Staff								
Surf operations - 10 One shift/day Assume rate of 80% total in peak hour	10	0.8	8	50% arrive in AM peak 50% exit in PM peak	0.5	4	50% left in 50% right in	50% left in 50% right in

User / Area and Assumptions	Total type	Peak Hr Rate (RTA or Assumed)	No. peak hour trips	Peak hour split assumptions	Percentage assumption	Movements	AM Peak Movement Distribution	PM Peak Movement Distribution
Surf shop - 4 One shift/day Assume rate of 80% total in peak hour	4	0.8	3.2	50% arrive in AM peak 50% exit in PM peak	0.5	1.6	50% left in 50% right in	50% left in 50% right in
Other retail - 8 One shift/day Assume rate of 80% total in peak hour	8	0.8	6.4	50% arrive in AM peak 50% exit in PM peak	0.5	3.2	50% left in 50% right in	50% left in 50% right in
Hotel - 50 Two shifts / day Assume rate of 50% total in peak hour as half of staff will arrive/exit in off peak	100	0.5	50	50% arrive in AM peak 50% exit in PM peak	0.5	25	50% left in 50% right in	50% left in 50% right in
Restaurants - 20 Two shifts / day Assume rate of 50% total in peak hour as half of staff will arrive/exit in off peak	40	0.5	20	50% arrive in AM peak 50% exit in PM peak	0.5	10	50% left in 50% right in	50% left in 50% right in
Hotel Bar/Alfresco/Dining								
Hotel bar 67 pax 20% Casual visitor Assume 85% capacity for traffic modelling Assume casual visitor peak hour rate 0.4	11.39	0.4	5	100% arrive in PM peak	1	5	50% left out 50% right out	

User / Area and Assumptions	Total type	Peak Hr Rate (RTA or Assumed)	No. peak hour trips	Peak hour split assumptions	Percentage assumption	Movements	AM Peak Movement Distribution	PM Peak Movement Distribution
Hotel Alfesco 78 pax 20% Casual visitor Assume 85% capacity for traffic modelling Assume casual visitor peak hour rate 0.4	13.26	0.4	5	100% arrive in PM peak	1	5	50% left out 50% right out	
Hotel dining 97 pax 20% Casual visitor Assume 85% capacity for traffic modelling Assume casual visitor peak hour rate 0.4	16.49	0.4	7	100% arrive in PM peak	1	7	50% left out 50% right out	
Food and Beverages								
Surf Deck and Kiosk Deck 381 pax 60% Casual visitors Assume 85% capacity for traffic modelling Assume casual visitor peak hour rate 0.05	194.31	0.05	9	50% enter in PM peak	0.5	5		50% left in 50% right in
				50% exit in PM peak	0.5	5		50% left out 50% right out
VIP Lounge Areas 44 pax 50% Casual visitors Assume 85% capacity for traffic modelling Assume casual visitor peak hour rate 0.1	18.7	0.1	1.87	100% arrive in PM peak	1	1.87	70% left in 30% right in	

User / Area and Assumptions	Total type	Peak Hr Rate (RTA or Assumed)	No. peak hour trips	Peak hour split assumptions	Percentage assumption	Movements	AM Peak Movement Distribution	PM Peak Movement Distribution
Wave Bar 48 pax Assume 85% capacity for traffic modelling	32.64	0.5	16.32	50% enter in PM peak	0.5	8		50% left in 50% right in
80% Casual visitors Assume casual visitor peak hour rate 0.5				50% exit in PM peak	0.5	8		50% left out 50% right out
Event / Function Function spaces (incl. VIP func, Ext func, Func 1-4, Level 2 Func) 507 pax 20% Casual Visitor Assume 85% capacity for traffic modelling Assume 2 person per vehicle Assume casual visitor peak hour rate 0.1	43.095	0.1	4	100% arrive in PM peak	1	4	40% left in 60% right in	

3.3.1 Development traffic generation

Based on the above data and assumptions, the volumes outlined in Table 3, were determined as the traffic generated in the development peak. These volumes are considered to be conservative and likely reflect the ultimate case of traffic generation.

Table 3 Development traffic generation volumes

Development Traffic Generation Totals	AM	PM
Arriving into the Development		
Left in (Coming from North-Port)	58	32
Right in (Coming from South-Cairns)	49	28
Total IN	**107**	**61**
Departing the Development		
Left out (Going South-Cairns)	19	69
Right out (Going North-Port)	23	51
Total OUT	**42**	**120**

3.4 Growth rate and projected traffic

The TMR supplied AADT Segment Analysis Report for Craiglie (closest location) 6257 identified a 10-year growth of 1.5%. For this TIA, the 1.5% growth rate was applied to the 10-year projected traffic on the Captain Cook Highway. It is anticipated that no growth is to occur within the development and hence, no growth was applied to development traffic for the future case.

3.5 Volumes for modelling

Based on the review of data and assumptions for both the local traffic and the development generated traffic, the volumes were determined for each movement at the intersection which are shown in Table 4, which provides the volumes for the base case (2022) and Table 5, which provides the volumes for the future case (2032). This accounts for the 1.5% growth on the through traffic on the CCH. It is noted that the future case assumes all other traffic does not grow and so the same volumes for the base case are applied.

For the purposes of assessing the development traffic coincident with the CCH peak, a conservative estimate of 50% of the development daily volumes. The peak hour development traffic is 30% of the daily development traffic, therefore it was justified that 50% would be a reasonable estimate for the development traffic in the off-peak period.

Table 4 Traffic volumes for Base Case (2023)

Approach	Turn	Base Case (2033)			
		AM Movements		PM Movements	
		CCH Peak	Devel. Peak	Devel. Peak	CCH Peak
		8:00 - 9:00	9:00 - 10:00	3:00-4:00	4:00 - 5:00
CCH North (Coming from Port Douglas)	Left	29	58	32	16
	Through	262	237	242	262
New Road (Surf PD)	Right	11	23	51	26
	Left	9	19	69	34
CCH South (Coming from Cairns)	Right	24	49	28	14
	Through	262	237	242	262

Table 5 Traffic volumes for 10-year Future Case (2033)

Approach	Turn	Future Case (2033)			
		AM Movements		PM Movements	
		CCH Peak	Devel. Peak	Devel. Peak	CCH Peak
		8:00 - 9:00	9:00 - 10:00	3:00-4:00	4:00 - 5:00
CCH North (Coming from Port Douglas)	Left	29	58	32	16
	Through	304	275	281	304
New Road (Surf PD)	Right	11	23	51	26
	Left	9	19	69	34
CCH South (Coming from Cairns)	Right	24	49	28	14
	Through	304	275	281	304

3.6 SIDRA modelling overview

The traffic analysis was undertaken using SIDRA Intersection 9 by modelling the intersection with the two traffic scenarios. The intersection was modelled as an unsignalised two-way, give-way/yield intersection. Lane geometry for the intersection was determined from aerial imagery and the concept design. SIDRA input parameters were verified using local knowledge, an understanding of the existing local traffic and the proposed development functionality.

The intersection was analysed and evaluated in terms of the Level of Service (LoS), Degree of Saturation (DoS), Queuing Length and Delay. SIDRA provides two performance measures being the Network LoS, based on speed efficiency, travel time index and a congestion coefficient; and Lane LoS, based on queueing length and delays. Due to low traffic volumes and the basic layout of the intersections, the Lane LoS measure is more applicable as it considers parameters more

relevant to the context of the intersection and was used in determining the ‘network’ LoS as reported below.

It must also be noted that SIDRA outputs have a 5% increase buffer on all traffic volumes. This is an inert function of the program applied to all intersection analysis to ensure a factor of safety is accounted for.

4. Base case (2023)

4.1 Layout

As outlined in Section 2 of this report, a concept design was undertaken to determine intersection layout with the development's new access road and the CCH. The outcomes of this design were included as geometric parameters for SIDRA analysis to reflect the most accurate modelling situation. The layout of the intersection as modelled in SIDRA is shown in Figure 3 below.

