

# Response to Submissions

## Loreto Normanhurst Master Plan

Prepared for Loreto Normanhurst / 15 January 2020

181202 TAAB

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## Revision Register

Rev	Date	Remarks	Prepared By	Reviewed By	Approved By
0	30/10/20	Draft	GC	PY	-
1	04/12/20	For Review	GC	PY	PY
2	08/12/20	For Issue	GC	PY	PY
3	16/12/20	For Issue	GC	PY	PY
4	15/01/20	For Issue	GC	PY	PY

## Document Control

Internal reference	181202 TAAB
File path	P:\2018\1812\181202\Reports\TTW\Traffic\2020 SSDA Submission\Response to Submissions\Traffic Response to Submissions.docx

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## 1.0 Executive Summary

This report has been prepared to provide an update to the traffic engineering aspects of the State Significant Development Approval for the Loreto Normanhurst Concept Proposal and Stage 1 Development Application. A number of submissions were received with regards to the previous proposal and as a result Loreto has proposed additional works to ameliorate the impacts of the School on traffic and parking conditions in the local area.

Since the original submission, the project team has reviewed the existing site including parking; pick up and drop off; surrounding intersections; bus movements; and community concerns to identify areas of improvement within the Concept Plan. Key issues identified included the capacity of the existing pick up and drop off, the impact of queuing onto Osborn Road as a result of this capacity, and lack of information regarding future car parking on site.

Following this review, a staged approach to the Concept Plan was developed with associated traffic and parking improvement projects to address potential increases in parking demand and traffic generation. These improvements include: relocation of the existing pick up and drop off facility; construction of a through site link with additional pick up and drop off provisions; and additional car parking on site.

Further consultation was also undertaken with the relevant authorities and community engagement sessions were held with the local community to review the revised Concept Plan. Feedback received during these sessions has assisted in the development of the Concept Plan.

Separate to the physical building works that are proposed under the revised concept plan, a detailed Green Travel Plan and Operational Traffic Management Plan have been provided as part of this Response to Submissions. The Green Travel Plan encourages the reduction of private vehicle trips to the site by proposing a number of travel initiatives and actions that Loreto has committed to undertake. The Operational Traffic Management Plan provides clear direction on the management of traffic and parking around the School's campus.

Overall, the Concept Plan and Detailed Development Application have been significantly adjusted to sufficiently respond to submissions received regarding traffic engineering matters.

## 2.0 Introduction

### 2.1 Background

TTW has been engaged by Loreto Normanhurst ("Loreto") to provide traffic engineering advice regarding the proposed State Significant Development Application for a Concept Proposal and Stage 1 Development Application for a new site wide master plan.

#### 2.1.1 Previous State Significant Development Proposal

Loreto identified the need to develop a new campus wide planning approach to development on site including future projections of development and requirements of the campus. A 30 year master plan was developed including:

- Establishment of a series of new building envelopes across the site for education and ancillary uses including student accommodation;
- Increase of the student number cap by 850 students from 1,150 to 2,000 students;
- Improvements to open space and landscape design;
- Changes to pedestrian and circulation arrangements; and
- Associated car parking provision.

The previous State Significant Development Application (SSDA) was seeking approval for the overall masterplan as well as Stage 1 detailed design works for a new on campus student boarding facility, landscaping works, and some demolition works to the buildings between Mary Ward and the existing dining room building.

The Environmental Impact Statement prepared for the scheme was submitted to the Department of Planning on the 18<sup>th</sup> of June 2019.

#### 2.1.2 Response to Proposal

Following the exhibition of the Environmental Impact Statement (EIS), authority and public submissions were received highlighting a number of concerns. From this the Department of Planning, Industry and Environment prepared a key issues letter that requested a review of the Concept Plan and further details in relation to traffic and parking demands.

A significant number of public submissions were received during the exhibition period that largely related to traffic and parking. Key issues raised include:

- Increased pick up and drop off demand as a result of increased student numbers.
- Increased queuing at the Osborn Road pick up and drop off location.
- Reduced safety at the intersection of Mount Pleasant Avenue and Pennant Hills Road.
- Increased on street parking demand due to increased staff and students and inadequate on-site parking.

#### 2.1.3 Current Planning Approvals

The Early Learning Centre Development Application (DA/1227/2018) was approved through Hornsby Shire Council and includes construction of an 80 place Early Learning Centre building.

Current development approvals have imposed the following relevant conditions of consent on the site:

▪ **DA/1277/2004/B Loreto Normanhurst:**

- Condition 65 states *“there shall be no increase in the number of students above 1150 pupils without prior written consent of Council.”*
- Condition 67 states *“the Osborn Road carpark must be made available for student parking.”*
- Condition 68 states *“student driver permits must be limited to 40 and student parking must be provided on site.”*

▪ **DA/1227/2018 Loreto Normanhurst:**

- Condition 61 states:
  - *“25 off street car parking spaces must be provided and allocated to the Early Child Care Centre at all times.”*
  - *“5 car spaces within the Year 12 car park and 5 spaces within the maintenance car park ... must be for Staff only given there is only one-way access during the morning and afternoon.”*
  - *“5 car spaces ... within the existing administration car park must be designated as pick up/drop off car spaces for the ELC only during the morning and afternoon from 7am to 10am and 4pm to 6pm.”*
- Condition 63 states *“the child care centre shall accommodate a maximum of 80 children”*

▪ **SSD 07\_166 Wahroonga Estate:**

- Condition B7(2) states:
  - *“The proponent is to install full time No Right Turn signage at the intersection of Mount Pleasant Avenue and Pennant Hills Road prior to the release of the first Construction Certificate for the Mount Pleasant Precinct.”*

## 2.2 Scope of Report

This report aims to summarise the changes relevant to traffic and parking that have been made to the Concept Plan and Detailed Development in response to items raised during the EIS exhibition period. This report is supplemented by the Transport Assessment Report prepared by Ason in January 2019 for the original proposal.

The key items covered by this report are as follows:

- The revised Concept Plan and Stage 1 Detailed Development including new swept path analyses for the site.
- Updated parking demand and staged supply to reflect the revised design and updated student and staff projections.
- Updated vehicular traffic modelling to address authority comments and the new staging of works.
- Review of the current pick up and drop off; provision of a demand analysis throughout the staging of works; and summary of proposed measures to ameliorate impacts of this demand.

- Review of existing bus patronage, future demands on bus services, and proposed measures to provide for these demands.
- Review of active transport connections and modifications required as a part of the revised Concept Plan and Detailed Development Application.
- Summary of the relevant submissions received and the response to these items through design adjustment.

A separate Green Travel Plan and Operational Traffic Management Plan has been prepared for the site and is included as part of this Response to Submissions. These plans should be read in conjunction with this report.

Through the development of the revised design, TTW have met with Hornsby Shire Council, Transport for New South Wales and Roads and Maritime Services to present options for the redevelopment. Meeting minutes are attached in Appendices C and D.

## 2.3 References

This report has been prepared with reference to the following documents:

- Hornsby Shire Council's Development Control Plan 2013 and Local Environmental Plan 2013
- NSW Future Transport Strategy 2056
- RMS Guide to Traffic Generating Developments
- RMS Guide to Traffic Modelling
- Early Learning Centre Traffic Impact Assessment prepared by Ason Group dated November 2018
- Early Learning Centre Response to Deferral Decision prepared by Ason Group dated November 2019
- Transport Assessment Report Loreto Normanhurst Long-Term Master Plan prepared by Ason Group dated January 2019
- Relevant Australian Standards



## 3.0 Revised Proposed Development

The proposed first stage of the Concept Plan has been revised to include additional works largely related to improved car parking and traffic flow. Refer to the Environmental Impact Statement prepared by Ethos Urban for a detailed description of the proposed works.

### 3.1 Assumptions

#### 3.1.1 Staging of Works

The revised Concept Plan includes a series of staged works aiming to progressively increase parking to account for the demand as a result of enrolment increases. The stages have been summarised in Table 3.1 below.

**Table 3.1: Staging of Development**

		Building Work
Detailed Development Approval	Stage 1	Additional car parking to P3A car park Relocated pick up and drop off to P3A car park Construction of Boarding House Mary Ward Wing alterations Additional enrolment growth
	Stage 2	New through site link including pick up and drop off Additional P1A car park
	Stage 3	Additional P4A car park Additional enrolment growth
	Stage 4	Additional enrolment growth
Concept Approval only	Stage 5	P3 Car park redevelopment and expansion Building work to future Development Application Additional enrolment growth

#### 3.1.2 Enrolment and Staffing

TTW have been provided with projected increases in enrolment per year group per year and staffing requirements per year. These increases relate to the staged development within the master plan and are detailed in Table 3.2.

**Table 3.2: Enrolment and Staffing Increases**

	Current	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Increase from Existing
Total Student Enrolments	1,100 <sup>1</sup>	1,250	1,250	1,400	1,650	2,000	900
Year 12 Enrolments	163	175	175	175	235	275	112
Full Time Equivalent Staff	254	254	254	266	290	325	71

<sup>1</sup>Note that current student enrolments are below the existing student cap of 1,150 students.

## 4.0 Parking Demand

### 4.1 Travel Mode Share

A survey was conducted as part of the preparation of the previous Transport Assessment Report to determine the travel mode share of existing students and staff to and from Loreto.

### 4.2 Assessment

#### 4.2.1 Development Control Plan

Hornsby Shire Council's Development Control Plan (DCP) stipulates the following parking requirements:

- 1 space per 2 students of driving age
- 1 space per staff member

In order to meet HSC's DCP requirements, the increase in number of car parking spaces required per stage is as shown in Table 4.1.

**Table 4.1: DCP Parking Assessment per Year**

	Population					Parking Requirement				
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
<b>Year 12 Students</b>	+12	0	0	+60	+40	+6	0	0	+30	+20
<b>Staff</b>	+0	0	+12	+24	+35	0	0	+12	+24	+35
<b>Total Increase in Parking</b>						<b>+6</b>	<b>0</b>	<b>+12</b>	<b>+54</b>	<b>+55</b>

#### 4.2.2 Mode Share Targets

Given the constrained access of the site, and general sentiment from the public that there needs to be a reduction in vehicle traffic in the area, Loreto is committed to implementing a Green Travel Plan to modify the current travel patterns. The mode share targets within this Plan are as indicated in Table 4.2, further details on the actions proposed to meet these targets can be found in the Green Travel Plan submitted as part of this Response to Submissions. To show commitment to this Plan, Loreto intends to implement some measures starting in Term 1 2021.

As the Concept Plan is intended to be completed over 25 to 30 years, two sets of travel mode share targets have been proposed. The short-term travel mode share targets are intended to be achieved on completion of Stages 1 to 4, with longer term targets provided as an aim for completion of the Concept Plan.

The current student driving rate indicates that a greater number of students are driving than are provided with student parking permits. The proposed student mode share targets are therefore focused on reducing the student driving rate to within the provided permits, with no increase in student parking permits proposed throughout the Concept Plan.

**Table 4.2: Travel Mode Share Targets Proposed**

Mode	Student Mode Share			Staff Mode Share		
	Existing	Short Term Targets (Change from Existing)	Long Term Targets (Change from Existing)	Existing	Short Term (Change from Existing)	Long Term (Change from Existing)
Driver	13.9%	3.5% (-10.4%)	2% (-10.9%)	89.1%	84.0% (-5.1%)	80% (-9.1%)
Dropped Off	15.8%	15.0% (-0.8%)	10% (-5.8%)	0.5%	0.5%	0.5%
Taxi/Uber	0.2%	0.0% (-0.2%)	0.0% (-0.2%)	0.0%	0.0%	0.0%
Train	19.5%	23.0% (+3.5%)	25.5% (+6%)	5.7%	10.8% (+5.1%)	12.8% (+7.1%)
STA Bus	16.2%	17.0% (+0.8%)	19.0% (+3.8%)	0.0%	0.0%	2.0% (+2.0%)
Loreto Bus	12.7%	14.0% (+1.3%)	15.0% (+2.3%)	0.0%	0.0%	0.0%
Bicycle	0	2.0% (+2.0%)	2.0% (+2.0%)	0.5%	0.5%	0.5%
Walk	3.8%	4.0% (+0.2%)	5.0% (+1.2%)	2.6%	2.6%	2.6%
Live on Campus	10.4%	14.0% (adjusted for increase in Boarding students)	14.0%	0.0%	0.0%	0.0%
Other	7.5%	7.5%	7.5% (no change)	1.6%	1.6%	1.6%

### 4.2.3 Early Learning Centre Demand

As part of the separate Development Application for the Early Learning Centre, 25 parking spaces must be allocated as parking made available for the ELC (refer to Section 2.1.3) to allow for staff parking and pick up and drop off.

## 4.3 Parking Supply

### 4.3.1 Detailed Development Approval Increase

The parking supply on site is proposed to be increased in stages in response to the staged increase in enrolment and staffing discussed in Table 3.2. The increase in parking per location (shown in Figure 4.1) has been detailed in Table 4.3, note that the parking demands required as part of the Early Learning Centre development have been separated from the parking allocation available to the School.

As shown in Table 4.1, the increase in parking required under the DCP will be met during each stage, either by works within that stage or works that occur prior to that stage. The detailed development proposes an increase in parking of 108 spaces which meets the required increase in parking stipulated in the DCP rates (72 spaces as per Table 4.1).

It is noted that there is an existing shortfall in parking on the campus. To manage this shortfall and reduce the vehicle demands for the site, a Green Travel Plan is proposed. This Plan aims to reduce the requirement for additional parking on site, however the Concept Plan has provision for addressing any shortfall in future through the introduction of a 200 space car park replacing the P3A car park.



Figure 4.1: Car Parking Locations



**Table 4.3: Detailed Development Staged Parking Increase**

<b>Carpark</b>	<b>Existing</b>	<b>Stage 1</b>	<b>Stage 2</b>	<b>Stage 3</b>	<b>Stage 4</b>
P1 Year 12	53	53	45	45	45
P2 Admin	23 (inc. 2 accessible)	22 (inc. 2 accessible)	22 (inc. 3 accessible)	22 (inc. 3 accessible)	22 (inc. 3 accessible)
P3 Osborn	60 (inc. 1 accessible)	87 (inc. 1 accessible)	87 (inc. 1 accessible)	87 (inc. 1 accessible)	87 (inc. 1 accessible)
Chapel	14	14	0	0	0
ELC Car Park	0	10 (inc. 2 accessible)	10	10	10
P1A Tennis Court Car Park	0	0	42	42	42
P4A Basketball Car Park	0	0	0	64 (inc. 2 accessible spaces)	64 (inc. 2 accessible spaces)
P4 Primary	34 (inc. 1 accessible)	15	15	15	15
Outside Gate	3 (inc. 1 accessible)	3 (inc. 1 accessible)	3 (inc. 1 accessible)	3 (inc. 1 accessible)	3 (inc. 1 accessible)
Boarding	0	32 (including 2 accessible)	32 (including 2 accessible)	32 (including 2 accessible)	32 (including 2 accessible)
<b>Total Parking</b>	<b>187</b>	<b>236</b>	<b>256</b>	<b>320</b>	<b>320</b>

ELC Allocation	0	25	25	25	25
<b>School Allocation</b>	<b>187</b>	<b>211 (+24)</b>	<b>231 (+20)</b>	<b>295 (+64)</b>	<b>295 (+0)</b>

A detailed turning path analysis has been prepared for the car parking and vehicle access points proposed as a part of the Stage 1 Detailed Development Approval. These have been attached in Appendix A.

