

APPENDIX 2

Addendum to Traffic and Transport Planning Statement

Introduction

Council has requested that we investigate the traffic impacts on roads and calculate the level of service at the Jamberoo Road/Banksia Street roundabout if a second dwelling was erected on every new lot over 300m².

Assumptions Made

To analyse the Level of Service at the Jamberoo Road/Banksia Street roundabout some traffic flows needed to be calculated for Jamberoo Road west of Banksia Street. The following assumptions/traffic flows have been used to calculate traffic flows along Jamberoo Road

- (i) AADT on Jamberoo Road west of Dido Street is approximately 800
- (ii) Dido Street serves approximately 55 houses, and
- (iii) We have assumed another 50 lots could be developed off Dido Street

Traffic Impacts

The calculated AADT for Jamberoo Road west of Banksia Street is

(i) No Second Dwellings	
800 trips per day on Jamberoo Road	= 800
55 existing lots serviced by Dido Street @ 10 trips per lot	= 550
50 future lots off Dido Street @ 10 trips per lot	= 500
Therefore AADT for Jamberoo Road would be	= <u>1,850</u>

(ii) Second Dwellings on all new lots plus increase on Jamberoo Road	
850 trips per day on Jamberoo Road	= 850
55 existing lots serviced by Dido Street @ 10 trips per lot	= 550
100 future dwellings off Dido Street @ 10 trips per lot	= <u>1,000</u>
Therefore AADT for Jamberoo Road would be	= <u>2,400</u>

The masterplan for Stage 2 of the Cedar Grove Estate indicate a possible lot yield of 78 lots greater than 450m² and 20 small lots only suitable for a single dwelling. If a second dwelling was constructed on each of the 78 lots then the AADT on the access road to stage 2 and along Banksia Street would increase by 780 by the volumes originally calculated.

Figure 1 overleaf shows the predicted average daily traffic volumes along key roads within the subject site, the adjacent Cedar Grove Estate and Jamberoo Road assuming single dwellings on each lot.

Figure 2 overleaf shows the predicted peak hour traffic flows along key roads within the subject site, the adjacent Cedar Grove Estate and Jamberoo Road assuming a second dwelling is constructed on 78 lots within stage 2 of the Cedar Grove Estate and 50 future lots off Dido Street.

Intersection Analysis

Peak hour flows have been calculated at the Jamberoo Road/Banksia Street roundabout by using the AADT volumes in Figures 1 & 2 and assuming

- peak hour flows are 10% of the AADT volumes; and
- peak hour flow splits of 70/30.

A SIDRA analysis of the roundabout has been undertaken for the following four scenarios

- (i) am peak – no second dwellings
- (ii) pm peak – no second dwellings
- (iii) am peak – second dwellings on all future lots, and
- (iv) pm peak – second dwellings on all future lots

The SIDRA analysis shows that all legs of the roundabout operate at a Level of Service of A.

A copy of the SIDRA analysis for the four options is attached overleaf.

Conclusions

The traffic impacts of this development do not impose any unacceptable effects on either the existing and proposed roads networks or residents within the Cedar Grove Estate.



