Proposed Rezoning for Residential Subdivision
West Gable, the Gables Box Hill

Traffic Impact Assessment Report

Prepared for: Allam Property Group & Stockland

December 2022

Report No: PT22014r01_Final

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1. Executive Summary

This traffic impact assessment report has assessed the potential traffic impacts of the proposed rezoning of lands known as West Gables. The report has considered all current public and draft traffic modelling assessments of surrounding precincts along with those undertaken for The Gables precinct.

It is observed that additional yield of the Box Hill / Box Hill Industrial and The Gables Precincts have been approved by the Department of Planning since the preparation of the area wide traffic impact assessments for the Box Hill / Box Hill Industrial and The Gables Precincts without any update to these existing reports.

However, this report has fully accounted for this additional yield in the assessment of future traffic conditions at intersections close to the subject site as agreed with Hills Shire Council through consultation on the scope of the traffic assessment to inform this proposal.

This report has provided a robust assessment of future traffic conditions accounting for *all additional* development within the Box Hill / Box Hill Industrial and The Gables Precincts.

This assessment has confirmed that the proposed road infrastructure upgrades surrounding the development would be adequate to accommodate the potential additional traffic generated by the proposal on the immediate surrounding road network.

These identified changes as detailed in the contributions plan include:

- Upgrade of Boundary Road to collector road status
- Signalisation of the intersection of Boundary Road / Old Pitt Town Road
- Signalisation of the intersection of Old Pitt Town Road / Valetta Drive
- Upgrade of Old Pitt Town Road to provide two (2) travel lanes in each direction.

Further road improvements to provide a public benefit would include provision of a separate left slip turn lane from Old Pitt Town Road west into Valetta Drive and a left turn slip lane from Valetta Drive into Old Pitt Town Road.

The proposed development also provides the opportunity for improved pedestrian / cycle connections to Boundary Road with the extension of the shared pedestrian / cycleway along the riparian corridor (northern side of Sundowner Drive) to Boundary Road and its proposed shared pedestrian / cycleway on the eastern side as proposed as part of the upgrade of Boundary Road.

The site would be well served now and into the future by the proposed expanded bus servicing network of The Gables with *all* dwellings located within 400m walking distance to local / regional bus services.

Overall, the potential traffic impacts of the proposal are considered acceptable and would not result in detrimental operating conditions of the immediate surrounding road network.

2. Introduction

This report has been prepared on behalf of Allam Property Group & Stockland to present findings of a traffic and parking assessment of the proposed rezoning of lands known as West Gable within the Gables development, Box Hill to provide residential housing.

The study has assessed existing traffic conditions, parking demands, access arrangements, future traffic conditions, service vehicle provision and design compliance.

The remainder of the report is set out as follows:

- Section 3 provides a background report review;
- Section 4 describes the existing traffic and parking conditions;
- Section 5 summarises the future transport network in and around the site:
- Section 6 summarises the proposed development;
- Section 7 reviews the potential traffic impacts of the proposal; and
- Section 8 presents the conclusions

3. Background Report Review

The following presents a summary of the reports undertaken to date which are considered applicable to this proposal. Of note, there has been significant area wide multi model traffic modelling assessments to underpin both the approvals of the Box Hill / Box Hill Industrial Precinct and Box Hill North (now The Gables) precinct.

3.1 GHD Transport & Access Study – Box Hill / Box Hill Industrial Precincts – February 2011

The Box Hill / Box Hill Industrial Precincts forms part of the North West Growth Corridor and has been subject to a number of historical studies to inform the planning for the precinct. On traffic matters, the GHD report[1] prepared for the Department of Planning provided a full assessment of the development of Box Hill / Box Hill Industrial Precincts as a whole and provided an infrastructure delivery plan for the road network to service the ultimate precinct.

This assessment included area wide modelling of the *full potential yield* of the precinct proposal and recommendations for access connections to the existing road network (including Windsor Road). Further, the report included the development of the road hierarchy and major road intersection controls within the precinct.

The Box Hill and Box Hill Industrial Precinct assessed in the report is shown below in **Figure 1**:

Figure 1 - Box Hill & Box Hill Industrial Precincts

Map source: http://www.gcc.nsw.gov.au/media/Pdf/BoxHillnewsletterjulyI10pt2.pdf

[1] Box Hill & Box Hill Industrial Precincts – Transport and Access Study – GHD 2011

The multi modal traffic impact assessment report included both a mid block capacity assessment of key roads in and immediately surrounding the precinct along with SIDRA intersection analysis of a number of locations. Of note, the report *did not* include any mid block assessment of Old Pitt Town Road or SIDRA intersection assessments of any intersections along Old Pitt Town Road which formed the northern boundary of the Box Hill Precinct. This was despite 2036 AM / PM peak volumes published in the report all key intersections in Old Pitt Town Road as shown below from the report.

Figure 2 - Box Hill & Box Hill Industrial Precinct GHA TIA Report 2036 Forecast Intersection Flows Locations

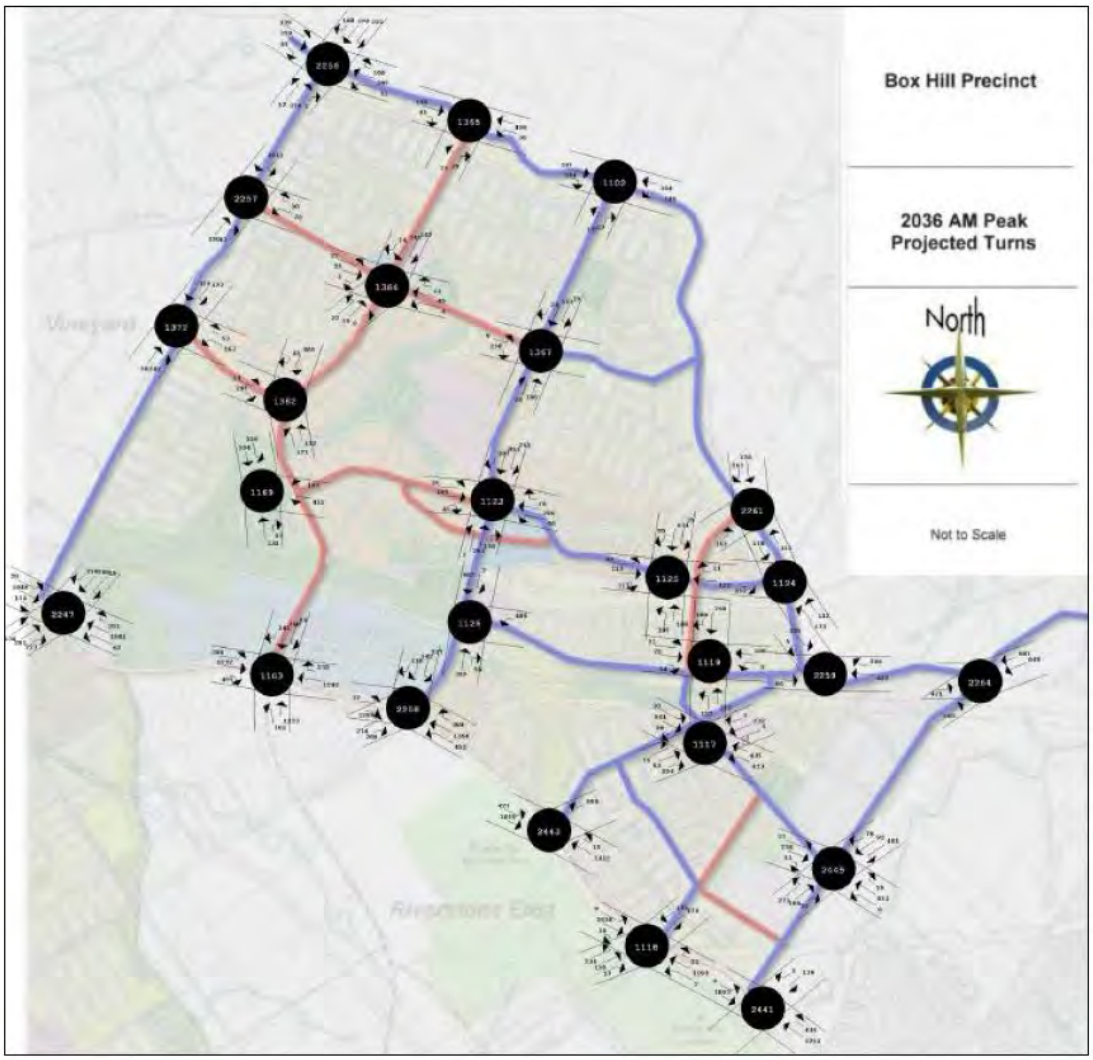
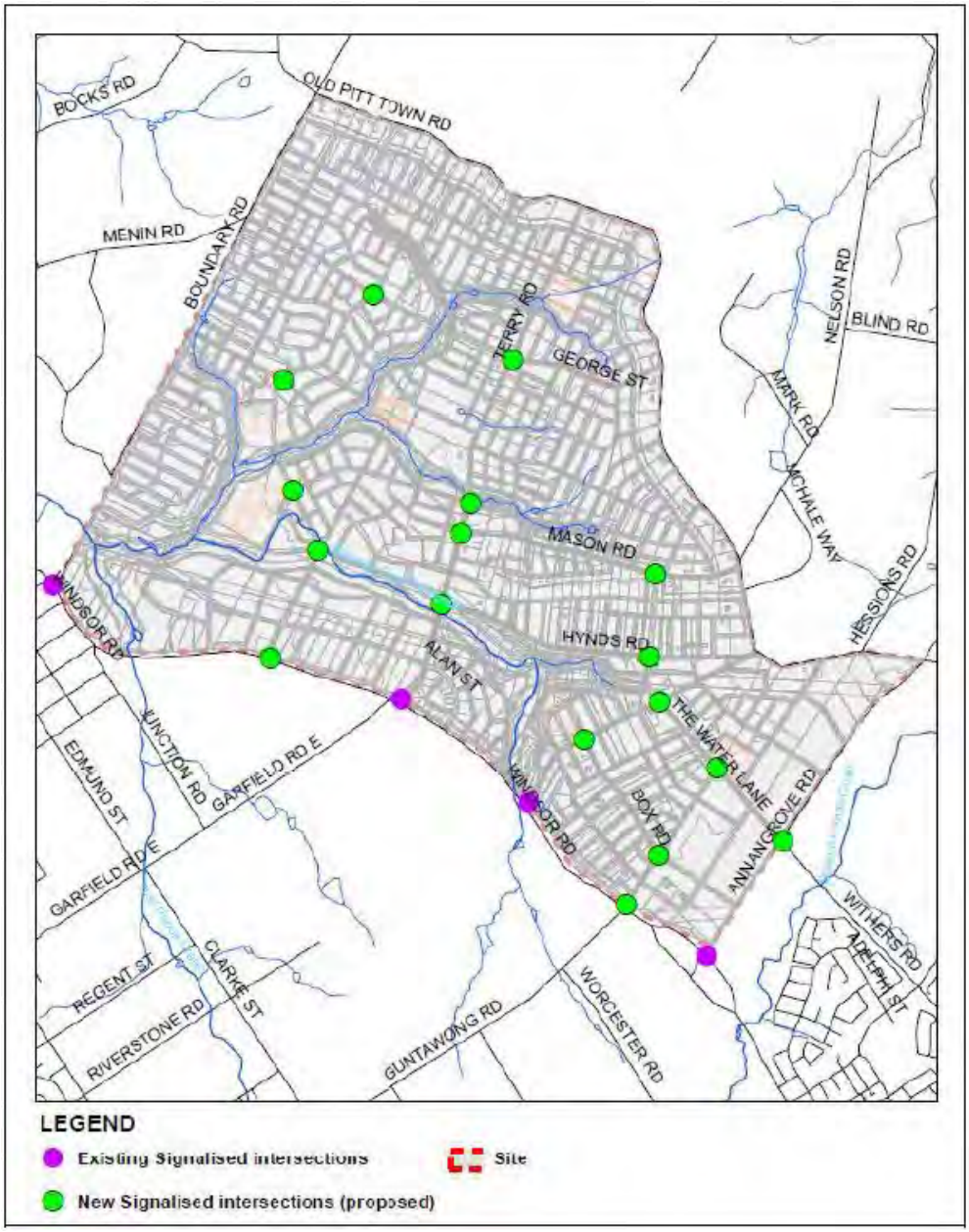
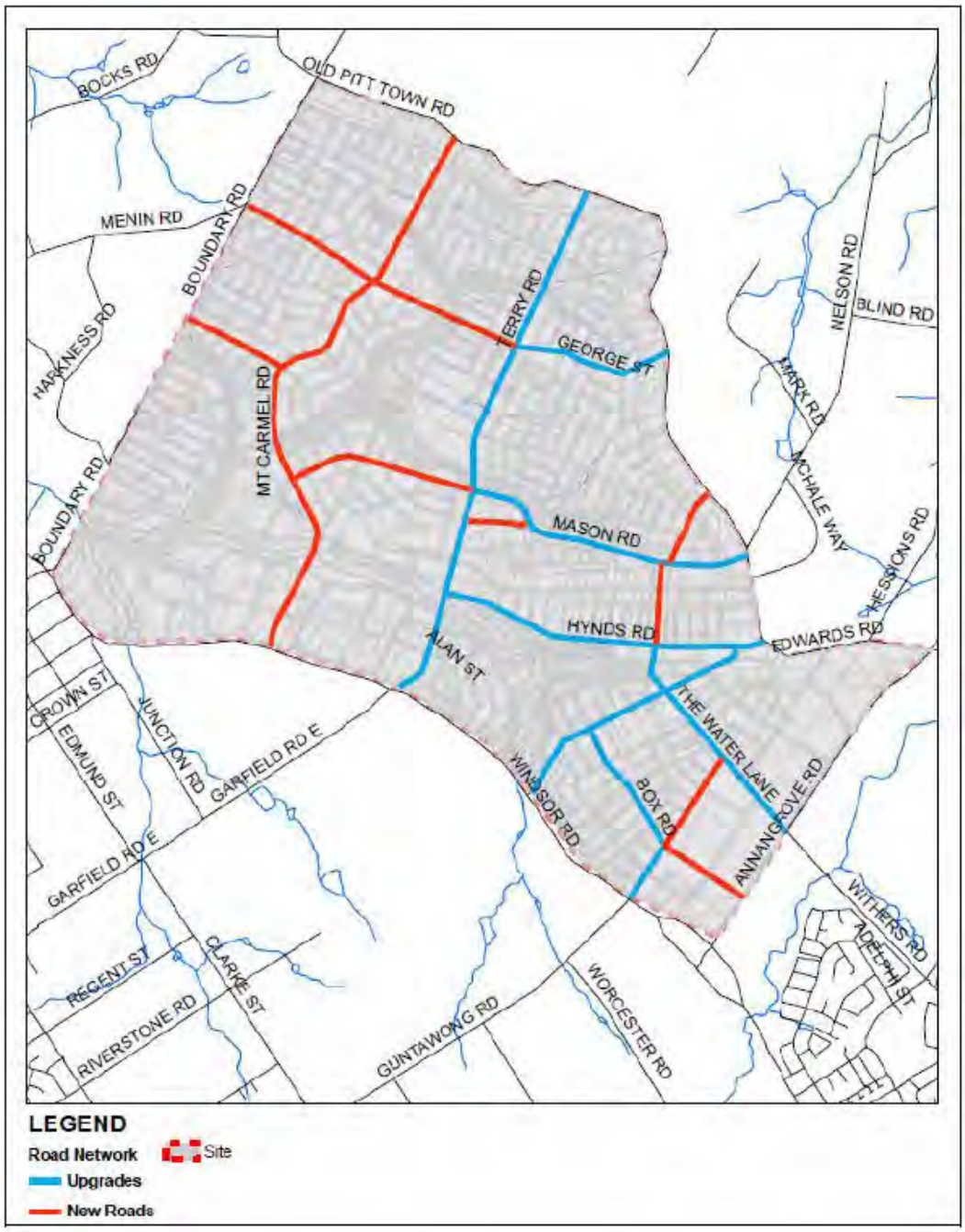


Figure 3 - Box Hill & Box Hill Industrial Precinct GHA TIA Report Modelled Intersection Locations



The reporting / assessment culminated in the following recommended proposed main road network of the Box Hill / Box Hill Industrial Precinct as detailed in **Figure 4** below.

Figure 4 - Box Hill & Box Hill Industrial Precincts Recommended Road Network



Of note, the report did not include any specific recommended upgrade of Old Pitt Town Road.

3.2 Box Hill / Box Hill Industrial Precincts Post Exhibition Traffic Report GHD Transport – April 2012

Following exhibition of the ILP, a further traffic assessment was undertaken by GHD to gauge the potential impacts of an overall reduced yield for the Box Hill Precinct. The key elements of the changes noted in the report are provided below:

Changes to the quantum of residential development: The ILPD has been modified since public display to include a ***reduction*** *in the quantum of residential land use and redistribution of residential land use throughout the precinct.*

Comments have been received from Transport for NSW (TfNSW) regarding the road reserve and cross section requirements for Terry Road, Mt Carmel Road and the Water Lane to Mason Road Link through the Box Hill Town Centre (referred to in TfNSW submission as Withers Road to George Street).

Comments have been received on the spatial requirements for Old Pitt Town Road and whether there is any requirement to widen Old Pitt Town Road by the planning horizon beyond the existing two-lane corridor.

The overall quantum of dwellings has reduced by 525 dwellings over the whole precinct.

As confirmed above, TfNSW requested the modelling assessment to be expanded to assess the future impacts on Old Pitt Town Road specifically when assessing the reduction in overall potential yield.

However, the post exhibition GHD traffic report *did not* include any specific intersection analysis of intersections along Old Pitt Town Road but focused only on a mid block assessment of the road using the following 2036 AM / PM peak hour flows.

Figure 5 – GHD Post Exhibition Traffic Report Revised Forecast AM Peak 2036 Traffic Flows

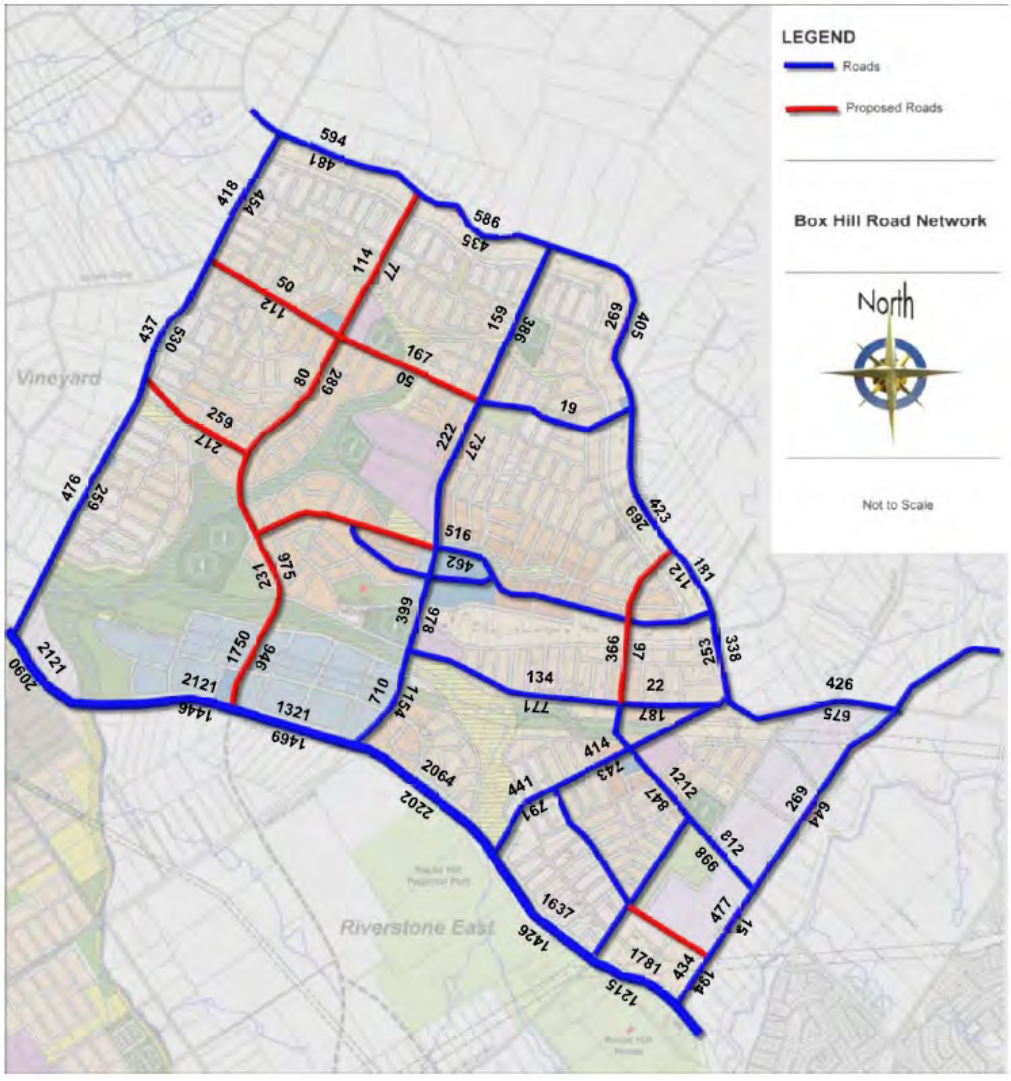
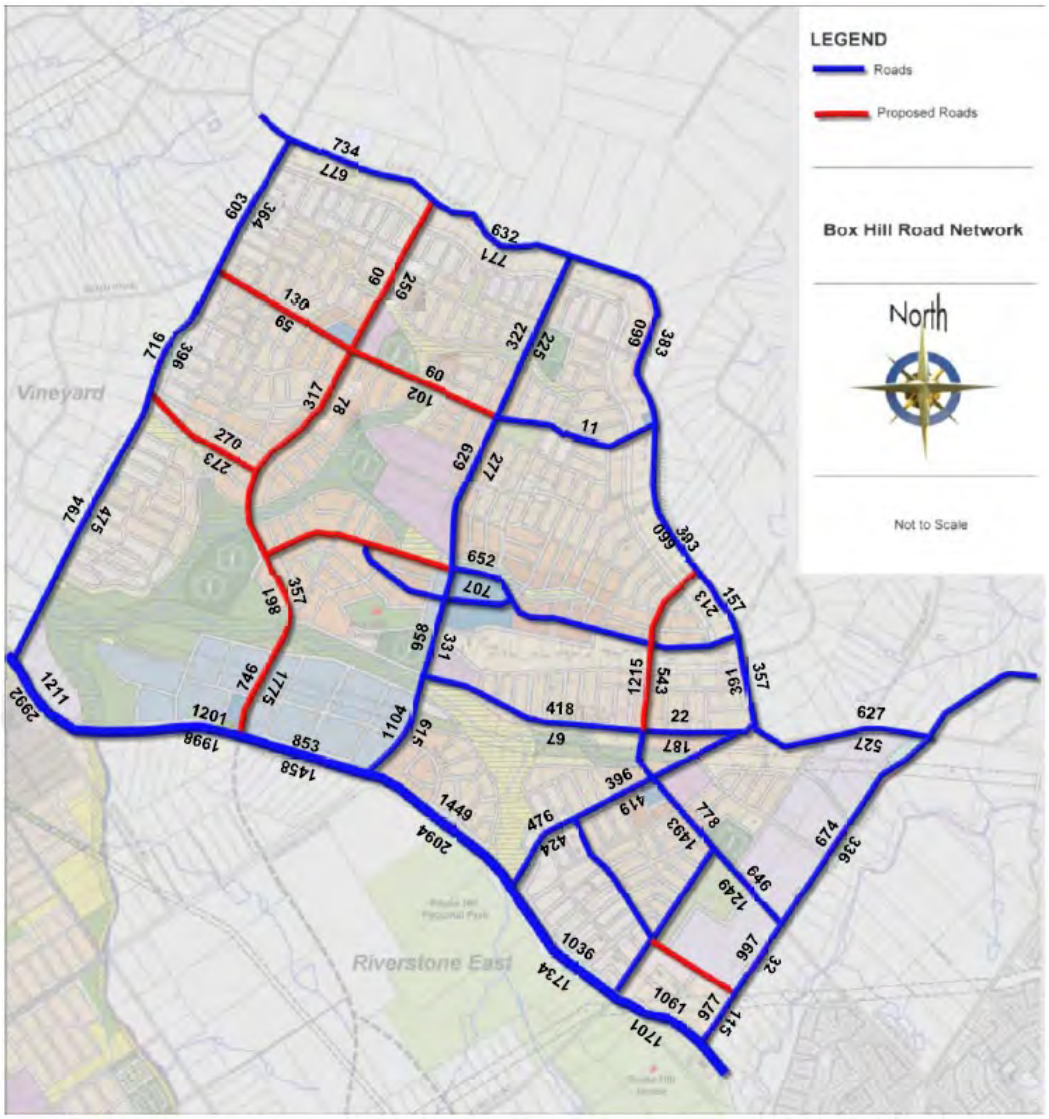


Figure 6 - GHD Post Exhibition Traffic Report Revised Forecast PM Peak 2036 Traffic Flows



3.3 Box Hill North Traffic Impact Assessment Report – GTA Consultants July 2013

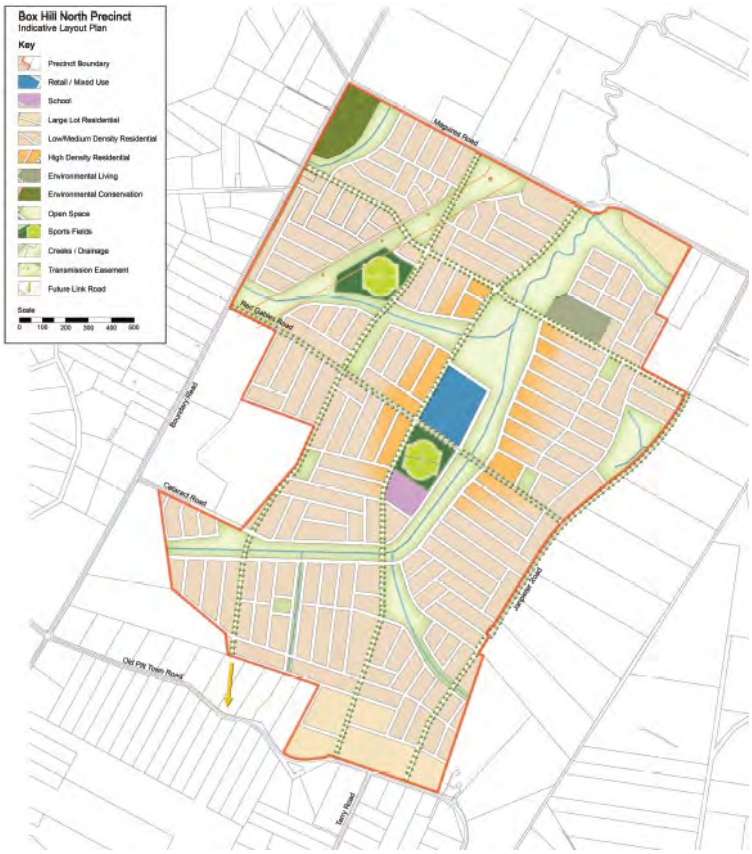
This traffic impact assessment report for the area at the time known as Box Hill North, now known as The Gables included consideration of the following:

- existing and base year (2036) traffic conditions surrounding the site;
- the traffic generating characteristics of the planning proposal; and
- the transport impact of the planning proposal on the surrounding road network.

Further, the transport assessment undertaken identified what transport infrastructure improvements were required in addition to those already planned and funded through the North West Growth Centre planning framework to accommodate the development of the Box Hill North planning proposal.

The area included in this traffic impact assessment report is shown below:

Figure 7 – Box Hill North TIA Report Area of Assessment Boundaries

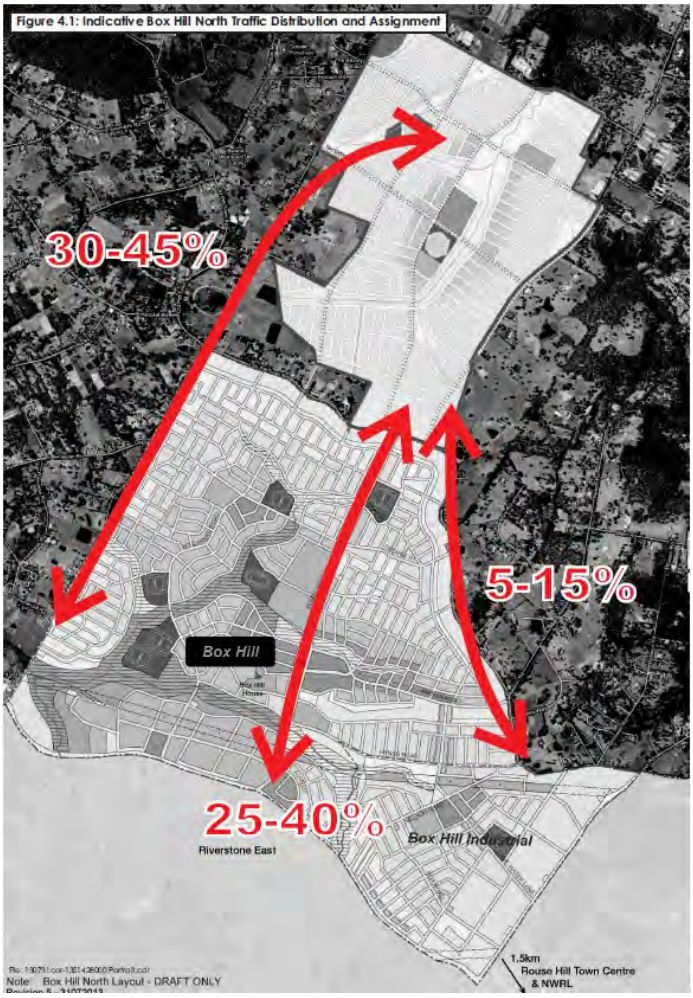


As shown above in **Figure 7**, The Gables development was to include three (3) intersection connections to Old Pitt Town Road along with three (3) further intersection connections with Boundary Road north of Old Pitt Town Road.

The report adopted (**Figure 8**) the following distribution of trips generated by the precinct having regard to:

- configuration of the arterial road network in the immediate vicinity of the area;
- collectors roads between the area and the arterial road network;
- connections to future public transport infrastructure (i.e. commuter car parking at Cudgegong Station on the North West Rail Line);
- surrounding employment centres, retail centres and schools in relation to the area; and
- configuration of access points to the area.

Figure 8 – Box Hill North Adopted Distribution of Trips



The report included both a midblock capacity assessment and intersection capacity assessment having regard to the 2036 traffic conditions forecast in the Box Hill / Box Hill Industrial Traffic Report and combined with the additional traffic generated by the Box Hill North (The Gables) proposal. The 2036 midblock future conditions for the AM and PM peak estimated by the report are shown below:

Figure 9 – 2036 Box Hill / Box Hill Industrial + Box Hill North AM Peak Period Mid Block Volume vs Capacity

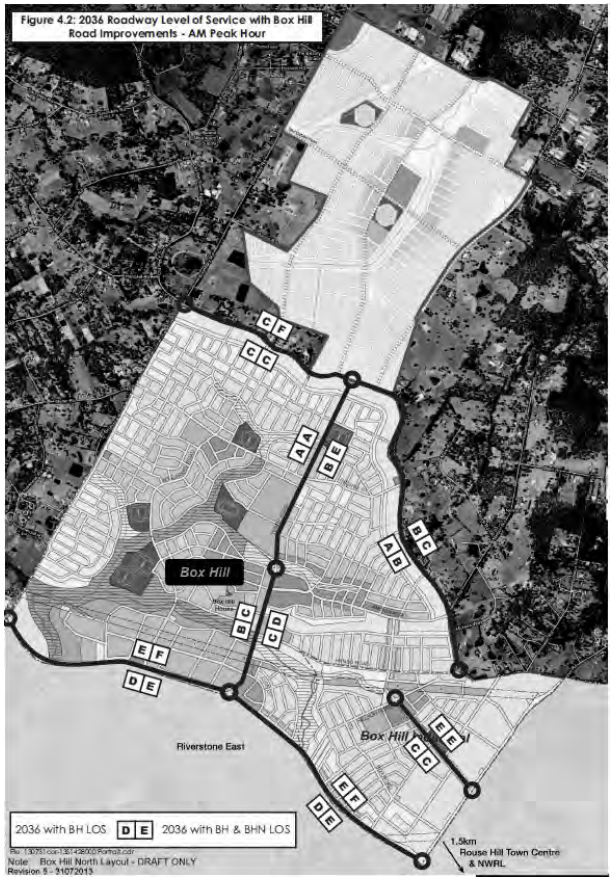
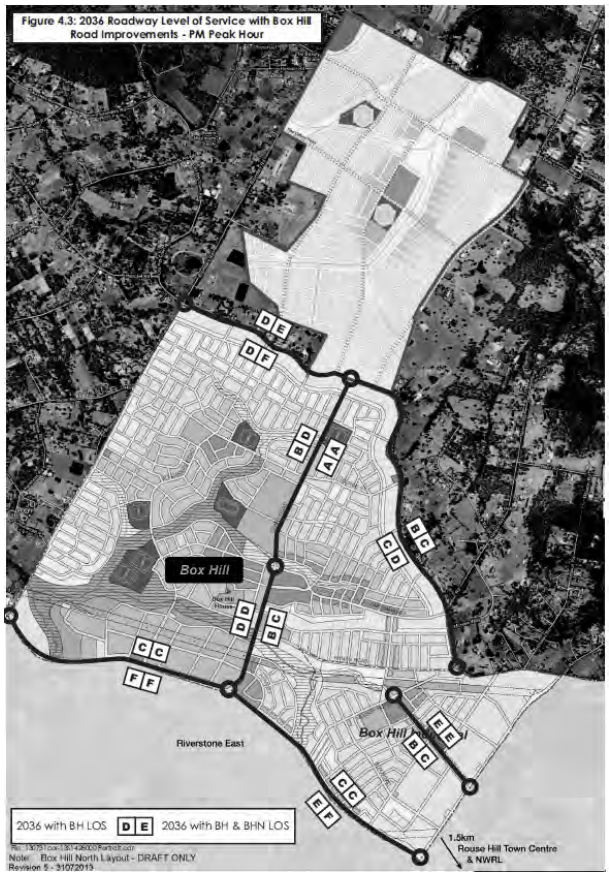


Figure 10 – 2036 Box Hill / Box Hill Industrial + Box Hill North PM Peak Period Mid Block Volume vs Capacity



After considering the road network improvements proposed surrounding the site at Box Hill North including both Old Pitt Town Road and Boundary Road, the report found the following 2036 intersection operating conditions taking into account the traffic generation of Box Hill North, Box Hill and Box Hill Industrial Precincts.

Figure 11 - 2036 Forecast Intersection Operating Conditions

Table 4.8: Local Road Intersection Operation with Box Hill and Box Hill North Road Network Improvements (Ultimate Development 2036)

Intersection	Proposed Treatment	Degree of Saturation		Average Delay (sec)		Level of Service	
		AM	PM	AM	PM	AM	PM
Old Pitt Town Road/ Boundary Road	Dual-Lane Roundabout	0.96	0.73	33	47	C	B
Old Pitt Town Road/ BHN Access Road West	Dual-Lane Roundabout	0.51	0.43	8	9	A	A
Old Pitt Town Road/ Terry Road	Dual-Lane Roundabout	0.52	0.66	11	24	B	B
Old Pitt Town Road/ BHN Access Road East	Dual-Lane Roundabout	0.35	0.36	9	8	A	A
Annangrove Road/ The Water Lane	Provide Left Turn Slip Lane (South Leg)	0.80	0.94	20	27	B	C
Old Pitt Town Road/ Nelson Road/ Edward Road	N/A [1]	0.77	0.50	12	11	D	D

Notes: 1. No specific works proposed at this intersection for Box Hill North. Improvement works are proposed as part of Box Hill Contribution Plan

Figure 12 - 2036 Forecast AM Peak Intersection Operating Conditions

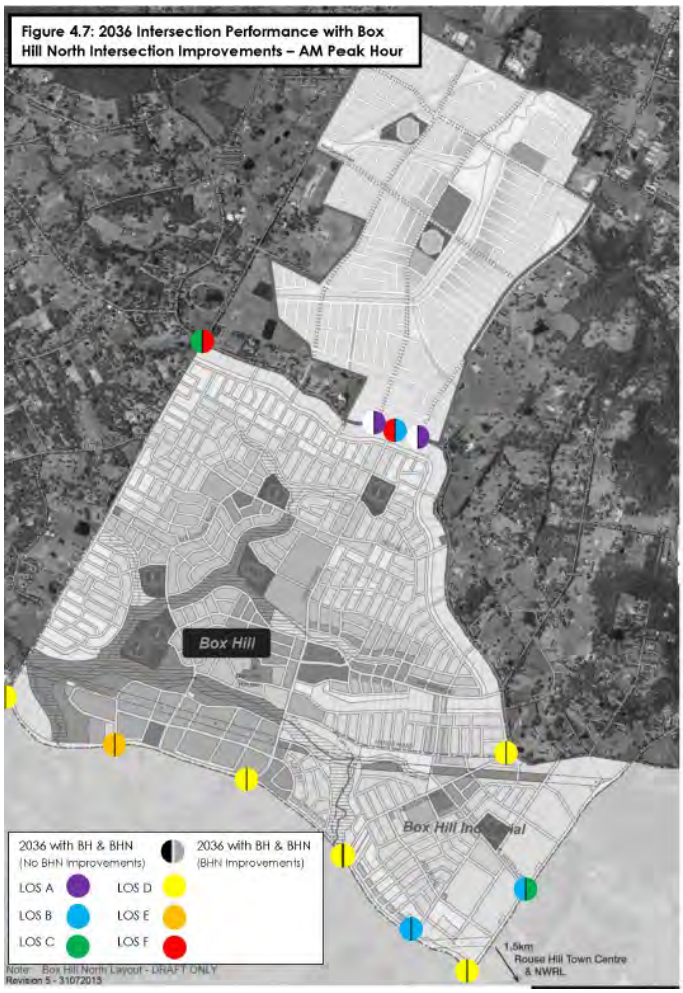
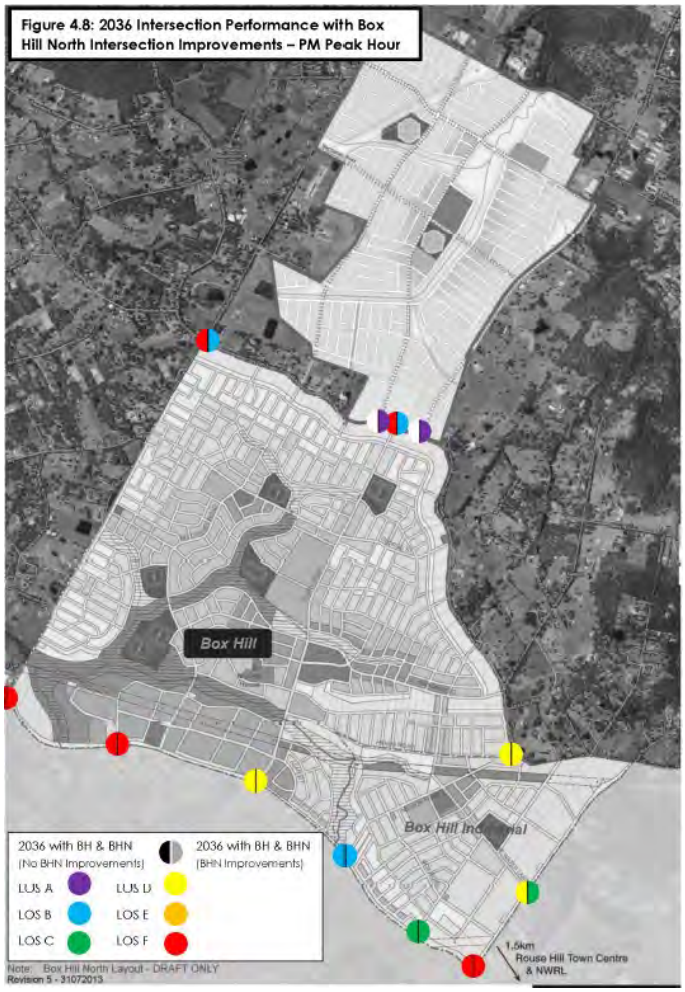


Figure 13 - 2036 Forecast PM Peak Intersection Operating Conditions



As shown above, the intersection of Old Pitt Town Road / Valetta Drive (now constructed) was not included at the time of the above assessment as the lands subject to this proposal were not included in the rezoning application.

The report recommended the following infrastructure improvements:

- Capacity improvements to existing and proposed intersections with additional turning lanes and / or increased lane storage (particularly along Windsor Road);
- Intersection treatment upgrades, i.e.. priority controls (stop give way signage) to roundabouts or traffic signals (i.e.. Old Pitt Town Road);
- Road widening, clearway treatments and condition improvements; and
- Bus accessible routes through Box Hill North and bus stop facilities.

Further, *all* intersections which would serve the Box Hill North precinct were assumed to be dual lane roundabouts as shown below including the existing intersection of Old Pitt Town Road / Boundary Road. Further, the intersections with Boundary Road were assumed to be priority controlled intersection with a single lane of travel in each direction in Boundary Road. The adopted intersection arrangements by location for **2036** conditions are presented below. For reference the intersections in the vicinity of the proposed development have been numbered.

Figure 14 – GTA Box Hill North Traffic Report 2036 Intersection Assessment Numbering

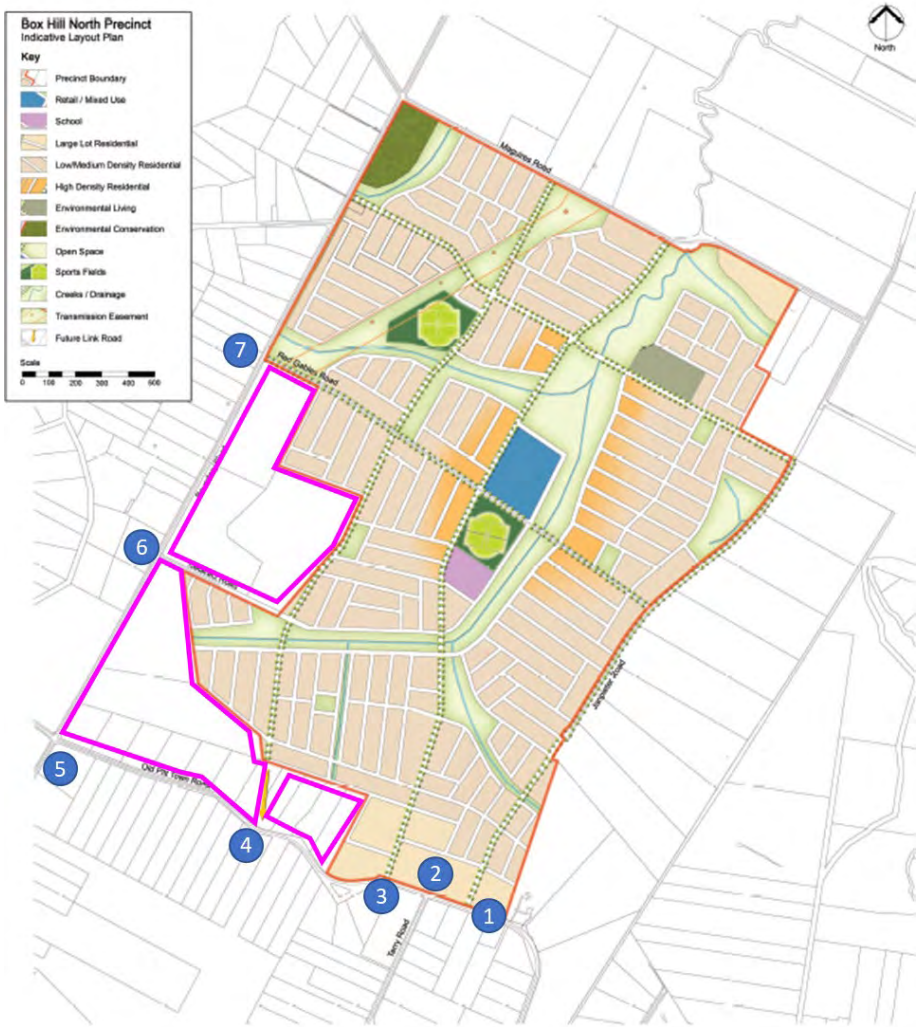


Figure 15 – Intersection 1 - Dual Lane Roundabout - Old Pitt Town Road / BHN Access Road East (not constructed)

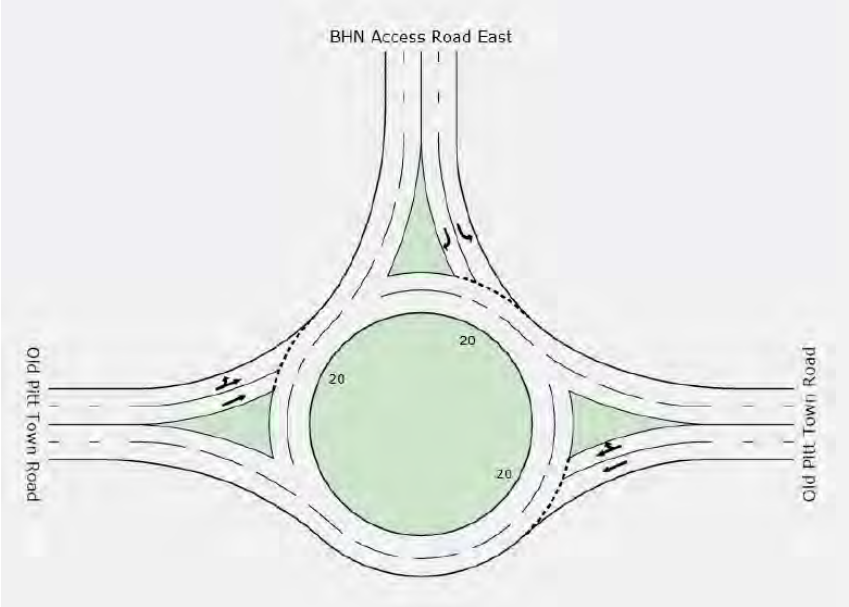


Figure 16 – Intersection 2 - Dual Lane Roundabout - Old Pitt Town Road / Terry Road T Intersection (not constructed)

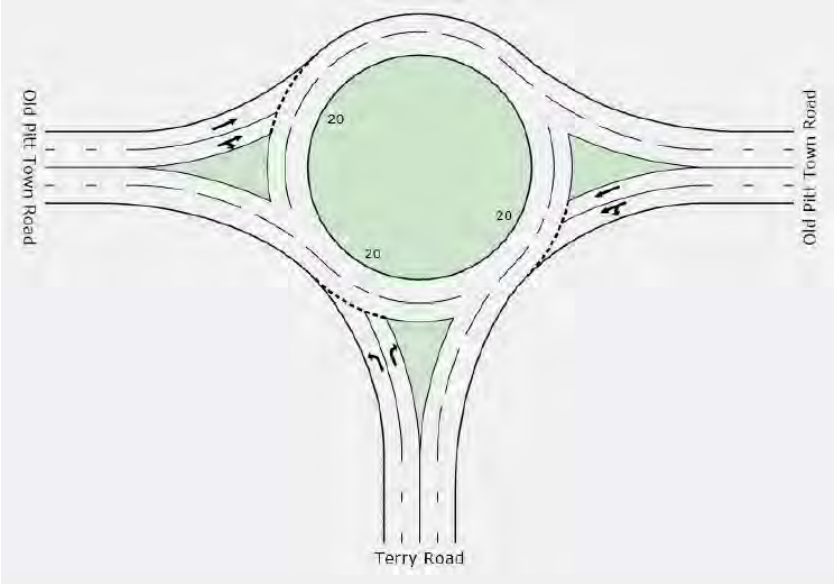


Figure 17 – Intersection 3 - Dual Lane Roundabout - Old Pitt Town Road / BHN Access Road West (not constructed)

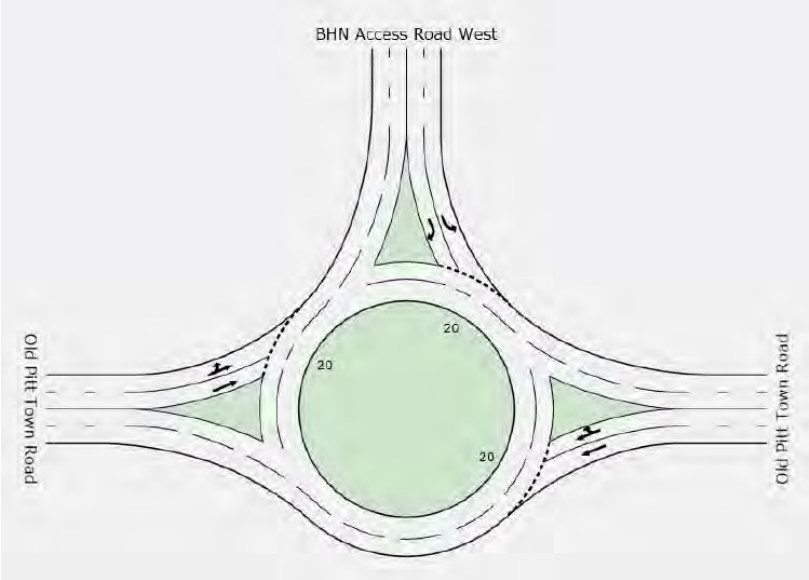


Figure 18 – Intersection 4 – T Intersection Old Pitt Town Road / Mount Carmel Road (not constructed)

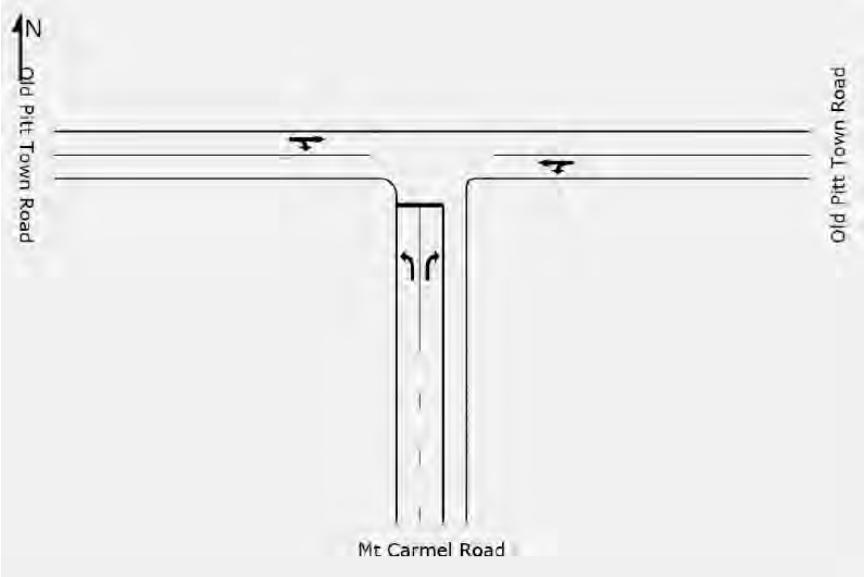


Figure 19 – Intersection 5 - Dual Lane Roundabout - Old Pitt Town Road / Boundary Road (now replaced with traffic signal proposal)

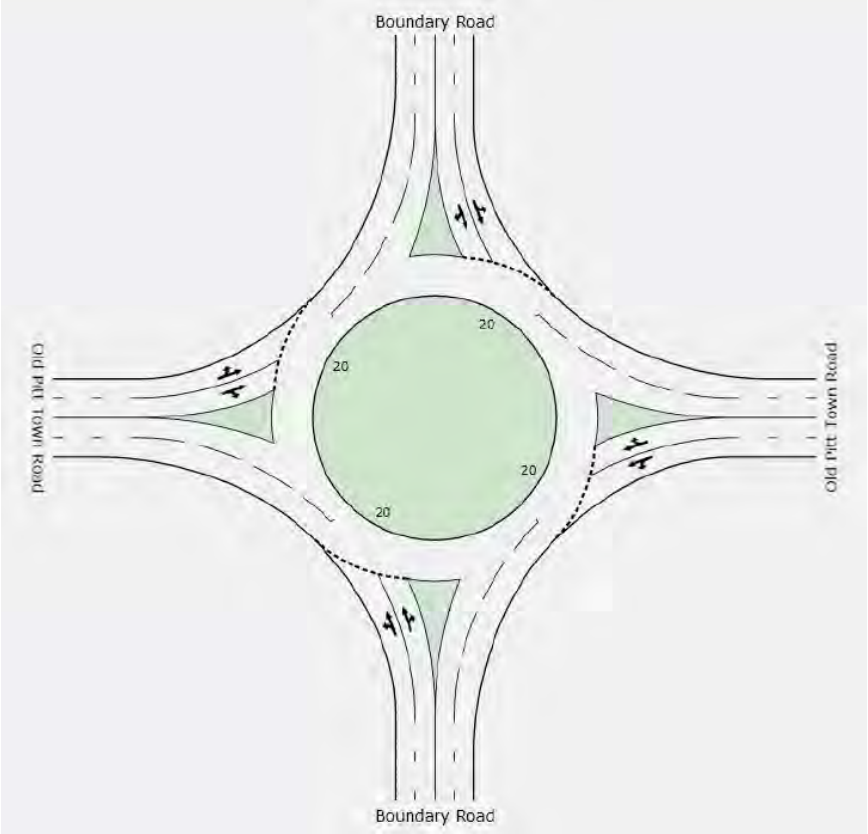


Figure 20 – Intersection 6 – Priority Controlled Intersection – Boundary Road / Cataract Road (now constructed as 'seagull' type intersection)

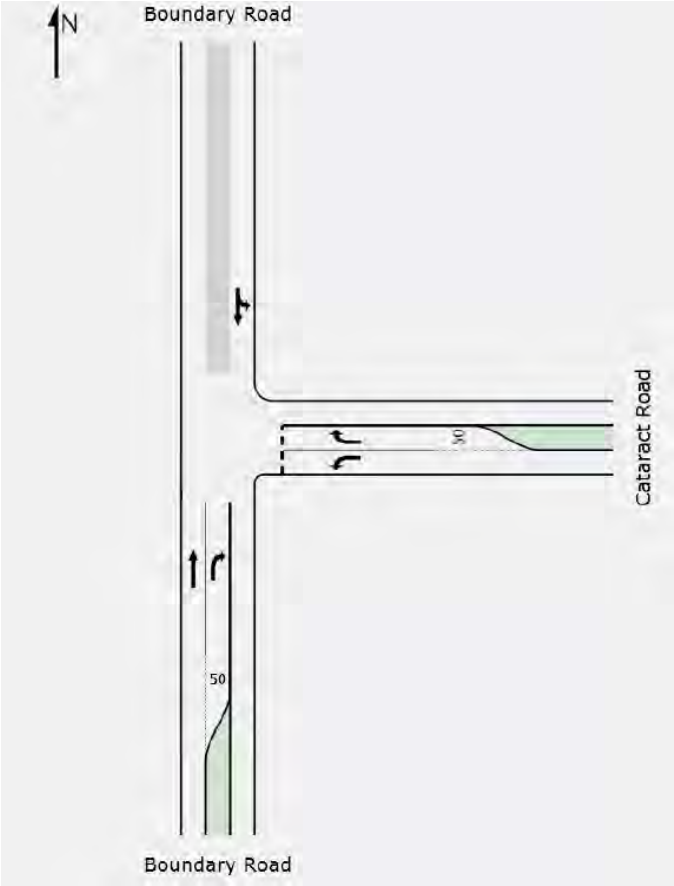
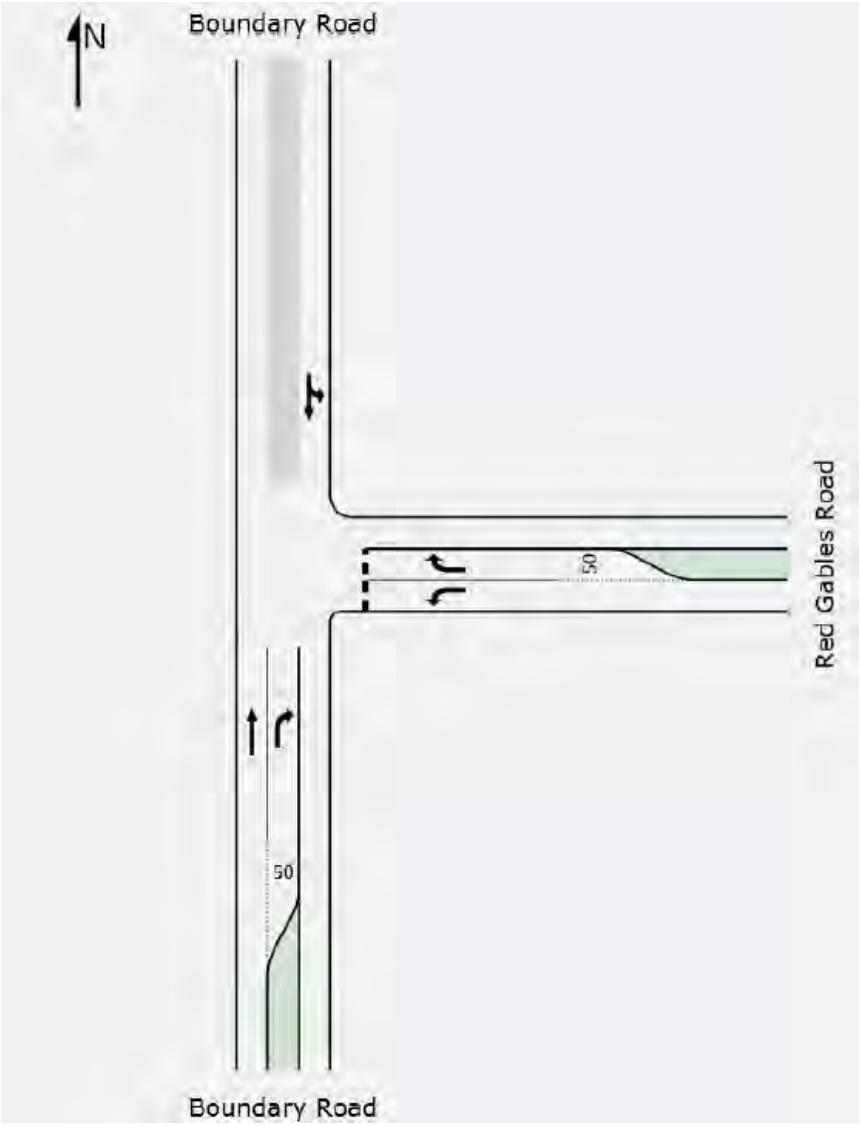


Figure 21 – Intersection 7 – T Intersection – Boundary Road / Red Gables Road



As shown above, a number of the assumed intersection arrangements of the GTA Box Hills North traffic report have not been undertaken as originally proposed. In particular, the access roads from Box Hill North to Old Pitt Town Road have been reduced from three (3) intersections to two (2) intersections. Further, the reduction in intersections has resulted in combined four way intersections with both Terry Road and the future Mount Carmel Road extension (soon to be complete).