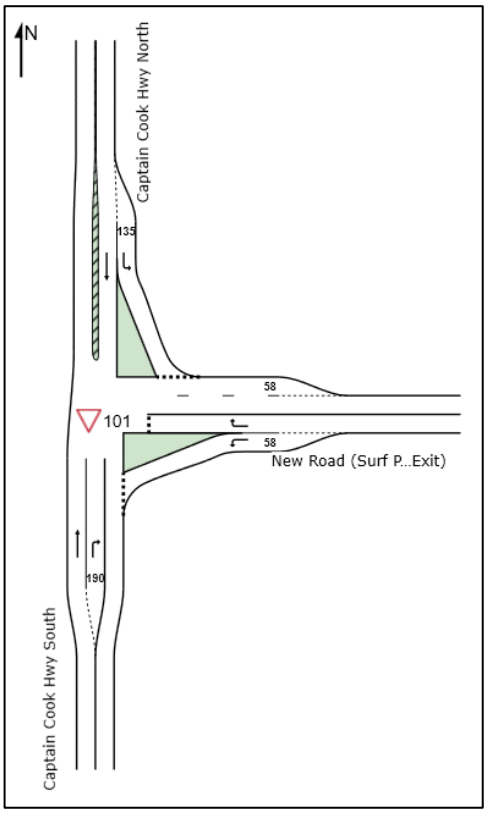
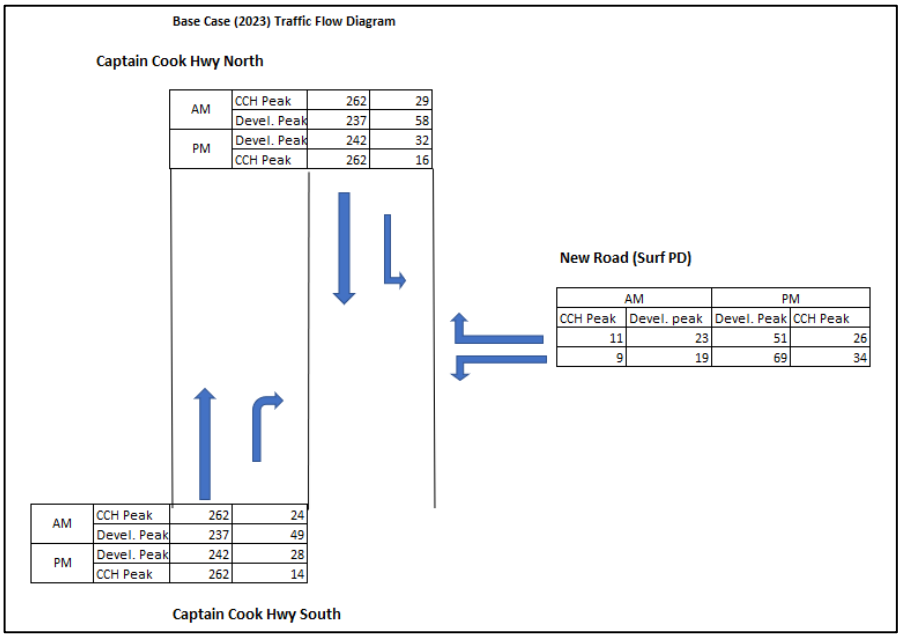


Figure 3 Proposed intersection layout extracted from SIDRA model

4.1.1 Traffic flow diagram for base case



4.2 Results and analysis

The SIDRA analysis identified that in the Base Case (2023), all lanes of the proposed intersection are achieving a Level of Service 'A', which is the best achievable outcome.

As identified in Figure 4, the Captain Cook Highway in both the inbound and outbound lanes is demonstrating a Level of Service 'A' for all traffic scenarios. Due to the intersection being modelled as an unsignalised two-way give way/yield intersection, giving the priority movement the major road which in this case is the CCH. As a result, it is expected that there will be a high LoS for the CCH lanes in each traffic scenario, as there is no opportunity to cause delay or queuing as the analysis favours this movement.

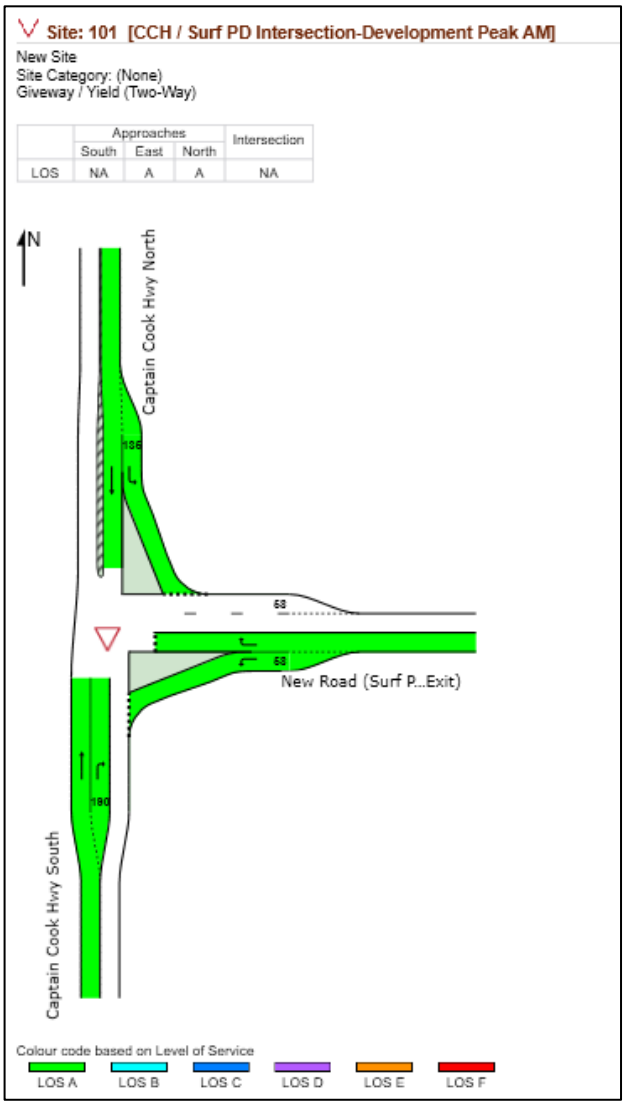


Figure 4 Lane Level of Service Display for the Development Peak AM

Despite the traffic scenarios demonstrating a high level of functionality, it is worth identifying results from performance-based criteria including queuing and lane delay to demonstrate the high functionality of the intersection and the extents to which it can operate.

4.2.1 Relevant performance-based criteria results

The relevant performance criteria are as follows:

- Queue (average): This performance criterion gives the average back of queue distance in 'metres' for any lane

- Queue (percentile): This performance criterion gives the largest 95% back of queue distance in 'number of vehicles' for any lane
    - Note: In the context of this analysis, the only lane that is impacted is the Apron Drive, noted in SIDRA as the South lane. This is the only lane referenced in the table below.
- Delay (control): This performance criterion determines the average control delay per vehicle in 'seconds'.

Table 6 Queues for worst lane for traffic scenarios

Scenario	Queue Distance (average) (metres)	Queue Distance (%) (vehicles)	Worst lane
Development Peak - AM	1.1	0.2	Left turn and right turn from CCH into Development
CCH Peak - AM	0.5	0.1	Right turn from Development onto CCH
Development Peak - PM	2.3	0.3	Right turn from Development onto CCH
CCH Peak - PM	1.2	0.2	Right turn from Development onto CCH

Table 7 Delay control results for traffic scenarios (seconds)

Scenario	CCH South (Right Turn)	Surf New Road (Right Turn)	Surf New Road (Left Turn)	CCH North (Left Turn)
Development Peak - AM	5.4	8.3	5.0	4.6
Development Peak - PM	5.3	8.5	5.3	4.6
CCH Peak - AM	5.4	8.0	5.0	4.5
CCH Peak - PM	5.4	8.6	5.4	4.5

As can be seen in Table 6 and

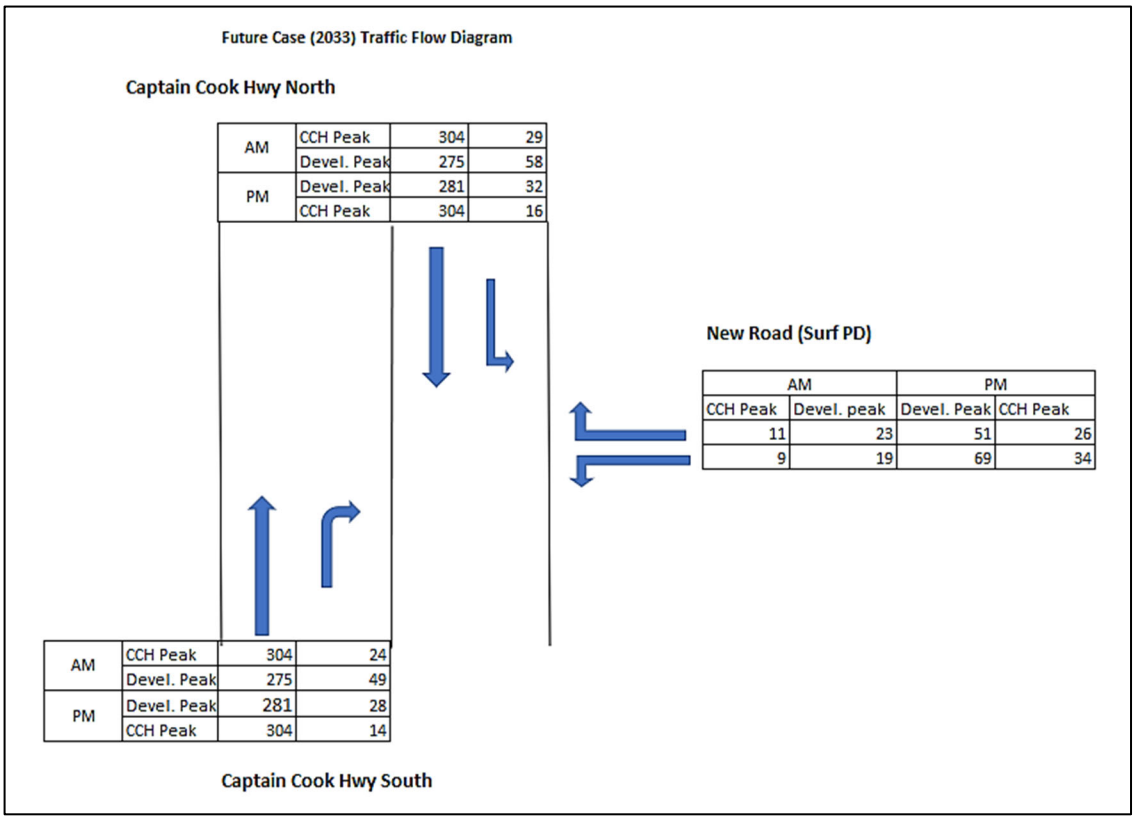
Table 7, very low queueing and delays are occurring. It is expected that the Surf New Road is experiencing the highest delay and queuing as it is not the priority movement. In the context of safe and efficient traffic operation, the levels of queuing delay at the intersection are considered immaterial to the performance of the intersection, and therefore are acceptable.