FIGURE 1

Average Annual Daily Traffic Flows

LOTS 1 & 2 DP 797732 & LOTS 1, 2, 3 & 4 SEC 67 DP 758563

JAMBEROO ROAD

KIAMA

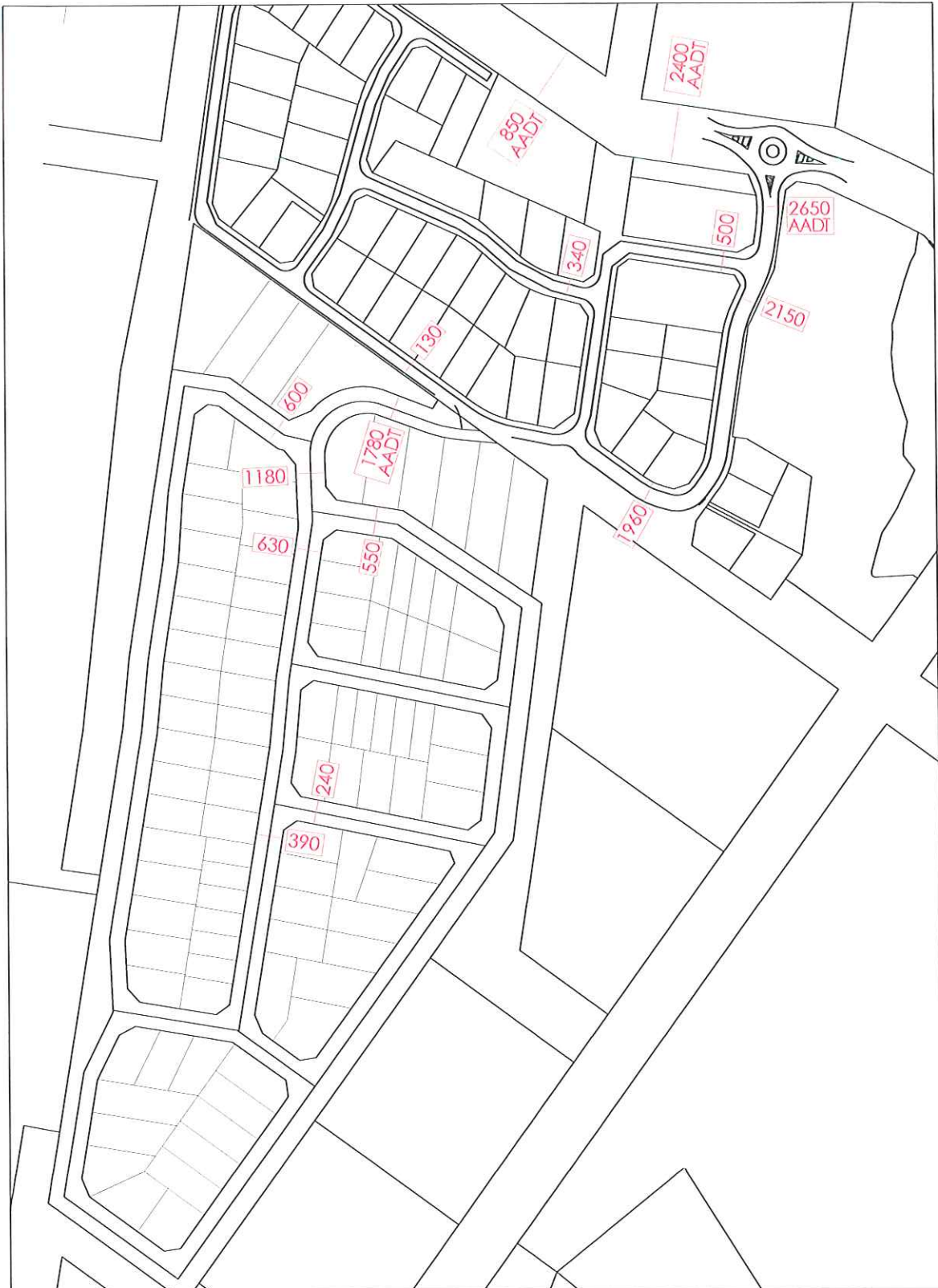


FIGURE II

Average Annual Daily Traffic Flows

LOTS 1 & 2 DP 797732 & LOTS 1, 2, 3 & 4 SEC 67 DP 758563

JAMBEROO ROAD, KIAMA

ASSUMING SECOND DWELLING ON NEW LOTS > 450m²



Intersection Summary

Roundabout with single lane approaches and circulating lanes

AM PEAK

Performance Measure	Vehicles	Persons
Demand Flows - Total	392 veh/h	588 pers/h
Percent Heavy Vehicles	0.0 %	
Degree of Saturation	0.118	
Effective Intersection Capacity	3332 veh/h	
95% Back of Queue (m)	4 m	
95% Back of Queue (veh)	0.6 veh	
Control Delay (Total)	0.70 veh-h/h	1.05 pers-h/h
Control Delay (Average)	6.4 s/veh	6.4 s/pers
Level of Service	LOS A	
Level of Service (Worst Movement)	LOS A	
Total Effective Stops	214 veh/h	322 pers/h
Effective Stop Rate	0.55 per veh	0.55 per pers
Proportion Queued	0.14	0.14
Travel Distance (Total)	58.0 veh-km/h	86.9 pers-km/h
Travel Distance (Average)	148 m	148 m
Travel Time (Total)	1.9 veh-h/h	2.9 pers-h/h
Travel Time (Average)	17.5 secs	17.5 secs
Travel Speed	30.4 km/h	30.4 km/h
Operating Cost (Total)	66 \$/h	66 \$/h
Fuel Consumption (Total)	10.1 L/h	
Carbon Dioxide (Total)	25.3 kg/h	
Hydrocarbons (Total)	0.048 kg/h	
Carbon Monoxide (Total)	2.77 kg/h	
NOX (Total)	0.068 kg/h	



