# Department of Transport and Main Roads

## Gold Coast Infill Station Project

## Traffic Impact Assessment Report

## North Helensvale Station

September 2019

GHD
Level 9
145 Ann Street
T: 61 7 3316 3000 F: 61 7 3316 333 E: bnemail@ghd.com



Document Status: Draft

| Revision | Author | Reviewer | | Approved for Issue | | |
|---|---|---|---|---|---|---|
| | | Name | Signature | Name | Signature | Date |
| Draft A | NR [redacted] | | DRAFT | NR [redacted] | | 5/06/19 |
| Draft B | | | | | | |
| Final | | | | | | |

# Table of contents

# Table index



# Figure index



# Appendices

# 1. Introduction

## 1.1 Background

Department of Transport and Main Roads (TMR) has commissioned GHD Pty Ltd (GHD) to prepare this traffic impact assessment to assist with the concept design development of the proposed railway station at north Helensvale. This assessment has been undertaken as part of the Gold Coast Infill Stations Project scope to understand the potential traffic impacts of the proposed public transport infrastructure. .

This Traffic Impact Assessment (TIA) has been prepared in accordance with the requirements stated in the *Guide to Traffic Impact Assessment (GTIA)*, 2017 by TMR to assess the effects of traffic generated by the proposed development.

## 1.2 Study area

The subject site forms part of Lot 4 SP201957 on Hope Island Road, north Helensvale. The site is located immediately west of the rail corridor, northwest of Hope Island Road / Monterey Keys Drive intersection. The location of the subject site and the surrounding land uses are shown in the Figure 1.


**Figure 1: Study area**

## 1.3 Scope and limitations

This report has been prepared by GHD for Department of Transport and Main Roads and may only be used and relied on by Department of Transport and Main Roads for the purpose agreed between GHD and the Department of Transport and Main Roads as set out in Section 1.1 of this report. GHD otherwise disclaims responsibility to any person other than Department of Transport and Main Roads 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.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report Section 0, 3 and 1. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Department of Transport and Main Roads and others who provided information to GHD, which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report, which were caused by errors, or omissions in that information.

## 1.4 References

The following reference materials informed the assessment:

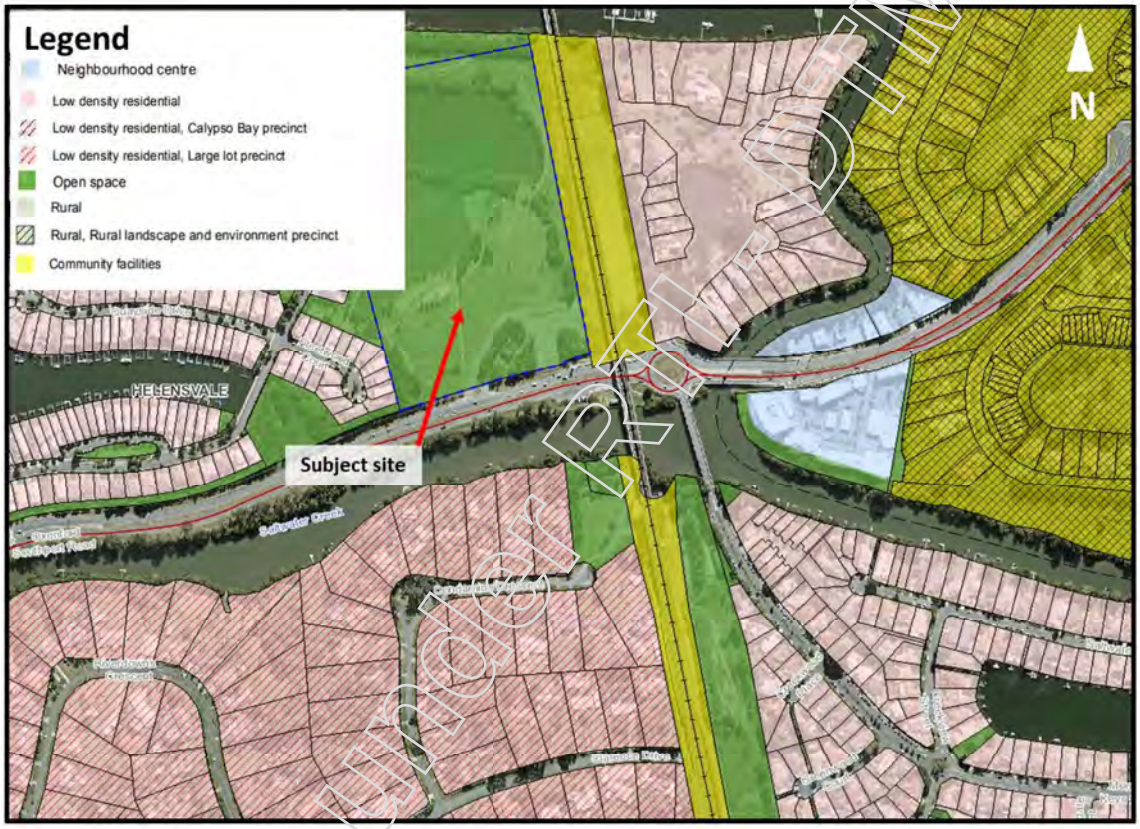
- Guide to Traffic Impact Assessment, TMR, Dec 2018;
- Guide to Traffic Generating Developments, Road Traffic Authority, 2002;
- Guide to Traffic Management Part 12: Traffic Impacts of Development, Austroads, 2016;
- Transport Code, City Plan Version 2 by CoGC.

# 2. Existing conditions

## 2.1 Land use and zoning

The subject site is located west of the rail corridor predominantly surrounded by low to medium density residential land uses. The subject site is located within Queensland Rail (QR) land reserve which holds zoning classification of open space.

Figure 2 shows the current zoning allocation of the area surrounding to the subject site.




*Source: City Plan interactive mapping – Version 6, CoGC*

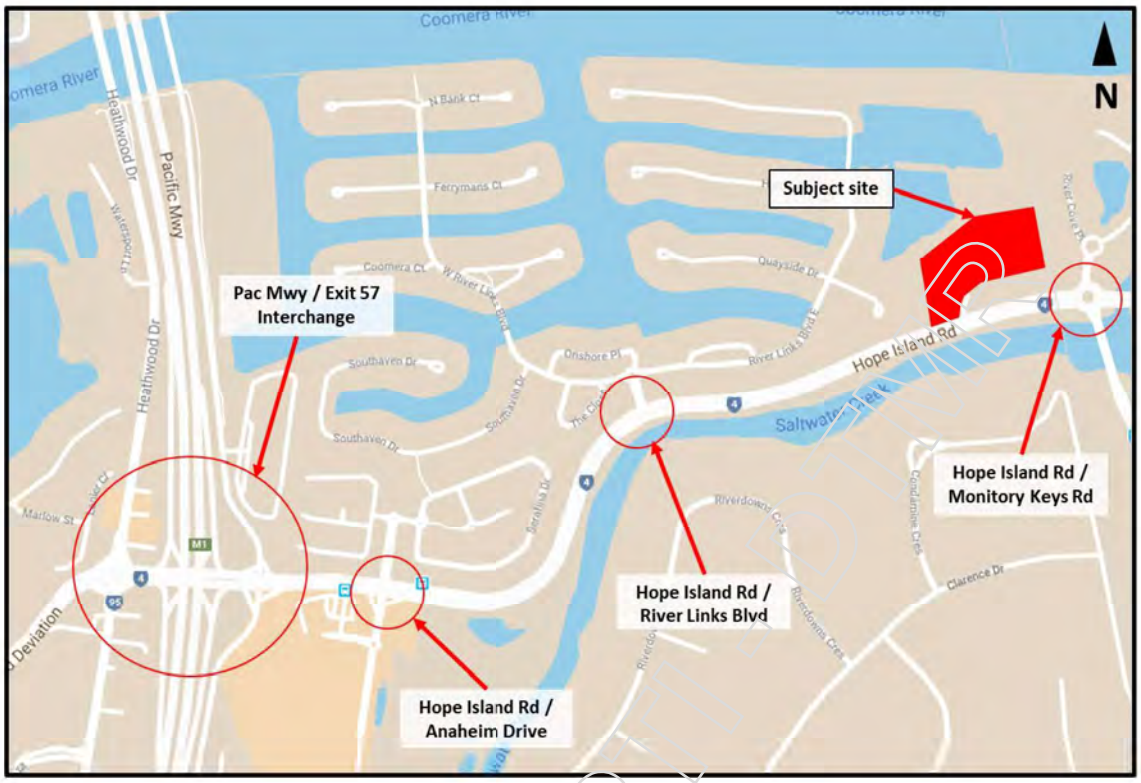
**Figure 2: Zoning allocation area surrounding subject site**

## 2.2 Surrounding road network details

The subject site is located fronting Hope Island Road which is classified as one of the key arterial roads in the north Helensvale local road network. Pacific Motorway Exit 57 interchange is located approximately 1.8km west of the subject site, whilst the Hope Island Road / Monterey Keys Drive intersection is located approximately 110m to the east.

Hope Island Road is a dual carriageway, four-lane, two-way road section in the state controlled road network. The designated operating speed of this corridor is 80 km/h. The typical cross section of the Hope Island Road link comprises of built median, sealed shoulders and table drains along either side of the road. The cross road intersections typically are signal controlled or roundabout configuration.

Figure 3 identifies the key road sections and the intersections located within the surrounding road network of the subject site.




Source: Google Maps modified by GHD

**Figure 3: Surrounding road network to the subject site**

## 2.3 Existing traffic volumes

### 2.3.1 Link Volumes

For the purpose of this study, TMR has provided 2018 annual volume report from a data counter located at the Hope Island Road on section between Monterey Keys Drive and Santa Barbara Road intersection. Historical annual average daily traffic (AADT) volume distribution included in the report shown in the Figure 4.

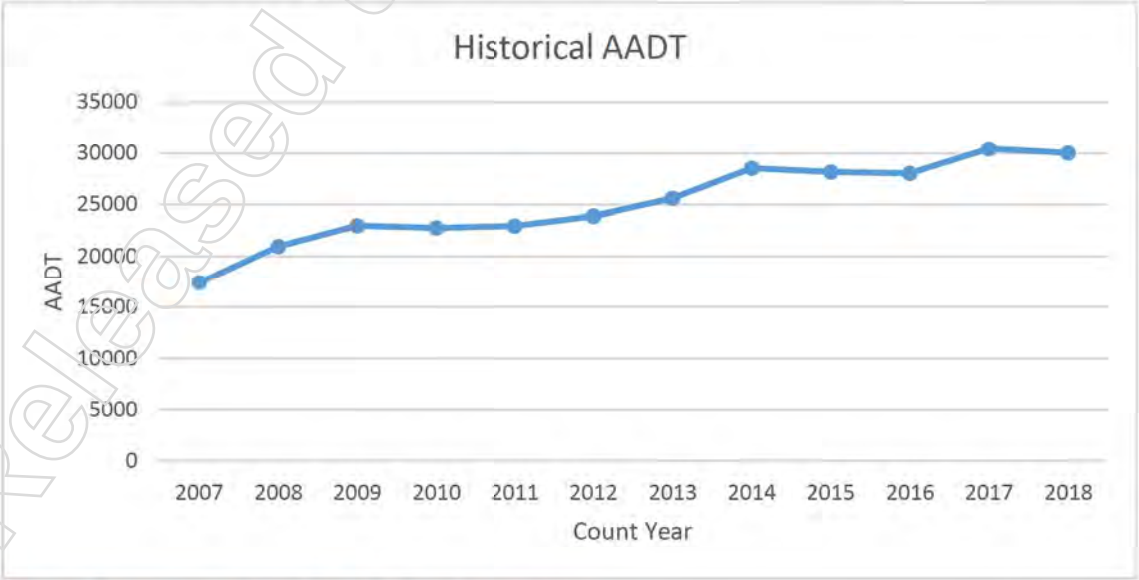



**Figure 4: Hope Island Road AADT History**

The report has derived traffic growth over the past five year and 10 year periods on the Hope Island Road to be 4.3% and 3.7% respectively.

Table 1 summarises the classification of the vehicles on through traffic flow on Hope Island Road as determined from the 2018 annual volume report.

**Table 1: Vehicle classification summary**

| Vehicle classifications | 2018 AADT Volume | Proportion |
|---|---|---|
| Light Vehicles | 27,806 | 93% |
| Two Axle Truck or Bus | 1,865 | 6% |
| Three Axle Truck or Bus | 120 | 0.4% |
| Four Axle Truck | 52 | 0.1% |
| Three Axle Articulated | 97 | 0.3% |
| Four Axle Articulated | 53 | 0.2% |
| Five Axle Articulated | 6 | 0.02% |
| Six Axle Articulated | 38 | 0.13% |
| B Double | 6 | 0.02% |
| Double Road Train | 0 | 0% |
| Triple Road Train | 0 | 0% |
| Total | 30,042 | 100% |

### 2.3.2 Intersection Counts

In addition to the 2018 annual volume report, intersection count data summarised in Table 2 was also obtained from TMR to inform the traffic analysis summarised in this report.

**Table 2: Intersection count data summary**

| Intersection | Source | Survey date | Peak periods |
|---|---|---|---|
| Hope Island Road / Anaheim Drive | TMR | Wednesday, 13 May 2015 | 6:00am to 7:00PM |
| Hope Island Road / Monterey Keys Drive | TMR | Wednesday 18 June 2014 | 6:00am to 7:00PM |
| Hope Island Road / River Links Boulevard | TMR | Wednesday 5 June 2018 | 6:00am to 7:00PM |

## 2.4 Existing intersection performance

As identified in Section 2.3.1 of this report, the historical AADT volume review has derived 3.7% per annum growth rate over the period of 2008 to 2018.

As such, the existing intersection performance analysis for the following intersections were undertaken by applying 3.8% per annum growth on traffic count survey data obtained from TMR to estimate 2019 traffic demands:

- Hope Island Road / Monterey Keys Drive roundabout;
- Hope Island Road / Anaheim Drive Intersection; and
- Hope Island Road / River Links Boulevard intersection.

The performance analysis was undertaken using the SIDRA 8 software package. In order to quantify the intersection performance, the following performance measures of the station access intersection has been reported:

- Degree of saturation (DOS) (%) –This is the ratio of demand flow to capacity;

- Average delay (sec) – The average delay per vehicle in seconds incurred by vehicles over the modelled time period;
- 95th %ile queue – A queue length measured in metres of which only 5% of queues are equal to or greater than.

The criteria for acceptable limits of operation for intersections specified by *Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development (2019)* has been adopted for this assessment. The acceptable limit of operation is reached when the DOS exceeds 90% for signalised intersections, 80% for priority-controlled intersections and 85% for roundabouts.

A summary of the performance of the existing intersections adjacent to the proposed development site is provided in Table 3, with detailed assessment outputs provided in Appendix A.

**Table 3: Existing intersection performance summary**

| Intersection | Peak Period | DOS (%) | Average Delay* (s) | Queue Length* (m) |
|---|---|---|---|---|
| Hope Island Road / Monterey Keys Drive | AM | 58% | 4 | 32 |
| | PM | 65% | 5 | 40 |
| Hope Island Road / Anaheim Drive | AM | 82% | 37 | 278 |
| | PM | 84% | 38 | 240 |
| Hope Island Road / River Links Boulevard | AM | 90% | 22 | 234 |
| | PM | 85% | 15 | 229 |

**Operational outputs for the worst movement*

As demonstrated above, the Hope Island Road / Monterey Keys Drive roundabout currently operates within acceptable threshold with moderate delays and queue propagation. The Hope Island Road / Anaheim Drive intersection and Hope Island Road / River Links Boulevard intersections however, show marginal performance with extensive queue propagation on the Hope Island Road approaches to the intersection.

## 2.5 Crash history

Figure 5 shows the recorded crashes within the surrounding road network to the proposed development over the past five year period starting from Jan 2013 to June 2018.


Source: Queensland government open source dataset

**Figure 5: Crash locations**

Findings from the crash data review are summarised below.

- There have been a total of 13 crashes recorded over the past five year period within the study area depicted in Figure 5.
- Eight of these crashes were recorded at the Hope Island Road / Monterey Keys Drive intersection. Angle type collisions at the intersection and approaching vehicles colliding with rigid objects on the carriageway were identified to be the common crash types.
- Angle crashes at this roundabout have primarily occurred due to vehicles approaching from the adjacent approaches colliding due to failing to give away. Errant vehicles mounting on the central island of the roundabout shown to be a common cause for hitting objects type crashes.
- A fatal crash has been reported approximately 600m west of the Hope Island Road / Monterey Keys Drive intersection in 2017. An errant vehicle colliding with a parked vehicle on the roadside has been identified as the crash cause.
- There are four other midblock crashes recorded within local vicinity to the subject site which are categorised as “Off path way on curve to hit object”.
- The majority of the recorded crashes have occurred during day light with clear atmospheric conditions.

The crash data analysis did not identify any crash pattern or trend that may be worsened by the proposed station facility.

## 2.6 Public transport

### 2.6.1 Bus services

Currently Route 725, which operates from Coomera Station to Helensvale Station, travels via Hope Island Road. This route services the bus stop pair located at Monterey Keys Drive approximately 150m south of the Hope Island Road / Monterey Keys Drive intersection.

Route 725 operates every 30 minutes starting from 8:09am to 2:39pm and departs every 10 minutes between 3:00pm to 5:30pm.

Figure 6 shows the current route of service 725 and bus stop locations within the study area.

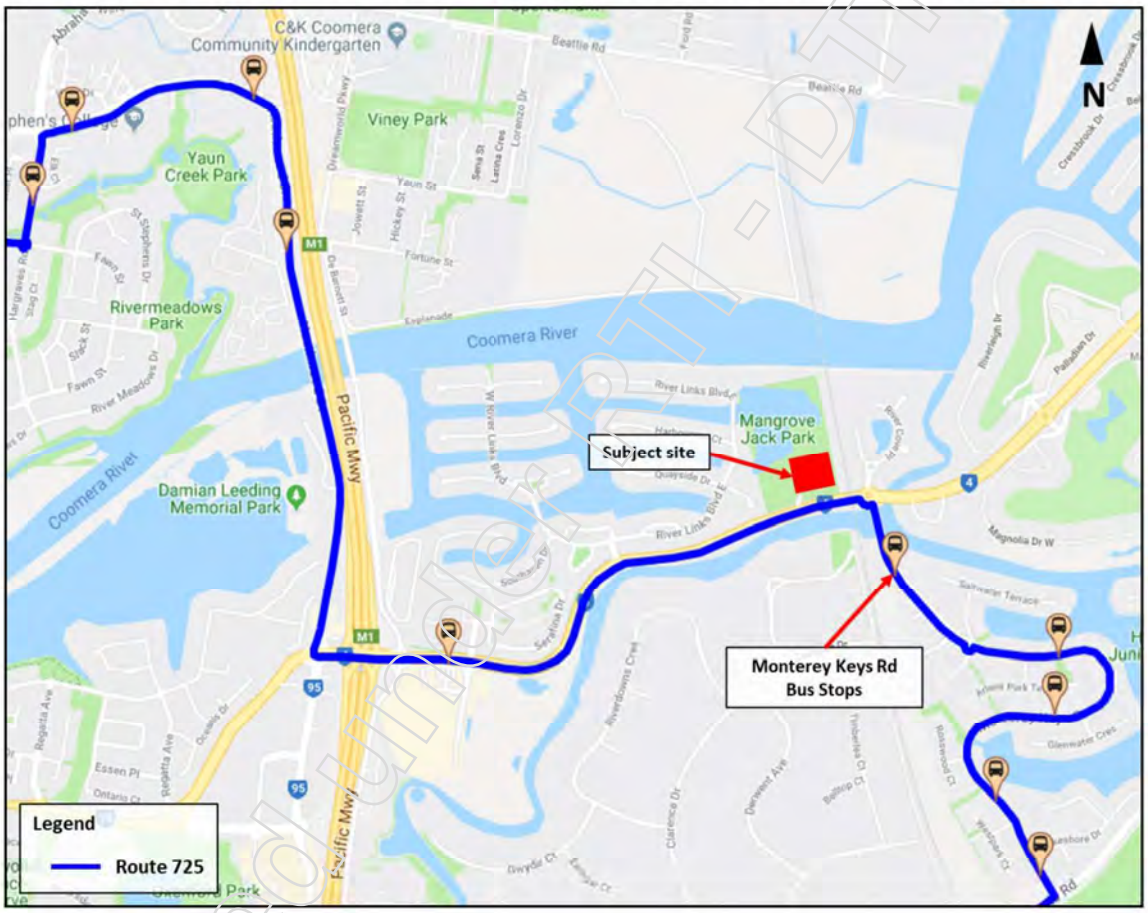



**Figure 6: Public transport route**

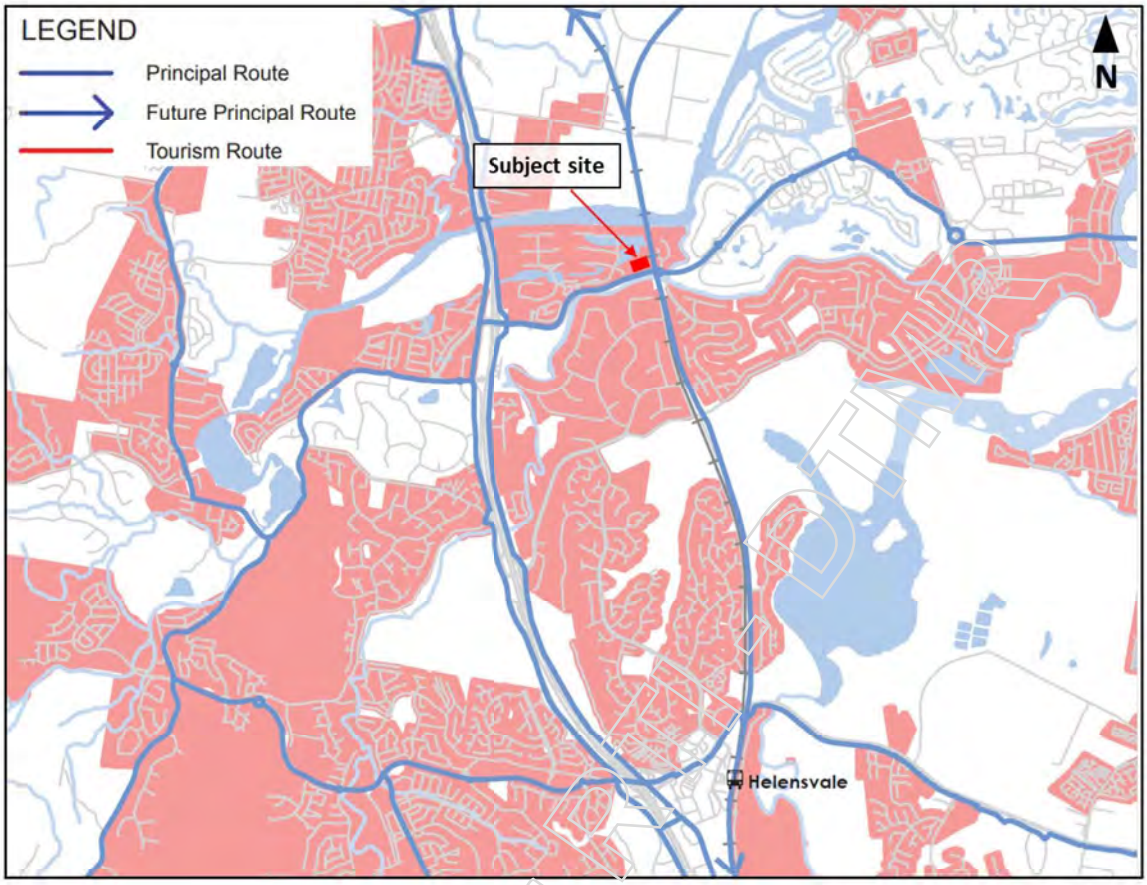
### 2.6.2 Train services

On the Gold Coast line, the Helensvale Station is located approximately 5km south of the subject site whilst the Coomera Station is located approximately 3.5km north.

## 2.7 Active transport

Both the northern and southern shoulders of the Hope Island Road corridor are currently line marked as Bicycle Awareness Zones (BAZ), The BAZs are typically provided when space for bicycle lanes is restricted.

According to *South East Queensland Principal Cycle Network Plan* by TMR dated 2016 (SEQPCNP, 2019), Hope Island Road is a designated principal cycling route. The corridor parallel to railway line is also earmarked as a future principal cycling route. However, this route is currently classified as an un-prioritised route.




Source: Principal Cycle Network Plan, TMR

**Figure 7: Current and future cyclist's provisions**

A desktop review undertaken using CoGC future infrastructure plans for the study area has not identified any planned cycling infrastructure upgrades within immediate vicinity of the proposed facility. However, it is expected that surrounding projects such as the Coomera Connector will improve the active transport provisions within the immediate vicinity to the subject site.

# 3. Proposed development details

## 3.1 Development site plan

A preliminary site layout has been prepared by GHD for discussions with project stakeholders, which is provided in Appendix B of this report.

## 3.2 Site access

Access to the proposed station will be provided via a new signalised intersection located on Hope Island Road, to the west of the existing Hope Island Road / Monterey Keys Drive Intersection. The access intersection is designed to achieve maximum storage on the auxiliary lanes considering the constrained site environment.

An indicative layout of the proposed intersection is provided in Figure 8.

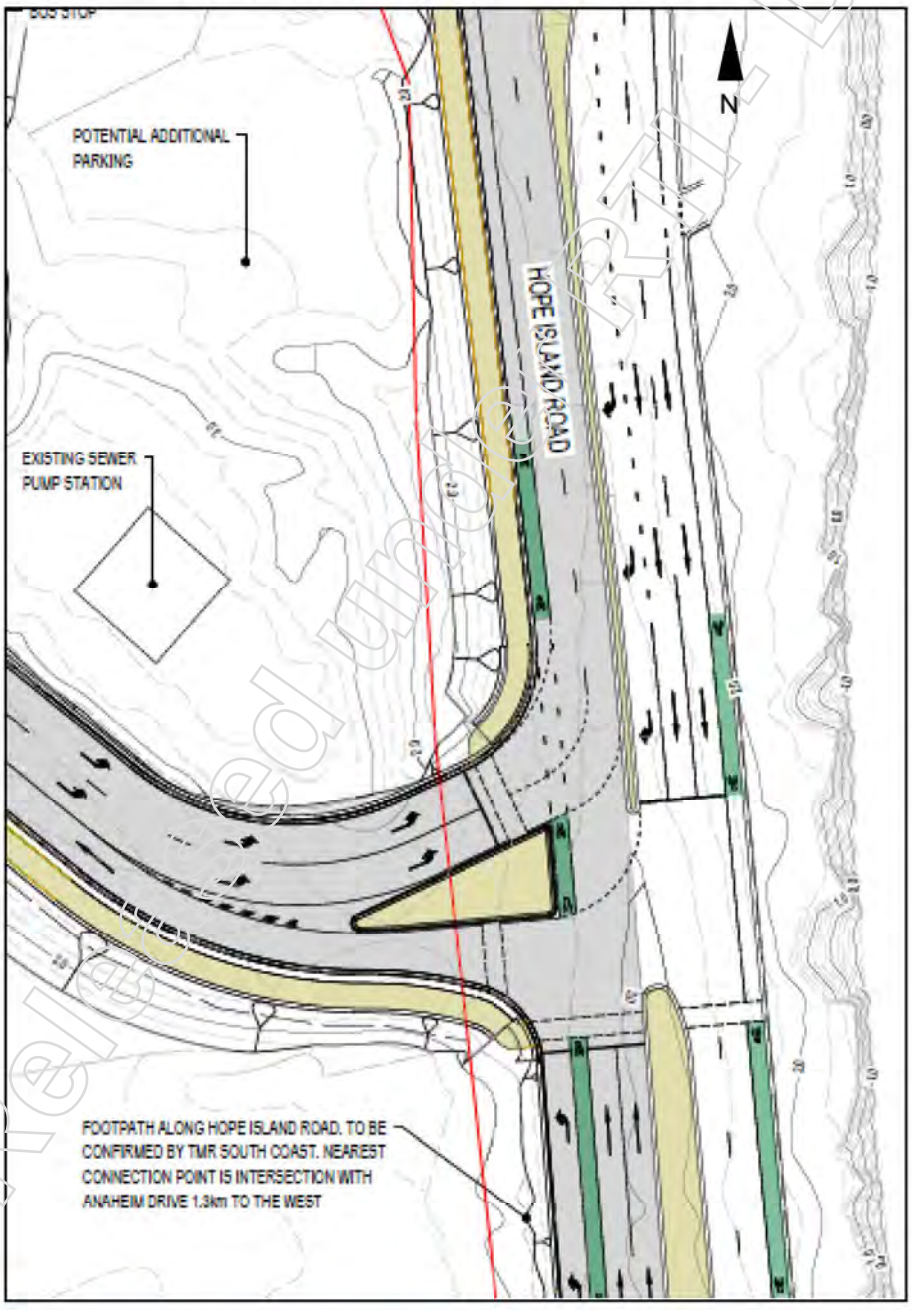



**Figure 8: Hope Island Road / Station Access intersection**

The design proposes displacing right turn out from the proposed station via a U-turn movement at Hope Island Road / Monterey Keys Drive intersection. This will allow the intersection to operate in a two phase signal sequence minimising queuing and associated delays at all approaches.

## 3.3 Site operational details

In addition to station platforms on either side of the rail corridor, the main Park 'n' ride and passenger pick-up and drop-off areas will be located at the western side of the rail corridor. At the opening year of the facility, there will be 165 Park 'n' ride spaces provided within the facility with three Kiss 'n' ride bays and a taxi rank with two bays. The eastern quadrant of the site is allocated for bus operations improving accessibility to routes expected to service the station.

All the car parking bays are design to comply with "Class 1 – employee and commuter parking" design standards in accordance with AS2890. There are four DSAPT compliant parking bays been provided in the design directly adjacent to the platform entry allowing convenient access for mobility impaired passengers.

# 4. Development traffic

## 4.1 Traffic generation

A new railway station facility is not a typical trip generating development and as such there are no known established benchmarks with respect to traffic generation from this type of development. The traffic generation at these facilities are predominantly dependent on population demographics of the catchment area, availability of alternative travel modes, service frequencies of the proposed facility and proximity and accessibility of adjacent railway stations.

*The Gold Coast Infill Stations preliminary demand assessment report dated December 2018 by PWC* (demand assessment report) outlines the anticipated passenger patronage demands of the proposed infill station at north Helensvale (known as Hope Island).

The following patronage demand estimations were provided in the demand assessment report and will be utilised to estimate the expected traffic generation from the proposed facility:

- 670 total boardings are expected during the two hour AM peak period (7:00 am – 9:00 am)
- The number of boardings estimated to increase up to 1,170 total boardings during the two hour AM peak period (7:00 am – 9:00 am) by forecast year 2036.

The demand report further estimates that the majority of the commuters boarding at north Helensvale station will be boarding on to the northbound services in both 2024 and 2036 scenarios. Currently there are total of five northbound services operating during the two hour morning peak period (maximum three services per hour) on the Gold Coast line.

As such, a maximum hourly boardings of 402 and 702 commuters assumed to arrive at the station in AM peak periods of 2024 and 2036 forecast years respectively.

Whilst the departure profile of the commuters during afternoon peak period are typically more spread over a longer period of time, following a conservative approach GHD has been assumed that 80% of the total commuters boarding to the services during the morning peak period will depart the station during the afternoon peak period. As such, a maximum hourly alightings of 322 and 562 commuters assumed to depart at the station in the PM peak periods of 2024 and 2036 forecast years respectively.

## 4.2 Mode splits

For the commuters who intend to board the train services from Helensvale station during the AM peak period, the following alternative travel modes will be available to access the facility:

- Park 'n' ride: parking facilities will be provided at the station facility to cater for the passengers who wish to park their private vehicles at the station. At the opening year there will be 165 computer parking spaces provided at the facility with space provisions for future demand increments.
- Kiss 'n' ride – passenger drop-off or pick-up area will be provided adjacent to the station access to allow passengers to be dropped off or picked up at the station.
- Public Transport bus services: Route 725 is a frequent service that operates via the study area on Hope Island Road.
- Active transport modes: the station is located in a walkable catchment especially for the commuters located in the residential precincts in the immediate area to the west and east. Cyclist provisions will be provided at the station to cater for any commuters wishing to travel to the station by cycling.

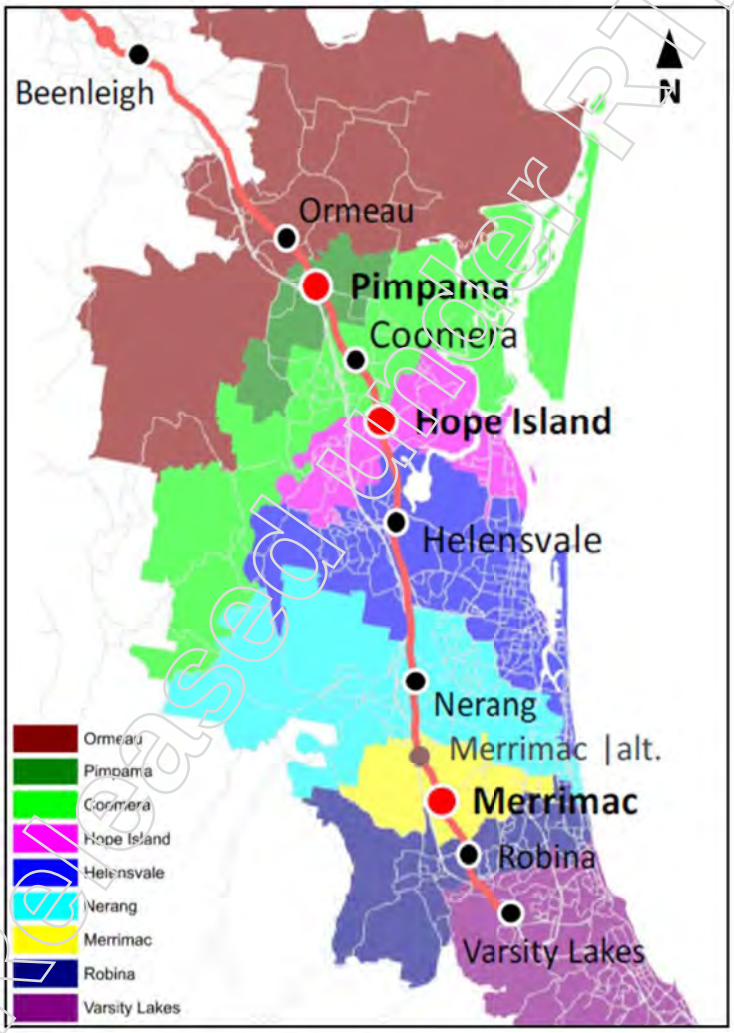
Based on these available travel alternatives, Table 4 below summarises the assumed mode share of the each travel mode.

**Table 4: Assumed mode split**

| Travel Mode | Assumed mode share |
|---|---|
| Park 'n' ride | 80% of the commuters |
| Kiss 'n' ride | 15% of the commuters |
| Public transport | 3% of the commuters |
| Active transport | 2% of the commuters |

## 4.3 Traffic demand distribution

The passenger forecast modelling undertaken in the demand report has identified the likely patronage catchment area of the north Helensvale railway station. Figure 9 depicts the indicative catchment areas of the existing and proposed stations along the Gold Coast line (where north Helensvale is noted as Hope Island).




(Source: Demand Report, 2018)

**Figure 9: Gold Coast line station catchment areas (North Helensvale is indicated as Hope Island)**

At the time of this assessment, no detailed traffic modelling has been undertaken to understand the origins of the commuters who will be boarding to the services at the proposed station. Therefore, considering the available travel routing options, Figure 10 depicts the assumed distribution of the trips generated by the proposed station.

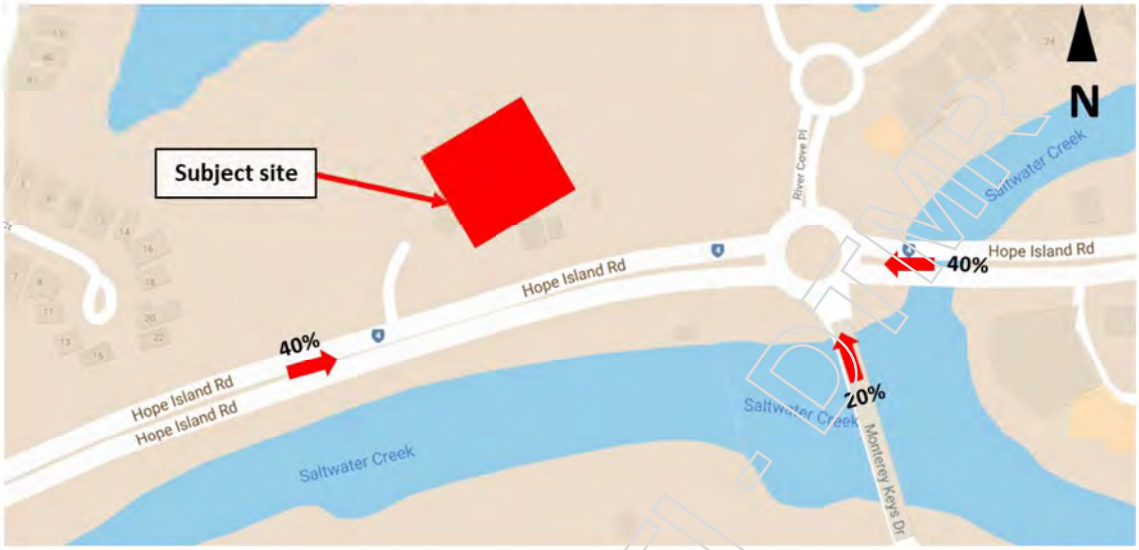



**Figure 10: Assumed trip distribution**

Based on the route choice and mode choice assumptions summarised above, the estimated peak hour vehicular traffic distributions of the forecast year 2024 and 2036 are summarised in the Table 5 and Table 6 below.

**Table 5: 2024 development traffic distribution**

| Travel direction | Commuter AM Peak | | Commuter PM Peak | |
|---|---|---|---|---|
| | Arrive | Depart | Arrive | Depart |
| Hope Island Road east | 153 | 24 | 19 | 122 |
| Hope Island Road west | 153 | 24 | 19 | 122 |
| Monterey Keys Drive south | 76 | 12 | 10 | 61 |
| TOTAL | 382 | 60 | 48 | 306 |

**Table 6: 2036 development traffic distribution**

| Travel direction | Commuter AM Peak | | Commuter PM Peak | |
|---|---|---|---|---|
| | Arrive | Depart | Arrive | Depart |
| Hope Island Road east | 267 | 42 | 34 | 213 |
| Hope Island Road west | 267 | 42 | 34 | 213 |
| Monterey Keys Drive south | 133 | 21 | 17 | 107 |
| TOTAL | 667 | 105 | 84 | 534 |

# 5. Assessment extents

## 5.1 Traffic scenarios considered

### 5.1.1 Pre-development traffic volumes

Whilst, the project correspondence undertaken with TMR has identified suitability of adopting a lower growth rate in the forecast scenario analysis.

As discussed in Section 2.3 of this report, the historical traffic counts on Hope Island Road yielding over 3.7% annual growth. However considering the built nature of the surrounding land uses within the development catchment, TMR has requested adopting a traffic growth rate below 2% per annum in estimating pre-development (background) traffic volumes for the future design years (i.e. 2024 and 2036).

As such the forecast background demands for the local road network was derived using a compound growth rate of 1.8% per annum.

The estimated pre-development traffic volumes at forecast year 2024 and 2036 are presented in Appendix C.

### 5.1.2 Post development volumes

Considering the built nature of the surrounding land uses to the subject site, the additional traffic generation by the proposed station (development) has been added to the forecast background volumes to derive post-development traffic volumes to use in the analysis.

The estimated post-development traffic volumes at 2024 and 2036 design years are presented in Appendix C.

## 5.2 Assessment area limitation

Primary access to the development will be provided via a new intersection located on Hope Island Road. As such the following intersections were selected for this assessment based on development traffic generation that exceeds 5% of background traffic volumes in accordance with guidelines provided in GTIA:

- Hope Island Road / Anaheim Drive intersection
- Hope Island Road / River Links Boulevard intersection
- Hope Island Road Monterey Keys Drive intersection

Traffic flow diagrams showing AM and PM peak traffic flow distribution at these intersections are included in Appendix C.

# 6. Impact assessment and mitigation

## 6.1 Road safety assessment

A road safety impact assessment has been undertaken to demonstrate if there is likely to be any significant change to the level of road safety risk on the surrounding road network with the development. The desired outcome is for road safety at any location on the network to not be significantly worsened as a result of the proposed development. Significantly worsened is defined within the *Guide to Traffic Impact Assessment (GTIA)*, TMR, 2017 as a change to the level of safety risk.

In order to achieve the desired outcomes for safety, the road safety assessment process carried out includes:

- Identifying the current safety risks relevant to the development impact assessment area;
- Identifying the likely new risks or modified risks resulting from the proposed development and the relevant road environment, including the safety risk rating; and
- Recommending management and mitigation works to ensure the existing safety risk rating for the road is not worsened as a result of the development and that any unacceptable safety risk is addressed.

The safety risks for all road users (including pedestrians and cyclists) has been identified and scored in accordance with the GTIA risk scoring matrix, as shown in Figure 11 and has been assessed for the pre development, post development and post development with mitigation measures (if required) scenarios.

| | | Potential consequence | | | | |
|---|---|---|---|---|---|---|
| | | Property only (1) | Minor injury (2) | Medical treatment (3) | Hospitalisation (4) | Fatality (5) |
| Potential likelihood | Almost certain (5) | M | M | H | H | H |
| | Likely (4) | M | M | M | H | H |
| | Moderate (3) | L | M | M | M | H |
| | Unlikely (2) | L | L | M | M | M |
| | Rare (1) | L | L | L | M | M |

L: Low risk
M: Medium risk
H: High risk

**Figure 11: GTIA safety risk score matrix (see Figure 9.3.2(a) in GTIA)**

The road safety assessment is presented in Table 7.

**Table 7: Safety risk assessment summary**

| Risk Item | Pre Development | | | Post Development | | | Mitigation Measures | Post with Mitigation | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | L | C | Risk | L | C | Risk | | L | C | Risk |
| There are steep batters located at either side of the proposed station access. A vehicle leaving the road edge whilst attempting to enter or egress the proposed facility may not be able to recover and regain the control due to significant grade difference between the road and bottom of the batter, especially during inclement weather conditions.<br><br>This presents an increased risk of impact hazard for vehicles leaving the road edge. | 1 | 3 | L | 3 | 3 | M | The proposed design of the access intersection provide recoverable / traversable slopes or guard rails at either side of the intersection to prevent vehicles leaving the road edge whilst traversing the turning movements. | 1 | 3 | L |
| The proposed right turn movement from Hope Island Road east to the proposed facility may encourage unsafe lane changing manoeuvres for the commuters attempting to access the facility from east. This increases the risk of rear-end and side-swipe type crashes on the Hope Island Road westbound direction. | - | - | - | 3 | 3 | M | Consider providing advanced wayfinding signage for commuters approaching the facility from eastern and southern approaches of Monterey Keys Drive roundabout to encourage lane changes prior approaching the access intersection. | 2 | 3 | M |
| The upgraded intersection layout proposes to add right-in movements to the existing left in / left out intersection at the development site. This increases the number of conflict points at the intersection and may worsen the potential for right-through and rear-end type crashes. | 1 | 3 | L | 3 | 3 | M | The signal controlled configuration of the proposed access intersection will minimise the crash potential at the station access for all road users including pedestrians and cyclists. | 2 | 2 | L |
| Potential queue propagation at the eastern approach of the proposed station access intersection. Considering the close proximity of the Hope Island Road / Monterey Keys Road roundabout to the access intersection, this may increases the risk of rear-end crashes. | - | - | - | 3 | 3 | M | The proposed access arrangement only stops the eastbound traffic on Hope Island Road when the pedestrian movement | 1 | 3 | L |

Legend: L = Likelihood, C = Consequence

As shown above, mitigation measures (i.e. signalisation and provision of full turn treatments) can be implemented in order to ensure that there are no significant safety change to the level of road safety risk on the surrounding road network with the development.

## 6.2 Access and frontage assessment

The proposed development is solely accessed off Hope Island Road and provides no frontage to any other local road sections. In order to ensure the safety and efficiency of the surrounding road network is not worsened by the proposed development, an analysis of station access intersection layout has been undertaken for 2024 (opening year) and 2036 (design horizon) design years.