Of further note, whilst the GTA report did include modelled intersection configurations for Boundary Road / Red Gables Road and Boundary Road / Cataract Road, no information was provided in the report on what forecast volumes was used to model these intersections and what resulting future Level of Service would occur at these intersections under priority control. Further, the report *did not* account for the potential future arrangement of Boundary Road which has the capacity to provide two (2) travel lanes in each direction.

There was *no 2036 forecast traffic flows* for Boundary Road included in the report which can be referred to in this assessment. The only information provided for 2036 conditions was forecast trip generation at these intersections (no baseline 2036 volumes) as shown in Appendix A of the GTA report.

The GTA report did not include *any* forecast traffic generation in Appendix A of the report for the intersection of Boundary Road / Cataract Road which was omitted entirely despite the fact that the report included a modelled intersection arrangement for this intersection but with no volume information (SIDRA volumes) detailed in the report.

Therefore, the existing intersection arrangements have been modelled for future conditions to be consistent with all reporting to date. It is noted that the current intersection arrangement of Boundary Road / Cataract Road includes a seagull type intersection which has been maintained in the future scenario testing.

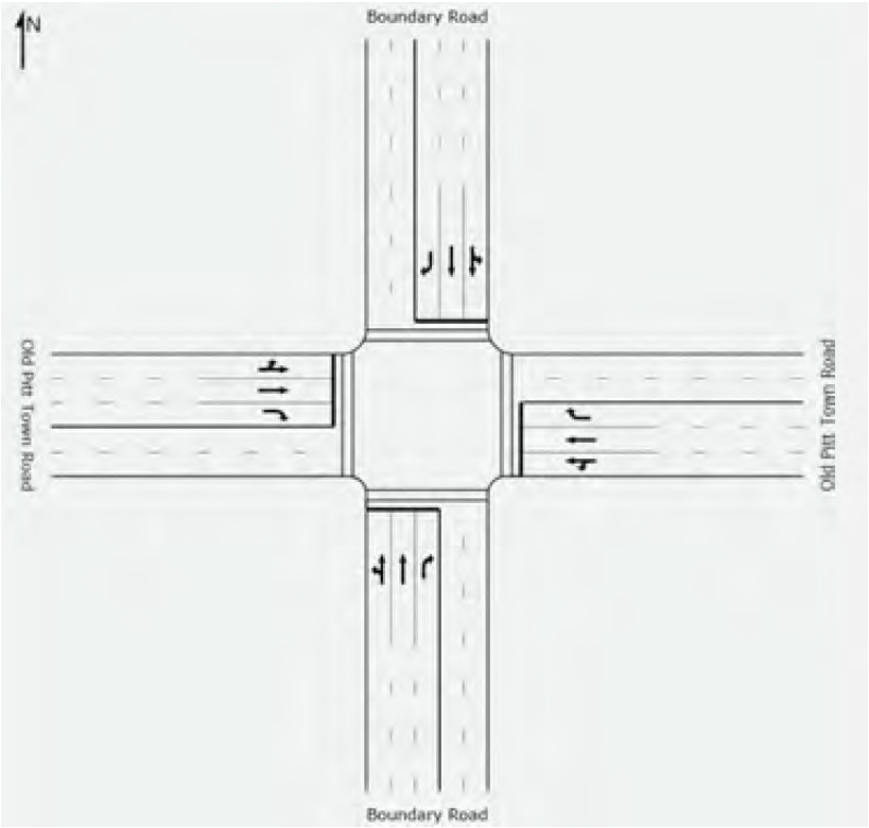
3.4 Box Hill North Transport & Access Assessment Addendum Report - GTA Consultants December 2013

Following a review of the initial transport & access assessment report prepared by GTA consultants, Transport for NSW sought revision of the original report to account for a number of the assumptions which in turn had been modified.

The addendum report included changes to the potential traffic generation of Box Hill North overall to account for a potential greater shift to public transport over and above the assumed 8% PT mode share along with a change to assumed traffic generation rates.

In terms of future year (2036) intersection modelling, the *only* change to the assumed intersection arrangements was the intersection of Old Pitt Town Road / Boundary Road which was assumed to operate as a traffic signal-controlled intersection instead of the previously assumed dual lane roundabout arrangement. The resulting signalised intersection arrangement is shown below.

Figure 22 – Intersection 5 – Signalised Intersection – Old Pitt Town Road / Boundary Road

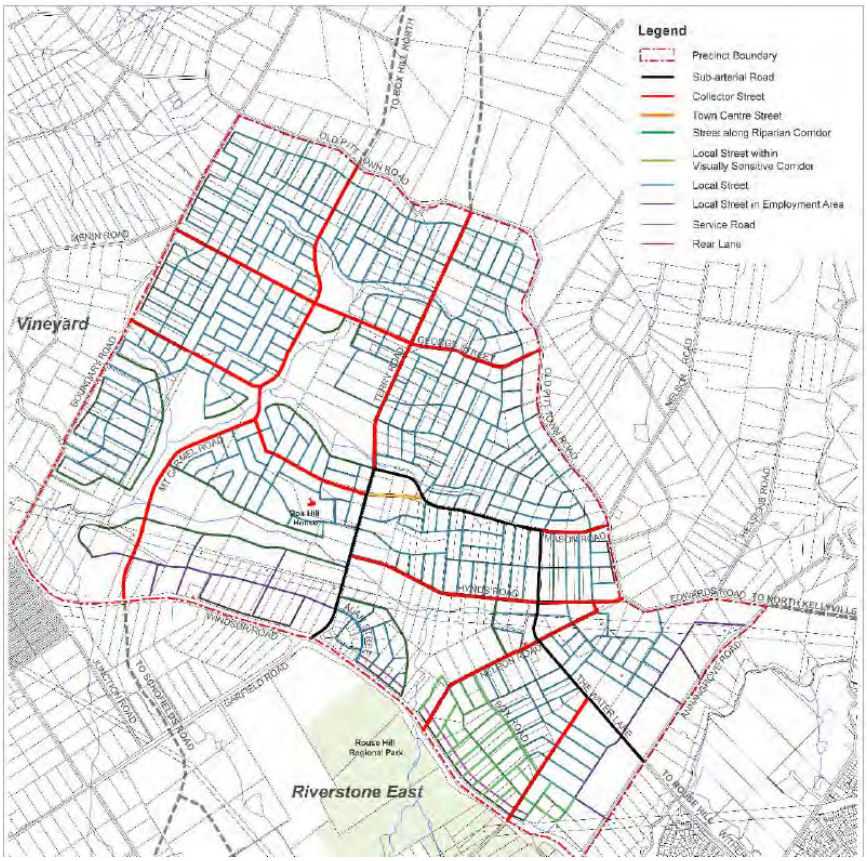


It is noted above that the right turn bays in all legs of the intersection were assumed not has specific length turning bays but as *full length* lanes which is unlikely.

Overall, it is observed that both the traffic and access assessment reports for Box Hill / Box Hill Industrial and Box Hill North assumed a number of intersection configurations in Old Pitt Town Road which ultimately have not been undertaken.

That is, the resulting DCP 2018 road network rationalised intersection connections to Old Pitt Town Road to two (2) four way intersections with Terry Road and the future Mount Carmel Road extension as shown below:

Figure 23 – DCP 2018 Recommended Box Hill North Road Connections to Old Pit Town Road



3.5 Traffic Signal Warrant Analysis – Old Pitt Town Road / Valetta Drive / Mount Carmel Road – Stanbury Traffic Planning – May 2022

In consultation with Hills Shire Council, Council provided a copy of this traffic signal warrant assessment report for a new signalised intersection Old Pitt Town Road / Valetta Drive / Mount Carmel Road. The purpose of this assessment is to analyse planned, existing and likely future traffic demands as well as undertake a traffic signal warrant and operational performance assessment of the subject junction.

Of note this was the first report to account for the DCP 2018 road network serving Box Hill whilst also including the traffic generation forecasts of *all* historical area wide traffic impact assessment reports for Box Hill / Box Hill Industrial / Box Hill North precincts.

It is further noted that this traffic report accounted for the *increase* in yield of Box Hill. This is referenced below:

The GHD Post Exhibition Report stated that the Box Hill Growth Centre was originally envisaged to accommodate 9,600 residential dwellings and a population of 30,000.

The Box Hill Contributions Plan however states the following:
"In May 2017 the Department of Planning published a revised population projection for the Box Hill Precinct of 42,483 persons (13,276 dwellings) and is reflective of the ongoing impacts of the Department's Housing Diversity Package which took effect in August 2014 (where minimum residential densities were applied to land within Growth Centre Precincts without any associated maximum residential density).

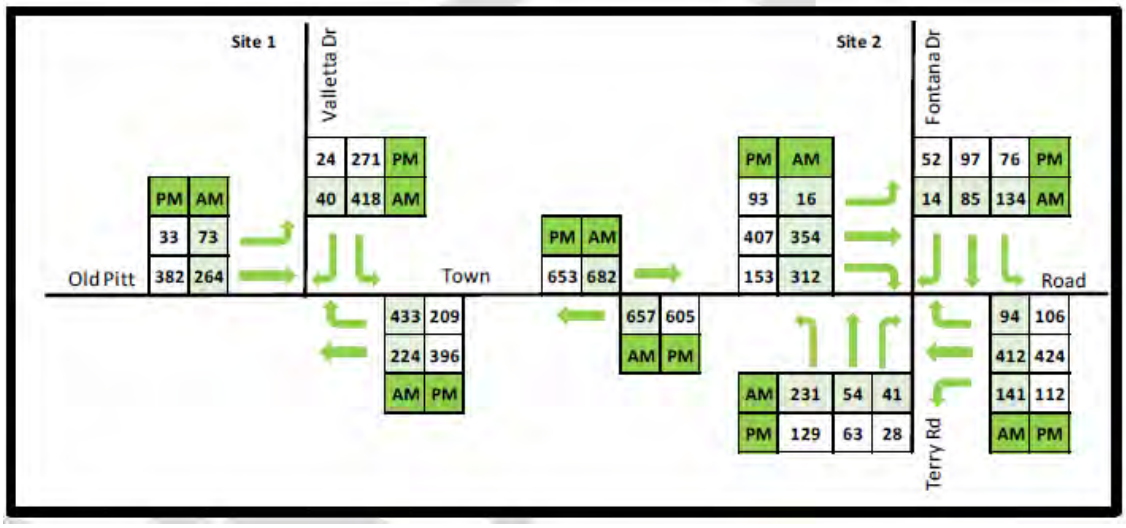
The population and dwelling estimate is derived from the North West Growth Centre Social Infrastructure Assessment (September 2015) prepared for the then Department of Planning and Environment by GHD.

In August 2019, Council received advice from the Minister for Planning and Public Spaces which required this Contributions Plan to be amended to reflect a total population of 42,483 persons at the conclusion of the plan. This version of the plan has been updated to reflect the requirements of the Minister."

As a result of the above diversity and density amendments. The alteration in density represents an increase of approximately 3,676 dwellings (or approximately 38%) over and above that previously assessed and a population increase of approximately 12,483 (of approximately 42%) over and above that previously assessed.

To inform the warrant assessment, intersection counts were undertaken in February 2022 to gauge current conditions. These are shown below:

Figure 24 – Stanbury Traffic Planning Warrant Assessment Report February 2022 Intersection Counts



The above indicated a westbound direction on Old Pitt Town Road of 657 vehicles in the weekday AM peak hour with 605 vehicles in the weekday PM peak hour.

These recorded traffic flows in Old Pitt Town Road where *similar* to the forecast **2036** traffic flows in Old Pitt Town Road estimated in the GHD traffic report for Box Hill / Box Hill Industrial Precincts (See **Figure 5** and **Figure 6**). On this matter, the report[2] made the following statements:

This is likely the result of a number of factors:

- *As outlined in Section 3.1, the alteration in density represents an increase of approximately 3,676 dwellings (or approximately 38%) over and above that previously assessed (total of 13,276 dwellings) and a population increase of approximately 12,483 (of approximately 42%) over and above that previously assessed;*
- *The Box Hill North Precinct (now called Gables) was not rezoned at the time that the Box Hill and Box Industrial Precinct was rezoned. As outlined in the Gables Contribution Plan, a total of 4,600 dwellings and 13,498 people are expected to live to the north of the subject junction;*

[2] Traffic Signal Warrant Analysis – Old Pitt Town Road / Valetta Drive / Mount Carmel Road – Stanbury Traffic Planning – May 2022

- *The nearby North Kellyville Precinct was originally envisaged to accommodate 4,500 residential dwellings in conjunction with education and local activity centres. Subsequent planning amendments now expect a total of 7,200 dwellings in this Precinct, an increase of 60%.*
- *The nearby Vineyard Precinct Stage 1 was originally envisaged to accommodate 2,3213 residential dwellings in conjunction with education and a local activity centre. Subsequent planning amendments now expect a total of 2,459 dwellings in this Precinct, an increase of 6%4.*
- *As outlined in Section 3.2, Santa Sophia College was constructed on land originally envisaged as a town centre. This has resulted in an expected higher traffic volume for this area than originally envisaged. In 2021 there were 135 students enrolled in the primary school and 320 enrolled in the high school.*

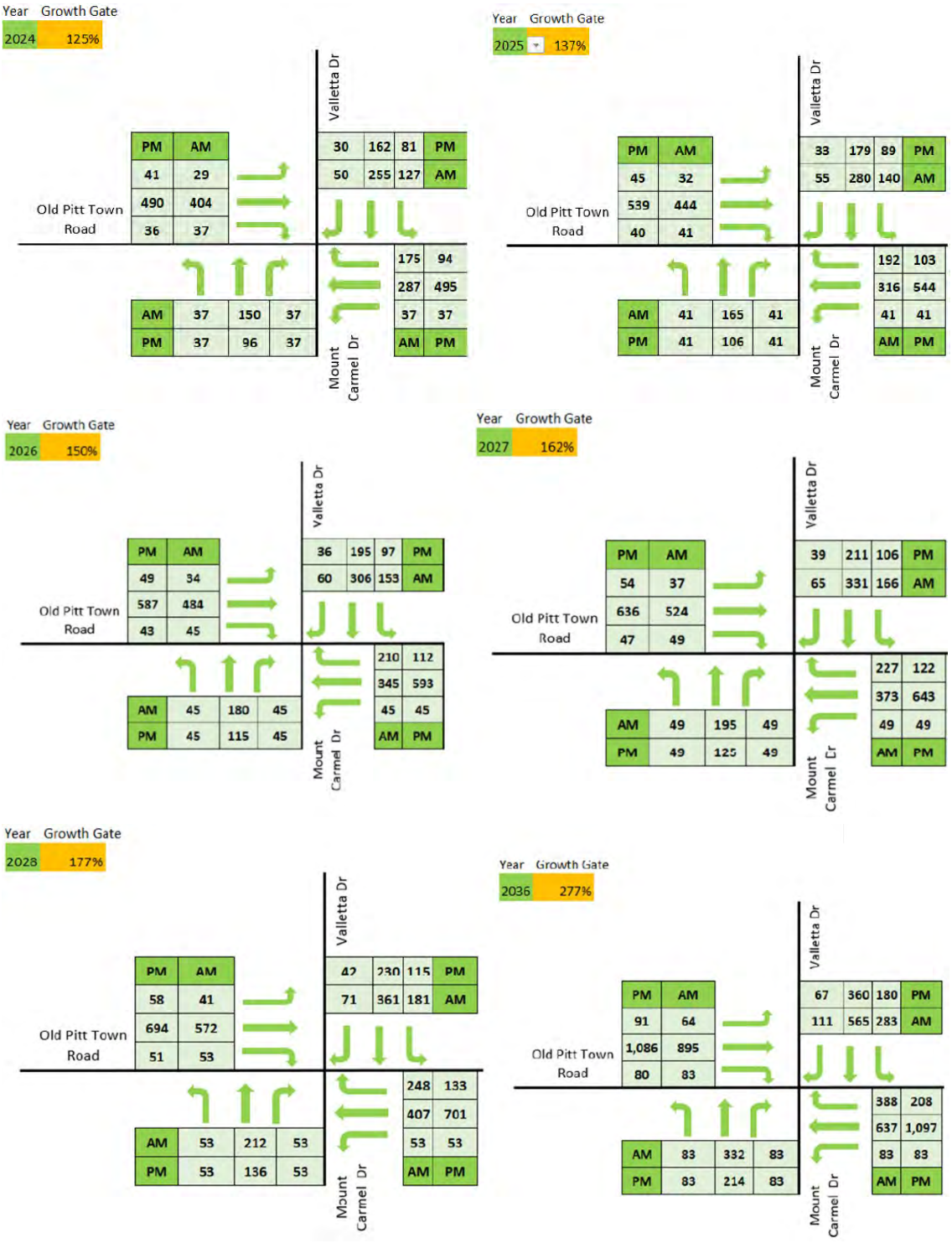
To provide an estimate of overall future traffic growth having regard to the above approved changes to development yield in and around Box Hill, the report included the following growth projection by year estimated from the NSW Open Data for 2019 Travel Zones

Table 1 - Forecast Development Growth by Year for Box Hill / The Gables

TABLE 3 PROJECTED POULATION GROWTH RATE OF BOX HILL AND THE GABLES			
Year	Occupied Private Dwellings	Yearly Growth Rate	Cumulative Growth Rate
2022	4,617	100%	100%
2023	5,129	112%	112%
2024	5,640	111%	125%
2025	6,152	110%	137%
2026	6,664	109%	150%
2027	7,266	108%	162%
2028	7,868	109%	177%
2029	8,469	108%	192%
2030	9,071	108%	206%
2031	9,673	107%	221%
2032	10,099	107%	236%
2033	10,524	104%	246%
2034	10,950	104%	256%
2035	11,375	104%	267%
2036	11,801	104%	277%

The above approach allowed an estimate of future traffic generation noting 2022 counts reflecting the above occupied private dwellings in 2022. The resulting forecast traffic generation of the intersection of Old Pitt Town Road / Valetta Drive / Mount Carmel Road

Figure 25 – Stanbury Traffic Planning Forecast Intersection Flows by Year to 2036



The 2036 forecasts for Valletta Drive have been used in the assessment of potential traffic impacts below.

4. Existing Development / Conditions

The following presents a summary of existing site and traffic conditions.

4.1 Site Location

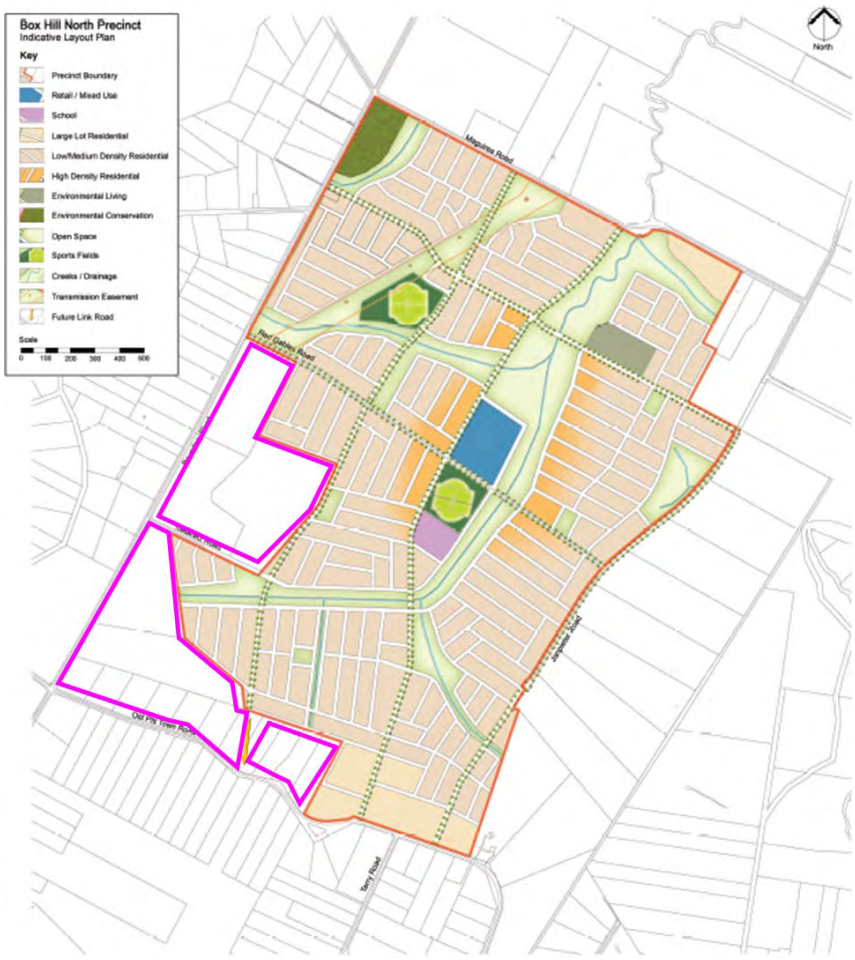
The proposed lands subject to this rezoning application are located within the Box Hill North (The Gables) development and to date were not rezoned as part of the approved rezoning for this precinct.

The development includes three (3) separate parcels of lands. The lands are bounded by Old Pitt Town Road in the south, Boundary Road in the west, Red Gables Road in the north and existing residential development of The Gables in the east. The location of the development site is shown below in **Figure 26**.

Figure 26 – Location of Development

The location of the development sites in the context of the approved ILP arrangements for the Box Hill North Precinct is shown below in **Figure 27**.

Figure 27 – Location of Development Relative to Box Hill North ILP



It should be noted that the proposed road connections above to Old Pitt Town Road which included three (3) new intersections now includes only two (2) intersection connections as approved which is discussed further below in **Section 3** of this report.

4.2 Existing Site Traffic Generation

For the purpose of this modelling assessment and noting the majority of the lands subject to this application include greenfield sites, it has been assumed that the existing lands do not generate any peak hour traffic generation.

4.3 Classification Criteria

It is usual to classify roads according to a road hierarchy in order to determine their functional role within the road network. Changes to traffic flows on the roads can then be assessed within the context of the road hierarchy. Roads are classified according to the role they fulfil and the volume of traffic they should appropriately carry. The RTA has set down the following guidelines for the functional classification of roads.

- Arterial Road – typically a main road carrying over 15,000 vehicles per day and fulfilling a role as a major inter-regional link (over 1,500 vehicles per hour)
- Sub-arterial Road – defined as secondary inter-regional links, typically carrying volumes between 5,000 and 20,000 vehicles per day (500 to 2,000 vehicles per hour)

- Collector Road – provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles per day (250 to 1,000 vehicles per hour). At volumes greater than 5,000 vehicles per day, residential amenity begins to decline noticeably.
- Local Road – provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles per day (250 vehicles per hour).

4.4 Existing Road Network

Old Pitt Town Road – in its current form is an north-south collector road linking Annangrove Road in the east with Pitt Town in the west. Across the site frontage, the road includes a single travel lane in each direction and unformed shoulders. The intersection of Old Pitt Town Road / Boundary Road is controlled by a single lane roundabout. The street has a posted speed limit of 60km/hr. The road has been identified for significant upgrade in the future which is discussed further below in **Section 3**.

Boundary Road – is also a collector road linking Windsor Road in the west with the suburbs of Cattai / Maraylya in the east. It includes a single lane of travel in each direction and unformed shoulders. In the vicinity of the intersection with Old Pitt Town Road it includes a posted of 60 km/h. The intersection of Old Pitt Town Road currently includes a single lane roundabout control which has been identified for upgrade to traffic signals in the future.

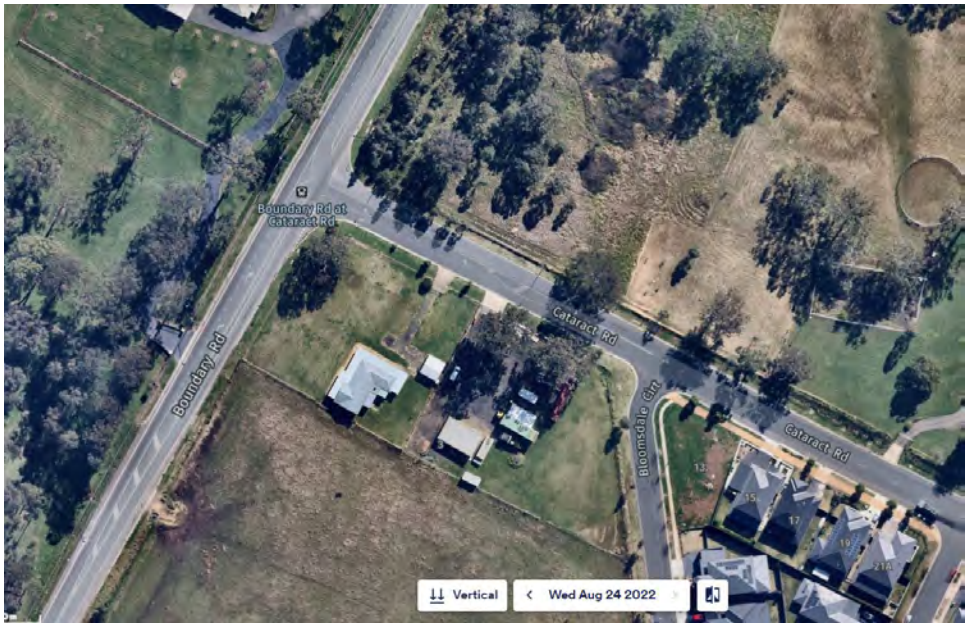
Valetta Drive – is a local collector road forming a four (4) way priority-controlled intersection with Old Pitt Town Road and the future extension of Mount Carmel Road. The road includes a posted speed limit of 50km/hr and a central landscaped median on approach to Old Pitt Town Road allowing for two (2) travel lanes in each direction. The existing arrangements of the intersection at the time of preparing this report is shown below in **Figure 28**.

Figure 28 – Existing Intersection Arrangements – Old Pitt Town Road / Valetta Drive

© Nearmap

Cataract Road – is a local road connecting to Boundary Road in the west via a seagull intersection arrangement and extending east to Fontana Drive. The road includes a single travel lane in each direction, a carriageway width of some 11.5m and unrestricted parallel parking on both sides of the street. The existing intersection arrangements of Boundary Road / Cataract Road at the time of preparing this report are shown below in **Figure 29**.

Figure 29 – Existing Intersection Arrangements – Boundary Road / Cataract Road



© Nearmap

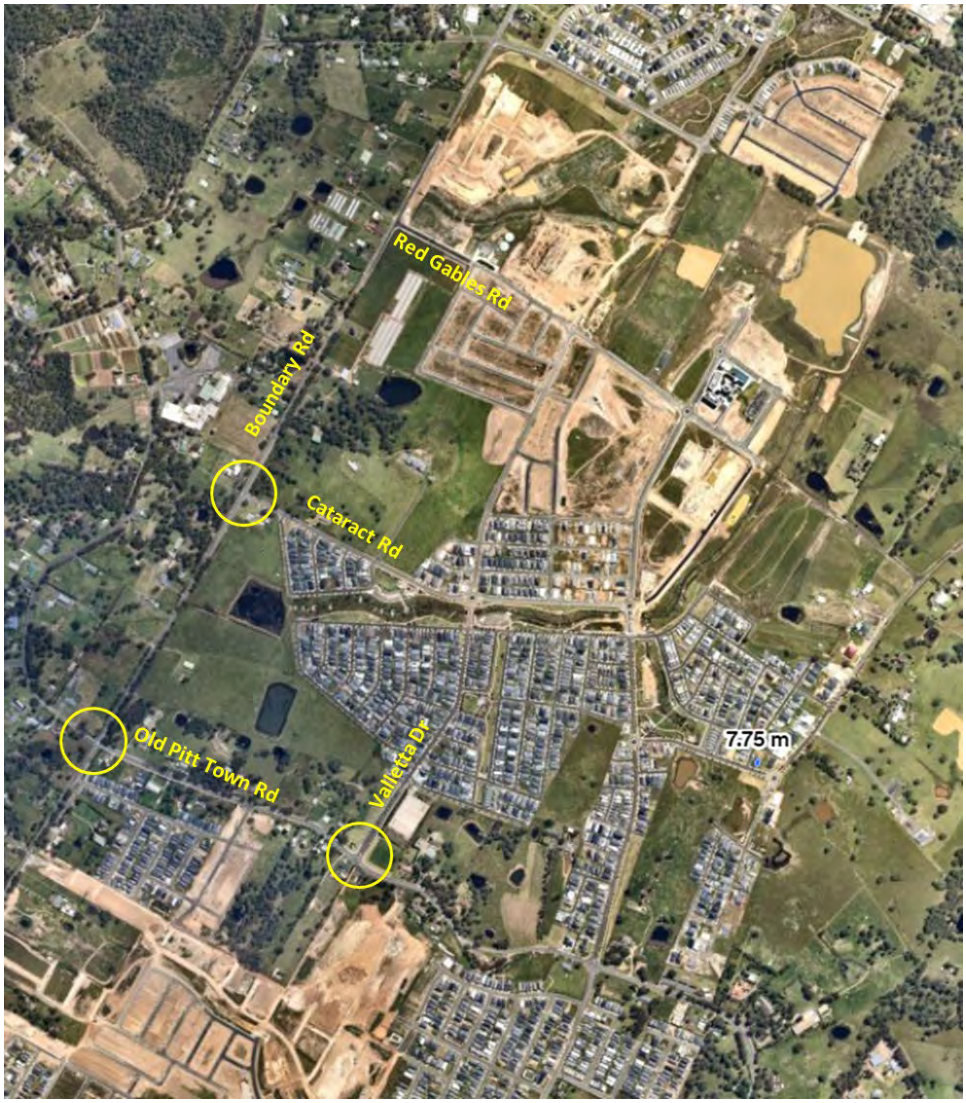
Red Gables Road – is a local road with a future connection to Boundary Road in a priority controlled arrangement. At the time of preparing this report, the road remained closed at Boundary Road subject to final construction. The road includes a single travel lane in each direction, a carriageway width of some 11.5m and unrestricted parallel parking on both sides of the street. The existing intersection arrangements of Boundary Road / Red Gables Road at the time of preparing this report are shown below in **Figure 30**.

Figure 30 – Existing Intersection Arrangements – Boundary Road / Cataract Road

4.5 Existing Traffic Flows

Having regard to the historical traffic impact assessment reporting undertaken to date for the Box Hill / Box Hill Industrial Precinct and The Gables Precinct and in consultation with representatives of the Hills Shire Council traffic section, AM / PM peak hour intersection counts were undertaken at the following locations:

Figure 31 – Council Agreed Locations of Intersection Counts



Copies of all intersection counts are provided in **Appendix A** of this report.

The peak flows by direction in each street at each intersection are summarised below.
4

Table 2 – Existing Weekday Peak Period Volumes in vicinity of site (veh/hr)

		AM		PM	
Road	**Location**	**NB/EB**	**SB/WB**	**NB/EB**	**SB/WB**
Boundary Rd	North of Cataract Rd	186	248	217	186
	South of Cataract Rd	245	350	229	222
	North of Old Pitt Town Rd	246	347	227	227
	South of Old Pitt Town Rd	304	416	301	275
Cataract Rd	East of Boundary Rd	170	213	52	76
Old Pitt Town Rd	West of Boundary Rd	237	144	126	190
	East of Boundary Rd	286	204	209	248
	West of Valletta Dr	313	171	183	263
	East of Valletta Dr	607	419	277	377
Valletta Dr	North of Old Pitt Town Road	363	409	166	146

From **Table 2** it can be seen that existing flows on surrounding roads are in generally in line with their classification. Of further note, the traffic volumes in Old Pitt Town Road west of Valletta Drive are *significantly* lower in the PM peak compared to those recorded in February 2022 in the Stanbury Traffic report.

4.6 Existing Intersection Operating Conditions

All intersections surveyed have been analysed using the Sidra Intersection analysis program. Sidra Intersection determines the average delay that vehicles encounter, the degree of saturation of the intersection, and the level of service. The degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Sidra Intersection provides analysis of the operating conditions which can be compared to the performance criteria set out in **Table 3.**

Table 3 – Level of Service Criteria

Level of Service	Average Delay per Vehicle (secs/veh)	Signals & Roundabouts	Give Way & Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & Spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	> 70	Extra capacity required	Extreme delay, traffic signals or other major treatment required

Adapted from RTA Guide to Traffic Generating Developments, 2002.

For roundabouts and priority intersections, the reported average delay is for the individual movement with the highest average delay per vehicle. At signalised intersections, the reported average delay is over all movements.

The existing weekday and weekend day intersection operating conditions are presented in **Table 4.** Average delay is expressed in seconds per vehicle.

Table 4 – Existing Weekday AM / PM Intersection Operating Conditions

Intersection	Control	Morning Peak		Evening Peak	
		Av Delay	LOS	Av Delay	LOS
Boundary Rd / Cataract Rd	Priority	8.7	A	9.7	A
Boundary Rd / Old Pitt Town Rd	Roundabout	13.1	A	11.5	A
Old Pitt Town Rd / Valletta Drive	Priority	23.3	B	16.3	

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From **Table 4** it is noted that agreed intersections surveyed currently operate at a satisfactory level of service during both the AM and PM peak periods on a weekday with spare capacity.

SIDRA outputs are provided in **Appendix B** of this report.

4.7 Public Transport

The development is located within a convenient walking distance to a large number of local and regional bus services which will continue to expand in terms of their offerings as The Gables, Box Hill and Box Hill Industrial Precincts evolve. The proximity of existing bus stops to the proposed development lands are shown below in **Figure 32**.

Figure 32 – Existing Bus Stops Within Convenient Walking Distance to Development Site

The bus routes which serve the above bus stops along Old Pitt Town Road, Boundary Road and internally within The Gables development include:

- Route 643 – The Gables to Rouse Hill & return

- Route 740 – Box Hill to Rouse Hill & return
- Route 741 – Oakville to Riverstone via Maraylya & return

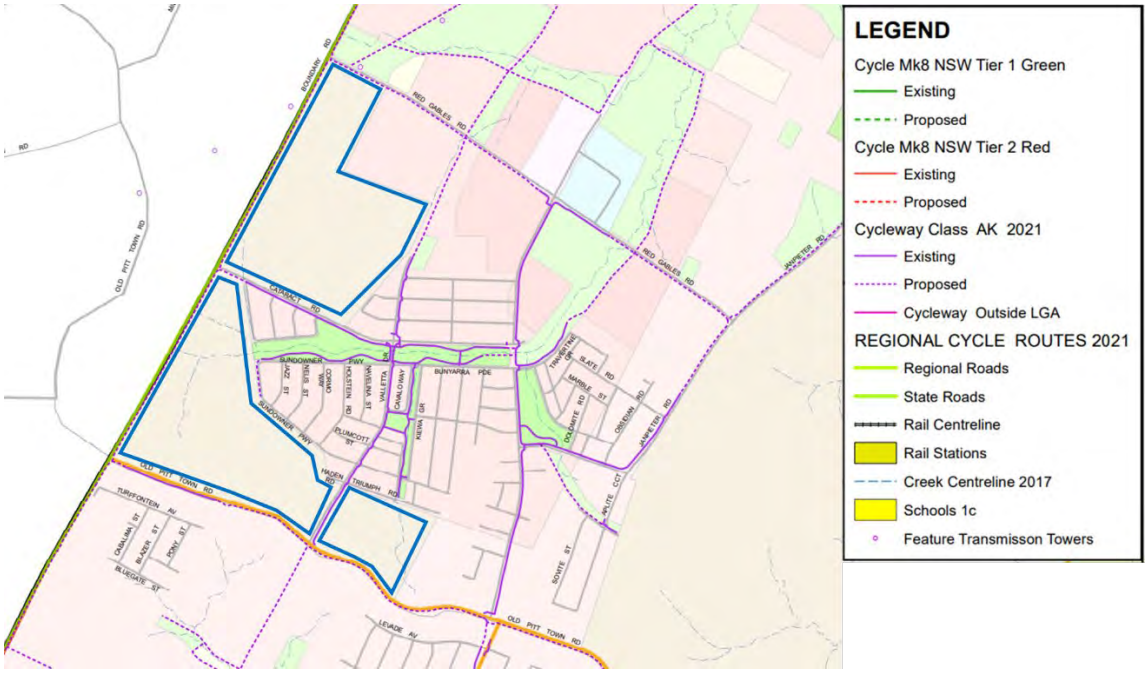
The future public transport network which will serve The Gables precinct is discussed further in **Section 3** of this report.

4.8 Cycle Network

The delivery of The Gables precinct and Box Hill Precinct has also resulted in a significant expanding provision of bicycle network facilities in accordance with the approval requirements of both precincts. The provision of cycling facilities is guided by the Hills Shire Bike Plan exhibited in August 2022

In terms of the cycle network in close proximity to the subject lands of this rezoning proposal, the existing network is shown below in **Figure 33**.

Figure 33 – Existing / Proposed Bicycle Network Near Development Site



5. Future Road Network

As confirmed above, the future road network / intersection arrangements serving The Gables where the proposed development is located has evolved over time. These changes include both rationalisation of access points along Old Pitt Town Road and upgrades of intersections over and above those which were identified in supporting traffic impact assessment reports prepared for the Box Hill / Box Hill Industrial / The Gables precincts.

5.1 Contributions Plan No.16 Gables Precinct Transport Provisions

On the matter of the provision of transport infrastructure, the existing contributions plan for the Gables Precinct states and requires the following:

A traffic and transport analysis titled "Box Hill North – Transport and Access Impact Assessment" was prepared by GTA in July 2013 ("Traffic Report"). This report establishes the need for infrastructure works resulting from development of the Gables Precinct, namely:

- capacity improvements to existing intersections with additional turning lanes and / or increased lane storage;
- intersection treatment upgrades (i.e. priority controls to roundabouts or traffic
- signals);
- road widening, clearway treatments and condition improvements; and
- bus accessible routes through Gables and bus stop facilities.

Transport Works	Description
Road Upgrades	
Boundary Road (north)	Resurfacing of Pavement between Old Pitt Town Road and Maguires Road
Old Pitt Town Road	Widening of Old Pitt Town Road between ~150 metres west of BHN Access Road West and ~150 metres east of BHN Access Road East.
Road Upgrade (Collector Road 2)	Upgrade of Red Gables Road
Road Upgrade (Collector Road 5)	Upgrade of Janpieter Road (north) south of Red Gables Road
Boundary Road	Additional upgrade works (removing crest)
New Roads	
New Road (Collector Road 1)	Between Boundary Road and drainage reserve
New Road (Collector Road 3)	Between "Collector Road 1" and Old Pitt Town Road (east)
New Road (Collector Road 4)	Between "Collector Road 1" and Red Gables Road
Intersections	
Boundary Road / Maguires Road	Give-way control: Localised widening, turn bays

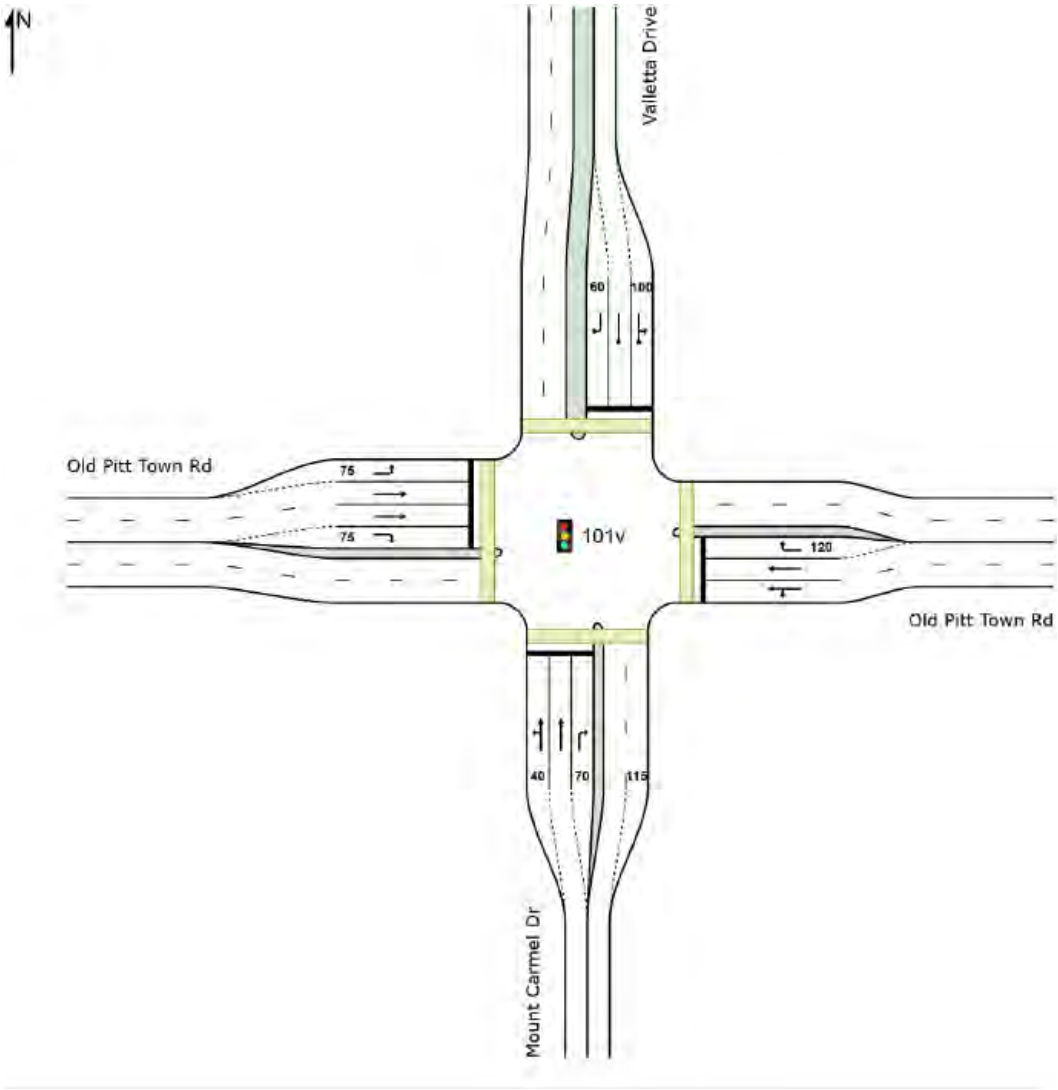
Transport Works	Description
Boundary Road / opp. Hession Rd	Give-way control: Localised widening, turn bays
Boundary Road / Red Gables Road	Give-way control: Localised widening, turn bays
Boundary Road / Cataract Road	Give-way control: Localised widening, turn bays
Boundary Road / Old Pitt Town Rd	Convert to dual-lane roundabout
Old Pitt Town Road / BHN Access Road West	Provide new dual-lane roundabout
Old Pitt Town Road / Terry Road	Upgrade existing intersection to a dual (2) lane roundabout
Annangrove Road/ The Water Lane/ Withers Road	Provide left turn/slip lane
Mountable Roundabouts	Six new mountable roundabouts at various Locations
Bus Stops	
Bus stops along D2	Provide 12 additional bus stops along Route D2
Bus stops along D3	Provide 16 additional bus stops along Route D3
Cycleways	
Cycleway 1	Adjoining open space and water management
Cycleway 2	Adjoining open space and water management
Cycleway 3	Adjoining open space and water management

5.2 Future Road Network Planning

Further the above requirements of the contributions plan, Hills Shire Council has identified (as noted in the Stanbury Traffic Signal Warrant Assessment report described above) that *both* current intersections in Old Pitt Town Road (Valletta Drive / Fontana Drive, would *not* include a dual lane roundabout arrangements but signalised intersection control.

The anticipated intersection configuration is shown below.

Figure 34 – Proposed Signalised Intersection Arrangement of Old Pitt Town Road / Valletta Drive & Old Pitt Town Road / Fontana Drive



The above arrangements show two (2) travel lanes in each direction in Old Pitt Town Road which will be adopted for the assessment of 2036 conditions presented below in **Section 7**.

As also identified in the contributions plan, Boundary Road north of Old Pitt Town Road past the site frontage would be widened to two (2) travel lanes in each direction with a shared pedestrian / cycle pathway provided on its eastern side.

6. The Proposed Development

The key components of the proposed development and associated public works are described below.

- Rezoning of remnant lands within The Gables precinct to provide a total of **1,200 – 1,300** potential residential lots.
- Construction of an internal road system which links in a number of locations to the existing local road network adjacent.
- Left in / left out local road connection to Old Pitt Town Road between Boundary Road and Valetta Drive.
- Extension of the existing shared pedestrian / cycle path over the riparian corridor providing the missing link between Sundowner Parkway and Bloomsdale Circuit.
- Allowance for the widening of Boundary Road to provide two (2) travel lanes in each direction along with a shared pedestrian / cycle pathway along its eastern side as identified in contributions plan.
- Local parks / greenspace areas.

Plans of the potential development arrangement which could be achieved in the rezoning proposal is provided in **Appendix C** of this report.

7. Potential Traffic Impacts

7.1 Introduction

The following presents an assessment of the potential traffic impacts of the proposal using the Roads and Traffic Authority Guide to Traffic Generating Developments standard approach.

7.2 Development Traffic Generation

In line with the consistent assumptions to date for potential traffic generation, both the Box Hill / Box Hill Industrial traffic impact report and the Box Hill North (The Gables) traffic impact assessment report adopted the following traffic generation rates by type.

Table 4.5: Peak Hour Traffic Generation (No Trip Containment or Mode Shift)

Land Use	Dwellings	Traffic Generation Rate	Traffic Generation
Low Density Residential	3,280	0.85 trips/ dwelling	2,788
Medium Density Residential	615	0.50 trips/ dwelling	308
High Density Residential	205	0.24 trips/ dwelling	49
Total	4,100		3,145

As per the Box Hill and Box Hill Industrial – Transport and Access Study (GHD, 2011) trip containment (20%) and mode shift to public transport (8%) have been applied to the peak hour traffic generation estimates as shown in Table 4.5 for the purpose of assessing the external traffic implications of the Box Hill North development proposal.

