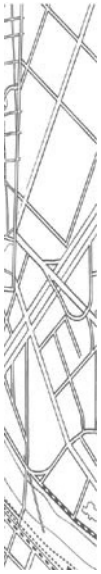


Supplementary Traffic Report

Illawarra Regional Business Park, Albion Park

20 November 2007

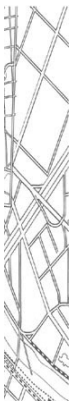
Prepared for

Delmo Albion Park Pty Ltd

Suite 20/809 Pacific Highway
Chatswood NSW 2067
(t) 02 9410 4100 **(f)** 02 9410 4199
(e) info@mwttraffic.com.au
(w) www.mwttraffic.com.au

MASSON | WILSON | TWINEY

TRAFFIC AND TRANSPORT CONSULTANTS

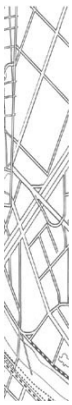


Copyright

The concepts and information contained in this document are the property of Masson Wilson Twiney Pty Limited. Use or copying of this document in whole or part without the written permission of Masson Wilson Twiney Pty Limited constitutes an infringement of copyright.

Disclaimer

The information contained in this document produced by Masson Wilson Twiney Pty Limited is solely for the use of Delmo Albion Park Pty Ltd for the purpose for which it has been prepared and Masson Wilson Twiney Pty Ltd undertakes no duty to or accepts any responsibility to any third party who may rely upon this document.



Contents

1. Introduction 1

2. Background to Traffic Assessment 2
2.1 Director General's Requirements 2
2.2 Authority Consultation 3
2.2.1 Site Inspection / Planning Focus Meeting 3
2.2.2 RTA Consultation 3
2.2.3 Shellharbour City Council Consultation 4
2.3 Road Network Traffic Modelling Assessment Methodology 4
2.3.1 The TRACKS Model Used 4
2.3.2 TRACKS Model Analysis Methodology 5

3. Estimation of Future Road Network Base Traffic Flows 6
3.1 Overview 6
3.2 Base Model Traffic Flows (Raw Data) 6
3.3 Extrapolating Modelled Traffic Flows 7
3.4 Using Modelled Traffic Flows (Base) for Assessment Purposes 7

4. Implication of Proposed Development Traffic Flows 12
4.1 Proposed Development Traffic Generation 12
4.2 Proposed Development Traffic Distribution and Road Network Traffic Flow Changes 12
4.3 Supplementary Intersection Analysis 15
4.3.1 Princes Highway / Illawarra Highway Intersection 15
4.3.2 Tongarra Road Intersections 17
4.4 Tongarra Road / Site Access Intersection 18
4.5 Tongarra Road Cycleway 18

5. Response to Submissions – Traffic and Transport Issues 19

Appendix A - Director General's Requirements A.1

Appendix B - Authority Consultation Documentation B.1

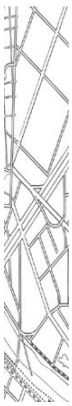
Appendix C - Cardno Eppell Olsen – TRACKS Modelling Sector Outputs C.1

Appendix D - Supplementary Traffic Counts D.1

Appendix E - Shellharbour City Council – TRACKS Modelling Outputs E.1

Appendix F - Tongarra Road Long Section F.1

© Masson Wilson Twiney



1. Introduction

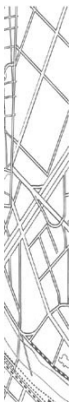
This supplementary traffic report has been prepared on behalf on Delmo Albion Park Pty Ltd to provide responses to the various traffic issues raised in submissions received by the Department of Planning in relation to the major project application for the Illawarra Regional Business Park.

The purpose of this supplementary traffic report is provide the relevant authorities, stakeholders and local residents with a clear understanding of the traffic impact assessment undertaken for the proposed development as well as responding directly to issues raised in submissions.

This supplementary report includes descriptions of the following:

- Background to traffic assessment methodologies;
- Consultation with relevant authorities;
- Application of traffic modelling tools; and
- Presentation of supplementary traffic analysis requested by RTA / Shellharbour City Council.

© Masson Wilson Twiney



2. Background to Traffic Assessment

This section of the supplementary report provides a description of how, through consultation with the relevant authorities, the methodology for the traffic impact assessment of the proposed Illawarra Regional Business Park was developed and undertaken.

2.1 Director General's Requirements

In November 2006 Director Generals Requirements (DGRs) were issued for the proposed Illawarra Regional Business Park at Albion Park. These DGRs were prepared with input from the RTA regarding what was required in the traffic assessment.

A copy of the DGRs is provided at Appendix A.

With regard to traffic and transport the required the following to be assessed:

- Site access arrangements and in particular the potential to connect to "the New Freeway" once constructed;
- Peak period intersection modelling of the site access on Tongarra Road;
- Intersection modelling to consider existing and 10 year projected traffic flows with and without the proposed development;
- Justification of proposed intersection locations with ameliorative measures if required; and
- Pedestrian and cycle access within and to relevant transport services and key off site locations.

Each of the DGRs relating to traffic and transport were addressed in detail the *Rezoning Traffic and Transport Report* (MWT, April 2007) as submitted with the project application.

It is noted that the RTA submission to the Department of Planning on the Project Application requested that additional intersections be assessed beyond those that were identified in the DGRs and subsequent consultations.

© Masson Wilson Twiney

2.2 Authority Consultation

This section provides an overview of the authority consultation undertaken during the assessment stage. The purpose of this review is to providing an understanding of how the assessment process was developed in consultation with the relevant authorities, namely RTA and Shellharbour City Council.

Copies of authority correspondence are provided in Appendix B.

2.2.1 Site Inspection / Planning Focus Meeting

A site inspection and planning focus meeting (PFM) was held on 7 December 2006. This meeting was attended by representatives of the RTA and Shellharbour City Council.

The meeting was an opportunity for these authorities to better understand the proposed development and site characteristics and identify any issues in addition to the DGR that should be addressed as part of the assessment process.

During the PFM the RTA representative identified the need for the traffic assessment to consider highway junctions (including Tongarra Road) and constraints to site access via Croome Lane due to the potential Illawarra Hwy upgrade.

2.2.2 RTA Consultation

A meeting was held with the RTA on 18 December 2006 to discuss the proposed development.

Issued discussed were:

- Illawarra Highway Upgrade (New Freeway) and potential access arrangements
- Access to RTA count data
- Seasonal influences on traffic count data
- Future traffic growth predictions
- Planned regional road network
- Requirements for traffic assessment
- Contributions – developer agreement / Section 94
- Flooding impacts on Illawarra Hwy upgrade

The key outcomes of the meeting were considered to be that:

- No funding or timing was set for the Illawarra Hwy upgrade;
- In addition to the DGRs, the traffic assessment needed to consider the traffic implications of development on the Princes Hwy / Illawarra Hwy intersection;
- Traffic counts undertaken in December 2006 would represent a seasonally busy period along the highways. This could be supported with permanent traffic data analysis;
- Distributions of future traffic should be generated by the TRACKS model;

© Masson Wilson Twiney

- The RTA does not operate a TRACKS model and MWT should approach Councils (ie. Shellharbour, Wollongong, Shoalhaven) to get access to the model; and
- The RTA was currently investigating the potential of installing a signalised roundabout at the intersection of the Princes Hwy / Illawarra Hwy to address short term capacity issues. MWT would be provided with the modelling outputs and report when completed.

The modelling results for the proposed signalised roundabout at the Princes Hwy / Illawarra Hwy intersection were not made available to MWT until after the RTA's submission on project application was received and after the implementation of the intersection upgrade (ie. installation of signals).

Therefore the traffic assessment presented in the *Rezoning Traffic and Transport Report* (MWT, April 2007) considered the traffic implications of the proposed development on the then existing Princes Hwy / Illawarra Hwy intersection arrangements (ie. pre signalisation).

It is noted that with the exception of the signalisation of the Princes Hwy / Illawarra Hwy intersection, each of the issues raised by the RTA during this meeting have been addressed in the *Rezoning Traffic and Transport Report* (MWT, April 2007).

2.2.3 Shellharbour City Council Consultation

On the basis of consultation with the RTA it was determined that a TRACKS model should be run to consider the road network implications of development.

Shellharbour City Council was consulted regarding access to the TRACKS model. MWT were advised that Council did not have available resources to run the TRACKS model for the proposed development and referred MWT to Wollongong Council.

Subsequent to the lodgement of the project application, Shellharbour City Council has provided outputs from Council's TRACKS model to assist in addressing the traffic issues raised by Council in their submission to the DoP regarding the project application.

2.3 Road Network Traffic Modelling Assessment Methodology

2.3.1 The TRACKS Model Used

As directed by the RTA and Shellharbour City Council, the TRACKS traffic modelling software was used to estimate the traffic distribution of estimated traffic generated by the proposed development of the subject site.

The advantages of using a TRACKS model are that traffic flows can be estimated taking into account planned land use forecasts, traffic patterns, background traffic growth, traffic reassignment and future road network improvements such as new road links or capacity improvements.

The TRACKS model for the south coast is used by the RTA and south coast Councils, including Shellharbour City Council, to consider regional road network operations and future planning.

The model includes certain assumptions regarding traffic growth associated with land use changes in the Illawarra and the influence of background growth from external areas.

As Shellharbour City Council was unable to run the TRACKS model at the time of the traffic assessment, MWT approached Wollongong Council to undertake the TRACKS modelling. Wollongong Council employs Cardno Eppell Olsen (CEO) to manage Council's WOLSH TRACKS model.

2.3.2 TRACKS Model Analysis Methodology

CEO was commissioned to provide traffic distribution estimates for site generated traffic for the years 2001 and 2016 for the following scenarios using the WOLSH TRACKS model:

- Base Case (no development); and
- Base Case + High Traffic Generation scenario for proposed development.

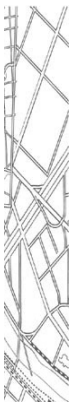
The distribution of site generated traffic was estimated based on the TRACKS modelling results by calculating the difference between 'base' and 'with development' modelled scenarios.

However, it is important that TRACKS modelled flows for any particular year be calibrated with actual existing traffic flows and existing land uses in order to ensure that the model reflects real life conditions.

It is noted that for the purpose of the traffic impact assessment of the proposed Illawarra Regional Business Park the modelled future traffic growth has been used by adding the base and with development growth flows to the existing surveyed traffic flows.

As such the traffic assessment presented in the *Rezoning Traffic and Transport Report* (MWT, April 2007) reflects the implications of future land use and traffic growth predictions from the WOLSH TRACKS model to the existing road network conditions. This is consistent with the assessment approach defined by DGRs.

© Masson Wilson Twiney



3. Estimation of Future Road Network Base Traffic Flows

3.1 Overview

The objectives of Section 3 and Section 4 of this report are to provide a summary of the assessment methodology used in the traffic impact assessment, an appreciation of how the TRACKS modelling has been used as a tool to assessing future traffic scenarios as well as some of the constraints associated with TRACKS modelling.

This section of the report provides a comparison of surveyed (actual) traffic flows on the road network surrounding the proposed development site with:

- WOLSH TRACKS (CEO) modelled traffic flows
- Shellharbour City Council TRACKS modelled traffic flows.

The comparisons in this section do not include estimated traffic generation by the proposed Illawarra Regional Business Park. These are addressed in Section 4.

3.2 Base Model Traffic Flows (Raw Data)

A summary of the raw modelled traffic flows for each of the key roads surrounding the proposed development site are presented in Table 1.

The modelled flows from the CEO TRACKS model and Shellharbour City Council TRACKS model are presented in Table 1 with the December 2006 surveyed flows.

It is somewhat difficult to directly compare the raw modelled traffic flows to the surveyed traffic flows as the modelled year varies.

However, based on the raw numbers it is obvious that:

- Council's model has significantly higher traffic flows along Tongarra Road for sections east of the Illawarra Highway compared to the 2006 surveyed flows and the CEO model;
- Council's 2008 modelled flows along the Princes Highway south of Tongarra Road are approximately 50% less than the 2006 surveyed flows.

© Masson Wilson Twiney

- Council's 2008 modelled flows north of Tongarra Road are double those south of Tongarra Road. This does not reflect the trend of the surveyed 2006 flows along the Princes Highway north and south of Tongarra Road.

To help identify the differences in modelled flows, the annual growth rate has been calculated for the Council and CEO models. These growth rates are shown in Table 2.

3.3 Extrapolating Modelled Traffic Flows

The annual growth rates have been applied to the modelled flows to convert them into 2006 flows in order to better illustrate the differences in modelled and surveyed traffic flows.

The adjusted traffic flow results presented in Table 2 indicates some variation between modelled growth rates. In general Council's model has higher growth rates on Tongarra Road and Station Road compared to the CEO model, while the CEO model has a higher growth rate along the Illawarra Highway compared to Council's model.

The application of modelled growth rates to the modelled flows (see Table 3) to create a standard year (2006) indicates significant differences between the modelled and surveyed traffic flows. This indicates that modelled flows for future years have not been accurately calibrated to existing and real life conditions and driver behaviour.

For example, the Council TRACKS model has assumed a base traffic flow along sections of Tongarra Road are significantly higher than would be expected based on actual survey data and historical traffic growth (see *Rezoning Traffic and Transport Report* (MWT, April 2007)).

3.4 Using Modelled Traffic Flows (Base) for Assessment Purposes

While the above analysis does not necessarily infer that the modelling process is wrong or incorrect, it does clearly indicate that careful application of modelling results needs to be undertaken to ensure that the realistic implications of future development and infrastructure planning is assessed.

As such simple application of modelling outputs to determine the future capacity of road network can be misleading.

To this end, the analysis of base traffic flows as presented in the *Rezoning Traffic and Transport Report* (MWT, April 2007) was based on the following methodology:

- Base Case 2006 - Utilised actual 2006 survey data during peak season
- Base Case 2016 - Applied CEO modelled annual traffic growth rates to 2006 surveyed flows and extrapolated to Year 2016

© Masson Wilson Twiney

This methodology provides a basic calibration of modelled flows to actual surveyed flows which may or may not be reflected in the outputs from the various TRACKS model.

© Masson Wilson Twiney

Table 1 - Base Model (Without Proposed Development) Traffic Flows

Location		Surveyed		Council Modelled				CEO Modelled					
		2006		2008		2018		2001		2016		2026	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Illawarra Hwy	North of Tongarra Rd	1239	1484	1248	1285	1385	1426	1285	1252	1498	1889	1550	2100
	South of Tongarra Rd	985	1169	1167	1244	1280	1227	1519	1573	2314	2287	2545	2512
	West of Princess Hwy	1243	1408	1360	1396	1468	1532	1419	1285	1799	1974	2150	2171
Tongarra Rd	East of Illawarra Hwy	953	1119	1065	1166	1576	1573	1093	1170	1576	1615	1865	1725
	West of Illawarra Hwy	1283	1780	1171	1223	1712	1796	773	749	674	1085	758	1171
	East of Croome Rd	899	982	1083	1238	1601	1686	1073	1170	1847	1645	1997	1775
	East of Station St	838	843	1364	2554	1503	2867	1267	1155	1878	1609	2158	1720
Princess Hwy	North of Tongarra Rd	2623	2866	4781	3205	5012	3553	1802	1398	1854	1607	1846	1864
	South of Tongarra Rd	3112	3412	1600	1453	2016	1801	2698	2303	3351	2898	3652	3277
	North of Station Rd	2934	3307	3764	3855	3807	4089	2576	1952	2814	2449	2815	2644
	North of Illawarra Hwy	4235	4569	3960	2866	3940	3100	3226	2054	3743	3056	5001	5054
Station Rd	West of Princess Hwy	326	382	161	328	222	400	275	323	396	419	355	419
	North of Tongarra Rd	342	391	179	340	249	416	338	405	495	538	493	567
Croome Rd	South of Tongarra Rd	311	364	59	124	145	187	-	-	-	-	-	-

© Masson Wilson Twiney

Table 2 - Base Models - Annual Modelled Traffic Growth

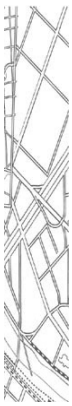
Location		Surveyed 2006		Council Modelled Growth (%pa) 2008 - 2018		CEO Modelled Growth (%pa) 2001 – 2016	
		AM	PM	AM	PM	AM	PM
Illawarra Hwy	North of Tongarra Rd	1239	1484	1.05	1.05	1.03	2.79
	South of Tongarra Rd	985	1169	0.93	-0.14	2.85	2.53
	West of Princess Hwy	1243	1408	0.77	0.93	1.59	2.9
Tongarra Rd	East of Illawarra Hwy	953	1119	4.09	3.04	2.47	2.17
	West of Illawarra Hwy	1283	1780	3.87	3.92	0.91	2.50
	East of Croome Rd	899	982	3.99	3.14	3.69	2.30
	East of Station St	838	843	0.98	1.16	2.66	2.23
Princess Hwy	North of Tongarra Rd	2623	2866	0.47	1.04	0.19	0.93
	South of Tongarra Rd	3112	3412	2.34	2.17	1.46	1.54
	North of Station Rd	2934	3307	0.11	0.59	0.59	1.52
	North of Illawarra Hwy	4235	4569	-0.05	0.79	1.00	2.68
Station Rd	West of Princess Hwy	326	382	3.26	2.00	2.46	1.75
	North of Tongarra Rd	342	391	3.36	2.04	2.58	1.91
Croome Rd	South of Tongarra Rd	311	364	9.41	4.19	-	-

© Masson Wilson Twiney

Table 3 - Base Models - Modelled Traffic Growth Adjusted to 2006 Based on Modelled Traffic Growth

Location		Surveyed 2006		Council Modelled 2006 Adjusted		CEO Modelled 2006 Adjusted	
		AM	PM	AM	PM	AM	PM
Illawarra Hwy	North of Tongarra Rd	1239	1484	1222	1258	1352	1436
	South of Tongarra Rd	985	1169	1145	1247	1748	1782
	West of Princess Hwy	1243	1408	1339	1370	1536	1483
Tongarra Rd	East of Illawarra Hwy	953	1119	982	1096	1235	1303
	West of Illawarra Hwy	1283	1780	1082	1129	738	847
	East of Croome Rd	899	982	998	1162	1286	1311
	East of Station St	838	843	1338	2495	1445	1290
Princess Hwy	North of Tongarra Rd	2623	2866	4736	3139	1819	1464
	South of Tongarra Rd	3112	3412	1526	1391	2900	2486
	North of Station Rd	2934	3307	3755	3810	2653	2105
	North of Illawarra Hwy	4235	4569	3964	2821	3390	2345
Station Rd	West of Princess Hwy	326	382	151	315	311	352
	North of Tongarra Rd	342	391	167	326	384	445
Croome Rd	South of Tongarra Rd	311	364	48	114	0	0

© Masson Wilson Twiney



4. Implication of Proposed Development Traffic Flows

4.1 Proposed Development Traffic Generation

The estimated traffic generation potential of the proposed Illawarra Regional Business Park has been estimated and documented in the *Rezoning Traffic and Transport Report* (MWT, April 2007).

The peak period traffic generation of the site was estimated to be:

The potential traffic generation potential of the high yield development scenario was estimated to be:

- AM Peak Hour = 525 vehicle trips per hour
- PM Peak Hour = 602 vehicle trips per hour

Based on the submissions received from the RTA and Council, it is considered that the traffic generation estimates are appropriate for use in the traffic assessment.

4.2 Proposed Development Traffic Distribution and Road Network Traffic Flow Changes

As part of the traffic assessment of the project application the estimated traffic generation potential of the proposed development (high yield scenario) was applied to the CEO TRACKS model for the 2001 and 2016 base case years.

It is assumed that a similar approach was undertaken by Council in generating the modelled outputs for the with development scenario for 2008 and 2018.

The modelled base plus development traffic flows are presented in Table 4.

To determine the modelled future net changes in traffic flows resulting from the proposed development the base case traffic flows presented in Table 1 have been subtracted from the 'with development' flows presented in Table 4. The results are presented in Table 5.

© Masson Wilson Twiney

Table 4 - Modelled Traffic Flows With Proposed Development

Location		Surveyed		Council Model				CEO Model			
		2006		2008		2018		2001		2016	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Illawarra Hwy	North of Tongarra Rd	1239	1484	1230	1205	1353	1439	1202	1194	1595	1820
	South of Tongarra Rd	985	1169	1193	1200	1338	1260	1512	1583	2257	2307
	West of Princess Hwy	1243	1408	1329	1335	1463	1530	1370	1203	1828	1887
Tongarra Rd	East of Illawarra Hwy	953	1119	1114	1345	1633	1823	1134	1258	1647	1700
	West of Illawarra Hwy	1283	1780	1174	1225	1719	1836	732	769	839	1079
	East of Croome Rd	899	982	1336	1426	1473	1872	1440	1516	1871	1956
	East of Station St	838	843	1477	2590	1593	2949	1441	1339	1825	1727
Princess Hwy	North of Tongarra Rd	2623	2866	4824	3279	6076	3647	1763	1346	1842	1539
	South of Tongarra Rd	3112	3412	1500	1618	2221	2126	2827	2434	3359	2979
	North of Station Rd	2934	3307	3706	3793	3687	4061	2636	2009	2813	2529
	North of Illawarra Hwy	4235	4569	3861	2816	3795	3084	4196	2026	3772	3044
Station Rd	West of Princess Hwy	326	382	230	297	241	367	392	444	397	545
	North of Tongarra Rd	342	391	249	312	312	376	458	528	498	663
Croome Rd	South of Tongarra Rd	311	364	75	137	265	203	-	-	-	-

© Masson Wilson Twiney

Table 5 - Modelled Net Changes in Traffic Flows With Proposed Development

Location		Council Model				CEO Model			
		2008		2018		2001		2016	
		AM	PM	AM	PM	AM	PM	AM	PM
Illawarra Hwy	North of Tongarra Rd	-18	-80	-32	13	-83	-58	97	-69
	South of Tongarra Rd	26	-44	58	33	-7	10	-57	20
	West of Princess Hwy	-31	-61	-5	-2	-49	-82	29	-87
Tongarra Rd	East of Illawarra Hwy	49	179	57	250	41	88	71	85
	West of Illawarra Hwy	3	2	7	40	-41	20	165	-6
	East of Croome Rd	253	188	-128	186	367	346	24	311
	East of Station St	113	36	90	82	174	184	-53	118
Princess Hwy	North of Tongarra Rd	43	74	1064	94	-39	-52	-12	-68
	South of Tongarra Rd	-100	165	205	325	129	131	8	81
	North of Station Rd	-58	-62	-120	-28	60	57	-1	80
	North of Illawarra Hwy	-99	-50	-145	-16	970	-28	29	-12
Station Rd	West of Princess Hwy	69	-31	19	-33	117	121	1	126
	North of Tongarra Rd	70	-28	63	-40	120	123	3	125
Croome Rd	South of Tongarra Rd	16	13	120	16	0	0	0	0

© Masson Wilson Twiney

The modelled traffic flow results presented in Table 5 indicate that both the CEO and Council TRACKS models generally reflect expected changes to road network traffic flows resulting from estimated traffic generated by the proposed Illawarra Regional Business Park.

However there are several anomalies which require consideration rather than blind acceptance of the outputted traffic flows.

For example, the Council model estimated that traffic flows along the Princes Highway north of Tongarra Road would increase by 1064 vehicles per hour in the 2018 AM peak period as a result of the proposed development. Such an increase is highly unlikely given that the traffic generation potential of the proposed development was 525 vehicles per hour under the high yield development scenario.

4.3 Supplementary Intersection Analysis

4.3.1 Princes Highway / Illawarra Highway Intersection

This intersection was identified in the *Rezoning Traffic and Transport Report* (MWT, April 2007) as an intersection which, prior to the implementation of the signalised roundabout treatment, experience existing capacity constraints.

At the time the *Rezoning Traffic and Transport Report* (MWT, April 2007) was prepared no information regarding the proposed intersection upgrade was available to MWT.

It is understood from discussions with the RTA that the recently installed traffic signals on the roundabout are considered to be Stage 1 of an upgrading project of the intersection. Future works are likely to include some civil works to increase the right turn storage capacity for the southbound approach along the Princes Highway.

The RTA prepared a Paramics model as part of the assessment of the signalised roundabout. MWT received a copy of this model for review following to assist with the preparation of a response to the RTA's submission on the Project Application.

As detailed in correspondence with the RTA (see Appendix B) the review highlighted several deficiencies in the model set up which limited it application.

Notwithstanding the above, the issue with regard to the Project Application is the implications proposed development traffic will have on intersection operation.

The traffic assessment presented in the *Rezoning Traffic and Transport Report* (MWT, April 2007) assumed that 100% of site generated traffic would be additional to the background traffic flows. This was a conservative approach as a proportion of background traffic is likely to be attracted to the site from alternative locations.

© Masson Wilson Twiney

For example employment traffic travelling north to Wollongong may be intercepted at Albion Park thus not generating an additional trip but rather diverted existing trip.

At the request of the RTA, further analysis of the sector based trip attraction / diversion was undertaken using the CEO TRACKS model.

The sectors are as follows:

- 1 – South West of the development site, including Illawarra Hwy external
- 2 – South East of the development site, including the Princes Hwy external.
- 3 – remainder north of the site
- 4 – the proposed development site.

The results are presented in Appendix C and summarised in Table 6.

Table 6 – Princes Highway / Illawarra Highway Intersection
Net Change to Traffic Flows with Proposed Development (CEO TRACKS Model)

Modelled Year	Net Change in Peak Hour Traffic Flows with Development (veh/hr)	
	AM Peak	PM Peak
2001	- 34	- 98
2016	- 103	- 16
2026	+ 59	-108

The general pattern is that the proposed development attracts traffic from Sectors 1 and 2 (south of the site) that would have otherwise headed north to the remainder of Albion Park and beyond. This obviously reduces the flows at the intersection of Illawarra Highway/Princes Highway, however there is also an increase in flows from the north to the development site.

Overall the sector modelling indicates that there is likely to only be a marginal change (+/-) in traffic flows using the Illawarra/Princes Hwy intersection with the proposed development.

There is also some variability in the possible change in flows at the intersection (up or down) which relates to other attractions within the model area and the relative attractiveness of the proposed development in relation to them. As an example, at 2026 the net flows decrease at a greater level than 2016, meaning that the proposed development attractiveness has possibly increased relative to other nearby attractions.

The implication of this analysis is that the proposed development is unlikely to generate additional demands on the Princes Highway / Illawarra Highway intersection and hence not contribute to the need for further intersection upgrades.

© Masson Wilson Twiney

4.3.2 Tongarra Road Intersections

In response to Council's submission on the Project Application supplementary intersection counts were undertaken at the following intersections:

- Tongarra Road / Station Road
- Tongarra Road / Croome Road

Copies of these counts are provided in Appendix D.

These surveyed traffic flows were used to analysis the existing (2007) operation of the intersection both without and with proposed development traffic. The 'with development' traffic scenario used the high yield scenario and traffic distribution assumptions as presented in the *Rezoning Traffic and Transport Report* (MWT, April 2007).

The existing operation of the surveyed intersections was analysed using SIDRA. The results are presented in Table 7.

Table 7 – Tongarra Road Intersections Operational Performance

Intersection with Tongarra Rd	Scenario	Intersection Control	AM Peak		PM Peak	
			LoS	Av. Delay (sec/veh)	LoS	Av. Delay (sec/veh)
Croome Road	Base (Surveyed 2007)	Priority	C	30.8	D	43.5
	Base + Development	Priority	F	71.0	F	114.9
	Base + Development	Seagull	B	24.4	B	24.2
Station Road	Base (Surveyed 2007)	Priority	C	32.4	F	88.6
	Base + Development	Priority	F	>200	F	> 200
	Base + Development	Seagull	B	21.3	B	26.9

The analysis indicates that both the Station Road and Croome Road intersections with Tongarra Road experience capacity constraints in the PM peak period.

The existing intersection operation was reassessed with proposed development traffic as estimated in the *Rezoning Traffic and Transport Report* (MWT, April 2007). The results are summarised in Table 7. This analysis indicates that performance is adversely impacts with the proposed development.

The with development traffic flow scenario was reassessed with both intersections operating as seagull intersections. The analysis (see Table 7) indicates that the implementation of a seagull treatment provides better intersection operation with development traffic than the existing intersection arrangements with no development traffic.

© Masson Wilson Twiney

Based on this analysis it is suggested that seagull treatments at the intersections of Station Road and Croome Road would satisfactorily address the additional demands generated by the proposed development. The implementation of seagull treatments at the intersection could be achieved by line marking within the existing road pavement.

4.4 Tongarra Road / Site Access Intersection

Council's submission on the Project Application included comments on the modelling assessment of the Tongarra Road / Site access intersection suggesting that additional road capacity (ie additional lanes) were required along Tongarra Road to accommodate the proposed development.

Council's analysis of the intersection capacity has been based on modelled future flows along Tongarra Road.

As discussed in some detail in Sections 3 and 4 of this report, due care needs to be undertaken in the application of future modelled flows. The traffic analysis presented in the *Rezoning Traffic and Transport Report* (MWT, April 2007) utilised the CEO modelled flows with an adjustment to take into account surveyed existing flows.

On this basis it is considered that the Council's TRACK model and thus analysis has significantly overestimated the likely traffic flows along Tongarra Road for the future assessment year (2016).

In summary, the analysis presented in the *Rezoning Traffic and Transport Report* (MWT, April 2007) is considered appropriate for determine capacity requirements of the site access.

4.5 Tongarra Road Cycleway

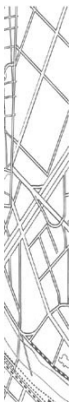
As noted in the RTA's submission on the Project Application, there is currently a 1.1 metre wide cycleway on each shoulder of Tongarra Road. The RTA suggests that the existing cycleway should be upgraded.

Council's Section 94 plan identifies a number of bicycle and pedestrian facility improvements in Albion Park and the wider Council area. This includes the recoup of costs for cycle way provision along Tongarra Road between the Illawarra Highway and Station Road.

It is understood that contributions from the development of the Illawarra Regional Business Park for cycleway provisions both along Tongarra Road and the wider Council area will be undertaken either as part of Council's Section 94 plan or as a developer agreement.

It is noted that Council has not identified the cycleway along Tongarra Road as an issue in their submission on the Project Application.

© Masson Wilson Twiney



5. Response to Submissions – Traffic and Transport Issues

This section of the report provides responses to each of the traffic and transport related issues raised in the submissions on the Project Application. Where appropriate a reference to further information is provided. The responses are provided in Table 8.

Table 8 - Response to Submissions

SUBMISSION MATTERS	COMMENTS	REFERENCES
A PUBLIC SUBMISSIONS A2 Traffic		
(a) Concerned about increase in traffic	Traffic analysis has shown that future traffic flows including the traffic generated by the development can be accommodated on the surrounding road network and existing / future intersections continue to operate with a satisfactory level of service	See Project Application and Supplementary Traffic Reports
(b) Tongarra, Station and Croome Rds are not suitable to accommodate increased traffic from this development in addition to increased housing in Albion Park and Tullimbar	See above. Furthermore, the provision of increased local employment opportunities in Albion Park. As such trips a proportion of trips to employment from residential will be captured within the locality and thereby reduce potential regional traffic flows.	See Project Application and Supplementary Traffic Reports
(c) One vehicle access point on Tongarra Road, near the crest of a hill is not sufficient	The proposed signalised access into the site would operate with a good level of service in the future. This issue is further discussed in response to an RTA issued issue.	See Section 5.2 of Projection Application Traffic Report & Section 4.4 of Supplementary Traffic Report
(d) Vehicle flow on Tongarra Road would be increased to an inappropriate degree	Future vehicle flows on Tongarra Road which include background traffic growth and traffic generated by the development would remain below the mid block capacity of this road.	See Section 4.2 of Supplementary Traffic Report

© Masson Wilson Twiney

(e) Seek the widening of Tongarra Rd to increase capacity and traffic conditions in the area	Tongarra Road is a state road under the shared control of the RTA and Shellharbour Council. The RTA have confirmed the widening of Tongarra Road is not on their current 10 year construction program. Further, the proposed highway bypass would change traffic conditions markedly in the area removing through traffic from surrounding roads. The traffic analysis has concluded that a single lane along Tongarra Road can accommodate proposed development traffic for the future timeframe required by the RTA.	See Section 4.2 of Supplementary Traffic Report
(f) Seek the implementation of plans for the expressway extension and Township bypass	This outside the scope of this development and this request should be directed to the RTA. The RTA was consulted during concept design stages to determine if vehicle access to a Bypass could be achieved. However, the project has not yet been designed or funded and thus access to the site via the Bypass can not be provided at this stage.	See Section 5.2.3 and Appendix B of Supplementary Traffic Report for consultation with RTA on this issue.
(g) Disagree with the increased traffic impacts of the development	The traffic impact analysis has been based on open and transparent calculations and recommended RTA traffic generation rates.	-
(h) Object to increased traffic	The development represents a good opportunity to provide employment in the immediate area which would have a positive impact on traffic conditions reducing long distance work related trips.	-
(i) Additional heavy vehicles will worsen air quality in the locality. Roads should be widened to disperse fumes additional traffic will cause.	The impacts of road widening on the dispersing fumes are outside the scope of our expertise.	-
(j) Local Roads are incapable for accommodating the predicted traffic increase.	The site benefits from having direct access to a State Road. Traffic can travel to / from the site using only State or Arterial Roads which negates the need to use local roads.	-
(k) Road needs to be upgraded.	Tongarra Road is a state road under the shared control of the RTA and Shellharbour Council. The RTA have confirmed the widening of Tongarra Road is not on their current 10 year construction program. Further, the proposed highway bypass would change traffic conditions markedly in the area removing through traffic from surrounding roads. The RTA has recently installed traffic signals at the Illawarra / Princes Hwy intersection as a staged approach to addressing existing capacity constraints at the intersection.	See Project Application and Supplementary Traffic Reports
(l) One access point via	The proposed signalised access into the site	See Section 4.2 of

© Masson Wilson Twiney

Tongarra Road is not sufficient.	would operate with a good level of service in the future	Supplementary Traffic Report
(m) The proposal should not proceed until access from the planned Illawarra Highway can be created.	The development of the site is not dependant on the provision of the planned Illawarra Highway bypass.	See Section 5.2.3 and Appendix B of Supplementary Traffic Report for consultation with RTA on this issue.
(n) One access point at Tongarra Road is insufficient.	The proposed signalised access into the site would operate with a good level of service in the future	See Section 4.2 of Supplementary Traffic Report
(o) Tongarra Road currently runs at capacity at times, it is not adequate to accommodate the development.	Tongarra Road is currently under capacity having regard to RTA recommended mid block traffic flow capacities. The traffic generated by the development would not exceed the recommended capacity for Tongarra Road.	See Section 4.2 of Supplementary Traffic Report
E Roads and Traffic Authority (a) The RTA requires electronic copies of the TRACKS model for verification. This must be accompanied by a report detailing the impact of the proposal on the surrounding road network and in particular state variations in traffic volumes to the state road network (with and without development)	Electronic copies (PDF) of TRACKS modelling outputs generated by CEO and Council have been included as part of the Project Application or the supplementary traffic report. MWT do not own either the Wollongong (CEO) or Shellharbour Council TRACKS model and thus further electronic copies if required should be obtained from these sources. Both the Project Application and Supplementary traffic reports provide an analysis and assessment of the traffic implications of development on the state road network.	-
(b) The RTA require the SIDRA analysis to consider am and pm peak periods, existing and 10 year projects and the impact with and without development from all scenarios. The junction of the Princes Highway and Tongarra Road should also be analysed	SIDRA analysis has been undertaken and the results of this analysis are provided in the supplementary report. Electronic copies of all models have been included in the supplementary report.	See Section 4.3 and 4.4 of the Supplementary Traffic Report for further intersection analysis.
(c) The applicant should identify any road infrastructure requirements necessary to mitigate the impacts of the proposal. The traffic assessment should identify any treatments needed in addition to current upgrades to ensure the development does not adversely impact the junction	The following road infrastructure improvements have been identified in either the Project Application or Supplementary traffic report: - Signalised intersection at Tongarra Rd / Site Access intersection - Seagull treatment at Tongarra Rd / Croome Rd intersection - Seagull treatment at Tongarra / Station St intersection - Provision of bus stop facilities on Tongarra Rd - Contributions for local and regional	See Section 4 of Supplementary Traffic Report

© Masson Wilson Twiney

	transport infrastructure as defined by Council's Section 94 plan.	
(d) A concept plan of the proposed access treatment on Tongarra Road must be provided. The plan shall demonstrate that sight distance can be achieved in accordance with the RTA Road Design Guide and the plan must show the property boundaries	A long section of Tongarra Road including the location of the site access and site boundary is provided in Appendix F. The long section indicates that available sight distances are likely to be at the limit of the RTA's minimum requirements for a 80km/h road way. The location of the access has been sited as far east as possible to maximise sight distances. Ameliorative measures to consider in detail design include advance warning signage and a speed limit reduction.	See Appendix F
(e) For any bus services that do not enter the site loop road bus bays and associated infrastructure must be provided both sides of Tongarra Road. This should be shown on the concept plan	Agreed. To be considered as part of detailed design.	-
(f) The traffic study should outline the bus infrastructure that would be provided internally on the loop road.	Bus stops would be located along the loop road. The stops would utilise the parking lane such that traffic flows can be maintained.	-
(g) The 1.1m wide cycle way on each shoulder of Tongarra Road should be upgraded along the full frontage of the proposed development in accordance with AUSTROADS	The proposed development would be levied Section 94 contributions for cycleways including along Tongarra Road as specified by Council's Section 94 plan.	See Section 4.5 of Supplementary traffic report
H. Shellharbour City Council H16 Traffic (a) Disagree with traffic assessment findings and recommendations with regards to the proposed intersection treatment at Tongarra Road and the main access road. Council's SIDRA traffic model assessment of the proposal using the report's traffic generation figures indicate the intersection will operate significantly above traffic volumes indicated in the Masson, Wilson and Twiney report.	It is considered that Council's SIDRA analysis which is based on TRACKS model outputs, does not reflect existing (surveyed) conditions. As such the lack of calibration results in over estimating the likely traffic flows along Tongarra Road.	See Section 3 and Section 4.4 of the Supplementary Traffic Report
(b) The intersection of Tongarra Road / Station Road and Tongarra Road / Croom	Analysis of this intersection has been included in the supplementary traffic report.	See Section 4.3 of the Supplementary Traffic Report

Road has not been sufficiently assessed.		
K Ministry for Transport		
(a) A freight movement strategy is recommended to better ascertain the impact of freight for the surrounding road network and what percentage of freight can be handled via rail or air transport.	This request is beyond the scope of the development. The development represents a commercial office employment opportunity and therefore its impact on freight movements would be minimal. This request requires a separate freight study.	
(b) How heavy vehicle movement growth is addressed in traffic modelling at key intersections also needs further clarification	Surveyed and estimated future heavy vehicle flows have been included in the detailed (SIDRA) intersection analysis presented in the Project Application and Supplementary traffic reports.	
(c) Shellharbour City Council has recently completed the Albion Park Transport Study. The analysis and recommendations of this report should be addressed by the proposal.	The estimated future traffic growth associated with future development of the Albion Park area and planned road network improvements have been incorporated in the TRACKS modelling outputs and thus considered as part of the traffic assessment.	
(d) Concerned that existing traffic congestion at the intersection of the Princes Highway and the Illawarra Highway will be exacerbated by the proposed development without a clear solution or means to mitigate these impacts.	Stage 1 of the upgrade of this intersection has now been completed by the RTA. Stage 2 will commence in the near future to provide even more capacity. The traffic generated by the proposed development would not result in this intersection operating at a poor level of service in the future.	See Section 4.3 of Supplementary Traffic Report
(e) Congestion will also increase for the key intersection of Tongarra Road and Terry Street, which is used by most existing bus services. Priority for buses at local intersections should be specifically considered, particularly at Tongarra Road and Terry Street.	This intersection continues to operate at a good level of service in the future and therefore impacts on bus travel time through this intersection would be minimal. The development welcomes any bus improvements on the surrounding road network.	
(f) The EA Report identifies S117 Direction 3.4 -Integrating Land Use and Transport9 (ILUT), yet only a cursory review of the ILUT policy package is provided. Detailed consideration of the ILUT is recommended together with	The development would provide a significant increase in employment opportunities within close proximity to an ever expanding residential release area and transport infrastructure.	

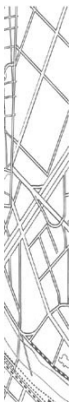
© Masson Wilson Twiney

the directions for transport within the State Plan.		
(g) The capacity of public transport to adequately meet the needs of future workers to the subject site is not addressed. The preparation of a transport access guide is recommended.	Discussions were undertaken with the local bus operator who expressed support for the development as a means of increasing demand on existing service which had spare capacity. The development includes an internal road network and bus stops which can accommodate a bus if the decision is made to re-route buses into the site. The preparation of a transport access guide could be undertaken during detailed design.	
(h) The proposed development should meet the minimum standards for pedestrian and cycle access	Pedestrian access across Tongarra Road linking existing bus routes in either direction would be markedly improved with the introduction of traffic signals at the site entry road. The proposed development includes widening of the existing bicycle pathway across the frontage of the site.	
(i) A minimalist approach to car parking provision on site should be adopted with a parking rate determined based on the accessibility of the site to public transport.	On site parking is proposed in accordance with Council's DCP for parking. However Council has expressed a desire to be involved in the development of DCP controls for the site as part of the future planning process.	
(j) Prominent facilities for the secure storage of bikes and amenities for cyclists should be included within future development.	This request could incorporated into the DCP for the site.	
(k) The preparation of a site specific development control plan to better integrate transport and land use is recommended.	The concept plan has been designed to incorporate elements of non-private motor vehicle use including an internal loop road to facilitate efficient bus access.	
(l) The Ministry seek close consultation on the preparation of any planning agreement which has potential to secure funding for local and regional public transport including priority bus measures and roadside infrastructure.	Noted	
O Owner of Ravensthorpe		
(k) Vehicular access • Potential access form the Illawarra highway extension should be investigated.	This matter has been considered as part of the planning process. At this stage the RTA does not have a formal design or timing for the Illawarra Highway upgrade thus access to such a road can not be provided at this stage. However, the	See Section 5.2.3 and Appendix B of Supplementary Traffic Report for consultation with RTA on this issue.

© Masson Wilson Twiney

	potential to access to the upgrade should it proceed would be investigated again at such a time.	
•The intersection of the Princes Highway/ Illawarra Highway needs to be upgraded for extra capacity.	Stage 1 of the upgrade of this intersection has now been completed by the RTA. It is understood that Stage 2 will commence in the future to provide additional capacity. However the form of Stage 2 treatments is still unknown. The provision of employment land uses provides some benefits (traffic flow reduction) as it intercepts traffic travelling from the south / west through the intersection on the way to employment further north.	
P Co Owner of Ravensthorpe (i) Traffic flow		
•The Illawarra Highway / Princes Highway intersection currently experiences poor performance during peak periods. •The operation restraints of this major intersection must be addressed before allowing additional traffic the proposed business park has the potential to generate.	Stage 1 of the upgrade of this intersection has now been completed by the RTA. Stage 2 will commence in the near future to provide even more capacity. The traffic generated by the proposed development would not result in this intersection operating at a poor level of service in the future.	See Section 5.2.3 and Appendix B of Supplementary Traffic Report for consultation with RTA on this issue.

© Masson Wilson Twiney



Appendix A - Director General's Requirements

© Masson Wilson Twiney

NSW GOVERNMENT
Department of Planning

Office of the Director General

Contact: Antony Pedroza
Phone: 02 9228 6545
Fax: 02 9228 6570
Email: antony.pedroza@planning.nsw.gov.au

Our ref: S06/00690
MP_06_0272
File: Letter+ DGRs (APABP) Final.doc

Jose De La Vega
Delmo Albion Park Pty Ltd
Level 32
126 Phillip Street
Sydney NSW 2000

20 November 2006

Dear Mr De La Vega,

Subject: Albion Park Airport Business Park, Albion Park – State Significant Site Study and Director General's Requirements

I refer to your letter and Preliminary Information dated 31 August 2006 concerning the development of land at 78 Tongarra Road as a Part 3A project and its listing as a State Significant Site (SSS) in the *State Environmental Planning Policy (Major Projects) 2005* (Major Projects SEPP).

On 28 September 2006, the Minister formed the opinion that under Clause 6 of the Major Project that your proposal was a Major Project to which Part 3A of the Environmental Planning and Assessment Act applies. The Minister concurrently authorised your request to submit a Concept Plan for the proposal.

With regards to the Concept Plan, please find attached the Director-General's Requirements (DGRs) for your Environmental Assessment (EA). The Concept Plan should provide an environmental envelope and assessment regime for the development (including subsequent stages) that is based on relevant, contemporary studies.

Once you lodge the EA for the Concept Plan it will be the subject of a test of adequacy to determine whether it adequately satisfies the DGRs. In the event that the Department considers the EA does not adequately address the DGRs, you may be required to submit a revised EA. Please be aware that I may choose to modify these requirements by further notice to you.

With regard to the nomination of the Albion Park Airport Business Park as a SSS, I have provided the SSS Study requirements for you in the DGRs. A single document that combines the Concept Plan EA and SSS Study must be submitted to the Department and should be clearly separated to allow assessment.

Should you have any enquiries, please contact Antony Pedroza, Senior Planner–Strategic Assessment on 9228 6545.

Yours sincerely

SHaddad

Sam Haddad
Director General

22/11/2006.

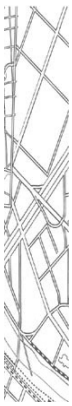
NSW GOVERNMENT
Department of Planning

Project	State Significant Site and Concept plan application for establishment of a Business Park and environmental conservation, Albion Park (MP_06_0272)
Location	Albion Park Airport Business Park, Tongarra Road, Albion Park
Proponent	Delmo Albion Park Pty Ltd
Date issued	November 2006
Expiry date	November 2008
Special Provision	The Minister for Planning formed the opinion pursuant to clause 6 of *State Environmental Planning Policy (Major Projects) 2005* (MP SEPP) that the project is a Major Project under Part 3A of the *Environmental Planning and Assessment Act 1979* on 28 September 2006. Concurrently authorising the submission of a Concept Plan.
State significant site Study requirements	A State significant site Study will need to include (but not be limited to) the following: (1) Address the criteria at Clause 8 (2) of the Major Projects SEPP, (2) Address the Criteria for State Significant Sites in the attached Draft Guideline dated 24 July 2006, with particular focus on criterion (a), (b) and (d), (3) Proposed land uses and suitability of the site for the proposed land uses taking into consideration environmental, social and economic factors, the principles of ecologically sustainable development and any applicable State or regional planning strategy; (4) The implications of any proposed land use for local and regional land use, infrastructure, service delivery and natural resource planning; (5) Detail the proposed land use controls (including zoning) and justify the necessity for these controls against the existing planning instruments; and (6) Indicate the future approval regime for development on the site you are seeking by identifying the circumstances when Part 3A or Part 4 (including exempt or complying development) would apply.
General requirements	The Environmental Assessment (EA) must include (1) an executive summary; (2) a description of the project including the: (a) need for the project; (b) alternatives considered; and (c) various components and stages of the project; (3) a consideration of all relevant Legislation, State Environmental Planning Policies and applicable planning instruments (especially SEPP 55, the Draft Illawarra Regional Strategy, Illawarra Action for Transport, Shellharbour Industrial Development Control Plan, August 2006 and Planning for Bushfire Protection); (4) a draft Statement of Commitments outlining commitments to public benefits, environmental management, mitigation and monitoring measures (especially in relation to flooding, biodiversity and stormwater) to be established on site and clear identification of who is responsible for these measures; (5) a conclusion justifying the project, taking into consideration the environmental impacts of the proposal, the suitability of the site, and whether or not the project is in the public interest; (6) a signed statement from the author of the EA certifying that the information contained in the report is neither false nor misleading; and (7) if relevant, the likely scope of developer contributions between the proponent, Council and other agencies for matters such as community, regional and local infrastructure, public transport provision, social infrastructure and facilities.