5. Future case (2033)

5.1 Layout

No changes were made to the geometrical layout of the intersection as part of the future case assessment. The traffic flow diagram in the figure below is showing the movements for the future case scenario.

5.1.1 Traffic flow diagram for future case



5.2 Results and analysis

The SIDRA analysis identified that in the Base Case (2022) all lanes of the Apron Drive and Hunter Street intersection are achieving a Level of Service ‘A’.

As identified in Figure 5 (which is showing the Development Peak Scenario – AM as an example), the Captain Cook Highway inbound and outbound lanes are demonstrating a Level of Service ‘A’ for all traffic scenarios. The same as the Base Case scenario, the intersection has been modelled as an unsignalised two-way give way/yield intersection, giving the priority movement to the major road which in this case is the CCH. Hence, the expected result of a high LoS for the CCH lanes in each traffic scenario.

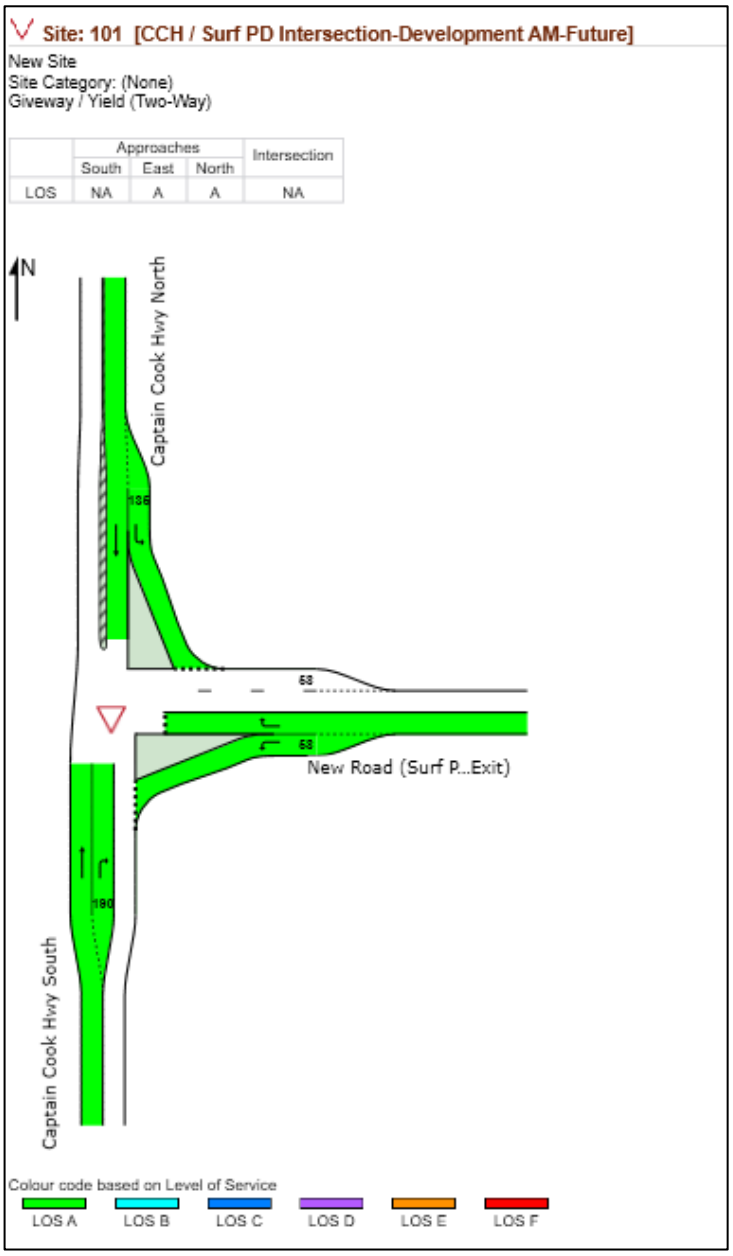


Figure 5 Lane Level of Service Display for the Development Peak AM

Similarly to the base case, the traffic scenarios are demonstrating a high level of functionality however it is worth identifying any change in results from performance-based criteria to identify any potential impacts of increased traffic volumes.

5.2.1 Relevant performance-based criteria results

The relevant performance criteria are as follows:

- Queue (average): This performance criterion gives the average back of queue distance in 'metres' for any lane
- Queue (percentile): This performance criterion gives the largest 95% back of queue distance in 'number of vehicles' for any lane
    - Note: In the context of this analysis, the only lane that is impacted is the Apron Drive, noted in SIDRA as the South lane. This is the only lane referenced in the table below.
- Delay (control): This performance criterion determines the average control delay per vehicle in' seconds'.

Table 8 Queues for worst lane for traffic scenarios

Scenario	Queue Distance (average) (metres)	Queue Distance (%) (vehicles)	Worst lane
Development Peak - AM	1.1	0.2	Right turn from Development onto CCH
CCH Peak - AM	0.6	0.1	Right turn from Development into CCH
Development Peak - PM	2.5	0.4	Right turn from Development onto CCH
CCH Peak - PM	1.3	0.2	Right turn from Development onto CCH

Table 9 Delay control results for traffic scenarios (seconds)

Scenario	CCH South (Right Turn)	Surf New Road (Right Turn)	Surf New Road (Left Turn)	CCH North (Left Turn)
Development Peak - AM	5.5	9.2	5.1	4.7
Development Peak - PM	5.5	9.5	5.5	4.6
CCH Peak - AM	5.6	9.6	5.5	4.6
CCH Peak - PM	5.6	9.6	5.5	4.5

As can be seen in Table 8 and Table 9, the traffic volumes have increased with the 1.5% growth rate on the Captain Cook Highway volumes, and the queuing, as well as delays, have only slightly increased in most cases only by 0.1-0.3 seconds. This is suggesting the low growth over a 10-year horizon will have no further impact on the proposed new development. It is also expected to continue to see the Surf New Road demonstrating the highest of delay and queuing as it is not the priority movement.

It could be assumed that if the traffic volume was projected for a high growth scenario, the LoS and criteria performance will still be at operating at a high level. This is assumed based on the geometric design requirements providing ample storage length in the AUL and CHR lanes.

6. Conclusions

The traffic impact assessment undertaken has identified that the proposed intersection of the Captain Cook Highway (20A) and the new development will function at a high level for the forecasted 2033 traffic demands and with the anticipated development generated traffic impact.

Therefore, it can be concluded that the proposed development for the Surf Park, South of the Mowbray River, will have a negligible negative impact on the current and future safety and efficiency of the existing State Controlled Road Network.

Appendices

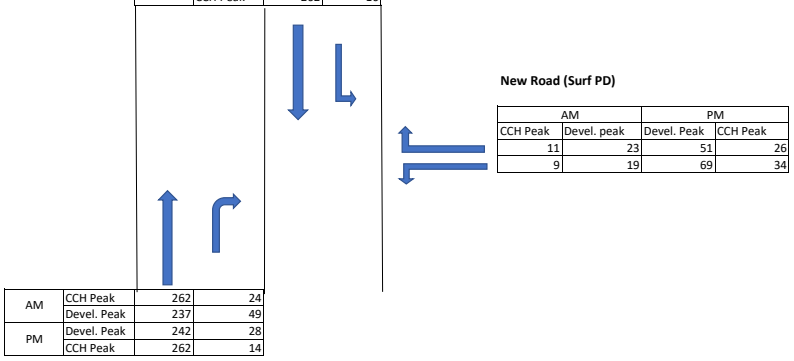
Appendix A – Traffic volumes

Traffic Volumes

Base Case (2023) Traffic Flow Diagram

Captain Cook Hwy North

AM	CCH Peak	262	29
	Devel. Peak	237	58
PM	Devel. Peak	242	32
	CCH Peak	262	16



AM	CCH Peak	262	24
	Devel. Peak	237	49
PM	Devel. Peak	242	28
	CCH Peak	262	14

Captain Cook Hwy South

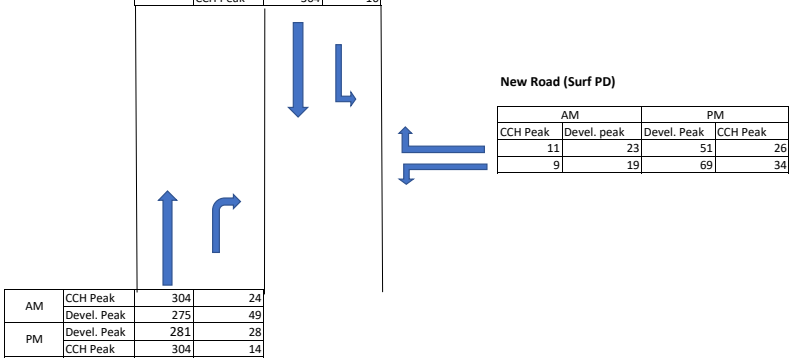
New Road (Surf PD)

