



Graythwaite Concept & Stage 1  
Project Applications  
Response to DoPI Request for  
Further Information  
Traffic and Transport Matters

transportation planning, design and delivery

# Graythwaite Concept & Stage 1 Project Applications

## Response to DoPI Request for Further Information, Traffic and Transport Matters


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## 1. Introduction

### 1.1 Background

In October 2011 the Shore School submitted to the Department of Planning and Infrastructure (DoPI) a Revised Environmental Assessment (REA) for a Part 3A Concept Application and Stage 1 Project Application for the proposed redevelopment of the site referred to as "Graythwaite" in North Sydney. This REA was accompanied by a *Transport and Accessibility Impact Statement* (Halcrow, October 2011).

In March 2012 the Shore School submitted the REA Preferred Project Report (PPR). This included the *Preferred Project Report – Transport Aspects Report* (Halcrow, March 2012) which detailed the traffic and transport implications of the preferred project modifications undertaken in response to submissions on the REA.

In June 2012, GTA Consultants prepared on behalf of the Shore School a further report responding to traffic and transport matters raised in submissions to the PPR, namely North Sydney Council, the Edward Street Precinct Committee and local residents.

### 1.2 DoPI Traffic Peer Review Process

As part of the DoPI's assessment of the Concept Application and Stage 1 Project Application, the DoPI sought a Peer Review of the traffic and transport aspects of the proposal. To this end, the DoPI engaged SMEC to provide them with advice regarding the traffic and transport aspects of the proposal.

In undertaking the peer review, SMEC raised a number of traffic and transport related issues that they considered required clarification.

A phone meeting between the DoPI, SMEC, Shore School and their representatives (WSP and GTA) was held on the 27 July 2012 to discuss and resolve the issues identified by SMEC requiring clarification. During this meeting the traffic and transport issues were discussed and generally resolved through the discussions.

### 1.3 Purpose of this Report

The purpose of this report is to provide documentation regarding the issues raised, discussed and resolved as part of the Peer Review process and to provide additional documentation / clarification as requested in the peer review meeting.

This report will enable the DoPI to appropriately assess the proposals (Concept and Stage 1 Project) and prepare a report as part of the PAC process.

## 2. Traffic and Transport Issues

### 2.1 Overview of Issues Requiring Further Clarification

The SMEC peer review identified a number of traffic and transport related issues that they believed required further clarification.

These issues can be grouped together into the following key core matters:

- Assessment of Worst Case Scenario – Cumulative Assessment to Stage 3
- Proposed Union Street Pick Up and Potential Drop Off Facility
- On Site Car Parking Provisions
- On Site School Bus Facilities and Associated Bus Issues
- Response to Agencies and Community Submissions.

Each of the above issues were raised and discussed during the Peer Review phone meeting. The issues discussed and the resolutions achieved are presented in the following sections of this report.

### 2.2 Assessment of Worst Case Scenario

#### 2.2.1 Description of Issue

A key issue identified by the peer review was the need to demonstrate that the “worst case” scenario had been considered with regards to traffic generation and its associated potential implications to the surrounding road network.

The peer review noted that, based on their review of the various traffic and transport reports, it was not clear as to whether the “worst case” scenario had been assessed as part of the Concept Application (ie full development) assessment.

The traffic generation potential of the Concept Application (cumulative Stages 1, 2 and 3) is documented in Table 4.1 and Table 5.1 of the *REA Transport and Accessibility Impact Assessment* (Halcrow, October 2011) and repeated in Table 2.1 and Table 2.2 the *PPR – Transport Aspects* (Halcrow, March 2012).

The peer review acknowledges these traffic generation estimates for the worst case scenario and states that:

*“The magnitude of the trip generation rates for the prep and senior schools in Table 5.1 appears plausible. Halcrow’s method of using the existing Travel Survey results for the Edward Street facility is supported. This technique provides a site specific set of trip generation rates applicable for the Shore School”. (SMEC, July 2012)*

It should be noted that the Travel Survey referenced by the peer review was based on the whole school (preparatory, senior students and staff) not just the Edward Street facility.

It is further noted that North Sydney Council's traffic engineer agreed with the traffic generation estimates used in the traffic assessment of the Concept Application (Stage 3). The Council officer's report included in Council's submission on the REA stated that:

*"In Stage 3 the School is seeking to have an additional 100 preparatory students and 400 senior school students. I concur with Halcrow's calculations that this is likely to result in an additional 288 peak hour vehicle trips."*

*"Due to the size of the school, with multiple access points, traffic generation and impacts are somewhat dispersed throughout the surrounding streets. I generally concur with Halcrow's calculations that the surrounding road network can generally accommodate the proposed additional vehicle movements. There will be modest decreases in service levels at the intersections."*

(Source: Report of George Youhanna, Executive Planner, Page 31 of Submission to Amended Proposal and Revised EA, 12 December 2011)

[Note that this original North Sydney Council assessment was based on a potential 500 students whereas the REA applies for 450 students so that the REA predicted impacts would actually be less than originally assessed].

As part of North Sydney Council's review of the Concept Application, they commissioned an independent review of the traffic assessment. This independent review concluded that:

*"We agree with the estimates of additional traffic generation in the Halcrow report. We also generally agree that the surrounding roads will be able to cater for the additional traffic from the proposed development"*.

(Source: Colston Budd Hunt & Kafes contained in the report of George Youhanna, Executive Planner, Page 26 of Submission to Amended Proposal and Revised EA, 12 December 2011)

During discussions as part of the peer review meeting, it was identified that the issue regarding the "worst case" scenario was not the level of traffic generation, but rather the distribution of additional traffic and the inclusion of this traffic in the analysis of the various intersections operations.

However it became apparent during discussions that the peer reviewer had assumed that the Edward Street drop off / pick up is currently utilised by both Senior and Preparatory School students and that the proposed Union Street pick up facility would also be utilised by both Senior School and Preparatory School students. The peer reviewer had thus assumed that all cumulative Stage 3 traffic generation would be accessing either the Edward Street or proposed Union Street facility.

This is not the present case and will not be the future case. The existing facility is and will continue to be a Preparatory School facility. Similarly the Union Street facility will be a Preparatory School facility.

Thus the peer reviewer's comments regarding the assessment not assessing the worst case scenario was based on an incorrect assumption. This was acknowledged by the peer reviewer during the discussions.

The distribution of additional traffic for the cumulative development for Stages 1 – 3 was presented in the Appendix D of the original EA *Transport and Accessibility Impact Assessment* (Halcrow, November 2010). This distribution shows preparatory school traffic accessing the drop off pick up facility, senior school related traffic accessing the various access points (as per Council's submission noted above) and staff accessing the various car park accesses.

Notwithstanding the above, it was agreed that that the peer reviewers understanding of the development proposal and associated traffic generation assessment would have benefited from a site inspection and inclusion of intersection modelling inputs and outputs.

To assist the peer review, the input / output summary information for the intersection modelling (SIDRA Movement Summary) undertaken as part of the assessment is presented in Appendix A.

Furthermore, as per the peer reviewer's request, supplementary intersection modelling for the Union Street / Blues Point Road / Lavender Street has been undertaken to reflect the inclusion of the Union Street pick up facility as detailed in the modified Concept Application REA and PPR. This analysis is summarised below and the Sidra Movement Summary contained in Appendix A.

### 2.2.2 Description of Assessed Traffic Generation (Worst Case Scenario)

For the sake of completeness, this section provides a summary of the "worst case" traffic generation assessment used in the intersection operation analysis (Sidra modelling).

The traffic generation used in the intersection modelling presented in both the original EA traffic assessment (Halcrow, November 2010) and the REA traffic assessment (Halcrow, October 2011) was based on the following additional student and staff numbers by the end of Stage 3:

- Preparatory School = 100 students
- Senior School = 400 students
- Staff = 50 staff.

It is noted that as part of the REA the proposed additional student numbers were reduced from 500 to 450 students and from 50 to 45 staff members. However, the intersection analysis was not rerun for the reduced proposal.

Thus the traffic generation assessed for the REA was some 8% higher than estimated traffic generation for the REA proposal.

Furthermore, the analysis presented in the original EA did not envisage an additional pick up facility. Thus the results in the original EA and REA assume that 100% of the additional preparatory school traffic is accessing the site via Edward Street. With the provision of the Union Street facility, the volume of additional traffic accessing the school via Edward Street will be lower than that assessed in the traffic analysis.

Thus the traffic assessment presented through the various traffic and transport reports has consistently assessed a "worst case scenario".

### 2.2.3 Summary of Issue Resolution

It was agreed that the "worst case" scenario had been assessed as part of the various traffic assessments including the *REA Transport and Accessibility Impact Assessment* (Halcrow, October 2011).

Further information relating to the intersection analysis is provided in this report as requested by the Peer Reviewer.



## 2.3 Proposed Union Street Pick Up Facility

### 2.3.1 Description of Issue

As noted above, the peer review had assumed that the proposed pick up facility would service both preparatory school and senior school students. Following discussions and clarifications regarding the operation of the pick up facility the majority of issues raised by the peer review were addressed.

Notwithstanding the above, it was agreed that the proposed operation of the pick up facility as discussed be documented in this report along with additional information relating to the Sidra intersection analysis.

### 2.3.2 Description of Proposed Pick Up Facility Operation

As per the existing Edward Street facility, the Shore School will manage and supervise the departure of Preparatory School students from the pick up facility including accompanying students from the Preparatory School to the new pick-up facility and managing their timely departure.

Pick up will be arranged by classes with particular classes assigned to either the Edward Street pick up or the Union Street pick up facility. Parents will not be given the choice of pick up locations. As such the School can satisfactorily manage a 50 / 50 split of students between the pick up locations.

The Preferred Project Report identified the potential to increase the number of pick up bays from 4 spaces (as indicated in the REA) to 6 spaces to increase the through capacity of the facility. It is considered that the provision of 6 spaces will more than adequately accommodate demand (as shown by the on-site queuing analysis) but could potentially be increased as part of the detailed design of the facility as part of future project applications for Stage 2 / 3 (subject to space considerations).