Office of Sustainable Development Assessment and Approvals – Strategic Assessment
23-33 Bridge Street SYDNEY NSW 2000 GPO Box 39 SYDNEY NSW 2001
Phone 02 9228 6111 Fax 02 9228 6155 Website planning.nsw.gov.au

Key issues	The EA must address the following key issues: **Flooding** (1) A comprehensive flood analysis report should include, but not be limited to: (a) The impact of flooding on the development including the estimation of the extent of flood prone land (ie PMF), high hazard areas and floodways, the implications of the full range of floods and the safety of users of the development (b) The impact of the development on flood behaviour on and off site, include existing and planned development in the wider area. (c) The flood hazard in the area (including the hydraulic hazard, flood readiness, flood warning time, rate of rise of floodwater, flood duration and type of development) and access and evacuation issues; (d) Detail viable strategies to manage any adverse impacts of the development on flood behaviour; and (e) Demonstrate consistency with the aims and intent of the Floodplain Development Manual, 2005 and relevant local and regional policies. **Biodiversity** (1) Determine the impact on existing native flora and fauna, including identified threatened species and the Indicative Habitat Corridor as identified in the Draft Illawarra Regional Strategy. (2) Assess any potential impact on surrounding waterways in terms of water quality and aquatic ecosystems. This should include but not be limited to: (a) Onsite pollution such as accidental spills and sewer overflows; (b) Risks such as weed invasion, encroachment and litter; and (c) Vegetated buffer zones. **Hydrology, Water Management & Geotechnical** (1) Identify the impacts of the development on the existing hydrology, hydrogeology and geology of the Site. Consideration should be given to flood prone areas and the impact on wetlands and riparian zones. (2) Identify the implications for development of soil type and the presence of potential and actual acid sulfate soils if any **Noise** (1) Demonstrate the extent of noise impacts (including traffic noise) on present and possibly future adjacent developments and how they will be mitigated. (2) Identify noise limits and constraints in relation to the development and users of the development associated with airport activity. **Built form and land use** (1) Identify the provisions that will ensure the built form will complement surrounding existing land uses, assist in protecting significant views and features and achieve high quality architectural design for both landscaping and public domain. (2) Demonstrate consistency with the *Airport Height Limitation and Noise Exposure Forecast Plan* dated 17 April 1998 and justify any variations. **Transport and Access** (1) A traffic impact study in accordance with relevant RTA's Guidelines. This should include, but not be limited to the following: (a) Detail the proposed access arrangements in the context of the wider road network as well the opportunities and constraints of alternative vehicular access points. Consideration should be given to the possibility of providing an alternative access point with the new Freeway once constructed and therefore the position of the Tongarra Road access point; (b) Intersection modelling using aaSIDRA for the junction of Tongarra Road and the proposed access. This should include but not be limited to the following: (i) AM and PM peak volumes;

Key Issues (Cont)	(ii) Existing traffic volumes with and without development and 10 year projected volumes with and without development; and (iii) Justification of proposed intersection locations and design details (to meet RTA/Council requirements). Identify suitable treatments required to ameliorate any traffic and safety impacts. (c) Provide information on proposed pedestrian and cycle access within and to the site that connects to all relevant transport services and key off-site locations. **Subdivision** (1) Demonstrate that the subdivision layout is appropriate by achieving high degrees of access for all forms of transport (including walking) and detail the subdivision layout, lot size and mix, the location of open space and road network. (2) Provide a detailed contour plan to identify the finished contour levels of the site, with details provided on the earthworks required to achieve the finished contours. **Utilities Infrastructure and stormwater management** (1) Prepare a utility and infrastructure servicing report and plan for the Site that includes the identification of existing utility and infrastructure servicing the site and require augmentation works (2) Provide appropriate information on the drainage and stormwater management measures to be incorporated on site, including (but not limited to) on site stormwater detention and water sensitive urban design measures. (3) Provide appropriate information on measure to be taken to promote demand management for potable water through the site. **Staging of Development** Provide a plan demonstrating that the staging of development where applicable will proceed in an orderly and coordinated manner.
Consultation	During the preparation of the EA, you should undertake an appropriate and justified level of consultation with relevant parties during the preparation of the Environmental Assessment. If consultation has already been undertaken or will be undertaken during exhibition, this needs to be documented. Relevant agencies include: • Shellharbour City Council • Department of Planning (Wollongong) • Roads and Traffic Authority • Department of Environment and Conservation • Department of Natural Resources • Department of Transport and Rural Services • Utility and infrastructure providers, • Emergency Services, including the Ambulance Service of NSW, the State Emergency Service, RFS and NSW Fire Brigades If the Director-General considers that significant changes are proposed to the nature of the project, the Director-General may require the proponent to make the preferred project available to the public.
Deemed refusal period	60 days



Appendix B - Authority Consultation Documentation

© Masson Wilson Twiney

Table B.1 - Summary of Authority Consultation

Date	Sent by	Sent to	Subject	Summary of Correspondence/ Comments
14/12/2006	Jason Rudd (MWT)	Christopher Millet (RTA)	Agenda for Upcoming Meeting	Agenda items included Illawarra Hwy upgrade, traffic count data, future traffic growth predictions, regional road network improvements.
18/12/2006	Jason Rudd		Minutes of Meeting	Issues discussed : - Illawarra Hwy upgrade - Existing Count Data - Future traffic growth predictions / modelling methods - Regional network improvements - Requirements for Traffic Study - Contributions / Deed of Agreement - Flooding
19/12/2006	Christopher Millet (RTA)	Jason Rudd (MWT)	Traffic Data	Permanent Station Traffic count data provided to MWT
1/02/2007	Jason Rudd (MWT)	Matthew Wong (RTA)	Princes / Illawarra Hwy Modelling Report	RTA advised: - report not available (due end of Feb) - options considered included short and medium terms treatments - Contact at Wollongong Council for TRACKS modelling
13/02/2007	Jason Rudd (MWT)	Chris Millet (RTA)	Status of Princes / Illawarra Hwy Modelling Report	RTA advised: - report would be issued to MWT when reviewed internally
15/02/2007	Jason Rudd (MWT)	Matthew Wong (RTA)	Status of Princes / Illawarra Hwy Modelling Report	Preliminary report prepared awaiting internal review
26/02/2007	Jason Rudd (MWT)	Christopher Millet (RTA)	Status of Princes / Illawarra Hwy Modelling Report	Request to provide MWT with the Princes / Illawarra Hwy Modelling Report
5/03/2007	Jason Rudd (MWT)	Christopher Millet (RTA)	Status of Princes / Illawarra Hwy Modelling Report	MWT: - Requested copy of Princes / Illawarra Hwy Modelling Report - Noted the implications to the project application if report not received RTA – agreed to chase up report

Date	Sent by	Sent to	Subject	Summary of Correspondence/ Comments
20/03/2007	Jason Rudd (MWT)	Christopher Millet (RTA)	Status of Princes / Illawarra Hwy Modelling Report	RTA – still no date given for release of report
14/09/2007	Jason Rudd (MWT)	Christopher Millet (RTA)	RTA Submission to Project Application	Request for meeting to discuss the RTA submission and clarify what information required to address issues raised Further request for Princes / Illawarra Hwy Modelling Report
17/09/2007	Christopher Millet (RTA)	Jason Rudd (MWT)	Albion Park Industrial Park Proposed Rezoning	RTA to chase up information and arrange a time for a meeting
18/09/2007	Dean Brodie (MWT)	Christopher Millet (RTA)	Albion Park Rezoning – Meeting	Arrangements for meeting
18/09/2007	Dean Brodie (MWT)	Luke Preston (Shellharbour Council)	Albion Park Rezoning - Meeting to discuss traffic matters	Arrangements for meeting
20/09/2007	Dean Brodie (MWT)		Minutes of RTA meeting	Issued discussed included: - discrepancy between DGRs and request for supplementary information as presented in the submission - Upgrade of Princes / Illawarra Hwy and assessment of development traffic on intersection - Proposed development as a trip capture not just trip generator - Tongarra Road / Station St analysis - Additional traffic count data
20/09/2007	Dean Brodie (MWT)		Minutes of Shellharbour Council meeting	Issued discussed included: - Shellharbour v Wollongong Council TRACKS model - Additional traffic count data
25/09/2007	Dean Brodie (MWT)	Luke Preston (Shellharbour Council)	Request for TRACKS Modelling Information	Details provided for requested TRACKS modelling information
25/09/2007	Dean Brodie (MWT)	Christopher Millet (RTA) Nicole Stevenson (RTA)	Request for TRACKS Modelling Information	Details provided for requested modelling information
26/09/2007	Luke Preston (Shellharbour Council)	Dean Brodie (MWT)	Request for TRACKS Modelling Information	Reply to request – further information to be provided by RTA to MWT

© Masson Wilson Twiney

Date	Sent by	Sent to	Subject	Summary of Correspondence/ Comments
27/09/2007	Dean Brodie (MWT)	Christopher Millet (RTA), Nicole Stevenson (RTA)	Albion Park - Modelling Information	Request for timeline for delivery of requested information
4/10/2007	Luke Preston (Shellharbour Council)	Dean Brodie (MWT)	Request for TRACKS Modelling Information	Provision of requested turning movements from Council's TRACKS model
5/10/2007	Dean Brodie (MWT)	Luke Preston (Shellharbour Council)	Request for TRACKS Modelling Information	Queries on Council produced TRACKS modelling results
5/10/2007	Nicole Stevenson (RTA)	Dean Brodie (MWT)	Request for Paramics modelling results	Provision of base Paramics models and associated information.
5/10/2007	Dean Brodie (MWT)	Nicole Stevenson (RTA)	Request for Paramics modelling results	Queries on RTA produced Paramics model
8/10/2007	Nicole Stevenson (RTA)	Dean Brodie (MWT)	Paramics Model	Queries on RTA produced Paramics model Process for consultation and response to MWT queries
8/10/2007	Dean Brodie (MWT)	Nicole Stevenson (RTA)	Paramics Model	Queries on RTA produced Paramics model
8/10/2007	Luke Preston (Shellharbour Council)	Dean Brodie (MWT)	Request for TRACKS Modelling Information	Provision of further TRACKS information
8/10/2007	Dean Brodie (MWT)	Luke Preston (Shellharbour Council)	Request for TRACKS Modelling Information	Thanks for further information
11/10/2007	Dean Brodie (MWT)	Nicole Stevenson (RTA)	Illawarra Highway / Princes Highway Paramics Model Queries	Further queries on RTA Paramics modelling
18/10/2007	Dean Brodie (MWT)	Nicole Stevenson (RTA)	Illawarra Highway / Princes Highway Paramics Model Queries	Additional queries on RTA Paramics modelling
18/10/2007	Nicole Stevenson (RTA)	Dean Brodie (MWT)	Illawarra Highway / Princes Highway Paramics Model Queries	Partial response to additional queries on RTA Paramics modelling
25/10/2007	Dean Brodie (MWT)	Nicole Stevenson (RTA)	Illawarra Highway / Princes Highway Paramics Model Queries	Chasing response to additional queries

© Masson Wilson Twiney

Date	Sent by	Sent to	Subject	Summary of Correspondence/ Comments
26/10/2007	Dean Brodie (MWT)	MILLET Christopher P	Illawarra Road / Princes Highway Roundabout - Plans showing Staging	Request for information relating to Stage 1 and Stage 2 intersection configurations and relationship to Paramics modelling.
6/11/2007	Nicole Stevenson (RTA)	Dean Brodie (MWT)	HW1/HW25 Roundabout Channelisation Plan	Provision of plan showing existing channelisation at intersection. Still awaiting information regarding further stage works at intersection and responses to Paramics queries.

© Masson Wilson Twiney

Yvette Worboys

From: Jason Rudd
Sent: Thursday, 14 December 2006 9:07 PM
To: MILLET Christopher P
Cc: kharris@amw.com.au
Subject: Albion Park Rezoning

Follow Up Flag: Follow up
Flag Status: Red

Attachments: 063273f03.doc

Chris,

Discussion points attached for Monday's meeting (9:30am) at your office.

063273f03.doc
(258 KB)

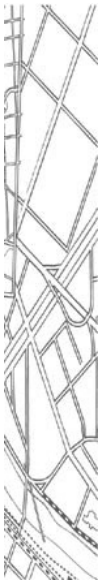
Regards

Jason Rudd
Associate

Masson Wilson Twiney Pty Limited
Suite 20
809 Pacific Highway
Chatswood NSW 2067
Phone + 61 2 9410 4100
Fax + 61 2 9410 4199
Mob + 61 418 601 094

MASSON | WILSON | TWINEY
TRAFFIC AND TRANSPORT CONSULTANTS

20/809 Pacific Highway Chatswood NSW 2067 • (t) 02 9410 4100 • (f) 02 9410 4199
info@mwttraffic.com • www.mwttraffic.com



fax

To:	Company:	Fax No:
Chris Millet	RTA	Via Email

From: Yvette
Pages:
Job No: 06-3273
Date: 14 December 2006

Subject: **Albion Park Rezoning - Discussion Points for Meeting**

Chris,

Thanks again for the opportunity to meet and discussion issues relating to the proposed rezoning of land adjacent to the Albion Park Airport.

The following are a list of discussion points which may assist you in getting your thoughts / information together before the meeting. They are by no means exhaustive and I would welcome any other issues you may wish to discuss.

1. Illawarra Highway Upgrade

Any information you can provide regarding the following would assist us in site planning, including:

- Road alignment
- Likely interchange points
- Local access road provision
- Timing of road construction
- Any indicative cost estimates
- Traffic modelling results (ie. diversion of traffic from existing routes)
- Contribution expectations and mechanisms (Section 94 / developer agreement)

2. Existing Traffic Counts / Data

- We have access to the RTA Traffic Volume Data (2003) document
- Any additional or updated data would assist us.
- The nearest count stations are:
    a. 07.035 (V)
    b. 07.037
    c. 07.038
    d. 07.039
    e. 07.040
    f. 07.298
    g. 07.297
    h. 07.296
    i. 07.293

Please telephone if the message you receive was incomplete or illegible. This facsimile may contain privileged or confidential information and is intended for the addressee only. Any unauthorised use of this information is prohibited. If you received this facsimile by mistake, please telephone us (reverse charges). Thank you. Masson Wilson Twiney Pty Limited ABN 69 063 095 009

3. Future Traffic Growth Predations

- Outputs from the RTA's TRACKS model which will assist us in assessing the traffic implications of the rezoning application.
- We are particularly interested in future land use assumptions that have gone into the model.

4. Other Regional Road Network Improvements

- Are there any other planned network improvements relevant to the site?
- Has the RTA considered / development options to improve the operation of the Princes Hwy / Illawarra Hwy intersection?

At this stage it is proposed that it will be myself and possibly Kate Harris from Ashe Morgan Property (the developer representative) who will be attending the meeting on Monday morning (9:30am).

If you have any queries, please do not hesitate to contact me on 9410 4100 or 0418 601 094.

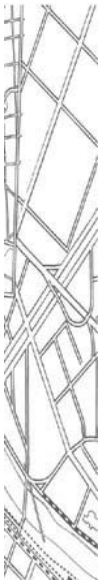
Regards

Jason Rudd

Please telephone if the message you receive was incomplete or illegible. This facsimile may contain privileged or confidential information and is intended for the addressee only. Any unauthorised use of this information is prohibited. If you received this facsimile by mistake, please telephone us (reverse charges). Thank you. Masson Wilson Twiney Pty Limited ABN 69 063 095 009
063273f03

MASSON | WILSON | TWINEY
TRAFFIC AND TRANSPORT CONSULTANTS

20/809 Pacific Highway Chatswood NSW 2067 • (t) 02 9410 4100 • (f) 02 9410 4199
info@mwttraffic.com • www.mwttraffic.com



minutes

Attendee:	Company:
Chris Millet (CM)	RTA
Jason Rudd (JR)	MWT
Nick Boyd (NB)	RTA
Glenn Mealey (GM)	Jordan & Mealey
James Wong (JW)	RTA

Date:	18 December 2006
Pages:	
Job No:	06-3273
Prepared By:	Jason Rudd

Subject: **Albion Park Rezoning - Meeting Minutes**

Meeting Location: RTA Offices, Wollongong

1. Illawarra Highway Upgrade

- CM – The RTA has a commitment to provide 4 lanes (2 each way) along the Princes Highway between Wollongong and south of Kiama. At Albion Park this commitment can be satisfied by existing road network.
- NB – However the RTA southern office is keen to pursue the construction of the Illawarra Highway Upgrade to provide dual carriageway road from Wollongong to Kiama and beyond.
- NB - RTA view the Illawarra Hwy Upgrade as a long term solution to the problem of congestion at Princes Hwy / Illawarra Hwy intersection and through Albion Park.
- NB – No funding has been provided for the project nor does the project sit on the RTA's work programme.
- CM – Tabled a document with a preferred Route Alignment. This preferred option was prepared principally to ensure that a road could be constructed to link with the Oak Flats Interchange to the south and to give some consideration to flooding.
- CM - The preferred alignment is in no way a final alignment. No detailed analysis of the alignment of the traffic implications has been undertaken.
- NB – No timing commitment to the project but likely to be a long term project.
- NB – As there is no commitment to the project the RTA are unlikely to seek contributions from existing developers (ie. Albion Park Airport Business Park). However, the RTA would seek contributions for other short term capacity improvements in lieu of Illawarra Hwy upgrade contributions.
- NB – site access to the Albion Park Business Park to be located as far east as possible along Tongarra Road to avoid future constraints to the Illawarra Hwy Upgrade interchange at Tongarra Road (not designed yet).

Please telephone if the message you receive was incomplete or illegible. This facsimile may contain privileged or confidential information and is intended for the addressee only. Any unauthorised use of this information is prohibited. If you received this facsimile by mistake, please telephone us (reverse charges). Thank you. Masson Wilson Twiney Pty Limited ABN 69 063 095 009

- CM – Local access from existing Illawarra Hwy to Upgrade will be a problem for the RTA when constructing the project. The RTA would not support access to the site from Croome Lane to Illawarra Hwy. RTA would prefer all access via Tongarra Road. Has applicant considered airside access?

2. Existing Traffic Counts / Data

- CM – The RTA will forward to MWT 2005 count data from permanent count station.

3. Future Traffic Growth Predations

- NB – Future growth and traffic distributions would be outputs from the TRACKS model. The RTA does not operate the model as it is generally managed by Councils (Wollongong, Shellharbour, Shoalhaven). MWT would need to approach Council's to get access to the model.

4. Other Regional Road Network Improvements

- CM – RTA are currently investigating short term capacity improvement options for the Princes Highway / Illawarra Highway intersection which experiences congestion and queuing due to unbalanced flows at the existing roundabout. Likely that this will involve a signalised roundabout.
- CM - Council are considering a proposal to install traffic signals at Tongarra Rd / Calderwood St.

5. Requirements for Albion Airport Business Park Traffic Study

- CM – Reiterated his comments from the PFM which were that the development is significantly larger than envisaged when RTA comments to draft DG requirements were prepared.
- CM – In addition to the DG requirements the RTA would need to see an assessment of the implications to the Illawarra Highway / Princes Hwy intersection.
- CM – The RTA would like to review the traffic generation estimates of the proposal prior to the analysis being undertaken to avoid future disagreements about traffic generation rates used (bad experience with other developments).
- CM – Distribution of proposed development traffic should be generated from the TRACKS model.

6. Contributions – Developer Agreement / Section 94

- NB – The RTA would probably seek a developer agreement for contributions to road improvement works. This would probably be contributions to the Princes Hwy / Illawarra Hwy intersection.
- CM - Developer would need to pay for all site access works necessary to facilitate access to the site.

7. Flooding (An RTA design engineer come into the meeting to discuss flooding and brief NB & CM)

- CM – The Illawarra Hwy Upgrade will need to consider flooding impacts. RTA does not know how they will address the issue, but essentially they intend to treat all impacts with the road reserve such that there is no off site impacts.
- This may mean an elevated roadway or culverts. Design unknown at this stage.

Please telephone if the message you receive was incomplete or illegible. This facsimile may contain privileged or confidential information and is intended for the addressee only. Any unauthorised use of this information is prohibited. If you received this facsimile by mistake, please telephone us (reverse charges). Thank you. Masson Wilson Twiney Pty Limited ABN 69 063 095 009

Option 6A fully satisfies this objective. The route partly follows freeway and link road reservations and is able to accommodate full development of the Wollongong/Shellharbour region, including West Dapto. Ultimately it could form part of a link south from Tongarra Road towards the Kiama Bypass if future traffic volumes exceed expectations.

Objective 2 - to provide adequate capacity for the predicted volumes of traffic for both weekday traffic and weekend traffic for at least the next 30 years.

Option 6A satisfies this objective.

Objective 3 - to improve road safety and reduce the accident rate to a level which is comparable with other parts of the State.

All options were designed in concept form to a standard which would improve safety and reduce accident rates.

Objective 4 - to reduce conflict between through and local traffic in the study area.

Through traffic will be separated from local traffic, and there will be no direct access to the new road.

Objective 5 - to be compatible with existing and future residential. commercial and industrial development in Shellharbour and Wollongong.

Option 6A fulfils this objective. It can accommodate the growth in the study area. Effects on existing development are relatively minor, and the effect on the Croome Road Sporting Complex is manageable.

Objective 6 - to maintain or enhance the environmental quality and amenity of the study area.

Option 6A leaves sufficient distance from residential areas for the construction of landscaped sound mounds and this provides significant positive benefits in reduction of traffic noise, air quality and local amenity.

Objective 7 - to provide a net economic benefit by a ratio of 2:1 relative to investment costs.

Option 6A provides a benefit/cost ratio of 2.9:1

WHAT HAPPENS NEXT?

The RTA has adopted Option 6A as the long term route for the Princes Highway on the basis that it best satisfies the project objectives and is likely to cause least overall environmental and social impact. In the longer term (40 years plus) the route could be potentially redirected to continue directly south toward Kiama if justified on transportation and environmental grounds.

As part of the strategic planning process for this project, the RTA will:

* liaise with Shellharbour Council to identify adjustments required to the Croome Road Sporting Complex and to ensure that future development of the Complex will be compatible with the preferred option
* carry out sufficient concept design to identify new road boundaries, so that the route can be formally incorporated into the relevant planning instruments
* monitor road safety and traffic flow along the existing Highway between Yallah and Oak Flats and provide short term upgrading works where necessary until Option 6A is constructed
* proceed with the detailed design and construction of the Oak Flats Interchange, connecting with the East-West Link when it is constructed
* assist Council with the design of the East-West Link to ensure that it can be incorporated as part of the Highway in the future

CONTACTS

If you have any queries please contact either

Ken Collis, Zone Planner (042) 212 445

or

Brian Lefoe, Project Manager (042) 212 428

Roads and Traffic Authority
PO Box 477
Wollongong East 2520

Fax (042)273705

RTA
Roads and Traffic Authority New South Wales

POSTAGE PAID AUSTRALIA

YALLAH TO OAK FLATS
ROUTE SELECTION STUDY

NEWSLETTER NO. 5 AUGUST 1996

INTRODUCTION

The purpose of this newsletter is to announce the RTA's preferred option and indicate the next steps in the planning process.

The previous Newsletter (No 4) sought comments on Option 5A, a western route which combined some aspects of both Options 5 and 6.

FINDINGS

Connell Wagner's study indicated a western route as the superior alternative. This conclusion resulted from an analysis of various factors including road user benefits, environment (ie flora, noise, air quality, heritage), community impact, land use, cost and recreation facilities. All options had similar engineering construction costs, but the eastern options had very high acquisition costs compared to the western options.

The significant difference between Options 5 and 6 was the additional length of Option 6 and the effect on the Croome Sporting Complex of Option 5. Option 5A presented in Newsletter No 4 reduced the effect on the developed area of the Complex, but was closer to houses in Croome Rd and affected the remnant bushland.

Discussions with Council's officers and the response to Newsletter No 4 clearly indicated that the effects of options 5, 6 and 5A on the Croome Road Sporting Complex were unacceptable. As a result, the RTA carried out some additional concept design work to develop a route which minimised the effect on the Croome Road Sport Complex. This route, designated 6A, is shown on the map overleaf.

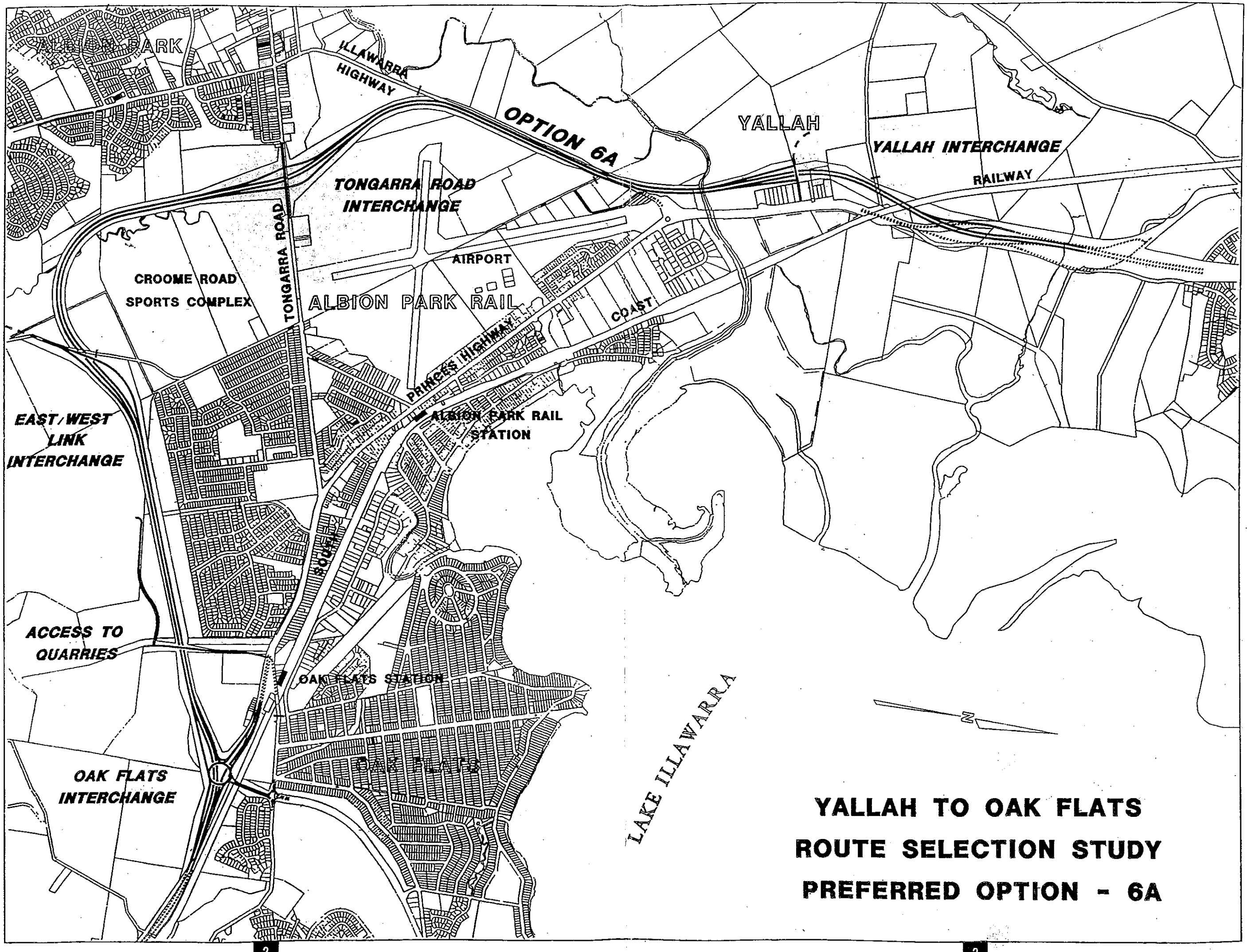
An interchange is provided at Tongarra Road and a connection to the East West Link is provided near Croome Road. The route could be modified in the future so the Highway could continue directly south toward Kiama.

Following consideration of the report by Connell Wagner, the submissions received and subsequent discussions with Shellharbour Councillors and Staff, the Roads and Traffic Authority has adopted Option 6A as the preferred long term route for the Princes Highway.

PROJECT OBJECTIVES

When the study commenced, seven major objectives were identified, and the route selected had to satisfy these objectives.

Objective 1 - to establish a suitable corridor which would serve as a major transport route for this section of the Princes Highway in the long term.


ILLAWARRA HIGHWAY
OPTION 6A
YALLAH
YALLAH INTERCHANGE
RAILWAY
TONGARRA ROAD INTERCHANGE
TONGARRA ROAD
AIRPORT
CROOME ROAD SPORTS COMPLEX
ALBION PARK RAIL
COAST
PRINCES HIGHWAY
EAST / WEST LINK INTERCHANGE
ALBION PARK RAIL STATION
SOUTH
ACCESS TO QUARRIES
OAK FLATS STATION
OAK FLATS
OAK FLATS INTERCHANGE
LAKE ILLAWARRA
N
YALLAH TO OAK FLATS
ROUTE SELECTION STUDY
PREFERRED OPTION - 6A

Yvette Worboys

From: MILLET Christopher P [Christopher_MILLET@rta.nsw.gov.au]
Sent: Tuesday, 19 December 2006 4:34 PM
To: Jason Rudd
Subject: Albion Park rezoning
Follow Up Flag: Follow up
Flag Status: Red
Attachments: 20061218_Albion_Park_DA.zip

Jason

1. Traffic count data - permanent station - see attached
2. Estimated future traffic volumes on the freeway - Still awaiting advice
3. Traffic Signals - The traffic signals proposal that was brought up along Tongarra Rd is a Council proposal and is not at Station St, its at Calderwood St (west of Terry St)

Cheers

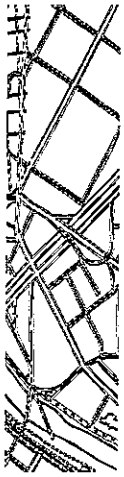
Chris Millet

Manager, Land Use Development Impacts
Road Safety & Traffic Management
Southern Region
Roads and Traffic Authority

P - 4221 2570
F - 4221 2777

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. The RTA is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of the RTA. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. You must not disclose, copy or use any part of this e-mail if you are not the intended recipient.



MASSON | WILSON | TWINEY
TRAFFIC AND TRANSPORT CONSULTANTS
20/809 Pacific Highway Chatswood NSW 2067 • (t) 02 9410 4100 • (f) 9410 4199
info@mwttraffic.com.au • www.mwttraffic.com.au

Calculation/Records

Project: Delma Albion Park

Task: Matthew Wong. (RTA)

Job No: 06-3273

Sheet No:

Prepared By: J.R

Date: 1/2/07

- (MW) undertaking modelling of options to improve operation of Princes / Illawarra Hwy intersection.
- (MW) key issue is capacity of left turn (AM) from Illawarra to Princes.

options under consideration:

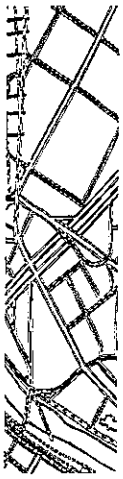
AM Peak - left slip lane Illawarra to Princes

PM Peak - signal metering /
- grade separation

- (MW) referred TRACKS modelling to Ted Calling Wollongong Council 4227 7111

- (MW) RTA results on intersection modelling due out end of Feb. 07

Comments:



MASSON | WILSON | TWINEY
TRAFFIC AND TRANSPORT CONSULTANTS
20/809 Pacific Highway Chatswood NSW 2067 • (t) 02 9410 4100 • (f) 9410 4199
info@mwttraffic.com.au • www.mwttraffic.com.au

Calculation/Records

Project: Delmo Albion Park.

Task: Chris Millett (RTA)

Job No: 06-3273

Sheet No:

Prepared By: J.R.

Date: 13/2/2007

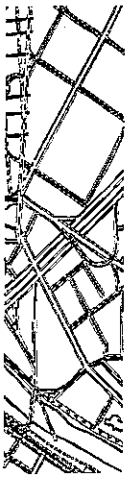
Re: Status of RTA modelling report for Princes Hwy / Illawarra Hwy Intersection.

(JR): Rang CM to request update on progress on modelling report for hwy's intersection as discuss at previous meeting

(CM): Confirmed copy would be issued to MWT to assist assessment of development.

Refer query on timing to Matthew Wang (RTA).

Comments:



MASSON | WILSON | TWINEY
TRAFFIC AND TRANSPORT CONSULTANTS
20/809 Pacific Highway Chatswood NSW 2067 • (t) 02 9410 4100 • (f) 9410 4199
info@mwttraffic.com.au • www.mwttraffic.com.au

Calculation/Records

Project: Delmo Albion Park.

Task: Matthew Way (RTA)

Job No: 06-3273

Sheet No:

Prepared By: J.R

Date: 15/2/07

Re Princes Hwy / Illawarra Hwy Modelling

- MW advised that a draft report with preliminary modelling result was ready for review
- MW once reviewed it would be available to MWT.
- MW uncertain of timing of review.
- report to be review by RTA @ director level.

Comments:

Yvette Worboys

From: Jason Rudd
Sent: Monday, 26 February 2007 12:20 PM
To: MILLET Christopher P
Subject: Albion Park Rezoning (Site next to the airport)

Follow Up Flag: Follow up
Flag Status: Red

Chris,

From my discussions with Matthew Wong it is understood that his report detailing improvement options for the Princes Hwy / Illawarra Hwy intersection has been prepared and is awaiting internal RTA review before it can become a public document.

The environmental investigations for the site have determined a developable area and thus allowed us to estimate future traffic flows. Cardno Eppell Olsen are modelling, in TRACKS, future distributions.

We have already identified the Princes Hwy / Illawarra Hwy as a critical intersection for analysis. Obviously there are existing congestion constraints and rezoning the Albion Park site to light industrial will only put more traffic through the intersection. Thus it is likely that the rezoning will bring forward the need for any future intersection improvement works.

It would be appreciated if you could expedite the release of the report such that we can undertake an assessment of the improvement options with rezoning traffic and possible contributions for works.

If you have any queries, please do not hesitate to contact me.

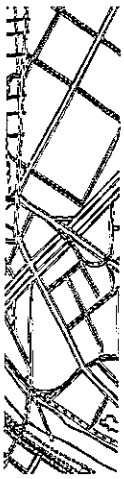
Regards

Jason Rudd
Associate

MWT Transport Planning
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0418 601 094
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.



MASSON | WILSON | TWINEY
TRAFFIC AND TRANSPORT CONSULTANTS
20/809 Pacific Highway Chatswood NSW 2067 • (t) 02 9410 4100 • (f) 9410 4199
info@mwttraffic.com.au • www.mwttraffic.com.au

Calculation/Records

Project: Delvo Albion Park.

Task: Chris Millett (RTA).

Job No: 063273.

Sheet No:

Prepared By: J.R.

Date: 5/3/07.

- JR rang to enquire about the progress of the Princes Hwy / Illawarra Hwy modelling reports.
- CM advised timing uncertain but should be soon.
- JR noted that the Project Application was near lodgement and would benefit from the results of the modelling. At this stage no one outside RTA is aware of what is proposed for Hwy intersections. If unavailable MWT would only be able to assess the traffic implications of development on the existing layout.
- CM agreed to clear up report.

20/3/07. JR / CM.

- CM still no news on progress of modelling reports for Princes / Illawarra Hwy.

Comments:

Yvette Worboys

From: Jason Rudd
Sent: Friday, 14 September 2007 3:46 PM
To: MILLET Christopher P
Cc: Dean Brodie
Subject: Albion Park Industrial Park Proposed Rezoning

Follow Up Flag: Follow up
Flag Status: Red

Attachments: Albion Park Rezoning (Site next to the airport)

Chris,

I've tried calling you a couple of times without luck so I thought I'd try another approach.

I'm working my way through the various submissions made to the DoP regarding the proposed rezoning for the Illawarra Business Park adjacent to the Albion Park airport. One of which is from the RTA.

We would like to arrange a meeting with the RTA to discuss the RTA's submission to clarify what information is required by way of a response and what information the RTA can provide us with to assist in preparing said response.

One of the key issues raised in the RTA's submission was the operation of the Princess Hwy / Illawarra Hwy intersection.

As you would recall we were discussing on several occasions that the RTA were considering options to improve the existing operational constraints at the intersection and that the modelling results and associated report would be made available to us to allow an assessment with site generated traffic once the modelling was completed (see attached email).

Albion Park
Rezoning (Site nex..

This information / report has not been provided to MWT. Hence my surprise the other day to see workmen installing lights at the roundabout and the comments in the submission relating to these works. Could you please provide us with a copy of the modelling report which considered the various improvement options at this intersection.

Further - it is requested that a concept plan of the Wongarra Road site access be provided. What level of detail is required for this concept plan. Could you please provide further details of the information required for the concept plan. Thanks

If you have any queries, please do not hesitate to contact myself or Dean Brodie on 9410 4100.

Regards

Jason Rudd
Associate

MWT Transport Planning
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0418 601 094
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

Yvette Worboys

From: MILLET Christopher P [Christopher_MILLET@rta.nsw.gov.au]
Sent: Monday, 17 September 2007 4:01 PM
To: Jason Rudd
Subject: RE: Albion Park Industrial Park Proposed Rezoning
Follow Up Flag: Follow up
Flag Status: Completed

Jason

Sorry have been very busy. Will chase up the info below tomorrow and call re a meeting

Cheers
Chris

From: Jason Rudd [mailto:jason.rudd@mwttraffic.com.au]
Sent: Friday, 14 September 2007 3:46 PM
To: MILLET Christopher P
Cc: Dean Brodie
Subject: Albion Park Industrial Park Proposed Rezoning

Chris,

I've tried calling you a couple of times without luck so I thought I'd try another approach.

I'm working my way through the various submissions made to the DoP regarding the proposed rezoning for the Illawarra Business Park adjacent to the Albion Park airport. One of which is from the RTA.

We would like to arrange a meeting with the RTA to discuss the RTA's submission to clarify what information is required by way of a response and what information the RTA can provide us with to assist in preparing said response.

One of the key issues raised in the RTA's submission was the operation of the Princess Hwy / Illawarra Hwy intersection.

As you would recall we were discussing on several occasions that the RTA were considering options to improve the existing operational constraints at the intersection and that the modelling results and associated report would be made available to us to allow an assessment with site generated traffic once the modelling was completed (see attached email).

<<Albion Park Rezoning (Site next to the airport)>>

This information / report has not been provided to MWT. Hence my surprise the other day to see workmen installing lights at the roundabout and the comments in the submission relating to these works. Could you please provide us with a copy of the modelling report which considered the various improvement options at this intersection.

Further - it is requested that a concept plan of the Wongarra Road site access be provided. What level of detail is required for this concept plan. Could you please provide further details of the information required for the concept plan. Thanks

If you have any queries, please do not hesitate to contact myself or Dean Brodie on 9410 4100.

Yvette Worboys

From: Dean Brodie
Sent: Tuesday, 18 September 2007 3:30 PM
To: Christopher_MILLET@rta.nsw.gov.au
Subject: Albion Park Rezoning - Meeting

Follow Up Flag: Follow up
Flag Status: Red

Good afternoon Chris

At this stage both myself and Bruce Masson will be attending this meeting. I am awaiting confirmation from the planner and client whether they also wish to attend. Therefore it would be appreciated if you could lock in 2pm this Thursday.

Do you suggest that Council's Traffic Engineer is also invited to attend to discuss the differences in the TRACKS model results or whether both Bruce and myself meet with them separately?

I look forward to your advice.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

Yvette Worboys

From: MILLET Christopher P [Christopher_MILLET@rta.nsw.gov.au]
Sent: Tuesday, 18 September 2007 3:32 PM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Meeting
Follow Up Flag: Follow up
Flag Status: Red

Dean

Good idea. In this regard you should give Luke Preston at Shellharbour Council a call

Cheers

Chris Millet
Manager, Land Use Development Impacts
Southern Region
Roads and Traffic Authority

P - 4221 2570
F - 4221 2777

From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Tuesday, 18 September 2007 3:30 PM
To: MILLET Christopher P
Subject: Albion Park Rezoning - Meeting

Good afternoon Chris

At this stage both myself and Bruce Masson will be attending this meeting. I am awaiting confirmation from the planner and client whether they also wish to attend. Therefore it would be appreciated if you could lock in 2pm this Thursday.

Do you suggest that Council's Traffic Engineer is also invited to attend to discuss the differences in the TRACKS model results or whether both Bruce and myself meet with them separately?

I look forward to your advice.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of

Yvette Worboys

From: MILLET Christopher P [Christopher_MILLET@rta.nsw.gov.au]
Sent: Tuesday, 18 September 2007 3:43 PM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Meeting
Follow Up Flag: Follow up
Flag Status: Red

Dean

Sounds good

Cheers
Chris

From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Tuesday, 18 September 2007 3:42 PM
To: MILLET Christopher P
Subject: RE: Albion Park Rezoning - Meeting

Chris

At this stage Luke is unavailable for a meeting at 2pm so we will be meeting with him at 12pm prior to our meeting with yourself. This might work better because we can then bring any common issues to the table at the meeting with yourself.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: MILLET Christopher P [mailto:Christopher_MILLET@rta.nsw.gov.au]
Sent: Tuesday, 18 September 2007 3:32 PM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Meeting

Dean

Yvette Worboys

From: Dean Brodie
Sent: Tuesday, 18 September 2007 3:48 PM
To: luke.preston@shellharbour.nsw.gov.au
Subject: Albion Park Rezoning - Meeting to discuss traffic matters

Follow Up Flag: Follow up
Flag Status: Red

Luke

Further to our telephone conversation both Bruce Masson and myself look forward to meeting with you at your office at 2pm on Thursday 20 September to discuss outstanding traffic matters with the above proposal.

Please contact me prior if there is any specific information you would like me to bring to this meeting.

Regards

Dean Brodie
Executive Transport Planner

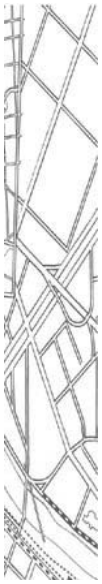
Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

MASSON | WILSON | TWINEY
TRAFFIC AND TRANSPORT CONSULTANTS

20/809 Pacific Highway Chatswood NSW 2067 • (t) 02 9410 4100 • (f) 02 9410 4199
info@mwttraffic.com.au • www.mwttraffic.com.au



minutes of meeting

Meeting:	Albion Park Rezoning RTA Meeting
Project:	063273 – Albion Park Rezoning
Date of Meeting:	Thursday 20 September 2007
Time of Meeting:	2:00pm
Location:	RTA Wollongong Office
Attendance:	Bruce Masson (BM) - Masson Wilson Twiney Dean Brodie (DB) - Masson Wilson Twiney Chris Millet (CM) – NSW Roads and Traffic Authority Nicole Stevenson (NS) – NSW Roads and Traffic Authority

Item No.	Description	Action
1.	DB provided a summary of the work undertaken to date and advised that the purpose of this meeting was to discuss the RTAs request for additional information as detailed in their submission letter dated 30/8/07	-
2.	BM asked why the request for information in the RTA letter dated 30/8/07 included additional information to that listed in the Director General requirements. CM advised that the RTA requires additional information so they can make an informed assessment of the project whether or not this information was listed in the DG requirements	-
3.	CM advised that the roundabout at the intersection of Princes Highway / Illawarra Highway had been upgraded and would be subject to a Stage 2 upgrade in the near future.	-
4.	NS advised that fresh traffic counts of the roundabout were required to analyse the impacts of the proposed development on Stage 1 and Stage 2 of the roundabout upgrade	Traffic counts / additional modelling required
5.	All discussed the best method to model the signalised roundabout and it was agreed that the Paramics Microsimulation software package offered the best method to analyse potential impacts	-
6.	DB requested copy of RTA's Paramics model of the signalised roundabout. NS advised that she would obtain a copy of the model and forward it to MWT	NS to provide copy of Paramics model

© Masson Wilson Twiney

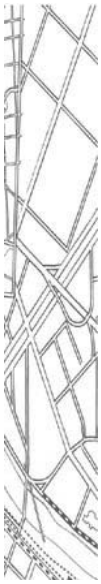
Item No.	Description	Action
7.	BM advised that provision of employment at the site could result in a shift of existing employment trips travelling from the south to / from Wollongong to the site. This would reduce existing traffic volumes through the roundabout in question which may counterbalance partly the traffic impacts of the site at this roundabout. CM agreed that this may be the case and the shift in traffic volumes should be quantified. DB advised that he would request Eppel Olsen to provide this data.	DB to request Eppel Olsen to analyse shift in O/D trips from TRACKS model
8.	CM advised that intersection counts at Toongarra Road and Station Street should be undertaken as traffic to / from the north would use this intersection and not pass through the intersection of Princes Highway / Toongarra Road. NS also advised that SIDRA analysis of this intersection was required to analyse existing and future traffic conditions	DB to organise traffic counts at Toongarra Rd / Station St intersection and SIDRA analysis
9.	DB advised that Luke Preston of Shellharbour Council requested intersection counts and SIDRA analysis of Croome Road / Toongarra Road intersection. CM advised that the RTA would support this request.	-
10.	DB advised that he would provide copies of all TRACKS models prepared by Eppel Olsen as requested by the RTA	Copies of TRACKS models to be provided to RTA
11.	DB advised that he would provide copies of all SIDRA models prepared by MWT as requested by the RTA	Copies of SIDRA models to be provided to RTA

The meeting finished at approximately 3:30pm.

© Masson Wilson Twiney

MASSON | WILSON | TWINEY
TRAFFIC AND TRANSPORT CONSULTANTS

20/809 Pacific Highway Chatswood NSW 2067 • (t) 02 9410 4100 • (f) 02 9410 4199
info@mwttraffic.com.au • www.mwttraffic.com.au



minutes of meeting

Meeting:	Albion Park Rezoning Council Meeting
Project:	063273 – Albion Park Rezoning
Date of Meeting:	Thursday 20 September 2007
Time of Meeting:	12:00pm
Location:	Shellharbour Council Office
Attendance:	Bruce Masson (BM) - Masson Wilson Twiney Dean Brodie (DB) - Masson Wilson Twiney Luke Preston (LP) – Shellharbour Council

Item No.	Description	Action
1.	DB provided a summary of the work undertaken to date and determine a way forward to resolve all outstanding issues pertaining to traffic and parking as detailed in Council's submission during the exhibition of the proposal.	-
2.	LP indicated that Shellharbour Council had taken the TRACKS model for the area and disaggregated the zoning of the model to more than 400 zones.	-
3.	LP advised that Council's TRACKS model indicated significant traffic volume increase in Tongarra Road and that the road would require widening to two lanes in each direction in the future. LP also advised that analysis of the future traffic volumes from Council's TRACKS model also indicated that the access road into the site would operate at a poor level of service in the future.	-
4.	DB requested that Council provide a copy of all TRACKS model outputs for each scenario so comparisons could be made between the Eppel Olsen TRACKS model, Council's TRACKS model and the RTA's tracks model.	LP to provide model outputs including turn flows
5.	LP advised that traffic counts and operational assessment of the intersection of Tongarra Road / Croome Road was required to analyse future traffic impacts on this intersection following ultimate occupation of the development.	DB to arrange traffic counts / intersection operation assessment using SIDRA

The meeting finished at approximately 12:45pm.