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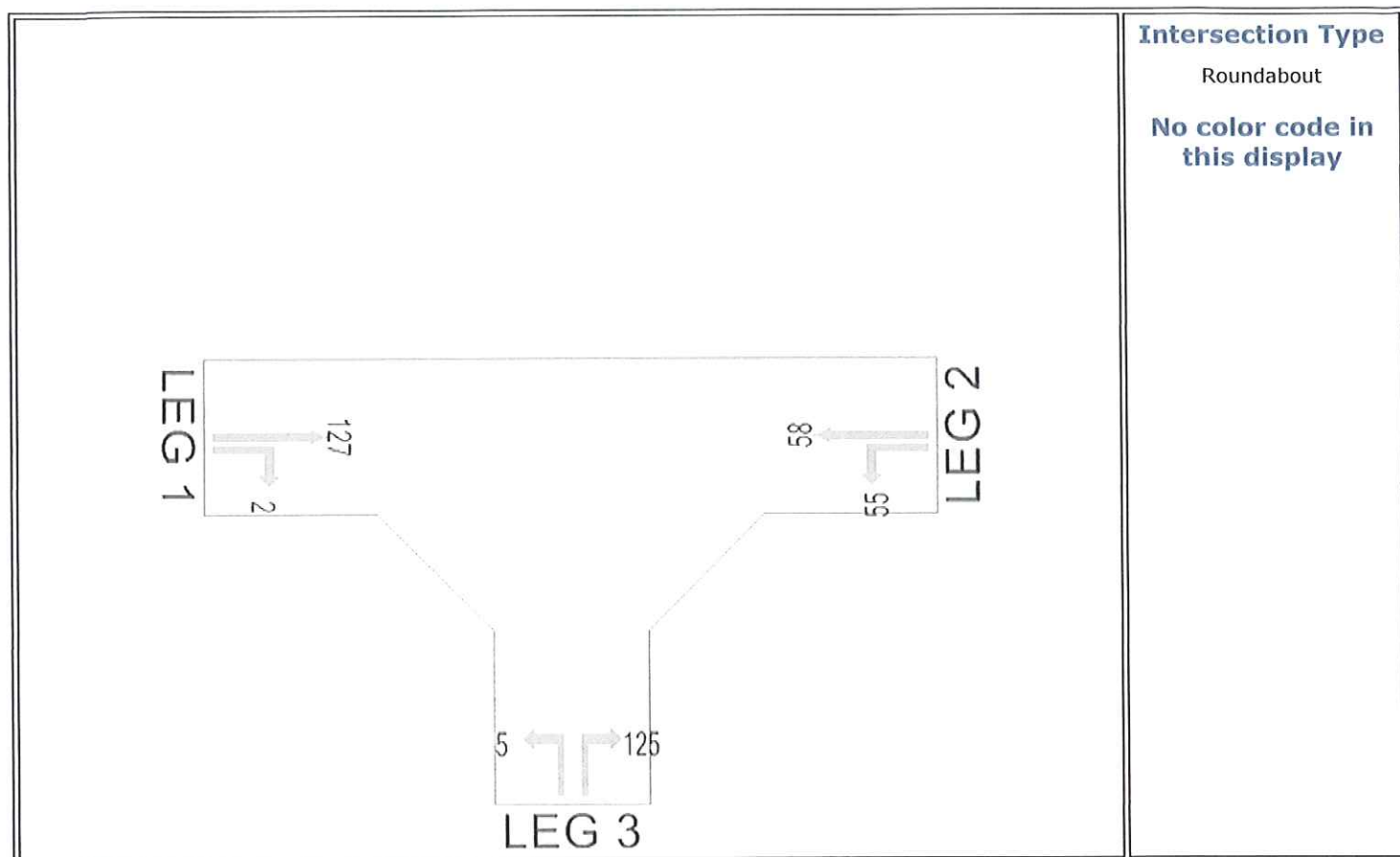
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Input Volumes

Total flow rates as given by the user (veh/60 min)

