Appendix M

NTPE Traffic and Transport Assessment

Transpacific Industries Pty Ltd

Proposed Resource Recovery and Recycling Facility, Rutherford

Traffic Impact Study

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1. INTRODUCTION

This report deals with the traffic impact of the proposed Resource Recovery and Recycling (RRR) Facility to be located at Lot 223 DP 1037300, on the former National Textiles plant off Kyle Street at Rutherford.

The proposed facility is to be constructed on land already zoned industrial and will house multiple recovery and recycling processes. The site will operate 24 hours a day, 7 days a week, but the majority of activity will occur between 6AM and 6PM on weekdays.

Administration buildings and a weighbridge have already been constructed on site under a previous development application. The remaining facilities required to complete the development will be constructed in a single stage.

Access to the proposed development will be via an existing driveway to the site connecting to Kyle Street forming a Type A intersection.

2. EXISTING TRAFFIC

Intersection Counts

Surveys of existing vehicle movements were carried out as detailed below:

New England Highway	Kyle Street	7th April 2005	7:00am	9:30am
		6th April 2005	3:00pm	5:30pm
Kyle Street	Access to Proposed Development	7th April 2005	7:00am	9:30am
		6th April 2005	3:00pm	5:30pm

A summary of the results of these intersection counts is presented in Figure 2-1 to 2-4 below (full report attached as Appendix A).

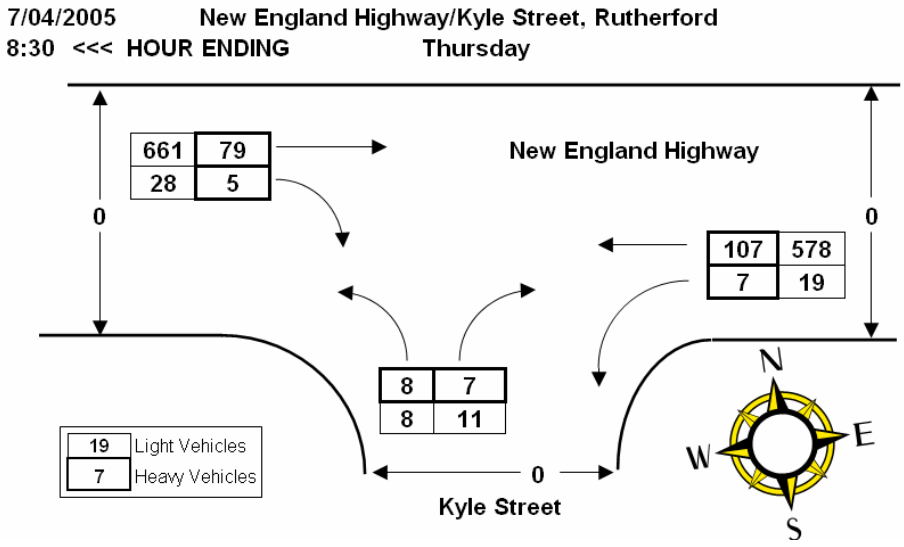


Figure 2-1: New England Highway/Kyle Street – Existing AM Period

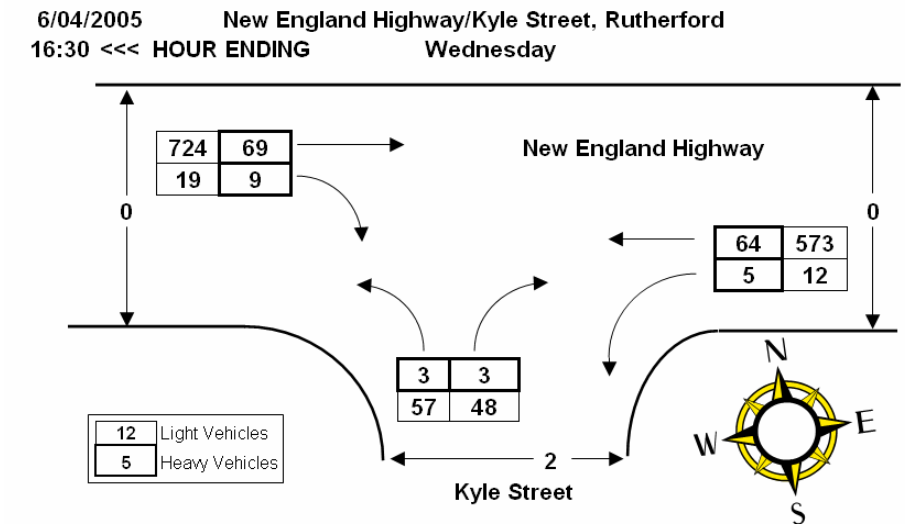


Figure 2-2: New England Highway/Kyle Street – Existing PM Period

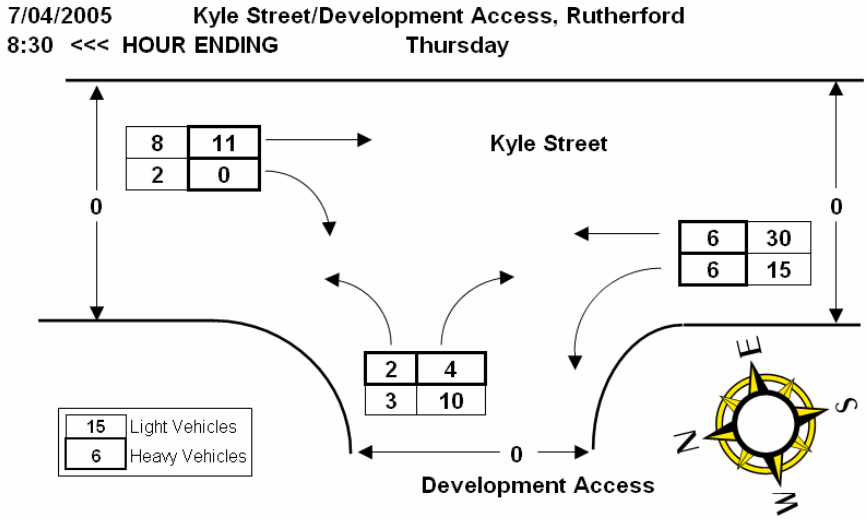


Figure 2-3: Kyle Street/Development Access – AM Peak Period

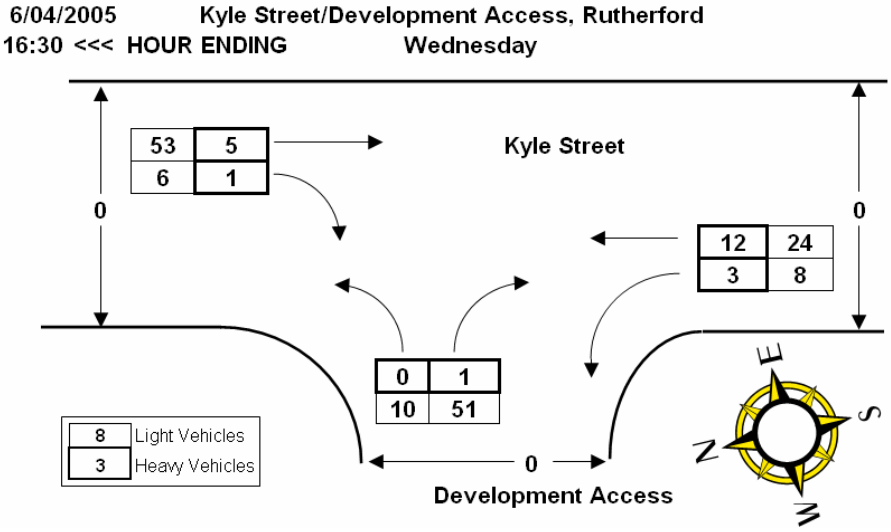


Figure 2-4: Kyle Street/Development Access – PM Peak Period

Automatic Counts

Automatic vehicle counters were installed as follows:

Road	Location	Start	Finish
Kyle Street	South of the New England Highway	1st April 2005	7th April 2005
Development Access	East of Kyle Street	1st April 2005	7th April 2005

A summary of the results of this survey are presented in Table 2-1 below (A full report on the results of this survey is attached as Appendix B):

Table 2-1: Daily Traffic Flows

Street		*Nearest Side St*	*Direction*	*AM Peak 8am-9am*	*PM Peak 3pm-4pm*	*Daily*
Kyle Street	South	New England Highway	Northbound	38	100	791
			Southbound	67	52	761
			Total	***105***	***152***	***1552***
Development Access	East	Kyle Street	Eastbound	21	17	256
			Westbound	21	22	276
			Total	***42***	***39***	***532***

Truck Movements from a Similar Site

Surveys of truck movements into and out of a similar development within the Maitland Council area has shown that the peak times for truck arrivals/departures was between 8AM-9AM and 11AM to 4PM. The truck arrivals/departures in the afternoon were found to be reasonably consistent.

3. OUTLINE OF PROPOSED DEVELOPMENT

Proposed Operation of RRR Facility

Heavy Vehicle Movements

The construction of the RRR Facility at Rutherford will generate heavy vehicle trips to and from the plant. A proportion of these trips already travel on the New England Highway betweens places such as Branxton, Singleton, Newcastle, Sydney and Queensland. Daily and weekly schedules of truck movements into and out of the site have been established based on experience with similar waste recycling facilities. These daily and weekly schedules have been used to derive the equivalent weekday Daily Truck movements into and out of the site as shown in Table 3-1 below:

Table 3-1: Heavy Vehicle Movement Schedule

Source	No. of Movements	Schedule	Equiv. Weekday Daily Movements	Type of Vehicle	Days Operating
Valley Disposal Service	44	Daily	44	Rigid Tankers	Monday to Friday
	20	Daily	20	Truck and Dog	Monday to Friday
	20	Daily	20	Semi-Trailers	Monday to Friday
	6	Weekly	1	B-Doubles	Monday to Sunday
Transpacific Industrial Solutions	8	Daily	8	Super vacuum Tankers	Monday to Friday
Nationwide Oil: Waste Oil	8	Daily	8	Rigid Tankers	Monday to Friday
	4	Weekly	1	Rigid Vehicles	Monday to Friday
	12	Weekly	2	Trailer Tankers	Monday to Friday
Nationwide Oil: Oil Hydrogenation Plant	30	Weekly	5	B-Double	Monday to Sunday
Environmental Solvent Recovery	20	Weekly	4	Flat Bed Trucks	Monday to Friday
	2	Monthly	0	Semi-Trailer	Per Month
Fixation Process: Incoming Materials	6	Weekly	1	Semi-Trailer	Monday to Friday
	4	Monthly	0	Semi-Trailer	Per Month
	30	Daily	30	Tanker	Monday to Saturday
Fixation Process: Outgoing Product	40	Weekly	8	Semi-Trailer	Monday to Friday
Compost: Incoming Material	20	Weekly	4	Semi-Trailers	Monday to Saturday
Compost: Outgoing Product	40	Weekly	7	Semi-Trailers	Monday to Saturday
Total Truck Movements	314		163		

Light Vehicle Movements

The peak hour light vehicle movements to and from the proposed development will be dependent on employee shift times which vary between the different facilities to be constructed. A summary of the employee shift times is shown below in Table 3-2.

Table 3-2: Employee Shift Times

Facility	No. of Staff	Shifts	Days Operating
Hydrogenation Plant	6	3×8 hour shifts	Continuous
Oil Transfers/ Waste Water Treatment Plant	4	8 to 10 hours/day	Monday to Saturday
Flamm. And Comb. Liquids Transfer Station	5	8 to 10 hours/day	Monday to Saturday
Truck Drivers	20	6AM to 4PM	Monday to Saturday
Workshop	5	2×8 hour shifts	Monday to Friday
Lab	4	7AM to 5PM	Monday to Friday
Maintenance	3	7AM to 5PM	Monday to Friday
Administration	20	7AM to 5PM	Monday to Friday
CFS Plant	6	2×8 hour shifts	Monday to Saturday
Composting	2	2×8 hour shifts	Monday to Saturday
Total Employees	75		

Based on these Employee Shift Times the following assumptions have been made in relation to the trips that are expected to occur during the peak design hours:

- The facilities that run on two or three shifts per day will not impact on peak times
- The shifts that run on 8 to 10 hours per day will impact on peak design hours
- 50% of the administration staff trips will occur within the design peak hours. The remaining administration employees are assumed to arrive or leave outside peak times.
- Truck drivers are assumed to arrive outside peak hours. Additionally, many of the drivers are involved in long haul routes and therefore will only enter or leave the site periodically

Design Peak Hour

The results of the surveys of existing traffic intersection flows during the morning and afternoon peak hours and the expected truck movements and shift times have yielded different peak times. The following peak hours have been observed for the traffic on the surrounding network:

Existing Traffic	AM	7:30am	-	8:30am
Peak Hours	PM	3:30pm	-	4:30pm

The following peak hours will be expected based on employees at the facilities whose start and finish times generally coincide with the peak hours of the surrounding network:

Employee	AM	7:00am	-	8:00am
Peak Hours	PM	4:00pm	-	5:00pm

The remaining shift times are outside the peak activity of the existing network and therefore are considered to generate only a marginal impact on the network.