#### 4.3.2 Concept Increase

The aim of the parking provided within the Concept Plan is to remove the existing shortfall of parking on site through a combination of reducing the existing private vehicle driving rate and providing additional parking.

Provision has been made within the concept plan for a future car park providing up to 200 spaces located at the P3A car park. As the staged development occurs within the School, new travel mode surveys will be conducted, and adjustments made to parking demand projections. During future detailed development applications for the Stage 5 works, the total parking demand calculated (based on the travel mode split at the time of application) will dictate the number of car parking spaces to be provided within the P3 car park.

This approach has been proposed as:

- Feedback from the community has indicated the key concern in the area is increasing vehicle traffic.
- Travel behaviour changes proposed in the Green Travel Plan will occur over time with gradual shifts away from private vehicle use. As the Concept Plan is intended to occur over a long timeframe (over 20 years), travel behaviour can be difficult to predict.
- If car parking were provided to meet the shortfall early in the Concept Plan, this would discourage change in travel patterns and encourage private vehicle use.
- The number of spaces provided within the future P3 car park can be adjusted to suit the shortfall on completion of the Concept Plan, allowing for flexibility dependent on the success of the Green Travel Plan in reducing private vehicle use.
- If long term travel mode share targets are met, the proposed larger P3 car park would no longer be required (as shown in Table 4.4) which would avoid increasing traffic flows on Osborn Road.

**Table 4.4: Comparison of Parking Demands at Completion of Concept Plan**

	Parking Demand	
	Detailed DA	Concept Plan
<b>With Short Term Travel Mode Targets</b>	287 spaces	327 spaces
<b>With Long Term Travel Mode Targets</b>	257 spaces	291 spaces

**Table 4.5: Proposed Concept Plan Parking Provision**

Carpark	Detailed DA	Concept Plan
P1 Year 12	45	45
P2 Admin	22 (inc. 3 accessible)	22 (inc. 3 accessible)
P3 Osborn	87 (inc. 1 accessible)	200
Chapel	0	0
ELC Car Park	10	10
P1A Tennis Court Car Park	42	42
P4A Basketball Car Park	64 (inc. 2 accessible spaces)	64 (inc. 2 accessible spaces)
P4 Primary	15	15
Outside Gate	3 (inc. 1 accessible)	3 (inc. 1 accessible)
Boarding	32 (including 2 accessible)	32 (including 2 accessible)
<b>Total Parking</b>	<b>320</b>	<b>433</b>
ELC Allocation	25	25
<b>School Allocation</b>	<b>295</b>	<b>408 (+113)</b>

### 4.3.3 Early Learning Centre

As stipulated in the consent conditions for the Early Learning Centre (ELC), 25 car parking spaces must be allocated for use by the ELC. A total of 5 staff spaces will be provided for the ELC staff within both the Year 12 car park and maintenance car park, while 5 spaces within the administration car park will be designated as pick up and drop off car spaces for the ELC during the morning and afternoon.

### 4.3.4 Accessible Parking

The total number of accessible spaces currently on site is equal to 5 spaces. In accordance with the Building Code of Australia, at school buildings, 1 per every 100 spaces or part thereof shall be accessible. At all stages of the Concept Plan, accessible parking is provided that exceeds this requirement as shown in Table 4.6.

**Table 4.6: Accessible Parking Provision per Stage**

Existing	Stage 1	Stage 2	Stage 3	Stage 4
5 spaces	8 spaces	7 spaces	9 spaces	9 spaces

## 5.0 Traffic Demand

### 5.1 Traffic Count Data

#### 5.1.1 Tube Count Data

To supplement the previous data collected as part of the original submission, additional traffic count data has been collected at the access driveways to the School on the 25<sup>th</sup> of June 2020 to determine existing traffic flows in and out of the School throughout the day. This tube count data was collected primarily to comment on the operation of the existing pick up and drop off, and to assist with future trip distributions.

#### 5.1.2 Sydney Coordinated Adaptive Traffic System (SCATS) Data

Intersection traffic count data was obtained from RMS for the 7<sup>th</sup> November 2019 to conduct a SIDRA intersection model and review the results provided in the previous traffic modelling. SCATS data provides information on signal phasing, green times and traffic volumes in peak periods.

### 5.2 Existing Intersection Operation

Traffic modelling was conducted using SIDRA intersection modelling software to determine the existing intersection performance. Results are shown in Table 5.1, with detailed results available in Appendix A.

It was found that the existing Osborn Road/Pennant Hills Road/Normanhurst Road intersection is operating at a high level of service for the Pennant Hills Road intersection legs, and operating near capacity for the minor legs of the intersection.

The Pennant Hills Road/Mount Pleasant Avenue intersection experiences acceptable levels of service on the Pennant Hills Road legs of the intersection, however the Mount Pleasant Avenue leg of the intersection has a level of service F. The detailed results indicate that this poor performance is due to the right turn movement out of Mount Pleasant Avenue, with the left turn movement operating at a level of service A, with delays of only 11 seconds.

**Table 5.1: Existing Intersection Operation**

Intersection	Leg	Existing Operation		
		DOS	Delay (sec)	LOS
Osborn Road/Pennant Hills Road/Normanhurst Road (AM)	Osborn Road (S)	0.693	56.6	E
	Pennant Hills Road (E)	0.674	22.0	B
	Normanhurst Road (N)	0.665	57.6	E
	Pennant Hills Road (W)	0.680	22.0	B
	Total Intersection Performance	0.693	25.9	B
Pennant Hills Road/Mount Pleasant Avenue (AM)	Mount Pleasant Avenue (S)	0.883	163.8	F
	Pennant Hills Road (E)	0.391	0.2	A
	Pennant Hills Road (W)	0.327	32.9	C
	Total Intersection Operation	1.068	3.0	F

#### 5.2.1 Issues

The key issues with these intersections relate to safety concerns by Hornsby Shire Council and the public. At the Osborn Road and Pennant Hills Road intersection, the single departure lane onto Osborn Road results in



safety concerns with queuing associated with the existing pick up and drop off facility. At the Mount Pleasant Avenue and Pennant Hills Road intersection, the unsignalised right turn movement has resulted in delays for the Mount Pleasant Avenue leg of the intersection.

### 5.3 Future Traffic Volumes

Since the traffic counts were conducted, NorthConnex has been opened and is operational. As part of the original Traffic Impact Assessment submitted, Ason Group obtained the Strategic Traffic Forecasting Model (STFM) data from RMS. The STFM data provided included the future traffic flows expected on Pennant Hills Road for 2027 and 2036. The projections from the model indicated that traffic flows on Pennant Hills Road would reduce as a result of NorthConnex, further details can be found in the original Transport Assessment Report. These same principles have been adopted for the model prepared as part of this Response to Submissions.

### 5.4 Trip Generation

Trip generation has been based on future parking and pick up/drop off demands as discussed in Sections 4.2 and 6.2. The pick up and drop off demand is expected to generate two trips, one incoming and one outgoing. Traffic generated by the Early Learning Centre (approved as part of a separate Development Application) has also been applied in the trip generation.

A comparison of the trips generated currently, on completion of the Detailed Development Application works and on completion of the Concept Plan is provided in Table 5.2.

**Table 5.2: Traffic Generation Comparison**

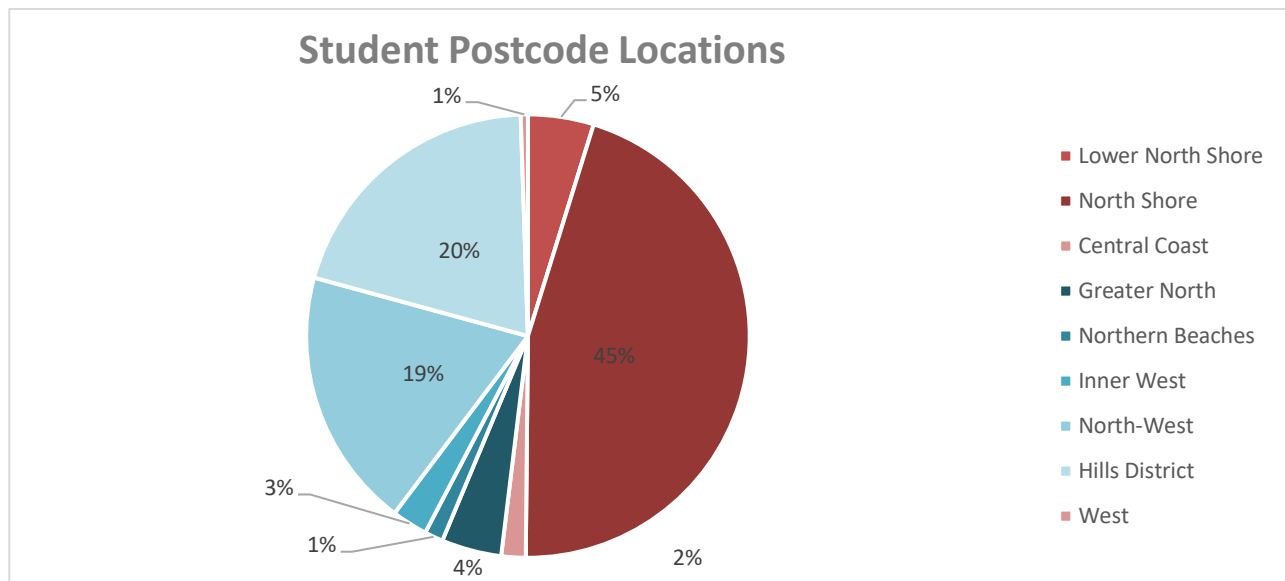
		Existing	Stage 1-4	Concept Plan Trip Generation
School Trip Generation	Pick Up and Drop Off Incoming	195	374	436
	Pick Up and Drop Off Outgoing	195	374	436
	Parking	365	287	327
ELC Trip Generation	Pick Up and Drop Off Incoming	0	42	42
	Pick Up and Drop Off Outgoing	0	42	42
	Parking	0	10	10
Total		755	1129	1296

### 5.5 Trip Distribution

#### 5.5.1 Pick Up and Drop Off Movements

In the existing scenario, all pick up and drop off movements need to occur through the Osborn Road facility. The inclusion of the through site link will distribute traffic movements through both Osborn Road and Mount Pleasant Avenue.

TTW were provided with current student postcode data to project potential trip distribution across the two pick up and drop off areas. This postcode data indicated a split of 52% approaching the School from the east and 48% approaching from the west.



**Figure 5.1: Student Postcode Locations**

To reduce the instance of right turns into and out of Mount Pleasant Avenue, the Operational Traffic Management Plan (submitted as part of this Response to Submissions) dictates that students travelling to and from the east will be directed to the Osborn Road pick up and drop off, and those travelling to and from the west will be directed to the through site link facility.

Pick up and drop off movements associated with the ELC have been assumed to access the site through a right turn onto Mount Pleasant Avenue and egress through a left turn out onto Pennant Hills Road.

## 5.5.2 Parking Movements

Trip distribution of parking vehicles has been based on the distribution of car parking spaces through the site. Since the proposed P3 Osborn Road car park will result in a greater number of parking spaces on completion of the Concept Plan, the trip distribution has been modified from the Detailed Development Approval model to the Concept Plan approval.

## 5.6 Post Development Intersection Operation

Traffic modelling was conducted of the key intersections adopting the future traffic volumes discussed in Section 5.3 and the trip generation and distribution discussed in Sections 5.4 and 5.5. Post development models were prepared for completion of the Detailed Development and on completion of the Concept Plan for both with development and without development.

### 5.6.1 Detailed Development Application Modelling

The results of the post development model are shown in Table 5.3, with detailed results available in Appendix B.

**Table 5.3: Detailed Development Application Modelling Results With and Without Development**

Intersection	Leg	Stages 1-4 No Development			Stages 1-4 With Development		
		DOS	Delay (sec)	LOS	DOS	Delay (sec)	LOS
<b>Osborn Road/Pennant Hills Road/Normanhurst Road (AM)</b>	Osborn Road (S)	0.627	52.9	<b>D</b>	0.827	57.5	<b>E</b>
	Pennant Hills Road (E)	0.629	22.7	<b>B</b>	0.821	35.5	<b>C</b>
	Normanhurst Road (N)	0.580	54.7	<b>D</b>	0.437	46.5	<b>D</b>
	Pennant Hills Road (W)	0.612	22.3	<b>B</b>	0.744	32.6	<b>C</b>
	Total Intersection Performance	0.629	26.4	<b>B</b>	0.827	36.7	<b>C</b>
<b>Pennant Hills Road/Mount Pleasant Avenue (AM)</b>	Mount Pleasant Avenue (S)	0.690	170.3	<b>F</b>	0.765	208.8	<b>F</b>
	Pennant Hills Road (E)	0.350	3.5	<b>A</b>	0.365	3.5	<b>A</b>
	Pennant Hills Road (W)	0.264	26	<b>B</b>	0.333	29.3	<b>C</b>
	Total Intersection Performance	0.690	170.3	<b>F</b>	0.765	208.8	<b>F</b>

### 5.6.2 Concept Plan Modelling

The results of the post development model are shown in Table 5.4, with detailed results available in Appendix B.

**Table 5.4: Concept Plan Modelling Results With and Without Development**

Intersection	Leg	Stages 1-5 No Development			Stages 1-5 With Development		
		DOS	Delay (sec)	LOS	DOS	Delay (sec)	LOS
<b>Osborn Road/Pennant Hills Road/Normanhurst Road (AM)</b>	Osborn Road (S)	0.591	51.1	<b>D</b>	0.773	55.4	<b>D</b>
	Pennant Hills Road (E)	0.600	23.2	<b>B</b>	0.774	33.0	<b>C</b>
	Normanhurst Road (N)	0.534	52.1	<b>D</b>	0.560	51.4	<b>D</b>
	Pennant Hills Road (W)	0.598	23.9	<b>B</b>	0.642	31.7	<b>C</b>
	Total Intersection Performance	0.600	26.8	<b>B</b>	0.774	35.4	<b>C</b>
<b>Pennant Hills Road/Mount Pleasant Avenue (AM)</b>	Mount Pleasant Avenue (S)	0.506	100.8	<b>F</b>	0.582	125.9	<b>F</b>
	Pennant Hills Road (E)	0.313	3.5	<b>A</b>	0.328	3.5	<b>A</b>
	Pennant Hills Road (W)	0.347	23.3	<b>B</b>	0.426	26.5	<b>B</b>
	Total Intersection Performance	0.506	100.8	<b>F</b>	0.582	125.9	<b>F</b>

### 5.6.3 Analysis of Results

The Osborn Road/Pennant Hills Road/Normanhurst Road intersection is shown to perform at an acceptable Level of Service in the Concept Plan post development model. It is noted that as for the existing model, the Pennant Hills Road legs of the intersection are prioritised as it is the major road movement. Signal phase timing for the future scenario has been based on current phase times provided by SCATS for the intersection. Changes to traffic flows on Pennant Hills Road as a result of NorthConnex may result in changes to signal phasing as Pennant Hills Road experiences reduced traffic. This may result in better performance for the minor legs of the intersection including Osborn Road and Normanhurst Road.