© Masson Wilson Twiney

Yvette Worboys

From: Dean Brodie
Sent: Tuesday, 25 September 2007 2:52 PM
To: Luke Preston
Subject: Albion Park Rezoning - Request for TRACKS Modelling Information

Follow Up Flag: Follow up
Flag Status: Red

Good afternoon Luke

Firstly thank you for meeting with us as short notice last week. Following our meeting with yourself and the RTA, I believe we now have clear direction on resolving the outstanding traffic matters associated with the above proposal.

As discussed if would be appreciated if you could provide the following at your earliest convenience from Council's TRACKS model:

- 2006 Base AM Peak, PM Peak and Daily traffic flows including turn counts;
- 2018 WITHOUT development AM Peak, PM Peak and Daily traffic flows including turn counts; and
- 2018 WITH development AM Peak, PM Peak and Daily traffic flows including turn counts.

Intersections that should be included in providing turn count information should include:

- Princes Highway / Illawarra Highway
- Princes Highway / Station Street
- Prince Highway / Toongarra Road
- Toongarra Road / Station Street
- Toongarra Road / Croome Road
- Toongarra Road / Illawarra Highway / Terry Road

It would be appreciated if you could all this information in hard copy format as we do not have access to the TRACKS model.

Thank you for your assistance so far and I look forward to receiving this information.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

Yvette Worboys

From: Dean Brodie
Sent: Tuesday, 25 September 2007 2:56 PM
To: MILLET Christopher P; Nicole_STEVENSON@rta.nsw.gov.au
Subject: Albion Park Rezoning - Modelling Information

Follow Up Flag: Follow up
Flag Status: Red

Dear All

Firstly thank you for meeting with us last week to discuss the above project.

I can confirm that traffic counts at the intersection of Tongarra Road / Station Street and Tongarra Road / Croom Road have been undertaken this week.

As discussed it would be appreciated if you could provide the forecast traffic flows modelled from the Paramics model for the intersection of Princes Highway / Illawarra Highway and which years each set of data relates to. We would appreciate both peak periods and which times these times relate to.

I look forward to receiving this information.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

Yvette Worboys

From: Dean Brodie
Sent: Thursday, 27 September 2007 4:06 PM
To: 'MILLET Christopher P'; 'Nicole_STEVENSON@rta.nsw.gov.au'
Subject: RE: Albion Park Rezoning - Modelling Information

Follow Up Flag: Follow up
Flag Status: Red

Good afternoon All

The client is endeavouring to set a timetable to finalise all outstanding matters and to undertake any further work / modelling required to provide the relevant stakeholders with the information they require.

So I can determine this timetable, can you give me a timeframe as to when the modelling information from the RTA on the recently upgraded roundabout may be available. I will then be able to add in our time for reviewing and reporting.

Thank you for your time and I look forward to your response.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: Dean Brodie
Sent: Tuesday, 25 September 2007 2:56 PM
To: MILLET Christopher P; Nicole_STEVENSON@rta.nsw.gov.au
Subject: Albion Park Rezoning - Modelling Information

Dear All

Firstly thank you for meeting with us last week to discuss the above project.

I can confirm that traffic counts at the intersection of Tongarra Road / Station Street and Tongarra Road / Croom Road have been undertaken this week.

As discussed it would be appreciated if you could provide the forecast traffic flows modelled from the Paramics model for the intersection of Princes Highway / Illawarra Highway and which years each set of data relates to. We would appreciate both peak periods and which times these times relate to.

I look forward to receiving this information.

Yvette Worboys

From: Luke Preston [luke.preston@shellharbour.nsw.gov.au]
Sent: Wednesday, 26 September 2007 8:41 AM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information
Follow Up Flag: Follow up
Flag Status: Red
Attachments: header.htm

Dean

The information you've requested goes beyond what is readily available and as a result I'll have to rerun some of the options, particularly for the AM and PM peaks. I expect that I should be able to send you the information by Friday 5th October.

Regards

Luke Preston

-----Original Message-----
From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Tuesday, 25 September 2007 2:52 PM
To: Luke Preston
Subject: Albion Park Rezoning - Request for TRACKS Modelling Information

Good afternoon Luke

Firstly thank you for meeting with us as short notice last week. Following our meeting with yourself and the RTA, I believe we now have clear direction on resolving the outstanding traffic matters associated with the above proposal.

As discussed if would be appreciated if you could provide the following at your earliest convenience from Council's TRACKS model:

- 2006 Base AM Peak, PM Peak and Daily traffic flows including turn counts;
- 2018 WITHOUT development AM Peak, PM Peak and Daily traffic flows including turn counts; and
- 2018 WITH development AM Peak, PM Peak and Daily traffic flows including turn counts.

Intersections that should be included in providing turn count information should include:

- Princes Highway / Illawarra Highway
- Princes Highway / Station Street
- Prince Highway / Toongarra Road
- Toongarra Road / Station Street
- Toongarra Road / Croome Road
- Toongarra Road / Illawarra Highway / Terry Road

It would be appreciated if you could all this information in hard copy format as we do not have access to the TRACKS model.

Thank you for your assistance so far and I look forward to receiving this information.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

Please consider the environment before printing this email notice.

****
DISCLAIMER NOTICE: This communication contains information which is confidential and the copyright of Shellharbour City Council or a third party.

This E-mail, including any attached files, contains confidential and may contain privileged information. Any privilege is not waived nor lost or destroyed by mistaken de
mail nor any of its attachments and must immediately delete this E-mail. The Shellharbour City Council believes that this E-
mail and any attachments are free of any virus or other defect which may affect the operation of a computer. Despite this, it is the responsibility of the recipient to ensure
mail or any attachments.
****

To visit Council's website go to www.shellharbour.nsw.gov.au

Yvette Worboys

From: Dean Brodie
Sent: Wednesday, 26 September 2007 8:50 AM
To: Luke Preston
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information
Follow Up Flag: Follow up
Flag Status: Red
Attachments: header.htm

Good morning Luke

I apologise if my request causes you too much inconvenience and appreciate your efforts in obtaining this information.

I can confirm that we undertook the intersection counts this week at Tongarra / Croom and Tongarra / Station as requested by yourself and the RTA.

Regards
Dean

From: Luke Preston [mailto:luke.preston@shellharbour.nsw.gov.au]
Sent: Wed 26/09/2007 8:41 AM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information

Dean

The information you've requested goes beyond what is readily available and as a result I'll have to rerun some of the options, particularly for the AM and PM peaks. I expect that I should be able to send you the information by Friday 5th October.

Regards

Luke Preston

-----Original Message-----
From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Tuesday, 25 September 2007 2:52 PM
To: Luke Preston
Subject: Albion Park Rezoning - Request for TRACKS Modelling Information

Good afternoon Luke

Firstly thank you for meeting with us as short notice last week. Following our meeting with yourself and the RTA, I believe we now have clear direction on resolving the outstanding traffic matters associated with the above proposal.

As discussed if would be appreciated if you could provide the following at your earliest convenience from Council's TRACKS model:

- 2006 Base AM Peak, PM Peak and Daily traffic flows including turn counts;
- 2018 WITHOUT development AM Peak, PM Peak and Daily traffic flows including turn counts; and
- 2018 WITH development AM Peak, PM Peak and Daily traffic flows including turn counts.

Intersections that should be included in providing turn count information should include:

- Princes Highway / Illawarra Highway
- Princes Highway / Station Street
- Prince Highway / Toongarra Road
- Toongarra Road / Station Street
- Toongarra Road / Croome Road
- Toongarra Road / Illawarra Highway / Terry Road

It would be appreciated if you could all this information in hard copy format as we do not have access to the TRACKS model.

Thank you for your assistance so far and I look forward to receiving this information.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

Please consider the environment before printing this email notice.

****
DISCLAIMER NOTICE: This communication contains information which is confidential and the copyright of Shellharbour City Council or a third party.

This E-mail, including any attached files, contains confidential and may contain privileged information. Any privilege is not waived nor lost or destroyed by mistaken de

Yvette Worboys

From: Luke Preston [luke.preston@shellharbour.nsw.gov.au]
Sent: Thursday, 4 October 2007 4:24 PM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information
Follow Up Flag: Follow up
Flag Status: Red
Attachments: header.htm; lp2010 delmo.doc

Dean

Please find attached the requested turning movement information. At the front of the document are the intersection node summary diagrams – followed by the turning movement flows at each of the intersections for each of the land use years and models (AM, PM & 24HR).

If you have any questions please call me on 02 4221 6039.

Regards

Luke Preston

-----Original Message-----
From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Wednesday, 26 September 2007 8:50 AM
To: Luke Preston
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information

Good morning Luke

I apologise if my request causes you too much inconvenience and appreciate your efforts in obtaining this information.

I can confirm that we undertook the intersection counts this week at Tongarra / Croom and Tongarra / Station as requested by yourself and the RTA.

Regards
Dean

From: Luke Preston [mailto:luke.preston@shellharbour.nsw.gov.au]
Sent: Wed 26/09/2007 8:41 AM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information

Dean

The information you've requested goes beyond what is readily available and as a result I'll have to rerun some of the options, particularly for the AM and PM peaks. I expect that I should be able to send you the information by Friday 5th October.

Regards

Luke Preston

-----Original Message-----
From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Tuesday, 25 September 2007 2:52 PM
To: Luke Preston
Subject: Albion Park Rezoning - Request for TRACKS Modelling Information

Good afternoon Luke

Firstly thank you for meeting with us as short notice last week. Following our meeting with yourself and the RTA, I believe we now have clear direction on resolving the outstanding traffic matters associated with the above proposal.

As discussed if would be appreciated if you could provide the following at your earliest convenience from Council's TRACKS model:

- 2006 Base AM Peak, PM Peak and Daily traffic flows including turn counts;
- 2018 WITHOUT development AM Peak, PM Peak and Daily traffic flows including turn counts; and
- 2018 WITH development AM Peak, PM Peak and Daily traffic flows including turn counts.

Intersections that should be included in providing turn count information should include:

- Princes Highway / Illawarra Highway
- Princes Highway / Station Street
- Prince Highway / Toongarra Road
- Toongarra Road / Station Street
- Toongarra Road / Croome Road
- Toongarra Road / Illawarra Highway / Terry Road

It would be appreciated if you could all this information in hard copy format as we do not have access to the TRACKS model.

Thank you for your assistance so far and I look forward to receiving this information.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Yvette Worboys

From: Dean Brodie
Sent: Friday, 5 October 2007 1:31 PM
To: Luke Preston
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information
Follow Up Flag: Follow up
Flag Status: Red

Luke

We have reviewed all the forecast information you have provided and it appears we are missing the following:

1. AM 2008 with development intersection flows at Node 3419
2. AM 2018 with development intersection flows at Node 3420

It would be appreciated if you could print out the flows for the above scenarios.

In addition to this so we can 'balance' flows along Tongarra Road, I was wondering whether we could obtain intersection flows for all scenarios for **Node 1962** as the eastbound / westbound flows between Croome Road and Princes Highway differ by a fair margin even after taking into account flows at the intersection of Tongarra Road / Station Street. I think Node 1962 is **Ash Avenue**.

Your assistance so far has been appreciated.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: Luke Preston [mailto:luke.preston@shellharbour.nsw.gov.au]
Sent: Thursday, 4 October 2007 4:24 PM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information

Dean

Please find attached the requested turning movement information. At the front of the document are the intersection node summary diagrams – followed by the turning movement flows at each of the intersections for each of the land use years and models (AM, PM & 24HR).

If you have any questions please call me on 02 4221 6039.

Regards

Luke Preston

-----Original Message-----
From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Wednesday, 26 September 2007 8:50 AM
To: Luke Preston
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information

Good morning Luke

I apologise if my request causes you too much inconvenience and appreciate your efforts in obtaining this information.

I can confirm that we undertook the intersection counts this week at Tongarra / Croom and Tongarra / Station as requested by yourself and the RTA.

Regards
Dean

From: Luke Preston [mailto:luke.preston@shellharbour.nsw.gov.au]
Sent: Wed 26/09/2007 8:41 AM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information

Dean

The information you've requested goes beyond what is readily available and as a result I'll have to rerun some of the options, particularly for the AM and PM peaks. I expect that I should be able to send you the information by Friday 5th October.

Regards

Luke Preston

-----Original Message-----
From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Tuesday, 25 September 2007 2:52 PM

Yvette Worboys

From: STEVENSON Nicole R [Nicole_STEVENSON@rta.nsw.gov.au]
Sent: Friday, 5 October 2007 3:28 PM
To: Dean Brodie
Cc: MILLET Christopher P
Follow Up Flag: Follow up
Flag Status: Red
Attachments: sh1_sh25.zip

Hi Dean

Please find attached base Paramics models and associated information for the intersection of the Princes Highway and the Illawarra Highway.

Please note that as the facility is open, the RTA requires the applicant to undertake traffic counts at the intersection to provide up to date traffic volume information. These traffic counts must be used in the development of a revised base model. Details regarding the traffic counts completed plus each modelled scenario (as previously requested) will need to be submitted to the RTA for review.

Please also note that this modelling is provided for this project only. The information remains the property of the RTA and cannot be used for any other purpose. The use of this modelling is at the applicant's risk.

Should you have any questions, please contact me on 42212523.

Regards

Nicole

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. The RTA is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of the RTA. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. You must not disclose, copy or use any part of this e-mail if you are not the intended recipient.

Yvette Worboys

From: Dean Brodie
Sent: Friday, 5 October 2007 4:05 PM
To: STEVENSON Nicole R
Cc: MILLET Christopher P
Subject: Albion Park Rezoning - Paramics Model
Follow Up Flag: Follow up
Flag Status: Red

Nicole

Thank you for sending through the Paramics model and we will review this afternoon.

Can you provide the name of the contact person in the RTA who built the model so if there are any technical questions we contact them directly?

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: STEVENSON Nicole R [mailto:Nicole_STEVENSON@rta.nsw.gov.au]
Sent: Friday, 5 October 2007 3:28 PM
To: Dean Brodie
Cc: MILLET Christopher P
Subject:

Hi Dean

Please find attached base Paramics models and associated information for the intersection of the Princes Highway and the Illawarra Highway.

Please note that as the facility is open, the RTA requires the applicant to undertake traffic counts at the intersection to provide up to date traffic volume information. These traffic counts must be used in the development of a revised base model. Details regarding the traffic counts completed plus each modelled scenario (as previously requested) will need to be submitted to the RTA for review.

Please also note that this modelling is provided for this project only. The information remains the property of the RTA and cannot be used for any other purpose. The use of this modelling is at the applicant's risk.

Yvette Worboys

From: STEVENSON Nicole R [Nicole_STEVENSON@rta.nsw.gov.au]
Sent: Monday, 8 October 2007 8:42 AM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Paramics Model
Follow Up Flag: Follow up
Flag Status: Red

Hi Dean

So we can manage the process I'd prefer that you send any questions you may have to me and I'll coordinate a response.

Regards

Nicole

From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Friday, 5 October 2007 16:05 PM
To: STEVENSON Nicole R
Cc: MILLET Christopher P
Subject: Albion Park Rezoning - Paramics Model

Nicole

Thank you for sending through the Paramics model and we will review this afternoon.

Can you provide the name of the contact person in the RTA who built the model so if there are any technical questions we contact them directly?

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: STEVENSON Nicole R [mailto:Nicole_STEVENSON@rta.nsw.gov.au]
Sent: Friday, 5 October 2007 3:28 PM

Yvette Worboys

From: Dean Brodie
Sent: Monday, 8 October 2007 8:58 AM
To: STEVENSON Nicole R
Subject: RE: Albion Park Rezoning - Paramics Model
Follow Up Flag: Follow up
Flag Status: Red

Thanks Nicole

I will send through some questions to pass on today.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: STEVENSON Nicole R [mailto:Nicole_STEVENSON@rta.nsw.gov.au]
Sent: Monday, 8 October 2007 8:42 AM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Paramics Model

Hi Dean

So we can manage the process I'd prefer that you send any questions you may have to me and I'll coordinate a response.

Regards

Nicole

From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Friday, 5 October 2007 16:05 PM
To: STEVENSON Nicole R
Cc: MILLET Christopher P
Subject: Albion Park Rezoning - Paramics Model

Yvette Worboys

From: Dean Brodie
Sent: Monday, 8 October 2007 8:58 AM
To: STEVENSON Nicole R
Subject: RE: Albion Park Rezoning - Paramics Model
Follow Up Flag: Follow up
Flag Status: Red

Thanks Nicole

I will send through some questions to pass on today.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: STEVENSON Nicole R [mailto:Nicole_STEVENSON@rta.nsw.gov.au]
Sent: Monday, 8 October 2007 8:42 AM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Paramics Model

Hi Dean

So we can manage the process I'd prefer that you send any questions you may have to me and I'll coordinate a response.

Regards

Nicole

From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Friday, 5 October 2007 16:05 PM
To: STEVENSON Nicole R
Cc: MILLET Christopher P
Subject: Albion Park Rezoning - Paramics Model

Yvette Worboys

From: Luke Preston [luke.preston@shellharbour.nsw.gov.au]
Sent: Monday, 8 October 2007 9:08 AM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information
Follow Up Flag: Follow up
Flag Status: Red
Attachments: header.htm; lp2010 delmo - revised.doc; lp2010 delmo ash ave flows.doc

Dean

I have attached the requested information - however please note that Ash Avenue is node 1964 and I have included that data accordingly.

Regards

Luke Preston

-----Original Message-----
From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Friday, 5 October 2007 1:31 PM
To: Luke Preston
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information

Luke

We have reviewed all the forecast information you have provided and it appears we are missing the following:

1. AM 2008 with development intersection flows at Node 3419
2. AM 2018 with development intersection flows at Node 3420

It would be appreciated if you could print out the flows for the above scenarios.

In addition to this so we can 'balance' flows along Tongarra Road, I was wondering whether we could obtain intersection flows for all scenarios for **Node 1962** as the eastbound / westbound flows between Croome Road and Princes Highway differ by a fair margin even after taking into account flows at the intersection of Tongarra Road / Station Street. I think Node 1962 is **Ash Avenue**.

Your assistance so far has been appreciated.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: Luke Preston [mailto:luke.preston@shellharbour.nsw.gov.au]
Sent: Thursday, 4 October 2007 4:24 PM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information

Dean

Please find attached the requested turning movement information. At the front of the document are the intersection node summary diagrams – followed by the turning movement flows at each of the intersections for each of the land use years and models (AM, PM & 24HR).

If you have any questions please call me on 02 4221 6039.

Regards

Luke Preston

-----Original Message-----
From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Wednesday, 26 September 2007 8:50 AM
To: Luke Preston
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information

Good morning Luke

I apologise if my request causes you too much inconvenience and appreciate your efforts in obtaining this information.

I can confirm that we undertook the intersection counts this week at Tongarra / Croom and Tongarra / Station as requested by yourself and the RTA.

Regards
Dean

From: Luke Preston [mailto:luke.preston@shellharbour.nsw.gov.au]
Sent: Wed 26/09/2007 8:41 AM

Yvette Worboys

From: Dean Brodie
Sent: Monday, 8 October 2007 9:18 AM
To: Luke Preston
Cc: Sarah Taylor (CHQ)
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information
Follow Up Flag: Follow up
Flag Status: Red

Luke

Thanks for your prompt response once again.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: Luke Preston [mailto:luke.preston@shellharbour.nsw.gov.au]
Sent: Monday, 8 October 2007 9:08 AM
To: Dean Brodie
Subject: RE: Albion Park Rezoning - Request for TRACKS Modelling Information

Dean

I have attached the requested information - however please note that Ash Avenue is node 1964 and I have included that data accordingly.

Regards

Luke Preston

> -----Original Message-----
> **From:** Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
> **Sent:** Friday, 5 October 2007 1:31 PM
> **To:** Luke Preston
> **Subject:** RE: Albion Park Rezoning - Request for TRACKS Modelling Information
>
> Luke
>
> We have reviewed all the forecast information you have provided and it appears we are missing the following:
>
> 1. AM 2008 with development intersection flows at Node 3419
> 2. AM 2018 with development intersection flows at Node 3420
>
> It would be appreciated if you could print out the flows for the above scenarios.
>
> In addition to this so we can 'balance' flows along Tongarra Road, I was wondering whether we could obtain intersection flows for all scenarios for **Node 1962** as the eastbound / westbound flows between Croome Road and Princes Highway differ by a fair margin even after taking into account flows at the intersection of Tongarra Road / Station Street. I think Node 1962 is **Ash Avenue**.
>
> Your assistance so far has been appreciated.
>
> Regards
>
> **Dean Brodie**
> *Executive Transport Planner*
>
> **Masson Wilson Twiney**
> 20/809 Pacific Highway Chatswood 2067
> (p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
> (w) www.mwttraffic.com.au
>
> Before printing, please consider the environment.
>
> IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.
>
> ---
>
> **From:** Luke Preston [mailto:luke.preston@shellharbour.nsw.gov.au]
> **Sent:** Thursday, 4 October 2007 4:24 PM
> **To:** Dean Brodie
> **Subject:** RE: Albion Park Rezoning - Request for TRACKS Modelling Information
>
> Dean

Yvette Worboys

From: Dean Brodie
Sent: Thursday, 11 October 2007 2:41 PM
To: STEVENSON Nicole R
Cc: sarah.taylor@syd.alp.org.au
Subject: Illawarra Highway / Princes Highway Paramics Model Queries

Follow Up Flag: Follow up
Flag Status: Red

Good afternoon Nicole

Please find below some queries in regards to the Paramics model sent over last week. It would be appreciated if you could pass them onto your modelling section for clarification.

Further to the comments below, can you confirm whether there was any written report which summarised the Paramics modelling and the results of the existing and future cases? If so, can we obtain a copy of the report?

I look forward to your response.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: Iwan Smith
Sent: Thursday, 11 October 2007 12:24 PM
To: Dean Brodie
Subject: Airport Rd/Princes Hwy

Dean

Here are some queries regarding the Paramics modelling of this roundabout:

- The model uses an outdated version of CeeJazz (Version 5A)
- The nodes that form the roundabout are not roundabout nodes, and thus do not use the roundabout turning movement model
- Each roundabout node is signalised, however both phases at each of the roundabout nodes are identical, both in green split and priority. Funtionally, the signals appear to have no impact on the model.
- Vehicle detectors exist in the model on the Western and Southern approaches of the roundabout, however they appear not to be connected to any signals by way of actuation logic.

Yvette Worboys

From: Dean Brodie
Sent: Thursday, 18 October 2007 2:11 PM
To: STEVENSON Nicole R
Cc: MILLET Christopher P; Jason Rudd
Subject: FW: Illawarra Highway / Princes Highway Paramics Model Queries

Follow Up Flag: Follow up
Flag Status: Red

Good afternoon Nicole

I have two additional questions to the ones I asked below:

- What modelled year was the Paramics model for?
- Were the flows in the model sourced directly from the RTA Tracks model from the relevant year?

Thank you for your time and I look forward to your response to these additional questions and the questions below at your earliest convenience.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: Dean Brodie
Sent: Thursday, 11 October 2007 2:41 PM
To: STEVENSON Nicole R
Cc: sarah.taylor@syd.alp.org.au
Subject: Illawarra Highway / Princes Highway Paramics Model Queries

Good afternoon Nicole

Please find below some queries in regards to the Paramics model sent over last week. It would be appreciated if you could pass them onto your modelling section for clarification.

Further to the comments below, can you confirm whether there was any written report which summarised the Paramics modelling and the results of the existing and future cases? If so, can we obtain a copy of the report?

I look forward to your response.

Regards

Jason Rudd

From: STEVENSON Nicole R [Nicole_STEVENSON@rta.nsw.gov.au]
Sent: Thursday, 18 October 2007 3:13 PM
To: Dean Brodie
Subject: FW: Illawarra Highway / Princes Highway Paramics Model Queries
Follow Up Flag: Follow up
Flag Status: Red

Hi Dean

Please find attached a copy of the response to your previous questions. I'll organise for the response to the remainder of your questions asap.

Regards

Nicole

A general comment: PARAMICS roundabout model generally dose not handle high vehicle flows well, hence the changes made below. Overall functionally the model still emulates a priority roundabout.

- The model uses an outdated version of CeeJazz (Version 5A)

Yes, the model build commenced from December 2006 being the latest version at the time. It was decided to not switch to the latest plug-in as long as consistency of the plug-in were used across all modelling scenarios.

- The nodes that form the roundabout are not roundabout nodes, and thus do not use the roundabout turning movement model

Yes. The 'RB' nodes was tested to be not aggressive enough to provide the throughput at the stop line on the Southern and Western approaches upon validating the modelled flows against actual data always under counting.

To emulate modelled flows close to the actual data, nodes were switched from 'RB' to 'normal' which was an improvement on the throughput but still did not enough to achieve the throughput required.

Second attempt was made to change the node from normal to signalised priority, that made a much improved result on the throughput on the modelling flows and thus adopted. This gave a more realistic queue length as well as flows at the stop line against actual data.

- Each roundabout node is signalised, however both phases at each of the roundabout nodes are identical, both in green split and priority. Functionally, the signals appear to have no impact on the model.

Yes, functionally the priorities under signals provide improved modelled flows at the stop line of the roundabout closer to actual data. The Southern and Western approaches have been set to a filter priority (i.e yellow).

- Vehicle detectors exist in the model on the Western and Southern approaches of the roundabout, however they appear not to be connected to any signals by way of actuation logic.

Yes, they provide no functionality to the model. They are there for validation purposes only.

- Actuation data connecting the detectors to the signals at the roundabout appears to be missing.

Functionally, the roundabout is indistinguishable from a normal priority roundabout, with the exception of displayed signals head (which essentially serve no purpose).
See above.

Let me know if you want to discuss further.

cheers,
Matt.

From: Dean Brodie [mailto:dean.brodie@mwttraffic.com.au]
Sent: Thursday, 11 October 2007 14:41 PM
To: STEVENSON Nicole R
Cc:
Subject: Illawarra Highway / Princes Highway Paramics Model Queries

Good afternoon Nicole

Please find below some queries in regards to the Paramics model sent over last week. It would be appreciated if you could pass them onto your modelling section for clarification.

Further to the comments below, can you confirm whether there was any written report which summarised the Paramics modelling and the results of the existing and future cases? If so, can we obtain a copy of the report?

I look forward to your response.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: Iwan Smith
Sent: Thursday, 11 October 2007 12:24 PM
To: Dean Brodie
Subject: Airport Rd/Princes Hwy

Dean

Here are some queries regarding the Paramics modelling of this roundabout:

- The model uses an outdated version of CeeJazz (Version 5A)
- The nodes that form the roundabout are not roundabout nodes, and thus do not use the roundabout turning movement model
- Each roundabout node is signalised, however both phases at each of the roundabout nodes are identical, both in green split and priority. Funtionally, the signals appear to have no impact on the model.
- Vehicle detectors exist in the model on the Western and Southern approaches of the roundabout, however they appear not to be connected to any signals by way of actuation logic.
- Actuation data connecting the detectors to the signals at the roundabout appears to be missing. Funtionally, the roundabout is indistiguishable from a normal priority roundabout, with the exception of displayed signals head (which essentially serve no purpose).

Iwan Smith
Transport Planner

MWT Transport Planning
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0407 439 100
(w) www.mwttraffic.com.au
Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. The RTA is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of the RTA. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. You must not disclose, copy or use any part of this e-mail if you are not the intended recipient.

Yvette Worboys

From: Dean Brodie
Sent: Thursday, 18 October 2007 5:01 PM
To: STEVENSON Nicole R
Subject: RE: Illawarra Highway / Princes Highway Paramics Model Queries
Follow Up Flag: Follow up
Flag Status: Red

Thanks Nicole for arranging responses thus far.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: STEVENSON Nicole R [mailto:Nicole_STEVENSON@rta.nsw.gov.au]
Sent: Thursday, 18 October 2007 3:13 PM
To: Dean Brodie
Subject: FW: Illawarra Highway / Princes Highway Paramics Model Queries

Hi Dean

Please find attached a copy of the response to your previous questions. I'll organise for the response to the remainder of your questions asap.

Regards

Nicole

A general comment: PARAMICS roundabout model generally dose not handle high vehicle flows well, hence the changes made below. Overall functionally the model still emulates a priority roundabout.

- The model uses an outdated version of CeeJazz (Version 5A)

Yes, the model build commenced from December 2006 being the latest version at the time. It was

Yvette Worboys

From: Dean Brodie
Sent: Thursday, 25 October 2007 2:23 PM
To: STEVENSON Nicole R
Subject: FW: Illawarra Highway / Princes Highway Paramics Model Queries

Follow Up Flag: Follow up
Flag Status: Red

Good afternoon Nicole

I was just enquiring whether you had received any information / comments back from your modeller on the additional questions below?

I look forward to your response.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

From: Dean Brodie
Sent: Thursday, 18 October 2007 2:11 PM
To: STEVENSON Nicole R
Cc: MILLET Christopher P; Jason Rudd
Subject: FW: Illawarra Highway / Princes Highway Paramics Model Queries

Good afternoon Nicole

I have two additional questions to the ones I asked below:

- What modelled year was the Paramics model for?
- Were the flows in the model sourced directly from the RTA Tracks model from the relevant year?

Thank you for your time and I look forward to your response to these additional questions and the questions below at your earliest convenience.

Regards

Dean Brodie
Executive Transport Planner

Yvette Worboys

From: Dean Brodie
Sent: Friday, 26 October 2007 9:24 AM
To: MILLET Christopher P
Cc: STEVENSON Nicole R
Subject: Illawarra Road / Princes Highway Roundabout - Plans showing Staging

Follow Up Flag: Follow up
Flag Status: Red

Good morning Chris

So we can in the future model the correct Stage 1 and Stage 2 configurations of the above signalised roundabout, can you provide me with plans of both stages in either PDF or AutoCAD form?

I look forward to your response.

Regards

Dean Brodie
Executive Transport Planner

Masson Wilson Twiney
20/809 Pacific Highway Chatswood 2067
(p) 02 9410 4100 (f) 02 9410 4199 (m) 0414 46 22 47
(w) www.mwttraffic.com.au

Before printing, please consider the environment.

IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Masson Wilson Twiney Pty Limited is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Masson Wilson Twiney Pty Limited. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. If you are not the intended recipient, any use, interference with, disclosure or copying of this material is unauthorised and prohibited.

Yvette Worboys

From: STEVENSON Nicole R [Nicole_STEVENSON@rta.nsw.gov.au]
Sent: Tuesday, 6 November 2007 1:40 PM
To: Dean Brodie
Subject: FW: HW1/HW25 Roundabout Channelisation Plan
Follow Up Flag: Follow up
Flag Status: Red
Attachments: vv4196_4a.pdf

Dean

I have just been forwarded a copy of the relevant plans for HW1/HW25.

The note from the project manager for this job state that " Stage 1 didnt include any civil works, just signals "

Hope this helps

Regards

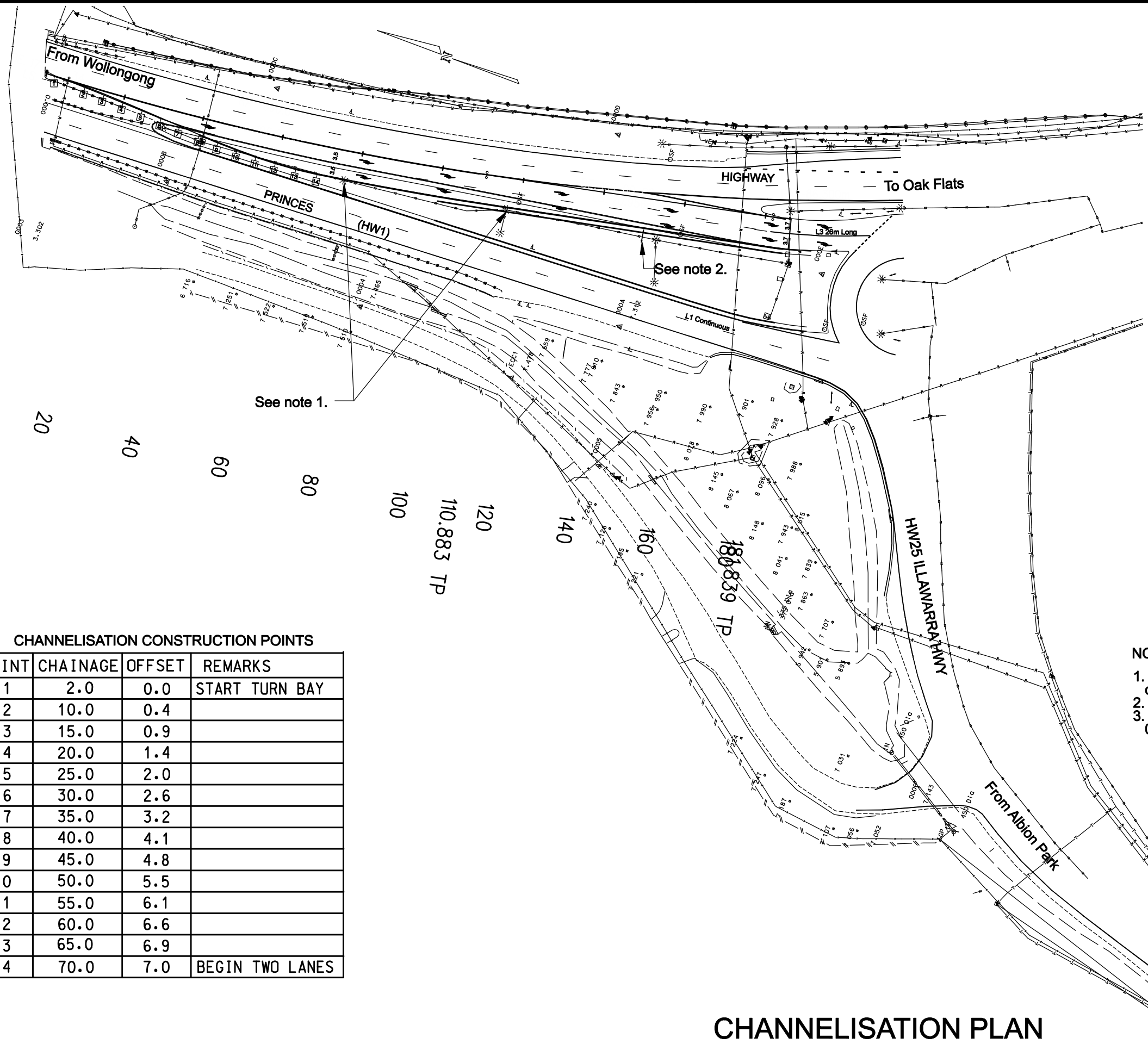
Nicole

Before printing, please consider the environment.

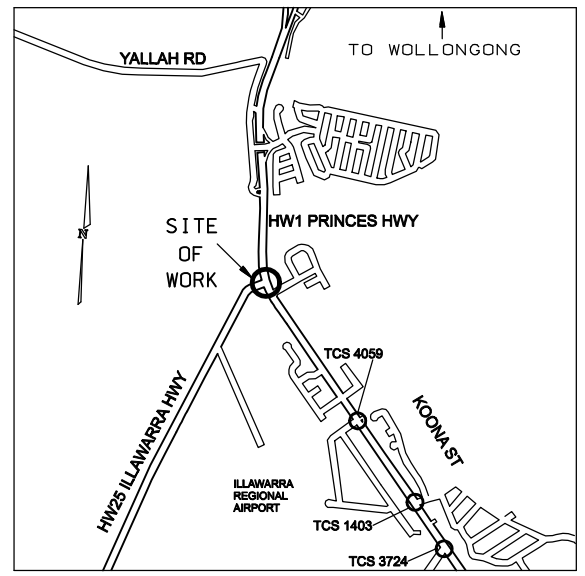
IMPORTANT NOTICE: This e-mail and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. The RTA is not responsible for any unauthorised alterations to this e-mail or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of the RTA. If you receive this e-mail in error, please immediately delete it from your system and notify the sender. You must not disclose, copy or use any part of this e-mail if you are not the intended recipient.

Sheet Type G

Date in Service .....



LOCALITY SKETCH



(not to scale)

CHANNELISATION CONSTRUCTION POINTS

POINT	CHAINAGE	OFFSET	REMARKS
1	2.0	0.0	START TURN BAY
2	10.0	0.4	
3	15.0	0.9	
4	20.0	1.4	
5	25.0	2.0	
6	30.0	2.6	
7	35.0	3.2	
8	40.0	4.1	
9	45.0	4.8	
10	50.0	5.5	
11	55.0	6.1	
12	60.0	6.6	
13	65.0	6.9	
14	70.0	7.0	BEGIN TWO LANES

NOTES

1. Two lightpoles to be relocated/removed due to new alignment of right turn facility.
2. Sign to be relocated.
3. For cross section details see plan 0001.401.MW.2795.

CHANNELISATION PLAN

PUBLIC UTILITY LEGEND			
HYDRANT	□	ELECTRIC LIGHT POLE	⌀
STOP VALVE	▲	POWER POLE	○
GAS VALVE	#	STAY POLE	
SEWER MANHOLE	⊕	TELEPHONE BOX	⊞
TELECOM PIT	▬	TELECOM PILLAR	◐

FILE NAME :/tcs/vv4100-vv4199/vv4196/vv4196_4b.dgn

SURVEY FILE : /tcs/vv4100-vv4199/vv4196/MX/Survey/SURVEY_Tms003573.inp

A ORIGINAL ISSUE

REFERENCE PLANS	
Symbols & Abb.	VD003-6
Standard Posit.	VD001-5
Det. Sched. Exp.	VD018-10
Pres. Detectors	VC005-17
SSG Dis. Seq.	VD018-8
Type 2 Posts	PM202-1
Type 3 Mast Arm	PM240-2

U.B.D.REF. 48 D10

I.S.G. CO-ORDS E 296 784.6 N 6 174 727.2

J. WALTERS DESIGNED

B. WALTERS CHECKED

B. WALTERS PASSED

THESE DRAWINGS HAVE BEEN EXAMINED AND ARE RECOMMENDED FOR APPROVAL

SIGNATURE.....
NAME. J. Harper
POSITION. Manager, RSTS
DATE.....

APPROVED

SIGNATURE.....
NAME. T. McClure
POSITION. Manager, RS & TM
DATE.....

ROADS AND TRAFFIC AUTHORITY OF NSW

MUNICIPALITY OF SHELLHARBOUR
HW1 PRINCES HIGHWAY AND
HW25 ILLAWARRA HIGHWAY
ALBION PARK RAIL

REGION : SOUTHERN REGION
ZONE : WOLLONGONG ZONE
SCALE 5 0 5 10

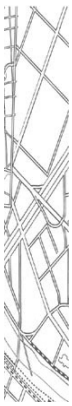
SHEET 4

ISSUE A

FILE 401.TS.280 SUPERSEDES SHEET

REGN. 0001.401.VV.4196

©COPYRIGHT RTA



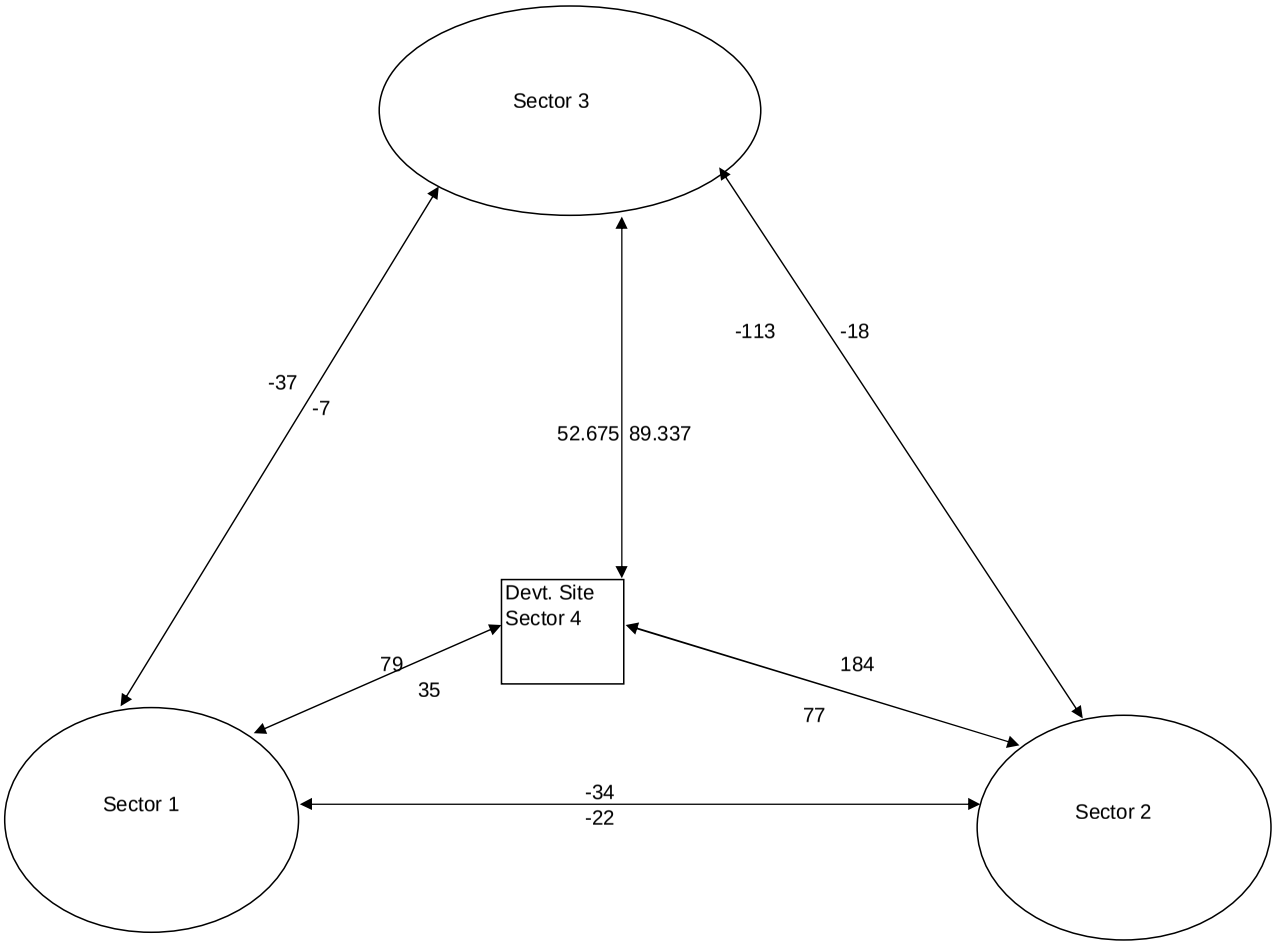
Appendix C - Cardno Eppell Olsen – TRACKS Modelling Sector Outputs

© Masson Wilson Twiney

TRACKS AM PEAK 2001 Scenario A - Base Case

	1	2	3	4
1	-11	-34	-37	79
2	-22	-62	-113	184
3	-7	-18	-182	89
4	35	77	53	2

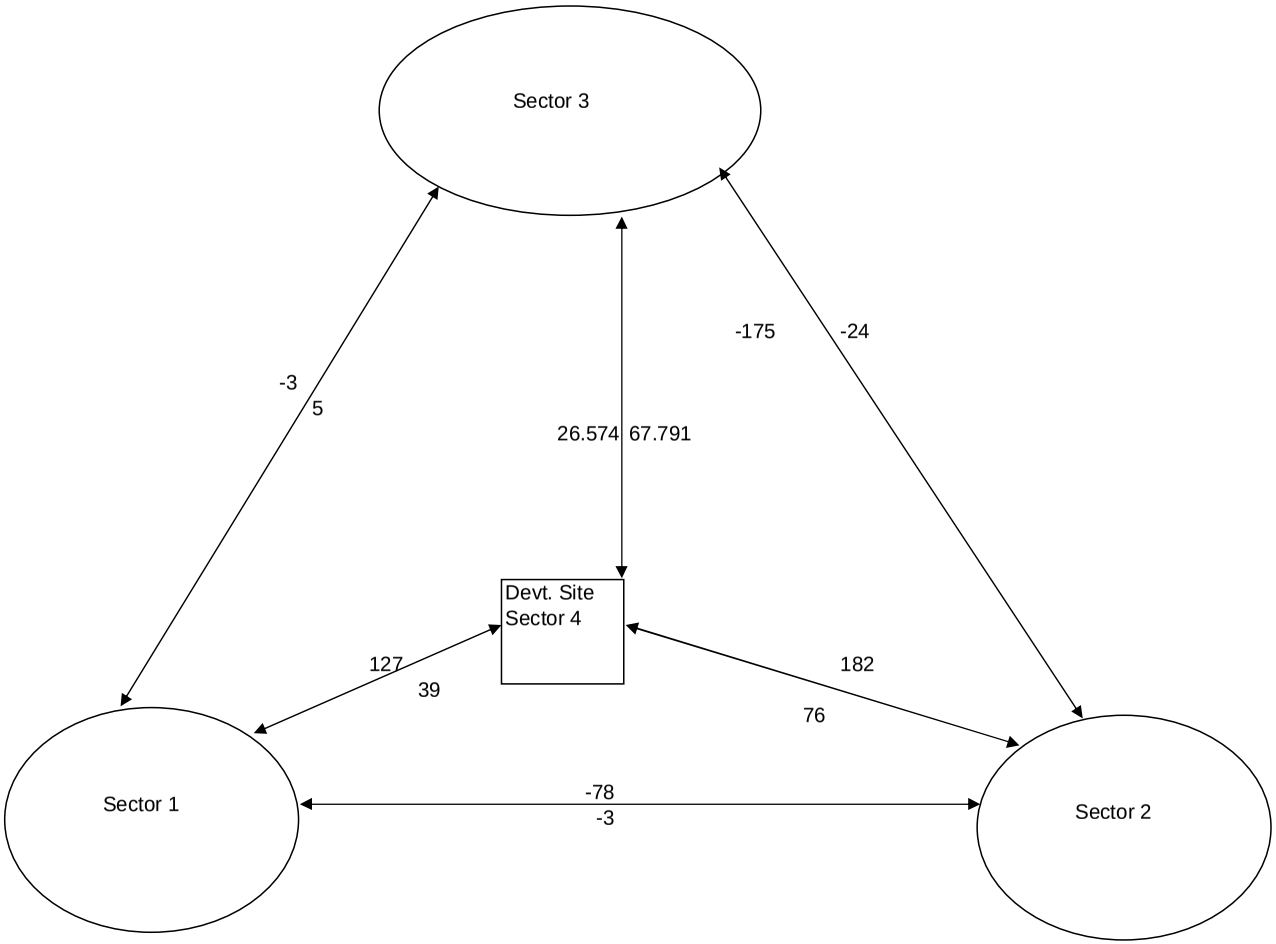
Approx. change at Pacific Hwy/Illawarra Hwy
-34



