Kirrawee Brick Pit

Updated Traffic Management & Accessibility Plan

October 2011

Part 1 of 2

Prepared for

Henroth Investments Pty Ltd

Halcrow

Kirrawee Brick Pit
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This report has been issued and amended as follows:

Rev	Description	Date	Prepared by	Approved by
0	Draft for Client review	12/05/11	PT	BM
1	Second Draft for Client review	27/06/11	PT	KH
2	Formal Issue (to RTA)	13/07/11	PT	KH
3	Third Draft for Client review	17/10/11	PT	KH
4	Formal PPR Issue	27/10/11	PT	KH

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Contents

1 Introduction

In October 2010, Halcrow prepared a Transport Management & Accessibility Plan (TMAP) as part of a Concept Plan application regarding the former Kirrawee Brick Pit site. A copy of that TMAP is provided in Part 2 of this update report.

Part 1 of this update report provides additional traffic analysis requested by the NSW Roads and Traffic Authority (RTA) and additional information requested by the NSW Department of Planning (DOP) based on the revised scheme that is the subject of the Preferred Project Report (PPR). It also provides a response in respect of traffic and parking matters to submissions made by Sutherland Shire Council (SSC), matters raised in a submission by Transport NSW are largely covered in the additional information requested by DOP.

This Updated TMAP, consisting of Parts 1 and 2 above, supports the Preferred Project Report (PPR) that has been prepared for the Kirrawee Brick Pit major project.

Since the 2010 Environmental Assessment (EA) submission, the scheme has undergone a number of amendments, including a reduction in residential floor space and number of units, largely in response to the comments received during the exhibition period. For clarity, the following summarises the latest area schedule and development mix for the scheme that is proposed by the PPR:

• Supermarkets	(5,370m^2 GFA)	5,370m^2	GLA
• Mini Major	(1,280m^2 GFA)	1,280m^2	GLA
• Specialty Shops (inc. Cafes/Kiosks)	(2,940m^2 GFA)	2,940m^2	GLA
• Retail Showrooms	(2,860m^2 GFA)	2,860m^2	GLA
• Commercial/Office	(860m^2 GFA)	860m^2	GLA
• Internal Mall area etc	(1,820m^2 GFA)		
• Toilets/Centre Management	(230m^2 GFA)		
• Residential Apartments		432	Units

The breakdown of apartments is as follows:

- One Bedroom 59
- Two Bedroom 277
- Three Bedroom 96

  Total 432

As part of developing the PPR, extensive consultation has been undertaken with the RTA. Much of this consultation has focussed on the package of improvement works developed by the RTA and referred to as the RTA Stage 1 and Stage 2 Works. These works proposed staged improvements to the intersections of the Princes Highway with Oak Road and Bath Road.

The traffic study undertaken for Oct. 2010 TMAP (which supported the 2010 EA submission) concluded that provision of the RTA's Stage 1 Works (which involved improvements only at the Oak Road intersection with the Princes Highway) would be sufficient to offset the traffic impacts associated with the proposed Brick Pit scheme. The Stage 1 Works can be summarised as follows:

- Three northbound lanes on Oak Road on the southern leg of the intersection with each lane a minimum of 90 metres in length;
- An 80 metre long left turn slip lane on the westbound carriageway of Princes Highway into Oak Road;
- One southbound lane on Oak Road on the southern leg of the intersection; and
- A raised 900mm wide central concrete median island on Oak Road in front of the proposed left in/left out driveway with the median extending from the stop line at the Princes Highway intersection to an appropriate point to the south of the proposed driveway.

However, following the consultation with the RTA since the 2010 EA submission, Henroth has agreed to implement the Stage 1 and Stage 2 Works in full. The Stage 2 Works build upon the Stage 1 improvements and can be summarised as follows:

- Left in/left out only for Bath Road south approach, left turn out to be signalised;
- No movements across Princes Highway (i.e. no north-south traffic from Bath Road);

- Signalised left in/left & right out of Bath Road north approach with a double right turn lane; and
- No right turns permitted from Princes Highway from either direction to Bath Road.

Finally, traffic matters raised in submissions by other parties are responded to in a response prepared by CityPlan, Consultant Planners.

2 Response to DOP Letter Dated 14 April 2011

2.1 Traffic

As requested by the RTA, further analysis has been undertaken and is reported separately in **Section 3** of Part 1 of this Update TMAP.

This work included:

- Incorporation of RTA supported traffic generation rates;
- Assessment of redistributed traffic effects of the RTA's Stage 1 and Stage 2 road improvement schemes;
- Assessment of the effects of the additional traffic on the Princes Highway with these improvements in place using the RTA's SCATES traffic model as requested;
- Investigation of traffic effects in the area north of the Princes Highway; and
- Confinement of all service vehicle access to the proposed Flora Street site access.

The investigation found that the local road system would be able to satisfactorily accommodate the extra development traffic subject to implementation of the RTA's Stage 1 and Stage 2 works.

2.2 Car Parking Servicing

2.2.1 Residential Parking

The DOP has queried the amount of residential parking proposed and suggested that provision of one space per dwelling should be considered.

In this regard the DOP suggests that the parking provision should be reduced in line with Transport NSW's recommendation that SSC's DCP rates be set as maxima for the site.

However, it should be noted that Transport NSW made the recommendation in reference to parking only for the non-residential uses proposed on the site.

Furthermore, the RTA raised no objections to the parking rates proposed, both residential and non-residential.

Notwithstanding the above, Halcrow has considered the implications of providing residential parking at one space per dwelling as requested by the DOP and whether such a reduced provision would have the desired effect of reducing trips.

Firstly, it is noted that RTA guidance does not reflect a relationship between parking provision in high density residential developments and traffic generation. Rather, it is the proximity of good public transport and good local facilities that best moderates traffic generation.

This has been confirmed by recent Halcrow studies based on surveys of two residential apartment blocks close to Circular Quay station; one with an over provision of parking (with respect to RTA guidance) and the other with an under provision of parking. The survey data indicated that both developments generated the same level of vehicular traffic. This concurs with the accepted view that parking restraint at trip origin (i.e. place of residence) does not discourage vehicle use as much as at trip destination.

Secondly, some owners, tenants and investors, who have demonstrated a willingness to use public transport, will not locate or invest in a transport friendly centre if they do not have adequate car parking. This in turn can reduce the amenity, saleability and attractiveness of a residential development because residents living in such areas still wish to own cars, even if they do not use them for their regular commute or to the same extent as other persons for social/recreation trips. It would be a pity if such persons with a low propensity for car use, were obliged to live in less transport friendly areas just because they wished to own a car.

Finally, the RTA often defers judgement and advice on parking to the local Council. As such, it is important to note comments from Sutherland Shire indicating they consider the proposed parking to be an under provision, with the report submitted by Council's Traffic Consultant (McLaren Traffic Engineering) stating that the on-site parking provision is, "*insufficient in terms of residential parking provision*". Further details regarding the Council's submission are covered in **Section 4**.

Therefore, as requested by the DOP, residential parking provision of one space per dwelling has been considered. However, it is concluded that a provision of one space per dwelling:

1. Would be opposed by Sutherland Council, who would have to deal with any subsequent issues that could arise from an under provision of residential parking;
2. May not have the desired effect of reducing car use;
3. Would have an impact on the viability of the scheme;
4. Could potentially have a detrimental impact by discouraging people from residing in this location, which would be contradictory to current policies that seek to encourage population growth in areas that benefit from good access to public transport services.

Therefore, the residential parking rates applied to the original EA scheme have been maintained. These rates and the corresponding parking provision are presented in **Table 2.1**, along with the Sutherland DCP rates and the corresponding parking provision if this standard was applied.

Table 2.1 – Residential Parking Rates

Type	No.	Proposed		Sutherland DCP	
		Rate	***Provision***	***Rate***	***Provision***
1 x bed	59	1.00	59	1.00	59
2 x bed	277	1.25	346	1.50	416
3 x bed	96	1.50	144	2.00	192
Visitor Spaces	*for 432*	0.125	54	0.25	108
Total	**432**		**603**		**775**

The revised scheme has reduced the residential units in number from 450 to 432 and changed the mix of unit types and accordingly the proposed amount of residential parking has reduced from 650 spaces to 603 spaces. It can be seen that the proposal intends to provide significantly less residential parking than the DCP prescribes due to the excellent connectivity of the site to public transport and services.

The amended proposal for 603 resident and resident visitor parking spaces represents a 7% reduction on the original proposed provision of 650 spaces. Application of the DCP rates yields a Council code requirement for 775 residential spaces, some 172

spaces more than the 603 spaces proposed. This equates to a 22% reduction below this provision derived from the DCP.

In summary, the Director General EA requirements (DGRs) dated 24/08/2010 stated that the EA for the Brick Pit proposal would need to:

"Demonstrate the provision of sufficient on-site car parking for the proposal having regard to local planning controls and RTA guidelines. (Note: the Department supports reduced car parking rates in areas well-served by public transport)."

The proposed residential parking provision of 603 spaces provides a reasonable balance between the DCP requirement of 775 spaces requested by Council and the 432 spaces suggested by the DOP for consideration. The proposed residential parking rates fully comply with the DGRs on parking by providing sufficient on-site parking for residents (based on census parking demand data) whilst achieving the objective of reduced parking rates for this area of Kirrawee, which is well served by public transport, in particular train services stopping at Kirrawee station. Finally, the rates accord with the requirement of Transport NSW that the Sutherland DCP rates be adopted as maxima and as can be seen, further reductions have been applied to the eventual provision.

2.2.2 Retail & Commercial Parking

The DOP advice suggests that retail and commercial parking be provided at RTA rates and that existing parking displaced from Flora Street also be provided on-site. The calculation of parking based on RTA rates is set out in **Table 2.2**.

Table 2.2 – Retail and Commercial RTA Parking Rates and Provision

USE	Area (m^2 GLA)	Rate (spaces/100m^2)	Provision
Supermarket	5370	4.5	242
Mini-Major (Faster Trade Retail)	1280	4.0	51
Specialty Shop & Secondary Retail (inc. Kiosks)	2940	4.2	123
Showroom	2860	2.4	69
Office	860 *	2.5	22
Total	**13,310**		**507**

* - Area for office in Gross Floor Area (GFA)

Adding the 40 spaces that would be lost through re-instating the footpath on Flora Street brings the proposed public car park to 547 spaces. It should be noted that we do not consider it fair or reasonable for the scheme to provide replacement for all of the temporary rear to curb parking that is currently provided in lieu of a footpath on Flora Street. However, Henroth is willing to accommodate the request of the DOP and provide the displaced on-street parking within the proposed basement car park.

The office spaces would be allocated to tenants. The balance would be incorporated in the general public car park. To avoid long stay parking by commuters, this parking would be security controlled.

While obviously the secured car park is intended to primarily serve visitors to the site, by its very nature it would become a resource for the whole Kirrawee centre and would be used by persons cross shopping between the development and the rest of the centre.

2.2.3 Commuter Car Park

Henroth offered to construct a 200 space commuter car park which was then to be given to others to own and manage. From Transport NSW's response it is understood that a commuter car park on the site has not previously been planned for and that it has no knowledge of any demand for such a facility. Accordingly this parking is no longer proposed.

3 Response to RTA Letter Dated 28 February 2011

3.1 Introduction

3.1.1 Sydney Regional Development Advisory Committee

The Sydney Regional Development Advisory Committee (SRDAC) considered the traffic impact of the Environmental Assessment Application (EA) for the proposed mixed-use development at the site at 566-594 Princes Highway, Kirrawee (known as the Kirrawee Brick Pit) at its meeting of 09/02/11. Reference was made to the Halcrow TMAP report (dated October 2010) that was issued as part of the EA.

Following the meeting, the RTA issued a letter of 28/02/11, which set out the issues it required further information on before it could fully consider the EA. A copy of the letter is attached at **Appendix A**.

The RTA's letter raised issues relating to the following:

- Traffic Generation;
- Site Access;
- Development Staging; and
- Intersection Modelling.

3.1.2 Traffic Generation and Princes Highway Improvements

Amended Trip Rate Assumptions

Immediately following the SRDAC meeting, Halcrow issued revised traffic generation rates to the RTA via a letter of 11/02/11, a copy of which is attached at **Appendix B**. Based on the proposed development schedule at the time the letter was issued, the revised traffic generation rates estimated the traffic generation of the proposal to be:

- 1,106 vehicles per hour during the Thursday evening peak period, and
- 1,208 vehicles per hour during the Saturday midday peak period.

In their letter of 28/02/11 the RTA endorsed the revised traffic generation rates.

Since the Halcrow letter was issued, the proposed scheme has undergone further amendments, resulting in the final PPR scheme as detailed in Section 1. **Table 3.1** presents the predicted traffic generation of the site based on the agreed trip rates attached at Appendix B.

Table 3.1 – Predicted Traffic Generation

Land Use	GLA / Units	Thursday Evening Peak		Saturday Peak	
		Rate (per 100m²)	Trips	Rate (per 100m²)	Trips
Supermarket	5,370	14.00	752	13.20	709
Mini-Major	1,280	4.60	59	1.17	15
Specialty	2,940	4.14	122	9.60	282
Showroom	2,860	1.46	42	2.88	82
Office	860	2.00	17	0.00	0
Residential	433	0.29	125	0.29	125
Total			**1117**		**1213**

Therefore, based on the agreed trip rates, the revised traffic generation of the proposal is:

- 1,117 vehicles per hour during the Thursday evening peak period, and
- 1,213 vehicles per hour during the Saturday midday peak period.

RTA Stage 1 and Stage 2 Works

For an earlier development proposal for the Kirrawee Brick Pit site, the RTA had developed a package of improvements that were considered necessary to offset the impact of the forecasted development traffic on the local road network, in particular the Princes Highway corridor. The total package of works was split in to two stages to accord with the stages of development proposed by the former scheme.

The Halcrow TMAP that assessed the 2010 proposal concluded that the provision of the RTA's Stage 1 Works would be sufficient to offset the traffic impacts associated with the proposed Brick Pit scheme. The Stage 1 improvement scheme consists of the following:

- Three northbound lanes on Oak Road on the southern leg of the intersection with each lane a minimum of 90 metres in length;

- An 80 metre long left turn slip lane on the westbound carriageway of Princes Highway into Oak Road;
- One southbound lane on Oak Road on the southern leg of the intersection; and
- A raised 900mm wide central concrete median island on Oak Road in front of the proposed left in/left out driveway with the median extending from the stop line at the Princes Highway intersection to an appropriate point to the south of the proposed driveway.

However, the RTA advised that as a result of the increase in forecast development traffic generation, the Stage 2 Works (previously recommended by the RTA for the aforementioned earlier proposal), should be implemented.

Details of the Stage 2 Works were provided in a letter from the RTA of 29/06/09, which was attached to the letter issued by the RTA following the SRDAC meeting. A copy of this letter is attached at **Appendix C**.

In summary, the Stage 2 Works recommend the following:

- Left in/left out only for Bath Road south approach, left turn out to be signalised;
- No movements across Princes Highway (i.e. no north-south traffic from Bath Road);
- Signalised left in/left & right out of Bath Road north approach with a double right turn lane; and
- No right turns permitted from Princes Highway from either direction to Bath Road.

Henroth has agreed to implement the RTA's Stage 1 & 2 Works in full.

Relevant traffic analysis of future traffic conditions on the basis of the RTA's Stage 1 & 2 Works road layout has been undertaken and is included in the following sections of this report.

3.1.3 Site Access

Based on the comments from the RTA regarding site access, relevant amendments to the Concept Plans have been made. The revised plans are attached at **Appendix D**.

In summary, the design amendments requested by the RTA were:

- Amend the Flora Street access to make it a secondary access to the proposed development;
- The primary access driveway is to be provided via the proposed deceleration lane on the Princes Highway;
- This access should designed to allow an uninterrupted flow of traffic into the proposal site;
- Removal of the shared zone accessed from Oak Road; and
- All service vehicle movements gain access via the Flora Street access and consequently, no heavy vehicles are to enter the site via the access off the Princes Highway.

The RTA also voiced concerns regarding the levels of traffic forecast to use the Oak Road access.

For the 2010 proposal, a significant amount of this traffic that was forecast to enter via the Oak Road access would have arrived from areas north of the Princes Highway and crossed the highway in a southbound direction at its intersection with Oak Road. However, as a result of the RTA's Stage 1 & 2 Works, the majority of this development traffic has been reassigned to the proposed Bath Street signalised intersection. This intersection is east of the proposed entry slip-lane from the Princes Highway and accordingly the majority of the traffic from north of the highway would now use this access to enter the site.

The 2010 proposal also included a shared zone allowing vehicular access from Oak Road to the area north of the public park and continuing through to meet the deceleration lane from the Princes Highway. This shared zone has been removed and access from Oak Road to this area will be for vehicles that service the public park only. Access will be physically controlled with moveable bollards or a similar device.

As a result, the level of traffic using the Oak Road access has reduced significantly, as shown on the traffic flow diagrams presented later in this report.

3.1.4 Development Staging

Staging plans for the revised scheme are also attached at Appendix D and it is envisaged that the Stage 1 and 2 RTA works would be completed in conjunction with the first stage of the development.

3.1.5 Intersection Modelling

The RTA has requested that in addition to the SIDRA traffic modelling undertaken in the TMAP, SCATES analysis of this section of the Princes Highway should also be undertaken. The following sections of this report cover this SCATES analysis, as well as further traffic analysis for other intersections arising from the revised traffic generation assumptions.

3.2 Intersection Modelling

3.2.1 Revised Traffic Flow Data

TMAP Study Network

The forecasted future traffic flows have been revised to account for the following:

- PPR scheme amendments;
- The reassignment of surveyed traffic flows as a result of the RTA's Stage 1 & 2 Road Works;
- The amended trip rate assumptions; and
- Pass-by trip diversions.

The amended trip rate assumptions and the resulting traffic generation of the PPR scheme have been covered above. In addition, the reassignment of existing traffic is described in greater detail in the following sections covering the Road Network North of the Princes Highway.

This latest assessment accounts for the well recognised phenomenon that a new shopping centre in an established area derives a significant amount of its business from traffic that would otherwise have passed the centre to shop elsewhere. This occurrence is recognised by the RTA which indicates that it would typically represent 20% for centres of between 10,000-30,000 m^2 of GLA, such as the Brick Pit site proposes.

The effects of the above changes are reflected in the traffic flow and distribution diagrams that are presented at **Appendix E** of this report. For the Thursday evening peak period, these provide a build up of future traffic generation forecasts as follows:

- **Figure E.1** shows existing traffic flows for the Thursday evening peak hour;
- **Figure E.2** shows the reassignment of traffic on the road network as a result of the RTA's Stage 1 & 2 Works;
- **Figure E.3** shows the development traffic volumes that are expected to be diverted from traffic that already passes the site;
- **Figure E.4** shows the trip assignment of development traffic; and
- **Figure E.5** shows the net change in traffic flows resulting from the development (excluding the RTA's Stage 1 & 2 Works), which is the sum of Figures E.3 and E.4.

Figures E.6 to **E.10** in Appendix E provide the corresponding traffic flow diagrams for the Saturday midday peak period.

The sum of the flows shown on Figures E.1, E.2 and E.5 provides the forecasted future traffic flows for the Thursday evening peak; similarly, the sum of the flows on Figures E.6, E.7 and E.10 provides the forecasted future traffic flows for the Saturday midday peak period. These future forecasted traffic flows are presented on **Figures 1** and **2** for the Thursday evening and Saturday peak periods respectively.

Road Network North of the Princes Highway

Surveys of the road network north of the Princes Highway were carried out during the evening peak period of Thursday 10th February 2011 and the midday peak period of Saturday 12th February 2011 at the following intersections:

- Oak Road priority T-intersection with Monro Avenue;
- Oak Road roundabout intersection with Waratah Street;
- Bath Road priority T-intersection with Monro Avenue; and
- Bath Road roundabout intersection with Waratah Street.

Future Network Traffic Flows (under Stage 2 works), Evening Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT

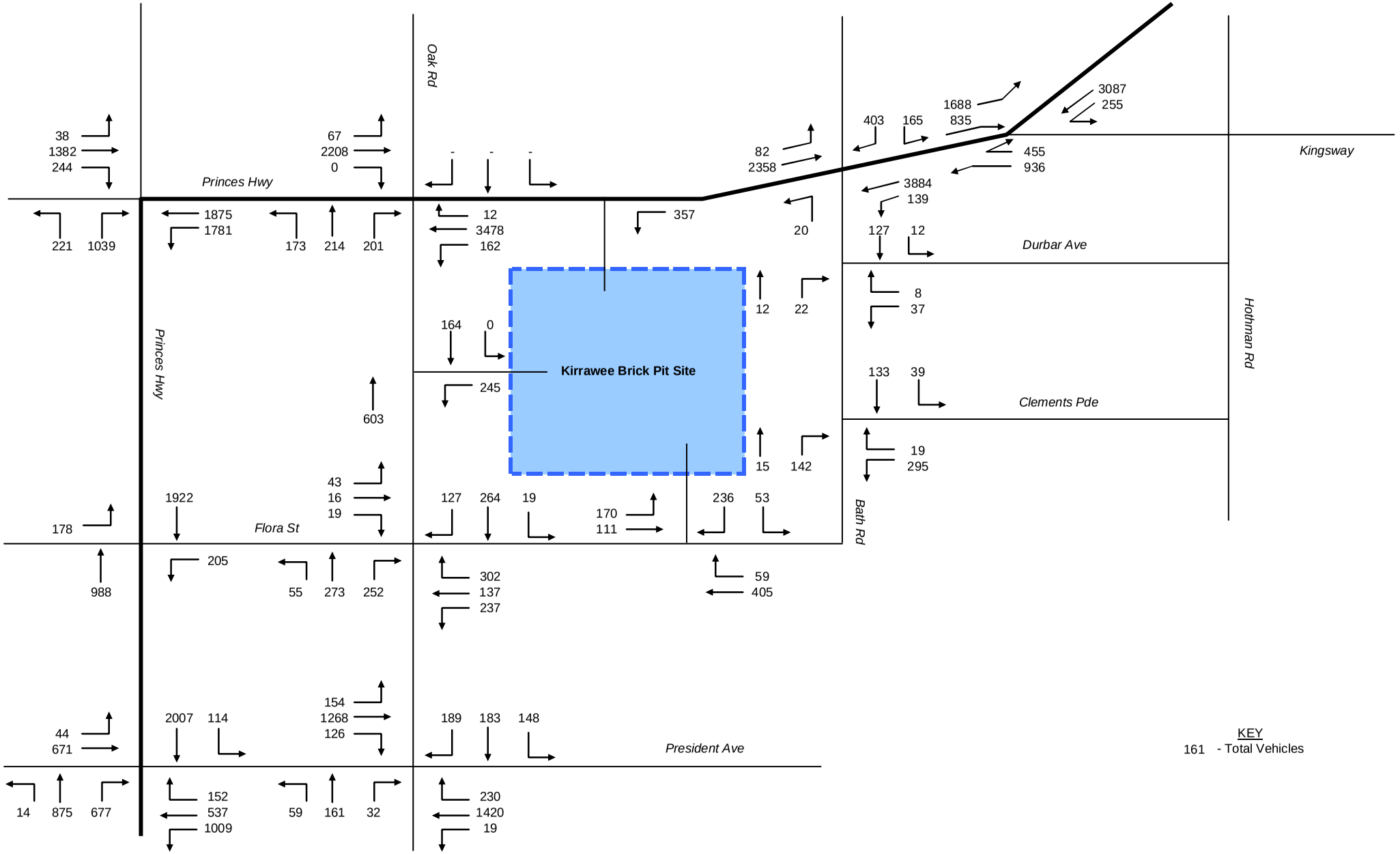

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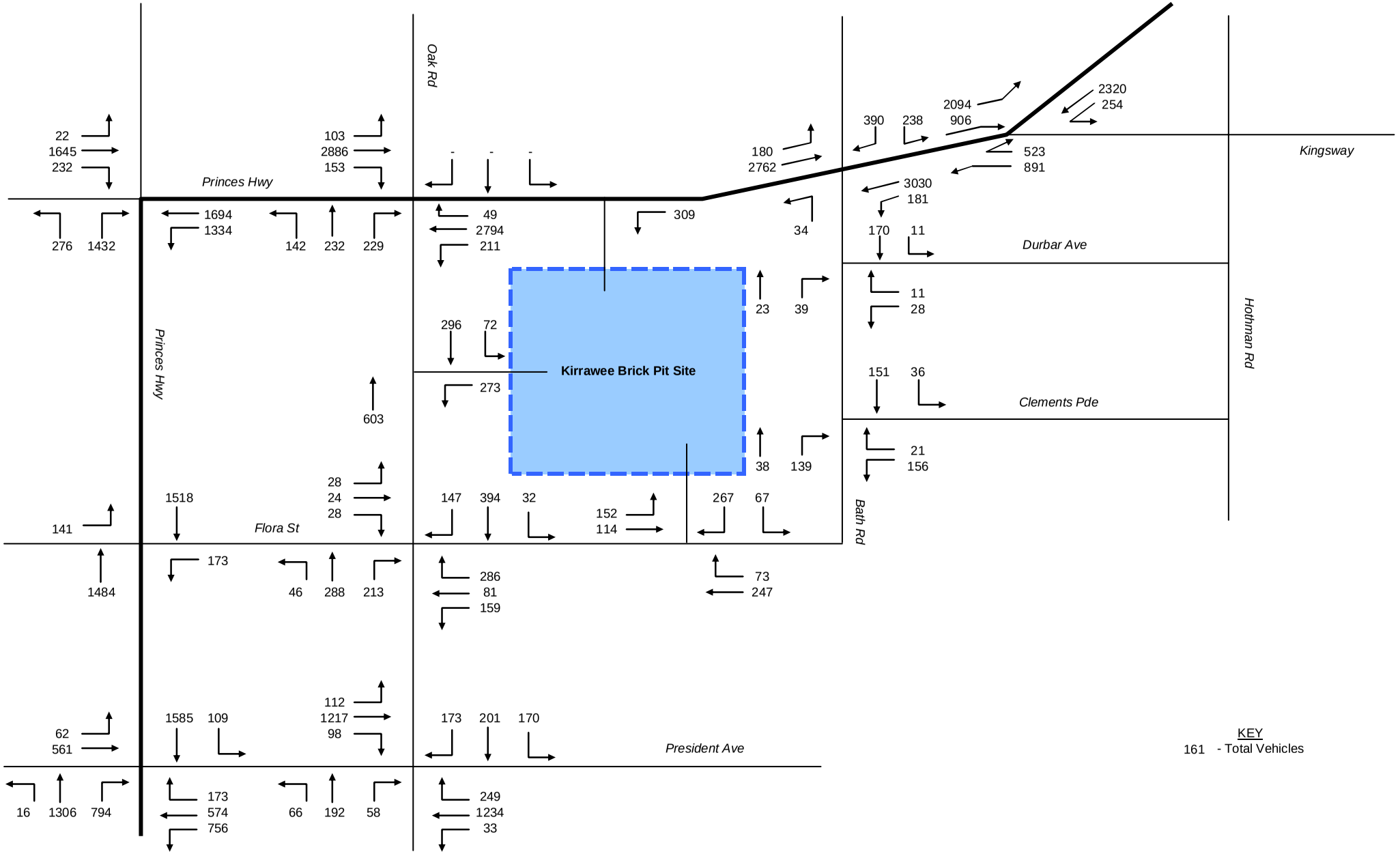
Figure 1

X:\CTLRLQ - Kirrawee Part 3a\67 - Calculations\CTLRLQx03 Network Kirrawee_v12.xls - 14/10/2011

Updated TMAP, Oct. 2011 - Part 1 of 2

Future Network Traffic Flows (under Stage 2 works), Saturday Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



KEY

161 - Total Vehicles

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Figure 2

X:\CTLRLQ - Kirrawee Part 3a\67 - Calculations\CTLRLQx03 Network Kirrawee_v12.xls - 14/10/2011

Updated TMAP, Oct. 2011 - Part 1 of 2

To obtain future year traffic flows for the road network, the following analysis was carried out:

1. Existing traffic was reassigned to reflect changed conditions at the intersections arising from the changed controls at the Princes Highway intersections with Bath Road and Oak Road; and
2. Net traffic flows (accounting for pass-by trips) expected to be generated by the proposed development on the road network north of the Princes Highway were added to the surveyed intersections.