The following peak hours are expected for the trucking movements based on the survey of a similar development.

Truck	AM	8:00am	-	9:00am
Peak Hours	PM	3:00pm	-	4:00pm

The trucks afternoon peak hour is relatively constant over a number of hours; the hour chosen was based on its proximity to the peak hour of the surrounding network.

From Roads and Traffic Authority Guide to Traffic Generating Developments, both the peak hour of the proposed site and the adjacent road network need to be considered. Accordingly, the peak hours to be adopted for this report are as follows:

Design	**AM**	**7:30am**	**-**	**8:30am**
Peak Hours	**PM**	**3:30pm**	**-**	**4:30pm**

4. ACCESS AND PARKING ARRANGEMENTS

Vehicular Access

The proposed access to the site is via an existing access connecting to Kyle Street constructed under a previous development application. The access to the proposed facility is approximately 20 metres at the property line, narrowing down to 15 metres internally. Heavy vehicle turning paths into and out of the site at Kyle Street are presented in the drawing attached as Appendix C. This drawing shows that the intersection will be able to accommodate vehicle movements with minor modifications to provide additional pavement for the swept path of the B-Double.

Cycle/Pedestrian Access

Pedestrians and cyclists will use the vehicular access to the site. It is expected these forms of transport to and from the site will be insignificant.

Public Transport

Bus route 182 operated by Blue Ribbon coaches travels along the New England Highway past Kyle Street four times per day in each direction between Maitland and Singleton. The low frequency of this service combined with the distance from the nearest bus stop to the site make these existing bus services unattractive to employees of the proposed development. However, the recent connection of Racecourse Road to Kyle Street provides the opportunity for a bus service to be established that would run past the access to the site. Accordingly, it is expected that with further development in the surrounding area an improved bus service could be established at some time in the future.

Parking Requirements

The predicted number of employees expected on site at any one time based on the shift times provided is shown below in Table 4-1.

Table 4-1: Predicted Peak Number of Employees On-site for Proposed Development

Facility	No. of Staff	Shifts	Employees on site during Max. Occupancy (2)
Hydrogenation Plant (1)	6	3×8 hour shifts	4
Oil Transfers/ Waste Water Treatment Plant	4	8 to 10 hours/day	4
Flamm. And Comb. Liquids Transfer Station	5	8 to 10 hours/day	5
Truck Drivers(1)	20	6AM to 4PM	10
Workshop	5	2×8 hour shifts	3
Lab	4	7AM to 5PM	4
Maintenance	3	7AM to 5PM	3
Administration	20	7AM to 5PM	20
CFS Plant	6	2×8 hour shifts	4
Composting	2	2×8 hour shifts	2
Predicted Employees On-site			59

Notes: (1) Assumed 50% of truck drivers would drive there trucks to work
(2) Figures allow for overlap during change in shift times

The light vehicle parking requirements for the proposed development based on the rates specified by Maitland City Council DCP 40 are shown below in Table 4-2.

Table 4-2: Parking Requirements for Proposed Development (MCC DCP40)

Land Use	No. Employees On-site	Parking Rate	Parking	
			Required	Provided
Industry	59	1 space per 2 employees	30	32
		Total	**30**	**32**

Discussion

Based on the expected number of employees to be on-site as shown in Table 4-2 it is expected that the parking provided, will exceed the requirements of Maitland City Council DCP 40 by two spaces.

This assessment has not included parking requirements for heavy vehicles. It is considered that the internal road layout and associated hard standing areas will provide ample capacity to accommodate B-Double movements to and from all major activity areas and for these vehicles to load/unload and/or park if necessary.

Parking Layout

The travel isle adjacent to Light Vehicle parking bays is 6.2 metres wide with parking bays 2.7 metres wide and 5.5 metres long. The parking layout provided complies with Australian Standard AS2890.1 Off Street Parking in terms of parking bay length and width and aisle width.

Internal Road

The internal road layout will provide ample capacity to accommodate B-Double movements to and from all major activity areas. Sight distance at each internal road junction is considered adequate. However, all landscape work should be carefully designed to insure adequate sight distance is maintained at all internal intersections.

5. TRIP GENERATION AND DISTRIBUTION

Trip Generation – Light Vehicles

Light vehicle trips will depend on the number of employees travelling to and from the site during the design peak hours. As detailed in Chapter 3 of this report, the design peak hours adopted for this analysis are as follows:

Design	**AM**	**7:30am**	**-**	**8:30am**
Peak Hours	**PM**	**3:30pm**	**-**	**4:30pm**

The shift changeovers likely to impact on the AM and PM peaks hours have been identified in Table 5.1 below in order to derive the number of employees likely to travel to and from the site during these peak hours.

Table 5-1: Predicted Light Vehicle Trip Generation

Facility	No. of Staff	Shifts	Shift Change Occur During Peak Hour	Employees on site during Design Peak Hour	
Hydrogenation Plant (1)	6	3×8 hour shifts	No	-	-
Oil Transfers/ Waste Water Treatment Plant	4	8 to 10 hours/day	Yes	4	4
Flamm. And Comb. Liquids Transfer Station	5	8 to 10 hours/day	Yes	5	5
Truck Drivers(1)	20	6AM to 4PM	Half (PM Only)	-	10
Workshop	5	2×8 hour shifts	No	-	-
Lab	4	7AM to 5PM	Yes	4	4
Maintenance	3	7AM to 5PM	Yes	3	3
Administration	20	7AM to 5PM	Half (AM Only)	10	-
CFS Plant	6	2×8 hour shifts	No	-	-
Composting	2	2×8 hour shifts	No	-	-
Predicted Employees On-site				26	26

As detailed in Table 5-1 it is estimated that up to 26 employees will undertake a trip to or from the site during the morning or afternoon peak hour.

Based on a study of the Moto Lane Industrial Estate carried out by NTPE in 1996 the number of trips per employee during the AM and PM peak hours would be 0.7. However, due to the location of the site, it is considered a more conservative figure of one trip per employee should be adopted for this analysis.

Accordingly, the total number of Light Vehicle trips generated by employees to and from the site is estimated to be **25**.

Trip Generation – Heavy Vehicles

A total of 163 heavy vehicle trips have been calculated based on the schedule of equivalent daily truck movements to and from the plant as shown in Table 3-1 of this report.

The results of a survey of a similar Waste Recycling Plant within the Maitland City Council area indicates that approximately 13% and 10% of daily heavy vehicle movements will occur during the AM and PM Peak Hours respectively. Therefore, the peak hour heavy vehicle trips would be:

	Trips to and From Site		
	Daily	*AM Peak*	*PM Peak*
		13% of Daily	*10% of Daily*
Heavy Vehicle Trips – Full Development	163	22	17

Trip Distribution – Light Vehicles

The distribution of light vehicle trips calculated above to and from the proposed development is based on the existing trip distribution from the intersection counts of the New England Highway/Kyle Street and Kyle Street/Development Access. Additionally the following assumptions have been made regarding the light vehicle travel patterns.

- An inbound/outbound ratio of 80%/20% for light vehicles in the morning peak hour and 20%/80% in the afternoon peak hour

Trip Distribution – Heavy Vehicles

Heavy vehicle trips have been distributed as 50% to the east and 50% to the west. Additionally, an inbound/outbound ratio of 50%/50% has been used for heavy vehicles

Due to safety considerations with the right in/right out movements at the intersection of the New England Highway and Kyle Street, heavy vehicles accessing the proposed development will be instructed to use the following paths:

- Heavy vehicles travelling from the west will turn right in at the intersection with Racecourse Road
- Heavy vehicles travelling to the west will turn left out at the intersection with Kyle Street
- Heavy vehicles travelling from the east will turn left in at the intersection with Kyle Street
- Heavy vehicles travelling to the east will turn right out at the intersection with Racecourse Road
- If the intersection of the New England Highway and Kyle Street is upgraded to a roundabout by 2015, this will allow all heavy vehicles to access the site via Kyle Street

The upgrade of the intersection of the New England Highway and Kyle Street to a roundabout is dependent on the proposed business park to the north being approved. If this does not occur, heavy vehicles will simply continue using the same travel patterns.

Trip Distribution – All Vehicles

Figures 5-1 & 5-2 show the expected light and heavy vehicle trip distribution during the design peak hours with existing layout of Kyle Street.

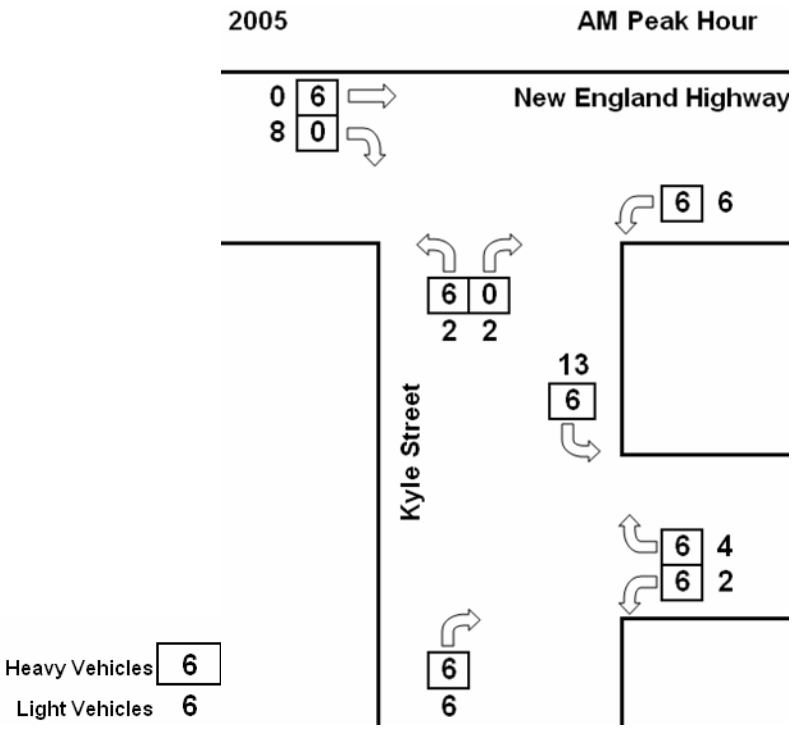


Figure 5-1: Trip Distribution – AM Peak Hour

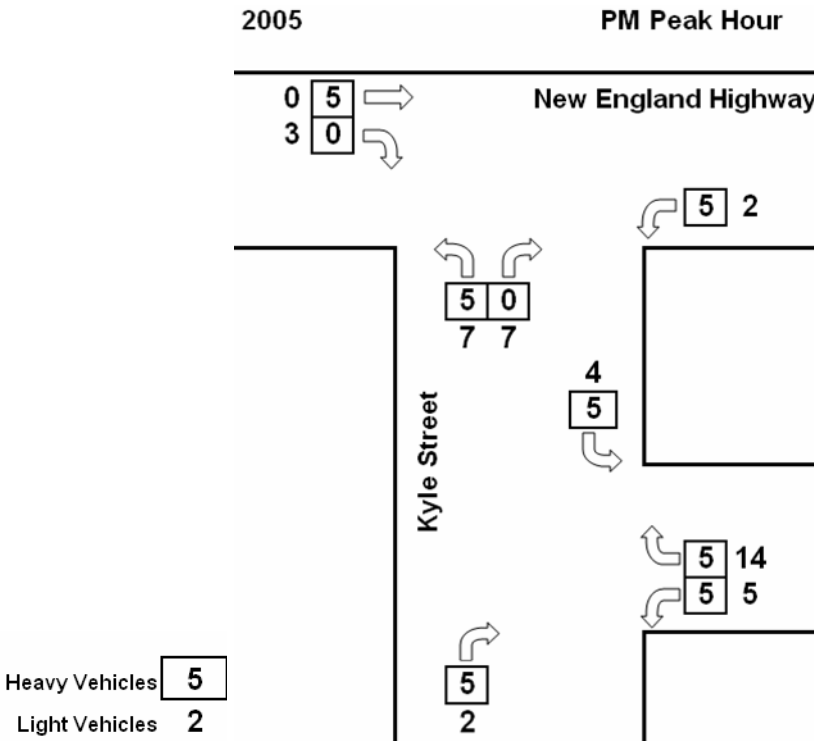


Figure 5-2: Trip Distribution –PM Peak Hour

Figures 5-3 and 5-4 show the altered travel patterns if the intersection of the New England Highway and Kyle Street is upgraded to a roundabout.