The early development of the Box Hill North town centre will facilitate trip containment within Box Hill North with a proportion of retail, educational, social and employment related trips with origins and destinations within Box Hill North.

Table 4.6 shows the estimated external peak period traffic generation for the Box Hill North development proposal. These estimates have been used in the assessment of the external road network operation and infrastructure improvements.

Table 4.6: External Peak Hour Traffic Generation of Box Hill North

Land Use	Dwellings	External Traffic Generation Rate	Traffic Generation
Low Density Residential	3,280	0.61 trips/ dwelling	2,002
Medium Density Residential	615	0.36 trips/ dwelling	221
High Density Residential	205	0.17 trips/ dwelling	35
Total	4,100		2,258

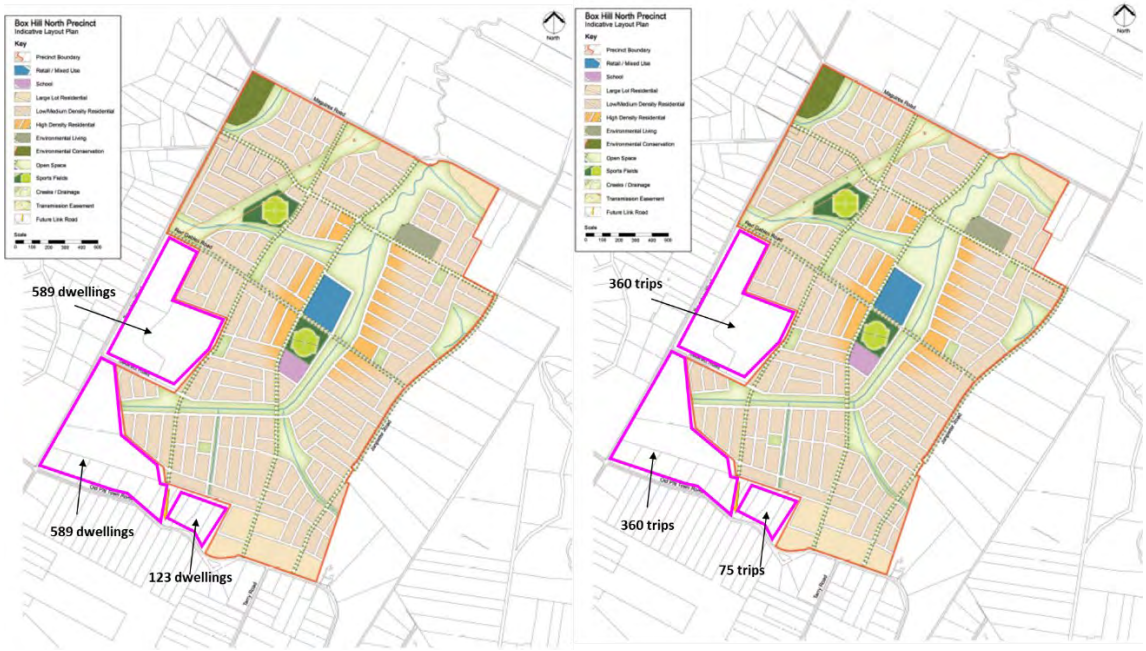
As a conservative estimate of the traffic generation of the proposal, the maximum anticipated potential yield of **1,300** dwellings has been adopted for all modelling. Therefore, the proposed 1,300 potential dwellings (*all* assumed to be low density) would generate in the order of **793 trips** in the AM and PM peak periods two way. Of these, 80% (635) trips would be outbound in the AM peak and 20% (158) would be inbound. The reverse would occur in the PM peak.

7.3 Trip Distribution

The distribution of trips by precinct would mirror that assumed in the Box Hill North (The Gables) traffic impact assessment report which is shown above in **Figure 8**.

The number of dwellings by each development area and the resulting number of peak hour trips two way is shown below in **Figure 35**.

Figure 35 – Potential Development No. Dwellings & Peak Hour Traffic Generation by Location



The resulting assumed routes of travel by each development area within the proposed development is shown below in **Figure 36**.

Figure 36 – Assumed Trip Distribution by Routes of Travel for Each Development Area

7.4 Future Public Transport Network

The traffic impact assessment of 2036 conditions have assumed the following:

- Adopt Stanbury report 2036 forecast flows for Old Pitt Town Road / Valletta Drive as *baseline* 2036 conditions as these forecasts account for the 42% increase in yield in the precinct.
- Factor 2022 count of Old Pitt Town Road / Boundary Road traffic flows recorded in 2022 by 277% to mirror 2036 conditions modelled in Stanbury Road and account for all approved growth of surrounding precincts (average 12.6% growth per annum).
- Factor forecast traffic generation of GTA report for Red Gables Road / Boundary by 42% to account for increase yield of The Gables now approved for traffic coming into and out of The Gables precinct.
- Adopt a 2% per annum growth of traffic flows in Boundary Road north of Old Pitt Town Road as a 2036 baseline traffic demands in Boundary Road at Red Gables Road / Cataract Road as all growth would be generally attributed to The Gables generated traffic and thus increases from other development would be minimal.
- 50/50 split in routes of travel generated by trips generated to Old Pitt Town Road east shared between the new left in / left out intersection and Valetta Drive.
- Adopt the *same* traffic generation forecasts of the GTA report for the intersection of Boundary Road / Red Gables Road at the intersection of Boundary Road / Cataract Road to account for the fact that this intersection was omitted from the traffic

generation forecasts of the report. This provides a conservative estimate of future traffic generation at this intersection.

- Also factor these volumes for Boundary Road / Cataract Road by 42% (entry / exit volumes) to account for now approved yield increase in Box Hill.
- Discount existing entry / exit volumes at Cataract Road / Boundary Road from 2036 forecast traffic generation to account for existing now constructed development prior to factoring of the forecasts by 42%.
- Signalised intersection of Old Pitt Town Road / Boundary Road (**Figure 22** with 100m right turn bays) and Old Pitt Town Road / Valletta Drive (**Figure 34**) in place.
- Boundary Road upgraded to two (2) travel lanes in each direction.
- Old Pitt Town Road upgraded to two (2) travel lanes in each direction.
- Mount Carmel Road extension would occur by year 2024 prior to occupation of any development within the proposal.

The resultant 2036 forecast traffic generation of The Gables precinct prior to the factoring by 42% which accounts for the omitted Cataract Road is shown below in

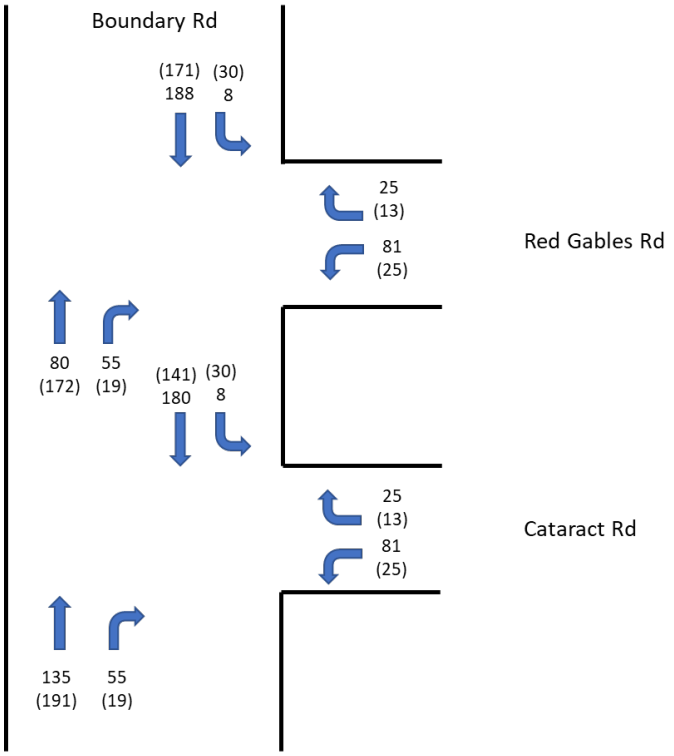
Figure 37 – Adopted The Gables 2036 Traffic Generation (prior to factoring by 42%) to Account for Omitted Cataract Rd

2036 AM Peak Traffic Generation

2036 PM Peak Traffic Generation

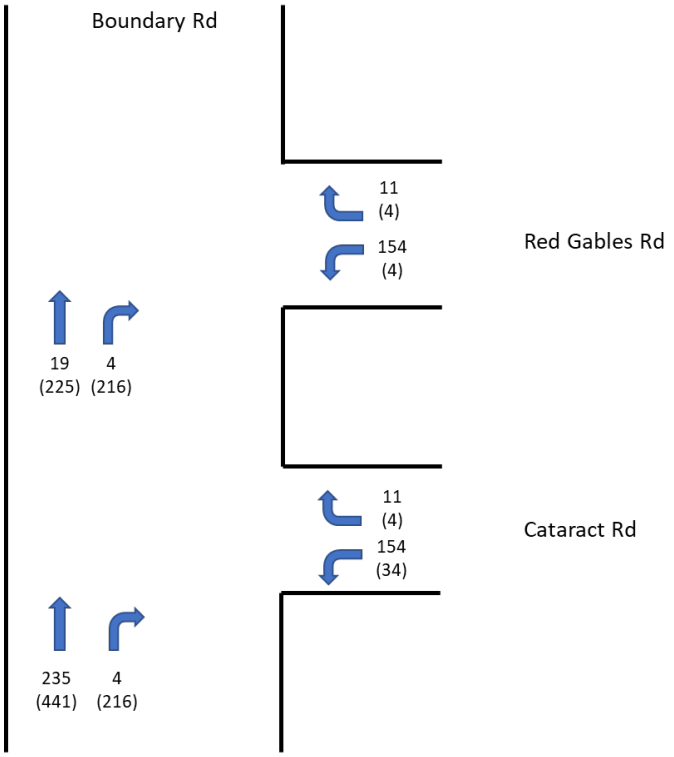
The adopted split of existing traffic flows at Cataract Road / Boundary Road to the closed at the time of surveys Boundary Road / Red Gables Road intersection is shown below.

Figure 38 – Adopted Split of Existing Traffic Flows Between Cataract Road and Red Gables Road



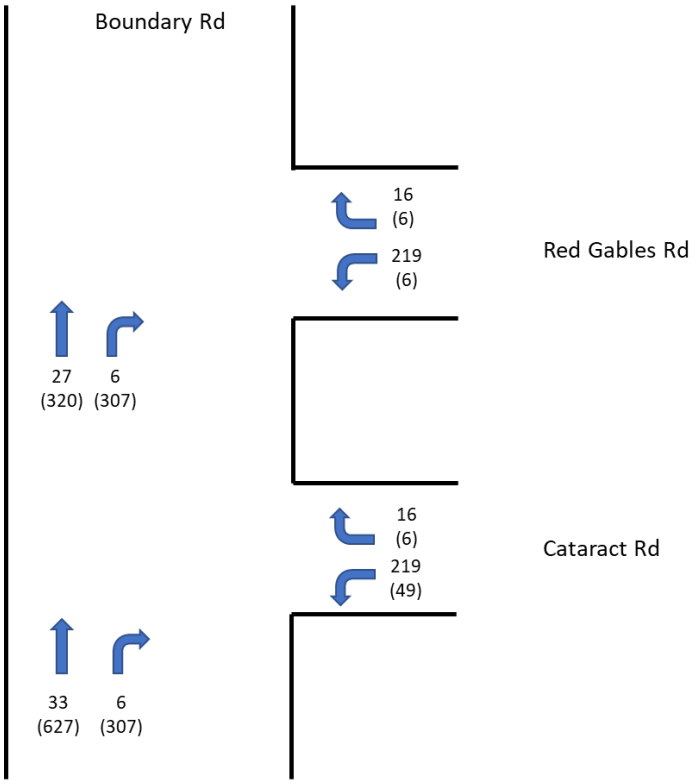
The calculated difference plot of 2036 traffic generation of The Gables precinct which accounts for existing traffic flows split above is shown below in **Figure 39**.

Figure 39 – 2036 The Gables Traffic Generation Accounting for Existing Traffic Volumes at Boundary Road / Cataract Road and Boundary Road / Red Gables Road



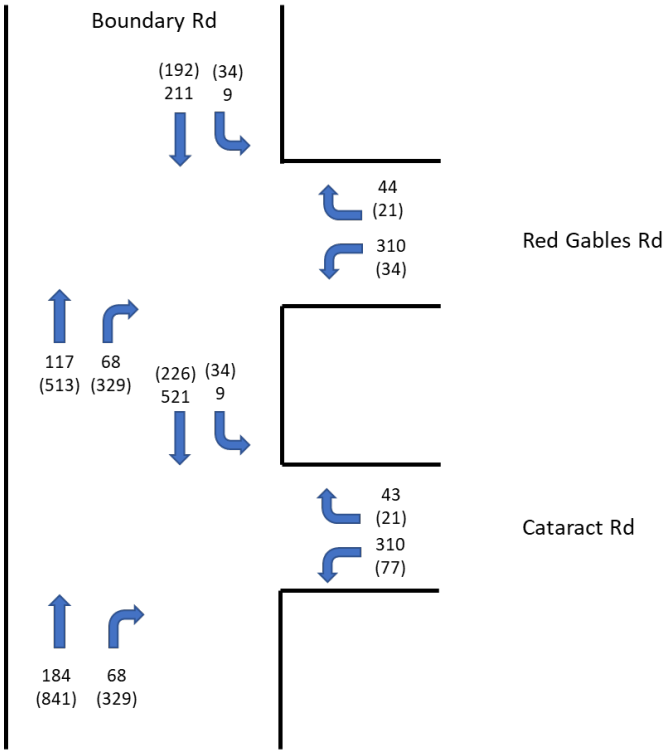
The factored traffic generation by 42% of the difference plot volumes shown above in **Figure 39** is presented below in **Figure 40**.

Figure 40 – 2036 The Gables Traffic Generation Factored by 42%



The overall 2036 baseline traffic flows by direction at the intersections of Boundary Road / Red Gables Road and Boundary Road / Cataract Road are presented below in **Figure 41**.

Figure 41 – 2036 Boundary Rd / Red Gables Rd & Boundary Rd / Cataract Rd Baseline Traffic Flows



The resultant additional trips over and above those estimated for 2036 conditions by route of travel are presented below.

Figure 42 – Proposed Development AM Peak Outbound Traffic Generation by Route

Figure 43 – Proposed Development AM Peak Inbound Traffic Generation by Route

Figure 44 – Proposed Development PM Peak Outbound Traffic Generation by Route

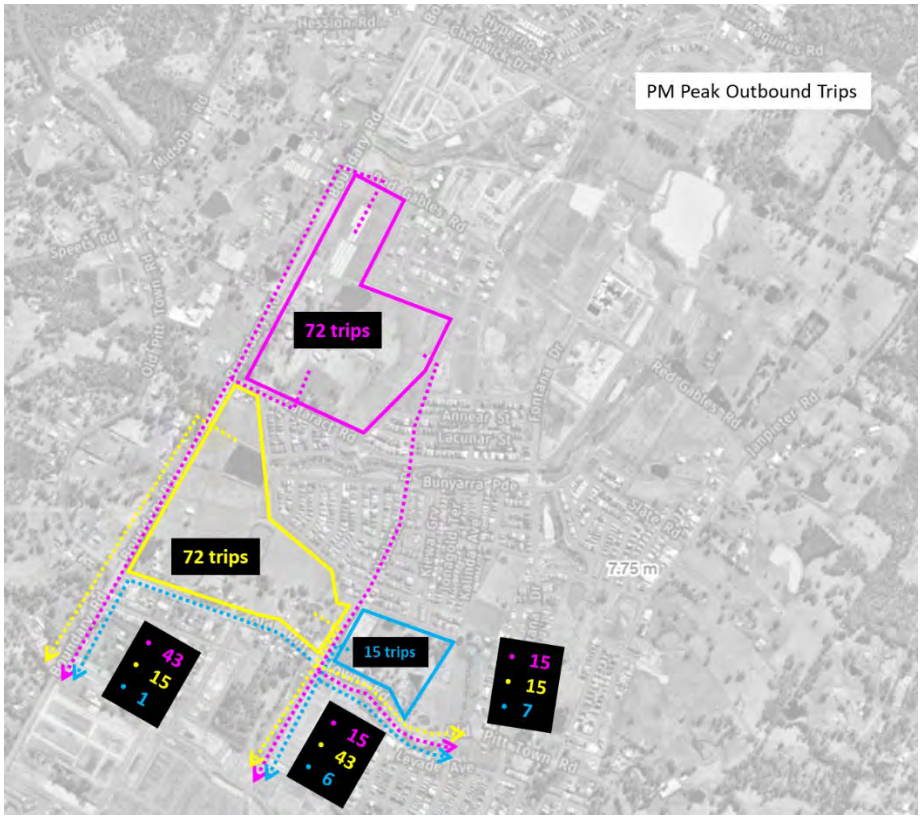
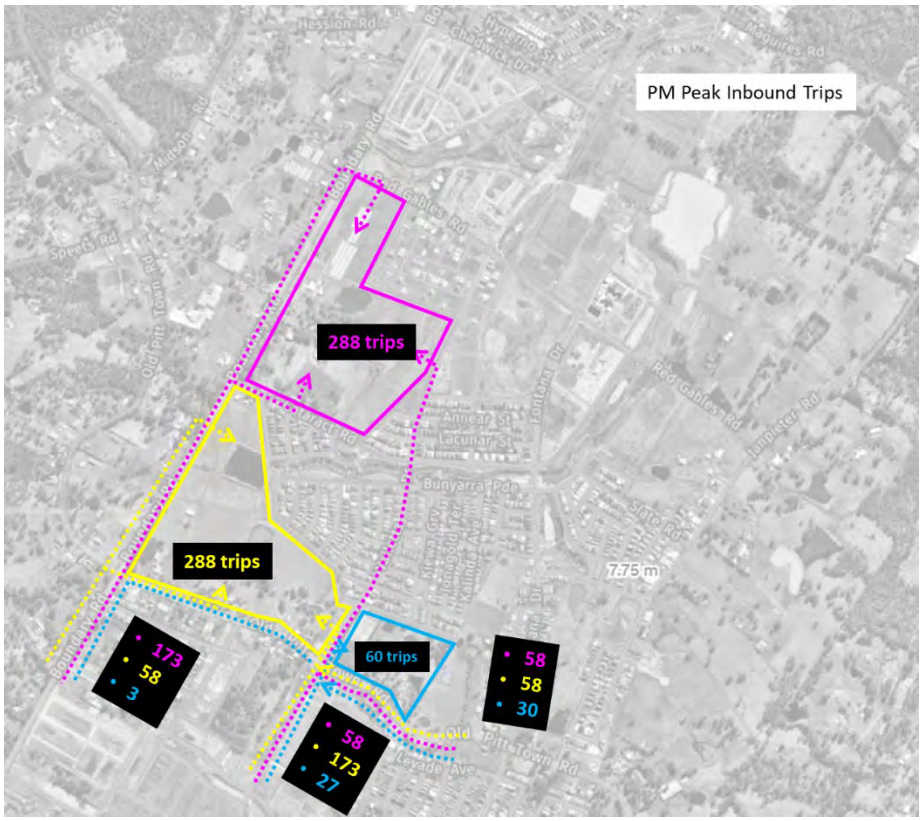


Figure 45 – Proposed Development PM Peak Outbound Traffic Generation by Route



The resulting future 2036 intersection operating conditions within and without the proposed rezoning for the agreed intersections surveyed is shown below in **Table 5**.

Table 5 – Existing vs 2036 Weekday AM / PM Intersection Operating Conditions With & Without Development

Intersection	Control	Morning Peak		Evening Peak	
		Av Delay	LOS	Av Delay	LOS
2022					
Boundary Rd / Cataract Rd	Priority	8.7	A	9.7	A
Boundary Rd / Old Pitt Town Rd	Roundabout	13.1	A	11.5	A
Old Pitt Town Rd / Valletta Drive	Priority	23.3	B	16.3	B
2036 – No Development					
Boundary Rd / Red Gables Rd**	Priority	12.4	A	**53.6**	**E**
Boundary Rd / Cataract Rd	Priority	15.6	B	25.7	B
Boundary Rd / Old Pitt Town Rd	Signals	38.8	C	30.0	C
Old Pitt Town Rd / Valletta Drive*	Signals	54.1	D	27.7	B
2036 With Development					
Boundary Rd / Red Gables Rd***	Priority	13.0	A	**66.1**	**E**
Boundary Rd / Cataract Rd	Priority	21.5	B	32.2	C
Boundary Rd / Old Pitt Town Rd	Signals	50.5	D	32.6	C
Old Pitt Town Rd / Valletta Drive	Signals	**100**	**F**	35.6	C

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

*This 2036 level of service does not mirror that found in the Stanbury traffic report for the *same* 2036 volumes / intersection arrangement / signal phasing where it found **LOS C** operating conditions

** 42% increase to 2036 forecast traffic flows into / out of The Gables as forecast in GTA report

*** 42% increase to 2036 forecast traffic flows into / out of The Gables as forecast in GTA report + development traffic

From **Table 5** it is noted that in 2036 all surrounding intersections would operate at a satisfactory level of service *without* the traffic generation of the proposed development except the intersection of Boundary Road / Red Gables Road whereas a priority controlled intersection would be considered as failing at **Level of Service E**.

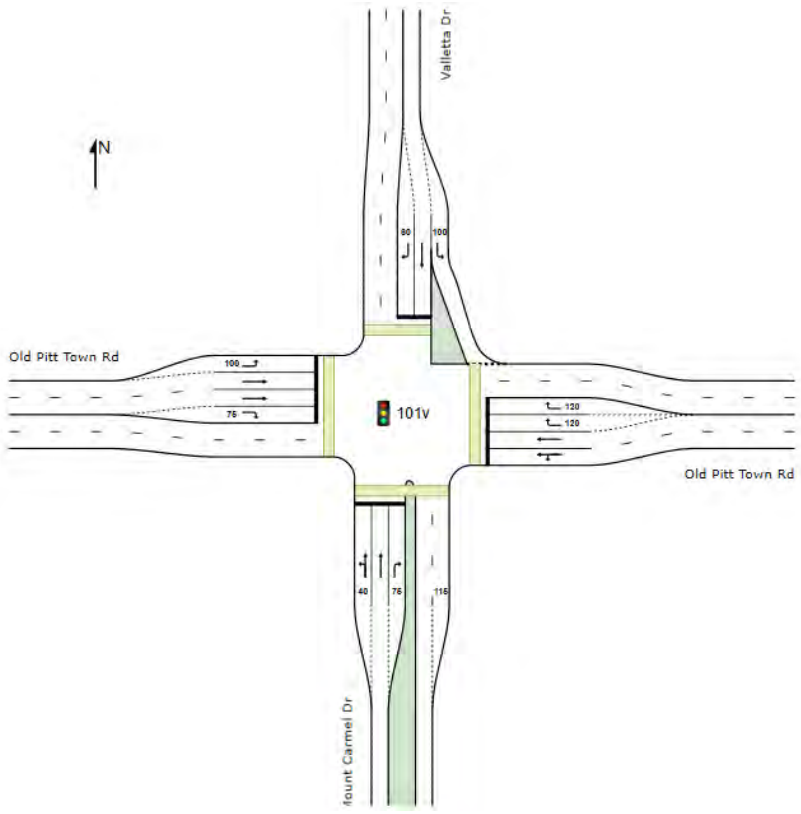
It is noted that the existing 'seagull' intersection arrangement at Boundary Road / Cataract Road would continue to operate at a satisfactory level of service in 2036 following *full* development of the subject site.

At full development of the site the intersection of Boundary Road / Red Gables Road as a basic priority controlled intersection would continue to operate at capacity (albeit with little change to resulting delay of the worst vehicle movement). Thus. The adoption of the same seagull type intersection at Boundary Road / Red Gables Road would resolve this near capacity intersection operation with or without the development.

However, despite mirroring the 2036 traffic flows, traffic signal phasing adopted in the Stanbury Traffic Planning Warrant Assessment report for the signalisation of the intersection of Old Pitt Town Road / Valletta Drive, it was not possible to mirror the forecast AM Peak level of service conditions at the intersection.

The proposed development which includes lands on the north-east and north-west corner of the intersection of Old Pitt Town Road / Valletta Drive which in turn enables the opportunity for the provision of a left turn slip lane which would greatly benefit the future intersection operating conditions given the AM / PM peak left turn volumes expected. A further right turn bay would be provided to provide additional capacity for westbound traffic turning into Valetta Drive. The revised potential arrangement of the intersection in 2036 is shown below.

Figure 46 – Potential Slip Lanes from Valetta Drive at Old Pitt Town Road + Additional Right Turn Lane



The enhancements of the intersection include:

- Second right turn lane from Old Pitt Town Road into Valletta Drive.
- Left turn slip lane from Valetta Drive into Old Pitt Town Road east.
- Left turn slip lane from Old Pitt Town Road west into Valetta Drive.

Adopting the slip lane arrangement above would result in the following future intersection operating conditions with and without the proposed development.

Table 6 – Valetta Drive Slip Lane 2036 Weekday AM / PM Intersection Operating Conditions With & Without Development

		Morning Peak		Evening Peak	
Intersection	**Control**	**Av Delay**	**LOS**	**Av Delay**	**LOS**
2036 – No Development					
Old Pitt Town Rd / Valletta Drive	Signals	54.1	D	26.7	B
2036 With Development					
Old Pitt Town Rd / Valletta Drive	Signals	67.7	E	26.8	B

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

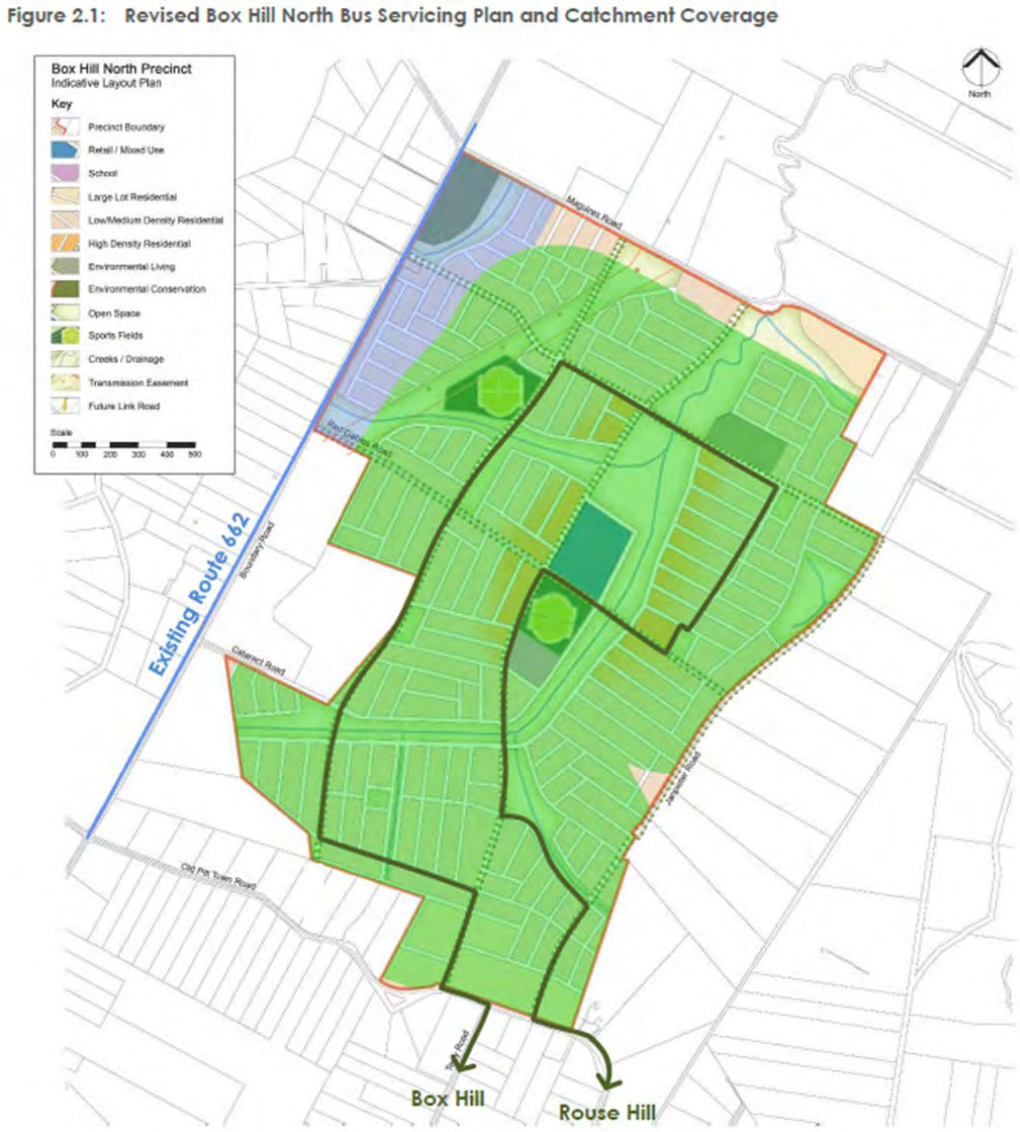
The proposal enables the opportunity for further enhancement of the intersection with the provision of additional slip lanes and a right turn bay in Old Pitt Town Road and would result in a minor increase in average delay at the intersection following *full development* of the proposal.

On this basis, the traffic impacts of the rezoning proposal are considered acceptable.

7.5 Future Public Transport

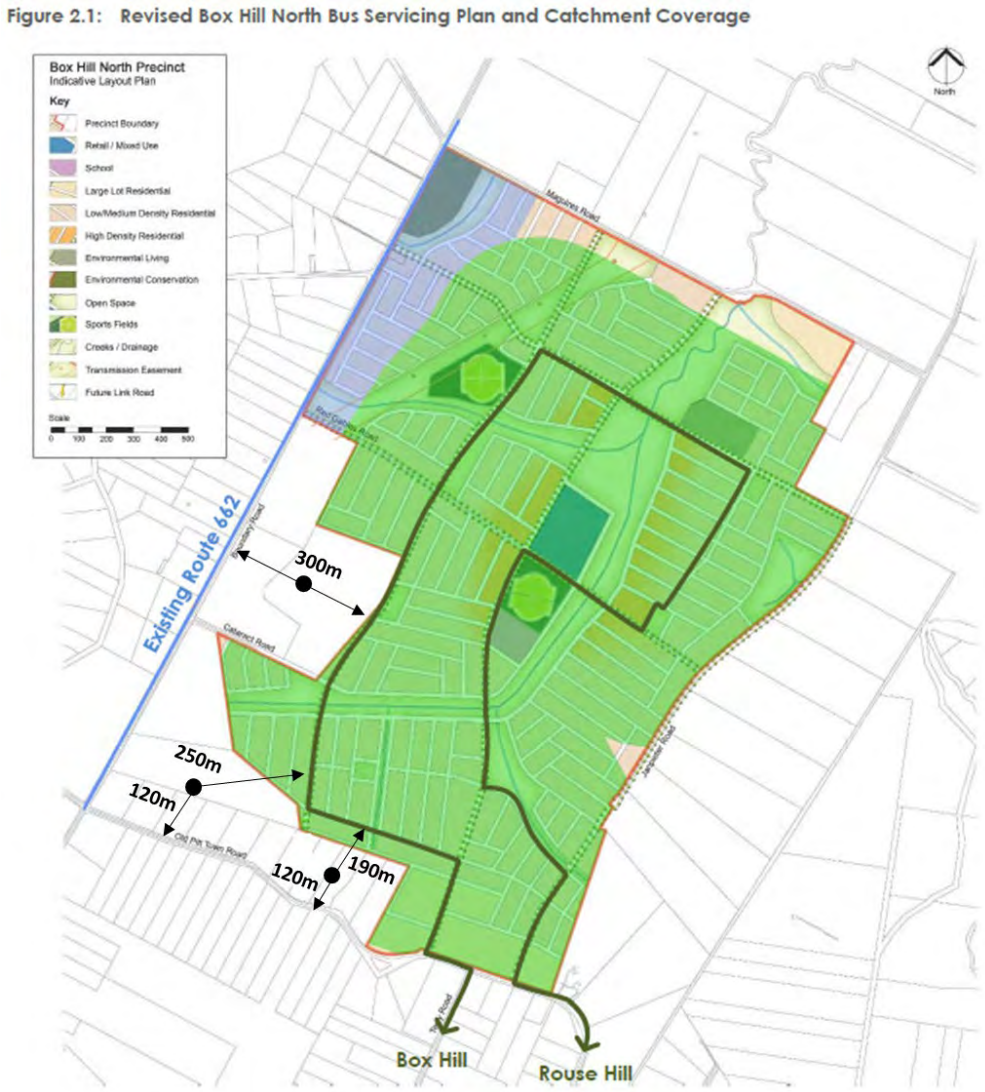
The outcome of the GTA Transport and Access Assessment Report for The Gables resulted in the following future bus network within the precinct which ensured all dwellings would be within a 400m walking distance to existing / future bus routes as shown below.

Figure 47 – The Gables Adopted Future Bus Network



The resulting bus network above would also allow all future residents of the proposed development to also be within 400m walking distance to existing / future bus routes without the need for any marked change to the approved network. The centroid walking distances to the above future network for each area of the subject development are shown below.

Figure 48 – Proposed Development Walking Distances to Future Bus Network



8. Conclusions

This report has reviewed the potential traffic impacts of the rezoning of lands within The Gables precinct to provide 1,175 residential housing lots. The findings of this assessment are presented below:

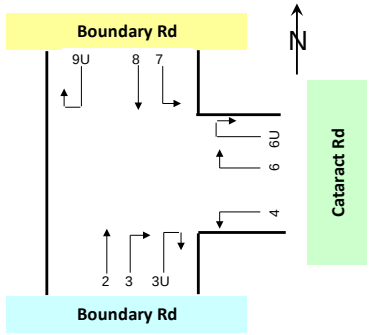
1. To date, no traffic impact assessment report has assessed the potential traffic impacts of approved development growth within the Box Hill precincts and surroundings and the associated impacts of this now approved development beyond the intersection of Old Pitt Town Road / Valetta Drive.
2. The intersections agreed with Hills Shire Council for the assessment of traffic impacts of this proposal currently function at a satisfactory level of service during the AM and PM weekday periods.
3. On the basis the traffic growth adopted in the Stanbury traffic signal warrant assessment report is realised for Old Pitt Town Road / Boundary Road, intersections along Boundary Road serving the Gables Precinct would fail as priority controlled intersection *without* the proposed development.
4. The approved contributions plan does not include any specific upgrade of priority controlled intersections along Boundary Road north of Old Pitt Town Road.
5. The proposed signalised intersection of Old Pitt Town Road / Boundary Road as currently proposed would operate at a satisfactory level of service in the future with the full traffic generation of the proposed development accounted for.
6. The intersection of Old Pitt Town Road / Valletta Drive would operate near capacity in the future without the proposed development.
7. The proposed development provides the opportunity for the creation of left turn slip lanes in Valletta Drive / Old Pitt Town Road west to further improve intersection operating conditions in the future.
8. The proposed development would be located within 400m walking distance to existing / future bus routes in and around The Gables precinct.

Overall the traffic impacts of the proposal are considered acceptable.

9. Appendix A – 2022 Intersection Counts

Job No.	: AUNSW3121
Client	: The Trustee for Positive Traffic Trust
Suburb	: Box Hill
Location	: 1. Boundary Rd / Cataract Rd
Day/Date	: Wed, 30th March 2022
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2
Classifications	Lights	Heavies



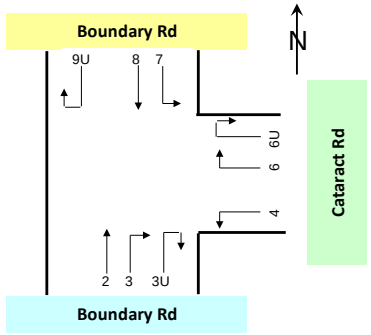
MATRIX Traffic and Transport Data

Approach	Boundary Rd									Cataract Rd								
Direction		Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)				Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total
7:00 to 7:15		44	6	**50**	12	1	**13**	0	0	**0**	6	1	**7**		4	2	**6**	0	0	**0**
7:15 to 7:30		29	5	**34**	22	3	**25**	0	0	**0**	11	3	**14**		3	2	**5**	0	0	**0**
7:30 to 7:45		24	8	**32**	46	1	**47**	0	0	**0**	26	2	**28**		6	1	**7**	0	0	**0**
7:45 to 8:00		30	4	**34**	40	2	**42**	0	0	**0**	47	1	**48**		15	1	**16**	0	0	**0**
8:00 to 8:15		20	4	**24**	15	2	**17**	0	0	**0**	58	2	**60**		17	0	**17**	0	0	**0**
8:15 to 8:30		38	7	**45**	4	0	**4**	0	0	**0**	25	1	**26**		11	0	**11**	0	0	**0**
8:30 to 8:45		35	4	**39**	5	0	**5**	0	0	**0**	15	3	**18**		2	0	**2**	0	0	**0**
8:45 to 9:00		25	2	**27**	3	1	**4**	0	0	**0**	6	1	**7**		5	0	**5**	0	0	**0**
AM Totals		**245**	**40**	**285**	**147**	**10**	**157**	**0**	**0**	**0**	**194**	**14**	**208**		**63**	**6**	**69**	**0**	**0**	**0**
16:00 to 16:15		47	2	**49**	10	0	**10**	0	0	**0**	19	1	**20**		7	0	**7**	0	0	**0**
16:15 to 16:30		37	4	**41**	10	0	**10**	0	0	**0**	9	0	**9**		5	1	**6**	0	0	**0**
16:30 to 16:45		49	5	**54**	11	0	**11**	1	0	**1**	13	0	**13**		6	0	**6**	0	0	**0**
16:45 to 17:00		43	4	**47**	6	0	**6**	0	0	**0**	8	0	**8**		7	0	**7**	0	0	**0**
17:00 to 17:15		47	0	**47**	7	0	**7**	0	0	**0**	14	0	**14**		4	0	**4**	0	0	**0**
17:15 to 17:30		42	4	**46**	10	0	**10**	0	0	**0**	10	0	**10**		5	0	**5**	0	0	**0**
17:30 to 17:45		51	0	**51**	10	0	**10**	0	0	**0**	11	1	**12**		3	2	**5**	0	0	**0**
17:45 to 18:00		45	1	**46**	5	0	**5**	0	0	**0**	6	0	**6**		2	1	**3**	0	0	**0**
PM Totals		**361**	**20**	**381**	**69**	**0**	**69**	**1**	**0**	**1**	**90**	**2**	**92**		**39**	**4**	**43**	**0**	**0**	**0**

Approach	Boundary Rd											
Direction	Direction 7 (Left Turn)			Direction 8 (Through)				Direction 9U (U Turn)				
Time Period	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total		
7:00 to 7:15	2	1	**3**	55	0	**55**		0	0	**0**		
7:15 to 7:30	11	1	**12**	45	3	**48**		0	0	**0**		
7:30 to 7:45	13	1	**14**	42	7	**49**		0	0	**0**		
7:45 to 8:00	21	3	**24**	43	6	**49**		0	0	**0**		
8:00 to 8:15	14	1	**15**	31	5	**36**		0	0	**0**		
8:15 to 8:30	5	2	**7**	45	9	**54**		0	0	**0**		
8:30 to 8:45	2	0	**2**	39	2	**41**		0	0	**0**		
8:45 to 9:00	4	1	**5**	31	8	**39**		0	0	**0**		
AM Totals	**72**	**10**	**82**	**331**	**40**	**371**		**0**	**0**	**0**		
16:00 to 16:15	4	0	**4**	39	5	**44**		0	0	**0**		
16:15 to 16:30	3	0	**3**	46	2	**48**		0	0	**0**		
16:30 to 16:45	7	0	**7**	41	2	**43**		0	0	**0**		
16:45 to 17:00	1	0	**1**	35	1	**36**		0	0	**0**		
17:00 to 17:15	3	0	**3**	25	2	**27**		0	0	**0**		
17:15 to 17:30	5	0	**5**	34	2	**36**		0	0	**0**		
17:30 to 17:45	0	0	**0**	37	4	**41**		0	0	**0**		
17:45 to 18:00	0	0	**0**	26	2	**28**		0	0	**0**		
PM Totals	**23**	**0**	**23**	**283**	**20**	**303**		**0**	**0**	**0**		

Job No. : AUNSW3121
Client : The Trustee for Positive Traffic Trust
Suburb : Box Hill
Location : 1. Boundary Rd / Cataract Rd

Day/Date : Wed, 30th March 2022
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



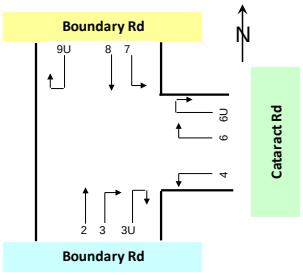
MATRIX Traffic and Transport Data

Approach	Boundary Rd									Cataract Rd								
Direction		Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)			Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
7:00 to 8:00		127	23	**150**	120	7	**127**	0	0	**0**	90	7	**97**	28	6	**34**	0	0	**0**
7:15 to 8:15		103	21	**124**	123	8	**131**	0	0	**0**	142	8	**150**	41	4	**45**	0	0	**0**
7:30 to 8:30		112	23	**135**	105	5	**110**	0	0	**0**	156	6	**162**	49	2	**51**	0	0	**0**
7:45 to 8:45		123	19	**142**	64	4	**68**	0	0	**0**	145	7	**152**	45	1	**46**	0	0	**0**
8:00 to 9:00		118	17	**135**	27	3	**30**	0	0	**0**	104	7	**111**	35	0	**35**	0	0	**0**
AM Totals		**245**	**40**	**285**	**147**	**10**	**157**	**0**	**0**	**0**	**194**	**14**	**208**	**63**	**6**	**69**	**0**	**0**	**0**
16:00 to 17:00		176	15	**191**	37	0	**37**	1	0	**1**	49	1	**50**	25	1	**26**	0	0	**0**
16:15 to 17:15		176	13	**189**	34	0	**34**	1	0	**1**	44	0	**44**	22	1	**23**	0	0	**0**
16:30 to 17:30		181	13	**194**	34	0	**34**	1	0	**1**	45	0	**45**	22	0	**22**	0	0	**0**
16:45 to 17:45		183	8	**191**	33	0	**33**	0	0	**0**	43	1	**44**	19	2	**21**	0	0	**0**
17:00 to 18:00		185	5	**190**	32	0	**32**	0	0	**0**	41	1	**42**	14	3	**17**	0	0	**0**
PM Totals		**361**	**20**	**381**	**69**	**0**	**69**	**1**	**0**	**1**	**90**	**2**	**92**	**39**	**4**	**43**	**0**	**0**	**0**

Approach	Boundary Rd									
Direction	Direction 7 (Left Turn)			Direction 8 (Through)				Direction 9U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total
7:00 to 8:00	47	6	**53**	185	16	**201**		0	0	**0**
7:15 to 8:15	59	6	**65**	161	21	**182**		0	0	**0**
7:30 to 8:30	53	7	**60**	161	27	**188**		0	0	**0**
7:45 to 8:45	42	6	**48**	158	22	**180**		0	0	**0**
8:00 to 9:00	25	4	**29**	146	24	**170**		0	0	**0**
AM Totals	**72**	**10**	**82**	**331**	**40**	**371**		**0**	**0**	**0**
16:00 to 17:00	15	0	**15**	161	10	**171**		0	0	**0**
16:15 to 17:15	14	0	**14**	147	7	**154**		0	0	**0**
16:30 to 17:30	16	0	**16**	135	7	**142**		0	0	**0**
16:45 to 17:45	9	0	**9**	131	9	**140**		0	0	**0**
17:00 to 18:00	8	0	**8**	122	10	**132**		0	0	**0**
PM Totals	**23**	**0**	**23**	**283**	**20**	**303**		**0**	**0**	**0**

Job No. : AUNSW3121
Client : The Trustee for Positive Traffic Trust
Suburb : Box Hill
Location : 1. Boundary Rd / Cataract Rd

Day/Date : Wed, 30th March 2022
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



MATRIX Traffic and Transport Data

	Approach	Boundary Rd			Cataract Rd			Boundary Rd			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	7:30 to 8:30	217	28	**245**	205	8	**213**	214	34	**248**	**706**
PM	16:00 to 17:00	214	15	**229**	74	2	**76**	176	10	**186**	**491**

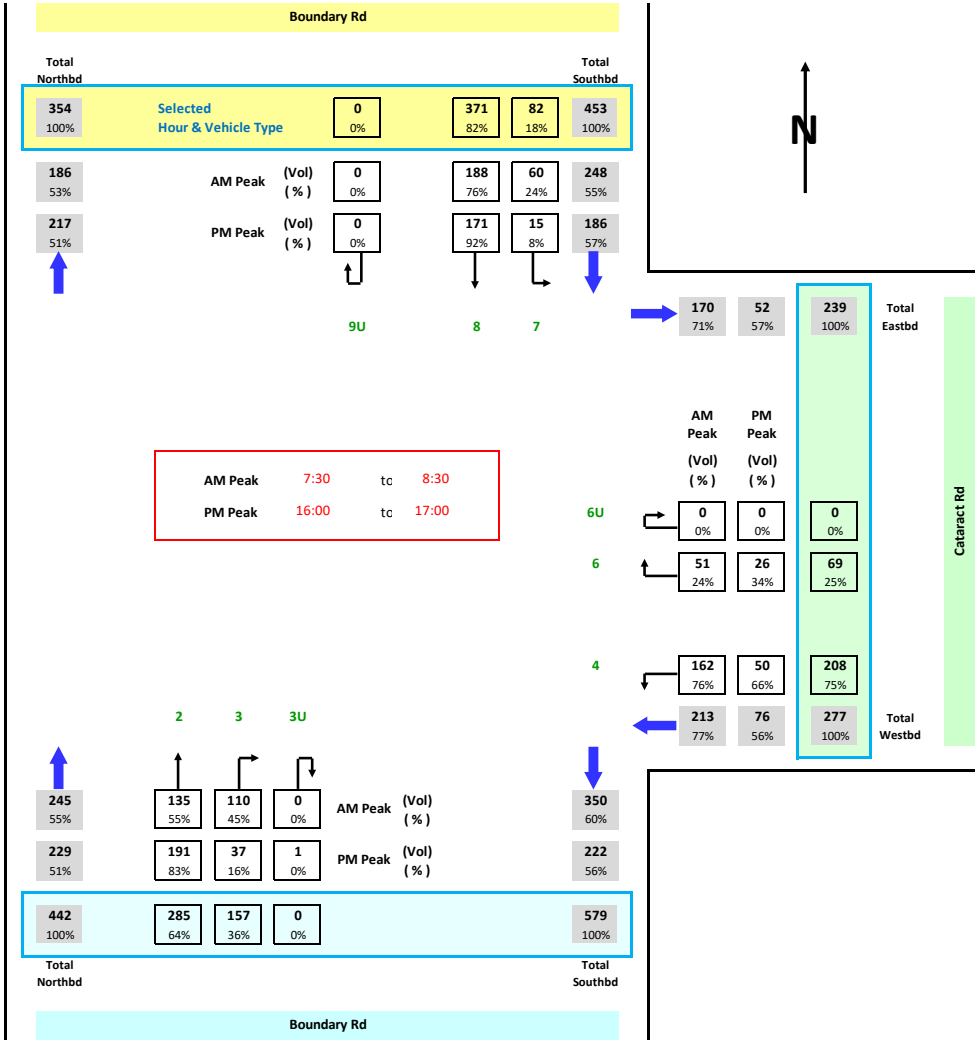
Approach	Boundary Rd			Cataract Rd			Boundary Rd			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
7:00 to 8:00	247	30	**277**	118	13	**131**	232	22	**254**	**662**
7:15 to 8:15	226	29	**255**	183	12	**195**	220	27	**247**	**697**
7:30 to 8:30	217	28	**245**	205	8	**213**	214	34	**248**	**706**
7:45 to 8:45	187	23	**210**	190	8	**198**	200	28	**228**	**636**
8:00 to 9:00	145	20	**165**	139	7	**146**	171	28	**199**	**510**
AM Totals	**392**	**50**	**442**	**257**	**20**	**277**	**403**	**50**	**453**	**1,172**
16:00 to 17:00	214	15	**229**	74	2	**76**	176	10	**186**	**491**
16:15 to 17:15	211	13	**224**	66	1	**67**	161	7	**168**	**459**
16:30 to 17:30	216	13	**229**	67	0	**67**	151	7	**158**	**454**
16:45 to 17:45	216	8	**224**	62	3	**65**	140	9	**149**	**438**
17:00 to 18:00	217	5	**222**	55	4	**59**	130	10	**140**	**421**
PM Totals	**431**	**20**	**451**	**129**	**6**	**135**	**306**	**20**	**326**	**912**

Job No. : AUNSW3121
Client : The Trustee for Positive Traffic Trust
Suburb : Box Hill
Location : 1. Boundary Rd / Cataract Rd

Day/Date : Wed, 30th March 2022
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

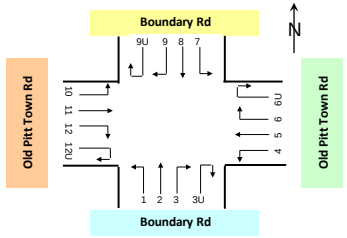
Hour Starting	Vehicle Type
AM Totals	All Vehicles

MATRIX Traffic and Transport Data



Job No.	: AUNSW3121
Client	: The Trustee for Positive Traffic Trust
Suburb	: Box Hill
Location	: 2. Boundary Rd / Old Pitt Town Rd
Day/Date	: Wed, 30th March 2022
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	**Class 1**	**Class 2**
	Lights	Heavies

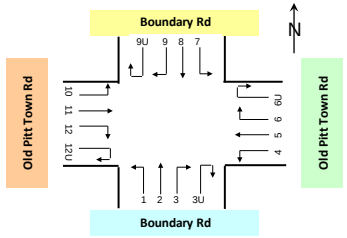


Approach	**Boundary Rd**												**Old Pitt Town Rd**											
Direction	**Direction 1 (Left Turn)**			**Direction 2 (Through)**			**Direction 3 (Right Turn)**			**Direction 3U (U Turn)**			**Direction 4 (Left Turn)**			**Direction 5 (Through)**			**Direction 6 (Right Turn)**			**Direction 6U (U Turn)**		
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
7:00 to 7:15	8	0	**8**	43	7	**50**	11	4	**15**	0	0	**0**	8	1	**9**	6	1	**7**	11	1	**12**	0	0	**0**
7:15 to 7:30	5	1	**6**	42	7	**49**	20	2	**22**	0	0	**0**	7	2	**9**	8	1	**9**	3	0	**3**	0	1	**1**
7:30 to 7:45	3	0	**3**	54	7	**61**	31	4	**35**	0	0	**0**	21	4	**25**	15	1	**16**	7	1	**8**	0	0	**0**
7:45 to 8:00	7	0	**7**	54	4	**58**	32	2	**34**	2	0	**2**	18	3	**21**	23	0	**23**	6	1	**7**	0	0	**0**
8:00 to 8:15	3	0	**3**	22	5	**27**	14	2	**16**	0	0	**0**	19	1	**20**	23	0	**23**	5	1	**6**	0	0	**0**
8:15 to 8:30	10	0	**10**	31	5	**36**	9	3	**12**	0	0	**0**	15	4	**19**	20	1	**21**	13	2	**15**	0	0	**0**
8:30 to 8:45	11	0	**11**	29	4	**33**	15	3	**18**	0	0	**0**	15	4	**19**	23	0	**23**	10	1	**11**	0	0	**0**
8:45 to 9:00	14	0	**14**	20	3	**23**	12	3	**15**	0	0	**0**	11	2	**13**	27	1	**28**	3	0	**3**	1	0	**1**
AM Totals	**61**	**1**	**62**	**295**	**42**	**337**	**144**	**23**	**167**	**2**	**0**	**2**	**114**	**21**	**135**	**145**	**5**	**150**	**58**	**7**	**65**	**1**	**1**	**2**
16:00 to 16:15	14	3	**17**	35	1	**36**	20	4	**24**	0	0	**0**	22	4	**26**	27	2	**29**	16	1	**17**	0	1	**1**
16:15 to 16:30	13	0	**13**	33	3	**36**	13	0	**13**	0	0	**0**	12	2	**14**	32	0	**32**	11	1	**12**	0	0	**0**
16:30 to 16:45	20	0	**20**	46	4	**50**	17	3	**20**	0	0	**0**	17	1	**18**	21	0	**21**	14	1	**15**	0	0	**0**
16:45 to 17:00	16	1	**17**	33	3	**36**	17	2	**19**	0	0	**0**	12	1	**13**	33	0	**33**	15	1	**16**	1	0	**1**
17:00 to 17:15	18	0	**18**	38	0	**38**	9	2	**11**	0	0	**0**	16	2	**18**	32	1	**33**	16	0	**16**	0	1	**1**
17:15 to 17:30	13	1	**14**	34	3	**37**	11	2	**13**	0	0	**0**	23	1	**24**	18	0	**18**	13	1	**14**	1	0	**1**
17:30 to 17:45	8	1	**9**	46	0	**46**	13	0	**13**	1	0	**1**	29	1	**30**	27	1	**28**	15	0	**15**	0	0	**0**
17:45 to 18:00	9	0	**9**	38	1	**39**	20	2	**22**	0	0	**0**	24	2	**26**	27	0	**27**	8	0	**8**	0	0	**0**
PM Totals	**111**	**6**	**117**	**303**	**15**	**318**	**120**	**15**	**135**	**1**	**0**	**1**	**155**	**14**	**169**	**217**	**4**	**221**	**108**	**5**	**113**	**2**	**2**	**4**