TRACKS AM PEAK 2016 Scenario A - Base Case

	1	2	3	4
1	-48	-78	-3	127
2	-3	-15	-175	182
3	5	-24	-720	68
4	39	76	27	2

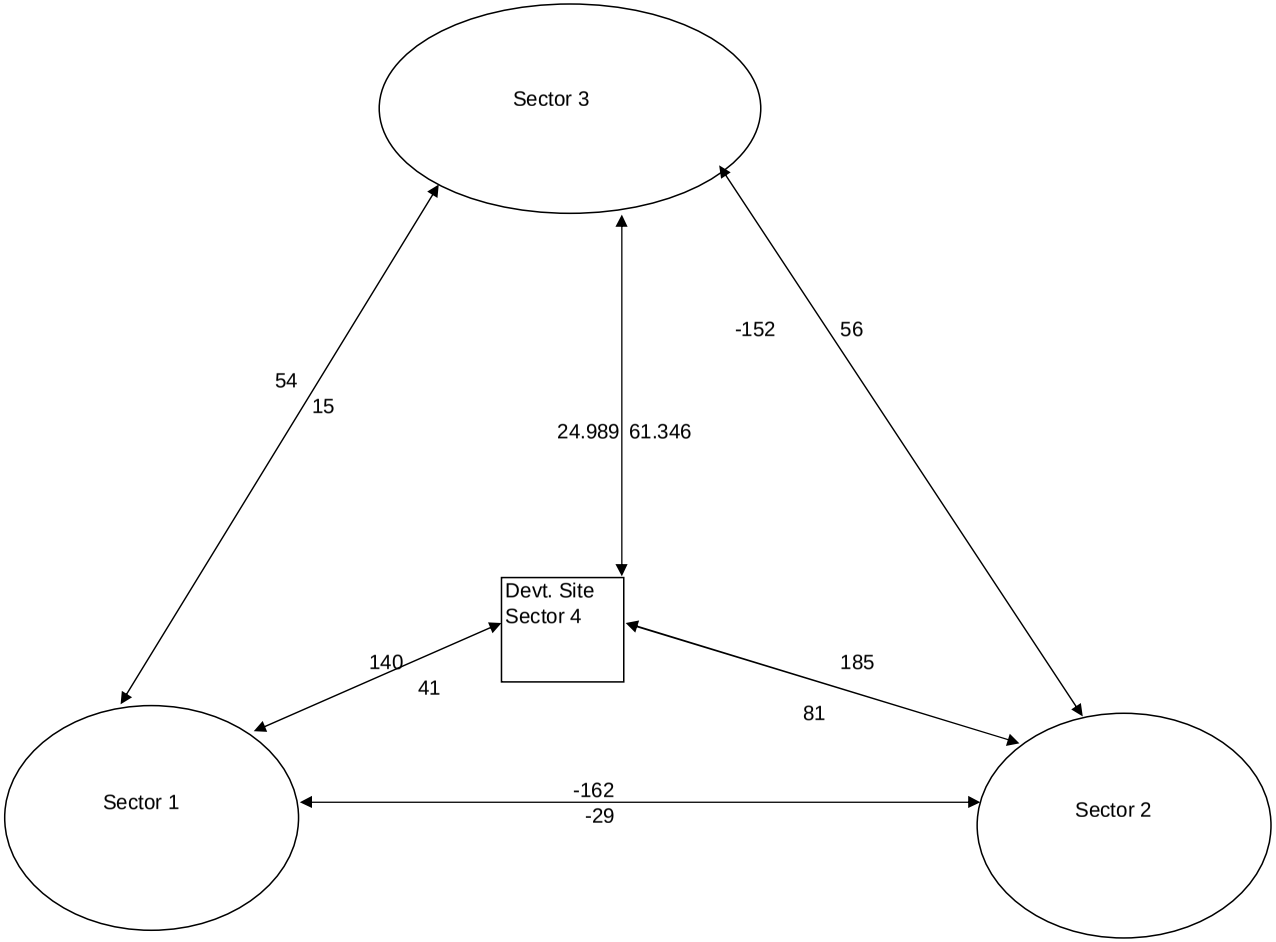
Approx. change at Pacific Hwy/Illawarra Hwy
-103



TRACKS AM PEAK 2026 Scenario A - Base Case

	1	2	3	4
1	-35	-162	54	140
2	-29	-17	-152	185
3	15	56	-229	61
4	41	81	25	2

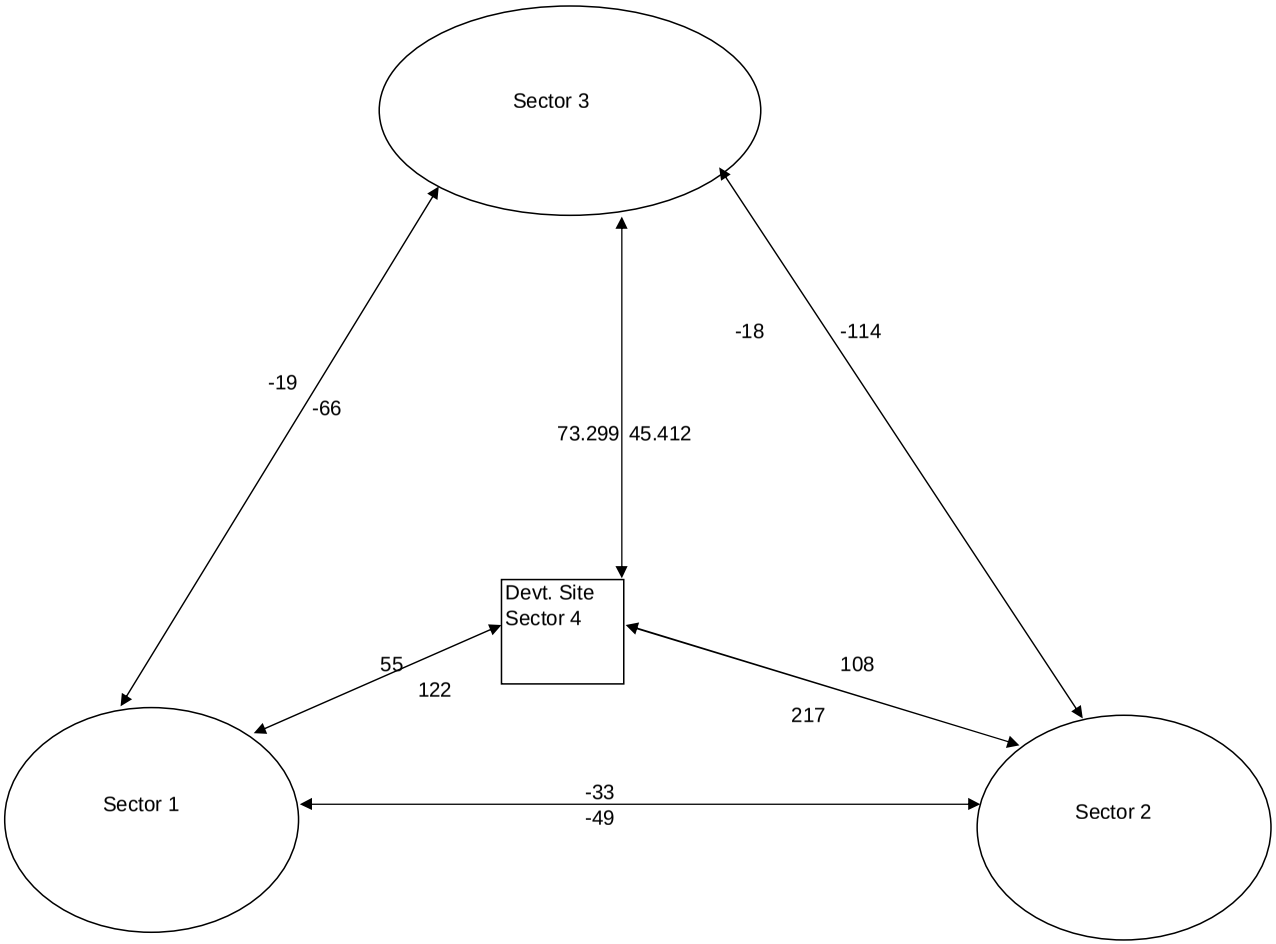
Approx. change at Pacific Hwy/Illawarra Hwy
59



TRACKS PM PEAK 2001 Scenario A - Base Case

	1	2	3	4
1	-9	-33	-19	55
2	-49	-85	-18	108
3	-66	-114	-130	45
4	122	217	73	0

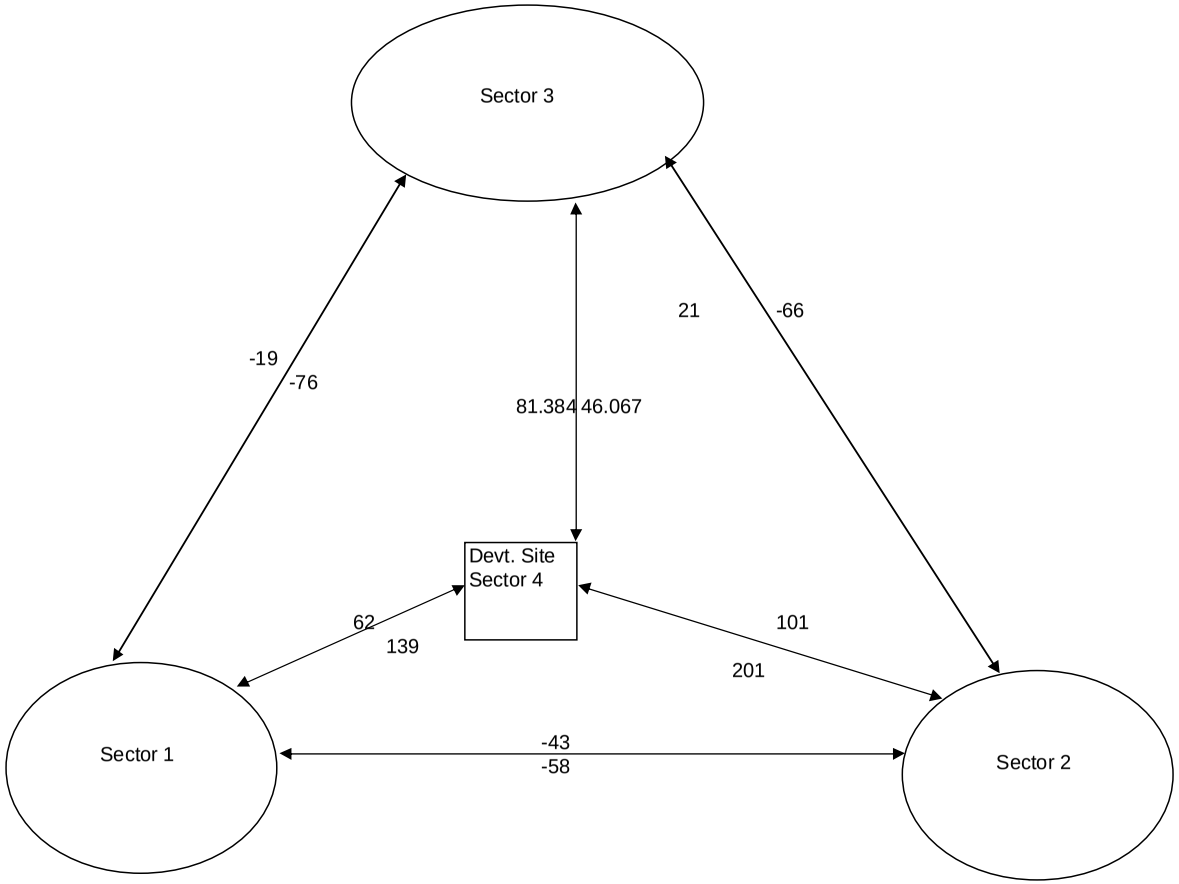
Approx. change at Pacific Hwy/Illawarra Hwy
-98



TRACKS PM PEAK 2016 Scenario A - Base Case

	1	2	3	4
1	-7	-43	-19	62
2	-58	-108	21	101
3	-76	-66	-178	46
4	139	201	81	0

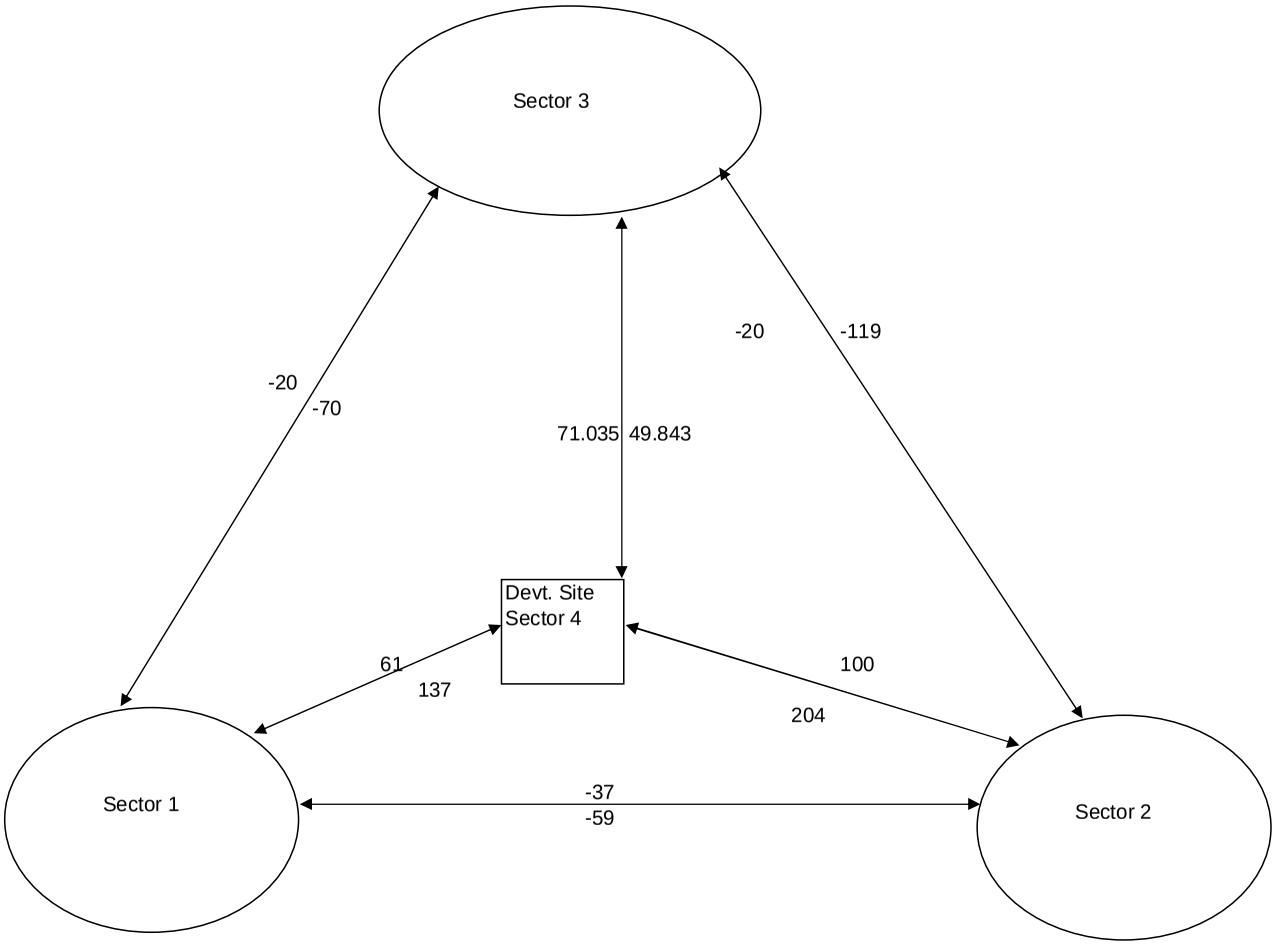
Approx. change at Pacific Hwy/Illawarra Hwy
-13

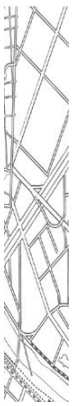


TRACKS PM PEAK 2026 Scenario A - Base Case

	1	2	3	4
1	-10	-37	-20	61
2	-59	-63	-20	100
3	-70	-119	-137	50
4	137	204	71	0

Approx. change at Pacific Hwy/Illawarra Hwy
-108





Appendix D - Supplementary Traffic Counts

© Masson Wilson Twiney

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.
Mobile.0418239019

Client : Masson Wilson Twiney
Job No/Name : 1968 Albion Park - Tongarra Rd
Day/Date : Monday 24th September 2007

PEDS	WEST	SOUTH	EAST	
Time Per	*Tongarra Rd*	*Croome Rd*	*Tongarra Rd*	TOT
0700 - 0715				**0**
0715 - 0730				**0**
0730 - 0745				**0**
0745 - 0800				**0**
0800 - 0815				**0**
0815 - 0830				**0**
0830 - 0845				**0**
0845 - 0900				**0**
0900 - 0915				**0**
0915 - 0930				**0**
0930 - 0945				**0**
0945 - 1000				**0**
Per End	**0**	**0**	**0**	**0**

PEDS	WEST	SOUTH	EAST	
Peak Per	*Tongarra Rd*	*Croome Rd*	*Tongarra Rd*	TOT
0700 - 0800	0	0	0	**0**
0715 - 0815	0	0	0	**0**
0730 - 0830	0	0	0	**0**
0745 - 0845	0	0	0	**0**
0800 - 0900	0	0	0	**0**
0815 - 0915	0	0	0	**0**
0830 - 0930	0	0	0	**0**
0845 - 0945	0	0	0	**0**
0900 - 1000	0	0	0	**0**
PEAK HR	**0**	**0**	**0**	**0**

Lights	WEST		SOUTH		EAST		
	Tongarra Rd		*Croome Rd*		*Tongarra Rd*		
Time Per	T	R	L	R	L	T	TOT
0700 - 0715	43	5	6	21	9	39	**123**
0715 - 0730	46	4	4	12	7	44	**117**
0730 - 0745	57	9	7	12	9	36	**130**
0745 - 0800	68	9	15	18	1	51	**162**
0800 - 0815	93	4	20	24	5	68	**214**
0815 - 0830	75	15	32	24	4	78	**228**
0830 - 0845	106	11	47	15	12	110	**301**
0845 - 0900	96	14	41	13	11	108	**283**
0900 - 0915	110	26	24	8	5	67	**240**
0915 - 0930	107	10	34	14	9	56	**230**
0930 - 0945	88	15	18	9	9	50	**189**
0945 - 1000	88	14	24	8	3	49	**186**
Per End	**977**	**136**	**272**	**178**	**84**	**756**	**2403**

Heavies	WEST		SOUTH		EAST		
	Tongarra Rd		*Croome Rd*		*Tongarra Rd*		
Time Per	T	R	L	R	L	T	TOT
0700 - 0715	4	1	0	0	0	1	**6**
0715 - 0730	4	1	0	0	0	1	**6**
0730 - 0745	3	0	1	0	0	3	**7**
0745 - 0800	1	1	0	1	0	3	**6**
0800 - 0815	1	2	2	0	1	3	**9**
0815 - 0830	5	1	1	0	0	3	**10**
0830 - 0845	4	0	1	0	0	10	**15**
0845 - 0900	15	1	1	1	0	6	**24**
0900 - 0915	4	2	1	0	0	4	**11**
0915 - 0930	2	1	2	0	0	2	**7**
0930 - 0945	3	2	0	0	0	0	**5**
0945 - 1000	1	2	0	0	0	2	**5**
Per End	**47**	**14**	**9**	**2**	**1**	**38**	**111**

Combined	WEST		SOUTH		EAST		
	Tongarra Rd		*Croome Rd*		*Tongarra Rd*		
Time Per	T	R	L	R	L	T	TOT
0700 - 0715	47	6	6	21	9	40	**129**
0715 - 0730	50	5	4	12	7	45	**123**
0730 - 0745	60	9	8	12	9	39	**137**
0745 - 0800	69	10	15	19	1	54	**168**
0800 - 0815	94	6	22	24	6	71	**223**
0815 - 0830	80	16	33	24	4	81	**238**
0830 - 0845	110	11	48	15	12	120	**316**
0845 - 0900	111	15	42	14	11	114	**307**
0900 - 0915	114	28	25	8	5	71	**251**
0915 - 0930	109	11	36	14	9	58	**237**
0930 - 0945	91	17	18	9	9	50	**194**
0945 - 1000	89	16	24	8	3	51	**191**
Per End	**1024**	**150**	**281**	**180**	**85**	**794**	**2514**

Lights	WEST		SOUTH		EAST		
	Tongarra Rd		*Croome Rd*		*Tongarra Rd*		
Peak Per	T	R	L	R	L	T	TOT
0700 - 0800	214	27	32	63	26	170	**532**
0715 - 0815	264	26	46	66	22	199	**623**
0730 - 0830	293	37	74	78	19	233	**734**
0745 - 0845	342	39	114	81	22	307	**905**
0800 - 0900	370	44	140	76	32	364	**1026**
0815 - 0915	387	66	144	60	32	363	**1052**
0830 - 0930	419	61	146	50	37	341	**1054**
0845 - 0945	401	65	117	44	34	281	**942**
0900 - 1000	393	65	100	39	26	222	**845**
PEAK HR	**387**	**66**	**144**	**60**	**32**	**363**	**1052**

Heavies	WEST		SOUTH		EAST		
	Tongarra Rd		*Croome Rd*		*Tongarra Rd*		
Peak Per	T	R	L	R	L	T	TOT
0700 - 0800	12	3	1	1	0	8	**25**
0715 - 0815	9	4	3	1	1	10	**28**
0730 - 0830	10	4	4	1	1	12	**32**
0745 - 0845	11	4	4	1	1	19	**40**
0800 - 0900	25	4	5	1	1	22	**58**
0815 - 0915	28	4	4	1	0	23	**60**
0830 - 0930	25	4	5	1	0	22	**57**
0845 - 0945	24	6	4	1	0	12	**47**
0900 - 1000	10	7	3	0	0	8	**28**
PEAK HR	**28**	**4**	**4**	**1**	**0**	**23**	**60**

Combined	WEST		SOUTH		EAST		
	Tongarra Rd		*Croome Rd*		*Tongarra Rd*		
Peak Per	T	R	L	R	L	T	TOT
0700 - 0800	226	30	33	64	26	178	**557**
0715 - 0815	273	30	49	67	23	209	**651**
0730 - 0830	303	41	78	79	20	245	**766**
0745 - 0845	353	43	118	82	23	326	**945**
0800 - 0900	395	48	145	77	33	386	**1084**
0815 - 0915	415	70	148	61	32	386	**1112**
0830 - 0930	444	65	151	51	37	363	**1111**
0845 - 0945	425	71	121	45	34	293	**989**
0900 - 1000	403	72	103	39	26	230	**873**
PEAK HR	**415**	**70**	**148**	**61**	**32**	**386**	**1112**

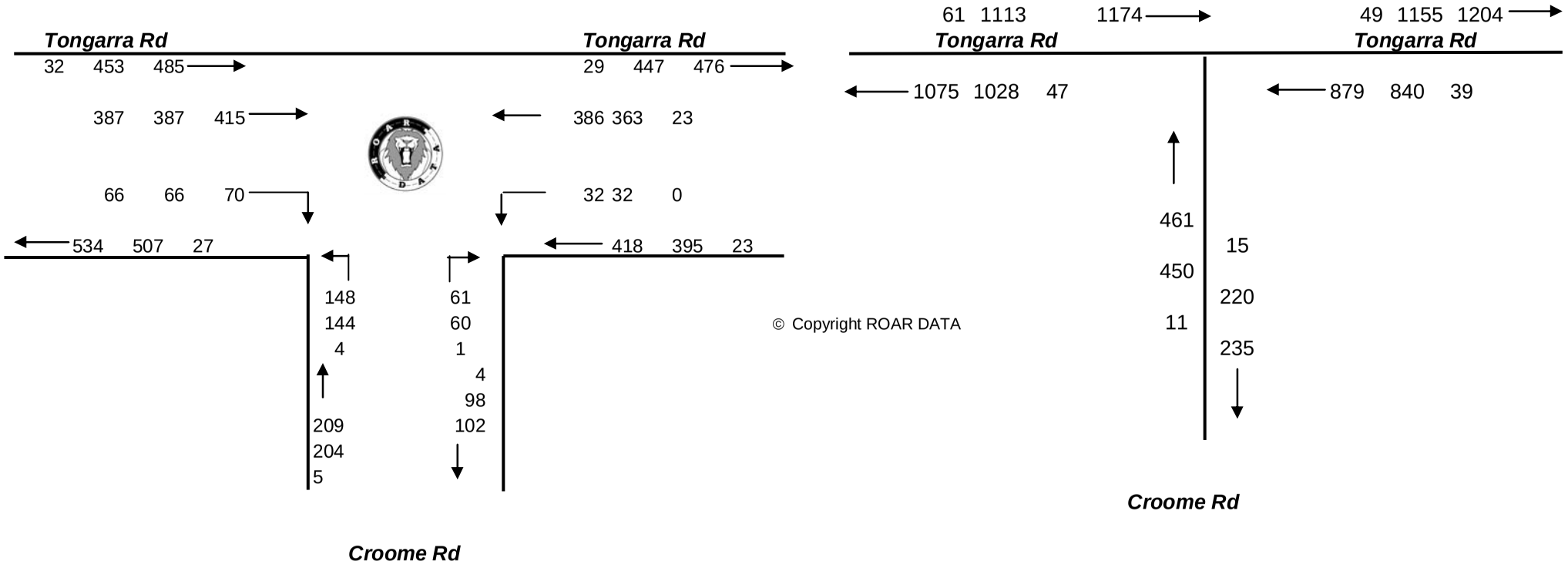
R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Masson Wilson Twiney
Job No/Name : 1968 Albion Park - Tongarra Rd
Day/Date : Monday 24th September 2007

AM PEAK
0815 - 0915

N

TOTAL VOLUMES
FOR COUNT PERIOD



© Copyright ROAR DATA

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.

Mobile.0418239019

Client : Masson Wilson Twiney

Job No/Name : 1968 Albion Park - Tongarra Rd

Day/Date : Monday 24th September 2007

PEDS	WEST	NORTH	EAST	
Time Per	*Tongarra Rd*	*Station St*	*Tongarra Rd*	TOT
0700 - 0715				**0**
0715 - 0730				**0**
0730 - 0745				**0**
0745 - 0800				**0**
0800 - 0815				**0**
0815 - 0830				**0**
0830 - 0845				**0**
0845 - 0900				**0**
0900 - 0915				**0**
0915 - 0930				**0**
0930 - 0945				**0**
0945 - 1000				**0**
Per End	**0**	**0**	**0**	**0**

PEDS	WEST	NORTH	EAST	
Peak Per	*Tongarra Rd*	*Station St*	*Tongarra Rd*	TOT
0700 - 0800	0	0	0	**0**
0715 - 0815	0	0	0	**0**
0730 - 0830	0	0	0	**0**
0745 - 0845	0	0	0	**0**
0800 - 0900	0	0	0	**0**
0815 - 0915	0	0	0	**0**
0830 - 0930	0	0	0	**0**
0845 - 0945	0	0	0	**0**
0900 - 1000	0	0	0	**0**
PEAK HR	**0**	**0**	**0**	**0**

Lights	WEST		NORTH		EAST		
	Tongarra Rd		*Station St*		*Tongarra Rd*		
Time Per	T	L	R	L	R	T	TOT
0700 - 0715	37	26	16	4	16	33	**132**
0715 - 0730	36	24	12	5	8	37	**122**
0730 - 0745	46	26	12	9	15	32	**140**
0745 - 0800	56	29	11	5	19	39	**159**
0800 - 0815	72	50	22	4	19	58	**225**
0815 - 0830	67	33	19	4	11	64	**198**
0830 - 0845	88	33	31	8	19	93	**272**
0845 - 0900	82	30	33	9	15	88	**257**
0900 - 0915	93	28	22	9	11	50	**213**
0915 - 0930	85	31	23	10	12	44	**205**
0930 - 0945	80	26	21	5	14	37	**183**
0945 - 1000	72	23	17	5	6	39	**162**
Per End	**814**	**359**	**239**	**77**	**165**	**614**	**2268**

Heavies	WEST		NORTH		EAST		
	Tongarra Rd		*Station St*		*Tongarra Rd*		
Time Per	T	L	R	L	R	T	TOT
0700 - 0715	4	0	1	0	0	0	**5**
0715 - 0730	3	0	0	1	0	1	**5**
0730 - 0745	2	1	1	0	0	2	**6**
0745 - 0800	2	0	0	0	0	3	**5**
0800 - 0815	1	0	0	0	0	4	**5**
0815 - 0830	5	0	0	0	0	3	**8**
0830 - 0845	4	0	0	1	0	10	**15**
0845 - 0900	16	0	1	0	0	4	**21**
0900 - 0915	4	0	0	0	0	4	**8**
0915 - 0930	2	0	0	0	0	2	**4**
0930 - 0945	2	0	0	0	0	0	**2**
0945 - 1000	2	0	2	0	0	0	**4**
Per End	**47**	**1**	**5**	**2**	**0**	**33**	**88**

Combined	WEST		NORTH		EAST		
	Tongarra Rd		*Station St*		*Tongarra Rd*		
Time Per	T	L	R	L	R	T	TOT
0700 - 0715	41	26	17	4	16	33	**137**
0715 - 0730	39	24	12	6	8	38	**127**
0730 - 0745	48	27	13	9	15	34	**146**
0745 - 0800	58	29	11	5	19	42	**164**
0800 - 0815	73	50	22	4	19	62	**230**
0815 - 0830	72	33	19	4	11	67	**206**
0830 - 0845	92	33	31	9	19	103	**287**
0845 - 0900	98	30	34	9	15	92	**278**
0900 - 0915	97	28	22	9	11	54	**221**
0915 - 0930	87	31	23	10	12	46	**209**
0930 - 0945	82	26	21	5	14	37	**185**
0945 - 1000	74	23	19	5	6	39	**166**
Per End	**861**	**360**	**244**	**79**	**165**	**647**	**2356**

Lights	WEST		NORTH		EAST		
	Tongarra Rd		*Station St*		*Tongarra Rd*		
Peak Per	T	L	R	L	R	T	TOT
0700 - 0800	175	105	51	23	58	141	**553**
0715 - 0815	210	129	57	23	61	166	**646**
0730 - 0830	241	138	64	22	64	193	**722**
0745 - 0845	283	145	83	21	68	254	**854**
0800 - 0900	309	146	105	25	64	303	**952**
0815 - 0915	330	124	105	30	56	295	**940**
0830 - 0930	348	122	109	36	57	275	**947**
0845 - 0945	340	115	99	33	52	219	**858**
0900 - 1000	330	108	83	29	43	170	**763**
PEAK HR	**309**	**146**	**105**	**25**	**64**	**303**	**952**

Heavies	WEST		NORTH		EAST		
	Tongarra Rd		*Station St*		*Tongarra Rd*		
Peak Per	T	L	R	L	R	T	TOT
0700 - 0800	11	1	2	1	0	6	**21**
0715 - 0815	8	1	1	1	0	10	**21**
0730 - 0830	10	1	1	0	0	12	**24**
0745 - 0845	12	0	0	1	0	20	**33**
0800 - 0900	26	0	1	1	0	21	**49**
0815 - 0915	29	0	1	1	0	21	**52**
0830 - 0930	26	0	1	1	0	20	**48**
0845 - 0945	24	0	1	0	0	10	**35**
0900 - 1000	10	0	2	0	0	6	**18**
PEAK HR	**26**	**0**	**1**	**1**	**0**	**21**	**49**

Combined	WEST		NORTH		EAST		
	Tongarra Rd		*Station St*		*Tongarra Rd*		
Peak Per	T	L	R	L	R	T	TOT
0700 - 0800	186	106	53	24	58	147	**574**
0715 - 0815	218	130	58	24	61	176	**667**
0730 - 0830	251	139	65	22	64	205	**746**
0745 - 0845	295	145	83	22	68	274	**887**
0800 - 0900	335	146	106	26	64	324	**1001**
0815 - 0915	359	124	106	31	56	316	**992**
0830 - 0930	374	122	110	37	57	295	**995**
0845 - 0945	364	115	100	33	52	229	**893**
0900 - 1000	340	108	85	29	43	176	**781**
PEAK HR	**335**	**146**	**106**	**26**	**64**	**324**	**1001**

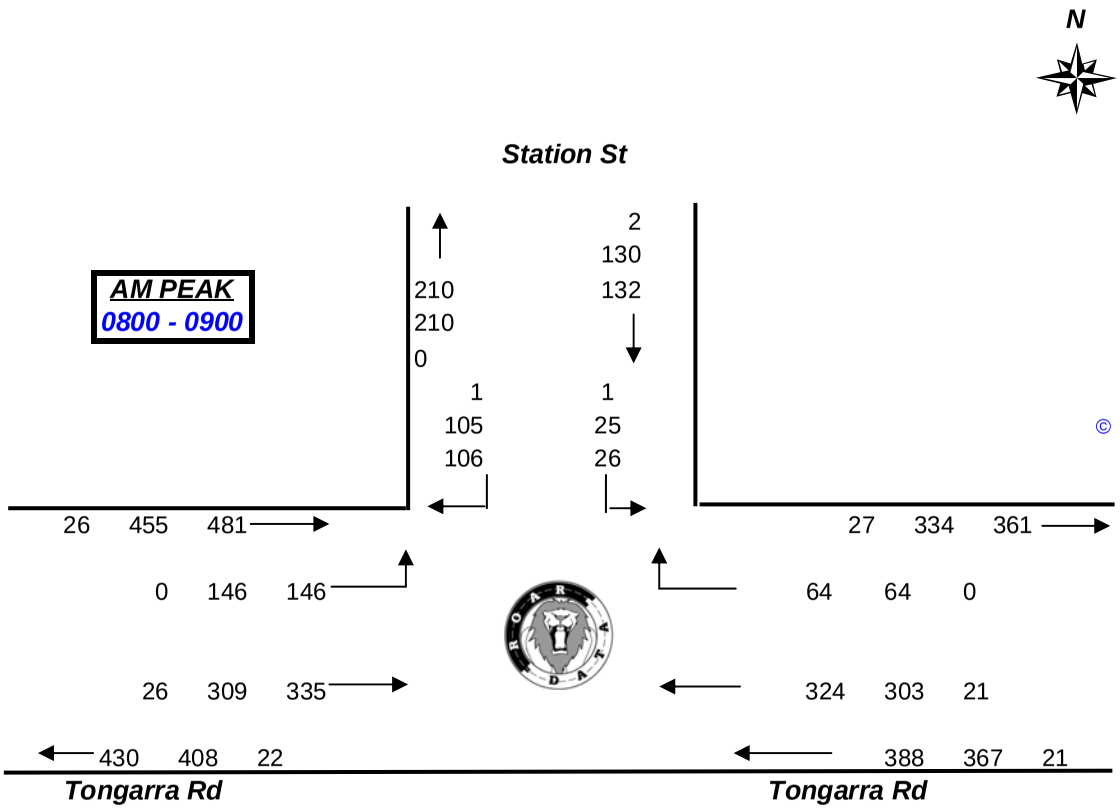
R.O.A.R. DATA

Client : Masson Wilson Twiney

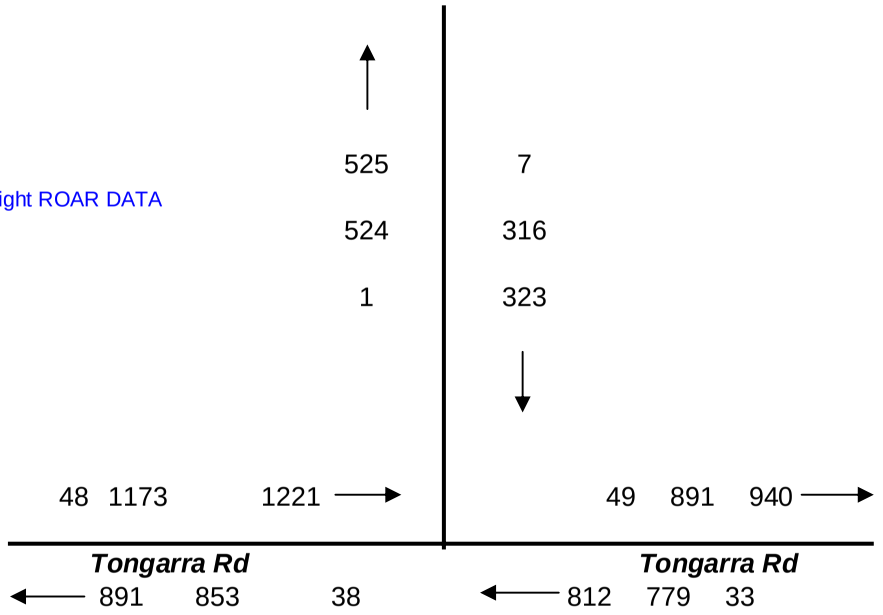
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Job No/Name : 1968 Albion Park - Tongarra Rd
Day/Date : Monday 24th September 2007

TOTAL VOLUMES FOR COUNT PERIOD



© Copyright ROAR DATA



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.
Mobile.0418239019

Client : Masson Wilson Twiney
Job No/Name : 1968 Albion Park - Tongarra Rd
Day/Date : Monday 24th September 2007

PEDS	WEST	SOUTH	EAST	
Time Per	*Tongarra Rd*	*Croome Rd*	*Tongarra Rd*	TOT
1500 - 1515				**0**
1515 - 1530				**0**
1530 - 1545				**0**
1545 - 1600				**0**
1600 - 1615				**0**
1615 - 1630				**0**
1630 - 1645				**0**
1645 - 1700				**0**
1700 - 1715				**0**
1715 - 1730				**0**
1730 - 1745				**0**
1745 - 1800				**0**
Per End	**0**	**0**	**0**	**0**

PEDS	WEST	SOUTH	EAST	
Peak Per	*Tongarra Rd*	*Croome Rd*	*Tongarra Rd*	TOT
1500 - 1600	0	0	0	**0**
1515 - 1615	0	0	0	**0**
1530 - 1630	0	0	0	**0**
1545 - 1645	0	0	0	**0**
1600 - 1700	0	0	0	**0**
1615 - 1715	0	0	0	**0**
1630 - 1730	0	0	0	**0**
1645 - 1745	0	0	0	**0**
1700 - 1800	0	0	0	**0**
PEAK HR	**0**	**0**	**0**	**0**

Lights	WEST		SOUTH		EAST		
	Tongarra Rd		*Croome Rd*		*Tongarra Rd*		
Time Per	T	R	L	R	L	T	TOT
1500 - 1515	68	17	33	16	18	87	**239**
1515 - 1530	109	15	25	16	25	81	**271**
1530 - 1545	147	28	27	10	26	85	**323**
1545 - 1600	134	25	35	14	21	97	**326**
1600 - 1615	108	17	28	9	25	113	**300**
1615 - 1630	103	22	27	18	24	82	**276**
1630 - 1645	89	17	21	14	22	102	**265**
1645 - 1700	74	13	29	7	24	91	**238**
1700 - 1715	100	15	27	8	27	105	**282**
1715 - 1730	77	13	31	9	30	89	**249**
1730 - 1745	71	16	25	10	32	79	**233**
1745 - 1800	77	13	27	20	25	91	**253**
Per End	**1157**	**211**	**335**	**151**	**299**	**1102**	**3255**

Heavies	WEST		SOUTH		EAST		
	Tongarra Rd		*Croome Rd*		*Tongarra Rd*		
Time Per	T	R	L	R	L	T	TOT
1500 - 1515	0	0	0	2	0	4	**6**
1515 - 1530	3	0	1	0	0	2	**6**
1530 - 1545	3	0	0	1	0	6	**10**
1545 - 1600	9	1	0	1	1	0	**12**
1600 - 1615	3	0	0	0	0	1	**4**
1615 - 1630	1	0	1	2	1	0	**5**
1630 - 1645	0	0	0	0	1	1	**2**
1645 - 1700	0	1	0	0	0	1	**2**
1700 - 1715	0	0	0	0	0	0	**0**
1715 - 1730	0	0	1	0	0	0	**1**
1730 - 1745	0	1	0	0	0	0	**1**
1745 - 1800	0	0	0	0	0	1	**1**
Per End	**19**	**3**	**3**	**6**	**3**	**16**	**50**

Combined	WEST		SOUTH		EAST		
	Tongarra Rd		*Croome Rd*		*Tongarra Rd*		
Time Per	T	R	L	R	L	T	TOT
1500 - 1515	68	17	33	18	18	91	**245**
1515 - 1530	112	15	26	16	25	83	**277**
1530 - 1545	150	28	27	11	26	91	**333**
1545 - 1600	143	26	35	15	22	97	**338**
1600 - 1615	111	17	28	9	25	114	**304**
1615 - 1630	104	22	28	20	25	82	**281**
1630 - 1645	89	17	21	14	23	103	**267**
1645 - 1700	74	14	29	7	24	92	**240**
1700 - 1715	100	15	27	8	27	105	**282**
1715 - 1730	77	13	32	9	30	89	**250**
1730 - 1745	71	17	25	10	32	79	**234**
1745 - 1800	77	13	27	20	25	92	**254**
Per End	**1176**	**214**	**338**	**157**	**302**	**1118**	**3305**

Lights	WEST		SOUTH		EAST		
	Tongarra Rd		*Croome Rd*		*Tongarra Rd*		
Peak Per	T	R	L	R	L	T	TOT
1500 - 1600	458	85	120	56	90	350	**1159**
1515 - 1615	498	85	115	49	97	376	**1220**
1530 - 1630	492	92	117	51	96	377	**1225**
1545 - 1645	434	81	111	55	92	394	**1167**
1600 - 1700	374	69	105	48	95	388	**1079**
1615 - 1715	366	67	104	47	97	380	**1061**
1630 - 1730	340	58	108	38	103	387	**1034**
1645 - 1745	322	57	112	34	113	364	**1002**
1700 - 1800	325	57	110	47	114	364	**1017**
PEAK HR	**492**	**92**	**117**	**51**	**96**	**377**	**1225**

Heavies	WEST		SOUTH		EAST		
	Tongarra Rd		*Croome Rd*		*Tongarra Rd*		
Peak Per	T	R	L	R	L	T	TOT
1500 - 1600	15	1	1	4	1	12	**34**
1515 - 1615	18	1	1	2	1	9	**32**
1530 - 1630	16	1	1	4	2	7	**31**
1545 - 1645	13	1	1	3	3	2	**23**
1600 - 1700	4	1	1	2	2	3	**13**
1615 - 1715	1	1	1	2	2	2	**9**
1630 - 1730	0	1	1	0	1	2	**5**
1645 - 1745	0	2	1	0	0	1	**4**
1700 - 1800	0	1	1	0	0	1	**3**
PEAK HR	**16**	**1**	**1**	**4**	**2**	**7**	**31**

Combined	WEST		SOUTH		EAST		
	Tongarra Rd		*Croome Rd*		*Tongarra Rd*		
Peak Per	T	R	L	R	L	T	TOT
1500 - 1600	473	86	121	60	91	362	**1193**
1515 - 1615	516	86	116	51	98	385	**1252**
1530 - 1630	508	93	118	55	98	384	**1256**
1545 - 1645	447	82	112	58	95	396	**1190**
1600 - 1700	378	70	106	50	97	391	**1092**
1615 - 1715	367	68	105	49	99	382	**1070**
1630 - 1730	340	59	109	38	104	389	**1039**
1645 - 1745	322	59	113	34	113	365	**1006**
1700 - 1800	325	58	111	47	114	365	**1020**
PEAK HR	**508**	**93**	**118**	**55**	**98**	**384**	**1256**

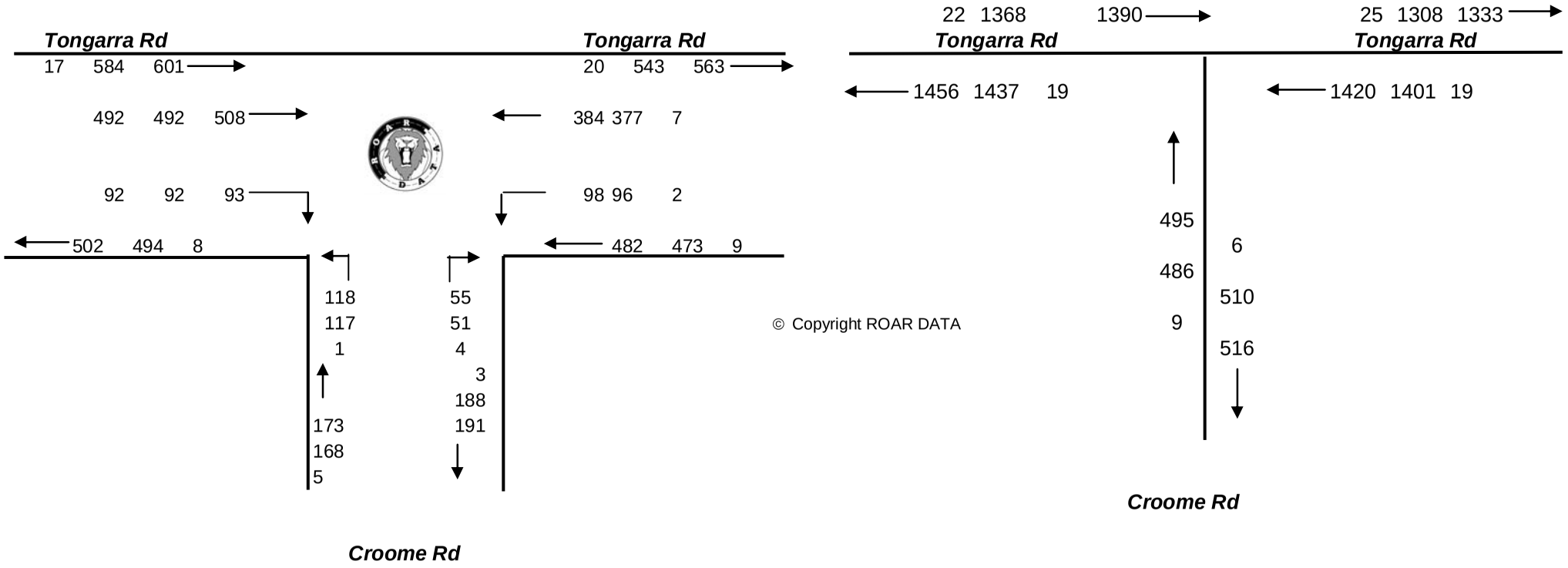
R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Masson Wilson Twiney
Job No/Name : 1968 Albion Park - Tongarra Rd
Day/Date : Monday 24th September 2007

PM PEAK
1530 - 1630

N

TOTAL VOLUMES
FOR COUNT PERIOD



© Copyright ROAR DATA

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849.