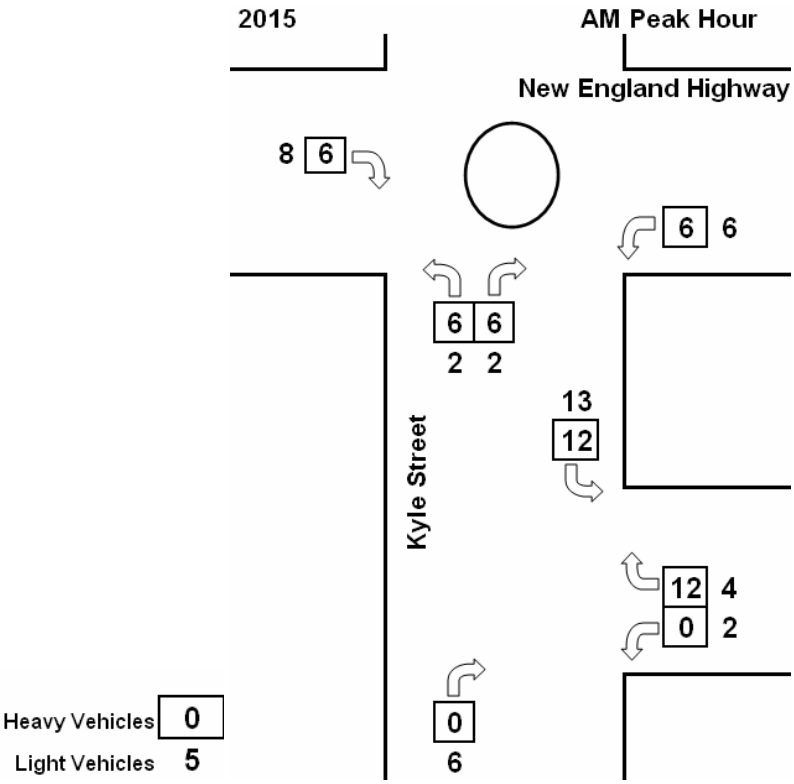


Figure 5-3: Trip Distribution – AM Peak Hour – Altered Heavy Vehicle Travel Patterns with Roundabout

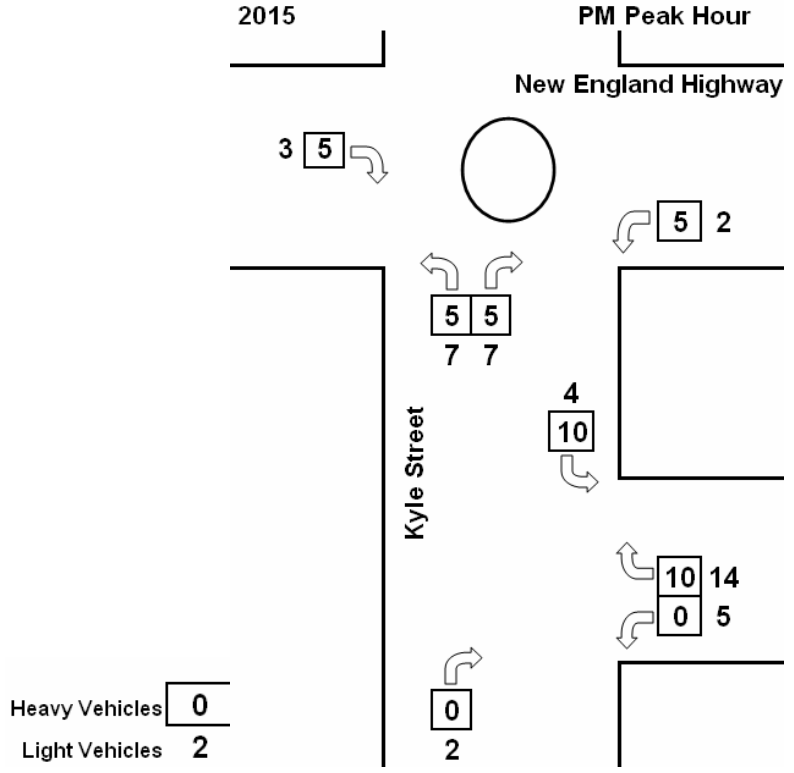


Figure 5-4: Trip Distribution – PM Peak Hour – Altered Heavy Vehicle Travel Patterns with Roundabout

6. PREDICTED TRAFFIC FLOWS 2005

This assessment has not included the intersections of New England Highway/Anambah Road and New England Highway/Racecourse Road. It is considered that these intersections are remote form the proposed development and that they are therefore outside to realm of this study. It is also understood that significant changes to the road network in this area are likely to occur as a result of other major developments currently under review by Maitland Council.

Accordingly, this assessment of the impact of the proposed development on the surrounding road network has focused on the nearby intersections of the New England Highway/Kyle Street and Kyle Street/Development Access.

Figures 6-1 and 6-2 below show the predicted traffic flows during the design peak hours on the surrounding road network assuming the development were constructed in 2005:

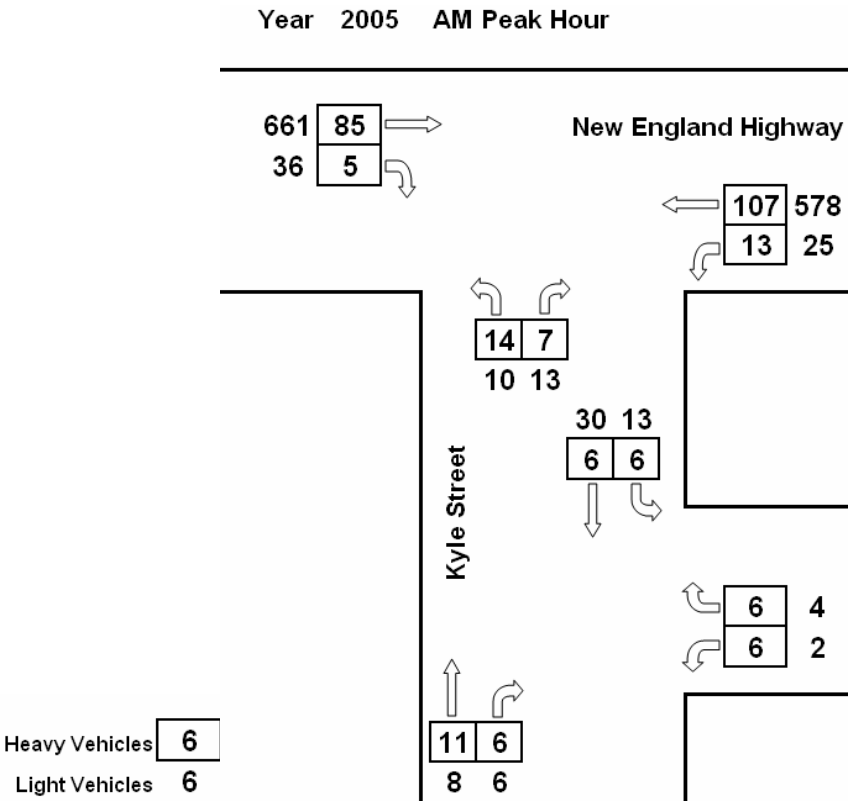


Figure 6-1: Predicted Traffic Flows 2005 – AM Peak Hour

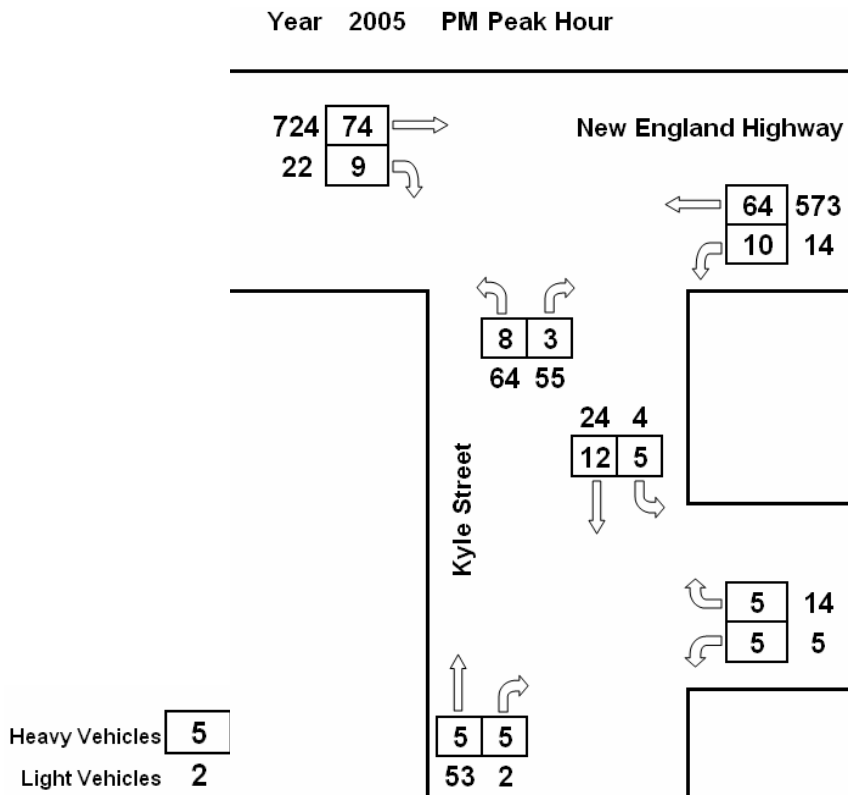


Figure 6-2: Predicted Traffic Flows 2005 – PM Peak Hour

7. PREDICTED TRAFFIC FLOWS 2015

A linear growth rate of 2% per annum has been applied to existing through traffic flows on the New England Highway and existing turning movements in and out of Kyle Street. This growth rate was considered conservative based on the results recorded at RTA survey site 05.062 on the New England Highway South of Anambah Road between 1995 and 2001, which indicated that the traffic volumes have remained static in the six year period between 1995 and 2001.

Additionally, there is a proposal to develop a business park on the northern side of the New England Highway on land owned by the Newcastle Aero Club, which would have an access to the New England Highway at Kyle Street. A Traffic Impact Assessment of this development completed recently by NTPE recommended that the intersection of the New England Highway and Kyle Street be upgraded to a 4-way roundabout. It is assumed for this report that if this development is approved it would be fully operational by the planning year 2015. Accordingly predicted traffic volumes for the intersection of the New England Highway/Kyle Street and Kyle St/Site Access Road have been derived both with and without the proposed development on the Newcastle Aero Club Land.

The 2015 predicted flows both with and without the proposed business park on the northern side of the New England Highway is shown below in Figures 7-1 to 7-4.

