SYDNEY INTERNATIONAL CONVENTION, EXHIBITION AND ENTERTAINMENT PRECINCT (SICEEP)

TRANSPORT AND TRAFFIC ASSESSMENT

Technical Note 3 – Modelling Results for Post Development Condition Based on AIMSUN

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DARLIN HARBOUR LIVE

Sydney International Convention, Exhibition and Entertainment Precinct (SICEEP)

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REVISIONS

Revision	Date	Description	Prepared By	Approved By
A	20 June 13	Internal Review	MR, KN	MR
B	20 June 13	Draft for Client's Review	MR	MR
C	21 June 13	Final Report	MR	MR

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1 Introduction

1.1 Report Purpose

This technical report is an extension to the Traffic and Transport Assessment Report, March 2013, prepared by Hyder Consulting for the Sydney International Conventional, Exhibition and Entertainment Precinct (SICEEP) Project. This technical report has been prepared to document modelling results for post development condition based on AIMSUN micro-simulation modelling.

This technical report documents Hyder's findings on the traffic performance analysis of road network for current and post development traffic conditions using updated AIMSUN model. The modelling results are based on calibrated and validated AIMSUN model required for the Traffic and Transport Assessment Addendum Report – SSD 5752.

The modelling results in Technical Note 3 do not change the conclusion drawn in March 2013 Traffic and Transport Assessment Report.

1.2 Reference Traffic Data and Model

For the purpose of traffic modelling investigation, recent traffic counts and modelling data have been sourced from following sources:

- AIMSUN modelling undertaken for wider road network as part of SICEEP.

Detailed traffic data and analysis results can be found in Technical Note 1.

1.3 Modelling Study Area

Hyder extended the AIMSUN model incorporating the full length of Darling Drive. The AIMSUN model was extended from Hay Street to Ultimo Road intersection.

The AIMSUN model coverage includes Darling Drive between Murray Street and Ultimo Road, Harbour Street between Day Street and Hay Street, Pier Street/Goulburn Street between Darling Drive and George Street, and Liverpool Street between Harbour Street and Sussex Street. Figure 1-1 below shows AIMSUN model study area.