The intersection analysis has been undertaken using SIDRA intersection 8 package. The key findings from the SIDRA assessment are provided in the following sections of this report, with detailed SIDRA outputs presented in Appendix D.

The performance criteria adopted for the SIDRA assessment is described in Section 2.4 of this report.

### 6.2.1 Hope Island Road / Station access intersection

The intersection layout considered in the post development intersection assessment is depicted in Figure 12 below. As this intersection will require to operate as a pair with Hope Island Road / Monterey Keys Drive roundabout, a network analysis has been undertaken to demonstrate the anticipated operational performances upon opening the facility.

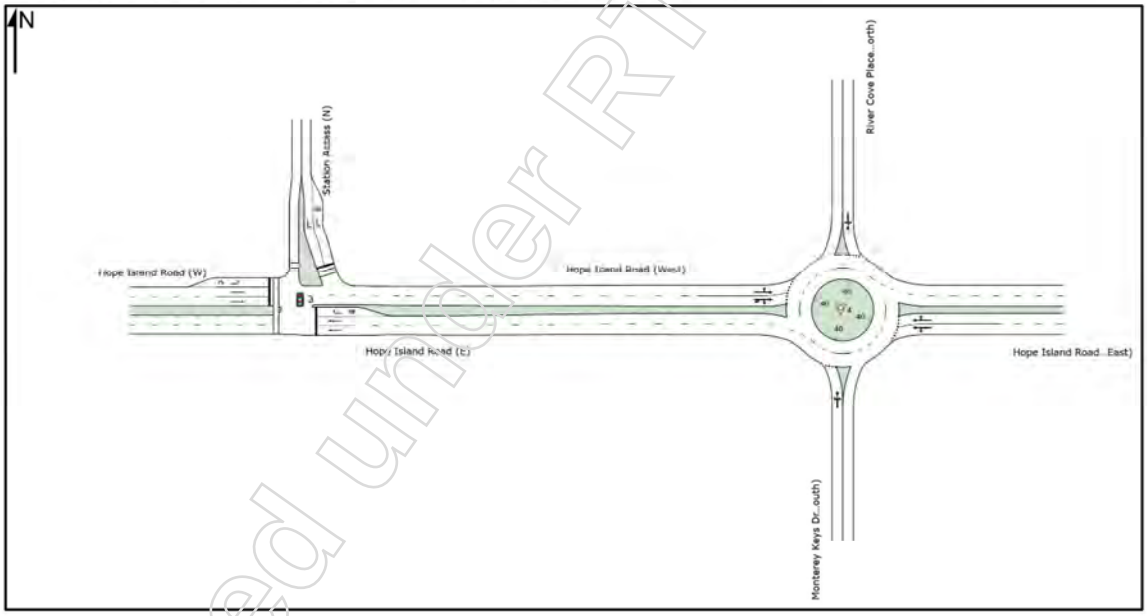



**Figure 12: Helensvale North Station access arrangement**

Table 8 summarises the performance of the facility access under distinct traffic scenarios considered in this analysis

**Table 8: Helensvale North access arrangement performance summary**

| Traffic scenario | Intersection | DOS (%) | Average delay* (s) | Max 95%tile queue* (m) |
|---|---|---|---|---|
| 2024 post development AM peak | Access | 80% | 9 | 216 |
| | Roundabout | 72% | 5 | 50 |
| 2024 post development PM peak | Access | 76% | 10 | 207 |
| | Roundabout | 83% | 6 | 82 |
| 2036 post development AM peak | Access | 106% | 83 | 1332 |
| | Roundabout | 180% | 72 | 877 |
| 2036 post development PM peak | Access | 85% | 14 | 405 |
| | Roundabout | 111% | 75 | 980 |

**Operational outputs for the worst movement*

At the expected opening year of the facility, the intersection demonstrated to operate within acceptable threshold of operations. During PM peak period moderate queuing demonstrated at the Hope Island West approach which is unlikely to generate any wider network impacts considering available queue storage.

Due to expected patronage demand increments and growth to background traffic volumes, the operational performance of the proposed scheme shown to significantly exacerbate in 2036 forecast scenario. The analysis noted that a wider network upgrade will be required to cater for forecast 2036 volume despite the status of the proposed facility.

The background information reviews undertaken has identified that TMR is currently considering number of major upgrades to the adjacent road network to Hope Island Road, which include but not limited to:

- Pacific Motorway (M1) Exit 57 – Oxenford Interchange Upgrade
- Coomera Connector Upgrade

Whilst status of these projects and their impacts to the traffic performance of Hope Island Road is currently unknown, this TIA recommends undertaking a detailed study of the access intersection be undertaken in the subsequent stages of this project utilising the demand outputs from the wider area forecast traffic model.

## 6.3 Intersection delay assessment

An intersection delay impact assessment has been undertaken as part of this analysis to understand the potential delay increments to the background traffic as a result of development trip generation.

The assessment was carried out in accordance with the guidelines provided in GTIA and intended to demonstrate if the proposed development is expected to generate significant delay impacts on the base traffic movements of the surrounding road networks.

Table 9 summarises the outcomes from the intersection delay assessment undertaken for the opening year of the proposed station. The detailed calculations along with SIDRA modelling outputs are presented in Appendix E

**Table 9: 2024 Intersection delay impacts summary**

| Intersection with Hope Island road | Pre-development | | Post-development | |
|---|---|---|---|---|
| | AM (vehicle hours) | PM (vehicle hours) | AM (vehicle hours) | PM (vehicle hours) |
| Anaheim Road | 34 | 35 | 28 | 37 |
| River Links Road | 21 | 17 | 22 | 18 |
| Monterey Keys Drive | 3 | 4 | 4 | 5 |
| Station Access | - | - | 10 | 10 |
| Total intersection delay | 59 | 59 | 64 | 70 |
| Intersection delay impacts | - | - | 6 | 14 |
| % Impact | | | 10% | 26% |

As shown in the table above, the overall intersection delays are expected to exceed the maximum acceptable delay threshold of 5% during peak both AM and PM peak periods of the opening year of the facility. In the analysis, it was demonstrated that the adjacent road network to the proposed station facility is currently operating at capacity with significant delays and queue propagation. Therefore, any increment to the traffic volume results will exponential increase the aggregated delays.

Furthermore, provision of a new signalised intersection on the Hope Island Road has also shown to increase the overall delays in the post-development scenario as in the pre-development scenario, the through traffic movement is not required to stop at this location.

## 6.4 Road link capacity assessment

The requirement of undertaking a link capacity assessment has been considered as part of this assessment. Based on the assumed mode splits summarised in Section 4.2, the expected daily development traffic flow on Hope island road is summarised in Table 10.

**Table 10: Daily development traffic volumes**

| Travel Mode | 2024 total daily trips | 2036 total daily trips |
|---|---|---|
| Park 'n' ride | 1488 | 2208 |
| Kiss 'n' ride | 558 | 828 |
| TOTAL | 2046 | 3036 |

Hope Island Road is a four lane dual carriage way arterial road which is utilised by 30,042 vehicles per day as per the traffic survey data collected in 2018. Based on the growth rate derived comparing the historical survey data (explained in Section 2.3 of this report), Table 11 summarises the additional traffic generated by the proposed station as a proportion of background AADT.

**Table 11: Road link capacity impacts**

| Forecast year | Base AADT | Development AADT | % demand increment |
|---|---|---|---|
| 2024 | 33,436 | 2,046 | 6% |
| 2036 | 46,097 | 3,306 | 7% |

As shown above, the traffic generated by the proposed station facility is expected to increase the AADT volumes on Hope Island Road by 6% and 8% in 2024 and 2036 respectively. It is noted that due to limited modelling data available on the expected traffic patterns, this assessment has conservatively assumed all the trips generated by the station will be new trips rather than diverted trips from the adjacent network. However, it is likely that a proportion of the trips generated by the station will be diverted trips from the adjacent road network, which will reduce the total new trips generated by the station.

As such the analysis has concluded that additional trip generated by station will have a negligible effect on the speeds and level of service to other vehicles already on the network.

# 7. Conclusion and recommendation

## 7.1 Summary of impacts and mitigation measures proposed

This report details the potential traffic impacts of the proposed railway station facility at north Helensvale. Access to the station is proposed via a new signalised intersection located on the Hope Island Road.

A road safety impact assessment has been carried out to identify the existing safety risks and any new or modified risks that result from the proposed facility. The assessment identified the potential risk of increased rear-end crashes due to queue propagation at the eastern approach of the station access intersection. However, the proposed station access intersection only require westbound traffic to stop at the phases where the pedestrian movement across Hope Island Road is actuated. As such it has been considered as a low risk safety issue.

The access and frontage assessment undertaken has identified that proposed access arrangement to operate within acceptable threshold at the opening year. However, the assessment shown that additional treatments to proposed access arrangements will be required to cater for the increased demands in forecast year 2036.

The intersection delay assessment undertaken to demonstrate the wider network impacts has shown that the overall intersection delays are expected to exceed the maximum acceptable delay threshold of 5% during both peak periods of the opening year. Similarly, the road link capacity assessment has also shown that the traffic generated by the proposed station facility is expected to increase the AADT volumes on Hope Island Road by 6% and 8% in 2024 and 2036 respectively.

## 7.2 Traffic impact assessment RPEQ certification

As a professional engineer registered by the Board of Professional Engineers of Queensland pursuant to the Professional Engineers Act 2002 as competent in my areas of nominated expertise, I understand and recognise:

- The significant role of engineering as a profession, and that
- The community has a legitimate expectation that my certification affixed to this engineering work can be trusted, and that
- I am responsible for ensuring its preparation has satisfied all necessary standards, conduct and contemporary practice.

As the responsible RPEQ, I certify:

1. I am satisfied that all submitted components comprising this traffic impact assessment, listed in the following table, have been completed in accordance with the *Guide to Traffic Impact Assessment* published by the Queensland Department of Transport and Main Roads and using sound engineering principles, and
2. where specialised areas of work have not been under my direct supervision, I have reviewed the outcomes of the work and consider the work and its outcomes as suitable for the purposes of this traffic impact assessment, and that
3. the outcomes of this traffic impact assessment are a true reflection of results of assessment, and that
4. I believe the strategies recommended for mitigating impacts by this traffic impact assessment, embrace contemporary practice initiatives and will deliver the desired outcomes.

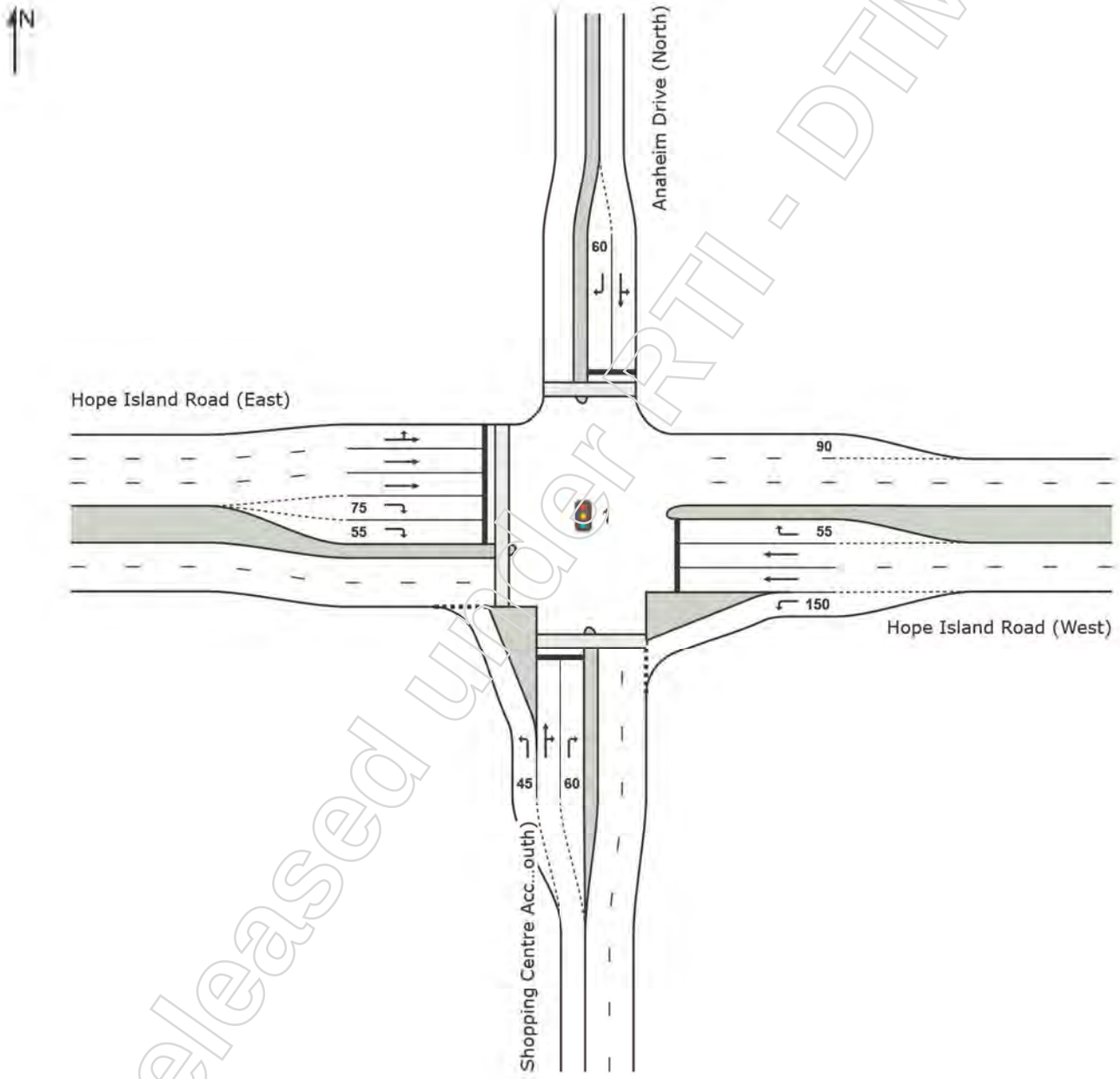
| | | | |
|---|---|---|---|
| Name: | | RPEQ No: | |
| RPEQ Competences: | | | |
| Signature: | | Date: | |
| Postal address: | | | |
| Email: | | | |

# **Appendix A** – SIDRA outputs from existing intersection analysis

# SITE LAYOUT

## Site: 1 [2019_HIR_Anaheim Dr_AM Peak]

Hope Island Road /Anaheim Drive Intersection
2019 AM Peak
Existing Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated



# MOVEMENT SUMMARY

## Site: 1 [2019_HIR_Anaheim Dr_AM Peak]

Hope Island Road /Anaheim Drive Intersection
2019 AM Peak
Existing Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Shopping Centre Access (South) | | | | | | | | | | | | |
| 1 | L2 | 75 | 8.5 | 0.099 | 16.1 | LOS B | 1.9 | 13.9 | 0.50 | 0.67 | 0.50 | 29.9 |
| 2 | T1 | 3 | 0.0 | 0.045 | 48.1 | LOS D | 0.6 | 4.3 | 0.89 | 0.66 | 0.89 | 11.3 |
| 3 | R2 | 20 | 5.3 | 0.045 | 53.1 | LOS D | 0.6 | 4.3 | 0.89 | 0.67 | 0.89 | 24.0 |
| Approach | | 98 | 7.5 | 0.099 | 24.7 | LOS C | 1.9 | 13.9 | 0.59 | 0.67 | 0.59 | 26.9 |
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 4 | L2 | 12 | 9.1 | 0.008 | 6.1 | LOS A | 0.0 | 0.3 | 0.12 | 0.57 | 0.12 | 48.4 |
| 5 | T1 | 1303 | 6.5 | 0.825 | 32.2 | LOS C | 37.7 | 278.3 | 0.90 | 0.85 | 0.95 | 34.4 |
| 6 | R2 | 176 | 4.2 | 0.579 | 32.6 | LOS C | 5.7 | 41.6 | 0.97 | 0.80 | 0.97 | 30.9 |
| Approach | | 1491 | 6.2 | 0.825 | 32.1 | LOS C | 37.7 | 278.3 | 0.90 | 0.84 | 0.94 | 34.0 |
| North: Anaheim Drive (North) | | | | | | | | | | | | |
| 7 | L2 | 12 | 0.0 | 0.034 | 30.2 | LOS C | 0.5 | 3.3 | 0.81 | 0.65 | 0.81 | 32.6 |
| 8 | T1 | 2 | 0.0 | 0.034 | 24.7 | LOS C | 0.5 | 3.3 | 0.81 | 0.65 | 0.81 | 16.9 |
| 9 | R2 | 79 | 5.3 | 0.437 | 62.5 | LOS E | 4.5 | 33.1 | 0.98 | 0.77 | 0.98 | 14.1 |
| Approach | | 93 | 4.5 | 0.437 | 57.6 | LOS E | 4.5 | 33.1 | 0.96 | 0.75 | 0.96 | 16.1 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 12 | 9.1 | 0.419 | 42.0 | LOS D | 12.4 | 91.6 | 0.80 | 0.71 | 1.13 | 13.0 |
| 11 | T1 | 1303 | 6.5 | 0.795 | 38.3 | LOS D | 29.2 | 215.9 | 0.92 | 0.84 | 1.02 | 31.8 |
| 12 | R2 | 176 | 4.2 | 0.413 | 60.3 | LOS E | 4.9 | 35.8 | 0.97 | 0.77 | 0.97 | 13.2 |
| Approach | | 1491 | 6.2 | 0.795 | 40.9 | LOS D | 29.2 | 215.9 | 0.92 | 0.83 | 1.02 | 29.5 |
| All Vehicles | | 3172 | 6.2 | 0.825 | 36.8 | LOS D | 37.7 | 278.3 | 0.90 | 0.83 | 0.97 | 31.1 |

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

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P3 | North Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| All Pedestrians | | 158 | 54.3 | LOS E | | | 0.95 | 0.95 |

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.

# PHASING SUMMARY

## Site: 1 [2019_HIR_Anaheim Dr_AM Peak]

Hope Island Road /Anaheim Drive Intersection
2019 AM Peak
Existing Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

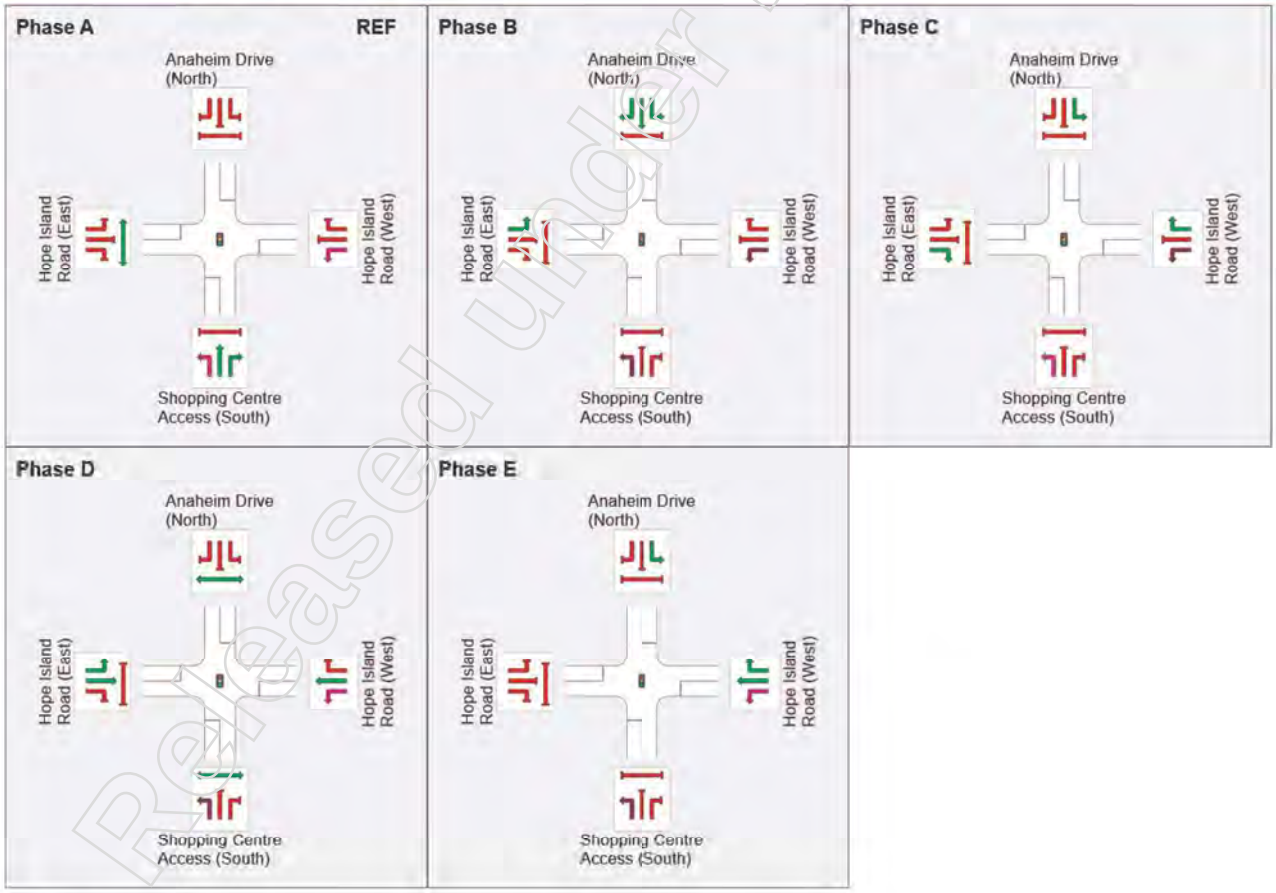
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times specified by the user**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C, D, E**
**Output Phase Sequence: A, B, C, D, E**

### Phase Timing Summary

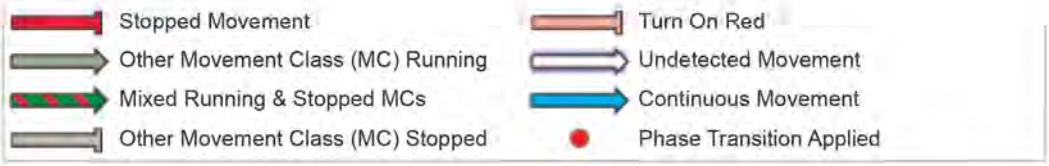
| Phase | A | B | C | D | E |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 23 | 39 | 59 | 108 |
| Green Time (sec) | 17 | 12 | 14 | 43 | 6 |
| Phase Time (sec) | 21 | 18 | 20 | 49 | 12 |
| Phase Split | 18% | 15% | 17% | 41% | 10% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase



# MOVEMENT SUMMARY

## Site: 1 [2019_HIR_Anaheim Dr_PM Peak]

Hope Island Road /Anaheim Drive Intersection
2019 PM Peak
Existing Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Shopping Centre Access (South) | | | | | | | | | | | | |
| 1 | L2 | 323 | 1.3 | 0.384 | 16.9 | LOS B | 9.4 | 66.5 | 0.59 | 0.74 | 0.59 | 29.9 |
| 2 | T1 | 3 | 0.0 | 0.155 | 45.5 | LOS D | 2.5 | 17.9 | 0.88 | 0.73 | 0.88 | 11.5 |
| 3 | R2 | 98 | 1.1 | 0.155 | 50.5 | LOS D | 2.5 | 17.9 | 0.88 | 0.73 | 0.88 | 24.7 |
| Approach | | 424 | 1.2 | 0.384 | 24.9 | LOS C | 9.4 | 66.5 | 0.66 | 0.74 | 0.66 | 27.5 |
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 4 | L2 | 53 | 2.0 | 0.035 | 6.4 | LOS A | 0.3 | 2.1 | 0.15 | 0.58 | 0.15 | 48.3 |
| 5 | T1 | 1180 | 3.8 | 0.767 | 27.3 | LOS C | 33.1 | 239.6 | 0.84 | 0.76 | 0.85 | 36.8 |
| 6 | R2 | 293 | 2.2 | 0.792 | 35.0 | LOS C | 9.8 | 69.7 | 1.00 | 0.89 | 1.11 | 29.9 |
| Approach | | 1525 | 3.5 | 0.792 | 28.0 | LOS C | 33.1 | 239.6 | 0.85 | 0.78 | 0.88 | 35.7 |
| North: Anaheim Drive (North) | | | | | | | | | | | | |
| 7 | L2 | 7 | 0.0 | 0.022 | 27.4 | LOS C | 0.2 | 1.7 | 0.82 | 0.64 | 0.82 | 33.9 |
| 8 | T1 | 1 | 0.0 | 0.022 | 21.9 | LOS C | 0.2 | 1.7 | 0.82 | 0.64 | 0.82 | 18.1 |
| 9 | R2 | 41 | 2.6 | 0.382 | 67.9 | LOS E | 2.5 | 17.6 | 1.00 | 0.73 | 1.00 | 13.3 |
| Approach | | 49 | 2.1 | 0.382 | 60.9 | LOS E | 2.5 | 17.6 | 0.97 | 0.72 | 0.97 | 15.7 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 53 | 2.0 | 0.444 | 46.7 | LOS D | 12.1 | 87.5 | 0.84 | 0.78 | 1.25 | 12.2 |
| 11 | T1 | 1180 | 3.8 | 0.842 | 45.5 | LOS D | 30.4 | 219.5 | 0.95 | 0.92 | 1.12 | 29.2 |
| 12 | R2 | 293 | 2.2 | 0.792 | 68.4 | LOS E | 9.1 | 65.0 | 1.00 | 0.89 | 1.21 | 12.0 |
| Approach | | 1525 | 3.5 | 0.842 | 49.9 | LOS D | 30.4 | 219.5 | 0.96 | 0.91 | 1.14 | 25.3 |
| All Vehicles | | 3524 | 3.2 | 0.842 | 37.6 | LOS D | 33.1 | 239.6 | 0.88 | 0.83 | 0.97 | 29.5 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P3 | North Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| All Pedestrians | | 158 | 54.3 | LOS E | | | 0.95 | 0.95 |

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.

# PHASING SUMMARY

## Site: 1 [2019_HIR_Anaheim Dr_PM Peak]

Hope Island Road /Anaheim Drive Intersection
2019 PM Peak
Existing Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

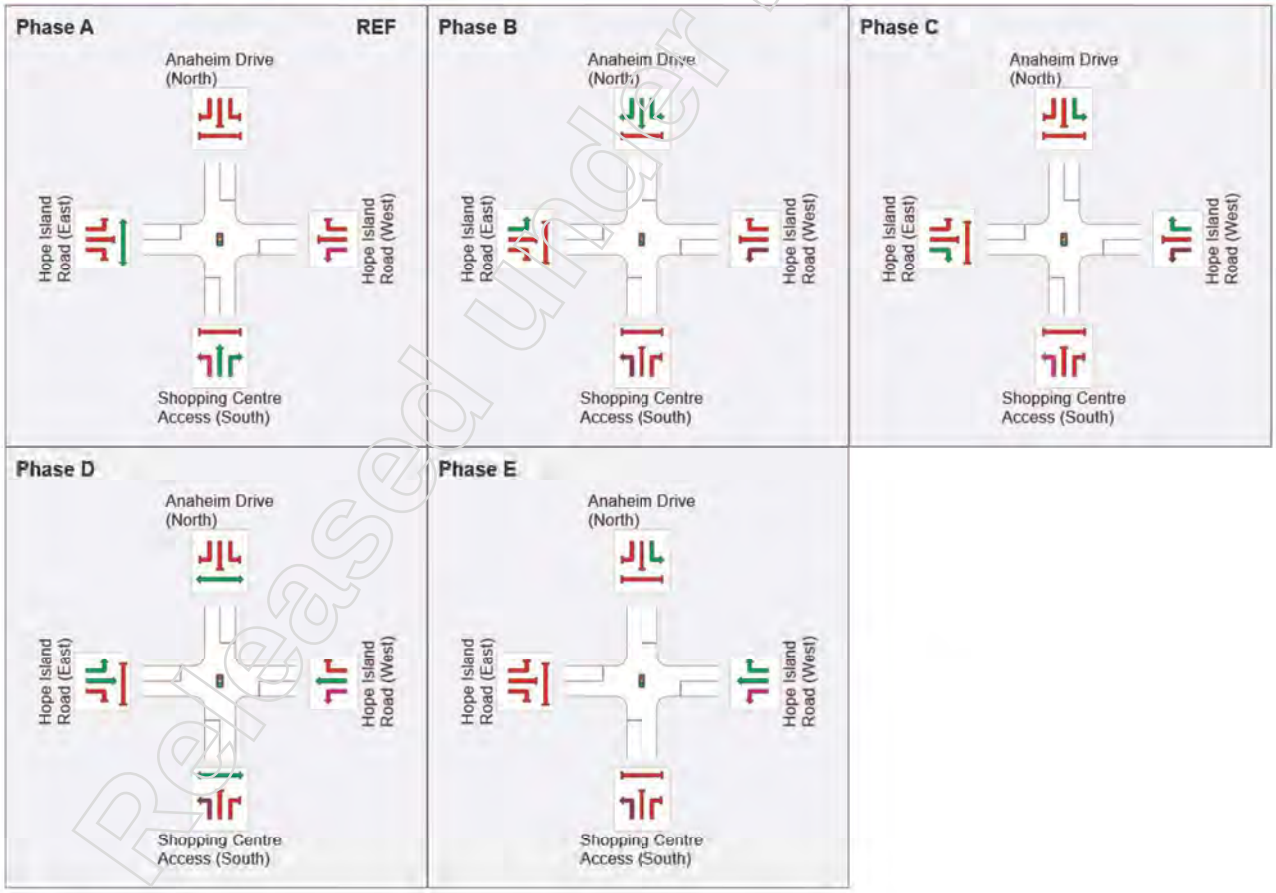
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C, D, E**
**Output Phase Sequence: A, B, C, D, E**

### Phase Timing Summary

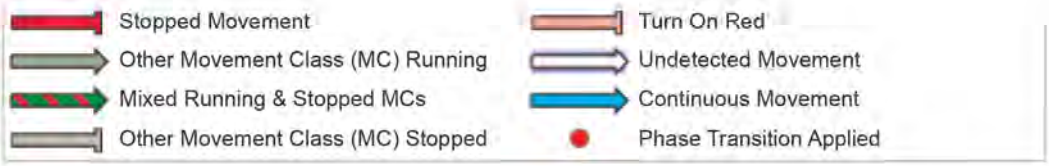
| Phase | A | B | C | D | E |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 27 | 40 | 58 | 102 |
| Green Time (sec) | 21 | 7 | 12 | 38 | 12 |
| Phase Time (sec) | 27 | 13 | 18 | 44 | 18 |
| Phase Split | 23% | 11% | 15% | 37% | 15% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence



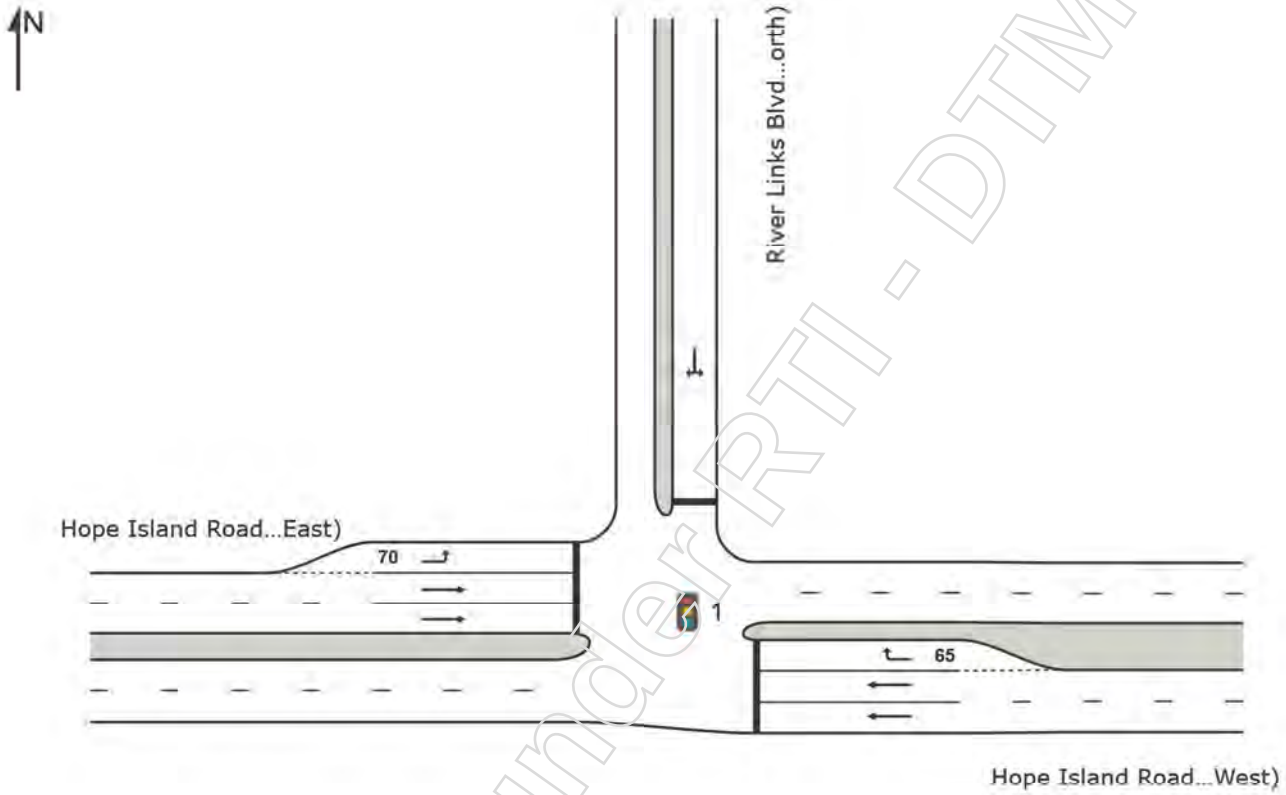

REF: Reference Phase
VAR: Variable Phase



# SITE LAYOUT

## Site: 1 [2019_HIR_River Links Blvd_AM Peak]

Hope Island Road / River Links Boulvard
2019 AM Peak
Existing Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated





Organisation: GHD SERVICES PTY LTD | Created: Friday, 6 September 2019 9:10:59 AM
Project: G:\41\32391\Tech\Traffic\5_SIDRA Models\Helensvale\Base Models.sip8

# MOVEMENT SUMMARY

## Site: 1 [2019_HIR_River Links Blvd_AM Peak]

Hope Island Road / River Links Boulvard
2019 AM Peak
Existing Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 5 | T1 | 2086 | 2.5 | 0.902 | 22.9 | LOS C | 32.8 | 234.3 | 0.94 | 1.11 | 1.28 | 43.6 |
| 6 | R2 | 23 | 9.1 | 0.110 | 28.2 | LOS C | 0.5 | 4.1 | 0.92 | 0.70 | 0.92 | 32.6 |
| Approach | | 2109 | 2.6 | 0.902 | 22.9 | LOS C | 32.8 | 234.3 | 0.94 | 1.11 | 1.28 | 43.5 |
| North: River Links Blvd (North) | | | | | | | | | | | | |
| 7 | L2 | 57 | 0.0 | 0.861 | 34.7 | LOS C | 8.6 | 60.7 | 1.00 | 1.04 | 1.50 | 30.3 |
| 9 | R2 | 234 | 1.8 | 0.861 | 34.8 | LOS C | 8.6 | 60.7 | 1.00 | 1.04 | 1.50 | 30.3 |
| Approach | | 291 | 1.4 | 0.861 | 34.8 | LOS C | 8.6 | 60.7 | 1.00 | 1.04 | 1.50 | 30.3 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 66 | 3.2 | 0.100 | 17.2 | LOS B | 1.1 | 7.9 | 0.69 | 0.71 | 0.69 | 39.0 |
| 11 | T1 | 1043 | 5.8 | 0.763 | 18.2 | LOS B | 12.7 | 93.1 | 0.94 | 0.90 | 1.08 | 46.2 |
| Approach | | 1109 | 5.6 | 0.763 | 18.1 | LOS B | 12.7 | 93.1 | 0.93 | 0.89 | 1.06 | 45.9 |
| All Vehicles | | 3509 | 3.4 | 0.902 | 22.4 | LOS C | 32.8 | 234.3 | 0.94 | 1.04 | 1.23 | 43.2 |

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

# PHASING SUMMARY

## Site: 1 [2019_HIR_River Links Blvd_AM Peak]

Hope Island Road / River Links Boulvard
2019 AM Peak
Existing Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)

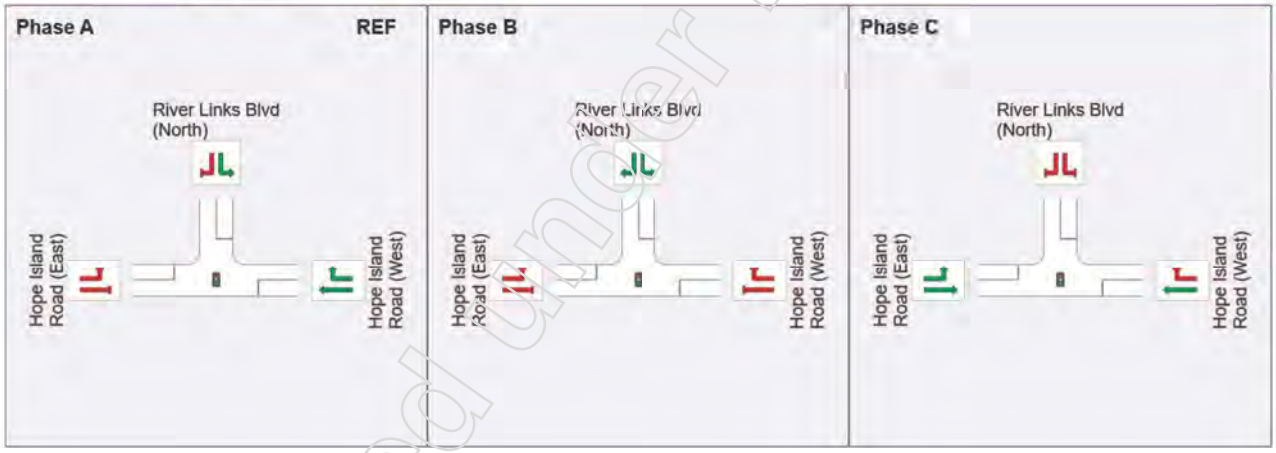
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, B, C**

### Phase Timing Summary

| Phase | A | B | C |
|---|---|---|---|
| Phase Change Time (sec) | 0 | 12 | 26 |
| Green Time (sec) | 6 | 8 | 18 |
| Phase Time (sec) | 12 | 14 | 24 |
| Phase Split | 24% | 28% | 48% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# MOVEMENT SUMMARY

## Site: 1 [2019_HIR_River Links Blvd_PM Peak]

Hope Island Road / River Links Boulvard
2019 AM Peak
Existing Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 5 | T1 | 1202 | 3.9 | 0.421 | 3.6 | LOS A | 7.6 | 55.1 | 0.40 | 0.36 | 0.40 | 56.6 |
| 6 | R2 | 45 | 0.0 | 0.281 | 40.2 | LOS D | 1.6 | 10.9 | 0.97 | 0.73 | 0.97 | 27.8 |
| Approach | | 1247 | 3.8 | 0.421 | 4.9 | LOS A | 7.6 | 55.1 | 0.42 | 0.38 | 0.42 | 55.4 |
| North: River Links Blvd (North) | | | | | | | | | | | | |
| 7 | L2 | 53 | 4.0 | 0.832 | 45.6 | LOS D | 6.3 | 45.1 | 1.00 | 0.96 | 1.41 | 26.3 |
| 9 | R2 | 109 | 1.9 | 0.832 | 45.6 | LOS D | 6.3 | 45.1 | 1.00 | 0.96 | 1.41 | 26.4 |
| Approach | | 162 | 2.6 | 0.832 | 45.6 | LOS D | 6.3 | 45.1 | 1.00 | 0.96 | 1.41 | 26.4 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 181 | 0.6 | 0.170 | 13.2 | LOS B | 2.9 | 20.5 | 0.50 | 0.70 | 0.50 | 42.0 |
| 11 | T1 | 1843 | 1.5 | 0.854 | 19.9 | LOS B | 32.3 | 229.1 | 0.88 | 0.91 | 1.02 | 45.2 |
| Approach | | 2024 | 1.4 | 0.854 | 19.3 | LOS B | 32.3 | 229.1 | 0.85 | 0.89 | 0.97 | 45.0 |
| All Vehicles | | 3434 | 2.3 | 0.854 | 15.3 | LOS B | 32.3 | 229.1 | 0.70 | 0.71 | 0.79 | 47.3 |

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.
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.