AM		PM	
CCH Peak	Devel. peak	Devel. Peak	CCH Peak
11	23	51	26
9	19	69	34

Future Case (2033) Traffic Flow Diagram

Captain Cook Hwy North

AM	CCH Peak	304	29
	Devel. Peak	275	58
PM	Devel. Peak	281	32
	CCH Peak	304	16



AM	CCH Peak	304	24
	Devel. Peak	275	49
PM	Devel. Peak	281	28
	CCH Peak	304	14

Captain Cook Hwy South

New Road (Surf PD)

AM		PM	
CCH Peak	Devel. peak	Devel. Peak	CCH Peak
11	23	51	26
9	19	69	34

		Base Case (2023)				Future Case (2033)			
		AM Movements		PM Movements		AM Movements		PM Movements	
		CCH Peak	Devel. Peak	Devel. Peak	CCH Peak	CCH Peak	Devel. Peak	Devel. Peak	CCH Peak
Approach	**Turn**	**8:00 - 9:00**	**9:00 - 10:00**	**3:00-4:00**	**4:00 - 5:00**	**8:00 - 9:00**	**9:00 - 10:00**	**3:00-4:00**	**4:00 - 5:00**
CCH North (Coming from Port Douglas)	Left	29	58	32	16	29	58	32	16
	Through	262	237	242	262	304	275	281	304
New Road (Surf PD)	Right	11	23	51	26	11	23	51	26
	Left	9	19	69	34	9	19	69	34
CCH South (Coming from Cairns)	Right	24	49	28	14	24	49	28	14
	Through	262	237	242	262	304	275	281	304

Assumptions for overall traffic movement determination

50% of development peak traffic is the amount of traffic in the CCH peak	50%
Through traffic on CCH is 50/50 split for Northbound and Southbound traffic	
1.5% growth factor only applied to through traffic (local traffic on CCH)	1.50%

Appendix B – Base case results (2023)

MOVEMENT SUMMARY

Site: 101 [CCH / Surf PD Intersection-Development Peak PM (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Hwy														
2	T1	242	0.0	255	0.0	0.131	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	28	0.0	29	0.0	0.021	5.3	LOS A	0.1	0.6	0.34	0.53	0.34	45.7
Approach		270	0.0	284	0.0	0.131	0.6	NA	0.1	0.6	0.04	0.06	0.04	49.5
East: New Road (Surf PD Entry/Exit)														
4	L2	69	0.0	73	0.0	0.056	5.3	LOS A	0.2	1.5	0.33	0.53	0.33	46.4
6	R2	51	0.0	54	0.0	0.087	8.5	LOS A	0.3	2.3	0.55	0.73	0.55	44.4
Approach		120	0.0	126	0.0	0.087	6.7	LOS A	0.3	2.3	0.42	0.61	0.42	45.5
North: Captain Cook Hwy														
7	L2	32	0.0	34	0.0	0.021	4.6	LOS A	0.1	0.6	0.09	0.47	0.09	47.0
8	T1	242	0.0	255	0.0	0.131	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		274	0.0	288	0.0	0.131	0.6	LOS A	0.1	0.6	0.01	0.05	0.01	49.6
All Vehicles		664	0.0	699	0.0	0.131	1.7	NA	0.3	2.3	0.09	0.16	0.09	48.7

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [CCH / Surf PD Intersection-Development Peak AM (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Hwy South														
2	T1	237	0.0	249	0.0	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	49	0.0	52	0.0	0.036	5.4	LOS A	0.2	1.1	0.34	0.54	0.34	42.0
Approach		286	0.0	301	0.0	0.129	0.9	NA	0.2	1.1	0.06	0.09	0.06	49.0
East: New Road (Surf PD Entry/Exit)														
4	L2	19	0.0	20	0.0	0.015	5.0	LOS A	0.1	0.4	0.32	0.50	0.32	44.3
6	R2	23	0.0	24	0.0	0.041	8.3	LOS A	0.1	1.0	0.54	0.70	0.54	41.0
Approach		42	0.0	44	0.0	0.041	6.8	LOS A	0.1	1.0	0.44	0.61	0.44	42.5
North: Captain Cook Hwy North														
7	L2	58	0.0	61	0.0	0.039	4.7	LOS A	0.2	1.1	0.13	0.47	0.13	43.2
8	T1	237	0.0	249	0.0	0.128	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		295	0.0	311	0.0	0.128	0.9	LOS A	0.2	1.1	0.03	0.09	0.03	49.0
All Vehicles		623	0.0	656	0.0	0.129	1.3	NA	0.2	1.1	0.07	0.13	0.07	48.7

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [CCH / Surf PD Intersection-CCH Peak AM (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Hwy														
2	T1	262	0.0	276	0.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	24	0.0	25	0.0	0.018	5.4	LOS A	0.1	0.5	0.36	0.54	0.36	41.9
Approach		286	0.0	301	0.0	0.141	0.5	NA	0.1	0.5	0.03	0.05	0.03	49.5
East: New Road (Surf PD Entry/Exit)														
4	L2	9	0.0	9	0.0	0.007	5.0	LOS A	0.0	0.2	0.33	0.50	0.33	44.3
6	R2	11	0.0	12	0.0	0.020	8.3	LOS A	0.1	0.5	0.54	0.67	0.54	41.0
Approach		20	0.0	21	0.0	0.020	6.9	LOS A	0.1	0.5	0.45	0.59	0.45	42.4
North: Captain Cook Hwy														
7	L2	29	0.0	31	0.0	0.019	4.6	LOS A	0.1	0.5	0.08	0.47	0.08	43.4
8	T1	262	0.0	276	0.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		291	0.0	306	0.0	0.141	0.5	LOS A	0.1	0.5	0.01	0.05	0.01	49.5
All Vehicles		597	0.0	628	0.0	0.141	0.7	NA	0.1	0.5	0.03	0.06	0.03	49.3

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [CCH / Surf PD Intersection-CCH Peak PM (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Hwy														
2	T1	262	0.0	276	0.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	14	0.0	15	0.0	0.011	5.4	LOS A	0.0	0.3	0.36	0.53	0.36	45.6
Approach		276	0.0	291	0.0	0.141	0.3	NA	0.0	0.3	0.02	0.03	0.02	49.7
East: New Road (Surf PD Entry/Exit)														
4	L2	34	0.0	36	0.0	0.028	5.4	LOS A	0.1	0.8	0.34	0.52	0.34	46.3
6	R2	26	0.0	27	0.0	0.046	8.6	LOS A	0.2	1.2	0.54	0.71	0.54	44.3
Approach		60	0.0	63	0.0	0.046	6.8	LOS A	0.2	1.2	0.43	0.60	0.43	45.5
North: Captain Cook Hwy														
7	L2	16	0.0	17	0.0	0.010	4.5	LOS A	0.0	0.3	0.06	0.47	0.06	47.1
8	T1	262	0.0	276	0.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		278	0.0	293	0.0	0.141	0.3	LOS A	0.0	0.3	0.00	0.03	0.00	49.8
All Vehicles		614	0.0	646	0.0	0.141	0.9	NA	0.2	1.2	0.05	0.08	0.05	49.3