It is noted that as for the existing model, the poor performance of Pennant Hills Road/Mount Pleasant Avenue is due to the right turn movement out of Mount Pleasant Avenue. As noted in Section 2.1.3, there is an existing consent condition related to SSD 07\_166 (Wahroonga Estate) that requires installation of No Right Turn signage at Mount Pleasant Avenue. This is likely to result in better performance of this intersection, however there is no timeframe for the completion of these works and therefore the intersection has been modelled in its normal operation with right turns permitted.

Loreto supports signalisation of the intersection of Mount Pleasant Avenue/Pennant Hills Road and has consulted with Hornsby Shire Council (HSC) and Roads and Maritime Services (RMS) about the potential of this being approved. While HSC is supportive, RMS will not permit the installation of signals in this location due to its proximity to the Osborn Road/Pennant Hills Road/Normanhurst Road intersection. With the changes to vehicle flow expected on Pennant Hills Road as a result of NorthConnex, Loreto will continue to consult with RMS on the potential signalisation throughout the Concept Plan.

Due to the significant changes expected to traffic flow on Pennant Hills Road over the duration of the Concept Plan, it is recommended that future detailed development applications review both intersections for consistency with the projected traffic modelling and undertake further consultation with both HSC and RMS to determine whether any intersection improvements can be undertaken (if required).

## 6.0 Pick Up and Drop Off Demand

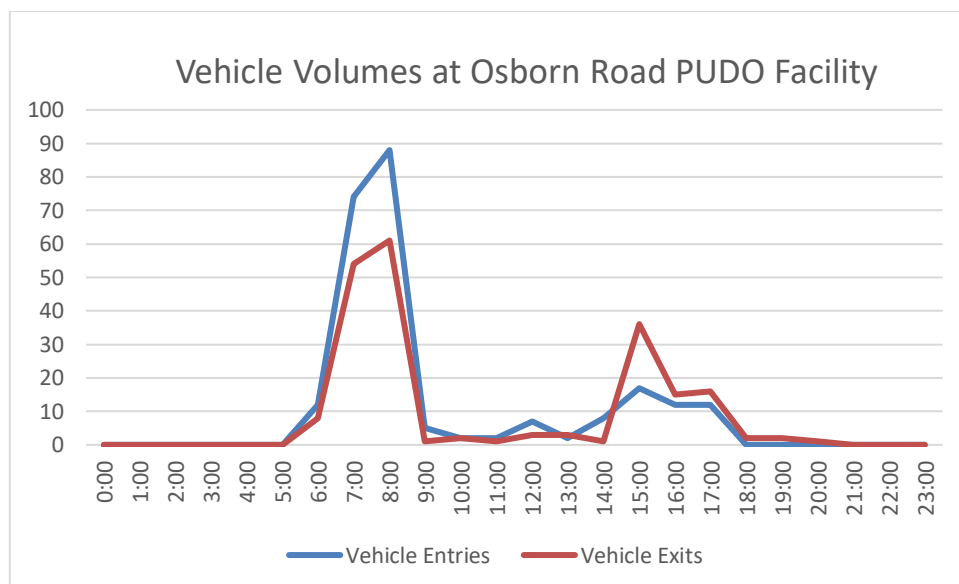
### 6.1 Review of Existing Facility

#### 6.1.1 Submissions

A number of public submissions were received regarding the operation of the existing pick up and drop off (PUDO) on Osborn Road. These submissions are further detailed in Section 8.6.

#### 6.1.2 Traffic Count Data

TTW has collected tube counts of the existing access and egress points into the School and conducted a site visit during a peak morning drop off period to observe current driver behaviour. Figure 6.1 shows the existing traffic flows into and out of the PUDO facility which illustrates the short peak that is experienced during school pick up and drop off times. From site observation and discussions with the school, the morning peak is concentrated from 8:00am to 8:20am and the afternoon peak from 3:15pm to 3:30pm.



**Figure 6.1: Traffic Movements through Existing PUDO Facility**

The travel mode survey indicated that currently 15.8% of students are dropped off. Based on the provided current student numbers, it is anticipated that 181 vehicles require use of the PUDO facility during peak times. The traffic count data collected supports the travel mode survey results as 179 vehicles are shown to enter the PUDO facility between 6:00am to 10:00am, with a peak of 88 vehicles (49% of PUDO demand) from 8:00am to 9:00am.

Queuing at the PUDO driveway can occur when vehicles enter Osborn Road in groups due to the proximity of the signalised intersection at Pennant Hills Road. The geometry of the existing driveway is such that the angle reduces manoeuvrability of right turns which deters recirculation. The steep driveway entry can also cause drivers to queue further apart to avoid front to rear collisions.

It was observed on site that some queuing can occur during peak periods as a result of the above geometrical constraints and driver behaviour.

It is noted that the tube count data was collected during COVID-19 school operation, which has generally resulted in greater instances of students being picked up and dropped off due to Government advice to avoid public transport in peak time where possible.

## 6.2 Future Demands

It is anticipated that the PUDO demand will increase from the existing by 178 vehicles on completion of the Detailed Development Application and a further 62 vehicles from the Detailed Development Application to the completion of the Concept Plan. These future numbers have been based on the short term travel mode share targets. Demand for the PUDO facility is shown in Table 6.1.

**Table 6.1: PUDO Vehicle Demand per Year**

	PUDO Total Vehicle Demand per Morning Period					
	Current	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
<b>Kindergarten to Year 4</b>	N/A	N/A	N/A	80	133	133
<b>Year 5 to Year 6</b>	37	53	53	53	53	70
<b>Year 7 to Year 12</b>	158	165	165	165	188	233
<b>Total</b>	<b>195</b>	<b>218</b>	<b>218</b>	<b>298</b>	<b>374</b>	<b>436</b>

The current peak hour of pick up and drop off consists of 49% of the total demand, which results in a total increase in peak hour vehicle demand through the PUDO facility of 12 vehicles, 51 vehicles, 88 vehicles and 118 vehicles for Stages 1, 3, 4, and 5 respectively.

**Table 6.2: Peak Hour PUDO Vehicle Demand per Year**

	PUDO Total Vehicle Demand per Morning Period					
	Current	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
<b>Kindergarten to Year 4</b>	N/A	N/A	N/A	39	65	65
<b>Year 5 to Year 6</b>	18	26	26	26	26	34
<b>Year 7 to Year 12</b>	77	81	81	81	92	114
<b>Total</b>	<b>95</b>	<b>107</b>	<b>107</b>	<b>146</b>	<b>183</b>	<b>213</b>

As shown by the analysis, there is currently demand for 95 vehicles in the PUDO facility during the peak period. Based on the site inspection and on previous investigations into school pick up and drop off zones, typically each vehicle takes 90 seconds to pull into the space, unload the passenger and exit the space. Distributing the peak hour vehicles to the condensed 20-minute peak on site as observed, there is currently demand for queuing of 7 to 8 vehicles at any one time.

As the staged development occurs there will be demand for:

- 8 to 9 vehicles queuing in Stages 1 and 2
- 10 to 11 vehicles queuing in Stage 3
- 13 to 14 vehicles queuing in Stage 4
- 15 to 16 vehicles queuing on completion of the concept plan.

## 6.3 Proposed Supply

The proposed Osborn Road pick up will provide for 2 designated pick up and drop off spaces with sufficient queuing area prior to the spaces internal to the School for 12 vehicles. This will be completed within Stage 1

of the works. The proposed through site link that will be completed during Stage 2 will provide 3 pick up and drop off spaces with queuing area for an additional 24 vehicles.

This supply represents a significant increase in queuing capacity internal to the school as the current facility provides only 4 pick up and drop off spaces with queuing capacity for only 3 vehicles. A comparison of the different queue lengths available is shown in Figure 6.2.

In Stage 5 when adjustments are made to the P3A car park, a pick up and drop off area of equal or increased length will be provided dependent on travel mode surveys that will be conducted throughout the staged developments.

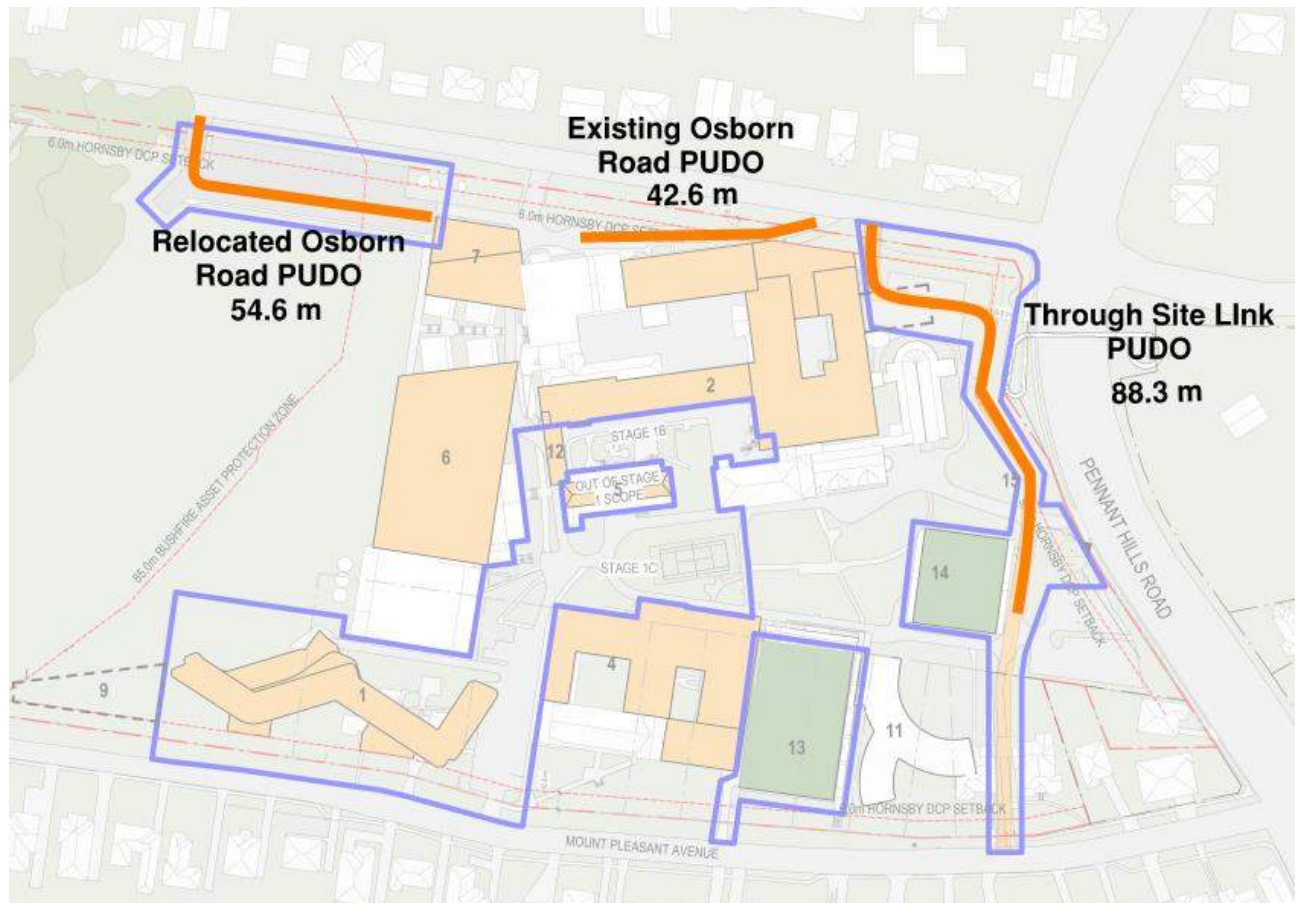


Figure 6.2: Comparison of PUDO Queue Lengths

## 7.0 Bus Vehicle Demand

### 7.1 Review of Existing Facility

The existing bus facility is a dedicated bus layover within the Osborn Road pick up and drop off facility that can accommodate two buses. The School currently manages bus pick-up by organising students into bus lines prior to the bus arriving to make the boarding process quicker. The access driveway to the bus layover is shared with the traffic generated by the pick up and drop off.

### 7.2 Current Supply

Loreto Normanhurst currently charts 6 buses with patronage as shown in Table 7.1. There are also public school buses that utilise the slip road within Loreto.

**Table 7.1: School Bus Services and Occupancy**

Location Served	Capacity	Patronage
Arcadia	27	12
Drummoyne/Gladesville	57	38
Lane Cove/North Ryde	39	29
Mosman/North Shore	39	29
Northern Beaches	27	2
The Hills District	27	16

### 7.3 Future Demands

With the projected increase in student enrolments and proposed travel mode share, it can be expected that the additional student bus demand will be as shown in Table 7.2. It is noted the private school buses are likely to be more popular with the primary students, this has been accounted for in the demand. With this increase in patronage, 2 additional school buses are likely required on completion of the detailed development application works and an additional bus on completion of the concept plan. Note that future bus requirements will be dependent on the locations of residence for new students.

**Table 7.2: Projected School Bus Patronage**

	PUDO Total Vehicle Demand per Morning Period					
	Current	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Student Private Bus Demand	126 <sup>1</sup>	177	177	215	259	309

<sup>1</sup>Note that the current demand has been based on students that are registered to the private bus service, not the travel mode survey demand.

### 7.4 Proposed Facilities and Supply

As the existing pick up and drop off facility is relocated from its location in the slip road, the current pick up and drop off area will be allocated for additional bus layover. This will provide capacity for additional private school buses. It is anticipated that public school buses will continue to use this facility.



## 8.0 Summary of Response to Submissions

### 8.1 Hornsby Shire Council

TTW met with Hornsby Shire Council on the 20<sup>th</sup> of July 2020 to discuss potential responses to submissions that were received during the exhibition period and potential revisions to the Concept Plan. These meeting minutes are attached in Appendix C.