Organisation: GHD SERVICES PTY LTD | Processed: Thursday, 5 September 2019 1:53:17 PM
Project: G:\41\32391\Tech\Traffic\5_SIDRA Models\Helensvale\Base Models.sip8

# PHASING SUMMARY

## Site: 1 [2019_HIR_River Links Blvd_PM Peak]

Hope Island Road / River Links Boulvard
2019 AM Peak
Existing Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

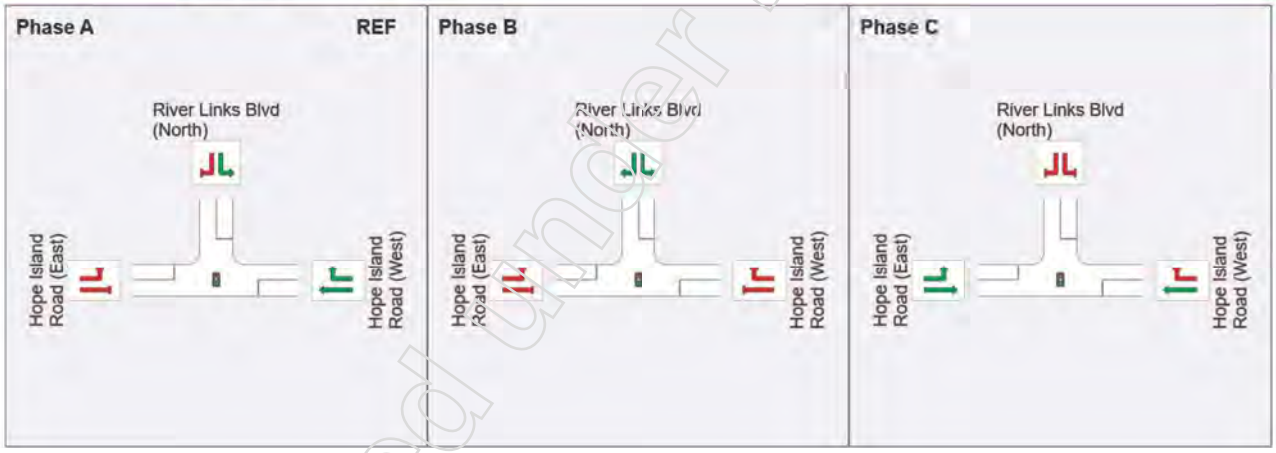
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, B, C**

### Phase Timing Summary

| Phase | A | B | C |
|---|---|---|---|
| Phase Change Time (sec) | 0 | 12 | 24 |
| Green Time (sec) | 6 | 6 | 40 |
| Phase Time (sec) | 12 | 12 | 46 |
| Phase Split | 17% | 17% | 66% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence

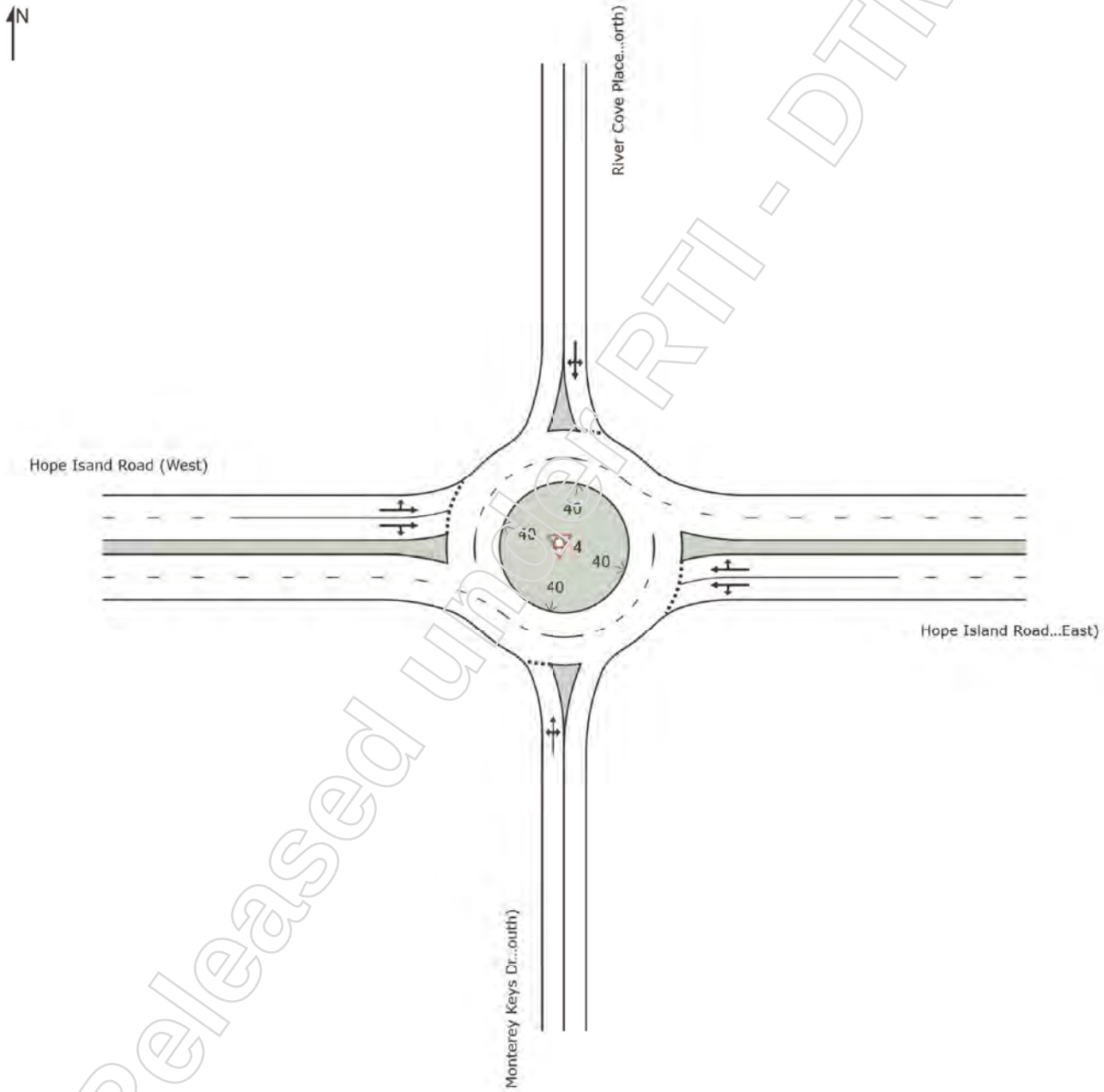



REF: Reference Phase
VAR: Variable Phase

# SITE LAYOUT

## Site: 4 [2019_HIR_Monterey Keys Dr_AM Peak]

Hope Island Road / Monterey Keys Drive
2019 AM Peak
Existing Scenario Assessment
Site Category: Roundabout
Roundabout



# MOVEMENT SUMMARY

## Site: 4 [2019_HIR_Monterey Keys Dr_AM Peak]

Hope Island Road / Monterey Keys Drive
2019 AM Peak
Existing Scenario Assessment
Site Category: Roundabout
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Monterey Keys Drive (South) | | | | | | | | | | | | |
| 1 | L2 | 149 | 3.5 | 0.297 | 8.1 | LOS A | 1.4 | 9.9 | 0.74 | 0.86 | 0.76 | 52.4 |
| 2 | T1 | 1 | 0.0 | 0.297 | 7.8 | LOS A | 1.4 | 9.9 | 0.74 | 0.86 | 0.76 | 54.4 |
| 3 | R2 | 39 | 8.1 | 0.297 | 14.7 | LOS B | 1.4 | 9.9 | 0.74 | 0.86 | 0.76 | 54.9 |
| Approach | | 189 | 4.4 | 0.297 | 9.4 | LOS A | 1.4 | 9.9 | 0.74 | 0.86 | 0.76 | 52.9 |
| East: Hope Island Road (East) | | | | | | | | | | | | |
| 4 | L2 | 101 | 8.3 | 0.581 | 3.6 | LOS A | 4.4 | 31.7 | 0.27 | 0.33 | 0.27 | 55.9 |
| 5 | T1 | 1672 | 2.2 | 0.581 | 3.3 | LOS A | 4.5 | 31.9 | 0.28 | 0.33 | 0.28 | 58.2 |
| 6 | R2 | 4 | 25.0 | 0.581 | 10.2 | LOS B | 4.5 | 31.9 | 0.29 | 0.33 | 0.29 | 58.1 |
| Approach | | 1777 | 2.6 | 0.581 | 3.3 | LOS A | 4.5 | 31.9 | 0.28 | 0.33 | 0.28 | 58.0 |
| North: River Cove Place (North) | | | | | | | | | | | | |
| 7 | L2 | 4 | 25.0 | 0.029 | 6.2 | LOS A | 0.1 | 0.8 | 0.55 | 0.73 | 0.55 | 51.3 |
| 8 | T1 | 1 | 0.0 | 0.029 | 5.3 | LOS A | 0.1 | 0.8 | 0.55 | 0.73 | 0.55 | 53.5 |
| 9 | R2 | 18 | 5.9 | 0.029 | 12.0 | LOS B | 0.1 | 0.8 | 0.55 | 0.73 | 0.55 | 54.0 |
| Approach | | 23 | 9.1 | 0.029 | 10.7 | LOS B | 0.1 | 0.8 | 0.55 | 0.73 | 0.55 | 53.5 |
| West: Hope Isand Road (West) | | | | | | | | | | | | |
| 10 | L2 | 7 | 14.3 | 0.328 | 3.5 | LOS A | 2.1 | 15.6 | 0.19 | 0.30 | 0.19 | 56.3 |
| 11 | T1 | 940 | 4.5 | 0.328 | 3.1 | LOS A | 2.1 | 15.6 | 0.19 | 0.32 | 0.19 | 58.5 |
| 12 | R2 | 47 | 6.7 | 0.328 | 9.7 | LOS A | 2.1 | 15.2 | 0.20 | 0.35 | 0.20 | 58.9 |
| Approach | | 995 | 4.7 | 0.328 | 3.4 | LOS A | 2.1 | 15.6 | 0.19 | 0.32 | 0.19 | 58.5 |
| All Vehicles | | 2984 | 3.5 | 0.581 | 3.8 | LOS A | 4.5 | 31.9 | 0.28 | 0.37 | 0.28 | 57.8 |

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

# MOVEMENT SUMMARY

## Site: 4 [2019_HIR_Monterey Keys Dr_PM Peak]

Hope Island Road / Monterey Keys Drive
2019 PM Peak
Existing Scenario Assessment
Site Category: Roundabout
Roundabout

**Movement Performance - Vehicles**

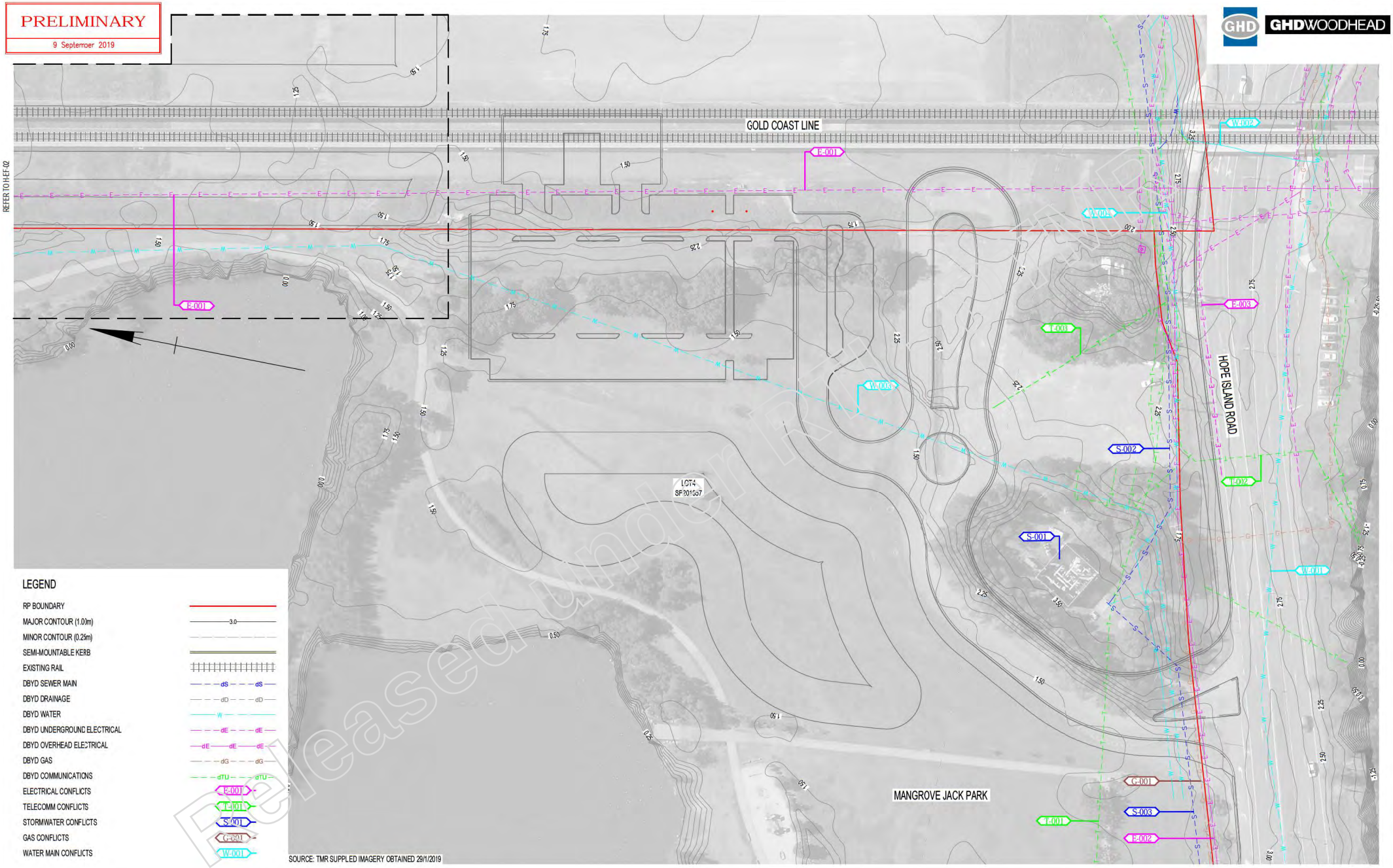
| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Monterey Keys Drive (South) | | | | | | | | | | | | |
| 1 | L2 | 88 | 4.8 | 0.207 | 5.9 | LOS A | 0.9 | 6.3 | 0.62 | 0.80 | 0.62 | 52.9 |
| 2 | T1 | 3 | 0.0 | 0.207 | 5.6 | LOS A | 0.9 | 6.3 | 0.62 | 0.80 | 0.62 | 54.9 |
| 3 | R2 | 72 | 4.4 | 0.207 | 12.3 | LOS B | 0.9 | 6.3 | 0.62 | 0.80 | 0.62 | 55.5 |
| Approach | | 163 | 4.5 | 0.207 | 8.7 | LOS A | 0.9 | 6.3 | 0.62 | 0.80 | 0.62 | 54.1 |
| East: Hope Island Road (East) | | | | | | | | | | | | |
| 4 | L2 | 67 | 7.8 | 0.390 | 3.9 | LOS A | 2.5 | 17.9 | 0.37 | 0.36 | 0.37 | 55.4 |
| 5 | T1 | 932 | 3.6 | 0.390 | 3.6 | LOS A | 2.5 | 17.9 | 0.37 | 0.38 | 0.37 | 57.3 |
| 6 | R2 | 67 | 0.0 | 0.390 | 10.2 | LOS B | 2.4 | 17.4 | 0.38 | 0.41 | 0.38 | 57.9 |
| Approach | | 1066 | 3.7 | 0.390 | 4.0 | LOS A | 2.5 | 17.9 | 0.37 | 0.38 | 0.37 | 57.3 |
| North: River Cove Place (North) | | | | | | | | | | | | |
| 7 | L2 | 5 | 0.0 | 0.019 | 7.9 | LOS A | 0.1 | 0.6 | 0.75 | 0.77 | 0.75 | 51.8 |
| 8 | T1 | 1 | 0.0 | 0.019 | 7.7 | LOS A | 0.1 | 0.6 | 0.75 | 0.77 | 0.75 | 53.6 |
| 9 | R2 | 4 | 0.0 | 0.019 | 14.3 | LOS B | 0.1 | 0.6 | 0.75 | 0.77 | 0.75 | 54.3 |
| Approach | | 11 | 0.0 | 0.019 | 10.4 | LOS B | 0.1 | 0.6 | 0.75 | 0.77 | 0.75 | 53.0 |
| West: Hope Isand Road (West) | | | | | | | | | | | | |
| 10 | L2 | 21 | 0.0 | 0.645 | 4.0 | LOS A | 5.6 | 39.7 | 0.46 | 0.37 | 0.46 | 55.0 |
| 11 | T1 | 1668 | 1.2 | 0.645 | 3.8 | LOS A | 5.6 | 39.7 | 0.47 | 0.40 | 0.47 | 56.7 |
| 12 | R2 | 149 | 3.5 | 0.645 | 10.5 | LOS B | 5.5 | 39.4 | 0.49 | 0.45 | 0.49 | 57.0 |
| Approach | | 1839 | 1.4 | 0.645 | 4.3 | LOS A | 5.6 | 39.7 | 0.48 | 0.41 | 0.48 | 56.7 |
| All Vehicles | | 3079 | 2.3 | 0.645 | 4.5 | LOS A | 5.6 | 39.7 | 0.45 | 0.42 | 0.45 | 56.8 |

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

# **Appendix B** – Site plans

PRELIMINARY
9 September 2019

GHD GHDWOODHEAD




LEGEND

- RP BOUNDARY
- MAJOR CONTOUR (1.0m)
- MINOR CONTOUR (0.25m)
- SEMI-MOUNTABLE KERB
- EXISTING RAIL
- DBYD SEWER MAIN
- DBYD DRAINAGE
- DBYD WATER
- DBYD UNDERGROUND ELECTRICAL
- DBYD OVERHEAD ELECTRICAL
- DBYD GAS
- DBYD COMMUNICATIONS
- ELECTRICAL CONFLICTS
- TELECOMM CONFLICTS
- STORMWATER CONFLICTS
- GAS CONFLICTS
- WATER MAIN CONFLICTS



| Revisions/Descriptions | Certification | Date | Microfilmed |
|---|---|---|---|
| 1 REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 | |

CAD FILES: \\ghdnet\ghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-EF-01.dwg

Associated Job Nos:
Auxiliary Jrg Nos:

| Survey Data | |
|---|---|
| Datum | GDA94 |
| Horiz. Grid | BCSG 2002 |
| Height Origin | AHD DERIVED |
| Survey Books | |

Scales: 0 5 10 15 20m
Dimensions shown in metres except where shown otherwise
GHD project number 41-32391

CITY OF GOLD COAST
HOPE ISLAND ROAD

Reference Points

| Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP |
|---|---|---|---|---|
| | | | | |

Through Chainage from THRUCH

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
EXISTING FEATURES AND SERVICES PLAN - SHEET 1 OF 2

Drawn: K. STEWART
Designed: B. VASTA

ENGINEERING CERTIFICATION (RPEQ)

| ENG. AREA | NAME | SIGNATURE | NO. | DATE |
|---|---|---|---|---|
| | | | | |

Queensland Government

| | |
|---|---|
| Job No. | |
| Contract. No. | |
| Drawing No. | 1 |
| Series Number | H-EF-01 of 2 |

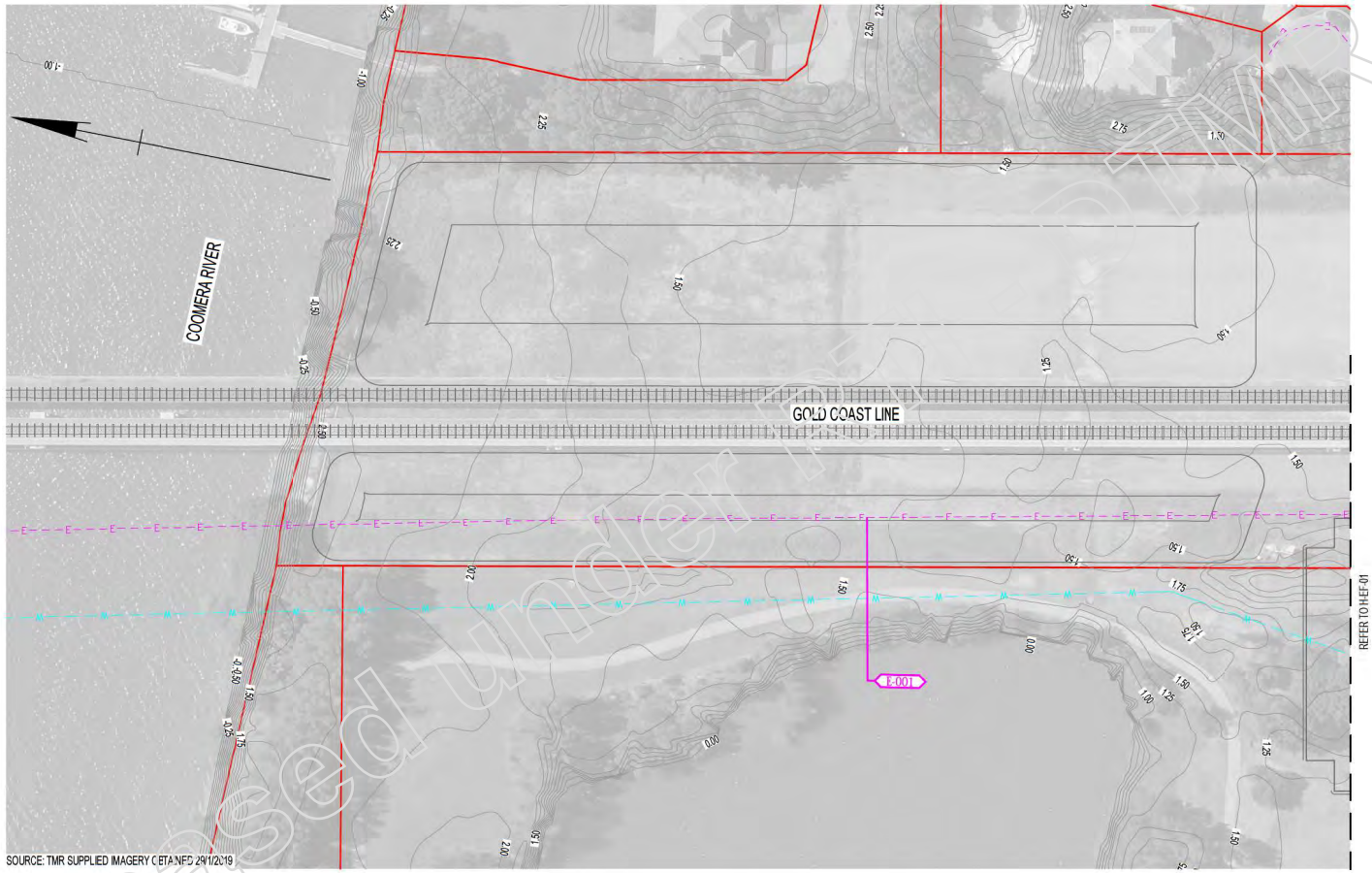
MRR_Detail (02/14)

XREFS: -
Last Modified: - Sep 09, 2019 - 7:17pm

IR HAT PLATFORM

PRELIMINARY
9 September 2019

GHD WOODHEAD






NOTE
REFER SERIES NUMBER H-EF-01 FOR LEGEND.

| Revisions/Descriptions | Certification | Date | Microfilm |
|---|---|---|---|
| 1 REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 | |

CAD FILES: \\ghdnet\ghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-EF-02.dwg

Associated Job Nos:
Auxiliary Drg Nos:

Survey Data: Datum GDA94; Horiz. Grid BCSG 2002; Height Origin AHD DERIVED; Survey Books

Scales: 0 5 10 15 20m
Dimensions shown in metres except where shown otherwise

GHD project number 41-32391

CITY OF GOLD COAST
HOPE ISLAND ROAD

Reference Points

| Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP |
|---|---|---|---|---|
| | | | | |

Through Chainage from THRUCH

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
EXISTING FEATURES AND SERVICES PLAN - SHEET 2 OF 2

Drawn: K. STEWART
Designed: B. VASTA

| ENGINEERING CERTIFICATION (RPEQ) | | | | |
|---|---|---|---|---|
| ENG. AREA | NAME | SIGNATURE | NO. | DATE |
| | | | | |

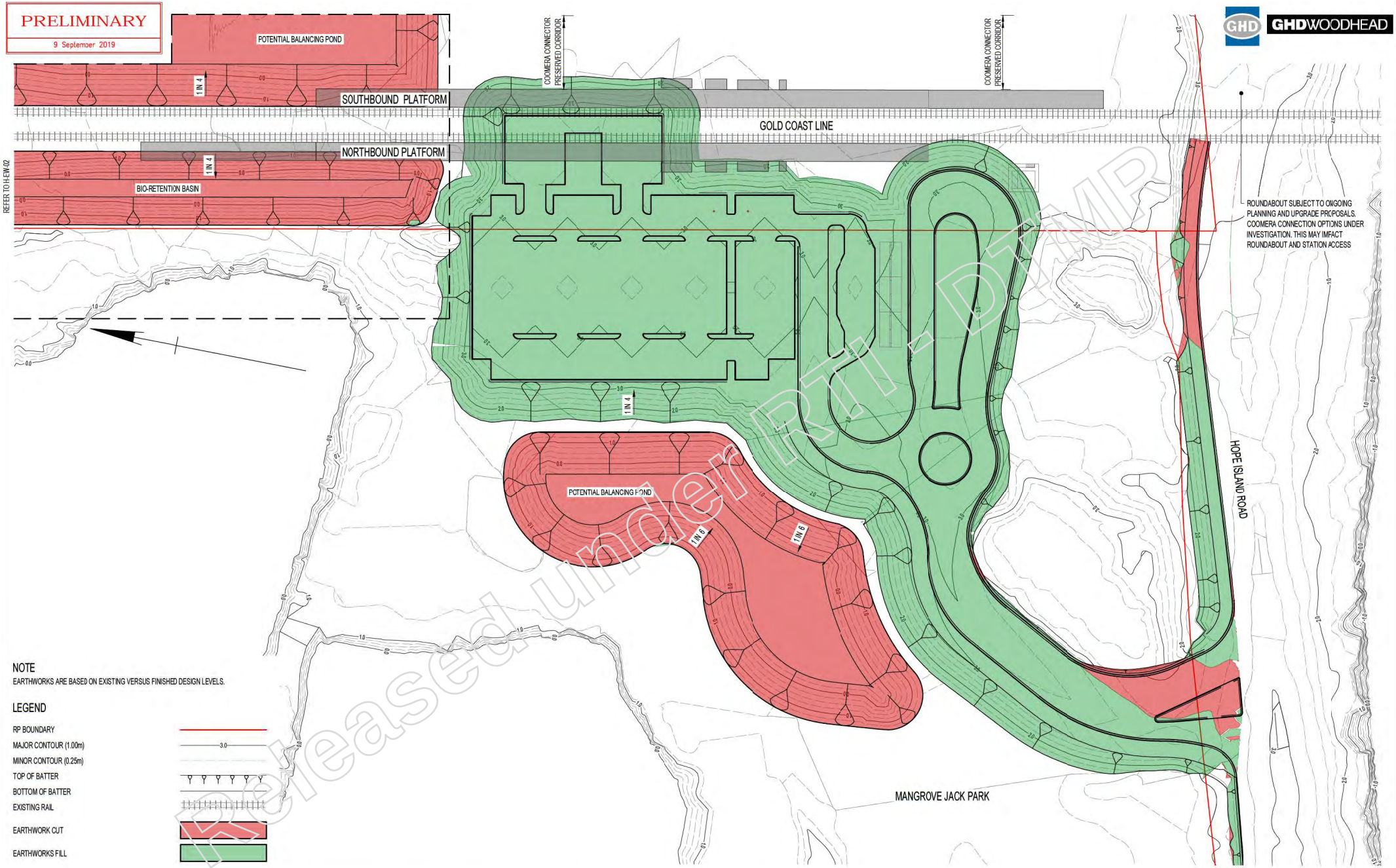
Queensland Government

Job No.
Contract. No.
Drawing No. 1
Series Number H-EF-02 of 2

MRR_Detail (02/14)

Last Modified: Sep 05, 2019 - 7:17pm
XREFS:

PRELIMINARY
9 September 2019




NOTE
EARTHWORKS ARE BASED ON EXISTING VERSUS FINISHED DESIGN LEVELS.

LEGEND
- RP BOUNDARY
- MAJOR CONTOUR (1.00m) 3.0
- MINOR CONTOUR (0.25m)
- TOP OF BATTER
- BOTTOM OF BATTER
- EXISTING RAIL
- EARTHWORK CUT
- EARTHWORKS FILL



| Revisions/Descriptions | Certification | Date | Microfilled |
|---|---|---|---|
| 1 REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 | |

Associated Job Nos
Auxiliary Drg Nos

| Survey Data | |
|---|---|
| Datum | GDA94 |
| Horiz. Grid | BCSG 2002 |
| Height Origin | AHD DERIVED |
| Survey Books | |

Scales: 0 5 10 15 20m
Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
HOPE ISLAND ROAD

Reference Points

| Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP |
|---|---|---|---|---|
| | | | | |

Through Chainage from THRUCH

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
EARTHWORKS PLAN - SHEET 1 OF 2

Drawn K. STEWART
Designed B. VASTA

| ENGINEERING CERTIFICATION (RPEQ) | | | | |
|---|---|---|---|---|
| ENG. AREA | NAME | SIGNATURE | NO. | DATE |
| | | | | |

Queensland Government

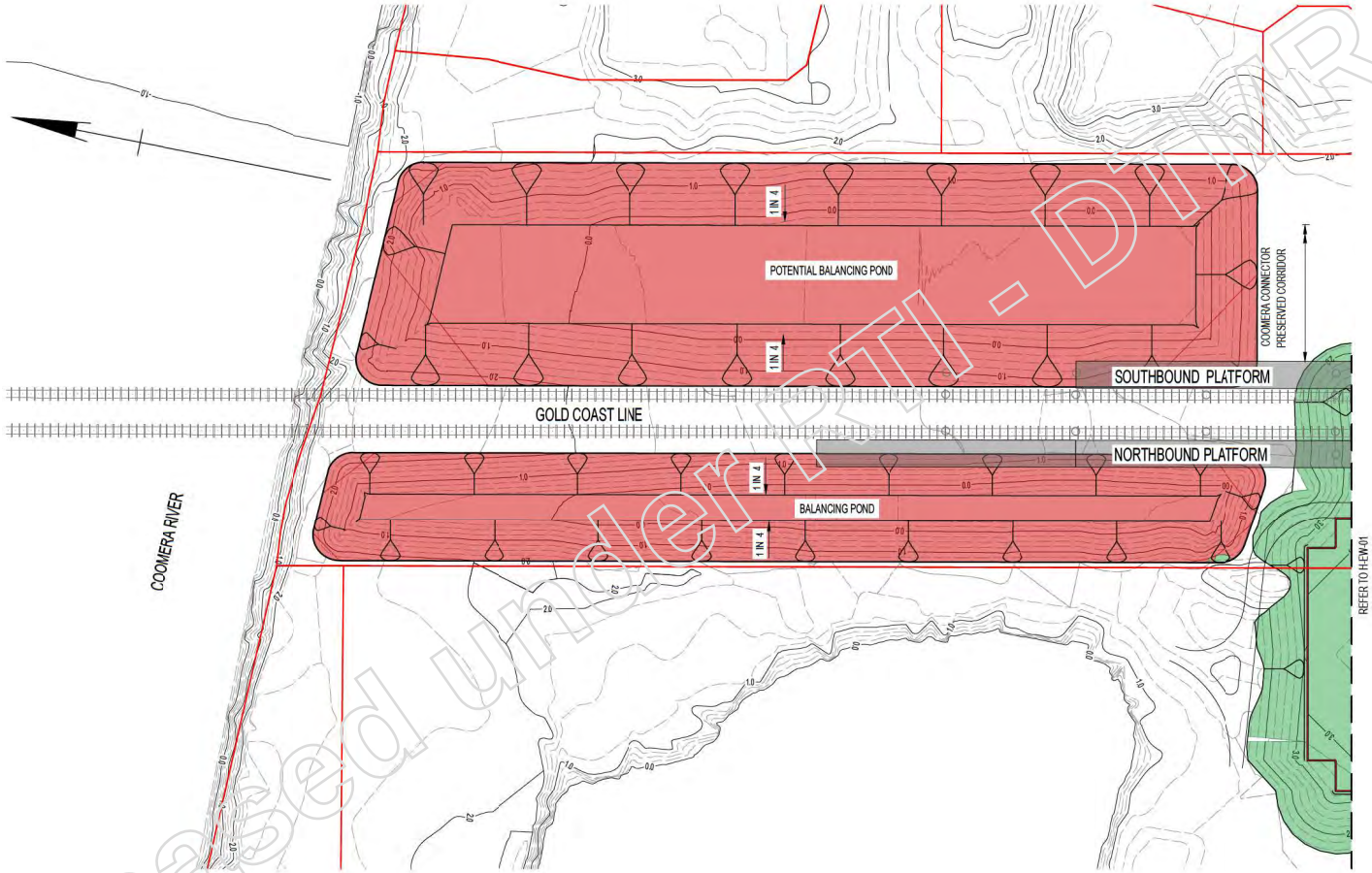
| | |
|---|---|
| Job No. | |
| Contract. No. | |
| Drawing No. | 1 |
| Series Number | H-EW-01 of 2 |

MRR_Detail (02/14)

CAD FILES \\ghdnetfghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-EW-01.dwg
GHD project number 41-32391
Last Modified: Sep 05, 2019 - 7:18pm
XREFS:

PRELIMINARY
9 September 2019

GHD GHDWOODHEAD






NOTE
REFER SERIES NUMBER H-EW-01 FOR LEGEND.

| | | | |
|---|---|---|---|
| 1 | REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 |

Revisons/Descriptions | Certification | Date | Microfilmed

CAD FILES: \\ghdnet\ghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-EW-02.dwg

Associated Job Nos:
Auxiliary Drg Nos:

Survey Data: Datum GDA94; Horiz. Grid BCSG 2002; Height Origin AHD DERIVED; Survey Books

Scales: 0 5 10 15 20m
Dimensions shown in metres except where shown otherwise

GHD project number 41-32391

CITY OF GOLD COAST
HOPE ISLAND ROAD

Reference Points

| Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP |
|---|---|---|---|---|
| | | | | |

Through Chainage from THRUCH

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
EARTHWORKS PLAN - SHEET 2 OF 2

Drawn: K. STEWART
Designed: B. VASTA

ENGINEERING CERTIFICATION (RPEQ)

| ENG. AREA | NAME | SIGNATURE | NO. | DATE |
|---|---|---|---|---|
| | | | | |

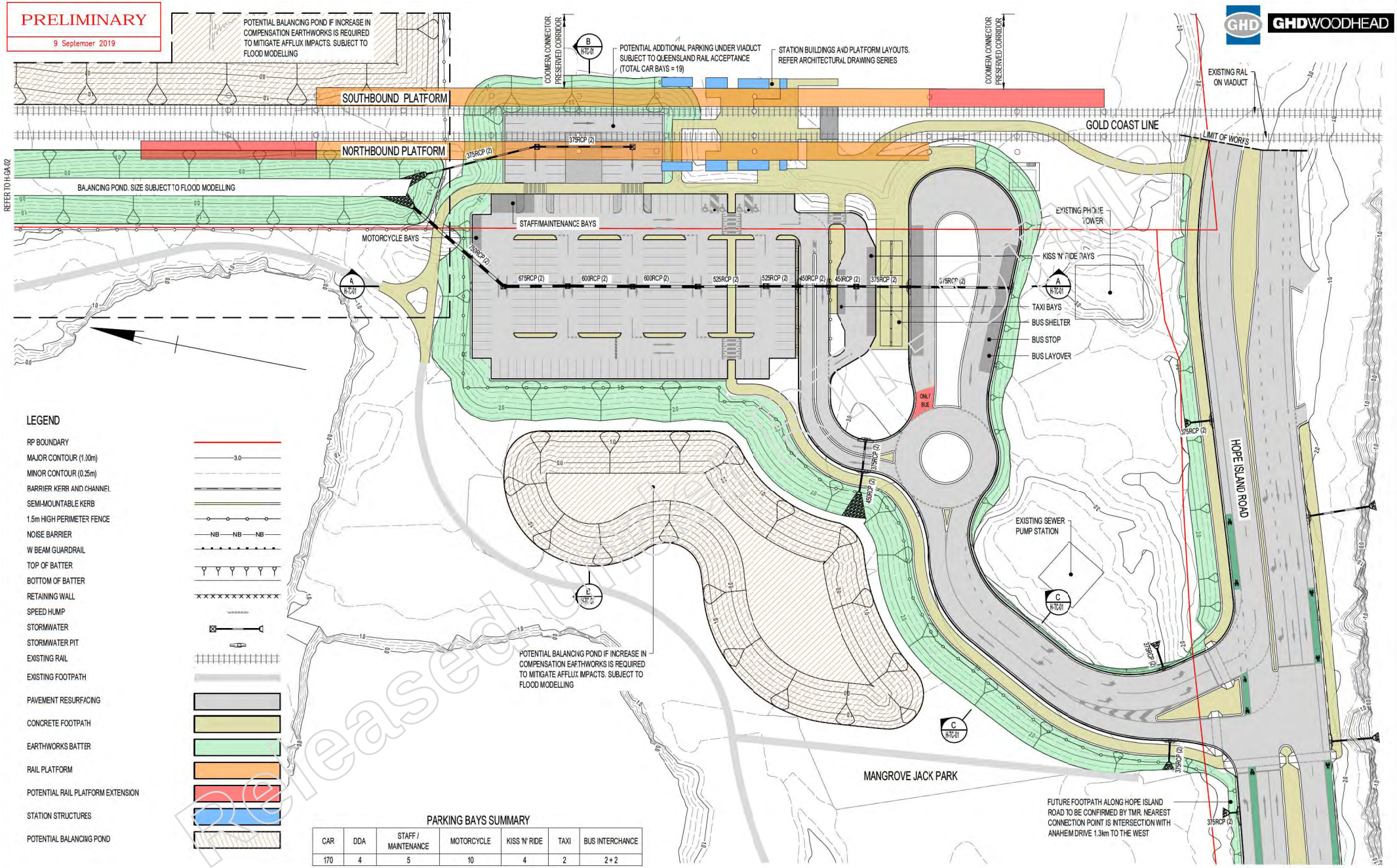
Queensland Government

Job No.
Contract. No.
Drawing No. 1
Series Number H-EW-02 of 2

MRR_Detail (02/14)

Last Modified: Sep 05, 2019 - 7:18pm
XREFS:

PRELIMINARY
9 September 2019




PARKING BAYS SUMMARY

| CAR | DDA | STAFF / MAINTENANCE | MOTORCYCLE | KISS 'N' RIDE | TAXI | BUS INTERCHANCE |
|---|---|---|---|---|---|---|
| 170 | 4 | 5 | 10 | 4 | 2 | 2 + 2 |



GHD GHDWOODHEAD

CITY OF GOLD COAST
HOPE ISLAND ROAD

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
GENERAL ARRANGEMENT PLAN - SHEET 1 OF 2

Queensland Government

| Revisions/Descriptions | Certification | Date | Microfilmed |
|---|---|---|---|
| 1 REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 | |

Associated Job Nos
Auxiliary Drg Nos

Survey Data: Datum GDA94; Horiz. Grid BCSG 2002; Height Origin AHD DERIVED; Survey Books

Scales: 0 5 10 15 20m
Dimensions shown in metres except where shown otherwise

Reference Points: Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP
Through Chainage from THRUCH

Drawn K. STEWART
Designed B. VASTA

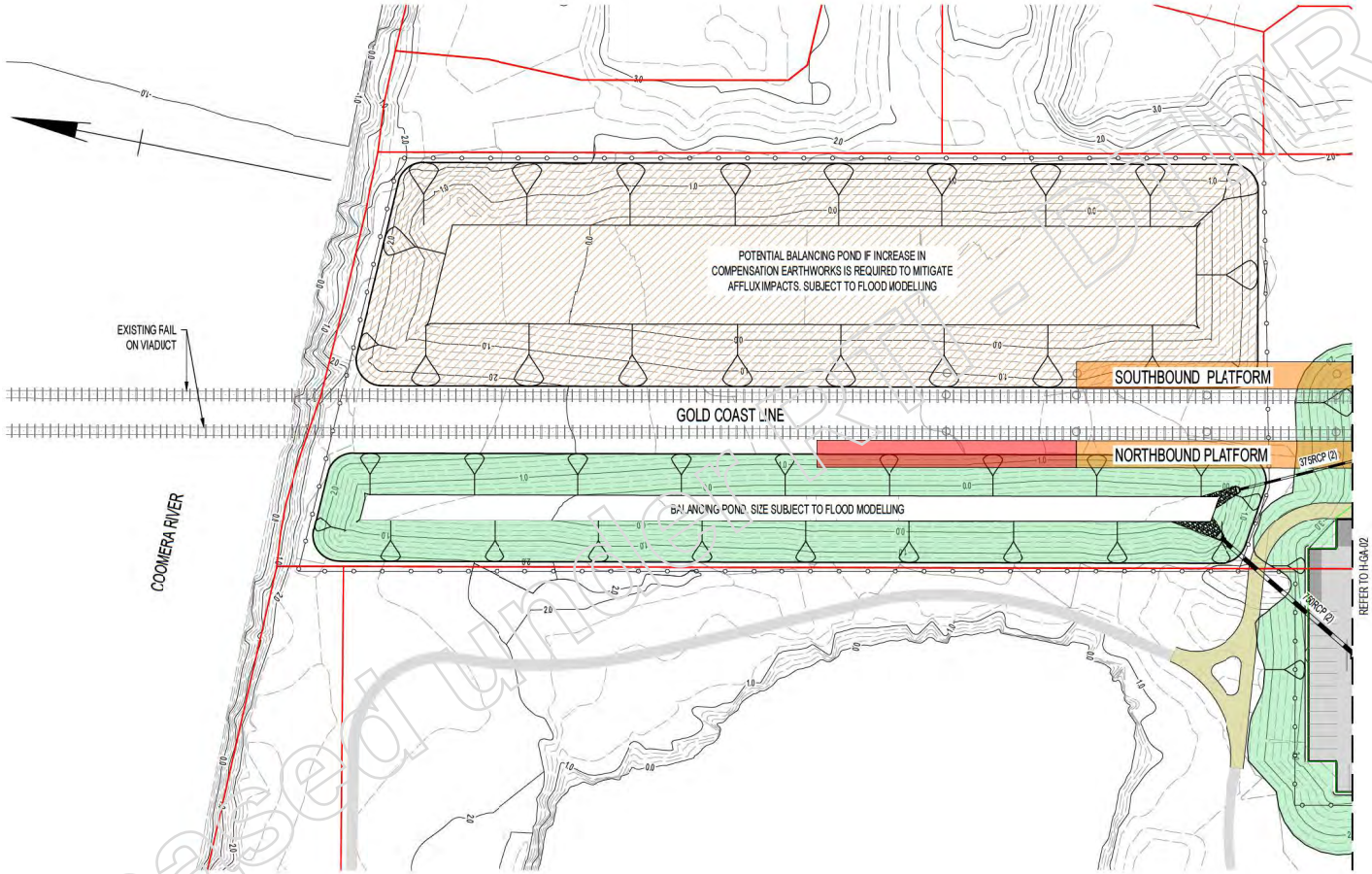
ENGINEERING CERTIFICATION (RPEQ): ENG. AREA | NAME | SIGNATURE | NO. | DATE

Job No.
Contract. No.
Drawing No. 1
Series Number H-SA-01 of 2

CAD FILES \\ghdnetghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-GA-01.dwg
GHD project number 41-32391
MRR_Detail (02/14)
Last Modified: - Sep 05, 2019 - 7:18pm
XREFS:

PRELIMINARY
9 September 2019

GHD WOODHEAD




NOTE
REFER SERIES NUMBER H-GA-02 FOR LEGEND.

| | | | | |
|---|---|---|---|---|
| 1 | REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 | |
| Revisons/Descriptions | | Certification | Date | Microfilmed |

CAD FILES: \\ghdnet\ghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-GA-02.dwg

Associated Job Nos:
Auxiliary Drg Nos:

Survey Data
Datum: GDA94
Horiz. Grid: BCSG 2002
Height Origin: AHD DERIVED
Survey Books:

Scales
0 5 10 15 20m
Dimensions shown in metres except where shown otherwise

GHD project number 41-32391

CITY OF GOLD COAST
HOPE ISLAND ROAD

Reference Points

| Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP |
|---|---|---|---|---|
| | | | | |

Through Chainage from THRUCH

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
GENERAL ARRANGEMENT PLAN - SHEET 2 OF 2

Drawn: K. STEWART
Designed: B. VASTA

| ENGINEERING CERTIFICATION (RPEQ) | | | | |
|---|---|---|---|---|
| ENG. AREA | NAME | SIGNATURE | NO. | DATE |
| | | | | |

Queensland Government

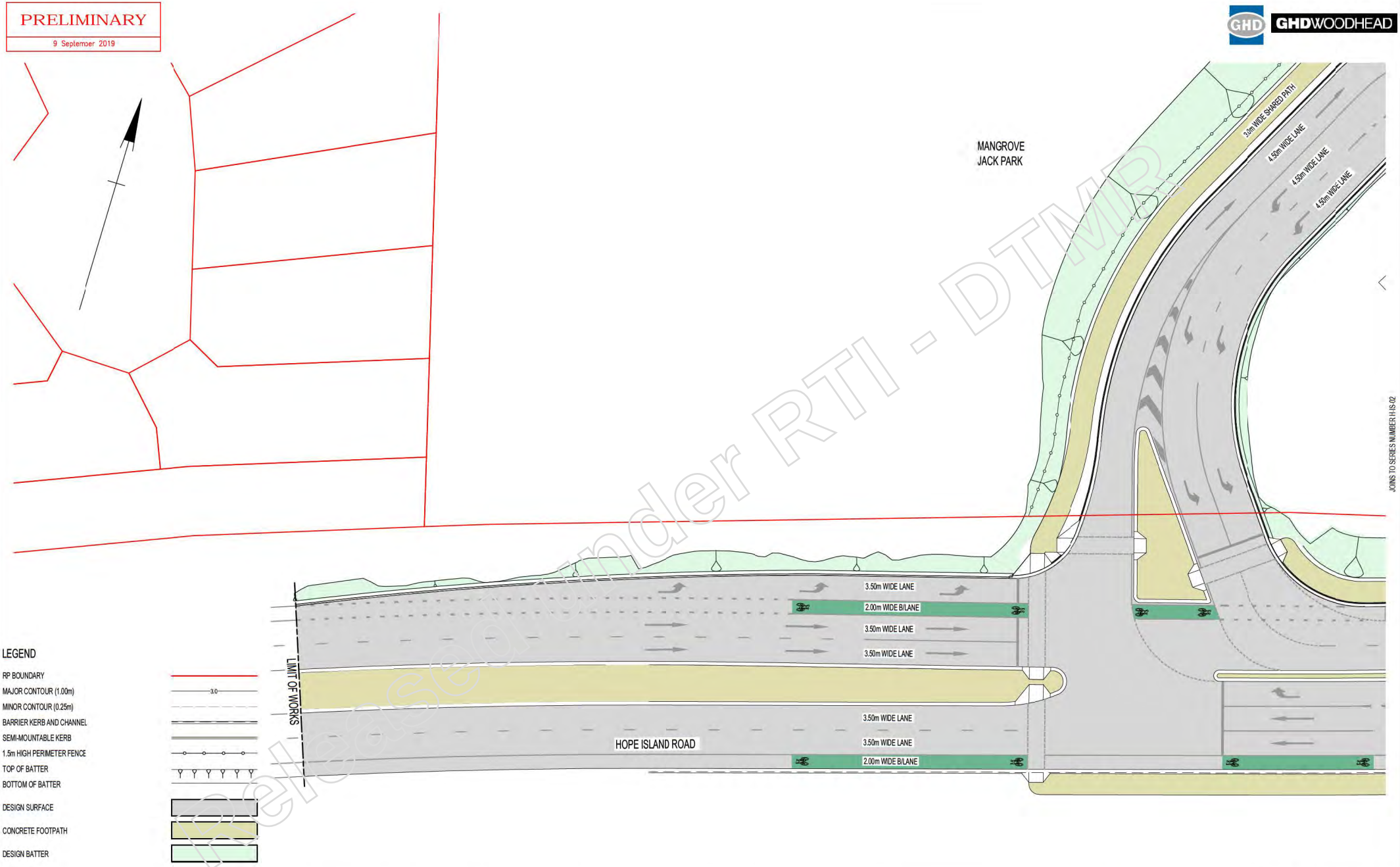
Job No.:
Contract No.:
Drawing No.: 1
Series Number: H-GA-02 of 2
MRR Detail (02/14)

Last Modified: Sep 05, 2019 - 7:18pm
XREFS:

PRELIMINARY

9 September 2019

GHD GHDWOODHEAD






| Revisions/Descriptions | Certification | Date | Microfilled |
|---|---|---|---|
| 1 REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 | |

CAD FILES: \\ghdnetghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-IS-01.dwg

Last Modified: - Sep 05, 2019 - 7:18pm

XREFS:

Associated Job Nos

Auxiliary Drg Nos

Survey Data: Datum GDA94; Horiz. Grid BCSG 2002; Height Origin AHD DERIVED; Survey Books

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

GHD project number 41-32391

CITY OF GOLD COAST

HOPE ISLAND ROAD

Reference Points

| Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP |
|---|---|---|---|---|
| | | | | |

Through Chainage from

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
INTERSECTION PLAN - SHEET 1 OF 2

Drawn: K. STEWART

Designed: B. VASTA

ENGINEERING CERTIFICATION (RPEQ)

| ENG. AREA | NAME | SIGNATURE | NO. | DATE |
|---|---|---|---|---|
| | | | | |

Queensland Government

Job No.