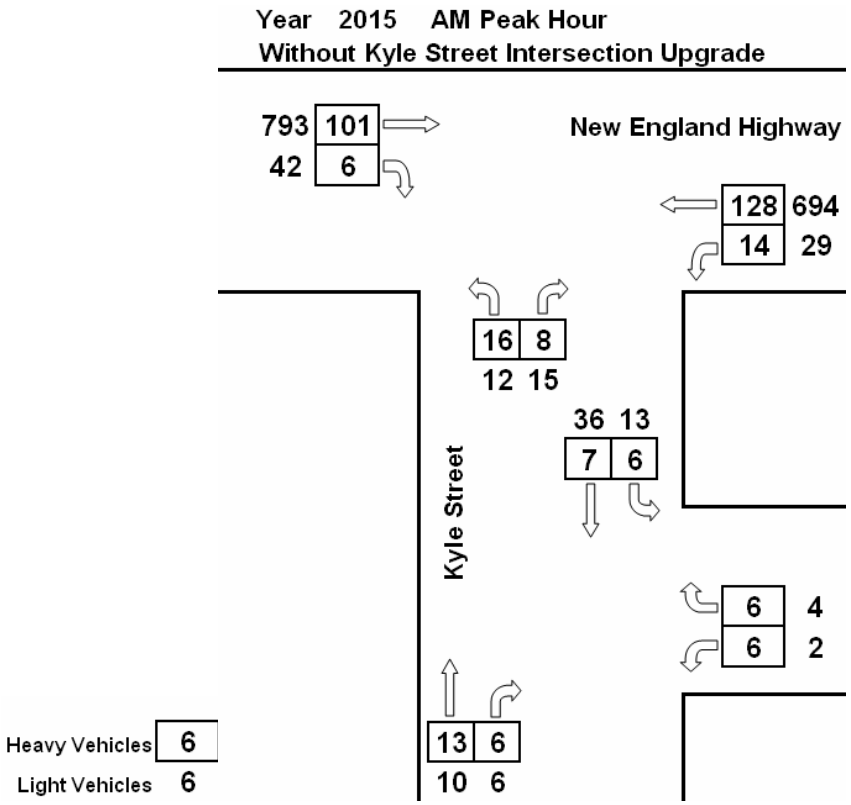


Figure 7-1: Predicted Traffic Flows 2015 – AM Peak Hour – Without Proposed Business park

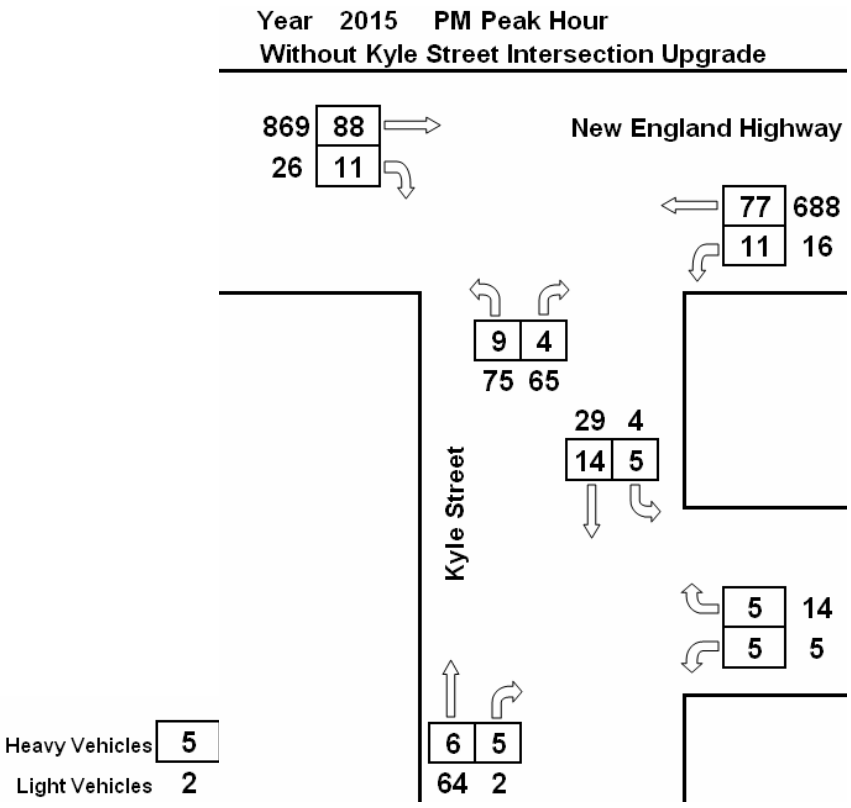


Figure 7-2: Predicted Traffic Flows 2015 – PM Peak Hour –Without Proposed Business park

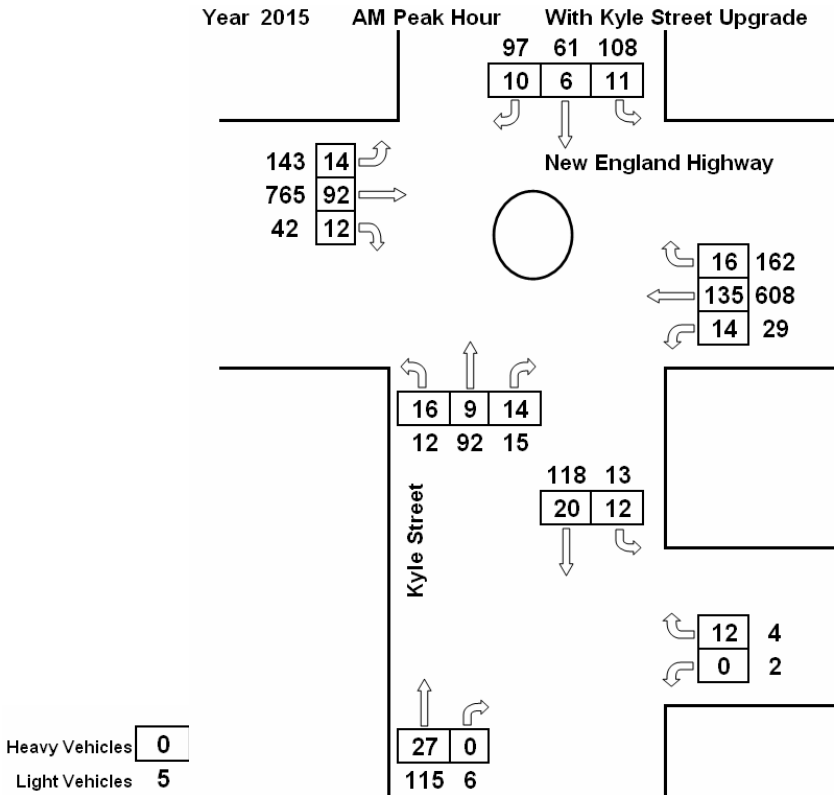


Figure 7-3: Predicted Traffic Flows 2015 – AM Peak Hour – With Proposed Business park

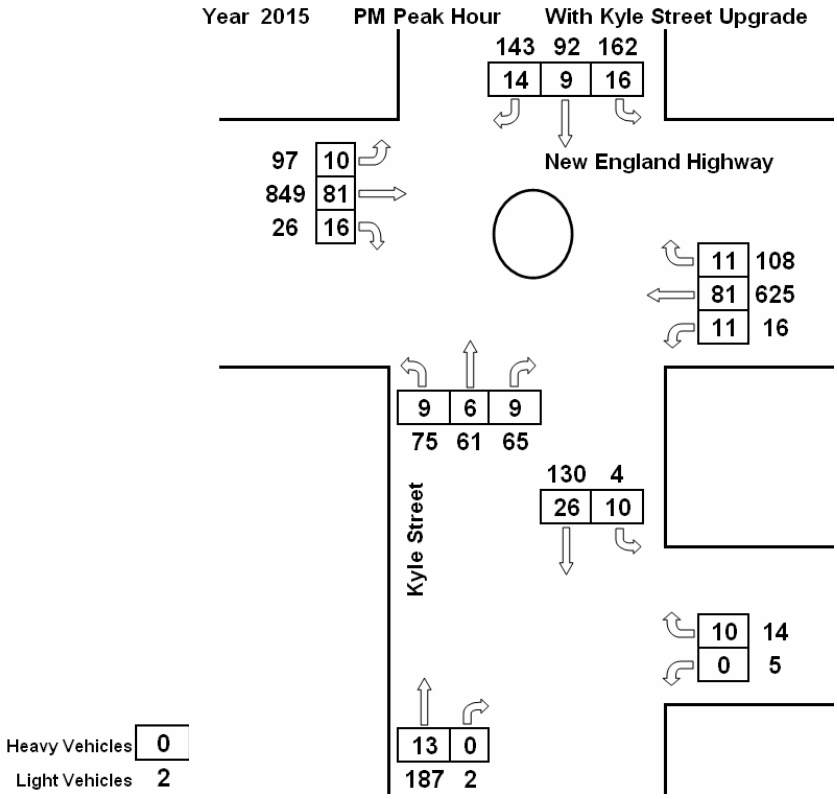


Figure 7-4: Predicted Traffic Flows 2015 – PM Peak Hour – With Proposed Business park

8. SIDRA ANALYSIS: NEW ENGLAND HWY/KYLE ST - EXISTING LAYOUT

2005 Existing Conditions

SIDRA has been used to assess the current performance of the existing layout of the intersection of New England Highway and Kyle Street during the design peak hours for 2005. The junction is controlled as a seagull intersection allowing vehicles turning right out of Kyle Street to access the New England Highway and accelerate before merging with the eastbound traffic flow.

The results of the existing condition analysis of the New England Highway and Kyle Street are summarised below in Tables 8-1 and 8-2.

Table 8-1: SIDRA Analysis – SH9/Kyle Street AM Peak 2005 Existing Conditions

AM Peak	2005	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
Existing Conditions		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
							Queue
							(m)
Kyle Street	Left	16	215	0.074	23.5	LOS B	3
Southern Approach	Right	18	189	0.095	26.4	LOS B	3
New England Highway	Left	26	1558	0.017	11.8	LOS A	0
Eastern Approach	Through	685	1770	0.387	0	LOS A	0
New England Highway	Through	740	1823	0.406	0	LOS A	0
Western Approach	Right	33	718	0.046	14.6	LOS B	2
All Vehicles		1518	6273	0.406	1.1	LOS A	3

Table 8-2: SIDRA Analysis – SH9/Kyle Street PM Peak 2005 Existing Conditions

PM Peak	2005	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
Existing Conditions		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
							Queue
							(m)
Kyle Street	Left	60	367	0.163	19.6	LOS B	6
Southern Approach	Right	51	299	0.171	22.5	LOS B	7
New England Highway	Left	17	1535	0.011	12	LOS A	0
Eastern Approach	Through	637	1830	0.348	0	LOS A	0
New England Highway	Through	793	1846	0.43	0	LOS A	0
Western Approach	Right	28	687	0.041	14.8	LOS B	1
All Vehicles		1586	6564	0.43	1.9	LOS A	7

Discussion

From Tables 8-1 and 8-2, the intersection of the New England Highway and Kyle Street currently performs at Level of Service A during the morning and afternoon peak hours.

2005 With Proposed Development

SIDRA has been used to assess the performance of the intersection of the New England Highway and Kyle Street with the proposed development implemented during the design peak hours for 2005.

The results of the SIDRA analysis is summarised below in Tables 8-3 and 8-4.

Table 8-3: SIDRA Analysis – SH9/Kyle Street AM Peak 2005 with Proposed Development

AM Peak	2005	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
With Development		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
							Queue
							(m)
Kyle Street	Left	24	213	0.094	23.7	LOS B	3
Southern Approach	Right	21	181	0.122	27.2	LOS B	4
New England Highway	Left	38	1554	0.021	11.9	LOS A	0
Eastern Approach	Through	685	1770	0.387	0	LOS A	0
New England Highway	Through	746	1823	0.406	0	LOS A	0
Western Approach	Right	41	702	0.06	14.7	LOS B	2
All Vehicles		1555	6244	0.406	1.4	LOS A	4

Table 8-4: SIDRA Analysis – SH9/Kyle Street PM Peak 2005 with Proposed Development

PM Peak	2005	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
With Development		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
							Queue
							(m)
Kyle Street	Left	72	358	0.19	19.9	LOS B	7
Southern Approach	Right	58	288	0.205	23.1	LOS B	8
New England Highway	Left	24	1529	0.013	12	LOS A	0
Eastern Approach	Through	637	1830	0.348	0	LOS A	0
New England Highway	Through	798	1846	0.43	0	LOS A	0
Western Approach	Right	31	673	0.048	15	LOS B	2
All Vehicles		1620	6523	0.43	2.1	LOS A	8

Discussion

From Tables 8-3 and 8-4, the intersection of the New England Highway and Kyle Street performs at Level of Service A during the morning and afternoon peak hours in 2005 with the proposed development implemented.