Approach	Boundary Rd												Old Pitt Town Rd											
Direction	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
7:00 to 7:15	11	1	**12**	49	1	**50**	0	0	**0**	0	0	**0**	1	0	**1**	28	0	**28**	10	1	**11**	0	0	**0**
7:15 to 7:30	20	0	**20**	32	6	**38**	1	0	**1**	0	0	**0**	5	1	**6**	32	1	**33**	17	0	**17**	0	0	**0**
7:30 to 7:45	16	2	**18**	41	6	**47**	6	0	**6**	0	0	**0**	11	0	**11**	52	1	**53**	24	2	**26**	0	0	**0**
7:45 to 8:00	17	1	**18**	60	6	**66**	12	0	**12**	0	0	**0**	11	0	**11**	28	0	**28**	24	1	**25**	0	0	**0**
8:00 to 8:15	11	2	**13**	69	6	**75**	13	0	**13**	0	0	**0**	4	0	**4**	17	2	**19**	19	0	**19**	0	0	**0**
8:15 to 8:30	16	1	**17**	47	8	**55**	7	0	**7**	0	0	**0**	2	0	**2**	22	1	**23**	16	0	**16**	0	0	**0**
8:30 to 8:45	16	1	**17**	33	5	**38**	4	0	**4**	0	0	**0**	0	0	**0**	32	2	**34**	15	0	**15**	0	0	**0**
8:45 to 9:00	10	0	**10**	25	8	**33**	4	1	**5**	0	0	**0**	2	0	**2**	39	0	**39**	16	0	**16**	0	0	**0**
AM Totals	**117**	**8**	**125**	**356**	**46**	**402**	**47**	**1**	**48**	**0**	**0**	**0**	**36**	**1**	**37**	**250**	**7**	**257**	**141**	**4**	**145**	**0**	**0**	**0**
16:00 to 16:15	16	1	**17**	44	5	**49**	1	0	**1**	0	0	**0**	3	0	**3**	25	1	**26**	9	0	**9**	0	0	**0**
16:15 to 16:30	14	0	**14**	41	2	**43**	1	0	**1**	0	0	**0**	3	0	**3**	26	0	**26**	8	0	**8**	0	0	**0**
16:30 to 16:45	8	0	**8**	43	2	**45**	5	0	**5**	0	0	**0**	2	0	**2**	13	0	**13**	8	1	**9**	0	0	**0**
16:45 to 17:00	10	0	**10**	31	2	**33**	1	0	**1**	0	0	**0**	1	0	**1**	17	0	**17**	8	1	**9**	0	0	**0**
17:00 to 17:15	12	0	**12**	22	1	**23**	3	0	**3**	1	0	**1**	3	0	**3**	17	0	**17**	6	1	**7**	0	0	**0**
17:15 to 17:30	13	1	**14**	28	1	**29**	5	0	**5**	0	0	**0**	3	0	**3**	25	1	**26**	11	0	**11**	0	0	**0**
17:30 to 17:45	10	1	**11**	34	4	**38**	3	0	**3**	0	0	**0**	2	0	**2**	18	0	**18**	7	0	**7**	0	0	**0**
17:45 to 18:00	11	2	**13**	22	0	**22**	0	0	**0**	0	0	**0**	0	0	**0**	8	0	**8**	11	0	**11**	0	0	**0**
PM Totals	**94**	**5**	**99**	**265**	**17**	**282**	**19**	**0**	**19**	**1**	**0**	**1**	**17**	**0**	**17**	**149**	**2**	**151**	**68**	**3**	**71**	**0**	**0**	**0**

Job No. : AUNSW3121
Client : The Trustee for Positive Traffic Trust
Suburb : Box Hill
Location : 2. Boundary Rd / Old Pitt Town Rd

Day/Date : Wed, 30th March 2022
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



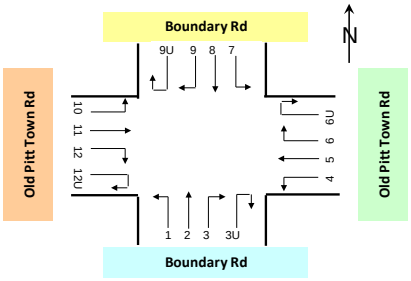
MATRIX Traffic and Transport Data

Approach	Boundary Rd												Old Pitt Town Rd											
Direction	Direction 1 (Left Turn)			Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)			Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
7:00 to 8:00	23	1	**24**	193	25	**218**	94	12	**106**	2	0	**2**	54	10	**64**	52	3	**55**	27	3	**30**	0	1	**1**
7:15 to 8:15	18	1	**19**	172	23	**195**	97	10	**107**	2	0	**2**	65	10	**75**	69	2	**71**	21	3	**24**	0	1	**1**
7:30 to 8:30	23	0	**23**	161	21	**182**	86	11	**97**	2	0	**2**	73	12	**85**	81	2	**83**	31	5	**36**	0	0	**0**
7:45 to 8:45	31	0	**31**	136	18	**154**	70	10	**80**	2	0	**2**	67	12	**79**	89	1	**90**	34	5	**39**	0	0	**0**
8:00 to 9:00	38	0	**38**	102	17	**119**	50	11	**61**	0	0	**0**	60	11	**71**	93	2	**95**	31	4	**35**	1	0	**1**
AM Totals	**61**	**1**	**62**	**295**	**42**	**337**	**144**	**23**	**167**	**2**	**0**	**2**	**114**	**21**	**135**	**145**	**5**	**150**	**58**	**7**	**65**	**1**	**1**	**2**
16:00 to 17:00	63	4	**67**	147	11	**158**	67	9	**76**	0	0	**0**	63	8	**71**	113	2	**115**	56	4	**60**	1	1	**2**
16:15 to 17:15	67	1	**68**	150	10	**160**	56	7	**63**	0	0	**0**	57	6	**63**	118	1	**119**	56	3	**59**	1	1	**2**
16:30 to 17:30	67	2	**69**	151	10	**161**	54	9	**63**	0	0	**0**	68	5	**73**	104	1	**105**	58	3	**61**	2	1	**3**
16:45 to 17:45	55	3	**58**	151	6	**157**	50	6	**56**	1	0	**1**	80	5	**85**	110	2	**112**	59	2	**61**	2	1	**3**
17:00 to 18:00	48	2	**50**	156	4	**160**	53	6	**59**	1	0	**1**	92	6	**98**	104	2	**106**	52	1	**53**	1	1	**2**
PM Totals	**111**	**6**	**117**	**303**	**15**	**318**	**120**	**15**	**135**	**1**	**0**	**1**	**155**	**14**	**169**	**217**	**4**	**221**	**108**	**5**	**113**	**2**	**2**	**4**

Approach	Boundary Rd												Old Pitt Town Rd											
Direction	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
7:00 to 8:00	64	4	**68**	182	19	**201**	19	0	**19**	0	0	**0**	28	1	**29**	140	2	**142**	75	4	**79**	0	0	**0**
7:15 to 8:15	64	5	**69**	202	24	**226**	32	0	**32**	0	0	**0**	31	1	**32**	129	4	**133**	84	3	**87**	0	0	**0**
7:30 to 8:30	60	6	**66**	217	26	**243**	38	0	**38**	0	0	**0**	28	0	**28**	119	4	**123**	83	3	**86**	0	0	**0**
7:45 to 8:45	60	5	**65**	209	25	**234**	36	0	**36**	0	0	**0**	17	0	**17**	99	5	**104**	74	1	**75**	0	0	**0**
8:00 to 9:00	53	4	**57**	174	27	**201**	28	1	**29**	0	0	**0**	8	0	**8**	110	5	**115**	66	0	**66**	0	0	**0**
AM Totals	**117**	**8**	**125**	**356**	**46**	**402**	**47**	**1**	**48**	**0**	**0**	**0**	**36**	**1**	**37**	**250**	**7**	**257**	**141**	**4**	**145**	**0**	**0**	**0**
16:00 to 17:00	48	1	**49**	159	11	**170**	8	0	**8**	0	0	**0**	9	0	**9**	81	1	**82**	33	2	**35**	0	0	**0**
16:15 to 17:15	44	0	**44**	137	7	**144**	10	0	**10**	1	0	**1**	9	0	**9**	73	0	**73**	30	3	**33**	0	0	**0**
16:30 to 17:30	43	1	**44**	124	6	**130**	14	0	**14**	1	0	**1**	9	0	**9**	72	1	**73**	33	3	**36**	0	0	**0**
16:45 to 17:45	45	2	**47**	115	8	**123**	12	0	**12**	1	0	**1**	9	0	**9**	77	1	**78**	32	2	**34**	0	0	**0**
17:00 to 18:00	46	4	**50**	106	6	**112**	11	0	**11**	1	0	**1**	8	0	**8**	68	1	**69**	35	1	**36**	0	0	**0**
PM Totals	**94**	**5**	**99**	**265**	**17**	**282**	**19**	**0**	**19**	**1**	**0**	**1**	**17**	**0**	**17**	**149**	**2**	**151**	**68**	**3**	**71**	**0**	**0**	**0**

Job No. : AUNSW3121
Client : The Trustee for Positive Traffic Trust
Suburb : Box Hill
Location : 2. Boundary Rd / Old Pitt Town Rd

Day/Date : Wed, 30th March 2022
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



MATRIX Traffic and Transport Data

	Approach	Boundary Rd			Old Pitt Town Rd			Boundary Rd			Old Pitt Town Rd			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	7:30 to 8:30	272	32	**304**	185	19	**204**	315	32	**347**	230	7	**237**	**1,092**
PM	16:00 to 17:00	277	24	**301**	233	15	**248**	215	12	**227**	123	3	**126**	**902**

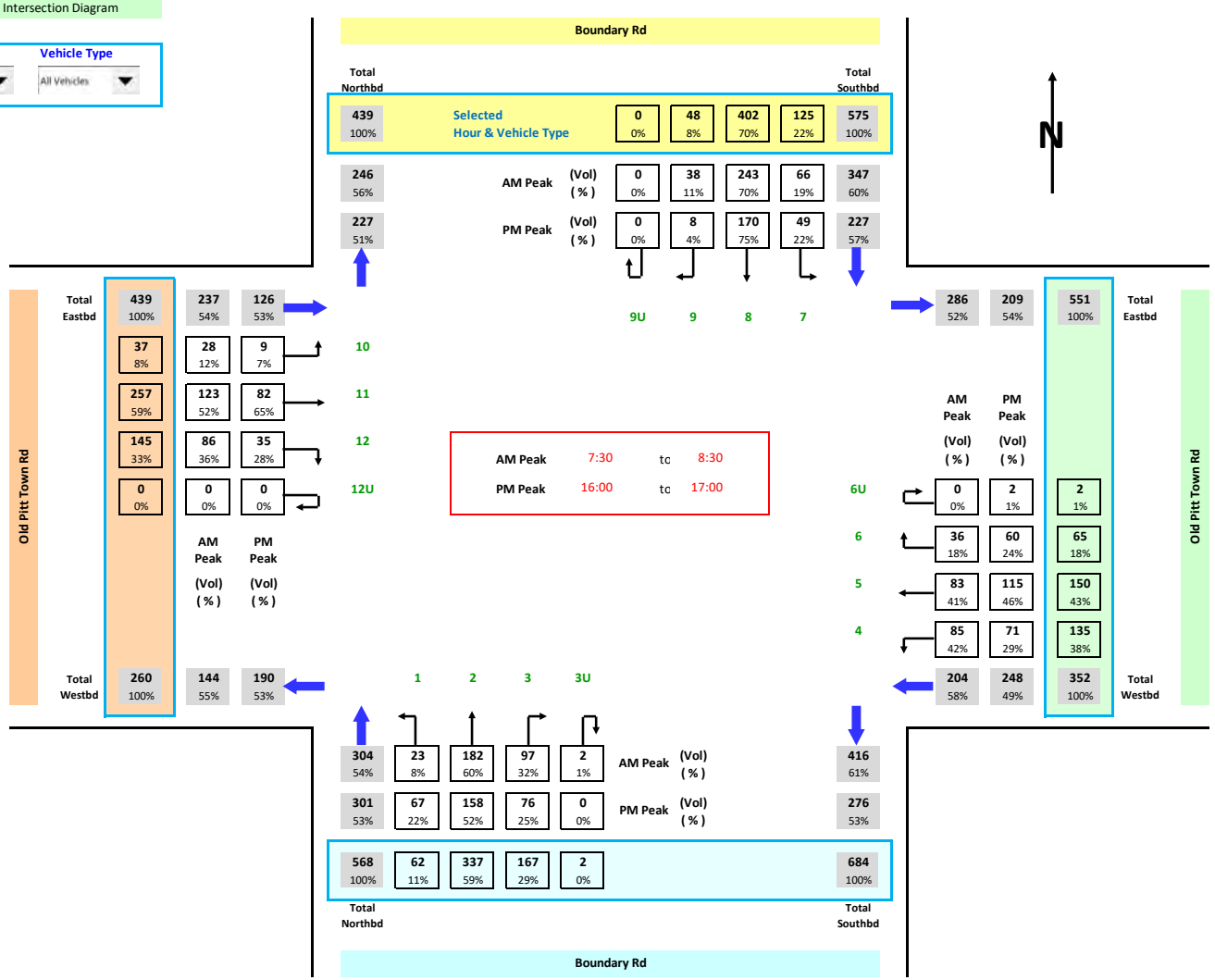
Approach	Boundary Rd			Old Pitt Town Rd			Boundary Rd			Old Pitt Town Rd			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
7:00 to 8:00	312	38	**350**	133	17	**150**	265	23	**288**	243	7	**250**	**1,038**
7:15 to 8:15	289	34	**323**	155	16	**171**	298	29	**327**	244	8	**252**	**1,073**
7:30 to 8:30	272	32	**304**	185	19	**204**	315	32	**347**	230	7	**237**	**1,092**
7:45 to 8:45	239	28	**267**	190	18	**208**	305	30	**335**	190	6	**196**	**1,006**
8:00 to 9:00	190	28	**218**	185	17	**202**	255	32	**287**	184	5	**189**	**896**
AM Totals	**502**	**66**	**568**	**318**	**34**	**352**	**520**	**55**	**575**	**427**	**12**	**439**	**1,934**
16:00 to 17:00	277	24	**301**	233	15	**248**	215	12	**227**	123	3	**126**	**902**
16:15 to 17:15	273	18	**291**	232	11	**243**	192	7	**199**	112	3	**115**	**848**
16:30 to 17:30	272	21	**293**	232	10	**242**	182	7	**189**	114	4	**118**	**842**
16:45 to 17:45	257	15	**272**	251	10	**261**	173	10	**183**	118	3	**121**	**837**
17:00 to 18:00	258	12	**270**	249	10	**259**	164	10	**174**	111	2	**113**	**816**
PM Totals	**535**	**36**	**571**	**482**	**25**	**507**	**379**	**22**	**401**	**234**	**5**	**239**	**1,718**

Job No. : AUNSW3121
Client : The Trustee for Positive Traffic Trust
Suburb : Box Hill
Location : 2. Boundary Rd / Old Pitt Town Rd

Day/Date : Wed, 30th March 2022
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

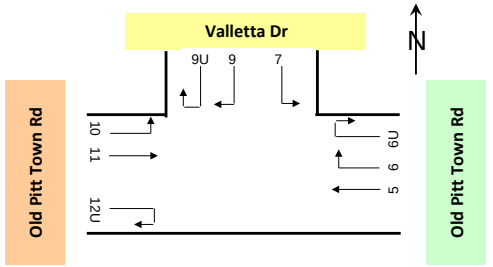
MATRIX Traffic and Transport Data

Hour Starting AM Totals | **Vehicle Type** All Vehicles



Job No.	: AUNSW3121
Client	: The Trustee for Positive Traffic Trust
Suburb	: Box Hill
Location	: 3. Old Pitt Town Rd / Valletta Dr
Day/Date	: Wed, 30th March 2022
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2
Classifications	Lights	Heavies



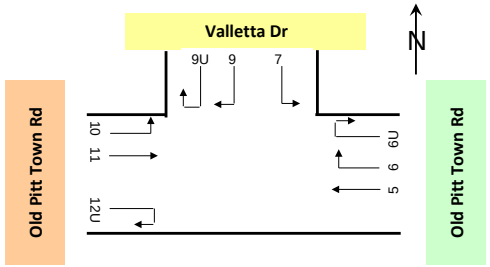
MATRIX Traffic and Transport Data

Approach		Old Pitt Town Rd								
Direction		Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
7:00	to 7:15	21	2	**23**	31	1	**32**	0	0	**0**
7:15	to 7:30	18	2	**20**	63	0	**63**	0	0	**0**
7:30	to 7:45	34	4	**38**	98	2	**100**	0	0	**0**
7:45	to 8:00	31	3	**34**	92	1	**93**	0	0	**0**
8:00	to 8:15	31	1	**32**	38	1	**39**	0	0	**0**
8:15	to 8:30	36	5	**41**	20	2	**22**	0	0	**0**
8:30	to 8:45	37	2	**39**	19	1	**20**	1	0	**1**
8:45	to 9:00	30	1	**31**	16	0	**16**	0	0	**0**
AM Totals		**238**	**20**	**258**	**377**	**8**	**385**	**1**	**0**	**1**
16:00	to 16:15	56	6	**62**	33	1	**34**	0	0	**0**
16:15	to 16:30	46	1	**47**	20	0	**20**	0	0	**0**
16:30	to 16:45	47	2	**49**	32	0	**32**	0	0	**0**
16:45	to 17:00	58	1	**59**	35	1	**36**	0	0	**0**
17:00	to 17:15	62	2	**64**	36	0	**36**	0	0	**0**
17:15	to 17:30	48	0	**48**	32	1	**33**	0	0	**0**
17:30	to 17:45	68	1	**69**	32	0	**32**	0	0	**0**
17:45	to 18:00	57	1	**58**	29	0	**29**	0	0	**0**
PM Totals		**442**	**14**	**456**	**249**	**3**	**252**	**0**	**0**	**0**

Approach	Valletta Dr										Old Pitt Town Rd								
Direction	Direction 7 (Left Turn)				Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)				Direction 12U (U Turn)	
Time Period	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total
7:00 to 7:15	28	0	**28**		4	1	**5**	0	0	**0**	1	0	**1**	47	3	**50**		0	0	**0**
7:15 to 7:30	41	2	**43**		2	2	**4**	0	0	**0**	7	5	**12**	70	1	**71**		0	0	**0**
7:30 to 7:45	90	3	**93**		9	2	**11**	0	0	**0**	22	1	**23**	66	2	**68**		0	0	**0**
7:45 to 8:00	111	4	**115**		11	1	**12**	0	0	**0**	23	2	**25**	60	5	**65**		0	0	**0**
8:00 to 8:15	110	1	**111**		19	1	**20**	0	0	**0**	7	1	**8**	37	4	**41**		0	0	**0**
8:15 to 8:30	48	1	**49**		11	2	**13**	0	0	**0**	2	4	**6**	44	1	**45**		0	0	**0**
8:30 to 8:45	27	0	**27**		11	3	**14**	0	0	**0**	7	1	**8**	56	5	**61**		0	0	**0**
8:45 to 9:00	24	2	**26**		16	2	**18**	0	0	**0**	8	1	**9**	60	3	**63**		0	0	**0**
AM Totals	**479**	**13**	**492**		**83**	**14**	**97**	**0**	**0**	**0**	**77**	**15**	**92**	**440**	**24**	**464**		**0**	**0**	**0**
16:00 to 16:15	50	3	**53**		7	2	**9**	0	0	**0**	10	2	**12**	48	5	**53**		0	0	**0**
16:15 to 16:30	31	1	**32**		4	2	**6**	0	0	**0**	2	0	**2**	44	0	**44**		0	0	**0**
16:30 to 16:45	21	0	**21**		4	0	**4**	0	0	**0**	6	2	**8**	34	0	**34**		0	0	**0**
16:45 to 17:00	27	1	**28**		4	1	**5**	0	0	**0**	6	1	**7**	36	0	**36**		0	0	**0**
17:00 to 17:15	32	1	**33**		4	2	**6**	0	0	**0**	6	1	**7**	33	2	**35**		0	0	**0**
17:15 to 17:30	25	0	**25**		4	1	**5**	0	0	**0**	6	1	**7**	42	3	**45**		0	0	**0**
17:30 to 17:45	36	1	**37**		6	1	**7**	0	0	**0**	6	2	**8**	37	1	**38**		0	0	**0**
17:45 to 18:00	16	0	**16**		2	1	**3**	0	0	**0**	6	3	**9**	35	0	**35**		0	0	**0**
PM Totals	**238**	**7**	**245**		**35**	**10**	**45**	**0**	**0**	**0**	**48**	**12**	**60**	**309**	**11**	**320**		**0**	**0**	**0**

Job No. : AUNSW3121
Client : The Trustee for Positive Traffic Trust
Suburb : Box Hill
Location : 3. Old Pitt Town Rd / Valletta Dr

Day/Date : Wed, 30th March 2022
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



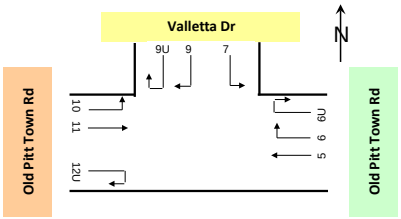
MATRIX Traffic and Transport Data

Approach		Old Pitt Town Rd								
Direction		Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
7:00 to 8:00		104	11	**115**	284	4	**288**	0	0	**0**
7:15 to 8:15		114	10	**124**	291	4	**295**	0	0	**0**
7:30 to 8:30		132	13	**145**	248	6	**254**	0	0	**0**
7:45 to 8:45		135	11	**146**	169	5	**174**	1	0	**1**
8:00 to 9:00		134	9	**143**	93	4	**97**	1	0	**1**
AM Totals		**238**	**20**	**258**	**377**	**8**	**385**	**1**	**0**	**1**
16:00 to 17:00		207	10	**217**	120	2	**122**	0	0	**0**
16:15 to 17:15		213	6	**219**	123	1	**124**	0	0	**0**
16:30 to 17:30		215	5	**220**	135	2	**137**	0	0	**0**
16:45 to 17:45		236	4	**240**	135	2	**137**	0	0	**0**
17:00 to 18:00		235	4	**239**	129	1	**130**	0	0	**0**
PM Totals		**442**	**14**	**456**	**249**	**3**	**252**	**0**	**0**	**0**

Approach	Valletta Dr									Old Pitt Town Rd								
Direction	Direction 7 (Left Turn)				Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)				Direction 12U (U Turn)	
Time Period	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total
7:00 to 8:00	270	9	**279**		26	6	**32**	0	0	**0**	53	8	**61**	243	11	**254**		0	0	**0**
7:15 to 8:15	352	10	**362**		41	6	**47**	0	0	**0**	59	9	**68**	233	12	**245**		0	0	**0**
7:30 to 8:30	359	9	**368**		50	6	**56**	0	0	**0**	54	8	**62**	207	12	**219**		0	0	**0**
7:45 to 8:45	296	6	**302**		52	7	**59**	0	0	**0**	39	8	**47**	197	15	**212**		0	0	**0**
8:00 to 9:00	209	4	**213**		57	8	**65**	0	0	**0**	24	7	**31**	197	13	**210**		0	0	**0**
AM Totals	**479**	**13**	**492**		**83**	**14**	**97**	**0**	**0**	**0**	**77**	**15**	**92**	**440**	**24**	**464**		**0**	**0**	**0**
16:00 to 17:00	129	5	**134**		19	5	**24**	0	0	**0**	24	5	**29**	162	5	**167**		0	0	**0**
16:15 to 17:15	111	3	**114**		16	5	**21**	0	0	**0**	20	4	**24**	147	2	**149**		0	0	**0**
16:30 to 17:30	105	2	**107**		16	4	**20**	0	0	**0**	24	5	**29**	145	5	**150**		0	0	**0**
16:45 to 17:45	120	3	**123**		18	5	**23**	0	0	**0**	24	5	**29**	148	6	**154**		0	0	**0**
17:00 to 18:00	109	2	**111**		16	5	**21**	0	0	**0**	24	7	**31**	147	6	**153**		0	0	**0**
PM Totals	**238**	**7**	**245**		**35**	**10**	**45**	**0**	**0**	**0**	**48**	**12**	**60**	**309**	**11**	**320**		**0**	**0**	**0**

Job No. : AUNSW3121
Client : The Trustee for Positive Traffic Trust
Suburb : Box Hill
Location : 3. Old Pitt Town Rd / Valletta Dr

Day/Date : Wed, 30th March 2022
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



MATRIX Traffic and Transport Data

	Approach		Old Pitt Town Rd			Valletta Dr			Old Pitt Town Rd			Grand Total
	Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	7:15	to 8:15	405	14	**419**	393	16	**409**	292	21	**313**	**1,141**
PM	16:45	to 17:45	371	6	**377**	138	8	**146**	172	11	**183**	**706**

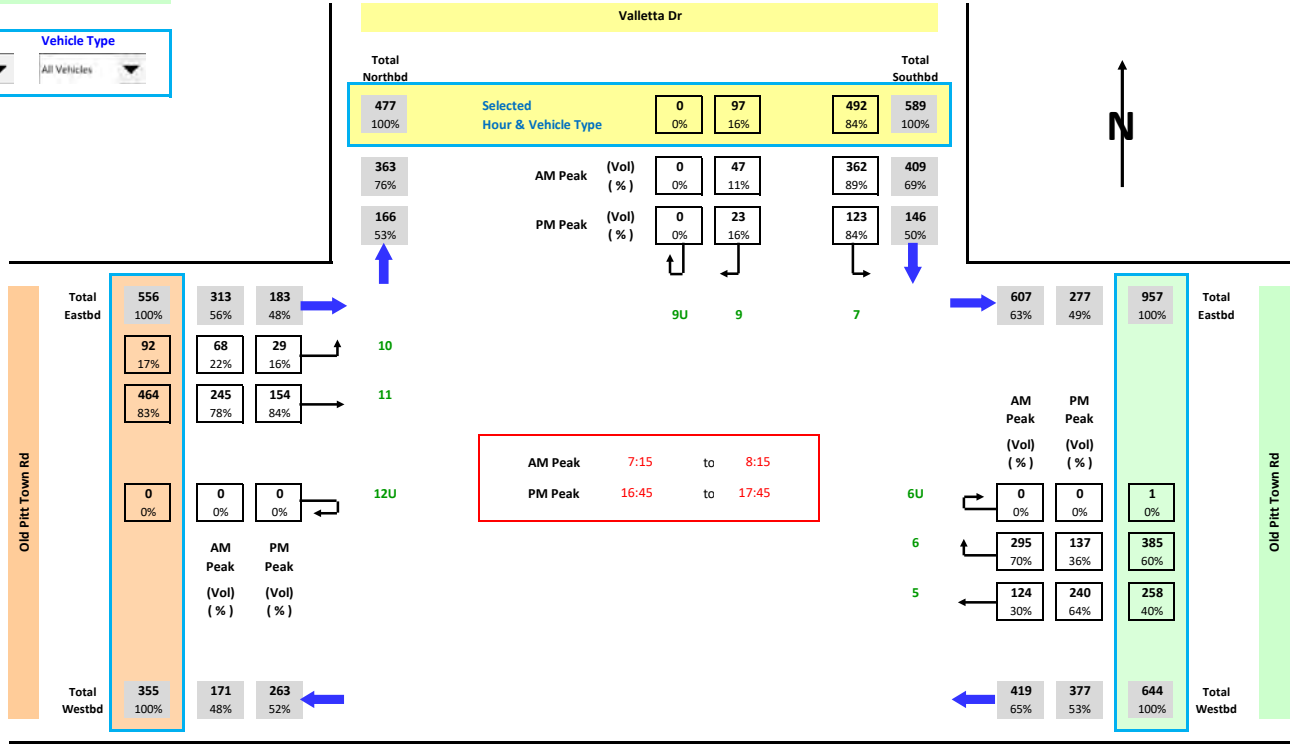
Approach		Old Pitt Town Rd			Valletta Dr			Old Pitt Town Rd			Grand Total
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
7:00	to 8:00	388	15	**403**	296	15	**311**	296	19	**315**	**1,029**
7:15	to 8:15	405	14	**419**	393	16	**409**	292	21	**313**	**1,141**
7:30	to 8:30	380	19	**399**	409	15	**424**	261	20	**281**	**1,104**
7:45	to 8:45	305	16	**321**	348	13	**361**	236	23	**259**	**941**
8:00	to 9:00	228	13	**241**	266	12	**278**	221	20	**241**	**760**
AM Totals		**616**	**28**	**644**	**562**	**27**	**589**	**517**	**39**	**556**	**1,789**
16:00	to 17:00	327	12	**339**	148	10	**158**	186	10	**196**	**693**
16:15	to 17:15	336	7	**343**	127	8	**135**	167	6	**173**	**651**
16:30	to 17:30	350	7	**357**	121	6	**127**	169	10	**179**	**663**
16:45	to 17:45	371	6	**377**	138	8	**146**	172	11	**183**	**706**
17:00	to 18:00	364	5	**369**	125	7	**132**	171	13	**184**	**685**
PM Totals		**691**	**17**	**708**	**273**	**17**	**290**	**357**	**23**	**380**	**1,378**

Job No. : AUNSW3121
Client : The Trustee for Positive Traffic Trust
Suburb : Box Hill
Location : 3. Old Pitt Town Rd / Valletta Dr

Day/Date : Wed, 30th March 2022
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

Hour Starting AM Totals
Vehicle Type All Vehicles



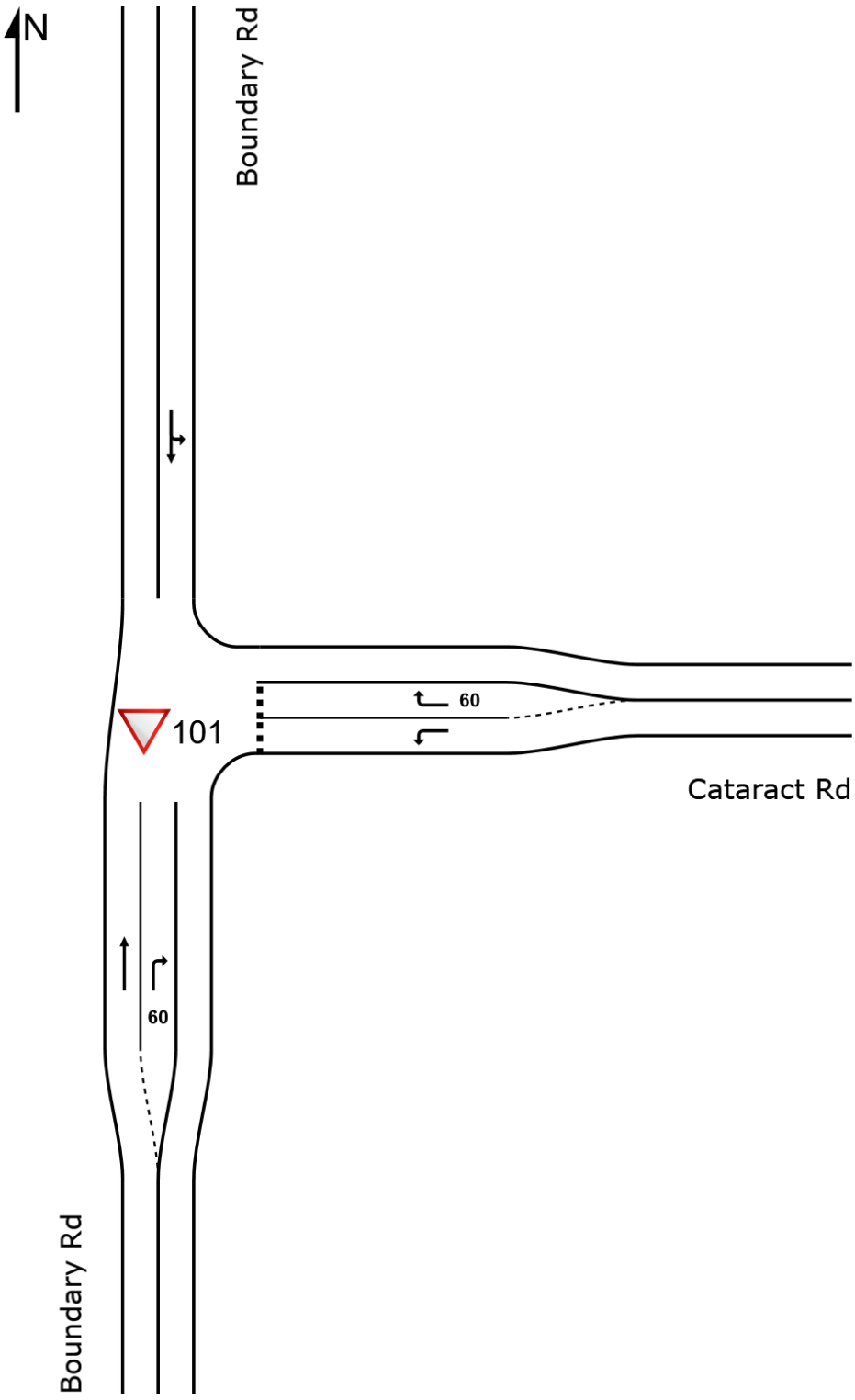
10. Appendix B – SIDRA Outputs

SITE LAYOUT

Site: 101 [Boundary_Red Gables_AM_2036 +Dev (Site Folder: General)]

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

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



INTERSECTION SUMMARY

Site: 1 [Boundary_Cataract Stage 1_AM Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	62.5	62.5 km/h
Travel Distance (Total)	veh-km/h	617.0	740.4 pers-km/h
Travel Time (Total)	veh-h/h	9.9	11.8 pers-h/h
Desired Speed	km/h	70.4	
Speed Efficiency		0.89	
Travel Time Index		8.74	
Congestion Coefficient		1.13	
Demand Flows (Total)	veh/h	609	731 pers/h
Arrival Flows (Total)	veh/h	609	
Percent Heavy Vehicles (Demand)	%	1.4	
Percent Heavy Vehicles (Arrivals)	%	1.4	
Degree of Saturation		0.149	
Practical Spare Capacity	%	438.7	
Effective Intersection Capacity	veh/h	4104	
Control Delay (Total)	veh-h/h	0.71	0.86 pers-h/h
Control Delay (Average)	sec	4.2	4.2 sec
Control Delay (Worst Lane by MC)	sec	6.4	
Control Delay (Worst Movement by MC)	sec	7.6	7.6 sec
Geometric Delay (Average)	sec	3.8	
Stop-Line Delay (Average)	sec	0.4	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	0.6	
95% Back of Queue - Dist (Worst Lane)	m	4.4	
Ave. Que Storage Ratio (Worst Lane)		0.00	
Effective Stops (Total)	veh/h	245	295 pers/h
Effective Stop Rate		0.40	0.40
Proportion Queued		0.18	0.18
Performance Index		12.1	12.1
Cost (Total)	$/h	401.72	401.72 $/h
Fuel Consumption (Total)	L/h	52.9	
Carbon Dioxide (Total)	kg/h	124.7	
Hydrocarbons (Total)	kg/h	0.013	
Carbon Monoxide (Total)	kg/h	0.23	
NOx (Total)	kg/h	0.115	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 17.1% 24.0% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**

Demand Flows (Total)	veh/y	292,547	351,057	pers/y
Delay (Total)	veh-h/y	343	411	pers-h/y
Effective Stops (Total)	veh/y	117,834	141,401	pers/y
Travel Distance (Total)	veh-km/y	296,144	355,373	pers-km/y
Travel Time (Total)	veh-h/y	4,740	5,688	pers-h/y
Cost (Total)	$/y	192,825	192,825	$/y
Fuel Consumption (Total)	L/y	25,379		
Carbon Dioxide (Total)	kg/y	59,872		
Hydrocarbons (Total)	kg/y	6		
Carbon Monoxide (Total)	kg/y	109		
NOx (Total)	kg/y	55		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 1 [Boundary_Cataract Stage 1_AM Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Cataract Rd															
1	L2	All MCs	173	1.2	173	1.2	0.149	6.3	LOS A	0.6	4.4	0.30	0.57	0.30	52.2
		LV	171		171		0.149	6.3	LOS A	0.6	4.4	NA	NA	NA	52.2
		HV	2		2		0.149	7.2	LOS A	0.6	4.4	NA	NA	NA	51.5
2	T1	All MCs	56	3.8	56	3.8	0.149	4.5	LOS A	0.6	4.4	0.30	0.57	0.30	52.5
		LV	54		54		0.149	4.5	LOS A	0.6	4.4	NA	NA	NA	52.5
		HV	2		2		0.149	4.9	LOS A	0.6	4.4	NA	NA	NA	52.2
Approach			228	1.8	228	1.8	0.149	5.8	LOS A	0.6	4.4	0.30	0.57	0.30	52.3
East: Boundary Rd															
4	L2	All MCs	64	1.6	64	1.6	0.137	7.5	LOS A	0.0	0.0	0.00	0.16	0.00	78.2
		LV	63		63		0.137	7.5	LOS A	0.0	0.0	NA	NA	NA	78.2
		HV	1		1		0.137	7.5	LOS A	0.0	0.0	NA	NA	NA	78.2
5	T1	All MCs	199	0.5	199	0.5	0.137	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	87.4
		LV	198		198		0.137	0.0	LOS A	0.0	0.0	NA	NA	NA	87.4
		HV	1		1		0.137	0.0	LOS A	0.0	0.0	NA	NA	NA	87.4
Approach			263	0.8	263	0.8	0.137	1.9	NA	0.0	0.0	0.00	0.16	0.00	84.9
West: Boundary Rd															
12	R2	All MCs	118	1.8	118	1.8	0.085	6.4	LOS A	0.4	2.7	0.37	0.60	0.37	51.6
		LV	116		116		0.085	6.4	LOS A	0.4	2.7	NA	NA	NA	51.6
		HV	2		2		0.085	7.6	LOS A	0.4	2.7	NA	NA	NA	50.7
Approach			118	1.8	118	1.8	0.085	6.4	NA	0.4	2.7	0.37	0.60	0.37	51.6
All Vehicles			609	1.4	609	1.4	0.149	4.2	NA	0.6	4.4	0.18	0.40	0.18	62.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 2 [Boundary_Cataract Stage 2_AM Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	92.6	92.6 km/h
Travel Distance (Total)	veh-km/h	174.0	208.7 pers-km/h
Travel Time (Total)	veh-h/h	1.9	2.3 pers-h/h
Desired Speed	km/h	95.2	
Speed Efficiency		0.97	
Travel Time Index		9.70	
Congestion Coefficient		1.03	
Demand Flows (Total)	veh/h	199	239 pers/h
Arrival Flows (Total)	veh/h	199	
Percent Heavy Vehicles (Demand)	%	1.6	
Percent Heavy Vehicles (Arrivals)	%	1.6	
Degree of Saturation		0.075	
Practical Spare Capacity	%	1212.7	
Effective Intersection Capacity	veh/h	2665	
Control Delay (Total)	veh-h/h	0.01	0.01 pers-h/h
Control Delay (Average)	sec	0.2	0.2 sec
Control Delay (Worst Lane by MC)	sec	0.6	
Control Delay (Worst Movement by MC)	sec	1.1	1.1 sec
Geometric Delay (Average)	sec	0.0	
Stop-Line Delay (Average)	sec	0.2	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	0.1	
95% Back of Queue - Dist (Worst Lane)	m	0.8	
Ave. Que Storage Ratio (Worst Lane)		0.04	
Effective Stops (Total)	veh/h	5	6 pers/h
Effective Stop Rate		0.03	0.03
Proportion Queued		0.06	0.06
Performance Index		2.9	2.9
Cost (Total)	$/h	87.04	87.04 $/h
Fuel Consumption (Total)	L/h	15.5	
Carbon Dioxide (Total)	kg/h	36.6	
Hydrocarbons (Total)	kg/h	0.005	
Carbon Monoxide (Total)	kg/h	0.12	
NOx (Total)	kg/h	0.034	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 30.3% 0.0% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**

Demand Flows (Total)	veh/y	95,495	114,594	pers/y
Delay (Total)	veh-h/y	5	6	pers-h/y
Effective Stops (Total)	veh/y	2,556	3,067	pers/y
Travel Distance (Total)	veh-km/y	83,497	100,196	pers-km/y
Travel Time (Total)	veh-h/y	902	1,082	pers-h/y
Cost (Total)	$/y	41,778	41,778	$/y
Fuel Consumption (Total)	L/y	7,444		
Carbon Dioxide (Total)	kg/y	17,577		
Hydrocarbons (Total)	kg/y	3		
Carbon Monoxide (Total)	kg/y	59		
NOx (Total)	kg/y	16		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 2 [Boundary_Cataract Stage 2_AM Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Median Storage Area															
3	R2	All MCs	55	1.9	55	1.9	0.043	0.6	LOS A	0.1	0.8	0.20	0.10	0.20	51.1
		LV	54		54		0.043	0.6	LOS A	0.1	0.8	NA	NA	NA	51.1
		HV	1		1		0.043	1.1	LOS A	0.1	0.8	NA	NA	NA	50.4
Approach			55	1.9	55	1.9	0.043	0.6	LOS A	0.1	0.8	0.20	0.10	0.20	51.1
West: Boundary Rd															
11	T1	All MCs	144	1.5	144	1.5	0.075	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
		LV	142		142		0.075	0.0	LOS A	0.0	0.0	NA	NA	NA	110.0
		HV	2		2		0.075	0.0	LOS A	0.0	0.0	NA	NA	NA	110.0
Approach			144	1.5	144	1.5	0.075	0.0	NA	0.0	0.0	0.00	0.00	0.00	110.0
All Vehicles			199	1.6	199	1.6	0.075	0.2	NA	0.1	0.8	0.06	0.03	0.06	92.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 1 [Boundary_Cataract Stage 1_AM 2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	71.8	71.8 km/h
Travel Distance (Total)	veh-km/h	1013.0	1215.6 pers-km/h
Travel Time (Total)	veh-h/h	14.1	16.9 pers-h/h
Desired Speed	km/h	79.8	
Speed Efficiency		0.90	
Travel Time Index		8.88	
Congestion Coefficient		1.11	
Demand Flows (Total)	veh/h	1001	1201 pers/h
Arrival Flows (Total)	veh/h	1001	
Percent Heavy Vehicles (Demand)	%	1.6	
Percent Heavy Vehicles (Arrivals)	%	1.6	
Degree of Saturation		0.374	
Practical Spare Capacity	%	114.0	
Effective Intersection Capacity	veh/h	2677	
Control Delay (Total)	veh-h/h	1.07	1.28 pers-h/h
Control Delay (Average)	sec	3.8	3.8 sec
Control Delay (Worst Lane by MC)	sec	8.6	
Control Delay (Worst Movement by MC)	sec	14.0	14.0 sec
Geometric Delay (Average)	sec	2.5	
Stop-Line Delay (Average)	sec	1.4	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	2.0	
95% Back of Queue - Dist (Worst Lane)	m	14.0	
Ave. Que Storage Ratio (Worst Lane)		0.01	
Effective Stops (Total)	veh/h	363	436 pers/h
Effective Stop Rate		0.36	0.36
Proportion Queued		0.26	0.26
Performance Index		19.2	19.2
Cost (Total)	$/h	596.24	596.24 $/h
Fuel Consumption (Total)	L/h	87.0	
Carbon Dioxide (Total)	kg/h	205.4	
Hydrocarbons (Total)	kg/h	0.026	
Carbon Monoxide (Total)	kg/h	0.53	
NOx (Total)	kg/h	0.184	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 46.4% 46.7% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**

Demand Flows (Total)	veh/y	480,505	576,606	pers/y
Delay (Total)	veh-h/y	511	614	pers-h/y
Effective Stops (Total)	veh/y	174,347	209,217	pers/y
Travel Distance (Total)	veh-km/y	486,243	583,492	pers-km/y
Travel Time (Total)	veh-h/y	6,771	8,125	pers-h/y
Cost (Total)	$/y	286,194	286,194	$/y
Fuel Consumption (Total)	L/y	41,761		
Carbon Dioxide (Total)	kg/y	98,595		
Hydrocarbons (Total)	kg/y	12		
Carbon Monoxide (Total)	kg/y	256		
NOx (Total)	kg/y	88		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 1 [Boundary_Cataract Stage 1_AM 2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Cataract Rd															
1	L2	All MCs	326	1.0	326	1.0	0.374	9.0	LOS A	2.0	14.0	0.59	0.82	0.72	50.6
		LV	323		323		0.374	9.0	LOS A	2.0	14.0	NA	NA	NA	50.7
		HV	3		3		0.374	14.0	LOS A	2.0	14.0	NA	NA	NA	47.4
2	T1	All MCs	45	1.0	45	1.0	0.374	5.3	LOS A	2.0	14.0	0.59	0.82	0.72	51.0
		LV	45		45		0.374	5.3	LOS A	2.0	14.0	NA	NA	NA	51.0
		HV	0		0		0.374	6.4	LOS A	2.0	14.0	NA	NA	NA	50.3
Approach			372	1.0	372	1.0	0.374	8.6	LOS A	2.0	14.0	0.59	0.82	0.72	50.7
East: Boundary Rd															
4	L2	All MCs	9	2.0	9	2.0	0.290	8.2	LOS A	0.0	0.0	0.00	0.01	0.00	88.0
		LV	9		9		0.290	8.2	LOS A	0.0	0.0	NA	NA	NA	88.0
		HV	0		0		0.290	8.2	LOS A	0.0	0.0	NA	NA	NA	88.0
5	T1	All MCs	548	2.0	548	2.0	0.290	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	107.9
		LV	537		537		0.290	0.0	LOS A	0.0	0.0	NA	NA	NA	107.9
		HV	11		11		0.290	0.0	LOS A	0.0	0.0	NA	NA	NA	107.9
Approach			558	2.0	558	2.0	0.290	0.2	NA	0.0	0.0	0.00	0.01	0.00	107.5
West: Boundary Rd															
12	R2	All MCs	72	2.0	72	2.0	0.073	7.9	LOS A	0.3	2.1	0.54	0.72	0.54	50.8
		LV	70		70		0.073	7.8	LOS A	0.3	2.1	NA	NA	NA	50.8
		HV	1		1		0.073	11.9	LOS A	0.3	2.1	NA	NA	NA	48.1
Approach			72	2.0	72	2.0	0.073	7.9	NA	0.3	2.1	0.54	0.72	0.54	50.8
All Vehicles			1001	1.6	1001	1.6	0.374	3.8	NA	2.0	14.0	0.26	0.36	0.31	71.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 2 [Boundary_Cataract Stage 2_AM 2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles:**	**All MCs**	**Persons**	
Travel Speed (Average)	km/h	97.6	97.6	km/h
Travel Distance (Total)	veh-km/h	219.6	263.5	pers-km/h
Travel Time (Total)	veh-h/h	2.2	2.7	pers-h/h
Desired Speed	km/h	99.6		
Speed Efficiency		0.98		
Travel Time Index		9.78		
Congestion Coefficient		1.02		
Demand Flows (Total)	veh/h	240	288	pers/h
Arrival Flows (Total)	veh/h	240		
Percent Heavy Vehicles (Demand)	%	2.0		
Percent Heavy Vehicles (Arrivals)	%	2.0		
Degree of Saturation		0.101		
Practical Spare Capacity	%	874.0		
Effective Intersection Capacity	veh/h	2385		
Control Delay (Total)	veh-h/h	0.01	0.01	pers-h/h
Control Delay (Average)	sec	0.2	0.2	sec
Control Delay (Worst Lane by MC)	sec	0.9		
Control Delay (Worst Movement by MC)	sec	1.6	1.6	sec
Geometric Delay (Average)	sec	0.0		
Stop-Line Delay (Average)	sec	0.2		
Idling Time (Average)	sec	0.0		
Intersection Level of Service (LOS)		NA		
95% Back of Queue - Veh (Worst Lane)	veh	0.1		
95% Back of Queue - Dist (Worst Lane)	m	0.7		
Ave. Que Storage Ratio (Worst Lane)		0.04		
Effective Stops (Total)	veh/h	6	7	pers/h
Effective Stop Rate		0.02	0.02	
Proportion Queued		0.05	0.05	
Performance Index		3.1	3.1	
Cost (Total)	$/h	105.90	105.90	$/h
Fuel Consumption (Total)	L/h	19.4		
Carbon Dioxide (Total)	kg/h	45.9		
Hydrocarbons (Total)	kg/h	0.007		
Carbon Monoxide (Total)	kg/h	0.16		
NOx (Total)	kg/h	0.047		

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 33.1% 0.0% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**

Demand Flows (Total)	veh/y	115,200	138,240	pers/y
Delay (Total)	veh-h/y	5	7	pers-h/y
Effective Stops (Total)	veh/y	2,864	3,437	pers/y
Travel Distance (Total)	veh-km/y	105,392	126,470	pers-km/y
Travel Time (Total)	veh-h/y	1,080	1,295	pers-h/y
Cost (Total)	$/y	50,831	50,831	$/y
Fuel Consumption (Total)	L/y	9,326		
Carbon Dioxide (Total)	kg/y	22,048		
Hydrocarbons (Total)	kg/y	3		
Carbon Monoxide (Total)	kg/y	77		
NOx (Total)	kg/y	22		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 2 [Boundary_Cataract Stage 2_AM 2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Median Storage Area															
3	R2	All MCs	46	2.0	46	2.0	0.038	0.9	LOS A	0.1	0.7	0.24	0.13	0.24	50.9
		LV	45		45		0.038	0.9	LOS A	0.1	0.7	NA	NA	NA	50.9
		HV	1		1		0.038	1.6	LOS A	0.1	0.7	NA	NA	NA	50.0
Approach			46	2.0	46	2.0	0.038	0.9	LOS A	0.1	0.7	0.24	0.13	0.24	50.9
West: Boundary Rd															
11	T1	All MCs	194	2.0	194	2.0	0.101	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
		LV	190		190		0.101	0.0	LOS A	0.0	0.0	NA	NA	NA	110.0
		HV	4		4		0.101	0.0	LOS A	0.0	0.0	NA	NA	NA	110.0
Approach			194	2.0	194	2.0	0.101	0.0	NA	0.0	0.0	0.00	0.00	0.00	110.0
All Vehicles			240	2.0	240	2.0	0.101	0.2	NA	0.1	0.7	0.05	0.02	0.05	97.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 1 [Boundary_Cataract Stage 1_AM 2036 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	68.4	68.4 km/h
Travel Distance (Total)	veh-km/h	1257.3	1508.7 pers-km/h
Travel Time (Total)	veh-h/h	18.4	22.0 pers-h/h
Desired Speed	km/h	78.3	
Speed Efficiency		0.87	
Travel Time Index		8.60	
Congestion Coefficient		1.14	
Demand Flows (Total)	veh/h	1242	1491 pers/h
Arrival Flows (Total)	veh/h	1242	
Percent Heavy Vehicles (Demand)	%	1.6	
Percent Heavy Vehicles (Arrivals)	%	1.6	
Degree of Saturation		0.596	
Practical Spare Capacity	%	34.1	
Effective Intersection Capacity	veh/h	2082	
Control Delay (Total)	veh-h/h	1.84	2.21 pers-h/h
Control Delay (Average)	sec	5.3	5.3 sec
Control Delay (Worst Lane by MC)	sec	11.4	
Control Delay (Worst Movement by MC)	sec	19.7	19.7 sec
Geometric Delay (Average)	sec	2.7	
Stop-Line Delay (Average)	sec	2.7	
Idling Time (Average)	sec	0.1	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	4.3	
95% Back of Queue - Dist (Worst Lane)	m	30.4	
Ave. Que Storage Ratio (Worst Lane)		0.02	
Effective Stops (Total)	veh/h	606	728 pers/h
Effective Stop Rate		0.49	0.49
Proportion Queued		0.33	0.33
Performance Index		28.5	28.5
Cost (Total)	$/h	768.15	768.15 $/h
Fuel Consumption (Total)	L/h	109.0	
Carbon Dioxide (Total)	kg/h	257.3	
Hydrocarbons (Total)	kg/h	0.032	
Carbon Monoxide (Total)	kg/h	0.64	
NOx (Total)	kg/h	0.228	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 53.5% 53.2% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**