Contract. No.

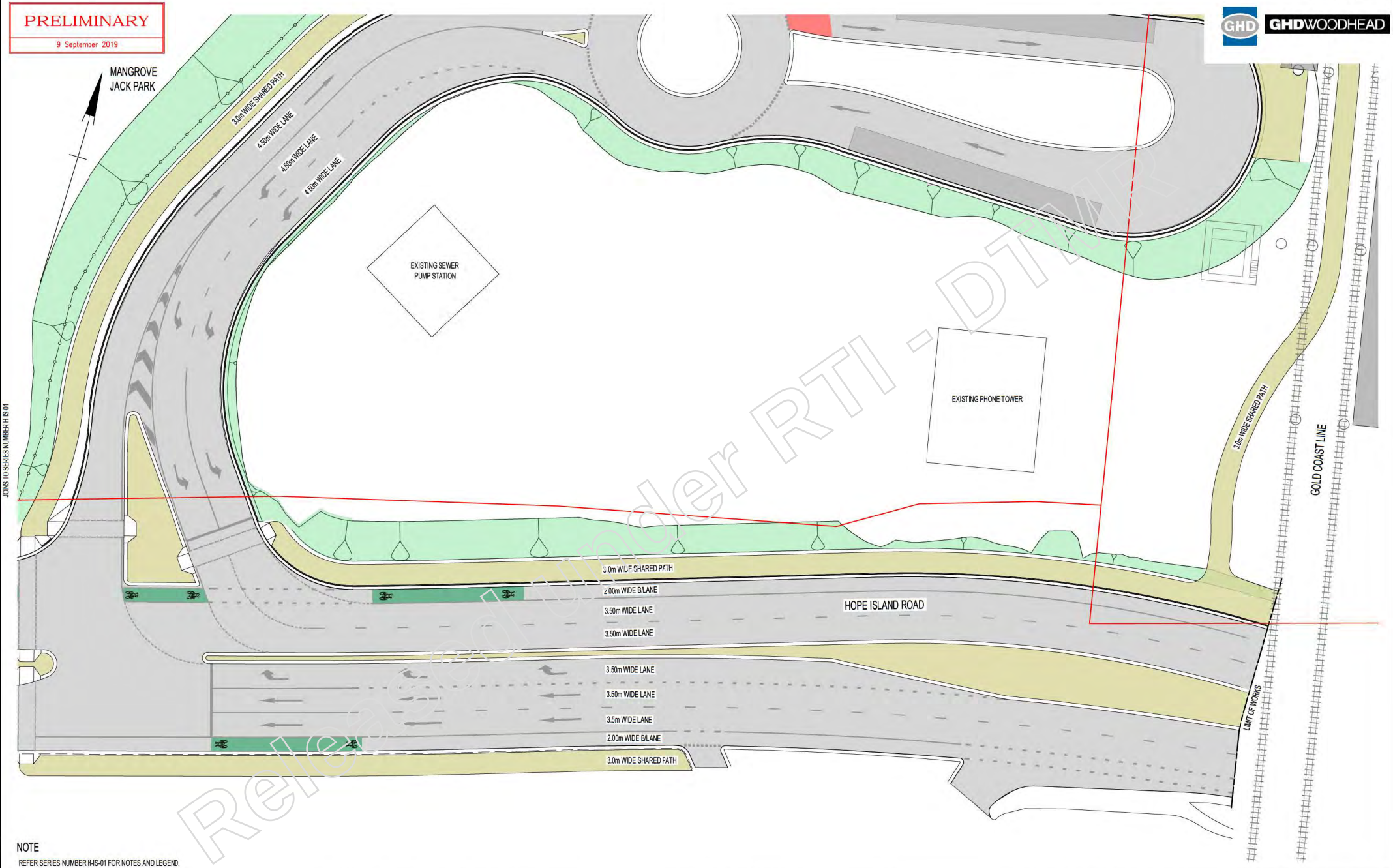
Drawing No. 1

Series Number H-IS-01 of 2

MRR_Detail (02/14)

PRELIMINARY
9 September 2019

GHD GHDWOODHEAD




JOINS TO SERIES NUMBER H-IS-01

NOTE
REFER SERIES NUMBER H-IS-01 FOR NOTES AND LEGEND.



| | | | | |
|---|---|---|---|---|
| 1 | REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 | |
| Revisons/Descriptions | | Certification | Date | Microfilled |

CAD FILES: \\ghdnetfghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-IS-02.dwg

Associated Job Nos
Auxiliary Drg Nos

Survey Data
Datum: GDA94
Horiz. Grid: BCSG 2002
Height Origin: AHD DERIVED
Survey Books

Scales
0 2 4 6 8 10m
Dimensions shown in metres except where shown otherwise

GHD project number 41-32391

CITY OF GOLD COAST
HOPE ISLAND ROAD

Reference Points

| Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP |
|---|---|---|---|---|
| | | | | |

Through Chainage from

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
INTERSECTION PLAN - SHEET 2 OF 2

Drawn: K. STEWART
Designed: B. VASTA

| ENGINEERING CERTIFICATION (RPEQ) | | | | |
|---|---|---|---|---|
| ENG. AREA | NAME | SIGNATURE | NO. | DATE |
| | | | | |

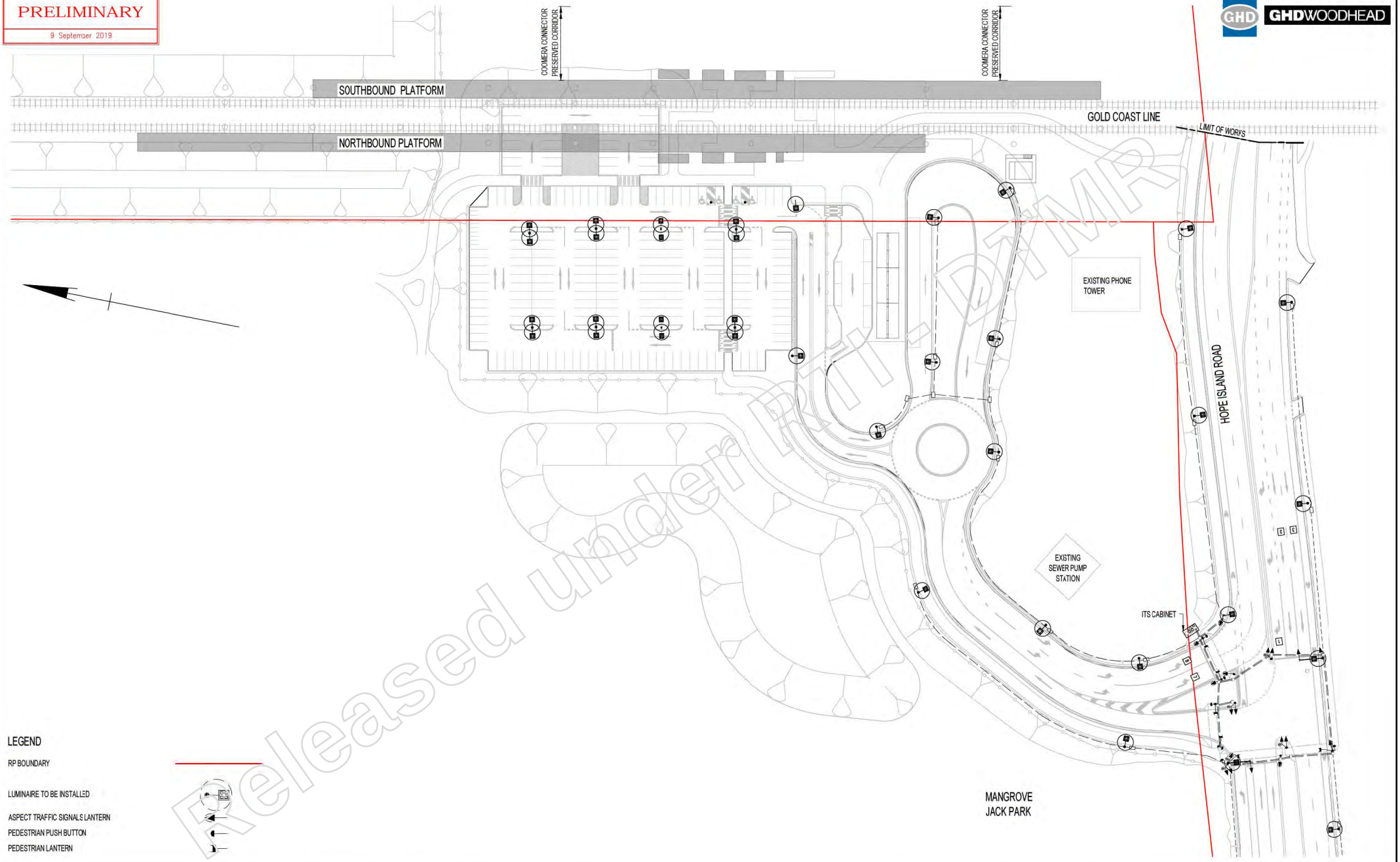
Queensland Government

Job No.
Contract. No.
Drawing No. 1
Series Number H-IS-02 of 2
MRR_Detail (02/14)

Last Modified: - Sep 05, 2019 - 7:18pm
XREFS:

PRELIMINARY
9 September 2019

GHD GHDWOODHEAD






LEGEND

RP BOUNDARY

LUMINAIRE TO BE INSTALLED

ASPECT TRAFFIC SIGNALS LANTERN

PEDESTRIAN PUSH BUTTON

PEDESTRIAN LANTERN

| Revisions/Descriptions | Certification | Date | Microfilled |
|---|---|---|---|
| 1 REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 | |

CAD FILES: \\ghdnet\ghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-IT-01.dwg

Associated Job Nos:

Auxiliary Drg Nos:

Survey Data: Datum GDA94; Horiz. Grid BCSG 2002; Height Origin AHD DERIVED; Survey Books

Scales: 0 5 10 15 20m

Dimensions shown in metres except where shown otherwise

GHD project number 41-32391

CITY OF GOLD COAST

HOPE ISLAND ROAD

Reference Points

| Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP |
|---|---|---|---|---|
| | | | | |

Through Chainage from

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
TRAFFIC SIGNALS AND ROAD LIGHTING - SHEET 1 OF 3

Drawn: K. STEWART

Designed: P.PARNELL

ENGINEERING CERTIFICATION (RPEQ)

| ENG. AREA | NAME | SIGNATURE | NO. | DATE |
|---|---|---|---|---|
| | | | | |

Queensland Government

Job No.

Contract. No.

Drawing No. 1

Series Number H-IT-01 of 3

MRR_Detail (02/14)

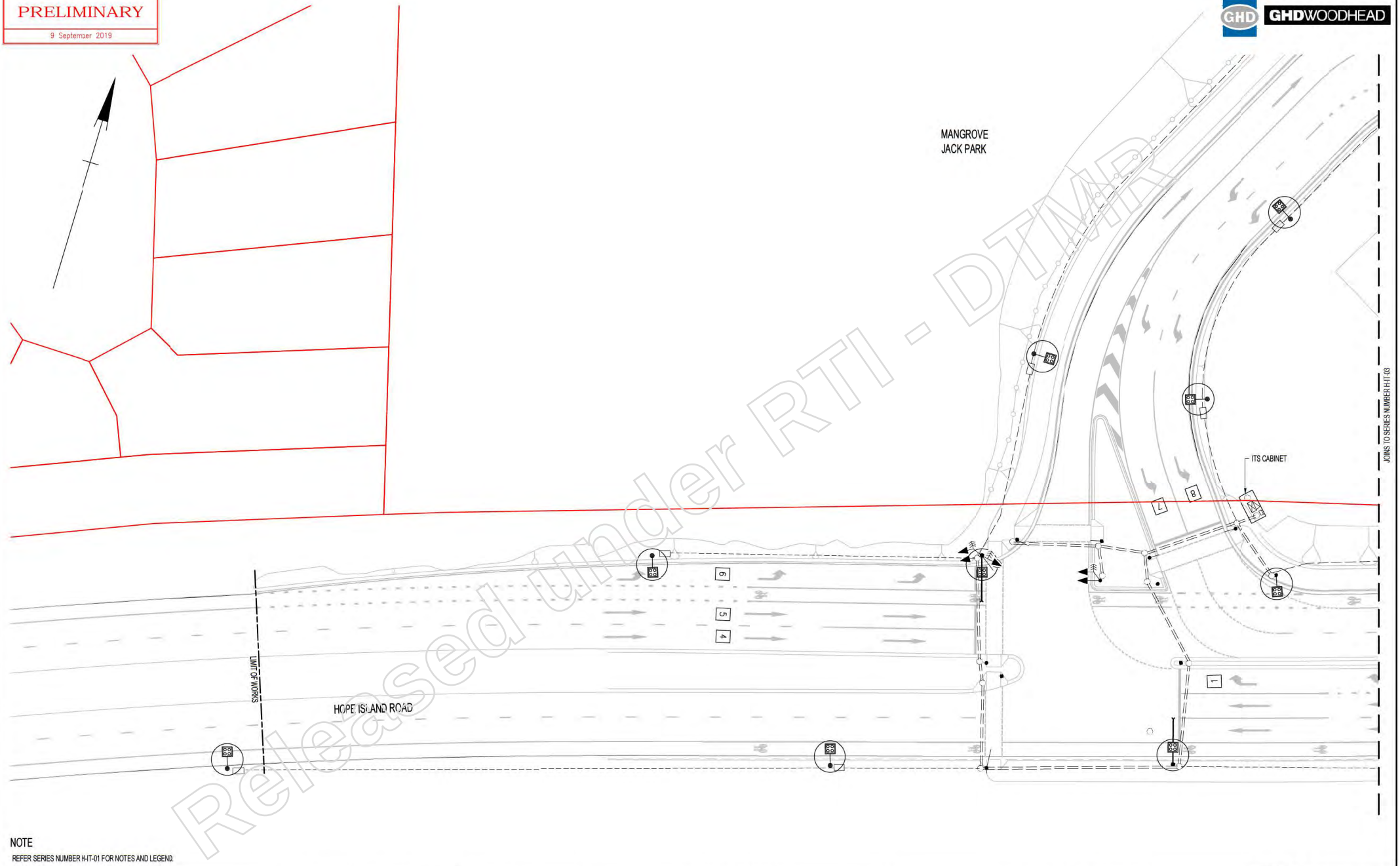
Last Modified: Sep 05, 2019 - 7:18pm

XREFS:

PRELIMINARY

9 September 2019

GHD GHDWOODHEAD






NOTE

REFER SERIES NUMBER H-IT-01 FOR NOTES AND LEGEND.

| Revisions/Descriptions | Certification | Date | Microfilled |
|---|---|---|---|
| 1 REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 | |

CAD FILES: \\ghdnetghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-IT-02.dwg

Associated Job Nos:

Auxiliary Drg Nos:

Survey Data: Datum GDA94; Horiz. Grid BCSG 2002; Height Origin AHD DERIVED; Survey Books

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

GHD project number 41-32391

CITY OF GOLD COAST

HOPE ISLAND ROAD

Reference Points

| Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP |
|---|---|---|---|---|
| | | | | |

Through Chainage from

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
TRAFFIC SIGNALS AND ROAD LIGHTING - SHEET 2 OF 3

Drawn: K. STEWART

Designed: P.PARNELL

| ENGINEERING CERTIFICATION (RPEQ) | | | | |
|---|---|---|---|---|
| ENG. AREA | NAME | SIGNATURE | NO. | DATE |
| | | | | |

Queensland Government

Job No.

Contract. No.

Drawing No. 1

Series Number H-IT-02 of 3

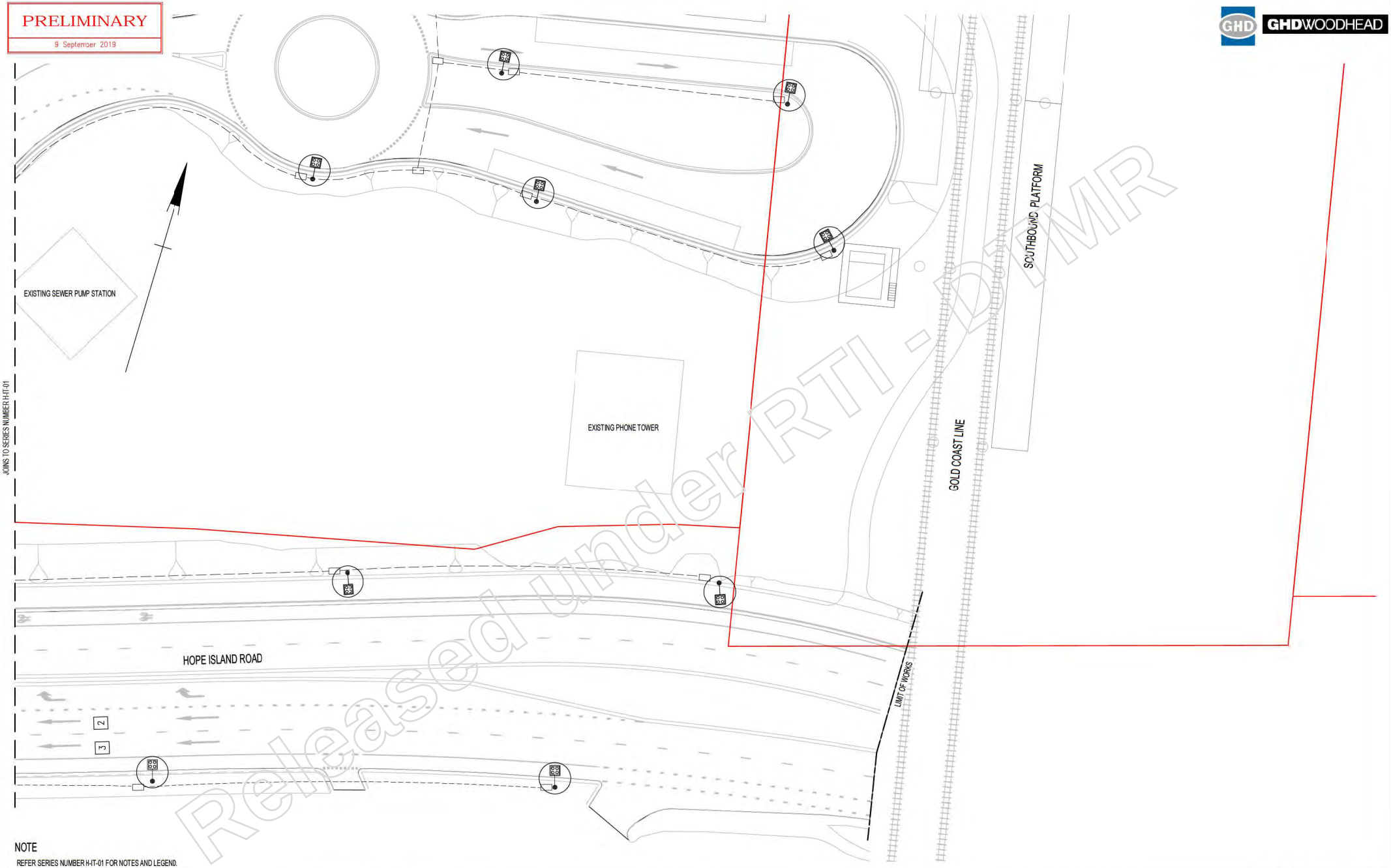
MRR_Detail (02/14)

Last Modified: Sep 05, 2019 - 7:18pm

XREFS:

PRELIMINARY
9 September 2019

GHD GHDWOODHEAD






NOTE
REFER SERIES NUMBER H-IT-01 FOR NOTES AND LEGEND.

| Revisions/Descriptions | Certification | Date | Microfilled |
|---|---|---|---|
| 1 REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 | |

CAD FILES: \\ghdnet\ghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-IT-03.dwg

Associated Job Nos:
Auxiliary Drg Nos:

Survey Data
Datum: GDA94
Horiz. Grid: BCSG 2002
Height Origin: AHD DERIVED
Survey Books:

Scales
0 2 4 6 8 10m
Dimensions shown in metres except where shown otherwise

GHD project number 41-32391

CITY OF GOLD COAST
HOPE ISLAND ROAD

Reference Points

| Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP |
|---|---|---|---|---|
| | | | | |

Through Chainage from

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
TRAFFIC SIGNALS AND ROAD LIGHTING - SHEET 3 OF 3

Drawn: K. STEWART
Designed: P.PARNELL

ENGINEERING CERTIFICATION (RPEQ)

| ENG. AREA | NAME | SIGNATURE | NO. | DATE |
|---|---|---|---|---|
| | | | | |

Queensland Government

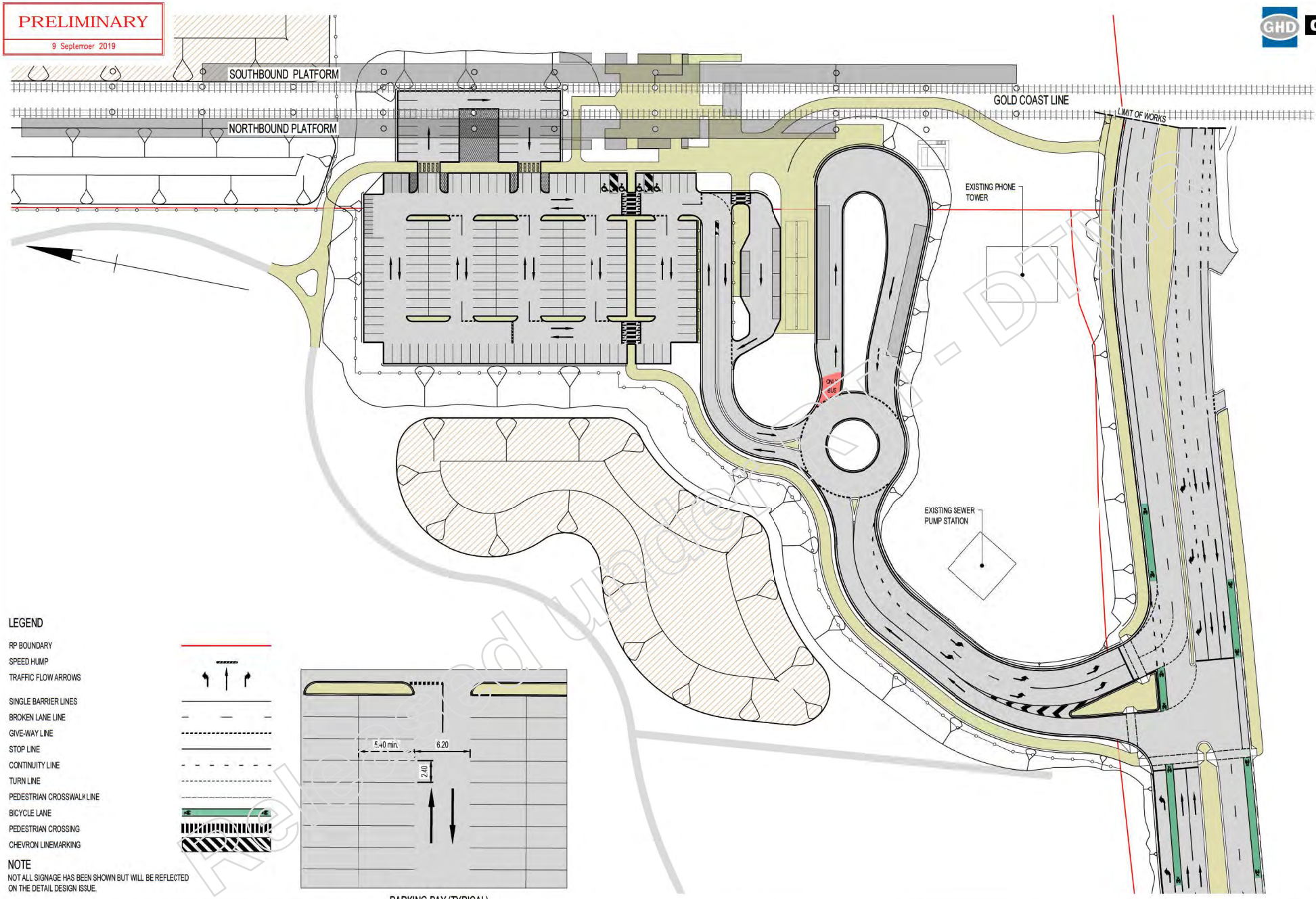
Job No.:
Contract No.:
Drawing No.: 1
Series Number: H-IT-03 of 3

MRR_Detail (02/14)

Last Modified: - Sep 05, 2019 - 7:19pm
XREFS:

PRELIMINARY
9 September 2019

GHD GHDWOODHEAD




NOTE
NOT ALL SIGNAGE HAS BEEN SHOWN BUT WILL BE REFLECTED ON THE DETAIL DESIGN ISSUE.



| | | | | |
|---|---|---|---|---|
| 1 | REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 | |
| Revisons/Descriptions | | Certification | Date | Microfilmed |

CAD FILES: \\ghdnetghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-SL-01.dwg

Associated Job Nos:
Auxiliary Drg Nos:

Survey Data: Datum GDA94; Horiz. Grid BCSG 2002; Height Origin AHD DERIVED; Survey Books

Scales: 0 2 4 6 8m; 0 5 10 15 20m
Dimensions shown in metres except where shown otherwise

GHD project number 41-32391

CITY OF GOLD COAST
OLD PACIFIC HIGHWAY

Reference Points: Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP
Through Chainage from

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
SIGNS AND LINEMARKING

Drawn: K. STEWART
Designed: B. VASTA

ENGINEERING CERTIFICATION (RPEQ): ENG. AREA | NAME | SIGNATURE | NO. | DATE

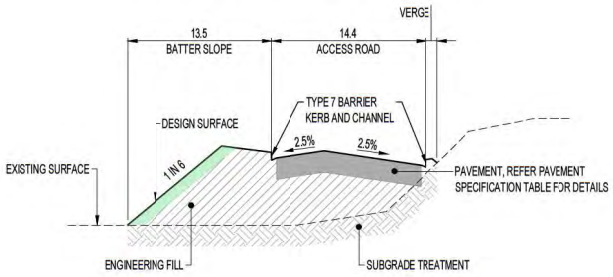
Queensland Government

Job No.
Contract. No.
Drawing No. 1
Series Number H-SL-01 of 1
MRR_Detail (02/14)

Last Modified: - Sep 05, 2019 - 7:19pm
XREFS:

PRELIMINARY
9 September 2019

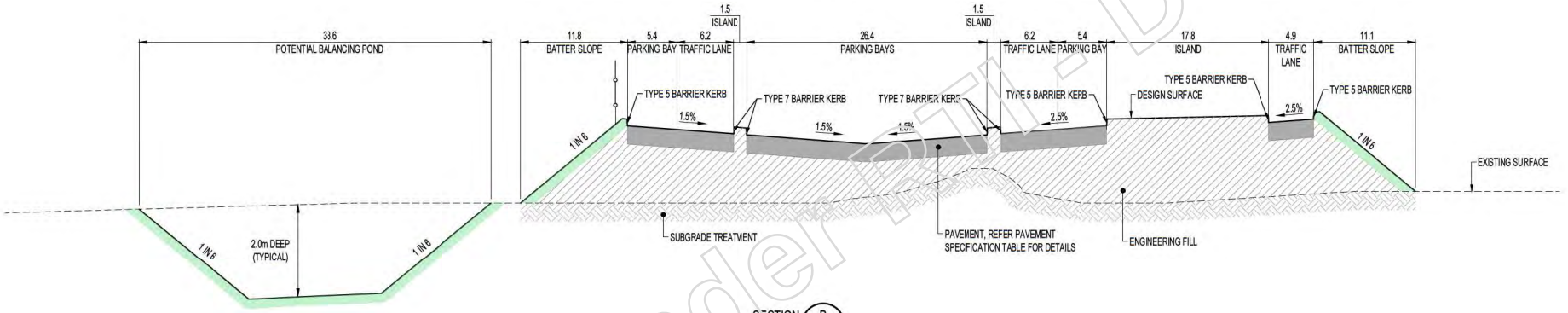
GHD GHDWOODHEAD



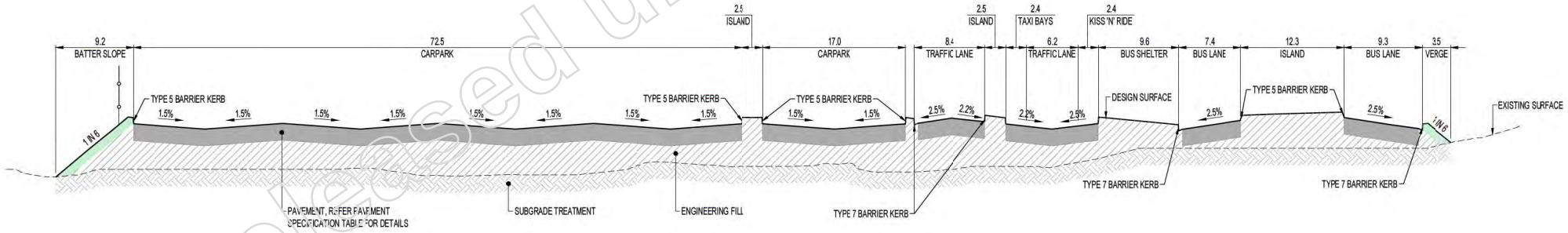

SECTION C H-GA-01

PAVEMENT SPECIFICATIONS

| TYPE | DESCRIPTION | DESIGN ESA'S | ASSUMED CBR |
|---|---|---|---|
| A | -35mm AC10M (C320) ASPHALT WEARING COURSE (MRTS30)<br>-SPECIALITY BITUMEN EMULSION PRIME AND 10mm C170 SEAL (MRTS11)<br>- 325mm TYPE 2.1 UNBOUND GRANULAR BASE (MRTS05) (1)(2) | N/A | 2 |




SECTION B H-GA-01




SECTION A H-GA-01



| Revisions/Descriptions | Certification | Date | Microfilled |
|---|---|---|---|
| 1 REFERENCE DESIGN (DRAFT) ISSUE FOR REVIEW | | 09/09/19 | |
| A ORIGINAL ISSUE | | | |

CAD FILES: \\ghdnetnghd\AU\Brisbane\Projects\41\32391\CADD\Drawings\H-TC-01.dwg

Associated Job Nos:
Auxiliary Drg Nos:

Survey Data
Datum: GDA94
Horiz. Grid: BCSG 2002
Height Origin: AHD DERIVED
Survey Books:

Scales
0 1.0 2.0m
0 2 4 6 8 10m
Dimensions shown in metres except where shown otherwise

GHD project number 41-32391

CITY OF GOLD COAST
HOPE ISLAND ROAD

Reference Points

| Preceding RP | Dist. to start of job (km) | From start to end of job | From end to Following RP | Following RP |
|---|---|---|---|---|
| | | | | |

Through Chainage from THRUCH

GOLD COAST INFILL STATIONS
HELENSVALE NORTH STATION PARK 'N' RIDE
SITE SECTIONS

Drawn: K. STEWART
Designed: B. VASTA

ENGINEERING CERTIFICATION (RPEQ)

| ENG. AREA | NAME | SIGNATURE | NO. | DATE |
|---|---|---|---|---|
| | | | | |

Queensland Government

Job No.
Contract. No.
Drawing No. 1
Series Number TCH-C01 of 1
MRR_Detail (02/14)

Last Modified: Sep 05, 2019 - 7:19pm
XREFS:

# **Appendix C** – Volume diagrams

Gold Coast Infill Stations - North Helensvale Station

5-Sep-19

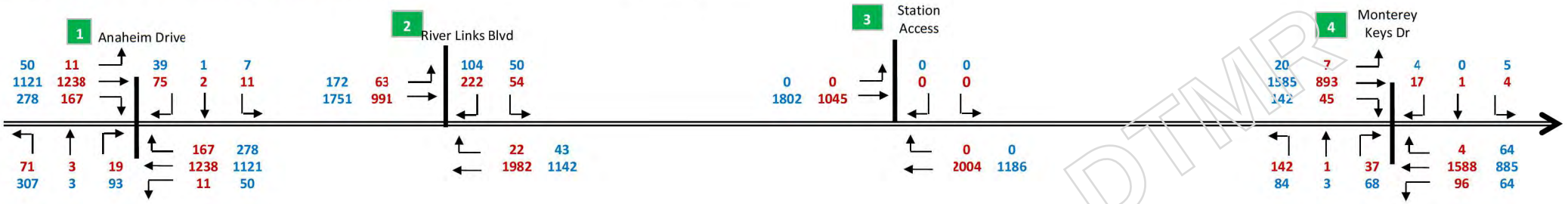
22 / 22 - AM / PM peak period (1 hr) volume

**Hope Island Road** Peak hour: **7:30 - 8:30,** 3:15-4:15

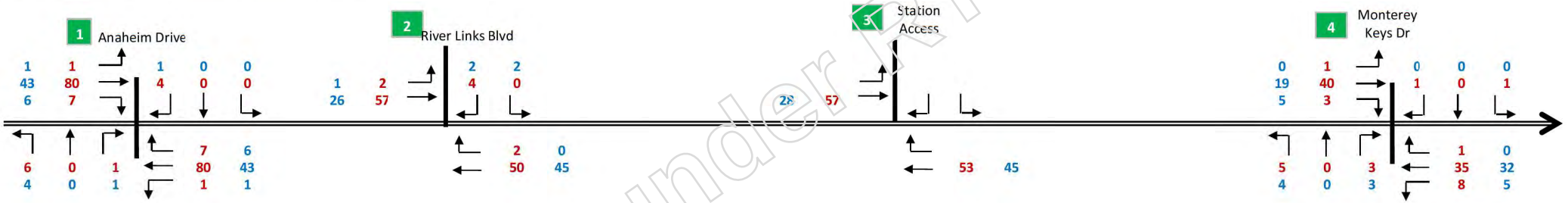
N

**2019 Background Traffic - Peak Summary - All Vehicle Classes**

Year 2019




**2019 Background Traffic - Peak Summary - Heavy Vehicles**



Gold Coast Infill Stations - North Helensvale Station

22 / 22 - AM / PM peak period (1 hr) volume

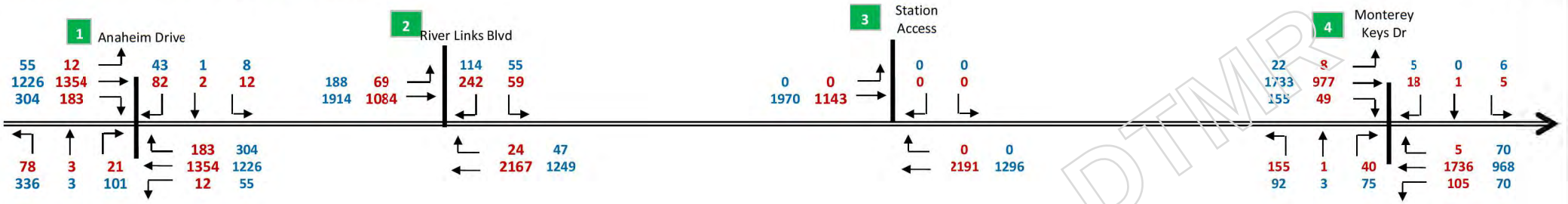
**Hope Island Road** Peak hour: **7:45 - 8:45**, 3:00-4:00

5-Sep-19

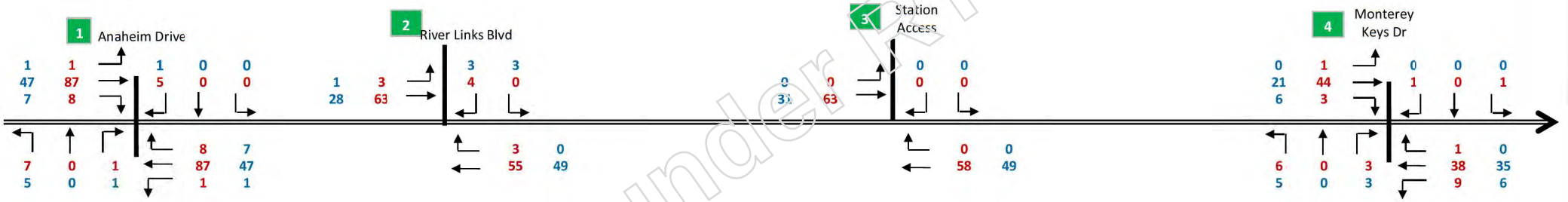
N

**2024 Background Traffic - Peak Summary - All Vehicle Classes**

Growth Rate **1.8%**




**2024 Background Traffic - Peak Summary - Heavy Vehicles**



Gold Coast Infill Stations - North Helensvale Station

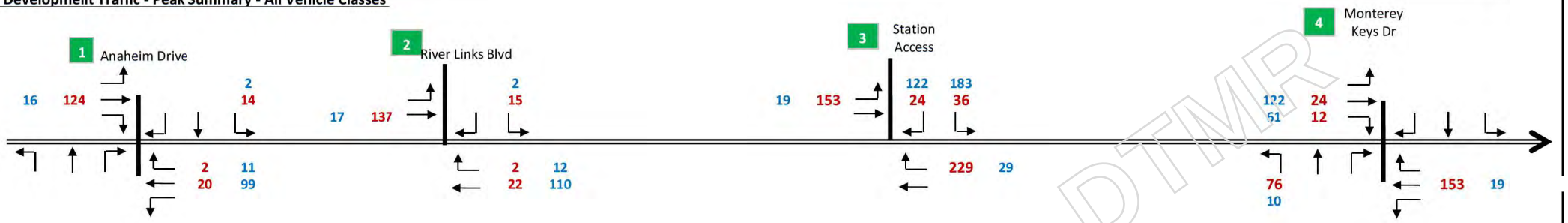
5-Sep-19

22 / 22 - AM / PM peak period (1 hr) volume

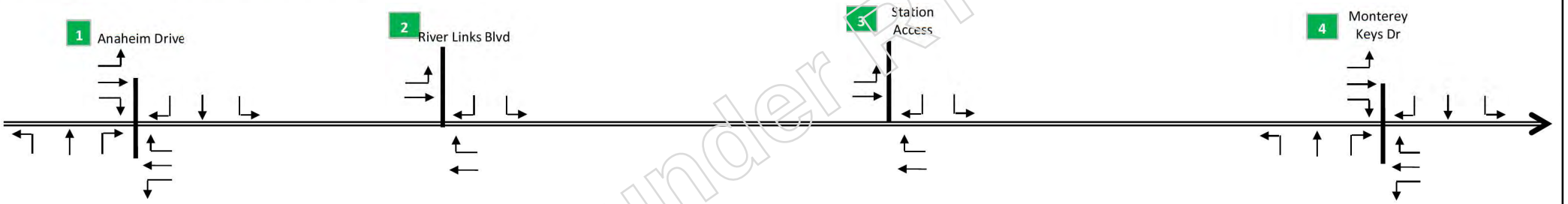
**Hope Island Road** Peak hour: **7:45 - 8:45**, 3:00-4:00

N

**2024 Development Traffic - Peak Summary - All Vehicle Classes**




**2024 Development Traffic - Peak Summary - Heavy Vehicles**



Gold Coast Infill Stations - North Helensvale Station

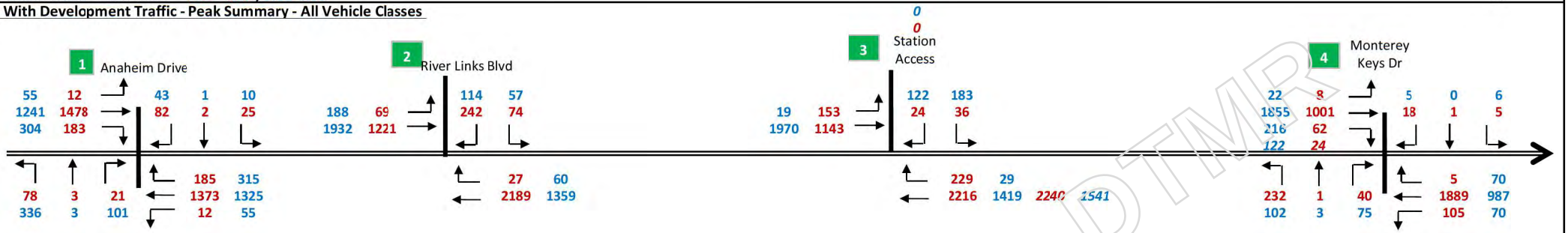
22 / 22 - AM / PM peak period (1 hr) volume

**Hope Island Road** Peak hour: **7:45 - 8:45,** 3:00-4:00

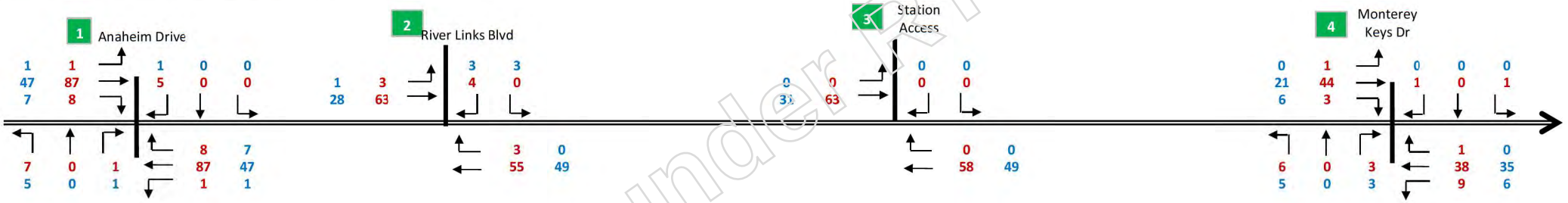
5-Sep-19

N

**2024 With Development Traffic - Peak Summary - All Vehicle Classes**




**2024 With Development Traffic - Peak Summary - Heavy Vehicles**



Gold Coast Infill Stations - North Helensvale Station

22 / 22 - AM / PM peak period (1 hr) volume

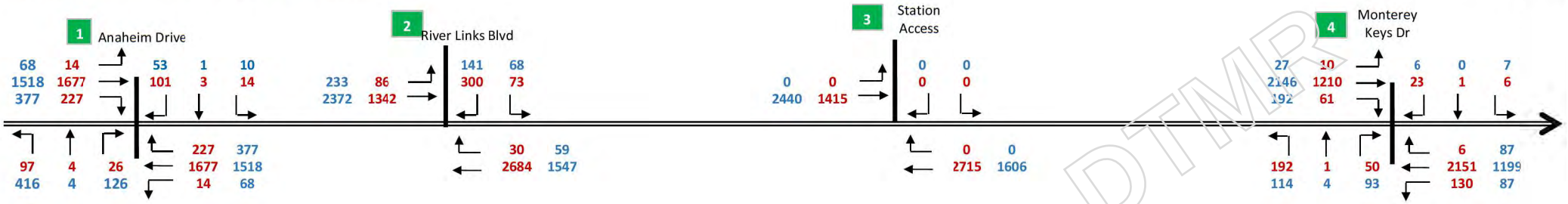
**Hope Island Road** Peak hour: **7:45 - 8:45,** 3:00-4:00