The RTA's Stage 1 & 2 Works affect all the traffic that currently exits the northern arm of the Oak Road intersection with the Princes Highway. These movements would relocate to the Bath Road north approach of the proposed new signalised intersection.

The following summarises the traffic flow diagrams that reflect the analysis described above. These figures relate to the Thursday evening peak period and are attached at **Appendix F**:

- **Figure F.1** shows surveyed traffic flows for the Thursday evening peak hour;
- **Figure F.2** shows the reassignment of traffic on the road network as a result of the RTA's Stage 1 & 2 Works;
- **Figure F.3** shows the reassigned Base Traffic Flows (i.e. Flows F.1 plus Flows F.2); and
- **Figure F.4** shows the assignment of net development traffic on the study road network north of the Princes Highway.

Figures F.5 to **F.8** in Appendix F provide the corresponding traffic flow diagrams for the Saturday midday peak period.

The sum of the flows shown on Figures F.3 and F.4 provides the forecasted future traffic flows for the Thursday evening peak; similarly, the sum of the flows on Figures F.7 and F.8 provides the forecasted future traffic flows for the Saturday midday peak period. These future forecasted traffic flows are presented on **Figures 3** and **4** for the Thursday evening and Saturday peak periods respectively.

Future (with Development) Traffic Flows - Thursday Evening Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT

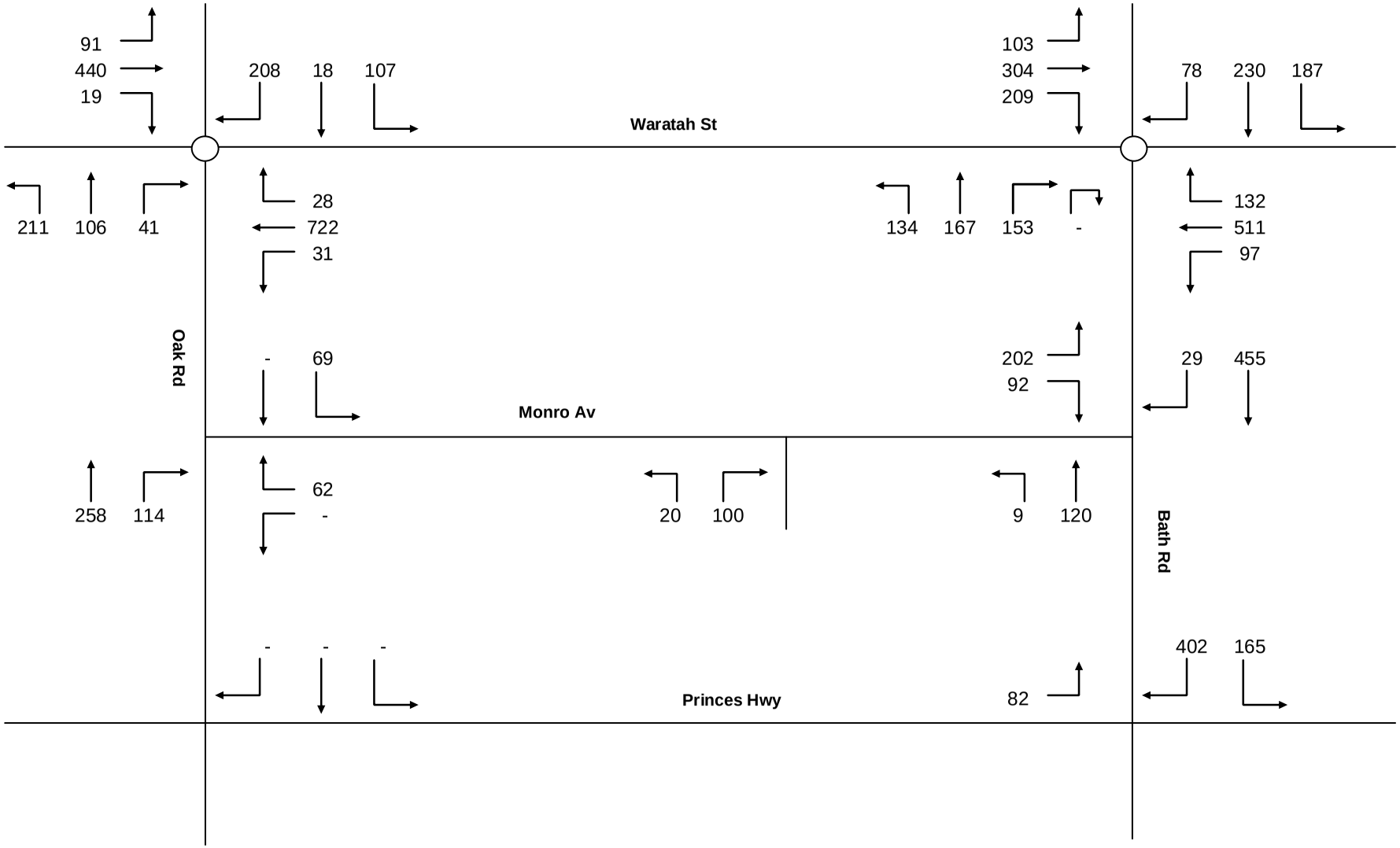

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FIGURE 3

October 2011

CTLRLQx07Av7 Network North Princes Hwy_Thu PM.xls

Updated TMAP, Oct. 2011 - Part 1 of 2

Future (with Development) Traffic Flows - Saturday Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT

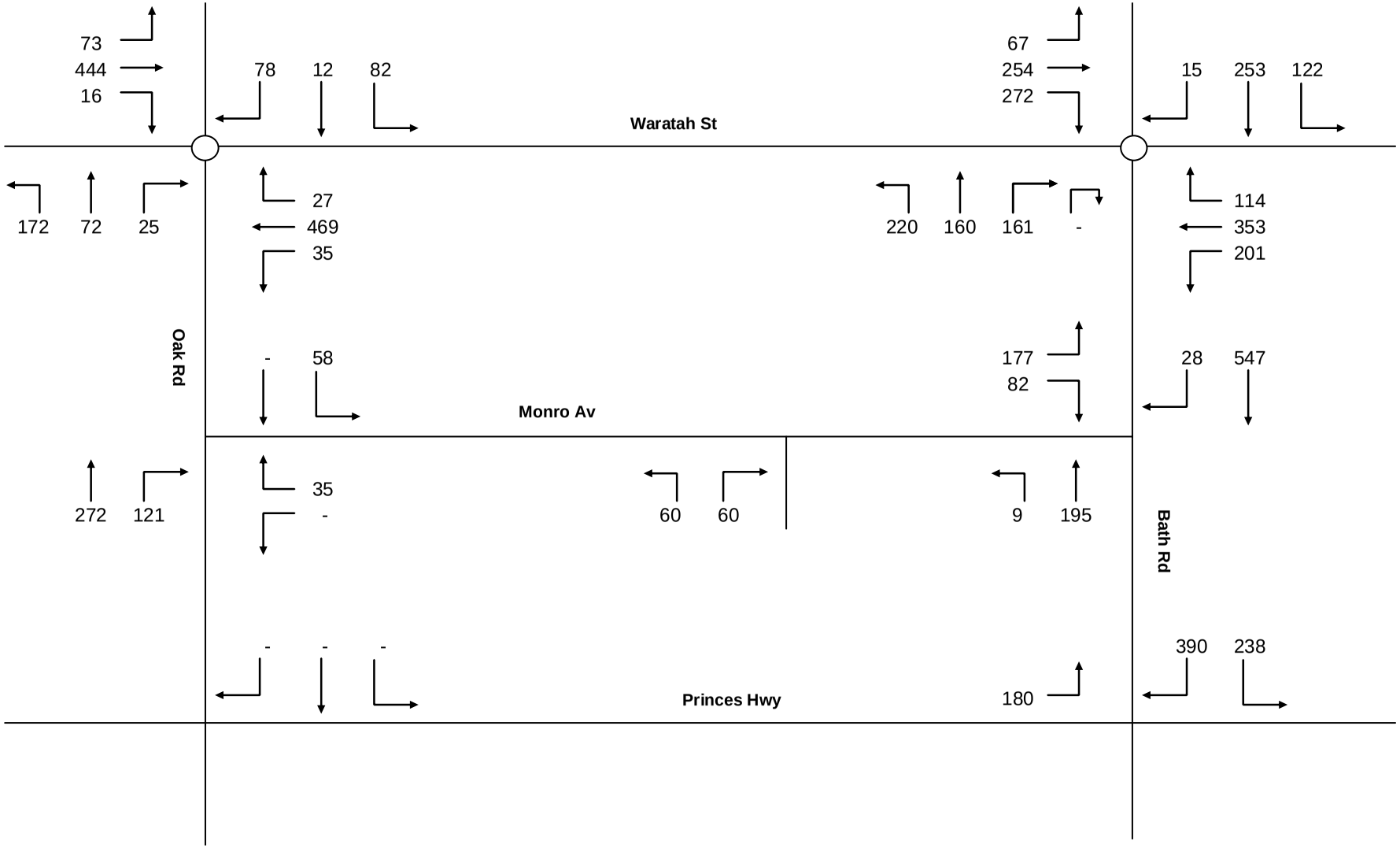

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FIGURE 4
October 2011
CTLRLQx07Bv7 Network North Princes Hwy_SAT.xls

Updated TMAP, Oct. 2011 - Part 1 of 2

3.2.2 SCATES Modelling

Base 2008 Validated SCATES Model

The RTA's SCATES model was kindly provided by McLaren Traffic Engineering (MTE), the consultants representing Sutherland Shire Council (SSC). The package of data provided by MTE included the following two reports that had been issued by B-LINE Traffic Consultants, the consultants commissioned by the RTA to undertake the 2008 SCATES analysis of this section of the Princes Highway:

- TRAFFIC ANALYSIS, Princes Highway – PPC 17, Kogarah to Sutherland 'Pinch Point' Corridor Modelling – FINAL REPORT, Rev 3, July 2008; and
- TRAFFIC ANALYSIS, Princes Highway, Waratah Street to President Avenue, Sutherland – Improvement Options – DRAFT REPORT, November 2008.

From these reports, it was determined that the SCATES model with the reference: OAK-EX, represented the 2008 validated Base SCATES model.

Base 2010 SCATES Model

The first task was to update the Base 2008 SCATES Model to produce a Base 2010 SCATES Model. In order to do this, the following steps were undertaken:

1. Amend intersection geometry at the Kingsway intersection to account for the extension of the dual right-turn lanes from the Princes Highway, that has been undertaken since the 2008 modelling; and
2. Test under 2010 surveyed traffic flows (see Figure E.1 and Figure E.6).

The results of the Base 2010 SCATES modelling are shown on **Table 3.2**.

Future SCATES Model

To produce a Future SCATES Model, the following steps were undertaken:

1. Amend intersection geometry at the Princes Highway intersections of Oak Road and Bath Road to account for the RTA's Stage 1 & 2 Works; and
2. Test under the revised forecasted future traffic flows (see Figure 1 and Figure 2).

The results of the Future SCATES modelling are also shown on Table 3.2.

Table 3.2 – SCATES Analysis Results – Thursday Evening Peak Period

	2010 Base			Future (with Development)		
	Av. Delay	**D/S**	**LoS**	**Av. Delay**	**D/S**	**LoS**
Bates Ave	15	0.63	B	13	0.64	A
The Boulevarde	10	0.83	A	12	0.86	A
Waratah St	25	0.72	B	21	0.75	B
Kingsway	46	0.97	D	45	1.00	D
Bath Rd	-	-	-	24	1.03	B
Oak Rd	58	0.99	E	17	0.79	B
Acacia Rd	48	1.07	D	53	1.10	D
President Ave	47	0.92	D	53	0.96	D

The SCATES analysis shows that the major intersection improvements proposed by the RTA's Stage 1 & 2 Works package would assist the flow of traffic along the Princes Highway corridor, such that the road network would operate similarly to current operating conditions post-opening of the Brick Pit development.

It is worth noting that the performance of the modified Oak Road intersection (Level of Service B) would be considerably better than its current operation (Level of Service E) even with the additional Brick Pit development traffic added.

3.2.3 SIDRA Modelling

Princes Highway Intersections

Because the RTA does not have a Calibrated Saturday SCATES model, the SIDRA modelling that was carried out for the TMAP has been revisited to account for the RTA's Stage 1 & 2 Works at Oak Road and Bath Road and the revised traffic generation assumptions. This allowed a relativity for Thursday SCATES and SIDRA analysis to be determined which would then provide a context within which to consider the Saturday SIDRA analysis result.

Table 3.3 shows the revised Future Thursday evening and Saturday peak hour SIDRA results for the four Princes Highway intersections assessed in the TMAP report, along with the SCATES results for these intersections from Table 3.2.

Table 3.3 –SCATES and SIDRA Analysis Results

	Thu. PM SCATES			Thu. PM SIDRA			Sat. SIDRA		
	Av. Delay	**D/S**	**LoS**	**Av. Delay**	**D/S**	**LoS**	**Av. Delay**	**D/S**	**LoS**
Kingsway	45	1.00	D	56	1.05	D	28	0.94	B
Bath Rd	24	1.03	B	39	1.03	C	10	0.88	A
Oak Rd	17	0.79	B	10	0.86	A	12	0.88	A
Acacia Rd	53	1.10	D	56	1.01	D	53	1.00	D

By comparing the Saturday SIDRA results, with the SIDRA and SCATES results from the Thursday evening peak hour, the following conclusions can be drawn:

- At the Kingsway intersection:
  - The SIDRA and SCATES results for the Thursday evening peak were fairly similar, with both sets of results indicating that the intersection would operate satisfactorily with a Level of Service (LoS) of D or 'near capacity';
  - The SIDRA results for the Saturday peak are considerably better than the SIDRA results for the Thursday peak; therefore, it can be inferred that the intersection's operation on a Saturday would be 'satisfactory' with a LoS of C or better;
- At the Bath Road intersection:
  - The SIDRA and SCATES results for the Thursday evening peak were again fairly similar, with the SCATES modelling indicating that the intersection would operate at a LoS of B or 'good with acceptable delays';
  - Again, the SIDRA results for the Saturday peak are considerably better than the SIDRA results for the Thursday peak; therefore, it can be inferred that the intersection's operation on a Saturday would also be 'good with acceptable delays' with a LoS of B or better;
- At the Oak Road intersection:
  - The SIDRA and SCATES results for the Thursday evening peak were also fairly similar, with the SCATES modelling indicating that the intersection would operate at a LoS of B or 'good with acceptable delays';
  - The SIDRA results for the Saturday peak are similar to the SIDRA results for the Thursday peak; therefore, it can be inferred that the intersection's operation on a Saturday would also be 'good with acceptable delays' with a LoS of B;

- At the Acacia Road intersection:
  - The SIDRA and SCATES results for the Thursday evening peak were also fairly similar, with both sets of results indicating that the intersection would operate satisfactorily with a Level of Service (LoS) of D or 'near capacity'; and
  - The SIDRA results for the Saturday peak are similar to the SIDRA results for the Thursday peak; therefore, it can be inferred that the intersection's operation on a Saturday would also be satisfactorily with a Level of Service (LoS) of D or 'near capacity'.

In summary, the SIDRA analysis backs up the findings of the SCATES analysis and indicates that the combination of the RTA's Stage 1 and Stage 2 works on the Princes highway would mitigate the effects of the additional traffic that would be generated by the proposed Brick Pit development.

TMAP Study Network South of Princes Highway

The SIDRA analysis for the intersections south of the Princes Highway has been revisited to account for the revised trip generation. The results are shown on **Table 3.4**

Table 3.4 – SIDRA Results – Network South of Princes Highway

Intersection		Control	Thursday PM		Saturday	
			Av. Delay	LoS	Av. Delay	LoS
Oak Rd / Flora St	Existing	Roundabout	11	A	11	A
	Future	Signals	25	B	24	B
Oak Rd / President Av	Existing	Signals	22	B	24	B
	Future	Signals	33	C	33	C
Flora St Site Access	Existing	n/a	-	-	-	-
	Future	Priority - T	13	A	11	A
Oak Rd Site Access	Existing	n/a	-	-	-	-
	Future	Priority - T	9	A	9	A

Table 3.4 shows that all intersections would operate satisfactorily (LoS C or better) during the peak periods including the proposed site accesses on Flora Street and Oak Road.

Extended Study Network North of Princes Highway

At the request of the RTA and SSC, the SIDRA analysis has been extended to include two roundabouts north of Princes Highway, these being the Waratah Street roundabout intersections with Oak Road and Bath Road.

The roundabouts have been tested using SIDRA and the results for the existing traffic flows and under the future predicted traffic flows are shown on **Table** 3.5.

Table 3.5 – SIDRA Results – Network North of Princes Highway

Intersection		Control	Thursday PM		Saturday	
			Av. Delay	LoS	Av. Delay	LoS
Waratah St / Oak Rd	Existing	Roundabout	53	D	13	A
	Future	Roundabout	45	D	13	A
Waratah St / Bath Rd	Existing	Roundabout	25	B	19	B
	Future	Roundabout	34	C	24	B

The results show that the operation of the Oak Road roundabout will effectively remain the same as the amount of traffic diverted away from the roundabout as a result of the Stage 2 RTA works, offsets the impact of the development traffic associated with the Brick Pit development.

The Bath Road roundabout is predicted to operate satisfactorily with a LoS C.

On 06/10/11, Halcrow met with the RTA to discuss potential modifications to the Stage 1 & 2 Works and the potential impact the package of works would have on the network north of the Princes Highway.

Attached at **Appendix G** is the RTA's letter of 07/10/11, which sets out the RTA's position on a number of issues that were discussed at the meeting. With regard to the network north of the Princes Highway, the following comments made by the RTA are of significance.

Page 1, paragraph 2:

> *"The RTA also notes that concerns are raised with the proximity of the Bath Road and Monro intersection to the proposed signalised intersection of Bath Road and Princes Highway. However, this can be addressed by priority sign posting and linemarking at the intersection of Monro Avenue and Bath Road."*

Page 1, paragraph 4:

> *"However, the redistribution of the traffic associated with the closure of the Oak Road north approach to the Princes Highway will require in due course (post consent) a Traffic Management Plan to be submitted to Council for review. Further, this partial road closure will require monitoring (post closure) to determine if any further remedial works are required. The period of this monitoring shall be to the satisfaction of Council."*

Henroth accepts these conditions and would not object to these conditions being attached to any subsequent Part 3A approval so the corresponding tasks can be undertaken at a subsequent project application stage.

Finally, indicative SIDRA layout plans showing the proposed Princes Highway intersections of Oak Road and Bath Road, subsequent to the implementation of the RTA's Stage 1 & 2 Works, are attached at **Appendix H**, as well as the proposed signalised intersection of Oak Road with Flora Street.

The RTA has requested that Concept Signal Design Plans be prepared for the Princes Highway intersection with Bath Road and the Oak Road intersection with Flora Street. At the time of writing, the work involved with preparing these plans (which includes liaising with the RTA) was ongoing. In due course these plans will be issued to the RTA.

4 Response to Sutherland Council's Traffic & Parking Submission

The Council submission relies on and re-iterates the material presented in its consultant's report on the matter.

In the interests of brevity, the matters raised in the Council Submission are addressed below in response to the Council Consultant's (McLaren Traffic Engineering) submission.

4.1 Response to McLaren Traffic Engineering Report

This response follows the same numbering sequence as in the report.

1. Land Use

The submission raises issues to do with land use definitions and with the mix of retail uses in the Kirrawee centre as raised in a previous land and environment court case for a previous application for the site.

This particular material is not relevant to the specific consideration of traffic and parking aspects of the subject proposal.

2. Traffic Generation and External Impacts

The report contends that instead of using the RTA's aggregate traffic generation rate for a shopping centre of the size proposed, it would be more appropriate to use the RTA's category traffic generation rates. This alternative approach is not considered appropriate as:

i. It does not take into account the fact that as a shopping centre gets larger, the traffic generation per square metre reduces as customers undertake more business on each visit;

ii. There are some serious anomalies in the RTA category rates as these were inferred from statistical analysis of surveys of shopping centres as a whole rather than being determined from actual counts of traffic or customers attracted by each

component. An example of the anomaly is that for a discount department store the RTA specifies the following traffic generation rates:

- Thursday evening 51 vehicle trips per 100m^2 GLA; and
- Saturday morning 13 vehicle trips per 100m^2 GLA;

It is obvious from a cursory visit to a discount department store in a shopping centre on a Thursday and on a Saturday that the store is not four times as busy on a Thursday night as on a Saturday; and

iii. A second anomaly is that the RTA category rates suggest that speciality shops are about 4 to 5 times busier on a Thursday or Friday night than on a Saturday morning which is very clearly not the case.

The McLaren report refers to the RTA's 1990 survey of the traffic generation of the Kareela Shopping Centre as an example of traffic generation in the area. This is not considered to be relevant as:

i. The survey is very old and shopping patterns have changed significantly over the last 20 years especially in supermarket based centres due to supermarkets now being open late every night of the week;
ii. The Kareela centre is much smaller than that proposed; and
iii. The Kareela centre is not on a railway line.

The traffic assignment used in the Halcrow assessment is similar to that used for the recent Land and Environmental Court appeal regarding this site. Minor differences relate to different access locations and assessments of how traffic from different directions would split between route choice options.

Notwithstanding the concerns with the application of RTA category rates as explained above, the traffic generation of the proposal was recalculated using the rates adopted in the Land and Environment Court appeal using also bulky goods retail traffic generation rates derived from very recent RTA surveys of such.

The analysis established the following comparative traffic generation figures in vehicles trips per hour.

Table 4.1 – Forecast Peak Hour Traffic Generation (vehicles/hour)

Period	Halcrow Report	McLaren	Amended McLaren
Thursday PM Peak	1,092	1,397	1,106
Saturday Peak	1,063	1,570	1,208

The McLaren estimates are too high because:

- They do not use the same rates as were actually adopted in the court case;
- They do not adopt RTA high density residential development trip rates as is appropriate for this site; and
- They treat the showroom retail as small shops rather than as bulky retail.

The RTA in its advice on the application has requested that the Amended McLaren traffic generation estimates be used and these have been assessed in **Section 3** which responds to the RTA letter

The McLaren Report raises issues related to the extent of use and operation of the proposed Oak Road driveway. Following a meeting with the RTA it is now proposed to signalise the intersection of Princes Highway with Bath Road which will cause traffic approaching the centre from the north to use the Princes Highway entry rather than the Oak Road entry, thus significantly reducing use of this driveway. This aspect is discussed further below.