**Table 8.1: Hornsby Shire Council Comments**

Item	Response
Existing pick up operation is to be reviewed and improved.	<p>Since the original Transport Assessment Report, the existing pick up and drop off arrangement at Osborn Road has been reviewed in its current operation and for its adequacy for the future operations at the School.</p> <p>To address the pick up and drop off issues and future demands Loreto has proposed a relocation of the existing facility and an additional through site link to further increase on site capacity.</p>
With 42.5% increase in students it can be argued that there will be a significant increase in queue length, this is not acceptable to the Branch as it would result in the pickup queue extending onto Osborn Road. Council has received many complaints from local residents regarding queuing onto Osborn Road issue during pickup time.	<p>The relocated Osborn Road pick up and drop off and proposed additional through site link facility will increase the queuing capacity on site by five times what it is currently.</p> <p>Shifting the Osborn Road facility further south will also provide greater departure length from the Osborn Road/Pennant Hills Road intersection which will prevent queues from blocking vehicles entering Osborn Road.</p> <p>These works have been proposed as part of Stage 1 to help ameliorate existing impacts that are experienced by the residents of Osborn Road.</p>
ELC Operational Traffic Management Plan will be impacted by the Master Plan of Loreto. Although the Master Plan excludes the DA of ELC, staff of ELC will rely on car parking areas in Loreto. The TAR needs to have a discussion regarding the future impact to ELC staff parking.	<p>An Operational Traffic Management Plan has been prepared that includes the operation of the ELC, in particular car parking requirements.</p> <p>Car parking demand projections have accounted for demands generated by the ELC and future staff at Loreto.</p>
Will there be dedicated bus services for Loreto Normanhurst students? If so how are the buses to be catered for?	<p>Loreto currently operates 6 bus services and will include additional services as required as stages of the master plan are constructed. By relocating the Osborn Road pick up and drop off, additional capacity for these bus services will be provided at the Osborn Road slip road.</p>
Date of traffic counts has not been provided and is required.	<p>Updated SIDRA models have been prepared with traffic volumes from the Ason report. The volumes within this report have been reviewed against SCATS volumes from Thursday the 7<sup>th</sup> of November 2019 to ensure they reflect the school during normal operations.</p>

## 8.2 Transport for New South Wales

TTW met with Transport for New South Wales on the 30<sup>th</sup> of September 2020 to discuss potential responses to submissions that were received during the exhibition period and the proposed revisions to the master plan. These meeting minutes are attached in Appendix D.

**Table 8.2: Transport for New South Wales Comments**

Item	Response
<p><b>Trip distribution and assignment of additional traffic</b> The Applicant should consider the existing travel preferences and availability of on-street parking, pick-up or drop-off in the surrounding local road network to estimate trip assignment. Intersection analysis of all impacted intersections should be revised or undertaken accordingly.</p>	<p>Traffic distribution has been revised to address the various vehicular access points around the site, with trips proportioned to available parking spaces. Increase provision of pick up and drop off will reduce the incidence of pick up and drop off occurring on local roads.</p>
<p><b>Managing school traffic volumes at Pennant Hills Road with Mount Pleasant Avenue</b> DPIE should consider requesting an investigation into traffic management measures or development design to mitigate potential increases in the occurrence of crashes due to existing and additional pick-up/drop-off movements and on-street parking on Mount Pleasant Avenue associated with the school.</p>	<p>The Operational Traffic Management Plan submitted with this proposal indicates that those traveling via Mount Pleasant Avenue will be restricted to left out movements only.</p> <p>Future signalisation of this intersection would be of benefit for the community and Loreto, however with the current use of Pennant Hills Road and proximity of the Osborn Road signalised intersection, it is not desirable from Roads and Maritime Services.</p>
<p><b>Pick up and drop off analysis required</b> The TA should include analysis to determine the suitability of the existing pick-up/drop-off facility to accommodate the future school population. Should it be determined that the existing facility is deemed inadequate to manage the incoming demand, the Applicant should consider provisions to redesign the facility in future stages of the development.</p>	<p>Since the original Transport Impact Assessment, the existing pick up and drop off arrangement at Osborn Road has been reviewed in its current operation and for its adequacy for the future operations at the School.</p> <p>To address the pick up and drop off issues and future demands Loreto has proposed a relocation of the existing facility and proposed an additional through site link to further increase on site capacity.</p> <p>These works have been proposed as part of Stage 1 to help ameliorate existing impacts that are experienced by the residents of Osborn Road.</p>

### 8.3 Roads and Maritime Services

TTW met with Roads and Maritime Services representatives on the 30<sup>th</sup> of September 2020 to discuss potential responses to submissions that were received during the exhibition period and the proposed revisions to the master plan. These meeting minutes are attached in Appendix C.

**Table 8.3: Roads and Maritime Services Comments**

Item	Response
The existing access on Pennant Hills Road shall be removed and replaced with kerb and gutter to match existing.	Loreto notes the safety concerns regarding the existing access point from Pennant Hills Road. During the consultation process, it was discussed that this access point could be maintained for occasional ceremonial use and when a traffic management plan is in place. This was agreed with RMS in principle.  To close the access driveway to general vehicular movements, removable bollards will be installed to prevent access when ceremonial events are not occurring.
School Zones must be installed along all roads with a direct access point (either pedestrian or vehicular) from the school. School Zones must not be provided along roads adjacent to the school without a direct access point.	School zones are currently in place on roads with a direct access point.
There should be suitable pedestrian paths/facilities within the vehicle accessible areas to corral pedestrians to appropriate crossing locations.	Where pedestrian movements are encouraged, pedestrian pathways and crossings have been provided. In the Operational Traffic Management Plan, it has been specified that the main pedestrian crossing areas are marshalled within the site.
All vehicles are to enter and exit the site in a forward direction. Provision for vehicles to turn around must be provided within the property boundary.	All vehicles are able to enter and exit the site in a forward direction. This has been shown in the attached swept path analysis.

### 8.4 New South Wales Rural Fire Service

One comment relevant to traffic was raised by the NSW Rural Fire Service.

**Table 8.4: NSW Rural Fire Service Key Issue**

Item	Response
Emergency vehicle access should continue to be provided onto the sports fields from Mount Pleasant Avenue and/or Osborn Road.	The emergency access gates onto the sports fields from Osborn Road and Mount Pleasant Avenue will not be impacted by the development.

## 8.5 Department of Planning, Industry and Environment

The project team met with Department of Planning, Industry and Environment a few times during the preparation of the revised master plan. Proposed traffic modifications to the original submission were presented to the DPIE on the 8<sup>th</sup> of September 2020.

**Table 8.5: Department of Planning, Industry and Environment Key Issues**

Item	Response
<p>The Department notes that a significant number of additional cars would require the drop-off / pick-up zone access in the future. It will be necessary for the concept proposal to demonstrate that the capacity of the existing drop-off / pick-up zone within the site can accommodate additional cars.</p>	<p>To address the pick up and drop off issues and future demands Loreto has proposed a relocation of the existing facility and an additional through site link to further increase on site capacity.</p> <p>The relocated Osborn Road pick up and drop off and proposed additional through site link facility will increase the queuing capacity on site by five times what it is currently.</p> <p>Shifting the Osborn Road facility further south will also provide greater departure length from the Osborn Road/Pennant Hills Road intersection which will prevent queues from blocking vehicles entering Osborn Road.</p> <p>These works have been proposed as part of Stage 1 to help ameliorate existing impacts that are experienced by the residents of Osborn Road.</p>
<p>Alternatively, additional drop-off/pick-up zones within the site are to be provided and details submitted for assessment by the Department as part of the concept proposal. This should include clear details of staging of the future works, comprising the staging of the building envelopes as well as the increase in the student capacity, so that the future delivery of additional drop-off/pick-up provisions align with the proposed future increase in student numbers.</p>	<p>See the above response.</p> <p>The improved pick up and drop off facilities have been proposed to occur as part of Stage 1 to assist in ameliorating existing impacts of the School on Osborn Road.</p> <p>Capacity for drop off and pick up demand will therefore be provided for the complete master plan from Stage 1.</p>
<p>A parking strategy must be submitted to support the concept proposal and delineate how the car parking spaces as well as additional drop-off/pick-up areas would be provided on the site in phases to cater for the student increase as well as the building envelope functions, including the construction phase for each of these stages. This needs to form part of the staging plan for the future works and include details of access to the site at each phase, and how each of these car parking and drop-off/pick-up areas would be accessed from the surrounding roads.</p>	<p>A staged car parking approach has been proposed that responds to increasing enrolments and staff.</p> <p>Stage 1 car parking improvements intend to address the current parking shortfall on site. The master plan has provision for providing for all car parking demands on site.</p> <p>While provision has been made in the master plan to fully account for car parking on site, Green Travel Plan initiatives will be put in place to aim to reduce single occupancy vehicle use to alleviate impacts to surrounding streets. In future stages, travel patterns at Loreto will be reassessed and provision of additional parking will be proposed to meet the demand requirements based on travel mode surveys.</p>

DA/1227/2018 for the Early Learning centre (local development) relies on the existing car parking spaces within the site. Please clarify how this development would integrate with the masterplan in the future and where would the parking for the child care centre be accommodated and maintained, when the future works are delivered as per the concept proposal.	As part of the Operational Traffic Management Plan, allocation of parking spaces is proposed throughout the site to reduce recirculation of vehicles and ensure parking space allocation to the Early Learning Centre is maintained.
If car spaces are proposed to be allocated specifically to the early learning centre as part of DA/1227/2018, the details of available parking for the school must be updated in this application and justification given to the adequacy of the remaining parking to service the development proposal.	The parking projections within this report have included the demands by the Early Learning Centre. Additional parking has been proposed as part of the revised master plan to cater for the current and future parking demands.

The Department of Planning, Industry and Environment also engaged an independent traffic consultant to review the originally proposed development and the submissions. A response to these comments is provided below

**Table 8.6: Department of Planning, Industry and Environment Independent Review Items**

Item	Response
An assessment of existing parking provisions against DCP requirements should be provided in the amended report. It seems that parking has only been assessed for the development traffic. Should the existing parking provision be non-compliant then this should be rectified in future development planning.	The proposed parking provision is based on a staged increase in supply in accordance with the DCP for the initial Detailed Design Approval, with the shortfall of parking to be addressed through a reduction in private vehicle trips and a future expanded car park as part of the Concept Plan. This approach has been proposed due to the constrained access of the site and public sentiment that focus should be on reducing vehicle trips.
Trip origin and destination information for students and staff travel should also be included as part of the travel survey. All data to be included in relevant report appendix for verification.	TTW has been provided with postcode data for existing students at the School to validate and verify the origin and destination of vehicle trips. For security reasons these have not been attached to this report, however information has been provided in Section 5.5.1.
Confirmation of the date that traffic surveys were undertaken to ascertain currency and validity of modelling outputs. All data to be included in relevant report appendix for verification.	While the original traffic counts were conducted by Ason Group, TTW has obtained SCATS data to verify that the traffic volumes are in line with typical operations (SCATS data was sourced from pre-COVID-19).
A calibration and validation report for the SIDRA modelling should be included to help determine if modelling is fit for purpose.	A comparison of the base traffic and SCATS data signal phase times has been completed to verify the model results. As the timing in the model and the SCATS timing correlates, the model is considered to be validated.
Authentication of any outputs from the strategic model should be provided	The strategic model was provided from RMS to Ason Group during the original submission. The intent is that future development applications in the Concept Plan will reassess these intersections to verify the strategic model findings.
The traffic report should confirm whether the Pennant Hills Road/Mount Pleasant Avenue intersection operates as a seagull intersection or justification of why it has been modelled this way.	The Pennant Hills Road/Mount Pleasant Avenue intersection does not operate as a seagull intersection. The revised traffic modelling completed as part of this report has modelled this intersection as a sign controlled intersection.

The report should confirm whether the IDM data to derive signal timings for the SIDRA models	SCATS IDM data was used to calibrate the signal timings for the SIDRA models.
Confirmation of the methodology used to calculate future traffic growth rates and calibration of the strategic model outputs	Future traffic growth rates have been based on RMS/TfNSW projections within their Strategic Traffic Forecasting Model.
Modelling of the ultimate 2047 master plan scenario with 2047 full development and future background traffic growth	A Concept Plan model has been developed for this report with full development and background growth.
<p>The following key issues as per the Transport for NSW Guide to Traffic Generating Developments (2002) should be addressed:</p> <ul style="list-style-type: none"> <li>▪ Current parking demand, including parking occupancy by time of day and turnover rates</li> <li>▪ Review of potential pedestrian conflicts with vehicles which cause capacity constraints on either vehicular or pedestrian movements</li> <li>▪ Analysis of projected queuing at entrances</li> <li>▪ Assessment of road safety impacts on surrounding roads and at critical intersections</li> <li>▪ Provision of Local Area Traffic Management measures (may be addressed in later stages).</li> </ul>	<p>Tube count data was collected of all driveway entries of the School to review traffic flow into and out of each area. As is typical for a School, parking experiences low turnover throughout the day.</p> <p>The proposed Concept Plan aims to reduce the instance of pedestrian conflict points and provide marshalled crossing points to control the pedestrian crossings.</p> <p>A queuing analysis has been completed for the proposed pick up and drop off facilities that shows sufficient queuing capacity is provided within the site such that no queuing will occur on local roadways.</p> <p>The Operational Traffic Management Plan details actions to be undertaken by Loreto to ensure safe operation of vehicle traffic associated with the School.</p>
Development traffic generation and volumes in residential streets	Development traffic generation has been based on future travel mode and enrolments/staff projections. These are discussed in detail in Section 5.3
Safety concerns at the Pennant Hills Road/Mount Pleasant Avenue intersection	Noting the safety concerns at Pennant Hills Road/Mount Pleasant Avenue, the Operational Traffic Management Plan has limited movements associated with the School to left in and left out of Mount Pleasant Avenue. Students will be allocated a pick up and drop off location based on their approach direction such that right turns are not required at this unsignalised intersection.
A review and analysis of the existing pick-up/drop-off facility	The existing pick up and drop off facility has been reviewed through site observation and tube count data collection. As a result of this review, the existing pick up and drop off facility is proposed to be relocated and an additional facility is proposed as part of the through site link.
The masterplan should consider cumulative impact of the subject DA and The Early Learning Centre DA as these are closely related	This report includes the Early Learning Centre in projections of traffic generation and parking demands.
As this development impacts on the State road network all modelling should be in accordance with RMS Modelling Guidelines and approved by RMS/TfNSW.	Modelling is in accordance with RMS Modelling Guidelines.



## 8.6 Community Concerns

A summary of common items raised in community submissions and the subsequent response is detailed in Table 8.7. Note most items raised are direct quotes from the community submissions and have been grouped per area of concern.