Roundabout with single lane approaches and circulating lanes

AM PEAK



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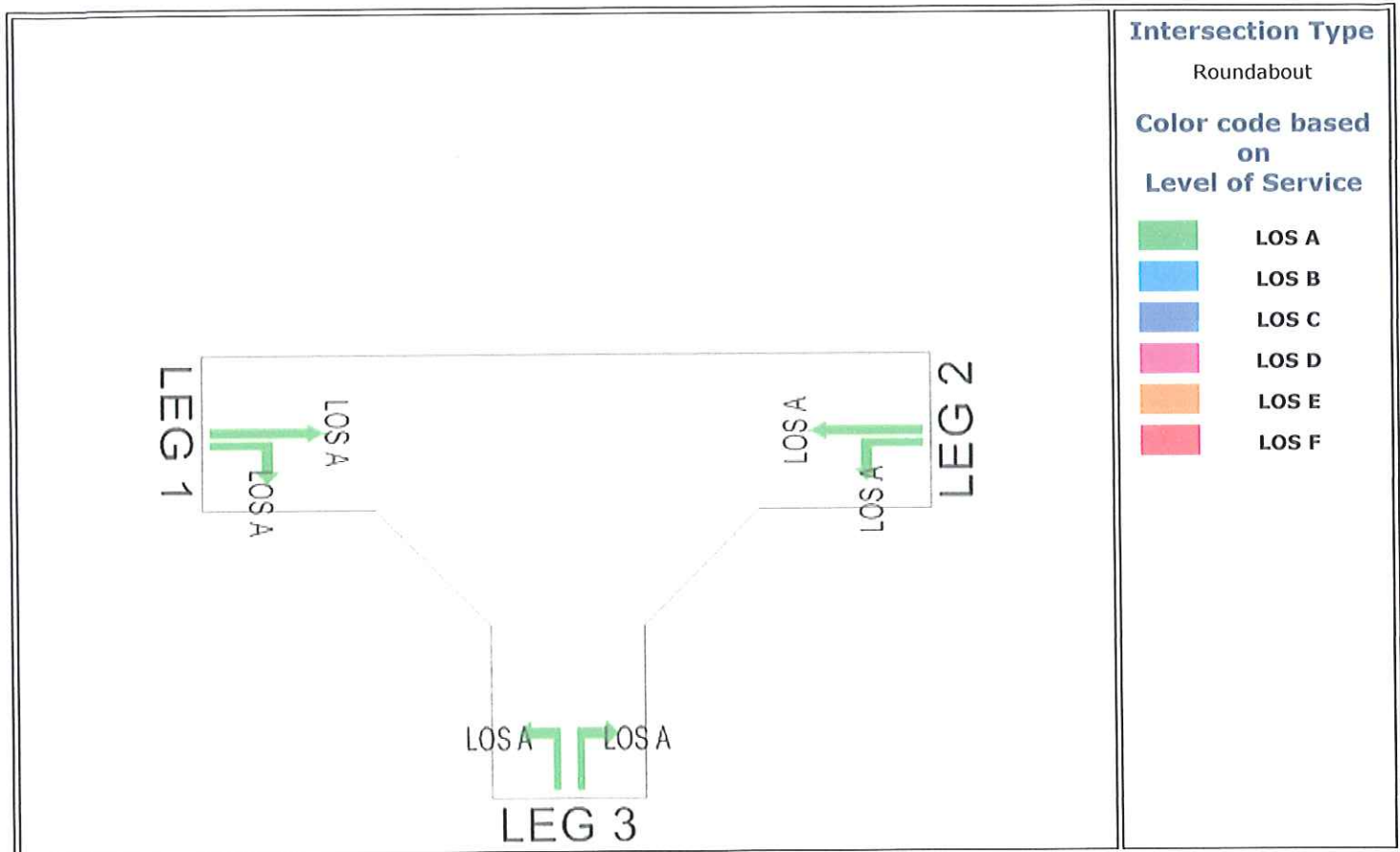
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Level of Service

Based on Delay (HCM method)

Roundabout with single lane approaches and circulating lanes

AM PEAK



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Intersection Summary

Roundabout with single lane approaches and circulating lanes

PM PEAK NDO

Performance Measure	Vehicles	Persons
Demand Flows - Total	392 veh/h	588 pers/h
Percent Heavy Vehicles	0.0 %	
Degree of Saturation	0.169	
Effective Intersection Capacity	2325 veh/h	
95% Back of Queue (m)	6 m	
95% Back of Queue (veh)	0.9 veh	
Control Delay (Total)	0.63 veh-h/h	0.94 pers-h/h
Control Delay (Average)	5.8 s/veh	5.8 s/pers
Level of Service	LOS A	
Level of Service (Worst Movement)	LOS A	
Total Effective Stops	204 veh/h	305 pers/h
Effective Stop Rate	0.52 per veh	0.52 per pers
Proportion Queued	0.08	0.08
Travel Distance (Total)	56.8 veh-km/h	85.2 pers-km/h
Travel Distance (Average)	145 m	145 m
Travel Time (Total)	1.8 veh-h/h	2.7 pers-h/h
Travel Time (Average)	16.4 secs	16.4 secs
Travel Speed	31.7 km/h	31.7 km/h
Operating Cost (Total)	63 \$/h	63 \$/h
Fuel Consumption (Total)	9.7 L/h	
Carbon Dioxide (Total)	24.3 kg/h	
Hydrocarbons (Total)	0.046 kg/h	
Carbon Monoxide (Total)	2.66 kg/h	
NOX (Total)	0.065 kg/h	