The Stage 2 road works involving signalisation of the Princes Highway/Bath Road intersection are now proposed as part of the application. These were required by both the RTA and Sutherland Council.

Given the level of concern regarding the need for the Stage 2 works and Council's concern regarding effects on roads north of the Princes Highway, fresh traffic counts and analysis for this area has been conducted. The assessment of the network north of Princes Highway is covered in **Section 3.2.3** of this report.

SCATES analysis has now been undertaken and is covered in **Section 3.2.2**. The analysis shows that the major intersection improvements proposed by the RTA's Stage 1 & 2 Works package would assist the flow of traffic along the Princes Highway corridor, such that the road network would operate similarly to current operating conditions post-

opening of the Brick Pit development. In addition, the performance of the modified Oak Road intersection would be considerably better than its current operation even with the additional Brick Pit development traffic added.

Suggested Sutherland Council traffic calming works on certain roads near the centre have not been provided. At this stage it is considered that both the relatively low traffic changes and existing features that naturally calm traffic on these roads would obviate the need for such works. However, if the Council was to make a reasonable case for such works and they were directly necessitated by the proposed development then it would be reasonable for the applicant to fund them.

The Halcrow SIDRA analysis for the Oak Road/Flora Road intersection shows a high degree of spare capacity and any changes to the assumed traffic signal cycle time or pedestrian movements would not affect the sufficiency of capacity that would be provided.

Electronic files of intersection analysis have been provided to the RTA.

3. Kirrawee Local Area Masterplan & Impact on Existing Kirrawee Shops

As mentioned earlier, upon request from the RTA, Concept Signal Design plans are being prepared for the intersection of Oak Road with Flora Street. These plans will take in to account the road geometry requirements for truck arrival and departure routes through the proposed intersection. In due course these plans will be issued to the RTA.

It is inevitable that signalisation of the intersection of Oak Road with Flora Street as required by the Council would result in some loss of on-street parking. However, any loss of parking would be offset by Henroth's agreement to replace all 40 on-street angled parking spaces on Flora Street (see following Section 4. Parking).

As mentioned above, modified traffic arrangements on Princes Highway required by the RTA and Council will significantly reduce use of the Oak Road driveway. A road safety audit of the driveway will be undertaken as part of the Project Application.

4. *Parking*

The McLaren report acknowledges that it is proposed to adopt the council DCP parking rate for the traditional retail components and accepts that there is merit in the Halcrow analysis of residential parking provision rates below the council area wide DCP standard in this particular location. However, in contradiction thereof, it goes on to say that there is a shortage of residential parking.

It is submitted that the Halcrow assessment of residential parking needs is well reasoned, will provide sufficient on site parking for residents, and is in accordance with sustainability principles of not oversupplying parking. Furthermore, the rates accord with the requirement of Transport NSW that the Sutherland DCP rates be adopted as maxima and as can be seen, further reductions have been applied to the eventual provision.

The McLaren report suggests that displaced angle parking along the front of the site should be replaced on the site. This is not considered appropriate as the angle parking takes up the whole verge or the road along the site. Such parking provision could only ever be seen as an interim parking arrangement as, inevitably when some form of development was to take place in the future, it would be necessary to reclaim a nature strip and footpath along the frontage of the site in accordance with undisputed urban design principles and with Council's adopted Urban Framework Plan for Kirrawee.

The community has enjoyed a temporary benefit while the Brick Pit site has been unused. It is considered unreasonable to require this temporary benefit to become permanent through the inclusion of the interim parking on the private land that adjoins it, especially when that site would be self sufficient in parking.

Notwithstanding this contention, at the request of the DOP, the lost parking will be replaced on the site. As mentioned earlier, the proposed signalisation of the Oak Road intersection with Flora Street could result in the loss of some on-street parking. However, replacing all 40 Flora Street interim angled parking spaces within the proposed public basement car park should more than fully compensate for any potential on-street parking that is lost in the immediate area of the Oak Road and Flora Street intersection.

5. Public Transport Integration

It is not appropriate to detail bus and train passenger capacity rates in the context of a single mixed use development. The Department of Planning sets overall employment and housing targets for each local government area and trunk public transport services need to be planned to meet the needs of the overall targets rather than on a site by site basis.

Notwithstanding this, the proposed development will provide employment that will help to contain travel in Sutherland and to this extent will be beneficial in overall transport terms.

Bus/taxi set down/pickup areas would most appropriately be considered in the Project Plan not in this Concept Plan, although it is noted that a bus set down area is envisaged on site.

6. Internal Car Park Design

The design matters referred to are not applicable to a Concept Plan and will be considered in the Project Plan.

7. Loading and Unloading

As for item 6 above.

8. Road and Traffic Authority

A meeting has been held with the RTA and additional analyses and information prepared for it.

9. Inadequacy of Information

As for item 6 above.

10. Matters Previously Raised by Objectors

As for item 6 above.

5 Conclusions

Further analysis provided in this report which incorporates assumptions regarding traffic generation and road improvements along the Princes Highway requested by the RTA indicates that the local road system would be able to satisfactorily accommodate traffic generated by the proposed development.

Parking provisions in the proposal have been modified to:

- Provide office and retail parking at RTA recommended rates;
- Include displaced on-street parking in the public car park; and
- Reduce resident parking well below Council DCP rates as requested by the DOP.

Overall it is considered that the traffic and parking aspects of the development are satisfactory.

Appendix A RTA Letter of 28 February 2011 (Sydney Regional Development Advisory Committee)

SRDAC

SYDNEY REGIONAL DEVELOPMENT ADVISORY COMMITTEE

Our Reference:	RDC 08M496_7 – SYD10/01071
Your Reference:	MP10_0076
Contact:	Aleks Tancevski
Telephone:	8849 2313

Director / Metropolitan Projects
Department of Planning
GPO Box 39
SYDNEY NSW 2001

Attention: Scott Schimanski

EXHIBITION OF ENVIRONMENTAL ASSESSMENT FOR THE KIRRAWEE BRICK PIT SITE AT 566-594 PRINCES HIGHWAY, KIRRAWEE

Dear Sir/Madam

I refer to your letter dated 14 December 2010 (Department Reference Ref: MP 10_0076), concerning the abovementioned Environmental Assessment Application (EA) which was referred to the Roads and Traffic Authority (RTA) for comment in accordance with Clause 104 of State Environmental Planning Policy (Infrastructure) 2007. I wish to advise that the Sydney Regional Development Advisory Committee (SRDAC) considered the traffic impact of this application at its meeting on 9 February 2011.

The RTA has reviewed the EA and raises the following concerns with regard to the EA application and these concerns shall be addressed prior to its determination. The RTA cannot determine this development unless the following issues are resolved satisfactorily:

INTERSECTION MODELLING

1. It is noted that the Transport Management and Accessibility Plan (TMAP) by Halcrow utilises SIDRA to analyse the performance of the intersections in proximity to the subject site pre and post development. However, the SIDRA analysis does not accurately reflect on-site observations, particularly along the Princes Highway. SIDRA cannot take into account the residual queuing that occurs at the intersection of Princes Highway and Oak Road during the AM and PM peak periods and as such the levels of service in the submitted SIDRA analysis does not reflect on-site conditions.

   In this regard, the Department is advised that the RTA developed a SCATES model of the Princes Highway in June 2008 which incorporates the intersection of Princes Highway and Oak Road and the modelling illustrates that this intersection already operates at capacity in peak periods.

   It is recommended that the submitted TMAP and associated intersection modelling be revised to reflect the findings of the abovementioned SCATES model. The modified SCATES model shall include pre and post development conditions. Particular attention is to be paid to the intersection of the Princes Highway and Oak Road.

TRAFFIC GENERATION

2. Following the SRDAC meeting, Halcrow submitted revised traffic generation rates for the critical Thursday PM and Saturday midday peak periods using the traffic generation rates in the RTA's Guide to Traffic Generating Developments. These revised traffic generation rates estimate traffic generation rates of 1106 veh/hr in the Thursday PM peak and 1208 veh/hr in the Saturday midday peak periods. The RTA endorses these rates being used to assess the traffic impact of the proposed development.

3. Further to the above, the development proposed on the subject site has increased in floor area relative to the previous development proposal that was refused by the Land and Environment Court. The RTA notes that the submitted TMAP argues that the Stage 2 works proposed by the RTA in it's letter to Council dated 29 June 2009 for the previous proposal, are not required as part of the current development proposal, on the basis that the SIDRA analysis submitted with the application infers that there is existing spare capacity at the intersection of Princes Highway and Oak Road. However, as stated above, the RTA's SCATES analysis illustrates that there is no spare capacity at this intersection to accommodate the additional traffic generation from the proposed development.

   As a result of the above, the RTA requires the developer to undertake the full scope of signal and civil works outlined in the RTA's previous letter dated 29 June 2009 (attached). It is anticipated these works will result in regional impacts on the local road network and the Department will need to consult Council regarding these regional impacts.

SITE ACCESS

4. Both the RTA and Council raise concerns with regard to the proposed access driveway on the Princes Highway via a new deceleration lane. Vehicles are expected to enter the site via the new deceleration lane and enter a shared zone with pedestrians, a bus/taxi drop off area and traverse the shared zone to the entrance of the basement car park. Heavy vehicles are also proposed to enter the subject site from the Princes Highway and traverse this shared zone. This is clearly unacceptable on road safety grounds.

5. The architectural plans also indicate that the Oak Road access driveway has become the primary access to the basement car park area as a result of this development proposal. Furthermore, the basement car park has a number of conflict points whereby the access driveway from Oak Road leads into the commuter, commercial, retail and residential car park. Under the previous proposal smaller numbers of vehicles were entering the subject site via this access driveway. Both the RTA and Council have concerns that vehicles may queue out of the subject site onto Oak Road and through the Princes Highway intersection.

   The layout of the development shall be amended to make the Flora Street access a secondary access to the proposed development with minor traffic movements.

6. As a result of the above, the access driveway via a deceleration lane on the Princes Highway shall become the primary access to the proposed development. This access driveway shall have an arrangement in place to allow an uninterrupted flow of traffic into the subject site. Any revised architectural plans and TMAP should reflect this modified access arrangement.

7. Furthermore, the revised architectural plans and TMAP shall have all service vehicle movements occurring through the Flora Street access driveway. No heavy vehicles are to enter the subject site via the new deceleration lane on the Princes Highway.

DEVELOPMENT STAGING

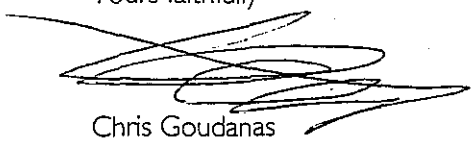
8. Upon perusal of the architectural plans and the submitted TMAP, it is unclear as to the proposed staging of the proposed development. This should be clearly and concisely set out in the TMAP and/or architectural plans to identify what aspects of the proposed development are proposed to be constructed under what stages.

Updated concept plans and an amended TMAP shall be submitted to the Department of Planning and referred to both the RTA and Council for review prior to the determination of the EA. The RTA reserves the right to provide further requirements following review of the revised concept plans and TMAP. It is reiterated that the Department of Planning should not determine the EA until the RTA is satisfied that the abovementioned concerns have been satisfactorily addressed.

Following submission of the revised EA, TMAP, architectural plans, intersection concept plans and other further information requested above, the RTA will review the supplementary information and provide further comments to the Department of Planning.

Any inquiries in relation to this Environmental Assessment application can be directed to Aleks Tancevski on telephone 8849 2313.

Yours faithfully



Chris Goudanas
Chairman, Sydney Regional Development Advisory Committee

28 February 2011

Appendix B Halcrow Letter of 11 February 2011

Halcrow
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Tel +61 2 9410 4100 Fax +61 2 9410 4199
www.halcrow.com/australasia

Roads and Traffic Authority
PO Box 793
Parramatta 2124

Att: Mr James Hall

11 February 2011

Dear James,

Re: Kirrawee Brick Pit Site, 566-594 Princess Highway, Kirrawee

Following our meeting on Wednesday we have revisited the traffic forecasts for the project presented by Craig McLaren. While we do not accept his basis for the analysis, we contend that he has not correctly calculated the traffic generation if the traffic generation rates agreed in the previous Land and Environment Court case were applied.

We have therefore re-estimated the traffic generation on the basis that arises from the court case agreement.

We set this out below in the interest of allowing the RTA to clarify its own position.

We submit that the calculation for Thursday conditions should have been as follows:

Land Use	GLA / Units	Traffic Generation Rate [1]	Traffic Generation veh/hr
Supermarket	5,270	14.0 per 100m²	738
Mini-Major	1,280	4.6 / 100m²	59
Specialty	2,940	4.14 / 100m²	122
Bulky Goods	2,930	1.46 / 100m² [2]	43
Office	660	2.0 / 100m²	13
Residential	450	0.29 / 100m² [3]	131
Total			1106

[1] – Retail traffic generation rates are 90% of RTA Category Rates as agreed for the L&E Court Case;
[2] – Based on RTA's latest bulky goods research, see attached information;
[3] – Based on RTA's high density residential rate.

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Similarly for a Saturday the traffic generation would be:

Land Use	GLA / Units	Traffic Generation Rate [1]	Traffic Generation veh/hr
Supermarket	5,270	13.2 per 100m²	696
Mini-Major	1,280	1.17 / 100m²	15
Specialty	2,940	9.6 / 100m²	282
Bulky Goods	2,930	2.88 / 100m² [2]	84
Office	660	-	-
Residential	450	0.29 / 100m² [3]	131
Total			1208

[1] – Retail traffic generation rates are 90% of RTA Category Rates as agreed for the L&E Court Case;
[2] – Based on RTA's latest bulky goods research, see attached information;
[3] – Based on RTA's high density residential rate.

We note that the Thursday estimate is essentially the same as our estimate of 1,092 veh/hr. The Saturday estimate is higher than our estimate of 1,063 veh/hr but nowhere near the figure of 1,570 veh/hr estimated by Council.

Finally, we note that the retail rates adopted for the Land and Environment Court Case represented a discount of only 10% below the RTA unconstrained category rates. As the normal supermarket viability threshold is 10,000 persons, the 1,000 persons living on the site would themselves alone account for this 10% discount. In addition, there would be reductions in the traffic generation due to good public transport in the area and walk-in business from the rest of the Kirrawee Centre. Correspondingly, customers of the subject centre would walk into shops in the Kirrawee Centre, thus reducing the traffic generation of their customers.

Overall we submit that our traffic generation estimates are of the correct order but that if the RTA does wish to use the logic submitted by the Council than the above traffic generation estimates should be used.

Should you have any queries, please do not hesitate to contact Piran Trethewey or myself.

Yours sincerely

Bruce Masson
Director Transport Planning

Cc Aleks Tancevski – RTA

Halcrow

APPENDIX A

Traffic Generation of Bulky Goods Development

The adopted bulky retail traffic generation rate was sourced from recent surveys of existing bulky goods developments undertaken by the RTA. The surveys were conducted in March 2009 by the RTA as part of its effort to progressively update their *Guide to Traffic Generating Development*, 2002. The survey results were published in the report "*Trip Generation and Parking Generation Surveys (Bulky Goods/Hardware Stores)*" prepared by Hyder. The survey results are summarised in **Table A.1.**

Table A.1- Summary of RTA's Surveys of Bulky Goods Retail Developments

Name		Sleep City Balgowlah	Harvey Norman, Auburn	Retravision, Springwood	Domayne, Kotara	Bing Lee, Warilla	Fantastic Furniture, South Nowra
Floor Area (m² GFA)		4,300	14,850	600	6,000	1,200	1,700
Weekday Morning Period (7am-9am)				Not Surveyed			
Weekday Evening Period (4pm-6pm)	No. of Trips (vph)	58	180	25	107	35	14
	Rate (per 100m² GFA)	1.3	1.2	4.2	1.8	2.9	0.8
Weekday Site Peak Activity	No. of Trips (vph)	61	232	26	118	57	35
	Rate (per 100m² GFA)	1.4	1.6	4.3	2.0	4.8	2.1
Weekend Morning (11am-2pm)	No. of Trips (vph)	84	398	37	205	66	37
	Rate (per 100m² GFA)	2.0	2.7	6.2	3.4	5.5	2.2
Weekend Site Peak Activity	No. of Trips (vph)	96	425	37	205	68	47
	Rate (per 100m² GFA)	2.2	2.9	6.2	3.4	5.7	2.8
Weekday Evening Weighted Average			***1.46 trips per peak hour per 100m² GFA***				
Weekend Morning Weighted Average			***2.88 trips per peak hour per 100m² GFA***				

Appendix C RTA Letter of 29 June 2009

Your Reference:	DA08/0347
Our Reference:	ID 08M496 Vol 5
Contact:	Aleks Tancevski
Telephone:	8849 2313

The General Manager
Sutherland Shire Council
DX 4511
SUTHERLAND

Attention: Adam Markham

FURTHER AMENDED PLANS FOR A PROPOSED MIXED USE DEVELOPMENT AT 566-594 PRINCES HIGHWAY (FORMER KIRRAWEE BRICK PIT SITE)

Dear Sir,

I refer to Council's letter dated 25 May 2009 (Council Ref: DA08/0347) with regard to the further amended plans and documentation submitted by Council to the Roads and Traffic Authority (RTA) for the above-mentioned development application. The RTA understands that, with the permission of the Land and Environment Court (LEC), the applicant is relying on further amended plans for the development proposal.

The RTA advises that the applicant's traffic consultant Traffix Pty Ltd advised the RTA in a letter dated 13 May 2009 that certain agreements had been reached with the parties (ie Council) with regard to the type and level of roadworks, staging of works and levels of contribution from the developer. Subsequently, Council's traffic consultant Craig McLaren Traffic Engineering Pty Ltd advised the RTA in a letter dated 25 June 2009 that they refuted the statement in the letter from Traffix that full agreement had been reached between the parties. The RTA has considered both these letters in its review of the recently amended plans.

The RTA has reviewed the amended plans and associated documentation submitted and the RTA is prepared to accept a two staged approach (as outlined in the letter to the RTA from Traffix Pty Ltd dated 13 May 2009) to the construction of the signal and civil works on the Princes Highway at the intersections of Oak Road and Bath Road and the traffic signals at the intersection of Oak Road and Flora Street. In this regard, the initial stage (Stage 1) will involve the widening of Oak Road, the left turn slip lane and deceleration lane on the Princes Highway and the traffic signals at the intersection of Oak and Flora Street. In this regard, the RTA requests the following requirements be incorporated into the development consent and shall apply to any stage of the development (if the development application were to be approved) to mitigate the traffic impact of the proposed development on the road network:

27-31 Argyle Street Parramatta NSW 2150
PO Box 973 Parramatta CBD NSW 2150 DX28555 Parramatta
www.rta.nsw.gov.au | 13 17 82

STAGE 1 – RTA REQUIREMENTS

1. Princes Highway Intersection at Oak Road

The layout of the existing signalised intersection on Princes Highway at Oak Road shall be reconfigured as follows:

a) Three northbound lanes shall be provided on Oak Road on the southern leg of the intersection and each lane shall be a minimum of 90 metres in length.

b) An 80 metre long left turn slip lane shall be provided on the westbound carriageway of Princes Highway into Oak Road.

c) One southbound lane shall be provided on Oak Road on the southern leg of the intersection.

d) A raised central concrete median island shall be installed on Oak Road in front of the proposed left in/left out driveway and the median shall extend from the stop line at the Princes Highway intersection to an appropriate point to the south of the proposed driveway. This median shall be a minimum of 900mm wide.

2. Traffic Signals on Oak Road at Flora Street Intersection

The applicant shall provide traffic control signals on Oak Road at the Flora Street intersection. In this regard, an electronic copy of the intersection analysis shall be submitted with the signal design plan to the RTA for review and comment. The configuration of the signalised intersection shall be to RTA satisfaction.

3. Operational Fee for Traffic Signals

The applicant will be required to provide an upfront 10 year operational fee for the above-mentioned traffic control signals at the intersection of Oak Road and Flora Street. The amount of this fee will be advised following the submission of the detailed signal and civil design plans to the RTA for construction approval. The approved plans will not be released until the fee is fully paid.

4. Deceleration Lane on Princes Highway

The left turn deceleration lane into the subject site from Princes Highway shall be a minimum of 60 metres in length (including taper) and shall be designed and constructed in accordance with the RTA's Road Design Guide.

5. Road Safety Audit

Road safety concerns are raised with regard to the close proximity of the proposed left in/left out driveway on Oak Road to the proposed left turn slip lane on Princes Highway into Oak Road and the subsequent potential for rear end accidents. In this regard, prior to any 'Construction Certificate' being issued for any stage of the proposed development, a Road Safety Audit shall be undertaken that investigates this issue and is to be undertaken by a certified Road Safety Auditor. The audit shall be completed in accordance with the Austroads: *Guidelines for Road Safety Audits.*

A copy of the findings of the audit shall be submitted to Council and the RTA for review.

6. Excavation of the Site and Support Structures

The developer is to submit detailed design drawings and geotechnical reports relating to the excavation of the site and support structures to the RTA for assessment (prior to the approval of any Construction Certificate). The developer is to meet the full cost of the assessment by the RTA.

This report would need to address the following key issues:

a. The impact of excavation/rock anchors on the stability of the Princes Highway and detailing how the carriageway would be monitored for settlement.
b. The impact of the excavation on the structural stability of the Princes Highway.
c. Any other issues that may need to be addressed (Contact: Geotechnical Engineer Stanley Yuen on Ph: 8837 0246 or Graham Yip on Ph: 8837 0245) for details.

7. Relocation of Public Utilities

The developer shall be responsible for all public utility adjustment/relocation works, necessitated by the above work and as required by the various public utility authorities and/or their agents.

8. Land Dedication

To facilitate the provision of the left turn deceleration lane on the Princes Highway and the left turn slip lane into Oak Road, the applicant shall provide a 3.5 metre wide land dedication from the subject site on the Princes Highway frontage of the site for the full length of the left turn deceleration lane into the site and slip lane into Oak Road. This land shall be dedicated as public road at no cost to the RTA and Council. Sufficient land dedication is to be provided for the relocation of the footway.

In addition, the applicant shall provide land dedication along the Oak Road frontage of the subject site to provide the additional lane on the southern leg of the Princes Highway intersection and the 900mm raised central concrete median island on Oak Road. This land shall be dedicated as public road at no cost to the RTA and Council.

This public road land dedication from the subject site shall be executed, prior to any release of a Construction Certificate for the proposed development.

9. Construction Certificate

No Construction Certificate shall be released for any stage of the development until such time that all the above-mentioned signal and civil works are fully constructed and operational.

Further to the above, no Construction Certificate shall be approved for any stage of the development until such time that a detailed Construction Traffic Management Plan (CTMP) and associated Traffic Control Plan (TCP) is submitted to Council and the RTA for review and acceptance. The CTMP and TCP shall be undertaken in accordance with the RTA's Traffic Control at Worksites Manual and the author shall be certified.

Comment: If the signal and civil works on Oak Road and Princes Highway were to be constructed at the same time as construction is taking place on site, it is likely to create significant delays on the road network.

10. Works Authorisation Deed

The developer will be required to enter into a "Major Works Authorisation Deed" (WAD) with the RTA for the above-mentioned signal and civil works. In this regard the developer is required to submit detailed design plans and all relevant additional information, as may be required in the RTA's Works Authorisation Deed documentation, for each specific change to state road network for the RTA's assessment and final decision concerning the work. The detailed design plans submitted shall be in accordance with the RTA's Road Design Guide and RTA requirements.

Comment: It is requested that Council advise the developer that the conditions of consent set by Council do not guarantee the RTA's final consent to the specific road work, traffic control facilities and other structures works on the classified road network. The RTA must provide a final consent for each specific change to the state road network prior to the commencement of any work.

11. Stormwater

Detailed design plans and hydraulic calculations of any changes to the stormwater drainage system are to be submitted to the RTA for approval, prior to the commencement of any works.

Details should be forwarded to:

The Sydney Asset Management
PO Box 973
Parramatta CBD NSW 2124

A plan checking fee will be payable and a performance bond may be required before the RTA's approval is issued. With regard to the Civil Works requirement please contact the RTA's Project Engineer, External Works Ph: 8849 2114 or Fax: 8849 2766.

12. No Cost to RTA or Council

All roadworks and traffic control signals associated with the proposed development shall be at full cost to the developer and at no cost to the RTA or Council.

STAGE 2 – RTA REQUIREMENTS

The half closure of the northern leg of the Oak Road intersection at the Princes Highway and signal and civil works at the intersection of Princes Highway and Bath Road (as outlined below) forms the second stage of the identified intersection and road upgrades required to mitigate the traffic impact of the development. The trigger for the second stage is the construction of the supermarket component of the application as the supermarket is the principle traffic generator of the overall development. In this regard, the RTA requests that the following requirements also be incorporated into the development consent and the trigger for these works is any stage of the development involving the supermarket.

13. Intersection of Princes Highway and Oak Road

The existing signalised intersection of Princes highway and Oak Road shall be reconfigured as follows:

a) Half closure of the Oak Road northern approach to the Princes Highway involving the discontinuation of the southbound lanes with northbound lanes remaining open.