**Table 8.7: Community Comments**

Item Raised	Response
<b><u>Intersection of Mount Pleasant Avenue and Pennant Hills Road</u></b>	
Impact to traffic in Mount Pleasant Avenue (Mount Pleasant) and the intersection with Pennant Hills Road (Pennant Hills), during the development phase and post the development.	<p>Trip distribution and trip generation have been revised from the original Transport Impact Assessment to reflect the revised pick up and drop off arrangements as well as the changes to parking around the site.</p> <p>These revisions have included traffic impacts to Mount Pleasant Avenue.</p>
Mount Pleasant Avenue and Pennant Hills Road should be signalised.	<p>Signalisation of Mount Pleasant Avenue and Pennant Hills Road is supported by Loreto, however it is not permitted by RMS due to its proximity to the signalised intersection at Osborn Road.</p> <p>During the staged development of the School, Loreto will continue to discuss the potential signalisation of this intersection with RMS during the development application process. With the future changes to Pennant Hills Road as a result of Northconnex future signalisation may become a possibility, however this will be subject to future approval by RMS.</p>
<p>Compounding developments at Mount Pleasant Avenue will combine to add to traffic congestion including developments approved at 51A Mount Pleasant Avenue and a subdivision currently under approval at 53 Mount Pleasant Avenue.</p> <p>The Wahrenonga Estate Project Precinct A has already been approved at the southern end of Mount Pleasant Avenue and is pending construction.</p>	<p>The Statement of Environmental Effects of the development of 51A Mount Pleasant Avenue states <i>"None of the residents will drive a vehicle so the role of the support staff is to also transport residents to activities and services they want to use in the community. Traffic and noise levels will be to a residential household."</i> This development is a single storey group home comprising of 5 bedrooms and is replacing an existing residence. As a result it will have limited traffic impact.</p> <p>53 Mount Pleasant Avenue proposes the subdivision of one resident into two, which is expected to have limited traffic impact.</p> <p>The Wahrenonga Estate Project has been approved in concept only as part of the master plan. When the detailed development approval is undertaken, a traffic impact assessment will be required to review the operation of the intersection of Mount Pleasant Avenue and Pennant Hills Road post development.</p>

The traffic report does not address additional trips that will move through the Mount Pleasant Avenue/Pennant Hills Road intersection as a result of on street parking.	The trip generation has been updated in this report to include impacts to Mount Pleasant Avenue and adjusted for the additional car parking proposed.
<b><u>Inadequate Pick Up and Drop Off</u></b>	
The school should implement an on-site parking area sufficient for all staff and students including a kiss and drop off area.	<p>The revised master plan includes additional car parking sufficient for staff demand and improved pick up and drop off. The Stage 1 works include additional car parking to account for the current shortfall of on site parking at the start of the master plan.</p> <p>Loreto aims to reduce single occupancy vehicle trips through the implementation of a Green Travel Plan. This Plan has a large focus on reducing student vehicular trips.</p> <p>Additional pick up and drop off provisions are proposed as part of Stage 1.</p>
Improved access for student drop-off/pick-ups is completed via Pennant Hills Road, instead of Osborn Road or Mount Pleasant Avenue. There should be an entirely internal access way to the school which does not impinge on neighbouring residents eg. entry and exit exclusively from Pennant Hills Road.	<p>The RMS aims to prioritise through movements on Pennant Hills Road to reduce congestion. As a result, they prefer to remove additional connections from Pennant Hills Road. This is reflected in their request to remove the existing access driveway into Loreto from Pennant Hills Road.</p> <p>Additional access driveways from Pennant Hills Road are therefore unlikely to be approved by RMS.</p>
Assurance should be given that the car park at 92-94 Pennant Hills Road (associated with the Church of Jesus Christ of Latter-day Saints) will not be used for pick-ups and drop-offs of students. The Church currently experiences a significant amount of traffic across its property from parents of children attending to the Normanhurst Public School.	Additional pick up and drop off facilities are proposed internal to Loreto which will prevent pick up and drop off manoeuvres occurring off site.
<b><u>Inadequate Parking</u></b>	
Loreto utilises unlimited parking conditions in the surrounding streets to accommodate a lack of onsite parking. The development needs to address street parking and traffic conditions that will be created by this development.	<p>Projected parking demands have been reviewed throughout the master plan and additional parking proposed.</p> <p>As part of the Stage 1 detailed application, additional parking is proposed to address the existing shortfall of on site parking.</p>
Parking should be provided within the school for students, staff, parents, drop-offs, etc. and that no kerbside parking at all be allowed for school purposes.	<p>As above.</p> <p>The Operational Traffic Management Plan has detailed allocation of parking within the site to provide for staff and students. Loreto is also committed to implementing the Green Travel Plan to reduce single occupancy vehicle trips and reduce parking demands.</p>
During events days parents and guests park in Carrawong Avenue, a small in width street.	The Operational Traffic Management Plan details the use of the sports field for overflow parking. Additional parking provision on site will also assist in parking occurring on local streets during events.



<b><u>Safety of Mount Pleasant Avenue and Osborn Road</u></b>	
Traffic calming and safety issues in Mount Pleasant Avenue. The proposed development will increase the traffic and parking burdens and therefore increase the already hazardous and unsatisfactory traffic and parking situation in the surrounding "no through" roads.	
There being no exit from Mount Pleasant Avenue other than onto Pennant Hills Road means that school traffic needs to make a 180 degree turn often by nosing into a vacant driveway then backing out. This presents a danger especially for students.	At all entrances to Loreto provision is made for vehicle to enter and exit in a forward direction. Additional pick up and drop off facilities on site will prevent informal pick up and drop off movements occurring on Mount Pleasant Avenue.
When cars are parked on both sides of Mount Pleasant Avenue there is insufficient space for cars travelling in opposite directions to pass each other.	
Access to Pennant Hills Road is reinstated via Nepean Avenue, to relieve increased local traffic on Osborn Road.	Local traffic flows such as reinstatement of the Nepean Avenue/Pennant Hills Road intersection is ultimately up to Hornsby Shire Council and RMS.
<b><u>Intersection of Osborn Road and Pennant Hills Road</u></b>	
The traffic report claims the Osborn Road intersection will improve as a result of Northconnex. A reduction in traffic volumes along Pennant Hills Road will not remove the traffic delays for traffic exiting Osborn Road in the AM peak and therefore this statement is not correct.	With reduction in the Pennant Hills Road through volumes, there is less demand on the phase of the intersection catering for this movement. As a result, greater green time can be provided to side roads from Pennant Hills Road.
<p>The intersection of Osborn Road and Pennant Hills Road needs to be widened (on the school side) to create a dedicated right turn lane, through lane and retain the left turn lane in Osborn Road. The number of lanes in Osborn Road should be increased to at least five lanes.</p>	<p>The through site link provided from Osborn Road to Mount Pleasant Avenue will alleviate impacts to the Osborn Road/Pennant Hills Road intersection by further distributing traffic flows generated by the School.</p> <p>Loreto is committed to implementing Green Travel initiatives to reduce the number of vehicle trips to and from the School to ameliorate impacts on the local road network.</p> <p>Further, the widening of Osborn Road has been investigated and it would require removal of a number of significant trees which would reduce the amenity of the streetscape.</p>
Retention of the left hand turn after stopping for traffic exiting Osborn Road to Pennant Hills Road.	This was requested to be removed by RMS due to safety concerns.
Loreto should be required to construct a road through their property with direct access to Pennant Hills Road leaving Osborn Road for resident's access.	<p>The RMS aims to prioritise through movements on Pennant Hills Road to reduce congestion. As a result, they prefer to remove additional connections from Pennant Hills Road. This is reflected in their request to remove the existing access driveway into Loreto from Pennant Hills Road.</p> <p>Additional access driveways from Pennant Hills Road are therefore unlikely to be approved by RMS.</p>

<b><u>Traffic Generation and Modelling</u></b>	
The traffic report has made an assumption that staff numbers will increase by 77 based on an unreferenced ratio of 1:10 (staff to students). This ratio is questionable for private schools.	The revised staff projections have been provided by Loreto and are based on anticipated staffing requirements as part of the increased classroom requirements.
The Traffic Report does not use consistent student numbers with the School's projections.	Projections have been used in this report that have been provided from Loreto.
The SSD-8996 is part of stage 1, which means there are many more stages Loreto has planned.	This State Significant Development Application seeks approval for a Concept Master Plan and a Stage 1 Detailed Development. Increased student and staff numbers that are proposed as part of the future stages have been accounted for within the Concept Master Plan.
Tangible incentives are provided to promote public transport usage for students and teachers.	Loreto is committed to implementing the Green Travel Plan that has been included as part of this Response to Submissions.
Traffic counts were conducted during the closing days of term 3 2019 including one day when the only students at the school were boarders.	Updated SIDRA models have been prepared that rely on SCATS volumes from Thursday the 7 <sup>th</sup> of November 2019 while the School was in typical operation.
<b><u>Inadequate Bus Facilities</u></b>	
The bus bay is not long enough for all the buses servicing the school and parents are using this facility. Parents need a separate space or road lane and much longer than the bus lane.	The relocation of the existing pick up and drop off facility from the slip road will provide additional length for bus layover. This will also allow for separation of bus and parent/carer vehicle movements.
Frequently buses and cars are banked up on Pennant Hills Road awaiting entry into Osborn Road at school pick up times.	The improved pick up and drop off facilities proposed as part of the Stage 1 detailed development will increase queuing capacity within the site which will avoid overflow queuing into Osborn Road.

## 9.0 Conclusion

The Loreto Normanhurst Concept Plan and Detailed Development Application have been significantly modified to respond to submissions received with regards to the previous proposal. Relevant traffic engineering modifications include additional car parking; revised and additional pick up and drop off arrangements; and additional capacity for bus services.

A staged approach to enrolment increases including additional parking to meet the increase required under Hornsby Shire Council's Development Control Plan has been proposed for the Detailed Development Application. By enforcement of Green Travel Plan initiatives and provision for a future expanded car park, no shortfall in parking provision is proposed upon completion of the Concept Plan.

A relocated pick up and drop off facility, and additional provision through the inclusion of a through site link are proposed to better manage the current pick up and drop off demand, as well as provide for future pick up and drop off demand projections. These two facilities provide a significant increase in internal queuing area within the School campus, eliminating the need to queue onto external roadways.

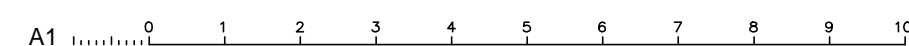
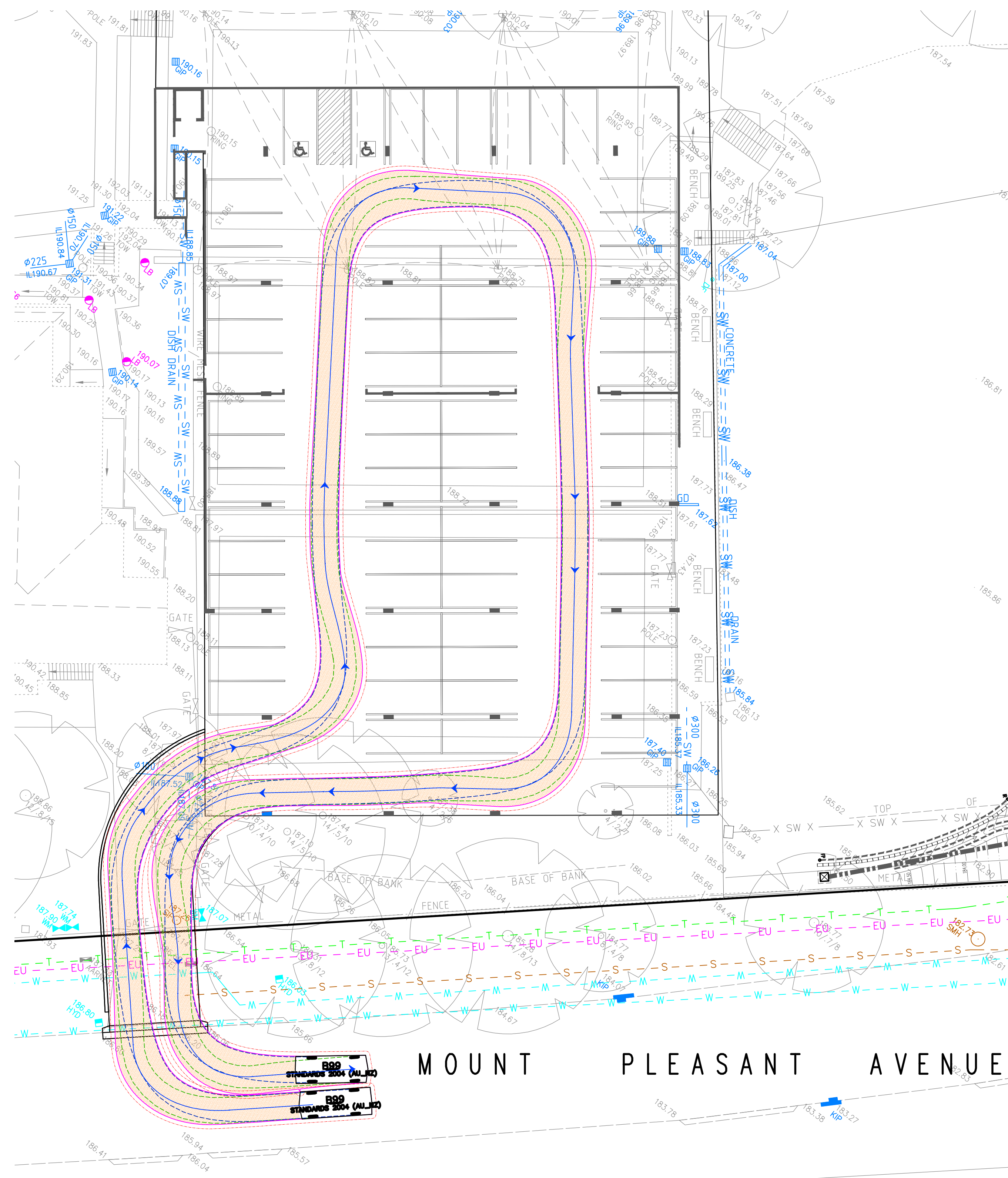
The key intersections adjacent to Loreto are currently prioritising through movements on Pennant Hills Road. Following the completion of NorthConnex, reduced vehicle traffic is anticipated on Pennant Hills Road which may provide the ability for future intersection improvements such as modified phasing or signalisation of the intersection of Mount Pleasant Avenue/Pennant Hills Road. These improvements will require further discussion with Roads and Maritime Services and Hornsby Shire Council throughout the staged development. The provision of a through site link will further distribute traffic flows generated by the School, reducing its impact.

The revisions made to the Concept Plan and Detailed Development Application have therefore sufficiently addressed relevant submissions received regarding traffic engineering.