Demand Flows (Total)	veh/y	596,211	715,453	pers/y
Delay (Total)	veh-h/y	883	1,059	pers-h/y
Effective Stops (Total)	veh/y	291,001	349,201	pers/y
Travel Distance (Total)	veh-km/y	603,496	724,195	pers-km/y
Travel Time (Total)	veh-h/y	8,819	10,583	pers-h/y
Cost (Total)	$/y	368,711	368,711	$/y
Fuel Consumption (Total)	L/y	52,318		
Carbon Dioxide (Total)	kg/y	123,501		
Hydrocarbons (Total)	kg/y	15		
Carbon Monoxide (Total)	kg/y	308		
NOx (Total)	kg/y	109		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 1 [Boundary_Cataract Stage 1_AM 2036 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Cataract Rd															
1	L2	All MCs	468	1.0	468	1.0	0.596	11.8	LOS A	4.3	30.4	0.70	1.05	1.22	48.8
		LV	464		464		0.596	11.7	LOS A	4.3	30.4	NA	NA	NA	48.8
		HV	5		5		0.596	19.7	LOS B	4.3	30.4	NA	NA	NA	44.1
2	T1	All MCs	45	1.0	45	1.0	0.596	6.9	LOS A	4.3	30.4	0.70	1.05	1.22	49.1
		LV	45		45		0.596	6.9	LOS A	4.3	30.4	NA	NA	NA	49.1
		HV	0		0		0.596	8.5	LOS A	4.3	30.4	NA	NA	NA	48.1
Approach			514	1.0	514	1.0	0.596	11.4	LOS A	4.3	30.4	0.70	1.05	1.22	48.8
East: Boundary Rd															
4	L2	All MCs	9	2.0	9	2.0	0.337	8.2	LOS A	0.0	0.0	0.00	0.01	0.00	88.0
		LV	9		9		0.337	8.2	LOS A	0.0	0.0	NA	NA	NA	88.0
		HV	0		0		0.337	8.2	LOS A	0.0	0.0	NA	NA	NA	88.0
5	T1	All MCs	639	2.0	639	2.0	0.337	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	108.2
		LV	626		626		0.337	0.0	LOS A	0.0	0.0	NA	NA	NA	108.2
		HV	13		13		0.337	0.0	LOS A	0.0	0.0	NA	NA	NA	108.2
Approach			648	2.0	648	2.0	0.337	0.1	NA	0.0	0.0	0.00	0.01	0.00	107.8
West: Boundary Rd															
12	R2	All MCs	80	2.0	80	2.0	0.093	8.6	LOS A	0.4	2.7	0.58	0.78	0.58	50.3
		LV	78		78		0.093	8.5	LOS A	0.4	2.7	NA	NA	NA	50.4
		HV	2		2		0.093	14.1	LOS A	0.4	2.7	NA	NA	NA	46.7
Approach			80	2.0	80	2.0	0.093	8.6	NA	0.4	2.7	0.58	0.78	0.58	50.3
All Vehicles			1242	1.6	1242	1.6	0.596	5.3	NA	4.3	30.4	0.33	0.49	0.54	68.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 2 [Boundary_Cataract Stage 2_AM 2036 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	98.6	98.6 km/h
Travel Distance (Total)	veh-km/h	241.9	290.3 pers-km/h
Travel Time (Total)	veh-h/h	2.5	2.9 pers-h/h
Desired Speed	km/h	100.5	
Speed Efficiency		0.98	
Travel Time Index		9.79	
Congestion Coefficient		1.02	
Demand Flows (Total)	veh/h	262	315 pers/h
Arrival Flows (Total)	veh/h	262	
Percent Heavy Vehicles (Demand)	%	2.0	
Percent Heavy Vehicles (Arrivals)	%	2.0	
Degree of Saturation		0.112	
Practical Spare Capacity	%	774.2	
Effective Intersection Capacity	veh/h	2338	
Control Delay (Total)	veh-h/h	0.01	0.02 pers-h/h
Control Delay (Average)	sec	0.2	0.2 sec
Control Delay (Worst Lane by MC)	sec	1.0	
Control Delay (Worst Movement by MC)	sec	1.8	1.8 sec
Geometric Delay (Average)	sec	0.0	
Stop-Line Delay (Average)	sec	0.2	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	0.1	
95% Back of Queue - Dist (Worst Lane)	m	0.7	
Ave. Que Storage Ratio (Worst Lane)		0.04	
Effective Stops (Total)	veh/h	7	8 pers/h
Effective Stop Rate		0.03	0.03
Proportion Queued		0.05	0.05
Performance Index		3.3	3.3
Cost (Total)	$/h	115.74	115.74 $/h
Fuel Consumption (Total)	L/h	21.3	
Carbon Dioxide (Total)	kg/h	50.4	
Hydrocarbons (Total)	kg/h	0.008	
Carbon Monoxide (Total)	kg/h	0.18	
NOx (Total)	kg/h	0.051	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 34.4% 0.0% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**

Demand Flows (Total)	veh/y	125,811	150,973	pers/y
Delay (Total)	veh-h/y	6	7	pers-h/y
Effective Stops (Total)	veh/y	3,197	3,837	pers/y
Travel Distance (Total)	veh-km/y	116,109	139,330	pers-km/y
Travel Time (Total)	veh-h/y	1,177	1,413	pers-h/y
Cost (Total)	$/y	55,557	55,557	$/y
Fuel Consumption (Total)	L/y	10,234		
Carbon Dioxide (Total)	kg/y	24,194		
Hydrocarbons (Total)	kg/y	4		
Carbon Monoxide (Total)	kg/y	85		
NOx (Total)	kg/y	24		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 2 [Boundary_Cataract Stage 2_AM 2036 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Median Storage Area															
3	R2	All MCs	46	2.0	46	2.0	0.039	1.0	LOS A	0.1	0.7	0.25	0.14	0.25	50.9
		LV	45		45		0.039	1.0	LOS A	0.1	0.7	NA	NA	NA	50.9
		HV	1		1		0.039	1.8	LOS A	0.1	0.7	NA	NA	NA	49.8
Approach			46	2.0	46	2.0	0.039	1.0	LOS A	0.1	0.7	0.25	0.14	0.25	50.9
West: Boundary Rd															
11	T1	All MCs	216	2.0	216	2.0	0.112	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
		LV	211		211		0.112	0.0	LOS A	0.0	0.0	NA	NA	NA	110.0
		HV	4		4		0.112	0.0	LOS A	0.0	0.0	NA	NA	NA	110.0
Approach			216	2.0	216	2.0	0.112	0.0	NA	0.0	0.0	0.00	0.00	0.00	110.0
All Vehicles			262	2.0	262	2.0	0.112	0.2	NA	0.1	0.7	0.05	0.03	0.05	98.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 1 [Boundary_Cataract Stage 1_PM Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	62.4	62.4 km/h
Travel Distance (Total)	veh-km/h	577.7	693.2 pers-km/h
Travel Time (Total)	veh-h/h	9.3	11.1 pers-h/h
Desired Speed	km/h	70.1	
Speed Efficiency		0.89	
Travel Time Index		8.77	
Congestion Coefficient		1.12	
Demand Flows (Total)	veh/h	571	685 pers/h
Arrival Flows (Total)	veh/h	571	
Percent Heavy Vehicles (Demand)	%	1.5	
Percent Heavy Vehicles (Arrivals)	%	1.5	
Degree of Saturation		0.187	
Practical Spare Capacity	%	326.8	
Effective Intersection Capacity	veh/h	3044	
Control Delay (Total)	veh-h/h	0.65	0.78 pers-h/h
Control Delay (Average)	sec	4.1	4.1 sec
Control Delay (Worst Lane by MC)	sec	6.1	
Control Delay (Worst Movement by MC)	sec	8.1	8.1 sec
Geometric Delay (Average)	sec	3.7	
Stop-Line Delay (Average)	sec	0.4	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	0.8	
95% Back of Queue - Dist (Worst Lane)	m	5.8	
Ave. Que Storage Ratio (Worst Lane)		0.00	
Effective Stops (Total)	veh/h	224	269 pers/h
Effective Stop Rate		0.39	0.39
Proportion Queued		0.19	0.19
Performance Index		11.7	11.7
Cost (Total)	$/h	377.30	377.30 $/h
Fuel Consumption (Total)	L/h	49.8	
Carbon Dioxide (Total)	kg/h	117.6	
Hydrocarbons (Total)	kg/h	0.013	
Carbon Monoxide (Total)	kg/h	0.23	
NOx (Total)	kg/h	0.113	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 17.4% 18.8% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**

Demand Flows (Total)	veh/y	273,853	328,623	pers/y
Delay (Total)	veh-h/y	313	375	pers-h/y
Effective Stops (Total)	veh/y	107,681	129,218	pers/y
Travel Distance (Total)	veh-km/y	277,285	332,742	pers-km/y
Travel Time (Total)	veh-h/y	4,447	5,336	pers-h/y
Cost (Total)	$/y	181,106	181,106	$/y
Fuel Consumption (Total)	L/y	23,919		
Carbon Dioxide (Total)	kg/y	56,442		
Hydrocarbons (Total)	kg/y	6		
Carbon Monoxide (Total)	kg/y	109		
NOx (Total)	kg/y	54		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 1 [Boundary_Cataract Stage 1_PM Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Cataract Rd															
1	L2	All MCs	231	0.9	231	0.9	0.187	6.2	LOS A	0.8	5.8	0.29	0.57	0.29	52.2
		LV	228		228		0.187	6.2	LOS A	0.8	5.8	NA	NA	NA	52.2
		HV	2		2		0.187	7.1	LOS A	0.8	5.8	NA	NA	NA	51.5
2	T1	All MCs	57	3.7	57	3.7	0.187	4.4	LOS A	0.8	5.8	0.29	0.57	0.29	52.5
		LV	55		55		0.187	4.4	LOS A	0.8	5.8	NA	NA	NA	52.5
		HV	2		2		0.187	4.7	LOS A	0.8	5.8	NA	NA	NA	52.3
Approach			287	1.5	287	1.5	0.187	5.9	LOS A	0.8	5.8	0.29	0.57	0.29	52.2
East: Boundary Rd															
4	L2	All MCs	17	6.3	17	6.3	0.103	8.1	LOS A	0.0	0.0	0.00	0.06	0.00	84.0
		LV	16		16		0.103	8.1	LOS A	0.0	0.0	NA	NA	NA	84.0
		HV	1		1		0.103	8.1	LOS A	0.0	0.0	NA	NA	NA	84.0
5	T1	All MCs	181	0.6	181	0.6	0.103	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	100.9
		LV	180		180		0.103	0.0	LOS A	0.0	0.0	NA	NA	NA	100.9
		HV	1		1		0.103	0.0	LOS A	0.0	0.0	NA	NA	NA	100.9
Approach			198	1.1	198	1.1	0.103	0.7	NA	0.0	0.0	0.00	0.06	0.00	99.2
West: Boundary Rd															
12	R2	All MCs	85	2.5	85	2.5	0.058	6.1	LOS A	0.3	1.8	0.31	0.58	0.31	51.7
		LV	83		83		0.058	6.1	LOS A	0.3	1.8	NA	NA	NA	51.7
		HV	2		2		0.058	6.9	LOS A	0.3	1.8	NA	NA	NA	51.1
Approach			85	2.5	85	2.5	0.058	6.1	NA	0.3	1.8	0.31	0.58	0.31	51.7
All Vehicles			571	1.5	571	1.5	0.187	4.1	NA	0.8	5.8	0.19	0.39	0.19	62.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 2 [Boundary_Cataract Stage 2_PM Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	102.0	102.0 km/h
Travel Distance (Total)	veh-km/h	219.9	263.9 pers-km/h
Travel Time (Total)	veh-h/h	2.2	2.6 pers-h/h
Desired Speed	km/h	103.4	
Speed Efficiency		0.99	
Travel Time Index		9.85	
Congestion Coefficient		1.01	
Demand Flows (Total)	veh/h	232	278 pers/h
Arrival Flows (Total)	veh/h	232	
Percent Heavy Vehicles (Demand)	%	1.4	
Percent Heavy Vehicles (Arrivals)	%	1.4	
Degree of Saturation		0.105	
Practical Spare Capacity	%	834.4	
Effective Intersection Capacity	veh/h	2208	
Control Delay (Total)	veh-h/h	0.01	0.01 pers-h/h
Control Delay (Average)	sec	0.1	0.1 sec
Control Delay (Worst Lane by MC)	sec	0.9	
Control Delay (Worst Movement by MC)	sec	1.6	1.6 sec
Geometric Delay (Average)	sec	0.0	
Stop-Line Delay (Average)	sec	0.1	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	0.1	
95% Back of Queue - Dist (Worst Lane)	m	0.4	
Ave. Que Storage Ratio (Worst Lane)		0.02	
Effective Stops (Total)	veh/h	4	4 pers/h
Effective Stop Rate		0.02	0.02
Proportion Queued		0.03	0.03
Performance Index		2.7	2.7
Cost (Total)	$/h	101.81	101.81 $/h
Fuel Consumption (Total)	L/h	18.8	
Carbon Dioxide (Total)	kg/h	44.3	
Hydrocarbons (Total)	kg/h	0.007	
Carbon Monoxide (Total)	kg/h	0.17	
NOx (Total)	kg/h	0.037	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 33.5% 0.0% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**

Demand Flows (Total)	veh/y	111,158	133,390	pers/y
Delay (Total)	veh-h/y	4	4	pers-h/y
Effective Stops (Total)	veh/y	1,745	2,095	pers/y
Travel Distance (Total)	veh-km/y	105,544	126,653	pers-km/y
Travel Time (Total)	veh-h/y	1,035	1,241	pers-h/y
Cost (Total)	$/y	48,870	48,870	$/y
Fuel Consumption (Total)	L/y	9,019		
Carbon Dioxide (Total)	kg/y	21,278		
Hydrocarbons (Total)	kg/y	3		
Carbon Monoxide (Total)	kg/y	79		
NOx (Total)	kg/y	18		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 2 [Boundary_Cataract Stage 2_PM Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Median Storage Area															
3	R2	All MCs	28	3.7	28	3.7	0.024	0.9	LOS A	0.1	0.4	0.24	0.13	0.24	50.8
		LV	27		27		0.024	0.9	LOS A	0.1	0.4	NA	NA	NA	50.8
		HV	1		1		0.024	1.6	LOS A	0.1	0.4	NA	NA	NA	49.8
Approach			28	3.7	28	3.7	0.024	0.9	LOS A	0.1	0.4	0.24	0.13	0.24	50.8
West: Boundary Rd															
11	T1	All MCs	203	1.0	203	1.0	0.105	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
		LV	201		201		0.105	0.0	LOS A	0.0	0.0	NA	NA	NA	110.0
		HV	2		2		0.105	0.0	LOS A	0.0	0.0	NA	NA	NA	110.0
Approach			203	1.0	203	1.0	0.105	0.0	NA	0.0	0.0	0.00	0.00	0.00	110.0
All Vehicles			232	1.4	232	1.4	0.105	0.1	NA	0.1	0.4	0.03	0.02	0.03	102.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 1 [Boundary_Cataract Stage 1_PM 2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	62.3	62.3 km/h
Travel Distance (Total)	veh-km/h	731.2	877.4 pers-km/h
Travel Time (Total)	veh-h/h	11.7	14.1 pers-h/h
Desired Speed	km/h	70.5	
Speed Efficiency		0.88	
Travel Time Index		8.70	
Congestion Coefficient		1.13	
Demand Flows (Total)	veh/h	723	868 pers/h
Arrival Flows (Total)	veh/h	723	
Percent Heavy Vehicles (Demand)	%	2.2	
Percent Heavy Vehicles (Arrivals)	%	2.2	
Degree of Saturation		0.253	
Practical Spare Capacity	%	287.5	
Effective Intersection Capacity	veh/h	2860	
Control Delay (Total)	veh-h/h	0.89	1.07 pers-h/h
Control Delay (Average)	sec	4.4	4.4 sec
Control Delay (Worst Lane by MC)	sec	6.6	
Control Delay (Worst Movement by MC)	sec	8.2	8.2 sec
Geometric Delay (Average)	sec	3.8	
Stop-Line Delay (Average)	sec	0.7	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	1.3	
95% Back of Queue - Dist (Worst Lane)	m	9.2	
Ave. Que Storage Ratio (Worst Lane)		0.01	
Effective Stops (Total)	veh/h	303	363 pers/h
Effective Stop Rate		0.42	0.42
Proportion Queued		0.25	0.25
Performance Index		14.4	14.4
Cost (Total)	$/h	481.78	481.78 $/h
Fuel Consumption (Total)	L/h	65.1	
Carbon Dioxide (Total)	kg/h	153.8	
Hydrocarbons (Total)	kg/h	0.016	
Carbon Monoxide (Total)	kg/h	0.29	
NOx (Total)	kg/h	0.181	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 22.4% 25.0% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**

Demand Flows (Total)	veh/y	347,116	416,539	pers/y
Delay (Total)	veh-h/y	427	513	pers-h/y
Effective Stops (Total)	veh/y	145,210	174,252	pers/y
Travel Distance (Total)	veh-km/y	350,968	421,162	pers-km/y
Travel Time (Total)	veh-h/y	5,633	6,760	pers-h/y
Cost (Total)	$/y	231,256	231,256	$/y
Fuel Consumption (Total)	L/y	31,233		
Carbon Dioxide (Total)	kg/y	73,847		
Hydrocarbons (Total)	kg/y	8		
Carbon Monoxide (Total)	kg/y	137		
NOx (Total)	kg/y	87		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 1 [Boundary_Cataract Stage 1_PM 2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Cataract Rd															
1	L2	All MCs	81	2.0	81	2.0	0.072	6.4	LOS A	0.3	2.0	0.33	0.58	0.33	52.1
		LV	79		79		0.072	6.3	LOS A	0.3	2.0	NA	NA	NA	52.1
		HV	2		2		0.072	7.4	LOS A	0.3	2.0	NA	NA	NA	51.3
2	T1	All MCs	22	2.0	22	2.0	0.072	4.7	LOS A	0.3	2.0	0.33	0.58	0.33	52.5
		LV	22		22		0.072	4.7	LOS A	0.3	2.0	NA	NA	NA	52.5
		HV	0		0		0.072	5.4	LOS A	0.3	2.0	NA	NA	NA	51.9
Approach			103	2.0	103	2.0	0.072	6.0	LOS A	0.3	2.0	0.33	0.58	0.33	52.1
East: Boundary Rd															
4	L2	All MCs	36	2.0	36	2.0	0.143	7.9	LOS A	0.0	0.0	0.00	0.09	0.00	84.0
		LV	35		35		0.143	7.9	LOS A	0.0	0.0	NA	NA	NA	84.0
		HV	1		1		0.143	7.9	LOS A	0.0	0.0	NA	NA	NA	84.0
5	T1	All MCs	238	2.0	238	2.0	0.143	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	96.4
		LV	233		233		0.143	0.0	LOS A	0.0	0.0	NA	NA	NA	96.4
		HV	5		5		0.143	0.0	LOS A	0.0	0.0	NA	NA	NA	96.4
Approach			274	2.0	274	2.0	0.143	1.0	NA	0.0	0.0	0.00	0.09	0.00	94.6
West: Boundary Rd															
12	R2	All MCs	346	2.5	346	2.5	0.253	6.6	LOS A	1.3	9.2	0.42	0.63	0.42	51.4
		LV	338		338		0.253	6.6	LOS A	1.3	9.2	NA	NA	NA	51.4
		HV	9		9		0.253	8.2	LOS A	1.3	9.2	NA	NA	NA	50.3
Approach			346	2.5	346	2.5	0.253	6.6	NA	1.3	9.2	0.42	0.63	0.42	51.4
All Vehicles			723	2.2	723	2.2	0.253	4.4	NA	1.3	9.2	0.25	0.42	0.25	62.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 2 [Boundary_Cataract Stage 2_PM 2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	109.2	109.2 km/h
Travel Distance (Total)	veh-km/h	894.5	1073.4 pers-km/h
Travel Time (Total)	veh-h/h	8.2	9.8 pers-h/h
Desired Speed	km/h	109.8	
Speed Efficiency		0.99	
Travel Time Index		9.94	
Congestion Coefficient		1.01	
Demand Flows (Total)	veh/h	907	1089 pers/h
Arrival Flows (Total)	veh/h	907	
Percent Heavy Vehicles (Demand)	%	2.0	
Percent Heavy Vehicles (Arrivals)	%	2.0	
Degree of Saturation		0.460	
Practical Spare Capacity	%	113.1	
Effective Intersection Capacity	veh/h	1973	
Control Delay (Total)	veh-h/h	0.05	0.06 pers-h/h
Control Delay (Average)	sec	0.2	0.2 sec
Control Delay (Worst Lane by MC)	sec	7.2	
Control Delay (Worst Movement by MC)	sec	17.5	17.5 sec
Geometric Delay (Average)	sec	0.0	
Stop-Line Delay (Average)	sec	0.2	
Idling Time (Average)	sec	0.1	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	0.1	
95% Back of Queue - Dist (Worst Lane)	m	0.7	
Ave. Que Storage Ratio (Worst Lane)		0.04	
Effective Stops (Total)	veh/h	14	17 pers/h
Effective Stop Rate		0.02	0.02
Proportion Queued		0.02	0.02
Performance Index		8.4	8.4
Cost (Total)	$/h	0.00	0.00 $/h
Fuel Consumption (Total)	L/h	0.0	
Carbon Dioxide (Total)	kg/h	0.0	
Hydrocarbons (Total)	kg/h	0.000	
Carbon Monoxide (Total)	kg/h	0.00	
NOx (Total)	kg/h	0.000	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 71.2% 0.0% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**

Demand Flows (Total)	veh/y	435,537	522,644	pers/y
Delay (Total)	veh-h/y	25	30	pers-h/y
Effective Stops (Total)	veh/y	6,746	8,095	pers/y
Travel Distance (Total)	veh-km/y	429,356	515,227	pers-km/y
Travel Time (Total)	veh-h/y	3,932	4,719	pers-h/y
Cost (Total)	$/y	0	0	$/y
Fuel Consumption (Total)	L/y	0		
Carbon Dioxide (Total)	kg/y	0		
Hydrocarbons (Total)	kg/y	0		
Carbon Monoxide (Total)	kg/y	0		
NOx (Total)	kg/y	0		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 2 [Boundary_Cataract Stage 2_PM 2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Median Storage Area															
3	R2	All MCs	22	2.0	22	2.0	0.042	7.2	LOS A	0.1	0.7	0.64	0.64	0.64	7.8
		LV	22		22		0.042	7.0	LOS A	0.1	0.7	NA	NA	NA	8.0
		HV	0		0		0.042	17.5	LOS B	0.1	0.7	NA	NA	NA	3.4
Approach			22	2.0	22	2.0	0.042	7.2	LOS A	0.1	0.7	0.64	0.64	0.64	7.8
West: Boundary Rd															
11	T1	All MCs	885	2.0	885	2.0	0.460	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.8
		LV	868		868		0.460	0.0	LOS A	0.0	0.0	NA	NA	NA	109.8
		HV	18		18		0.460	0.0	LOS A	0.0	0.0	NA	NA	NA	109.8
Approach			885	2.0	885	2.0	0.460	0.0	NA	0.0	0.0	0.00	0.00	0.00	109.8
All Vehicles			907	2.0	907	2.0	0.460	0.2	NA	0.1	0.7	0.02	0.02	0.02	109.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 1 [Boundary_Cataract Stage 1_PM 2036 +Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	60.6	60.6 km/h
Travel Distance (Total)	veh-km/h	913.2	1095.9 pers-km/h
Travel Time (Total)	veh-h/h	15.1	18.1 pers-h/h
Desired Speed	km/h	69.0	
Speed Efficiency		0.88	
Travel Time Index		8.65	
Congestion Coefficient		1.14	
Demand Flows (Total)	veh/h	903	1084 pers/h
Arrival Flows (Total)	veh/h	903	
Percent Heavy Vehicles (Demand)	%	2.0	
Percent Heavy Vehicles (Arrivals)	%	2.0	
Degree of Saturation		0.349	
Practical Spare Capacity	%	180.7	
Effective Intersection Capacity	veh/h	2587	
Control Delay (Total)	veh-h/h	1.21	1.46 pers-h/h
Control Delay (Average)	sec	4.8	4.8 sec
Control Delay (Worst Lane by MC)	sec	6.9	
Control Delay (Worst Movement by MC)	sec	8.8	8.8 sec
Geometric Delay (Average)	sec	4.0	
Stop-Line Delay (Average)	sec	0.9	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	1.9	
95% Back of Queue - Dist (Worst Lane)	m	13.5	
Ave. Que Storage Ratio (Worst Lane)		0.01	
Effective Stops (Total)	veh/h	412	494 pers/h
Effective Stop Rate		0.46	0.46
Proportion Queued		0.30	0.30
Performance Index		18.9	18.9
Cost (Total)	$/h	613.09	613.09 $/h
Fuel Consumption (Total)	L/h	80.8	
Carbon Dioxide (Total)	kg/h	190.9	
Hydrocarbons (Total)	kg/h	0.020	
Carbon Monoxide (Total)	kg/h	0.34	
NOx (Total)	kg/h	0.209	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 26.3% 26.7% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**

Demand Flows (Total)	veh/y	433,516	520,219	pers/y
Delay (Total)	veh-h/y	583	700	pers-h/y
Effective Stops (Total)	veh/y	197,717	237,260	pers/y
Travel Distance (Total)	veh-km/y	438,352	526,022	pers-km/y
Travel Time (Total)	veh-h/y	7,232	8,678	pers-h/y
Cost (Total)	$/y	294,282	294,282	$/y
Fuel Consumption (Total)	L/y	38,769		
Carbon Dioxide (Total)	kg/y	91,610		
Hydrocarbons (Total)	kg/y	9		
Carbon Monoxide (Total)	kg/y	164		
NOx (Total)	kg/y	101		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 1 [Boundary_Cataract Stage 1_PM 2036 +Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Cataract Rd															
1	L2	All MCs	117	2.0	117	2.0	0.102	6.5	LOS A	0.4	2.9	0.35	0.60	0.35	51.9
		LV	115		115		0.102	6.5	LOS A	0.4	2.9	NA	NA	NA	51.9
		HV	2		2		0.102	7.7	LOS A	0.4	2.9	NA	NA	NA	51.0
2	T1	All MCs	22	2.0	22	2.0	0.102	4.9	LOS A	0.4	2.9	0.35	0.60	0.35	52.3
		LV	22		22		0.102	4.9	LOS A	0.4	2.9	NA	NA	NA	52.4
		HV	0		0		0.102	6.0	LOS A	0.4	2.9	NA	NA	NA	51.5
Approach			139	2.0	139	2.0	0.102	6.2	LOS A	0.4	2.9	0.35	0.60	0.35	52.0
East: Boundary Rd															
4	L2	All MCs	36	2.0	36	2.0	0.155	7.9	LOS A	0.0	0.0	0.00	0.08	0.00	84.4
		LV	35		35		0.155	7.9	LOS A	0.0	0.0	NA	NA	NA	84.4
		HV	1		1		0.155	7.9	LOS A	0.0	0.0	NA	NA	NA	84.4
5	T1	All MCs	260	2.0	260	2.0	0.155	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	97.3
		LV	255		255		0.155	0.0	LOS A	0.0	0.0	NA	NA	NA	97.3
		HV	5		5		0.155	0.0	LOS A	0.0	0.0	NA	NA	NA	97.3
Approach			296	2.0	296	2.0	0.155	1.0	NA	0.0	0.0	0.00	0.08	0.00	95.6
West: Boundary Rd															
12	R2	All MCs	468	2.0	468	2.0	0.349	6.9	LOS A	1.9	13.5	0.47	0.65	0.47	51.3
		LV	459		459		0.349	6.8	LOS A	1.9	13.5	NA	NA	NA	51.3
		HV	9		9		0.349	8.8	LOS A	1.9	13.5	NA	NA	NA	49.9
Approach			468	2.0	468	2.0	0.349	6.9	NA	1.9	13.5	0.47	0.65	0.47	51.3
All Vehicles			903	2.0	903	2.0	0.349	4.8	NA	1.9	13.5	0.30	0.46	0.30	60.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 2 [Boundary_Cataract Stage 2_PM 2036 +Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles:**	**All MCs**	**Persons**	
Travel Speed (Average)	km/h	109.1	109.1	km/h
Travel Distance (Total)	veh-km/h	985.9	1183.1	pers-km/h
Travel Time (Total)	veh-h/h	9.0	10.8	pers-h/h
Desired Speed	km/h	109.8		
Speed Efficiency		0.99		
Travel Time Index		9.93		
Congestion Coefficient		1.01		
Demand Flows (Total)	veh/h	998	1197	pers/h
Arrival Flows (Total)	veh/h	998		
Percent Heavy Vehicles (Demand)	%	2.0		
Percent Heavy Vehicles (Arrivals)	%	2.0		
Degree of Saturation		0.507		
Practical Spare Capacity	%	93.3		
Effective Intersection Capacity	veh/h	1969		
Control Delay (Total)	veh-h/h	0.07	0.08	pers-h/h
Control Delay (Average)	sec	0.2	0.2	sec
Control Delay (Worst Lane by MC)	sec	9.1		
Control Delay (Worst Movement by MC)	sec	23.4	23.4	sec
Geometric Delay (Average)	sec	0.0		
Stop-Line Delay (Average)	sec	0.2		
Idling Time (Average)	sec	0.1		
Intersection Level of Service (LOS)		NA		
95% Back of Queue - Veh (Worst Lane)	veh	0.1		
95% Back of Queue - Dist (Worst Lane)	m	0.8		
Ave. Que Storage Ratio (Worst Lane)		0.04		
Effective Stops (Total)	veh/h	15	18	pers/h
Effective Stop Rate		0.02	0.02	
Proportion Queued		0.02	0.02	
Performance Index		9.2	9.2	
Cost (Total)	$/h	0.00	0.00	$/h
Fuel Consumption (Total)	L/h	0.0		
Carbon Dioxide (Total)	kg/h	0.0		
Hydrocarbons (Total)	kg/h	0.000		
Carbon Monoxide (Total)	kg/h	0.00		
NOx (Total)	kg/h	0.000		

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 75.7% 0.0% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**

Demand Flows (Total)	veh/y	478,990	574,787	pers/y
Delay (Total)	veh-h/y	32	38	pers-h/y
Effective Stops (Total)	veh/y	7,361	8,834	pers/y
Travel Distance (Total)	veh-km/y	473,243	567,892	pers-km/y
Travel Time (Total)	veh-h/y	4,337	5,205	pers-h/y
Cost (Total)	$/y	0	0	$/y
Fuel Consumption (Total)	L/y	0		
Carbon Dioxide (Total)	kg/y	0		
Hydrocarbons (Total)	kg/y	0		
Carbon Monoxide (Total)	kg/y	0		
NOx (Total)	kg/y	0		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 2 [Boundary_Cataract Stage 2_PM 2036 +Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Median Storage Area															
3	R2	All MCs	22	2.0	22	2.0	0.050	9.1	LOS A	0.1	0.8	0.69	0.69	0.69	6.7
		LV	22		22		0.050	8.8	LOS A	0.1	0.8	NA	NA	NA	6.9
		HV	0		0		0.050	23.4	LOS B	0.1	0.8	NA	NA	NA	2.6
Approach			22	2.0	22	2.0	0.050	9.1	LOS A	0.1	0.8	0.69	0.69	0.69	6.7
West: Boundary Rd															
11	T1	All MCs	976	2.0	976	2.0	0.507	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.7
		LV	956		956		0.507	0.0	LOS A	0.0	0.0	NA	NA	NA	109.7
		HV	20		20		0.507	0.0	LOS A	0.0	0.0	NA	NA	NA	109.7
Approach			976	2.0	976	2.0	0.507	0.0	NA	0.0	0.0	0.00	0.00	0.00	109.7
All Vehicles			998	2.0	998	2.0	0.507	0.2	NA	0.1	0.8	0.02	0.02	0.02	109.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 101 [Boundary_Old Pitt Town_AM Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	51.5	51.5 km/h
Travel Distance (Total)	veh-km/h	1172.3	1406.7 pers-km/h
Travel Time (Total)	veh-h/h	22.8	27.3 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.86	
Travel Time Index		8.42	
Congestion Coefficient		1.17	
Demand Flows (Total)	veh/h	1147	1377 pers/h
Arrival Flows (Total)	veh/h	1147	
Percent Heavy Vehicles (Demand)	%	2.0	
Percent Heavy Vehicles (Arrivals)	%	2.0	
Degree of Saturation		0.378	
Practical Spare Capacity	%	124.9	
Effective Intersection Capacity	veh/h	3036	
Control Delay (Total)	veh-h/h	2.36	2.83 pers-h/h
Control Delay (Average)	sec	7.4	7.4 sec
Control Delay (Worst Lane by MC)	sec	8.1	
Control Delay (Worst Movement by MC)	sec	13.1	13.1 sec
Geometric Delay (Average)	sec	5.4	
Stop-Line Delay (Average)	sec	2.0	
Idling Time (Average)	sec	0.1	
Intersection Level of Service (LOS)		LOS A	
95% Back of Queue - Veh (Worst Lane)	veh	2.5	
95% Back of Queue - Dist (Worst Lane)	m	17.6	
Ave. Que Storage Ratio (Worst Lane)		0.01	
Effective Stops (Total)	veh/h	691	829 pers/h
Effective Stop Rate		0.60	0.60
Proportion Queued		0.54	0.54
Performance Index		43.1	43.1
Cost (Total)	$/h	1070.70	1070.70 $/h
Fuel Consumption (Total)	L/h	105.0	
Carbon Dioxide (Total)	kg/h	248.1	
Hydrocarbons (Total)	kg/h	0.021	
Carbon Monoxide (Total)	kg/h	0.28	
NOx (Total)	kg/h	0.284	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 1.3 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.1% 1.2% 0.6%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Demand Flows (Total)	veh/y	550,737	660,884 pers/y
Delay (Total)	veh-h/y	1,132	1,359 pers-h/y

Effective Stops (Total)	veh/y	331,667	398,000	pers/y
Travel Distance (Total)	veh-km/y	562,683	675,220	pers-km/y
Travel Time (Total)	veh-h/y	10,933	13,120	pers-h/y
Cost (Total)	$/y	513,937	513,937	$/y
Fuel Consumption (Total)	L/y	50,400		
Carbon Dioxide (Total)	kg/y	119,080		
Hydrocarbons (Total)	kg/y	10		
Carbon Monoxide (Total)	kg/y	136		
NOx (Total)	kg/y	137		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101 [Boundary_Old Pitt Town_AM Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Boundary Rd															
1	L2	All MCs	24	2.0	24	2.0	0.281	5.6	LOS A	1.8	12.5	0.42	0.55	0.42	51.6
		LV	24		24		0.281	5.6	LOS A	1.8	12.5	NA	NA	NA	51.6
		HV	0		0		0.281	6.8	LOS A	1.8	12.5	NA	NA	NA	50.8
2	T1	All MCs	202	2.0	202	2.0	0.281	5.8	LOS A	1.8	12.5	0.42	0.55	0.42	52.0
		LV	198		198		0.281	5.8	LOS A	1.8	12.5	NA	NA	NA	52.0
		HV	4		4		0.281	7.0	LOS A	1.8	12.5	NA	NA	NA	51.1
3	R2	All MCs	92	2.0	92	2.0	0.281	9.1	LOS A	1.8	12.5	0.42	0.55	0.42	51.3
		LV	90		90		0.281	9.0	LOS A	1.8	12.5	NA	NA	NA	51.3
		HV	2		2		0.281	10.3	LOS B	1.8	12.5	NA	NA	NA	50.4
Approach			318	2.0	318	2.0	0.281	6.7	LOS A	1.8	12.5	0.42	0.55	0.42	51.8
East: Old Pitt Town Rd															
4	L2	All MCs	89	2.0	89	2.0	0.239	7.0	LOS A	1.4	10.1	0.59	0.64	0.59	51.3
		LV	88		88		0.239	7.0	LOS A	1.4	10.1	NA	NA	NA	51.3
		HV	2		2		0.239	9.7	LOS A	1.4	10.1	NA	NA	NA	49.4
5	T1	All MCs	87	2.0	87	2.0	0.239	7.2	LOS A	1.4	10.1	0.59	0.64	0.59	51.6
		LV	86		86		0.239	7.2	LOS A	1.4	10.1	NA	NA	NA	51.7
		HV	2		2		0.239	9.9	LOS A	1.4	10.1	NA	NA	NA	49.8
6	R2	All MCs	38	2.0	38	2.0	0.239	10.5	LOS B	1.4	10.1	0.59	0.64	0.59	50.9
		LV	37		37		0.239	10.4	LOS B	1.4	10.1	NA	NA	NA	51.0
		HV	1		1		0.239	13.1	LOS B	1.4	10.1	NA	NA	NA	49.1
Approach			215	2.0	215	2.0	0.239	7.7	LOS A	1.4	10.1	0.59	0.64	0.59	51.4
North: Boundary Rd															
7	L2	All MCs	69	2.0	69	2.0	0.378	6.9	LOS A	2.5	17.6	0.59	0.61	0.59	51.3
		LV	68		68		0.378	6.8	LOS A	2.5	17.6	NA	NA	NA	51.4
		HV	1		1		0.378	9.4	LOS A	2.5	17.6	NA	NA	NA	49.6
8	T1	All MCs	256	2.0	256	2.0	0.378	7.0	LOS A	2.5	17.6	0.59	0.61	0.59	51.7
		LV	251		251		0.378	7.0	LOS A	2.5	17.6	NA	NA	NA	51.8
		HV	5		5		0.378	9.5	LOS A	2.5	17.6	NA	NA	NA	49.9
9	R2	All MCs	40	2.0	40	2.0	0.378	10.3	LOS B	2.5	17.6	0.59	0.61	0.59	51.0
		LV	39		39		0.378	10.2	LOS B	2.5	17.6	NA	NA	NA	51.0
		HV	1		1		0.378	12.8	LOS B	2.5	17.6	NA	NA	NA	49.3
Approach			365	2.0	365	2.0	0.378	7.3	LOS A	2.5	17.6	0.59	0.61	0.59	51.6
West: Old Pitt Town Rd															
10	L2	All MCs	29	2.0	29	2.0	0.263	6.7	LOS A	1.6	11.1	0.55	0.63	0.55	51.0
		LV	29		29		0.263	6.7	LOS A	1.6	11.1	NA	NA	NA	51.0
		HV	1		1		0.263	9.1	LOS A	1.6	11.1	NA	NA	NA	49.3
11	T1	All MCs	129	2.0	129	2.0	0.263	6.9	LOS A	1.6	11.1	0.55	0.63	0.55	51.3
		LV	127		127		0.263	6.9	LOS A	1.6	11.1	NA	NA	NA	51.4
		HV	3		3		0.263	9.3	LOS A	1.6	11.1	NA	NA	NA	49.7
12	R2	All MCs	91	2.0	91	2.0	0.263	10.2	LOS B	1.6	11.1	0.55	0.63	0.55	50.6

	LV	89		89		0.263	10.1	LOS B	1.6	11.1	NA	NA	NA	50.7
	HV	2		2		0.263	12.6	LOS B	1.6	11.1	NA	NA	NA	49.0
Approach		249	2.0	249	2.0	0.263	8.1	LOS A	1.6	11.1	0.55	0.63	0.55	51.0
All Vehicles		1147	2.0	1147	2.0	0.378	7.4	LOS A	2.5	17.6	0.54	0.60	0.54	51.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 101 [Boundary_Old Pitt Town_PM Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	51.9	51.9 km/h
Travel Distance (Total)	veh-km/h	945.6	1134.8 pers-km/h
Travel Time (Total)	veh-h/h	18.2	21.8 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.87	
Travel Time Index		8.51	
Congestion Coefficient		1.16	
Demand Flows (Total)	veh/h	926	1112 pers/h
Arrival Flows (Total)	veh/h	926	
Percent Heavy Vehicles (Demand)	%	2.0	
Percent Heavy Vehicles (Arrivals)	%	2.0	
Degree of Saturation		0.271	
Practical Spare Capacity	%	213.2	
Effective Intersection Capacity	veh/h	3413	
Control Delay (Total)	veh-h/h	1.70	2.04 pers-h/h
Control Delay (Average)	sec	6.6	6.6 sec
Control Delay (Worst Lane by MC)	sec	7.3	
Control Delay (Worst Movement by MC)	sec	11.5	11.5 sec
Geometric Delay (Average)	sec	5.3	
Stop-Line Delay (Average)	sec	1.3	
Idling Time (Average)	sec	0.0	
Intersection Level of Service (LOS)		LOS A	
95% Back of Queue - Veh (Worst Lane)	veh	1.7	
95% Back of Queue - Dist (Worst Lane)	m	11.9	
Ave. Que Storage Ratio (Worst Lane)		0.01	
Effective Stops (Total)	veh/h	519	622 pers/h
Effective Stop Rate		0.56	0.56
Proportion Queued		0.44	0.44
Performance Index		32.6	32.6
Cost (Total)	$/h	855.77	855.77 $/h
Fuel Consumption (Total)	L/h	83.9	
Carbon Dioxide (Total)	kg/h	198.4	
Hydrocarbons (Total)	kg/h	0.017	
Carbon Monoxide (Total)	kg/h	0.23	
NOx (Total)	kg/h	0.227	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.9 %
Number of Iterations: 4 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 0.0% 1.2% 0.7%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Demand Flows (Total)	veh/y	444,632	533,558 pers/y
Delay (Total)	veh-h/y	817	980 pers-h/y

Effective Stops (Total)	veh/y	248,901	298,682	pers/y
Travel Distance (Total)	veh-km/y	453,900	544,680	pers-km/y
Travel Time (Total)	veh-h/y	8,738	10,485	pers-h/y
Cost (Total)	$/y	410,770	410,770	$/y
Fuel Consumption (Total)	L/y	40,295		
Carbon Dioxide (Total)	kg/y	95,208		
Hydrocarbons (Total)	kg/y	8		
Carbon Monoxide (Total)	kg/y	109		
NOx (Total)	kg/y	109		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101 [Boundary_Old Pitt Town_PM Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Boundary Rd															
1	L2	All MCs	71	2.0	71	2.0	0.271	5.8	LOS A	1.7	11.9	0.45	0.56	0.45	51.8
		LV	69		69		0.271	5.8	LOS A	1.7	11.9	NA	NA	NA	51.8
		HV	1		1		0.271	7.2	LOS A	1.7	11.9	NA	NA	NA	50.7
2	T1	All MCs	166	2.0	166	2.0	0.271	6.0	LOS A	1.7	11.9	0.45	0.56	0.45	52.2
		LV	163		163		0.271	5.9	LOS A	1.7	11.9	NA	NA	NA	52.2
		HV	3		3		0.271	7.4	LOS A	1.7	11.9	NA	NA	NA	51.1
3	R2	All MCs	59	2.0	59	2.0	0.271	9.3	LOS A	1.7	11.9	0.45	0.56	0.45	51.4
		LV	58		58		0.271	9.2	LOS A	1.7	11.9	NA	NA	NA	51.4
		HV	1		1		0.271	10.7	LOS B	1.7	11.9	NA	NA	NA	50.4
Approach			296	2.0	296	2.0	0.271	6.6	LOS A	1.7	11.9	0.45	0.56	0.45	51.9
East: Old Pitt Town Rd															
4	L2	All MCs	75	2.0	75	2.0	0.247	6.0	LOS A	1.4	10.3	0.46	0.58	0.46	51.6
		LV	73		73		0.247	6.0	LOS A	1.4	10.3	NA	NA	NA	51.7
		HV	1		1		0.247	7.6	LOS A	1.4	10.3	NA	NA	NA	50.5
5	T1	All MCs	121	2.0	121	2.0	0.247	6.2	LOS A	1.4	10.3	0.46	0.58	0.46	52.0
		LV	119		119		0.247	6.1	LOS A	1.4	10.3	NA	NA	NA	52.1
		HV	2		2		0.247	7.8	LOS A	1.4	10.3	NA	NA	NA	50.9
6	R2	All MCs	63	2.0	63	2.0	0.247	9.5	LOS A	1.4	10.3	0.46	0.58	0.46	51.3
		LV	62		62		0.247	9.4	LOS A	1.4	10.3	NA	NA	NA	51.3
		HV	1		1		0.247	11.1	LOS B	1.4	10.3	NA	NA	NA	50.2
Approach			259	2.0	259	2.0	0.247	6.9	LOS A	1.4	10.3	0.46	0.58	0.46	51.7
North: Boundary Rd															
7	L2	All MCs	52	2.0	52	2.0	0.218	5.7	LOS A	1.2	8.9	0.41	0.53	0.41	52.1
		LV	51		51		0.218	5.7	LOS A	1.2	8.9	NA	NA	NA	52.2
		HV	1		1		0.218	7.0	LOS A	1.2	8.9	NA	NA	NA	51.2
8	T1	All MCs	179	2.0	179	2.0	0.218	5.9	LOS A	1.2	8.9	0.41	0.53	0.41	52.6
		LV	175		175		0.218	5.8	LOS A	1.2	8.9	NA	NA	NA	52.6
		HV	4		4		0.218	7.2	LOS A	1.2	8.9	NA	NA	NA	51.6
9	R2	All MCs	8	2.0	8	2.0	0.218	9.1	LOS A	1.2	8.9	0.41	0.53	0.41	51.8
		LV	8		8		0.218	9.1	LOS A	1.2	8.9	NA	NA	NA	51.8
		HV	0		0		0.218	10.4	LOS B	1.2	8.9	NA	NA	NA	50.9
Approach			239	2.0	239	2.0	0.218	5.9	LOS A	1.2	8.9	0.41	0.53	0.41	52.4
West: Old Pitt Town Rd															
10	L2	All MCs	9	2.0	9	2.0	0.134	6.2	LOS A	0.7	5.1	0.47	0.59	0.47	51.4
		LV	9		9		0.134	6.2	LOS A	0.7	5.1	NA	NA	NA	51.4
		HV	0		0		0.134	8.1	LOS A	0.7	5.1	NA	NA	NA	50.1
11	T1	All MCs	86	2.0	86	2.0	0.134	6.4	LOS A	0.7	5.1	0.47	0.59	0.47	51.8
		LV	85		85		0.134	6.3	LOS A	0.7	5.1	NA	NA	NA	51.8
		HV	2		2		0.134	8.2	LOS A	0.7	5.1	NA	NA	NA	50.5
12	R2	All MCs	37	2.0	37	2.0	0.134	9.7	LOS A	0.7	5.1	0.47	0.59	0.47	51.1

	LV	36		36		0.134	9.6	LOS A	0.7	5.1	NA	NA	NA	51.1
	HV	1		1		0.134	11.5	LOS B	0.7	5.1	NA	NA	NA	49.8
Approach		133	2.0	133	2.0	0.134	7.3	LOS A	0.7	5.1	0.47	0.59	0.47	51.6
All Vehicles		926	2.0	926	2.0	0.271	6.6	LOS A	1.7	11.9	0.44	0.56	0.44	51.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 101v [Boundary_Old Pitt Town_AM 2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 14 years

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	36.4	36.4 km/h
Travel Distance (Total)	veh-km/h	3240.0	3888.0 pers-km/h
Travel Time (Total)	veh-h/h	89.1	107.0 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.61	
Travel Time Index		5.62	
Congestion Coefficient		1.65	
Demand Flows (Total)	veh/h	3171	3806 pers/h
Arrival Flows (Total)	veh/h	3171	
Percent Heavy Vehicles (Demand)	%	2.0	
Percent Heavy Vehicles (Arrivals)	%	2.0	
Degree of Saturation		0.879	
Practical Spare Capacity	%	2.4	
Effective Intersection Capacity	veh/h	3608	
Control Delay (Total)	veh-h/h	34.21	41.05 pers-h/h
Control Delay (Average)	sec	38.8	38.8 sec
Control Delay (Worst Lane by MC)	sec	51.4	
Control Delay (Worst Movement by MC)	sec	51.4	51.4 sec
Geometric Delay (Average)	sec	2.3	
Stop-Line Delay (Average)	sec	36.5	
Idling Time (Average)	sec	30.7	
Intersection Level of Service (LOS)		LOS D	
95% Back of Queue - Veh (Worst Lane)	veh	19.3	
95% Back of Queue - Dist (Worst Lane)	m	137.3	
Ave. Que Storage Ratio (Worst Lane)		0.17	
Effective Stops (Total)	veh/h	2931	3517 pers/h
Effective Stop Rate		0.92	0.92
Proportion Queued		0.98	0.98
Performance Index		263.7	263.7
Cost (Total)	$/h	3971.44	3971.44 $/h
Fuel Consumption (Total)	L/h	330.0	
Carbon Dioxide (Total)	kg/h	779.4	
Hydrocarbons (Total)	kg/h	0.070	
Carbon Monoxide (Total)	kg/h	0.85	
NOx (Total)	kg/h	0.849	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 2 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 6.8% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Demand Flows (Total)	veh/y	1,522,237	1,826,684 pers/y
Delay (Total)	veh-h/y	16,420	19,704 pers-h/y
Effective Stops (Total)	veh/y	1,406,909	1,688,291 pers/y