The School has the ability to manage the operation of the facility through the school's newsletter, direct notification to individual classes and students and parents and by on site management during the pick up period.

Following consideration of the above, the peer reviewer advised that they agreed that the Union Street pick-up would function well for the conditions specified in the Shore submissions and management approach outlined above.

### 2.3.3 Why a Drop Off Only Facility for Preparatory School Students?

The peer review requested clarification as to why the pick-up facility could not be used a morning (am) drop-off facility.

It is not proposed to provide a designated drop off or pick up facility for Senior School students. The School does not wish to potentially encourage increased use of private motor vehicles by all parents noting that such an outcome would not fit in with the School's, DoPI nor North Sydney Council's transport policies of encouraging non-private vehicle modes of transport.

The parents who currently drop off their Senior School children at the School have adequate alternate locations that are suitable for the more mature children.

GTA noted that existing drop-off activity is spread over a 1-1½ hour period which is unlike the pick-up activity which has a high demand over a short (15 minute) period. This feature means that there is spare capacity at the Edward Street facility to accommodate additional Preparatory School drop offs in the morning period.

GTA also noted that the use of the Union Street pick-up facility in the morning for a drop-off would coincide with the normal peak hour traffic (noting that the residents were already concerned about extra traffic in Union Street at peak periods).

The peer review accepted these points as being a valid justification for not using the Union Street facility as a morning drop-off facility.

### 2.3.4 Turn Warrants for Union Street Access Intersection

The peer reviewer also requested that discussion regarding the warrants for the provision of turn lanes at the Union Street / site access intersection be provided as part the supplementary information.

Typically Austroads Guide to Road Design would be utilised to assess the warrants for the provision of turning lanes or bays at road intersections. However it is considered that Austroads guidelines are not appropriate for the Union Street site access as the Austroad guide refers to:

- Intersections of major and minor roads (not driveways)
- major roads with speeds less than 100km/h including urban roads including those in the urban fringe and lower speed rural roads. Union Street is classified as a local road.

Notwithstanding the above the warrant for a right turn lane from Union Street into the site was considered as part of the REA traffic report and Response to Submissions.

It is considered that there is sufficient capacity to accommodate vehicle queuing from the pick up facility on site and thus vehicles turning into the site will only be delayed by approaching vehicles along Union Street.

The Sidra analysis of the site access indicated that the delays to vehicles turning right to access the pick up facility would not excessively delay vehicle flows along Union Street. It is noted that the pick up facility will operate prior to the commuter PM peak and occur over a short duration (peak 15 minute period).

Therefore it is concluded that the warrants to provide a designated turn lane in Union Street are not met.

### 2.3.5 Union Street / Blues Point Road / Lavender Street Supplementary SIDRA Modelling

As discussed above, the operation of the Union Street / Blues Point Road / Lavender Street intersection was assessed as part of the original EA traffic report (Halcrow, Oct 2010). This analysis included intersection operation under a development scenario of an additional 500 students and 50 staff but without the operation of the Union Street pick up facility which was developed through the consultation process and proposed as part of the REA and PPR.

As requested by the peer review the intersection analysis has been updated to include traffic associated with the Union Street pick up facility. It is noted that the facility will only operate in the afternoon and thus only the afternoon period has been assessed.

Furthermore, the analysis includes the scenario of an additional 500 students (100 prep school) and 50 staff. This allows a comparison with the original assessment however it is noted that the proposed development is for 450 students and 45 staff. The analysis also includes an allowance for the peak pick up generation occurring within a 15 minute period.

The results of the analysis are presented in Table 2.1. Movement summary data is provided in Appendix A.

Table 4.1 – Union St / Blues Point Rd / Lavender St - Intersection Operation with Union Street Pick Up (Stage 3).

	Level of Service	Average Vehicle Delay (sec/veh)
Without Union St Pick Up Facility (Stage 3)	Los B	26.0
With Union St Pick Up Facility (Stage 3)	LoS C	29.0

The results presented in Table 4.1 indicate that the proposed Union Street pick up facility will have a minimal adverse impact on intersection operation during the peak 15 minute pick up period. It is noted that the intersection will operate at a LoS C which is an acceptable level of service.

### 2.3.6 Summary of Issue Resolution

The peer review has advised that they agree with the findings that the proposed Union Street pick up facility will operate well for the conditions specified above and within the Shore submissions. The additional information requested by the peer reviewer has been provided in this report including the supplementary intersection analysis which indicates that the Union St / Blues Point Rd / Lavender Street intersection will continue to operate satisfactorily with the operation of the Union Street pick up facility in the afternoon period.

## 2.4 On Site Car Parking Provisions

### 2.4.1 Description of Issue

In the opinion of the peer reviewer, the traffic assessments did not provide adequate justification for the inclusion of 41 proposed car parking spaces under the new east building. The reviewer notes that the existing on site parking provision for the School (151 spaces) exceeds North Sydney Council's DCP 2002 maximum allowance for an 'educational establishment' and thus it recommends that no new additional parking be provided.

However, the School and its representatives do not agree with this opinion and note that the provision of no additional on site parking does not consider existing approvals for on site parking, the specific

nature of parking demand created by the Shore School nor community feedback requesting more not less on site parking.

It is noted that Council's independent traffic consult advised Council that a parking provision above the maximum DCP parking allowance would provide benefits such as:

*"Teachers often travel with equipment and materials for which travel modes other than car are impractical. The additional on site parking would mean there is less demand for on street parking in the vicinity of the site, both during the day, when the school is operating, and at night, when residents in the area return home and there may be other activities occurring at the school. The proposed parking provision is therefore considered to be appropriate".*

(Source: Colston Budd Hunt & Kafes contained in the report of George Youhanna, Executive Planner, Page 26 of Submission to Amended Proposal and Revised EA, 12 December 2011)

## 2.4.2 Description of Proposed Car Parking Provision

The School currently provides a total of 151 on site parking spaces (approved) on the School site. A further 7 formal spaces and some 16-20 informal spaces are currently provided on the Graythwaite site.

As part of the Concept Application including the Union Street pick up facility it is proposed that the onsite parking provision will be:

- Shore School site: 147 spaces (4 spaces lost to accommodate Union St Pick Up Facility)
- Graythwaite Site: 48 spaces
  - 41 spaces under the new East Building
  - 6 at grade visitor spaces near Graythwaite House and one near the Coach House (caretaker use).

## 2.4.3 Reasons for Proposed Parking Provision

The following reasons are put forward for the provision of the proposed on site parking spaces:

- The Graythwaite site has been approved by legislation as being suitable for educational purposes and the Concept and Stage 1 Project Applications for the most part apply to the Graythwaite site and not the existing Shore School site. Although the School has plans to amalgamate the two sites into one campus, the Graythwaite site is entitled to on-site parking as a separate entity regardless of the number of parking spaces on the adjoining School site.
- Since 1915, the Graythwaite site has operated with on-site parking and the School considers there is an "existing rights" claim to on-site parking which is discussed in the REA including the Transport and Accessibility Impact Assessment (see page 4 and 59-61 - Halcrow, October 2011).
- There is a large support from the adjoining community for the School to provide on-site parking to minimise the impact on street parking. As noted in the Preferred Project Report (page 18 - Halcrow, March 2012) over 50% of the community submissions identified increased demand for on street parking as an issue. The proposed provision of on site car parking responds to this community issue.

- North Sydney Council and the residents have called for the School to manage its traffic on site (or internalise its impacts). The East Building car park responds to this.
- Some external use of the Graythwaite House is envisaged out of School hours by School and non-School related organisations. Parking under the East Building will avoid parking in the streets, provide convenience and safety for the Graythwaite House attendees.
- The East Building car park will offset the loss of the 4 car spots in the Union Street car park.
- Six of the seven car parks associated with Stage 1 are only for visitors who need to deal with the School's Administration in the Graythwaite House and not for staff use. The seventh spot is for the new position of an on-site caretaker.
- The East Building car park is underground minimising visual impacts in accordance with the DCP's objectives.
- The Shore School has its main sporting facilities remote from its North Sydney campus and this creates additional transport and parking needs for its staff that are required to supervise after class sporting activities.

#### 2.4.4 Summary of Issue Resolution

As outlined in the PPR Transport and Accessibility Impact Assessment (Halcrow, March 2012) the proposed on site parking provision represents a fair balance between restrictive on site parking policies and the reduction of impacts to Shore's neighbours associated with demand for on street parking.

The School requests that the DoPI consider all the issues regarding the provision of on site parking in making its decision on the amount of allowable parking on the Graythwaite site.

## 2.5 On Site School Bus Facilities and Associated Bus Issues

### 2.5.1 Description of Issue

The Peer Reviewer acknowledged that the provision of an on site bus facility has been investigated as part of the Concept Application for Graythwaite. However the reviewer initially considered that inadequate details for the rejection of an on-site bus facility were provided. Through discussions between the peer reviewer and the School's representatives, further information relating to the various on site bus parking options and the associated rejection of these options was presented.

It was agreed that these proposals for on site bus parking were unacceptable. The reviewer requested that this information be documented. This has been done in the following section.

It was acknowledged that as part of future development applications for Stages 2 and 3, the School would seek approval to retain the Mount Street bus operation and if approved by Council seek to utilise a section of kerb side area along William Street for a period between say 3-4pm on weekdays. Furthermore the School would investigate the possibilities of operating bus services from the existing public bus stops in Miller Street and Blue Street.

## 2.5.2 Summary of On Site Bus Parking Option Assessment

One suggestion in a submission had the buses entering the site from Edward Street and exiting via Hunter Crescent to William Street. This exit is not possible since there is a major difference of levels between the Graythwaite and School sites with an uphill left turn against the climb and there is insufficient space for buses along the Hunter Street / William Street egress.

A bus entrance from Blue Street is not feasible and the internal road leads to a dead end and the roads are too narrow (not to mention the entrance gate being too low).

A bus entry into Graythwaite from Union Street would affect the heritage roadway and have significant adverse impact on the Graythwaite parklands (and possibly some trees). Diagrams in the REA show the extent of the impact. The School is strongly against this option as is North Sydney Council.