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

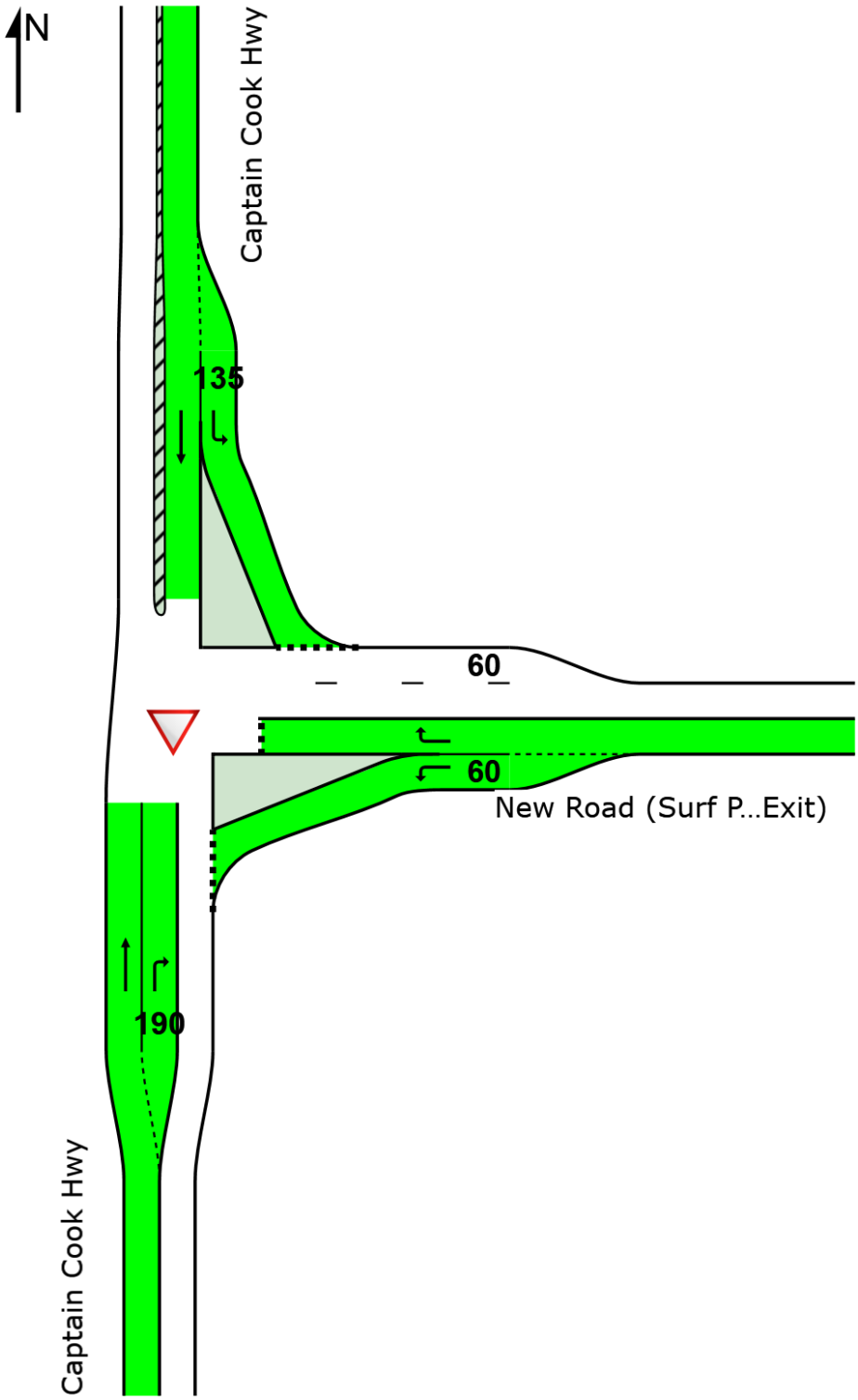
LEVEL OF SERVICE

Lane Level of Service

Site: 101 [CCH / Surf PD Intersection-CCH Peak PM (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

	Approaches			Intersection
	South	East	North	
LOS	NA	A	A	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

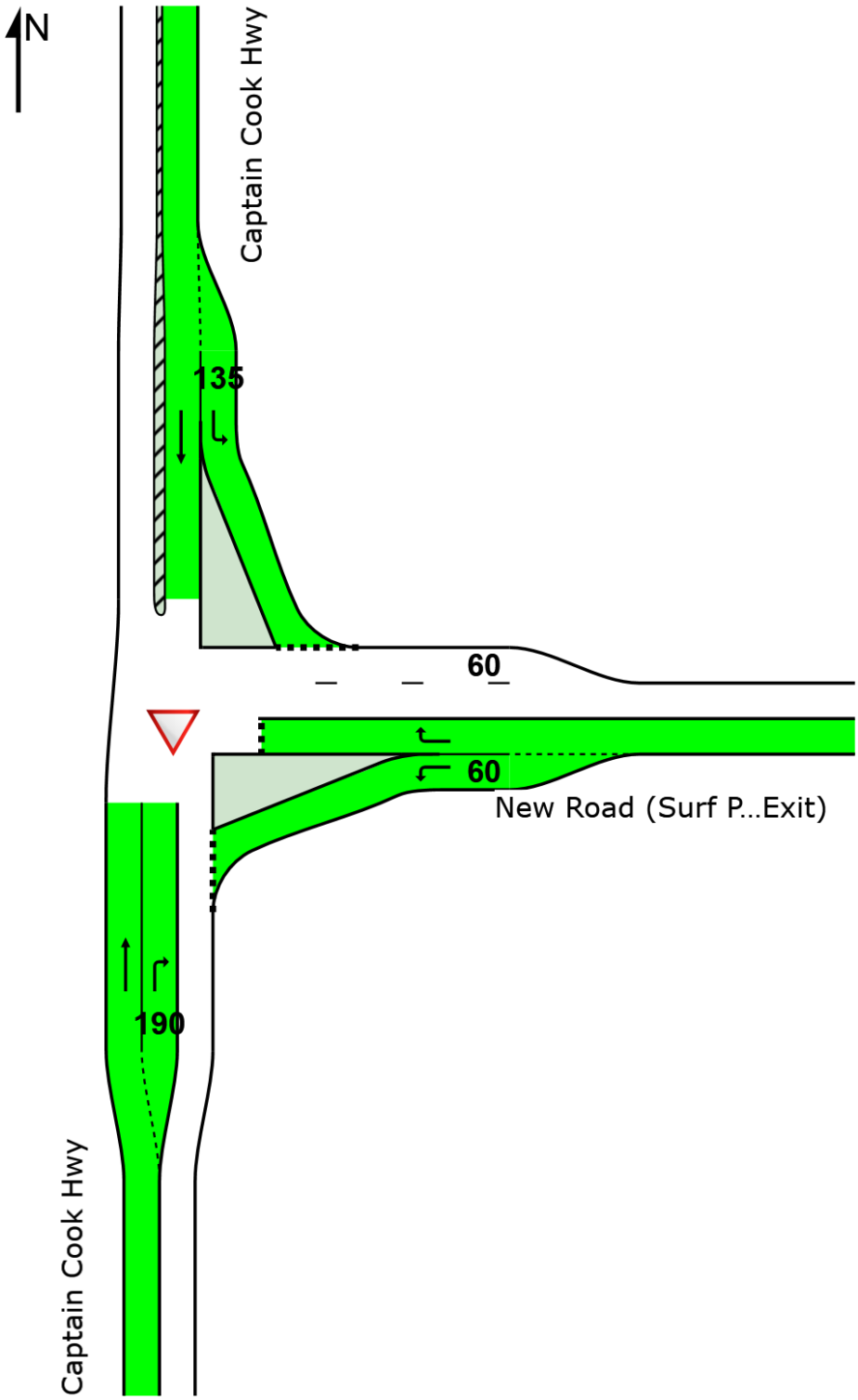
LEVEL OF SERVICE

Lane Level of Service

Site: 101 [CCH / Surf PD Intersection-Development Peak PM (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

	Approaches			Intersection
	South	East	North	
LOS	NA	A	A	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