2015 With Proposed Development

SIDRA has been used to assess the performance of the intersection of the New England Highway and Kyle Street with the proposed development implemented during the design peak hours for the planning year 2015.

The results of the SIDRA analysis is summarised below in Tables 8-5 and 8-6.

Table 8-5: SIDRA Analysis – SH9/Kyle Street AM Peak 2015 with Proposed Development

AM Peak	2015	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
With Development		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
							Queue
							(m)
Kyle Street	Left	28	158	0.158	28.7	LOS C	5
Southern Approach	Right	23	131	0.198	34.8	LOS C	7
New England Highway	Left	43	1546	0.025	11.9	LOS A	0
Eastern Approach	Through	822	1771	0.464	0	LOS A	0
New England Highway	Through	894	1823	0.487	0	LOS A	0
Western Approach	Right	48	588	0.085	15.9	LOS B	3
All Vehicles		1858	6017	0.487	1.6	LOS A	7

Table 8-6: SIDRA Analysis – SH9/Kyle Street PM Peak 2015 with Proposed Development

PM Peak	2015	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
With Development		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
							Queue
							(m)
Kyle Street	Left	84	280	0.286	25.4	LOS B	12
Southern Approach	Right	69	219	0.32	31.4	LOS C	13
New England Highway	Left	27	1500	0.016	12.1	LOS A	0
Eastern Approach	Through	765	1830	0.418	0	LOS A	0
New England Highway	Through	957	1845	0.516	0	LOS A	0
Western Approach	Right	37	577	0.068	15.9	LOS B	2
All Vehicles		1939	6251	0.516	2.7	LOS A	13

Discussion

From Tables 8-5 and 8-6, the intersection of the New England Highway and Kyle Street performs at Level of Service A during the morning and afternoon peak hours in 2015 with the proposed development implemented.

9. SIDRA ANALYSIS: NEW ENGLAND HWY/KYLE ST - ROUNDABOUT LAYOUT

2015 With Proposed Development Plus Anambah Business Park

SIDRA has been used to assess the performance of the intersection of the New England Highway and Kyle Street with both the proposed development and the business park on the northern side of the New England Highway on land owned by the Newcastle Aero Club implemented for the planning year 2015.

As part of the plan for the business park on the northern side of the New England Highway, the intersection of the New England Highway and Kyle Street is upgraded to a 4-way roundabout. The intersection layout as described by SIDRA is shown below in Figure 9-1.

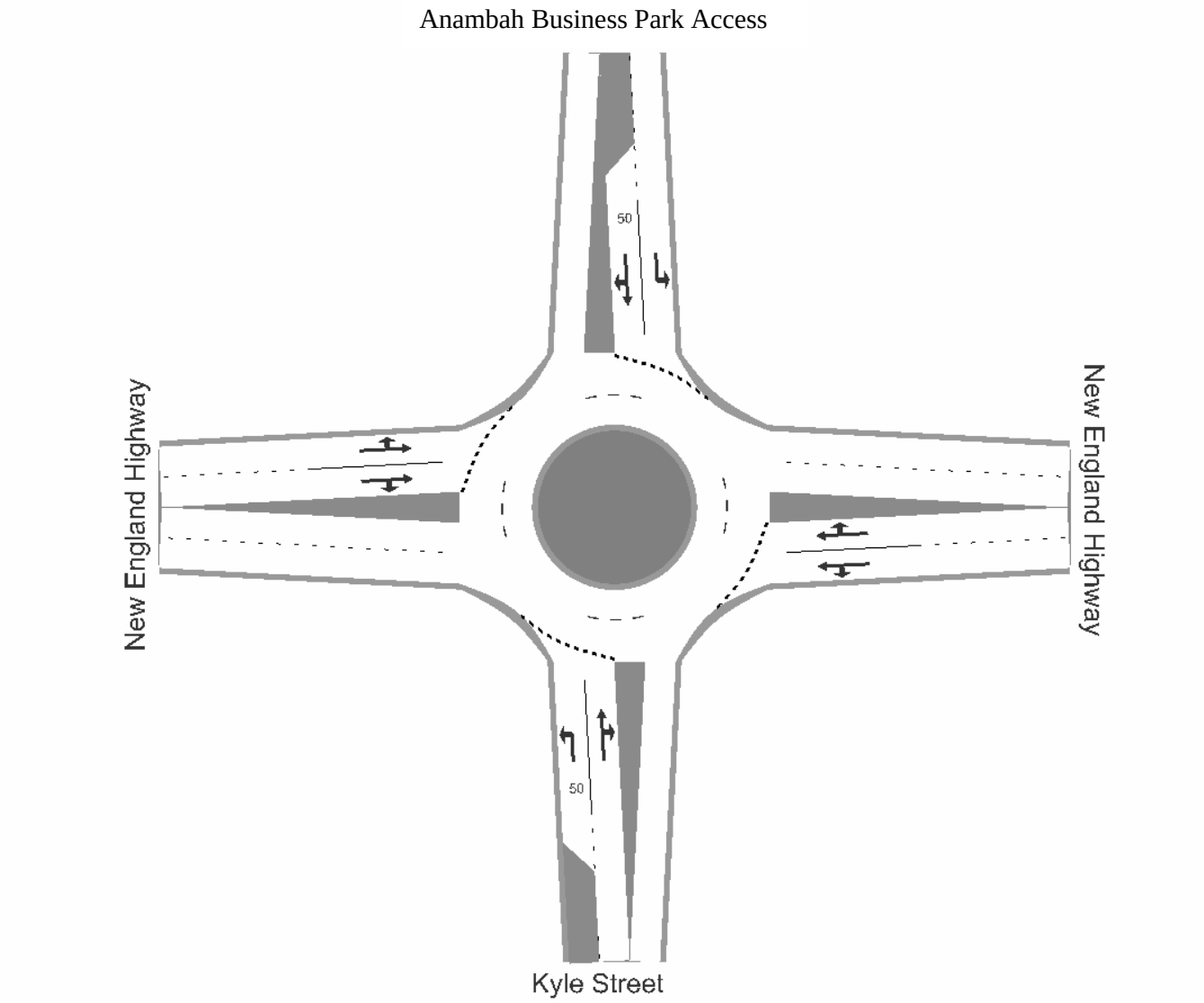


Figure 9-1: Intersection Layout – New England Highway/Kyle Street

The results of the SIDRA analysis is summarised below in Tables 9-1 and 9-2.

Table 9-1: SIDRA – SH9/Kyle St ROUNDABOUT AM Peak 2015 with Development and Business Park

AM Peak	2015	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
With Development		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
With Business park							Queue
							(m)
Kyle Street	Left	28	245	0.102	15.1	LOS B	3
Southern Approach	Through	101	505	0.2	7.1	LOS A	7
	Right	29	155	0.2	16.6	LOS B	7
New England Highway	Left	43	94	0.415	8.1	LOS A	19
Eastern Approach	Through	743	1787	0.416	6.8	LOS A	20
	Right	178	428	0.416	12.2	LOS A	20
Access to Business park	Left	119	612	0.194	10.1	LOS A	6
Southern Approach	Through	67	282	0.238	6.4	LOS A	8
	Right	107	451	0.237	14.9	LOS B	8
New England Highway	Left	157	326	0.482	8	LOS A	25
Western Approach	Through	857	1781	0.481	7.2	LOS A	25
	Right	54	104	0.481	13.5	LOS A	24
All Vehicles		2483	6770	0.482	8.3	LOS A	25

Table 9-2: SIDRA – SH9/Kyle St ROUNDABOUT PM Peak 2015 with Development and Business Park

PM Peak	2015	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
With Development		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
With Business park							Queue
							(m)
Kyle Street	Left	84	572	0.14	10.6	LOS A	5
Southern Approach	Through	67	326	0.206	6.8	LOS A	8
	Right	74	409	0.205	15.2	LOS B	8
New England Highway	Left	27	60	0.4	8.8	LOS A	18
Eastern Approach	Through	706	1761	0.401	7	LOS A	19
	Right	119	297	0.401	12.8	LOS A	19
Access to Business park	Left	178	596	0.299	10.7	LOS A	10
Southern Approach	Through	101	281	0.359	7.1	LOS A	13
	Right	157	437	0.359	15.6	LOS B	13
New England Highway	Left	107	237	0.451	7.6	LOS A	23
Western Approach	Through	930	2060	0.451	6.7	LOS A	23
	Right	42	86	0.453	13.7	LOS A	22
All Vehicles		2592	7123	0.453	8.5	LOS A	23

Discussion

From Tables 9-1 and 9-2, the proposed Roundabout upgraded intersection of the New England Highway and Kyle Street performs at Level of Service A during the morning and afternoon peak hours in 2015 with both the proposed development and the business park on the northern side of the New England Highway implemented.

10. SIDRA ANALYSIS: KYLE ST/ACCESS – EXISTING LAYOUT

2005 With Proposed Development

SIDRA has been used to assess the performance of the existing intersection layout of Kyle Street and the access to the proposed development during the design peak hours for 2005 with the proposed development implemented.

The results of the SIDRA analysis is summarised below in Tables 10-1 and 10-2.

Table 10-1: SIDRA Analysis – Kyle Street/Dev. Access AM Peak 2005 with Proposed Development

AM Peak	2005	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
With Development		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
							Queue
							(m)
Kyle Street	Through	19	1342	0.022	3.6	LOS A	1
Southern Approach	Right	12	1342	0.022	3.6	LOS A	1
Development Access	Left	8	193	0.041	10.7	LOS A	2
Eastern Approach	Right	10	482	0.041	10.5	LOS A	2
Kyle Street	Left	19	818	0.043	9.1	LOS A	0
Northern Approach	Through	36	842	0.043	0	LOS A	0
All Vehicles		104	3677	0.043	5.6	LOS A	2

Table 10-2: SIDRA Analysis – Kyle Street/Dev. Access PM Peak 2005 with Proposed Development

PM Peak	2005	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
With Development		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
							Queue
							(m)
Kyle Street	Through	58	1720	0.04	1.7	LOS A	2
Southern Approach	Right	7	1720	0.04	1.7	LOS A	2
Development Access	Left	10	163	0.098	9.8	LOS A	5
Eastern Approach	Right	19	681	0.098	9.8	LOS A	5
Kyle Street	Left	9	485	0.033	9.3	LOS A	0
Northern Approach	Through	38	1091	0.033	0	LOS A	0
All Vehicles		141	4140	0.098	5.3	LOS A	5

Discussion

From Tables 10-1 and 10-2, the intersection of Kyle Street and the access to the proposed development performs at Level of Service A during the morning and afternoon peak hours in 2005 with the proposed development implemented.

2015 With Proposed Development

SIDRA has been used to assess the performance of the existing intersection layout of Kyle Street and the access to the proposed development with the proposed development implemented during the design peak hours for the planning year 2015.

The results of the SIDRA analysis is summarised below in Tables10-3 and 10-4.

Table 10-3: SIDRA Analysis – Kyle Street/Dev. Access AM Peak 2015 with Proposed Development

AM Peak	2015	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
With Development		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
							Queue
							(m)
Kyle Street	Through	23	1323	0.026	3.5	LOS A	1
Southern Approach	Right	12	1323	0.026	3.5	LOS A	1
Development Access	Left	8	187	0.053	11.2	LOS A	2
Eastern Approach	Right	10	430	0.053	11	LOS A	2
Kyle Street	Left	19	762	0.049	9.3	LOS A	0
Northern Approach	Through	43	886	0.049	0	LOS A	0
All Vehicles		115	3589	0.053	5.6	LOS A	2

Table 10-4: SIDRA Analysis – Kyle Street/Dev. Access PM Peak 2015 with Proposed Development

PM Peak	2015	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
With Development		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
							Queue
							(m)
Kyle Street	Through	70	1710	0.048	1.7	LOS A	2
Southern Approach	Right	7	1710	0.048	1.7	LOS A	2
Development Access	Left	10	160	0.106	10.2	LOS A	5
Eastern Approach	Right	19	638	0.107	10.1	LOS A	5
Kyle Street	Left	9	460	0.039	9.5	LOS A	0
Northern Approach	Through	43	1100	0.039	0	LOS A	0
All Vehicles		158	4068	0.107	5.1	LOS A	5

Discussion

From Tables 10-3 and 10-4, the intersection of Kyle Street and the access to the proposed development performs at Level of Service A during the morning and afternoon peak hours in 2015 with the proposed development implemented.