Mobile.0418239019

Client : Masson Wilson Twiney

Job No/Name : 1968 Albion Park - Tongarra Rd

Day/Date : Monday 24th September 2007

PEDS	WEST	NORTH	EAST	
Time Per	*Tongarra Rd*	*Station St*	*Tongarra Rd*	TOT
1500 - 1515				**0**
1515 - 1530				**0**
1530 - 1545				**0**
1545 - 1600				**0**
1600 - 1615				**0**
1615 - 1630				**0**
1630 - 1645				**0**
1645 - 1700				**0**
1700 - 1715				**0**
1715 - 1730				**0**
1730 - 1745				**0**
1745 - 1800				**0**
Per End	**0**	**0**	**0**	**0**

PEDS	WEST	NORTH	EAST	
Peak Per	*Tongarra Rd*	*Station St*	*Tongarra Rd*	TOT
1500 - 1600	0	0	0	**0**
1515 - 1615	0	0	0	**0**
1530 - 1630	0	0	0	**0**
1545 - 1645	0	0	0	**0**
1600 - 1700	0	0	0	**0**
1615 - 1715	0	0	0	**0**
1630 - 1730	0	0	0	**0**
1645 - 1745	0	0	0	**0**
1700 - 1800	0	0	0	**0**
PEAK HR	**0**	**0**	**0**	**0**

Lights	WEST		NORTH		EAST		
	Tongarra Rd		*Station St*		*Tongarra Rd*		
Time Per	T	L	R	L	R	T	TOT
1500 - 1515	57	26	44	17	7	70	**221**
1515 - 1530	96	34	37	17	11	74	**269**
1530 - 1545	127	28	52	13	6	69	**295**
1545 - 1600	105	38	42	20	8	81	**294**
1600 - 1615	95	22	61	15	7	86	**286**
1615 - 1630	91	31	36	14	6	68	**246**
1630 - 1645	82	22	50	13	4	80	**251**
1645 - 1700	55	21	49	14	6	72	**217**
1700 - 1715	80	27	57	11	6	76	**257**
1715 - 1730	58	16	44	10	4	68	**200**
1730 - 1745	66	9	55	15	7	58	**210**
1745 - 1800	69	23	42	15	10	79	**238**
Per End	**981**	**297**	**569**	**174**	**82**	**881**	**2984**

Heavies	WEST		NORTH		EAST		
	Tongarra Rd		*Station St*		*Tongarra Rd*		
Time Per	T	L	R	L	R	T	TOT
1500 - 1515	2	0	0	0	0	4	**6**
1515 - 1530	3	0	0	0	0	2	**5**
1530 - 1545	4	0	0	0	0	8	**12**
1545 - 1600	8	2	0	0	0	1	**11**
1600 - 1615	2	0	0	0	0	1	**3**
1615 - 1630	2	0	0	0	0	0	**2**
1630 - 1645	0	0	0	0	0	1	**1**
1645 - 1700	0	0	0	0	0	1	**1**
1700 - 1715	0	0	0	0	0	0	**0**
1715 - 1730	0	0	0	0	0	0	**0**
1730 - 1745	0	0	0	0	0	0	**0**
1745 - 1800	0	0	1	0	0	0	**1**
Per End	**21**	**2**	**1**	**0**	**0**	**18**	**42**

Combined	WEST		NORTH		EAST		
	Tongarra Rd		*Station St*		*Tongarra Rd*		
Time Per	T	L	R	L	R	T	TOT
1500 - 1515	59	26	44	17	7	74	**227**
1515 - 1530	99	34	37	17	11	76	**274**
1530 - 1545	131	28	52	13	6	77	**307**
1545 - 1600	113	40	42	20	8	82	**305**
1600 - 1615	97	22	61	15	7	87	**289**
1615 - 1630	93	31	36	14	6	68	**248**
1630 - 1645	82	22	50	13	4	81	**252**
1645 - 1700	55	21	49	14	6	73	**218**
1700 - 1715	80	27	57	11	6	76	**257**
1715 - 1730	58	16	44	10	4	68	**200**
1730 - 1745	66	9	55	15	7	58	**210**
1745 - 1800	69	23	43	15	10	79	**239**
Per End	**1002**	**299**	**570**	**174**	**82**	**899**	**3026**

Lights	WEST		NORTH		EAST		
	Tongarra Rd		*Station St*		*Tongarra Rd*		
Peak Per	T	L	R	L	R	T	TOT
1500 - 1600	385	126	175	67	32	294	**1079**
1515 - 1615	423	122	192	65	32	310	**1144**
1530 - 1630	418	119	191	62	27	304	**1121**
1545 - 1645	373	113	189	62	25	315	**1077**
1600 - 1700	323	96	196	56	23	306	**1000**
1615 - 1715	308	101	192	52	22	296	**971**
1630 - 1730	275	86	200	48	20	296	**925**
1645 - 1745	259	73	205	50	23	274	**884**
1700 - 1800	273	75	198	51	27	281	**905**
PEAK HR	**373**	**113**	**189**	**62**	**25**	**315**	**1077**

Heavies	WEST		NORTH		EAST		
	Tongarra Rd		*Station St*		*Tongarra Rd*		
Peak Per	T	L	R	L	R	T	TOT
1500 - 1600	17	2	0	0	0	15	**34**
1515 - 1615	17	2	0	0	0	12	**31**
1530 - 1630	16	2	0	0	0	10	**28**
1545 - 1645	12	2	0	0	0	3	**17**
1600 - 1700	4	0	0	0	0	3	**7**
1615 - 1715	2	0	0	0	0	2	**4**
1630 - 1730	0	0	0	0	0	2	**2**
1645 - 1745	0	0	0	0	0	1	**1**
1700 - 1800	0	0	1	0	0	0	**1**
PEAK HR	**12**	**2**	**0**	**0**	**0**	**3**	**17**

Combined	WEST		NORTH		EAST		
	Tongarra Rd		*Station St*		*Tongarra Rd*		
Peak Per	T	L	R	L	R	T	TOT
1500 - 1600	402	128	175	67	32	309	**1113**
1515 - 1615	440	124	192	65	32	322	**1175**
1530 - 1630	434	121	191	62	27	314	**1149**
1545 - 1645	385	115	189	62	25	318	**1094**
1600 - 1700	327	96	196	56	23	309	**1007**
1615 - 1715	310	101	192	52	22	298	**975**
1630 - 1730	275	86	200	48	20	298	**927**
1645 - 1745	259	73	205	50	23	275	**885**
1700 - 1800	273	75	199	51	27	281	**906**
PEAK HR	**385**	**115**	**189**	**62**	**25**	**318**	**1094**

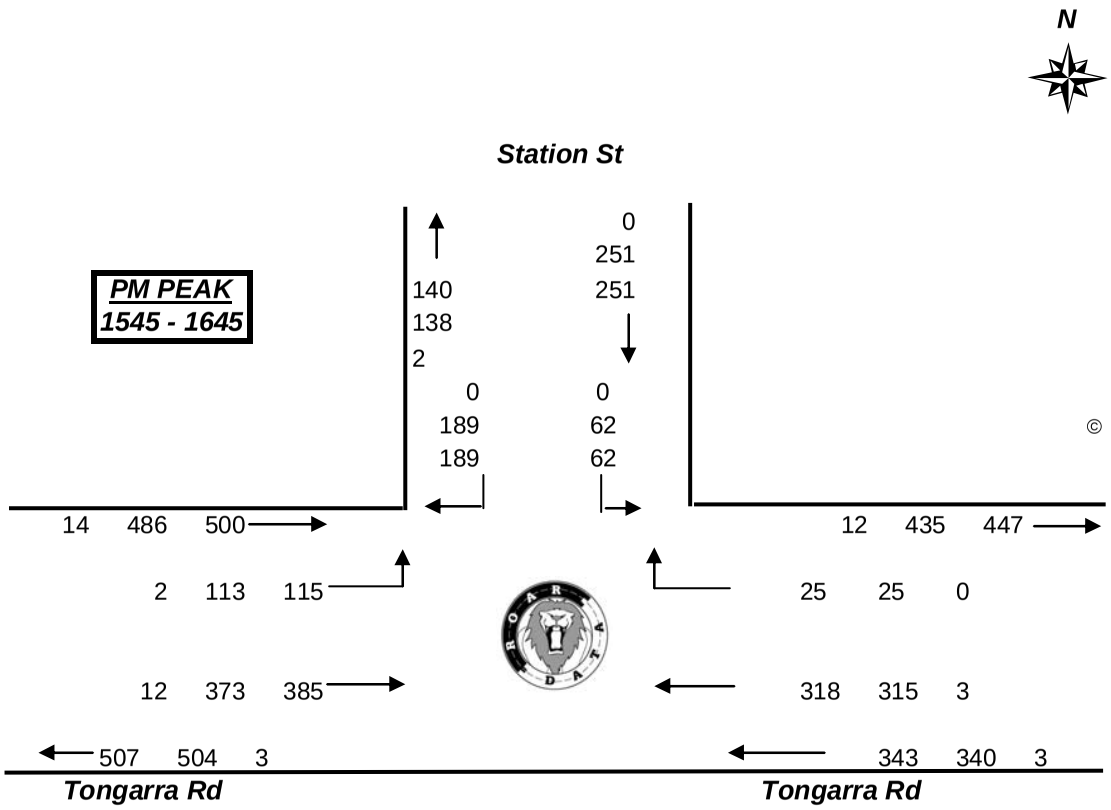
R.O.A.R. DATA

Client : Masson Wilson Twiney

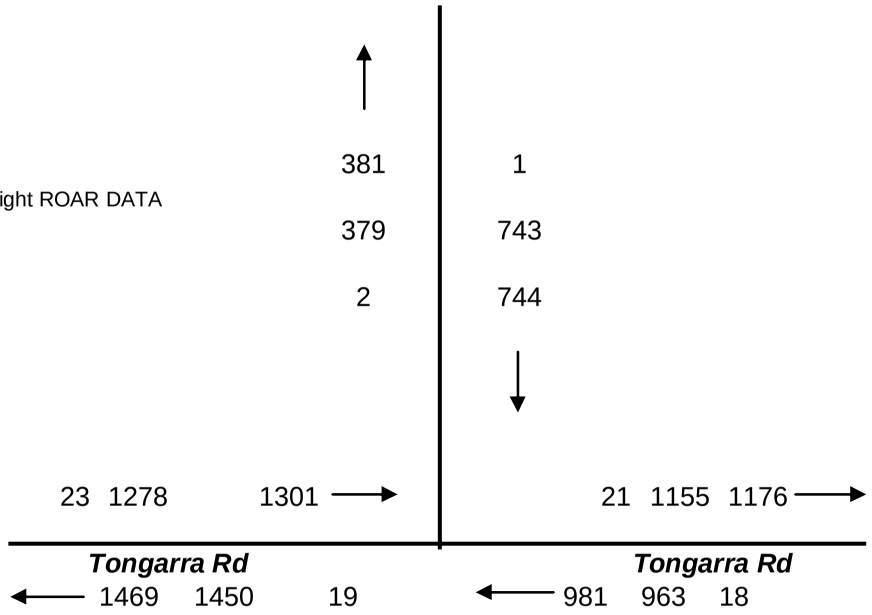
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

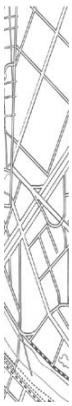
Job No/Name : 1968 Albion Park - Tongarra Rd
Day/Date : Monday 24th September 2007

TOTAL VOLUMES FOR COUNT PERIOD



© Copyright ROAR DATA





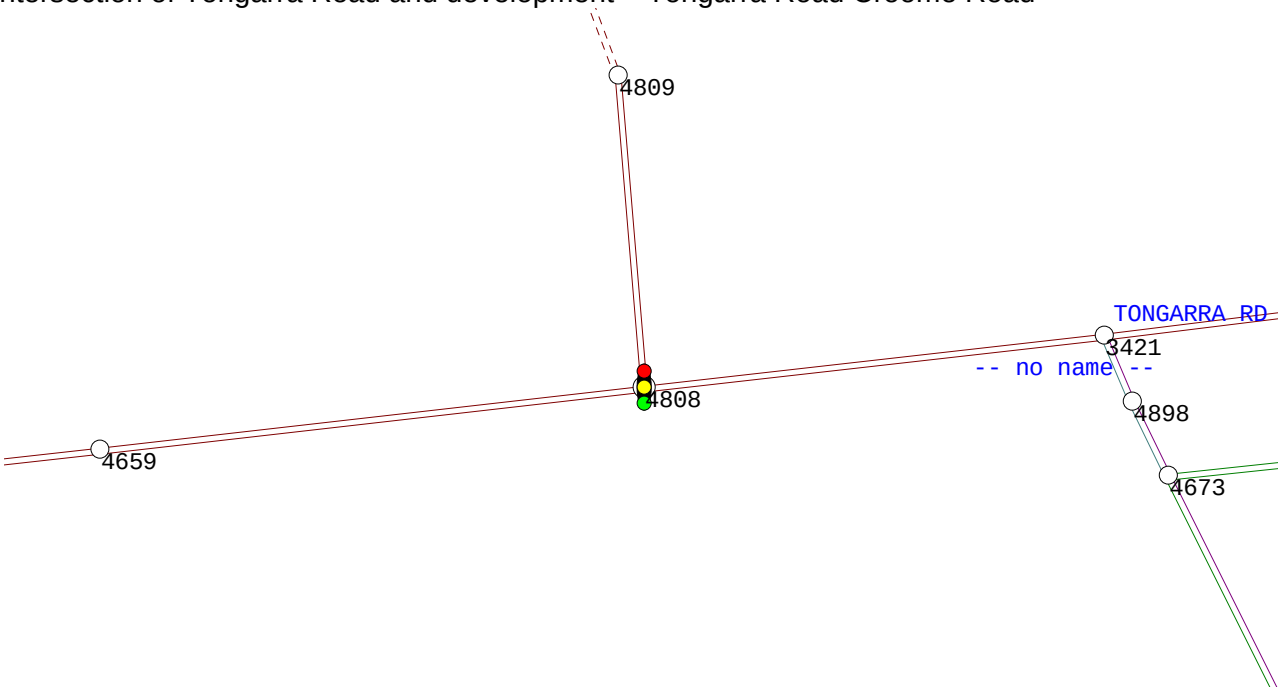
Appendix E - Shellharbour City Council – TRACKS Modelling Outputs

© Masson Wilson Twiney

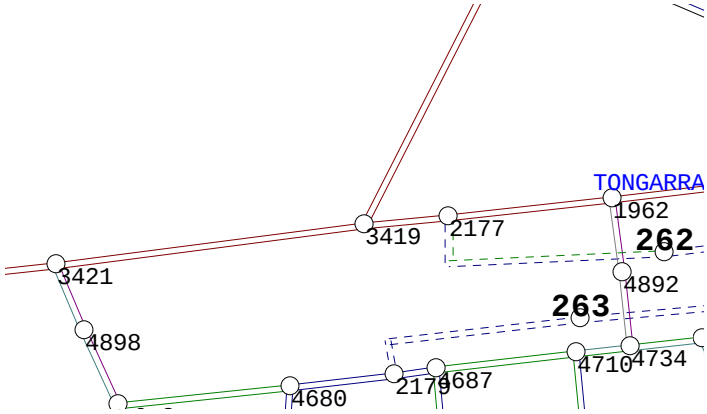
Delmo Proposal Traffic Modelling Results for the AM / PM Peaks and 24HR flow in the years 2008 and 2018 land use years.

Intersection Node Numbers

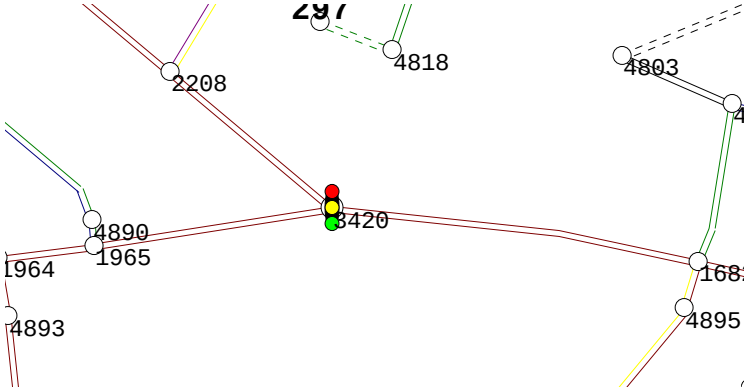
Intersection of Tongarra Road and development – Tongarra Road Croome Road