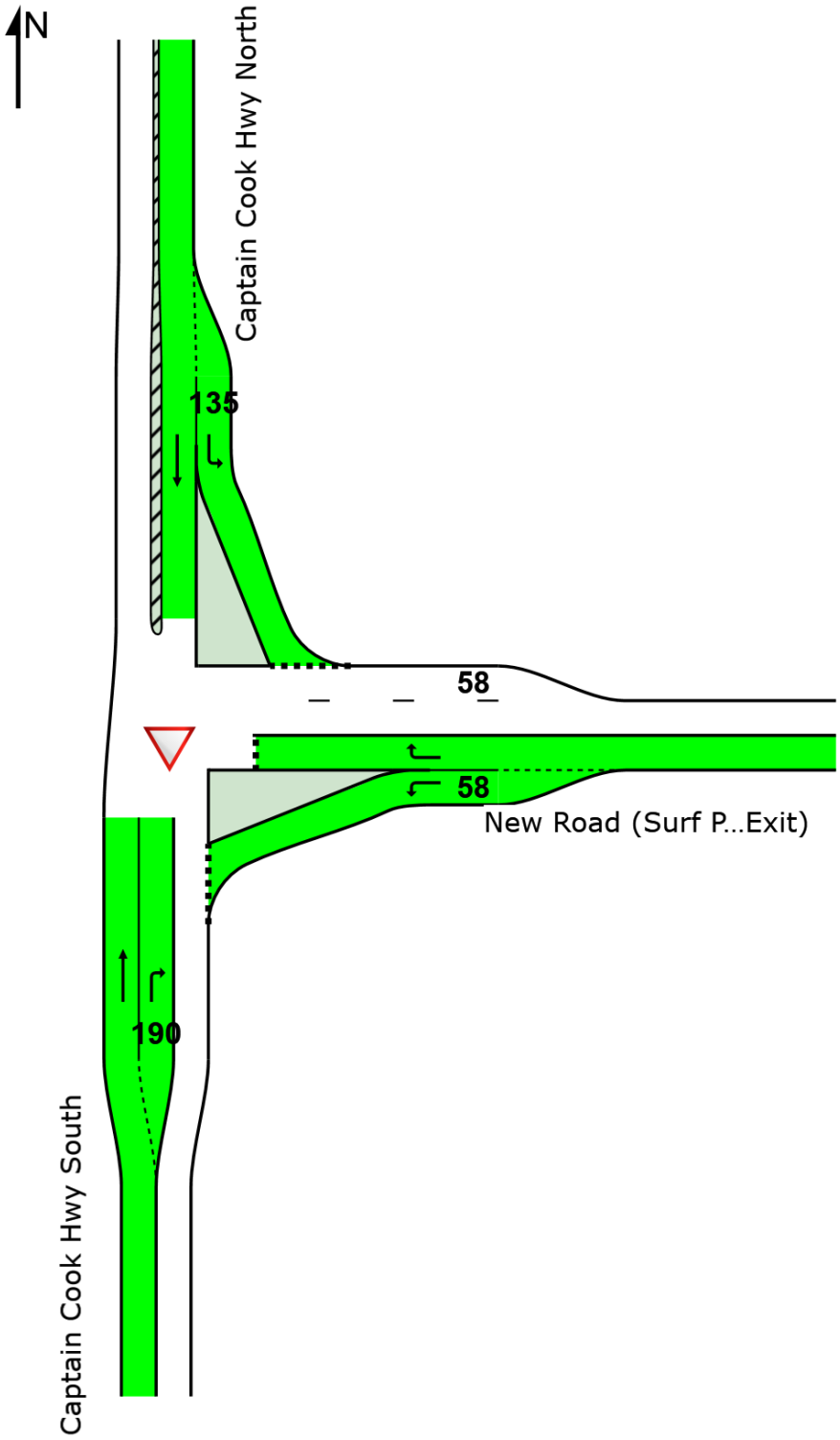
LEVEL OF SERVICE

Lane Level of Service

Site: 101 [CCH / Surf PD Intersection-Development Peak AM (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

	Approaches			Intersection
	South	East	North	
LOS	NA	A	A	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

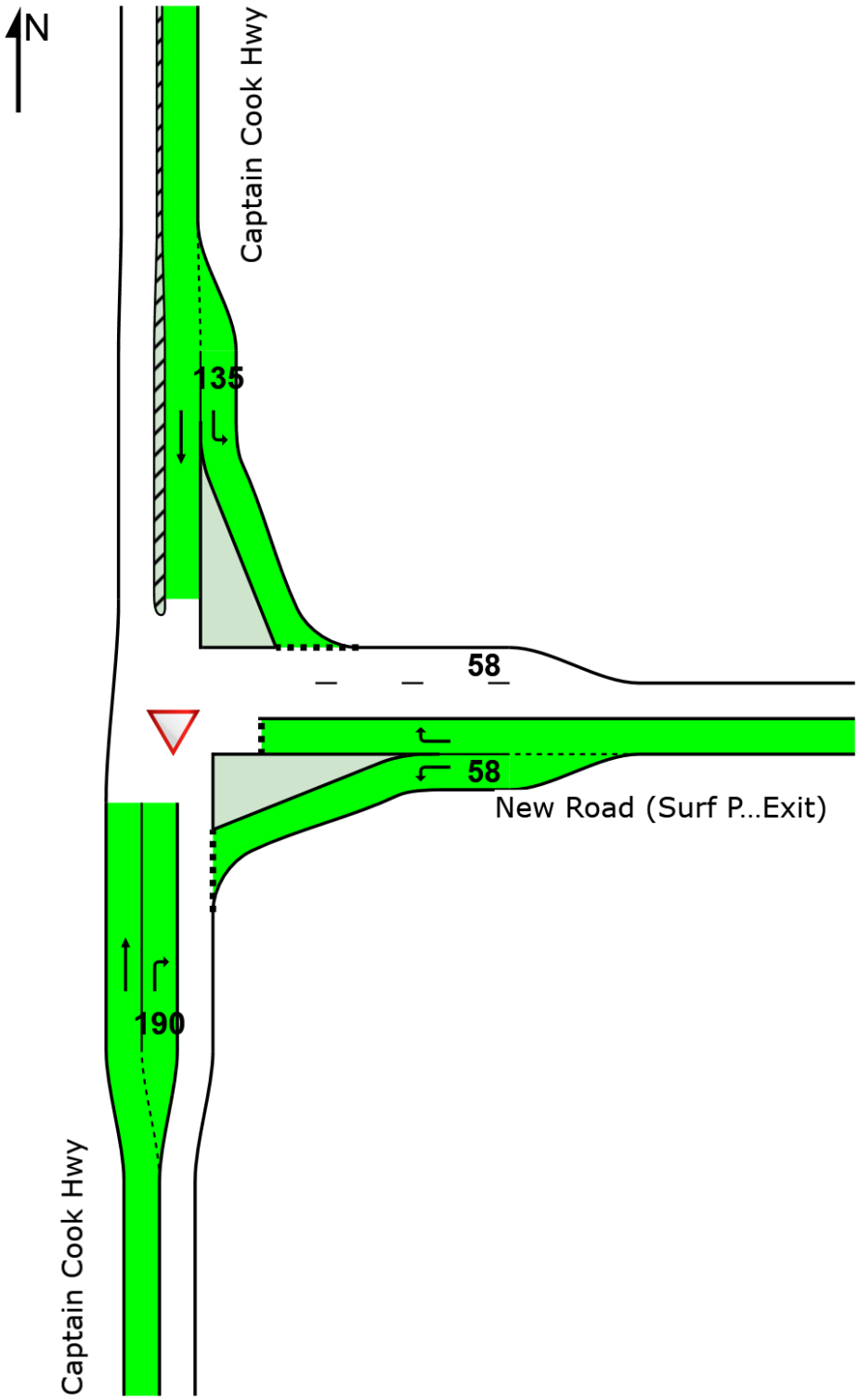
LEVEL OF SERVICE

Lane Level of Service

Site: 101 [CCH / Surf PD Intersection-CCH Peak AM (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

	Approaches			Intersection
	South	East	North	
LOS	NA	A	A	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

Appendix C – Future case results (2033)

MOVEMENT SUMMARY

Site: 101 [CCH / Surf PD Intersection-CCH Peak PM-Future (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Hwy														
2	T1	304	0.0	320	0.0	0.164	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	14	0.0	15	0.0	0.011	5.6	LOS A	0.0	0.3	0.39	0.54	0.39	45.6
Approach		318	0.0	335	0.0	0.164	0.3	NA	0.0	0.3	0.02	0.02	0.02	49.7
East: New Road (Surf PD Entry/Exit)														
4	L2	34	0.0	36	0.0	0.029	5.5	LOS A	0.1	0.8	0.37	0.54	0.37	46.2
6	R2	26	0.0	27	0.0	0.052	9.6	LOS A	0.2	1.3	0.58	0.75	0.58	43.8
Approach		60	0.0	63	0.0	0.052	7.3	LOS A	0.2	1.3	0.46	0.63	0.46	45.2
North: Captain Cook Hwy														
7	L2	16	0.0	17	0.0	0.010	4.5	LOS A	0.0	0.3	0.06	0.47	0.06	47.1
8	T1	304	0.0	320	0.0	0.164	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		320	0.0	337	0.0	0.164	0.3	LOS A	0.0	0.3	0.00	0.02	0.00	49.8
All Vehicles		698	0.0	735	0.0	0.164	0.9	NA	0.2	1.3	0.05	0.08	0.05	49.3

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [CCH / Surf PD Intersection-Development AM-Future (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Hwy South														
2	T1	275	0.0	289	0.0	0.149	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	49	0.0	52	0.0	0.038	5.5	LOS A	0.2	1.1	0.37	0.56	0.37	41.9
Approach		324	0.0	341	0.0	0.149	0.9	NA	0.2	1.1	0.06	0.08	0.06	49.1
East: New Road (Surf PD Entry/Exit)														
4	L2	19	0.0	20	0.0	0.016	5.1	LOS A	0.1	0.4	0.34	0.51	0.34	44.2
6	R2	23	0.0	24	0.0	0.046	9.2	LOS A	0.2	1.1	0.57	0.74	0.57	40.3
Approach		42	0.0	44	0.0	0.046	7.4	LOS A	0.2	1.1	0.47	0.64	0.47	42.0
North: Captain Cook Hwy North														
7	L2	58	0.0	61	0.0	0.039	4.7	LOS A	0.2	1.1	0.13	0.47	0.13	43.2
8	T1	275	0.0	289	0.0	0.148	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		333	0.0	351	0.0	0.148	0.8	LOS A	0.2	1.1	0.02	0.08	0.02	49.1
All Vehicles		699	0.0	736	0.0	0.149	1.2	NA	0.2	1.1	0.06	0.12	0.06	48.8