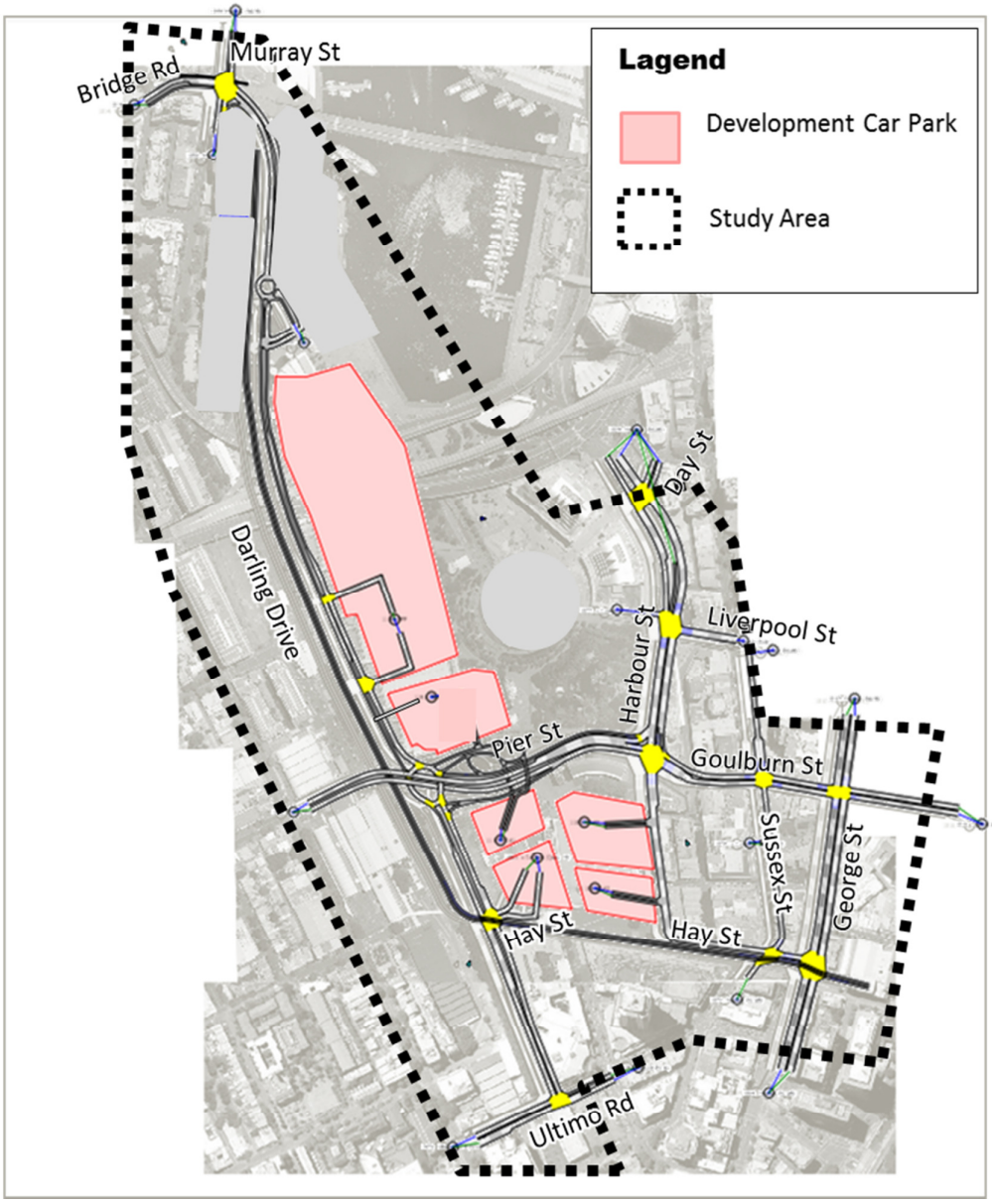

Figure 1-1 AIMSUN Model Study Area

2 Model Calibration and Validation

Hyder previously calibrated AIMSUN traffic model using the October 2012 counts. Further model calibration and validation was undertaken using new traffic data collected in June 2013. The June 2013 traffic data included travel time, intersection turning movement counts and queue length at key intersections. The AIMSUN model has been calibrated and validated according to the RMS's Traffic Modelling Guidelines (RMS 13.184). Detailed model calibration and validation results were documented in Technical Note 1.

3 Modelling Results

3.1 Existing Level of Service

The existing level of service (LoS) was reassessed using AIMSUN model. In Section 3.1.5 of the March 2012 Traffic and Transport Assessment Report documented existing network capacity and level of service (LoS) results.

The LoS analysis was repeated for existing 2013 traffic condition using calibrated and validated AIMSUN model at the following six key intersections:

- Darling Drive/Pyrmont Bridge Road/ Murray Street;
- Darling Drive / Pier Street;
- Darling Drive / Hay Street;
- Harbour Street / Pier Street / Goulburn Street;
- Harbour Street / Liverpool Street; and
- Darling Drive / Ultimo Road.

Table 3-1 summarises LoS results for existing 2013 traffic condition based on AIMSUN model.

The LoS is forecast between A and E for above six key intersections. In particular, poor level of service (LoS E) was forecast for Harbour Street/Liverpool Street for both Friday and Saturday PM peak hour. Traffic model suggested currently there is capacity problem at Harbour Street/Liverpool Street. The result is in line with previous modelling outcome.

Table 3-1 Existing Level of Service based on AIMSUN

Intersection	Control Type	Friday PM Peak		Saturday PM Peak	
		Overall Average Delay	LoS	Overall Average Delay	LoS
Darling Drive / Pyrmont Bridge Road / Murray Street	Signals	31	C	35	C
Darling Drive / Pier Street	Roundabout	10	A	11	A
Darling Drive / Hay Street	Signals	48	D	48	D
Harbour Street / Pier Street / Goulburn Street	Signals	50	D	53	D
Harbour Street / Liverpool Street	Signals	65	E	58	E
Darling Drive / Ultimo Road	Signals	21	B	24	B

Note: AIMSUN model code: Hyder SICEEP Aimsun Model_R4_Existing. File: F:\AA004399\D-Calcs\Traffic Modelling\POST TENDER TRAFFIC STUDY\Modellings\AIMSUN_For Reporting June 13\TN3_AIMSUN Modelling Result\inputs\AIMSUN Turn Table_Scenario Testing_Rev2_Friday_LoS.xlsx. F:\AA004399\D-Calcs\Traffic

Modelling\POST TENDER TRAFFIC STUDY\Modellings\AIMSUN_For Reporting June 13\TN3_AIMSUN Modelling Result\inputs\ AIMSUN Turn Table_Scenario Testing_Rev2_Saturday_LoS.xlsx

Further network operational analysis has been undertaken that identified operational issues currently being observed at four intersections as follows:

1. Darling Drive/Pyrmont Bridge Road/ Murray Street;
2. Harbour Street/Pier Street/Goulburn Street;
3. Harbour Street/Liverpool Street; and
4. Darling Drive/Pier Street

The traffic model has forecast poor level of service D to F to those movements showed in Figure 3-1.