A bus entry via Edward Street with an exit via Union Street (and the reverse) is equally unacceptable. Edward Street is very narrow making bus entry difficult (including the turn in from Mount Street). Shore does not own the land and road widening is difficult to contemplate due to the existing services, trees and pavements. A bus entry would potentially require no parking in the street during bus entry and bus entry would adversely impact on the Prep School pick-up and residents' travel from Edward and Lord Street. The entry from Edward Street to the Graythwaite site would require removal of part (or all) of an old tree and would require a new road from Edward to Union Streets. This road would pass very close to Graythwaite House, sub-divide the campus with buses in confined zones posing major safety hazards for the students, affect heritage trees and the heritage driveway, affect the East Building landscape and entrance, pass down a moderate slope and require parking / loading on the Graythwaite site below the existing Ward building (affecting access to the House temporarily) and finally require a bus exit onto Union Street.

Use of the oval on the School would destroy its practical use since the surface for buses would not be compatible with its sporting and other functions, plus affecting its heritage status. While the School uses this area occasionally for special events, this only occurs in good weather conditions and is so infrequent that damage to the playing surface is minor. This would not be the case for regular bus usage. Furthermore the use of the Oval would not address the issue of buses in Mount Street and this would continue to be the access route.

The PPR reiterated that the School's proposed concept application would not include the provision of an onsite bus facility to replace the existing on street operations in Mount Street.

The STA in its site visit to discuss the potential for additional buses for Stages 2 & 3 agreed that an on site bus facility was not feasible without major changes to the fabric of the School.

## 2.5.3 Consultation with Council

As directed by the DoPI, the School met with North Sydney Council officers (7 February 2012) to discuss the proposals for additional buses in William Street and other locations and it was understood that these proposals would be discussed by the North Sydney Council Traffic Committee along with the preferred pick-up facility. It is understood that North Sydney Council elected to not discuss the proposals at their Traffic Committee, a decision beyond the scope of the School.

It is also noted that in its submission to the DoPI on the PPR, Council states it is opposed to the use of the lower terraces of Union Street (i.e. the Graythwaite site) to be used as an on-site bus facility. As

such any on site bus facility would need to be provided via the School's existing site frontages. For the reasons described in the PPR the provision of an on-site bus facility with access via the existing School frontages is impractical. It is also a very inefficient use of School space for such limited time periods as also noted by the Colston Budd Hunt and Kafes review of the Halcrow transport assessment. The review was commissioned by North Sydney Council.

## 2.5.4 Bus Operation Management Plan

### 2.5.4.1 Existing Operations

The School currently utilises the existing bus stop in Mount Street in the afternoon to transfer students between North Sydney and the sporting fields at Northbridge. It is acknowledged that the Mount Street bus zone is utilised by other buses, including the adjacent Mary MacKillop Church as was noted in the Transport & Accessibility Impact Assessment (page 62) prepared by Halcrow, October 2011, although the School and Mary MacKillop uses rarely overlap.

Students travelling to School in the morning and travelling directly home in the afternoon via bus do so via the public bus facilities at North Sydney Station.

### 2.5.4.2 Survey of Existing Mount Street Bus Stop Operation

To assist with the further development and refinement of the School's Bus Management a survey of the bus movements at and operation of the existing Mount Street bus stop was undertaken in May 2012.

The results of the survey are summarised below.

A recent survey of bus use during term time (approximately 38 weeks per year) was undertaken by the School. In brief the results are:

- Bus loading typically takes between 6-11 minutes while bus unloading typically takes 1-3 minutes.
- Twice a week on Mondays and Wednesdays, there are midday buses (2-4) that typically take up space for between 18-25 minutes. As for all pick-up situations, the total time is affected by an early arrival of the first bus ahead of the pick-up time and an early bus can extend the total time of bus parking (one example up to 42 minutes). Buses typically arrive sequentially rather than en masse but have to wait until the front buses clear.
- Four days per week (Monday to Thursday), there are typically up to 8 buses that occupy space for between 23-35 minutes. Usually there is an early bus that arrives well before the pick-up time with others closer to the pick-up time, but usually always before required to facilitate a quick boarding time.
- Evening drop-off buses (1-2 on Mondays-Thursdays) are of negligible impact since they don't wait pre-pick-up.
- None of the Shore buses overlapped with the Mary McKillop buses.
- While arriving too early occupies street space for longer, buses must arrive before pick-up to ensure that the pick-up and departure is as efficient as possible. Some refinement may be possible, but overall the time taken for the bus pick-up is limited to specific times in the day and only applies 4 days per week during term time.

- There is no overlap with peak traffic periods.

This data supports the School's contentions that the current bus usage is satisfactory and represents a sensible and practical approach to transferring students from the North Sydney site to the Northbridge site for sport. The School also notes that it is entitled to use the public roads like others in the population.

#### 2.5.4.3 Bus Management Plans

The School currently has operational procedures relating to the management of bus movements to and from the Mount Street bus stop. The School will commit to preparing an updated plan as a condition of consent to deal with any additional bus needs.

The School's proposals for bus management associated with the Stage 2 and Stage 3 development of Graythwaite were discussed with existing bus operators (Forest Coach Lines and the STA). A summary of the discussions and the implications to future bus management is provided below with copies of the correspondence attached at Appendix B.

In the case of Shore School charters, Forest Coach Lines is able to collect students and teachers from either Blue Street or Mount Street.

The STA has advised its preference for use of William Street, north of Blue Street although use of Blue Street is possible with School and bus management.

#### 2.5.5 Summary of Response to Issue

It was agreed with the Peer Reviewer that the provision of an on site bus parking facility as part of the Graythwaite Concept application is not practical. The School is committed to the ongoing management of School bus movements to and from the School. This is to be reflected in School's '*Bus Operation Management Plan*'.

### 2.6 Response to Agencies and Community Submissions

It is understood that the various agency and community submissions have been reviewed as part of the Peer Review process. In preparing a response the Peer Review has summarised the submissions without providing significant comments as to the issues raised.

The peer review notes that RMS has provided submissions and has no objections to the proposed development.

The peer review has noted the issues presented in the North Sydney Council submission. However the review has not reviewed or commented on the Colston Budd Hunt & Kafes Report that was prepared for Council and included in their submission to the DoPI on the proposal (submission dated 12 December 2011). The independent traffic advice provided by Colston Budd Hunt & Kafes Report included the following:

- The proposed on site parking provision is considered appropriate.



- The surrounding road network would be able to cater for the additional traffic from the proposed development.
- An additional bus zone, subject to approval of the North Sydney Traffic Committee should be provided in William Street. Details in relation to the bus zone should be provided in association with future applications.

The peer review notes the comments from the community regarding a preference for more rather than less on site car parking provision associated with the proposed Concept Application.

The peer review did undertake a review of the McLaren Traffic Engineers report which was commissioned by and included as part of the SAD@Graythwaite community group submission. The peer review notes that *"the McLaren report overstates the additional traffic"* and that *"the use of Halcrow's travel survey should not be questioned as it is a reliable source of information based on current traffic and parking conditions within the Shore School"*. As such the peer reviewer agreed that it did not agree with the findings of the McLaren report.

The School requests that the DoPI consider all the responses including the Colston Budd Hunt and Kafes independent traffic review and the community feedback regarding on site parking as part of its assessment of the proposal.

### 3. Summary

A peer review of the traffic and transport aspects of the proposed Concept Application and Stage 1 Project Application for the Graythwaite site has been undertaken for the DoPI by SMEC Pty Ltd.

In undertaking a peer review, SMEC raised a number of traffic and transport related issues that they considered required clarification.

A phone meeting between the DoPI, SMEC, Shore School and their representatives (WSP and GTA) was held on the 27 July 2012 to discuss and resolve the issues identified by SMEC requiring clarification. During this meeting the traffic and transport issues were discussed and generally resolved through the discussions. Some of the issues were resolved subject to the provision of supplementary information and analysis. The additional information is provided in this report.

The key issues resolved through the peer review process are:

#### 1. Worst Case Scenario Assessment

- Peer review satisfied that senior school students' traffic movements were included in the assessment.
- Movement summary outputs from the Sidra modelling are provided (Appendix A) to confirm consideration of the worst case scenario.

#### 2. Proposed Union Street Pick Up facility

- The peer review advised that they agree with the findings that the proposed Union Street pick up facility will operate well for the conditions specified above and within the Shore submissions.
- The additional information requested by the peer reviewer has been provided in this report including the supplementary intersection analysis which indicates that the Union St / Blues Point Rd / Lavender Street intersection will continue to operate satisfactorily with the operation of the Union Street pick up facility in the afternoon period.
- The comments by McLaren Engineering with regard to the pick up facility overestimate the traffic generation and are thus the McLaren findings are inappropriate.

#### 3. On Site School Buses

- It was agreed with the Peer Reviewer that the provision of an on site bus parking facility as part of the Graythwaite Concept application is not practical.
- The School is committed to the ongoing management of School bus movements to and from the School. This is to be reflected in School's 'Bus Operation Management Plan'.

The only unresolved issue relates to the provision of on site car parking with the Peer Reviewer concurring with Council suggesting that no new parking be provided on site as part of the Concept Application. This document has reiterated the School's desire to provide additional on site parking to amongst other issues address the community's request for more rather than less on site car parking.

In this regard it is requested that the DoPI consider all the arguments surrounding the provision of on site parking when making its determination.

Notwithstanding the above, the School reinforces its commitment to undertake the following as part of the Concept Application:

- Update of the School's Bus Management Plan
- Update of the School's Drop Off and Pick Up Facility Operation and Management Plan
- Preparation of a Green Travel Plan for Students and Staff.