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [CCH / Surf PD Intersection-Development PM-Future (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Hwy														
2	T1	281	0.0	296	0.0	0.152	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	28	0.0	29	0.0	0.022	5.5	LOS A	0.1	0.6	0.37	0.55	0.37	45.6
Approach		309	0.0	325	0.0	0.152	0.5	NA	0.1	0.6	0.03	0.05	0.03	49.5
East: New Road (Surf PD Entry/Exit)														
4	L2	69	0.0	73	0.0	0.058	5.5	LOS A	0.2	1.6	0.36	0.54	0.36	46.3
6	R2	51	0.0	54	0.0	0.098	9.5	LOS A	0.4	2.5	0.58	0.78	0.58	43.9
Approach		120	0.0	126	0.0	0.098	7.2	LOS A	0.4	2.5	0.45	0.64	0.45	45.2
North: Captain Cook Hwy														
7	L2	32	0.0	34	0.0	0.021	4.6	LOS A	0.1	0.6	0.09	0.47	0.09	47.0
8	T1	281	0.0	296	0.0	0.152	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		313	0.0	329	0.0	0.152	0.5	LOS A	0.1	0.6	0.01	0.05	0.01	49.6
All Vehicles		742	0.0	781	0.0	0.152	1.6	NA	0.4	2.5	0.09	0.14	0.09	48.8

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [CCH / Surf PD Intersection-CCH Peak AM-Future (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Captain Cook Hwy														
2	T1	304	0.0	320	0.0	0.164	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	24	0.0	25	0.0	0.019	5.6	LOS A	0.1	0.6	0.39	0.55	0.39	45.6
Approach		328	0.0	345	0.0	0.164	0.5	NA	0.1	0.6	0.03	0.04	0.03	49.6
East: New Road (Surf PD Entry/Exit)														
4	L2	9	0.0	9	0.0	0.008	5.5	LOS A	0.0	0.2	0.36	0.51	0.36	46.3
6	R2	11	0.0	12	0.0	0.022	9.6	LOS A	0.1	0.6	0.58	0.71	0.58	43.8
Approach		20	0.0	21	0.0	0.022	7.8	LOS A	0.1	0.6	0.48	0.62	0.48	44.9
North: Captain Cook Hwy														
7	L2	29	0.0	31	0.0	0.019	4.6	LOS A	0.1	0.5	0.08	0.47	0.08	47.0
8	T1	304	0.0	320	0.0	0.164	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		333	0.0	351	0.0	0.164	0.4	LOS A	0.1	0.5	0.01	0.04	0.01	49.7
All Vehicles		681	0.0	717	0.0	0.164	0.7	NA	0.1	0.6	0.03	0.06	0.03	49.5

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

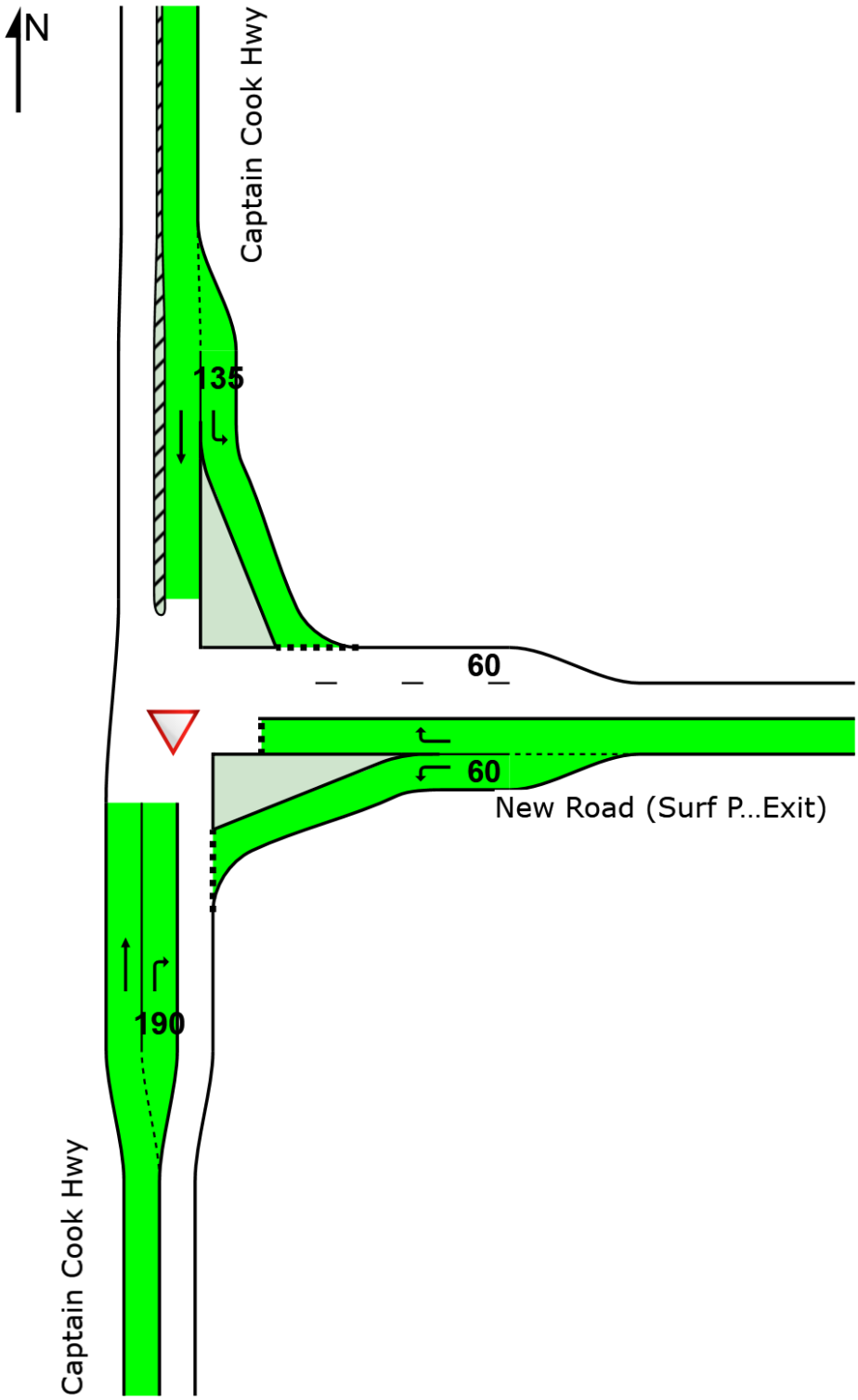
LEVEL OF SERVICE

Lane Level of Service

Site: 101 [CCH / Surf PD Intersection-CCH Peak AM-Future (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

	Approaches			Intersection
	South	East	North	
LOS	NA	A	A	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

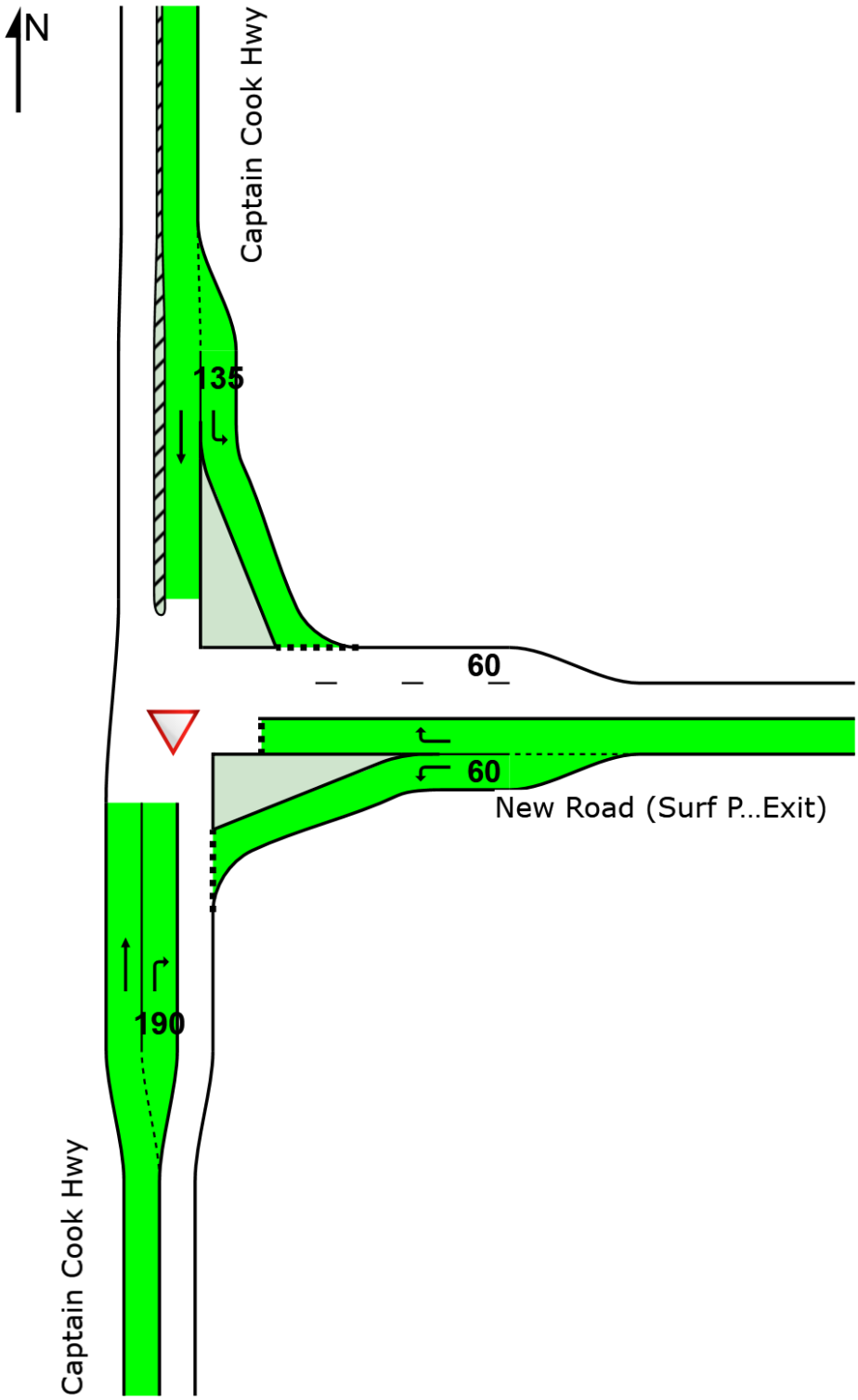
LEVEL OF SERVICE

Lane Level of Service

Site: 101 [CCH / Surf PD Intersection-CCH Peak PM-Future (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