5-Sep-19

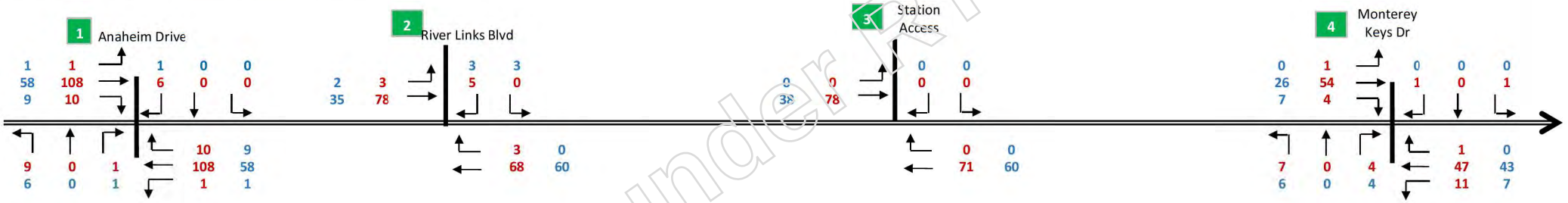
N

**2036 Background Traffic - Peak Summary - All Vehicle Classes**

Growth Rate **1.8%**




**2036 Background Traffic - Peak Summary - Heavy Vehicles**



Gold Coast Infill Stations - North Helensvale Station

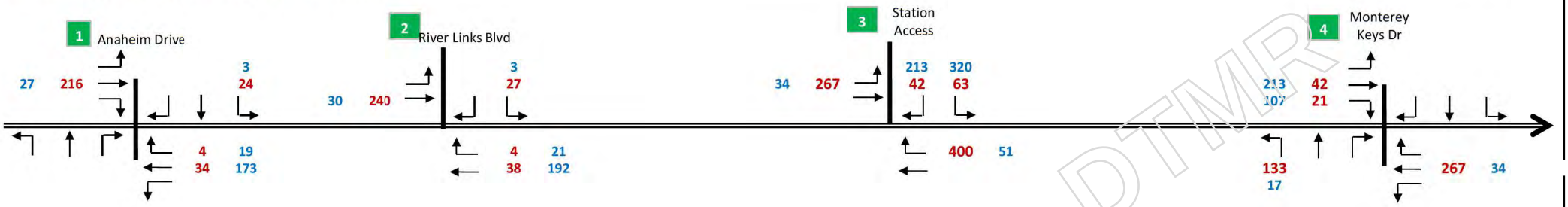
5-Sep-19

22 / 22 - AM / PM peak period (1 hr) volume

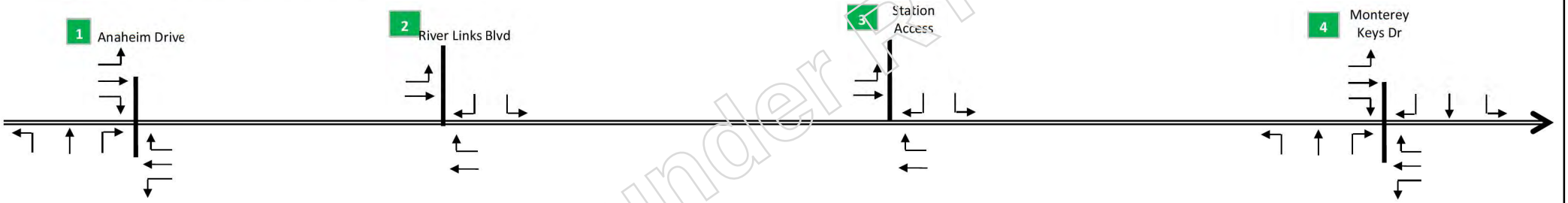
**Hope Island Road** Peak hour: **7:45 - 8:45**, 3:00-4:00

N

**2036 Development Traffic- Peak Summary - All Vehicle Classes**




**2036 Development Traffic - Peak Summary - Heavy Vehicles**



Gold Coast Infill Stations - North Helensvale Station

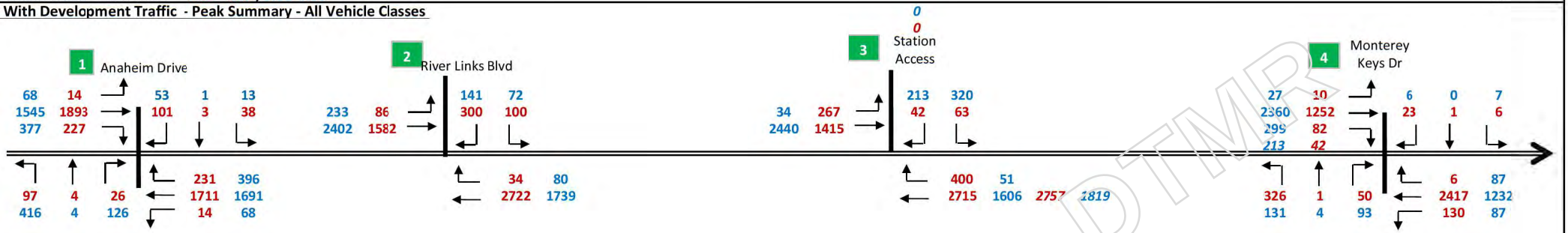
22 / 22 - AM / PM peak period (1 hr) volume

**Hope Island Road** Peak hour: **7:45 - 8:45,** 3:00-4:00

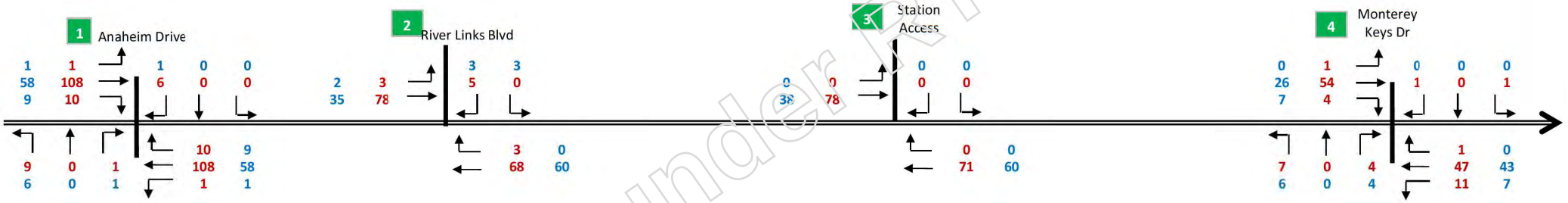
5-Sep-19

N

**2036 With Development Traffic - Peak Summary - All Vehicle Classes**




**2036 With Development Traffic - Peak Summary - Heavy Vehicles**

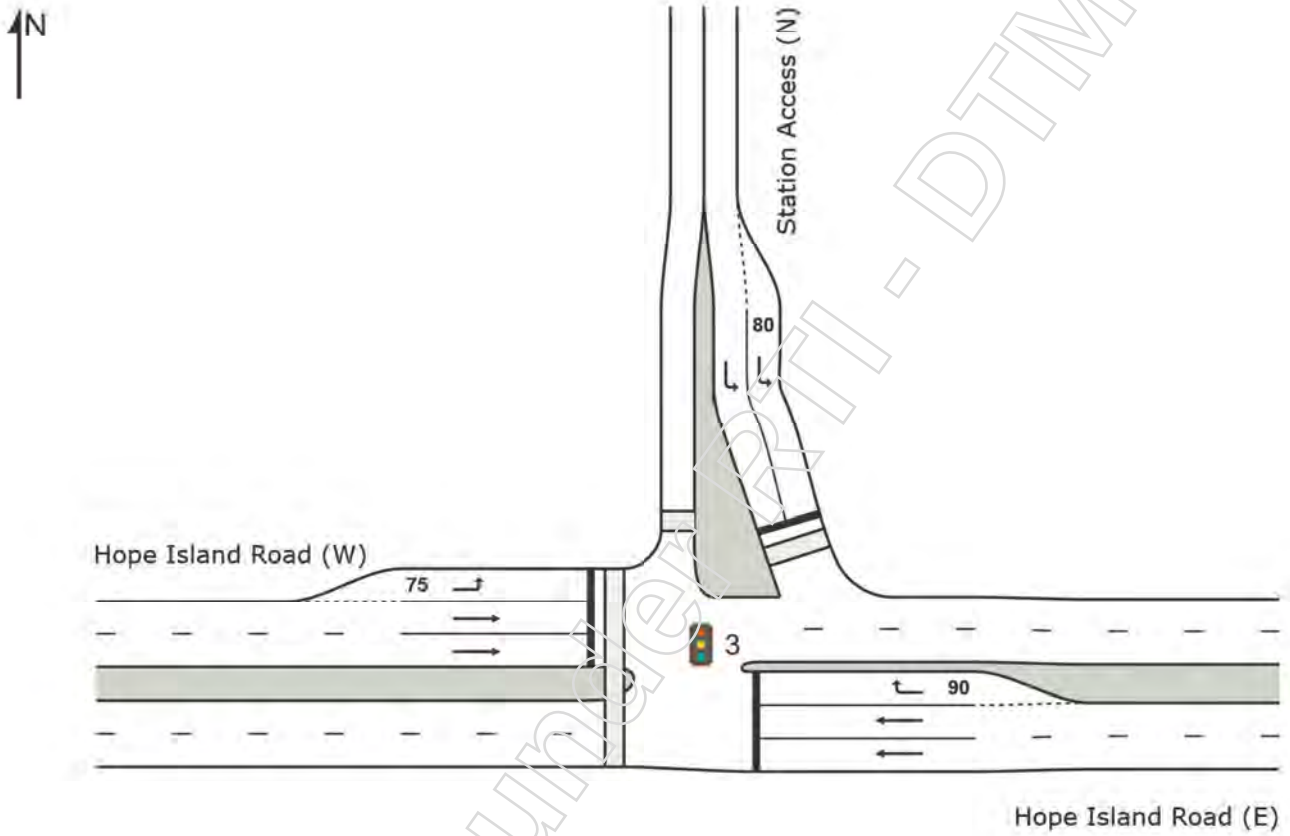


# **Appendix D** – SIDRA outputs from access and frontage assessment

# SITE LAYOUT

## Site: 3 [2024_Hope Island Rd_Station Access_AM - Reference Design ]

Hope Island Road / Infill Station Access Intersection
2024 AM Peak
2024 Post Development Scenario Assessment
Site Category: Signalised Intersection
Signals - Fixed Time Isolated





Organisation: GHD SERVICES PTY LTD | Created: Friday, 6 September 2019 10:36:59 AM
Project: G:\41\32391\Tech\Traffic\5_SIDRA Models\Helensvale\Station Access Reference Design Layout.sip8

# MOVEMENT SUMMARY

## Site: 3 [2024_Hope Island Rd_Station Access_AM - Reference Design ]

Hope Island Road / Infill Station Access Intersection
2024 AM Peak
2024 Post Development Scenario Assessment
Site Category: Signalised Intersection
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (E) | | | | | | | | | | | | |
| 5 | T1 | 2358 | 2.6 | 0.804 | 4.9 | LOS A | 30.2 | 216.4 | 0.56 | 0.53 | 0.56 | 54.4 |
| 6 | R2 | 241 | 0.0 | 0.503 | 36.9 | LOS D | 9.2 | 64.3 | 0.91 | 0.81 | 0.91 | 23.3 |
| Approach | | 2599 | 2.3 | 0.804 | 7.9 | LOS A | 30.2 | 216.4 | 0.60 | 0.56 | 0.60 | 51.1 |
| North: Station Access (N) | | | | | | | | | | | | |
| 7 | L2 | 38 | 0.0 | 0.040 | 32.6 | LOS C | 0.6 | 4.4 | 0.78 | 0.68 | 0.78 | 25.5 |
| Approach | | 38 | 0.0 | 0.040 | 32.6 | LOS C | 0.6 | 4.4 | 0.78 | 0.68 | 0.78 | 25.5 |
| West: Hope Island Road (W) | | | | | | | | | | | | |
| 10 | L2 | 161 | 0.0 | 0.146 | 14.4 | LOS B | 3.1 | 21.9 | 0.48 | 0.70 | 0.48 | 45.2 |
| 11 | T1 | 1203 | 5.5 | 0.518 | 10.6 | LOS B | 14.9 | 109.1 | 0.61 | 0.55 | 0.61 | 49.2 |
| Approach | | 1364 | 4.9 | 0.518 | 11.1 | LOS B | 14.9 | 109.1 | 0.60 | 0.57 | 0.60 | 48.7 |
| All Vehicles | | 4001 | 3.2 | 0.804 | 9.2 | LOS A | 30.2 | 216.4 | 0.60 | 0.56 | 0.60 | 49.9 |

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

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P3 | North Full Crossing | 53 | 39.3 | LOS D | 0.1 | 0.1 | 0.94 | 0.94 |
| P3B | North Slip/Bypass Lane Crossing | 53 | 39.3 | LOS D | 0.1 | 0.1 | 0.94 | 0.94 |
| P4 | West Full Crossing | 21 | 39.2 | LOS D | 0.1 | 0.1 | 0.93 | 0.93 |
| All Pedestrians | | 126 | 39.3 | LOS D | | | 0.94 | 0.94 |

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.

# PHASING SUMMARY

## Site: 3 [2024_Hope Island Rd_Station Access_AM - Reference Design ]

Hope Island Road / Infill Station Access Intersection
2024 AM Peak
2024 Post Development Scenario Assessment
Site Category: Signalised Intersection
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

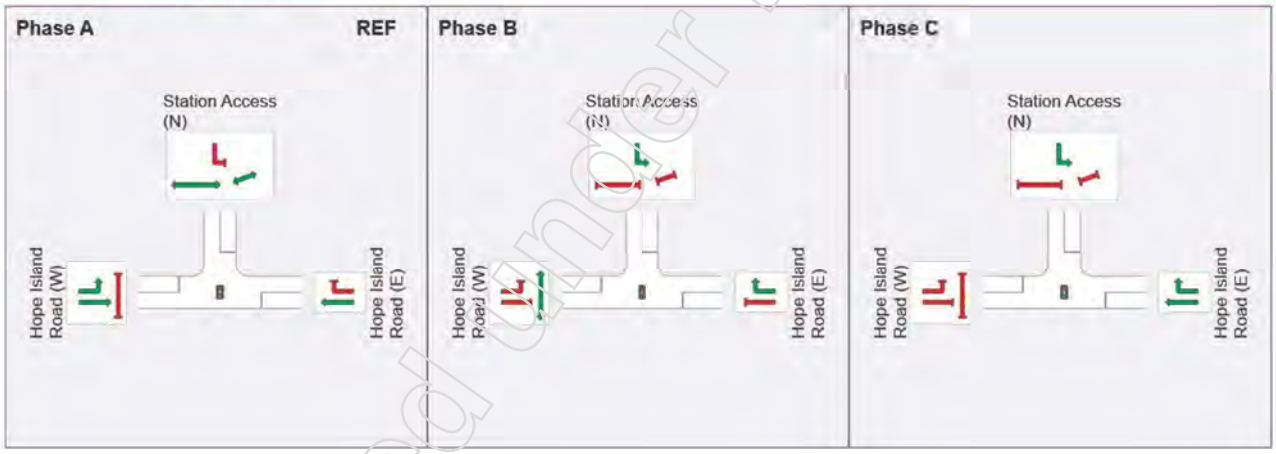
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Variable Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, B, C**

### Phase Timing Summary

| Phase | A | B | C |
|---|---|---|---|
| Phase Change Time (sec) | 0 | 61 | 73 |
| Green Time (sec) | 55 | 6 | 11 |
| Phase Time (sec) | 61 | 12 | 17 |
| Phase Split | 68% | 13% | 19% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# MOVEMENT SUMMARY

## Site: 3 [2024_Hope Island Rd_Station Access_PM - Reference Design]

Hope Island Road / Infill Station Access Intersection
2024 PM Peak
2024 Post Development Scenario Assessment
Site Category: Signalised Intersection
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (E) | | | | | | | | | | | | |
| 5 | T1 | 1622 | 3.2 | 0.600 | 7.4 | LOS A | 18.2 | 130.9 | 0.56 | 0.51 | 0.56 | 52.0 |
| 6 | R2 | 31 | 0.0 | 0.098 | 40.3 | LOS D | 1.2 | 8.1 | 0.88 | 0.71 | 0.88 | 22.1 |
| Approach | | 1653 | 3.1 | 0.600 | 8.0 | LOS A | 18.2 | 130.9 | 0.57 | 0.52 | 0.57 | 51.3 |
| North: Station Access (N) | | | | | | | | | | | | |
| 7 | L2 | 193 | 0.0 | 0.308 | 42.0 | LOS D | 3.8 | 26.7 | 0.92 | 0.77 | 0.92 | 22.0 |
| Approach | | 193 | 0.0 | 0.308 | 42.0 | LOS D | 3.8 | 26.7 | 0.92 | 0.77 | 0.92 | 22.0 |
| West: Hope Island Road (W) | | | | | | | | | | | | |
| 10 | L2 | 20 | 0.0 | 0.016 | 10.5 | LOS B | 0.3 | 1.9 | 0.34 | 0.63 | 0.34 | 48.0 |
| 11 | T1 | 2074 | 1.6 | 0.762 | 9.2 | LOS A | 29.1 | 206.3 | 0.70 | 0.65 | 0.70 | 50.4 |
| Approach | | 2094 | 1.6 | 0.762 | 9.2 | LOS A | 29.1 | 206.3 | 0.69 | 0.65 | 0.69 | 50.4 |
| All Vehicles | | 3939 | 2.1 | 0.762 | 10.3 | LOS B | 29.1 | 206.3 | 0.65 | 0.60 | 0.65 | 49.1 |

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

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P3 | North Full Crossing | 53 | 39.3 | LOS D | 0.1 | 0.1 | 0.94 | 0.94 |
| P3B | North Slip/Bypass Lane Crossing | 53 | 39.3 | LOS D | 0.1 | 0.1 | 0.94 | 0.94 |
| P4 | West Full Crossing | 53 | 39.3 | LOS D | 0.1 | 0.1 | 0.94 | 0.94 |
| All Pedestrians | | 158 | 39.3 | LOS D | | | 0.94 | 0.94 |

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.

# PHASING SUMMARY

## Site: 3 [2024_Hope Island Rd_Station Access_PM - Reference Design]

Hope Island Road / Infill Station Access Intersection
2024 PM Peak
2024 Post Development Scenario Assessment
Site Category: Signalised Intersection
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

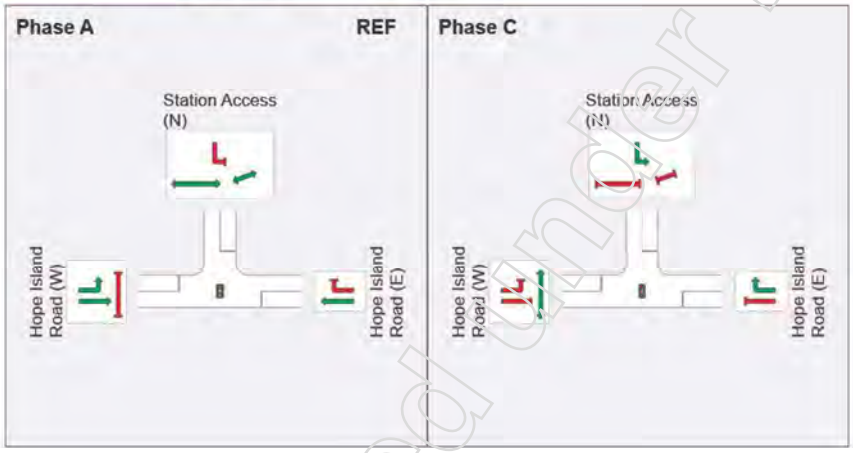
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Variable Phasing (phase reduction applied)**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, C**

### Phase Timing Summary

| Phase | A | C |
|---|---|---|
| Phase Change Time (sec) | 0 | 69 |
| Green Time (sec) | 63 | 15 |
| Phase Time (sec) | 69 | 21 |
| Phase Split | 77% | 23% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# MOVEMENT SUMMARY

## Site: 3 [2036_Hope Island Rd_Station Access_AM - Reference Design]

Hope Island Road / Infill Station Access Intersection
2036 AM Peak
2036 Post Development Scenario Assessment
Site Category: Signalised Intersection
Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (E) | | | | | | | | | | | | |
| 5 | T1 | 2902 | 2.6 | 1.067 | 114.8 | LOS F | 186.2 | 1332.3 | 1.00 | 1.44 | 1.61 | 17.6 |
| 6 | R2 | 421 | 0.0 | 1.012 | 121.2 | LOS F | 44.1 | 308.8 | 1.00 | 1.12 | 1.60 | 9.9 |
| Approach | | 3323 | 2.2 | 1.067 | 115.6 | LOS F | 186.2 | 1332.3 | 1.00 | 1.40 | 1.61 | 16.7 |
| North: Station Access (N) | | | | | | | | | | | | |
| 7 | L2 | 66 | 0.0 | 0.049 | 36.6 | LOS D | 1.4 | 10.1 | 0.68 | 0.69 | 0.68 | 23.9 |
| Approach | | 66 | 0.0 | 0.049 | 36.6 | LOS D | 1.4 | 10.1 | 0.68 | 0.69 | 0.68 | 23.9 |
| West: Hope Island Road (W) | | | | | | | | | | | | |
| 10 | L2 | 281 | 0.0 | 0.280 | 24.2 | LOS C | 10.3 | 71.8 | 0.58 | 0.74 | 0.58 | 39.2 |
| 11 | T1 | 1489 | 5.5 | 0.771 | 24.1 | LOS C | 42.5 | 311.7 | 0.80 | 0.73 | 0.80 | 40.0 |
| Approach | | 1771 | 4.6 | 0.771 | 24.1 | LOS C | 42.5 | 311.7 | 0.76 | 0.73 | 0.76 | 39.9 |
| All Vehicles | | 5160 | 3.0 | 1.067 | 83.2 | LOS F | 186.2 | 1332.3 | 0.91 | 1.16 | 1.30 | 21.2 |

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

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P3 | North Full Crossing | 53 | 64.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 |
| P3B | North Slip/Bypass Lane Crossing | 53 | 64.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 |
| P4 | West Full Crossing | 53 | 64.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 |
| All Pedestrians | | 158 | 64.3 | LOS F | | | 0.96 | 0.96 |

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.

# PHASING SUMMARY

## Site: 3 [2036_Hope Island Rd_Station Access_AM - Reference Design]

Hope Island Road / Infill Station Access Intersection
2036 AM Peak
2036 Post Development Scenario Assessment
Site Category: Signalised Intersection
Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

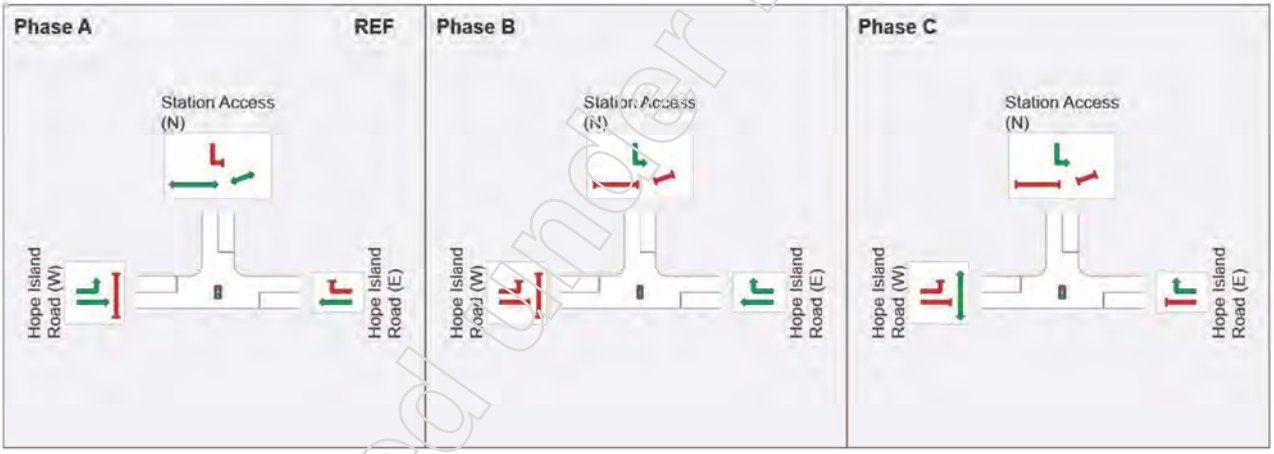
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Variable Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, B, C**

### Phase Timing Summary

| Phase | A | B | C |
|---|---|---|---|
| Phase Change Time (sec) | 0 | 84 | 115 |
| Green Time (sec) | 78 | 25 | 19 |
| Phase Time (sec) | 84 | 31 | 25 |
| Phase Split | 60% | 22% | 18% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# MOVEMENT SUMMARY

## Site: 3 [2036_Hope Island Rd_Station Access_PM - Reference Design]

Hope Island Road / Infill Station Access Intersection
2036 PM Peak
2036 Post Development Scenario Assessment
Site Category: Signalised Intersection
Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (E) | | | | | | | | | | | | |
| 5 | T1 | 1915 | 3.3 | 0.652 | 7.2 | LOS A | 29.3 | 210.8 | 0.48 | 0.45 | 0.48 | 52.2 |
| 6 | R2 | 54 | 0.0 | 0.211 | 64.2 | LOS E | 3.3 | 23.1 | 0.93 | 0.75 | 0.93 | 16.2 |
| Approach | | 1968 | 3.2 | 0.652 | 8.7 | LOS A | 29.3 | 210.8 | 0.49 | 0.46 | 0.49 | 50.7 |
| North: Station Access (N) | | | | | | | | | | | | |
| 7 | L2 | 337 | 0.0 | 0.661 | 69.1 | LOS E | 11.2 | 78.5 | 1.00 | 0.82 | 1.02 | 15.7 |
| Approach | | 337 | 0.0 | 0.661 | 69.1 | LOS E | 11.2 | 78.5 | 1.00 | 0.82 | 1.02 | 15.7 |
| West: Hope Island Road (W) | | | | | | | | | | | | |
| 10 | L2 | 36 | 0.0 | 0.025 | 9.9 | LOS A | 0.6 | 4.1 | 0.26 | 0.63 | 0.26 | 48.5 |
| 11 | T1 | 2568 | 1.6 | 0.854 | 10.6 | LOS B | 57.1 | 405.3 | 0.71 | 0.68 | 0.71 | 49.2 |
| Approach | | 2604 | 1.5 | 0.854 | 10.5 | LOS B | 57.1 | 405.3 | 0.71 | 0.68 | 0.71 | 49.2 |
| All Vehicles | | 4909 | 2.1 | 0.854 | 13.8 | LOS B | 57.1 | 405.3 | 0.64 | 0.60 | 0.64 | 46.1 |

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

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P3 | North Full Crossing | 53 | 64.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 |
| P3B | North Slip/Bypass Lane Crossing | 53 | 64.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 |
| P4 | West Full Crossing | 53 | 64.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 |
| All Pedestrians | | 158 | 64.3 | LOS F | | | 0.96 | 0.96 |

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.

# PHASING SUMMARY

## Site: 3 [2036_Hope Island Rd_Station Access_PM - Reference Design]

Hope Island Road / Infill Station Access Intersection
2036 PM Peak
2036 Post Development Scenario Assessment
Site Category: Signalised Intersection
Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

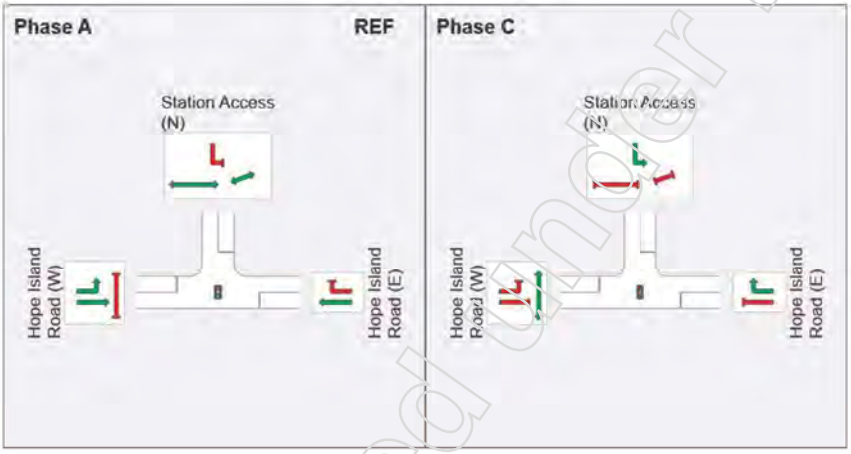
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Variable Phasing (phase reduction applied)**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, C**

### Phase Timing Summary

| Phase | A | C |
|---|---|---|
| Phase Change Time (sec) | 0 | 115 |
| Green Time (sec) | 109 | 19 |
| Phase Time (sec) | 115 | 25 |
| Phase Split | 82% | 18% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# **Appendix E** – Intersection delay assessment outputs

Gold Coast Infill Stations - North Helensvale Station
Intersection delay impact assessment
Pre-Development and Post-Development Scenario Assessments

**Hope Island Road / Anaheim Road Intersection**

Opening year 2024

| BC Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road East | Left | 12 | 39 | 452 | 55 | 40 | 2,181 |
| | Through | 1354 | 42 | 56,321 | 1226 | 40 | 49,146 |
| | Right | 183 | 61 | 11,095 | 304 | 63 | 19,144 |
| Hope Island Road west | Left | 12 | 6 | 73 | 55 | 6 | 345 |
| | Through | 1354 | 31 | 41,428 | 1226 | 24 | 28,801 |
| | Right | 183 | 32 | 5,932 | 304 | 35 | 10,774 |
| Anaheim Road North | Left | 12 | 25 | 290 | 8 | 26 | 210 |
| | Through | 2 | 19 | 45 | 1 | 20 | 24 |
| | Right | 82 | 57 | 4,653 | 43 | 64 | 2,757 |
| Shopping Centre Access south | Left | 78 | 18 | 1,367 | 336 | 18 | 6,045 |
| | Through | 3 | 42 | 146 | 3 | 49 | 171 |
| | Right | 21 | 47 | 980 | 101 | 54 | 5,458 |
| Total Aggregated Delay | | | | 122,783 | | | 125,057 |

| WD Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road East | Left | 12 | 38 | 438 | 55 | 42 | 2,302 |
| | Through | 1354 | 33 | 44,407 | 1226 | 40 | 49,514 |
| | Right | 183 | 69 | 12,578 | 304 | 73 | 22,218 |
| Hope Island Road west | Left | 12 | 6 | 71 | 55 | 6 | 345 |
| | Through | 1354 | 20 | 27,483 | 1226 | 26 | 31,375 |
| | Right | 183 | 35 | 6,426 | 304 | 37 | 11,322 |
| Anaheim Road North | Left | 12 | 30 | 353 | 8 | 27 | 217 |
| | Through | 2 | 25 | 58 | 1 | 21 | 25 |
| | Right | 82 | 91 | 7,396 | 43 | 68 | 2,938 |
| Shopping Centre Access south | Left | 78 | 17 | 1,328 | 336 | 20 | 6,784 |
| | Through | 3 | 50 | 176 | 3 | 52 | 182 |
| | Right | 21 | 55 | 1,161 | 101 | 57 | 5,793 |
| Total Aggregated Delay | | | | 101,875 | | | 133,015 |

| | AM Peak | PM Peak |
|---|---|---|
| ID | -20908 | 7959 |
| % Impact | -17% | 6% |

Gold Coast Infill Stations - North Helensvale Station
Intersection delay impact assessment
Pre-Development and Post-Development Scenario Assessments

**Hope Island Road / Anaheim Road Intersection**

Design Year 2036

| BC Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road East | Left | 14 | 45 | 649 | 68 | 49 | 3,293 |
| | Through | 1677 | 94 | 157,811 | 1518 | 147 | 222,715 |
| | Right | 227 | 99 | 22,542 | 377 | 153 | 57,532 |
| Hope Island Road west | Left | 14 | 7 | 94 | 68 | 7 | 441 |
| | Through | 1677 | 116 | 193,700 | 1518 | 112 | 169,275 |
| | Right | 227 | 74 | 16,737 | 377 | 128 | 48,182 |
| Anaheim Road North | Left | 14 | 31 | 448 | 10 | 26 | 265 |
| | Through | 3 | 26 | 74 | 1 | 21 | 30 |
| | Right | 101 | 78 | 7,846 | 53 | 71 | 3,784 |
| Shopping Centre Access south | Left | 97 | 30 | 2,913 | 416 | 31 | 12,980 |
| | Through | 4 | 44 | 192 | 4 | 46 | 200 |
| | Right | 26 | 49 | 1,282 | 126 | 51 | 6,422 |
| Total Aggregated Delay | | | | 404,288 | | | 525,118 |

| WD Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road East | Left | 14 | 43 | 621 | 68 | 49 | 3,313 |
| | Through | 1677 | 122 | 203,763 | 1518 | 158 | 239,870 |
| | Right | 227 | 191 | 43,248 | 377 | 153 | 57,532 |
| Hope Island Road west | Left | 14 | 6 | 90 | 68 | 6 | 435 |
| | Through | 1677 | 105 | 176,427 | 1518 | 193 | 292,247 |
| | Right | 227 | 181 | 41,071 | 377 | 169 | 63,866 |
| Anaheim Road North | Left | 14 | 30 | 435 | 10 | 26 | 260 |
| | Through | 3 | 25 | 71 | 1 | 20 | 29 |
| | Right | 101 | 112 | 11,345 | 53 | 71 | 3,784 |
| Shopping Centre Access south | Left | 97 | 32 | 3,049 | 416 | 31 | 12,980 |
| | Through | 4 | 44 | 192 | 4 | 46 | 200 |
| | Right | 26 | 49 | 1,282 | 126 | 51 | 6,422 |
| Total Aggregated Delay | | | | 481,592 | | | 680,936 |

| | AM Peak | PM Peak |
|---|---|---|
| ID | 77304 | 155818 |
| % Impact | 19% | 30% |

Gold Coast Infill Stations - North Helensvale Station
Intersection delay impact assessment
Pre-Development and Post-Development Scenario Assessments

**Hope Island Road / River Links Blvd Intersection**

Opening year 2024

| BC Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road east | Through | 2167 | 19 | 41,825 | 1249 | 4 | 4,496 |
| | Right | 24 | 43 | 1,048 | 47 | 46 | 2,192 |
| Hope Island Road west | Left | 69 | 17 | 1,156 | 188 | 13 | 2,394 |
| | Through | 1084 | 15 | 16,687 | 1914 | 23 | 44,033 |
| River Links Blvd North | Left | 59 | 50 | 2,926 | 55 | 48 | 2,625 |
| | Right | 242 | 50 | 12,021 | 114 | 48 | 5,432 |
| Total Aggregated Delay | | | | 75,662 | | | 61,172 |

| WD Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road east | Through | 2167 | 21 | 45,509 | 1249 | 4 | 4,746 |
| | Right | 24 | 44 | 1,082 | 47 | 47 | 2,216 |
| Hope Island Road west | Left | 69 | 16 | 1,115 | 188 | 13 | 2,394 |
| | Through | 1084 | 15 | 16,687 | 1914 | 25 | 47,096 |
| River Links Blvd North | Left | 59 | 48 | 2,831 | 55 | 48 | 2,625 |
| | Right | 242 | 48 | 11,633 | 114 | 48 | 5,432 |
| Total Aggregated Delay | | | | 78,856 | | | 64,509 |

| | AM Peak | PM Peak |
|---|---|---|
| ID | 3194 | 3337 |
| % Impact | 4% | 5% |

Gold Coast Infill Stations - North Helensvale Station
Intersection delay impact assessment
Pre-Development and Post-Development Scenario Assessments

**Hope Island Road / River Links Blvd Intersection**

Design Year 2036

| BC Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road east | Through | 2684 | 84 | 225,491 | 1547 | 4 | 6,807 |
| | Right | 30 | 69 | 2,094 | 59 | 71 | 4,190 |
| Hope Island Road west | Left | 86 | 15 | 1,312 | 233 | 12 | 2,825 |
| | Through | 1342 | 15 | 19,999 | 2372 | 56 | 132,330 |
| River Links Blvd North | Left | 73 | 115 | 8,388 | 68 | 84 | 5,717 |
| | Right | 300 | 115 | 34,464 | 141 | 84 | 11,833 |
| Total Aggregated Delay | | | | 291,749 | | | 163,702 |

| WD Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road east | Through | 2684 | 95 | 255,825 | 1547 | 5 | 7,426 |
| | Right | 30 | 65 | 1,956 | 59 | 80 | 4,672 |
| Hope Island Road west | Left | 86 | 17 | 1,424 | 233 | 12 | 2,825 |
| | Through | 1342 | 19 | 25,234 | 2372 | 64 | 150,828 |
| River Links Blvd North | Left | 73 | 151 | 11,011 | 68 | 86 | 5,888 |
| | Right | 300 | 151 | 45,242 | 141 | 86 | 12,186 |
| Total Aggregated Delay | | | | 340,691 | | | 183,825 |

| | AM Peak | PM Peak |
|---|---|---|
| ID | 48,942 | 20,123 |
| % Impact | 17% | 12% |

Gold Coast Infill Stations - North Helensvale Station
Intersection delay impact assessment
Pre-Development and Post-Development Scenario Assessments

**Hope Island Road / Monterey Keys Dr Intersection**

Opening year 2024

| BC Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road East | Left | 105 | 4 | 387 | 70 | 4 | 281 |
| | Through | 1736 | 3 | 5,903 | 968 | 4 | 3,580 |
| | Right | 5 | 10 | 47 | 70 | 10 | 723 |
| Hope Island Road west | Left | 8 | 4 | 28 | 22 | 4 | 92 |
| | Through | 977 | 3 | 3,028 | 1733 | 4 | 6,931 |
| | Right | 49 | 10 | 480 | 155 | 11 | 1,677 |
| River Clove Place | Left | 5 | 6 | 29 | 6 | 9 | 51 |
| | Through | 1 | 6 | 6 | 0 | 9 | 0 |
| | Right | 18 | 12 | 226 | 5 | 15 | 70 |
| Monterey keys Road | Left | 155 | 9 | 1,460 | 92 | 6 | 571 |
| | Through | 1 | 9 | 10 | 3 | 6 | 20 |
| | Right | 40 | 16 | 644 | 75 | 13 | 935 |
| Total Aggregated Delay | | | | 12,250 | | | 14,930 |

| WD Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road East | Left | 105 | 4 | 429 | 70 | 5 | 358 |
| | Through | 1736 | 4 | 6,597 | 968 | 5 | 4,741 |
| | Right | 5 | 11 | 50 | 70 | 12 | 814 |
| Hope Island Road west | Left | 8 | 4 | 28 | 22 | 5 | 101 |
| | Through | 977 | 3 | 3,028 | 1733 | 5 | 8,144 |
| | Right | 49 | 10 | 480 | 155 | 12 | 1,833 |
| | U-Turn | 122 | 12 | 1,491 | 122 | 14 | 1,748 |
| River Clove Place | Left | 5 | 6 | 29 | 6 | 12 | 66 |
| | Through | 1 | 6 | 6 | 0 | 11 | 0 |
| | Right | 18 | 12 | 228 | 5 | 18 | 82 |
| Monterey keys Road | Left | 155 | 14 | 2,174 | 92 | 7 | 626 |
| | Through | 1 | 14 | 16 | 3 | 7 | 22 |
| | Right | 40 | 21 | 834 | 75 | 13 | 987 |
| Total Aggregated Delay | | | | 15,391 | | | 19,522 |

| | AM Peak | PM Peak |
|---|---|---|
| ID | 3,141 | 4,592 |
| % Impact | 26% | 31% |

Gold Coast Infill Stations - North Helensvale Station
Intersection delay impact assessment
Pre-Development and Post-Development Scenario Assessments

**Hope Island Road / Monterey Keys Dr Intersection**

Design Year 2036

| BC Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road East | Left | 130 | 4 | 545 | 87 | 4 | 374 |
| | Through | 2151 | 4 | 8,172 | 1199 | 4 | 4,794 |
| | Right | 6 | 11 | 62 | 87 | 11 | 930 |
| Hope Island Road west | Left | 10 | 4 | 35 | 27 | 8 | 214 |
| | Through | 1210 | 3 | 3,872 | 2146 | 8 | 17,814 |
| | Right | 61 | 10 | 601 | 192 | 16 | 3,078 |
| River Clove Place | Left | 7 | 7 | 49 | 114 | 15 | 1,744 |
| | Through | 0 | 6 | 0 | 4 | 15 | 65 |
| | Right | 6 | 13 | 74 | 93 | 22 | 2,010 |
| Monterey keys Road | Left | 114 | 19 | 2,189 | 7 | 7 | 53 |
| | Through | 4 | 19 | 80 | 0 | 7 | 0 |
| | Right | 93 | 26 | 2,409 | 6 | 14 | 79 |
| Total Aggregated Delay | | | | 18,086 | | | 31,156 |

| WD Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road East | Left | 130 | 8 | 1,089 | 87 | 9 | 817 |
| | Through | 2151 | 9 | 19,570 | 1199 | 10 | 11,386 |
| | Right | 6 | 17 | 99 | 87 | 17 | 1,443 |
| Hope Island Road west | Left | 10 | 3 | 34 | 27 | 110 | 2,984 |
| | Through | 1210 | 3 | 3,751 | 2146 | 111 | 237,381 |
| | Right | 61 | 10 | 594 | 192 | 119 | 22,818 |
| | U-Turn | 42 | 12 | 514 | 213 | 121 | 25,844 |
| River Clove Place | Left | 7 | 7 | 52 | 114 | 22 | 2,463 |
| | Through | 0 | 7 | 0 | 4 | 22 | 92 |
| | Right | 6 | 13 | 76 | 93 | 28 | 2,603 |
| Monterey keys Road | Left | 114 | 753 | 85,795 | 7 | 11 | 80 |
| | Through | 4 | 752 | 3,216 | 0 | 11 | 0 |
| | Right | 93 | 759 | 70,338 | 6 | 18 | 100 |
| Total Aggregated Delay | | | | 185,129 | | | 308,011 |

| | AM Peak | PM Peak |
|---|---|---|
| ID | 167,043 | 276,855 |
| % Impact | 924% | 889% |

Gold Coast Infill Stations - North Helensvale Station
Intersection delay impact assessment
Pre-Development and Post-Development Scenario Assessments

**Hope Island Road / Station Access Intersection**

Opening year 2024

| BC Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road East | Through | 2191 | 0 | 0 | 1296 | 0 | 0 |
| | Right | 0 | 0 | 0 | 0 | 0 | 0 |
| Hope Island Road west | Left | 0 | 0 | 0 | 0 | 0 | 0 |
| | Through | 1143 | 0 | 0 | 1970 | 0 | 0 |
| Station Access north | Left | 0 | 0 | 0 | 0 | 0 | 0 |
| | Right | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Aggregated Delay | | | | 0 | | | 0 |

| WD Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road East | Through | 2240 | 5 | 10,975 | 1541 | 5 | 7,550 |
| | Right | 229 | 37 | 8,455 | 29 | 37 | 1,068 |
| Hope Island Road west | Left | 153 | 14 | 2,200 | 19 | 14 | 278 |
| | Through | 1143 | 11 | 12,111 | 1970 | 11 | 20,878 |
| Station Access north | Left | 36 | 33 | 1,179 | 183 | 33 | 5,976 |
| | Right | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Aggregated Delay | | | | 34,920 | | | 35,750 |

| | AM Peak | PM Peak |
|---|---|---|
| ID | 34,920 | 35,750 |
| % Impact | - | - |

Gold Coast Infill Stations - North Helensvale Station
Intersection delay impact assessment
Pre-Development and Post-Development Scenario Assessments

**Hope Island Road / Station Access Intersection**

Design Year 2036

| BC Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road East | Through | 2715 | 0 | 0 | 1606 | 0 | 0 |
| | Right | 0 | 0 | 0 | 0 | 0 | 0 |
| Hope Island Road west | Left | 0 | 0 | 0 | 0 | 0 | 0 |
| | Through | 1415 | 0 | 0 | 2440 | 0 | 0 |
| Station Access north | Left | 0 | 0 | 0 | 0 | 0 | 0 |
| | Right | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Aggregated Delay | | | | 0 | | | 0 |

| WD Delay Aggregation | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| Approach | Movement | Demand | Delay | Aggregated Delay | Demand | Delay | Aggregated Delay |
| Hope Island Road East | Through | 2757 | 115 | 316,471 | 1819 | 7 | 13,099 |
| | Right | 400 | 121 | 48,497 | 51 | 64 | 3,245 |
| Hope Island Road west | Left | 267 | 24 | 6,456 | 34 | 10 | 334 |
| | Through | 1415 | 24 | 34,108 | 2440 | 11 | 25,862 |
| Station Access north | Left | 63 | 37 | 2,312 | 320 | 69 | 22,120 |
| | Right | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Aggregated Delay | | | | 407,844 | | | 64,659 |

| | AM Peak | PM Peak |
|---|---|---|
| ID | 407,844 | 64,659 |
| % Impact | - | - |

Gold Coast Infill Stations - North Helensvale Station
Intersection delay impact assessment
Pre-Development and Post-Development Scenario Assessments

**Total delay aggregation**

Design Year 2024

| Intersection | Pre-development | | Post-development | |
|---|---|---|---|---|
| | AM | PM | AM | PM |
| Anaheim Road | 34 | 35 | 28 | 37 |
| Riverlinks Blvd | 21 | 17 | 22 | 18 |
| Monterey Keys Dr | 3 | 4 | 4 | 5 |
| Station Access Intersection | - | - | 10 | 10 |
| Total intersection delay | 59 | 56 | 64 | 70 |
| Intersection delay impacts | - | - | 6 | 14 |
| % Impact | | | 10% | 26% |

Design Year 2036

| Intersection | Pre-development | | Post-development | |
|---|---|---|---|---|
| | AM | PM | AM | PM |
| Anaheim Road | 112 | 146 | 134 | 189 |
| Riverlinks Blvd | 81 | 45 | 95 | 51 |
| Monterey Keys Dr | 5 | 9 | 51 | 86 |
| Station Access Intersection | - | - | 113 | 18 |
| Total intersection delay | 198 | 200 | 393 | 344 |
| Intersection delay impacts | - | - | 195 | 144 |
| % Impact | | | 98% | 72% |

# MOVEMENT SUMMARY

## Site: 1 [2024_HIR_Anaheim Dr_AM Peak - Predev]

Hope Island Road /Anaheim Drive Intersection
2024 AM Peak
Predevelopment Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Shopping Centre Access (South) | | | | | | | | | | | | |
| 1 | L2 | 82 | 9.0 | 0.123 | 17.5 | LOS B | 2.0 | 15.0 | 0.58 | 0.69 | 0.58 | 28.8 |
| 2 | T1 | 3 | 0.0 | 0.053 | 41.7 | LOS D | 0.6 | 4.0 | 0.90 | 0.67 | 0.90 | 12.5 |
| 3 | R2 | 22 | 4.8 | 0.053 | 46.7 | LOS D | 0.6 | 4.0 | 0.90 | 0.67 | 0.90 | 25.9 |
| Approach | | 107 | 7.8 | 0.123 | 24.2 | LOS C | 2.0 | 15.0 | 0.66 | 0.69 | 0.66 | 27.1 |
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 4 | L2 | 13 | 8.3 | 0.009 | 6.3 | LOS A | 0.1 | 0.4 | 0.16 | 0.57 | 0.16 | 48.2 |
| 5 | T1 | 1425 | 6.4 | 0.856 | 30.6 | LOS C | 37.4 | 276.5 | 0.91 | 0.91 | 1.02 | 35.1 |
| 6 | R2 | 193 | 4.4 | 0.756 | 32.4 | LOS C | 5.7 | 41.7 | 1.00 | 0.87 | 1.15 | 31.0 |
| Approach | | 1631 | 6.2 | 0.856 | 30.7 | LOS C | 37.4 | 276.5 | 0.91 | 0.90 | 1.03 | 34.7 |
| North: Anaheim Drive (North) | | | | | | | | | | | | |
| 7 | L2 | 13 | 0.0 | 0.037 | 24.9 | LOS C | 0.4 | 2.8 | 0.81 | 0.66 | 0.81 | 35.4 |
| 8 | T1 | 2 | 0.0 | 0.037 | 19.4 | LOS B | 0.4 | 2.8 | 0.81 | 0.66 | 0.81 | 19.4 |
| 9 | R2 | 86 | 6.1 | 0.600 | 57.0 | LOS E | 4.4 | 32.2 | 1.00 | 0.79 | 1.06 | 15.0 |
| Approach | | 101 | 5.2 | 0.600 | 52.2 | LOS D | 4.4 | 32.2 | 0.97 | 0.77 | 1.02 | 17.2 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 13 | 8.3 | 0.466 | 38.8 | LOS D | 11.6 | 85.9 | 0.83 | 0.73 | 1.21 | 13.5 |
| 11 | T1 | 1425 | 6.4 | 0.884 | 41.6 | LOS D | 31.8 | 234.9 | 0.96 | 0.98 | 1.21 | 30.6 |
| 12 | R2 | 193 | 4.4 | 0.756 | 60.6 | LOS E | 5.1 | 37.1 | 1.00 | 0.87 | 1.24 | 13.1 |
| Approach | | 1631 | 6.2 | 0.884 | 43.8 | LOS D | 31.8 | 234.9 | 0.96 | 0.97 | 1.21 | 28.5 |
| All Vehicles | | 3469 | 6.2 | 0.884 | 37.3 | LOS D | 37.4 | 276.5 | 0.93 | 0.92 | 1.10 | 30.9 |

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

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Pedestrian Back of Queue ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 44.3 | LOS E | 0.1 | 0.1 | 0.94 | 0.94 |
| P3 | North Full Crossing | 53 | 44.3 | LOS E | 0.1 | 0.1 | 0.94 | 0.94 |
| P4 | West Full Crossing | 53 | 44.3 | LOS E | 0.1 | 0.1 | 0.94 | 0.94 |
| All Pedestrians | | 158 | 44.3 | LOS E | | | 0.94 | 0.94 |

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.