Travel Distance (Total)	veh-km/y	1,555,189	1,866,226	pers-km/y
Travel Time (Total)	veh-h/y	42,783	51,340	pers-h/y
Cost (Total)	$/y	1,906,291	1,906,291	$/y
Fuel Consumption (Total)	L/y	158,407		
Carbon Dioxide (Total)	kg/y	374,132		
Hydrocarbons (Total)	kg/y	34		
Carbon Monoxide (Total)	kg/y	410		
NOx (Total)	kg/y	407		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101v [Boundary_Old Pitt Town_AM 2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 14 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Boundary Rd															
1	L2	All MCs	67	2.0	67	2.0	0.594	20.5	LOS C	10.8	77.2	0.92	0.79	0.92	39.6
		LV	66		66		0.594	20.5	LOS C	10.8	77.2	NA	NA	NA	39.6
		HV	1		1		0.594	20.5	LOS C	10.8	77.2	NA	NA	NA	39.6
2	T1	All MCs	559	2.0	559	2.0	0.594	29.5	LOS C	10.8	77.2	0.92	0.79	0.92	41.0
		LV	547		547		0.594	29.5	LOS C	10.8	77.2	NA	NA	NA	41.0
		HV	11		11		0.594	29.5	LOS C	10.8	77.2	NA	NA	NA	41.0
3	R2	All MCs	253	2.0	253	2.0	0.821	46.5	LOS D	10.8	76.9	1.00	0.96	1.25	33.4
		LV	248		248		0.821	46.5	LOS D	10.8	76.9	NA	NA	NA	33.4
		HV	5		5		0.821	46.5	LOS D	10.8	76.9	NA	NA	NA	33.4
Approach			879	2.0	879	2.0	0.821	33.7	LOS C	10.8	77.2	0.95	0.84	1.02	38.4
East: Old Pitt Town Rd															
4	L2	All MCs	247	2.0	247	2.0	0.741	34.9	LOS C	11.9	84.5	0.99	0.89	1.08	35.8
		LV	242		242		0.741	34.9	LOS C	11.9	84.5	NA	NA	NA	35.8
		HV	5		5		0.741	34.9	LOS C	11.9	84.5	NA	NA	NA	35.8
5	T1	All MCs	241	2.0	241	2.0	0.741	43.2	LOS D	11.9	84.5	1.00	0.89	1.14	36.4
		LV	237		237		0.741	43.2	LOS D	11.9	84.5	NA	NA	NA	36.4
		HV	5		5		0.741	43.2	LOS D	11.9	84.5	NA	NA	NA	36.4
6	R2	All MCs	105	2.0	105	2.0	0.368	39.9	LOS D	3.8	27.2	0.94	0.77	0.94	35.5
		LV	103		103		0.368	39.9	LOS D	3.8	27.2	NA	NA	NA	35.5
		HV	2		2		0.368	39.9	LOS D	3.8	27.2	NA	NA	NA	35.5
Approach			594	2.0	594	2.0	0.741	39.2	LOS D	11.9	84.5	0.98	0.87	1.08	36.0
North: Boundary Rd															
7	L2	All MCs	192	2.0	192	2.0	0.841	29.8	LOS C	19.3	137.3	1.00	0.99	1.19	36.1
		LV	188		188		0.841	29.8	LOS C	19.3	137.3	NA	NA	NA	36.1
		HV	4		4		0.841	29.8	LOS C	19.3	137.3	NA	NA	NA	36.1
8	T1	All MCs	707	2.0	707	2.0	*0.841	39.2	LOS D	19.3	137.3	1.00	1.00	1.20	37.4
		LV	693		693		*0.841	39.2	LOS D	19.3	137.3	NA	NA	NA	37.4
		HV	14		14		0.841	39.2	LOS D	19.3	137.3	NA	NA	NA	37.4
9	R2	All MCs	111	2.0	111	2.0	0.359	38.8	LOS D	4.0	28.3	0.93	0.77	0.93	35.9
		LV	108		108		0.359	38.8	LOS D	4.0	28.3	NA	NA	NA	35.9
		HV	2		2		0.359	38.8	LOS D	4.0	28.3	NA	NA	NA	35.9
Approach			1010	2.0	1010	2.0	0.841	37.4	LOS D	19.3	137.3	0.99	0.97	1.17	37.0
West: Old Pitt Town Rd															
10	L2	All MCs	81	2.0	81	2.0	*0.846	35.4	LOS D	10.1	71.7	1.00	1.01	1.32	33.6
		LV	80		80		*0.846	35.4	LOS D	10.1	71.7	NA	NA	NA	33.6
		HV	2		2		0.846	35.4	LOS D	10.1	71.7	NA	NA	NA	33.6
11	T1	All MCs	358	2.0	358	2.0	0.846	47.0	LOS D	10.1	71.7	1.00	1.00	1.33	34.7
		LV	351		351		0.846	47.0	LOS D	10.1	71.7	NA	NA	NA	34.7
		HV	7		7		0.846	47.0	LOS D	10.1	71.7	NA	NA	NA	34.7

12	R2	All MCs	250	2.0	250	2.0	* 0.879	51.4	LOS D	11.4	81.1	1.00	1.03	1.39	32.0
		LV	245		245		* 0.879	51.4	LOS D	11.4	81.1	NA	NA	NA	32.0
		HV	5		5		0.879	51.4	LOS D	11.4	81.1	NA	NA	NA	32.0
Approach			690	2.0	690	2.0	0.879	47.2	LOS D	11.4	81.1	1.00	1.01	1.35	33.5
All Vehicles			3171	2.0	3171	2.0	0.879	38.8	LOS D	19.3	137.3	0.98	0.92	1.15	36.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

INTERSECTION SUMMARY

Site: 101v [Boundary_Old Pitt Town_PM 2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 14 years

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	39.8	39.8 km/h
Travel Distance (Total)	veh-km/h	2615.2	3138.2 pers-km/h
Travel Time (Total)	veh-h/h	65.7	78.8 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.66	
Travel Time Index		6.26	
Congestion Coefficient		1.51	
Demand Flows (Total)	veh/h	2560	3072 pers/h
Arrival Flows (Total)	veh/h	2560	
Percent Heavy Vehicles (Demand)	%	2.0	
Percent Heavy Vehicles (Arrivals)	%	2.0	
Degree of Saturation		0.772	
Practical Spare Capacity	%	16.6	
Effective Intersection Capacity	veh/h	3316	
Control Delay (Total)	veh-h/h	21.34	25.61 pers-h/h
Control Delay (Average)	sec	30.0	30.0 sec
Control Delay (Worst Lane by MC)	sec	37.1	
Control Delay (Worst Movement by MC)	sec	37.1	37.1 sec
Geometric Delay (Average)	sec	2.3	
Stop-Line Delay (Average)	sec	27.7	
Idling Time (Average)	sec	22.0	
Intersection Level of Service (LOS)		LOS C	
95% Back of Queue - Veh (Worst Lane)	veh	10.6	
95% Back of Queue - Dist (Worst Lane)	m	75.5	
Ave. Que Storage Ratio (Worst Lane)		0.09	
Effective Stops (Total)	veh/h	2291	2749 pers/h
Effective Stop Rate		0.89	0.89
Proportion Queued		0.99	0.99
Performance Index		174.9	174.9
Cost (Total)	$/h	2966.90	2966.90 $/h
Fuel Consumption (Total)	L/h	258.3	
Carbon Dioxide (Total)	kg/h	610.2	
Hydrocarbons (Total)	kg/h	0.054	
Carbon Monoxide (Total)	kg/h	0.68	
NOx (Total)	kg/h	0.677	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 2 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 16.8% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Demand Flows (Total)	veh/y	1,228,962	1,474,754 pers/y
Delay (Total)	veh-h/y	10,243	12,291 pers-h/y
Effective Stops (Total)	veh/y	1,099,736	1,319,683 pers/y

Travel Distance (Total)	veh-km/y	1,255,277	1,506,333	pers-km/y
Travel Time (Total)	veh-h/y	31,519	37,823	pers-h/y
Cost (Total)	$/y	1,424,111	1,424,111	$/y
Fuel Consumption (Total)	L/y	124,004		
Carbon Dioxide (Total)	kg/y	292,902		
Hydrocarbons (Total)	kg/y	26		
Carbon Monoxide (Total)	kg/y	324		
NOx (Total)	kg/y	325		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101v [Boundary_Old Pitt Town_PM 2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 14 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Boundary Rd															
1	L2	All MCs	195	2.0	195	2.0	0.760	24.2	LOS C	10.6	75.5	0.98	0.92	1.14	39.5
		LV	191		191		0.760	24.2	LOS C	10.6	75.5	NA	NA	NA	39.5
		HV	4		4		0.760	24.2	LOS C	10.6	75.5	NA	NA	NA	39.5
2	T1	All MCs	460	2.0	460	2.0	0.760	30.2	LOS C	10.6	75.5	0.99	0.92	1.16	41.1
		LV	451		451		0.760	30.2	LOS C	10.6	75.5	NA	NA	NA	41.1
		HV	9		9		0.760	30.2	LOS C	10.6	75.5	NA	NA	NA	41.1
3	R2	All MCs	163	2.0	163	2.0	*0.736	37.1	LOS D	5.2	36.9	1.00	0.90	1.22	36.5
		LV	160		160		*0.736	37.1	LOS D	5.2	36.9	NA	NA	NA	36.5
		HV	3		3		0.736	37.1	LOS D	5.2	36.9	NA	NA	NA	36.5
Approach			818	2.0	818	2.0	0.760	30.1	LOS C	10.6	75.5	0.99	0.92	1.17	39.7
East: Old Pitt Town Rd															
4	L2	All MCs	207	2.0	207	2.0	0.772	28.0	LOS C	9.6	68.5	1.00	0.94	1.19	38.5
		LV	202		202		0.772	28.0	LOS C	9.6	68.5	NA	NA	NA	38.5
		HV	4		4		0.772	28.0	LOS C	9.6	68.5	NA	NA	NA	38.5
5	T1	All MCs	335	2.0	335	2.0	*0.772	32.9	LOS C	9.6	68.5	1.00	0.93	1.22	40.0
		LV	328		328		*0.772	32.9	LOS C	9.6	68.5	NA	NA	NA	40.0
		HV	7		7		0.772	32.9	LOS C	9.6	68.5	NA	NA	NA	40.0
6	R2	All MCs	175	2.0	175	2.0	*0.690	35.3	LOS D	5.4	38.3	1.00	0.87	1.14	37.2
		LV	171		171		*0.690	35.3	LOS D	5.4	38.3	NA	NA	NA	37.2
		HV	3		3		0.690	35.3	LOS D	5.4	38.3	NA	NA	NA	37.2
Approach			716	2.0	716	2.0	0.772	32.1	LOS C	9.6	68.5	1.00	0.92	1.19	38.8
North: Boundary Rd															
7	L2	All MCs	143	2.0	143	2.0	0.764	23.5	LOS C	10.1	72.2	0.99	0.93	1.15	39.5
		LV	140		140		0.764	23.5	LOS C	10.1	72.2	NA	NA	NA	39.5
		HV	3		3		0.764	23.5	LOS C	10.1	72.2	NA	NA	NA	39.5
8	T1	All MCs	495	2.0	495	2.0	*0.764	29.9	LOS C	10.1	72.2	1.00	0.93	1.17	41.0
		LV	485		485		*0.764	29.9	LOS C	10.1	72.2	NA	NA	NA	41.0
		HV	10		10		0.764	29.9	LOS C	10.1	72.2	NA	NA	NA	41.0
9	R2	All MCs	23	2.0	23	2.0	0.105	32.5	LOS C	0.6	4.6	0.92	0.70	0.92	38.2
		LV	23		23		0.105	32.5	LOS C	0.6	4.6	NA	NA	NA	38.2
		HV	0		0		0.105	32.5	LOS C	0.6	4.6	NA	NA	NA	38.2
Approach			660	2.0	660	2.0	0.764	28.6	LOS C	10.1	72.2	0.99	0.92	1.16	40.6
West: Old Pitt Town Rd															
10	L2	All MCs	26	2.0	26	2.0	0.434	21.1	LOS C	3.7	26.6	0.94	0.76	0.94	40.6
		LV	26		26		0.434	21.1	LOS C	3.7	26.6	NA	NA	NA	40.6
		HV	1		1		0.434	21.1	LOS C	3.7	26.6	NA	NA	NA	40.6
11	T1	All MCs	239	2.0	239	2.0	0.434	27.1	LOS C	3.7	26.6	0.95	0.75	0.95	41.9
		LV	234		234		0.434	27.1	LOS C	3.7	26.6	NA	NA	NA	41.9
		HV	5		5		0.434	27.1	LOS C	3.7	26.6	NA	NA	NA	41.9

12	R2	All MCs	102	2.0	102	2.0	0.402	32.9	LOS C	2.9	20.7	0.96	0.77	0.96	38.1
		LV	100		100		0.402	32.9	LOS C	2.9	20.7	NA	NA	NA	38.1
		HV	2		2		0.402	32.9	LOS C	2.9	20.7	NA	NA	NA	38.1
Approach			367	2.0	367	2.0	0.434	28.2	LOS C	3.7	26.6	0.95	0.76	0.95	40.7
All Vehicles			2560	2.0	2560	2.0	0.772	30.0	LOS C	10.6	75.5	0.99	0.89	1.14	39.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

INTERSECTION SUMMARY

Site: 101v [Boundary_Old Pitt Town_AM 2036 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles:**	**All MCs**	**Persons**	
Travel Speed (Average)	km/h	32.9	32.9	km/h
Travel Distance (Total)	veh-km/h	3690.2	4428.2	pers-km/h
Travel Time (Total)	veh-h/h	112.3	134.7	pers-h/h
Desired Speed	km/h	60.0		
Speed Efficiency		0.55		
Travel Time Index		4.98		
Congestion Coefficient		1.83		
Demand Flows (Total)	veh/h	3612	4334	pers/h
Arrival Flows (Total)	veh/h	3612		
Percent Heavy Vehicles (Demand)	%	2.0		
Percent Heavy Vehicles (Arrivals)	%	2.0		
Degree of Saturation		0.897		
Practical Spare Capacity	%	0.3		
Effective Intersection Capacity	veh/h	4025		
Control Delay (Total)	veh-h/h	50.67	60.80	pers-h/h
Control Delay (Average)	sec	50.5	50.5	sec
Control Delay (Worst Lane by MC)	sec	67.4		
Control Delay (Worst Movement by MC)	sec	67.4	67.4	sec
Geometric Delay (Average)	sec	2.1		
Stop-Line Delay (Average)	sec	48.4		
Idling Time (Average)	sec	42.0		
Intersection Level of Service (LOS)		LOS D		
95% Back of Queue - Veh (Worst Lane)	veh	33.6		
95% Back of Queue - Dist (Worst Lane)	m	239.1		
Ave. Que Storage Ratio (Worst Lane)		0.29		
Effective Stops (Total)	veh/h	3359	4030	pers/h
Effective Stop Rate		0.93	0.93	
Proportion Queued		0.97	0.97	
Performance Index		374.4	374.4	
Cost (Total)	$/h	4929.16	4929.16	$/h
Fuel Consumption (Total)	L/h	388.6		
Carbon Dioxide (Total)	kg/h	917.6		
Hydrocarbons (Total)	kg/h	0.084		
Carbon Monoxide (Total)	kg/h	0.99		
NOx (Total)	kg/h	0.976		

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 7.8% 2.5% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles:**	**All MCs**	**Persons**	
Demand Flows (Total)	veh/y	1,733,558	2,080,270	pers/y
Delay (Total)	veh-h/y	24,321	29,185	pers-h/y
Effective Stops (Total)	veh/y	1,612,155	1,934,586	pers/y
Travel Distance (Total)	veh-km/y	1,771,292	2,125,550	pers-km/y

Travel Time (Total)	veh-h/y	53,890	64,668	pers-h/y
Cost (Total)	$/y	2,365,997	2,365,997	$/y
Fuel Consumption (Total)	L/y	186,505		
Carbon Dioxide (Total)	kg/y	440,458		
Hydrocarbons (Total)	kg/y	40		
Carbon Monoxide (Total)	kg/y	476		
NOx (Total)	kg/y	468		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101v [Boundary_Old Pitt Town_AM 2036 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Boundary Rd															
1	L2	All MCs	71	2.0	71	2.0	0.530	21.8	LOS C	15.3	109.0	0.86	0.76	0.86	38.3
		LV	69		69		0.530	21.8	LOS C	15.3	109.0	NA	NA	NA	38.3
		HV	1		1		0.530	21.8	LOS C	15.3	109.0	NA	NA	NA	38.3
2	T1	All MCs	642	2.0	642	2.0	0.530	33.0	LOS C	15.4	109.7	0.86	0.75	0.86	39.5
		LV	629		629		0.530	33.0	LOS C	15.4	109.7	NA	NA	NA	39.5
		HV	13		13		0.530	33.0	LOS C	15.4	109.7	NA	NA	NA	39.5
3	R2	All MCs	267	2.0	267	2.0	0.861	62.6	LOS E	15.8	112.4	1.00	0.97	1.24	29.1
		LV	262		262		0.861	62.6	LOS E	15.8	112.4	NA	NA	NA	29.1
		HV	5		5		0.861	62.6	LOS E	15.8	112.4	NA	NA	NA	29.1
Approach			980	2.0	980	2.0	0.861	40.3	LOS D	15.8	112.4	0.90	0.81	0.96	35.9
East: Old Pitt Town Rd															
4	L2	All MCs	263	2.0	263	2.0	0.798	49.3	LOS D	17.2	122.6	1.00	0.91	1.12	31.2
		LV	258		258		0.798	49.3	LOS D	17.2	122.6	NA	NA	NA	31.2
		HV	5		5		0.798	49.3	LOS D	17.2	122.6	NA	NA	NA	31.2
5	T1	All MCs	254	2.0	254	2.0	0.798	59.3	LOS E	17.2	122.6	1.00	0.93	1.16	31.6
		LV	249		249		0.798	59.3	LOS E	17.2	122.6	NA	NA	NA	31.6
		HV	5		5		0.798	59.3	LOS E	17.2	122.6	NA	NA	NA	31.6
6	R2	All MCs	111	2.0	111	2.0	0.377	51.6	LOS D	5.4	38.8	0.94	0.78	0.94	31.9
		LV	108		108		0.377	51.6	LOS D	5.4	38.8	NA	NA	NA	31.9
		HV	2		2		0.377	51.6	LOS D	5.4	38.8	NA	NA	NA	31.9
Approach			627	2.0	627	2.0	0.798	53.8	LOS D	17.2	122.6	0.99	0.90	1.10	31.5
North: Boundary Rd															
7	L2	All MCs	202	2.0	202	2.0	0.874	34.8	LOS C	33.6	239.1	1.00	0.99	1.14	33.2
		LV	198		198		0.874	34.8	LOS C	33.6	239.1	NA	NA	NA	33.2
		HV	4		4		0.874	34.8	LOS C	33.6	239.1	NA	NA	NA	33.2
8	T1	All MCs	960	2.0	960	2.0	*0.874	51.2	LOS D	33.6	239.1	1.00	1.01	1.15	34.3
		LV	941		941		*0.874	51.2	LOS D	33.6	239.1	NA	NA	NA	34.3
		HV	19		19		0.874	51.2	LOS D	33.6	239.1	NA	NA	NA	34.3
9	R2	All MCs	117	2.0	117	2.0	0.376	55.2	LOS E	5.7	40.6	0.94	0.78	0.94	32.2
		LV	115		115		0.376	55.2	LOS E	5.7	40.6	NA	NA	NA	32.2
		HV	2		2		0.376	55.2	LOS E	5.7	40.6	NA	NA	NA	32.2
Approach			1279	2.0	1279	2.0	0.874	49.0	LOS D	33.6	239.1	0.99	0.98	1.13	33.9
West: Old Pitt Town Rd															
10	L2	All MCs	85	2.0	85	2.0	*0.886	49.7	LOS D	14.5	103.2	1.00	1.04	1.32	28.9
		LV	84		84		*0.886	49.7	LOS D	14.5	103.2	NA	NA	NA	28.9
		HV	2		2		0.886	49.7	LOS D	14.5	103.2	NA	NA	NA	28.9
11	T1	All MCs	377	2.0	377	2.0	0.886	65.3	LOS E	14.5	103.2	1.00	1.03	1.32	29.8
		LV	369		369		0.886	65.3	LOS E	14.5	103.2	NA	NA	NA	29.8
		HV	8		8		0.886	65.3	LOS E	14.5	103.2	NA	NA	NA	29.8
12	R2	All MCs	263	2.0	263	2.0	*0.897	67.4	LOS E	16.3	115.7	1.00	1.02	1.33	28.1

	LV	258		258		* 0.897	67.4	LOS E	16.3	115.7	NA	NA	NA	28.1
	HV	5		5		0.897	67.4	LOS E	16.3	115.7	NA	NA	NA	28.1
Approach		725	2.0	725	2.0	0.897	64.2	LOS E	16.3	115.7	1.00	1.03	1.32	29.0
All Vehicles		3612	2.0	3612	2.0	0.897	50.5	LOS D	33.6	239.1	0.97	0.93	1.12	32.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

INTERSECTION SUMMARY

Site: 101v [Boundary_Old Pitt Town_PM 2036 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles:**	**All MCs**	**Persons**	
Travel Speed (Average)	km/h	38.8	38.8	km/h
Travel Distance (Total)	veh-km/h	3037.9	3645.4	pers-km/h
Travel Time (Total)	veh-h/h	78.4	94.0	pers-h/h
Desired Speed	km/h	60.0		
Speed Efficiency		0.65		
Travel Time Index		6.07		
Congestion Coefficient		1.55		
Demand Flows (Total)	veh/h	2974	3568	pers/h
Arrival Flows (Total)	veh/h	2974		
Percent Heavy Vehicles (Demand)	%	2.0		
Percent Heavy Vehicles (Arrivals)	%	2.0		
Degree of Saturation		0.849		
Practical Spare Capacity	%	6.0		
Effective Intersection Capacity	veh/h	3501		
Control Delay (Total)	veh-h/h	26.95	32.34	pers-h/h
Control Delay (Average)	sec	32.6	32.6	sec
Control Delay (Worst Lane by MC)	sec	45.9		
Control Delay (Worst Movement by MC)	sec	45.9	45.9	sec
Geometric Delay (Average)	sec	2.1		
Stop-Line Delay (Average)	sec	30.6		
Idling Time (Average)	sec	24.9		
Intersection Level of Service (LOS)		LOS C		
95% Back of Queue - Veh (Worst Lane)	veh	16.7		
95% Back of Queue - Dist (Worst Lane)	m	118.6		
Ave. Que Storage Ratio (Worst Lane)		0.15		
Effective Stops (Total)	veh/h	2673	3207	pers/h
Effective Stop Rate		0.90	0.90	
Proportion Queued		0.98	0.98	
Performance Index		220.4	220.4	
Cost (Total)	$/h	3523.66	3523.66	$/h
Fuel Consumption (Total)	L/h	301.9		
Carbon Dioxide (Total)	kg/h	713.2		
Hydrocarbons (Total)	kg/h	0.063		
Carbon Monoxide (Total)	kg/h	0.79		
NOx (Total)	kg/h	0.785		

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 2 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 11.5% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles:**	**All MCs**	**Persons**	
Demand Flows (Total)	veh/y	1,427,368	1,712,843	pers/y
Delay (Total)	veh-h/y	12,937	15,525	pers-h/y
Effective Stops (Total)	veh/y	1,282,957	1,539,548	pers/y
Travel Distance (Total)	veh-km/y	1,458,169	1,749,802	pers-km/y

Travel Time (Total)	veh-h/y	37,617	45,140	pers-h/y
Cost (Total)	$/y	1,691,354	1,691,354	$/y
Fuel Consumption (Total)	L/y	144,935		
Carbon Dioxide (Total)	kg/y	342,336		
Hydrocarbons (Total)	kg/y	30		
Carbon Monoxide (Total)	kg/y	378		
NOx (Total)	kg/y	377		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101v [Boundary_Old Pitt Town_PM 2036 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Boundary Rd															
1	L2	All MCs	205	2.0	205	2.0	0.814	26.6	LOS C	16.7	118.6	0.99	0.97	1.16	38.3
		LV	201		201		0.814	26.6	LOS C	16.7	118.6	NA	NA	NA	38.3
		HV	4		4		0.814	26.6	LOS C	16.7	118.6	NA	NA	NA	38.3
2	T1	All MCs	700	2.0	700	2.0	*0.814	32.6	LOS C	16.7	118.6	0.99	0.97	1.17	39.8
		LV	686		686		*0.814	32.6	LOS C	16.7	118.6	NA	NA	NA	39.8
		HV	14		14		0.814	32.6	LOS C	16.7	118.6	NA	NA	NA	39.8
3	R2	All MCs	175	2.0	175	2.0	*0.806	43.9	LOS D	6.6	47.3	1.00	0.95	1.31	34.2
		LV	171		171		*0.806	43.9	LOS D	6.6	47.3	NA	NA	NA	34.2
		HV	3		3		0.806	43.9	LOS D	6.6	47.3	NA	NA	NA	34.2
Approach			1080	2.0	1080	2.0	0.814	33.3	LOS C	16.7	118.6	0.99	0.97	1.19	38.5
East: Old Pitt Town Rd															
4	L2	All MCs	219	2.0	219	2.0	0.795	32.7	LOS C	11.7	83.4	1.00	0.95	1.19	36.6
		LV	215		215		0.795	32.7	LOS C	11.7	83.4	NA	NA	NA	36.6
		HV	4		4		0.795	32.7	LOS C	11.7	83.4	NA	NA	NA	36.6
5	T1	All MCs	353	2.0	353	2.0	*0.795	37.9	LOS D	11.7	83.4	1.00	0.95	1.22	37.9
		LV	346		346		*0.795	37.9	LOS D	11.7	83.4	NA	NA	NA	37.9
		HV	7		7		0.795	37.9	LOS D	11.7	83.4	NA	NA	NA	37.9
6	R2	All MCs	184	2.0	184	2.0	*0.849	45.9	LOS D	7.2	51.6	1.00	1.00	1.41	33.6
		LV	181		181		*0.849	45.9	LOS D	7.2	51.6	NA	NA	NA	33.6
		HV	4		4		0.849	45.9	LOS D	7.2	51.6	NA	NA	NA	33.6
Approach			756	2.0	756	2.0	0.849	38.4	LOS D	11.7	83.4	1.00	0.96	1.26	36.4
North: Boundary Rd															
7	L2	All MCs	151	2.0	151	2.0	0.655	21.0	LOS C	11.3	80.7	0.93	0.82	0.93	40.9
		LV	148		148		0.655	21.0	LOS C	11.3	80.7	NA	NA	NA	40.9
		HV	3		3		0.655	21.0	LOS C	11.3	80.7	NA	NA	NA	40.9
8	T1	All MCs	575	2.0	575	2.0	0.655	26.7	LOS C	11.3	80.7	0.94	0.81	0.94	42.4
		LV	563		563		0.655	26.7	LOS C	11.3	80.7	NA	NA	NA	42.4
		HV	11		11		0.655	26.7	LOS C	11.3	80.7	NA	NA	NA	42.4
9	R2	All MCs	24	2.0	24	2.0	0.112	36.9	LOS D	0.8	5.5	0.93	0.70	0.93	36.6
		LV	24		24		0.112	36.9	LOS D	0.8	5.5	NA	NA	NA	36.6
		HV	0		0		0.112	36.9	LOS D	0.8	5.5	NA	NA	NA	36.6
Approach			749	2.0	749	2.0	0.655	25.9	LOS C	11.3	80.7	0.93	0.81	0.94	41.9
West: Old Pitt Town Rd															
10	L2	All MCs	29	2.0	29	2.0	0.441	24.2	LOS C	4.6	32.5	0.94	0.76	0.94	39.0
		LV	29		29		0.441	24.2	LOS C	4.6	32.5	NA	NA	NA	39.0
		HV	1		1		0.441	24.2	LOS C	4.6	32.5	NA	NA	NA	39.0
11	T1	All MCs	252	2.0	252	2.0	0.441	30.9	LOS C	4.6	32.5	0.95	0.76	0.95	40.2
		LV	247		247		0.441	30.9	LOS C	4.6	32.5	NA	NA	NA	40.2
		HV	5		5		0.441	30.9	LOS C	4.6	32.5	NA	NA	NA	40.2
12	R2	All MCs	107	2.0	107	2.0	0.495	39.0	LOS D	3.7	26.1	0.98	0.78	0.98	35.8

	LV	105		105		0.495	39.0	LOS D	3.7	26.1	NA	NA	NA	35.8
	HV	2		2		0.495	39.0	LOS D	3.7	26.1	NA	NA	NA	35.8
Approach		388	2.0	388	2.0	0.495	32.6	LOS C	4.6	32.5	0.96	0.76	0.96	38.8
All Vehicles		2974	2.0	2974	2.0	0.849	32.6	LOS C	16.7	118.6	0.98	0.90	1.11	38.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

INTERSECTION SUMMARY

Site: 101 [Old Pitt Town_Valletta_AM_Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	53.9	53.9 km/h
Travel Distance (Total)	veh-km/h	1217.9	1461.5 pers-km/h
Travel Time (Total)	veh-h/h	22.6	27.1 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.90	
Travel Time Index		8.86	
Congestion Coefficient		1.11	
Demand Flows (Total)	veh/h	1201	1441 pers/h
Arrival Flows (Total)	veh/h	1201	
Percent Heavy Vehicles (Demand)	%	2.0	
Percent Heavy Vehicles (Arrivals)	%	2.0	
Degree of Saturation		0.298	
Practical Spare Capacity	%	168.7	
Effective Intersection Capacity	veh/h	4033	
Control Delay (Total)	veh-h/h	1.59	1.90 pers-h/h
Control Delay (Average)	sec	4.8	4.8 sec
Control Delay (Worst Lane by MC)	sec	11.8	
Control Delay (Worst Movement by MC)	sec	23.3	23.3 sec
Geometric Delay (Average)	sec	3.8	
Stop-Line Delay (Average)	sec	1.0	
Idling Time (Average)	sec	0.2	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	1.4	
95% Back of Queue - Dist (Worst Lane)	m	10.1	
Ave. Que Storage Ratio (Worst Lane)		0.00	
Effective Stops (Total)	veh/h	521	625 pers/h
Effective Stop Rate		0.43	0.43
Proportion Queued		0.27	0.27
Performance Index		27.2	27.2
Cost (Total)	$/h	1046.31	1046.31 $/h
Fuel Consumption (Total)	L/h	98.1	
Carbon Dioxide (Total)	kg/h	231.9	
Hydrocarbons (Total)	kg/h	0.019	
Carbon Monoxide (Total)	kg/h	0.27	
NOx (Total)	kg/h	0.249	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 74.7% 29.4% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Demand Flows (Total)	veh/y	576,505	691,806 pers/y
Delay (Total)	veh-h/y	761	914 pers-h/y

Effective Stops (Total)	veh/y	250,030	300,036	pers/y
Travel Distance (Total)	veh-km/y	584,595	701,514	pers-km/y
Travel Time (Total)	veh-h/y	10,852	13,023	pers-h/y
Cost (Total)	$/y	502,229	502,229	$/y
Fuel Consumption (Total)	L/y	47,104		
Carbon Dioxide (Total)	kg/y	111,332		
Hydrocarbons (Total)	kg/y	9		
Carbon Monoxide (Total)	kg/y	130		
NOx (Total)	kg/y	120		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101 [Old Pitt Town_Valletta_AM_Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Old Pitt Town Rd															
5	T1	All MCs	131	2.0	131	2.0	0.068	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
		LV	128		128		0.068	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
		HV	3		3		0.068	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
6	R2	All MCs	311	2.0	311	2.0	0.240	6.9	LOS A	1.2	8.4	0.46	0.65	0.46	51.4
		LV	304		304		0.240	6.9	LOS A	1.2	8.4	NA	NA	NA	51.4
		HV	6		6		0.240	8.9	LOS A	1.2	8.4	NA	NA	NA	50.0
Approach			441	2.0	441	2.0	0.240	4.9	NA	1.2	8.4	0.32	0.46	0.32	53.7
North: Valletta Dr															
7	L2	All MCs	381	2.0	381	2.0	0.298	6.7	LOS A	1.4	10.1	0.40	0.62	0.40	51.6
		LV	373		373		0.298	6.7	LOS A	1.4	10.1	NA	NA	NA	51.6
		HV	8		8		0.298	8.2	LOS A	1.4	10.1	NA	NA	NA	50.5
9	R2	All MCs	49	2.0	49	2.0	0.107	11.8	LOS B	0.4	2.7	0.63	0.85	0.63	48.2
		LV	48		48		0.107	11.6	LOS B	0.4	2.7	NA	NA	NA	48.3
		HV	1		1		0.107	23.3	LOS C	0.4	2.7	NA	NA	NA	41.8
Approach			431	2.0	431	2.0	0.298	7.3	LOS A	1.4	10.1	0.43	0.64	0.43	51.2
West: Old Pitt Town Rd															
10	L2	All MCs	72	2.0	72	2.0	0.173	5.6	LOS A	0.0	0.0	0.00	0.13	0.00	56.3
		LV	70		70		0.173	5.6	LOS A	0.0	0.0	NA	NA	NA	56.3
		HV	1		1		0.173	5.6	LOS A	0.0	0.0	NA	NA	NA	56.3
11	T1	All MCs	258	2.0	258	2.0	0.173	0.0	LOS A	0.0	0.0	0.00	0.13	0.00	58.8
		LV	253		253		0.173	0.0	LOS A	0.0	0.0	NA	NA	NA	58.8
		HV	5		5		0.173	0.0	LOS A	0.0	0.0	NA	NA	NA	58.8
Approach			329	2.0	329	2.0	0.173	1.3	NA	0.0	0.0	0.00	0.13	0.00	58.2
All Vehicles			1201	2.0	1201	2.0	0.298	4.8	NA	1.4	10.1	0.27	0.43	0.27	53.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 101 [Old Pitt Town_Valletta_PM_Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	56.0	56.0 km/h
Travel Distance (Total)	veh-km/h	753.3	904.0 pers-km/h
Travel Time (Total)	veh-h/h	13.4	16.1 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.93	
Travel Time Index		9.27	
Congestion Coefficient		1.07	
Demand Flows (Total)	veh/h	743	892 pers/h
Arrival Flows (Total)	veh/h	743	
Percent Heavy Vehicles (Demand)	%	2.0	
Percent Heavy Vehicles (Arrivals)	%	2.0	
Degree of Saturation		0.131	
Practical Spare Capacity	%	646.7	
Effective Intersection Capacity	veh/h	5663	
Control Delay (Total)	veh-h/h	0.58	0.70 pers-h/h
Control Delay (Average)	sec	2.8	2.8 sec
Control Delay (Worst Lane by MC)	sec	9.6	
Control Delay (Worst Movement by MC)	sec	16.3	16.3 sec
Geometric Delay (Average)	sec	2.4	
Stop-Line Delay (Average)	sec	0.4	
Idling Time (Average)	sec	0.1	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	0.4	
95% Back of Queue - Dist (Worst Lane)	m	3.2	
Ave. Que Storage Ratio (Worst Lane)		0.00	
Effective Stops (Total)	veh/h	191	230 pers/h
Effective Stop Rate		0.26	0.26
Proportion Queued		0.12	0.12
Performance Index		15.0	15.0
Cost (Total)	$/h	614.21	614.21 $/h
Fuel Consumption (Total)	L/h	55.5	
Carbon Dioxide (Total)	kg/h	131.1	
Hydrocarbons (Total)	kg/h	0.010	
Carbon Monoxide (Total)	kg/h	0.16	
NOx (Total)	kg/h	0.132	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 68.0% 18.5% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Demand Flows (Total)	veh/y	356,716	428,059 pers/y
Delay (Total)	veh-h/y	279	335 pers-h/y

Effective Stops (Total)	veh/y	91,868	110,242	pers/y
Travel Distance (Total)	veh-km/y	361,585	433,902	pers-km/y
Travel Time (Total)	veh-h/y	6,451	7,741	pers-h/y
Cost (Total)	$/y	294,820	294,820	$/y
Fuel Consumption (Total)	L/y	26,617		
Carbon Dioxide (Total)	kg/y	62,931		
Hydrocarbons (Total)	kg/y	5		
Carbon Monoxide (Total)	kg/y	75		
NOx (Total)	kg/y	63		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101 [Old Pitt Town_Valletta_PM_Existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Old Pitt Town Rd															
5	T1	All MCs	253	2.0	253	2.0	0.131	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
		LV	248		248		0.131	0.0	LOS A	0.0	0.0	NA	NA	NA	59.9
		HV	5		5		0.131	0.0	LOS A	0.0	0.0	NA	NA	NA	59.9
6	R2	All MCs	144	2.0	144	2.0	0.097	6.2	LOS A	0.4	3.2	0.31	0.57	0.31	51.8
		LV	141		141		0.097	6.2	LOS A	0.4	3.2	NA	NA	NA	51.8
		HV	3		3		0.097	7.0	LOS A	0.4	3.2	NA	NA	NA	51.2
Approach			397	2.0	397	2.0	0.131	2.3	NA	0.4	3.2	0.11	0.21	0.11	56.7
North: Valletta Dr															
7	L2	All MCs	129	2.0	129	2.0	0.092	6.1	LOS A	0.4	2.7	0.26	0.56	0.26	52.0
		LV	127		127		0.092	6.1	LOS A	0.4	2.7	NA	NA	NA	52.0
		HV	3		3		0.092	6.8	LOS A	0.4	2.7	NA	NA	NA	51.5
9	R2	All MCs	24	2.0	24	2.0	0.041	9.6	LOS A	0.1	1.1	0.54	0.74	0.54	49.6
		LV	24		24		0.041	9.4	LOS A	0.1	1.1	NA	NA	NA	49.7
		HV	0		0		0.041	16.3	LOS C	0.1	1.1	NA	NA	NA	45.5
Approach			154	2.0	154	2.0	0.092	6.6	LOS A	0.4	2.7	0.31	0.59	0.31	51.6
West: Old Pitt Town Rd															
10	L2	All MCs	31	2.0	31	2.0	0.101	5.6	LOS A	0.0	0.0	0.00	0.09	0.00	56.6
		LV	30		30		0.101	5.6	LOS A	0.0	0.0	NA	NA	NA	56.6
		HV	1		1		0.101	5.6	LOS A	0.0	0.0	NA	NA	NA	56.6
11	T1	All MCs	162	2.0	162	2.0	0.101	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	59.1
		LV	159		159		0.101	0.0	LOS A	0.0	0.0	NA	NA	NA	59.1
		HV	3		3		0.101	0.0	LOS A	0.0	0.0	NA	NA	NA	59.1
Approach			193	2.0	193	2.0	0.101	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.7
All Vehicles			743	2.0	743	2.0	0.131	2.8	NA	0.4	3.2	0.12	0.26	0.12	56.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 101v [Old Pitt Town_Valletta_AM_2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Pedestrians	Persons
Travel Speed (Average)	km/h	32.2	3.8 km/h	30.2 km/h
Travel Distance (Total)	veh-km/h	3873.6	42.1 ped-km/h	4690.4 pers-km/h
Travel Time (Total)	veh-h/h	120.4	11.0 ped-h/h	155.5 pers-h/h
Desired Speed	km/h	60.0		
Speed Efficiency		0.54		
Travel Time Index		4.84		
Congestion Coefficient		1.87		
Demand Flows (Total)	veh/h	3795	211 ped/h	4764 pers/h
Arrival Flows (Total)	veh/h	3795		
Percent Heavy Vehicles (Demand)	%	2.0		
Percent Heavy Vehicles (Arrivals)	%	2.0		
Degree of Saturation		1.028	0.058	
Practical Spare Capacity	%	-12.5		
Effective Intersection Capacity	veh/h	3691		
Control Delay (Total)	veh-h/h	57.06	2.01 ped-h/h	70.47 pers-h/h
Control Delay (Average)	sec	54.1	34.3 sec	53.3 sec
Control Delay (Worst Lane by MC)	sec	97.1		
Control Delay (Worst Movement by MC)	sec	97.1	34.3 sec	97.1 sec
Geometric Delay (Average)	sec	1.8		
Stop-Line Delay (Average)	sec	52.3		
Idling Time (Average)	sec	42.7		
Intersection Level of Service (LOS)		LOS D	LOS D	
95% Back of Queue - Veh (Worst Lane)	veh	40.8		
95% Back of Queue - Dist (Worst Lane)	m	290.3		
Ave. Que Storage Ratio (Worst Lane)		0.36		
Effective Stops (Total)	veh/h	4115	195 ped/h	5134 pers/h
Effective Stop Rate		1.08	0.93	1.08
Proportion Queued		0.91	0.93	0.91
Performance Index		318.0	12.1	330.1
Cost (Total)	$/h	5281.99	316.88 $/h	5598.87 $/h
Fuel Consumption (Total)	L/h	414.7		
Carbon Dioxide (Total)	kg/h	979.2		
Hydrocarbons (Total)	kg/h	0.090		
Carbon Monoxide (Total)	kg/h	1.05		
NOx (Total)	kg/h	1.035		

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 74.2% 6.2% 0.0%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Pedestrians	Persons
Demand Flows (Total)	veh/y	1,821,474	101,053 ped/y	2,286,821 pers/y
Delay (Total)	veh-h/y	27,387	963 ped-h/y	33,828 pers-h/y

Effective Stops (Total)	veh/y	1,975,436	93,679	ped/y	2,464,202	pers/y
Travel Distance (Total)	veh-km/y	1,859,332	20,211	ped-km/y	2,251,409	pers-km/y
Travel Time (Total)	veh-h/y	57,810	5,281	ped-h/y	74,654	pers-h/y
Cost (Total)	$/y	2,535,354	152,102	$/y	2,687,455	$/y
Fuel Consumption (Total)	L/y	199,046				
Carbon Dioxide (Total)	kg/y	470,009				
Hydrocarbons (Total)	kg/y	43				
Carbon Monoxide (Total)	kg/y	505				
NOx (Total)	kg/y	497				

1 Hours per Year: 480 (Site)

12	R2	All MCs	87	0.0	87	0.0	0.248	21.4	LOS C	1.9	13.1	0.79	0.73	0.79	44.1
		LV	87		87		0.248	21.4	LOS C	1.9	13.1	NA	NA	NA	44.1
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			1095	1.8	1095	1.8	1.028	82.2	LOS F	31.6	225.1	0.97	1.39	1.77	25.7
All Vehicles			3795	2.0	3795	2.0	1.028	54.1	LOS D	40.8	290.3	0.91	1.08	1.32	32.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Mount Carmel Dr												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
East: Old Pitt Town Rd												
P2	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Valletta Dr												
P3	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
West: Old Pitt Town Rd												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		50	211	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

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.

INTERSECTION SUMMARY

Site: 101v [Old Pitt Town_Valletta_PM_2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values						
Performance Measure	**Vehicles:**	**All MCs**	**Pedestrians**		**Persons**	
Travel Speed (Average)	km/h	41.6	3.8	km/h	38.3	km/h
Travel Distance (Total)	veh-km/h	3903.4	42.1	ped-km/h	4726.2	pers-km/h
Travel Time (Total)	veh-h/h	93.8	11.0	ped-h/h	123.5	pers-h/h
Desired Speed	km/h	60.0				
Speed Efficiency		0.69				
Travel Time Index		6.60				
Congestion Coefficient		1.44				
Demand Flows (Total)	veh/h	3823	211	ped/h	4798	pers/h
Arrival Flows (Total)	veh/h	3823				
Percent Heavy Vehicles (Demand)	%	2.0				
Percent Heavy Vehicles (Arrivals)	%	2.0				
Degree of Saturation		0.831	0.058			
Practical Spare Capacity	%	8.4				
Effective Intersection Capacity	veh/h	4603				
Control Delay (Total)	veh-h/h	28.86	2.01	ped-h/h	36.64	pers-h/h
Control Delay (Average)	sec	27.2	34.3	sec	27.5	sec
Control Delay (Worst Lane by MC)	sec	48.2				
Control Delay (Worst Movement by MC)	sec	48.2	34.3	sec	48.2	sec
Geometric Delay (Average)	sec	1.3				
Stop-Line Delay (Average)	sec	25.8				
Idling Time (Average)	sec	20.2				
Intersection Level of Service (LOS)		LOS C	LOS D			
95% Back of Queue - Veh (Worst Lane)	veh	23.0				
95% Back of Queue - Dist (Worst Lane)	m	163.6				
Ave. Que Storage Ratio (Worst Lane)		0.20				
Effective Stops (Total)	veh/h	3252	195	ped/h	4098	pers/h
Effective Stop Rate		0.85	0.93		0.85	
Proportion Queued		0.91	0.93		0.91	
Performance Index		242.9	12.1		255.0	
Cost (Total)	$/h	4254.06	316.88	$/h	4570.94	$/h
Fuel Consumption (Total)	L/h	375.2				
Carbon Dioxide (Total)	kg/h	886.2				
Hydrocarbons (Total)	kg/h	0.078				
Carbon Monoxide (Total)	kg/h	0.99				
NOx (Total)	kg/h	0.964				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 2 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 20.5% 0.0%

Intersection Performance - Annual Values						
Performance Measure	**Vehicles:**	**All MCs**	**Pedestrians**		**Persons**	
Demand Flows (Total)	veh/y	1,835,116	101,053	ped/y	2,303,192	pers/y
Delay (Total)	veh-h/y	13,852	963	ped-h/y	17,585	pers-h/y

Effective Stops (Total)	veh/y	1,561,070	93,679	ped/y	1,966,963	pers/y
Travel Distance (Total)	veh-km/y	1,873,621	20,211	ped-km/y	2,268,556	pers-km/y
Travel Time (Total)	veh-h/y	45,015	5,281	ped-h/y	59,299	pers-h/y
Cost (Total)	$/y	2,041,948	152,102	$/y	2,194,049	$/y
Fuel Consumption (Total)	L/y	180,090				
Carbon Dioxide (Total)	kg/y	425,364				
Hydrocarbons (Total)	kg/y	37				
Carbon Monoxide (Total)	kg/y	475				
NOx (Total)	kg/y	463				

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101v [Old Pitt Town_Valletta_PM_2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Mount Carmel Dr															
1	L2	All MCs	87	2.0	87	2.0	0.298	24.1	LOS C	4.9	35.1	0.81	0.72	0.81	40.6
		LV	86		86		0.298	24.1	LOS C	4.9	35.1	NA	NA	NA	40.6
		HV	2		2		0.298	24.1	LOS C	4.9	35.1	NA	NA	NA	40.6
2	T1	All MCs	225	2.0	225	2.0	0.298	26.9	LOS C	4.9	35.1	0.83	0.70	0.83	42.1
		LV	221		221		0.298	26.9	LOS C	4.9	35.1	NA	NA	NA	42.1
		HV	5		5		0.298	26.9	LOS C	4.9	35.1	NA	NA	NA	42.1
3	R2	All MCs	87	2.0	87	2.0	0.667	48.2	LOS D	3.7	26.2	1.00	0.84	1.16	32.8
		LV	86		86		0.667	48.2	LOS D	3.7	26.2	NA	NA	NA	32.8
		HV	2		2		0.667	48.2	LOS D	3.7	26.2	NA	NA	NA	32.8
Approach			400	2.0	400	2.0	0.667	31.0	LOS C	4.9	35.1	0.86	0.73	0.90	39.4
East: Old Pitt Town Rd															
4	L2	All MCs	87	2.0	87	2.0	0.740	26.6	LOS C	20.5	146.3	0.89	0.82	0.91	42.9
		LV	86		86		0.740	26.6	LOS C	20.5	146.3	NA	NA	NA	42.9
		HV	2		2		0.740	26.6	LOS C	20.5	146.3	NA	NA	NA	42.9
5	T1	All MCs	1155	2.0	1155	2.0	0.740	20.8	LOS C	20.7	147.2	0.89	0.81	0.91	44.6
		LV	1132		1132		0.740	20.8	LOS C	20.7	147.2	NA	NA	NA	44.6
		HV	23		23		0.740	20.8	LOS C	20.7	147.2	NA	NA	NA	44.6
6	R2	All MCs	219	2.0	219	2.0	*0.564	21.2	LOS C	4.2	30.0	0.94	0.81	0.94	43.2
		LV	215		215		*0.564	21.2	LOS C	4.2	30.0	NA	NA	NA	43.2
		HV	4		4		0.564	21.2	LOS C	4.2	30.0	NA	NA	NA	43.2
Approach			1461	2.0	1461	2.0	0.740	21.2	LOS C	20.7	147.2	0.90	0.81	0.91	44.3
North: Valletta Dr															
7	L2	All MCs	189	2.0	189	2.0	0.251	22.2	LOS C	4.9	34.6	0.69	0.75	0.69	42.6
		LV	186		186		0.251	22.2	LOS C	4.9	34.6	NA	NA	NA	42.6
		HV	4		4		0.251	22.2	LOS C	4.9	34.6	NA	NA	NA	42.6
8	T1	All MCs	379	2.0	379	2.0	*0.750	31.9	LOS C	14.5	103.3	0.98	0.89	1.06	39.6
		LV	371		371		*0.750	31.9	LOS C	14.5	103.3	NA	NA	NA	39.6
		HV	8		8		0.750	31.9	LOS C	14.5	103.3	NA	NA	NA	39.6
9	R2	All MCs	71	2.0	71	2.0	0.276	36.1	LOS D	2.4	17.4	0.89	0.76	0.89	36.8
		LV	69		69		0.276	36.1	LOS D	2.4	17.4	NA	NA	NA	36.8
		HV	1		1		0.276	36.1	LOS D	2.4	17.4	NA	NA	NA	36.8
Approach			639	2.0	639	2.0	0.750	29.5	LOS C	14.5	103.3	0.88	0.83	0.93	40.1
West: Old Pitt Town Rd															
10	L2	All MCs	96	2.0	96	2.0	0.144	26.0	LOS C	2.5	17.9	0.71	0.73	0.71	41.7
		LV	94		94		0.144	26.0	LOS C	2.5	17.9	NA	NA	NA	41.7
		HV	2		2		0.144	26.0	LOS C	2.5	17.9	NA	NA	NA	41.7
11	T1	All MCs	1143	2.0	1143	2.0	*0.831	32.5	LOS C	23.0	163.6	0.98	0.97	1.12	40.1
		LV	1120		1120		*0.831	32.5	LOS C	23.0	163.6	NA	NA	NA	40.1
		HV	23		23		0.831	32.5	LOS C	23.0	163.6	NA	NA	NA	40.1

12	R2	All MCs	84	0.0	84	0.0	0.306	24.0	LOS C	1.5	10.8	0.85	0.75	0.85	43.9
		LV	84		84		0.306	24.0	LOS C	1.5	10.8	NA	NA	NA	43.9
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			1323	1.9	1323	1.9	0.831	31.5	LOS C	23.0	163.6	0.95	0.93	1.07	40.4
All Vehicles			3823	2.0	3823	2.0	0.831	27.2	LOS C	23.0	163.6	0.91	0.85	0.97	41.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Mount Carmel Dr												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
East: Old Pitt Town Rd												
P2	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Valletta Dr												
P3	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
West: Old Pitt Town Rd												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		50	211	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

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.