14. Traffic Signals on Princes Highway at Bath Road Intersection

Traffic control signals shall be provided at the intersection of Princes Highway and Bath Road (associated with the northern closure of Oak Road at the Princes Highway intersection) and shall consist of the following works:

a) Left in/left out only for the Bath Road southern approach. The left turn out would be signalised.

b) No through movements across Princes Highway (ie no north-south traffic from Bath Road).

c) Signalised left and right turn out of Bath Road northern approach with a double right turn lane.

d) No right turns permitted from Princes Highway from either direction to Bath Road.

15. Operational Fee for Traffic Signals

The applicant will be required to provide an upfront 10 year operational fee for the traffic control signals on the Princes Highway at the Bath Road intersection. The amount of this fee will be advised following the submission of the detailed signal and civil design plans to the RTA for construction approval. The approved plans will not be released until the fee is fully paid.

16. Construction Certificate

The Construction Certificate for the supermarket shall not be released until the above-mentioned signal and civil works are fully constructed and operational.

17. Relocation of Public Utilities

The developer shall be responsible for all public utility adjustment/relocation works, necessitated by the above work and as required by the various public utility authorities and/or their agents.

18. Works Authorisation Deed

The developer will be required to enter into a "Major Works Authorisation Deed" (WAD) with the RTA for the above-mentioned signal and civil works. In this regard the developer is required to submit detailed design plans and all relevant additional information, as may be required in the RTA's Works Authorisation Deed documentation, for each specific change to state road network for the RTA's assessment and final decision concerning the work. The detailed design plans submitted shall be in accordance with the RTA's Road Design Guide and RTA requirements.

Comment: It is requested that Council advise the developer that the conditions of consent set by Council do not guarantee the RTA's final consent to the specific road work, traffic control facilities and other structures works on the classified road network. The RTA must provide a final consent for each specific change to the state road network prior to the commencement of any work.

19. No Cost to RTA or Council

All roadworks and traffic control signals associated with the proposed development shall be at full cost to the developer and at no cost to the RTA or Council.

Further to the above staged implementation of the signal and civil works on the Princes Highway and Oak Road, Council should consider requesting the applicant to make a monetary contribution to Council's satisfaction towards upgrading the existing intersection of Waratah Street and Bath Road.

In accordance with Clause 104 (4) of State Environmental Planning Policy (Infrastructure) 2007, it is essential that a copy of the determination (conditions of consent if approved) is forwarded to the RTA at the same time it is sent to the developer.

Any inquiries can be directed to the nominated Assistant Land Use and Transport Planner, Aleks Tancevski by telephone on 8849 2313, or facsimile 8849 2918.

Yours faithfully,

James Hall
A/Senior Land Use Planner
Transport Planning, Sydney Region

29 June 2009

Appendix D Latest Concept Plans and Staging Plans

1 RL 100.50 UPPER GROUND FLOOR PLAN
1 : 1000

NSW Registered & Nominated Architects: Geoffrey Lee 4223, Philip Bowen 4527

Australia
Asia
Europe

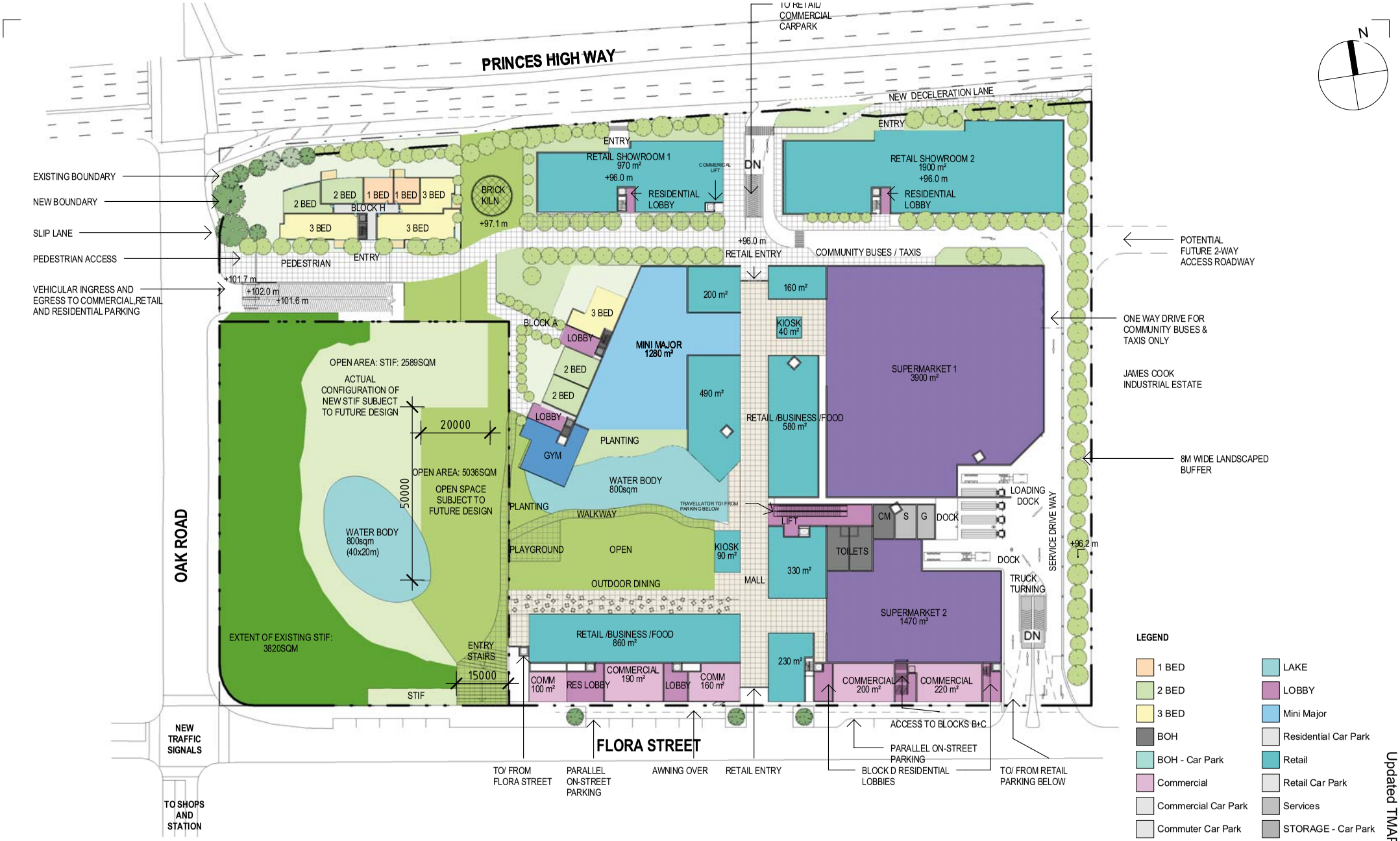
Client
Henroth Investments Pty Limited
46-56 Kippax Street
Surry Hills NSW 2010

343 Pacific Highway
North Sydney NSW 2060
T +612 9964 9500
F +612 9964 9683
ABN 61 007 747 748

woodhead™

DRAWING TITLE: UPPER GROUND FLOOR PLAN				
PROJECT NAME: KIRRAWEE BRICK PIT		CLIENT NAME: HENROTH INVESTMENTS PTY LIMITED		
PROJECT NUMBER: 09211902	SCALE: 1:1000	DRAWING NUMBER: 0120	DATE: 23/06/11	REVISION NUMBER:

Updated TMAP, Oct. 2011 - Part 1 of 2



1 RL 96.00 LOWER GROUND FLOOR PLAN PLOT

1 : 1000

NSW Registered & Nominated Architects: Geoffrey Lee 4223, Philip Bowen 4527

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F +612 9964 9683
ABN 61 007 747 748

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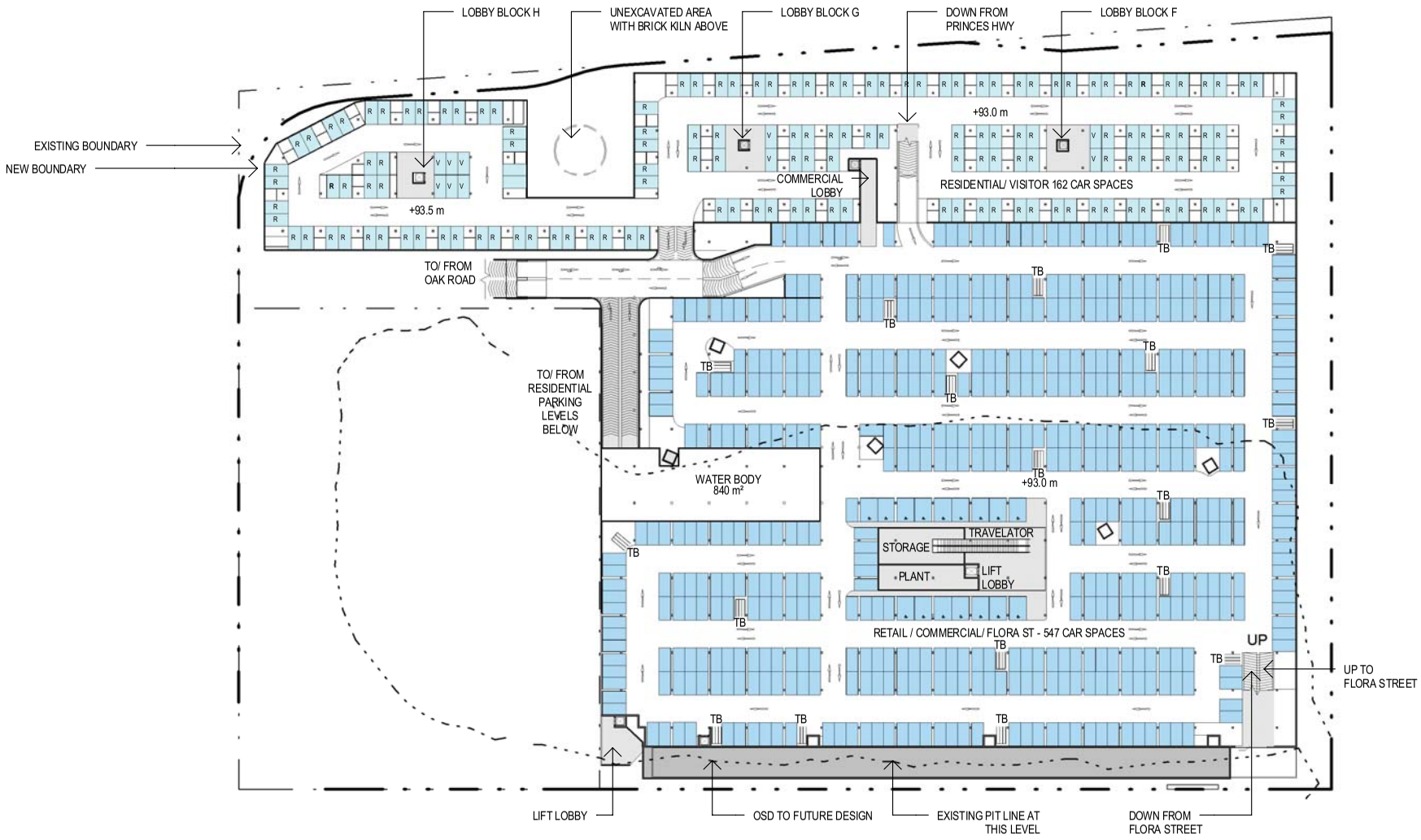
DRAWING TITLE: LOWER GROUND FLOOR PLAN

PROJECT NAME: KIRRAWEE BRICK PIT

CLIENT NAME: HENROTH INVESTMENTS PTY LIMITED

PROJECT NUMBER: 09211902 | SCALE: 1:1000 | DRAWING NUMBER: 0130 | DATE: 11/07/11 | REVISION NUMBER:

Updated TMAP, Oct. 2011 - Part 1 of 2



1 RL 93.0 BASEMENT 1 PLAN - PARKING
1 : 1000

NSW Registered & Nominated Architects: Geoffrey Lee 4223, Philip Bowen 4527

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Client
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Surry Hills NSW 2010

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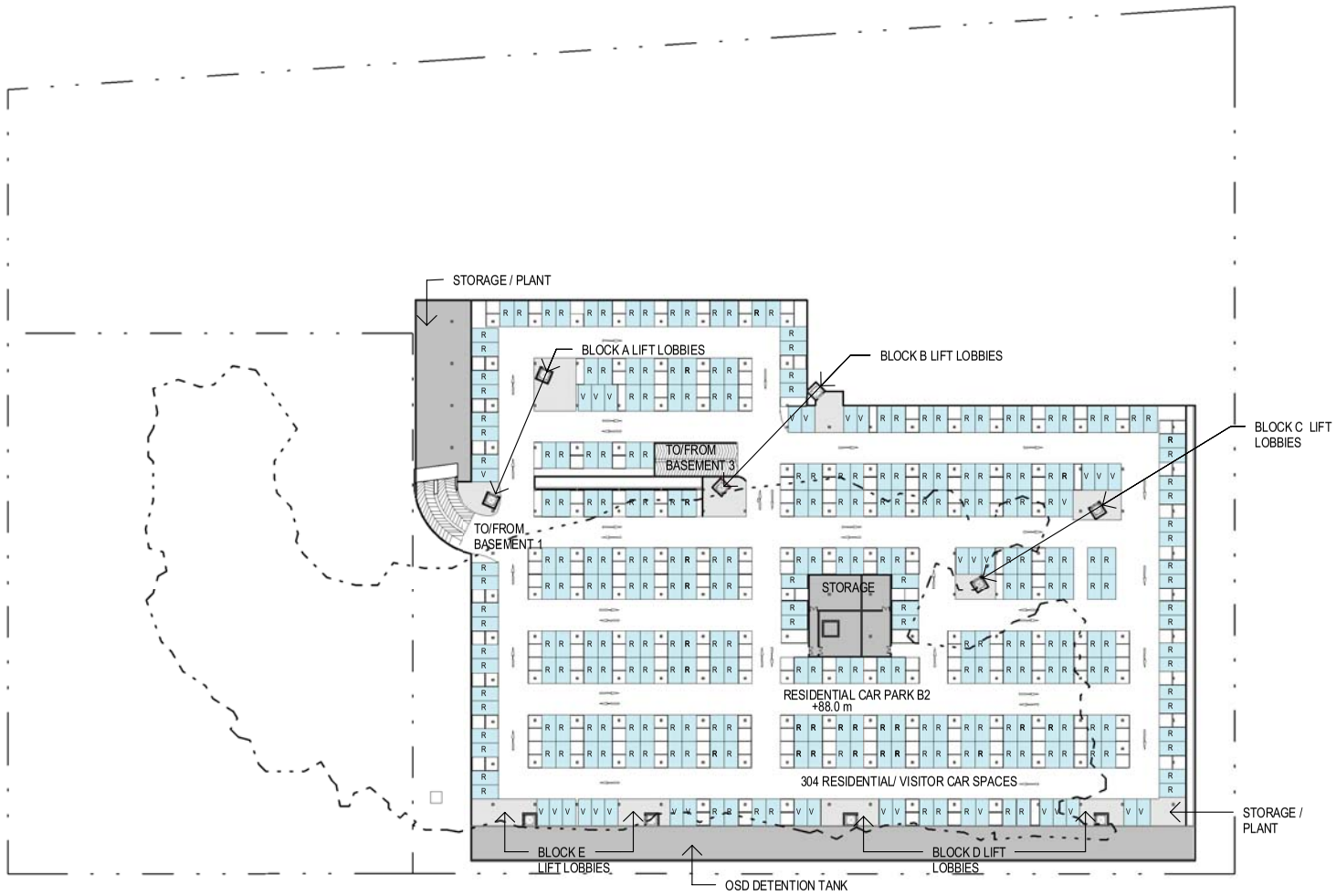
DRAWING TITLE: BASEMENT 1 PLAN					
PROJECT NAME: KIRRAWEE BRICK PIT			CLIENT NAME: HENROTH INVESTMENTS PTY LIMITED		
PROJECT NUMBER: 09211902	SCALE:		DRAWING NUMBER: 0140	DATE: 25/08/11	REVISION NUMBER: B

Updated TMAP, Oct. 2011 - Part 1 of 2



1 RL 88.0 BASEMENT 2 PLAN - PARKING
1 : 1000

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NSW Registered & Nominated Architects: Geoffrey Lee 4223, Philip Bowen 4527

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ABN 61 007 747 748

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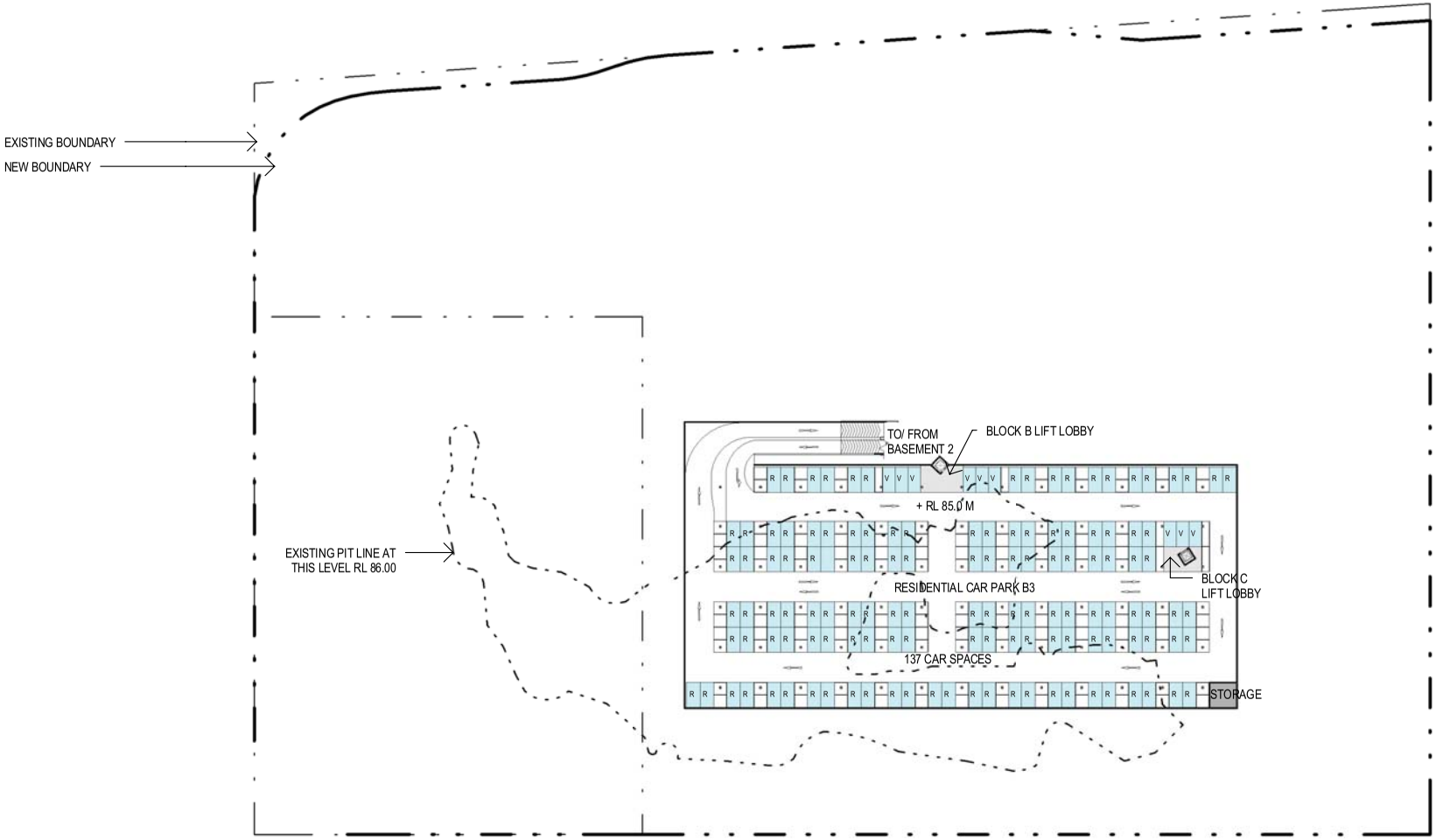
DRAWING TITLE: BASEMENT 2 PLAN				
PROJECT NAME: KIRRAWEE BRICK PIT		CLIENT NAME: HENROTH INVESTMENTS PTY LIMITED		
PROJECT NUMBER: 09211902	SCALE:	DRAWING NUMBER: 0150	DATE: 25/08/11	REVISION NUMBER: B



1 RL 85.00 BASEMENT 3 PLAN - PARKING
1 : 1000

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NSW Registered & Nominated Architects: Geoffrey Lee 4223, Philip Bowen 4527

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ABN 61 007 747 748

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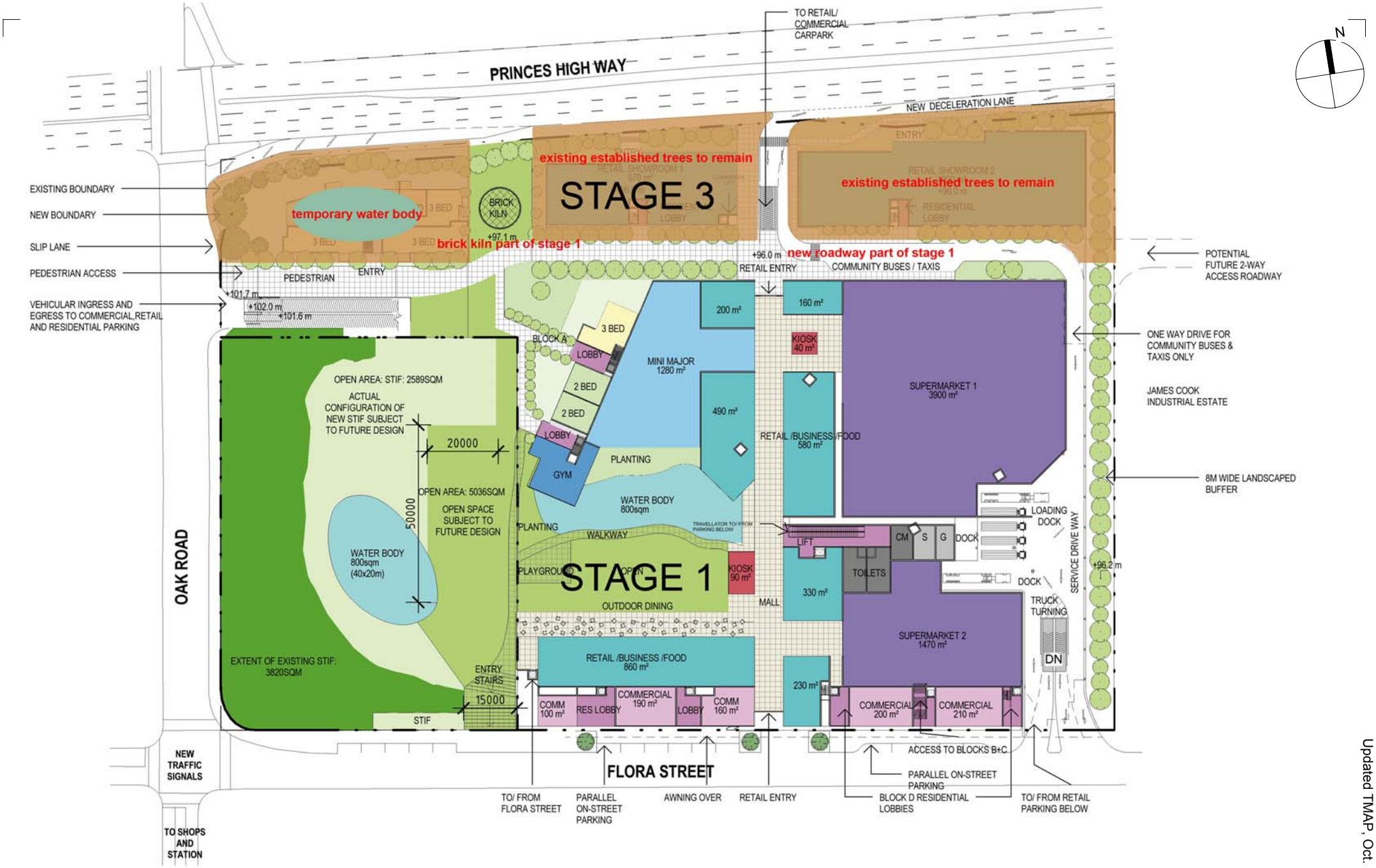
DRAWING TITLE: BASEMENT 3 PLAN					
PROJECT NAME: KIRRAWEE BRICK PIT		CLIENT NAME: HENROTH INVESTMENTS PTY LIMITED			
PROJECT NUMBER: 09211902	SCALE:	DRAWING NUMBER: 0160	DATE: 25/08/11	REVISION NUMBER: B	