# PHASING SUMMARY

## Site: 1 [2024_HIR_Anaheim Dr_AM Peak - Predev]

Hope Island Road /Anaheim Drive Intersection
2024 AM Peak
Predevelopment Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)

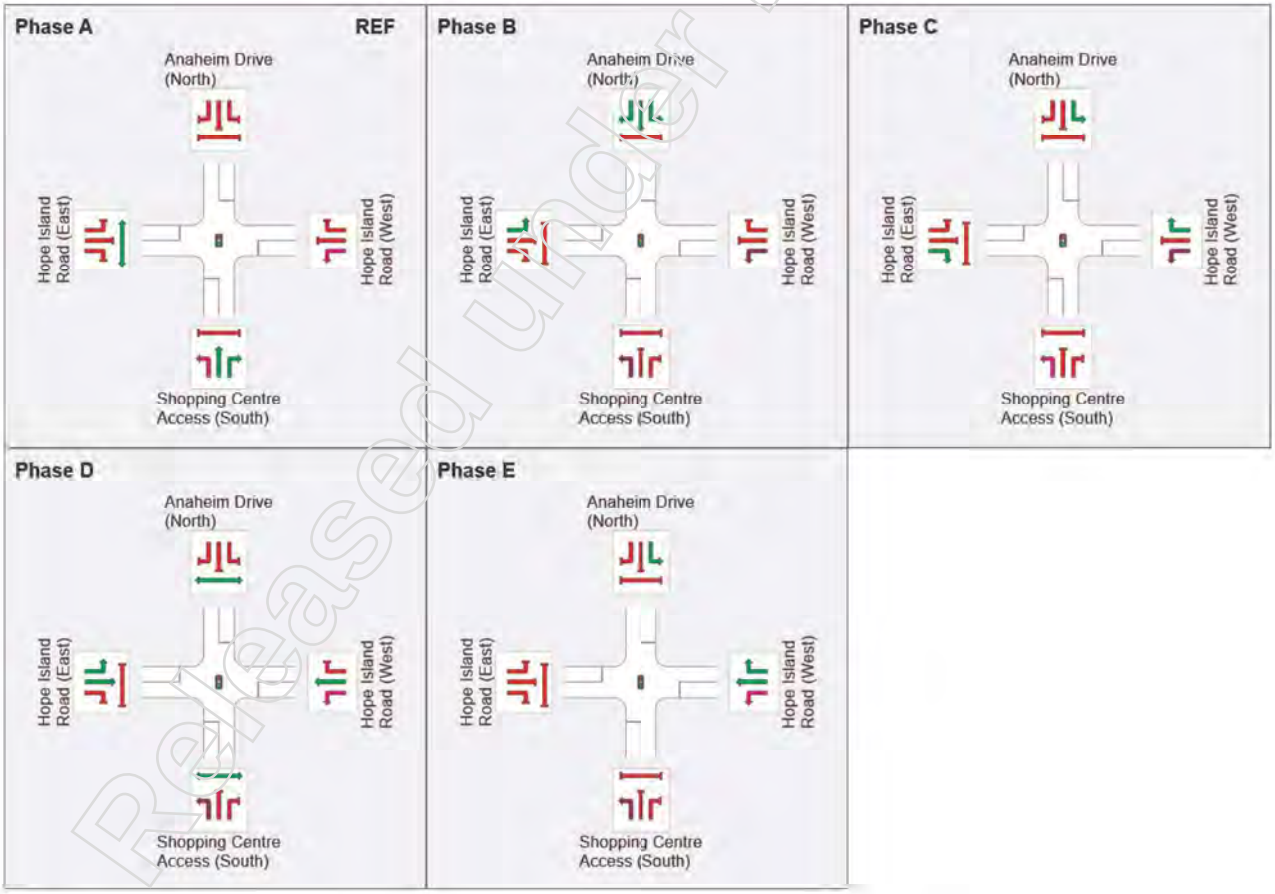
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C, D, E**
**Output Phase Sequence: A, B, C, D, E**

### Phase Timing Summary

| Phase | A | B | C | D | E |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 19 | 33 | 46 | 87 |
| Green Time (sec) | 13 | 8 | 7 | 35 | 7 |
| Phase Time (sec) | 19 | 14 | 13 | 41 | 13 |
| Phase Split | 19% | 14% | 13% | 41% | 13% |

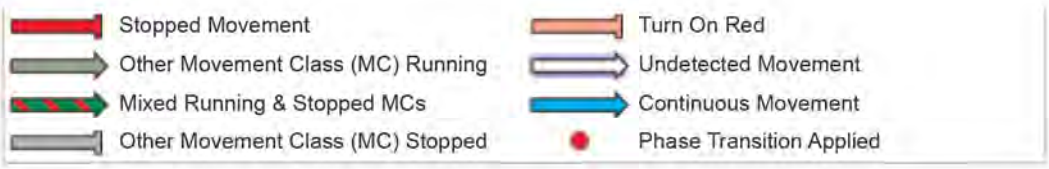
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane



# MOVEMENT SUMMARY

## Site: 1 [2024_HIR_Anaheim Dr_PM Peak - Predev]

Hope Island Road /Anaheim Drive Intersection
2024 PM Peak
Predevelopment Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Shopping Centre Access (South) | | | | | | | | | | | | |
| 1 | L2 | 354 | 1.5 | 0.467 | 18.0 | LOS B | 10.5 | 74.5 | 0.66 | 0.76 | 0.66 | 29.0 |
| 2 | T1 | 3 | 0.0 | 0.248 | 48.8 | LOS D | 2.8 | 19.4 | 0.95 | 0.74 | 0.95 | 10.9 |
| 3 | R2 | 106 | 1.0 | 0.248 | 53.8 | LOS D | 2.8 | 19.4 | 0.95 | 0.74 | 0.95 | 23.8 |
| Approach | | 463 | 1.4 | 0.467 | 26.4 | LOS C | 10.5 | 74.5 | 0.73 | 0.76 | 0.73 | 26.7 |
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 4 | L2 | 58 | 1.8 | 0.039 | 6.3 | LOS A | 0.3 | 2.2 | 0.16 | 0.59 | 0.16 | 48.3 |
| 5 | T1 | 1291 | 3.8 | 0.782 | 23.5 | LOS C | 32.8 | 237.5 | 0.83 | 0.76 | 0.85 | 38.9 |
| 6 | R2 | 320 | 2.3 | 0.829 | 35.4 | LOS D | 11.4 | 81.4 | 1.00 | 0.92 | 1.17 | 29.8 |
| Approach | | 1668 | 3.5 | 0.829 | 25.2 | LOS C | 32.8 | 237.5 | 0.84 | 0.78 | 0.88 | 37.1 |
| North: Anaheim Drive (North) | | | | | | | | | | | | |
| 7 | L2 | 8 | 0.0 | 0.023 | 25.7 | LOS C | 0.3 | 1.9 | 0.79 | 0.65 | 0.79 | 34.8 |
| 8 | T1 | 1 | 0.0 | 0.023 | 20.2 | LOS C | 0.3 | 1.9 | 0.79 | 0.65 | 0.79 | 18.9 |
| 9 | R2 | 45 | 2.3 | 0.450 | 63.9 | LOS E | 2.5 | 18.1 | 1.00 | 0.74 | 1.00 | 13.9 |
| Approach | | 55 | 1.9 | 0.450 | 57.2 | LOS E | 2.5 | 18.1 | 0.96 | 0.72 | 0.96 | 16.5 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 58 | 1.8 | 0.445 | 39.8 | LOS D | 11.8 | 85.3 | 0.82 | 0.77 | 1.18 | 13.2 |
| 11 | T1 | 1291 | 3.8 | 0.844 | 40.1 | LOS D | 30.5 | 220.7 | 0.94 | 0.92 | 1.11 | 31.1 |
| 12 | R2 | 320 | 2.3 | 0.794 | 62.9 | LOS E | 9.2 | 65.5 | 1.00 | 0.90 | 1.22 | 12.8 |
| Approach | | 1668 | 3.5 | 0.844 | 44.4 | LOS D | 30.5 | 220.7 | 0.95 | 0.91 | 1.13 | 26.9 |
| All Vehicles | | 3855 | 3.2 | 0.844 | 34.1 | LOS C | 32.8 | 237.5 | 0.87 | 0.83 | 0.97 | 30.9 |

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

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P3 | North Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 49.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| All Pedestrians | | 158 | 49.3 | LOS E | | | 0.95 | 0.95 |

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.

# PHASING SUMMARY

## Site: 1 [2024_HIR_Anaheim Dr_PM Peak - Predev]

Hope Island Road /Anaheim Drive Intersection
2024 PM Peak
Predevelopment Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

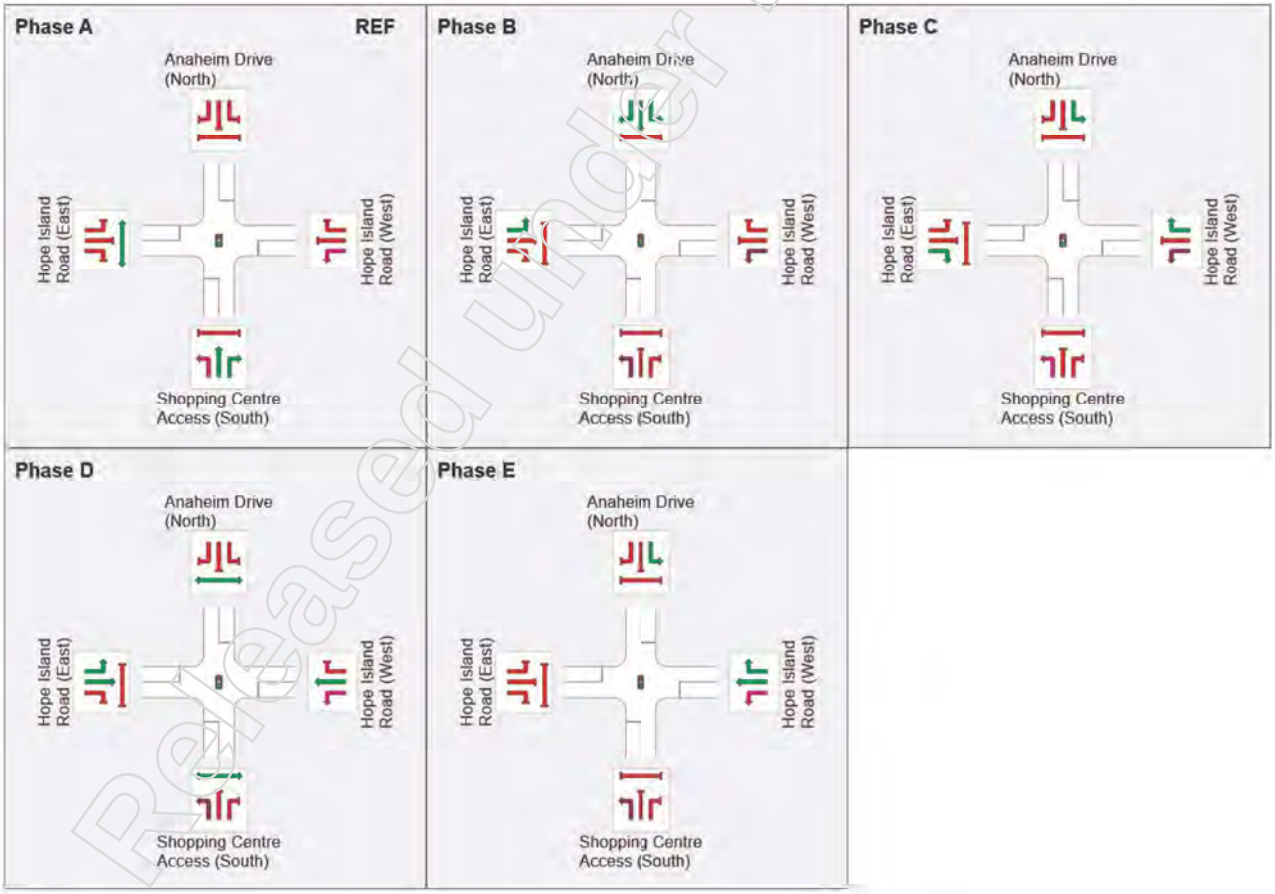
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C, D, E**
**Output Phase Sequence: A, B, C, D, E**

### Phase Timing Summary

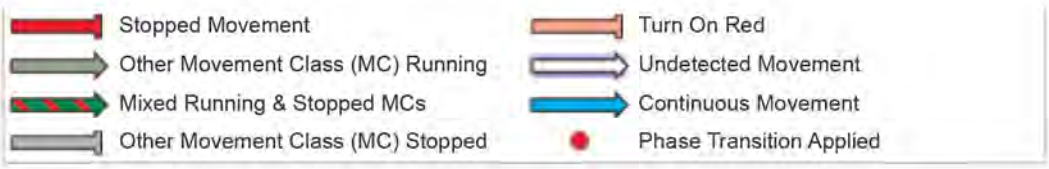
| Phase | A | B | C | D | E |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 19 | 31 | 49 | 93 |
| Green Time (sec) | 13 | 6 | 12 | 38 | 11 |
| Phase Time (sec) | 19 | 12 | 18 | 44 | 17 |
| Phase Split | 17% | 11% | 16% | 40% | 15% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase



# MOVEMENT SUMMARY

## Site: 1 [2024_HIR_Anaheim Dr_AM Peak - Postdev]

Hope Island Road /Anaheim Drive Intersection
2024 AM Peak
Post Development Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Shopping Centre Access (South) | | | | | | | | | | | | |
| 1 | L2 | 82 | 9.0 | 0.129 | 17.0 | LOS B | 2.2 | 16.2 | 0.52 | 0.68 | 0.52 | 29.2 |
| 2 | T1 | 3 | 0.0 | 0.055 | 50.3 | LOS D | 0.7 | 4.8 | 0.91 | 0.67 | 0.91 | 10.9 |
| 3 | R2 | 22 | 4.8 | 0.055 | 55.3 | LOS E | 0.7 | 4.8 | 0.91 | 0.68 | 0.91 | 23.5 |
| Approach | | 107 | 7.8 | 0.129 | 25.8 | LOS C | 2.2 | 16.2 | 0.52 | 0.68 | 0.62 | 26.2 |
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 4 | L2 | 13 | 8.3 | 0.008 | 6.1 | LOS A | 0.0 | 0.3 | 0.11 | 0.56 | 0.11 | 48.5 |
| 5 | T1 | 1445 | 6.3 | 0.755 | 20.3 | LOS C | 35.2 | 259.5 | 0.78 | 0.71 | 0.78 | 40.8 |
| 6 | R2 | 195 | 4.3 | 0.676 | 35.1 | LOS D | 7.2 | 52.4 | 0.99 | 0.82 | 1.02 | 29.8 |
| Approach | | 1653 | 6.1 | 0.755 | 21.9 | LOS C | 35.2 | 259.5 | 0.80 | 0.72 | 0.81 | 39.4 |
| North: Anaheim Drive (North) | | | | | | | | | | | | |
| 7 | L2 | 26 | 0.0 | 0.072 | 30.3 | LOS C | 1.0 | 6.9 | 0.82 | 0.69 | 0.82 | 32.4 |
| 8 | T1 | 2 | 0.0 | 0.072 | 24.7 | LOS C | 1.0 | 6.9 | 0.82 | 0.69 | 0.82 | 16.7 |
| 9 | R2 | 86 | 6.1 | 0.960 | 90.6 | LOS F | 6.3 | 46.6 | 1.00 | 1.05 | 1.75 | 10.5 |
| Approach | | 115 | 4.6 | 0.960 | 75.6 | LOS E | 6.3 | 46.6 | 0.96 | 0.96 | 1.52 | 14.0 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 13 | 8.3 | 0.421 | 37.6 | LOS D | 13.7 | 100.7 | 0.75 | 0.67 | 1.10 | 13.7 |
| 11 | T1 | 1556 | 5.9 | 0.798 | 32.8 | LOS C | 33.3 | 245.1 | 0.88 | 0.81 | 0.98 | 34.1 |
| 12 | R2 | 193 | 4.4 | 0.706 | 68.7 | LOS E | 5.9 | 43.1 | 1.00 | 0.84 | 1.14 | 11.9 |
| Approach | | 1761 | 5.7 | 0.798 | 36.8 | LOS D | 33.3 | 245.1 | 0.89 | 0.81 | 1.00 | 31.2 |
| All Vehicles | | 3636 | 5.9 | 0.960 | 30.9 | LOS C | 35.2 | 259.5 | 0.85 | 0.77 | 0.91 | 33.7 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P3 | North Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| All Pedestrians | | 158 | 54.3 | LOS E | | | 0.95 | 0.95 |

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.

# PHASING SUMMARY

## Site: 1 [2024_HIR_Anaheim Dr_AM Peak - Postdev]

Hope Island Road /Anaheim Drive Intersection
2024 AM Peak
Post Development Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

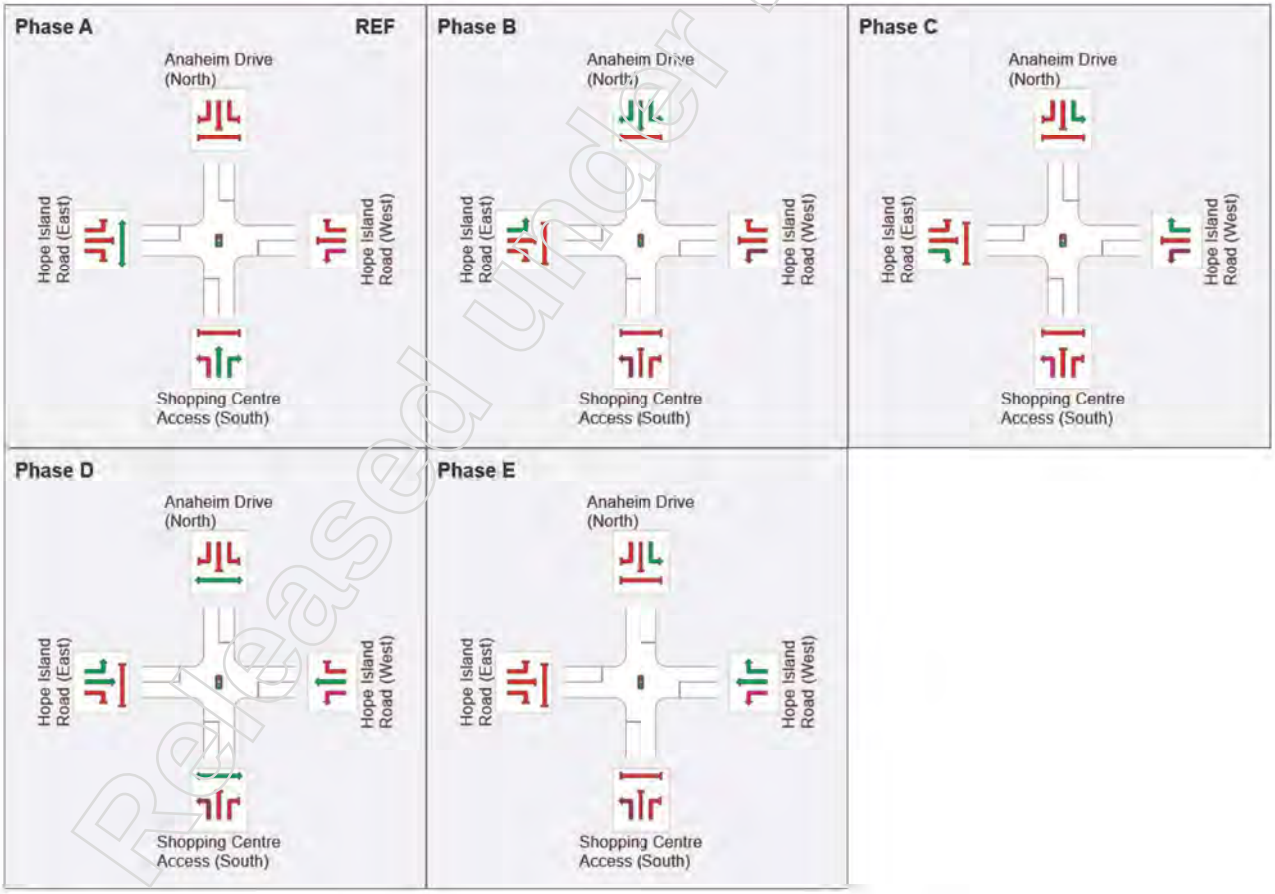
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times specified by the user**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C, D, E**
**Output Phase Sequence: A, B, C, D, E**

### Phase Timing Summary

| Phase | A | B | C | D | E |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 21 | 32 | 47 | 104 |
| Green Time (sec) | 15 | 6 | 9 | 51 | 10 |
| Phase Time (sec) | 20 | 12 | 15 | 57 | 16 |
| Phase Split | 17% | 10% | 13% | 48% | 13% |

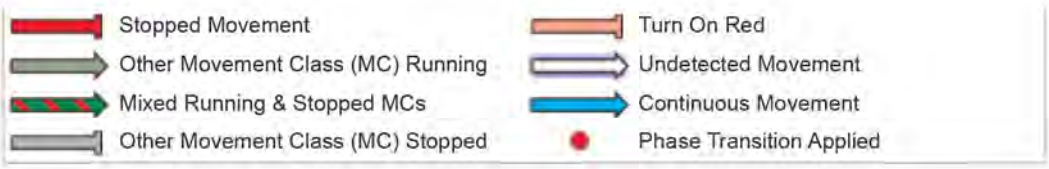
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane



# MOVEMENT SUMMARY

## Site: 1 [2024_HIR_Anaheim Dr_PM Peak - Postdev]

Hope Island Road /Anaheim Drive Intersection
2024 PM Peak
Post development Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Shopping Centre Access (South) | | | | | | | | | | | | |
| 1 | L2 | 354 | 1.5 | 0.504 | 20.2 | LOS C | 12.0 | 85.1 | 0.68 | 0.77 | 0.68 | 27.4 |
| 2 | T1 | 3 | 0.0 | 0.235 | 52.1 | LOS D | 3.0 | 20.9 | 0.94 | 0.74 | 0.94 | 10.4 |
| 3 | R2 | 106 | 1.0 | 0.235 | 57.1 | LOS E | 3.0 | 20.9 | 0.94 | 0.75 | 0.94 | 22.9 |
| Approach | | 463 | 1.4 | 0.504 | 28.9 | LOS C | 12.0 | 85.1 | 0.74 | 0.77 | 0.74 | 25.4 |
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 4 | L2 | 58 | 1.8 | 0.038 | 6.3 | LOS A | 0.3 | 2.1 | 0.15 | 0.58 | 0.15 | 48.4 |
| 5 | T1 | 1395 | 3.5 | 0.821 | 25.6 | LOS C | 38.6 | 278.2 | 0.82 | 0.77 | 0.86 | 37.7 |
| 6 | R2 | 332 | 2.2 | 0.828 | 37.2 | LOS D | 12.8 | 91.2 | 1.00 | 0.91 | 1.15 | 29.1 |
| Approach | | 1784 | 3.2 | 0.828 | 27.1 | LOS C | 38.6 | 278.2 | 0.83 | 0.79 | 0.89 | 36.1 |
| North: Anaheim Drive (North) | | | | | | | | | | | | |
| 7 | L2 | 11 | 0.0 | 0.026 | 26.6 | LOS C | 0.4 | 2.5 | 0.78 | 0.65 | 0.78 | 34.3 |
| 8 | T1 | 1 | 0.0 | 0.026 | 21.1 | LOS C | 0.4 | 2.5 | 0.78 | 0.65 | 0.78 | 18.4 |
| 9 | R2 | 45 | 2.3 | 0.420 | 68.1 | LOS E | 2.7 | 19.4 | 1.00 | 0.74 | 1.00 | 13.2 |
| Approach | | 57 | 1.9 | 0.420 | 59.5 | LOS E | 2.7 | 19.4 | 0.95 | 0.72 | 0.95 | 16.3 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 58 | 1.8 | 0.437 | 42.0 | LOS D | 12.9 | 93.0 | 0.81 | 0.76 | 1.18 | 12.9 |
| 11 | T1 | 1306 | 3.8 | 0.828 | 40.4 | LOS D | 32.4 | 234.2 | 0.93 | 0.88 | 1.06 | 30.9 |
| 12 | R2 | 320 | 2.3 | 0.867 | 73.0 | LOS E | 10.5 | 74.7 | 1.00 | 0.96 | 1.35 | 11.4 |
| Approach | | 1684 | 3.4 | 0.867 | 46.7 | LOS D | 32.4 | 234.2 | 0.94 | 0.89 | 1.12 | 26.3 |
| All Vehicles | | 3988 | 3.1 | 0.867 | 36.1 | LOS D | 38.6 | 278.2 | 0.87 | 0.83 | 0.97 | 30.1 |

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

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P3 | North Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| All Pedestrians | | 158 | 54.3 | LOS E | | | 0.95 | 0.95 |

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.

# PHASING SUMMARY

## Site: 1 [2024_HIR_Anaheim Dr_PM Peak - Postdev]

Hope Island Road /Anaheim Drive Intersection
2024 PM Peak
Post development Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

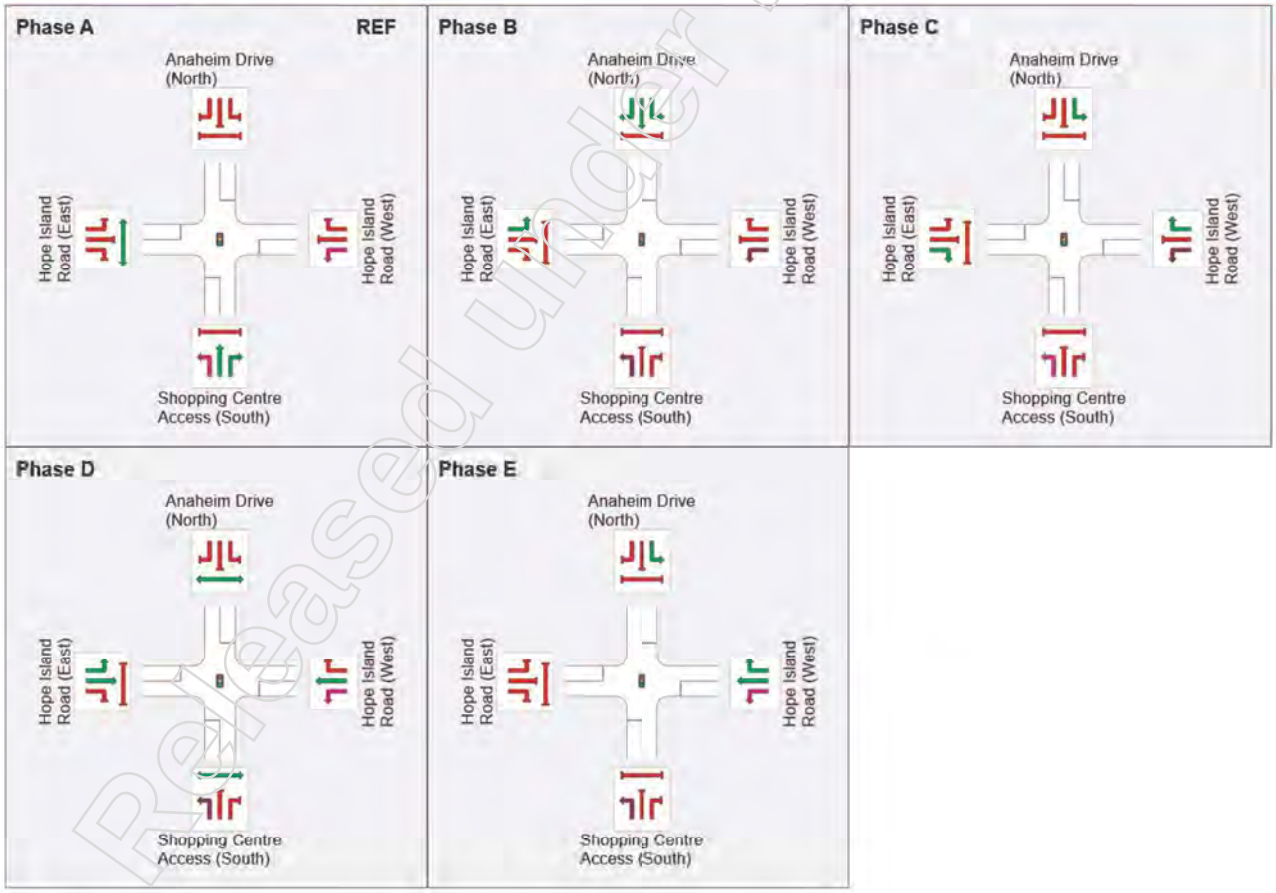
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times specified by the user**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C, D, E**
**Output Phase Sequence: A, B, C, D, E**

### Phase Timing Summary

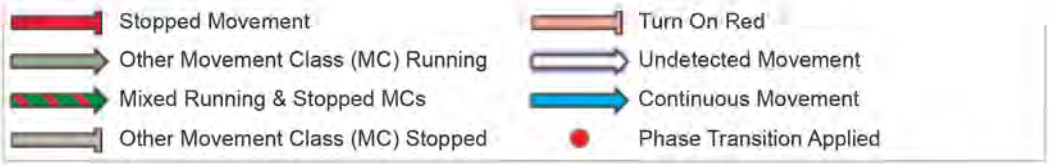
| Phase | A | B | C | D | E |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 21 | 33 | 51 | 100 |
| Green Time (sec) | 15 | 7 | 12 | 43 | 14 |
| Phase Time (sec) | 20 | 13 | 18 | 49 | 20 |
| Phase Split | 17% | 11% | 15% | 41% | 17% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase



# MOVEMENT SUMMARY

## Site: 1 [2036_HIR_Anaheim Dr_AM Peak - Predev]

Hope Island Road /Anaheim Drive Intersection
2024 AM Peak
Predevelopment Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Shopping Centre Access (South) | | | | | | | | | | | | |
| 1 | L2 | 102 | 9.3 | 0.160 | 30.1 | LOS C | 3.8 | 29.0 | 0.72 | 0.72 | 0.72 | 21.5 |
| 2 | T1 | 4 | 0.0 | 0.049 | 44.3 | LOS D | 0.8 | 5.6 | 0.86 | 0.67 | 0.86 | 12.0 |
| 3 | R2 | 27 | 3.8 | 0.049 | 49.3 | LOS D | 0.8 | 5.6 | 0.86 | 0.68 | 0.86 | 25.1 |
| Approach | | 134 | 7.9 | 0.160 | 34.4 | LOS C | 3.8 | 29.0 | 0.75 | 0.71 | 0.75 | 22.3 |
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 4 | L2 | 15 | 7.1 | 0.010 | 6.5 | LOS A | 0.1 | 0.7 | 0.16 | 0.57 | 0.16 | 48.1 |
| 5 | T1 | 1765 | 6.4 | 1.047 | 115.5 | LOS F | 97.3 | 718.9 | 1.00 | 1.47 | 1.70 | 16.2 |
| 6 | R2 | 239 | 4.4 | 0.985 | 73.8 | LOS E | 12.9 | 93.5 | 1.00 | 1.11 | 1.69 | 19.7 |
| Approach | | 2019 | 6.2 | 1.047 | 109.8 | LOS F | 97.3 | 718.9 | 0.99 | 1.43 | 1.69 | 16.6 |
| North: Anaheim Drive (North) | | | | | | | | | | | | |
| 7 | L2 | 15 | 0.0 | 0.057 | 31.0 | LOS C | 0.6 | 4.2 | 0.86 | 0.67 | 0.86 | 32.3 |
| 8 | T1 | 3 | 0.0 | 0.057 | 25.5 | LOS C | 0.6 | 4.2 | 0.86 | 0.67 | 0.86 | 16.7 |
| 9 | R2 | 106 | 5.9 | 0.886 | 77.6 | LOS E | 7.1 | 52.5 | 1.00 | 0.98 | 1.47 | 11.9 |
| Approach | | 124 | 5.1 | 0.886 | 70.7 | LOS E | 7.1 | 52.5 | 0.98 | 0.93 | 1.38 | 13.7 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 15 | 7.1 | 0.543 | 44.9 | LOS D | 17.5 | 129.4 | 0.84 | 0.76 | 1.24 | 12.6 |
| 11 | T1 | 1765 | 6.4 | 1.030 | 94.1 | LOS F | 69.3 | 511.6 | 0.97 | 1.28 | 1.57 | 18.8 |
| 12 | R2 | 239 | 4.4 | 0.985 | 99.4 | LOS F | 9.3 | 67.6 | 1.00 | 1.12 | 1.78 | 8.9 |
| Approach | | 2019 | 6.2 | 1.030 | 94.4 | LOS F | 69.3 | 511.6 | 0.97 | 1.26 | 1.59 | 17.7 |
| All Vehicles | | 4296 | 6.2 | 1.047 | 99.1 | LOS F | 97.3 | 718.9 | 0.97 | 1.31 | 1.60 | 17.1 |

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

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P3 | North Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| All Pedestrians | | 158 | 54.3 | LOS E | | | 0.95 | 0.95 |

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.

# PHASING SUMMARY

## Site: 1 [2036_HIR_Anaheim Dr_AM Peak - Predev]

Hope Island Road /Anaheim Drive Intersection
2024 AM Peak
Predevelopment Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

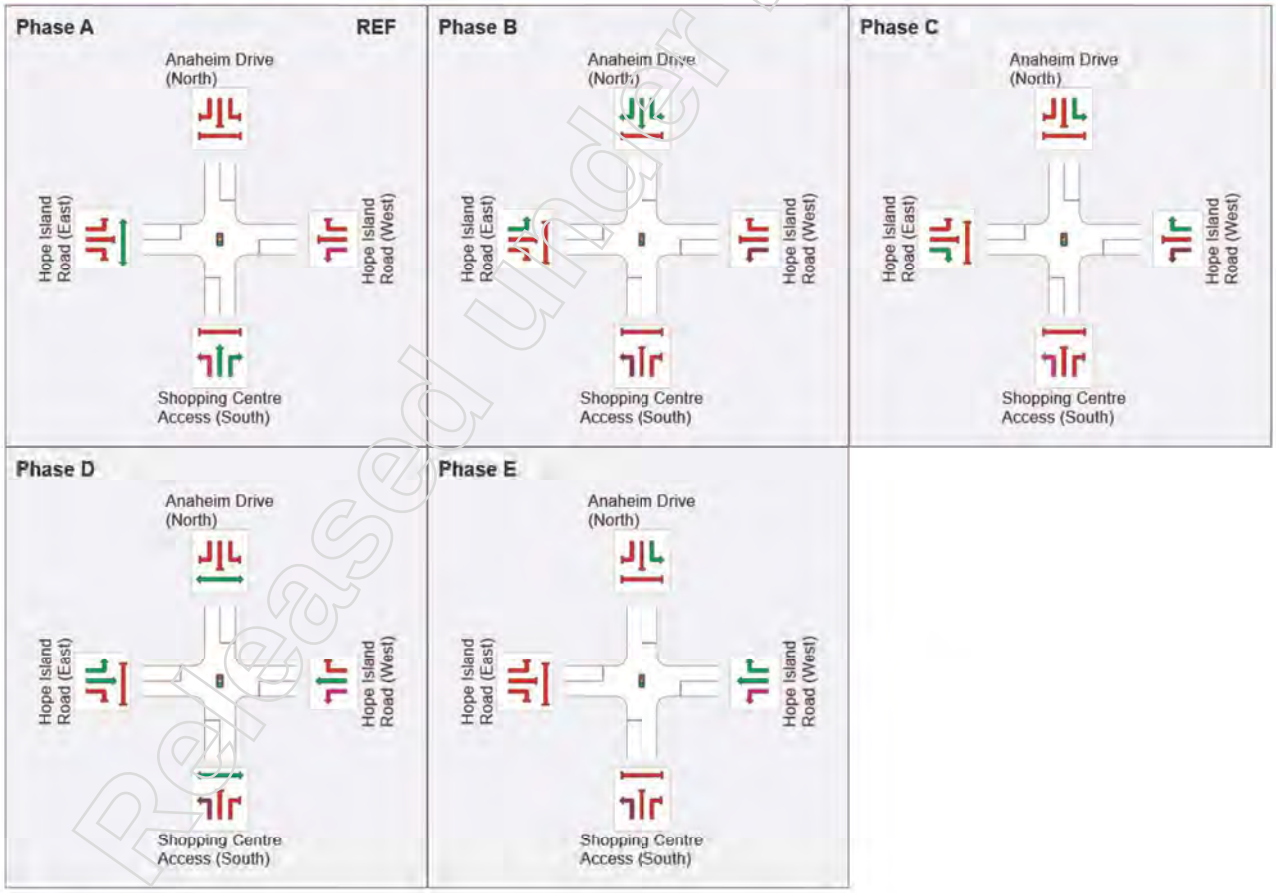
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C, D, E**
**Output Phase Sequence: A, B, C, D, E**

### Phase Timing Summary

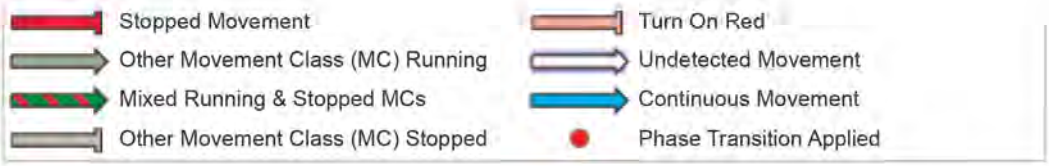
| Phase | A | B | C | D | E |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 27 | 41 | 55 | 106 |
| Green Time (sec) | 21 | 8 | 8 | 45 | 8 |
| Phase Time (sec) | 27 | 14 | 14 | 51 | 14 |
| Phase Split | 23% | 12% | 12% | 43% | 12% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase



# MOVEMENT SUMMARY

## Site: 1 [2036_HIR_Anaheim Dr_PM Peak - Predev]

Hope Island Road /Anaheim Drive Intersection
2024 PM Peak
Predevelopment Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Shopping Centre Access (South) | | | | | | | | | | | | |
| 1 | L2 | 438 | 1.4 | 0.616 | 31.2 | LOS C | 18.8 | 132.9 | 0.84 | 0.82 | 0.84 | 21.4 |
| 2 | T1 | 4 | 0.0 | 0.209 | 46.1 | LOS D | 3.5 | 24.4 | 0.90 | 0.75 | 0.90 | 11.4 |
| 3 | R2 | 133 | 0.8 | 0.209 | 51.1 | LOS D | 3.5 | 24.4 | 0.90 | 0.75 | 0.90 | 24.5 |
| Approach | | 575 | 1.3 | 0.616 | 35.9 | LOS D | 18.8 | 132.9 | 0.85 | 0.80 | 0.85 | 22.4 |
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 4 | L2 | 72 | 1.5 | 0.048 | 6.5 | LOS A | 0.5 | 3.2 | 0.17 | 0.59 | 0.17 | 48.2 |
| 5 | T1 | 1598 | 3.8 | 1.039 | 111.5 | LOS F | 90.2 | 651.9 | 1.00 | 1.45 | 1.67 | 16.6 |
| 6 | R2 | 397 | 2.4 | 1.075 | 127.8 | LOS F | 30.6 | 218.7 | 1.00 | 1.28 | 1.97 | 11.4 |
| Approach | | 2066 | 3.5 | 1.075 | 111.0 | LOS F | 90.2 | 651.9 | 0.97 | 1.39 | 1.68 | 15.7 |
| North: Anaheim Drive (North) | | | | | | | | | | | | |
| 7 | L2 | 11 | 0.0 | 0.028 | 26.2 | LOS C | 0.3 | 2.3 | 0.80 | 0.66 | 0.80 | 34.5 |
| 8 | T1 | 1 | 0.0 | 0.028 | 20.7 | LOS C | 0.3 | 2.3 | 0.80 | 0.66 | 0.80 | 18.5 |
| 9 | R2 | 56 | 1.9 | 0.603 | 70.8 | LOS E | 3.5 | 24.7 | 1.00 | 0.78 | 1.08 | 12.8 |
| Approach | | 67 | 1.6 | 0.603 | 63.0 | LOS E | 3.5 | 24.7 | 0.96 | 0.76 | 1.03 | 15.4 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 72 | 1.5 | 0.587 | 48.5 | LOS D | 17.5 | 126.0 | 0.89 | 0.83 | 1.30 | 12.0 |
| 11 | T1 | 1598 | 3.8 | 1.112 | 146.7 | LOS F | 81.2 | 587.2 | 0.98 | 1.58 | 1.94 | 13.4 |
| 12 | R2 | 397 | 2.4 | 1.075 | 152.6 | LOS F | 20.2 | 144.2 | 1.00 | 1.29 | 2.08 | 6.0 |
| Approach | | 2066 | 3.5 | 1.112 | 144.4 | LOS F | 81.2 | 587.2 | 0.98 | 1.50 | 1.94 | 12.0 |
| All Vehicles | | 4775 | 3.2 | 1.112 | 115.7 | LOS F | 90.2 | 651.9 | 0.96 | 1.35 | 1.68 | 14.1 |

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

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P3 | North Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| All Pedestrians | | 158 | 54.3 | LOS E | | | 0.95 | 0.95 |

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.