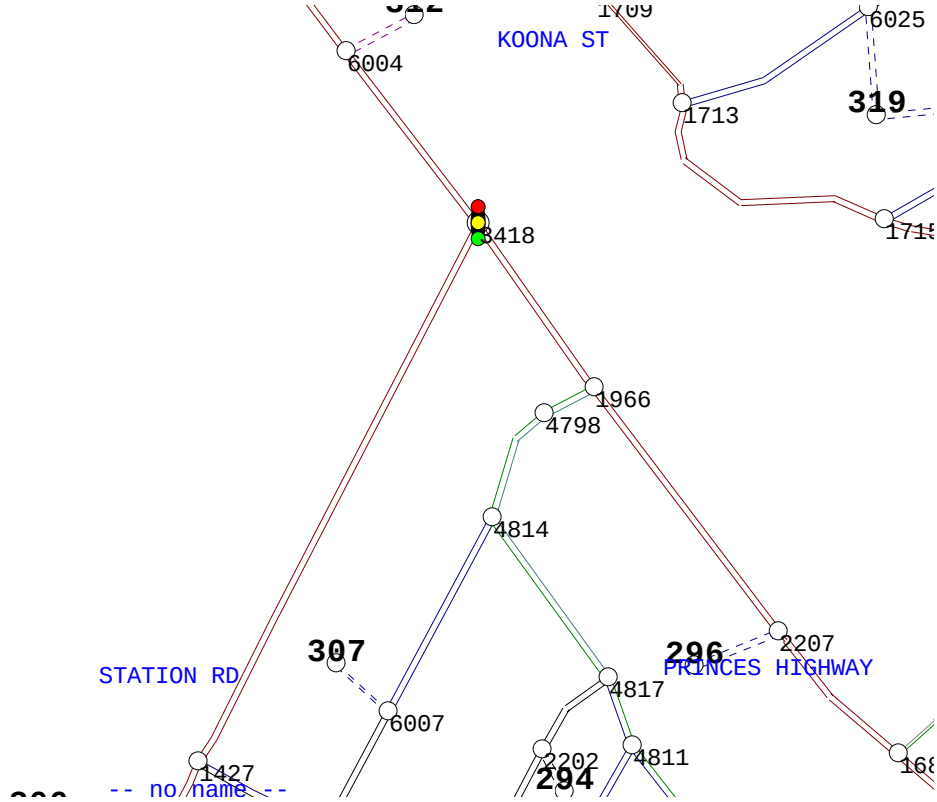
Tongarra Road and Station Road



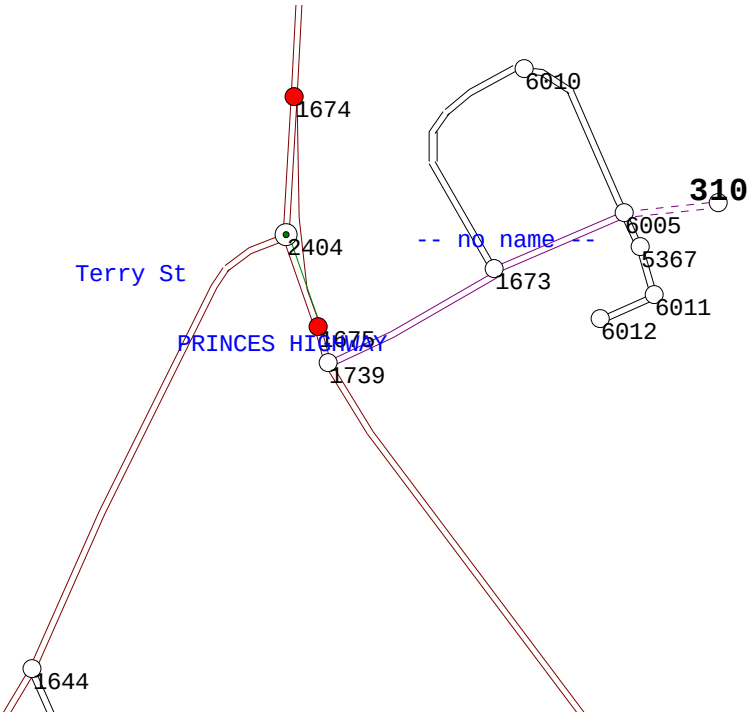
Tongarra Road and Princes Highway



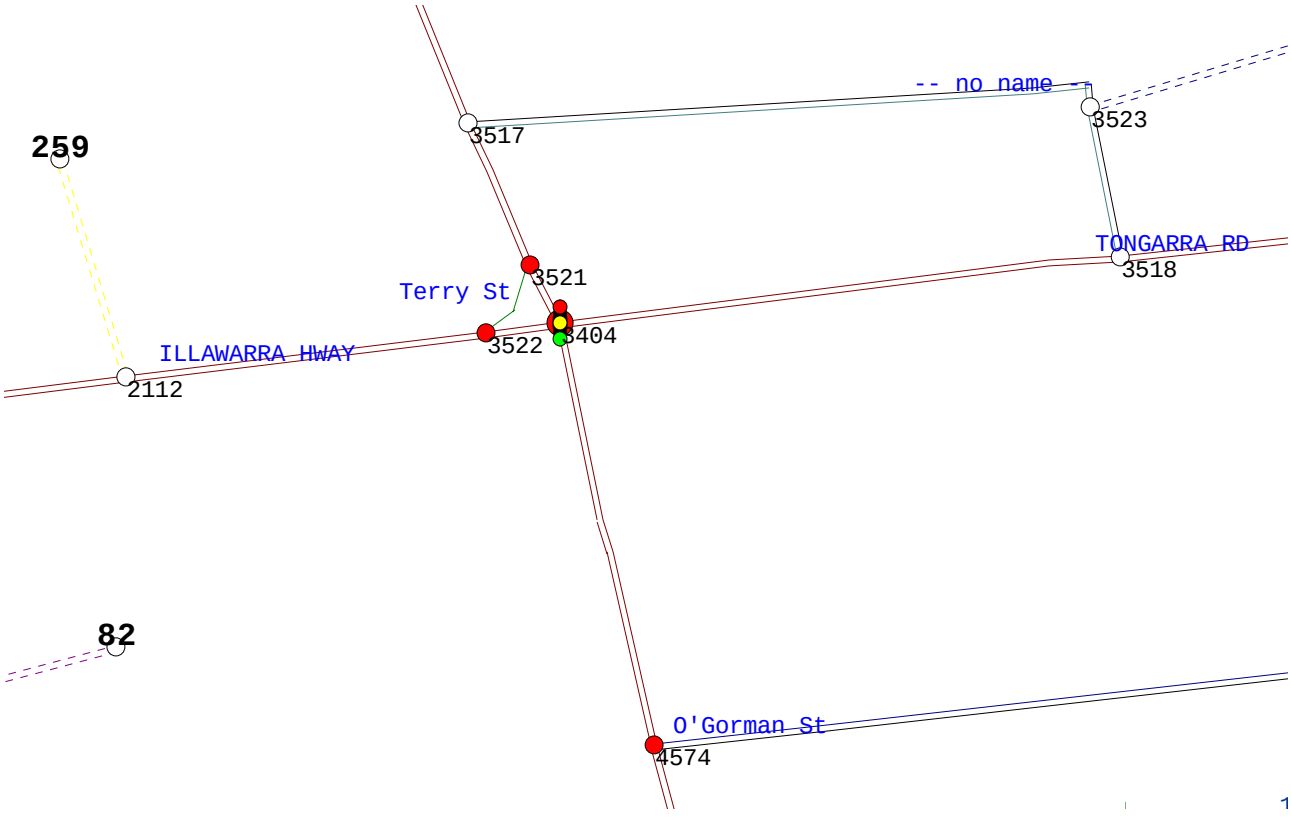
Princes Highway and Station Road



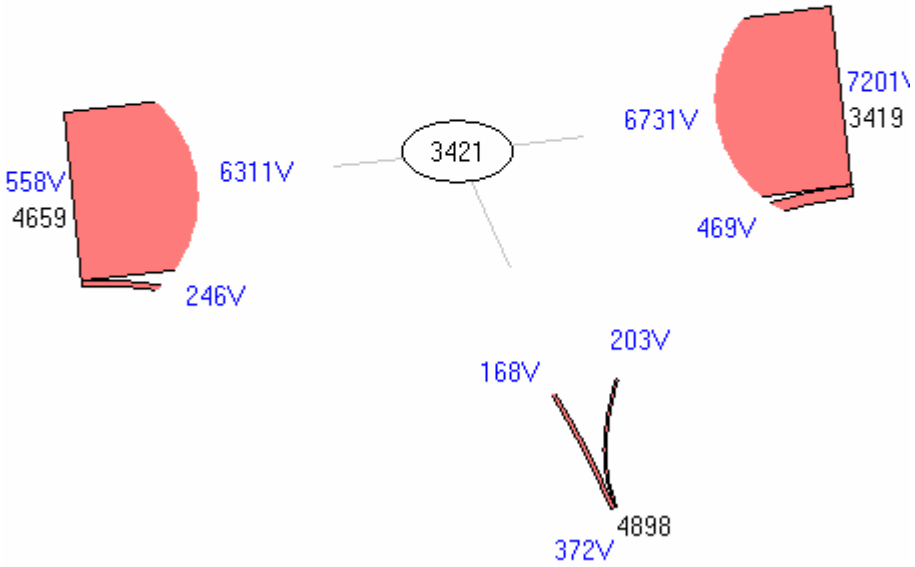
Princes Highway and Princes Highway

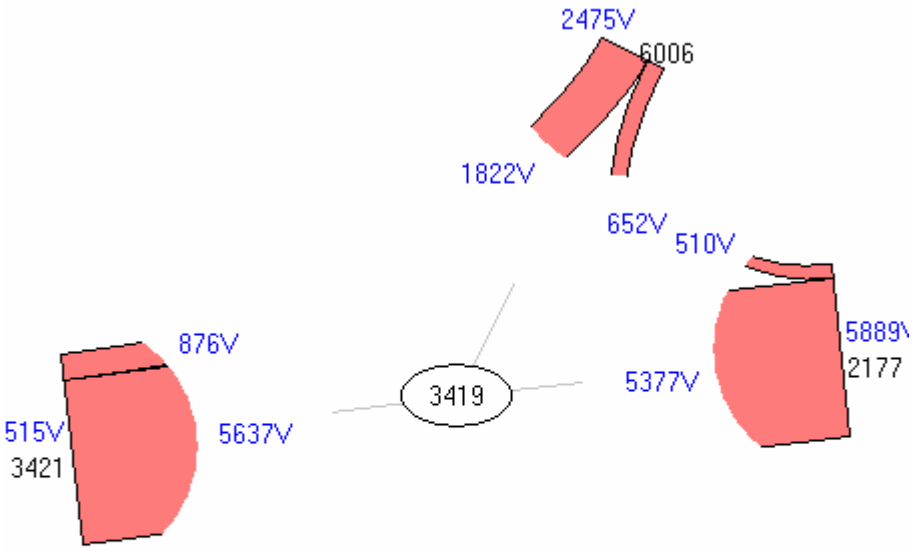


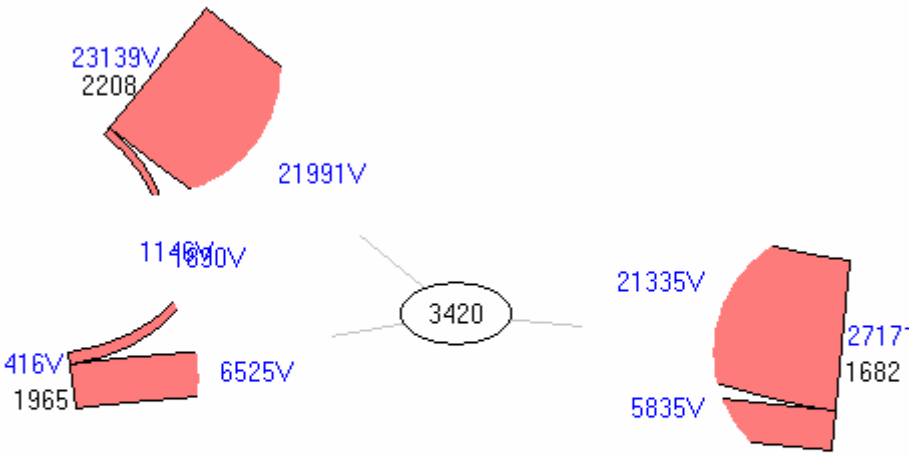
Tongarra Road and Terry Street

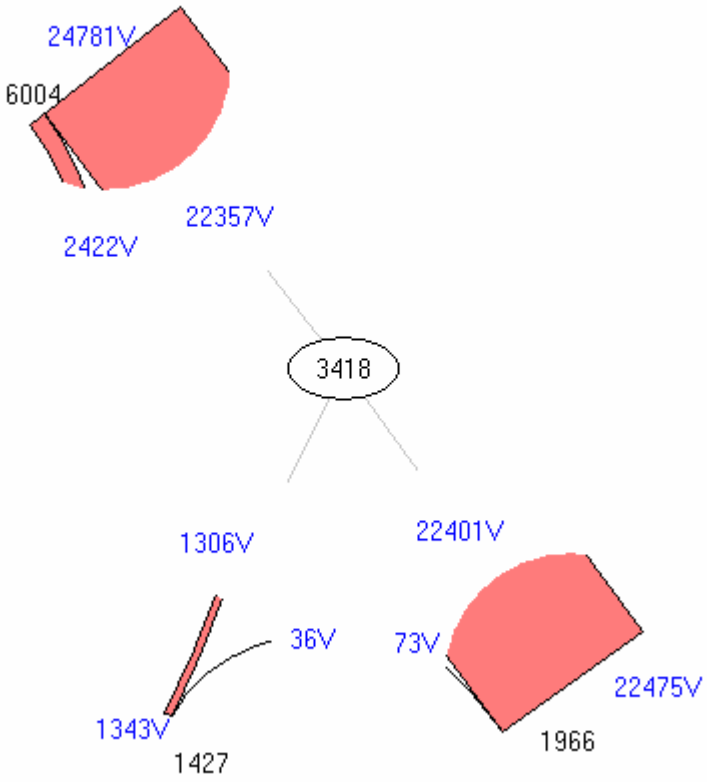


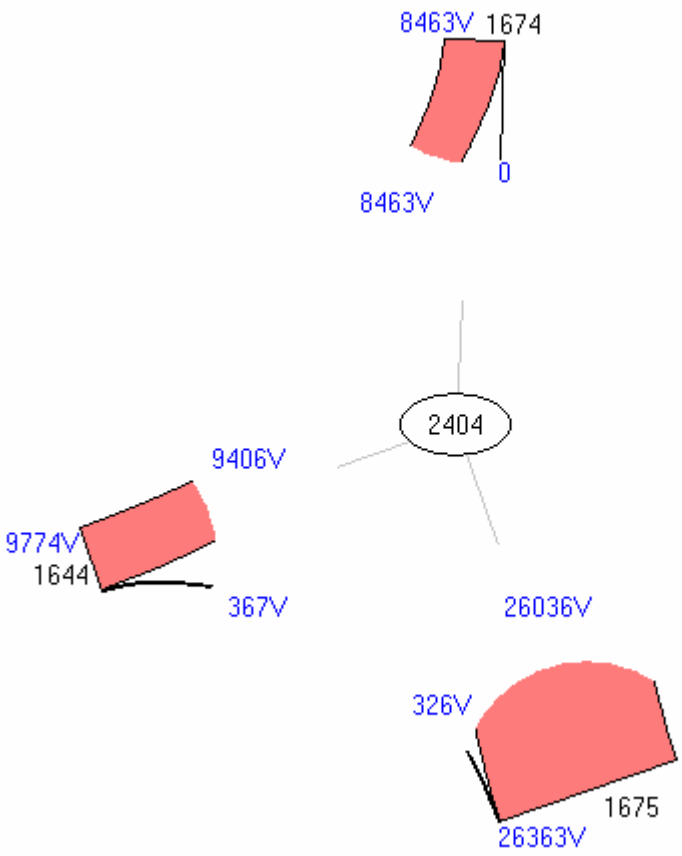
2008 24hr base model

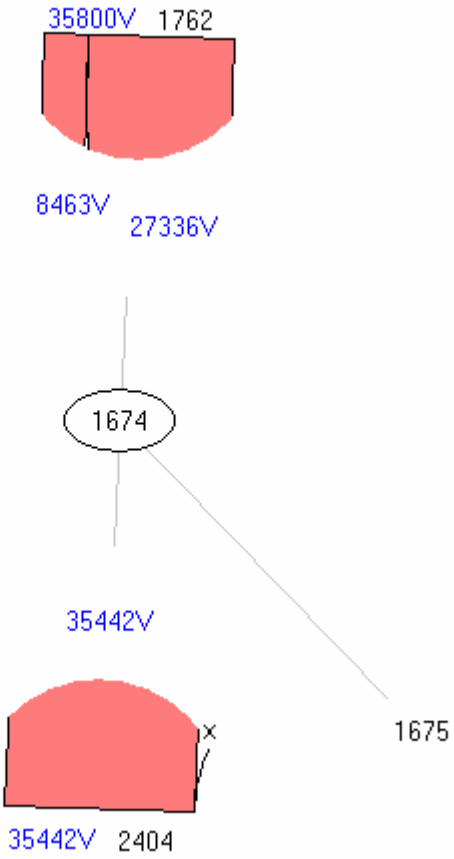


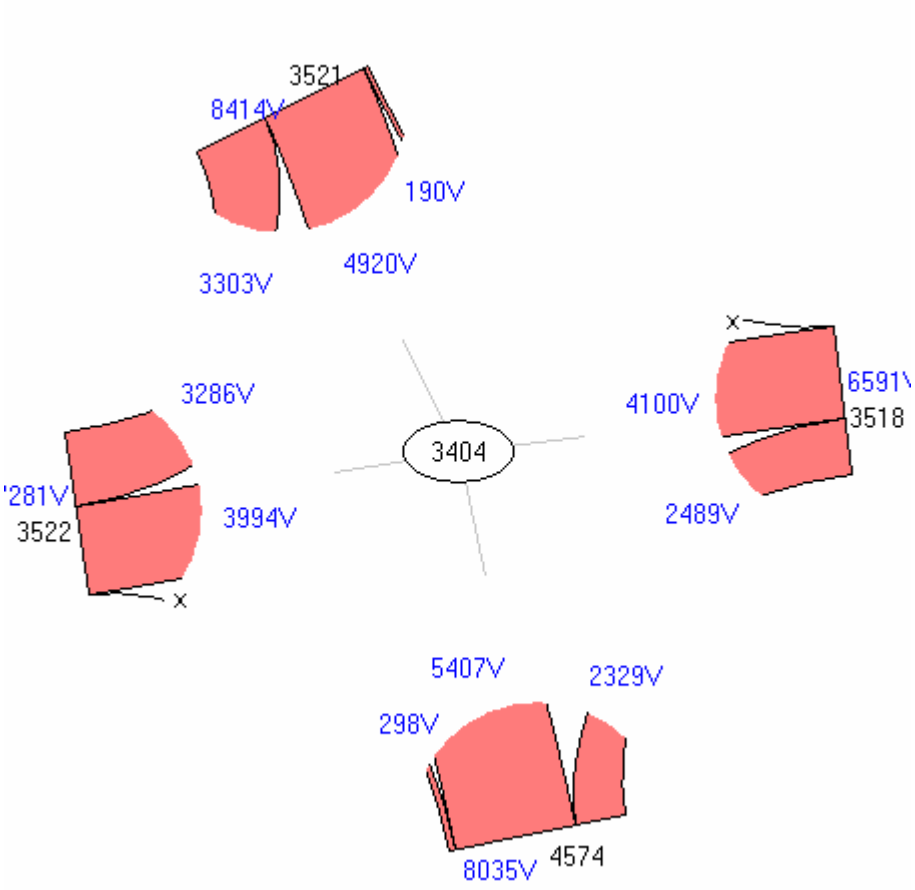

2475V
6006
1822V
652V
510V
5889V
2177
5377V
876V
3419
515V
3421
5637V


23139V
2208
21991V
1690V
3420
21335V
2717
1682
5835V
416V
1965
6525V

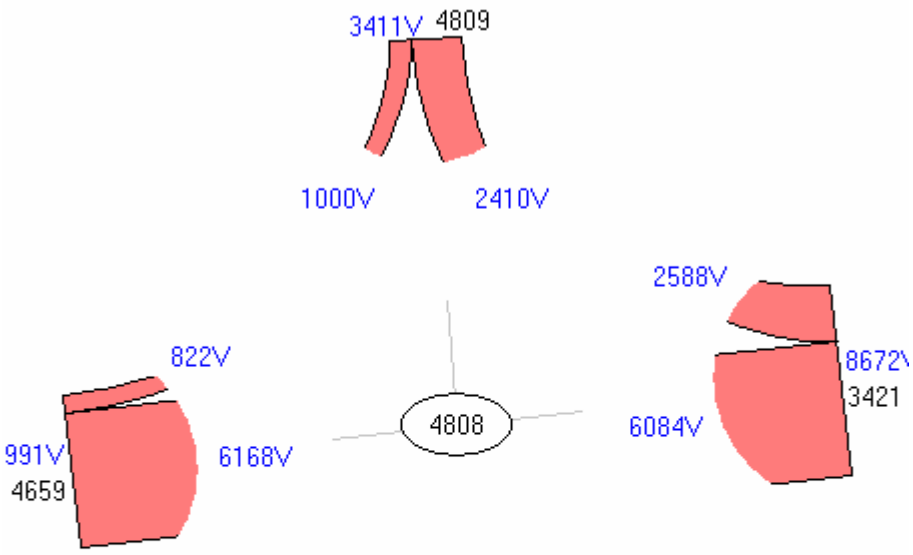

24781V
6004
22357V
2422V
3418
1306V
22401V
36V
73V
22475V
1343V
1427
1966

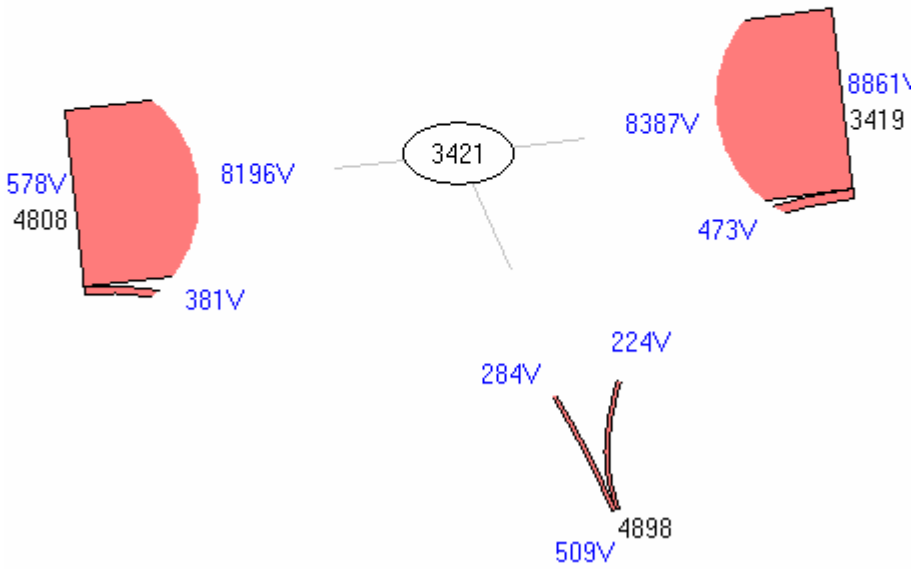

8463V
1674
0
8463V
2404
9406V
9774V
1644
367V
26036V
326V
1675
26363V

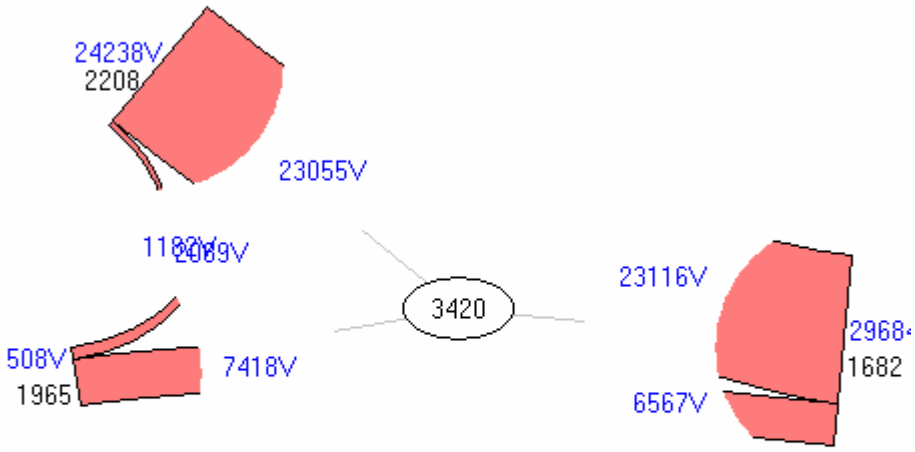

35800V
1762
8463V
27336V
1674
35442V
1675
35442V
2404

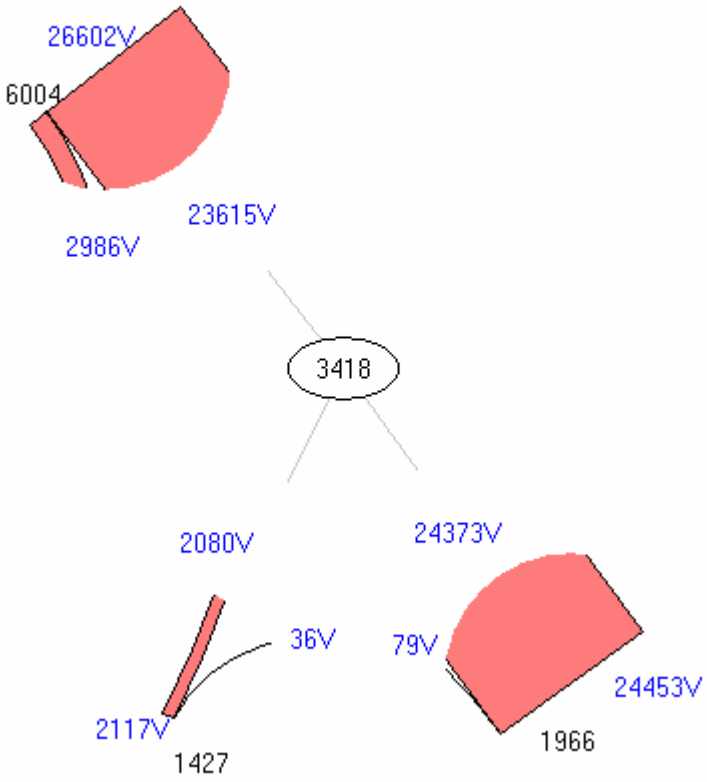

3521
8414V
190V
4920V
3303V
3286V
'281V
3522
3994V
x
3404
x
4100V
6591\
3518
2489V
5407V
2329V
298V
8035V
4574

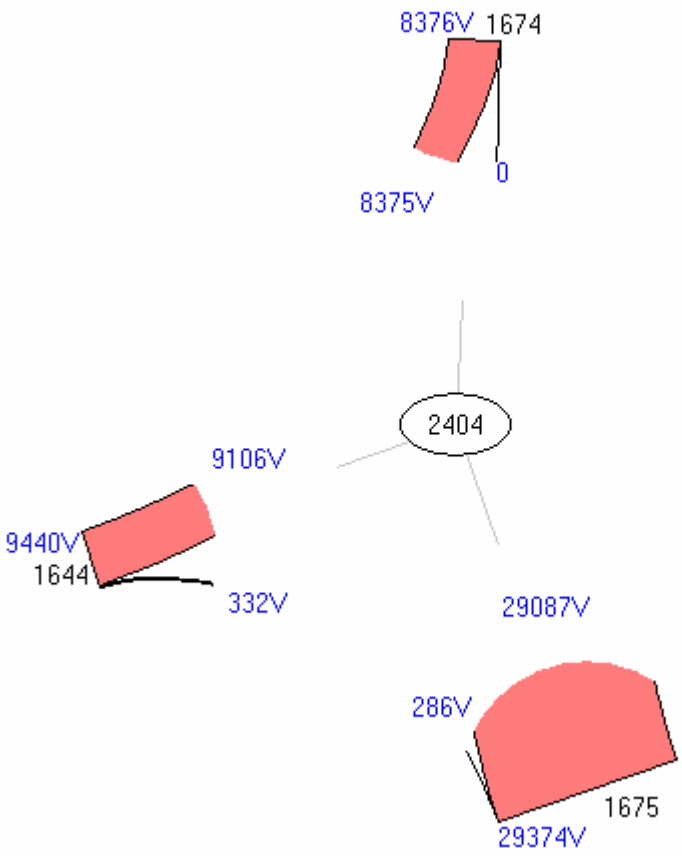
2008 24hr flows with development

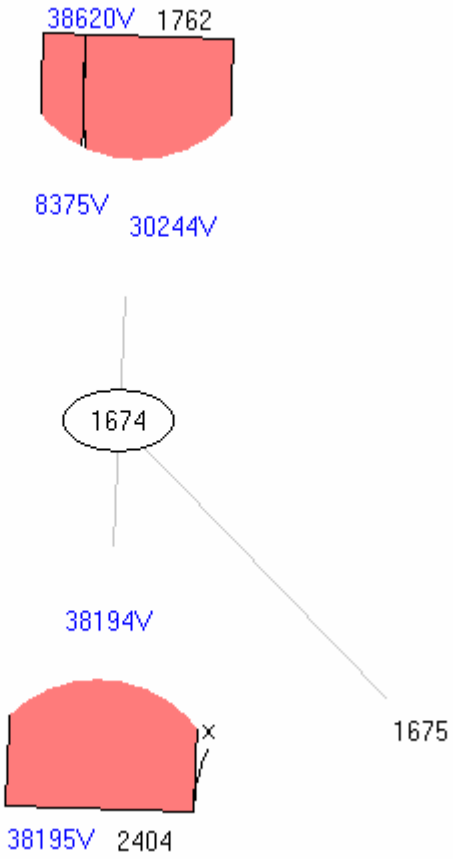


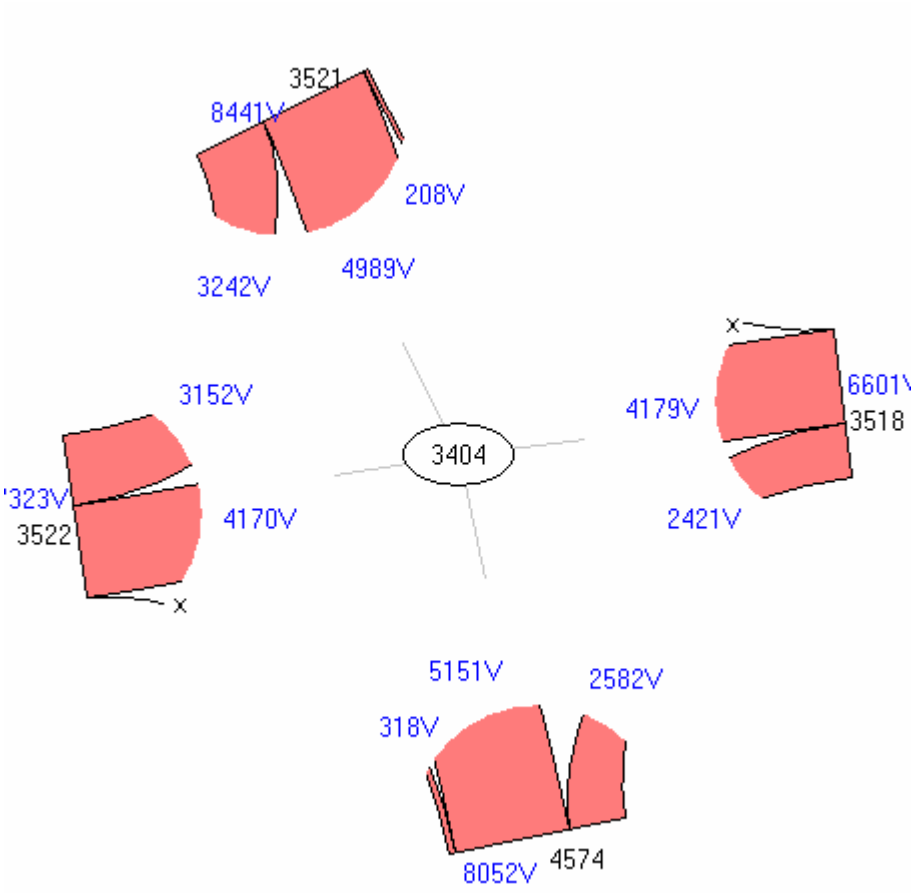

578V
4808
8196V
381V
3421
8387V
8861
3419
473V
224V
284V
4898
509V


24238V
2208
23055V
3420
508V
1965
7418V
23116V
2968
1682
6567V

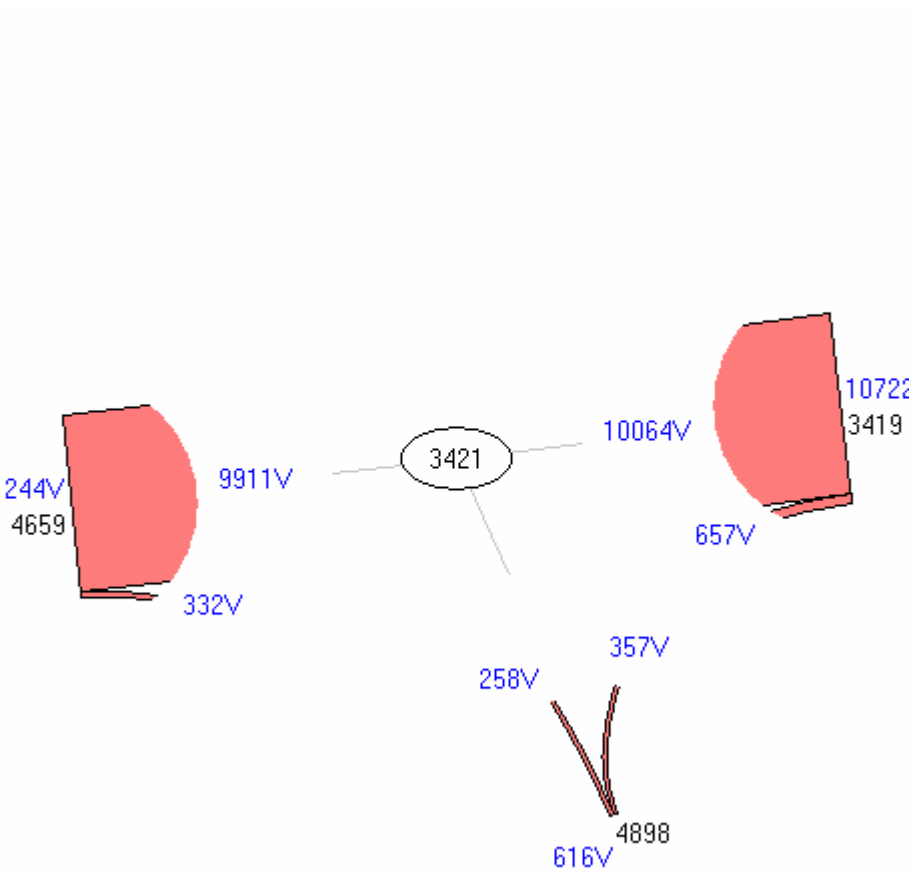

26602V
6004
23615V
2986V
3418
2080V
24373V
36V
79V
24453V
2117V
1966
1427

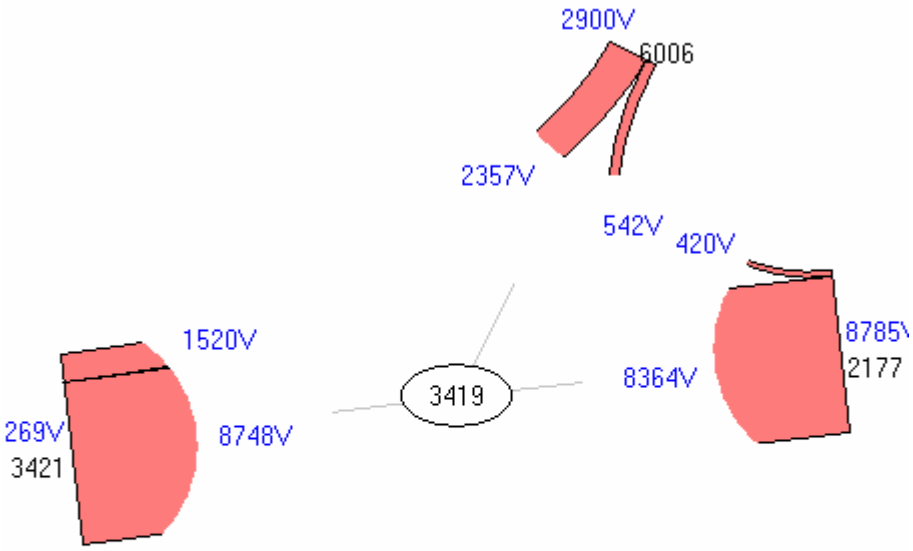

8376V
1674
0
8375V
2404
9106V
9440V
1644
332V
29087V
286V
1675
29374V

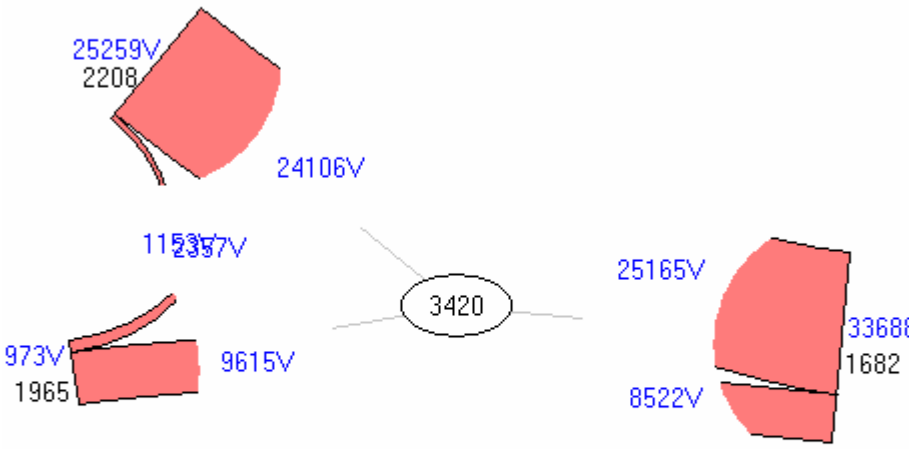

38620V
1762
8375V
30244V
1674
38194V
1675
38195V
2404

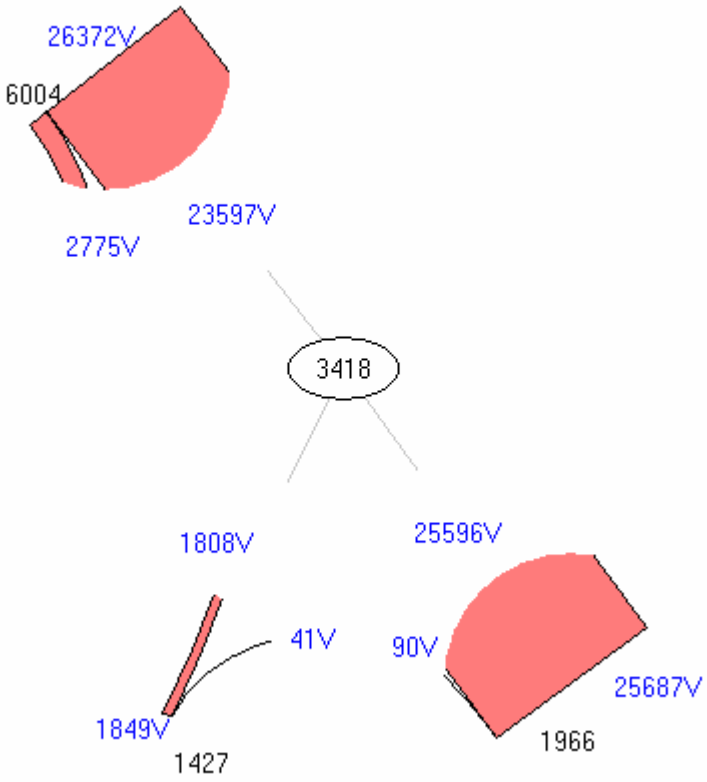

3521
8441V
208V
3242V
4989V
3152V
'323V
3522
4170V
x
3404
x
4179V
6601V
3518
2421V
5151V
2582V
318V
8052V
4574

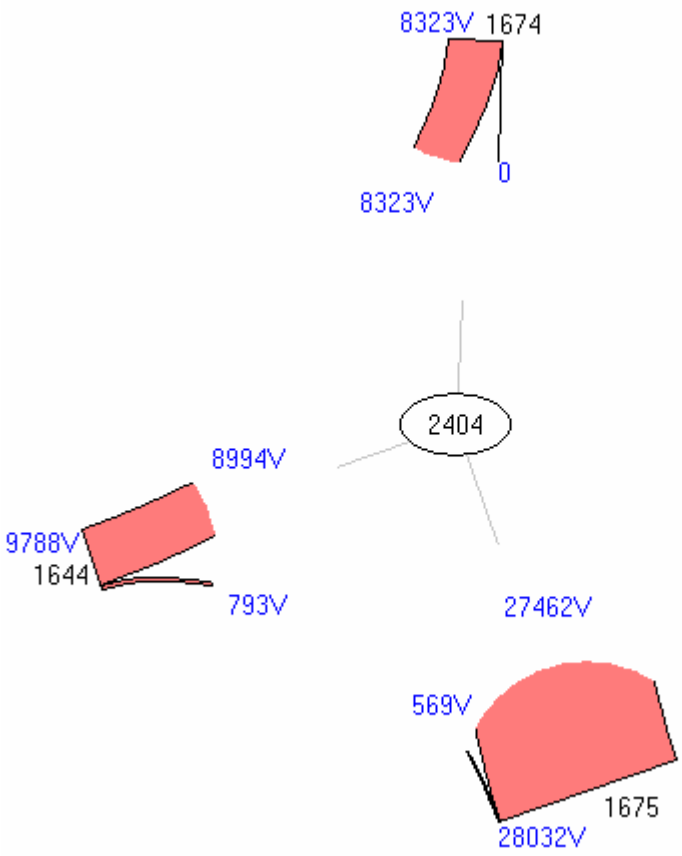
2018 base model 24hr flows

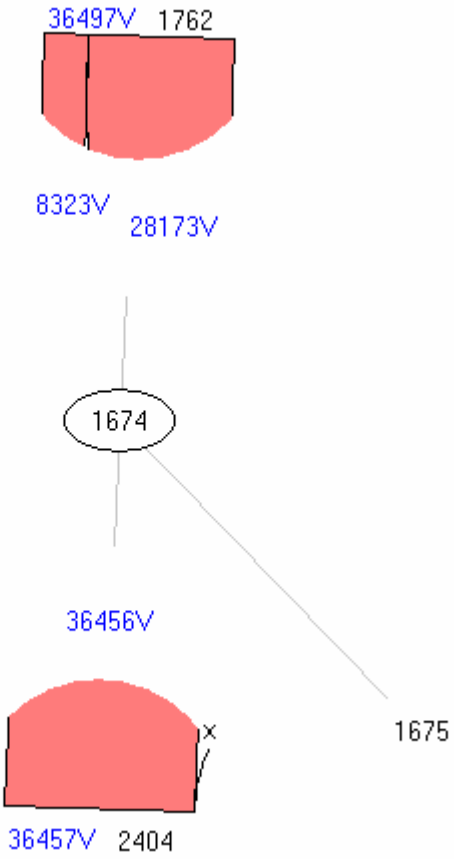


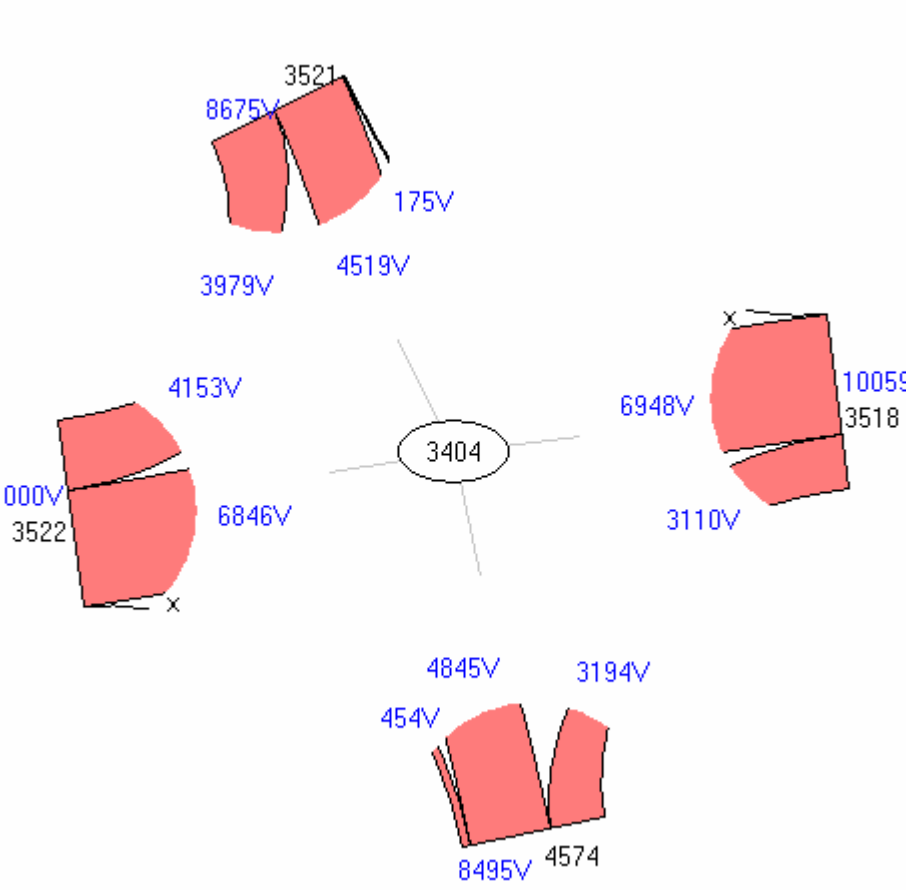

2900V
6006
2357V
542V
420V
8785\
2177
8364V
1520V
3419
269V
3421
8748V


25259V
2208
24106V
973V
1965
9615V
3420
25165V
8522V
1682

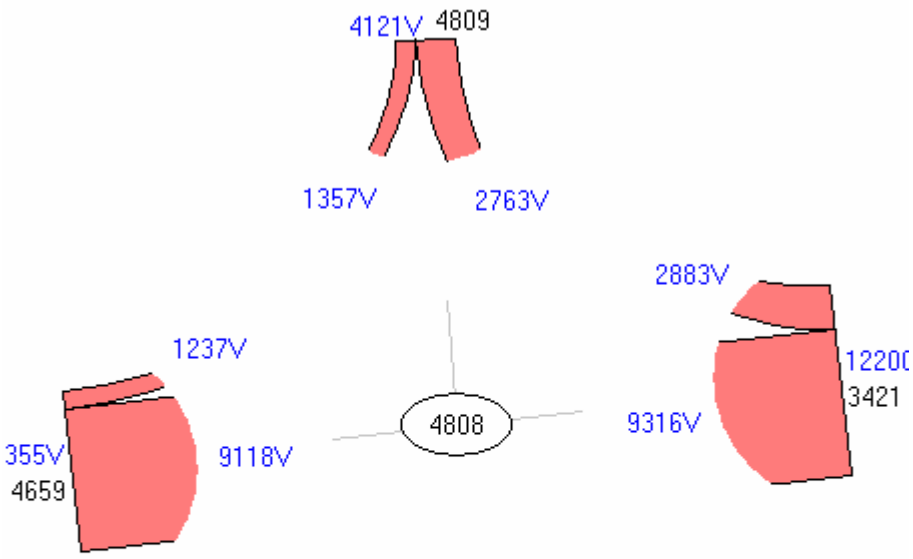

26372V
6004
23597V
2775V
3418
1808V
25596V
41V
90V
25687V
1849V
1966
1427

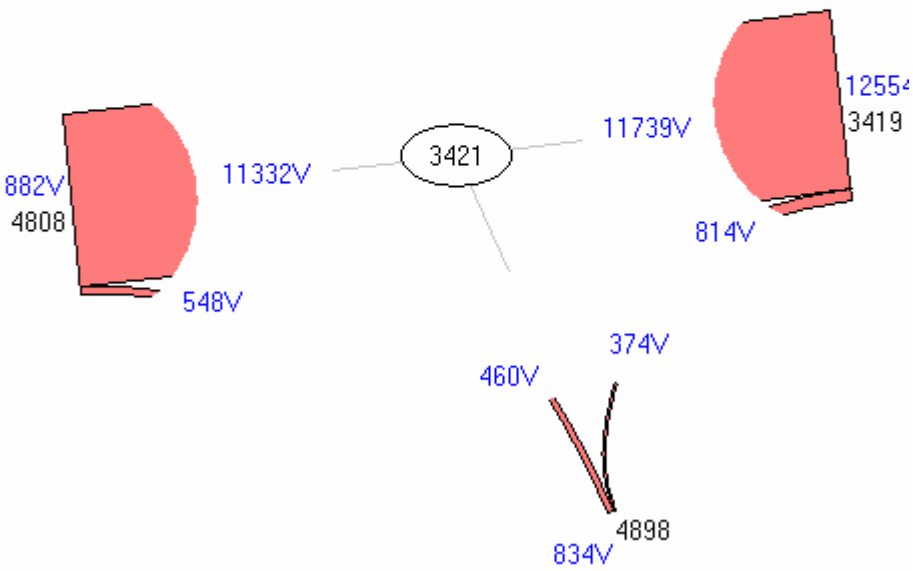

8323V
1674
0
8323V
2404
8994V
9788V
1644
793V
27462V
569V
1675
28032V

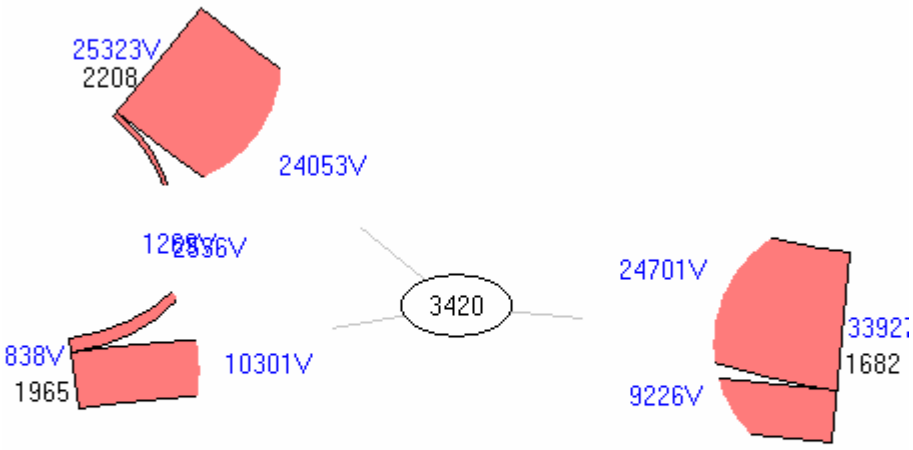

36497V
1762
8323V
28173V
1674
36456V
1675
36457V
2404

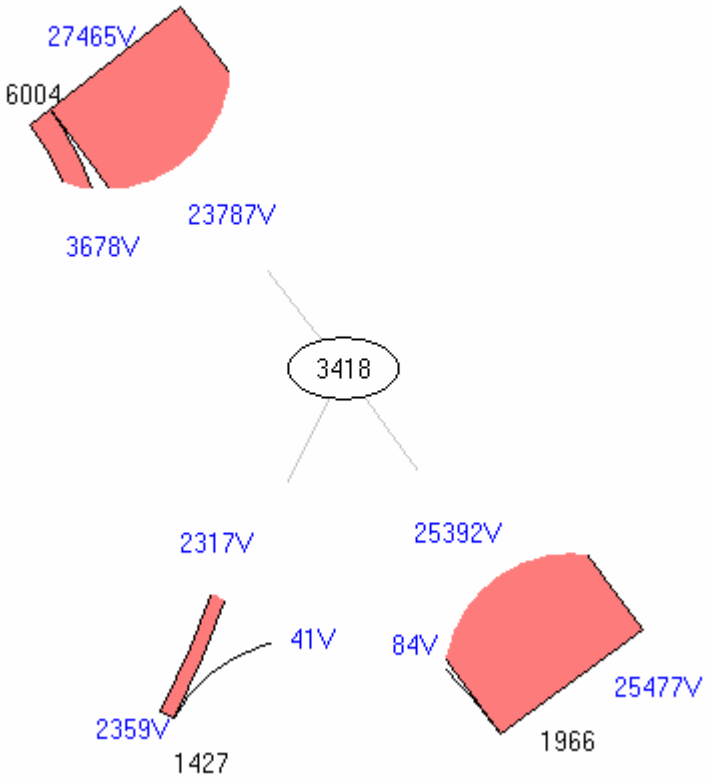

3521
8675V
175V
4519V
3979V
4153V
000V
3522
6846V
x
3404
x
6948V
10059
3518
3110V
4845V
3194V
454V
8495V
4574

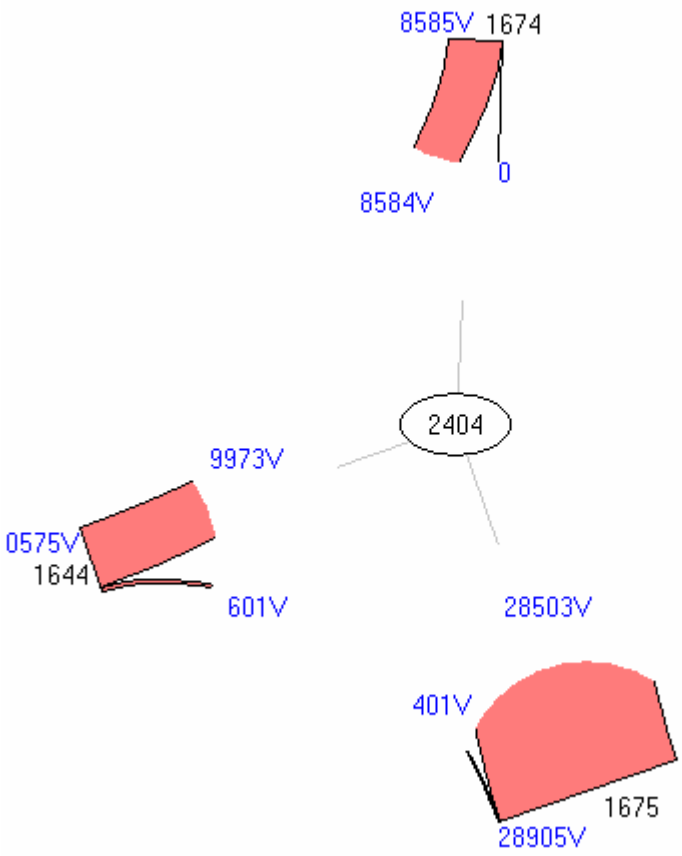
2018 24hr flows with development

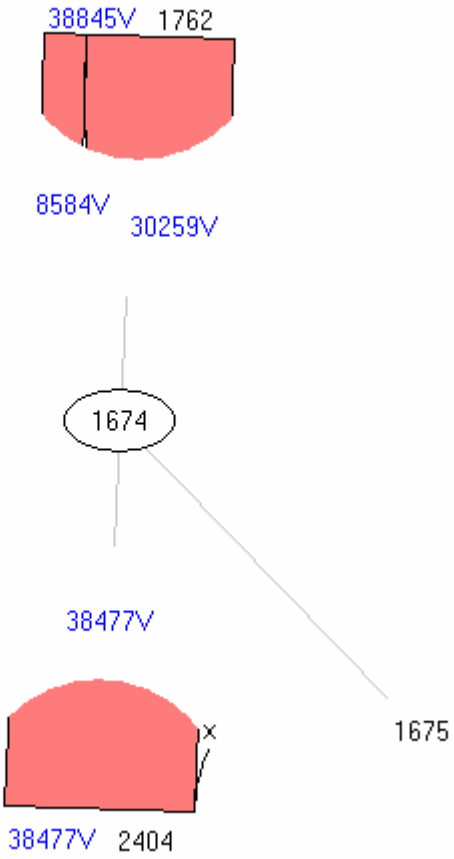


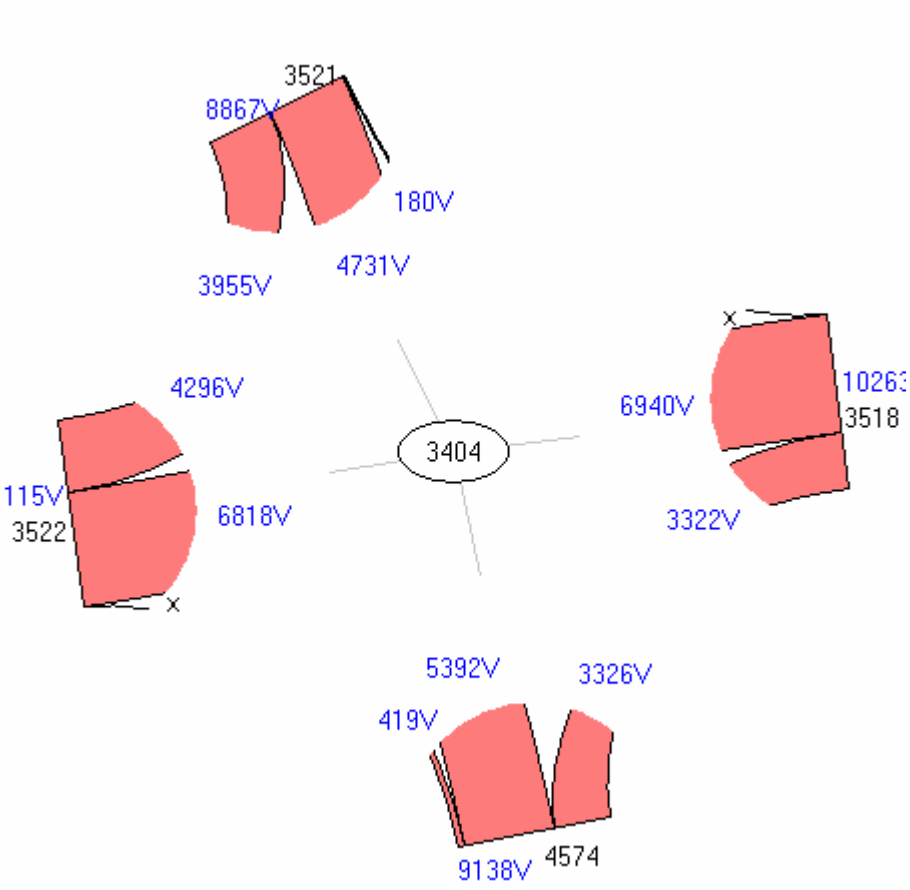

882V
4808
548V
11332V
3421
11739V
814V
3419
460V
374V
4898
834V


25323V
2208
24053V
838V
1965
10301V
3420
24701V
9226V
1682

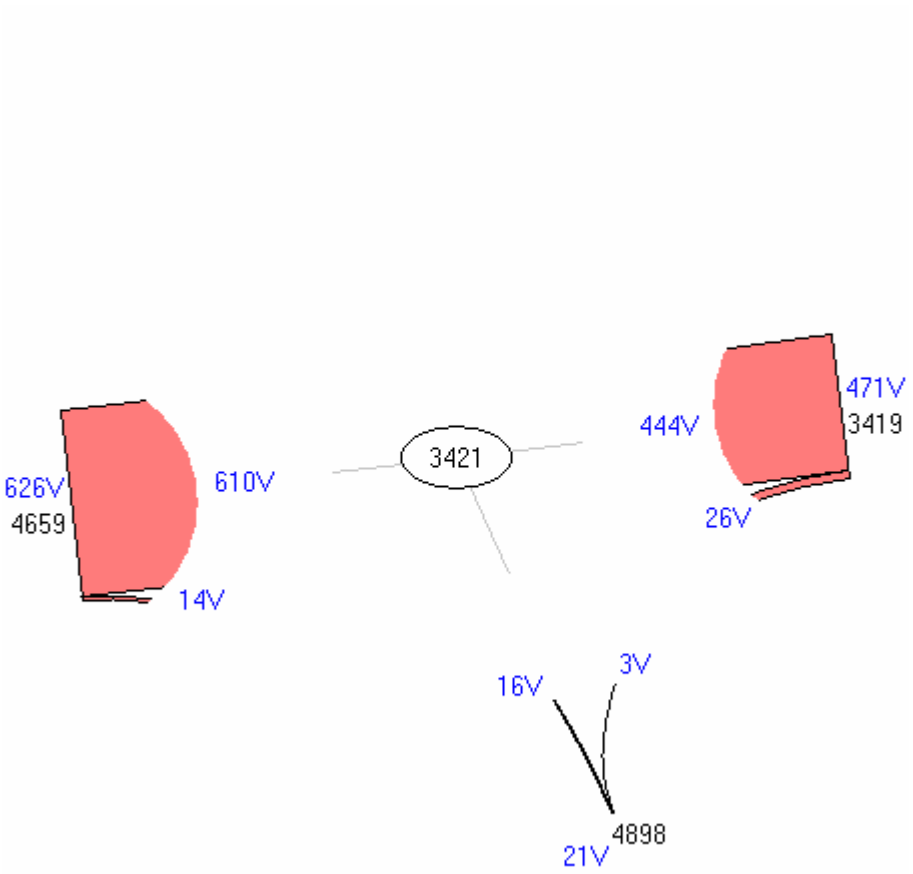

27465V
6004
23787V
3678V
3418
2317V
41V
2359V
1427
25392V
84V
25477V
1966

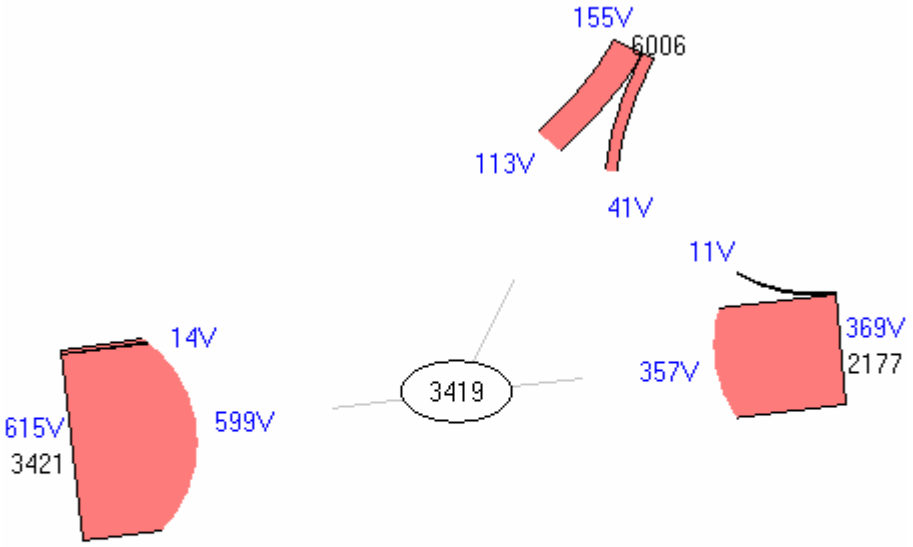

8585V
1674
0
8584V
2404
9973V
0575V
1644
601V
28503V
401V
1675
28905V

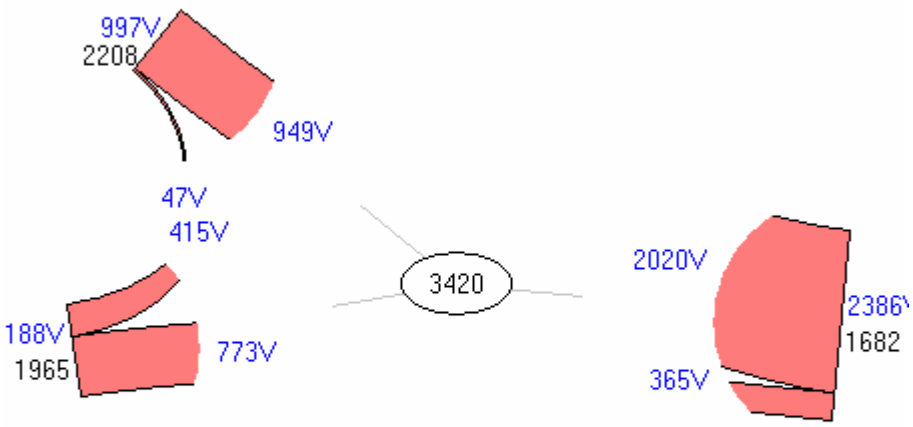

38845V
1762
8584V
30259V
1674
38477V
1675
38477V
2404

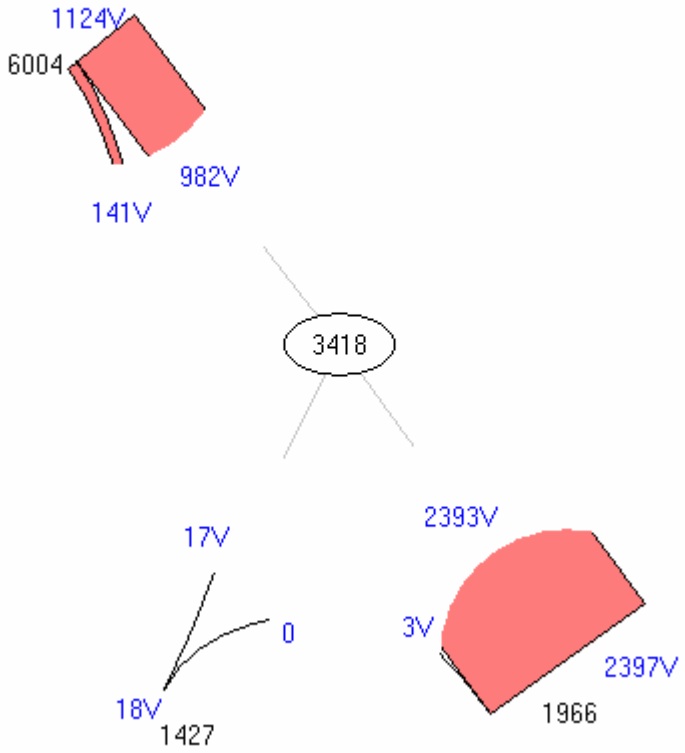

3521
8867V
180V
4731V
3955V
4296V
115V
3522
6818V
x
3404
6940V
10263
3518
3322V
x
5392V
3326V
419V
9138V
4574

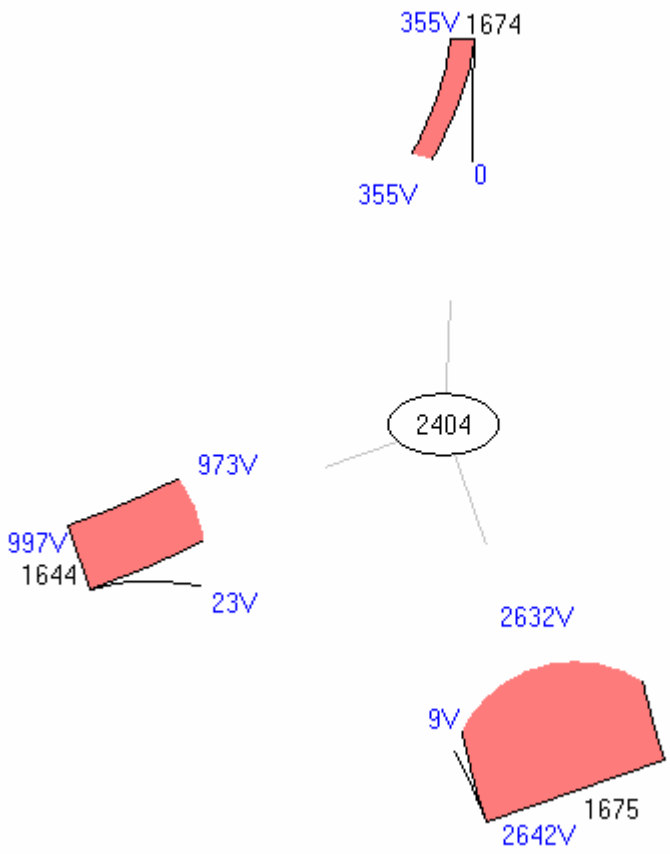
AM PEAK 2008 BASE MODEL FLOWS