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Surry Hills NSW 2010

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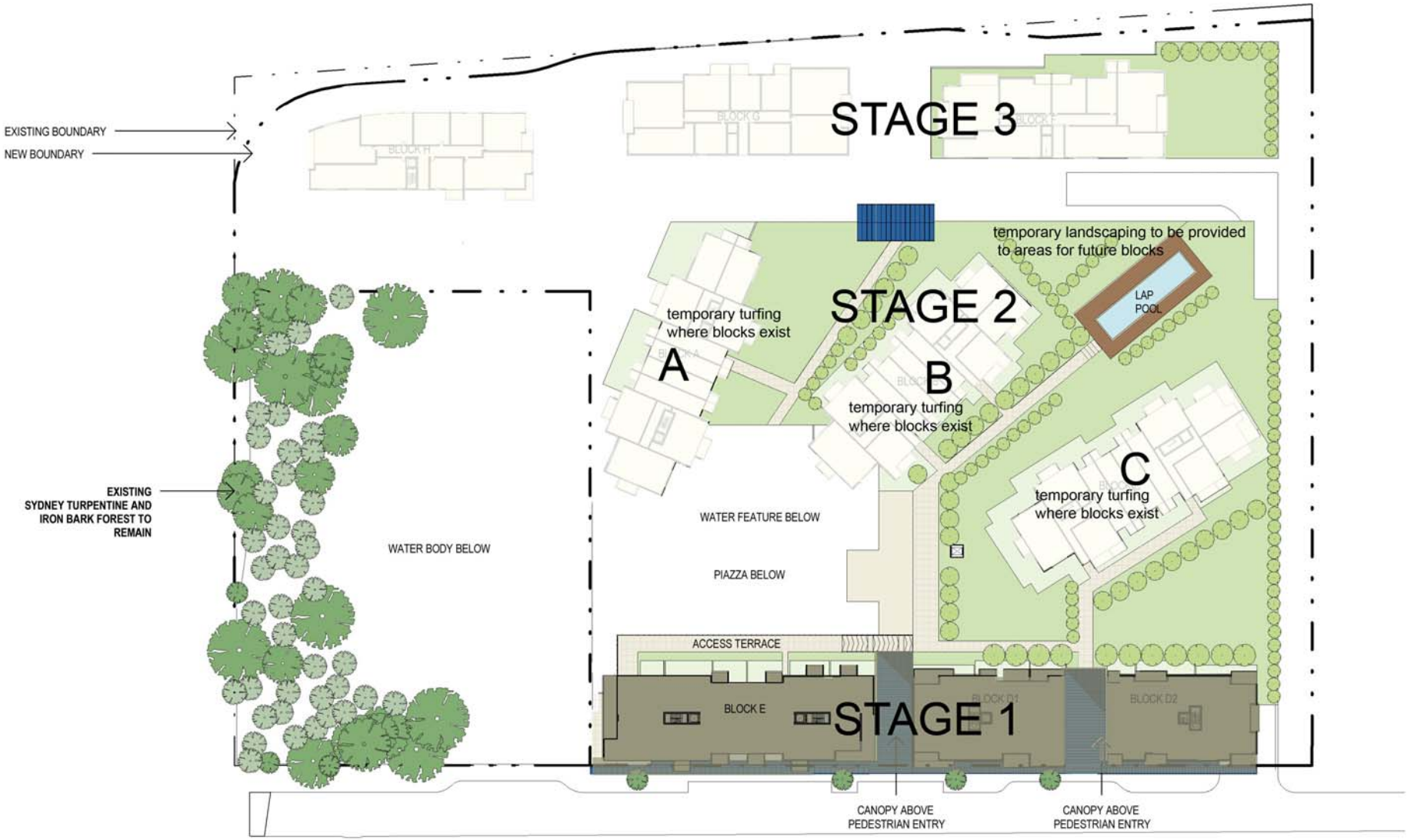
DRAWING TITLE: INDICATIVE STAGING - LOWER GROUND STAGE 1

PROJECT NAME	CLIENT NAME			
KIRRAWEE BRICK PIT	HENROTH INVESTMENTS PTY LIMITED			
PROJECT NUMBER: 09211902	SCALE:	DRAWING NUMBER: 0600	DATE: 11/07/11	REVISION NUMBER

Updated TMAP, Oct. 2011 - Part 1 of 2



NSW Registered & Nominated Architects: Geoffrey Lee 4223, Philip Bowen 4527

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Client

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46-56 Kippax Street
Surry Hills NSW 2010

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DRAWING TITLE: INDICATIVE STAGING - UPPER GROUND STAGE 1

PROJECT NAME:		CLIENT NAME:		
KIRRAWEE BRICK PIT		HENROTH INVESTMENTS PTY LIMITED		
PROJECT NUMBER:	SCALE:	DRAWING NUMBER:	DATE:	REVISION NUMBER:
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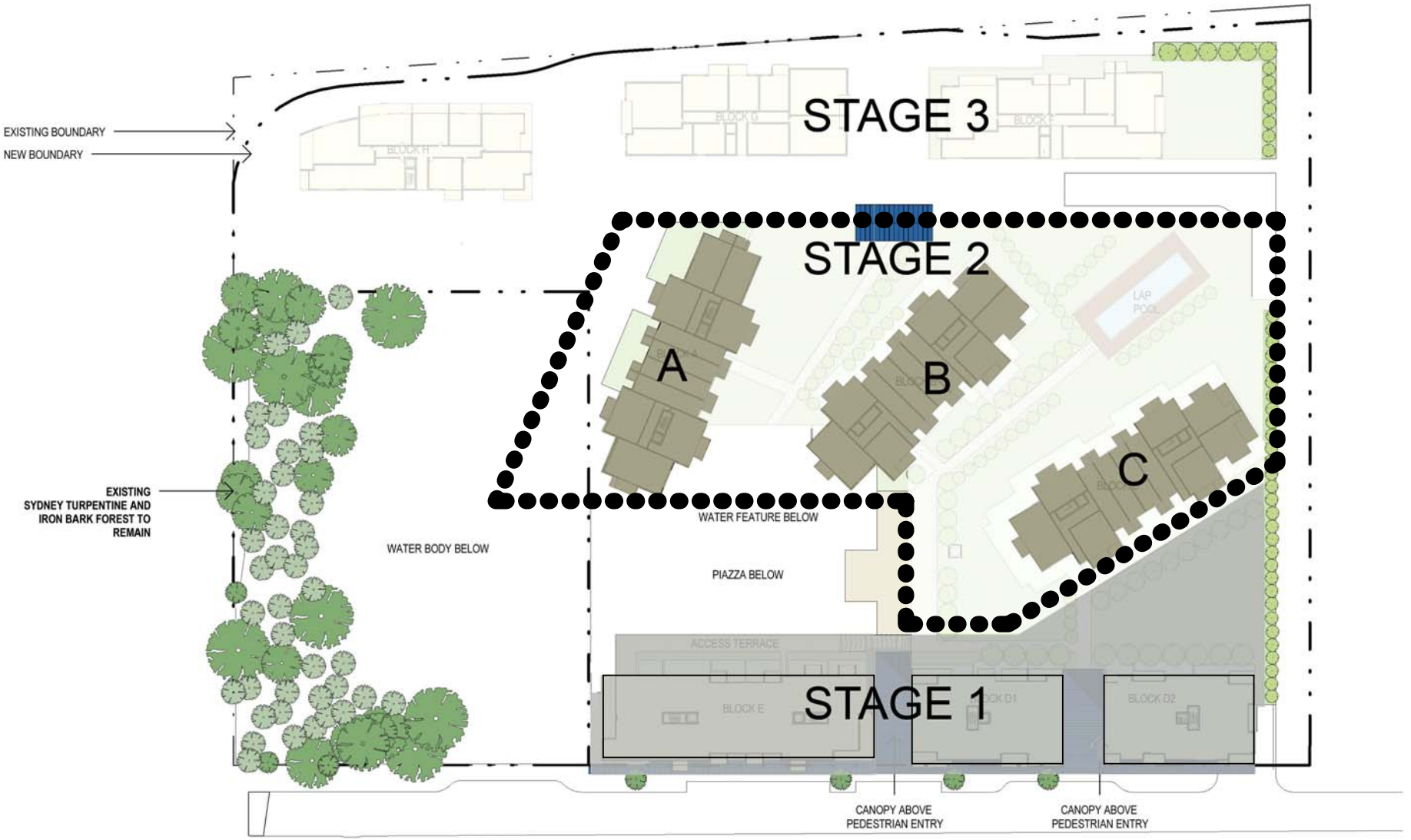
Updated TMAP, Oct. 2011 - Part 1 of 2



NSW Registered & Nominated Architects: Geoffrey Lee 4223, Philip Bowen 4527

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Client

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Surry Hills NSW 2010

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DRAWING TITLE: INDICATIVE STAGING - UPPER GROUND STAGE 2

PROJECT NAME:		CLIENT NAME:		
KIRRAWEE BRICK PIT		HENROTH INVESTMENTS PTY LIMITED		
PROJECT NUMBER:	SCALE:	DRAWING NUMBER:	DATE:	REVISION NUMBER:
09211902		0603	11/07/11	

Updated TMAP, Oct. 2011 - Part 1 of 2

NSW Registered & Nominated Architects: Geoffrey Lee 4223, Philip Bowen 4527

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Client

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Surry Hills NSW 2010

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DRAWING TITLE: INDICATIVE STAGING - UPPER GROUND STAGE 3

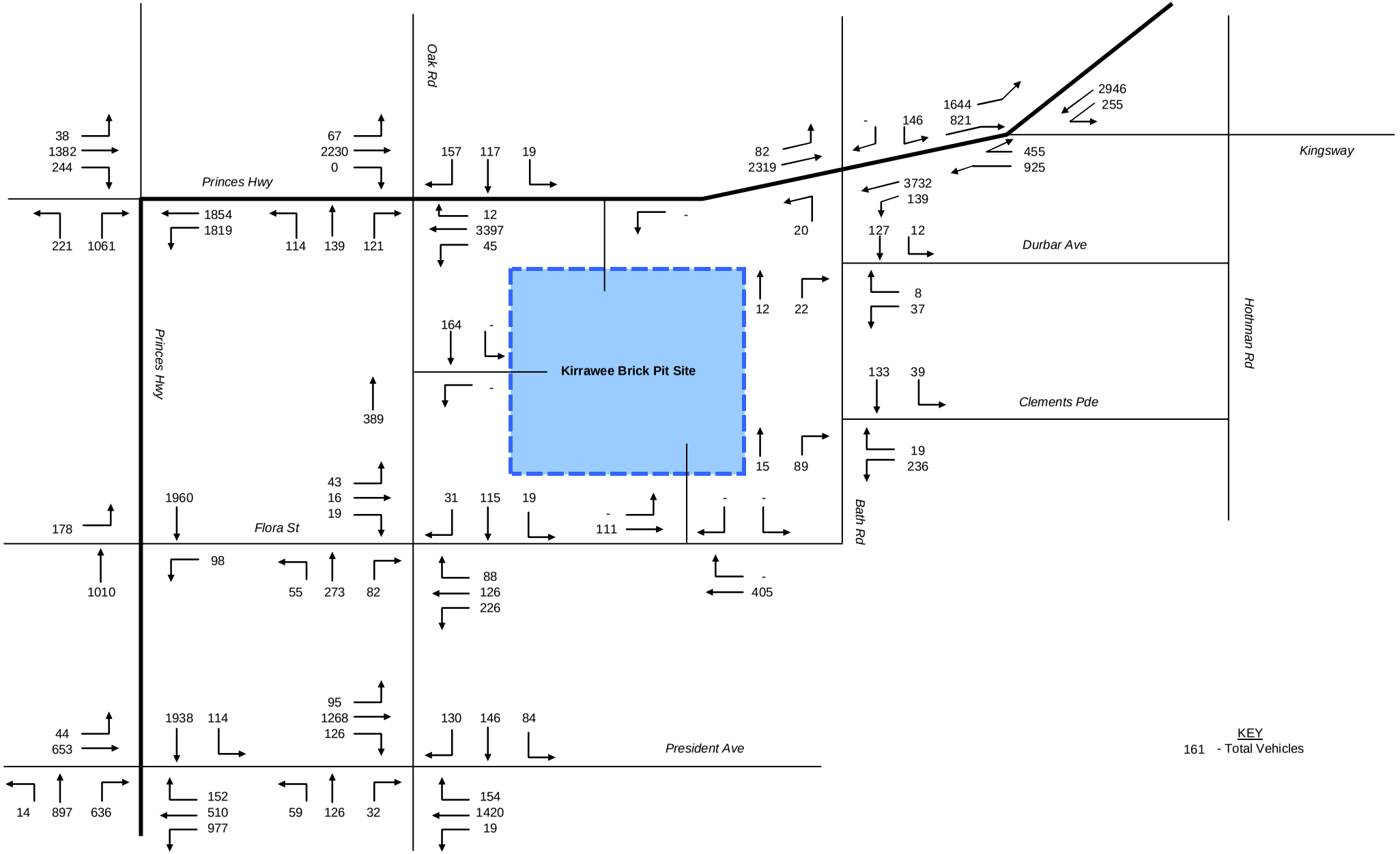
PROJECT NAME:		CLIENT NAME:		
KIRRAWEE BRICK PIT		HENROTH INVESTMENTS PTY LIMITED		
PROJECT NUMBER:	SCALE:	DRAWING NUMBER:	DATE:	REVISION NUMBER:
09211902		0604	11/07/11	

Updated TMAP, Oct. 2011 - Part 1 of 2

Appendix E TMAP Study Network Flows

2010 Surveyed, Existing Network Traffic Flows, Evening Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



Halcrow

Figure E.1

X:\CTLRLQ - Kirrawee Part 3a\67 - Calculations\CTLRLQx03 Network Kirrawee_v10.xls - 6/05/2011

Updated TMAP, Oct. 2011 - Part 1 of 2

Base Traffic Reassignment from Stage 2 Works, Evening Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT

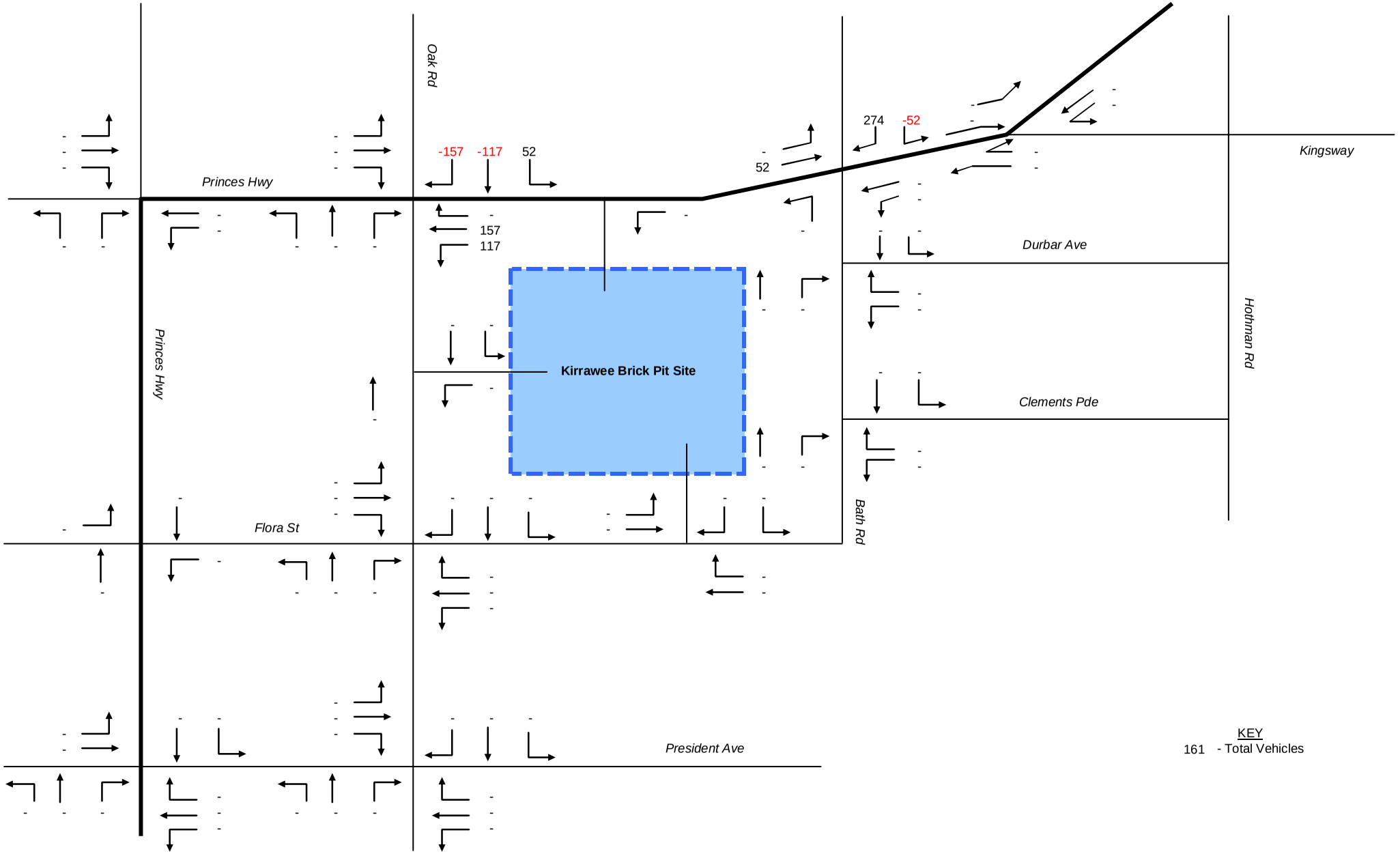


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Figure E.2

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Updated TMAP, Oct. 2011 - Part 1 of 2

20% Passby Trips, Evening Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT

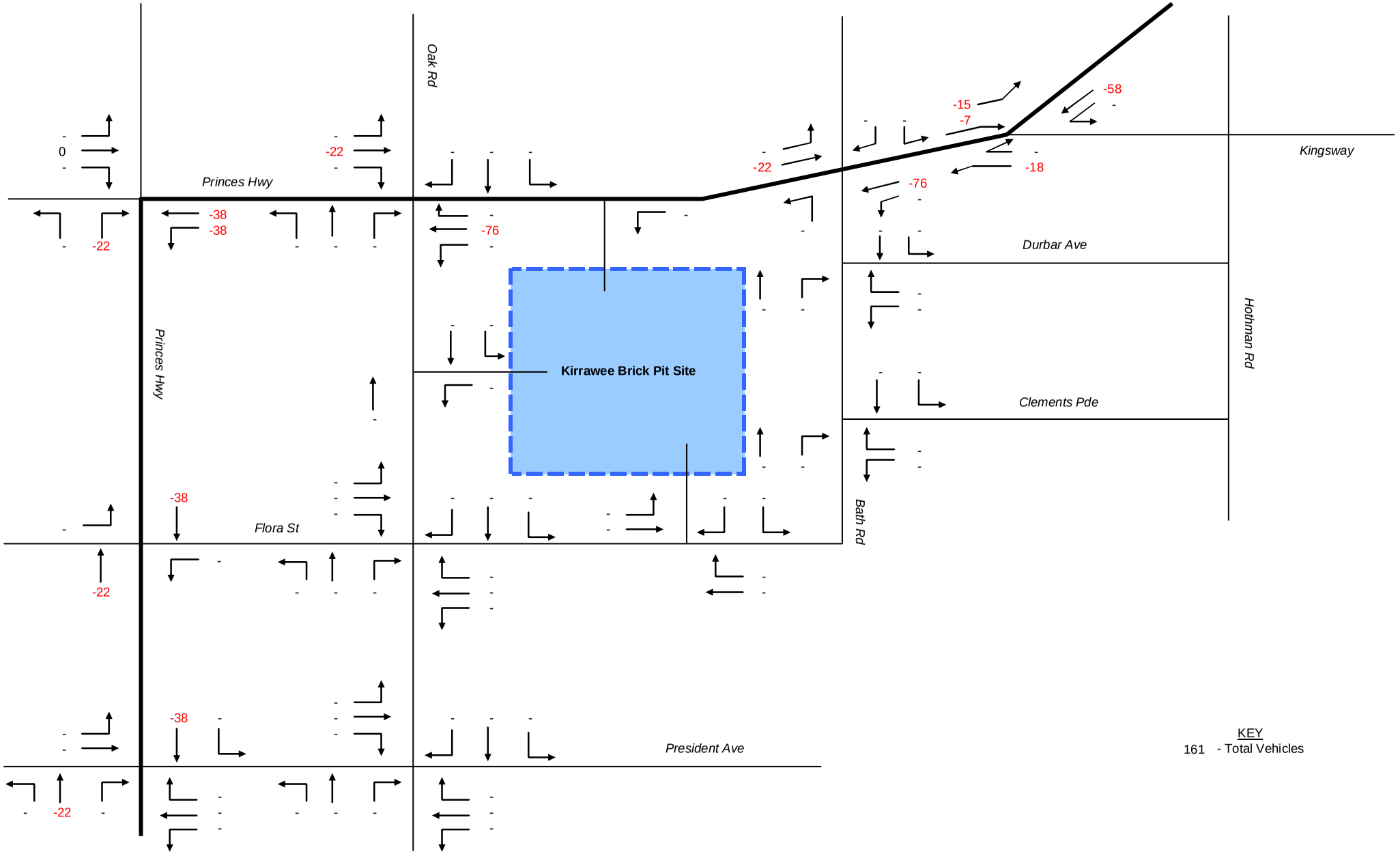

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Figure E.3

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Updated TMAP, Oct. 2011 - Part 1 of 2

Development Trip Assignment (under Stage 2 works), Evening Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT

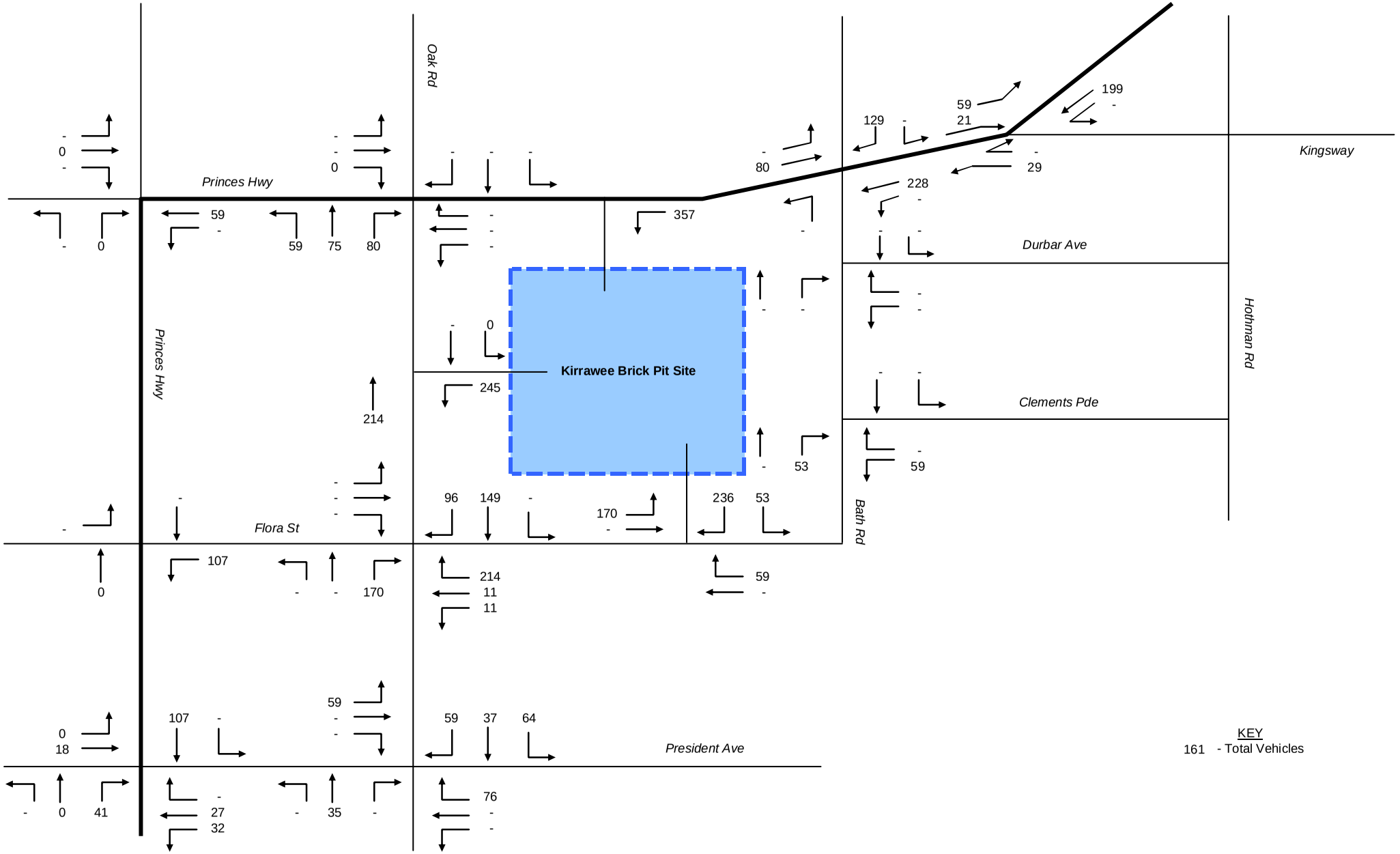

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Figure E.4

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Updated TMAP, Oct. 2011 - Part 1 of 2

Nett Change in Traffic Flows with Development, Evening Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT

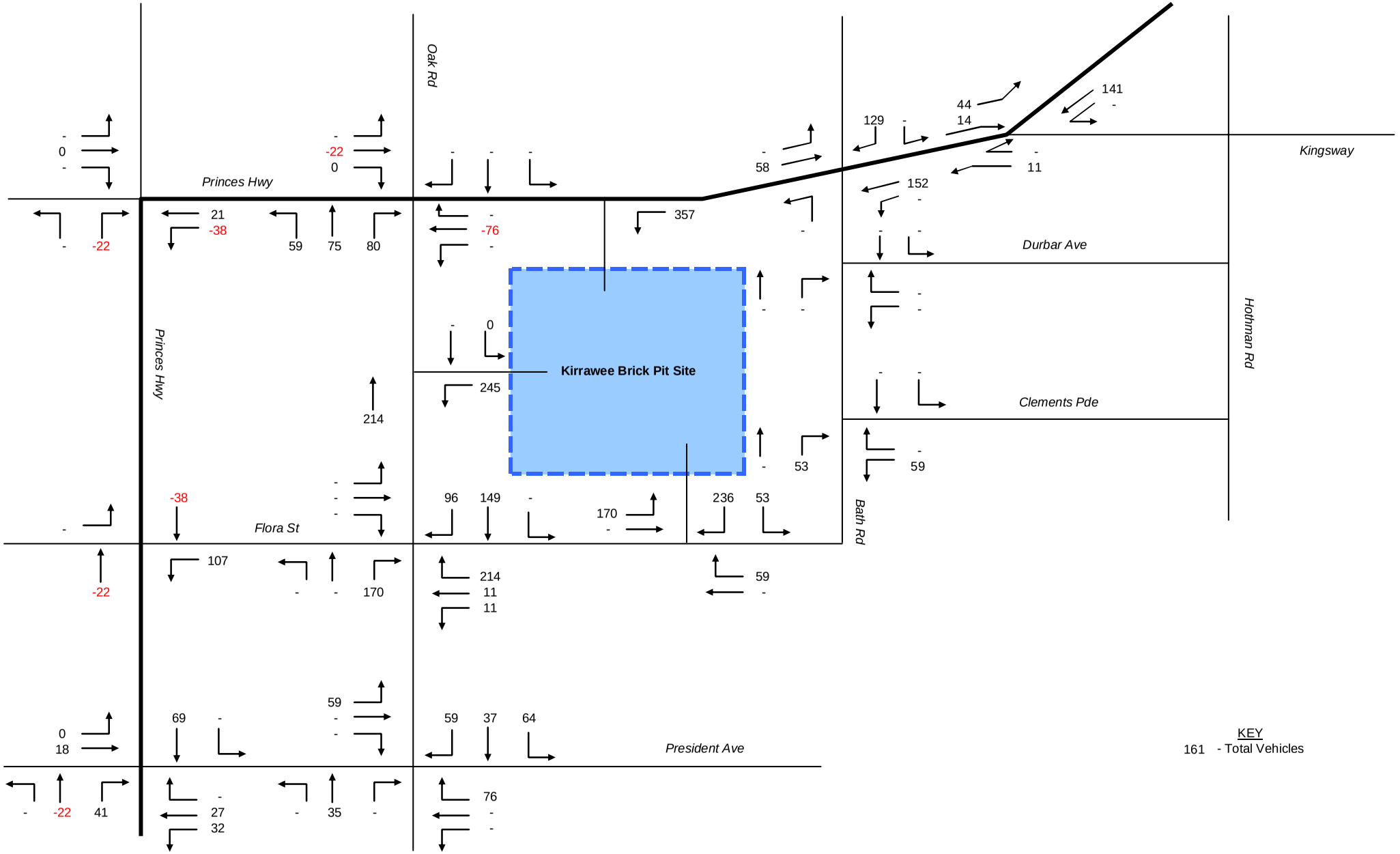

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Figure E.5

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Updated TMAP, Oct. 2011 - Part 1 of 2

2010 Surveyed, Existing Network Traffic Flows, Saturday Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT

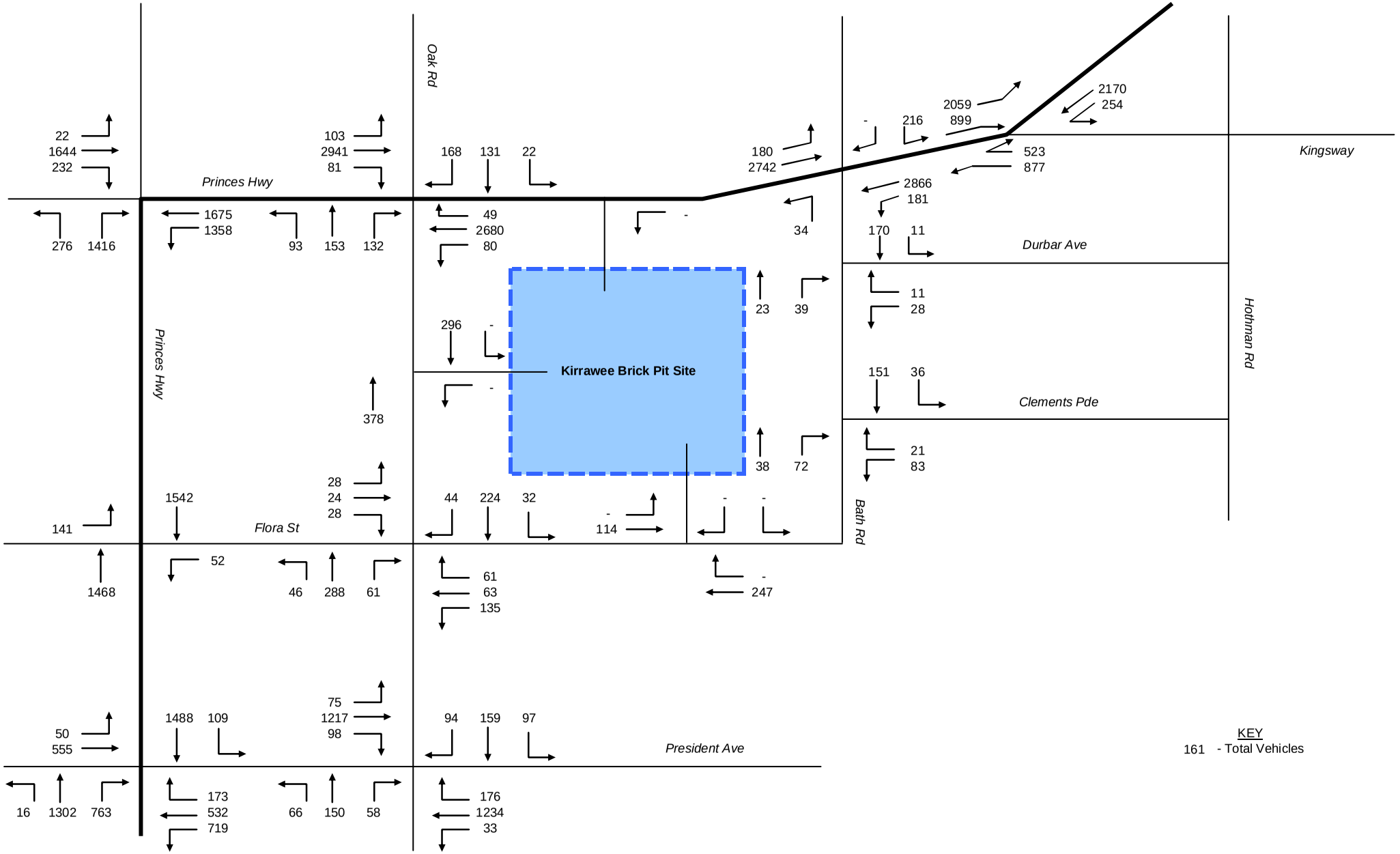

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Figure E.6

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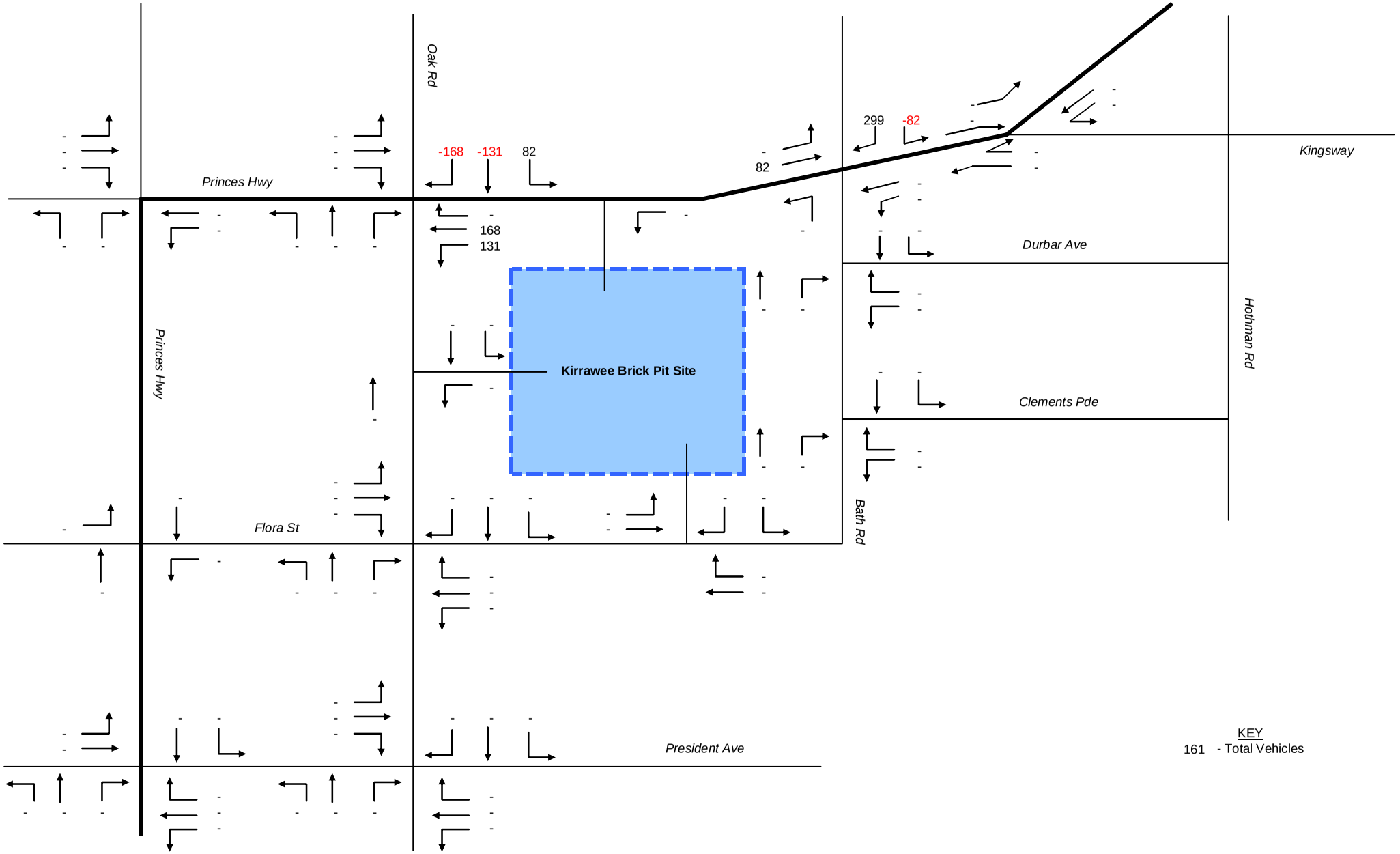
Updated TMAP, Oct. 2011 - Part 1 of 2

Base Traffic Reassignment from Stage 2 Works, Saturday Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



Halcrow

Figure E.7

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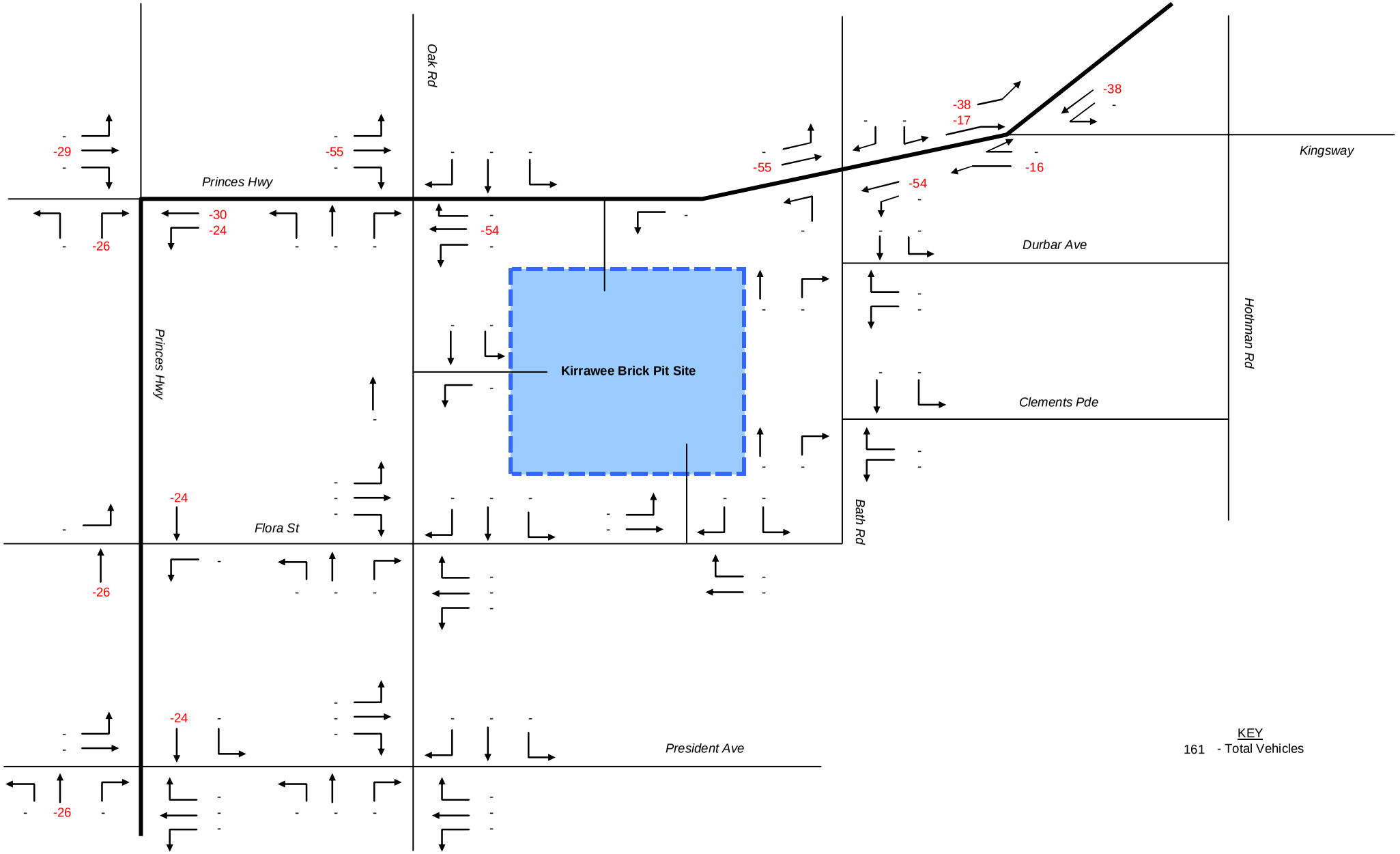
Updated TMAP, Oct. 2011 - Part 1 of 2

20% Passby Trips, Saturday Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



Halcrow

Figure E.8

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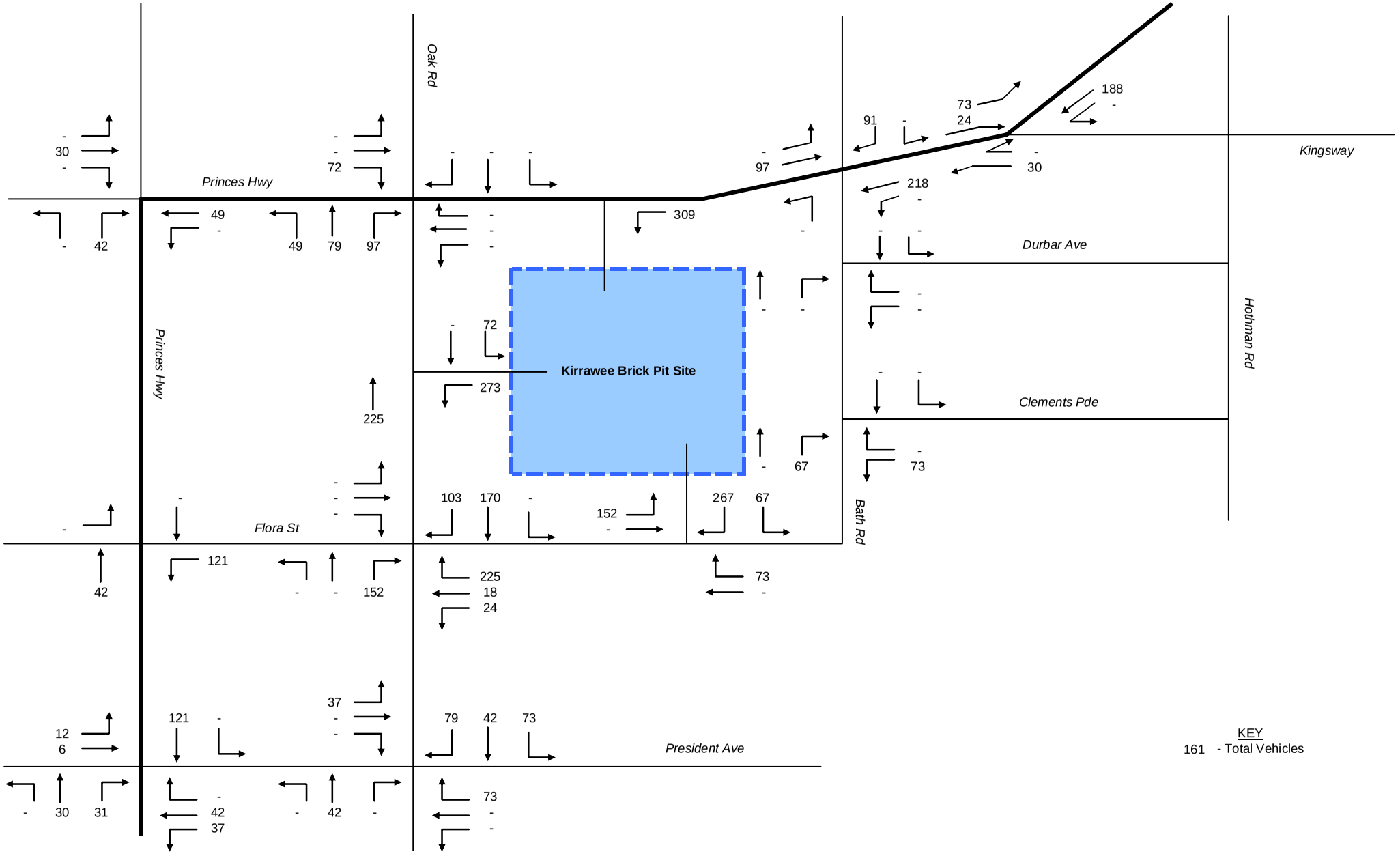
Updated TMAP, Oct. 2011 - Part 1 of 2

Development Trip Assignment (under Stage 2 works), Saturday Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



Halcrow

Figure E.9

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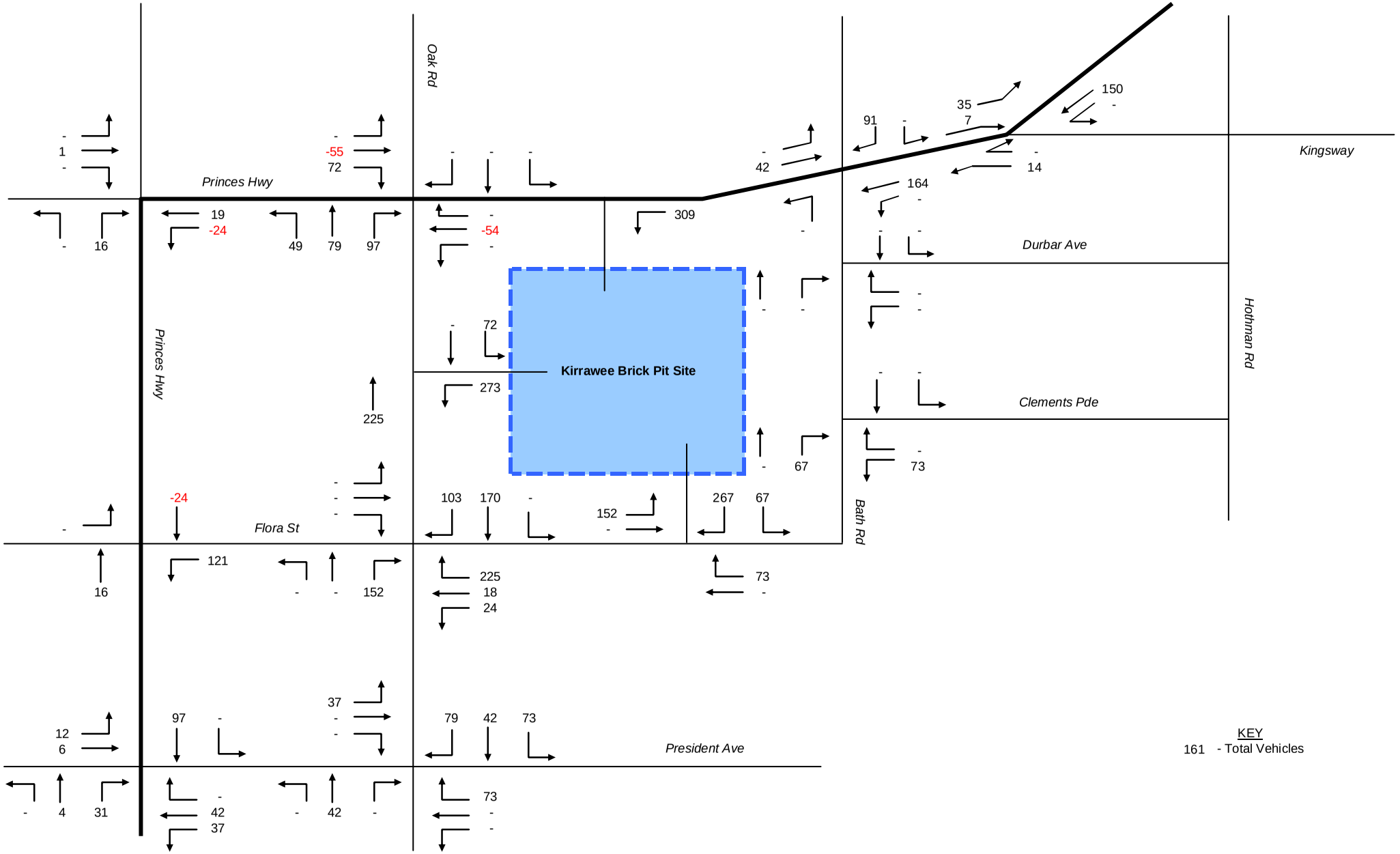
Updated TMAP, Oct. 2011 - Part 1 of 2

Nett Change in Traffic Flows with Development, Saturday Peak

MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



Halcrow

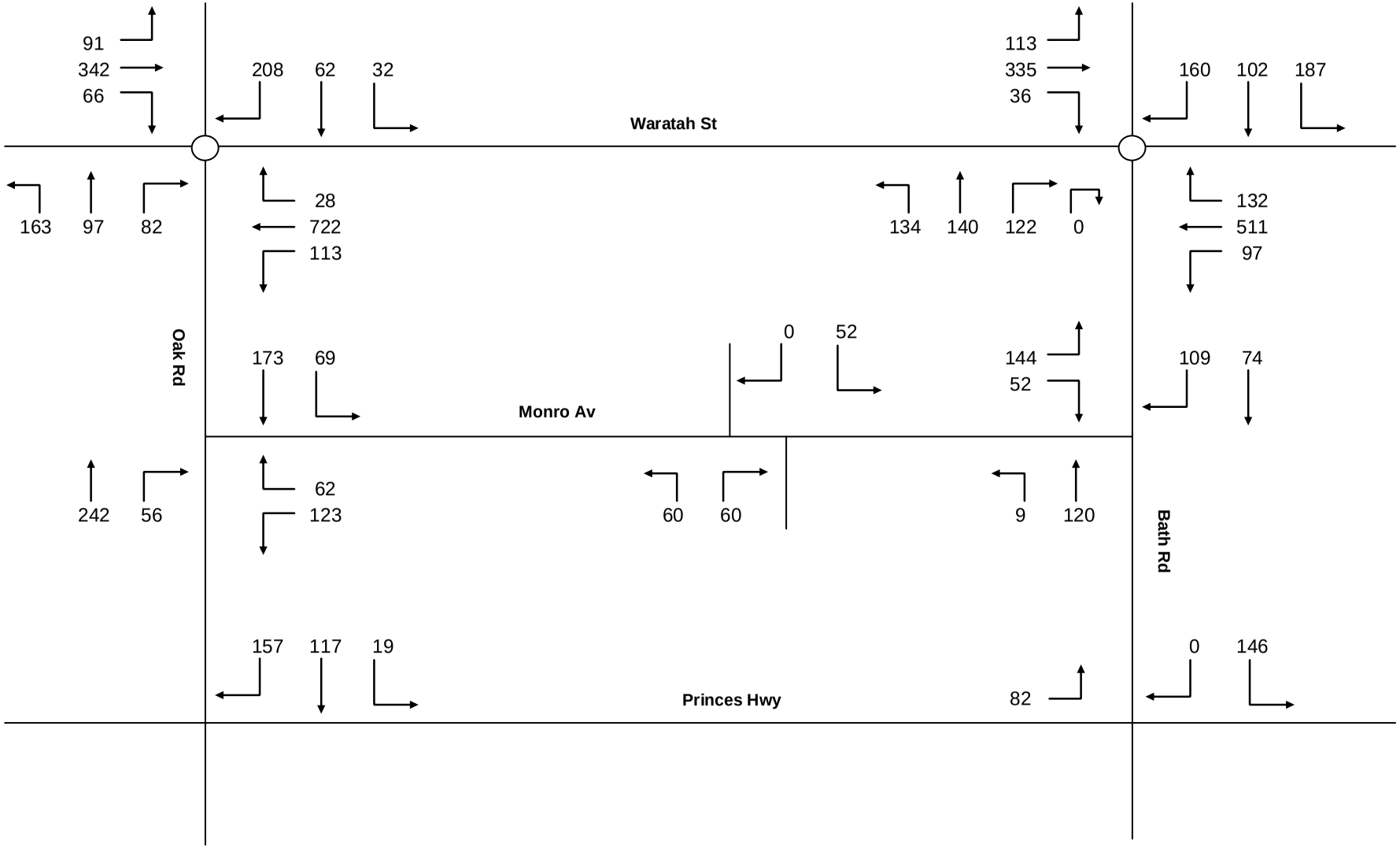
Figure E.10

X:\CTLRLQ - Kirrawee Part 3a\67 - Calculations\CTLRLQx03 Network Kirrawee_v11.xls - 21/06/2011