## Appendix A

Appendix A

### Sidra Movement Summary

# MOVEMENT SUMMARY

Site: Edward St-Lord St\_AM

CTLRJQ Graythwaite Master Plan  
Existing AM  
Edward St-Lord St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Edward St (S)											
1	L	7	0.0	0.070	4.5	LOS A	0.0	0.0	0.00	0.69	36.7
2	T	129	0.0	0.070	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		137	0.0	0.070	0.2	LOS A	0.0	0.0	0.00	0.04	39.8
North: Edward St (N)											
8	T	129	0.0	0.080	0.4	LOS A	0.6	3.9	0.26	0.00	38.1
9	R	22	0.0	0.080	5.3	LOS A	0.6	3.9	0.26	0.70	36.1
Approach		152	0.0	0.080	1.1	LOS A	0.6	3.9	0.26	0.10	37.8
West: Lord St (W)											
10	L	16	0.0	0.015	5.0	LOS A	0.1	0.5	0.23	0.49	36.0
12	R	4	0.0	0.015	5.4	LOS A	0.1	0.5	0.23	0.60	35.9
Approach		20	0.0	0.015	5.1	LOS A	0.1	0.5	0.23	0.51	36.0
All Vehicles		308	0.0	0.080	1.0	NA	0.6	3.9	0.14	0.10	38.5

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Edward St-Lord St\_AM

CTLRJQ Graythwaite Master Plan  
Stage 3\_AM  
Edward St-Lord St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Edward St (S)											
1	L	7	0.0	0.096	4.5	LOS A	0.0	0.0	0.00	0.69	36.7
2	T	180	0.0	0.096	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		187	0.0	0.096	0.2	LOS A	0.0	0.0	0.00	0.03	39.9
North: Edward St (N)											
8	T	180	0.0	0.107	0.6	LOS A	0.8	5.5	0.32	0.00	37.7
9	R	22	0.0	0.107	5.6	LOS A	0.8	5.5	0.32	0.71	36.1
Approach		202	0.0	0.107	1.2	LOS A	0.8	5.5	0.32	0.08	37.5
West: Lord St (W)											
10	L	16	0.0	0.016	5.2	LOS A	0.1	0.5	0.28	0.50	35.9
12	R	4	0.0	0.016	5.7	LOS A	0.1	0.5	0.28	0.62	35.8
Approach		20	0.0	0.016	5.3	LOS A	0.1	0.5	0.28	0.52	35.9
All Vehicles		409	0.0	0.107	0.9	NA	0.8	5.5	0.17	0.08	38.5

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Edward St-Lord St\_PM

CTLRJQ Graythwaite Master Plan  
Existing PM  
Edward St-Lord St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Edward St (S)											
1	L	5	0.0	0.132	4.5	LOS A	0.0	0.0	0.00	0.70	36.7
2	T	250	0.0	0.131	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		255	0.0	0.131	0.1	LOS A	0.0	0.0	0.00	0.01	39.9
North: Edward St (N)											
8	T	225	0.0	0.140	0.9	LOS A	1.1	7.7	0.39	0.00	37.2
9	R	35	0.0	0.140	5.9	LOS A	1.1	7.7	0.39	0.72	36.0
Approach		260	0.0	0.140	1.6	LOS A	1.1	7.7	0.39	0.10	37.1
West: Lord St (W)											
10	L	30	0.0	0.034	5.8	LOS A	0.2	1.1	0.36	0.54	35.7
12	R	5	0.0	0.034	6.2	LOS A	0.2	1.1	0.36	0.68	35.6
Approach		35	0.0	0.034	5.8	LOS A	0.2	1.1	0.36	0.56	35.7
All Vehicles		550	0.0	0.140	1.2	NA	1.1	7.7	0.20	0.09	38.2

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Edward St-Lord St\_PM

CTLRJQ Graythwaite Master Plan  
Stage 3\_PM  
Edward St-Lord St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Edward St (S)											
1	L	5	0.0	0.250	4.5	LOS A	0.0	0.0	0.00	0.70	36.7
2	T	490	0.0	0.254	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		495	0.0	0.254	0.0	LOS A	0.0	0.0	0.00	0.01	40.0
North: Edward St (N)											
8	T	465	0.0	0.271	2.7	LOS A	3.0	20.8	0.63	0.00	35.8
9	R	35	0.0	0.271	7.6	LOS A	3.0	20.8	0.63	0.86	35.6
Approach		500	0.0	0.271	3.1	LOS A	3.0	20.8	0.63	0.06	35.7
West: Lord St (W)											
10	L	30	0.0	0.051	7.9	LOS A	0.2	1.6	0.53	0.67	34.5
12	R	5	0.0	0.051	8.4	LOS A	0.2	1.6	0.53	0.82	34.3
Approach		35	0.0	0.051	8.0	LOS A	0.2	1.6	0.53	0.69	34.5
All Vehicles		1030	0.0	0.271	1.8	NA	3.0	20.8	0.32	0.06	37.6

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Edward St-Mount St\_AM

CTLRJQ Graythwaite Master Plan  
Existing AM  
Edward St-Mount St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Edward St (S)											
2	T	85	0.0	0.116	3.8	LOS A	0.6	4.1	0.20	0.38	36.8
3	R	63	0.0	0.116	5.5	LOS A	0.6	4.1	0.20	0.65	36.0
Approach		148	0.0	0.116	4.5	LOS A	0.6	4.1	0.20	0.49	36.5
East: Mount St (E)											
4	L	47	0.0	0.058	4.5	LOS A	0.0	0.0	0.00	0.50	36.7
6	R	60	0.0	0.058	4.9	LOS A	0.0	0.0	0.00	0.60	36.4
Approach		107	0.0	0.058	4.7	LOS A	0.0	0.0	0.00	0.55	36.5
North: Edward St (N)											
7	L	62	0.0	0.096	4.7	LOS A	0.6	4.2	0.16	0.52	36.4
8	T	106	0.0	0.096	0.2	LOS A	0.6	4.2	0.16	0.05	38.8
Approach		168	0.0	0.096	1.8	LOS A	0.6	4.2	0.16	0.23	37.9
All Vehicles		424	0.0	0.116	3.5	NA	0.6	4.2	0.13	0.40	37.0

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

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.

SIDRA Standard Delay Model used.

# MOVEMENT SUMMARY

Site: Edward St-Mount St\_AM

CTLRJQ Graythwaite Master Plan  
Stage 3\_AM  
Edward St-Mount St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Edward St (S)											
2	T	115	0.0	0.159	3.9	LOS A	0.8	5.8	0.22	0.38	36.8
3	R	84	0.0	0.159	5.7	LOS A	0.8	5.8	0.22	0.67	36.0
Approach		199	0.0	0.159	4.7	LOS A	0.8	5.8	0.22	0.50	36.4
East: Mount St (E)											
4	L	63	0.0	0.066	4.5	LOS A	0.0	0.0	0.00	0.50	36.7
6	R	60	0.0	0.066	4.9	LOS A	0.0	0.0	0.00	0.60	36.4
Approach		123	0.0	0.066	4.7	LOS A	0.0	0.0	0.00	0.55	36.5
North: Edward St (N)											
7	L	62	0.0	0.116	4.7	LOS A	0.7	5.1	0.16	0.53	36.4
8	T	141	0.0	0.116	0.2	LOS A	0.7	5.1	0.16	0.05	38.8
Approach		203	0.0	0.116	1.6	LOS A	0.7	5.1	0.16	0.20	38.0
All Vehicles		525	0.0	0.159	3.5	NA	0.8	5.8	0.15	0.40	37.1

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Edward St-Mount St\_PM

CTLRJQ Graythwaite Master Plan  
Existing PM  
Edward St-Mount St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Edward St (S)											
2	T	195	0.0	0.350	6.3	LOS A	2.2	15.4	0.51	0.64	35.3
3	R	100	0.0	0.350	8.1	LOS A	2.2	15.4	0.51	0.87	34.7
Approach		295	0.0	0.350	6.9	LOS A	2.2	15.4	0.51	0.71	35.1
East: Mount St (E)											
4	L	115	0.0	0.194	4.5	LOS A	0.0	0.0	0.00	0.50	36.7
6	R	245	0.0	0.194	4.9	LOS A	0.0	0.0	0.00	0.59	36.4
Approach		360	0.0	0.194	4.8	LOS A	0.0	0.0	0.00	0.56	36.5
North: Edward St (N)											
7	L	150	0.0	0.182	5.4	LOS A	1.3	9.0	0.38	0.37	35.9
8	T	145	0.0	0.181	0.9	LOS A	1.3	9.0	0.38	0.22	37.1
Approach		295	0.0	0.182	3.2	LOS A	1.3	9.0	0.38	0.30	36.5
All Vehicles		950	0.0	0.350	5.0	NA	2.2	15.4	0.28	0.53	36.0

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Edward St-Mount St\_PM

CTLRJQ Graythwaite Master Plan  
Stage 3\_PM  
Edward St-Mount St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Edward St (S)											
2	T	355	0.0	0.746	13.4	LOS A	9.6	67.3	0.72	1.30	31.3
3	R	180	0.0	0.747	15.1	LOS B	9.6	67.3	0.72	1.28	31.0
Approach		535	0.0	0.746	14.0	LOS A	9.6	67.3	0.72	1.29	31.2
East: Mount St (E)											
4	L	220	0.0	0.250	4.5	LOS A	0.0	0.0	0.00	0.50	36.7
6	R	245	0.0	0.251	4.9	LOS A	0.0	0.0	0.00	0.60	36.4
Approach		465	0.0	0.250	4.7	LOS A	0.0	0.0	0.00	0.55	36.5
North: Edward St (N)											
7	L	150	0.0	0.275	5.5	LOS A	2.0	14.2	0.41	0.37	36.0
8	T	280	0.0	0.275	1.1	LOS A	2.0	14.2	0.41	0.24	37.0
Approach		430	0.0	0.275	2.6	LOS A	2.0	14.2	0.41	0.28	36.6
All Vehicles		1430	0.0	0.746	7.5	NA	9.6	67.3	0.39	0.75	34.4