# PHASING SUMMARY

## Site: 1 [2036_HIR_Anaheim Dr_PM Peak - Predev]

Hope Island Road /Anaheim Drive Intersection
2024 PM Peak
Predevelopment Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated  Cycle Time = 120 seconds (Site Practical Cycle Time)

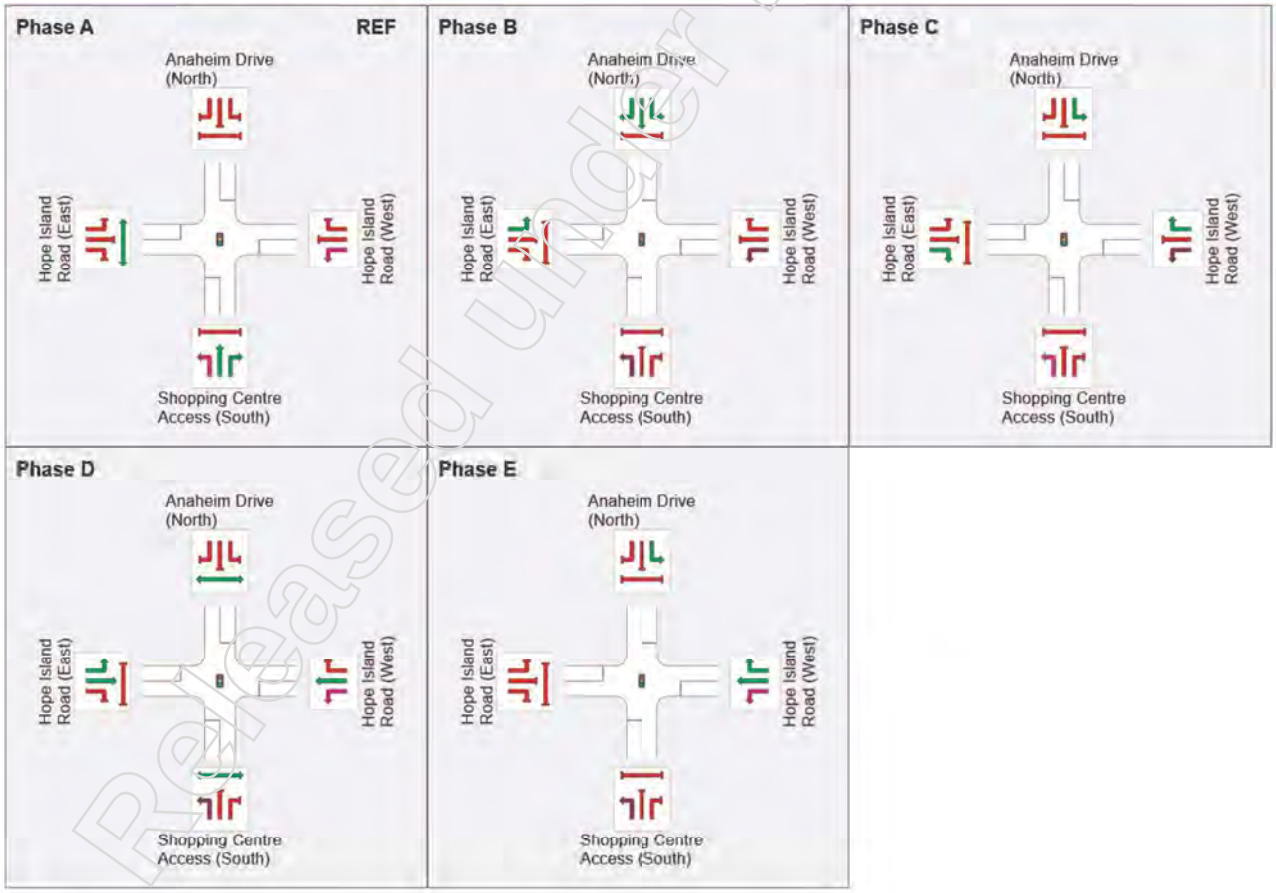
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C, D, E**
**Output Phase Sequence: A, B, C, D, E**

### Phase Timing Summary

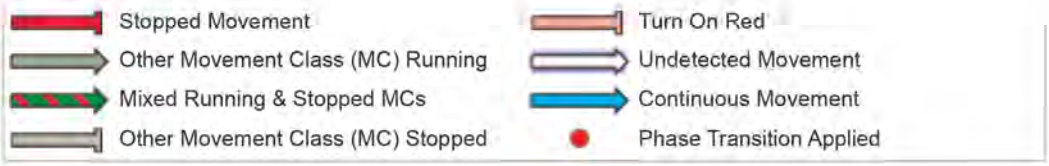
| Phase | A | B | C | D | E |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 27 | 39 | 57 | 102 |
| Green Time (sec) | 21 | 6 | 12 | 39 | 12 |
| Phase Time (sec) | 27 | 12 | 18 | 45 | 18 |
| Phase Split | 23% | 10% | 15% | 38% | 15% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase



# MOVEMENT SUMMARY

## Site: 1 [2036_HIR_Anaheim Dr_AM Peak - Postdev]

Hope Island Road /Anaheim Drive Intersection
2024 PM Peak
Post development Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Shopping Centre Access (South) | | | | | | | | | | | | |
| 1 | L2 | 102 | 9.3 | 0.165 | 31.5 | LOS C | 3.9 | 29.8 | 0.74 | 0.72 | 0.74 | 20.9 |
| 2 | T1 | 4 | 0.0 | 0.049 | 44.3 | LOS D | 0.8 | 5.6 | 0.86 | 0.67 | 0.86 | 12.0 |
| 3 | R2 | 27 | 3.8 | 0.049 | 49.3 | LOS D | 0.8 | 5.6 | 0.86 | 0.68 | 0.86 | 25.1 |
| Approach | | 134 | 7.9 | 0.165 | 35.5 | LOS D | 3.9 | 29.8 | 0.77 | 0.71 | 0.77 | 21.9 |
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 4 | L2 | 15 | 7.1 | 0.010 | 6.2 | LOS A | 0.1 | 0.5 | 0.13 | 0.57 | 0.13 | 48.4 |
| 5 | T1 | 1801 | 6.3 | 1.034 | 105.2 | LOS F | 95.7 | 705.9 | 1.00 | 1.42 | 1.63 | 17.4 |
| 6 | R2 | 243 | 4.3 | 1.145 | 181.1 | LOS F | 23.4 | 169.8 | 1.00 | 1.37 | 2.37 | 8.7 |
| Approach | | 2059 | 6.1 | 1.145 | 113.5 | LOS F | 95.7 | 705.9 | 0.99 | 1.41 | 1.70 | 15.8 |
| North: Anaheim Drive (North) | | | | | | | | | | | | |
| 7 | L2 | 40 | 0.0 | 0.118 | 30.1 | LOS C | 1.5 | 10.2 | 0.85 | 0.71 | 0.85 | 32.5 |
| 8 | T1 | 3 | 0.0 | 0.118 | 24.5 | LOS C | 1.5 | 10.2 | 0.85 | 0.71 | 0.85 | 16.7 |
| 9 | R2 | 106 | 5.9 | 1.012 | 112.2 | LOS F | 8.9 | 65.2 | 1.00 | 1.14 | 1.91 | 8.8 |
| Approach | | 149 | 4.2 | 1.012 | 88.4 | LOS F | 8.9 | 65.2 | 0.96 | 1.02 | 1.61 | 12.6 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 15 | 7.1 | 0.571 | 43.0 | LOS D | 19.5 | 143.3 | 0.83 | 0.76 | 1.22 | 12.9 |
| 11 | T1 | 1993 | 5.7 | 1.082 | 121.5 | LOS F | 90.0 | 660.5 | 0.96 | 1.44 | 1.75 | 15.5 |
| 12 | R2 | 239 | 4.4 | 1.126 | 190.7 | LOS F | 13.8 | 100.0 | 1.00 | 1.34 | 2.39 | 4.9 |
| Approach | | 2246 | 5.6 | 1.126 | 128.3 | LOS F | 90.0 | 660.5 | 0.97 | 1.42 | 1.82 | 14.1 |
| All Vehicles | | 4588 | 5.8 | 1.145 | 117.6 | LOS F | 95.7 | 705.9 | 0.97 | 1.38 | 1.73 | 14.9 |

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

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P3 | North Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| All Pedestrians | | 158 | 54.3 | LOS E | | | 0.95 | 0.95 |

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.

# PHASING SUMMARY

## Site: 1 [2036_HIR_Anaheim Dr_AM Peak - Postdev]

Hope Island Road /Anaheim Drive Intersection
2024 PM Peak
Post development Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

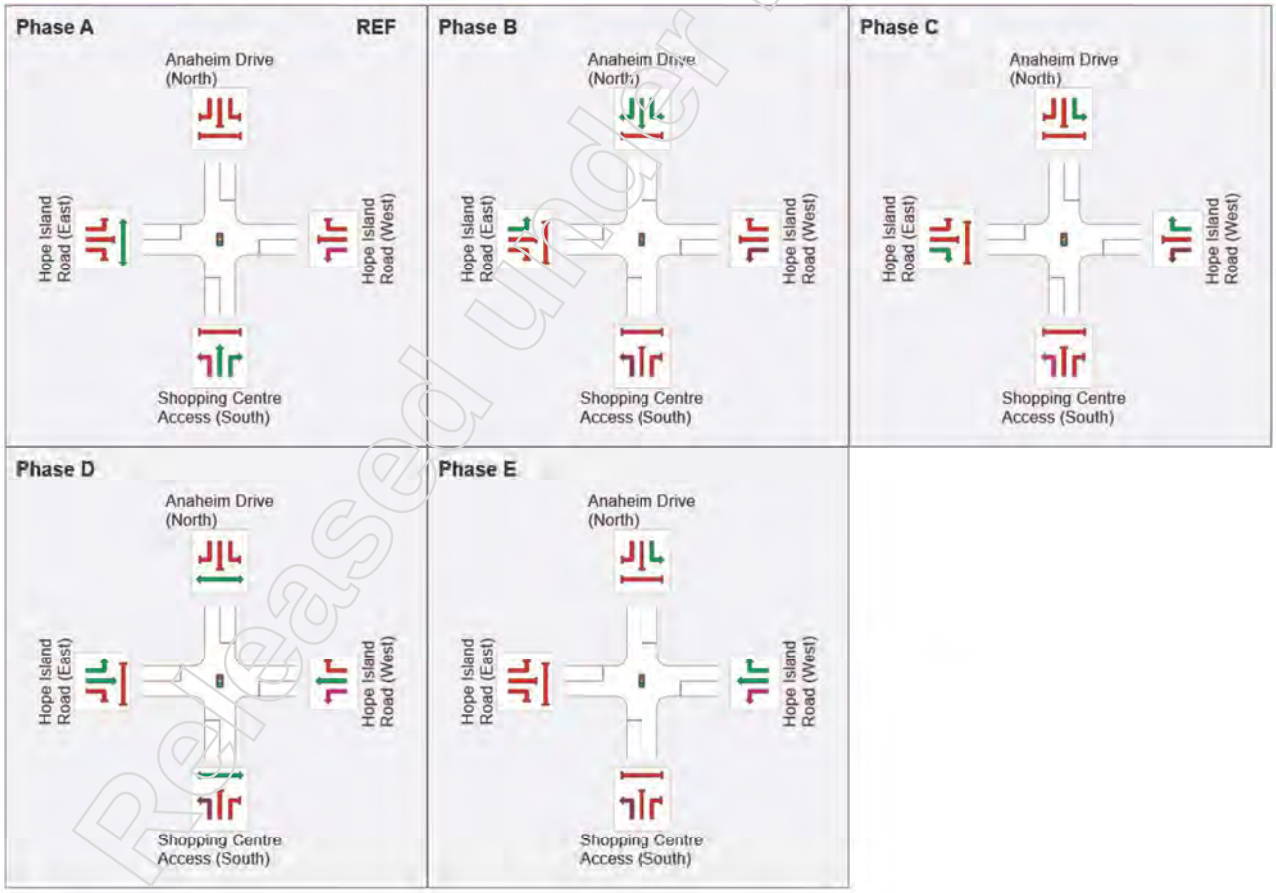
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C, D, E**
**Output Phase Sequence: A, B, C, D, E**

### Phase Timing Summary

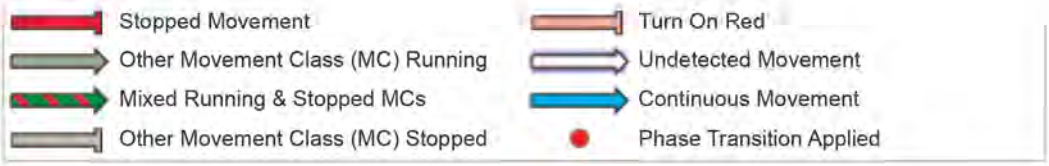
| Phase | A | B | C | D | E |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 27 | 40 | 53 | 107 |
| Green Time (sec) | 21 | 7 | 7 | 48 | 7 |
| Phase Time (sec) | 27 | 13 | 13 | 54 | 13 |
| Phase Split | 23% | 11% | 11% | 45% | 11% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase



# MOVEMENT SUMMARY

## Site: 1 [2036_HIR_Anaheim Dr_PM Peak - Postdev]

Hope Island Road /Anaheim Drive Intersection
2024 AM Peak
Post Development Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Shopping Centre Access (South) | | | | | | | | | | | | |
| 1 | L2 | 438 | 1.4 | 0.617 | 31.2 | LOS C | 18.8 | 133.1 | 0.84 | 0.82 | 0.84 | 21.4 |
| 2 | T1 | 4 | 0.0 | 0.209 | 46.1 | LOS D | 3.5 | 24.4 | 0.90 | 0.75 | 0.90 | 11.4 |
| 3 | R2 | 133 | 0.8 | 0.209 | 51.1 | LOS D | 3.5 | 24.4 | 0.90 | 0.75 | 0.90 | 24.5 |
| Approach | | 575 | 1.3 | 0.617 | 35.9 | LOS D | 18.8 | 133.1 | 0.85 | 0.80 | 0.85 | 22.4 |
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 4 | L2 | 72 | 1.5 | 0.047 | 6.4 | LOS A | 0.4 | 3.0 | 0.16 | 0.59 | 0.16 | 48.3 |
| 5 | T1 | 1780 | 3.4 | 1.145 | 192.5 | LOS F | 130.3 | 938.7 | 1.00 | 1.87 | 2.21 | 10.8 |
| 6 | R2 | 417 | 2.3 | 1.129 | 169.4 | LOS F | 38.3 | 273.5 | 1.00 | 1.39 | 2.22 | 9.3 |
| Approach | | 2268 | 3.2 | 1.145 | 182.4 | LOS F | 130.3 | 938.7 | 0.97 | 1.75 | 2.14 | 10.8 |
| North: Anaheim Drive (North) | | | | | | | | | | | | |
| 7 | L2 | 14 | 0.0 | 0.033 | 25.7 | LOS C | 0.4 | 2.9 | 0.79 | 0.67 | 0.79 | 34.7 |
| 8 | T1 | 1 | 0.0 | 0.033 | 20.2 | LOS C | 0.4 | 2.9 | 0.79 | 0.67 | 0.79 | 18.7 |
| 9 | R2 | 56 | 1.9 | 0.603 | 70.8 | LOS E | 3.5 | 24.7 | 1.00 | 0.78 | 1.08 | 12.8 |
| Approach | | 71 | 1.5 | 0.603 | 61.3 | LOS E | 3.5 | 24.7 | 0.96 | 0.75 | 1.02 | 16.1 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 72 | 1.5 | 0.596 | 48.8 | LOS D | 17.9 | 128.6 | 0.89 | 0.83 | 1.31 | 12.0 |
| 11 | T1 | 1626 | 3.8 | 1.130 | 158.0 | LOS F | 86.0 | 621.4 | 0.98 | 1.64 | 2.01 | 12.6 |
| 12 | R2 | 397 | 2.4 | 1.075 | 152.6 | LOS F | 20.2 | 144.2 | 1.00 | 1.29 | 2.08 | 6.0 |
| Approach | | 2095 | 3.4 | 1.130 | 153.3 | LOS F | 86.0 | 621.4 | 0.98 | 1.54 | 2.00 | 11.5 |
| All Vehicles | | 5008 | 3.0 | 1.145 | 151.7 | LOS F | 130.3 | 938.7 | 0.96 | 1.54 | 1.92 | 11.5 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**Movement Performance - Pedestrians**

| Mov ID | Description | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |
|---|---|---|---|---|---|---|---|---|
| P1 | South Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P3 | North Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| P4 | West Full Crossing | 53 | 54.3 | LOS E | 0.2 | 0.2 | 0.95 | 0.95 |
| All Pedestrians | | 158 | 54.3 | LOS E | | | 0.95 | 0.95 |

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.

# PHASING SUMMARY

## Site: 1 [2036_HIR_Anaheim Dr_PM Peak - Postdev]

Hope Island Road /Anaheim Drive Intersection
2024 AM Peak
Post Development Scenario Assessment
Site Category: Signalised Four-way intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

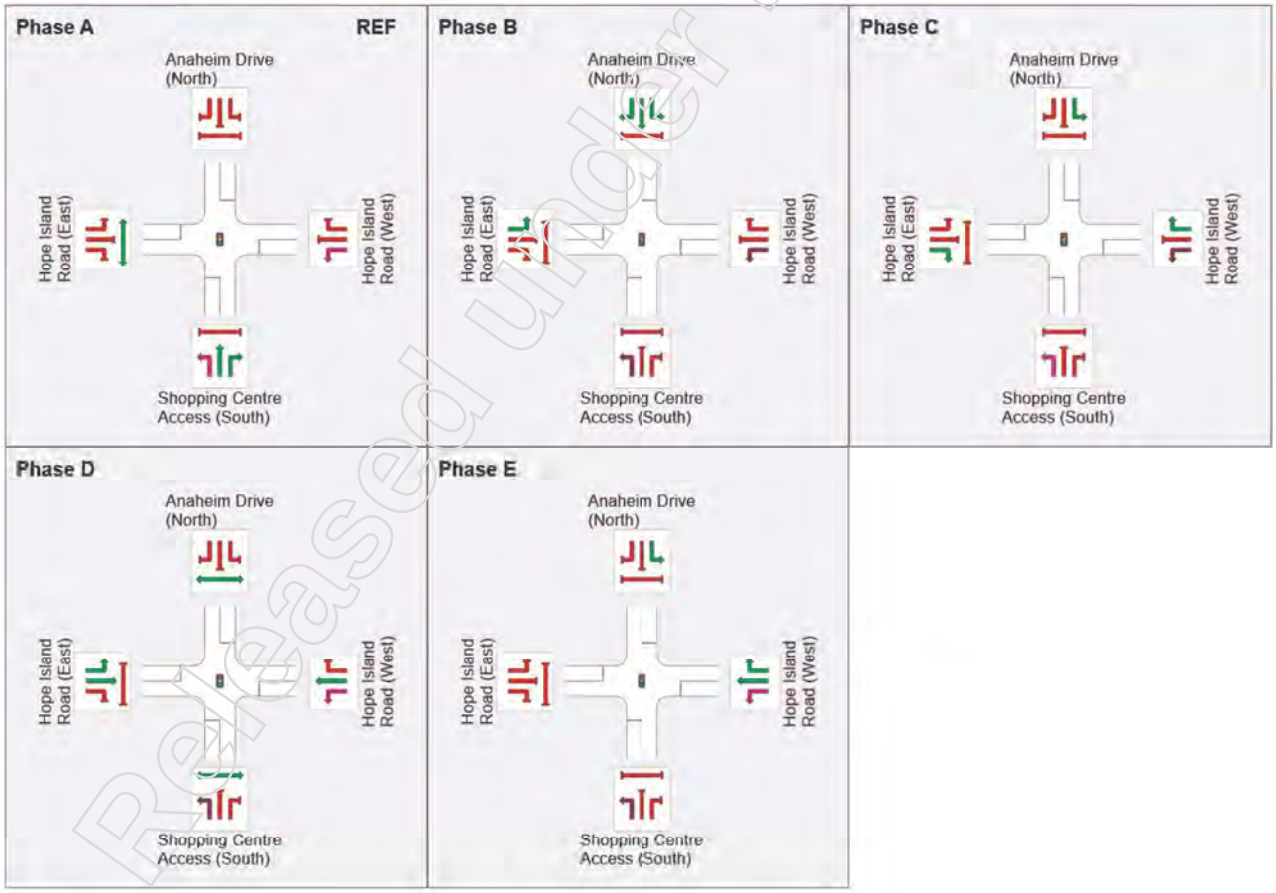
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C, D, E**
**Output Phase Sequence: A, B, C, D, E**

### Phase Timing Summary

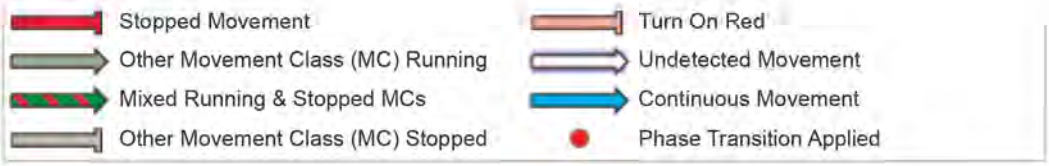
| Phase | A | B | C | D | E |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 27 | 39 | 57 | 102 |
| Green Time (sec) | 21 | 6 | 12 | 39 | 12 |
| Phase Time (sec) | 27 | 12 | 18 | 45 | 18 |
| Phase Split | 23% | 10% | 15% | 38% | 15% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase



# MOVEMENT SUMMARY

## Site: 1 [2024_HIR_River Links Blvd_AM Peak -Predev]

Hope Island Road / River Links Boulvard
2024 AM Peak
Predevelopment Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (east) | | | | | | | | | | | | |
| 5 | T1 | 2281 | 2.5 | 0.879 | 19.3 | LOS B | 43.4 | 310.4 | 0.86 | 0.89 | 0.98 | 45.6 |
| 6 | R2 | 25 | 12.5 | 0.147 | 43.0 | LOS D | 0.9 | 7.4 | 0.94 | 0.71 | 0.94 | 26.8 |
| Approach | | 2306 | 2.6 | 0.879 | 19.5 | LOS B | 43.4 | 310.4 | 0.86 | 0.89 | 0.98 | 45.3 |
| North: River Links Blvd (North) | | | | | | | | | | | | |
| 7 | L2 | 62 | 0.0 | 0.877 | 49.6 | LOS D | 14.4 | 101.9 | 1.00 | 1.00 | 1.37 | 25.2 |
| 9 | R2 | 255 | 1.7 | 0.877 | 49.6 | LOS D | 14.4 | 101.9 | 1.00 | 1.00 | 1.37 | 25.2 |
| Approach | | 317 | 1.3 | 0.877 | 49.6 | LOS D | 14.4 | 101.9 | 1.00 | 1.00 | 1.37 | 25.2 |
| West: Hope Island Road (west) | | | | | | | | | | | | |
| 10 | L2 | 73 | 4.3 | 0.080 | 16.7 | LOS B | 1.5 | 10.6 | 0.55 | 0.69 | 0.55 | 39.3 |
| 11 | T1 | 1141 | 5.8 | 0.601 | 15.4 | LOS B | 15.9 | 117.1 | 0.77 | 0.68 | 0.77 | 47.9 |
| Approach | | 1214 | 5.7 | 0.601 | 15.5 | LOS B | 15.9 | 117.1 | 0.75 | 0.68 | 0.75 | 47.5 |
| All Vehicles | | 3837 | 3.5 | 0.879 | 20.7 | LOS C | 43.4 | 310.4 | 0.84 | 0.84 | 0.94 | 44.1 |

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


Organisation: GHD SERVICES PTY LTD | Processed: Thursday, 5 September 2019 11:39:48 AM
Project: G:\41\32391\Tech\Traffic\5_SIDRA Models\Helensvale\HIR_River Links Rd.sip8

# PHASING SUMMARY

## Site: 1 [2024_HIR_River Links Blvd_AM Peak -Predev]

Hope Island Road / River Links Boulvard
2024 AM Peak
Predevelopment Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

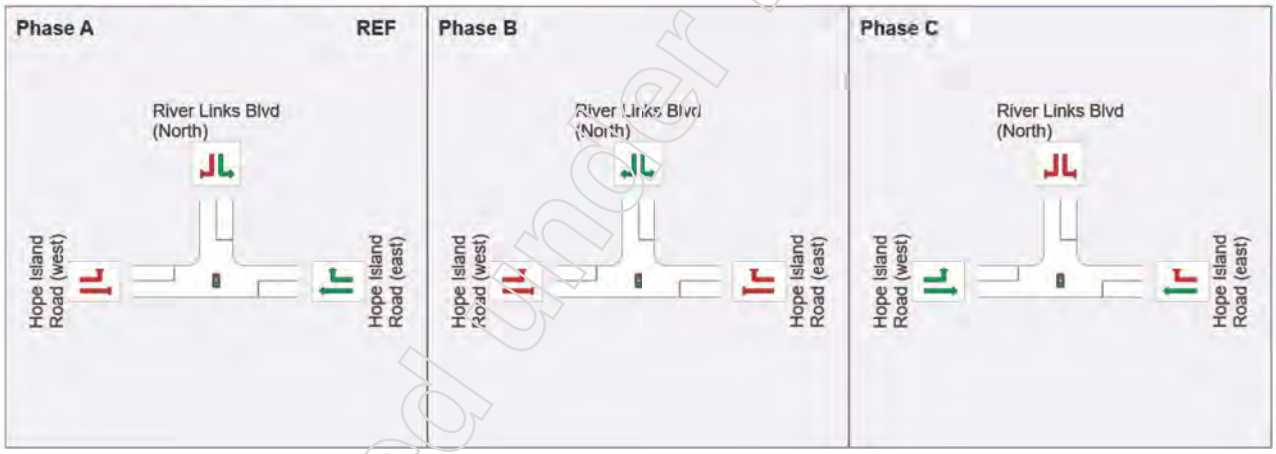
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, B, C**

### Phase Timing Summary

| Phase | A | B | C |
|---|---|---|---|
| Phase Change Time (sec) | 0 | 14 | 34 |
| Green Time (sec) | 8 | 14 | 40 |
| Phase Time (sec) | 14 | 20 | 46 |
| Phase Split | 18% | 25% | 58% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# MOVEMENT SUMMARY

## Site: 1 [2024_HIR_River Links Blvd_PM Peak - Predev]

Hope Island Road / River Links Boulvard
2024 PM Peak
Predevelopment Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 5 | T1 | 1315 | 3.9 | 0.449 | 3.6 | LOS A | 9.1 | 66.2 | 0.39 | 0.35 | 0.39 | 56.6 |
| 6 | R2 | 49 | 0.0 | 0.352 | 46.2 | LOS D | 2.0 | 13.8 | 0.99 | 0.74 | 0.99 | 25.8 |
| Approach | | 1364 | 3.8 | 0.449 | 5.2 | LOS A | 9.1 | 66.2 | 0.41 | 0.37 | 0.41 | 55.1 |
| North: River Links Blvd (North) | | | | | | | | | | | | |
| 7 | L2 | 58 | 5.5 | 0.789 | 47.6 | LOS D | 7.6 | 54.6 | 1.00 | 0.92 | 1.26 | 25.7 |
| 9 | R2 | 120 | 2.6 | 0.789 | 47.6 | LOS D | 7.6 | 54.6 | 1.00 | 0.92 | 1.26 | 25.8 |
| Approach | | 178 | 3.6 | 0.789 | 47.6 | LOS D | 7.6 | 54.6 | 1.00 | 0.92 | 1.26 | 25.8 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 198 | 0.5 | 0.173 | 12.7 | LOS B | 3.3 | 23.3 | 0.46 | 0.70 | 0.46 | 42.4 |
| 11 | T1 | 2015 | 1.5 | 0.882 | 23.0 | LOS C | 42.2 | 299.3 | 0.87 | 0.92 | 1.02 | 43.5 |
| Approach | | 2213 | 1.4 | 0.882 | 22.1 | LOS C | 42.2 | 299.3 | 0.84 | 0.90 | 0.97 | 43.4 |
| All Vehicles | | 3755 | 2.4 | 0.882 | 17.2 | LOS B | 42.2 | 299.3 | 0.69 | 0.71 | 0.78 | 46.2 |

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


Organisation: GHD SERVICES PTY LTD | Processed: Thursday, 5 September 2019 11:39:48 AM
Project: G:\41\32391\Tech\Traffic\5_SIDRA Models\Helensvale\HIR_River Links Rd.sip8

# PHASING SUMMARY

## Site: 1 [2024_HIR_River Links Blvd_PM Peak - Predev]

Hope Island Road / River Links Boulvard
2024 PM Peak
Predevelopment Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

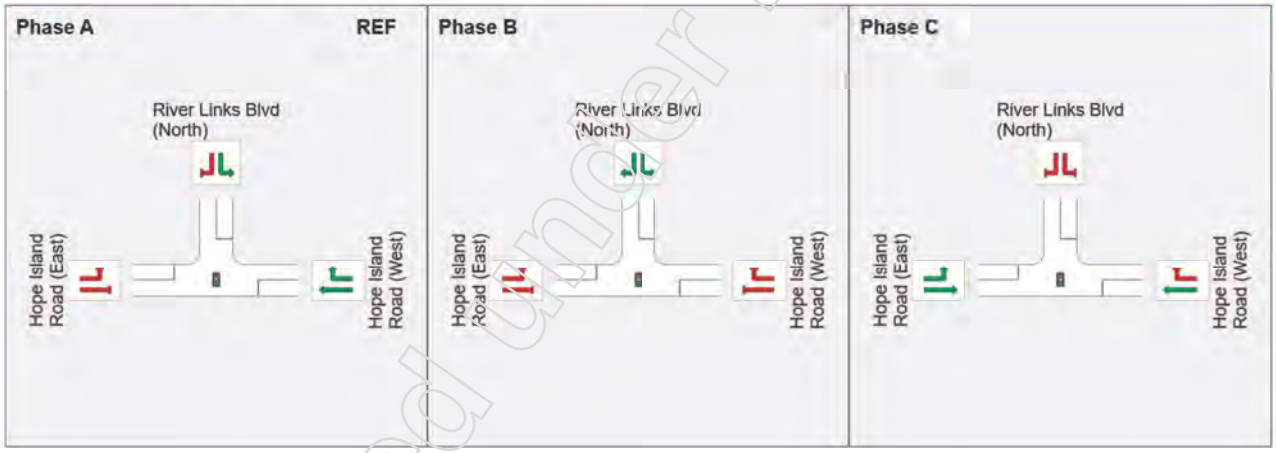
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, B, C**

### Phase Timing Summary

| Phase | A | B | C |
|---|---|---|---|
| Phase Change Time (sec) | 0 | 12 | 25 |
| Green Time (sec) | 6 | 7 | 49 |
| Phase Time (sec) | 12 | 13 | 55 |
| Phase Split | 15% | 16% | 69% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# MOVEMENT SUMMARY

## Site: 1 [2024_HIR_River Links Blvd_AM Peak -Postdev]

Hope Island Road / River Links Boulvard
2024 AM Peak
Post development Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 5 | T1 | 2304 | 2.5 | 0.889 | 21.0 | LOS C | 45.7 | 326.9 | 0.87 | 0.92 | 1.01 | 44.6 |
| 6 | R2 | 28 | 11.1 | 0.187 | 44.4 | LOS D | 1.1 | 8.4 | 0.96 | 0.71 | 0.96 | 26.3 |
| Approach | | 2333 | 2.6 | 0.889 | 21.3 | LOS C | 45.7 | 326.9 | 0.87 | 0.92 | 1.01 | 44.4 |
| North: River Links Blvd (North) | | | | | | | | | | | | |
| 7 | L2 | 78 | 0.0 | 0.866 | 48.0 | LOS D | 14.9 | 105.2 | 1.00 | 0.99 | 1.33 | 25.6 |
| 9 | R2 | 255 | 1.7 | 0.866 | 48.0 | LOS D | 14.9 | 105.2 | 1.00 | 0.99 | 1.33 | 25.7 |
| Approach | | 333 | 1.3 | 0.866 | 48.0 | LOS D | 14.9 | 105.2 | 1.00 | 0.99 | 1.33 | 25.7 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 73 | 4.3 | 0.078 | 16.1 | LOS B | 1.4 | 10.3 | 0.53 | 0.69 | 0.53 | 39.7 |
| 11 | T1 | 1285 | 5.2 | 0.661 | 15.4 | LOS B | 18.6 | 136.0 | 0.79 | 0.71 | 0.79 | 47.8 |
| Approach | | 1358 | 5.1 | 0.661 | 15.5 | LOS B | 18.6 | 136.0 | 0.78 | 0.71 | 0.78 | 47.5 |
| All Vehicles | | 4023 | 3.3 | 0.889 | 21.5 | LOS C | 45.7 | 326.9 | 0.85 | 0.85 | 0.96 | 43.7 |

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.
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.


Organisation: GHD SERVICES PTY LTD | Processed: Thursday, 5 September 2019 11:39:49 AM
Project: G:\41\32391\Tech\Traffic\5_SIDRA Models\Helensvale\HIR_River Links Rd.sip8

# PHASING SUMMARY

## Site: 1 [2024_HIR_River Links Blvd_AM Peak -Postdev]

Hope Island Road / River Links Boulvard
2024 AM Peak
Post development Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

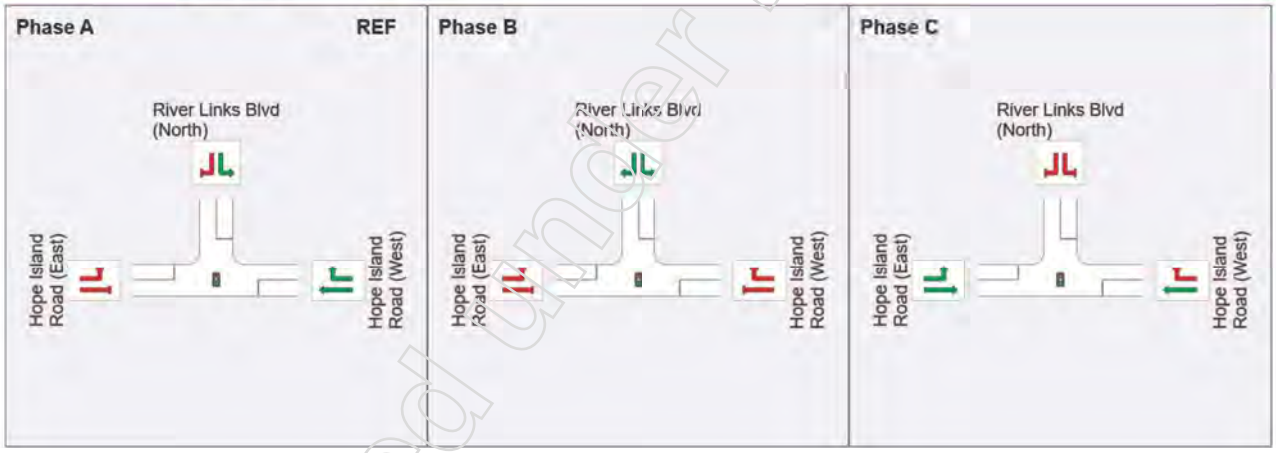
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, B, C**

### Phase Timing Summary

| Phase | A | B | C |
|---|---|---|---|
| Phase Change Time (sec) | 0 | 13 | 33 |
| Green Time (sec) | 7 | 14 | 41 |
| Phase Time (sec) | 13 | 20 | 47 |
| Phase Split | 16% | 25% | 59% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# MOVEMENT SUMMARY

## Site: 1 [2024_HIR_River Links Blvd_PM Peak - Postdev]

Hope Island Road / River Links Boulvard
2024 PM Peak
Post Development Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 5 | T1 | 1431 | 3.6 | 0.487 | 3.8 | LOS A | 10.4 | 75.2 | 0.41 | 0.37 | 0.41 | 56.5 |
| 6 | R2 | 63 | 0.0 | 0.449 | 46.7 | LOS D | 2.5 | 17.8 | 1.00 | 0.75 | 1.00 | 25.7 |
| Approach | | 1494 | 3.5 | 0.487 | 5.6 | LOS A | 10.4 | 75.2 | 0.43 | 0.39 | 0.43 | 54.7 |
| North: River Links Blvd (North) | | | | | | | | | | | | |
| 7 | L2 | 60 | 5.3 | 0.792 | 47.6 | LOS D | 7.7 | 55.2 | 1.00 | 0.92 | 1.26 | 25.7 |
| 9 | R2 | 120 | 2.6 | 0.792 | 47.6 | LOS D | 7.7 | 55.2 | 1.00 | 0.92 | 1.26 | 25.8 |
| Approach | | 180 | 3.5 | 0.792 | 47.6 | LOS D | 7.7 | 55.2 | 1.00 | 0.92 | 1.26 | 25.7 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 198 | 0.5 | 0.173 | 12.7 | LOS B | 3.3 | 23.3 | 0.46 | 0.70 | 0.46 | 42.4 |
| 11 | T1 | 2034 | 1.4 | 0.890 | 24.6 | LOS C | 44.1 | 312.6 | 0.88 | 0.95 | 1.05 | 42.7 |
| Approach | | 2232 | 1.4 | 0.890 | 23.6 | LOS C | 44.1 | 312.6 | 0.84 | 0.93 | 1.00 | 42.7 |
| All Vehicles | | 3905 | 2.3 | 0.890 | 17.8 | LOS B | 44.1 | 312.6 | 0.69 | 0.72 | 0.79 | 45.8 |

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.
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.

# PHASING SUMMARY

## Site: 1 [2024_HIR_River Links Blvd_PM Peak - Postdev]

Hope Island Road / River Links Boulvard
2024 PM Peak
Post Development Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

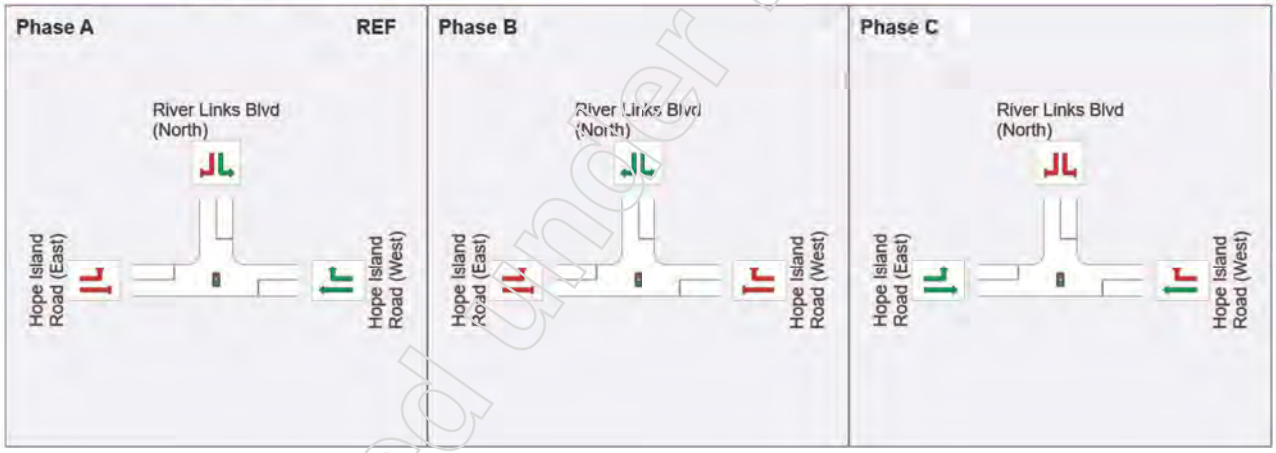
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, B, C**

### Phase Timing Summary

| Phase | A | B | C |
|---|---|---|---|
| Phase Change Time (sec) | 0 | 12 | 25 |
| Green Time (sec) | 6 | 7 | 49 |
| Phase Time (sec) | 12 | 13 | 55 |
| Phase Split | 15% | 16% | 69% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# MOVEMENT SUMMARY

## Site: 1 [2036_HIR_River Links Blvd_AM Peak -Predev]

Hope Island Road / River Links Boulvard
2036 AM Peak
Predevelopment Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 5 | T1 | 2825 | 2.5 | 1.027 | 84.0 | LOS F | 134.5 | 962.3 | 1.00 | 1.34 | 1.49 | 25.1 |
| 6 | R2 | 32 | 10.0 | 0.361 | 69.4 | LOS E | 1.9 | 14.6 | 1.00 | 0.72 | 1.00 | 20.3 |
| Approach | | 2857 | 2.6 | 1.027 | 83.8 | LOS F | 134.5 | 962.3 | 1.00 | 1.34 | 1.49 | 25.1 |
| North: River Links Blvd (North) | | | | | | | | | | | | |
| 7 | L2 | 77 | 0.0 | 1.021 | 114.8 | LOS F | 35.2 | 249.2 | 1.00 | 1.16 | 1.71 | 14.4 |
| 9 | R2 | 316 | 1.7 | 1.021 | 114.9 | LOS F | 35.2 | 249.2 | 1.00 | 1.16 | 1.71 | 14.4 |
| Approach | | 393 | 1.3 | 1.021 | 114.9 | LOS F | 35.2 | 249.2 | 1.00 | 1.16 | 1.71 | 14.4 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 91 | 3.5 | 0.080 | 15.3 | LOS B | 2.1 | 15.0 | 0.43 | 0.67 | 0.43 | 40.3 |
| 11 | T1 | 1413 | 5.8 | 0.617 | 14.9 | LOS B | 25.7 | 188.9 | 0.66 | 0.60 | 0.66 | 48.2 |
| Approach | | 1503 | 5.7 | 0.617 | 14.9 | LOS B | 25.7 | 188.9 | 0.65 | 0.61 | 0.65 | 47.9 |
| All Vehicles | | 4753 | 3.5 | 1.027 | 64.6 | LOS E | 134.5 | 962.3 | 0.89 | 1.09 | 1.24 | 28.3 |

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.
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.