Updated TMAP, Oct. 2011 - Part 1 of 2

Appendix F Network Flows North of Princes Highway

Surveyed Traffic Flows - Thursday Evening Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



Halcrow

Halcrow Pacific Pty Ltd

FIGURE F.1
February 2011
CTLRLQx07Av6 Network North Princes Hwy_Thu PM.xls

Updated TMAP, Oct. 2011 - Part 1 of 2

Base Traffic Reassignment from Stage 2 Works - Thursday Evening Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT

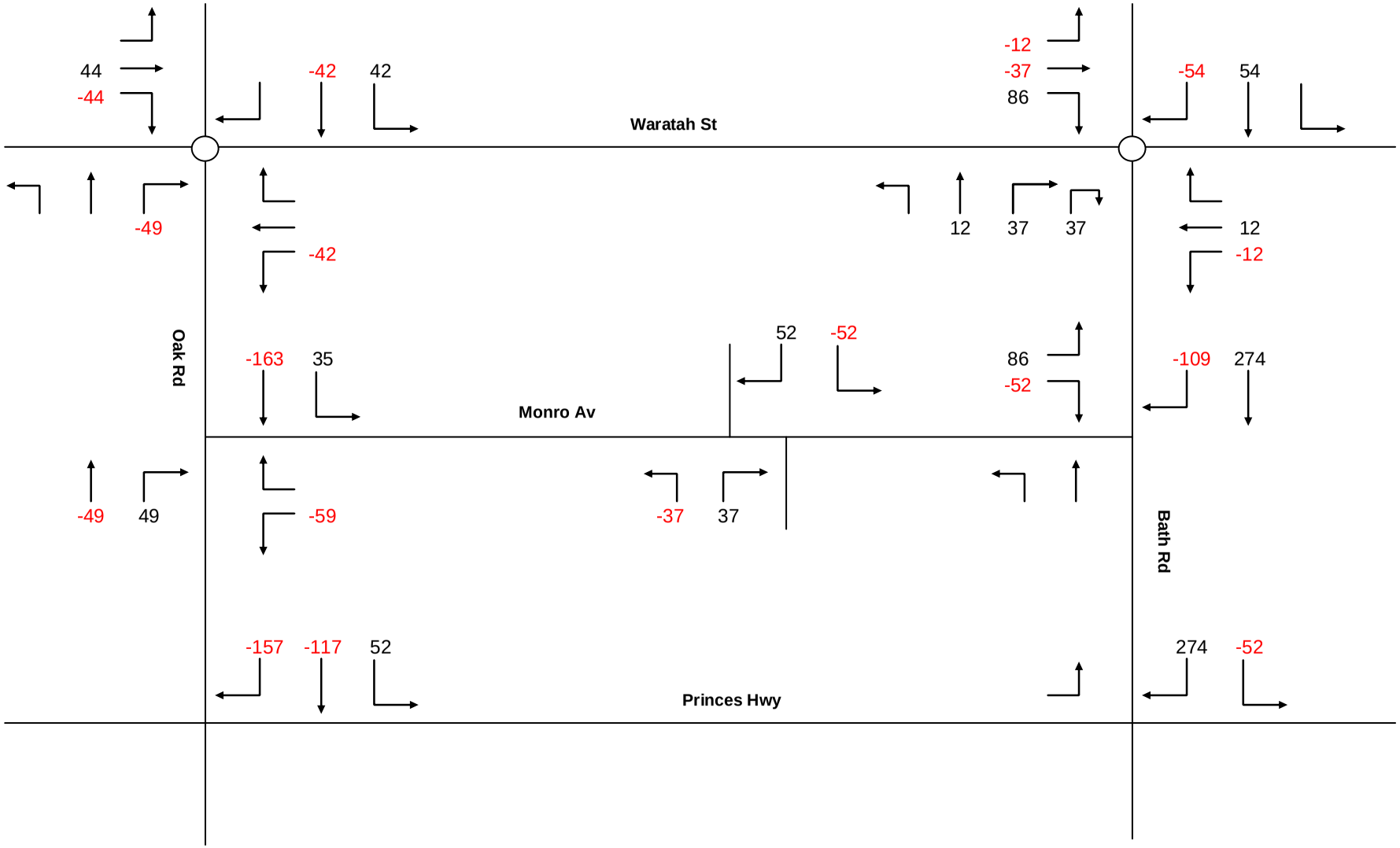


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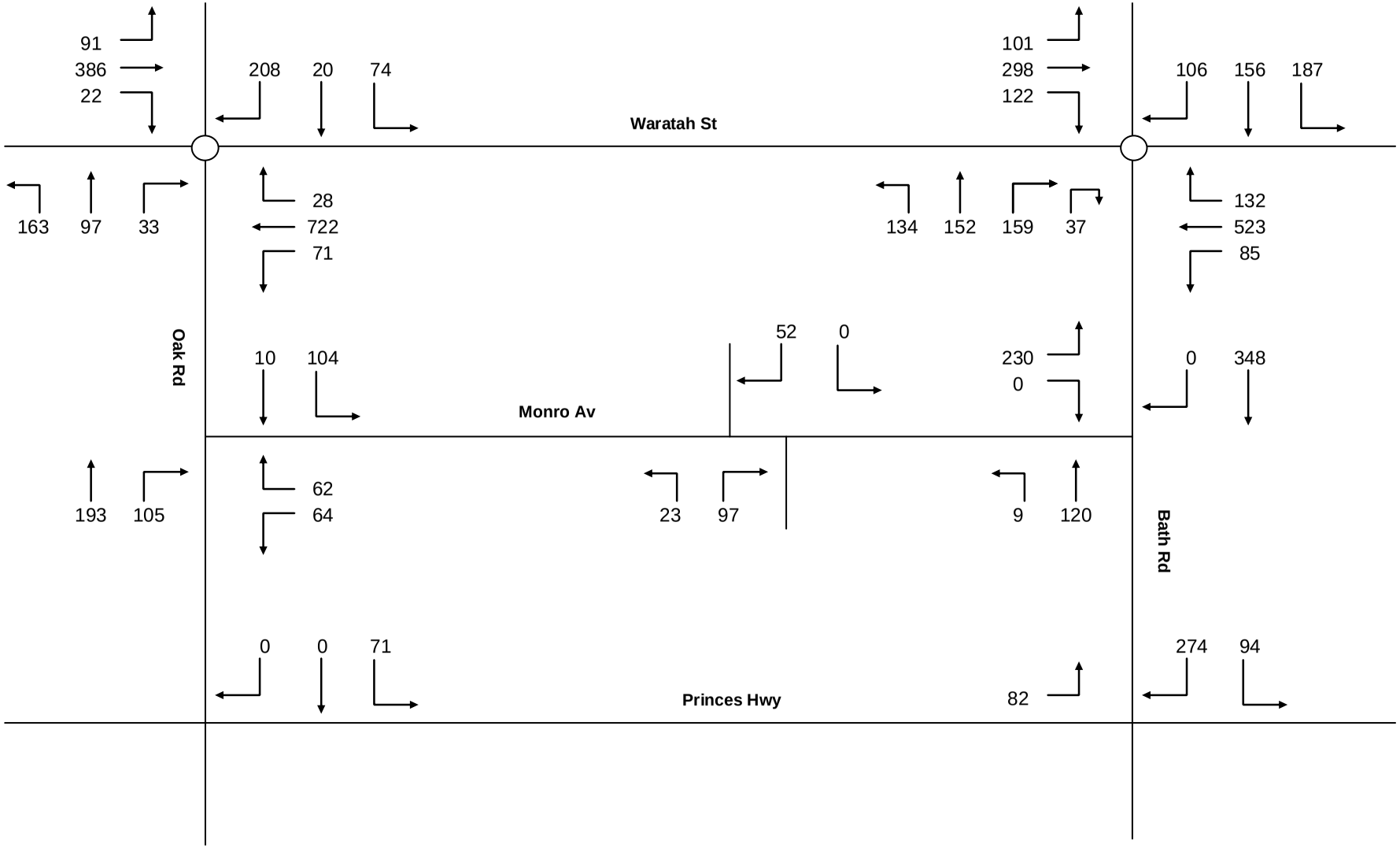
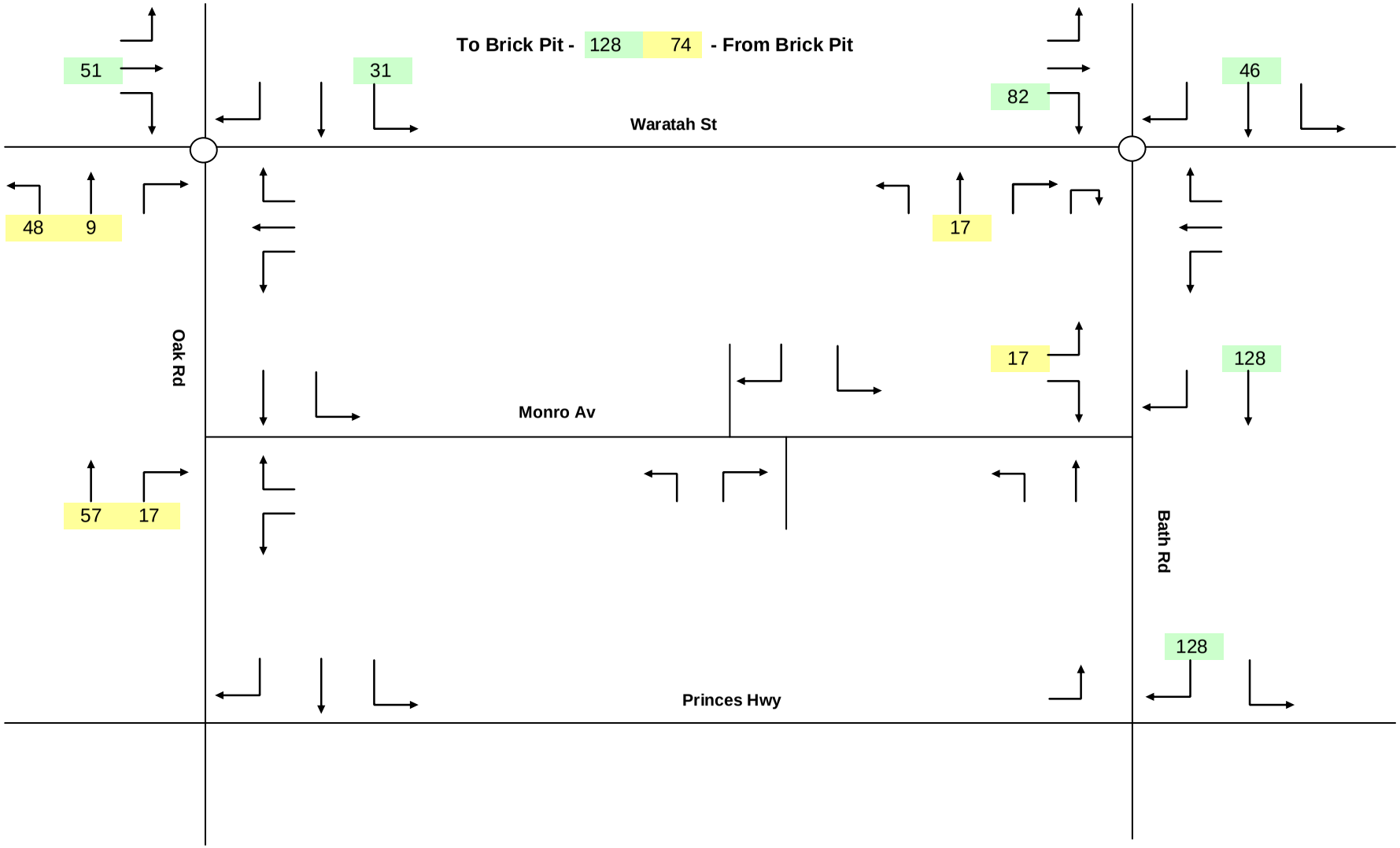
FIGURE F.2
February 2011
CTLRLQx07Av6 Network North Princes Hwy_Thu PM.xls

Updated TMAP, Oct. 2011 - Part 1 of 2

Reassigned Background Traffic Flows - Thursday Evening Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



Development Trip Assignment (under Stage 2 works) - Thursday Evening Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



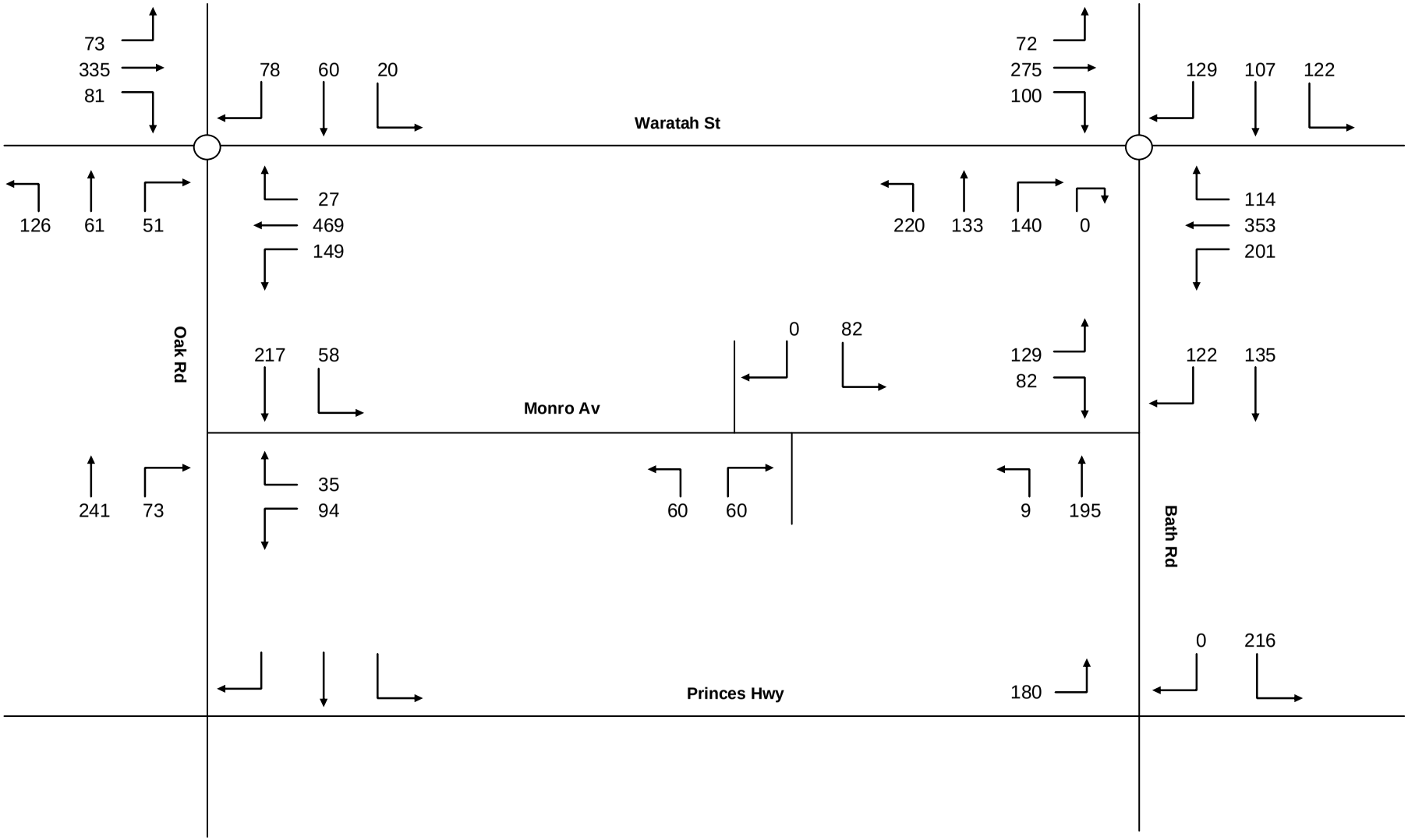
Halcrow

Halcrow Pacific Pty Ltd

FIGURE F.4
February 2011
CTLRLQx07Av6 Network North Princes Hwy_Thu PM.xls

Updated TMAP, Oct. 2011 - Part 1 of 2

Surveyed Traffic Flows - Saturday Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



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Halcrow Pacific Pty Ltd

FIGURE F.5
February 2011
CTLRLQx07Bv6 Network North Princes Hwy_SAT.xls

Updated TMAP, Oct. 2011 - Part 1 of 2

Base Traffic Reassignment from Stage 2 Works - Saturday Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT

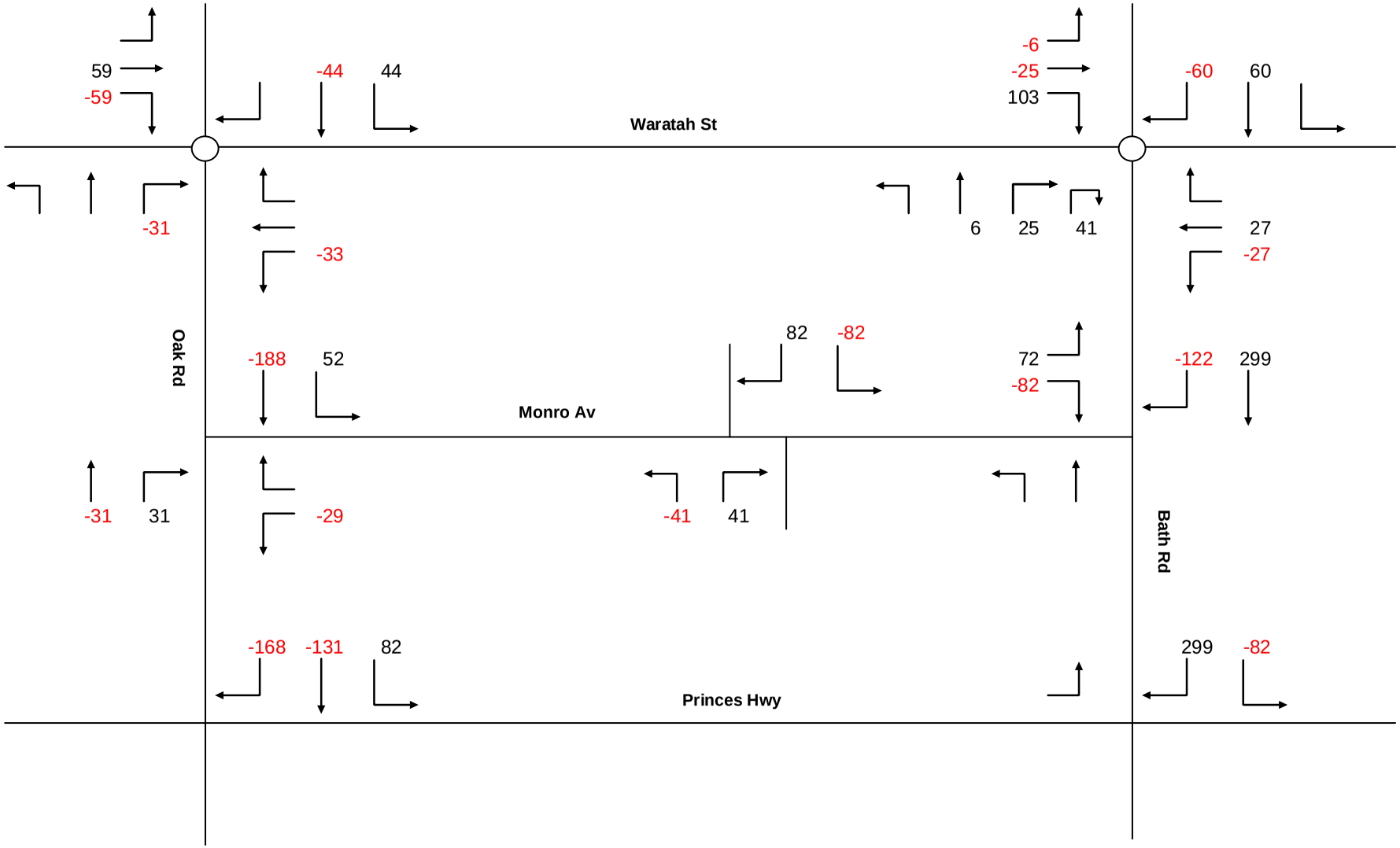

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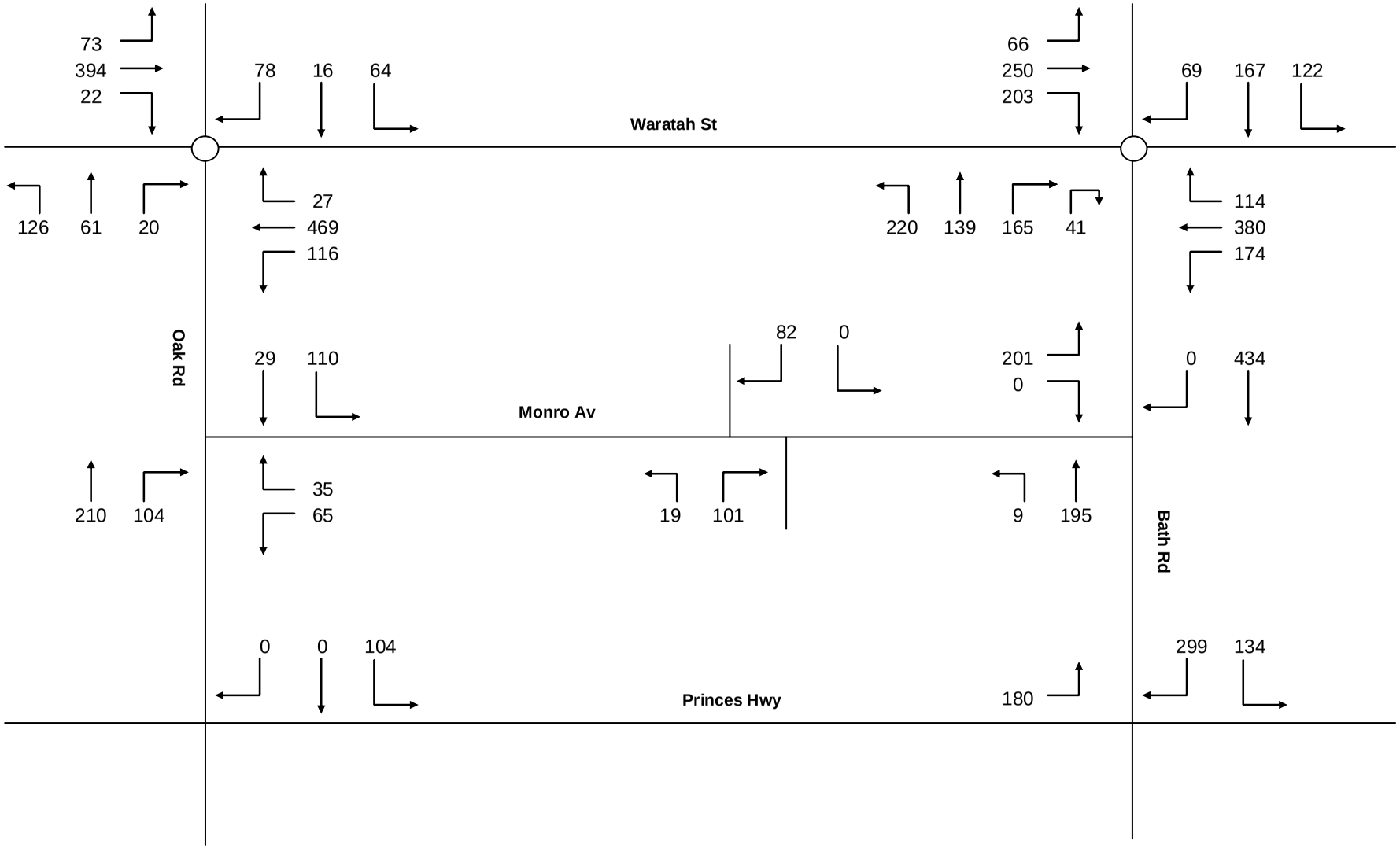
FIGURE F.6
February 2011
CTLRLQx07Bv6 Network North Princes Hwy_SAT.xls