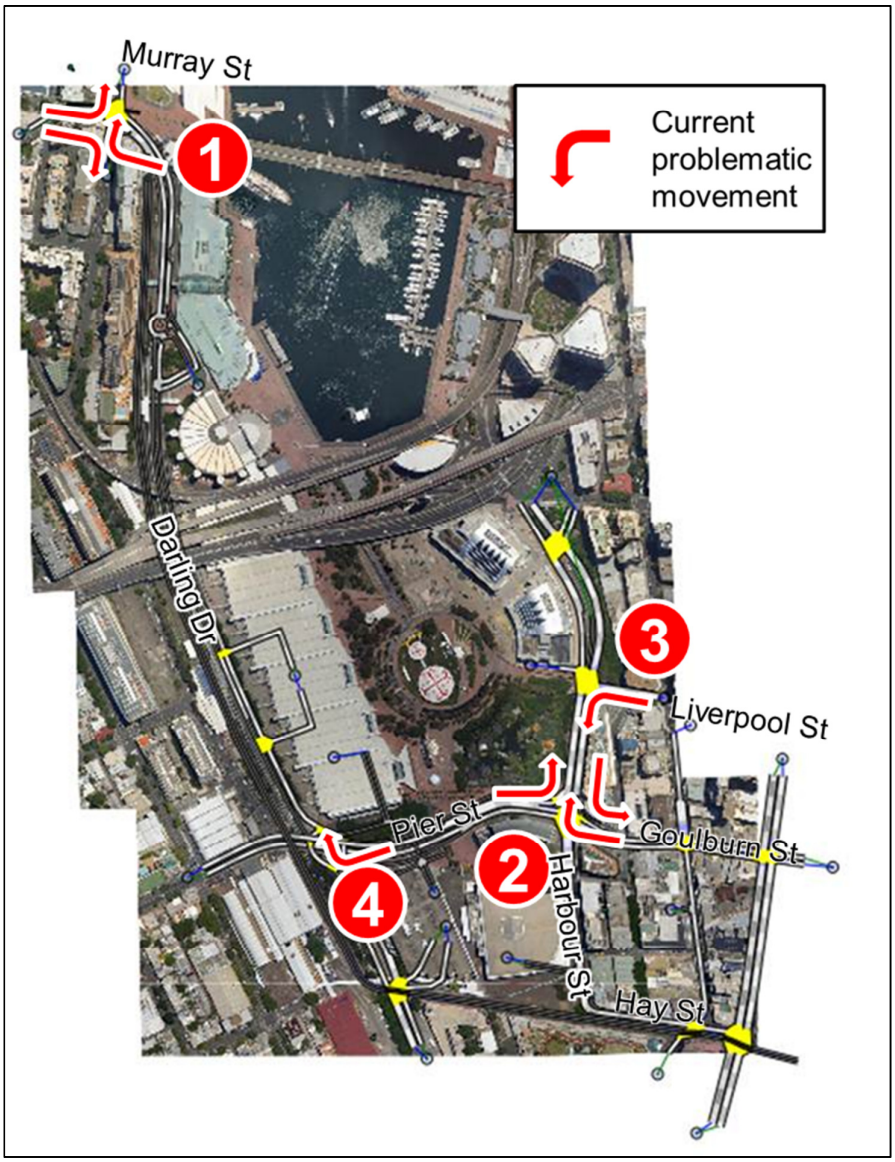

Figure 3-1 Existing Network Operational Issued Identified in Study area

3.2 Post Development Level of Service

AIMSUN model was developed for post development traffic condition to compare impact of the proposed SICEEP development on road network. In section 6.2 of the March 2012 Traffic and Transport Assessment Report documented forecast level of services (LoS) for post development condition. At that time modelling results were reported for original DA scheme. In that DA scheme Theatre car park was proposed off Exhibition Place Loop Road.

A revised Theatre Access Scheme is now developed. Essentially the Revised Theatre Access Scheme is similar to DA scheme with the relocation of the Theatre car park access to Darling Drive. The Theatre car park access on Darling Drive would be left-in/left-out.

Level of service was re-estimated for six key intersections. Table 3-2 summarises LoS results for post development traffic condition based on AIMSUN model. The LoS for both Friday and Saturday PM event traffic is shown in Table 3-2.