## Appendix A

# Swept Path Analysis





P1	ISSUE FOR SSDA					GC	GC	04.12.20																		
Rev	Description					Eng	Draft	Date	Rev	Description					Eng	Draft	Date	Rev	Description					Eng	Draft	Date

Architect

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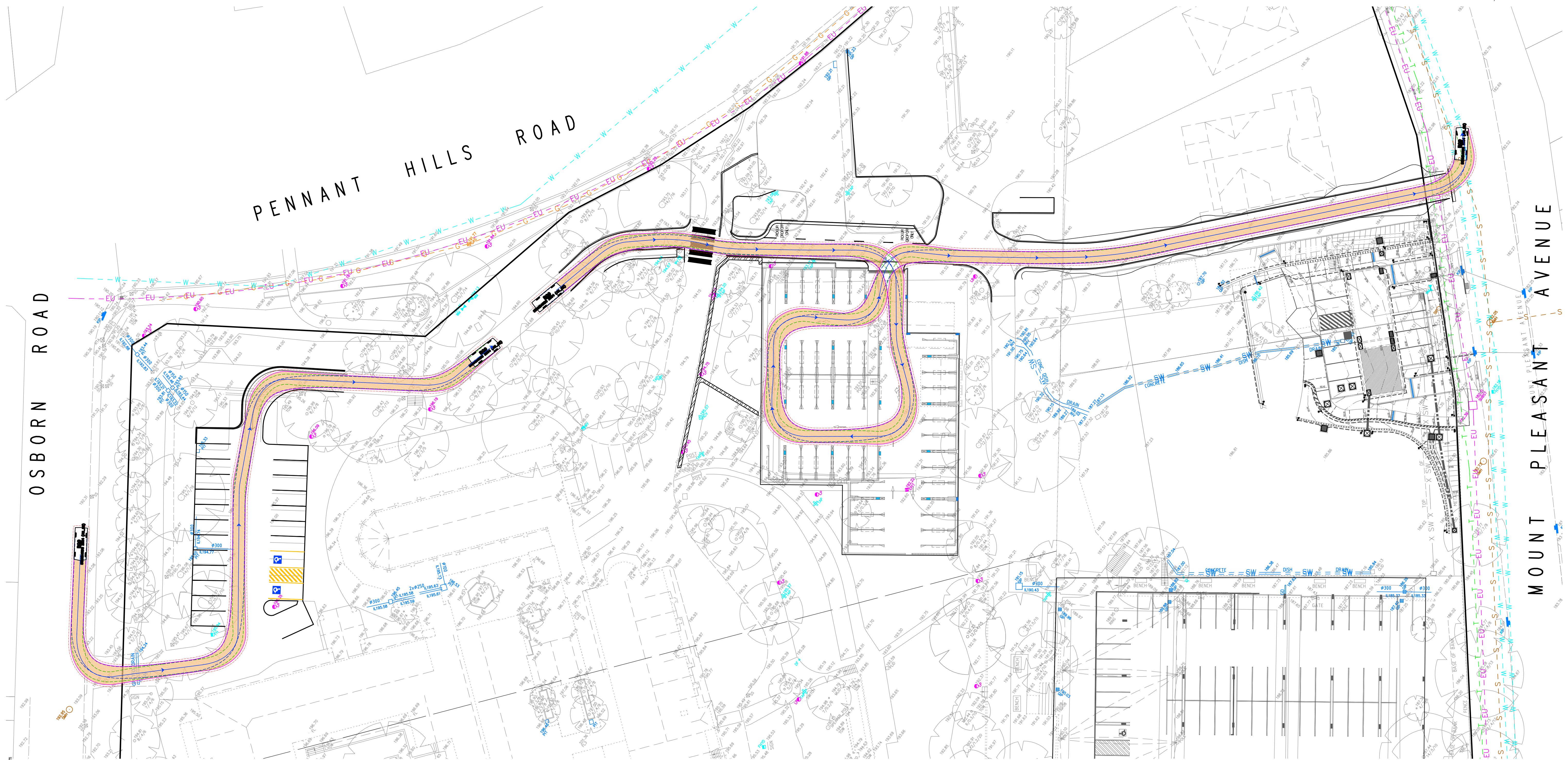
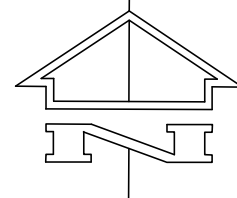
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project  
LORETO NORMANHURST,  
91-93 PENNANT HILLS ROAD  
SITE A, BOARDING HOUSE

Sheet Subject	TURNING PATH ANALYSIS SHEET 1
---------------	----------------------------------

Scale : A1	Drawn	Authorised
1:200	GC	PY
Job No	Drawing No	Revision
181202	SKT01	P1
Plot File Created: Dec 04, 2020 - 4:49pm		





THROUGH SITE LINK & P1A CAR PARK – B99 SWEEP PATH

Filename: SKT02.dwg - User: gmc - Plot File Created: Dec 04, 2020 - 4:56pm

A1 0 1 2 3 4 5 6 7 8 9 10

P1 ISSUE FOR SSDA				GC	GC	04.12.20								
Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date

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Project  
**LORETO NORMANHURST,**  
91-93 PENNANT HILLS ROAD  
SITE A, BOARDING HOUSE

Sheet Subject  
**TURNING PATH ANALYSIS**  
SHEET 2

Scale : A1 1:400	Drawn GC	Authorised PY
Job No <b>181202</b>	Drawing No <b>SKT02</b>	Revision <b>P1</b>
Plot File Created: Dec 04, 2020 - 4:56pm		



## Appendix B

# SIDRA Modelling Results

## MOVEMENT SUMMARY

 **Site: 1 [Pennant Hills Road-Normanhurst Road-Osborn Road  
AM-Base-2019 (Site Folder: General)]**

Penant Hills Road-Normanhurst Road-Osbourne Road

Site Category: Existing Design

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Osborn Road														
1	L2	70	8	74	11.4	0.125	37.0	LOS C	3.4	26.2	0.72	0.70	0.72	24.1
2	T1	49	1	52	2.0	0.693	63.8	LOS E	10.4	74.2	1.00	0.86	1.06	15.4
3	R2	97	2	102	2.1	* 0.693	67.1	LOS E	10.4	74.2	1.00	0.86	1.06	11.6
Approach		216	11	227	5.1	0.693	56.6	LOS E	10.4	74.2	0.91	0.81	0.95	16.5
East: Pennant Hills Road														
4	L2	70	2	74	2.9	0.674	25.5	LOS B	31.9	251.3	0.75	0.70	0.75	21.5
5	T1	1826	292	1922	16.0	0.674	21.8	LOS B	31.9	251.3	0.74	0.68	0.74	30.2
6	R2	60	1	63	1.7	0.285	22.0	LOS B	2.0	14.2	0.77	0.72	0.77	28.6
Approach		1956	295	2059	15.1	0.674	22.0	LOS B	31.9	253.2	0.75	0.69	0.75	30.0
North: Normanhurst Road														
7	L2	89	2	94	2.2	0.389	51.1	LOS D	9.9	70.1	0.88	0.76	0.88	20.9
8	T1	76	0	80	0.0	0.389	47.7	LOS D	9.9	70.1	0.88	0.76	0.88	18.2
9	R2	114	4	120	3.5	0.665	69.2	LOS E	8.2	59.2	1.00	0.84	1.05	22.0
Approach		279	6	294	2.2	0.665	57.6	LOS E	9.9	70.1	0.93	0.79	0.95	20.9
West: Pennant Hills Road														
10	L2	32	0	34	0.0	0.680	25.7	LOS B	32.3	256.7	0.76	0.70	0.76	31.6
11	T1	1850	309	1947	16.7	* 0.680	21.8	LOS B	32.3	256.7	0.74	0.68	0.74	30.2
12	R2	88	6	93	6.8	* 0.433	24.2	LOS B	3.5	26.2	0.87	0.78	0.87	28.1
Approach		1970	315	2074	16.0	0.680	22.0	LOS B	32.3	257.7	0.75	0.69	0.75	30.2
All Vehicles		4421	627	4654	14.2	0.693	25.9	LOS B	32.3	257.7	0.77	0.70	0.77	28.6

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

Queue Model: SIDRA Standard.

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

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

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
South: Osborn Road												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
North: Normanhurst Road												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
All		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93



## Pedestrians

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: P:\2018\1812\181202\Reports\TTW\Traffic\Modelling\Sidra model\201203 Loreto School.sip9

## MOVEMENT SUMMARY

### Site: 1 [Pennant Hills Road-Normanhurst Road-Osborn Road PM-Base-2019 (Site Folder: General)]

Penant Hills Road-Normanhurst Road-Osbourne Road

Site Category: Existing Design

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Osborn Road														
1	L2	62	6	65	9.7	0.150	47.2	LOS D	3.5	26.2	0.82	0.72	0.82	21.7
2	T1	28	0	29	0.0	0.549	63.7	LOS E	6.8	49.1	0.98	0.79	0.98	15.4
3	R2	70	3	74	4.3	0.549	67.0	LOS E	6.8	49.1	0.98	0.79	0.98	11.6
Approach		160	9	168	5.6	0.549	58.8	LOS E	6.8	49.1	0.92	0.76	0.92	16.4
East: Pennant Hills Road														
4	L2	57	1	60	1.8	0.655	18.1	LOS B	30.4	242.2	0.65	0.61	0.65	25.4
5	T1	2069	355	2178	17.2	0.655	14.5	LOS A	30.4	242.2	0.63	0.59	0.63	32.9
6	R2	66	3	69	4.5	* 0.475	22.2	LOS B	2.8	20.2	0.82	0.76	0.82	28.5
Approach		2192	359	2307	16.4	0.655	14.8	LOS B	30.4	243.6	0.64	0.60	0.64	32.7
North: Normanhurst Road														
7	L2	68	5	72	7.4	0.292	54.9	LOS D	6.0	43.9	0.89	0.75	0.89	20.0
8	T1	29	1	31	3.4	0.292	51.5	LOS D	6.0	43.9	0.89	0.75	0.89	17.3
9	R2	106	6	112	5.7	* 0.657	70.0	LOS E	7.7	56.2	1.00	0.84	1.05	21.9
Approach		203	12	214	5.9	0.657	62.3	LOS E	7.7	56.2	0.95	0.79	0.98	20.9
West: Pennant Hills Road														
10	L2	30	1	32	3.3	0.664	18.3	LOS B	32.1	246.5	0.65	0.61	0.65	34.0
11	T1	2214	253	2331	11.4	* 0.664	14.7	LOS B	32.1	247.1	0.64	0.60	0.64	32.9
12	R2	44	3	46	6.8	0.317	19.0	LOS B	1.5	10.8	0.70	0.70	0.70	30.0
Approach		2288	257	2408	11.2	0.664	14.8	LOS B	32.1	247.1	0.65	0.60	0.65	32.8
All Vehicles		4843	637	5098	13.2	0.664	18.3	LOS B	32.1	247.1	0.67	0.61	0.67	31.4

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

Queue Model: SIDRA Standard.

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

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

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
South: Osborn Road												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
North: Normanhurst Road												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
All		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93

## Pedestrians

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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## MOVEMENT SUMMARY

### Site: 1 [Pennant Hills Road-Normanhurst Road-Osborn Road AM-Base-2026 (Site Folder: General)]

Penant Hills Road-Normanhurst Road-Osbourne Road

Site Category: 2026 Base Case

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: Osborn Road														
1	L2	70	8	74	11.4	0.118	34.8	LOS C	3.3	25.3	0.70	0.69	0.70	24.7
2	T1	49	1	52	2.0	0.627	59.4	LOS E	10.0	71.2	0.98	0.81	0.98	16.1
3	R2	97	2	102	2.1	* 0.627	62.7	LOS E	10.0	71.2	0.98	0.81	0.98	12.2
Approach		216	11	227	5.1	0.627	52.9	LOS D	10.0	71.2	0.89	0.77	0.89	17.2
East: Pennant Hills Road														
4	L2	70	2	74	2.9	0.629	26.4	LOS B	28.4	223.0	0.74	0.69	0.74	21.1
5	T1	1631	261	1717	16.0	* 0.629	22.7	LOS B	28.4	223.0	0.73	0.67	0.73	29.9
6	R2	60	1	63	1.7	0.250	19.1	LOS B	1.6	11.3	0.70	0.70	0.70	29.8
Approach		1761	264	1854	15.0	0.629	22.7	LOS B	28.4	225.0	0.73	0.67	0.73	29.7
North: Normanhurst Road														
7	L2	89	2	94	2.2	0.367	49.2	LOS D	9.7	68.6	0.87	0.75	0.87	21.3
8	T1	76	0	80	0.0	0.367	45.8	LOS D	9.7	68.6	0.87	0.75	0.87	18.6
9	R2	114	4	120	3.5	0.580	64.8	LOS E	7.9	56.8	0.98	0.80	0.98	22.6
Approach		279	6	294	2.2	0.580	54.7	LOS D	9.7	68.6	0.91	0.77	0.91	21.4
West: Pennant Hills Road														
10	L2	32	0	34	0.0	0.612	26.0	LOS B	27.0	214.8	0.73	0.67	0.73	31.4
11	T1	1589	265	1673	16.7	0.612	22.2	LOS B	27.0	214.8	0.72	0.65	0.72	30.1
12	R2	88	6	93	6.8	* 0.390	21.8	LOS B	3.0	22.0	0.80	0.75	0.80	29.0
Approach		1709	271	1799	15.9	0.612	22.3	LOS B	27.0	215.7	0.72	0.66	0.72	30.1
All Vehicles		3965	552	4174	13.9	0.629	26.4	LOS B	28.4	225.0	0.75	0.68	0.75	28.4

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

Queue Model: SIDRA Standard.

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

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

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
South: Osborn Road												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
North: Normanhurst Road												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
All		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93

## Pedestrians

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY

## Site: 1 [Pennant Hills Road-Normanhurst Road-Osborn Road PM-Base-2026 (Site Folder: General)]

Penant Hills Road-Normanhurst Road-Osbourne Road PM-Existing Scenario

Site Category: 2026 Base Case

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: Osborn Road														
1	L2	62	6	65	9.7	0.146	46.4	LOS D	3.4	25.9	0.81	0.72	0.81	21.9
2	T1	28	0	29	0.0	0.521	62.5	LOS E	6.8	48.6	0.98	0.79	0.98	15.6
3	R2	70	3	74	4.3	0.521	65.8	LOS E	6.8	48.6	0.98	0.79	0.98	11.7
Approach		160	9	168	5.6	0.521	57.7	LOS E	6.8	48.6	0.91	0.76	0.91	16.6
East: Pennant Hills Road														
4	L2	57	1	60	1.8	0.619	18.0	LOS B	27.7	220.4	0.63	0.59	0.63	25.5
5	T1	1929	331	2031	17.2	* 0.619	14.4	LOS A	27.7	220.4	0.62	0.57	0.62	33.0
6	R2	66	3	69	4.5	* 0.420	16.7	LOS B	2.0	14.5	0.68	0.70	0.68	30.8
Approach		2052	335	2160	16.3	0.619	14.6	LOS B	27.7	221.8	0.62	0.58	0.62	32.8
North: Normanhurst Road														
7	L2	68	5	72	7.4	0.282	53.9	LOS D	5.9	43.4	0.89	0.75	0.89	20.2
8	T1	29	1	31	3.4	0.282	50.5	LOS D	5.9	43.4	0.89	0.75	0.89	17.5
9	R2	106	6	112	5.7	* 0.625	68.3	LOS E	7.5	55.3	1.00	0.82	1.02	22.1
Approach		203	12	214	5.9	0.625	60.9	LOS E	7.5	55.3	0.94	0.78	0.96	21.1
West: Pennant Hills Road														
10	L2	30	1	32	3.3	0.573	17.3	LOS B	25.1	192.6	0.60	0.56	0.60	34.3
11	T1	1881	215	1980	11.4	0.573	13.7	LOS A	25.1	193.1	0.59	0.54	0.59	33.2
12	R2	44	3	46	6.8	0.303	17.2	LOS B	1.3	9.6	0.66	0.68	0.66	30.8
Approach		1955	219	2058	11.2	0.573	13.9	LOS A	25.1	193.1	0.59	0.55	0.59	33.2
All Vehicles		4370	575	4600	13.2	0.625	18.0	LOS B	27.7	221.8	0.63	0.58	0.63	31.4

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

Queue Model: SIDRA Standard.