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Miller St-Blue St\_AM

CTLRJQ Graythwaite Master Plan

Existing AM

Miller St-Blue St

Signals - Fixed Time Cycle Time = 75 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Blues Point Rd (S)											
1	L	8	0.0	0.176	17.5	LOS B	2.3	15.8	0.61	0.73	30.0
2	T	312	0.0	0.877	35.1	LOS C	16.6	116.4	0.92	1.00	22.6
3	R	102	0.0	0.877	45.2	LOS D	16.6	116.4	1.00	1.13	21.2
Approach		422	0.0	0.877	37.2	LOS C	16.6	116.4	0.93	1.03	22.4
East: Blue St (E)											
4	L	69	0.0	0.880	37.0	LOS C	3.4	23.6	0.84	0.83	22.9
5	T	54	0.0	0.481	27.4	LOS B	7.3	51.4	0.91	0.75	24.6
6	R	121	0.0	0.481	31.8	LOS C	7.3	51.4	0.91	0.80	24.5
Approach		244	0.0	0.880	32.3	LOS C	7.3	51.4	0.89	0.80	24.1
North: Miller St (N)											
7	L	156	0.0	0.730	23.6	LOS B	4.8	33.8	0.70	0.86	27.1
8	T	435	0.0	0.772	18.6	LOS B	21.8	152.3	0.96	0.88	27.7
9	R	181	0.0	0.773	23.1	LOS B	21.8	152.3	0.96	0.92	27.8
Approach		809	0.0	0.773	21.1	LOS B	21.8	152.3	0.90	0.89	27.6
West: Blue St (W)											
10	L	32	0.0	0.398	28.4	LOS B	1.4	9.7	0.80	0.67	25.4
11	T	46	0.0	0.160	24.8	LOS B	2.8	19.6	0.83	0.64	25.8
12	R	18	0.0	0.160	29.3	LOS C	2.8	19.6	0.83	0.75	25.5
Approach		96	0.0	0.398	26.8	LOS B	2.8	19.6	0.82	0.67	25.6
All Vehicles		1572	0.0	0.880	27.2	LOS B	21.8	152.3	0.91	0.88	25.3

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

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	29.0	LOS C	0.1	0.1	0.88	0.88
P3	Across E approach	53	9.6	LOS A	0.1	0.1	0.51	0.51
P5	Across N approach	53	30.8	LOS D	0.1	0.1	0.91	0.91
P7	Across W approach	53	17.3	LOS B	0.1	0.1	0.68	0.68
All Pedestrians		212	21.7	LOS C			0.74	0.74

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

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

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

# MOVEMENT SUMMARY

Site: Miller St-Blue St\_AM

CTLRJQ Graythwaite Master Plan

Stage 3\_AM

Miller St-Blue St

Signals - Fixed Time Cycle Time = 75 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Blues Point Rd (S)											
1	L	8	0.0	0.181	17.5	LOS B	2.3	16.3	0.61	0.73	30.0
2	T	312	0.0	0.904	38.5	LOS C	17.3	121.4	0.92	1.05	21.8
3	R	102	0.0	0.905	49.8	LOS D	17.3	121.4	1.00	1.20	20.3
Approach		422	0.0	0.905	40.8	LOS C	17.3	121.4	0.93	1.08	21.5
East: Blue St (E)											
4	L	71	0.0	0.893	36.6	LOS C	3.4	23.6	0.85	0.82	23.0
5	T	71	0.0	0.520	27.6	LOS B	8.0	56.0	0.92	0.76	24.5
6	R	121	0.0	0.520	32.1	LOS C	8.0	56.0	0.92	0.81	24.5
Approach		262	0.0	0.894	32.1	LOS C	8.0	56.0	0.90	0.80	24.1
North: Miller St (N)											
7	L	156	0.0	0.730	23.6	LOS B	4.8	33.8	0.70	0.86	27.1
8	T	438	0.0	0.875	29.0	LOS C	28.8	201.4	1.00	1.07	24.2
9	R	232	0.0	0.875	33.5	LOS C	28.8	201.4	1.00	1.07	24.2
Approach		863	0.0	0.875	29.8	LOS C	28.8	201.4	0.94	1.03	24.7
West: Blue St (W)											
10	L	32	0.0	0.398	28.4	LOS B	1.4	9.7	0.80	0.67	25.4
11	T	46	0.0	0.161	24.8	LOS B	2.8	19.6	0.83	0.64	25.7
12	R	18	0.0	0.161	29.3	LOS C	2.8	19.6	0.83	0.75	25.5
Approach		96	0.0	0.398	26.8	LOS B	2.8	19.6	0.82	0.67	25.6
All Vehicles		1643	0.0	0.905	32.5	LOS C	28.8	201.4	0.93	0.96	23.7

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

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	29.0	LOS C	0.1	0.1	0.88	0.88
P3	Across E approach	53	9.6	LOS A	0.1	0.1	0.51	0.51
P5	Across N approach	53	30.8	LOS D	0.1	0.1	0.91	0.91
P7	Across W approach	53	17.3	LOS B	0.1	0.1	0.68	0.68
All Pedestrians		212	21.7	LOS C			0.74	0.74

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

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

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

# MOVEMENT SUMMARY

Site: Miller St-Blue St\_PM

CTLRJQ Graythwaite Master Plan

Existing PM

Miller St-Blue St

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Blues Point Rd (S)											
1	L	3	0.0	0.136	12.3	LOS A	1.6	11.4	0.53	0.73	32.6
2	T	420	0.0	0.677	14.8	LOS B	12.8	89.9	0.81	0.72	29.7
3	R	103	0.0	0.677	20.7	LOS B	12.8	89.9	0.87	0.86	28.8
Approach		526	0.0	0.677	15.9	LOS B	12.8	89.9	0.82	0.75	29.5
East: Blue St (E)											
4	L	61	0.0	0.592	23.7	LOS B	2.2	15.1	0.77	0.77	27.1
5	T	21	0.0	0.456	19.8	LOS B	6.6	46.2	0.87	0.72	27.1
6	R	179	0.0	0.457	24.3	LOS B	6.6	46.2	0.87	0.79	26.9
Approach		261	0.0	0.592	23.8	LOS B	6.6	46.2	0.85	0.78	27.0
North: Miller St (N)											
7	L	55	0.0	0.249	12.2	LOS A	1.2	8.6	0.52	0.64	32.1
8	T	324	0.0	0.610	15.0	LOS B	13.8	96.6	0.86	0.76	29.4
9	R	57	0.0	0.610	19.5	LOS B	13.8	96.6	0.86	0.85	29.2
Approach		566	0.0	0.610	15.8	LOS B	13.8	96.6	0.82	0.76	29.7
West: Blue St (W)											
10	L	22	0.0	0.213	21.4	LOS B	0.7	5.2	0.75	0.65	27.9
11	T	15	0.0	0.041	17.0	LOS B	0.7	4.7	0.75	0.54	28.8
12	R	5	0.0	0.041	21.5	LOS B	0.7	4.7	0.75	0.70	28.3
Approach		42	0.0	0.213	19.9	LOS B	0.7	5.2	0.75	0.62	28.3
All Vehicles		1396	0.0	0.677	17.2	LOS B	13.8	96.6	0.83	0.68	29.0

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

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	22.5	LOS C	0.1	0.1	0.87	0.87
P3	Across E approach	53	11.4	LOS B	0.1	0.1	0.62	0.62
P5	Across N approach	53	24.3	LOS C	0.1	0.1	0.90	0.90
P7	Across W approach	53	12.0	LOS B	0.1	0.1	0.63	0.63
All Pedestrians		212	17.6	LOS B			0.75	0.75

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.

Processed: Tuesday, 23 November 2010 3:30:23 PM

SIDRA INTERSECTION 5.1.12.2089

Project: P:\12S1300-1399\12S1321000 - Graythwaite- Shore School Project\2 External\Other\Background - MWT

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# MOVEMENT SUMMARY

Site: Miller St-Blue St\_PM

CTLRJQ Graythwaite Master Plan

Stage 3\_PM

Miller St-Blue St

Signals - Fixed Time Cycle Time = 65 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Blues Point Rd (S)											
1	L	3	0.0	0.130	11.6	LOS A	1.6	10.9	0.49	0.73	32.9
2	T	427	0.0	0.648	14.1	LOS A	13.3	93.0	0.78	0.68	30.0
3	R	105	0.0	0.648	19.9	LOS B	13.3	93.0	0.83	0.84	29.1
Approach		536	0.0	0.649	15.2	LOS B	13.3	93.0	0.79	0.71	29.9
East: Blue St (E)											
4	L	61	0.0	0.658	27.9	LOS B	2.5	17.3	0.80	0.82	25.6
5	T	34	0.0	0.524	23.0	LOS B	7.7	53.7	0.91	0.75	25.9
6	R	179	0.0	0.525	27.5	LOS B	7.7	53.7	0.91	0.80	25.8
Approach		274	0.0	0.657	27.1	LOS B	7.7	53.7	0.88	0.80	25.8
North: Miller St (N)											
7	L	55	0.0	0.249	11.6	LOS A	1.2	8.5	0.48	0.63	32.4
8	T	324	0.0	0.658	15.3	LOS B	15.4	107.7	0.85	0.76	29.3
9	R	91	0.0	0.658	19.8	LOS B	15.4	107.7	0.85	0.85	29.0
Approach		600	0.0	0.658	16.2	LOS B	15.4	107.7	0.81	0.76	29.6
West: Blue St (W)											
10	L	22	0.0	0.236	24.0	LOS B	0.8	5.8	0.77	0.66	27.0
11	T	15	0.0	0.045	19.6	LOS B	0.8	5.3	0.77	0.56	27.7
12	R	5	0.0	0.045	24.0	LOS B	0.8	5.3	0.77	0.70	27.4
Approach		42	0.0	0.236	22.4	LOS B	0.8	5.8	0.77	0.63	27.3
All Vehicles		1452	0.0	0.658	17.8	LOS B	15.4	107.7	0.82	0.68	28.7

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

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	25.0	LOS C	0.1	0.1	0.88	0.88
P3	Across E approach	53	10.5	LOS B	0.1	0.1	0.57	0.57
P5	Across N approach	53	26.8	LOS C	0.1	0.1	0.91	0.91
P7	Across W approach	53	11.1	LOS B	0.1	0.1	0.58	0.58
All Pedestrians		212	18.4	LOS B			0.73	0.73