INTERSECTION SUMMARY

Site: 101v [Old Pitt Town_Valletta_AM_2036 + Slip (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values						
Performance Measure	**Vehicles:**	**All MCs**	**Pedestrians**		**Persons**	
Travel Speed (Average)	km/h	33.4	3.8	km/h	31.2	km/h
Travel Distance (Total)	veh-km/h	3876.5	42.1	ped-km/h	4693.9	pers-km/h
Travel Time (Total)	veh-h/h	116.1	11.0	ped-h/h	150.3	pers-h/h
Desired Speed	km/h	60.0				
Speed Efficiency		0.56				
Travel Time Index		5.07				
Congestion Coefficient		1.80				
Demand Flows (Total)	veh/h	3795	211	ped/h	4764	pers/h
Arrival Flows (Total)	veh/h	3795				
Percent Heavy Vehicles (Demand)	%	2.0				
Percent Heavy Vehicles (Arrivals)	%	2.0				
Degree of Saturation		1.053	0.058			
Practical Spare Capacity	%	-14.6				
Effective Intersection Capacity	veh/h	3602				
Control Delay (Total)	veh-h/h	52.53	2.01	ped-h/h	65.04	pers-h/h
Control Delay (Average)	sec	49.8	34.3	sec	49.1	sec
Control Delay (Worst Lane by MC)	sec	115.9				
Control Delay (Worst Movement by MC)	sec	115.9	34.3	sec	115.9	sec
Geometric Delay (Average)	sec	1.8				
Stop-Line Delay (Average)	sec	48.0				
Idling Time (Average)	sec	38.9				
Intersection Level of Service (LOS)		LOS D	LOS D			
95% Back of Queue - Veh (Worst Lane)	veh	44.1				
95% Back of Queue - Dist (Worst Lane)	m	314.2				
Ave. Que Storage Ratio (Worst Lane)		0.39				
Effective Stops (Total)	veh/h	4017	195	ped/h	5015	pers/h
Effective Stop Rate		1.06	0.93		1.05	
Proportion Queued		0.92	0.93		0.92	
Performance Index		308.4	12.1		320.4	
Cost (Total)	$/h	5116.19	316.88	$/h	5433.06	$/h
Fuel Consumption (Total)	L/h	408.8				
Carbon Dioxide (Total)	kg/h	965.3				
Hydrocarbons (Total)	kg/h	0.088				
Carbon Monoxide (Total)	kg/h	1.04				
NOx (Total)	kg/h	1.026				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 5.6 %
Number of Iterations: 5 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 7.2% 9.6% 0.0%

Intersection Performance - Annual Values						
Performance Measure	**Vehicles:**	**All MCs**	**Pedestrians**		**Persons**	
Demand Flows (Total)	veh/y	1,821,474	101,053	ped/y	2,286,821	pers/y
Delay (Total)	veh-h/y	25,214	963	ped-h/y	31,219	pers-h/y

Effective Stops (Total)	veh/y	1,927,939	93,679	ped/y	2,407,206	pers/y
Travel Distance (Total)	veh-km/y	1,860,709	20,211	ped-km/y	2,253,061	pers-km/y
Travel Time (Total)	veh-h/y	55,728	5,281	ped-h/y	72,155	pers-h/y
Cost (Total)	$/y	2,455,769	152,102	$/y	2,607,870	$/y
Fuel Consumption (Total)	L/y	196,219				
Carbon Dioxide (Total)	kg/y	463,350				
Hydrocarbons (Total)	kg/y	42				
Carbon Monoxide (Total)	kg/y	500				
NOx (Total)	kg/y	492				

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101v [Old Pitt Town_Valletta_AM_2036 + Slip (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Mount Carmel Dr															
1	L2	All MCs	87	2.0	87	2.0	0.344	20.0	LOS C	6.4	45.9	0.78	0.71	0.78	42.2
		LV	86		86		0.344	20.0	LOS C	6.4	45.9	NA	NA	NA	42.2
		HV	2		2		0.344	20.0	LOS C	6.4	45.9	NA	NA	NA	42.2
2	T1	All MCs	349	2.0	349	2.0	0.344	23.3	LOS C	6.5	45.9	0.80	0.68	0.80	43.9
		LV	342		342		0.344	23.3	LOS C	6.5	45.9	NA	NA	NA	43.9
		HV	7		7		0.344	23.3	LOS C	6.5	45.9	NA	NA	NA	43.9
3	R2	All MCs	87	2.0	87	2.0	0.889	55.6	LOS E	4.0	28.3	1.00	0.96	1.59	30.8
		LV	86		86		0.889	55.6	LOS E	4.0	28.3	NA	NA	NA	30.8
		HV	2		2		0.889	55.6	LOS E	4.0	28.3	NA	NA	NA	30.8
Approach			524	2.0	524	2.0	0.889	28.2	LOS C	6.5	45.9	0.83	0.73	0.93	40.7
East: Old Pitt Town Rd															
4	L2	All MCs	87	2.0	87	2.0	0.546	27.8	LOS C	11.8	84.0	0.85	0.75	0.85	42.1
		LV	86		86		0.546	27.8	LOS C	11.8	84.0	NA	NA	NA	42.1
		HV	2		2		0.546	27.8	LOS C	11.8	84.0	NA	NA	NA	42.1
5	T1	All MCs	671	2.0	671	2.0	0.546	22.0	LOS C	11.9	85.0	0.85	0.74	0.85	43.8
		LV	657		657		0.546	22.0	LOS C	11.9	85.0	NA	NA	NA	43.8
		HV	13		13		0.546	22.0	LOS C	11.9	85.0	NA	NA	NA	43.8
6	R2	All MCs	408	2.0	408	2.0	*0.879	37.1	LOS D	14.5	103.5	1.00	0.99	1.30	36.4
		LV	400		400		*0.879	37.1	LOS D	14.5	103.5	NA	NA	NA	36.4
		HV	8		8		0.879	37.1	LOS D	14.5	103.5	NA	NA	NA	36.4
Approach			1166	2.0	1166	2.0	0.879	27.7	LOS C	14.5	103.5	0.90	0.83	1.01	40.8
North: Valletta Dr															
7	L2	All MCs	298	2.0	298	2.0	0.512	18.2	LOS B	5.7	40.2	0.84	0.78	0.84	45.0
		LV	292		292		0.512	18.2	LOS B	5.7	40.2	NA	NA	NA	45.0
		HV	6		6		0.512	18.2	LOS B	5.7	40.2	NA	NA	NA	45.0
8	T1	All MCs	595	2.0	595	2.0	*1.053	115.9	LOS F	44.1	314.2	1.00	1.66	2.06	22.0
		LV	583		583		*1.053	115.9	LOS F	44.1	314.2	NA	NA	NA	22.0
		HV	12		12		1.053	115.9	LOS F	44.1	314.2	NA	NA	NA	22.0
9	R2	All MCs	117	2.0	117	2.0	0.429	44.2	LOS D	4.1	28.9	0.89	0.79	0.89	37.3
		LV	115		115		0.429	44.2	LOS D	4.1	28.9	NA	NA	NA	37.3
		HV	2		2		0.429	44.2	LOS D	4.1	28.9	NA	NA	NA	37.3
Approach			1009	2.0	1009	2.0	1.053	78.8	LOS E	44.1	314.2	0.94	1.30	1.56	27.4
West: Old Pitt Town Rd															
10	L2	All MCs	67	2.0	67	2.0	0.076	12.2	LOS B	1.0	7.2	0.52	0.67	0.52	48.5
		LV	66		66		0.076	12.2	LOS B	1.0	7.2	NA	NA	NA	48.5
		HV	1		1		0.076	12.2	LOS B	1.0	7.2	NA	NA	NA	48.5
11	T1	All MCs	940	2.0	940	2.0	*0.977	63.8	LOS E	27.0	192.0	1.00	1.32	1.64	29.4
		LV	921		921		*0.977	63.8	LOS E	27.0	192.0	NA	NA	NA	29.4
		HV	19		19		0.977	63.8	LOS E	27.0	192.0	NA	NA	NA	29.4

12	R2	All MCs	87	0.0	87	0.0	0.241	19.1	LOS B	1.8	12.8	0.78	0.73	0.78	44.4
		LV	87		87		0.241	19.1	LOS B	1.8	12.8	NA	NA	NA	44.4
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			1095	1.8	1095	1.8	0.977	57.1	LOS E	27.0	192.0	0.95	1.23	1.50	31.0
All Vehicles			3795	2.0	3795	2.0	1.053	49.8	LOS D	44.1	314.2	0.92	1.06	1.29	33.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Mount Carmel Dr												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
East: Old Pitt Town Rd												
P2	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Valletta Dr												
P3	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
West: Old Pitt Town Rd												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		50	211	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

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.

INTERSECTION SUMMARY

Site: 101v [Old Pitt Town_Valletta_PM_2036 + Slip (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values						
Performance Measure	**Vehicles:**	**All MCs**	**Pedestrians**		**Persons**	
Travel Speed (Average)	km/h	41.9	3.8	km/h	38.5	km/h
Travel Distance (Total)	veh-km/h	3904.9	42.1	ped-km/h	4727.9	pers-km/h
Travel Time (Total)	veh-h/h	93.3	11.0	ped-h/h	122.9	pers-h/h
Desired Speed	km/h	60.0				
Speed Efficiency		0.70				
Travel Time Index		6.64				
Congestion Coefficient		1.43				
Demand Flows (Total)	veh/h	3823	211	ped/h	4798	pers/h
Arrival Flows (Total)	veh/h	3823				
Percent Heavy Vehicles (Demand)	%	2.0				
Percent Heavy Vehicles (Arrivals)	%	2.0				
Degree of Saturation		0.831	0.058			
Practical Spare Capacity	%	8.4				
Effective Intersection Capacity	veh/h	4603				
Control Delay (Total)	veh-h/h	28.34	2.01	ped-h/h	36.02	pers-h/h
Control Delay (Average)	sec	26.7	34.3	sec	27.0	sec
Control Delay (Worst Lane by MC)	sec	47.5				
Control Delay (Worst Movement by MC)	sec	47.5	34.3	sec	47.5	sec
Geometric Delay (Average)	sec	1.3				
Stop-Line Delay (Average)	sec	25.3				
Idling Time (Average)	sec	19.7				
Intersection Level of Service (LOS)		LOS C	LOS D			
95% Back of Queue - Veh (Worst Lane)	veh	23.0				
95% Back of Queue - Dist (Worst Lane)	m	163.6				
Ave. Que Storage Ratio (Worst Lane)		0.20				
Effective Stops (Total)	veh/h	3241	195	ped/h	4084	pers/h
Effective Stop Rate		0.85	0.93		0.85	
Proportion Queued		0.90	0.93		0.91	
Performance Index		240.3	12.1		252.4	
Cost (Total)	$/h	4234.62	316.88	$/h	4551.50	$/h
Fuel Consumption (Total)	L/h	374.5				
Carbon Dioxide (Total)	kg/h	884.6				
Hydrocarbons (Total)	kg/h	0.077				
Carbon Monoxide (Total)	kg/h	0.99				
NOx (Total)	kg/h	0.963				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 2 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 20.5% 0.0%

Intersection Performance - Annual Values						
Performance Measure	**Vehicles:**	**All MCs**	**Pedestrians**		**Persons**	
Demand Flows (Total)	veh/y	1,835,116	101,053	ped/y	2,303,192	pers/y
Delay (Total)	veh-h/y	13,605	963	ped-h/y	17,289	pers-h/y

Effective Stops (Total)	veh/y	1,555,651	93,679	ped/y	1,960,461	pers/y
Travel Distance (Total)	veh-km/y	1,874,335	20,211	ped-km/y	2,269,413	pers-km/y
Travel Time (Total)	veh-h/y	44,769	5,281	ped-h/y	59,005	pers-h/y
Cost (Total)	$/y	2,032,619	152,102	$/y	2,184,720	$/y
Fuel Consumption (Total)	L/y	179,773				
Carbon Dioxide (Total)	kg/y	424,619				
Hydrocarbons (Total)	kg/y	37				
Carbon Monoxide (Total)	kg/y	474				
NOx (Total)	kg/y	462				

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101v [Old Pitt Town_Valletta_PM_2036 + Slip (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Mount Carmel Dr															
1	L2	All MCs	87	2.0	87	2.0	0.298	24.1	LOS C	4.9	35.1	0.81	0.72	0.81	40.6
		LV	86		86		0.298	24.1	LOS C	4.9	35.1	NA	NA	NA	40.6
		HV	2		2		0.298	24.1	LOS C	4.9	35.1	NA	NA	NA	40.6
2	T1	All MCs	225	2.0	225	2.0	0.298	26.9	LOS C	4.9	35.1	0.83	0.70	0.83	42.1
		LV	221		221		0.298	26.9	LOS C	4.9	35.1	NA	NA	NA	42.1
		HV	5		5		0.298	26.9	LOS C	4.9	35.1	NA	NA	NA	42.1
3	R2	All MCs	87	2.0	87	2.0	0.630	47.5	LOS D	3.6	25.8	1.00	0.82	1.11	33.0
		LV	86		86		0.630	47.5	LOS D	3.6	25.8	NA	NA	NA	33.0
		HV	2		2		0.630	47.5	LOS D	3.6	25.8	NA	NA	NA	33.0
Approach			400	2.0	400	2.0	0.630	30.8	LOS C	4.9	35.1	0.86	0.73	0.89	39.4
East: Old Pitt Town Rd															
4	L2	All MCs	87	2.0	87	2.0	0.740	26.6	LOS C	20.5	146.3	0.89	0.82	0.91	42.9
		LV	86		86		0.740	26.6	LOS C	20.5	146.3	NA	NA	NA	42.9
		HV	2		2		0.740	26.6	LOS C	20.5	146.3	NA	NA	NA	42.9
5	T1	All MCs	1155	2.0	1155	2.0	0.740	20.8	LOS C	20.7	147.2	0.89	0.81	0.91	44.6
		LV	1132		1132		0.740	20.8	LOS C	20.7	147.2	NA	NA	NA	44.6
		HV	23		23		0.740	20.8	LOS C	20.7	147.2	NA	NA	NA	44.6
6	R2	All MCs	219	2.0	219	2.0	*0.564	21.2	LOS C	4.2	30.0	0.94	0.81	0.94	43.2
		LV	215		215		*0.564	21.2	LOS C	4.2	30.0	NA	NA	NA	43.2
		HV	4		4		0.564	21.2	LOS C	4.2	30.0	NA	NA	NA	43.2
Approach			1461	2.0	1461	2.0	0.740	21.2	LOS C	20.7	147.2	0.90	0.81	0.91	44.3
North: Valletta Dr															
7	L2	All MCs	189	2.0	189	2.0	0.213	12.7	LOS B	3.2	22.9	0.56	0.70	0.56	48.2
		LV	186		186		0.213	12.7	LOS B	3.2	22.9	NA	NA	NA	48.2
		HV	4		4		0.213	12.7	LOS B	3.2	22.9	NA	NA	NA	48.2
8	T1	All MCs	379	2.0	379	2.0	*0.750	31.9	LOS C	14.5	103.3	0.98	0.89	1.06	39.6
		LV	371		371		*0.750	31.9	LOS C	14.5	103.3	NA	NA	NA	39.6
		HV	8		8		0.750	31.9	LOS C	14.5	103.3	NA	NA	NA	39.6
9	R2	All MCs	71	2.0	71	2.0	0.276	36.1	LOS D	2.4	17.4	0.89	0.76	0.89	36.8
		LV	69		69		0.276	36.1	LOS D	2.4	17.4	NA	NA	NA	36.8
		HV	1		1		0.276	36.1	LOS D	2.4	17.4	NA	NA	NA	36.8
Approach			639	2.0	639	2.0	0.750	26.7	LOS C	14.5	103.3	0.84	0.82	0.89	41.4
West: Old Pitt Town Rd															
10	L2	All MCs	96	2.0	96	2.0	0.144	26.0	LOS C	2.5	17.9	0.71	0.73	0.71	41.7
		LV	94		94		0.144	26.0	LOS C	2.5	17.9	NA	NA	NA	41.7
		HV	2		2		0.144	26.0	LOS C	2.5	17.9	NA	NA	NA	41.7
11	T1	All MCs	1143	2.0	1143	2.0	*0.831	32.5	LOS C	23.0	163.6	0.98	0.97	1.12	40.1
		LV	1120		1120		*0.831	32.5	LOS C	23.0	163.6	NA	NA	NA	40.1
		HV	23		23		0.831	32.5	LOS C	23.0	163.6	NA	NA	NA	40.1

12	R2	All MCs	84	0.0	84	0.0	0.306	24.0	LOS C	1.5	10.8	0.85	0.75	0.85	43.9
		LV	84		84		0.306	24.0	LOS C	1.5	10.8	NA	NA	NA	43.9
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			1323	1.9	1323	1.9	0.831	31.5	LOS C	23.0	163.6	0.95	0.93	1.07	40.4
All Vehicles			3823	2.0	3823	2.0	0.831	26.7	LOS C	23.0	163.6	0.90	0.85	0.96	41.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Mount Carmel Dr												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
East: Old Pitt Town Rd												
P2	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Valletta Dr												
P3	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
West: Old Pitt Town Rd												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		50	211	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

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.

INTERSECTION SUMMARY

Site: 101v [Old Pitt Town_Valletta_AM_2036 +Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values						
Performance Measure	**Vehicles:**	**All MCs**	**Pedestrians**		**Persons**	
Travel Speed (Average)	km/h	23.1	3.7	km/h	22.2	km/h
Travel Distance (Total)	veh-km/h	4374.9	42.1	ped-km/h	5292.0	pers-km/h
Travel Time (Total)	veh-h/h	189.7	11.3	ped-h/h	238.9	pers-h/h
Desired Speed	km/h	60.0				
Speed Efficiency		0.38				
Travel Time Index		3.16				
Congestion Coefficient		2.60				
Demand Flows (Total)	veh/h	4286	211	ped/h	5354	pers/h
Arrival Flows (Total)	veh/h	4286				
Percent Heavy Vehicles (Demand)	%	1.9				
Percent Heavy Vehicles (Arrivals)	%	1.9				
Degree of Saturation		1.202	0.066			
Practical Spare Capacity	%	-25.1				
Effective Intersection Capacity	veh/h	3566				
Control Delay (Total)	veh-h/h	119.76	2.30	ped-h/h	146.01	pers-h/h
Control Delay (Average)	sec	100.6	39.3	sec	98.2	sec
Control Delay (Worst Lane by MC)	sec	223.0				
Control Delay (Worst Movement by MC)	sec	223.0	39.3	sec	223.0	sec
Geometric Delay (Average)	sec	2.0				
Stop-Line Delay (Average)	sec	98.6				
Idling Time (Average)	sec	85.5				
Intersection Level of Service (LOS)		LOS F	LOS D			
95% Back of Queue - Veh (Worst Lane)	veh	70.1				
95% Back of Queue - Dist (Worst Lane)	m	498.9				
Ave. Que Storage Ratio (Worst Lane)		0.61				
Effective Stops (Total)	veh/h	5515	197	ped/h	6815	pers/h
Effective Stop Rate		1.29	0.94		1.27	
Proportion Queued		0.90	0.94		0.91	
Performance Index		501.4	12.4		513.7	
Cost (Total)	$/h	8022.74	325.28	$/h	8348.01	$/h
Fuel Consumption (Total)	L/h	543.6				
Carbon Dioxide (Total)	kg/h	1283.0				
Hydrocarbons (Total)	kg/h	0.125				
Carbon Monoxide (Total)	kg/h	1.31				
NOx (Total)	kg/h	1.269				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 17.5 %
Number of Iterations: 7 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 8.1% 50.6% 5.4%

Intersection Performance - Annual Values						
Performance Measure	**Vehicles:**	**All MCs**	**Pedestrians**		**Persons**	
Demand Flows (Total)	veh/y	2,057,432	101,053	ped/y	2,569,971	pers/y
Delay (Total)	veh-h/y	57,483	1,103	ped-h/y	70,082	pers-h/y

Effective Stops (Total)	veh/y	2,647,065	94,523	ped/y	3,271,002	pers/y
Travel Distance (Total)	veh-km/y	2,099,970	20,211	ped-km/y	2,540,174	pers-km/y
Travel Time (Total)	veh-h/y	91,043	5,421	ped-h/y	114,673	pers-h/y
Cost (Total)	$/y	3,850,914	156,132	$/y	4,007,046	$/y
Fuel Consumption (Total)	L/y	260,910				
Carbon Dioxide (Total)	kg/y	615,840				
Hydrocarbons (Total)	kg/y	60				
Carbon Monoxide (Total)	kg/y	631				
NOx (Total)	kg/y	609				

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101v [Old Pitt Town_Valletta_AM_2036 +Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV %]	Arrival Flows [Total veh/h	HV %]	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Mount Carmel Dr															
1	L2	All MCs	87	2.0	87	2.0	0.281	16.2	LOS B	6.4	45.6	0.67	0.64	0.67	44.2
		LV	86		86		0.281	16.2	LOS B	6.4	45.6	NA	NA	NA	44.2
		HV	2		2		0.281	16.2	LOS B	6.4	45.6	NA	NA	NA	44.2
2	T1	All MCs	372	2.0	372	2.0	0.281	19.3	LOS B	6.5	46.6	0.69	0.61	0.69	46.0
		LV	364		364		0.281	19.3	LOS B	6.5	46.6	NA	NA	NA	46.0
		HV	7		7		0.281	19.3	LOS B	6.5	46.6	NA	NA	NA	46.0
3	R2	All MCs	87	2.0	87	2.0	1.000	82.2	LOS F	5.3	37.7	1.00	1.09	1.98	25.2
		LV	86		86		1.000	82.2	LOS F	5.3	37.7	NA	NA	NA	25.2
		HV	2		2		1.000	82.2	LOS F	5.3	37.7	NA	NA	NA	25.2
Approach			546	2.0	546	2.0	1.000	28.9	LOS C	6.5	46.6	0.74	0.69	0.89	40.4
East: Old Pitt Town Rd															
4	L2	All MCs	87	2.0	87	2.0	0.713	38.9	LOS D	15.4	109.6	0.96	0.85	0.99	37.5
		LV	86		86		0.713	38.9	LOS D	15.4	109.6	NA	NA	NA	37.5
		HV	2		2		0.713	38.9	LOS D	15.4	109.6	NA	NA	NA	37.5
5	T1	All MCs	671	2.0	671	2.0	0.713	32.7	LOS C	15.6	110.8	0.96	0.85	0.99	38.9
		LV	657		657		0.713	32.7	LOS C	15.6	110.8	NA	NA	NA	38.9
		HV	13		13		0.713	32.7	LOS C	15.6	110.8	NA	NA	NA	38.9
6	R2	All MCs	447	2.0	447	2.0	* 1.202	223.0	LOS F	46.2	329.1	1.00	1.72	2.91	12.1
		LV	438		438		* 1.202	223.0	LOS F	46.2	329.1	NA	NA	NA	12.1
		HV	9		9		1.202	223.0	LOS F	46.2	329.1	NA	NA	NA	12.1
Approach			1205	2.0	1205	2.0	1.202	103.8	LOS F	46.2	329.1	0.97	1.17	1.70	21.3
North: Valletta Dr															
7	L2	All MCs	452	2.0	452	2.0	0.419	22.9	LOS C	10.7	76.4	0.59	0.76	0.59	45.7
		LV	443		443		0.419	22.9	LOS C	10.7	76.4	NA	NA	NA	45.7
		HV	9		9		0.419	22.9	LOS C	10.7	76.4	NA	NA	NA	45.7
8	T1	All MCs	776	2.0	776	2.0	* 1.099	156.0	LOS F	70.1	498.9	1.00	1.90	2.20	18.2
		LV	760		760		* 1.099	156.0	LOS F	70.1	498.9	NA	NA	NA	18.2
		HV	16		16		1.099	156.0	LOS F	70.1	498.9	NA	NA	NA	18.2
9	R2	All MCs	120	2.0	120	2.0	0.340	44.2	LOS D	4.0	28.7	0.78	0.77	0.78	39.3
		LV	118		118		0.340	44.2	LOS D	4.0	28.7	NA	NA	NA	39.3
		HV	2		2		0.340	44.2	LOS D	4.0	28.7	NA	NA	NA	39.3
Approach			1347	2.0	1347	2.0	1.099	101.4	LOS F	70.1	498.9	0.84	1.42	1.53	24.2
West: Old Pitt Town Rd															
10	L2	All MCs	68	2.0	68	2.0	0.168	41.0	LOS D	2.5	17.5	0.84	0.74	0.84	36.5
		LV	67		67		0.168	41.0	LOS D	2.5	17.5	NA	NA	NA	36.5
		HV	1		1		0.168	41.0	LOS D	2.5	17.5	NA	NA	NA	36.5
11	T1	All MCs	940	2.0	940	2.0	* 1.102	153.6	LOS F	41.8	297.5	1.00	1.73	2.29	17.5
		LV	921		921		* 1.102	153.6	LOS F	41.8	297.5	NA	NA	NA	17.5
		HV	19		19		1.102	153.6	LOS F	41.8	297.5	NA	NA	NA	17.5

12	R2	All MCs	179	0.0	179	0.0	0.571	35.8	LOS D	5.1	36.0	0.95	0.80	0.95	40.6
		LV	179		179		0.571	35.8	LOS D	5.1	36.0	NA	NA	NA	40.6
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			1187	1.7	1187	1.7	1.102	129.3	LOS F	41.8	297.5	0.98	1.53	2.00	19.8
All Vehicles			4286	1.9	4286	1.9	1.202	100.6	LOS F	70.1	498.9	0.90	1.29	1.63	23.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Mount Carmel Dr												
P1	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04
East: Old Pitt Town Rd												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04
North: Valletta Dr												
P3	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04
West: Old Pitt Town Rd												
P4	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04
All Pedestrians		50	211	39.3	LOS D	0.1	0.1	0.94	0.94	193.1	200.0	1.04

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.

INTERSECTION SUMMARY

Site: 101v [Old Pitt Town_Valletta_AM_2036 +Dev + Slip (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values						
Performance Measure	**Vehicles:**	**All MCs**	**Pedestrians**		**Persons**	
Travel Speed (Average)	km/h	27.9	3.8	km/h	26.6	km/h
Travel Distance (Total)	veh-km/h	4159.8	40.0	ped-km/h	5031.8	pers-km/h
Travel Time (Total)	veh-h/h	149.1	10.6	ped-h/h	189.5	pers-h/h
Desired Speed	km/h	55.3				
Speed Efficiency		0.50				
Travel Time Index		4.50				
Congestion Coefficient		1.98				
Demand Flows (Total)	veh/h	4072	200	ped/h	5086	pers/h
Arrival Flows (Total)	veh/h	4072				
Percent Heavy Vehicles (Demand)	%	1.9				
Percent Heavy Vehicles (Arrivals)	%	1.9				
Degree of Saturation		1.008	0.059			
Practical Spare Capacity	%	-10.7				
Effective Intersection Capacity	veh/h	4039				
Control Delay (Total)	veh-h/h	76.06	2.04	ped-h/h	93.32	pers-h/h
Control Delay (Average)	sec	67.2	36.8	sec	66.0	sec
Control Delay (Worst Lane by MC)	sec	113.9				
Control Delay (Worst Movement by MC)	sec	113.9	36.8	sec	113.9	sec
Geometric Delay (Average)	sec	1.8				
Stop-Line Delay (Average)	sec	65.4				
Idling Time (Average)	sec	54.1				
Intersection Level of Service (LOS)		LOS E	LOS D			
95% Back of Queue - Veh (Worst Lane)	veh	60.6				
95% Back of Queue - Dist (Worst Lane)	m	431.7				
Ave. Que Storage Ratio (Worst Lane)		0.53				
Effective Stops (Total)	veh/h	4999	186	ped/h	6185	pers/h
Effective Stop Rate		1.23	0.93		1.22	
Proportion Queued		0.93	0.93		0.93	
Performance Index		396.5	11.6		408.1	
Cost (Total)	$/h	6379.17	305.02	$/h	6684.19	$/h
Fuel Consumption (Total)	L/h	454.6				
Carbon Dioxide (Total)	kg/h	1073.3				
Hydrocarbons (Total)	kg/h	0.097				
Carbon Monoxide (Total)	kg/h	1.02				
NOx (Total)	kg/h	1.058				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 2 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 0.0% 5.1% 0.4%

Intersection Performance - Annual Values						
Performance Measure	**Vehicles:**	**All MCs**	**Pedestrians**		**Persons**	
Demand Flows (Total)	veh/y	1,954,560	96,000	ped/y	2,441,472	pers/y
Delay (Total)	veh-h/y	36,509	981	ped-h/y	44,792	pers-h/y

Effective Stops (Total)	veh/y	2,399,454	89,410	ped/y	2,968,754	pers/y
Travel Distance (Total)	veh-km/y	1,996,702	19,200	ped-km/y	2,415,243	pers-km/y
Travel Time (Total)	veh-h/y	71,553	5,084	ped-h/y	90,948	pers-h/y
Cost (Total)	$/y	3,062,003	146,407	$/y	3,208,410	$/y
Fuel Consumption (Total)	L/y	218,191				
Carbon Dioxide (Total)	kg/y	515,160				
Hydrocarbons (Total)	kg/y	47				
Carbon Monoxide (Total)	kg/y	489				
NOx (Total)	kg/y	508				

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101v [Old Pitt Town_Valletta_AM_2036 +Dev + Slip (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Mount Carmel Dr															
1	L2	All MCs	83	2.0	83	2.0	0.263	21.0	LOS C	5.7	40.5	0.68	0.63	0.68	39.3
		LV	81		81		0.263	21.0	LOS C	5.7	40.5	NA	NA	NA	39.3
		HV	2		2		0.263	21.0	LOS C	5.7	40.5	NA	NA	NA	39.3
2	T1	All MCs	353	2.0	353	2.0	0.263	16.4	LOS B	5.8	41.3	0.68	0.59	0.68	40.6
		LV	346		346		0.263	16.4	LOS B	5.8	41.3	NA	NA	NA	40.6
		HV	7		7		0.263	16.4	LOS B	5.8	41.3	NA	NA	NA	40.6
3	R2	All MCs	83	2.0	83	2.0	0.897	58.1	LOS E	4.0	28.7	1.00	1.04	1.73	27.6
		LV	81		81		0.897	58.1	LOS E	4.0	28.7	NA	NA	NA	27.6
		HV	2		2		0.897	58.1	LOS E	4.0	28.7	NA	NA	NA	27.6
Approach			519	2.0	519	2.0	0.897	23.8	LOS C	5.8	41.3	0.73	0.67	0.85	37.6
East: Old Pitt Town Rd															
4	L2	All MCs	83	2.0	83	2.0	0.529	45.7	LOS D	10.2	72.3	0.89	0.77	0.89	39.5
		LV	81		81		0.529	45.7	LOS D	10.2	72.3	NA	NA	NA	39.5
		HV	2		2		0.529	45.7	LOS D	10.2	72.3	NA	NA	NA	39.5
5	T1	All MCs	637	2.0	637	2.0	0.529	20.6	LOS C	13.3	94.8	0.82	0.72	0.82	43.8
		LV	624		624		0.529	20.6	LOS C	13.3	94.8	NA	NA	NA	43.8
		HV	13		13		0.529	20.6	LOS C	13.3	94.8	NA	NA	NA	43.8
6	R2	All MCs	425	2.0	425	2.0	*0.986	89.2	LOS F	13.9	99.3	1.00	1.36	2.16	24.0
		LV	417		417		*0.986	89.2	LOS F	13.9	99.3	NA	NA	NA	24.0
		HV	9		9		0.986	89.2	LOS F	13.9	99.3	NA	NA	NA	24.0
Approach			1145	2.0	1145	2.0	0.986	47.9	LOS D	13.9	99.3	0.89	0.96	1.32	33.3
North: Valletta Dr															
7	L2	All MCs	429	2.0	429	2.0	0.969	67.5	LOS E	23.0	163.9	1.00	1.27	1.79	26.3
		LV	420		420		0.969	67.5	LOS E	23.0	163.9	NA	NA	NA	26.3
		HV	9		9		0.969	67.5	LOS E	23.0	163.9	NA	NA	NA	26.3
8	T1	All MCs	737	2.0	737	2.0	*1.008	113.9	LOS F	60.6	431.7	1.00	1.78	2.01	21.0
		LV	722		722		*1.008	113.9	LOS F	60.6	431.7	NA	NA	NA	21.0
		HV	15		15		1.008	113.9	LOS F	60.6	431.7	NA	NA	NA	21.0
9	R2	All MCs	114	2.0	114	2.0	0.300	37.2	LOS D	3.5	24.7	0.75	0.74	0.75	38.4
		LV	112		112		0.300	37.2	LOS D	3.5	24.7	NA	NA	NA	38.4
		HV	2		2		0.300	37.2	LOS D	3.5	24.7	NA	NA	NA	38.4
Approach			1280	2.0	1280	2.0	1.008	91.5	LOS F	60.6	431.7	0.98	1.52	1.83	23.5
West: Old Pitt Town Rd															
10	L2	All MCs	65	2.0	65	2.0	0.151	33.6	LOS C	2.2	15.4	0.83	0.74	0.83	37.6
		LV	64		64		0.151	33.6	LOS C	2.2	15.4	NA	NA	NA	37.6
		HV	1		1		0.151	33.6	LOS C	2.2	15.4	NA	NA	NA	37.6
11	T1	All MCs	893	2.0	893	2.0	*0.986	82.9	LOS F	30.8	219.1	1.00	1.50	1.92	25.5
		LV	875		875		*0.986	82.9	LOS F	30.8	219.1	NA	NA	NA	25.5
		HV	18		18		0.986	82.9	LOS F	30.8	219.1	NA	NA	NA	25.5

12	R2	All MCs	170	0.0	170	0.0	0.953	78.2	LOS E	10.6	73.9	1.00	1.29	2.00	25.9
		LV	170		170		0.953	78.2	LOS E	10.6	73.9	NA	NA	NA	25.9
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			1128	1.7	1128	1.7	0.986	79.3	LOS E	30.8	219.1	0.99	1.42	1.87	26.0
All Vehicles			4072	1.9	4072	1.9	1.008	67.2	LOS E	60.6	431.7	0.93	1.23	1.57	27.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Mount Carmel Dr												
P1	Full	50	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
East: Old Pitt Town Rd												
P2	Full	50	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
North: Valletta Dr												
P3	Full	50	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
West: Old Pitt Town Rd												
P4	Full	50	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
All Pedestrians		50	200	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05

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.

INTERSECTION SUMMARY

Site: 101v [Old Pitt Town_Valletta_PM_2036 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values						
Performance Measure	**Vehicles:**	**All MCs**	**Pedestrians**		**Persons**	
Travel Speed (Average)	km/h	38.3	3.8	km/h	35.7	km/h
Travel Distance (Total)	veh-km/h	4395.7	42.1	ped-km/h	5316.9	pers-km/h
Travel Time (Total)	veh-h/h	114.9	11.0	ped-h/h	148.8	pers-h/h
Desired Speed	km/h	60.0				
Speed Efficiency		0.64				
Travel Time Index		5.98				
Congestion Coefficient		1.57				
Demand Flows (Total)	veh/h	4305	211	ped/h	5377	pers/h
Arrival Flows (Total)	veh/h	4305				
Percent Heavy Vehicles (Demand)	%	2.0				
Percent Heavy Vehicles (Arrivals)	%	2.0				
Degree of Saturation		0.934	0.058			
Practical Spare Capacity	%	-3.7				
Effective Intersection Capacity	veh/h	4607				
Control Delay (Total)	veh-h/h	42.62	2.01	ped-h/h	53.15	pers-h/h
Control Delay (Average)	sec	35.6	34.3	sec	35.6	sec
Control Delay (Worst Lane by MC)	sec	56.3				
Control Delay (Worst Movement by MC)	sec	56.3	34.3	sec	56.3	sec
Geometric Delay (Average)	sec	1.4				
Stop-Line Delay (Average)	sec	34.2				
Idling Time (Average)	sec	26.8				
Intersection Level of Service (LOS)		LOS D	LOS D			
95% Back of Queue - Veh (Worst Lane)	veh	29.1				
95% Back of Queue - Dist (Worst Lane)	m	207.5				
Ave. Que Storage Ratio (Worst Lane)		0.25				
Effective Stops (Total)	veh/h	4089	195	ped/h	5102	pers/h
Effective Stop Rate		0.95	0.93		0.95	
Proportion Queued		0.94	0.93		0.94	
Performance Index		308.1	12.1		320.2	
Cost (Total)	$/h	5154.78	316.88	$/h	5471.65	$/h
Fuel Consumption (Total)	L/h	439.0				
Carbon Dioxide (Total)	kg/h	1036.8				
Hydrocarbons (Total)	kg/h	0.092				
Carbon Monoxide (Total)	kg/h	1.14				
NOx (Total)	kg/h	1.124				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 53.1% 4.0% 0.0%

Intersection Performance - Annual Values						
Performance Measure	**Vehicles:**	**All MCs**	**Pedestrians**		**Persons**	
Demand Flows (Total)	veh/y	2,066,526	101,053	ped/y	2,580,884	pers/y
Delay (Total)	veh-h/y	20,457	963	ped-h/y	25,512	pers-h/y

Effective Stops (Total)	veh/y	1,962,744	93,679	ped/y	2,448,972	pers/y
Travel Distance (Total)	veh-km/y	2,109,923	20,211	ped-km/y	2,552,119	pers-km/y
Travel Time (Total)	veh-h/y	55,132	5,281	ped-h/y	71,440	pers-h/y
Cost (Total)	$/y	2,474,293	152,102	$/y	2,626,394	$/y
Fuel Consumption (Total)	L/y	210,716				
Carbon Dioxide (Total)	kg/y	497,658				
Hydrocarbons (Total)	kg/y	44				
Carbon Monoxide (Total)	kg/y	548				
NOx (Total)	kg/y	540				

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101v [Old Pitt Town_Valletta_PM_2036 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Mount Carmel Dr															
1	L2	All MCs	87	2.0	87	2.0	0.555	33.6	LOS C	9.5	67.7	0.92	0.79	0.92	39.2
		LV	86		86		0.555	33.6	LOS C	9.5	67.7	NA	NA	NA	39.2
		HV	2		2		0.555	33.6	LOS C	9.5	67.7	NA	NA	NA	39.2
2	T1	All MCs	469	2.0	469	2.0	0.555	28.0	LOS C	9.7	68.7	0.92	0.78	0.92	40.9
		LV	460		460		0.555	28.0	LOS C	9.7	68.7	NA	NA	NA	40.9
		HV	9		9		0.555	28.0	LOS C	9.7	68.7	NA	NA	NA	40.9
3	R2	All MCs	87	2.0	87	2.0	0.886	56.3	LOS E	4.0	28.8	1.00	0.98	1.61	30.6
		LV	86		86		0.886	56.3	LOS E	4.0	28.8	NA	NA	NA	30.6
		HV	2		2		0.886	56.3	LOS E	4.0	28.8	NA	NA	NA	30.6
Approach			644	2.0	644	2.0	0.886	32.6	LOS C	9.7	68.7	0.93	0.81	1.01	38.9
East: Old Pitt Town Rd															
4	L2	All MCs	87	2.0	87	2.0	0.740	26.6	LOS C	20.5	146.3	0.89	0.82	0.91	42.9
		LV	86		86		0.740	26.6	LOS C	20.5	146.3	NA	NA	NA	42.9
		HV	2		2		0.740	26.6	LOS C	20.5	146.3	NA	NA	NA	42.9
5	T1	All MCs	1155	2.0	1155	2.0	0.740	20.8	LOS C	20.7	147.2	0.89	0.81	0.91	44.6
		LV	1132		1132		0.740	20.8	LOS C	20.7	147.2	NA	NA	NA	44.6
		HV	23		23		0.740	20.8	LOS C	20.7	147.2	NA	NA	NA	44.6
6	R2	All MCs	358	2.0	358	2.0	*0.814	32.9	LOS C	11.0	78.5	1.00	0.95	1.18	37.9
		LV	351		351		*0.814	32.9	LOS C	11.0	78.5	NA	NA	NA	37.9
		HV	7		7		0.814	32.9	LOS C	11.0	78.5	NA	NA	NA	37.9
Approach			1600	2.0	1600	2.0	0.814	23.9	LOS C	20.7	147.2	0.92	0.85	0.97	42.8
North: Valletta Dr															
7	L2	All MCs	224	2.0	224	2.0	0.466	32.8	LOS C	7.5	53.5	0.89	0.80	0.89	37.9
		LV	220		220		0.466	32.8	LOS C	7.5	53.5	NA	NA	NA	37.9
		HV	4		4		0.466	32.8	LOS C	7.5	53.5	NA	NA	NA	37.9
8	T1	All MCs	439	2.0	439	2.0	*0.889	44.8	LOS D	20.1	143.3	1.00	1.08	1.31	35.7
		LV	430		430		*0.889	44.8	LOS D	20.1	143.3	NA	NA	NA	35.7
		HV	9		9		0.889	44.8	LOS D	20.1	143.3	NA	NA	NA	35.7
9	R2	All MCs	72	2.0	72	2.0	0.411	44.7	LOS D	2.7	19.5	0.96	0.77	0.96	34.8
		LV	70		70		0.411	44.7	LOS D	2.7	19.5	NA	NA	NA	34.8
		HV	1		1		0.411	44.7	LOS D	2.7	19.5	NA	NA	NA	34.8
Approach			735	2.0	735	2.0	0.889	41.2	LOS D	20.1	143.3	0.96	0.97	1.15	36.2
West: Old Pitt Town Rd															
10	L2	All MCs	99	2.0	99	2.0	0.166	29.9	LOS C	2.8	19.7	0.75	0.74	0.75	40.6
		LV	97		97		0.166	29.9	LOS C	2.8	19.7	NA	NA	NA	40.6
		HV	2		2		0.166	29.9	LOS C	2.8	19.7	NA	NA	NA	40.6
11	T1	All MCs	1143	2.0	1143	2.0	*0.934	51.4	LOS D	29.1	207.5	1.00	1.20	1.41	33.7
		LV	1120		1120		*0.934	51.4	LOS D	29.1	207.5	NA	NA	NA	33.7
		HV	23		23		0.934	51.4	LOS D	29.1	207.5	NA	NA	NA	33.7

12	R2	All MCs	84	0.0	84	0.0	0.306	27.3	LOS C	1.5	10.8	0.85	0.75	0.85	43.9
		LV	84		84		0.306	27.3	LOS C	1.5	10.8	NA	NA	NA	43.9
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			1326	1.9	1326	1.9	0.934	48.3	LOS D	29.1	207.5	0.97	1.14	1.32	34.7
All Vehicles			4305	2.0	4305	2.0	0.934	35.6	LOS D	29.1	207.5	0.94	0.95	1.11	38.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Mount Carmel Dr												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
East: Old Pitt Town Rd												
P2	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Valletta Dr												
P3	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
West: Old Pitt Town Rd												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		50	211	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

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.

INTERSECTION SUMMARY

Site: 101v [Old Pitt Town_Valletta_PM_2036 + Dev + Slip (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Intersection Performance - Hourly Values

Performance Measure	Vehicles:	All MCs	Pedestrians	Persons
Travel Speed (Average)	km/h	41.6	3.8 km/h	38.6 km/h
Travel Distance (Total)	veh-km/h	4397.7	42.1 ped-km/h	5319.3 pers-km/h
Travel Time (Total)	veh-h/h	105.6	11.0 ped-h/h	137.7 pers-h/h
Desired Speed	km/h	60.0		
Speed Efficiency		0.69		
Travel Time Index		6.60		
Congestion Coefficient		1.44		
Demand Flows (Total)	veh/h	4305	211 ped/h	5377 pers/h
Arrival Flows (Total)	veh/h	4305		
Percent Heavy Vehicles (Demand)	%	2.0		
Percent Heavy Vehicles (Arrivals)	%	2.0		
Degree of Saturation		0.807	0.058	
Practical Spare Capacity	%	11.5		
Effective Intersection Capacity	veh/h	5332		
Control Delay (Total)	veh-h/h	32.07	2.01 ped-h/h	40.49 pers-h/h
Control Delay (Average)	sec	26.8	34.3 sec	27.1 sec
Control Delay (Worst Lane by MC)	sec	49.1		
Control Delay (Worst Movement by MC)	sec	49.1	34.3 sec	49.1 sec
Geometric Delay (Average)	sec	1.4		
Stop-Line Delay (Average)	sec	25.4		
Idling Time (Average)	sec	20.0		
Intersection Level of Service (LOS)		LOS C	LOS D	
95% Back of Queue - Veh (Worst Lane)	veh	22.6		
95% Back of Queue - Dist (Worst Lane)	m	160.6		
Ave. Que Storage Ratio (Worst Lane)		0.20		
Effective Stops (Total)	veh/h	3684	195 ped/h	4615 pers/h
Effective Stop Rate		0.86	0.93	0.86
Proportion Queued		0.92	0.93	0.92
Performance Index		272.6	12.1	284.7
Cost (Total)	$/h	4792.89	316.88 $/h	5109.77 $/h
Fuel Consumption (Total)	L/h	423.6		
Carbon Dioxide (Total)	kg/h	1000.5		
Hydrocarbons (Total)	kg/h	0.088		
Carbon Monoxide (Total)	kg/h	1.12		
NOx (Total)	kg/h	1.092		

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Intersection LOS value for Vehicles is based on average delay for all vehicle movements.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 8.4 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Main (Timing-Capacity) Iterations: 10.4% 3.6% 8.4%

Intersection Performance - Annual Values

Performance Measure	Vehicles:	All MCs	Pedestrians	Persons
Demand Flows (Total)	veh/y	2,066,527	101,053 ped/y	2,580,884 pers/y
Delay (Total)	veh-h/y	15,395	963 ped-h/y	19,436 pers-h/y

Effective Stops (Total)	veh/y	1,768,093	93,679	ped/y	2,215,391	pers/y
Travel Distance (Total)	veh-km/y	2,110,888	20,211	ped-km/y	2,553,277	pers-km/y
Travel Time (Total)	veh-h/y	50,683	5,281	ped-h/y	66,101	pers-h/y
Cost (Total)	$/y	2,300,589	152,102	$/y	2,452,690	$/y
Fuel Consumption (Total)	L/y	203,329				
Carbon Dioxide (Total)	kg/y	480,258				
Hydrocarbons (Total)	kg/y	42				
Carbon Monoxide (Total)	kg/y	536				
NOx (Total)	kg/y	524				

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101v [Old Pitt Town_Valletta_PM_2036 + Dev + Slip (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Mount Carmel Dr															
1	L2	All MCs	87	2.0	87	2.0	0.507	31.6	LOS C	9.1	65.1	0.89	0.77	0.89	40.0
		LV	86		86		0.507	31.6	LOS C	9.1	65.1	NA	NA	NA	40.0
		HV	2		2		0.507	31.6	LOS C	9.1	65.1	NA	NA	NA	40.0
2	T1	All MCs	469	2.0	469	2.0	0.507	26.0	LOS C	9.3	66.1	0.89	0.75	0.89	41.8
		LV	460		460		0.507	26.0	LOS C	9.3	66.1	NA	NA	NA	41.8
		HV	9		9		0.507	26.0	LOS C	9.3	66.1	NA	NA	NA	41.8
3	R2	All MCs	87	2.0	87	2.0	*0.687	49.1	LOS D	3.7	26.4	1.00	0.85	1.18	32.6
		LV	86		86		*0.687	49.1	LOS D	3.7	26.4	NA	NA	NA	32.6
		HV	2		2		0.687	49.1	LOS D	3.7	26.4	NA	NA	NA	32.6
Approach			644	2.0	644	2.0	0.687	29.9	LOS C	9.3	66.1	0.90	0.77	0.93	40.0
East: Old Pitt Town Rd															
4	L2	All MCs	87	2.0	87	2.0	0.785	30.3	LOS C	22.4	159.6	0.93	0.88	1.00	41.2
		LV	86		86		0.785	30.3	LOS C	22.4	159.6	NA	NA	NA	41.2
		HV	2		2		0.785	30.3	LOS C	22.4	159.6	NA	NA	NA	41.2
5	T1	All MCs	1155	2.0	1155	2.0	0.785	24.5	LOS C	22.6	160.6	0.93	0.88	1.00	42.7
		LV	1132		1132		0.785	24.5	LOS C	22.6	160.6	NA	NA	NA	42.7
		HV	23		23		0.785	24.5	LOS C	22.6	160.6	NA	NA	NA	42.7
6	R2	All MCs	358	2.0	358	2.0	*0.549	21.9	LOS C	3.6	25.7	0.94	0.80	0.94	42.8
		LV	351		351		*0.549	21.9	LOS C	3.6	25.7	NA	NA	NA	42.8
		HV	7		7		0.549	21.9	LOS C	3.6	25.7	NA	NA	NA	42.8
Approach			1600	2.0	1600	2.0	0.785	24.2	LOS C	22.6	160.6	0.93	0.86	0.98	42.6
North: Valletta Dr															
7	L2	All MCs	224	2.0	224	2.0	0.251	13.0	LOS B	4.0	28.2	0.58	0.71	0.58	48.0
		LV	220		220		0.251	13.0	LOS B	4.0	28.2	NA	NA	NA	48.0
		HV	4		4		0.251	13.0	LOS B	4.0	28.2	NA	NA	NA	48.0
8	T1	All MCs	439	2.0	439	2.0	0.807	35.0	LOS C	17.6	125.5	0.99	0.95	1.13	39.0
		LV	430		430		0.807	35.0	LOS C	17.6	125.5	NA	NA	NA	39.0
		HV	9		9		0.807	35.0	LOS C	17.6	125.5	NA	NA	NA	39.0
9	R2	All MCs	72	2.0	72	2.0	0.365	40.6	LOS D	2.6	18.7	0.92	0.77	0.92	35.8
		LV	70		70		0.365	40.6	LOS D	2.6	18.7	NA	NA	NA	35.8
		HV	1		1		0.365	40.6	LOS D	2.6	18.7	NA	NA	NA	35.8
Approach			735	2.0	735	2.0	0.807	28.8	LOS C	17.6	125.5	0.86	0.86	0.94	41.0
West: Old Pitt Town Rd															
10	L2	All MCs	99	2.0	99	2.0	0.144	23.3	LOS C	2.6	18.2	0.69	0.73	0.69	42.0
		LV	97		97		0.144	23.3	LOS C	2.6	18.2	NA	NA	NA	42.0
		HV	2		2		0.144	23.3	LOS C	2.6	18.2	NA	NA	NA	42.0
11	T1	All MCs	1143	2.0	1143	2.0	*0.795	27.9	LOS C	21.6	154.0	0.96	0.91	1.04	41.5
		LV	1120		1120		*0.795	27.9	LOS C	21.6	154.0	NA	NA	NA	41.5
		HV	23		23		0.795	27.9	LOS C	21.6	154.0	NA	NA	NA	41.5

12	R2	All MCs	84	0.0	84	0.0	0.318	24.1	LOS C	1.6	11.4	0.88	0.75	0.88	43.2
		LV	84		84		0.318	24.1	LOS C	1.6	11.4	NA	NA	NA	43.2
		HV	0		0		-	-	-	-	-	NA	NA	NA	-
Approach			1326	1.9	1326	1.9	0.795	27.3	LOS C	21.6	154.0	0.93	0.89	1.01	41.7
All Vehicles			4305	2.0	4305	2.0	0.807	26.8	LOS C	22.6	160.6	0.92	0.86	0.97	41.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		ped	m			sec	m	m/sec
South: Mount Carmel Dr												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
East: Old Pitt Town Rd												
P2	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Valletta Dr												
P3	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
West: Old Pitt Town Rd												
P4	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		50	211	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

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.