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

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

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
South: Osborn Road												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
North: Normanhurst Road												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
All		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93

## Pedestrians

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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## MOVEMENT SUMMARY

 **Site: 1 [Pennant Hills Road-Normanhurst Road-Osborn Road AM-WD-2026 (Site Folder: General)]**

Penant Hills Road-Normanhurst Road-Osbourne Road AM-Existing Scenario

Site Category: 2026 Post Development

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: Osborn Road														
1	L2	70	8	74	11.4	0.095	26.8	LOS B	2.8	21.8	0.60	0.66	0.60	27.1
2	T1	49	1	52	2.0	0.827	63.8	LOS E	18.1	128.3	1.00	0.97	1.17	15.3
3	R2	190	2	200	1.1	* 0.827	67.1	LOS E	18.1	128.3	1.00	0.97	1.17	11.5
Approach		309	11	325	3.6	0.827	57.5	LOS E	18.1	128.3	0.91	0.90	1.04	15.4
East: Pennant Hills Road														
4	L2	142	2	149	1.4	0.821	39.3	LOS C	40.7	314.2	0.94	0.87	0.95	16.6
5	T1	1737	261	1828	15.0	* 0.821	35.7	LOS C	40.7	314.2	0.92	0.85	0.94	26.2
6	R2	82	1	86	1.2	0.315	26.4	LOS B	2.7	18.8	0.85	0.75	0.85	27.0
Approach		1961	264	2064	13.5	0.821	35.5	LOS C	40.7	319.6	0.92	0.85	0.94	25.7
North: Normanhurst Road														
7	L2	111	2	117	1.8	0.327	41.8	LOS C	10.1	71.3	0.80	0.73	0.80	22.9
8	T1	76	0	80	0.0	0.327	38.4	LOS C	10.1	71.3	0.80	0.73	0.80	20.2
9	R2	114	4	120	3.5	0.437	56.4	LOS D	7.3	52.5	0.92	0.79	0.92	24.0
Approach		301	6	317	2.0	0.437	46.5	LOS D	10.1	71.3	0.85	0.75	0.85	22.9
West: Pennant Hills Road														
10	L2	32	0	34	0.0	0.744	36.1	LOS C	33.7	267.6	0.88	0.80	0.88	28.7
11	T1	1596	265	1680	16.6	0.744	31.8	LOS C	33.7	267.6	0.86	0.78	0.86	27.2
12	R2	154	6	162	3.9	* 0.628	40.8	LOS C	6.4	46.3	0.99	0.88	0.99	23.3
Approach		1782	271	1876	15.2	0.744	32.6	LOS C	33.7	268.7	0.87	0.79	0.87	26.9
All Vehicles		4353	552	4582	12.7	0.827	36.7	LOS C	40.7	319.6	0.89	0.82	0.91	25.3

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

Queue Model: SIDRA Standard.

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

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

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
South: Osborn Road												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
North: Normanhurst Road												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
All		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93



## Pedestrians

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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## MOVEMENT SUMMARY

### Site: 1 [Pennant Hills Road-Normanhurst Road-Osborn Road AM-Base-2036 (Site Folder: General)]

Penant Hills Road-Normanhurst Road-Osbourne Road AM-Existing Scenario

Site Category: 2036 Base Case

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: Osborn Road														
1	L2	70	8	74	11.4	0.113	33.4	LOS C	3.2	24.7	0.68	0.69	0.68	25.1
2	T1	49	1	52	2.0	0.591	57.4	LOS E	9.8	70.0	0.97	0.81	0.97	16.4
3	R2	97	2	102	2.1	* 0.591	60.7	LOS E	9.8	70.0	0.97	0.81	0.97	12.5
Approach		216	11	227	5.1	0.591	51.1	LOS D	9.8	70.0	0.87	0.77	0.87	17.5
East: Pennant Hills Road														
4	L2	122	2	128	1.6	0.600	26.9	LOS B	26.4	204.1	0.74	0.69	0.74	20.7
5	T1	1448	222	1524	15.3	* 0.600	23.2	LOS B	26.4	204.1	0.73	0.66	0.73	29.7
6	R2	82	1	86	1.2	0.315	18.2	LOS B	2.2	15.7	0.68	0.69	0.68	30.1
Approach		1652	225	1739	13.6	0.600	23.2	LOS B	26.4	207.4	0.73	0.67	0.73	29.4
North: Normanhurst Road														
7	L2	111	2	117	1.8	0.378	47.0	LOS D	10.8	76.2	0.86	0.75	0.86	21.7
8	T1	76	0	80	0.0	0.378	43.6	LOS D	10.8	76.2	0.86	0.75	0.86	19.0
9	R2	114	4	120	3.5	0.534	62.6	LOS E	7.7	55.6	0.97	0.80	0.97	23.0
Approach		301	6	317	2.0	0.534	52.1	LOS D	10.8	76.2	0.90	0.77	0.90	21.8
West: Pennant Hills Road														
10	L2	32	0	34	0.0	0.533	25.7	LOS B	22.0	174.3	0.70	0.64	0.70	31.5
11	T1	1304	214	1373	16.4	0.533	21.8	LOS B	22.0	174.3	0.68	0.61	0.68	30.2
12	R2	136	6	143	4.4	* 0.598	23.9	LOS B	5.3	38.2	0.91	0.81	0.91	28.2
Approach		1472	220	1549	14.9	0.598	22.1	LOS B	22.0	175.2	0.71	0.63	0.71	30.1
All Vehicles		3641	462	3833	12.7	0.600	26.8	LOS B	26.4	207.4	0.74	0.67	0.74	28.2

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

Queue Model: SIDRA Standard.

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

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

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
South: Osborn Road												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
North: Normanhurst Road												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
All		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93

## Pedestrians

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY

 **Site: 1 [Pennant Hills Road-Normanhurst Road-Osborn Road AM-WD-2036 (Site Folder: General)]**

Penant Hills Road-Normanhurst Road-Osbourne Road AM-Existing Scenario

Site Category: 2036 Post Development

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Osborn Road														
1	L2	70	8	74	11.4	0.094	26.2	LOS B	2.8	21.5	0.60	0.66	0.60	27.3
2	T1	49	1	52	2.0	0.773	64.5	LOS E	13.2	93.7	1.00	0.92	1.13	15.3
3	R2	130	2	137	1.5	* 0.773	67.8	LOS E	13.2	93.7	1.00	0.92	1.13	11.5
Approach		249	11	262	4.4	0.773	55.4	LOS D	13.2	93.7	0.89	0.85	0.98	16.3
East: Pennant Hills Road														
4	L2	193	2	203	1.0	0.774	37.4	LOS C	36.2	275.2	0.91	0.84	0.91	17.0
5	T1	1544	222	1625	14.4	* 0.774	33.3	LOS C	36.2	275.2	0.89	0.81	0.89	26.7
6	R2	103	1	108	1.0	0.286	20.9	LOS B	2.8	20.1	0.76	0.73	0.76	29.0
Approach		1840	225	1937	12.2	0.774	33.0	LOS C	36.2	281.6	0.88	0.81	0.88	26.2
North: Normanhurst Road														
7	L2	133	2	140	1.5	0.407	46.0	LOS D	12.0	84.7	0.85	0.76	0.85	21.9
8	T1	76	0	80	0.0	0.407	42.5	LOS D	12.0	84.7	0.85	0.76	0.85	19.2
9	R2	114	4	120	3.5	0.560	63.8	LOS E	7.8	56.3	0.97	0.80	0.97	22.8
Approach		323	6	340	1.9	0.560	51.4	LOS D	12.0	84.7	0.90	0.78	0.90	21.8
West: Pennant Hills Road														
10	L2	32	0	34	0.0	0.642	34.4	LOS C	26.9	213.0	0.83	0.75	0.83	29.1
11	T1	1313	214	1382	16.3	0.642	30.2	LOS C	26.9	213.0	0.80	0.72	0.80	27.7
12	R2	201	6	212	3.0	* 0.616	41.1	LOS C	8.6	61.8	0.97	0.92	0.97	23.2
Approach		1546	220	1627	14.2	0.642	31.7	LOS C	26.9	214.0	0.83	0.74	0.83	27.1
All Vehicles		3958	462	4166	11.7	0.774	35.4	LOS C	36.2	281.6	0.86	0.78	0.87	25.6

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

Queue Model: SIDRA Standard.

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

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

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
South: Osborn Road												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
North: Normanhurst Road												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93
All		100	105	64.3	LOS F	0.2	0.2	0.96	0.96	227.7	212.4	0.93

## Pedestrians

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# MOVEMENT SUMMARY

 **Site: 101 [Pennant Hills Road-Mount Pleasant Avenue AM-Base-2019 (Site Folder: General)]**

New Site

Site Category: Existing Design

Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Mount Pleasant Avenue														
1	L2	20	0	21	0.0	0.036	11.0	LOS A	0.1	0.9	0.56	0.94	0.56	34.7
3	R2	25	0	26	0.0	0.883	286.0	LOS F	2.6	18.5	1.00	1.14	1.48	9.0
Approach		45	0	47	0.0	0.883	163.8	LOS F	2.6	18.5	0.81	1.05	1.07	12.6
East: Pennant Hills Road														
4	L2	33	0	35	0.0	0.391	3.5	LOS A	0.0	0.0	0.00	0.02	0.00	39.9
5	T1	1947	295	2049	15.2	0.391	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	39.8
Approach		1980	295	2084	14.9	0.391	0.2	NA	0.0	0.0	0.00	0.01	0.00	39.8
West: Pennant Hills Road														
11	T1	1997	313	2102	15.7	0.396	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	39.8
12	R2	42	0	44	0.0	0.327	32.9	LOS C	0.9	6.1	0.93	1.00	1.05	26.5
Approach		2039	313	2146	15.4	0.396	0.8	NA	0.9	6.1	0.02	0.02	0.02	39.4
All Vehicles		4064	608	4278	15.0	0.883	2.3	NA	2.6	18.5	0.02	0.03	0.02	38.3

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

Queue Model: SIDRA Standard.

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

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

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# MOVEMENT SUMMARY

 **Site: 101 [Pennant Hills Road-Mount Pleasant Avenue PM-Base-2019 (Site Folder: General)]**

New Site

Site Category: Existing Design

Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Mount Pleasant Avenue														
1	L2	62	0	65	0.0	0.108	11.1	LOS A	0.4	2.7	0.57	0.99	0.57	34.7
3	R2	28	0	29	0.0	1.068	400.6	LOS F	4.6	32.0	1.00	1.32	2.13	6.8
Approach		90	0	95	0.0	1.068	132.3	LOS F	4.6	32.0	0.70	1.09	1.05	13.7
East: Pennant Hills Road														
4	L2	25	0	26	0.0	0.374	3.5	LOS A	0.0	0.0	0.00	0.02	0.00	39.9
5	T1	1828	349	1924	19.1	0.374	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	39.8
Approach		1853	349	1951	18.8	0.374	0.2	NA	0.0	0.0	0.00	0.01	0.00	39.8
West: Pennant Hills Road														
11	T1	2357	265	2481	11.2	0.459	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	39.8
12	R2	16	0	17	0.0	0.113	25.9	LOS B	0.3	2.0	0.90	0.95	0.90	28.6
Approach		2373	265	2498	11.2	0.459	0.3	NA	0.3	2.0	0.01	0.01	0.01	39.7
All Vehicles		4316	614	4543	14.2	1.068	3.0	NA	4.6	32.0	0.02	0.03	0.03	37.8

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

Queue Model: SIDRA Standard.

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

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

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# MOVEMENT SUMMARY

 **Site: 101 [Pennant Hills Road-Mount Pleasant Avenue AM-Base-2026 (Site Folder: General)]**

New Site

Site Category: 2026 Base Case

Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Mount Pleasant Avenue														
1	L2	20	0	21	0.0	0.033	10.3	LOS A	0.1	0.8	0.53	0.91	0.53	35.1
3	R2	25	0	26	0.0	0.690	170.3	LOS F	1.9	13.3	0.99	1.07	1.24	13.2
Approach		45	0	47	0.0	0.690	99.2	LOS F	1.9	13.3	0.79	1.00	0.93	17.3
East: Pennant Hills Road														
4	L2	33	0	35	0.0	0.350	3.5	LOS A	0.0	0.0	0.00	0.03	0.00	39.9
5	T1	1740	264	1832	15.2	0.350	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	39.8
Approach		1773	264	1866	14.9	0.350	0.2	NA	0.0	0.0	0.00	0.01	0.00	39.8
West: Pennant Hills Road														
11	T1	1715	269	1805	15.7	0.342	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	39.9
12	R2	42	0	44	0.0	0.264	26.0	LOS B	0.7	5.0	0.91	0.97	0.99	28.6
Approach		1757	269	1849	15.3	0.342	0.7	NA	0.7	5.0	0.02	0.02	0.02	39.4
All Vehicles		3575	533	3763	14.9	0.690	1.7	NA	1.9	13.3	0.02	0.03	0.02	38.8

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

Queue Model: SIDRA Standard.

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

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

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# MOVEMENT SUMMARY

 **Site: 101 [Pennant Hills Road-Mount Pleasant Avenue PM-Base-2026 (Site Folder: General)]**

New Site

Site Category: 2026 Base Case

Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Mount Pleasant Avenue														
1	L2	62	0	65	0.0	0.102	10.6	LOS A	0.4	2.6	0.55	0.97	0.55	34.9
3	R2	28	0	29	0.0	0.930	293.3	LOS F	3.1	21.5	1.00	1.19	1.65	8.9
Approach		90	0	95	0.0	0.930	98.5	LOS F	3.1	21.5	0.69	1.04	0.89	16.7
East: Pennant Hills Road														
4	L2	25	0	26	0.0	0.349	3.5	LOS A	0.0	0.0	0.00	0.02	0.00	39.9
5	T1	1704	325	1794	19.1	0.349	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	39.8
Approach		1729	325	1820	18.8	0.349	0.2	NA	0.0	0.0	0.00	0.01	0.00	39.8
West: Pennant Hills Road														
11	T1	2043	265	2151	13.0	0.402	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	39.8
12	R2	16	0	17	0.0	0.099	23.0	LOS B	0.3	1.8	0.89	0.94	0.89	29.6
Approach		2059	265	2167	12.9	0.402	0.3	NA	0.3	1.8	0.01	0.01	0.01	39.7
All Vehicles		3878	590	4082	15.2	0.930	2.5	NA	3.1	21.5	0.02	0.03	0.02	38.2

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

Queue Model: SIDRA Standard.