	Approaches			Intersection
	South	East	North	
LOS	NA	A	A	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

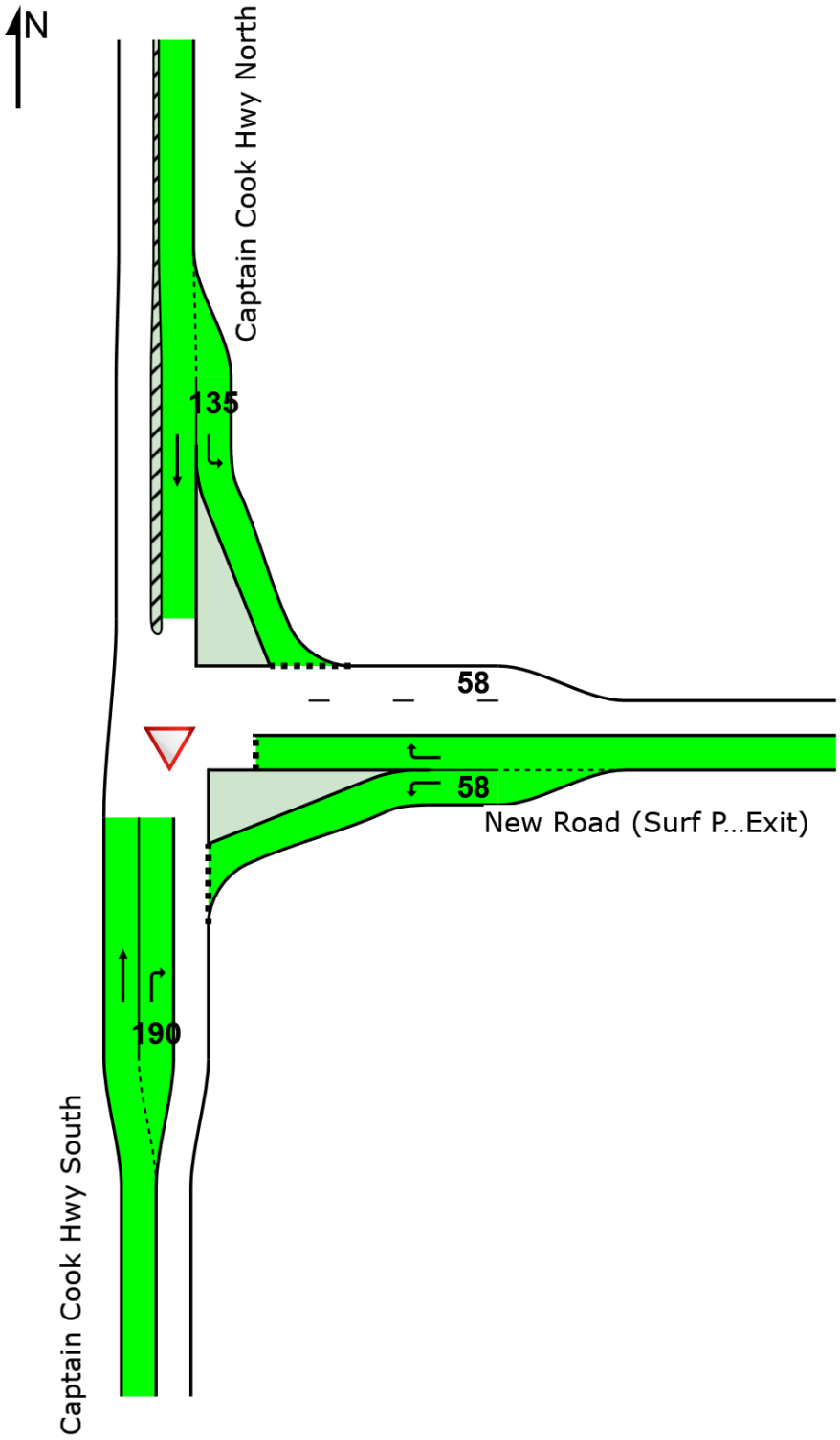
LEVEL OF SERVICE

Lane Level of Service

Site: 101 [CCH / Surf PD Intersection-Development AM-Future (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

	Approaches			Intersection
	South	East	North	
LOS	NA	A	A	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

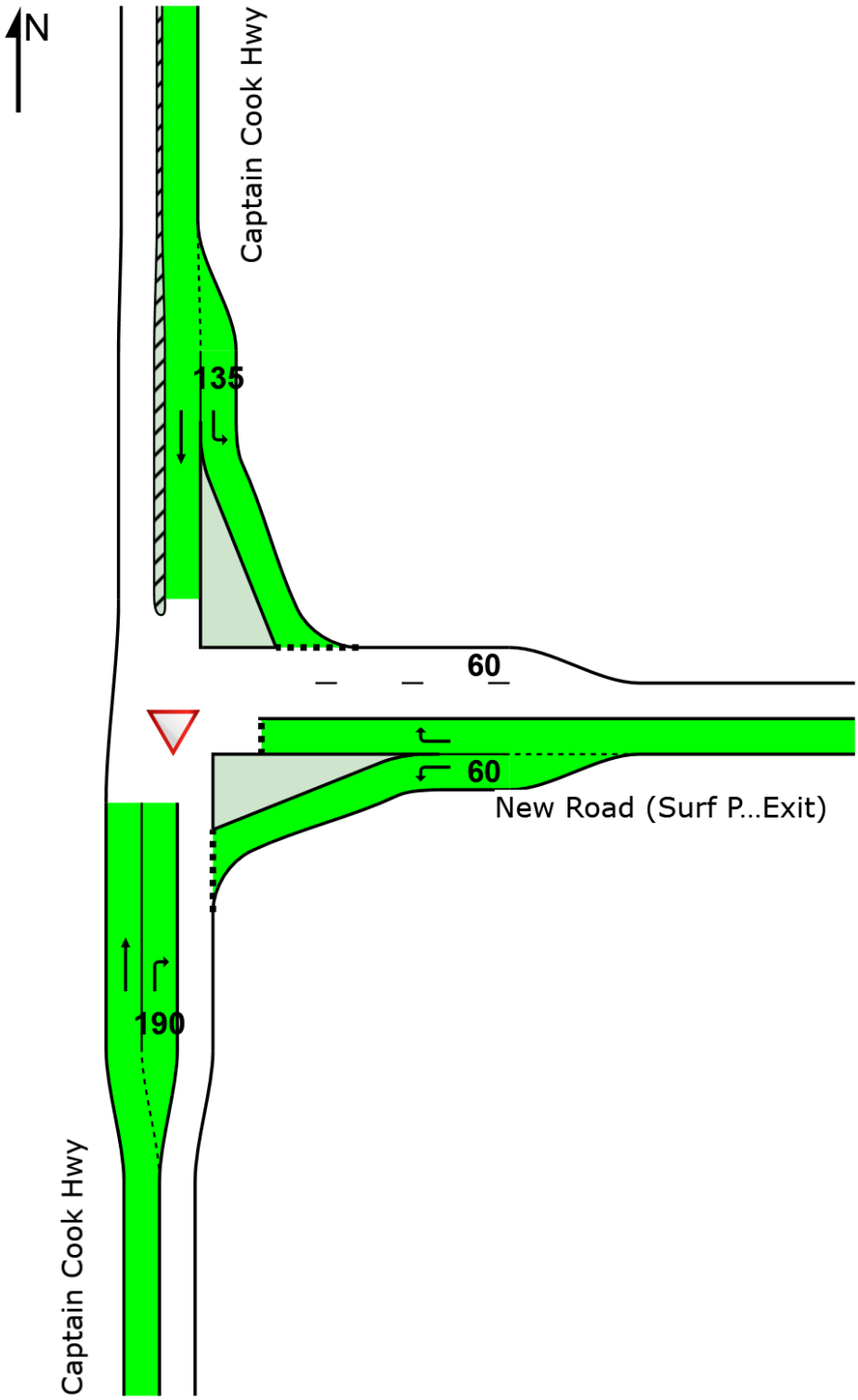
LEVEL OF SERVICE

Lane Level of Service

Site: 101 [CCH / Surf PD Intersection-Development PM-Future (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

	Approaches			Intersection
	South	East	North	
LOS	NA	A	A	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
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