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

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

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



# MOVEMENT SUMMARY

Site: Union St-Blues Point Rd\_AM

CTLRJQ Graythwaite Master Plan

Existing AM

Union St-Blues Point Rd-Lavender St

Signals - Fixed Time Cycle Time = 65 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Blues Point Rd (S)											
1	L	37	0.0	0.230	28.9	LOS C	1.5	10.7	0.86	0.70	25.3
2	T	253	0.0	0.663	25.3	LOS B	10.3	72.4	0.95	0.84	25.6
3	R	33	0.0	0.663	29.8	LOS C	10.3	72.4	0.95	0.87	25.5
Approach		322	0.0	0.663	26.2	LOS B	10.3	72.4	0.94	0.83	25.5
East: Lavender St (E)											
4	L	51	0.0	0.111	25.3	LOS B	1.9	13.4	0.81	0.71	26.5
5	T	183	0.0	0.769	28.1	LOS B	13.3	93.2	0.99	0.94	24.4
6	R	177	0.0	0.768	32.7	LOS C	13.3	93.2	0.99	0.95	24.4
Approach		411	0.0	0.768	29.7	LOS C	13.3	93.2	0.97	0.92	24.6
North: Blues Point Rd (N)											
7	L	239	0.0	0.387	10.9	LOS A	4.8	33.6	0.49	0.68	32.8
8	T	93	0.0	0.700	30.7	LOS C	7.8	54.8	0.99	0.90	23.6
9	R	94	0.0	0.700	35.2	LOS C	7.8	54.8	0.99	0.91	23.7
Approach		425	0.0	0.701	20.5	LOS B	7.8	54.8	0.71	0.78	28.1
West: Union St (W)											
10	L	98	0.0	0.457	33.5	LOS C	4.2	29.5	0.95	0.76	23.9
11	T	153	0.0	0.403	24.4	LOS B	6.3	44.1	0.90	0.73	25.9
12	R	16	0.0	0.403	29.1	LOS C	6.3	44.1	0.90	0.80	25.8
Approach		266	0.0	0.457	28.0	LOS B	6.3	44.1	0.92	0.75	25.1
All Vehicles		1424	0.0	0.768	25.9	LOS B	13.3	93.2	0.88	0.82	25.9

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

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	53	25.0	LOS C	0.1	0.1	0.88	0.88
P5	Across N approach	53	26.8	LOS C	0.1	0.1	0.91	0.91
P7	Across W approach	53	22.4	LOS C	0.1	0.1	0.83	0.83
All Pedestrians		159	24.7	LOS C			0.87	0.87

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

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

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

# MOVEMENT SUMMARY

Site: Union St-Blues Point Rd\_AM

CTLRJQ Graythwaite Master Plan

Stage 3\_AM

Union St-Blues Point Rd-Lavender St

Signals - Fixed Time Cycle Time = 65 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Blues Point Rd (S)											
1	L	39	0.0	0.244	29.0	LOS C	1.6	11.3	0.87	0.70	25.3
2	T	274	0.0	0.704	26.2	LOS B	11.2	78.5	0.97	0.88	25.2
3	R	33	0.0	0.705	30.7	LOS C	11.2	78.5	0.97	0.91	25.2
Approach		345	0.0	0.704	27.0	LOS B	11.2	78.5	0.96	0.86	25.2
East: Lavender St (E)											
4	L	51	0.0	0.111	25.3	LOS B	1.9	13.4	0.81	0.71	26.5
5	T	192	0.0	0.813	30.2	LOS C	14.5	101.8	1.00	1.00	23.7
6	R	189	0.0	0.814	34.9	LOS C	14.5	101.8	1.00	1.00	23.8
Approach		432	0.0	0.814	31.7	LOS C	14.5	101.8	0.98	0.97	24.0
North: Blues Point Rd (N)											
7	L	239	0.0	0.387	10.9	LOS A	4.8	33.6	0.49	0.68	32.8
8	T	93	0.0	0.777	33.6	LOS C	8.3	58.4	1.00	0.98	22.8
9	R	98	0.0	0.777	38.1	LOS C	8.3	58.4	1.00	0.98	22.9
Approach		429	0.0	0.777	22.0	LOS B	8.3	58.4	0.72	0.81	27.5
West: Union St (W)											
10	L	98	0.0	0.457	33.5	LOS C	4.2	29.5	0.95	0.76	23.9
11	T	153	0.0	0.403	24.4	LOS B	6.3	44.1	0.90	0.73	25.9
12	R	16	0.0	0.403	29.1	LOS C	6.3	44.1	0.90	0.80	25.8
Approach		266	0.0	0.457	28.0	LOS B	6.3	44.1	0.92	0.75	25.1
All Vehicles		1473	0.0	0.814	27.1	LOS B	14.5	101.8	0.89	0.86	25.5

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

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	53	25.0	LOS C	0.1	0.1	0.88	0.88
P5	Across N approach	53	26.8	LOS C	0.1	0.1	0.91	0.91
P7	Across W approach	53	22.4	LOS C	0.1	0.1	0.83	0.83
All Pedestrians		159	24.7	LOS C			0.87	0.87

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

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

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

# MOVEMENT SUMMARY

Site: Union St-Blues Point Rd\_PM

CTLRJQ Graythwaite Master Plan

Existing PM

Union St-Blues Point Rd-Lavender St

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Blues Point Rd (S)											
1	L	27	0.0	0.159	27.0	LOS B	1.1	7.4	0.86	0.69	25.9
2	T	259	0.0	0.703	24.4	LOS B	10.4	72.6	0.96	0.89	25.8
3	R	40	0.0	0.704	28.9	LOS C	10.4	72.6	0.96	0.91	25.8
Approach		326	0.0	0.703	25.2	LOS B	10.4	72.6	0.96	0.87	25.8
East: Lavender St (E)											
4	L	71	0.0	0.190	26.8	LOS B	2.6	18.4	0.87	0.73	26.0
5	T	109	0.0	0.700	26.4	LOS B	9.6	66.9	0.98	0.89	24.8
6	R	156	0.0	0.700	31.1	LOS C	9.6	66.9	0.98	0.90	24.8
Approach		336	0.0	0.700	28.7	LOS C	9.6	66.9	0.96	0.86	25.1
North: Blues Point Rd (N)											
7	L	169	0.0	0.275	11.1	LOS A	3.4	23.9	0.50	0.67	32.7
8	T	141	0.0	0.587	24.9	LOS B	7.2	50.4	0.96	0.79	25.6
9	R	57	0.0	0.587	29.3	LOS C	7.2	50.4	0.96	0.82	25.6
Approach		367	0.0	0.587	19.2	LOS B	7.2	50.4	0.75	0.74	28.4
West: Union St (W)											
10	L	117	0.0	0.504	30.9	LOS C	4.6	32.1	0.95	0.77	24.7
11	T	78	0.0	0.232	20.7	LOS B	3.7	25.6	0.85	0.67	27.2
12	R	26	0.0	0.232	25.4	LOS B	3.7	25.6	0.85	0.77	26.9
Approach		221	0.0	0.504	26.6	LOS B	4.6	32.1	0.90	0.73	25.8
All Vehicles		1251	0.0	0.703	24.6	LOS B	10.4	72.6	0.89	0.81	26.3

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

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	53	23.4	LOS C	0.1	0.1	0.88	0.88
P5	Across N approach	53	24.3	LOS C	0.1	0.1	0.90	0.90
P7	Across W approach	53	20.8	LOS C	0.1	0.1	0.83	0.83
All Pedestrians		159	22.8	LOS C			0.87	0.87

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

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

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

# MOVEMENT SUMMARY

Site: Union St-Blues Point Rd\_PM

CTLRJQ Graythwaite Master Plan

Stage 3\_PM

Union St-Blues Point Rd-Lavender St

Signals - Fixed Time Cycle Time = 65 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Blues Point Rd (S)											
1	L	27	0.0	0.164	26.8	LOS B	1.1	7.7	0.83	0.68	26.0
2	T	293	0.0	0.718	25.8	LOS B	12.0	84.0	0.97	0.89	25.4
3	R	40	0.0	0.718	30.3	LOS C	12.0	84.0	0.97	0.92	25.4
Approach		360	0.0	0.717	26.4	LOS B	12.0	84.0	0.95	0.88	25.4
East: Lavender St (E)											
4	L	71	0.0	0.176	27.5	LOS B	2.8	19.4	0.85	0.73	25.7
5	T	109	0.0	0.703	27.6	LOS B	10.7	75.1	0.98	0.88	24.4
6	R	177	0.0	0.703	32.3	LOS C	10.7	75.1	0.98	0.89	24.4
Approach		357	0.0	0.703	29.9	LOS C	10.7	75.1	0.95	0.86	24.7
North: Blues Point Rd (N)											
7	L	169	0.0	0.274	10.6	LOS A	3.4	23.8	0.47	0.66	33.0
8	T	141	0.0	0.586	26.7	LOS B	7.6	53.5	0.96	0.79	25.0
9	R	57	0.0	0.586	31.2	LOS C	7.6	53.5	0.96	0.82	25.0
Approach		367	0.0	0.586	20.0	LOS B	7.6	53.5	0.73	0.73	28.1
West: Union St (W)											
10	L	126	0.0	0.592	34.4	LOS C	5.4	37.8	0.97	0.81	23.6
11	T	85	0.0	0.274	23.6	LOS B	4.4	30.5	0.87	0.69	26.1
12	R	28	0.0	0.274	28.3	LOS B	4.4	30.5	0.87	0.78	25.9
Approach		240	0.0	0.592	29.8	LOS C	5.4	37.8	0.92	0.77	24.7
All Vehicles		1324	0.0	0.717	26.2	LOS B	12.0	84.0	0.89	0.81	25.8

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

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	53	23.3	LOS C	0.1	0.1	0.85	0.85
P5	Across N approach	53	26.8	LOS C	0.1	0.1	0.91	0.91
P7	Across W approach	53	20.8	LOS C	0.1	0.1	0.80	0.80
All Pedestrians		159	23.6	LOS C			0.85	0.85