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

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

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# MOVEMENT SUMMARY

 **Site: 101 [Pennant Hills Road-Mount Pleasant Avenue AM-WD-2026 (Site Folder: General)]**

New Site

Site Category: 2026 Post Development

Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Mount Pleasant Avenue														
1	L2	148	0	156	0.0	0.247	11.4	LOS A	1.0	7.0	0.60	1.02	0.63	34.6
3	R2	25	0	26	0.0	0.765	208.8	LOS F	2.1	14.9	1.00	1.09	1.31	11.4
Approach		173	0	182	0.0	0.765	39.9	LOS C	2.1	14.9	0.65	1.03	0.73	25.3
East: Pennant Hills Road														
4	L2	41	0	43	0.0	0.365	3.5	LOS A	0.0	0.0	0.00	0.03	0.00	39.9
5	T1	1812	264	1907	14.6	0.365	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	39.8
Approach		1853	264	1951	14.2	0.365	0.2	NA	0.0	0.0	0.00	0.01	0.00	39.8
West: Pennant Hills Road														
11	T1	1830	269	1926	14.7	0.362	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	39.9
12	R2	49	0	52	0.0	0.333	29.3	LOS C	0.9	6.4	0.92	1.00	1.05	27.6
Approach		1879	269	1978	14.3	0.362	0.8	NA	0.9	6.4	0.02	0.03	0.03	39.3
All Vehicles		3905	533	4111	13.6	0.765	2.3	NA	2.1	14.9	0.04	0.06	0.05	38.4

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

Queue Model: SIDRA Standard.

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

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

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# MOVEMENT SUMMARY

 **Site: 101 [Pennant Hills Road-Mount Pleasant Avenue AM-Base-2036 (Site Folder: General)]**

New Site

Site Category: 2036 Base Case

Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Mount Pleasant Avenue														
1	L2	102	0	107	0.0	0.148	9.9	LOS A	0.6	3.9	0.52	0.96	0.52	35.3
3	R2	25	0	26	0.0	0.506	100.8	LOS F	1.4	9.7	0.99	1.05	1.14	18.3
Approach		127	0	134	0.0	0.506	27.8	LOS B	1.4	9.7	0.62	0.97	0.65	28.8
East: Pennant Hills Road														
4	L2	60	0	63	0.0	0.313	3.5	LOS A	0.0	0.0	0.00	0.05	0.00	39.8
5	T1	1532	224	1613	14.6	0.313	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	39.8
Approach		1592	224	1676	14.1	0.313	0.2	NA	0.0	0.0	0.00	0.02	0.00	39.8
West: Pennant Hills Road														
11	T1	1445	216	1521	14.9	0.287	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	39.9
12	R2	67	0	71	0.0	0.347	23.3	LOS B	1.0	7.1	0.89	0.99	1.04	29.5
Approach		1512	216	1592	14.3	0.347	1.1	NA	1.0	7.1	0.04	0.04	0.05	39.2
All Vehicles		3231	440	3401	13.6	0.506	1.7	NA	1.4	9.7	0.04	0.07	0.05	38.8

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

Queue Model: SIDRA Standard.

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

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

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# MOVEMENT SUMMARY

 **Site: 101 [Pennant Hills Road-Mount Pleasant Avenue AM-WD-2036 (Site Folder: General)]**

New Site

Site Category: 2036 Post Development

Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Mount Pleasant Avenue														
1	L2	190	0	200	0.0	0.282	10.6	LOS A	1.2	8.6	0.57	1.02	0.62	35.0
3	R2	25	0	26	0.0	0.582	125.9	LOS F	1.6	11.2	0.99	1.06	1.18	16.1
Approach		215	0	226	0.0	0.582	24.0	LOS B	1.6	11.2	0.62	1.02	0.69	29.8
East: Pennant Hills Road														
4	L2	71	0	75	0.0	0.328	3.5	LOS A	0.0	0.0	0.00	0.06	0.00	39.8
5	T1	1603	224	1687	14.0	0.328	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	39.8
Approach		1674	224	1762	13.4	0.328	0.3	NA	0.0	0.0	0.00	0.02	0.00	39.8
West: Pennant Hills Road														
11	T1	1550	216	1632	13.9	0.307	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	39.9
12	R2	76	0	80	0.0	0.426	26.5	LOS B	1.3	9.0	0.91	1.02	1.12	28.4
Approach		1626	216	1712	13.3	0.426	1.3	NA	1.3	9.0	0.04	0.05	0.05	39.0
All Vehicles		3515	440	3700	12.5	0.582	2.2	NA	1.6	11.2	0.06	0.09	0.07	38.5

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

Queue Model: SIDRA Standard.

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

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

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## Appendix C

# Hornsby Shire Council Meeting Minutes

<b>Project</b>	<b>Loreto Normanhurst Master Plan</b>
<b>Meeting</b>	Parking and Traffic Review
<b>Date</b>	20.07.2020
<b>Location</b>	Hornsby Shire Council Building/Microsoft Teams
<b>Minutes</b>	Grace Carpp (TTW)

	<b>Name</b>	<b>Organisation</b>
<b>Attendees</b>	Paul Yannoulatos	TTW
	Grace Carpp	TTW
	Alan Yang	Hornsby Shire Council
	Radek Zarzycki	Hornsby Shire Council
	Matthew Miles	Hornsby Shire Council

<b>Item</b>	<b>Description</b>
<b>1</b>	<b>INTRODUCTION</b>
<b>1.1</b>	<b>Project Overview</b>
1.1a	TTW (PY) introduced the project and the TTW team to Hornsby Shire Council (HSC). It was acknowledged that the purpose of the meeting was to review potential ideas to ameliorate traffic impacts of the proposed Loreto Normanhurst Master Plan.
<b>2</b>	<b>DISCUSSION</b>
<b>2.1</b>	<b>Parking</b>
2.1a	TTW summarised the existing parking on site and acknowledged that Loreto Normanhurst (Loreto) is looking at locations to provide additional parking on site.
2.1b	TTW explained a parking demand approach is being investigated following travel mode survey data and the intent would be to apply a Green Travel Plan to reduce these rates. HSC stated evidence would be required that proved a lower parking demand than that of the Development Control Plan rates.
2.1c	HSC queried whether parking demands would account for the adjacent Early Learning Centre development that relies on parking within the Campus. TTW confirmed this demand would be accounted for.
<b>2.2</b>	<b>Right Turn from Mount Pleasant Avenue to Pennant Hills Road</b>
2.2a	HSC explained that there is a safety concern at this intersection, with a vehicle crash occurring during a right turn movement into Mount Pleasant Avenue.
2.2b	HSC stated that a right turn ban was unfavourable for residents on Mount Pleasant Avenue.
2.2c	The signalisation of the intersection was discussed. TTW explained that Loreto would be willing to contribute to the upgrade of this intersection if required. While HSC would support this being installed, it was stated that RMS currently does not support the installation of an intersection at this location due to the adjacent intersection at Osborn Road/Pennant Hills Road.
2.2d	HSC acknowledged that once North Connex opens there could be scope for signalisation due to the reduction in heavy vehicle usage on Pennant Hills Road.
2.2e	HSC explained that the TfNSW study of Pennant Hills Road following North Connex indicated that there may be some additional green time provided to side roads which may improve the situation.

Item	Description
<b>2.3</b>	<b>Through Site Link and Pick Up/Drop Off</b>
2.3a	TTW explained that Loreto is looking to provide additional pick up and drop off area to cater for the additional students.
2.3b	HSC noted that the existing arrangement is insufficient and results in queuing within Osborn Road. It was highlighted that through vehicles on Osborn Road are unable to pass vehicles queuing for the drop off safely.
2.3c	HSC explained that with the current COVID-19 situation, queuing has worsened though complaints had occurred prior to COVID-19. It was expressed that Loreto had not acknowledged these complaints or made an attempt to ameliorate existing traffic impacts.
2.3d	TTW acknowledged Loreto is also investigating the staggering of start and finish times to lengthen the pick up and drop off period. HSC supported this initiative.
2.3e	TTW noted that additional traffic counts had been completed to the existing pick up and drop off and future queuing areas would be based on projecting these numbers to the future student capacity. HSC stated that queuing calculations should be included within the response.
2.3f	HSC recommended TTW review Barker College's pick up and drop off facility that currently works effectively with no queuing on the surrounding roads.
<b>2.4</b>	<b>Osborn Road Widening</b>
2.4a	TTW queried whether parking restrictions could be put in place to alleviate traffic queues at the Osborn Road/Pennant Hills Road intersection. HSC stated any new controls would need to go through Local Traffic Committee and are likely to be seen unfavourably by residents.
2.4b	HSC's preference is to widen Osborn Road along the southern boundary to provide a through lane adjacent to queues from the pick up and drop off area. TTW stated that with additional queuing internal to the site no queuing would occur within Osborn Road and therefore road widening would not be required.
2.4c	TTW acknowledged the cost of road widening would be significant. HSC suggested that Loreto investigate the road widening to a costing level and to then investigate other avenues of funding such as State Government or HSC contributions.
<b>2.5</b>	<b>Pennant Hills Road Access Driveway</b>
2.5a	TTW explained that the intent is to pedestrianise the existing driveway to Pennant Hills Road during the week while allowing use on the weekend for ceremonial events (weddings, funerals, etc.). HSC stated that this would be determined by RMS, but that it would be unlikely to be accepted. HSC recommended Loreto implement a Traffic Control Plan with traffic marshals for these events.
<b>2.6</b>	<b>Planning Conditions</b>
2.6a	TTW queried whether a condition could be included that allowed for monitoring of the performance of the Osborn Road/Pennant Hills Road intersection in future as there are significant changes due to Pennant Hills Road in future due to NorthConnex. HSC stated it would be unusual, however could be discussed and potentially agreed on.
2.6b	TTW acknowledged that it is an aim of state and local government to reduce car usage. TTW queried whether a condition could be included for Loreto to reassess parking requirements as a result of changing travel patterns during the 20 year span of the masterplan. TTW explained that should the Green Travel Plan be successful Loreto would not require the number of spaces indicated in the DCP parking rate. HSC was supportive of this idea.
2.6c	HSC acknowledged that as the masterplan is a State Significant Development, the consent conditions would be ultimately up to the Department of Planning, however they could propose conditions be included.
	<b>Meeting closed approx. 12pm</b>

## Appendix D

# Transport for New South Wales/Roads and Maritime Services Meeting Minutes



<b>Project</b>	<b>Loreto Normanhurst Master Plan</b>
<b>Meeting</b>	Parking and Traffic Review
<b>Date</b>	30.09.2020
<b>Location</b>	Microsoft Teams
<b>Minutes</b>	Grace Carpp (TTW)

	<b>Name</b>	<b>Organisation</b>
<b>Attendees</b>	Paul Yannoulatos	TTW
	Grace Carpp	TTW
	Christina Papadopoulos	Transport for NSW
	Felix Liu	Transport for NSW
	Maria Swallow	Transport for NSW
	Pahee Rathan	Transport for NSW
	Peter Carruthers	Transport for NSW
	Robert Rutledge	Transport for NSW
	Zakaria Ahmad	Transport for NSW

<b>Item</b>	<b>Description</b>
<b>1</b>	<b>INTRODUCTION</b>
<b>1.1</b>	<b>Project Overview</b>
1.1a	TTW (PY) introduced the project and the TTW team to Transport for New South Wales (TfNSW). It was acknowledged that the purpose of the meeting was to review the proposed changes made to the Loreto Normanhurst Master Plan in response to submissions received.
1.1b	TfNSW (CP) queried current car parking on site and future provision. TTW (GC) responded that the site has around 180 spaces on site that will be increased by approximately 130 spaces in the initial stage of the master plan.
1.1c	TTW (PY) summarised the submissions received by Hornsby Shire Council, RMS and TfNSW following exhibition of the original master plan.
<b>1.2</b>	<b>Response to submissions</b>
1.2a	TTW (PY) summarised how the master plan has been adjusted to respond to the authority submissions and in the context of the wider public submissions. This included additional parking, the through site link from Osborn Road to Mount Pleasant Avenue, pick up and drop off analysis, and closure of Pennant Hills Road to general traffic.
1.2b	TTW (PY) explained the staged approach to traffic improvements, stating that most improvements would be brought forward to the Stage 1 Detailed Development Approval with longer master plan aims to provide for all parking demands on site and continual updating of the Green Travel Plan.
<b>2</b>	<b>DISCUSSION</b>
<b>2.1</b>	<b>Green Travel Plan</b>
2.1a	TfNSW (RR) raised that the School should consider prohibiting students from driving. TTW (GC) explained the current student driving rate is above other similar Schools and that while the School currently caps student drivers at 40, mode share surveys have indicated additional students are driving than allowed. The key focus of the Green Travel Plan would be to reduce this driving rate.

Item	Description
2.1b	TfNSW (CP) explained what was required of the Green Travel Plan including: an overall aim to limit car use, a site analysis in terms of walking/cycling, investigation into extracurricular activities that occur within the school, and consideration of weekend event impacts. TfNSW (CP) also noted that information on the current context and uses on the site (eg. sporting events, weddings, etc) should be discussed in the Green Travel Plan.
2.1c	TfNSW (MS) raised that Pennant Hills Road does not have a traditional peak, weekend traffic can at times be equally heavy and therefore should be considered in the Green Travel Plan.
<b>2.2</b>	<b>Right Turn from Mount Pleasant Avenue to Pennant Hills Road</b>
2.2a	TTW (GC) explained the current right turn from Mount Pleasant Avenue has considerable safety concerns and therefore the School will reduce right turning movements through the operational traffic management plan. TfNSW (MS) stated that any increase in right turns from Mount Pleasant Avenue should be avoided.
<b>2.3</b>	<b>Through Site Link and Pick Up/Drop Off</b>
2.3a	TfNSW (ZA) stated that the existing pick up and drop off needs to be reviewed and projections made for future student numbers.
2.3b	TfNSW (PR) queried how the proposed pick up and drop off would avoid rat runs through the site. TTW (GC) explained that there is an existing gate at the entry and a new gate would be proposed at the exit. This would be closed during weekends as per the existing scenario.
<b>2.5</b>	<b>Pennant Hills Road Access Driveway</b>
2.5a	TTW (GC) explained that the intent is to pedestrianise the existing driveway to Pennant Hills Road during the week while allowing use on the weekend for ceremonial events (weddings, funerals, etc.). TfNSW (MS) said this would be allowed provided it was infrequent and a Traffic Management Plan was in place.
<b>2.6</b>	<b>Closing Comments</b>
2.6a	TfNSW (RR) queried the timeframe for resubmission. TTW (GC) explained the intent was to relodge towards the end of October.
	<b>Meeting closed approx. 12pm</b>