2015 With Proposed Development and Newcastle Aero Club Business Park

SIDRA has been used to assess the performance of the existing intersection of Kyle Street and the access to the proposed development with both the proposed development and the business park on the northern side of the New England Highway implemented by planning year 2015.

The results of the SIDRA analysis is summarised below in Tables 10-5 and 10-6.

Table 10-5: SIDRA Analysis–Kyle Street/Dev. Access AM Peak 2015 with Development and Business Park

AM Peak	2015	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
With Development		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
With Business park							Queue
							(m)
Kyle Street	Through	128	1666	0.082	1.4	LOS A	4
Southern Approach	Right	6	1666	0.082	1.4	LOS A	4
Development Access	Left	2	144	0.069	13.1	LOS A	3
Eastern Approach	Right	16	331	0.069	12.9	LOS A	3
Kyle Street	Left	25	413	0.09	9.3	LOS A	0
Northern Approach	Through	117	1316	0.09	0	LOS A	0
All Vehicles		294	3870	0.09	2.9	LOS A	4

Table 10-6: SIDRA Analysis–Kyle Street/Dev. Access PM Peak 2015 with Development and Business Park

PM Peak	2015	Dem Flow	Cap	Deg of Satn	Aver Delay	Level of	95%
With Development		(veh/h)	(veh/h)	(v/c)	(sec)	Service	Back of
							Queue
							(m)
Kyle Street	Through	148	1758	0.09	1.4	LOS A	5
Southern Approach	Right	2	1758	0.09	1.4	LOS A	5
Development Access	Left	5	119	0.143	12.7	LOS A	6
Eastern Approach	Right	24	476	0.143	12.6	LOS A	6
Kyle Street	Left	14	189	0.095	9.5	LOS A	0
Northern Approach	Through	145	1533	0.095	0	LOS A	0
All Vehicles		338	4074	0.143	3.6	LOS A	6

Discussion

From Tables 10-5 and 10-6, the intersection of Kyle Street and the access to the proposed development performs at Level of Service A during the morning and afternoon peak hours in 2015 with both the proposed development and the business park on the northern side of the New England Highway implemented.

11. SENSITIVITY: KYLE ST/NEW ENGLAND HWY - ROUNDABOUT

To test the robustness of the SIDRA model with the additional trips estimated to be generated by the proposed development, an additional analysis has been performed in which an additional 10 heavy vehicles have been added to each turning movements into and out of Kyle Street during the 2015 PM peak hour analysis with both the proposed development and the proposed business park to the north of the New England Highway.

The comparison between the results of this sensitivity analysis and the results of the analysis without the additional trips is shown below in Table 11-1.

Table 11-1: Results of Sensitivity Analysis - Kyle St/New England Hwy - Roundabout

	Dem Flow (veh/h)	Cap (veh/h)	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)
Total 2015 PM With Proposed Development and Business Park	2592	7123	0.453	8.5	LOS A	23
Total As Above with 10 Additional Trips for Each Turning Movement	2632	6824	0.473	8.7	LOS A	24

From Table 11-1, the performance of the proposed roundabout at the intersection of the New England Highway and Kyle Street is only marginally impacted by the addition of 10 heavy vehicles on each turning movement into and out of Kyle Street during the PM peak hour. It is expected that an analysis of the AM Peak would show similar results.

12. DISCUSSION

The proposed resource recovery and recycling facility is to be constructed at the former National Textiles plant at Rutherford, with access via an driveway to Kyle Street and from there to the New England Highway.

The proposed development will employ approximately 75 staff when full operational and is estimated to generate up to 44 trips during the morning and afternoon peak hours of which 22 are heavy vehicle trips.

SIDRA analysis of the existing intersections of the New England Highway/Kyle Street and Kyle Street/Development Access show the existing intersection layouts will be able to accommodate predicted traffic flows past the planning year 2015.

Further analysis shows that with the upgrade of the intersection of Kyle Street and New England Highway in conjunction with a proposed business park on the northern side of the New England Highway the intersection will continue to accommodate predicted traffic flows.

13. RECOMMENDATION

Based on this assessment of predicted traffic impacts it is recommended that the proposed development be approved.

Appendix A

Existing Turning Movements

New England Highway/Kyle Street, Rutherford

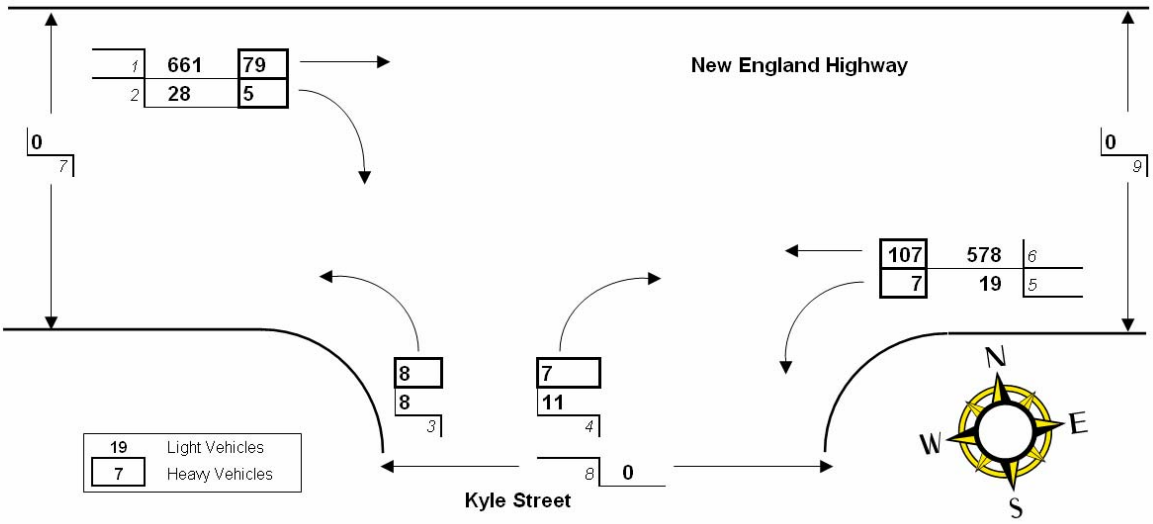
Kyle Street/Development Access, Rutherford

Quality Surveys

7/4/2005 - New England Highway / Kyle Street, Rutherford

8:30 <<< HOUR ENDING Thursday

Summary: New England Highway / Kyle Street	
1305	Total Light Vehicles
213	Total Heavy Vehicles
0	Total Pedestrians



7/4/2005 - New England Highway / Kyle Street, Rutherford

Light Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
07:15	99	12	2	2	2	138	0	0	0	255	
07:30	115	8	4	1	2	129	0	0	0	259	
07:45	147	6	2	3	7	156	0	0	0	321	
08:00	150	10 <	0	3	5	150	0	0	0	318	1153
08:15	173	4	1	2	6	133	0	0	0	319	1217
08:30	191	8	5	3	1	139 <	0	0	0	347	1305 <
08:45	156	5	2	1	8	138	0	0	0	310	1294
09:00	154 <	6	6	2	7	118	0	0	0	293	1269
09:15	146	6	3 <	3	9	87	0	0	0	254	1204
09:30	129	10	4	7 <	7 <	112	0	0	0	269	1126

Heavy Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
07:15	11	1	5	0	2	24	43	
07:30	16	6	2	0	3	23	50	
07:45	19	1	2	2	0	35	59	
08:00	23	2 <	1 <	3	4 <	17	50	202
08:15	18	1	5	0	2	24	50	209
08:30	19 <	1	0	2 <	1	31 <	54	213 <
08:45	15	0	3	0	0	15	33	187
09:00	17	0	1	1	1	19	39	176
09:15	14	1	2	0	2	26	45	171
09:30	18	1	1	4	2	26	52	169

All Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
07:15	109	13	8	2	4	162	0	0	0	298	
07:30	131	14	6	1	5	152	0	0	0	309	
07:45	166	7	4	5	7	191	0	0	0	380	
08:00	173	12 <	1	6	9	167	0	0	0	368	1355
08:15	191	5	6	2	8	157	0	0	0	369	1426
08:30	210	9	5	5 <	2	170 <	0	0	0	401	1518 <
08:45	171 <	5	5	1	8	153	0	0	0	343	1481
09:00	171	6	7 <	3	8	137	0	0	0	332	1445
09:15	160	7	5	3	11	113	0	0	0	299	1375
09:30	147	11	5	11 <	9 <	138	0	0	0	321	1295

Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

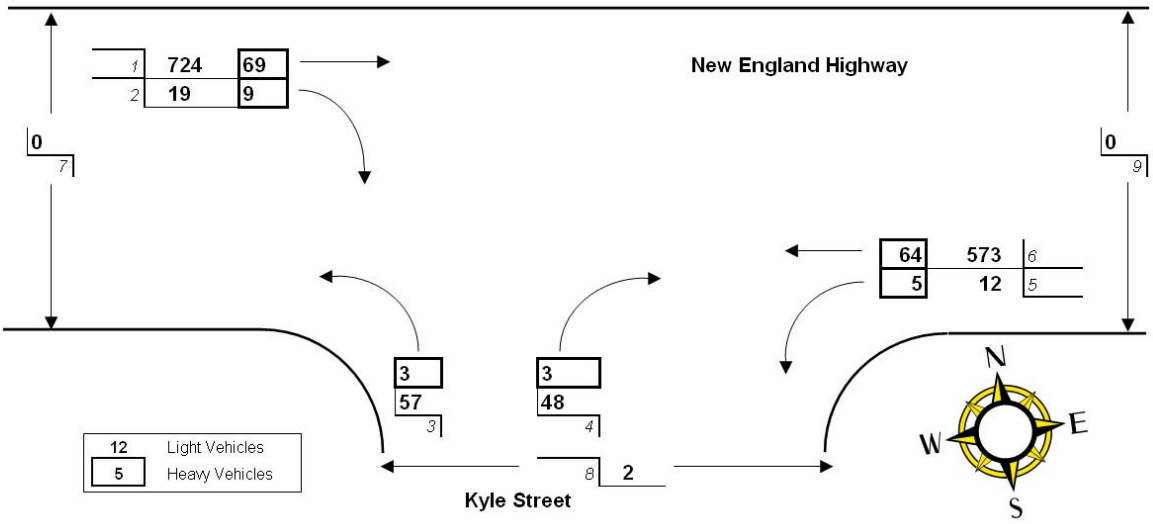
Quality Surveys

6/4/2005 - New England Highway / Kyle Street, Rutherford

16:30 <<< HOUR ENDING Wednesday

Summary:

New England Highway / Kyle Street	
1433	Total Light Vehicles
153	Total Heavy Vehicles
2	Total Pedestrians



6/4/2005 - New England Highway / Kyle Street, Rutherford

Light Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
15:15	156	4	8	2	4	130	0	0	0	304	
15:30	169	5	13	4	4	132	0	0	0	327	
15:45	178	6	29	19	3	147	0	0	0	382	
16:00	171	2	10 <	14	4 <	133	0	0	0	334	1347
16:15	184	5	8 <	9	2	144	0	1	0	352	1395
16:30	191	6 <	10	6 <	3	149	0	1 <	0	365	1433 <
16:45	176	4	9	8	6 <	130	0	0 <	0	333	1384
17:00	177 <	1	5	12	2	152	0	0 <	0	349	1399
17:15	182	3	4	9	2	166	0	0	0	366	1413
17:30	174	1	4	3	0	157 <	0	0	0	339	1387

Heavy Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
15:15	26	1	1	4	1	16	49	
15:30	16	1	2	0	0	18	37	
15:45	18	2	0	1	3	13	37	
16:00	17	4	2 <	2 <	1 <	26 <	52	175 <
16:15	12	2	0	0	0	15	29	155
16:30	22	1	1	0	1 <	10	35	153
16:45	21	2	0	1	0	14	38	154
17:00	25	4	2	0	1	8	40	142
17:15	15 <	2	0	2	1	7	27	140
17:30	11	2 <	1	0	2	12	28	133

All Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
15:15	182	5	9	6	5	146	0	0	0	353	
15:30	185	6	15	4	4	150	0	0	0	364	
15:45	196	8	29	20	6	160	0	0	0	419	
16:00	188	6	12 <	16	5 <	159	0	0	0	386	1522
16:15	196	7	8	9	2	159	0	1	0	381	1550
16:30	213	7 <	11	6 <	4	159	0	1 <	0	400	1586 <
16:45	197	6	9	9	6	144	0	0 <	0	371	1538
17:00	202	5	7	12	3	160	0	0 <	0	389	1541
17:15	197 <	5	4	11	3	173	0	0	0	393	1553
17:30	185	3	5	3	2	169 <	0	0	0	367	1520

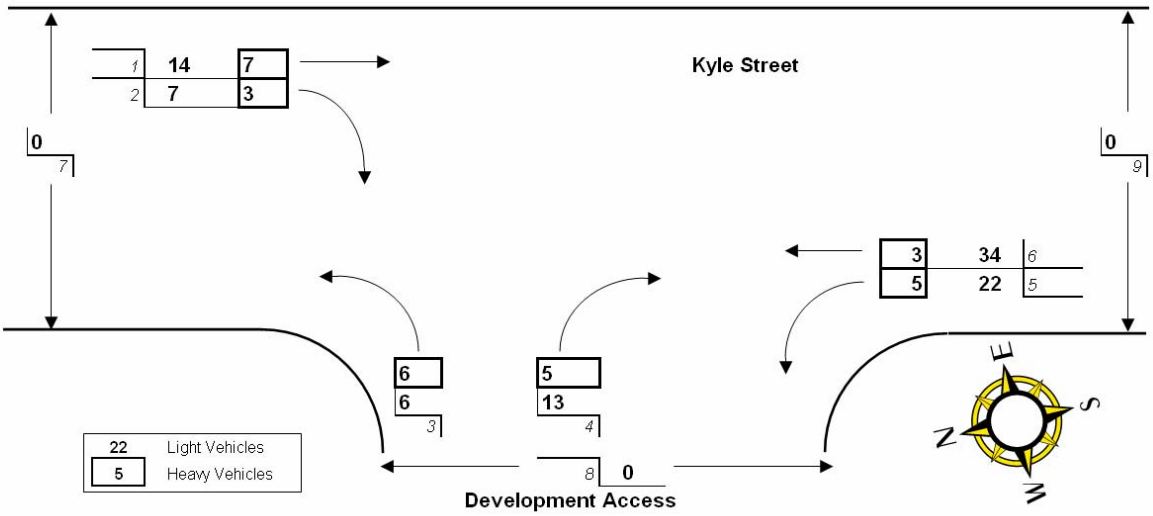
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

Quality Surveys

7/4/2005 - Kyle Street / Development Access, Rutherford

9:30 <<< HOUR ENDING Thursday

Summary: Kyle Street / Development Access	
96	Total Light Vehicles
29	Total Heavy Vehicles
0	Total Pedestrians



7/4/2005 - Kyle Street / Development Access, Rutherford

Light Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
07:15	2	0	0	3	4	9	0	0	0	18	
07:30	4	0	1	2	3	7	0	0	0	17	
07:45	3	0	0	1	4	8	0	0	0	16	
08:00	1	0	2	2	6	8	0	0	0	19	70
08:15	1	1	0	2	3	7	0	0	0	14	66
08:30	3	1	1	5	2	7	0	0	0	19	68
08:45	3	1	2	0	5	7	0	0	0	18	70
09:00	6	2	1	1	2	11	0	0	0	23	74
09:15	1	4 <	1	5	8	8	0	0	0	27	87
09:30	4 <	0	2 <	7 <	7 <	8 <	0	0	0	28	96 <

Heavy Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR
07:15	5	1	0	0	2	1	10	
07:30	1	0	0	0	2	7	10	
07:45	2	0	0	2	0	1	5	
08:00	3 <	0	1	1	4 <	2 <	11	36
08:15	5	0	1	1	2	1	10	36 <
08:30	1	0	0	0	0	2	3	29
08:45	2	1	0	1	0	0	4	28
09:00	2	1	4	0	0	0	7	24
09:15	2	0	0	1	2	2	7	21
09:30	1	1 <	2 <	3 <	3	1	11	29

All Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR
07:15	8	1	0	3	6	10	0	0	0	28	
07:30	5	0	1	2	5	14	0	0	0	27	
07:45	5	0	0	3	4	9	0	0	0	21	
08:00	4	0	3	3	10	10 <	0	0	0	30	106
08:15	6	1	1	3	5	8	0	0	0	24	102
08:30	4	1	1	5	2	9	0	0	0	22	97
08:45	5	2	2	1	5	7	0	0	0	22	98
09:00	8 <	3	5	1	2	11	0	0	0	30	98
09:15	3	4 <	1	6	10	10	0	0	0	34	108
09:30	5	1 <	4 <	10 <	10 <	9	0	0	0	39	125 <

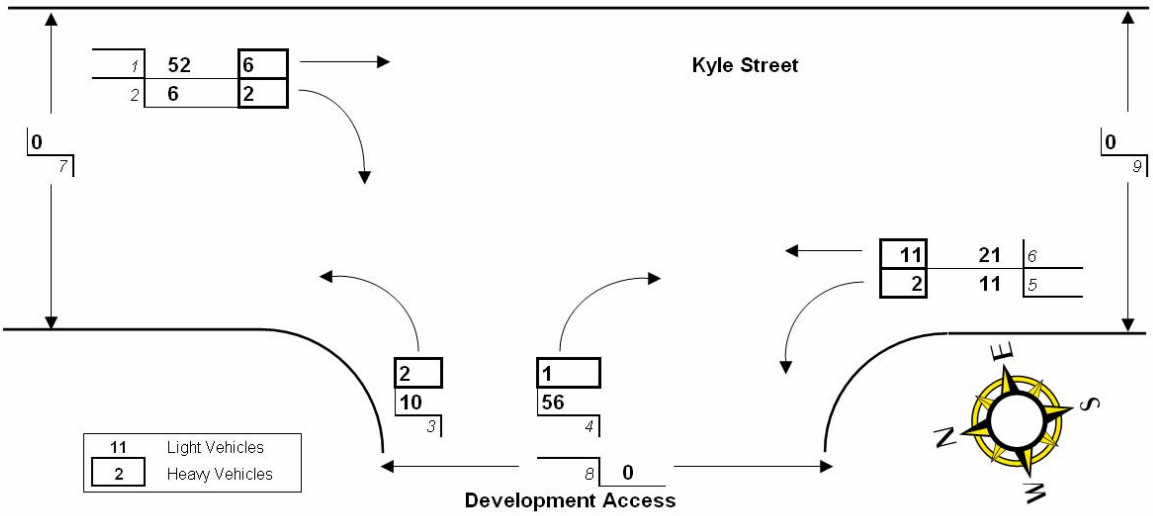
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

Quality Surveys

6/4/2005 - Kyle Street / Development Access, Rutherford

16:15 <<< HOUR ENDING Wednesday

Summary: Kyle Street / Development Access	
156	Total Light Vehicles
24	Total Heavy Vehicles
0	Total Pedestrians



6/4/2005 - Kyle Street / Development Access, Rutherford

Light Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR	
15:15	8	2	0	2	5	3	0	0	0	20		
15:30	10	1	1	12	5	5	0	0	0	34		
15:45	24	2	2	20	1	9	0	0	0	58		
16:00	9	2 <	3	15	3 <	3	0	0	0	35	147	
16:15	9	1	4	9 <	2	4	0	0	0	29	156 <	
16:30	11 <	1	1	7	2	8 <	0	0	0	30	152	
16:45	8	0	4 <	9	6	3	0	0	0	30	124	
17:00	8	0	0	10	1	2	0	0	0	21	110	
17:15	8	0	0	5	1	4	0	0	0	18	99	
17:30	7	0	1	4	0	1	0	0	0	13	82	

Heavy Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN	HOUR	
15:15	4	0	0	1	1	1	7		
15:30	2	1	2	0	0	1	6		
15:45	0	0	0	1	0	5	6		
16:00	4 <	1 <	0 <	0 <	1	4	10	29 <	
16:15	0	0 <	0 <	0	1	1	2	24	
16:30	1	0	0	0	1 <	2 <	4	22	
16:45	1	0	0	0	0 <	1	2	18	
17:00	2	0	0	0	0	5	7	15	
17:15	2	0	0	0	1	2	5	18	
17:30	1	0	0	0	1	2	4	18	

All Vehicles

	1	2	3	4	5	6	7	8	9	Total Vehicles 15 MIN	HOUR	
15:15	12	2	0	3	6	4	0	0	0	27		
15:30	12	2	3	12	5	6	0	0	0	40		
15:45	24	2	2	21	1	14	0	0	0	64		
16:00	13 <	3 <	3	15	4 <	7	0	0	0	45	176	
16:15	9	1	4 <	9 <	3	5	0	0	0	31	180 <	
16:30	12	1	1	7	3	10 <	0	0	0	34	174	
16:45	9	0	4 <	9	6 <	4	0	0	0	32	142	
17:00	10	0	0	10	1	7	0	0	0	28	125	
17:15	10	0	0	5	2	6	0	0	0	23	117	
17:30	8	0	1	4	1	3	0	0	0	17	100	

Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

Appendix B

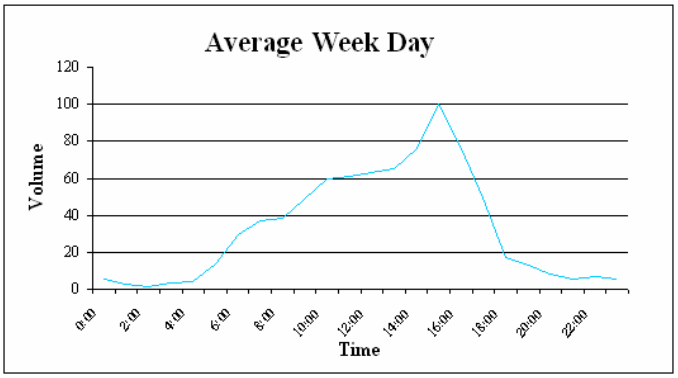
Automatic Counts

Kyle Street South of SH9, Rutherford

Development Access East of Kyle Street, Rutherford

Kyle Street South of the New England Highway, Rutherford **Northbound**

Day	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*Wed*	*Thu*	*W/Day*	*W/End*	*7 Day*
Time	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	*Ave.*	*Ave.*	*Ave*
0:00	5	8	1	1	2	7	11	5	9	5
1:00	3	0	3	3	1	4	3	3	4	2
2:00	1	2	3	2	1	0	4	2	2	2
3:00	1	3	3	7	1	4	3	3	4	3
4:00	6	3	5	4	8	0	1	4	1	4
5:00	20	14	4	12	12	10	15	14	13	12
6:00	28	13	9	20	32	33	36	30	35	24
7:00	34	15	5	37	31	46	36	37	41	29
8:00	43	17	7	46	29	32	42	38	37	31
9:00	54	28	12	57	48	54	30	49	42	40
10:00	51	27	11	65	51	52	78	59	65	48
11:00	51	44	20	81	61	66	47	61	57	53
12:00	51	35	17	63	53	82	66	63	74	52
13:00	78	20	15	78	57	78	36	65	57	52
14:00	48	25	24	122	60	84	65	76	75	61
15:00	77	16	22	120	98	117	90	100	104	77
16:00	65	12	24	77	84	77	78	76	78	60
17:00	54	9	31	54	47	53	40	50	47	41
18:00	14	14	24	21	12	24	15	17	20	18
19:00	10	8	20	9	20	16	10	13	13	13
20:00	5	4	17	7	9	8	12	8	10	9
21:00	2	8	6	6	7	10	2	5	6	6
22:00	3	3	10	7	11	6	6	7	6	7
23:00	11	0	4	0	2	12	2	5	7	4
Total	**715**	**328**	**297**	**899**	**737**	**875**	**728**	**791**	**802**	**654**