Organisation: GHD SERVICES PTY LTD | Processed: Thursday, 5 September 2019 11:39:50 AM
Project: G:\41\32391\Tech\Traffic\5_SIDRA Models\Helensvale\HIR_River Links Rd.sip8

# PHASING SUMMARY

## Site: 1 [2036_HIR_River Links Blvd_AM Peak -Predev]

Hope Island Road / River Links Boulvard
2036 AM Peak
Predevelopment Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

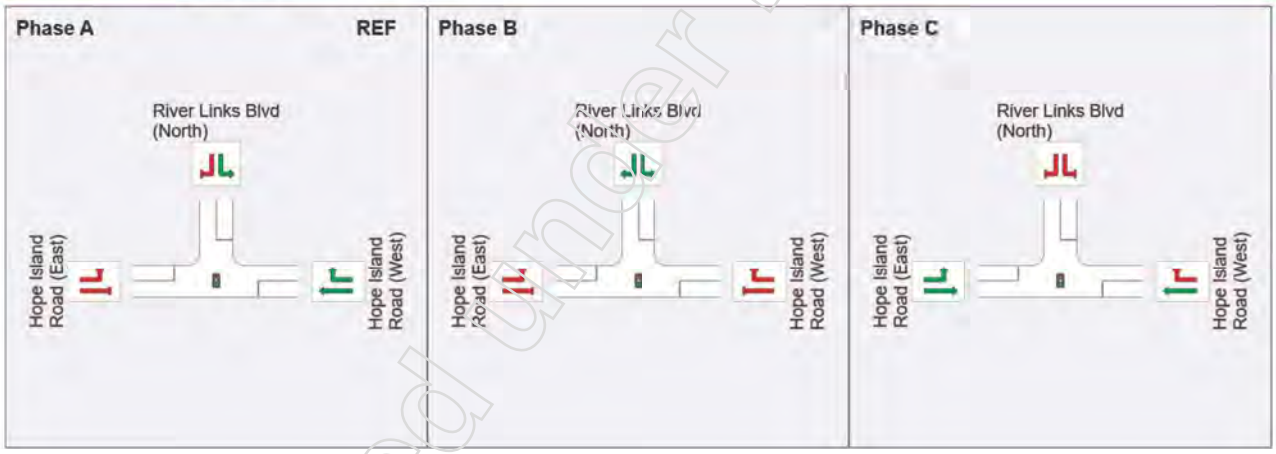
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, B, C**

### Phase Timing Summary

| Phase | A | B | C |
|---|---|---|---|
| Phase Change Time (sec) | 0 | 12 | 40 |
| Green Time (sec) | 6 | 22 | 74 |
| Phase Time (sec) | 12 | 28 | 80 |
| Phase Split | 10% | 23% | 67% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# MOVEMENT SUMMARY

## Site: 1 [2036_HIR_River Links Blvd_PM Peak - Predev]

Hope Island Road / River Links Boulvard
2036 PM Peak
Predevelopment Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 5 | T1 | 1628 | 3.9 | 0.539 | 4.4 | LOS A | 16.7 | 120.6 | 0.38 | 0.35 | 0.38 | 56.0 |
| 6 | R2 | 62 | 0.0 | 0.662 | 71.3 | LOS E | 3.9 | 27.2 | 1.00 | 0.80 | 1.13 | 20.0 |
| Approach | | 1691 | 3.7 | 0.662 | 6.8 | LOS A | 16.7 | 120.6 | 0.40 | 0.37 | 0.41 | 53.8 |
| North: River Links Blvd (North) | | | | | | | | | | | | |
| 7 | L2 | 72 | 4.4 | 0.943 | 83.7 | LOS F | 15.9 | 114.2 | 1.00 | 1.04 | 1.51 | 18.1 |
| 9 | R2 | 148 | 2.1 | 0.943 | 83.7 | LOS F | 15.9 | 114.2 | 1.00 | 1.04 | 1.51 | 18.2 |
| Approach | | 220 | 2.9 | 0.943 | 83.7 | LOS F | 15.9 | 114.2 | 1.00 | 1.04 | 1.51 | 18.2 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 245 | 0.9 | 0.188 | 12.1 | LOS B | 4.8 | 34.1 | 0.37 | 0.68 | 0.37 | 42.9 |
| 11 | T1 | 2497 | 1.5 | 0.983 | 55.8 | LOS E | 106.2 | 752.5 | 0.91 | 1.10 | 1.21 | 31.3 |
| Approach | | 2742 | 1.4 | 0.983 | 51.9 | LOS D | 106.2 | 752.5 | 0.86 | 1.06 | 1.14 | 31.8 |
| All Vehicles | | 4653 | 2.3 | 0.983 | 37.0 | LOS D | 106.2 | 752.5 | 0.70 | 0.81 | 0.89 | 36.5 |

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.
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.


Organisation: GHD SERVICES PTY LTD | Processed: Thursday, 5 September 2019 11:39:50 AM
Project: G:\41\32391\Tech\Traffic\5_SIDRA Models\Helensvale\HIR_River Links Rd.sip8

# PHASING SUMMARY

## Site: 1 [2036_HIR_River Links Blvd_PM Peak - Predev]

Hope Island Road / River Links Boulvard
2036 PM Peak
Predevelopment Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated  Cycle Time = 120 seconds (Site Practical Cycle Time)

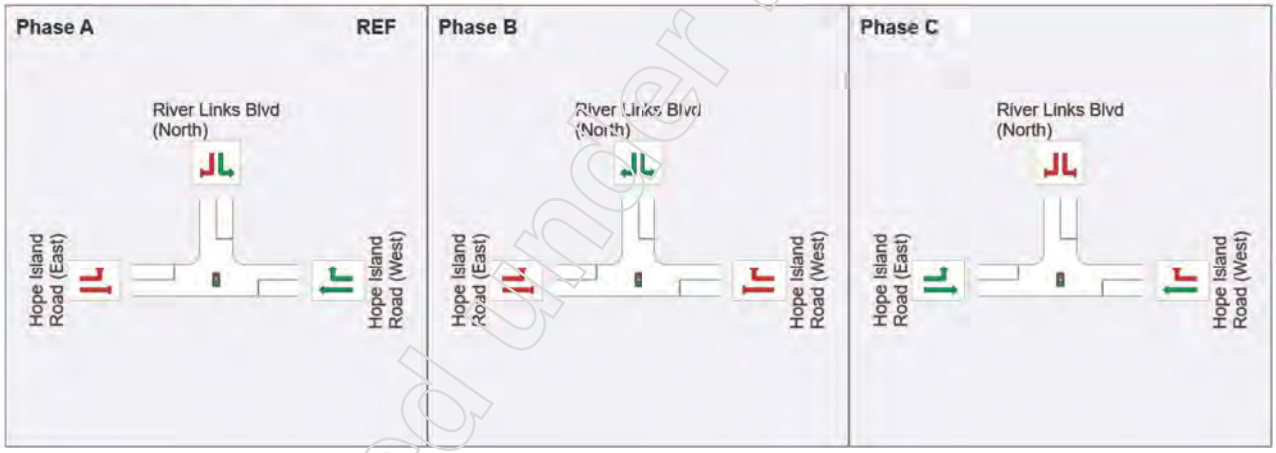
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, B, C**

### Phase Timing Summary

| Phase | A | B | C |
|---|---|---|---|
| Phase Change Time (sec) | 0 | 12 | 30 |
| Green Time (sec) | 6 | 12 | 84 |
| Phase Time (sec) | 12 | 18 | 90 |
| Phase Split | 10% | 15% | 75% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# MOVEMENT SUMMARY

## Site: 1 [2036_HIR_River Links Blvd_AM Peak -Postdev]

Hope Island Road / River Links Boulvard
2036 AM Peak
Predevelopment Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 5 | T1 | 2865 | 2.5 | 1.042 | 95.3 | LOS F | 143.4 | 1025.2 | 1.00 | 1.41 | 1.57 | 23.3 |
| 6 | R2 | 36 | 8.8 | 0.270 | 64.8 | LOS E | 2.1 | 15.6 | 0.98 | 0.73 | 0.98 | 21.2 |
| Approach | | 2901 | 2.6 | 1.042 | 94.9 | LOS F | 143.4 | 1025.2 | 1.00 | 1.40 | 1.57 | 23.2 |
| North: River Links Blvd (North) | | | | | | | | | | | | |
| 7 | L2 | 105 | 0.0 | 1.076 | 150.7 | LOS F | 43.9 | 310.3 | 1.00 | 1.27 | 1.96 | 11.5 |
| 9 | R2 | 316 | 1.7 | 1.076 | 150.8 | LOS F | 43.9 | 310.3 | 1.00 | 1.27 | 1.96 | 11.5 |
| Approach | | 421 | 1.3 | 1.076 | 150.8 | LOS F | 43.9 | 310.3 | 1.00 | 1.27 | 1.96 | 11.5 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 91 | 3.5 | 0.084 | 16.6 | LOS B | 2.2 | 16.0 | 0.45 | 0.68 | 0.45 | 39.4 |
| 11 | T1 | 1665 | 4.9 | 0.759 | 18.8 | LOS B | 36.6 | 267.3 | 0.79 | 0.72 | 0.79 | 45.8 |
| Approach | | 1756 | 4.9 | 0.759 | 18.7 | LOS B | 36.6 | 267.3 | 0.77 | 0.72 | 0.77 | 45.6 |
| All Vehicles | | 5078 | 3.3 | 1.076 | 73.2 | LOS E | 143.4 | 1025.2 | 0.92 | 1.16 | 1.32 | 26.4 |

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


Organisation: GHD SERVICES PTY LTD | Processed: Thursday, 5 September 2019 11:39:51 AM
Project: G:\41\32391\Tech\Traffic\5_SIDRA Models\Helensvale\HIR_River Links Rd.sip8

# PHASING SUMMARY

## Site: 1 [2036_HIR_River Links Blvd_AM Peak -Postdev]

Hope Island Road / River Links Boulvard
2036 AM Peak
Predevelopment Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

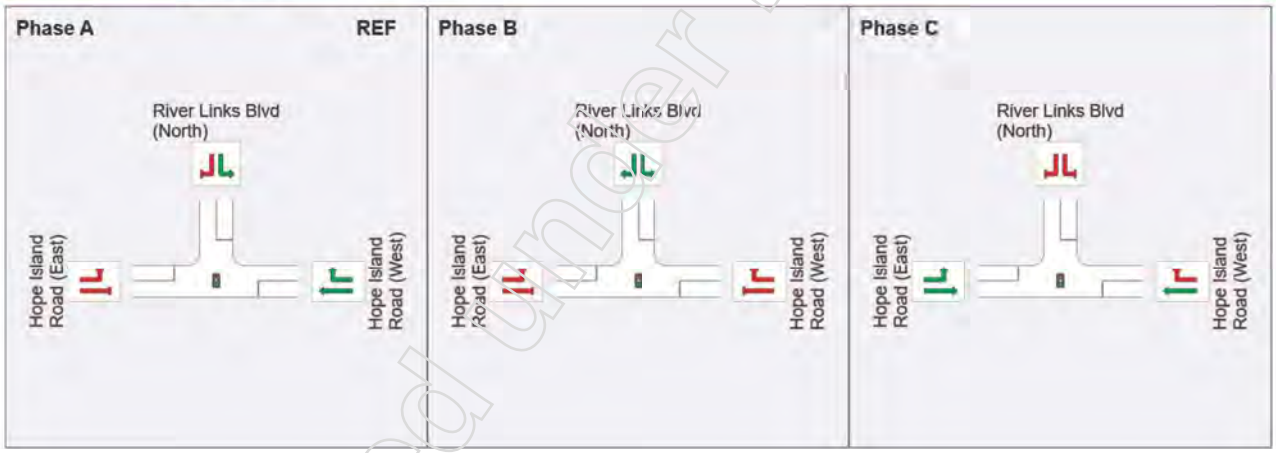
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times specified by the user**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, B, C**

### Phase Timing Summary

| Phase | A | B | C |
|---|---|---|---|
| Phase Change Time (sec) | 0 | 15 | 43 |
| Green Time (sec) | 9 | 22 | 71 |
| Phase Time (sec) | 15 | 28 | 77 |
| Phase Split | 13% | 23% | 64% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# MOVEMENT SUMMARY

## Site: 1 [2036_HIR_River Links Blvd_PM Peak - Postdev]

Hope Island Road / River Links Boulvard
2036 PM Peak
Predevelopment Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Hope Island Road (West) | | | | | | | | | | | | |
| 5 | T1 | 1831 | 3.5 | 0.616 | 4.8 | LOS A | 21.5 | 154.7 | 0.42 | 0.39 | 0.42 | 55.6 |
| 6 | R2 | 84 | 0.0 | 0.898 | 79.5 | LOS E | 5.7 | 39.9 | 1.00 | 0.97 | 1.54 | 18.6 |
| Approach | | 1915 | 3.3 | 0.898 | 8.1 | LOS A | 21.5 | 154.7 | 0.44 | 0.41 | 0.47 | 52.7 |
| North: River Links Blvd (North) | | | | | | | | | | | | |
| 7 | L2 | 76 | 4.2 | 0.952 | 86.2 | LOS F | 16.5 | 118.4 | 1.00 | 1.05 | 1.54 | 17.8 |
| 9 | R2 | 148 | 2.1 | 0.952 | 86.2 | LOS F | 16.5 | 118.4 | 1.00 | 1.05 | 1.54 | 17.8 |
| Approach | | 224 | 2.8 | 0.952 | 86.2 | LOS F | 16.5 | 118.4 | 1.00 | 1.05 | 1.54 | 17.8 |
| West: Hope Island Road (East) | | | | | | | | | | | | |
| 10 | L2 | 245 | 0.9 | 0.188 | 12.1 | LOS B | 4.8 | 34.1 | 0.37 | 0.68 | 0.37 | 42.9 |
| 11 | T1 | 2528 | 1.5 | 0.995 | 63.6 | LOS E | 114.5 | 811.3 | 0.92 | 1.15 | 1.27 | 29.3 |
| Approach | | 2774 | 1.4 | 0.995 | 59.0 | LOS E | 114.5 | 811.3 | 0.87 | 1.11 | 1.19 | 29.8 |
| All Vehicles | | 4913 | 2.2 | 0.995 | 40.4 | LOS D | 114.5 | 811.3 | 0.71 | 0.83 | 0.92 | 35.3 |

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.
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.


Organisation: GHD SERVICES PTY LTD | Processed: Thursday, 5 September 2019 11:39:52 AM
Project: G:\41\32391\Tech\Traffic\5_SIDRA Models\Helensvale\HIR_River Links Rd.sip8

# PHASING SUMMARY

## Site: 1 [2036_HIR_River Links Blvd_PM Peak - Postdev]

Hope Island Road / River Links Boulvard
2036 PM Peak
Predevelopment Scenario Assessment
Site Category: Signalised T-Intersection
Signals - Fixed Time Isolated  Cycle Time = 120 seconds (Site Practical Cycle Time)

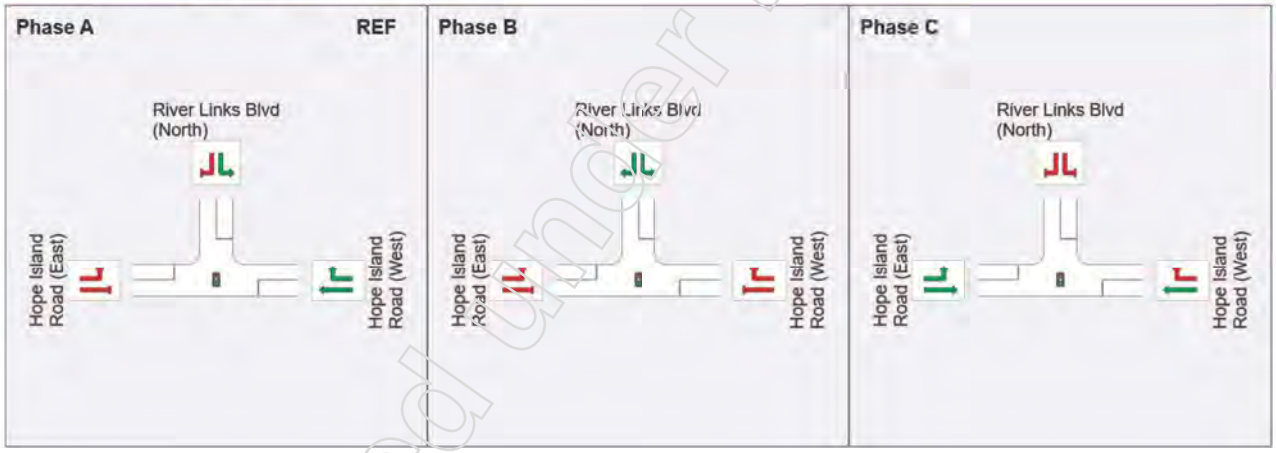
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Split Phasing**
**Reference Phase: Phase A**
**Input Phase Sequence: A, B, C**
**Output Phase Sequence: A, B, C**

### Phase Timing Summary

| Phase | A | B | C |
|---|---|---|---|
| Phase Change Time (sec) | 0 | 12 | 30 |
| Green Time (sec) | 6 | 12 | 84 |
| Phase Time (sec) | 12 | 18 | 90 |
| Phase Split | 10% | 15% | 75% |

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase
VAR: Variable Phase

# MOVEMENT SUMMARY

## Site: 4 [2024_HIR_Monterey Keys Dr_AM Peak - Predev]

Hope Island Road / River Links Boulvard
2019 AM Peak
Existing Scenario Assessment
Site Category: Roundabout
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Monterey Keys Drive (South) | | | | | | | | | | | | |
| 1 | L2 | 163 | 3.9 | 0.353 | 9.4 | LOS A | 1.8 | 12.8 | 0.79 | 0.91 | 0.88 | 51.5 |
| 2 | T1 | 1 | 0.0 | 0.353 | 9.0 | LOS A | 1.8 | 12.8 | 0.79 | 0.91 | 0.88 | 53.4 |
| 3 | R2 | 42 | 7.5 | 0.353 | 16.0 | LOS B | 1.8 | 12.8 | 0.79 | 0.91 | 0.88 | 53.9 |
| Approach | | 206 | 4.6 | 0.353 | 10.7 | LOS B | 1.8 | 12.8 | 0.79 | 0.91 | 0.88 | 52.0 |
| East: Hope Island Road (East) | | | | | | | | | | | | |
| 4 | L2 | 111 | 8.6 | 0.638 | 3.7 | LOS A | 5.4 | 38.6 | 0.31 | 0.34 | 0.31 | 55.7 |
| 5 | T1 | 1827 | 2.2 | 0.638 | 3.4 | LOS A | 5.4 | 38.9 | 0.32 | 0.34 | 0.32 | 57.9 |
| 6 | R2 | 5 | 20.0 | 0.638 | 10.3 | LOS B | 5.4 | 38.9 | 0.34 | 0.34 | 0.34 | 58.0 |
| Approach | | 1943 | 2.6 | 0.638 | 3.4 | LOS A | 5.4 | 38.9 | 0.32 | 0.34 | 0.32 | 57.8 |
| North: River Cove Place (North) | | | | | | | | | | | | |
| 7 | L2 | 5 | 20.0 | 0.033 | 6.3 | LOS A | 0.1 | 0.9 | 0.57 | 0.75 | 0.57 | 51.4 |
| 8 | T1 | 1 | 0.0 | 0.033 | 5.5 | LOS A | 0.1 | 0.9 | 0.57 | 0.75 | 0.57 | 53.4 |
| 9 | R2 | 19 | 5.6 | 0.033 | 12.3 | LOS B | 0.1 | 0.9 | 0.57 | 0.75 | 0.57 | 54.0 |
| Approach | | 25 | 8.3 | 0.033 | 10.7 | LOS B | 0.1 | 0.9 | 0.57 | 0.75 | 0.57 | 53.4 |
| West: Hope Isand Road (West) | | | | | | | | | | | | |
| 10 | L2 | 8 | 12.5 | 0.360 | 3.5 | LOS A | 2.5 | 17.9 | 0.21 | 0.31 | 0.21 | 56.2 |
| 11 | T1 | 1028 | 4.5 | 0.360 | 3.1 | LOS A | 2.5 | 17.9 | 0.21 | 0.33 | 0.21 | 58.4 |
| 12 | R2 | 52 | 6.1 | 0.360 | 9.7 | LOS A | 2.4 | 17.5 | 0.22 | 0.35 | 0.22 | 58.8 |
| Approach | | 1088 | 4.6 | 0.360 | 3.4 | LOS A | 2.5 | 17.9 | 0.21 | 0.33 | 0.21 | 58.4 |
| All Vehicles | | 3263 | 3.5 | 0.638 | 3.9 | LOS A | 5.4 | 38.9 | 0.32 | 0.38 | 0.32 | 57.5 |

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

# MOVEMENT SUMMARY

## Site: 4 [2024_HIR_Monterey Keys Dr_PM Peak - Predev]

Hope Island Road / River Links Boulvard
2019 PM Peak
Existing Scenario Assessment
Site Category: Roundabout
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Monterey Keys Drive (South) | | | | | | | | | | | | |
| 1 | L2 | 97 | 5.4 | 0.240 | 6.2 | LOS A | 1.0 | 7.6 | 0.66 | 0.82 | 0.66 | 52.7 |
| 2 | T1 | 3 | 0.0 | 0.240 | 5.8 | LOS A | 1.0 | 7.6 | 0.66 | 0.82 | 0.66 | 54.7 |
| 3 | R2 | 79 | 4.0 | 0.240 | 12.5 | LOS B | 1.0 | 7.6 | 0.66 | 0.82 | 0.66 | 55.3 |
| Approach | | 179 | 4.7 | 0.240 | 9.0 | LOS A | 1.0 | 7.6 | 0.66 | 0.82 | 0.66 | 53.9 |
| East: Hope Island Road (East) | | | | | | | | | | | | |
| 4 | L2 | 74 | 8.6 | 0.434 | 4.0 | LOS A | 3.0 | 21.4 | 0.41 | 0.37 | 0.41 | 55.1 |
| 5 | T1 | 1019 | 3.6 | 0.434 | 3.7 | LOS A | 3.0 | 21.4 | 0.42 | 0.40 | 0.42 | 57.1 |
| 6 | R2 | 74 | 0.0 | 0.434 | 10.3 | LOS B | 2.9 | 20.6 | 0.43 | 0.42 | 0.43 | 57.6 |
| Approach | | 1166 | 3.7 | 0.434 | 4.1 | LOS A | 3.0 | 21.4 | 0.42 | 0.40 | 0.42 | 57.0 |
| North: River Cove Place (North) | | | | | | | | | | | | |
| 7 | L2 | 6 | 0.0 | 0.027 | 8.8 | LOS A | 0.1 | 0.9 | 0.80 | 0.82 | 0.80 | 51.1 |
| 8 | T1 | 1 | 0.0 | 0.027 | 8.7 | LOS A | 0.1 | 0.9 | 0.80 | 0.82 | 0.80 | 52.8 |
| 9 | R2 | 5 | 0.0 | 0.027 | 15.3 | LOS B | 0.1 | 0.9 | 0.80 | 0.82 | 0.80 | 53.6 |
| Approach | | 13 | 0.0 | 0.027 | 11.5 | LOS B | 0.1 | 0.9 | 0.80 | 0.82 | 0.80 | 52.2 |
| West: Hope Isand Road (West) | | | | | | | | | | | | |
| 10 | L2 | 23 | 0.0 | 0.713 | 4.2 | LOS A | 7.0 | 49.4 | 0.54 | 0.40 | 0.54 | 54.6 |
| 11 | T1 | 1824 | 1.2 | 0.713 | 4.0 | LOS A | 7.0 | 49.4 | 0.56 | 0.43 | 0.56 | 56.3 |
| 12 | R2 | 163 | 3.9 | 0.713 | 10.8 | LOS B | 6.9 | 49.1 | 0.58 | 0.47 | 0.58 | 56.5 |
| Approach | | 2011 | 1.4 | 0.713 | 4.6 | LOS A | 7.0 | 49.4 | 0.56 | 0.43 | 0.56 | 56.3 |
| All Vehicles | | 3368 | 2.4 | 0.713 | 4.7 | LOS A | 7.0 | 49.4 | 0.52 | 0.44 | 0.52 | 56.4 |

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

# MOVEMENT SUMMARY

## Site: 4 [2024_HIR_Monterey Keys Dr_AM Peak - Postdev]

Hope Island Road / River Links Boulvard
2019 AM Peak
Existing Scenario Assessment
Site Category: Roundabout
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Monterey Keys Drive (South) | | | | | | | | | | | | |
| 1 | L2 | 244 | 2.6 | 0.578 | 14.0 | LOS B | 3.7 | 26.3 | 0.88 | 1.05 | 1.24 | 44.8 |
| 2 | T1 | 1 | 0.0 | 0.578 | 13.7 | LOS B | 3.7 | 26.3 | 0.88 | 1.05 | 1.24 | 50.3 |
| 3 | R2 | 42 | 7.5 | 0.578 | 20.7 | LOS C | 3.7 | 26.3 | 0.88 | 1.05 | 1.24 | 50.7 |
| Approach | | 287 | 3.3 | 0.578 | 14.9 | LOS B | 3.7 | 26.3 | 0.88 | 1.05 | 1.24 | 45.9 |
| East: Hope Island Road (East) | | | | | | | | | | | | |
| 4 | L2 | 111 | 8.6 | 0.716 | 4.1 | LOS A | 7.0 | 49.9 | 0.45 | 0.38 | 0.45 | 54.9 |
| 5 | T1 | 1988 | 2.0 | 0.716 | 3.8 | LOS A | 7.0 | 50.0 | 0.47 | 0.38 | 0.47 | 55.7 |
| 6 | R2 | 5 | 20.0 | 0.716 | 10.8 | LOS B | 7.0 | 50.0 | 0.49 | 0.39 | 0.49 | 57.0 |
| Approach | | 2104 | 2.4 | 0.716 | 3.8 | LOS A | 7.0 | 50.0 | 0.47 | 0.38 | 0.47 | 55.6 |
| North: River Cove Place (North) | | | | | | | | | | | | |
| 7 | L2 | 5 | 20.0 | 0.034 | 6.4 | LOS A | 0.1 | 1.0 | 0.59 | 0.76 | 0.59 | 51.3 |
| 8 | T1 | 1 | 0.0 | 0.034 | 5.6 | LOS A | 0.1 | 1.0 | 0.59 | 0.76 | 0.59 | 53.3 |
| 9 | R2 | 19 | 5.6 | 0.034 | 12.4 | LOS B | 0.1 | 1.0 | 0.59 | 0.76 | 0.59 | 51.4 |
| Approach | | 25 | 8.3 | 0.034 | 10.9 | LOS B | 0.1 | 1.0 | 0.59 | 0.76 | 0.59 | 51.5 |
| West: Hope Isand Road (West) | | | | | | | | | | | | |
| 10 | L2 | 8 | 12.5 | 0.381 | 3.5 | LOS A | 2.8 | 20.0 | 0.22 | 0.31 | 0.22 | 54.7 |
| 11 | T1 | 1054 | 4.4 | 0.381 | 3.1 | LOS A | 2.8 | 20.0 | 0.22 | 0.34 | 0.22 | 57.4 |
| 12 | R2 | 65 | 4.8 | 0.381 | 9.7 | LOS A | 2.7 | 19.4 | 0.23 | 0.38 | 0.23 | 57.6 |
| 12u | U | 25 | 0.0 | 0.381 | 12.2 | LOS B | 2.7 | 19.4 | 0.23 | 0.38 | 0.23 | 33.7 |
| Approach | | 1153 | 4.4 | 0.381 | 3.7 | LOS A | 2.8 | 20.0 | 0.22 | 0.34 | 0.22 | 56.9 |
| All Vehicles | | 3569 | 3.2 | 0.716 | 4.7 | LOS A | 7.0 | 50.0 | 0.42 | 0.42 | 0.45 | 55.0 |

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

# MOVEMENT SUMMARY

## Site: 4 [2024_HIR_Monterey Keys Dr_PM Peak - Postdev]

Hope Island Road / River Links Boulvard
2019 PM Peak
Existing Scenario Assessment
Site Category: Roundabout
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Monterey Keys Drive (South) | | | | | | | | | | | | |
| 1 | L2 | 107 | 4.9 | 0.298 | 6.8 | LOS A | 1.4 | 10.5 | 0.75 | 0.87 | 0.75 | 49.5 |
| 2 | T1 | 3 | 0.0 | 0.298 | 6.5 | LOS A | 1.4 | 10.5 | 0.75 | 0.87 | 0.75 | 54.4 |
| 3 | R2 | 79 | 4.0 | 0.298 | 13.2 | LOS B | 1.4 | 10.5 | 0.75 | 0.87 | 0.75 | 55.0 |
| Approach | | 189 | 4.4 | 0.298 | 9.4 | LOS A | 1.4 | 10.5 | 0.75 | 0.87 | 0.75 | 52.2 |
| East: Hope Island Road (East) | | | | | | | | | | | | |
| 4 | L2 | 74 | 8.6 | 0.526 | 5.1 | LOS A | 4.0 | 29.2 | 0.66 | 0.48 | 0.66 | 53.8 |
| 5 | T1 | 1039 | 3.5 | 0.526 | 4.9 | LOS A | 4.0 | 29.2 | 0.67 | 0.51 | 0.67 | 53.8 |
| 6 | R2 | 74 | 0.0 | 0.526 | 11.6 | LOS B | 3.9 | 28.3 | 0.67 | 0.56 | 0.69 | 56.2 |
| Approach | | 1186 | 3.6 | 0.526 | 5.3 | LOS A | 4.0 | 29.2 | 0.67 | 0.52 | 0.67 | 54.0 |
| North: River Cove Place (North) | | | | | | | | | | | | |
| 7 | L2 | 6 | 0.0 | 0.037 | 11.5 | LOS B | 0.2 | 1.4 | 0.88 | 0.87 | 0.88 | 49.3 |
| 8 | T1 | 1 | 0.0 | 0.037 | 11.4 | LOS B | 0.2 | 1.4 | 0.88 | 0.87 | 0.88 | 50.9 |
| 9 | R2 | 5 | 0.0 | 0.037 | 17.9 | LOS B | 0.2 | 1.4 | 0.88 | 0.87 | 0.88 | 48.8 |
| Approach | | 13 | 0.0 | 0.037 | 14.2 | LOS B | 0.2 | 1.4 | 0.88 | 0.87 | 0.88 | 49.3 |
| West: Hope Isand Road (West) | | | | | | | | | | | | |
| 10 | L2 | 23 | 0.0 | 0.825 | 4.6 | LOS A | 11.1 | 78.4 | 0.69 | 0.44 | 0.69 | 51.5 |
| 11 | T1 | 1953 | 1.1 | 0.825 | 4.7 | LOS A | 11.5 | 81.6 | 0.71 | 0.50 | 0.73 | 53.4 |
| 12 | R2 | 227 | 2.8 | 0.825 | 11.8 | LOS B | 11.5 | 81.6 | 0.75 | 0.60 | 0.78 | 53.1 |
| 12u | U | 128 | 0.0 | 0.825 | 14.3 | LOS B | 11.5 | 81.6 | 0.75 | 0.60 | 0.78 | 31.2 |
| Approach | | 2332 | 1.2 | 0.825 | 5.9 | LOS A | 11.5 | 81.6 | 0.72 | 0.51 | 0.73 | 52.1 |
| All Vehicles | | 3720 | 2.2 | 0.825 | 5.9 | LOS A | 11.5 | 81.6 | 0.70 | 0.53 | 0.72 | 52.7 |

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

# MOVEMENT SUMMARY

## Site: 4 [2036_HIR_Monterey Keys Dr_AM Peak - Predev]

Hope Island Road / River Links Boulvard
2019 AM Peak
Existing Scenario Assessment
Site Category: Roundabout
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Monterey Keys Drive (South) | | | | | | | | | | | | |
| 1 | L2 | 202 | 3.6 | 0.629 | 19.2 | LOS B | 4.2 | 30.8 | 0.92 | 1.11 | 1.41 | 45.3 |
| 2 | T1 | 1 | 0.0 | 0.629 | 18.8 | LOS B | 4.2 | 30.8 | 0.92 | 1.11 | 1.41 | 46.8 |
| 3 | R2 | 53 | 8.0 | 0.629 | 26.0 | LOS C | 4.2 | 30.8 | 0.92 | 1.11 | 1.41 | 47.1 |
| Approach | | 256 | 4.5 | 0.629 | 20.6 | LOS C | 4.2 | 30.8 | 0.92 | 1.11 | 1.41 | 45.7 |
| East: Hope Island Road (East) | | | | | | | | | | | | |
| 4 | L2 | 137 | 8.5 | 0.802 | 4.2 | LOS A | 10.6 | 76.4 | 0.50 | 0.38 | 0.50 | 54.6 |
| 5 | T1 | 2264 | 2.2 | 0.802 | 3.8 | LOS A | 10.6 | 76.4 | 0.53 | 0.39 | 0.53 | 56.7 |
| 6 | R2 | 6 | 16.7 | 0.802 | 10.8 | LOS B | 10.2 | 73.0 | 0.57 | 0.40 | 0.57 | 56.7 |
| Approach | | 2407 | 2.6 | 0.802 | 3.9 | LOS A | 10.6 | 76.4 | 0.53 | 0.39 | 0.53 | 56.5 |
| North: River Cove Place (North) | | | | | | | | | | | | |
| 7 | L2 | 6 | 16.7 | 0.046 | 6.9 | LOS A | 0.2 | 1.3 | 0.64 | 0.80 | 0.64 | 50.9 |
| 8 | T1 | 1 | 0.0 | 0.046 | 6.2 | LOS A | 0.2 | 1.3 | 0.64 | 0.80 | 0.64 | 52.9 |
| 9 | R2 | 24 | 4.3 | 0.046 | 12.9 | LOS B | 0.2 | 1.3 | 0.64 | 0.80 | 0.64 | 53.5 |
| Approach | | 32 | 6.7 | 0.046 | 11.5 | LOS B | 0.2 | 1.3 | 0.64 | 0.80 | 0.64 | 52.9 |
| West: Hope Isand Road (West) | | | | | | | | | | | | |
| 10 | L2 | 11 | 10.0 | 0.452 | 3.5 | LOS A | 3.6 | 26.2 | 0.27 | 0.31 | 0.27 | 55.9 |
| 11 | T1 | 1274 | 4.5 | 0.452 | 3.2 | LOS A | 3.6 | 26.2 | 0.28 | 0.33 | 0.28 | 58.0 |
| 12 | R2 | 64 | 6.6 | 0.452 | 9.8 | LOS A | 3.5 | 25.5 | 0.29 | 0.36 | 0.29 | 58.3 |
| Approach | | 1348 | 4.6 | 0.452 | 3.5 | LOS A | 3.6 | 26.2 | 0.28 | 0.33 | 0.28 | 58.0 |
| All Vehicles | | 4043 | 3.4 | 0.802 | 4.9 | LOS A | 10.6 | 76.4 | 0.47 | 0.42 | 0.50 | 56.1 |

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

# MOVEMENT SUMMARY

## Site: 4 [2036_HIR_Monterey Keys Dr_PM Peak - Predev]

Hope Island Road / River Links Boulvard
2019 PM Peak
Existing Scenario Assessment
Site Category: Roundabout
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Monterey Keys Drive (South) | | | | | | | | | | | | |
| 1 | L2 | 120 | 5.3 | 0.360 | 7.4 | LOS A | 1.8 | 13.1 | 0.77 | 0.91 | 0.83 | 51.9 |
| 2 | T1 | 4 | 0.0 | 0.360 | 7.0 | LOS A | 1.8 | 13.1 | 0.77 | 0.91 | 0.83 | 53.8 |
| 3 | R2 | 98 | 4.3 | 0.360 | 13.8 | LOS B | 1.8 | 13.1 | 0.77 | 0.91 | 0.83 | 54.4 |
| Approach | | 222 | 4.7 | 0.360 | 10.2 | LOS B | 1.8 | 13.1 | 0.77 | 0.91 | 0.83 | 53.0 |
| East: Hope Island Road (East) | | | | | | | | | | | | |
| 4 | L2 | 92 | 8.0 | 0.566 | 4.3 | LOS A | 4.9 | 35.8 | 0.58 | 0.41 | 0.58 | 54.2 |
| 5 | T1 | 1262 | 3.6 | 0.566 | 4.0 | LOS A | 4.9 | 35.8 | 0.59 | 0.43 | 0.59 | 56.1 |
| 6 | R2 | 92 | 0.0 | 0.566 | 10.7 | LOS B | 4.7 | 34.1 | 0.60 | 0.46 | 0.60 | 56.7 |
| Approach | | 1445 | 3.6 | 0.566 | 4.5 | LOS A | 4.9 | 35.8 | 0.59 | 0.43 | 0.59 | 56.0 |
| North: River Cove Place (North) | | | | | | | | | | | | |
| 7 | L2 | 7 | 0.0 | 0.061 | 15.3 | LOS B | 0.3 | 2.4 | 0.93 | 0.94 | 0.93 | 46.9 |
| 8 | T1 | 1 | 0.0 | 0.061 | 15.2 | LOS B | 0.3 | 2.4 | 0.93 | 0.94 | 0.93 | 48.4 |
| 9 | R2 | 6 | 0.0 | 0.061 | 21.7 | LOS C | 0.3 | 2.4 | 0.93 | 0.94 | 0.93 | 49.0 |
| Approach | | 15 | 0.0 | 0.061 | 18.1 | LOS B | 0.3 | 2.4 | 0.93 | 0.94 | 0.93 | 47.9 |
| West: Hope Isand Road (West) | | | | | | | | | | | | |
| 10 | L2 | 28 | 0.0 | 0.910 | 7.9 | LOS A | 20.2 | 142.9 | 0.92 | 0.72 | 1.05 | 52.6 |
| 11 | T1 | 2259 | 1.2 | 0.910 | 8.3 | LOS A | 20.3 | 143.9 | 0.95 | 0.76 | 1.11 | 53.9 |
| 12 | R2 | 202 | 3.6 | 0.910 | 16.0 | LOS B | 20.3 | 143.9 | 1.00 | 0.82 | 1.20 | 53.9 |
| Approach | | 2489 | 1.4 | 0.910 | 8.9 | LOS A | 20.3 | 143.9 | 0.96 | 0.77 | 1.12 | 53.9 |
| All Vehicles | | 4172 | 2.3 | 0.910 | 7.5 | LOS A | 20.3 | 143.9 | 0.82 | 0.66 | 0.92 | 54.6 |

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

# MOVEMENT SUMMARY

## Site: 4 [2036_HIR_Monterey Keys Dr_AM Peak - Postdev]

Hope Island Road / River Links Boulvard
2019 AM Peak
Existing Scenario Assessment
Site Category: Roundabout
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Monterey Keys Drive (South) | | | | | | | | | | | | |
| 1 | L2 | 343 | 2.1 | 1.804 | 752.5 | LOS F | 122.2 | 876.7 | 1.00 | 4.83 | 13.23 | 3.2 |
| 2 | T1 | 1 | 0.0 | 1.804 | 752.2 | LOS F | 122.2 | 876.7 | 1.00 | 4.83 | 13.23 | 4.5 |
| 3 | R2 | 53 | 8.0 | 1.804 | 759.3 | LOS F | 122.2 | 876.7 | 1.00 | 4.83 | 13.23 | 4.5 |
| Approach | | 397 | 2.9 | 1.804 | 753.4 | LOS F | 122.2 | 876.7 | 1.00 | 4.83 | 13.23 | 3.4 |
| East: Hope Island Road (East) | | | | | | | | | | | | |
| 4 | L2 | 137 | 8.5 | 0.945 | 8.4 | LOS A | 25.9 | 185.3 | 0.97 | 0.69 | 1.09 | 52.2 |
| 5 | T1 | 2544 | 1.9 | 0.945 | 9.1 | LOS A | 26.6 | 189.7 | 0.99 | 0.74 | 1.14 | 51.6 |
| 6 | R2 | 6 | 16.7 | 0.945 | 17.4 | LOS B | 26.6 | 189.7 | 1.00 | 0.78 | 1.20 | 54.0 |
| Approach | | 2687 | 2.3 | 0.945 | 9.1 | LOS A | 26.6 | 189.7 | 0.99 | 0.73 | 1.14 | 51.7 |
| North: River Cove Place (North) | | | | | | | | | | | | |
| 7 | L2 | 6 | 16.7 | 0.047 | 7.3 | LOS A | 0.2 | 1.4 | 0.65 | 0.81 | 0.65 | 50.7 |
| 8 | T1 | 1 | 0.0 | 0.047 | 6.5 | LOS A | 0.2 | 1.4 | 0.65 | 0.81 | 0.65 | 52.7 |
| 9 | R2 | 24 | 4.3 | 0.047 | 13.3 | LOS B | 0.2 | 1.4 | 0.65 | 0.81 | 0.65 | 50.7 |
| Approach | | 32 | 6.7 | 0.047 | 11.8 | LOS B | 0.2 | 1.4 | 0.65 | 0.81 | 0.65 | 50.8 |
| West: Hope Isand Road (West) | | | | | | | | | | | | |
| 10 | L2 | 11 | 10.0 | 0.471 | 3.4 | LOS A | 3.9 | 28.6 | 0.21 | 0.30 | 0.21 | 54.8 |
| 11 | T1 | 1318 | 4.3 | 0.471 | 3.1 | LOS A | 3.9 | 28.6 | 0.22 | 0.34 | 0.22 | 57.4 |
| 12 | R2 | 86 | 4.9 | 0.471 | 9.7 | LOS A | 3.8 | 27.8 | 0.23 | 0.38 | 0.23 | 57.5 |
| 12u | U | 44 | 0.0 | 0.471 | 12.2 | LOS B | 3.8 | 27.8 | 0.23 | 0.38 | 0.23 | 33.6 |
| Approach | | 1459 | 4.3 | 0.471 | 3.7 | LOS A | 3.9 | 28.6 | 0.22 | 0.34 | 0.22 | 56.6 |
| All Vehicles | | 4575 | 3.0 | 1.804 | 71.9 | LOS F | 122.2 | 876.7 | 0.74 | 0.96 | 1.89 | 23.4 |

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

# MOVEMENT SUMMARY

## Site: 4 [2036_HIR_Monterey Keys Dr_PM Peak - Postdev]

Hope Island Road / River Links Boulvard
2019 PM Peak
Existing Scenario Assessment
Site Category: Roundabout
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Monterey Keys Drive (South) | | | | | | | | | | | | |
| 1 | L2 | 138 | 4.6 | 0.536 | 11.2 | LOS B | 3.3 | 24.1 | 0.90 | 1.02 | 1.10 | 45.8 |
| 2 | T1 | 4 | 0.0 | 0.536 | 10.8 | LOS B | 3.3 | 24.1 | 0.90 | 1.02 | 1.10 | 51.2 |
| 3 | R2 | 98 | 4.3 | 0.536 | 17.6 | LOS B | 3.3 | 24.1 | 0.90 | 1.02 | 1.10 | 51.8 |
| Approach | | 240 | 4.4 | 0.536 | 13.8 | LOS B | 3.3 | 24.1 | 0.90 | 1.02 | 1.10 | 48.7 |
| East: Hope Island Road (East) | | | | | | | | | | | | |
| 4 | L2 | 92 | 8.0 | 0.763 | 9.4 | LOS A | 10.4 | 75.3 | 0.95 | 0.97 | 1.22 | 52.2 |
| 5 | T1 | 1297 | 3.5 | 0.763 | 9.5 | LOS A | 10.4 | 75.3 | 0.96 | 1.00 | 1.24 | 51.2 |
| 6 | R2 | 92 | 0.0 | 0.763 | 16.6 | LOS B | 9.8 | 70.3 | 0.96 | 1.03 | 1.26 | 53.9 |
| Approach | | 1480 | 3.6 | 0.763 | 10.0 | LOS A | 10.4 | 75.3 | 0.96 | 1.00 | 1.24 | 51.5 |
| North: River Cove Place (North) | | | | | | | | | | | | |
| 7 | L2 | 7 | 0.0 | 0.086 | 21.6 | LOS C | 0.5 | 3.4 | 0.97 | 0.99 | 0.97 | 43.5 |
| 8 | T1 | 1 | 0.0 | 0.086 | 21.5 | LOS C | 0.5 | 3.4 | 0.97 | 0.99 | 0.97 | 44.8 |
| 9 | R2 | 6 | 0.0 | 0.086 | 28.1 | LOS C | 0.5 | 3.4 | 0.97 | 0.99 | 0.97 | 41.2 |
| Approach | | 15 | 0.0 | 0.086 | 24.4 | LOS C | 0.5 | 3.4 | 0.97 | 0.99 | 0.97 | 42.8 |
| West: Hope Isand Road (West) | | | | | | | | | | | | |
| 10 | L2 | 28 | 0.0 | 1.112 | 110.2 | LOS F | 138.8 | 980.4 | 1.00 | 2.98 | 4.70 | 17.4 |
| 11 | T1 | 2484 | 1.1 | 1.112 | 110.6 | LOS F | 138.8 | 980.4 | 1.00 | 2.95 | 4.69 | 17.6 |
| 12 | R2 | 315 | 2.3 | 1.112 | 118.6 | LOS F | 122.6 | 867.2 | 1.00 | 2.89 | 4.69 | 17.5 |
| 12u | U | 224 | 0.0 | 1.112 | 121.1 | LOS F | 122.6 | 867.2 | 1.00 | 2.89 | 4.69 | 10.4 |
| Approach | | 3052 | 1.1 | 1.112 | 112.2 | LOS F | 138.8 | 980.4 | 1.00 | 2.94 | 4.69 | 17.0 |
| All Vehicles | | 4786 | 2.0 | 1.112 | 75.4 | LOS F | 138.8 | 980.4 | 0.98 | 2.24 | 3.43 | 22.9 |

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