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

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

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

# MOVEMENT SUMMARY

Site: Union St-Blues Point Rd\_PM  
- Union St Pick Up

CTLRJQ Graythwaite Master Plan  
Stage 3\_PM  
Union St-Blues Point Rd-Lavender St  
Signals - Fixed Time Cycle Time = 70 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Blues Point Rd (S)											
1	L	38	0.0	0.234	26.8	LOS B	1.0	7.1	0.80	0.69	26.0
2	T	293	0.0	0.659	24.7	LOS B	10.4	72.8	0.94	0.81	25.8
3	R	40	0.0	0.659	29.2	LOS C	10.4	72.8	0.94	0.86	25.7
Approach		371	0.0	0.659	25.4	LOS B	10.4	72.8	0.92	0.81	25.8
East: Lavender St (E)											
4	L	71	0.0	0.166	28.3	LOS B	2.0	13.8	0.84	0.73	25.5
5	T	167	0.0	0.792	31.8	LOS C	12.4	86.9	1.00	0.97	23.3
6	R	177	0.0	0.792	36.5	LOS C	12.4	86.9	1.00	0.97	23.3
Approach		415	0.0	0.792	33.2	LOS C	12.4	86.9	0.97	0.93	23.6
North: Blues Point Rd (N)											
7	L	169	0.0	0.274	10.1	LOS A	2.3	16.4	0.43	0.65	33.2
8	T	141	0.0	0.792	34.3	LOS C	9.1	64.0	1.00	1.01	22.7
9	R	104	0.0	0.792	38.8	LOS C	9.1	64.0	1.00	1.01	22.7
Approach		415	0.0	0.792	25.5	LOS B	9.1	64.0	0.77	0.86	26.1
West: Union St (W)											
10	L	126	0.0	0.638	37.8	LOS C	4.4	30.5	0.98	0.84	22.7
11	T	85	0.0	0.295	26.4	LOS B	3.4	23.8	0.89	0.70	25.1
12	R	28	0.0	0.295	31.1	LOS C	3.4	23.8	0.89	0.78	25.0
Approach		240	0.0	0.638	32.9	LOS C	4.4	30.5	0.94	0.78	23.8
All Vehicles		1440	0.0	0.792	29.0	LOS C	12.4	86.9	0.89	0.85	24.9

Level of Service (LOS) Method: Delay (RTA NSW).  
Vehicle movement LOS values are based on average delay per movement  
Intersection and Approach LOS values are based on average delay for all vehicle movements.  
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	53	23.2	LOS C	0.1	0.1	0.81	0.81
P5	Across N approach	53	29.3	LOS C	0.1	0.1	0.91	0.91
P7	Across W approach	53	20.8	LOS C	0.1	0.1	0.77	0.77
All Pedestrians		159	24.4	LOS C			0.83	0.83

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)  
Pedestrian movement LOS values are based on average delay per pedestrian movement.  
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

Site: Union St-Chuter St\_AM

CTLRJQ Graythwaite Master Plan  
Existing AM  
Union St-Chuter St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Union St (E)											
4	L	47	0.0	0.119	4.5	LOS A	0.0	0.0	0.00	0.65	36.7
5	T	183	0.0	0.119	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		231	0.0	0.119	0.9	LOS A	0.0	0.0	0.00	0.13	39.3
West: Union St (W)											
11	T	237	0.0	0.132	0.8	LOS A	1.0	7.3	0.37	0.00	37.4
12	R	15	0.0	0.132	6.2	LOS A	1.0	7.3	0.37	0.80	36.0
Approach		252	0.0	0.132	1.1	LOS A	1.0	7.3	0.37	0.05	37.3
All Vehicles		482	0.0	0.132	1.0	NA	1.0	7.3	0.19	0.09	38.2

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Union St-Chuter St\_AM

CTLRJQ Graythwaite Master Plan  
Stage 3\_AM  
Union St-Chuter St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Union St (E)											
4	L	47	0.0	0.119	4.5	LOS A	0.0	0.0	0.00	0.65	36.7
5	T	183	0.0	0.119	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		231	0.0	0.119	0.9	LOS A	0.0	0.0	0.00	0.13	39.3
West: Union St (W)											
11	T	243	0.0	0.135	0.8	LOS A	1.1	7.5	0.37	0.00	37.4
12	R	15	0.0	0.135	6.2	LOS A	1.1	7.5	0.37	0.80	36.0
Approach		258	0.0	0.135	1.1	LOS A	1.1	7.5	0.37	0.05	37.3
All Vehicles		488	0.0	0.135	1.0	NA	1.1	7.5	0.19	0.09	38.2

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Union St-Chuter St\_PM

CTLRJQ Graythwaite Master Plan  
Existing PM  
Union St-Chuter St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Union St (E)											
4	L	20	0.0	0.102	4.5	LOS A	0.0	0.0	0.00	0.68	36.7
5	T	178	0.0	0.102	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		198	0.0	0.102	0.5	LOS A	0.0	0.0	0.00	0.07	39.6
West: Union St (W)											
11	T	193	0.0	0.101	0.7	LOS A	0.8	5.4	0.33	0.00	37.7
12	R	3	0.0	0.102	6.0	LOS A	0.8	5.4	0.33	0.81	36.0
Approach		196	0.0	0.101	0.8	LOS A	0.8	5.4	0.33	0.01	37.7
All Vehicles		394	0.0	0.102	0.6	NA	0.8	5.4	0.16	0.04	38.6

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Union St-Chuter St\_PM

CTLRJQ Graythwaite Master Plan  
Stage 3\_PM  
Union St-Chuter St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Union St (E)											
4	L	20	0.0	0.104	4.5	LOS A	0.0	0.0	0.00	0.68	36.7
5	T	181	0.0	0.104	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		201	0.0	0.104	0.4	LOS A	0.0	0.0	0.00	0.07	39.6
West: Union St (W)											
11	T	193	0.0	0.101	0.7	LOS A	0.8	5.4	0.33	0.00	37.7
12	R	3	0.0	0.102	6.1	LOS A	0.8	5.4	0.33	0.81	36.0
Approach		196	0.0	0.101	0.8	LOS A	0.8	5.4	0.33	0.01	37.7
All Vehicles		397	0.0	0.104	0.6	NA	0.8	5.4	0.16	0.04	38.6

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Union St-School Access \_AM

CTLRJQ Graythwaite Master Plan  
Existing AM  
Union St-School Access  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Chuter St (E)											
5	T	228	0.0	0.148	0.9	LOS A	1.1	8.0	0.37	0.00	37.3
6	R	44	0.0	0.148	5.8	LOS A	1.1	8.0	0.37	0.72	36.0
Approach		273	0.0	0.148	1.7	LOS A	1.1	8.0	0.37	0.12	37.1
North: School Access (N)											
7	L	13	0.0	0.011	5.3	LOS A	0.1	0.4	0.30	0.51	35.9
9	R	1	0.0	0.011	5.7	LOS A	0.1	0.4	0.30	0.64	35.8
Approach		14	0.0	0.011	5.3	LOS A	0.1	0.4	0.30	0.52	35.8
West: Chuter St (W)											
10	L	21	0.0	0.122	4.5	LOS A	0.0	0.0	0.00	0.68	36.7
11	T	217	0.0	0.123	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		238	0.0	0.123	0.4	LOS A	0.0	0.0	0.00	0.06	39.7
All Vehicles		524	0.0	0.148	1.2	NA	1.1	8.0	0.20	0.10	38.2

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Union St-School Access \_AM

CTLRJQ Graythwaite Master Plan  
Stage 3\_AM  
Union St-School Access  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Chuter St (E)											
5	T	228	0.0	0.158	0.9	LOS A	1.2	8.6	0.38	0.00	37.2
6	R	59	0.0	0.158	5.8	LOS A	1.2	8.6	0.38	0.71	36.0
Approach		287	0.0	0.158	1.9	LOS A	1.2	8.6	0.38	0.15	37.0
North: School Access (N)											
7	L	13	0.0	0.011	5.3	LOS A	0.1	0.4	0.31	0.51	35.9
9	R	1	0.0	0.011	5.7	LOS A	0.1	0.4	0.31	0.64	35.8
Approach		14	0.0	0.011	5.3	LOS A	0.1	0.4	0.31	0.52	35.8
West: Chuter St (W)											
10	L	27	0.0	0.126	4.5	LOS A	0.0	0.0	0.00	0.67	36.7
11	T	217	0.0	0.126	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		244	0.0	0.126	0.5	LOS A	0.0	0.0	0.00	0.08	39.6
All Vehicles		545	0.0	0.158	1.4	NA	1.2	8.6	0.21	0.12	38.1

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Union St-School Access \_PM

CTLRJQ Graythwaite Master Plan  
Existing PM  
Union St-School Access  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Chuter St (E)											
5	T	185	0.0	0.099	0.7	LOS A	0.7	5.2	0.32	0.00	37.7
6	R	6	0.0	0.099	5.6	LOS A	0.7	5.2	0.32	0.73	36.1
Approach		192	0.0	0.099	0.8	LOS A	0.7	5.2	0.32	0.02	37.7
North: School Access (N)											
7	L	44	0.0	0.039	5.2	LOS A	0.2	1.3	0.29	0.52	35.9
9	R	6	0.0	0.039	5.6	LOS A	0.2	1.3	0.29	0.64	35.8
Approach		51	0.0	0.039	5.3	LOS A	0.2	1.3	0.29	0.53	35.9
West: Chuter St (W)											
10	L	1	0.0	0.096	4.5	LOS A	0.0	0.0	0.00	0.70	36.7
11	T	194	0.0	0.100	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		195	0.0	0.100	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
All Vehicles		437	0.0	0.100	1.0	NA	0.7	5.2	0.17	0.07	38.4

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: Union St-School Access \_PM