INTERSECTION SUMMARY

Site: 101 [Boundary_Red Gables_AM_2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	54.9	54.9 km/h
Travel Distance (Total)	veh-km/h	810.2	972.2 pers-km/h
Travel Time (Total)	veh-h/h	14.8	17.7 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.92	
Travel Time Index		9.06	
Congestion Coefficient		1.09	
Demand Flows (Total)	veh/h	799	959 pers/h
Arrival Flows (Total)	veh/h	799	
Percent Heavy Vehicles (Demand)	%	2.0	
Percent Heavy Vehicles (Arrivals)	%	2.0	
Degree of Saturation		0.246	
Practical Spare Capacity	%	225.1	
Effective Intersection Capacity	veh/h	3247	
Control Delay (Total)	veh-h/h	0.84	1.00 pers-h/h
Control Delay (Average)	sec	3.8	3.8 sec
Control Delay (Worst Lane by MC)	sec	8.3	
Control Delay (Worst Movement by MC)	sec	12.4	12.4 sec
Geometric Delay (Average)	sec	3.2	
Stop-Line Delay (Average)	sec	0.6	
Idling Time (Average)	sec	0.1	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	1.1	
95% Back of Queue - Dist (Worst Lane)	m	8.1	
Ave. Que Storage Ratio (Worst Lane)		0.01	
Effective Stops (Total)	veh/h	274	328 pers/h
Effective Stop Rate		0.34	0.34
Proportion Queued		0.20	0.20
Performance Index		17.1	17.1
Cost (Total)	$/h	679.01	679.01 $/h
Fuel Consumption (Total)	L/h	62.6	
Carbon Dioxide (Total)	kg/h	148.1	
Hydrocarbons (Total)	kg/h	0.012	
Carbon Monoxide (Total)	kg/h	0.17	
NOx (Total)	kg/h	0.154	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 60.9% 21.6% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Demand Flows (Total)	veh/y	383,495	460,194 pers/y
Delay (Total)	veh-h/y	401	481 pers-h/y

Effective Stops (Total)	veh/y	131,323	157,587	pers/y
Travel Distance (Total)	veh-km/y	388,899	466,678	pers-km/y
Travel Time (Total)	veh-h/y	7,081	8,498	pers-h/y
Cost (Total)	$/y	325,923	325,923	$/y
Fuel Consumption (Total)	L/y	30,070		
Carbon Dioxide (Total)	kg/y	71,082		
Hydrocarbons (Total)	kg/y	6		
Carbon Monoxide (Total)	kg/y	84		
NOx (Total)	kg/y	74		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101 [Boundary_Red Gables_AM_2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Boundary Rd															
2	T1	All MCs	123	2.0	123	2.0	0.064	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
		LV	121		121		0.064	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
		HV	2		2		0.064	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
3	R2	All MCs	72	2.0	72	2.0	0.050	6.3	LOS A	0.2	1.6	0.33	0.57	0.33	51.7
		LV	70		70		0.050	6.3	LOS A	0.2	1.6	NA	NA	NA	51.8
		HV	1		1		0.050	7.3	LOS A	0.2	1.6	NA	NA	NA	51.0
Approach			195	2.0	195	2.0	0.064	2.3	NA	0.2	1.6	0.12	0.21	0.12	56.7
East: Cataract Rd															
4	L2	All MCs	326	2.0	326	2.0	0.246	6.5	LOS A	1.1	8.1	0.36	0.60	0.36	51.7
		LV	320		320		0.246	6.5	LOS A	1.1	8.1	NA	NA	NA	51.7
		HV	7		7		0.246	7.7	LOS A	1.1	8.1	NA	NA	NA	50.9
6	R2	All MCs	46	2.0	46	2.0	0.065	8.3	LOS A	0.2	1.7	0.48	0.70	0.48	50.5
		LV	45		45		0.065	8.2	LOS A	0.2	1.7	NA	NA	NA	50.6
		HV	1		1		0.065	12.4	LOS B	0.2	1.7	NA	NA	NA	47.8
Approach			373	2.0	373	2.0	0.246	6.7	LOS A	1.1	8.1	0.37	0.61	0.37	51.6
North: Boundary Rd															
7	L2	All MCs	9	2.0	9	2.0	0.121	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	57.2
		LV	9		9		0.121	5.6	LOS A	0.0	0.0	NA	NA	NA	57.2
		HV	0		0		0.121	5.6	LOS A	0.0	0.0	NA	NA	NA	57.2
8	T1	All MCs	222	2.0	222	2.0	0.121	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
		LV	218		218		0.121	0.0	LOS A	0.0	0.0	NA	NA	NA	59.7
		HV	4		4		0.121	0.0	LOS A	0.0	0.0	NA	NA	NA	59.7
Approach			232	2.0	232	2.0	0.121	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.6
All Vehicles			799	2.0	799	2.0	0.246	3.8	NA	1.1	8.1	0.20	0.34	0.20	54.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 101 [Boundary_Red Gables_PM_2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	56.3	56.3 km/h
Travel Distance (Total)	veh-km/h	1197.8	1437.4 pers-km/h
Travel Time (Total)	veh-h/h	21.3	25.5 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.94	
Travel Time Index		9.32	
Congestion Coefficient		1.06	
Demand Flows (Total)	veh/h	1182	1419 pers/h
Arrival Flows (Total)	veh/h	1182	
Percent Heavy Vehicles (Demand)	%	2.0	
Percent Heavy Vehicles (Arrivals)	%	2.0	
Degree of Saturation		0.281	
Practical Spare Capacity	%	249.3	
Effective Intersection Capacity	veh/h	4214	
Control Delay (Total)	veh-h/h	0.88	1.05 pers-h/h
Control Delay (Average)	sec	2.7	2.7 sec
Control Delay (Worst Lane by MC)	sec	19.3	
Control Delay (Worst Movement by MC)	sec	53.6	53.6 sec
Geometric Delay (Average)	sec	2.1	
Stop-Line Delay (Average)	sec	0.6	
Idling Time (Average)	sec	0.2	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	1.2	
95% Back of Queue - Dist (Worst Lane)	m	8.9	
Ave. Que Storage Ratio (Worst Lane)		0.00	
Effective Stops (Total)	veh/h	271	325 pers/h
Effective Stop Rate		0.23	0.23
Proportion Queued		0.14	0.14
Performance Index		23.7	23.7
Cost (Total)	$/h	967.18	967.18 $/h
Fuel Consumption (Total)	L/h	86.1	
Carbon Dioxide (Total)	kg/h	203.5	
Hydrocarbons (Total)	kg/h	0.016	
Carbon Monoxide (Total)	kg/h	0.24	
NOx (Total)	kg/h	0.200	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 86.5% 22.1% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Demand Flows (Total)	veh/y	567,411	680,893 pers/y
Delay (Total)	veh-h/y	420	504 pers-h/y

Effective Stops (Total)	veh/y	129,926	155,911	pers/y
Travel Distance (Total)	veh-km/y	574,959	689,951	pers-km/y
Travel Time (Total)	veh-h/y	10,205	12,246	pers-h/y
Cost (Total)	$/y	464,246	464,246	$/y
Fuel Consumption (Total)	L/y	41,315		
Carbon Dioxide (Total)	kg/y	97,690		
Hydrocarbons (Total)	kg/y	8		
Carbon Monoxide (Total)	kg/y	117		
NOx (Total)	kg/y	96		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101 [Boundary_Red Gables_PM_2036 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Boundary Rd															
2	T1	All MCs	540	2.0	540	2.0	0.281	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
		LV	529		529		0.281	0.1	LOS A	0.0	0.0	NA	NA	NA	59.8
		HV	11		11		0.281	0.1	LOS A	0.0	0.0	NA	NA	NA	59.8
3	R2	All MCs	346	2.0	346	2.0	0.243	6.5	LOS A	1.2	8.9	0.39	0.60	0.39	51.6
		LV	339		339		0.243	6.5	LOS A	1.2	8.9	NA	NA	NA	51.6
		HV	7		7		0.243	7.8	LOS A	1.2	8.9	NA	NA	NA	50.6
Approach			886	2.0	886	2.0	0.281	2.6	NA	1.2	8.9	0.15	0.24	0.15	56.3
East: Cataract Rd															
4	L2	All MCs	36	2.0	36	2.0	0.026	6.2	LOS A	0.1	0.7	0.29	0.56	0.29	51.9
		LV	35		35		0.026	6.2	LOS A	0.1	0.7	NA	NA	NA	52.0
		HV	1		1		0.026	7.0	LOS A	0.1	0.7	NA	NA	NA	51.3
6	R2	All MCs	22	2.0	22	2.0	0.089	19.3	LOS C	0.3	2.1	0.80	0.92	0.80	43.8
		LV	22		22		0.089	18.6	LOS C	0.3	2.1	NA	NA	NA	44.2
		HV	0		0		0.089	53.6	LOS F	0.3	2.1	NA	NA	NA	31.0
Approach			58	2.0	58	2.0	0.089	11.2	LOS B	0.3	2.1	0.48	0.70	0.48	48.5
North: Boundary Rd															
7	L2	All MCs	36	2.0	36	2.0	0.125	5.6	LOS A	0.0	0.0	0.00	0.09	0.00	56.6
		LV	35		35		0.125	5.6	LOS A	0.0	0.0	NA	NA	NA	56.6
		HV	1		1		0.125	5.6	LOS A	0.0	0.0	NA	NA	NA	56.6
8	T1	All MCs	202	2.0	202	2.0	0.125	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	59.1
		LV	198		198		0.125	0.0	LOS A	0.0	0.0	NA	NA	NA	59.1
		HV	4		4		0.125	0.0	LOS A	0.0	0.0	NA	NA	NA	59.1
Approach			238	2.0	238	2.0	0.125	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.7
All Vehicles			1182	2.0	1182	2.0	0.281	2.7	NA	1.2	8.9	0.14	0.23	0.14	56.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 101 [Boundary_Red Gables_AM_2036 +Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Intersection Performance - Hourly Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Travel Speed (Average)	km/h	54.5	54.5 km/h
Travel Distance (Total)	veh-km/h	925.6	1110.7 pers-km/h
Travel Time (Total)	veh-h/h	17.0	20.4 pers-h/h
Desired Speed	km/h	60.0	
Speed Efficiency		0.91	
Travel Time Index		8.97	
Congestion Coefficient		1.10	
Demand Flows (Total)	veh/h	913	1095 pers/h
Arrival Flows (Total)	veh/h	913	
Percent Heavy Vehicles (Demand)	%	2.0	
Percent Heavy Vehicles (Arrivals)	%	2.0	
Degree of Saturation		0.315	
Practical Spare Capacity	%	153.9	
Effective Intersection Capacity	veh/h	2896	
Control Delay (Total)	veh-h/h	1.05	1.26 pers-h/h
Control Delay (Average)	sec	4.1	4.1 sec
Control Delay (Worst Lane by MC)	sec	8.5	
Control Delay (Worst Movement by MC)	sec	13.0	13.0 sec
Geometric Delay (Average)	sec	3.5	
Stop-Line Delay (Average)	sec	0.7	
Idling Time (Average)	sec	0.1	
Intersection Level of Service (LOS)		NA	
95% Back of Queue - Veh (Worst Lane)	veh	1.6	
95% Back of Queue - Dist (Worst Lane)	m	11.0	
Ave. Que Storage Ratio (Worst Lane)		0.01	
Effective Stops (Total)	veh/h	344	412 pers/h
Effective Stop Rate		0.38	0.38
Proportion Queued		0.23	0.23
Performance Index		20.1	20.1
Cost (Total)	$/h	784.60	784.60 $/h
Fuel Consumption (Total)	L/h	73.0	
Carbon Dioxide (Total)	kg/h	172.6	
Hydrocarbons (Total)	kg/h	0.014	
Carbon Monoxide (Total)	kg/h	0.20	
NOx (Total)	kg/h	0.183	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 62.0% 21.6% 0.0%

Intersection Performance - Annual Values			
Performance Measure	**Vehicles:**	**All MCs**	**Persons**
Demand Flows (Total)	veh/y	438,063	525,676 pers/y
Delay (Total)	veh-h/y	504	605 pers-h/y

Effective Stops (Total)	veh/y	164,966	197,959	pers/y
Travel Distance (Total)	veh-km/y	444,298	533,157	pers-km/y
Travel Time (Total)	veh-h/y	8,159	9,791	pers-h/y
Cost (Total)	$/y	376,608	376,608	$/y
Fuel Consumption (Total)	L/y	35,052		
Carbon Dioxide (Total)	kg/y	82,853		
Hydrocarbons (Total)	kg/y	7		
Carbon Monoxide (Total)	kg/y	97		
NOx (Total)	kg/y	88		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101 [Boundary_Red Gables_AM_2036 +Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Boundary Rd															
2	T1	All MCs	123	2.0	123	2.0	0.064	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
		LV	121		121		0.064	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
		HV	2		2		0.064	0.0	LOS A	0.0	0.0	NA	NA	NA	60.0
3	R2	All MCs	94	2.0	94	2.0	0.065	6.3	LOS A	0.3	2.1	0.34	0.58	0.34	51.7
		LV	92		92		0.065	6.3	LOS A	0.3	2.1	NA	NA	NA	51.7
		HV	2		2		0.065	7.3	LOS A	0.3	2.1	NA	NA	NA	51.0
Approach			217	2.0	217	2.0	0.065	2.7	NA	0.3	2.1	0.15	0.25	0.15	56.1
East: Cataract Rd															
4	L2	All MCs	418	2.0	418	2.0	0.315	6.6	LOS A	1.6	11.0	0.38	0.60	0.38	51.7
		LV	410		410		0.315	6.5	LOS A	1.6	11.0	NA	NA	NA	51.7
		HV	8		8		0.315	7.9	LOS A	1.6	11.0	NA	NA	NA	50.7
6	R2	All MCs	46	2.0	46	2.0	0.067	8.5	LOS A	0.2	1.8	0.49	0.71	0.49	50.4
		LV	45		45		0.067	8.4	LOS A	0.2	1.8	NA	NA	NA	50.5
		HV	1		1		0.067	13.0	LOS B	0.2	1.8	NA	NA	NA	47.4
Approach			464	2.0	464	2.0	0.315	6.7	LOS A	1.6	11.0	0.39	0.61	0.39	51.5
North: Boundary Rd															
7	L2	All MCs	9	2.0	9	2.0	0.121	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	57.2
		LV	9		9		0.121	5.6	LOS A	0.0	0.0	NA	NA	NA	57.2
		HV	0		0		0.121	5.6	LOS A	0.0	0.0	NA	NA	NA	57.2
8	T1	All MCs	222	2.0	222	2.0	0.121	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
		LV	218		218		0.121	0.0	LOS A	0.0	0.0	NA	NA	NA	59.7
		HV	4		4		0.121	0.0	LOS A	0.0	0.0	NA	NA	NA	59.7
Approach			232	2.0	232	2.0	0.121	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.6
All Vehicles			913	2.0	913	2.0	0.315	4.1	NA	1.6	11.0	0.23	0.38	0.23	54.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

INTERSECTION SUMMARY

Site: 101 [Boundary_Red Gables_PM_2036 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Intersection Performance - Hourly Values				
Performance Measure	**Vehicles:**	**All MCs**	**Persons**	
Travel Speed (Average)	km/h	55.8	55.8	km/h
Travel Distance (Total)	veh-km/h	1313.1	1575.7	pers-km/h
Travel Time (Total)	veh-h/h	23.5	28.2	pers-h/h
Desired Speed	km/h	60.0		
Speed Efficiency		0.93		
Travel Time Index		9.23		
Congestion Coefficient		1.07		
Demand Flows (Total)	veh/h	1296	1555	pers/h
Arrival Flows (Total)	veh/h	1296		
Percent Heavy Vehicles (Demand)	%	2.0		
Percent Heavy Vehicles (Arrivals)	%	2.0		
Degree of Saturation		0.307		
Practical Spare Capacity	%	219.2		
Effective Intersection Capacity	veh/h	4221		
Control Delay (Total)	veh-h/h	1.10	1.33	pers-h/h
Control Delay (Average)	sec	3.1	3.1	sec
Control Delay (Worst Lane by MC)	sec	21.9		
Control Delay (Worst Movement by MC)	sec	66.1	66.1	sec
Geometric Delay (Average)	sec	2.4		
Stop-Line Delay (Average)	sec	0.7		
Idling Time (Average)	sec	0.2		
Intersection Level of Service (LOS)		NA		
95% Back of Queue - Veh (Worst Lane)	veh	1.7		
95% Back of Queue - Dist (Worst Lane)	m	11.8		
Ave. Que Storage Ratio (Worst Lane)		0.00		
Effective Stops (Total)	veh/h	341	409	pers/h
Effective Stop Rate		0.26	0.26	
Proportion Queued		0.17	0.17	
Performance Index		26.6	26.6	
Cost (Total)	$/h	1073.28	1073.28	$/h
Fuel Consumption (Total)	L/h	96.5		
Carbon Dioxide (Total)	kg/h	228.1		
Hydrocarbons (Total)	kg/h	0.018		
Carbon Monoxide (Total)	kg/h	0.27		
NOx (Total)	kg/h	0.228		

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand effects.
In Network analysis, Arrival Flows will be reduced if Upstream Capacity Constraint exists.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
Site Model Variability Index (Average value of largest changes in Lane Degrees of Saturation from the third to the last Main (Timing-Capacity) Iterations): 0.0 %
Number of Iterations: 3 (Maximum: 10)
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 88.4% 22.1% 0.0%

Intersection Performance - Annual Values				
Performance Measure	**Vehicles:**	**All MCs**	**Persons**	
Demand Flows (Total)	veh/y	621,979	746,375	pers/y
Delay (Total)	veh-h/y	530	636	pers-h/y

Effective Stops (Total)	veh/y	163,620	196,344	pers/y
Travel Distance (Total)	veh-km/y	630,275	756,330	pers-km/y
Travel Time (Total)	veh-h/y	11,289	13,547	pers-h/y
Cost (Total)	$/y	515,176	515,176	$/y
Fuel Consumption (Total)	L/y	46,307		
Carbon Dioxide (Total)	kg/y	109,483		
Hydrocarbons (Total)	kg/y	9		
Carbon Monoxide (Total)	kg/y	131		
NOx (Total)	kg/y	109		

1 Hours per Year: 480 (Site)

MOVEMENT SUMMARY

Site: 101 [Boundary_Red Gables_PM_2036 + Dev (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Boundary Rd															
2	T1	All MCs	540	2.0	540	2.0	0.281	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
		LV	529		529		0.281	0.1	LOS A	0.0	0.0	NA	NA	NA	59.8
		HV	11		11		0.281	0.1	LOS A	0.0	0.0	NA	NA	NA	59.8
3	R2	All MCs	438	2.0	438	2.0	0.307	6.6	LOS A	1.7	11.8	0.41	0.61	0.41	51.5
		LV	429		429		0.307	6.6	LOS A	1.7	11.8	NA	NA	NA	51.5
		HV	9		9		0.307	8.0	LOS A	1.7	11.8	NA	NA	NA	50.5
Approach			978	2.0	978	2.0	0.307	3.0	NA	1.7	11.8	0.18	0.27	0.18	55.8
East: Cataract Rd															
4	L2	All MCs	58	2.0	58	2.0	0.043	6.2	LOS A	0.2	1.2	0.29	0.56	0.29	51.9
		LV	57		57		0.043	6.2	LOS A	0.2	1.2	NA	NA	NA	51.9
		HV	1		1		0.043	7.0	LOS A	0.2	1.2	NA	NA	NA	51.3
6	R2	All MCs	22	2.0	22	2.0	0.104	21.9	LOS C	0.3	2.3	0.83	0.93	0.83	42.5
		LV	22		22		0.104	21.0	LOS C	0.3	2.3	NA	NA	NA	42.9
		HV	0		0		0.104	66.1	LOS F	0.3	2.3	NA	NA	NA	28.0
Approach			80	2.0	80	2.0	0.104	10.5	LOS B	0.3	2.3	0.44	0.66	0.44	48.9
North: Boundary Rd															
7	L2	All MCs	36	2.0	36	2.0	0.125	5.6	LOS A	0.0	0.0	0.00	0.09	0.00	56.6
		LV	35		35		0.125	5.6	LOS A	0.0	0.0	NA	NA	NA	56.6
		HV	1		1		0.125	5.6	LOS A	0.0	0.0	NA	NA	NA	56.6
8	T1	All MCs	202	2.0	202	2.0	0.125	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	59.1
		LV	198		198		0.125	0.0	LOS A	0.0	0.0	NA	NA	NA	59.1
		HV	4		4		0.125	0.0	LOS A	0.0	0.0	NA	NA	NA	59.1
Approach			238	2.0	238	2.0	0.125	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.7
All Vehicles			1296	2.0	1296	2.0	0.307	3.1	NA	1.7	11.8	0.17	0.26	0.17	55.8

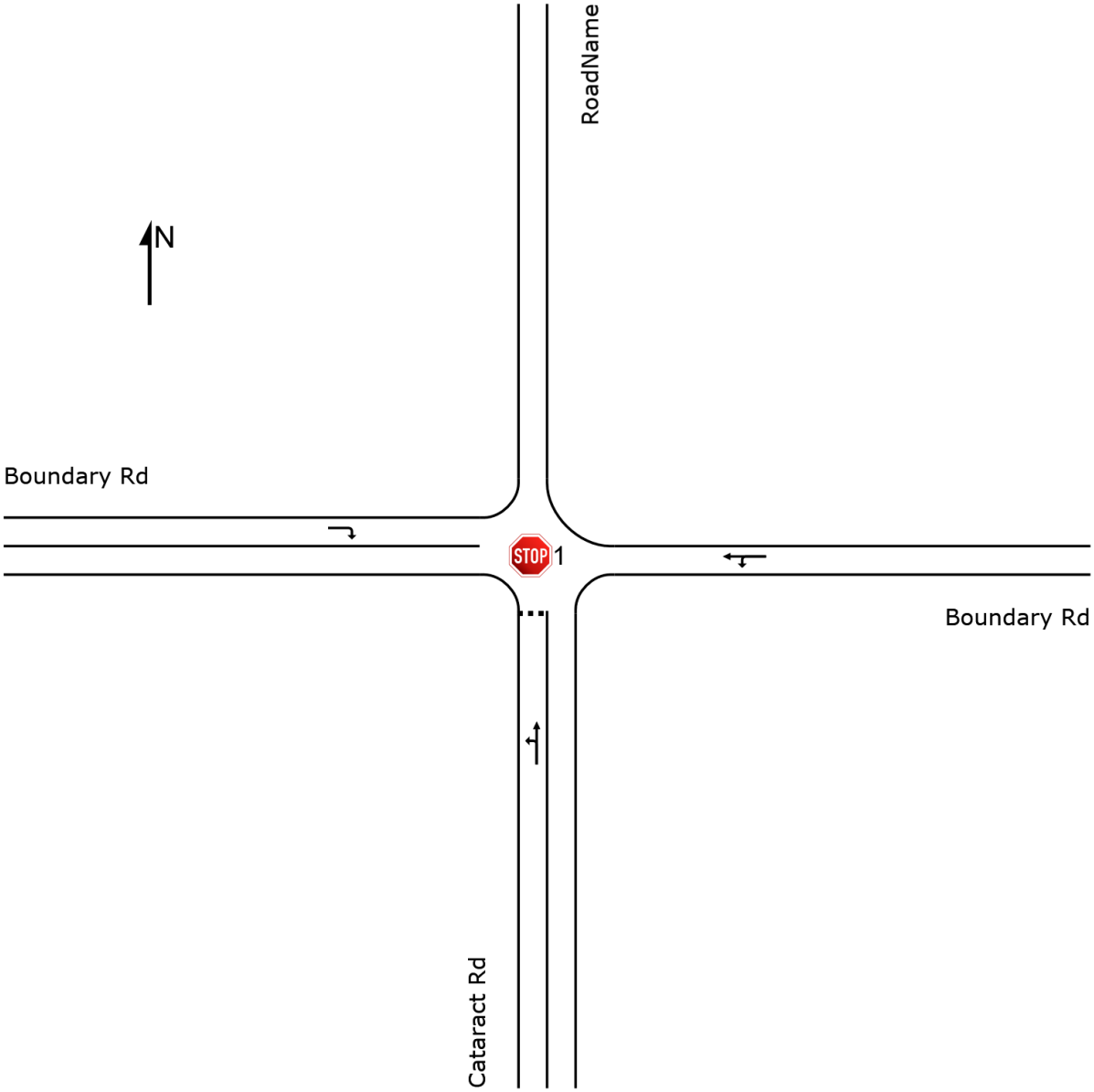
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 1 [Boundary_Cataract Stage 1_AM Existing (Site Folder: General)]

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

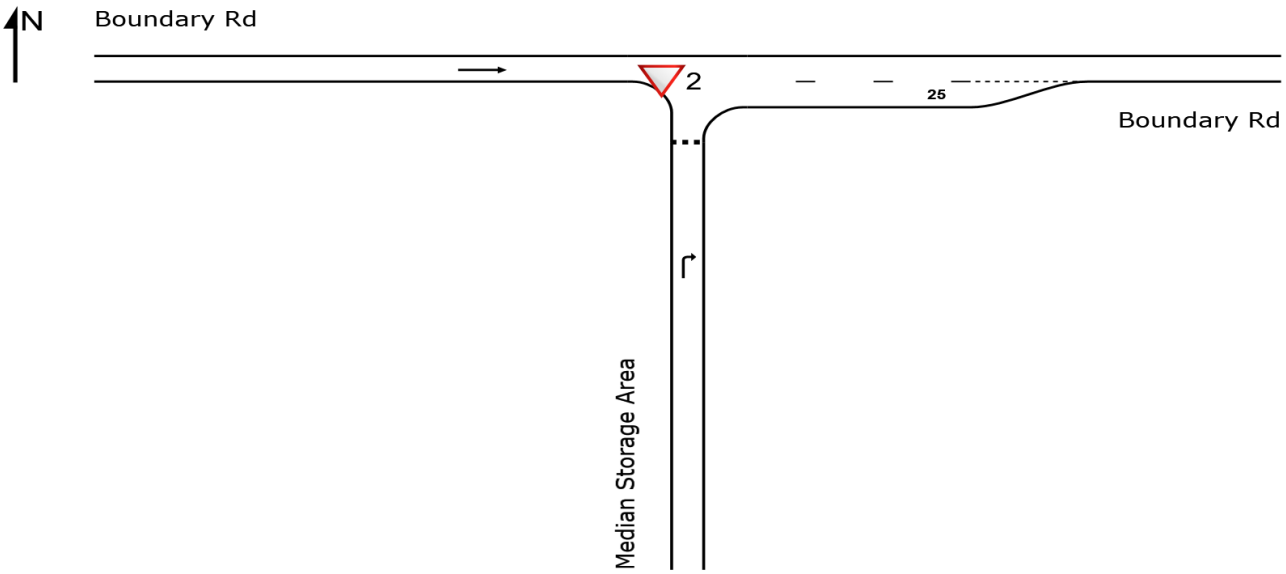


SITE LAYOUT

Site: 2 [Boundary_Cataract Stage 2_AM Existing (Site Folder: General)]

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

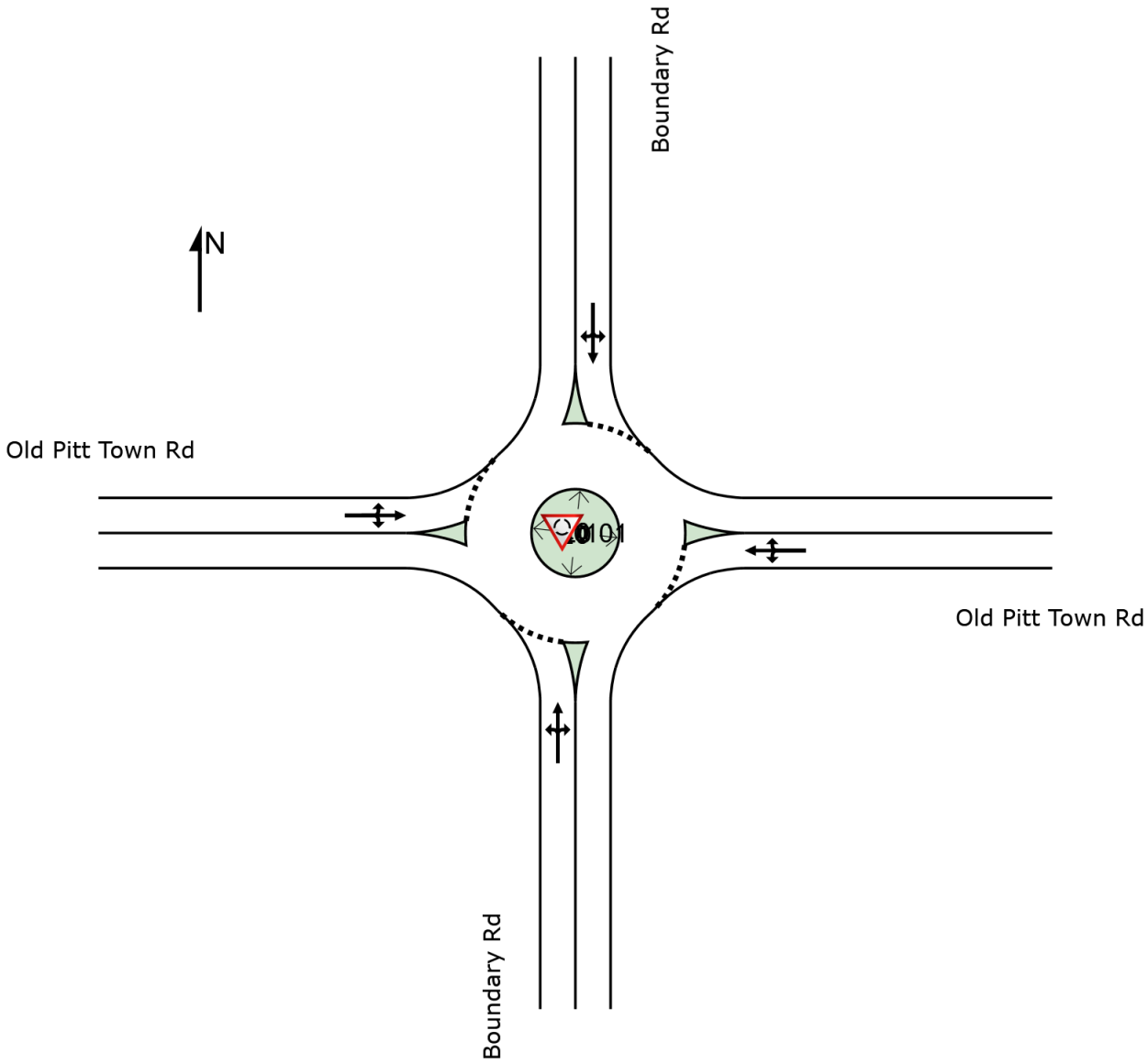


SITE LAYOUT

Site: 101 [Boundary_Old Pitt Town_AM Existing (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

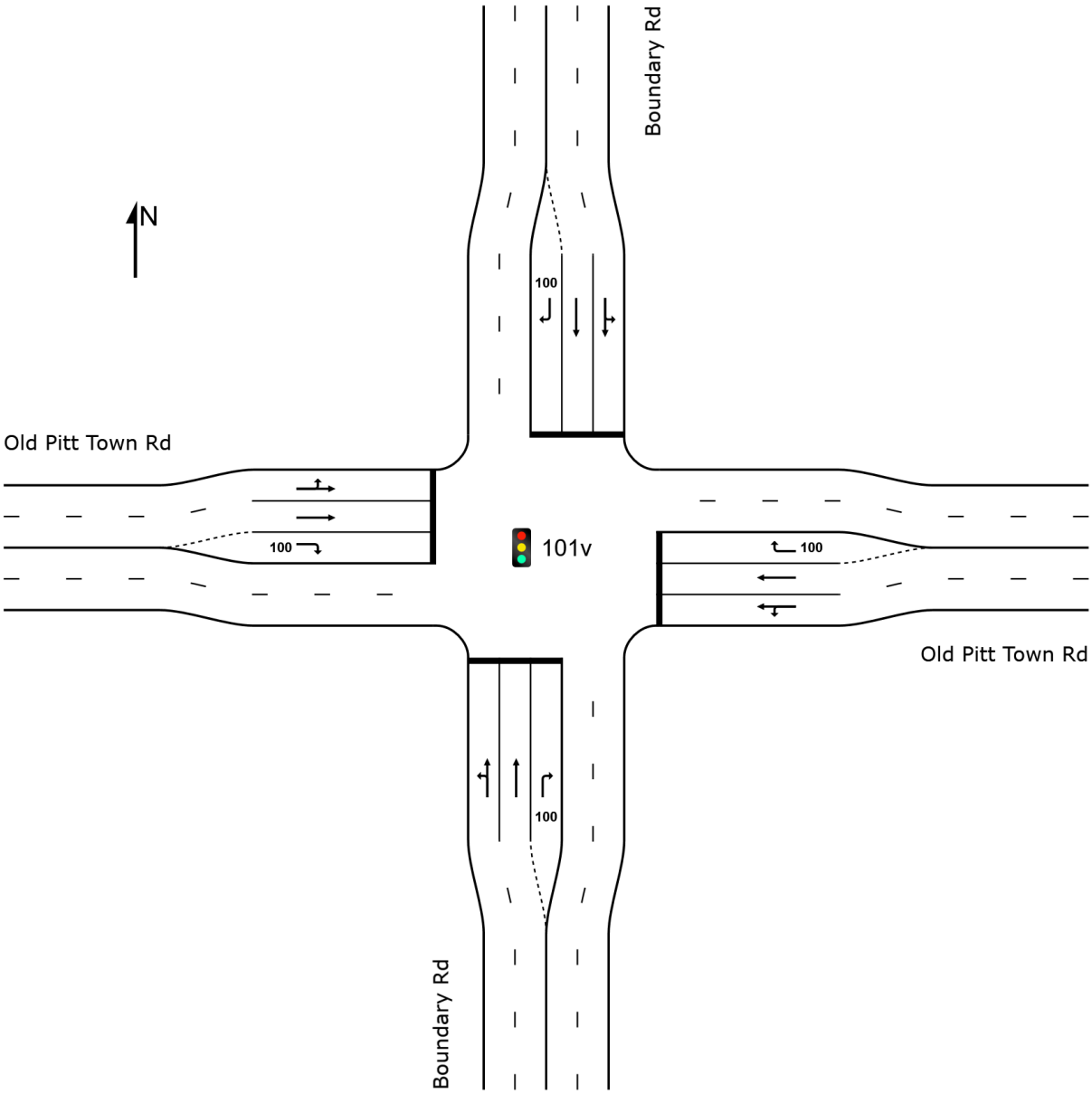


SITE LAYOUT

Site: 101v [Boundary_Old Pitt Town_AM 2036 (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

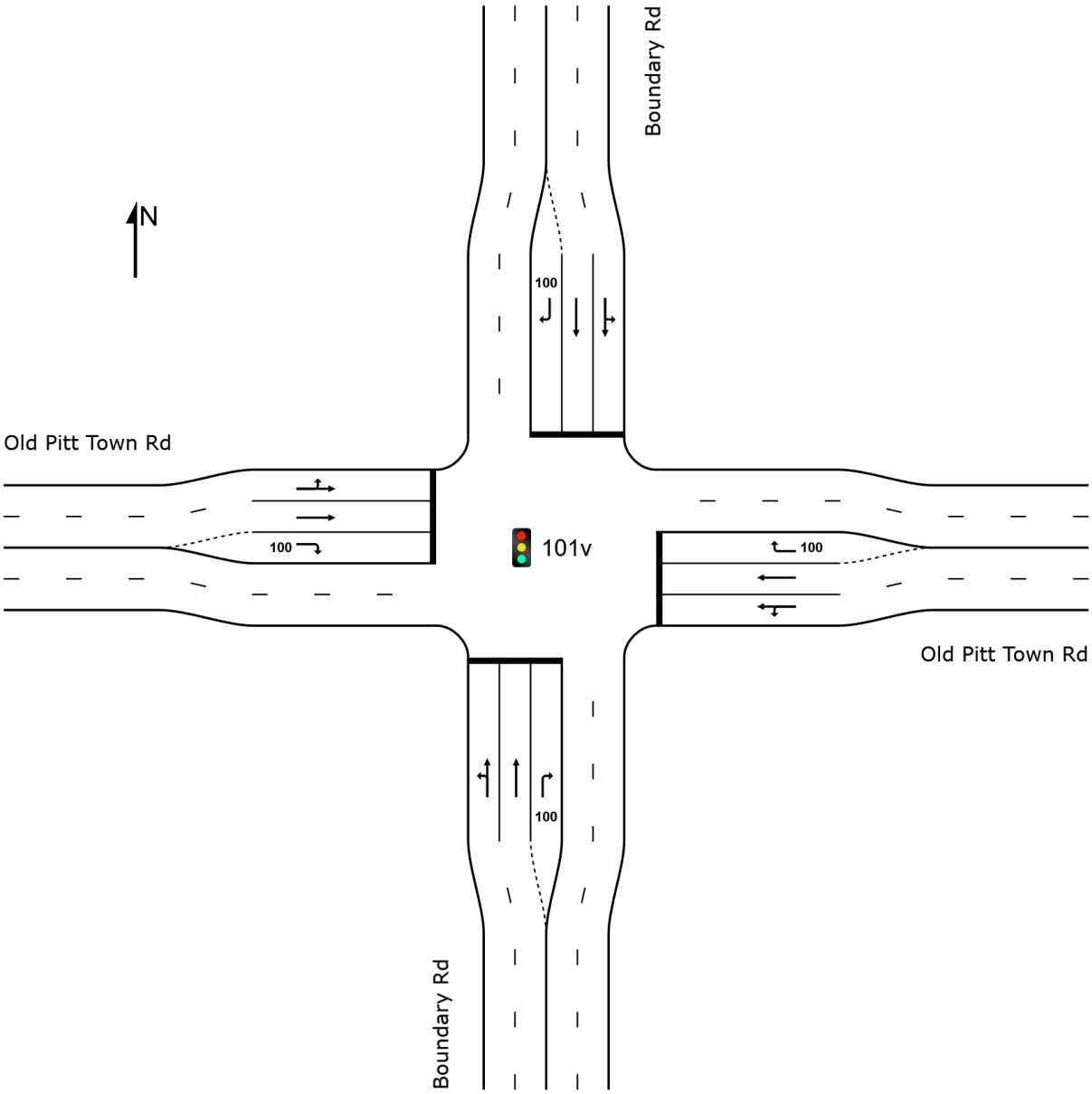


SITE LAYOUT

Site: 101v [Boundary_Old Pitt Town_AM 2036 + Dev (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

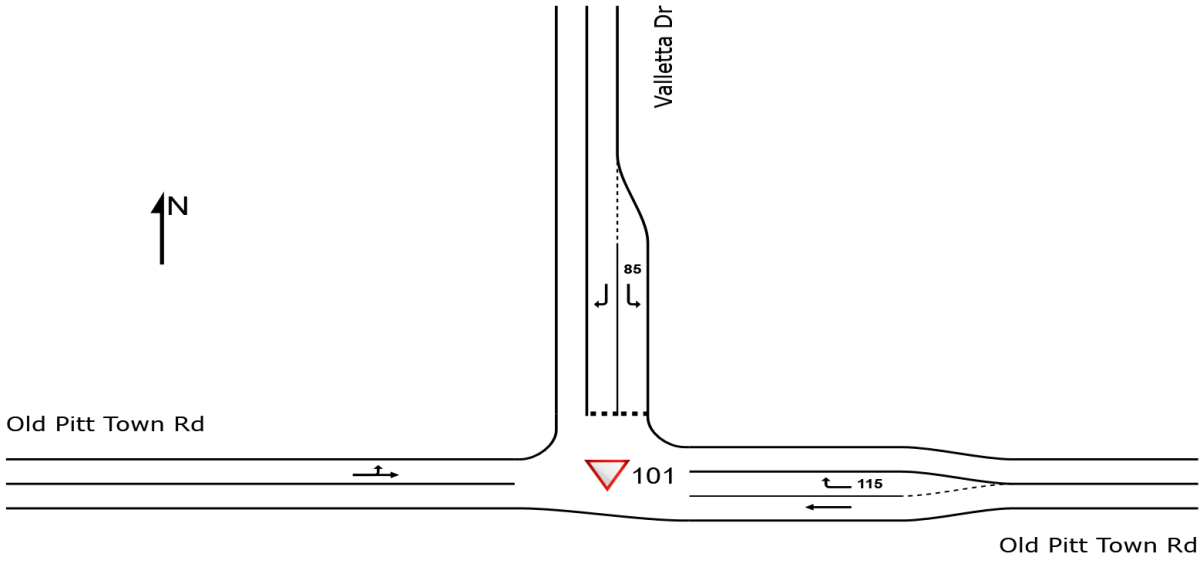


SITE LAYOUT

Site: 101 [Old Pitt Town_Valletta_AM_Existing (Site Folder: General)]

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

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

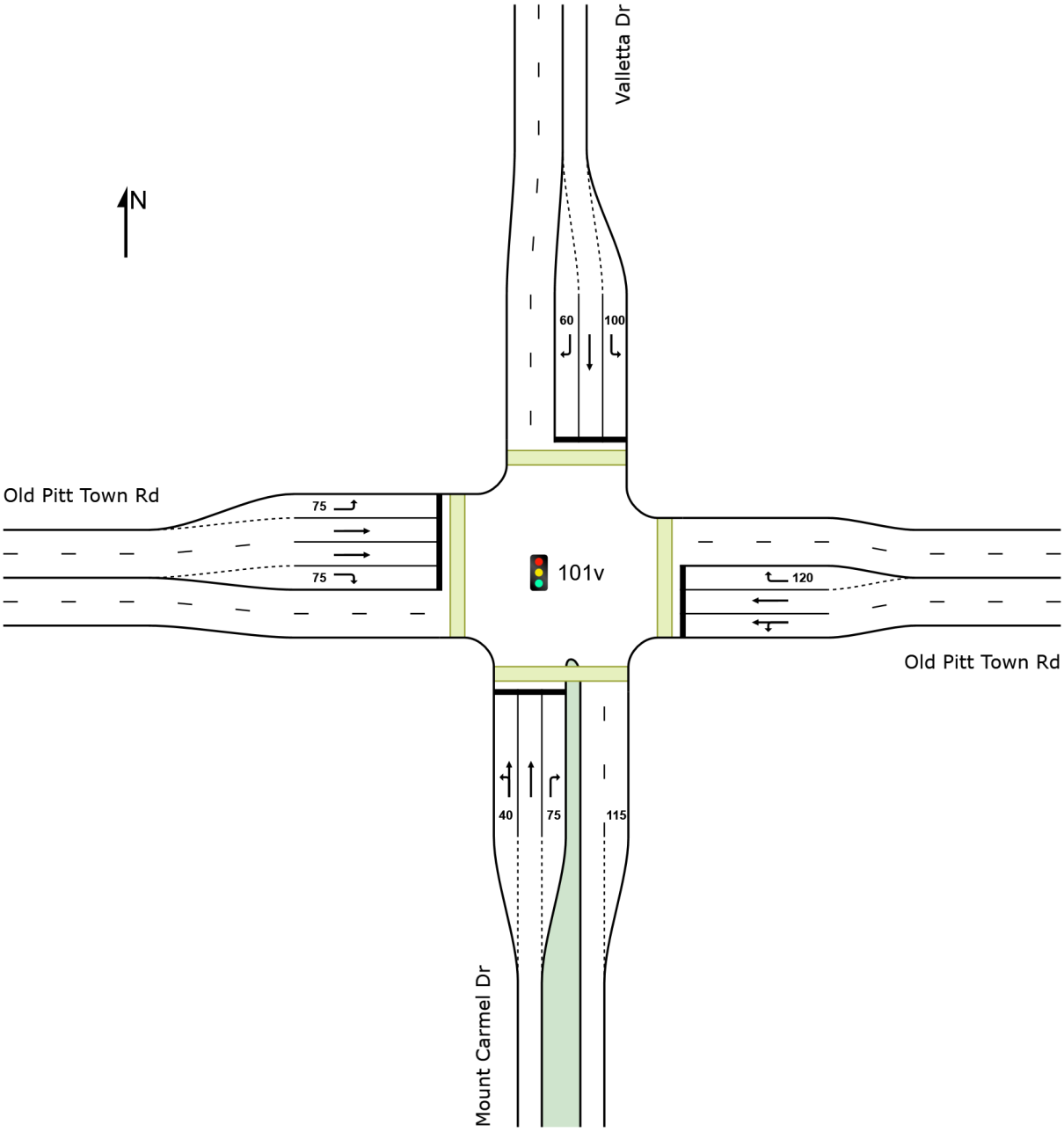


SITE LAYOUT

Site: 101v [Old Pitt Town_Valletta_AM_2036 (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

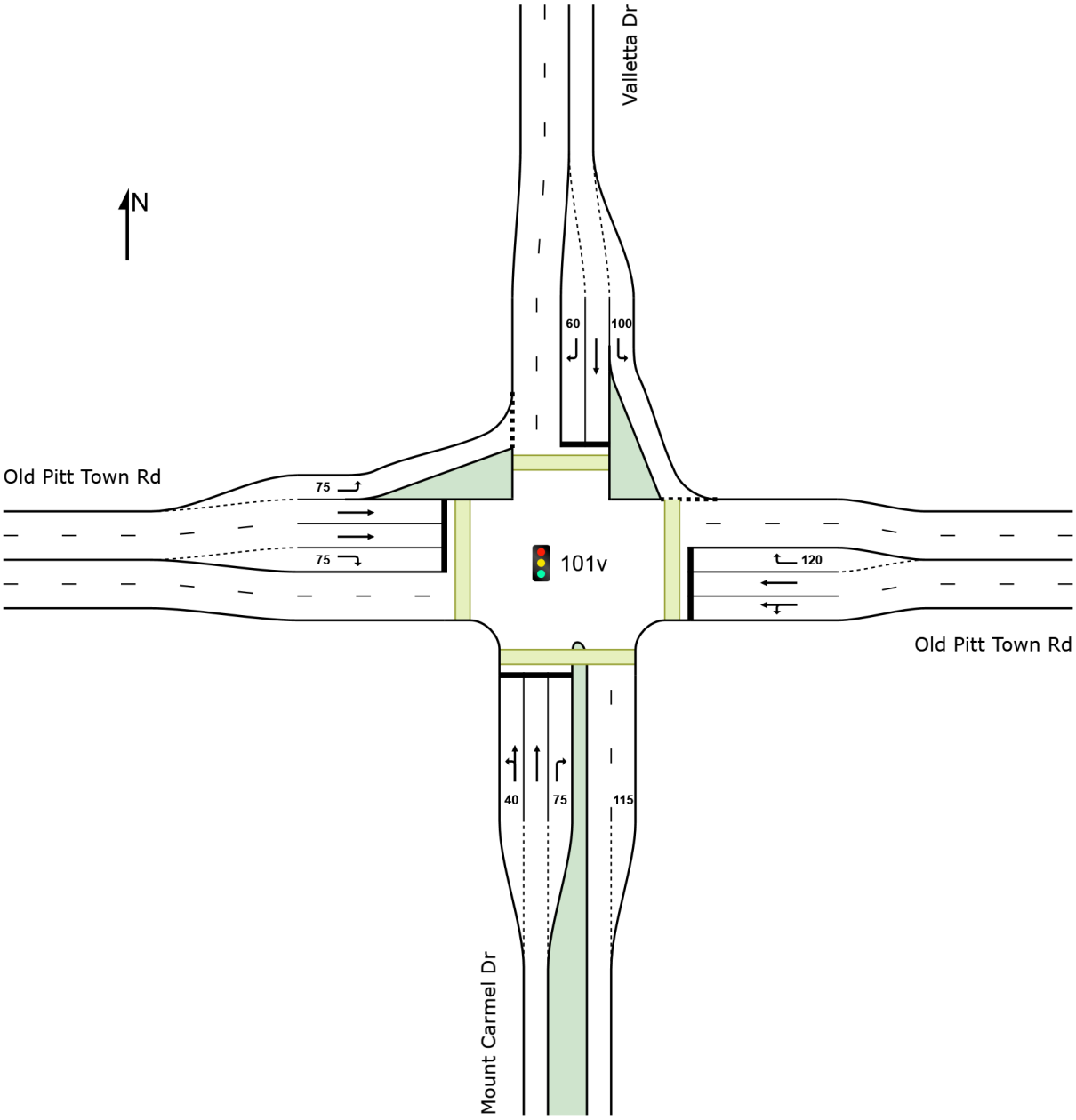


SITE LAYOUT

Site: 101v [Old Pitt Town_Valletta_AM_2036 + Slip (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

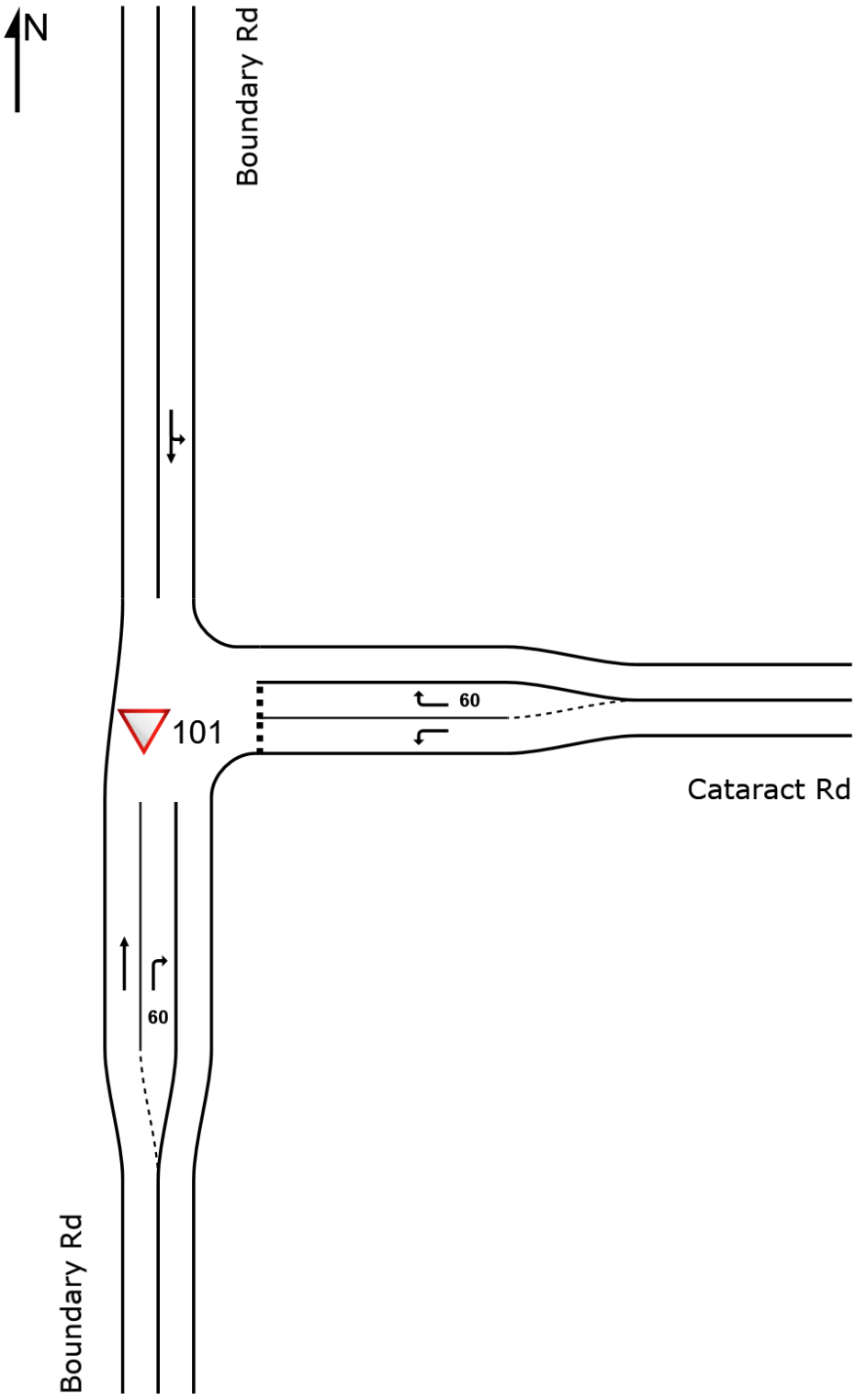


SITE LAYOUT

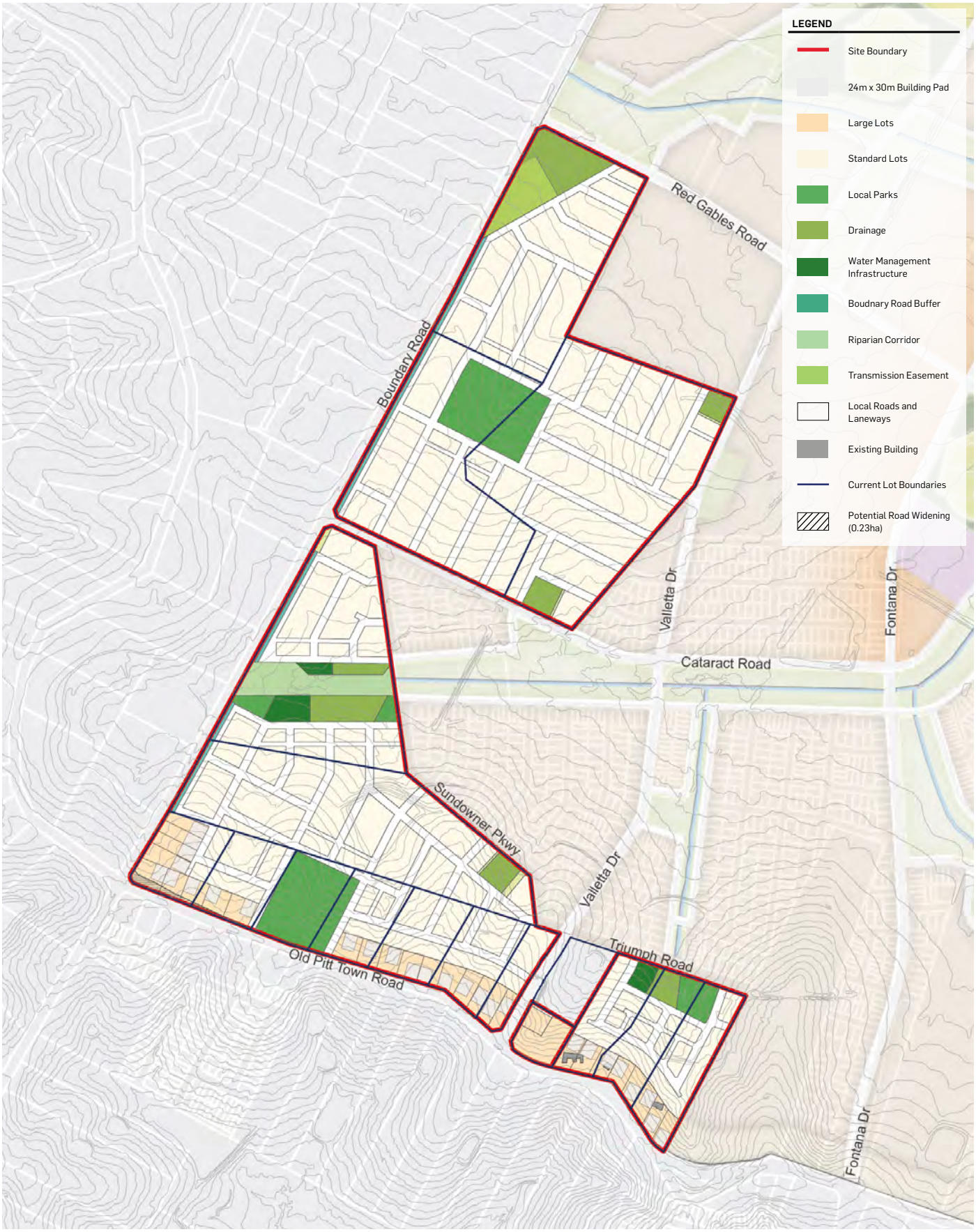
Site: 101 [Boundary_Red Gables_AM_2036 (Site Folder: General)]

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

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



11. Appendix C - Plans of Potential Development Arrangement



URBIS

WEST GABLE

ILLUSTRAVITIE CONCEPT PLAN_SCENARIO 2

1:10,000 @ A4

0 100 200 300 400 500