Table 3-2 Post Development Level of Service under Revised Theatre Access Scheme

Intersection	Control Type	Friday PM Event		Saturday PM Event	
		Overall Average Delay	LoS	Overall Average Delay	LoS
Darling Drive / Pyrmont Bridge Road / Murray Street	Signals	32	C	>100	F
Darling Drive / Pier Street	Roundabout	15	B	26	B
Darling Drive / Hay Street	Signals	20	B	21	B
Harbour Street / Pier Street / Goulburn Street	Signals	66	E	54	D
Harbour Street / Liverpool Street	Signals	68	E	71	F
Darling Drive / Ultimo Road	Signals	27	B	29	C

Note: AIMSUN model code: Hyder SICEEP Aimsun Model_R6_Future_New TH access. File: F:\AA004399\D-Calcs\Traffic Modelling\POST TENDER TRAFFIC STUDY\Modellings\AIMSUN_For Reporting June 13\TN3_AIMSUN Modelling Result\inputs\Future\AIMSUN Turn Table_Scenario Testing_Rev1_Friday Future_LoS_NewTH.xlsx. File: F:\AA004399\D-Calcs\Traffic Modelling\POST TENDER TRAFFIC STUDY\Modellings\AIMSUN_For Reporting June 13\TN3_AIMSUN Modelling Result\inputs\Future\ AIMSUN Turn Table_Scenario Testing_Rev1_Saturday Future_LoS_NewTH.xlsx

The level of service result at modelled intersections for revised Theatre access scheme was found in line with previous DA scheme.

The demolition of existing Entertainment Centre car park (currently have a capacity of 1800 car park) would improve LoS of Darling Drive/Hay Street intersection. With proposed 405 car park space at south west residential plot, the LoS for post development condition is forecast to be B at Darling Drive/Hay Street intersection.

The Theatre access car park off Darling Drive would not adversely impact the operation of roundabout with Pier Street. Model forecasts LoS B at this roundabout.

The analysis has forecast poor level of service F in Saturday PM peak for post development condition at Darling Drive/Murray Street. This is due to combined impact from existing and future SICEEP related traffic. The LoS for Friday peak is found to be C.

The LoS for post development condition at Harbour Street/Liverpool Street intersection is forecast to be F in Saturday PM peak. Even without SICEEP, LoS was found to be E primarily driven by the existing traffic. The result suggests minor impact from SICEEP at Harbour Street/Liverpool Street intersection.

3.3 Sensitivity Analysis of George Street LRT Proposal

In Section 6.3 of the March 2012 Traffic and Transport Assessment Report documented sensitivity analysis of George Street LRT Proposal. The scenario modelling was undertaken assuming George Street LRT proposal would increase traffic volume on Harbour Street by 10%. At that time assessment was undertaken using SIDRA.

At RMS request, the LoS analysis was undertaken using AIMSUN. The 10% traffic increase on Harbour Street as a result of LRT would further impact LoS for two intersections at Harbour Street/Goulburn Street and Harbour Street/Liverpool Street. Regardless of SICEEP these two intersections on Harbour Street would operate at poor level of service.

The impact of LRT on remaining four intersections assessed was found very small.

Table 3-3 summarises LoS results from sensitivity analysis based on AIMSUN model.

Table 3-3 Sensitivity Analysis Results

Intersection	Control Type	Friday PM Peak		Saturday PM Peak	
		Overall Average Delay	LoS	Overall Average Delay	LoS
Harbour Street / Pier Street / Goulburn Street	Signals	77	F	58	E
Harbour Street / Liverpool Street	Signals	>100	F	70	F

Note: AIMSUN model code: Hyder SICEEP Aimsun Model_R6_Future_New TH access. File: F:\AA004399\D-Calcs\Traffic Modelling\POST TENDER TRAFFIC STUDY\Modellings\AIMSUN_For Reporting June 13\TN3_AIMSUN Modelling Result\inputs\Future\AIMSUN Turn Table_Scenario Testing_Rev1_Friday Future_LoS_NewTH+10.xlsx. File: F:\AA004399\D-Calcs\Traffic Modelling\POST TENDER TRAFFIC STUDY\Modellings\AIMSUN_For Reporting June 13\TN3_AIMSUN Modelling Result\inputs\Future\AIMSUN Turn Table_Scenario Testing_Rev1_Saturday Future_LoS_NewTH+10.xlsx.

4 Findings

The results based on revised AIMSUN modelling in Technical Note 3 do not change the conclusion drawn in March 2013 Traffic and Transport Assessment Report.