CTLRJQ Graythwaite Master Plan  
Stage 3 \_PM  
Union St-School Access  
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Chuter St (E)											
5	T	185	0.0	0.099	0.7	LOS A	0.7	5.2	0.32	0.00	37.7
6	R	6	0.0	0.099	5.6	LOS A	0.7	5.2	0.32	0.73	36.1
Approach		192	0.0	0.099	0.8	LOS A	0.7	5.2	0.32	0.02	37.7
North: School Access (N)											
7	L	63	0.0	0.056	5.2	LOS A	0.3	1.9	0.29	0.52	35.9
9	R	9	0.0	0.056	5.7	LOS A	0.3	1.9	0.29	0.65	35.8
Approach		73	0.0	0.056	5.3	LOS A	0.3	1.9	0.29	0.54	35.9
West: Chuter St (W)											
10	L	1	0.0	0.096	4.5	LOS A	0.0	0.0	0.00	0.70	36.7
11	T	194	0.0	0.100	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		195	0.0	0.100	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
All Vehicles		459	0.0	0.100	1.2	NA	0.7	5.2	0.18	0.10	38.3

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: William St-Blue St\_AM

CTLRJQ Graythwaite Master Plan  
Existing AM  
William St-Blue St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: William St (S)											
1	L	1	0.0	0.132	5.3	LOS A	0.6	4.4	0.19	0.45	36.2
2	T	83	0.0	0.134	4.0	LOS A	0.6	4.4	0.19	0.41	36.9
3	R	57	0.0	0.134	6.3	LOS A	0.6	4.4	0.19	0.71	35.6
Approach		141	0.0	0.134	4.9	LOS A	0.6	4.4	0.19	0.53	36.3
East: Blue St (E)											
5	T	2	0.0	0.096	0.0	LOS A	0.6	4.2	0.03	0.00	39.7
6	R	173	0.0	0.097	5.4	LOS A	0.6	4.2	0.03	0.61	36.0
Approach		175	0.0	0.097	5.3	LOS A	0.6	4.2	0.03	0.60	36.1
West: School Access (W)											
10	L	1	0.0	0.002	4.5	LOS A	0.0	0.0	0.00	0.63	36.7
11	T	2	0.0	0.002	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		3	0.0	0.002	1.5	LOS A	0.0	0.0	0.00	0.21	38.8
All Vehicles		319	0.0	0.134	5.1	NA	0.6	4.4	0.10	0.56	36.2

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

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.

SIDRA Standard Delay Model used.

# MOVEMENT SUMMARY

Site: William St-Blue St\_AM

CTLRJQ Graythwaite Master Plan  
Stage 3\_M  
William St-Blue St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: William St (S)											
1	L	1	0.0	0.175	5.7	LOS A	0.8	5.9	0.23	0.44	35.9
2	T	117	0.0	0.175	4.4	LOS A	0.8	5.9	0.23	0.44	36.7
3	R	57	0.0	0.175	6.7	LOS A	0.8	5.9	0.23	0.74	35.4
Approach		175	0.0	0.176	5.1	LOS A	0.8	5.9	0.23	0.54	36.2
East: Blue St (E)											
5	T	2	0.0	0.132	0.0	LOS A	0.9	6.0	0.03	0.00	39.7
6	R	240	0.0	0.135	5.4	LOS A	0.9	6.0	0.03	0.60	36.0
Approach		242	0.0	0.135	5.3	LOS A	0.9	6.0	0.03	0.60	36.0
West: School Access (W)											
10	L	1	0.0	0.002	4.5	LOS A	0.0	0.0	0.00	0.63	36.7
11	T	2	0.0	0.002	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		3	0.0	0.002	1.5	LOS A	0.0	0.0	0.00	0.21	38.8
All Vehicles		420	0.0	0.176	5.2	NA	0.9	6.0	0.11	0.57	36.1

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

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.

SIDRA Standard Delay Model used.

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# MOVEMENT SUMMARY

Site: William St-Blue St\_PM

CTLRJQ Graythwaite Master Plan  
Existing PM  
William St-Blue St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: William St (S)											
1	L	1	0.0	0.055	4.7	LOS A	0.2	1.7	0.09	0.51	36.5
2	T	48	0.0	0.054	3.3	LOS A	0.2	1.7	0.09	0.37	37.2
3	R	17	0.0	0.054	5.7	LOS A	0.2	1.7	0.09	0.71	35.9
Approach		66	0.0	0.054	3.9	LOS A	0.2	1.7	0.09	0.46	36.9
East: Blue St (E)											
5	T	2	0.0	0.024	0.0	LOS A	0.1	1.0	0.03	0.00	39.7
6	R	42	0.0	0.025	5.4	LOS A	0.1	1.0	0.03	0.61	36.0
Approach		44	0.0	0.025	5.1	LOS A	0.1	1.0	0.03	0.58	36.2
West: School Access (W)											
10	L	1	0.0	0.002	4.5	LOS A	0.0	0.0	0.00	0.64	36.7
11	T	3	0.0	0.002	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		4	0.0	0.002	1.1	LOS A	0.0	0.0	0.00	0.16	39.1
All Vehicles		115	0.0	0.054	4.3	NA	0.2	1.7	0.07	0.50	36.7

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

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.

SIDRA Standard Delay Model used.



# MOVEMENT SUMMARY

Site: William St-Blue St\_PM

CTLRJQ Graythwaite Master Plan  
Stage 3\_PM  
William St-Blue St  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: William St (S)											
1	L	1	0.0	0.105	4.9	LOS A	0.5	3.3	0.14	0.50	36.4
2	T	103	0.0	0.101	3.5	LOS A	0.5	3.3	0.14	0.39	37.1
3	R	17	0.0	0.101	5.9	LOS A	0.5	3.3	0.14	0.74	35.9
Approach		121	0.0	0.101	3.9	LOS A	0.5	3.3	0.14	0.44	36.9
East: Blue St (E)											
5	T	2	0.0	0.050	0.0	LOS A	0.3	2.1	0.03	0.00	39.7
6	R	88	0.0	0.050	5.4	LOS A	0.3	2.1	0.03	0.61	36.0
Approach		91	0.0	0.050	5.3	LOS A	0.3	2.1	0.03	0.59	36.1
West: School Access (W)											
10	L	1	0.0	0.002	4.5	LOS A	0.0	0.0	0.00	0.64	36.7
11	T	3	0.0	0.002	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		4	0.0	0.002	1.1	LOS A	0.0	0.0	0.00	0.16	39.1
All Vehicles		216	0.0	0.101	4.4	NA	0.5	3.3	0.09	0.50	36.6

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

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.

SIDRA Standard Delay Model used.

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## Appendix B

### Consultation with Bus Operators

#### 1. Email Response from Forest Coach Lines

**From:** Jackie Lehmann [<mailto:jlehmann@forestcoachlines.com.au>]

**Sent:** Wednesday, 15 August 2012 2:03 PM

**To:** Kathy Dickson

**Subject:** Bus and Coach access at The Shore School

#### RE: Bus and Coach access at The Shore School

Dear Ms Dickson,

I refer to our recent discussions involving the safe boarding and alighting of Forest Coach Lines chartered vehicles to and from the Shore School.

We endeavour at all times to ensure the safe and appropriate boarding and alighting of Forest Coach Lines chartered vehicles by students and teachers. In the case of Shore School charters, Forest Coach Lines is able to collect students and teachers from either Blue Street or Mount Street. In these cases, we would always endeavour not to double park vehicles so that local traffic is not disrupted. Whenever Forest operates multivehicle charters we will endeavour to ensure that vehicles remain off site from the pick up area until they are ready for boarding to avoid unnecessary clogging up of streets for other road users.

In addition to this Forest Coach Lines will always return students to appropriate locations such as Blue Street and Miller Street Bus Stops especially in the evenings again to minimise traffic and noise for other residents.

If you have any further queries we welcome your feedback.

With Thanks

Jackie

Jackie Lehmann  
Charter Manager  
Forest Coach Lines

**Direct Phone:** (02) 9485 0603

**Fax:** (02) 9450 1619

**Email:** [jlehmann@forestcoachlines.com.au](mailto:jlehmann@forestcoachlines.com.au)

## 2. Email Response from Sydney Transit Authority (STA)

**From:** "[Wade Mitford@sta.nsw.gov.au](mailto:Wade_Mitford@sta.nsw.gov.au)" <[Wade\\_Mitford@sta.nsw.gov.au](mailto:Wade_Mitford@sta.nsw.gov.au)>  
**To:** "Kathy Dickson" <[kdickson@shore.nsw.edu.au](mailto:kdickson@shore.nsw.edu.au)>  
**Cc:** "[Michael Perrone@sta.nsw.gov.au](mailto:Michael_Perrone@sta.nsw.gov.au)" <[Michael\\_Perrone@sta.nsw.gov.au](mailto:Michael_Perrone@sta.nsw.gov.au)>  
**Subject:** Re: Shore School - Graythwaite Development Application

Hi Kathy,

Thanks for meeting with me on Friday to discuss the most suitable locations for an additional 3 buses to pick up students, should the school increase its population with the proposed expansion plans.

My preference would be to install a bus zone on Williams St, immediately north of Blue St for a length of no less than 40 metres. This location offers the safest location for the students to board the bus and will have no impact on regular timetable route services. This option will have a significant impact on parking, however this impact would be reduced by making the bus zone a timed bus zone to coincide with the afternoon pick up time only ie. bus zone between 3pm - 4pm only.

The other option would be to use the existing bus stop on Blues Point Rd near Blue St (western side). This option would not be considered as safe as option one as it would mean transporting 150+ students by foot to a bus stop one street away from the school grounds. This option would also need to be well managed to ensure no disruption to regular timetabled route services which use this bus stop.

I can approve in principle to both of these options. However I would require another meeting should the additional 3 buses be required, to confirm the details and to ensure the process of loading the buses is managed efficiently.

Please do not hesitate to contact me should you require any further information on the issue.

Regards,

Wade Mitford  
Regional Traffic and Services Manager  
Northern Region  
State Transit Authority of NSW

P: 02 9941 5864 | F: 02 9941 5873  
[www.sydneybuses.info](http://www.sydneybuses.info)

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