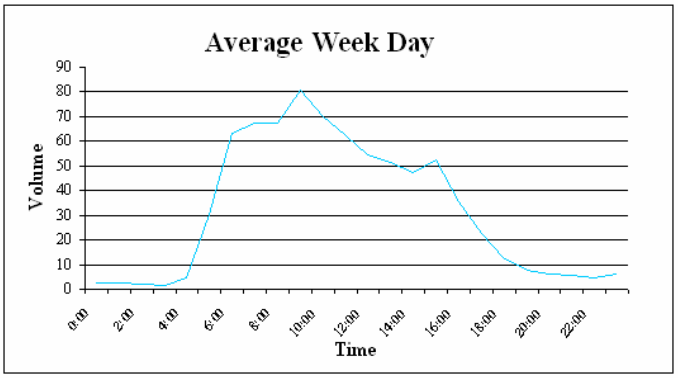


Summary

	from	to	
AM Peak	11:00 AM	12:00 PM	**81**
PM Peak	2:00 PM	3:00 PM	**122**
	Week Day Average		**791**
	Weekend Day Average		**313**
	7 Day Average		**654**

Kyle Street South of the New England Highway, Rutherford **Southbound**

Day	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*Wed*	*Thu*	*W/Day*	*W/End*	*7 Day*
Time	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	*Ave.*	*Ave.*	*Ave*
0:00	2	3	4	4	2	4	2	3	3	3
1:00	3	0	0	6	1	1	1	2	1	2
2:00	1	1	3	0	0	2	7	2	5	2
3:00	1	4	1	1	0	2	3	1	3	2
4:00	6	3	4	3	10	2	1	4	2	4
5:00	20	19	4	41	29	33	30	31	32	25
6:00	59	16	4	66	59	65	68	63	67	48
7:00	66	21	4	74	59	67	71	67	69	52
8:00	72	30	8	75	55	82	52	67	67	53
9:00	55	30	24	96	60	128	65	81	97	65
10:00	64	28	13	85	57	89	55	70	72	56
11:00	54	35	14	80	69	52	56	62	54	51
12:00	37	20	11	75	52	56	53	55	55	43
13:00	60	19	15	57	57	47	35	51	41	41
14:00	46	11	12	50	38	40	63	47	52	37
15:00	54	14	24	51	60	51	46	52	49	43
16:00	28	7	22	28	48	42	32	36	37	30
17:00	29	15	21	18	16	22	29	23	26	21
18:00	17	8	24	9	12	11	12	12	12	13
19:00	14	7	26	4	12	5	4	8	5	10
20:00	1	5	9	7	7	8	8	6	8	6
21:00	4	6	5	11	4	6	3	6	5	6
22:00	3	3	6	1	8	9	2	5	6	5
23:00	8	1	3	3	3	7	9	6	8	5
Total	**704**	**306**	**261**	**845**	**718**	**831**	**707**	**761**	**769**	**625**

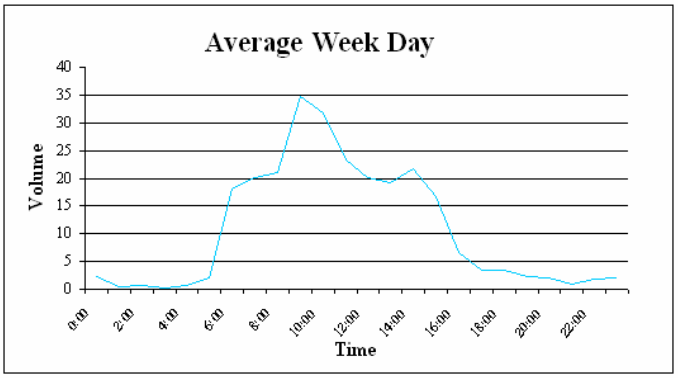


Summary

	from	to	
AM Peak	9:00 AM	10:00 AM	**128**
PM Peak	2:00 PM	3:00 PM	**63**
Week Day Average			**761**
Weekend Day Average			**284**
7 Day Average			**625**

Development Access, Rutherford **Eastbound**

Day	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*Wed*	*Thu*	*W/Day*	*W/End*	*7 Day*
Time	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	*Ave.*	*Ave.*	*Ave*
0:00	1	1	0	4	1	5	0	2	3	2
1:00	1	1	1	0	0	0	1	0	1	1
2:00	0	1	2	0	0	1	3	1	2	1
3:00	0	1	1	0	0	1	0	0	1	0
4:00	1	1	2	1	0	1	1	1	1	1
5:00	2	7	1	2	1	3	2	2	3	3
6:00	18	6	0	19	18	19	16	18	18	14
7:00	17	5	0	15	21	23	25	20	24	15
8:00	16	12	2	20	24	29	16	21	23	17
9:00	14	12	11	23	24	89	24	35	57	28
10:00	19	7	5	19	32	61	28	32	45	24
11:00	24	10	2	27	23	27	16	23	22	18
12:00	13	4	2	21	24	22	21	20	22	15
13:00	22	5	1	11	27	23	13	19	18	15
14:00	14	5	6	20	26	23	26	22	25	17
15:00	17	2	5	12	19	20	16	17	18	13
16:00	4	3	5	3	10	9	7	7	8	6
17:00	3	2	2	2	3	3	6	3	5	3
18:00	5	2	3	2	2	3	5	3	4	3
19:00	5	2	6	1	2	0	3	2	2	3
20:00	0	2	1	1	3	4	2	2	3	2
21:00	1	2	2	0	1	2	1	1	2	1
22:00	1	1	1	0	7	1	0	2	1	2
23:00	1	1	0	1	2	2	4	2	3	2
Total	**199**	**95**	**61**	**204**	**270**	**371**	**236**	**256**	**304**	**205**

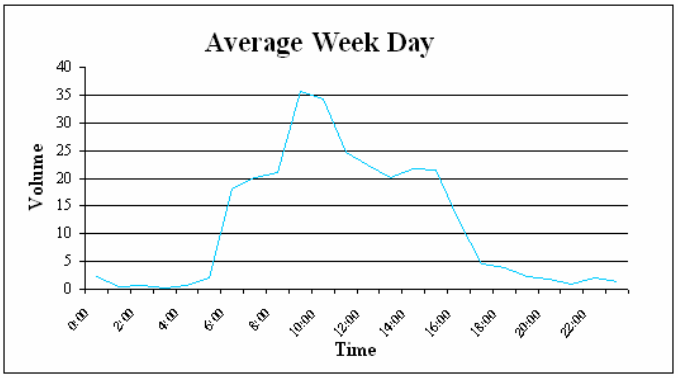


Summary

	from	to	
AM Peak	9:00 AM	10:00 AM	**89**
PM Peak	1:00 PM	2:00 PM	**27**
	Week Day Average		**256**
	Weekend Day Average		**78**
	7 Day Average		**205**

Development Access, Rutherford **Westbound**

Day	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*Wed*	*Thu*	*W/Day*	*W/End*	*7 Day*
Time	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	*Ave.*	*Ave.*	*Ave*
0:00	1	1	0	4	1	5	0	2	3	2
1:00	1	1	1	0	0	0	1	0	1	1
2:00	0	1	2	0	0	1	3	1	2	1
3:00	0	1	1	0	0	1	0	0	1	0
4:00	1	1	2	1	0	1	1	1	1	1
5:00	2	7	1	2	1	3	2	2	3	3
6:00	18	6	0	19	18	19	16	18	18	14
7:00	17	5	0	15	21	23	25	20	24	15
8:00	16	12	2	20	24	29	16	21	23	17
9:00	14	12	11	23	24	89	28	36	59	29
10:00	19	7	5	19	32	61	41	34	51	26
11:00	24	10	2	27	23	27	23	25	25	19
12:00	13	4	2	21	24	22	32	22	27	17
13:00	22	5	1	11	27	23	18	20	21	15
14:00	14	5	6	20	26	23	26	22	25	17
15:00	17	2	5	12	19	20	40	22	30	16
16:00	4	3	5	3	10	9	36	12	23	10
17:00	3	2	2	2	3	3	12	5	8	4
18:00	5	2	3	2	2	3	7	4	5	3
19:00	5	2	6	1	2	0	4	2	2	3
20:00	0	2	1	1	3	4	1	2	3	2
21:00	1	2	2	0	1	2	1	1	2	1
22:00	1	1	1	0	7	1	1	2	1	2
23:00	1	1	0	1	2	2	1	1	2	1
Total	**199**	**95**	**61**	**204**	**270**	**371**	**335**	**276**	**353**	**219**

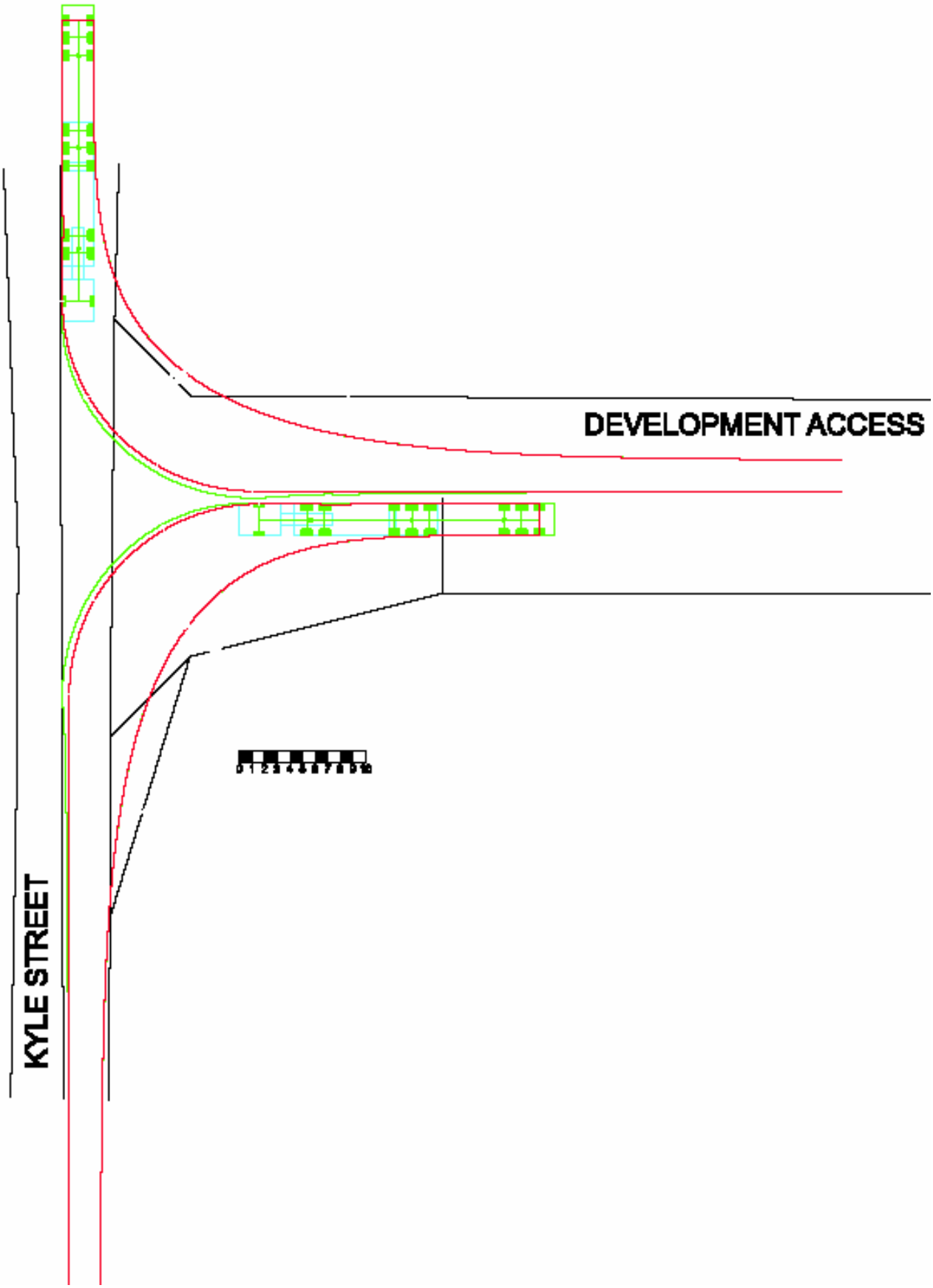


Summary

	from	to	
AM Peak	9:00 AM	10:00 AM	**89**
PM Peak	3:00 PM	4:00 PM	**40**
Week Day Average			**276**
Weekend Day Average			**78**
7 Day Average			**219**

Appendix C

Access Turning Paths


DEVELOPMENT ACCESS
KYLE STREET