Updated TMAP, Oct. 2011 - Part 1 of 2

Reassigned Background Traffic Flows - Saturday Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT



Development Trip Assignment (under Stage 2 works) - Saturday Peak Hour
MP 10_0076 - MIXED USE DEVELOPMENT, KIRRAWEE BRICK PIT

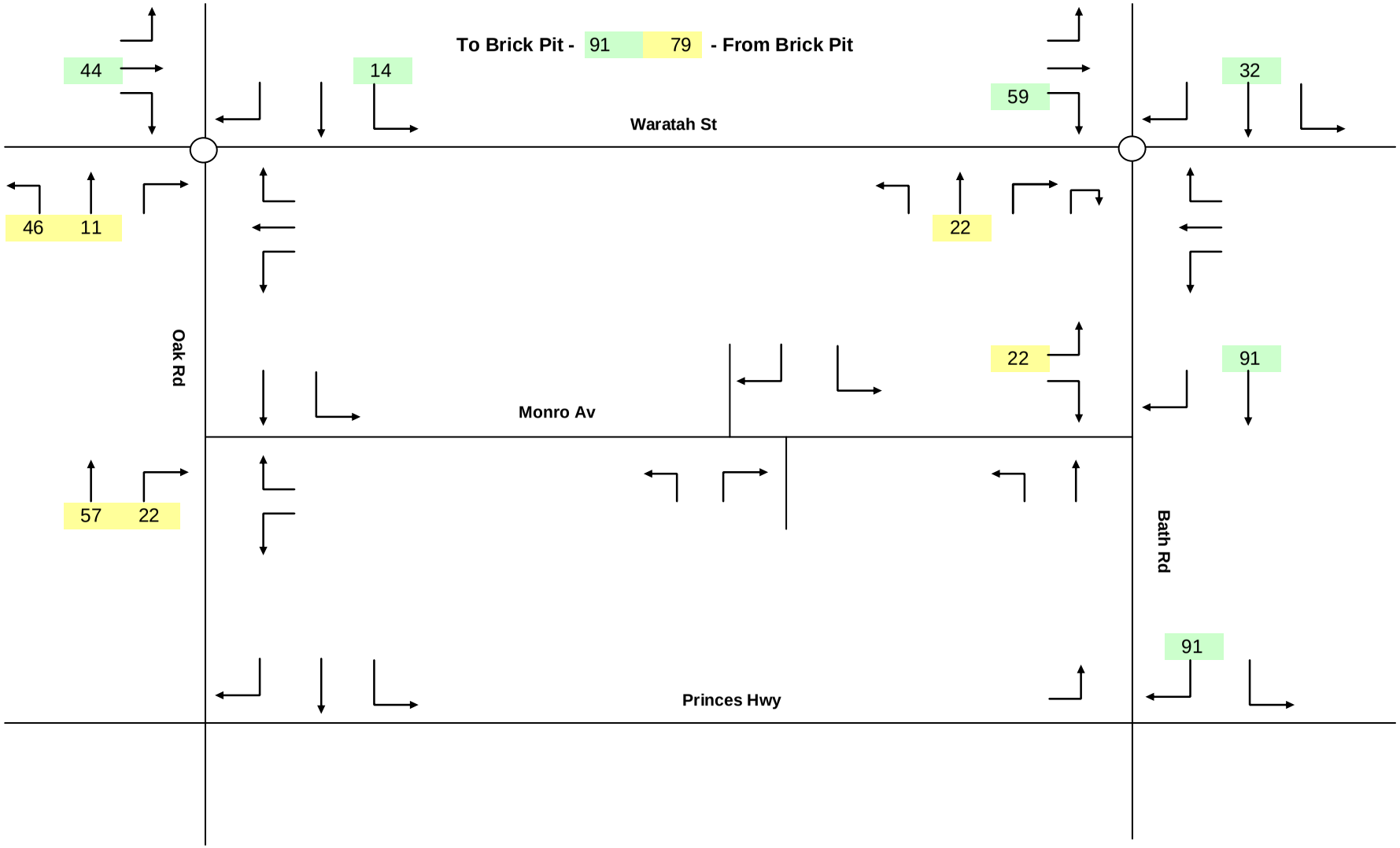


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FIGURE F.8
February 2011
CTLRLQx07Bv6 Network North Princes Hwy_SAT.xls

Updated TMAP, Oct. 2011 - Part 1 of 2

Appendix G RTA Letter of 07 October 2011

Our Reference:	RDC08M496Vol7 – SYD10/01071
Your Reference:	MP10_0076
Contact:	James Hall
Telephone:	8849 2047

NSW GOVERNMENT | Transport Roads & Traffic Authority

Executive Consultant
Halcrow
Suite 20, 809 Pacific Highway
Chatswood NSW 2067

Attention: Piran Trethewey

PROPOSED TRAFFIC MANAGEMENT AND ACCESSIBILITY PLAN
KIRRAWEE BRICK PIT, SUTHERLAND COUNCIL

Dear Mr Trethewey,

I refer to the meeting yesterday at the Traffic Management Centre to discuss the proposal for left turn movements to be permitted out of the Oak Road north approach to the Princes Highway intersection. The RTA notes that this left turn movement is proposed due to concerns that vehicles will be forced to enter Princes Highway via the Bath Road intersection and these vehicles will have difficulty merging into the right turn bay on Princes Highway west approach to the Kingsway intersection. However, the RTA advises that the Bath Road intersection at the Highway will be signalised and will be coordinated with the traffic signals at the Kingsway intersection. Therefore vehicles exiting from Bath Road north approach to the Highway will be able to satisfactorily and safely merge into the right turn bay on Princes Highway west approach to the Kingsway intersection.

The RTA also notes that concerns are raised with the proximity of the Bath Road and Monro intersection to the proposed signalised intersection of Bath Road and Princes Highway. However, this can be addressed by priority sign posting and linemarking at the intersection of Monro Avenue and Bath Road.

In addition to the above, the proposed closure of the Oak Road north approach to the Princes Highway intersection and associated traffic signal on the Highway at the Bath Road intersection is consistent with the Sutherland Shire Council's Kirrawee Local Area Masterplan (attached). However, it should be noted that this Masterplan was adopted into Council's Development Control Plan 2006.

However, the redistribution of the traffic associated with the closure of the Oak Road north approach to the Princes Highway will require in due course (post consent) a Traffic Management Plan to be submitted to Council for review. Further, this partial road closure will require monitoring (post closure) to determine if any further remedial works are required. The period of this monitoring shall be to the satisfaction of Council.

Further to the above, the RTA has reviewed the concept plan (sketch) of the proposed traffic signals and associated civil works at the intersection of Oak Road and Flora Street and provides the following comments, which are to be satisfactorily addressed:

- The through lane in Oak Road on the northern side of the intersection leads straight for the kerb on the southern side.
- The amended kerb return on the north eastern corner will lead to a high speed left turn when lights are green.
- The left turn out of Oak Road for a 19.0m semi leaves no margin for error and may in fact lead to the truck mounting the kerb. Same for the right turn into Oak Road from Flora Street.
- Signals will not operate as a double diamond. In this regard, the signalised intersection shall operate as two phases (filter). The signalised intersection shall operate with a cycle time of 70 seconds to be co-ordinated with the 140 second cycle time at the intersection of Princes Highway and Oak Road.
- The proposed signals combined with vehicles trying to park in Oak Road on the southern side could lead to excessive queuing.
- Is there adequate separation for the kerb ramps on the north eastern corner?
- No separate right turn is shown on the western side.

An updated plan of this intersection shall be submitted to the RTA for review. This updated concept plan shall be submitted with traffic modelling for RTA review.

Any further inquiries in relation to this matter should be forwarded to the undersigned on telephone 8849 2047 or via email james_hall@rta.nsw.gov.au.

Yours sincerely,

James Hall
Senior Land Use Planner
Transport Planning, Sydney Region

7 October 2011

CC: Scott Schimanski, Department of Planning and Infrastructure
Bruce Powe, Sutherland Shire Council

east-west travel and the crossing of Oak Road is best facilitated by traffic signal control and raised pedestrian crossings at this intersection.

- The road network for the area should generally include footpaths on either side of each road. Install pedestrian crossings on Flora Street and Bath Road to cater for local pedestrian movement between the development precincts
- All components of the development should include provision for bike parking as specified in Austroads, Guide to Traffic Engineering practice, Part 14- Bicycles.

Road Network / Intersections Town Centre Context Strategies

- Retain all existing roads, namely Oak Road and Flora Street; new internal roads should be provided to the Brick Pit site.
- In order to access and service the new development, local roads within the Brick Pit site are classified as:
  - Primary local roads
  - Local roads
  - Laneways/ Service road/ slip lane for Princes Highway commercial developments (refer to road sections)
- Any proposed access roadway from Oak Road to Brick Pit site is acceptable if it is located a minimum of 45 metres from Princes Highway / Oak Road intersection.
- A narrow central median should be provided in Oak Road across the intersection to eliminate potential right turns from the Brick Pit site.
- All intersections within and on the periphery of the Brick Pit and Flora Street sites should be priority controlled intersections and aligned to form tee-intersections.
- Oak Road Flora Street intersection requires traffic signals and it is predicted to operate at Level of Service A, for both the AM and PM peak hours.
- The intersections of Princes Highway/ Acacia Road/ Old Princes Highway and Princes Highway/ Oak Road are currently operating at or near capacity during the afternoon peak hour. To accommodate the increase in traffic that will result from any development within the area, it is recommended that further upgrading of the Princes Highway route be undertaken by Sutherland Shire Council.
- Following the Traffic Consultant's investigation the recommended option is as follows:
  - Half closure of the Oak Road northern approach to the Princes Highway involving the discontinuation of southbound lanes with northbound lanes remaining open
  - Signalisation of the Bath Road / Princes Highway intersection. This would include the following elements:
    - Left in / left out only for the Bath Road southern approach. The left turn out would be signalised and is assumed to have its own phase
    - No through movements across Princes Highway (i.e. no north-south traffic from Bath Road)
  - Signalised left and right turn out of Bath Road northern approach with a double right turn lane. The left lane would be shared with the second right turn lane
  - No right turns permitted from Princes Highway from either direction to Bath Road.

  This modelling also includes midblock pedestrian signals at Flora Street / Acacia Road intersection in conjunction with closing the left hand turn into Flora Street for both north and south bound traffic.
- Operations at the Princes Highway/Oak Road intersection with the suggested improvements remain enhanced over existing conditions with an approximate spare capacity of between 10% and 20% in both the morning and afternoon peak periods.

Car Parking Town Centre Context Strategies:

In summary, the current parking supply within the study area is adequate for existing levels of demand. Any development within the Town Centre would retain the majority of existing on- street parking and should provide additional on-street parking within any new Local Streets.

- The Primary Local roads are recommended as 10,4 metres kerb to kerb with one lane of traffic in each direction and kerb side parking on both sides. Lane widths should be minimal to encourage lower travel speeds. It may be appropriate to install kerb blisters in some locations to further reinforce a slow speed environment. (Figure 4.2.5)
- The Local Roads are recommended as 7.5 metre wide kerb to kerb with parallel parking on one side. (Figure 4.2.4) Service Roadway parallel to the Princes Highway should be 5.7metre wide kerb to kerb allowing a single lane of one -way traffic and parallel parking on the kerbside. A 5.0 metre off- set from the highway is recommended. (Figure 4.2.1)
- Off street parking should be provided according to the rates provided in SSC's parking code (DCP for Car Parking- May 2001) as summarised in Table 4.2.6.

Type of development	Car spaces
Business floorspace	
• At ground level or adjoins a pedestrian level;	1 space for each 30 sqm
• Other	1 space for each 30 sqm
Industrial floorspace	1 space for each 100 sqm with a minimum provision of two spaces for each industrial unit
Residential development	
• 1 Bedroom /Studio	1 Space
• 2 Bedroom	1.5 Space
• 3+ Bedroom	1.5 Space

Table 4.2.6> Sutherland Shire Council Parking Code

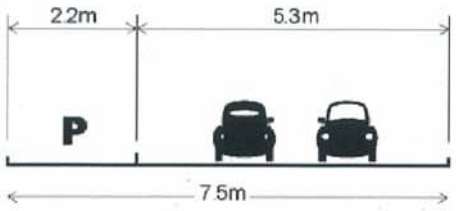


Fig 4.2.4> Cross section of local roads with parking

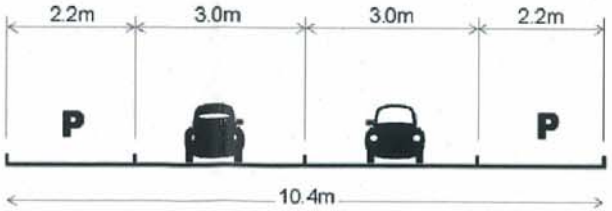
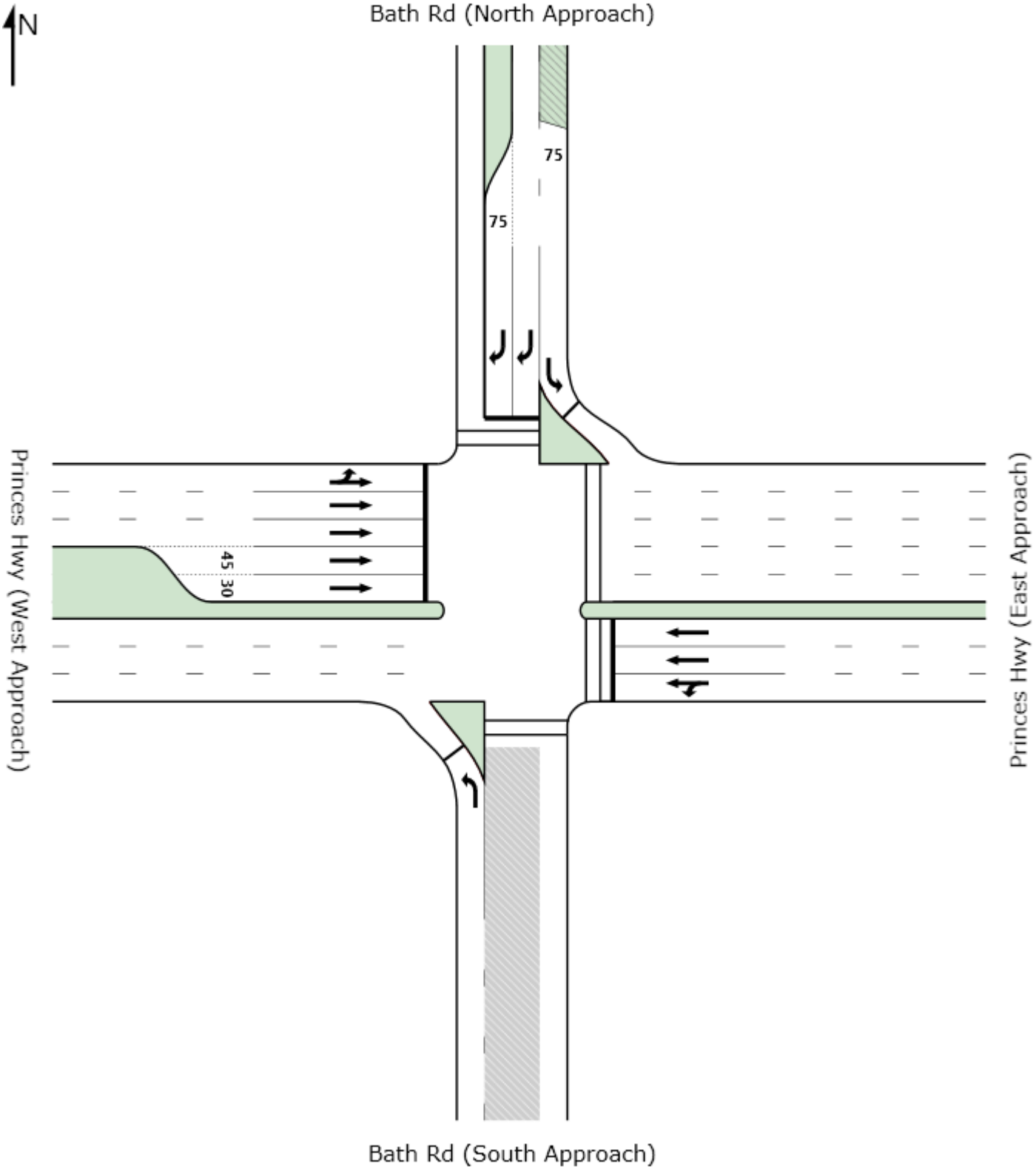


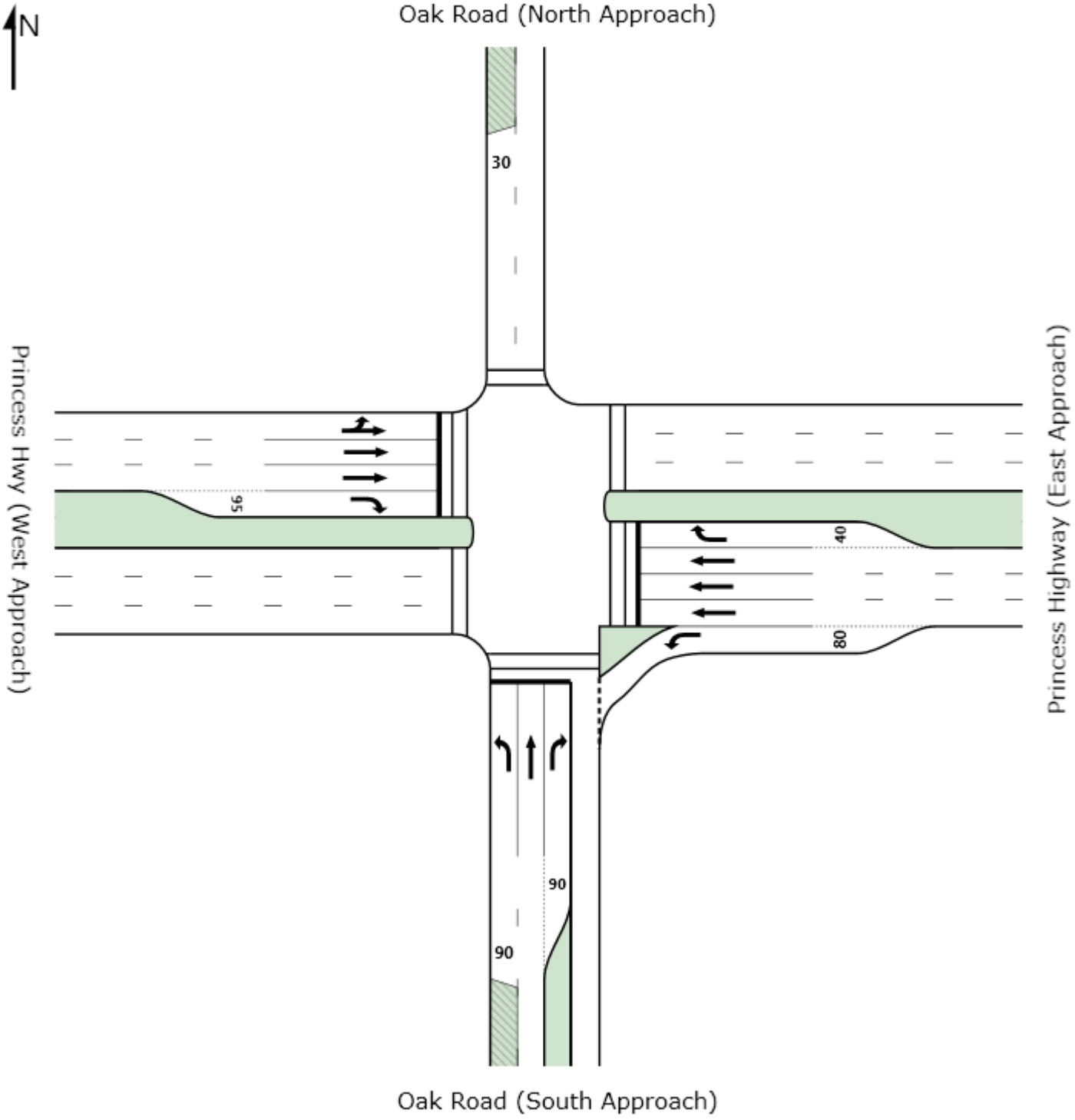
Fig 4.2.5> Cross section of primary local roads

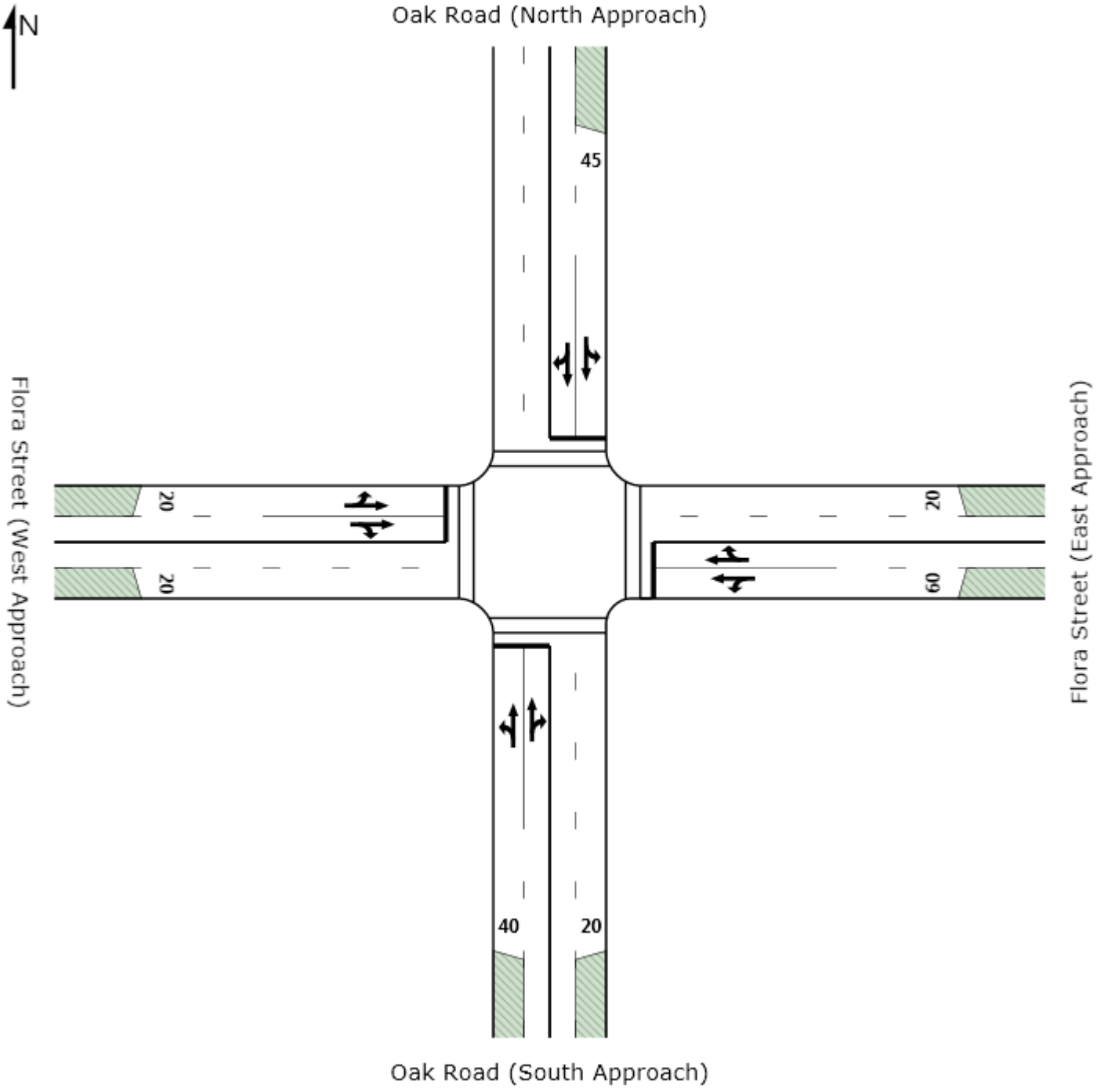
Fig 4.2.7> Kirrawee train station

Updated TMAP, Oct. 2011 - Part 1 of 2

Appendix H SIDRA Intersection Layout Plans


N
Bath Rd (North Approach)
75
75
Princes Hwy (West Approach)
45
30
Princes Hwy (East Approach)
Bath Rd (South Approach)


N
Oak Road (North Approach)
30
Princess Hwy (West Approach)
95
Princess Highway (East Approach)
40
80
90
90
Oak Road (South Approach)


N
Oak Road (North Approach)
45
Flora Street (West Approach)
20
20
20
60
Flora Street (East Approach)
40
20
Oak Road (South Approach)