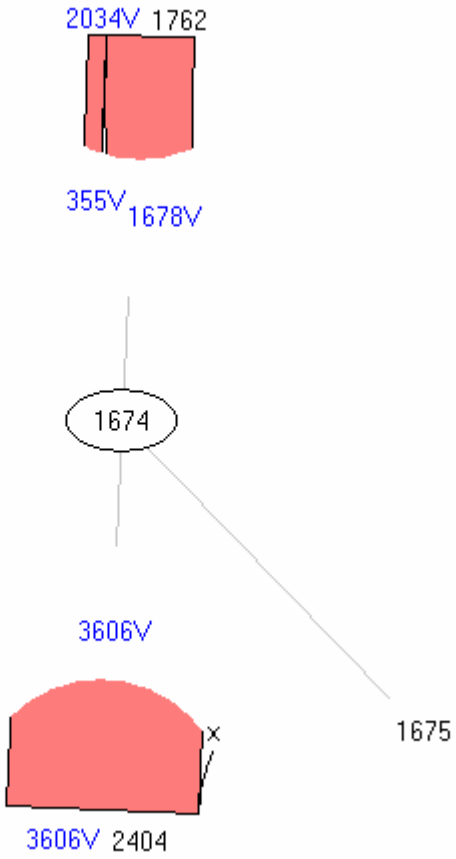


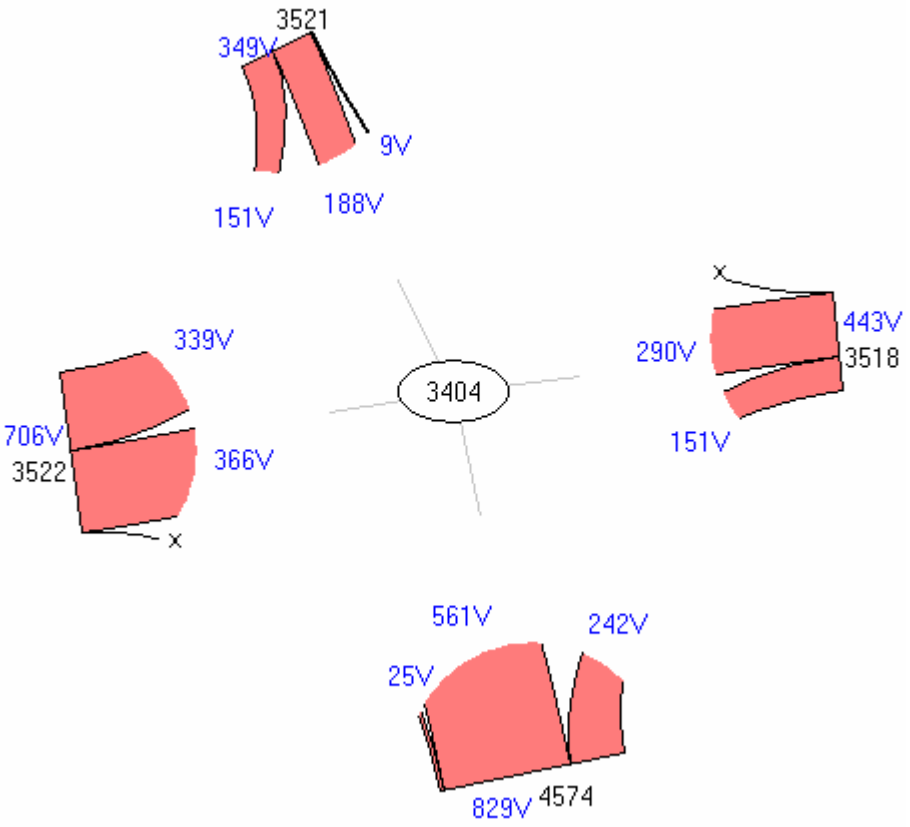

155V
6006
113V
41V
11V
14V
369V
2177
357V
3419
615V
3421
599V


997V
2208
949V
47V
415V
3420
188V
1965
773V
2020V
365V
1682

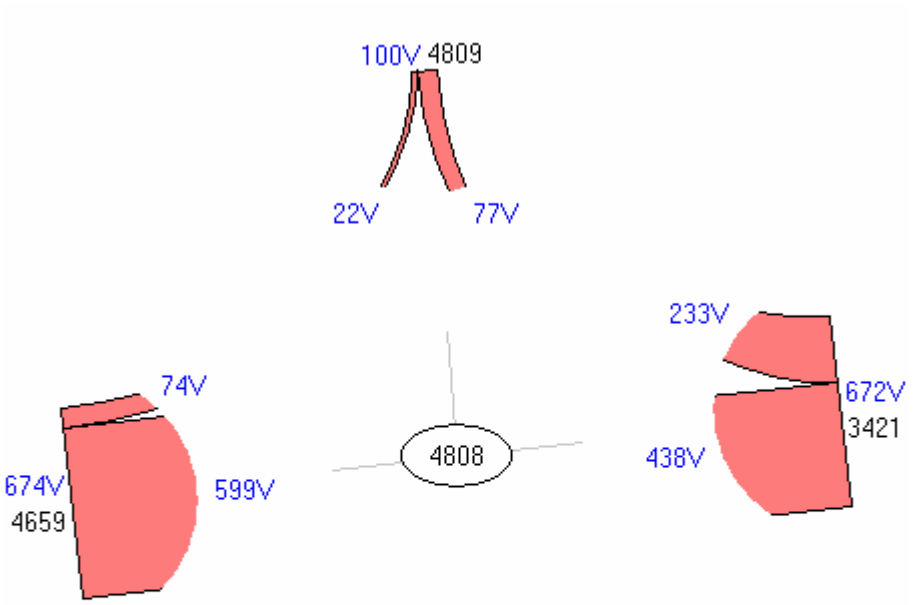

1124V
6004
982V
141V
3418
17V
0
18V
1427
2393V
3V
2397V
1966

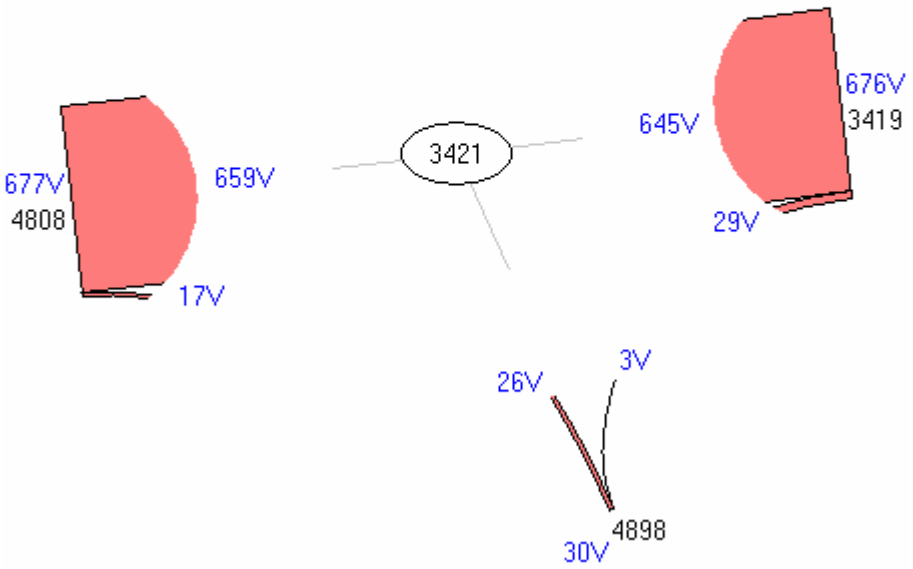

355V
1674
0
355V
2404
973V
997V
1644
23V
2632V
9V
1675
2642V

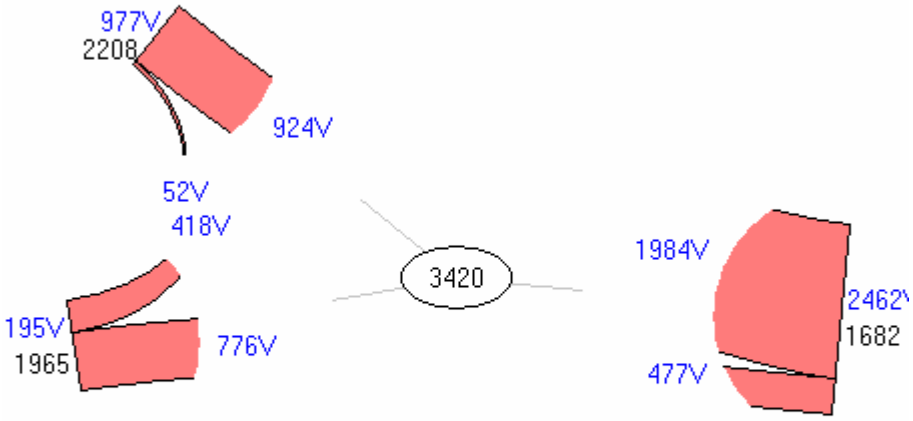

2034V 1762
355V 1678V
1674
3606V
1675
3606V 2404

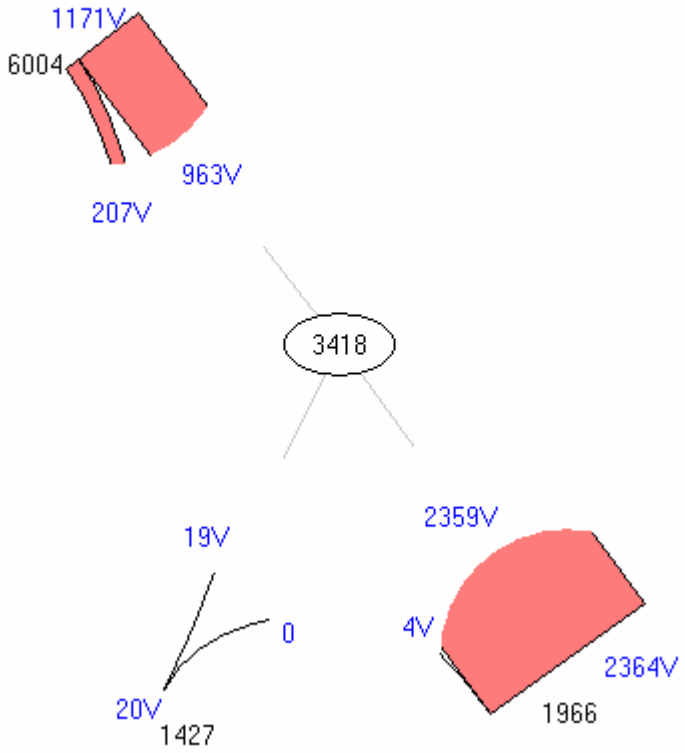

3521
349V
9V
151V
188V
339V
706V
3522
366V
x
3404
x
443V
290V
3518
151V
561V
242V
25V
829V
4574

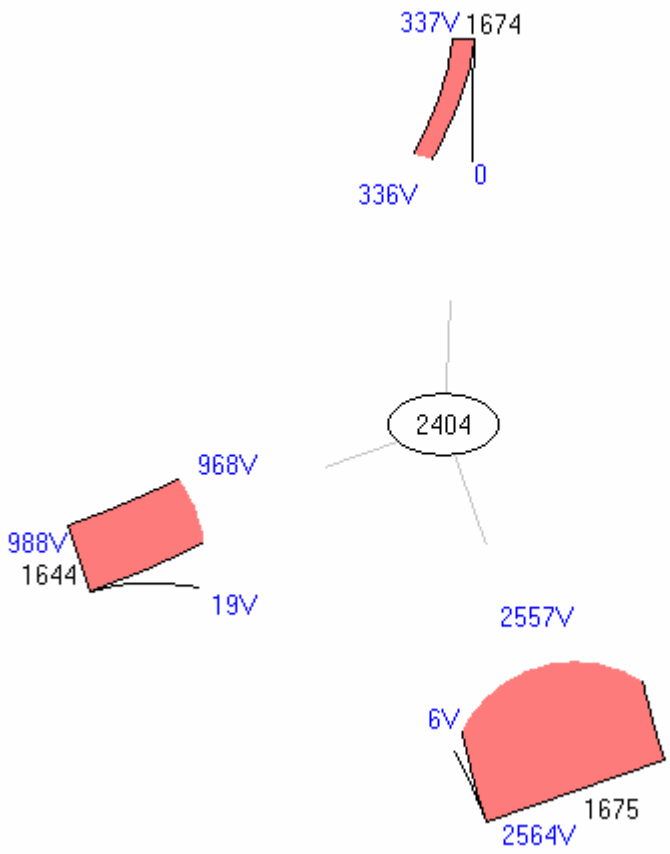
AM PEAK MODEL WITH DEVELOPMENT

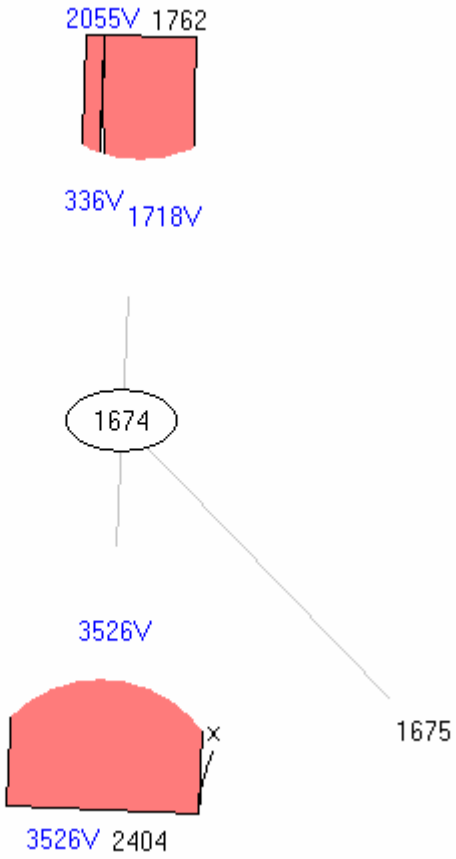


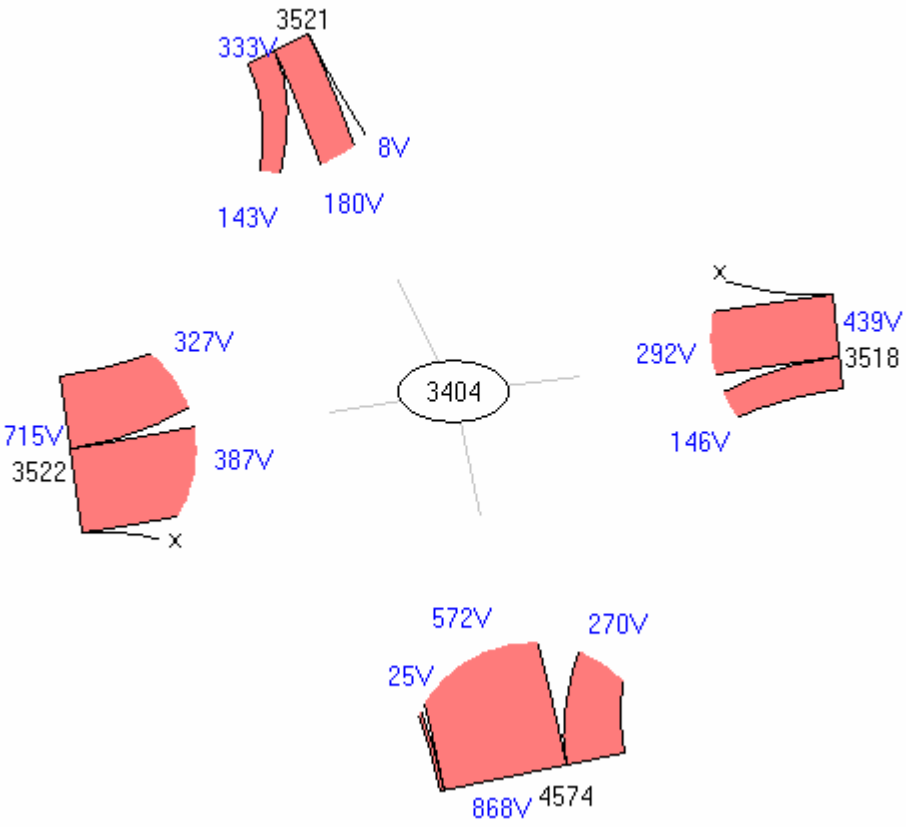

677V
4808
659V
17V
3421
645V
676V
3419
29V
26V
3V
4898
30V


977V
2208
924V
52V
418V
195V
1965
776V
3420
1984V
2462
1682
477V

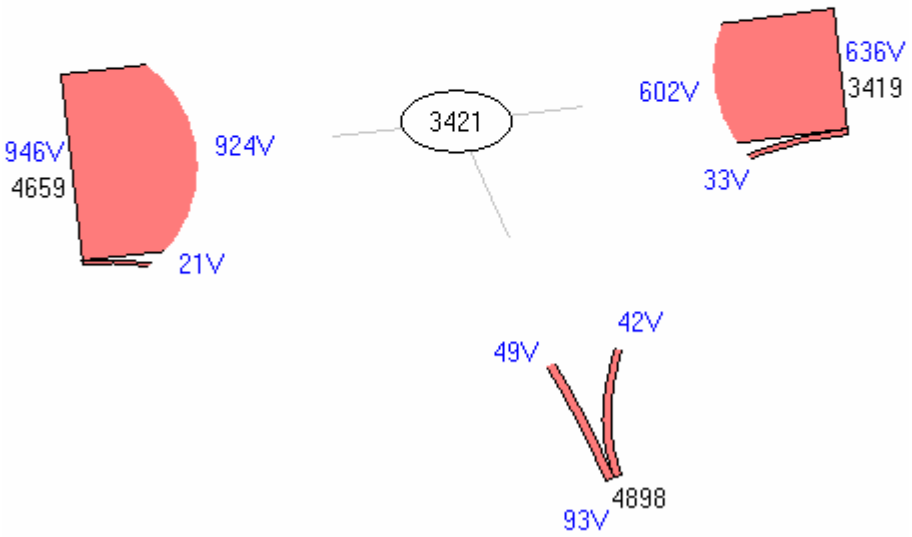

1171V
6004
963V
207V
3418
19V
0
20V
1427
2359V
4V
2364V
1966

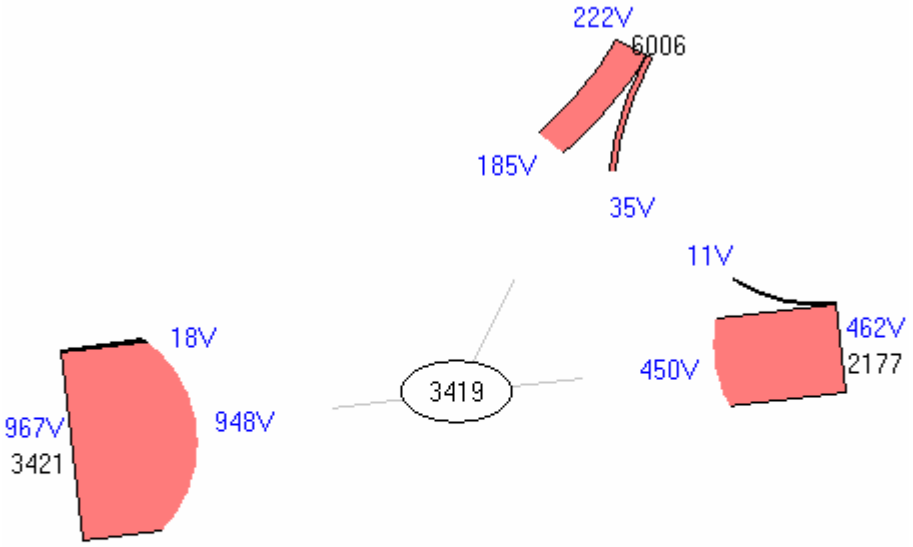

337V
1674
0
336V
2404
968V
988V
1644
19V
2557V
6V
1675
2564V

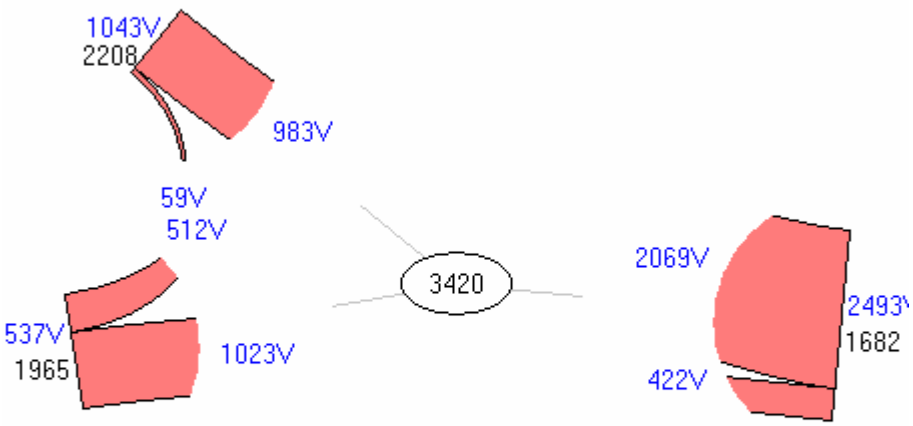

2055V 1762
336V 1718V
1674
3526V
1675
3526V 2404

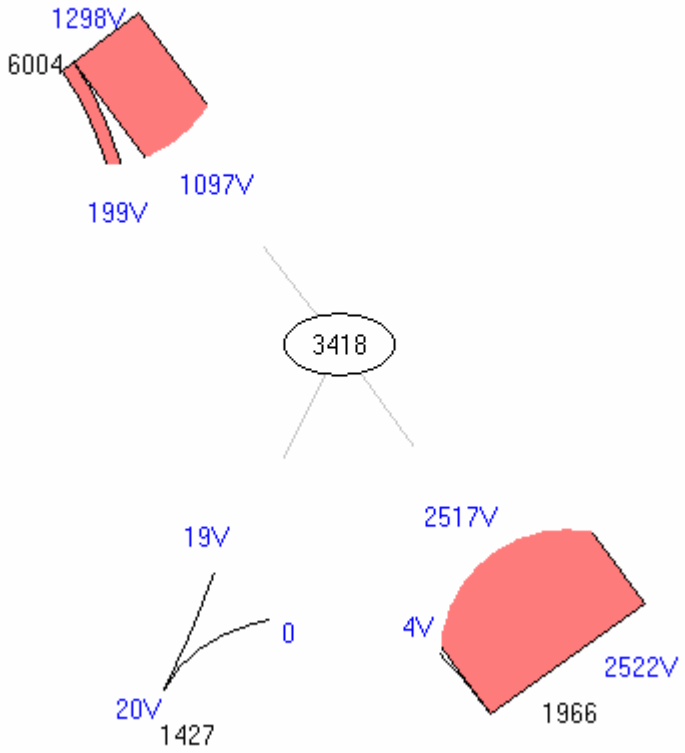

3521
333V
8V
143V
180V
327V
715V
3522
387V
x
3404
x
439V
292V
3518
146V
572V
270V
25V
868V
4574

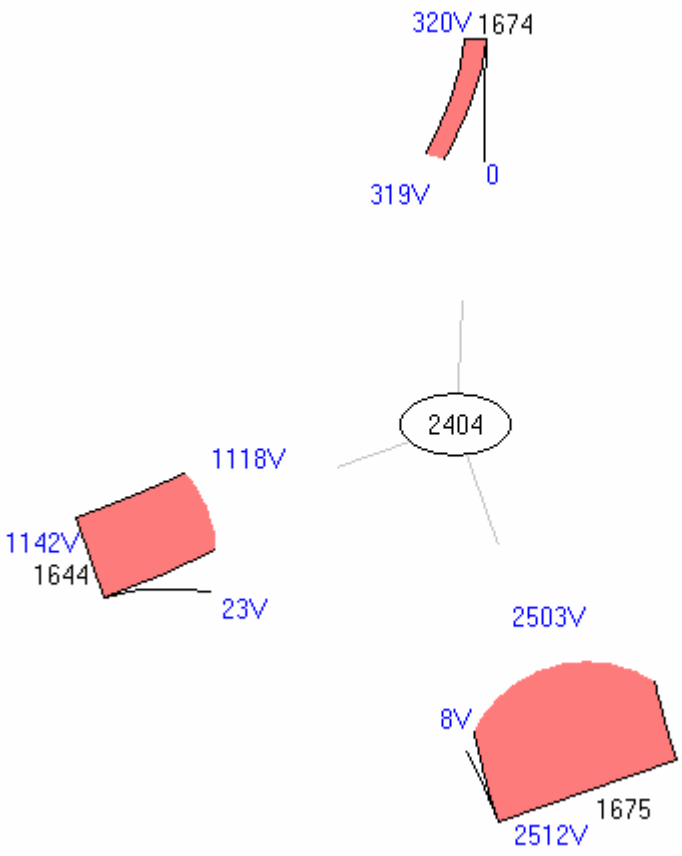
2018 AM BASE MODEL FLOWS

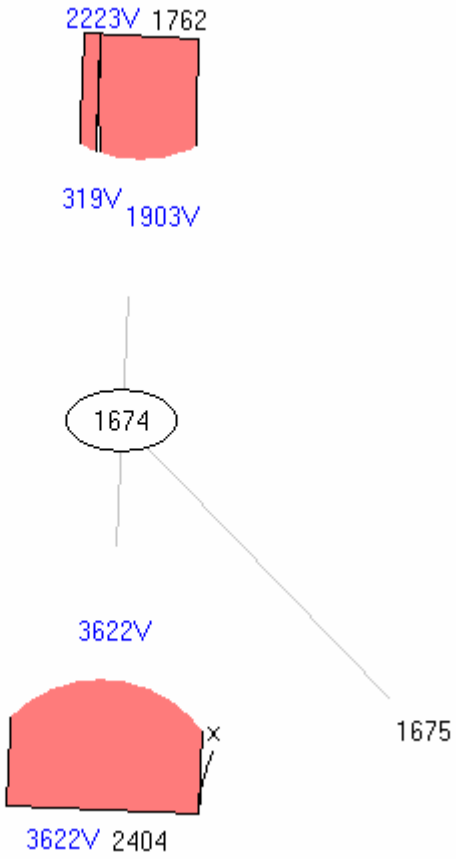


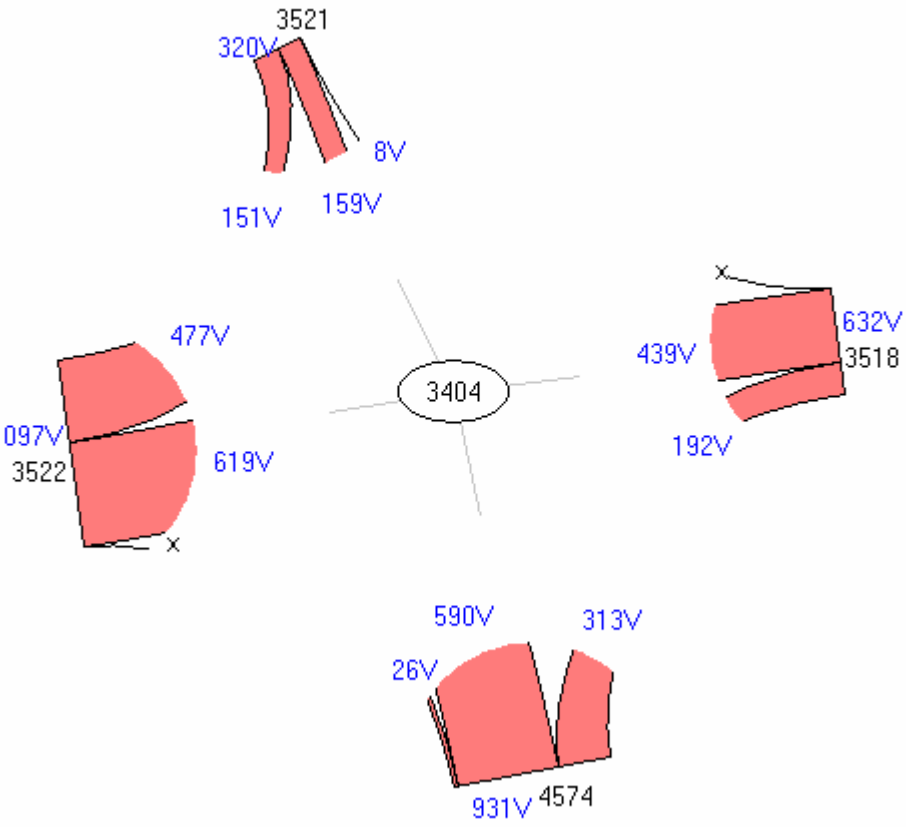

222V
6006
185V
35V
11V
462V
2177
450V
18V
967V
3421
948V
3419


1043V
2208
983V
59V
512V
537V
1965
1023V
3420
2069V
422V
1682

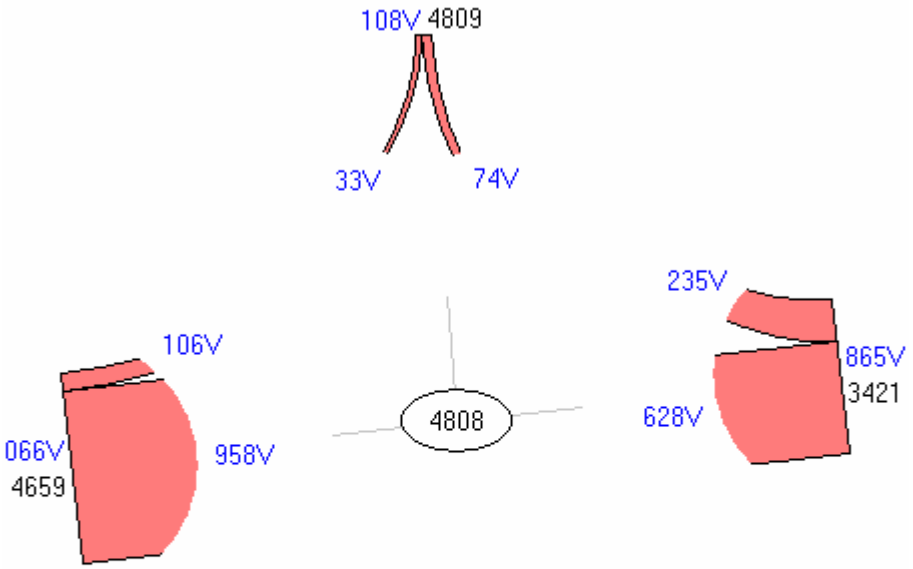

1298V
6004
1097V
199V
3418
19V
0
20V
1427
2517V
4V
2522V
1966

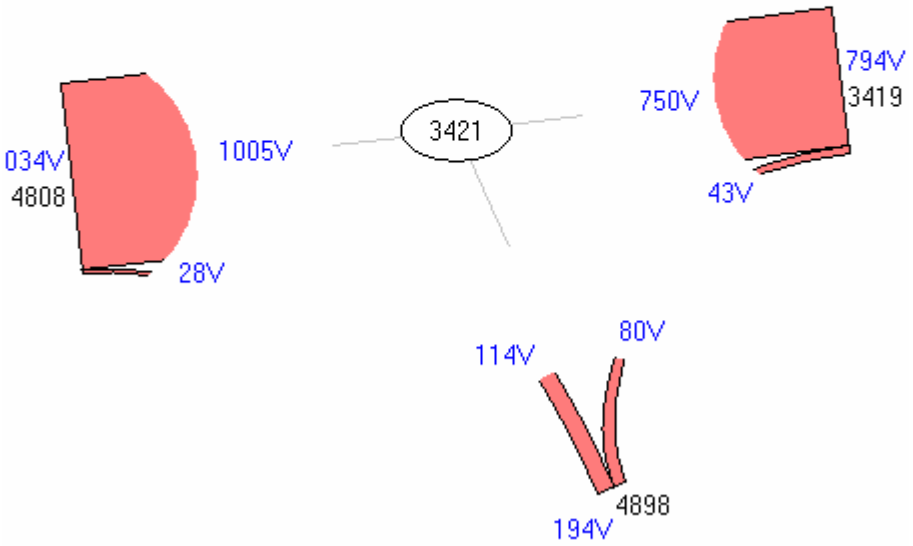

320V
1674
319V
0
2404
1118V
1142V
1644
23V
2503V
8V
1675
2512V

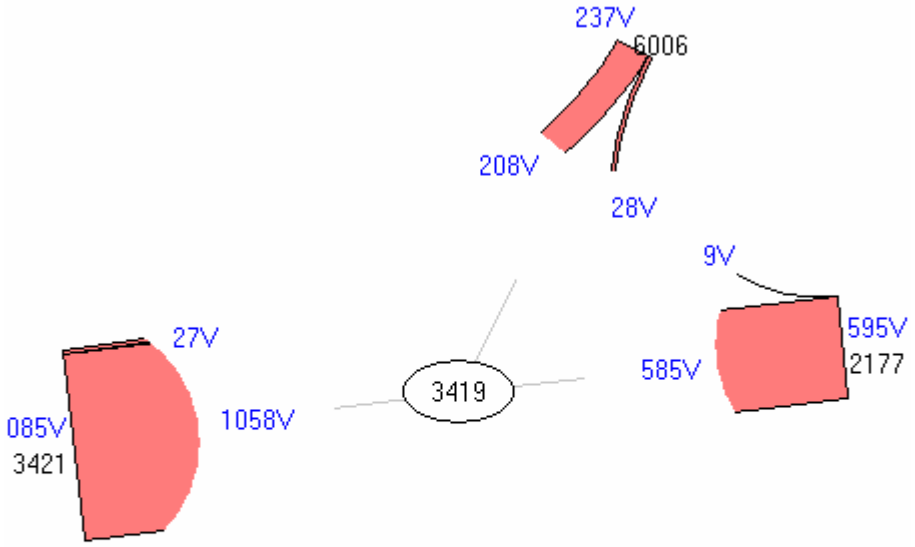

2223V 1762
319V 1903V
1674
3622V
1675
3622V 2404

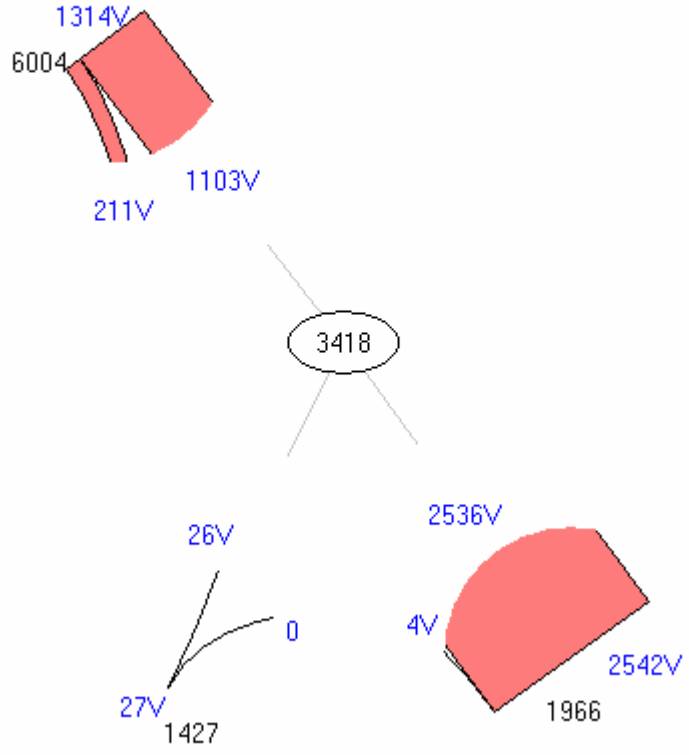

3521
320V
8V
151V
159V
477V
097V
3522
619V
x
3404
x
632V
439V
3518
192V
590V
313V
26V
931V
4574

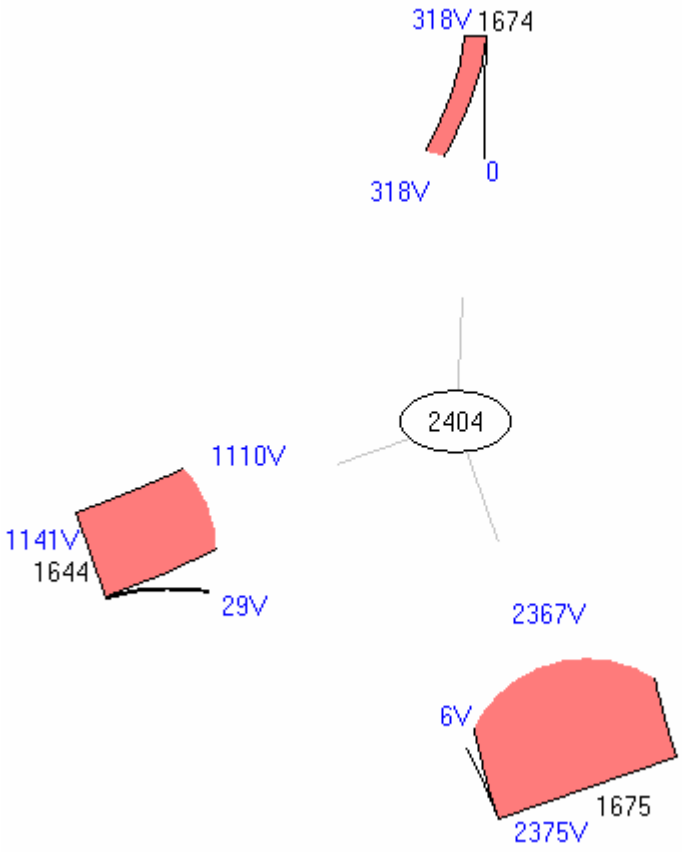
2018 AM PEAK WITH DEVELOPMENT

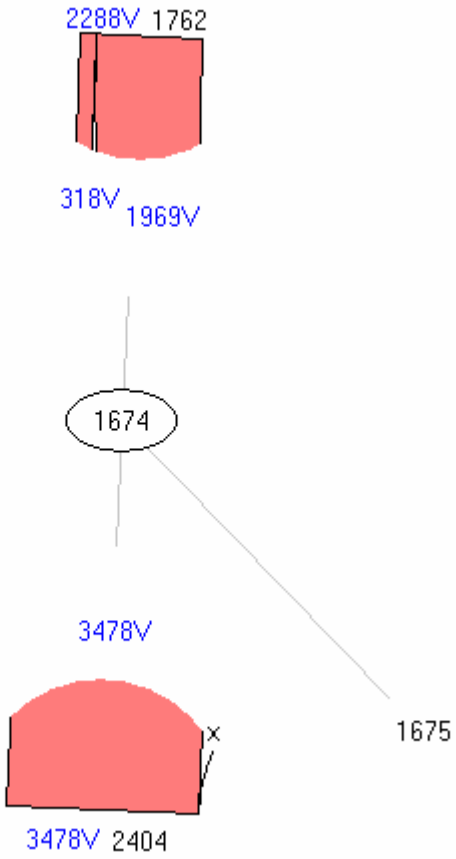


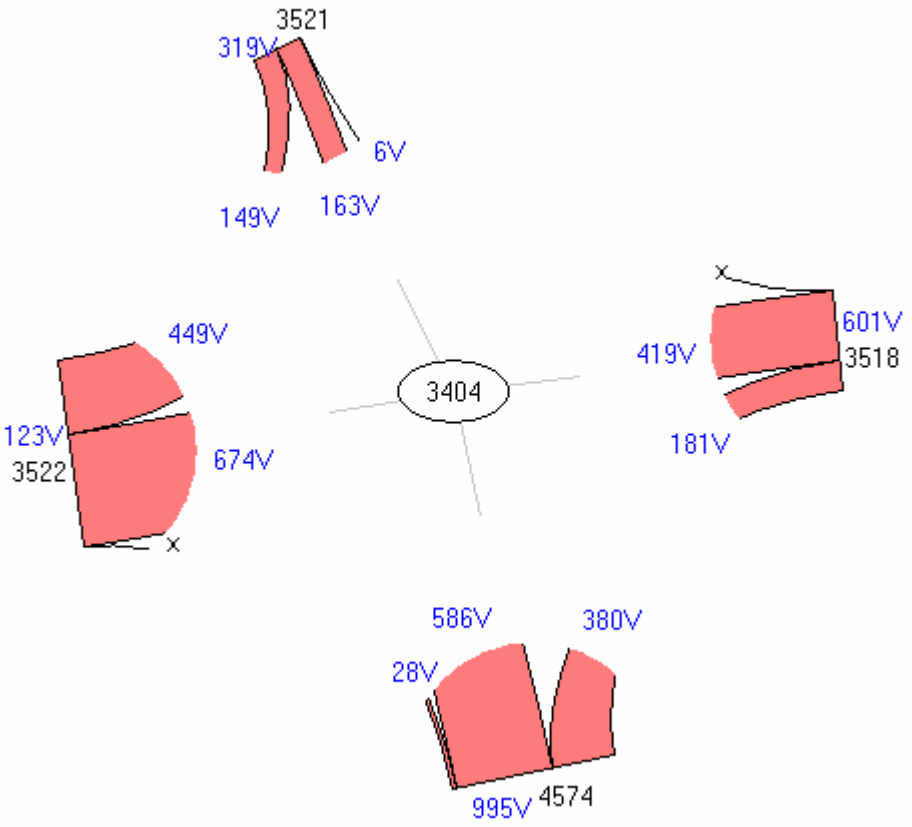

034V
4808
1005V
28V
3421
750V
794V
3419
43V
114V
80V
4898
194V


237V
6006
208V
28V
9V
595V
2177
585V
27V
085V
3421
1058V
3419

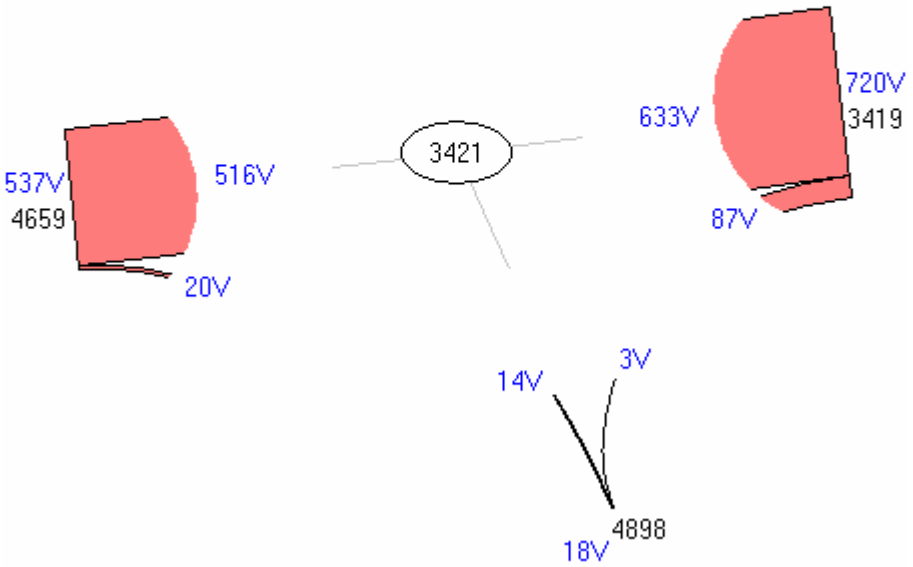

1314V
6004
1103V
211V
3418
26V
0
27V
1427
2536V
4V
2542V
1966

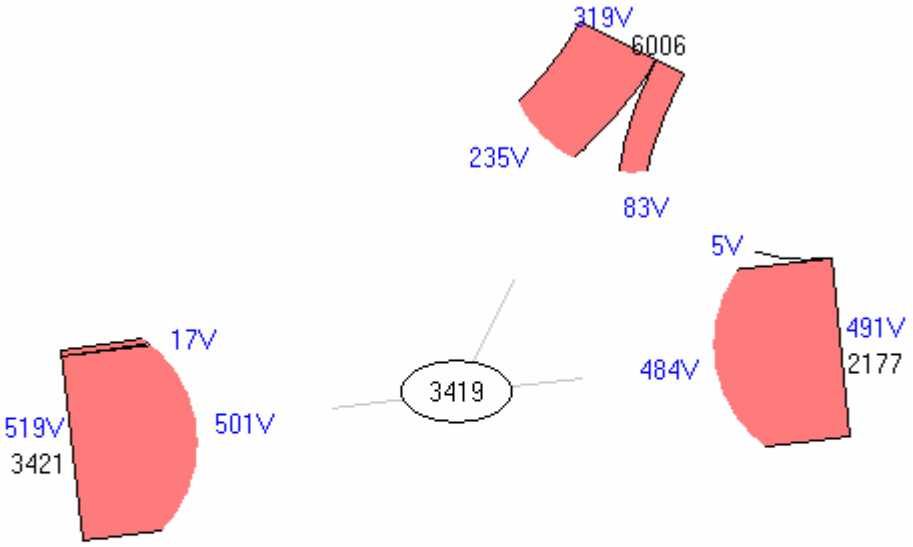

318V
1674
0
318V
2404
1110V
1141V
1644
29V
2367V
6V
1675
2375V

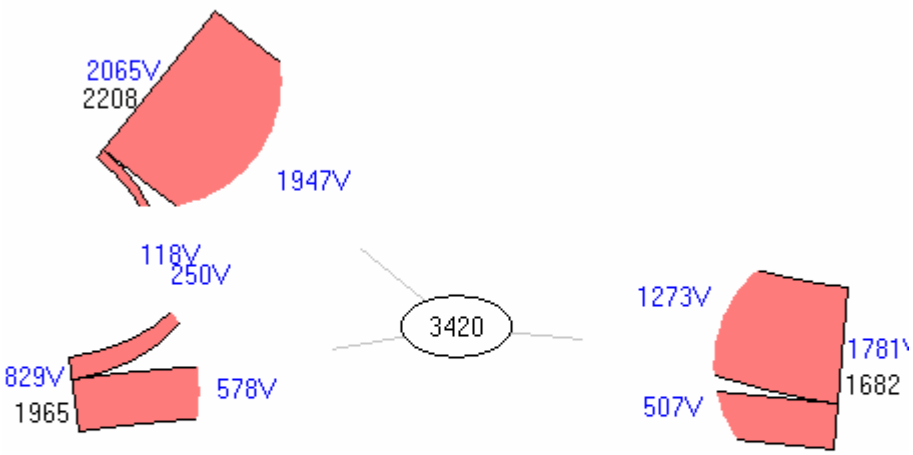

2288V 1762
318V 1969V
1674
3478V
1675
3478V 2404

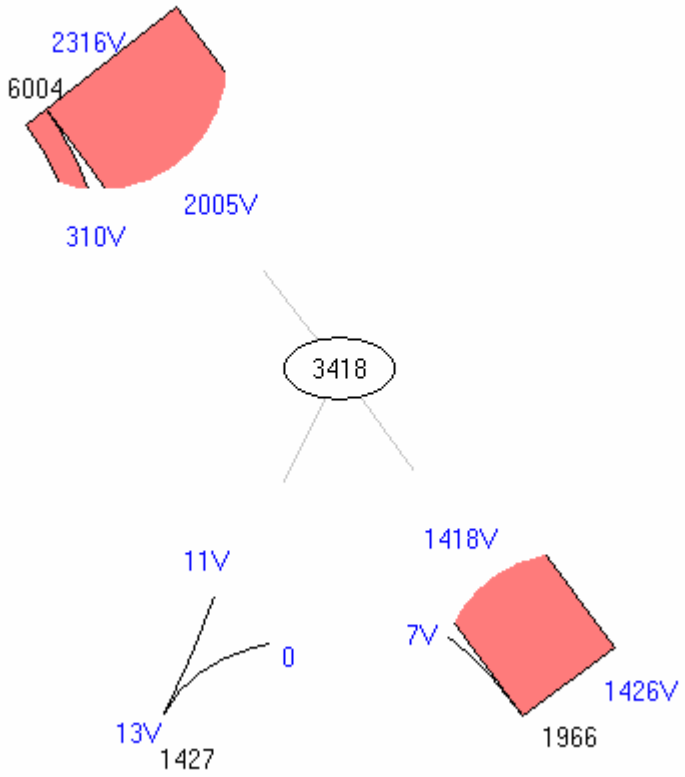

3521
319V
6V
149V
163V
449V
123V
3522
674V
x
3404
x
601V
419V
3518
181V
586V
380V
28V
995V
4574

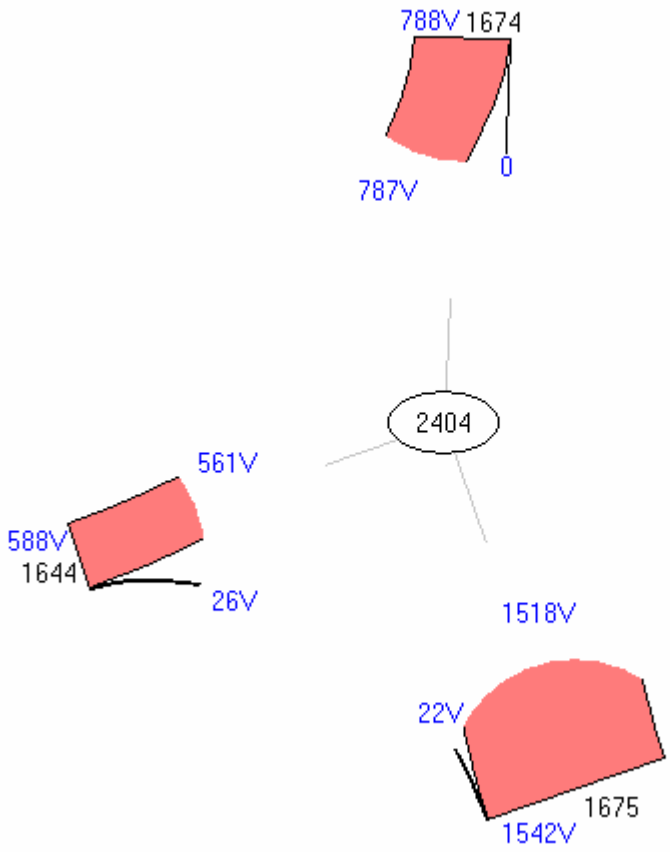
2008 PM BASE MODEL FLOWS

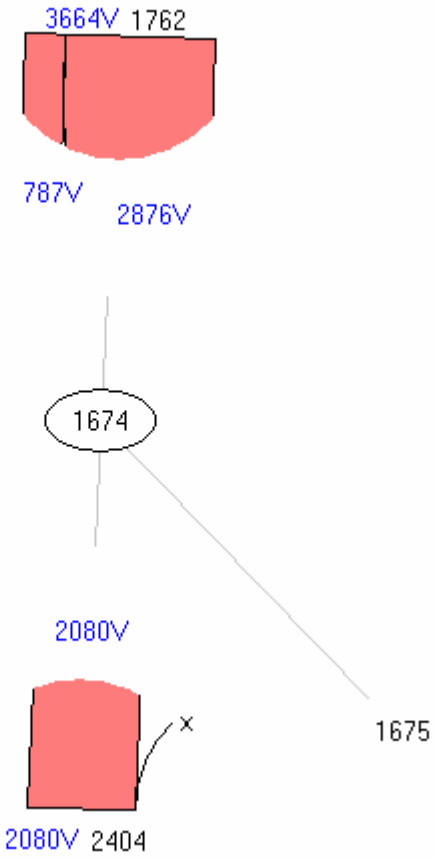


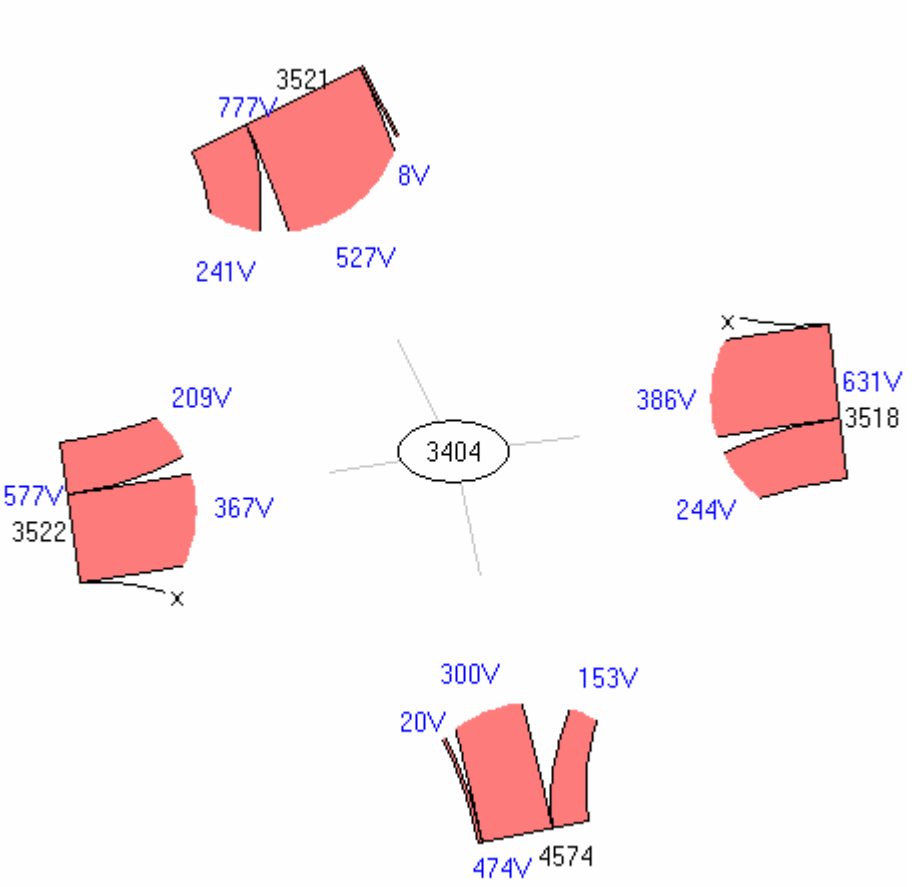

319V
6006
235V
83V
5V
491V
2177
484V
17V
519V
501V
3421
3419


2065V
2208
1947V
118V
250V
3420
829V
1965
578V
1273V
1781
1682
507V

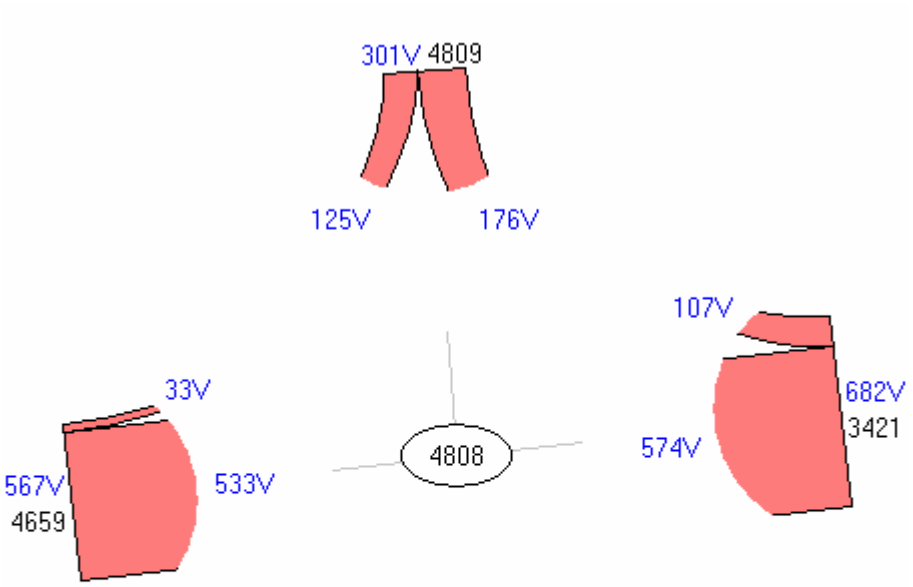

2316V
6004
2005V
310V
3418
11V
0
13V
1427
1418V
7V
1426V
1966

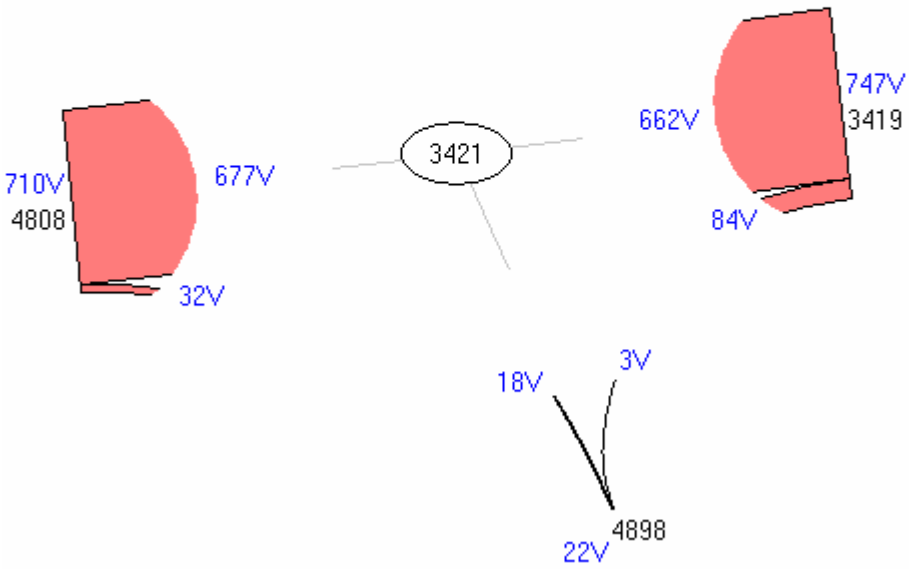

788V
1674
0
787V
2404
561V
588V
1644
26V
1518V
22V
1675
1542V

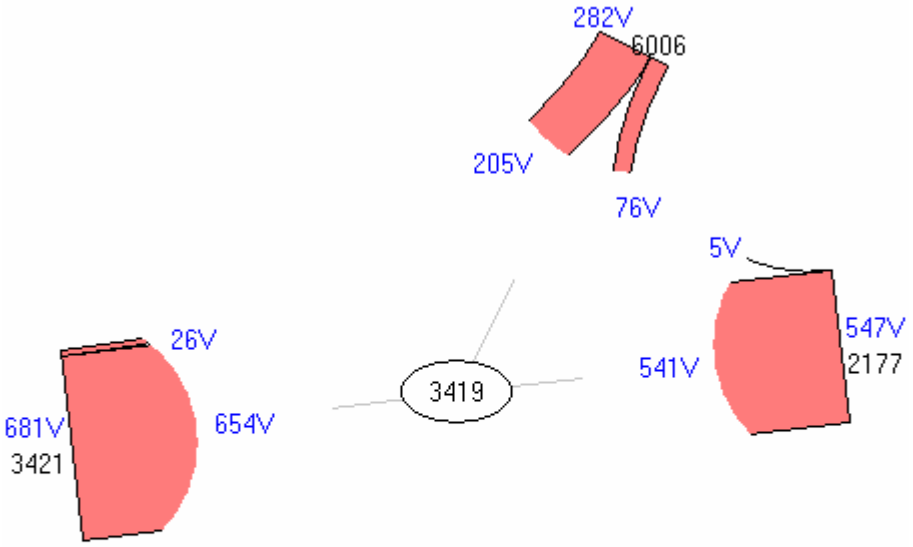

3664V 1762
787V
2876V
1674
2080V
1675
2080V 2404

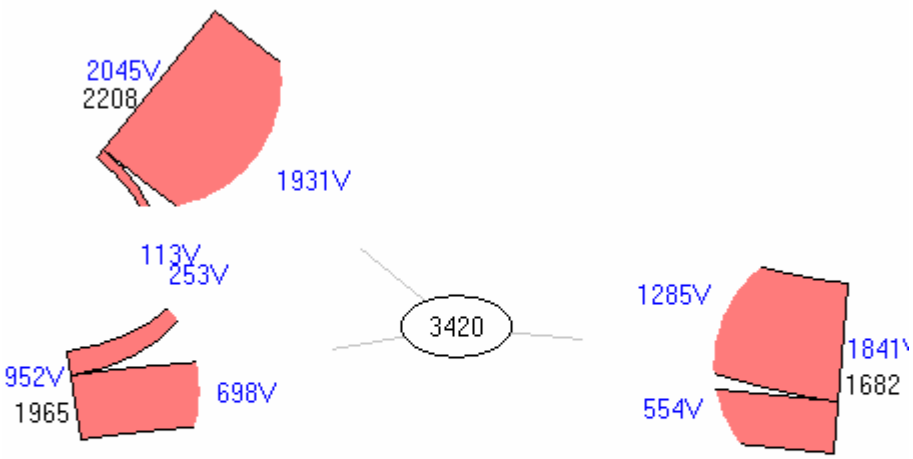

3521
777V
8V
241V
527V
209V
577V
3522
367V
x
3404
x
386V
631V
3518
244V
300V
153V
20V
474V
4574

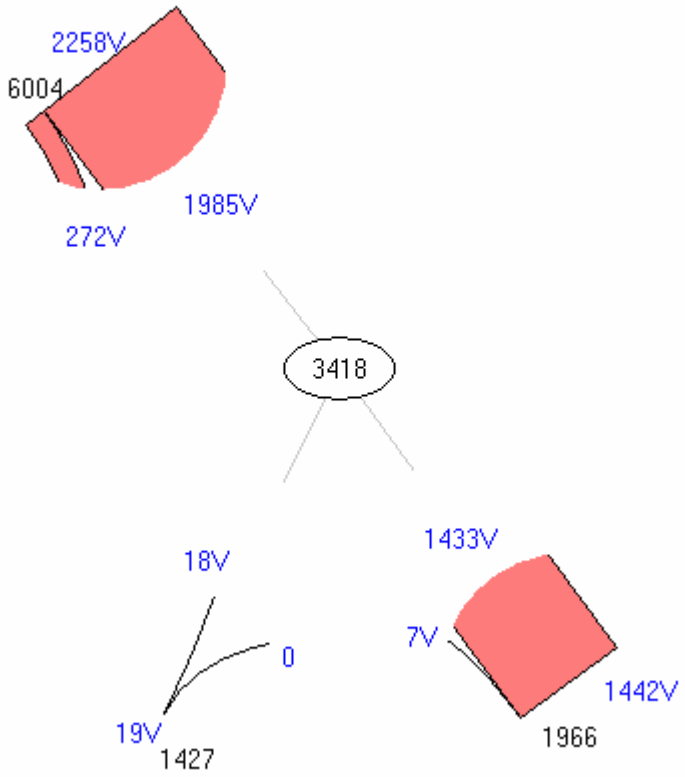
PM PEAK MODEL 2008 WITH DEVELOPMENT

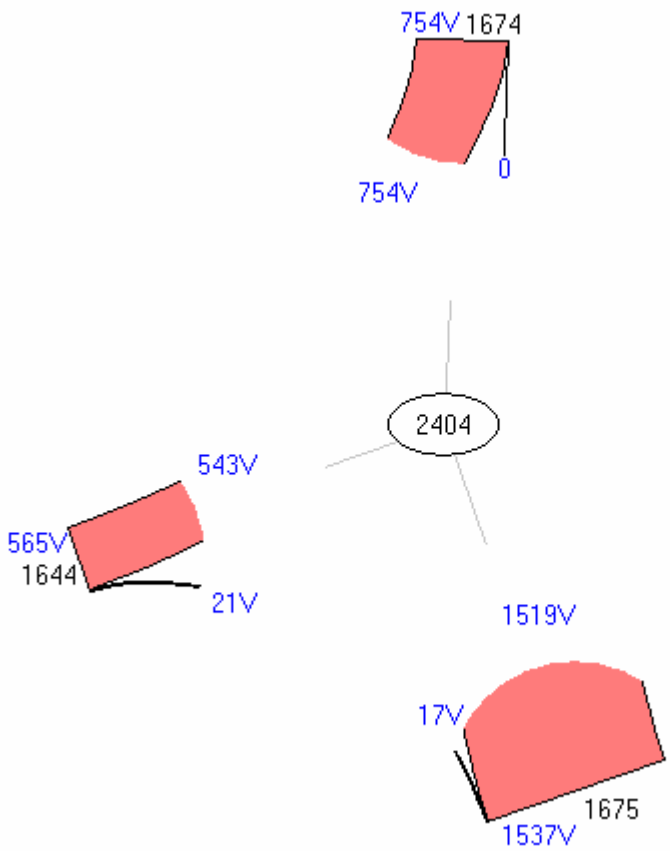


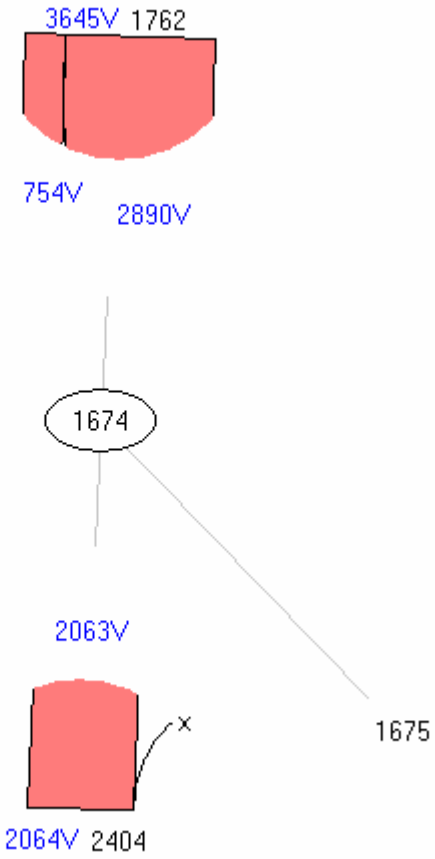

710V
4808
677V
32V
3421
662V
747V
3419
84V
18V
3V
4898
22V

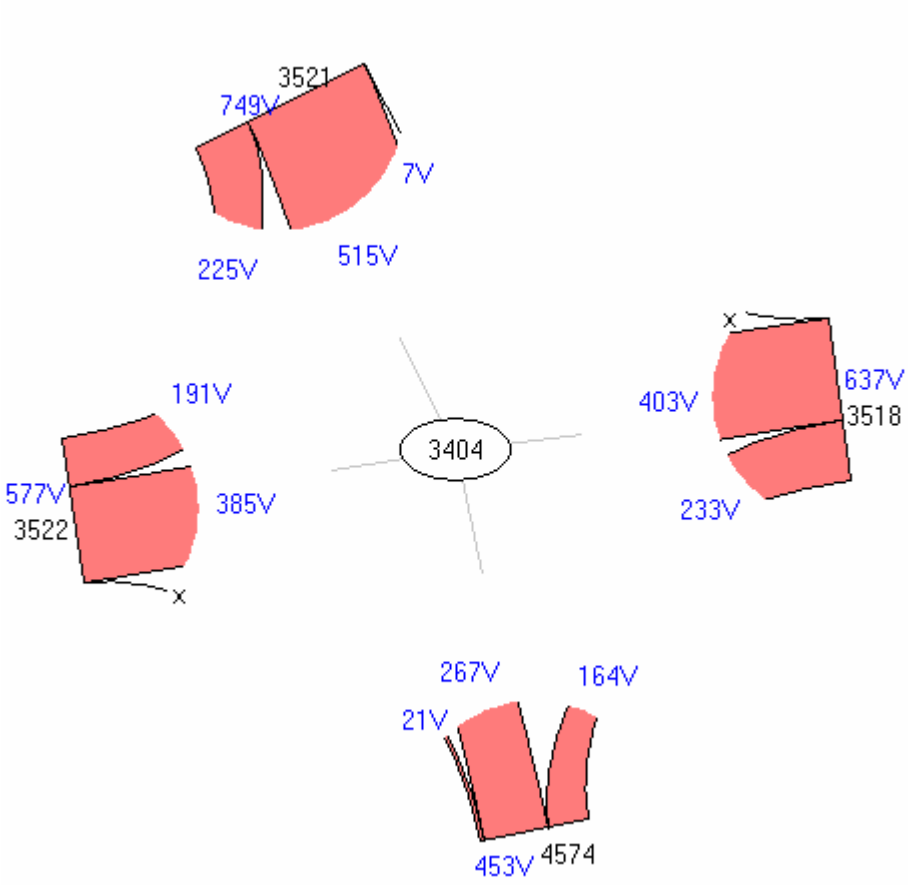

282V
6006
205V
76V
5V
547V
2177
541V
26V
681V
654V
3421
3419


2045V
2208
1931V
113V
253V
952V
1965
698V
3420
1285V
1841
1682
554V

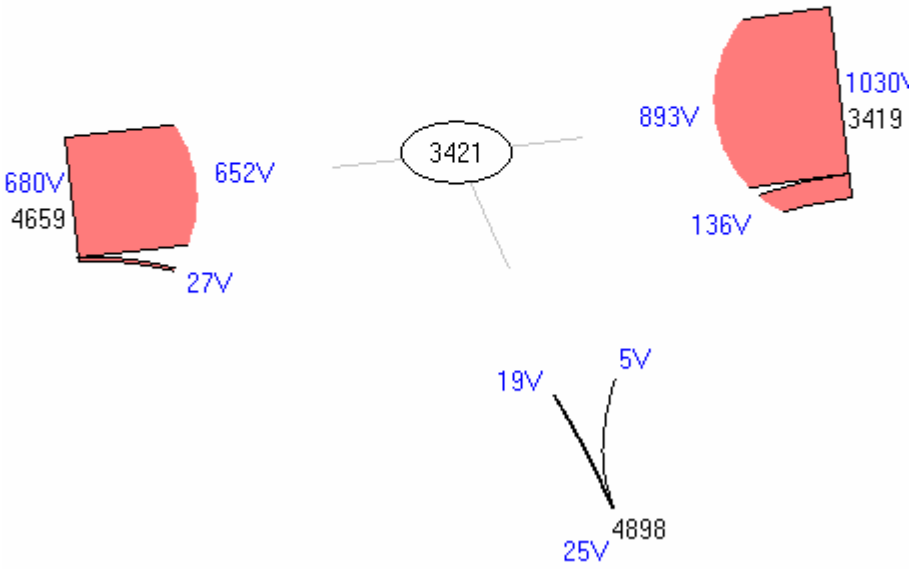

2258V
6004
1985V
272V
3418
18V
0
19V
1427
1433V
7V
1442V
1966

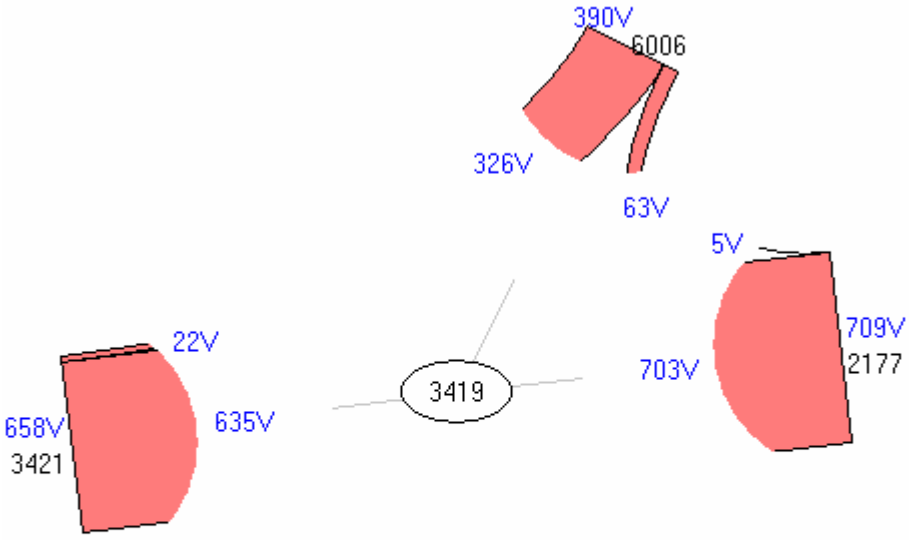

754V
1674
0
754V
2404
543V
565V
1644
21V
1519V
17V
1675
1537V

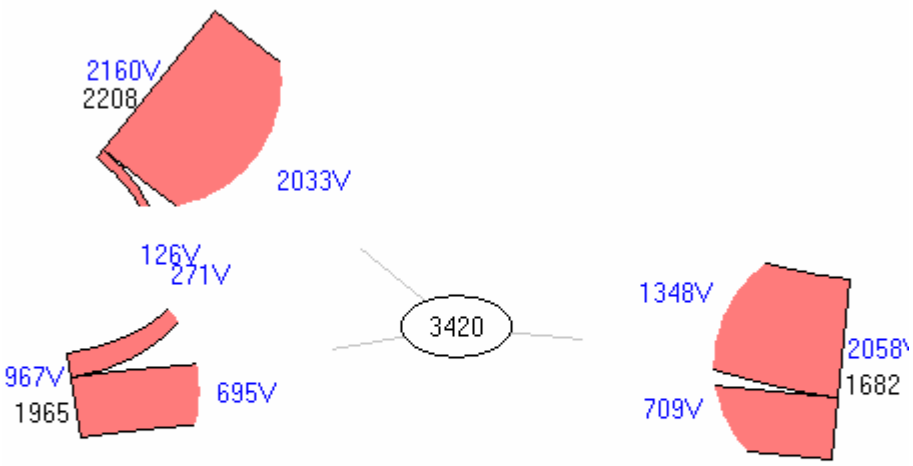

3645V 1762
754V
2890V
1674
2063V
1675
x
2064V 2404

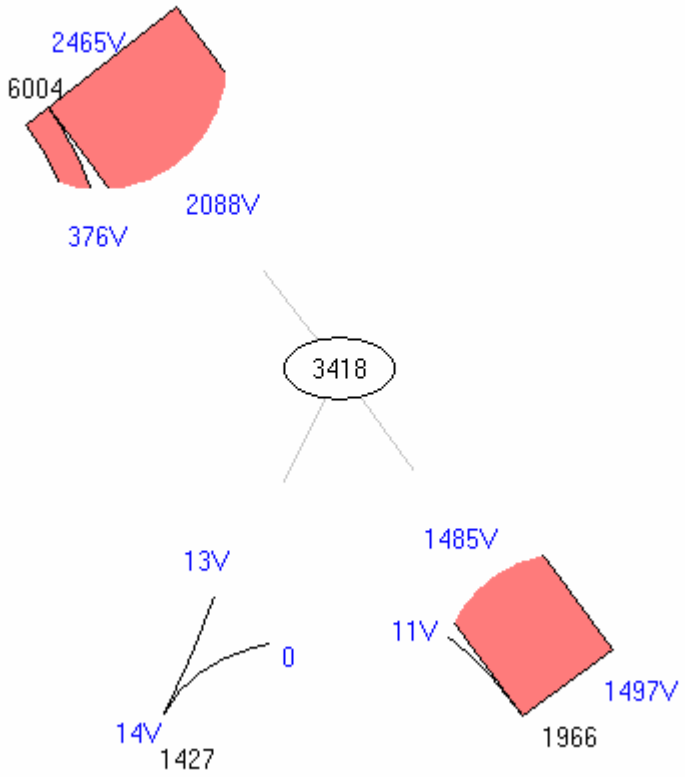

3521
749V
7V
225V
515V
191V
577V
3522
385V
x
3404
x
403V
637V
3518
233V
267V
164V
21V
453V
4574

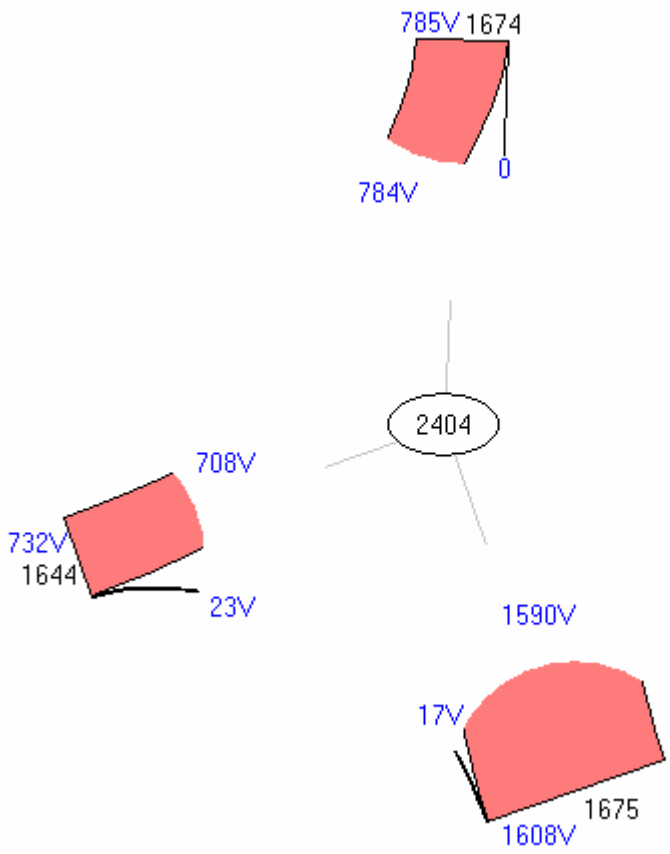
2018 PM PEAK BASE MODEL

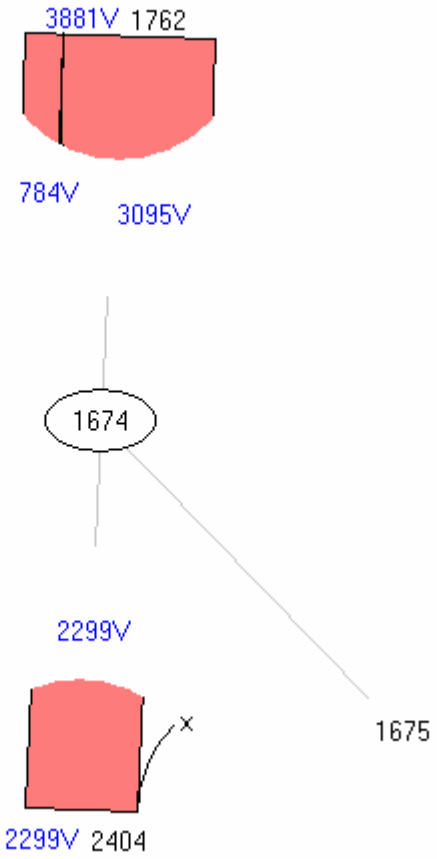


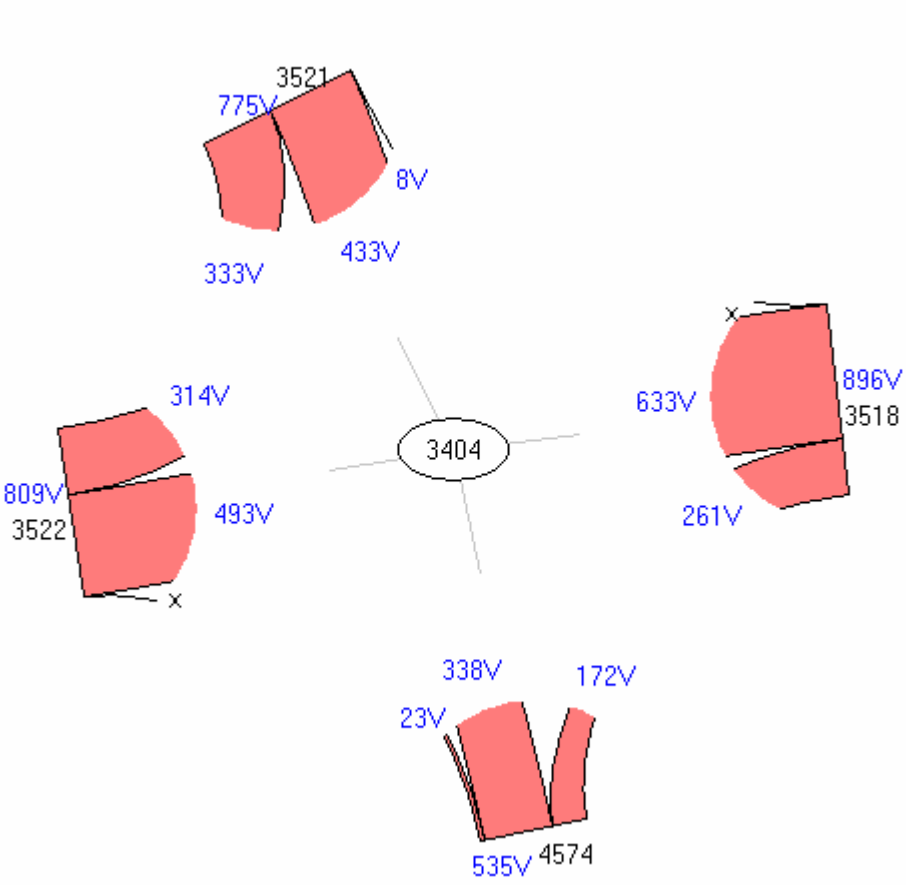

390V
6006
326V
63V
5V
709V
2177
703V
22V
658V
3421
635V
3419


2160V
2208
2033V
126V
271V
967V
1965
695V
3420
1348V
2058
1682
709V

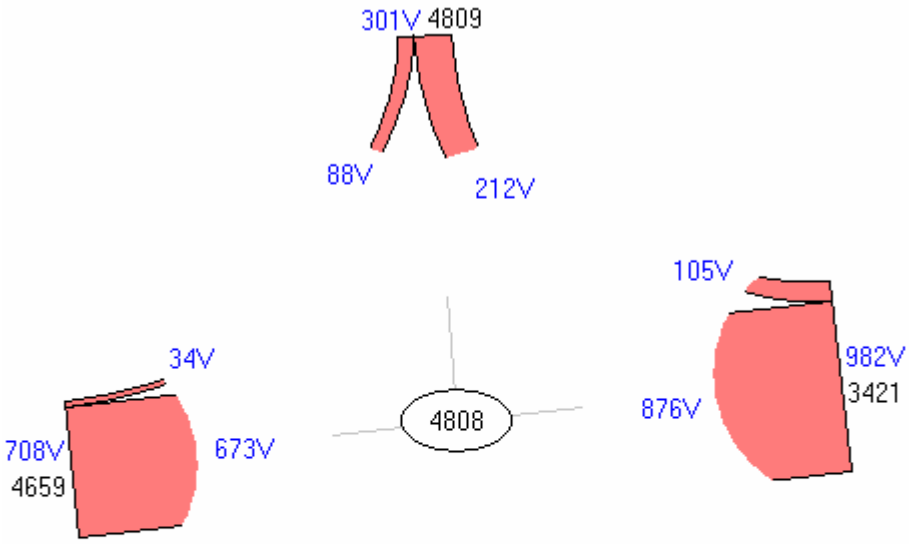

2465V
6004
2088V
376V
3418
13V
0
14V
1427
1485V
11V
1497V
1966

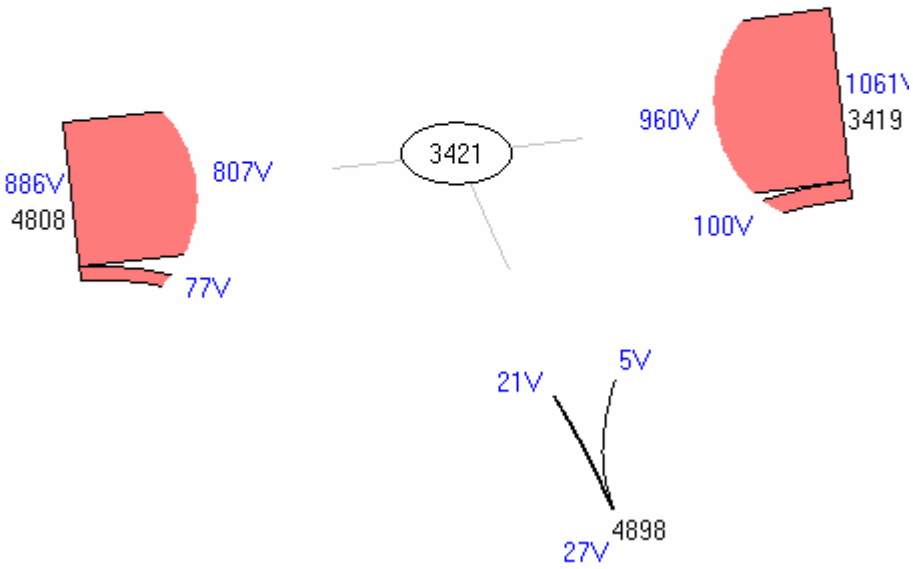

785V
1674
0
784V
2404
708V
732V
1644
23V
1590V
17V
1675
1608V

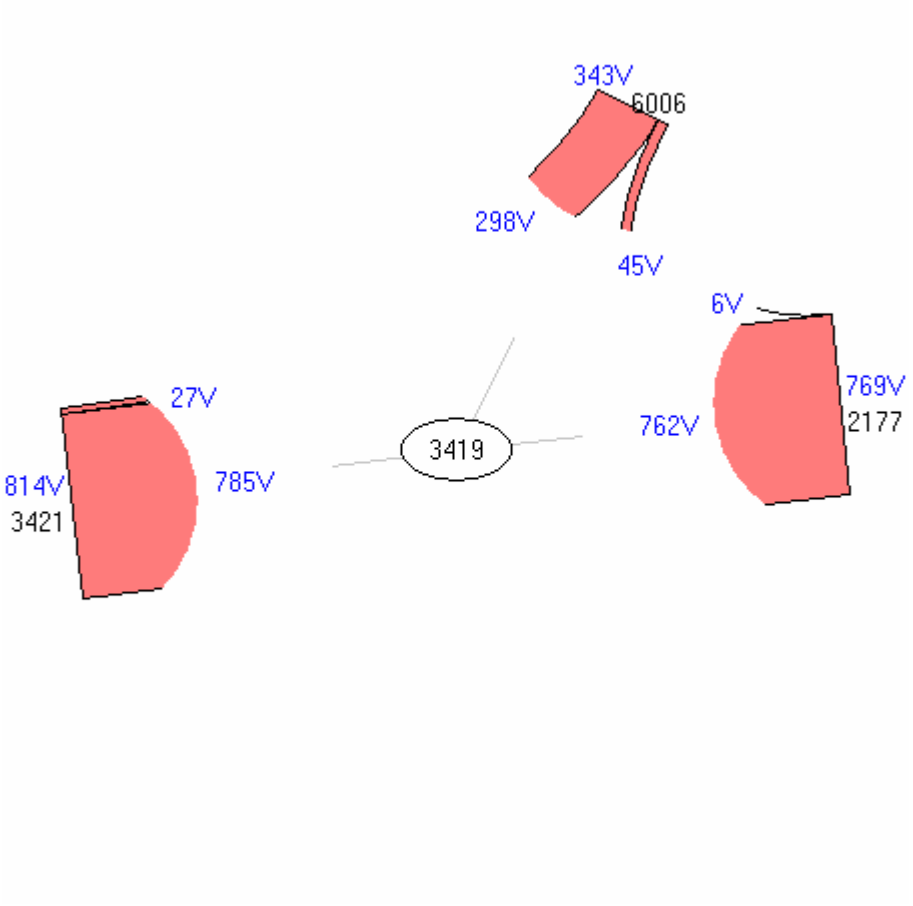

3881V 1762
784V
3095V
1674
2299V
1675
2299V 2404

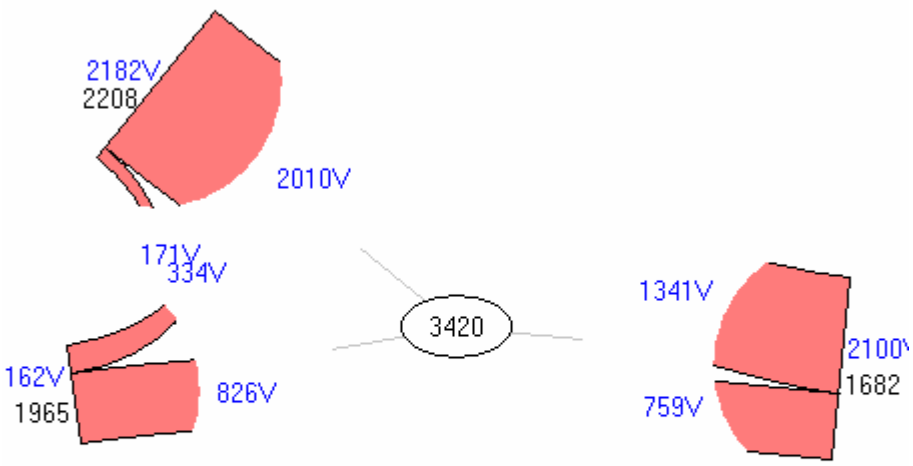

3521
775V
8V
433V
333V
314V
809V
3522
493V
x
3404
x
633V
896V
3518
261V
338V
172V
23V
535V
4574

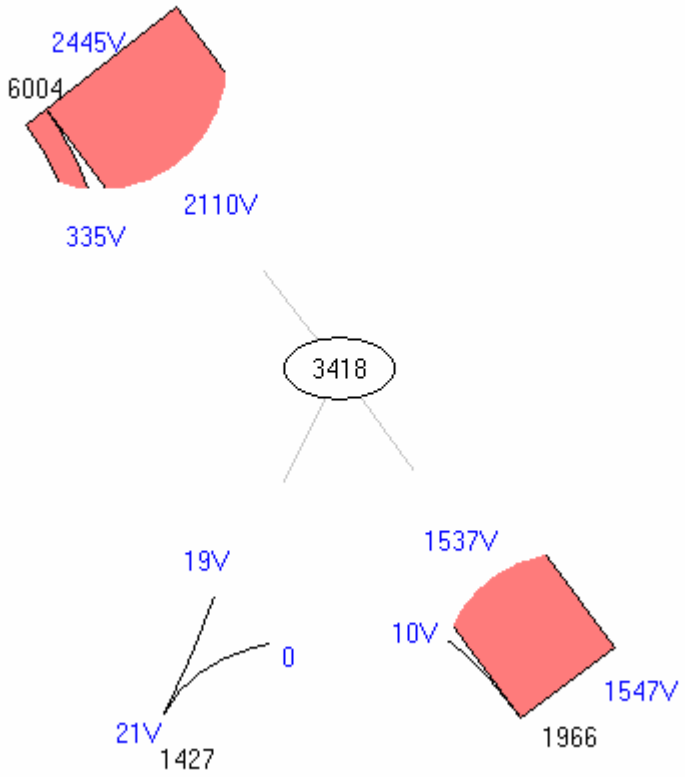
2018 PM MODEL WITH DEVELOPMENT

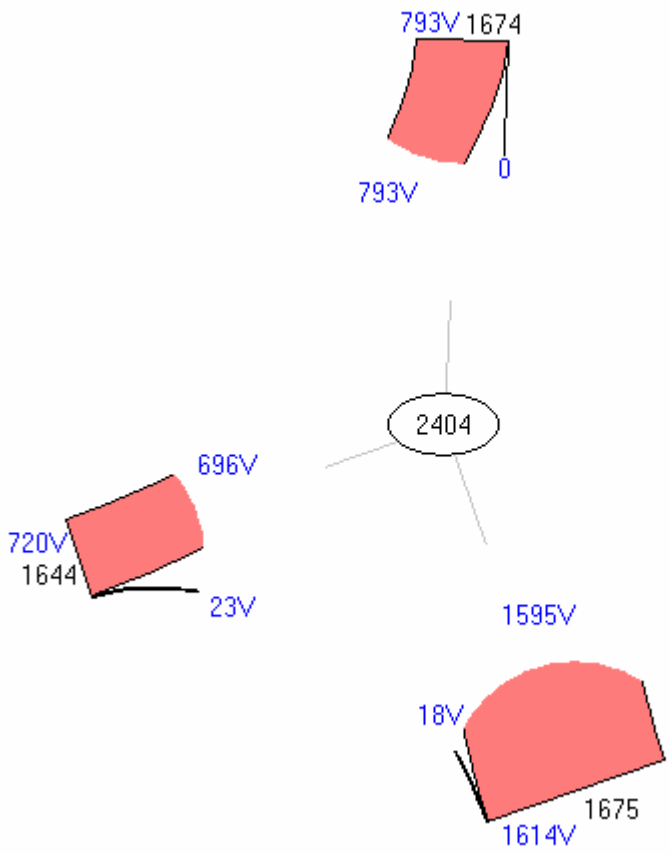


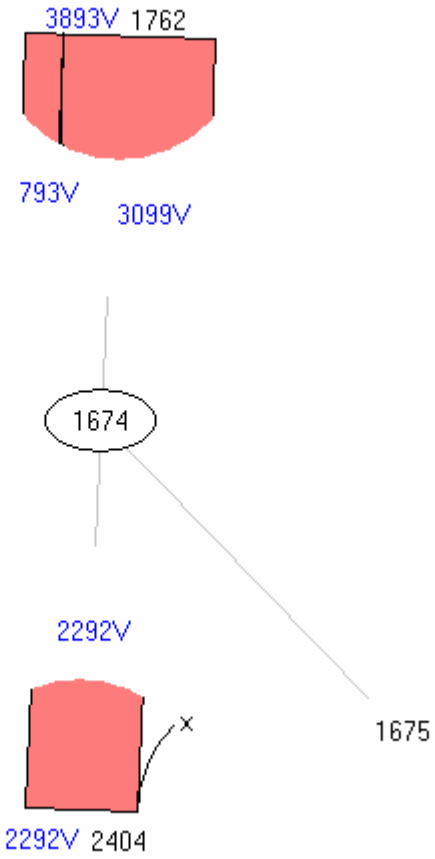

886V
4808
807V
77V
3421
960V
1061V
3419
100V
21V
5V
4898
27V

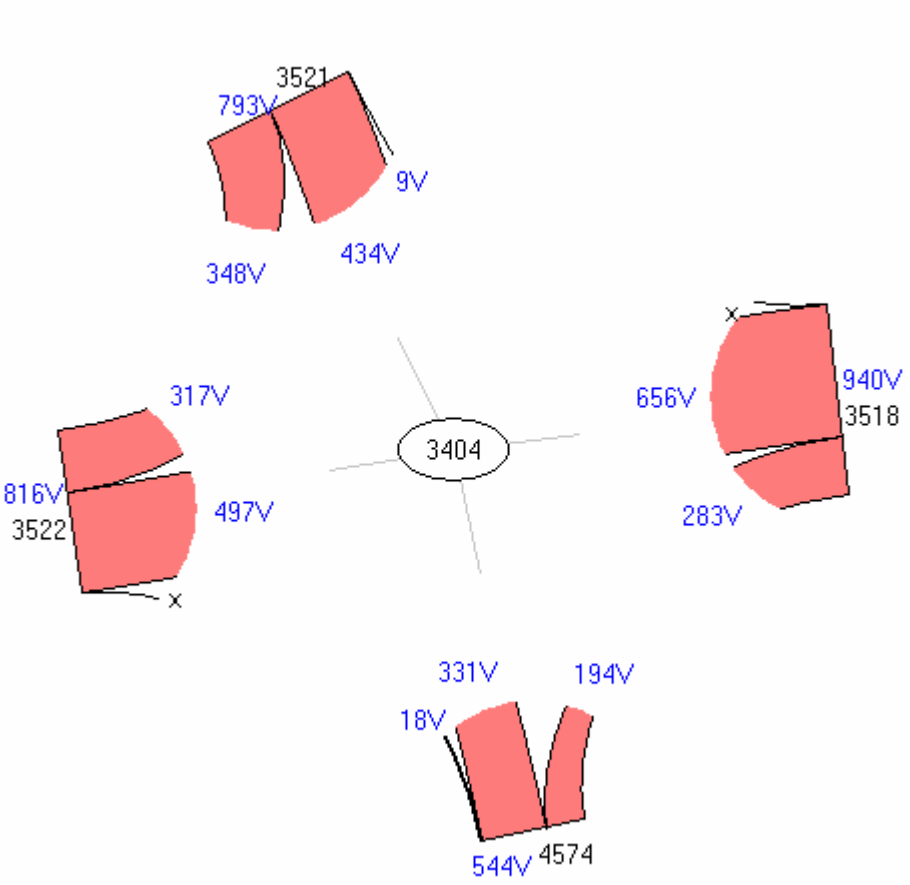

343V
6006
298V
45V
6V
769V
2177
762V
27V
814V
3421
785V
3419

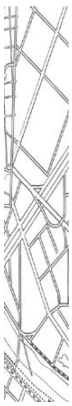

2182V
2208
2010V
171V
334V
3420
1341V
2100
1682
759V
162V
1965
826V


2445V
6004
2110V
335V
3418
19V
0
21V
1427
1537V
10V
1547V
1966


793V
1674
0
793V
2404
696V
720V
1644
23V
1595V
18V
1675
1614V

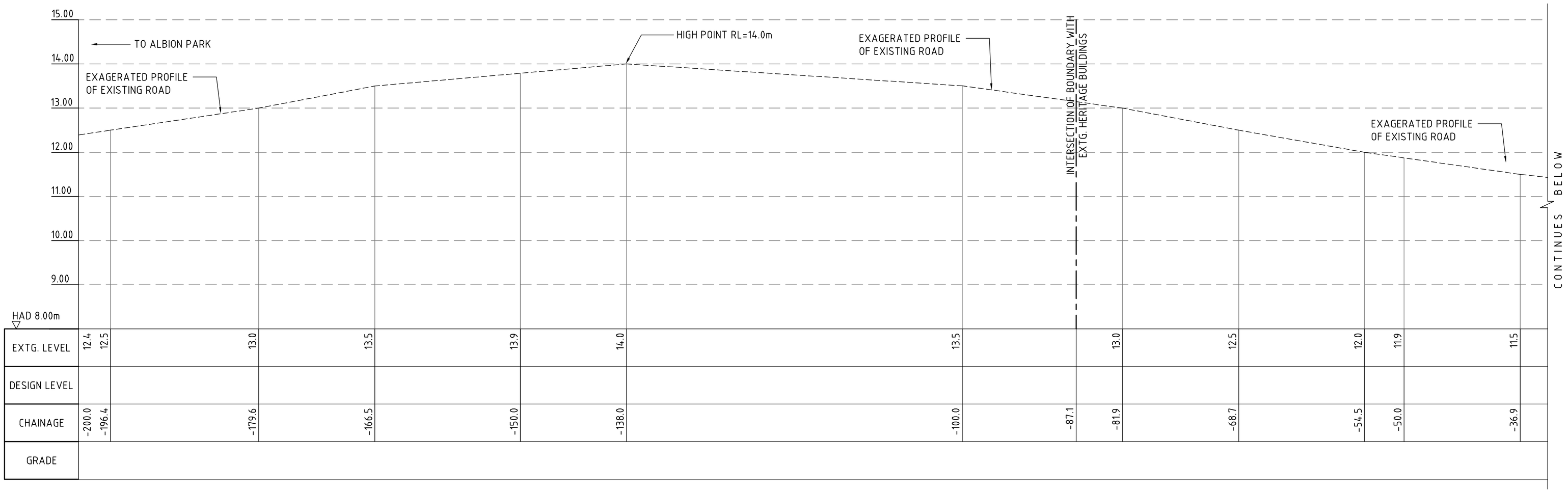

3893V 1762
793V
3099V
1674
2292V
1675
2292V 2404


3521
793V
9V
434V
348V
317V
816V
3522
497V
x
3404
x
656V
940V
3518
283V
331V
194V
18V
544V
4574



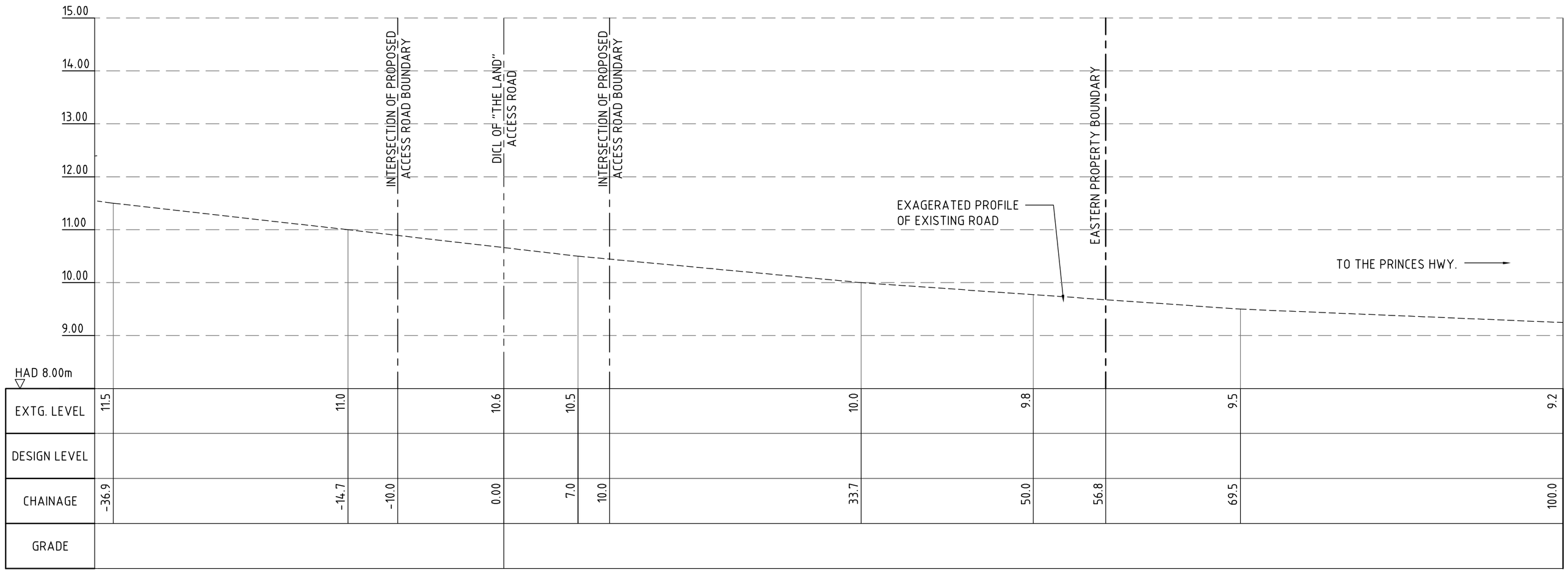
Appendix F - Tongarra Road Long Section

© Masson Wilson Twiney



TONGARRA ROAD DICL LONG SECTION

SCALE 1:250 HORIZONTAL
SCALE 1:50 VERTICAL



TONGARRA ROAD DICL LONG SECTION (CONTIN.)

SCALE 1:250 HORIZONTAL
SCALE 1:50 VERTICAL

LEVELS NOTE:

LEVELS ARE BASED ON SURVEY PERFORMED BY AIRBORNE LASER SCANNING TECHNIQUES AND ARE PROVIDED FOR INFORMATION ONLY.

SURVEY WAS PERFORMED BY DAVID YATES & ASSOCIATES CONSULTING SURVEYORS ON 15 JUNE 2005.

LEVELS ARE TO A.H.D.

THE LEVELS ARE APPROXIMATE ONLY TO AN ACCURACY OF +/- 0.5m.

ALL LEVELS ARE TO BE CONFIRMED BY ENGINEERING ACCURACY SURVEY PRIOR TO ANY DETAIL DESIGN IS PERFORMED.

500mm 0 1 2 3 4 5m
SCALE 1:50 AT A1 PLOT

2m 0 5 10 15 20 25m
SCALE 1:250 AT A1 PLOT

FOR INFORMATION ONLY

	DATE	ISSUE
FOR INFORMATION ONLY	14.11.07	A
AMENDMENTS	DATE	ISSUE

ARCHITECT

CLIENT
ASHE MORGAN WINTHROP
LEVEL 32
126 PHILLIP STREET
SYDNEY NSW 2000

PROJECT
"THE LAND"
78 TONGARRA ROAD
ALBION PARK

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MW	MW	27.06.07		A1	AS SHOWN	C08827.00-SKR01

Costin Roe Consulting Pty Ltd
Consulting Engineers ACN 003 696 448
Suite 310, 55 Harrington Street
The Rocks, Sydney NSW 2000
Tel: (02) 9251-7699 Fax: (02) 9241-3731
email: mail@costinroe.com.au ©

Costin Roe Consulting
Value in Engineering and Management

DRAWING TITLE
TONGARRA ROAD
LONG SECTION

DRAWING No C08827.00- SKR01

ISSUE A