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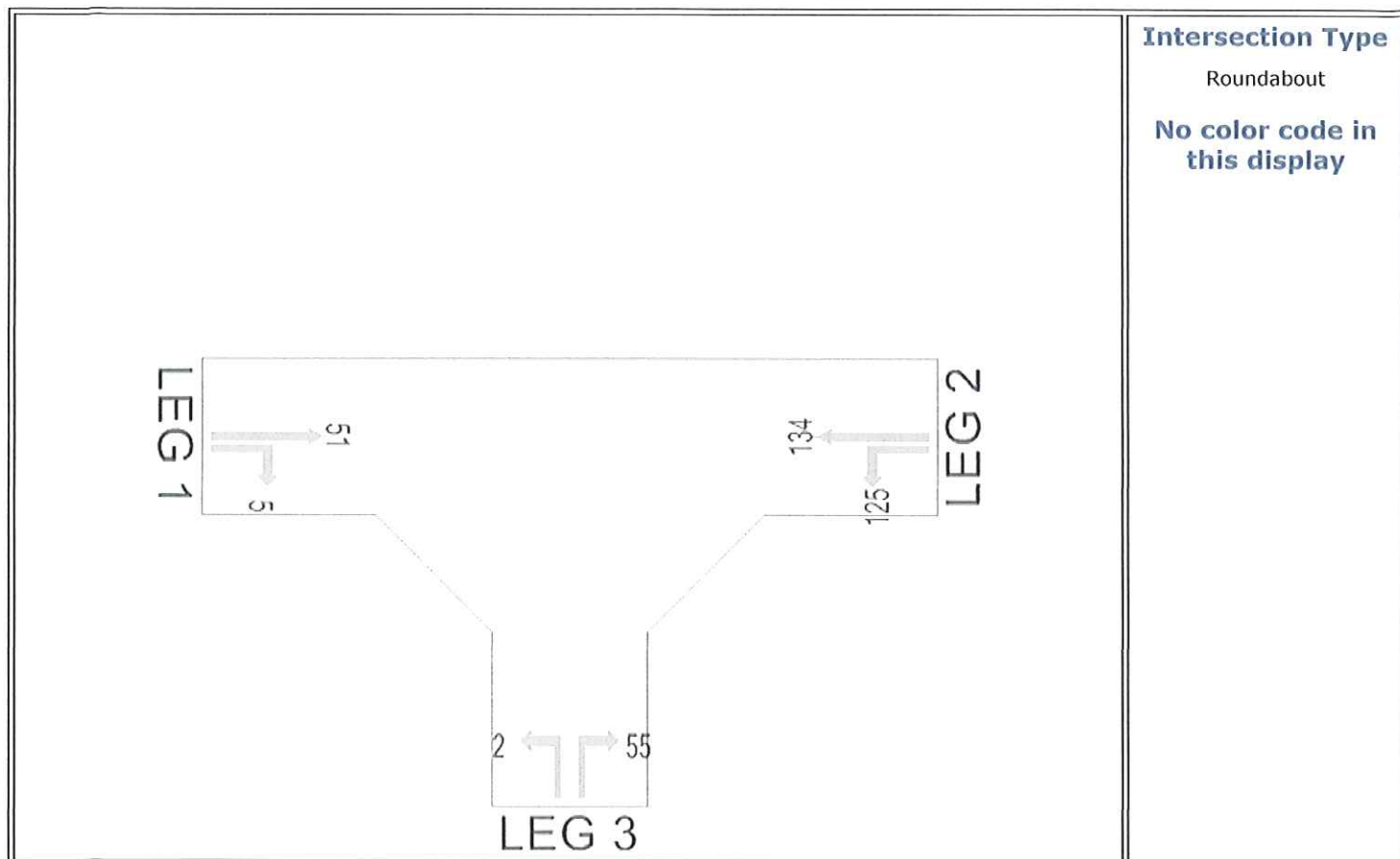
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Roundabout with single lane approaches and circulating lanes

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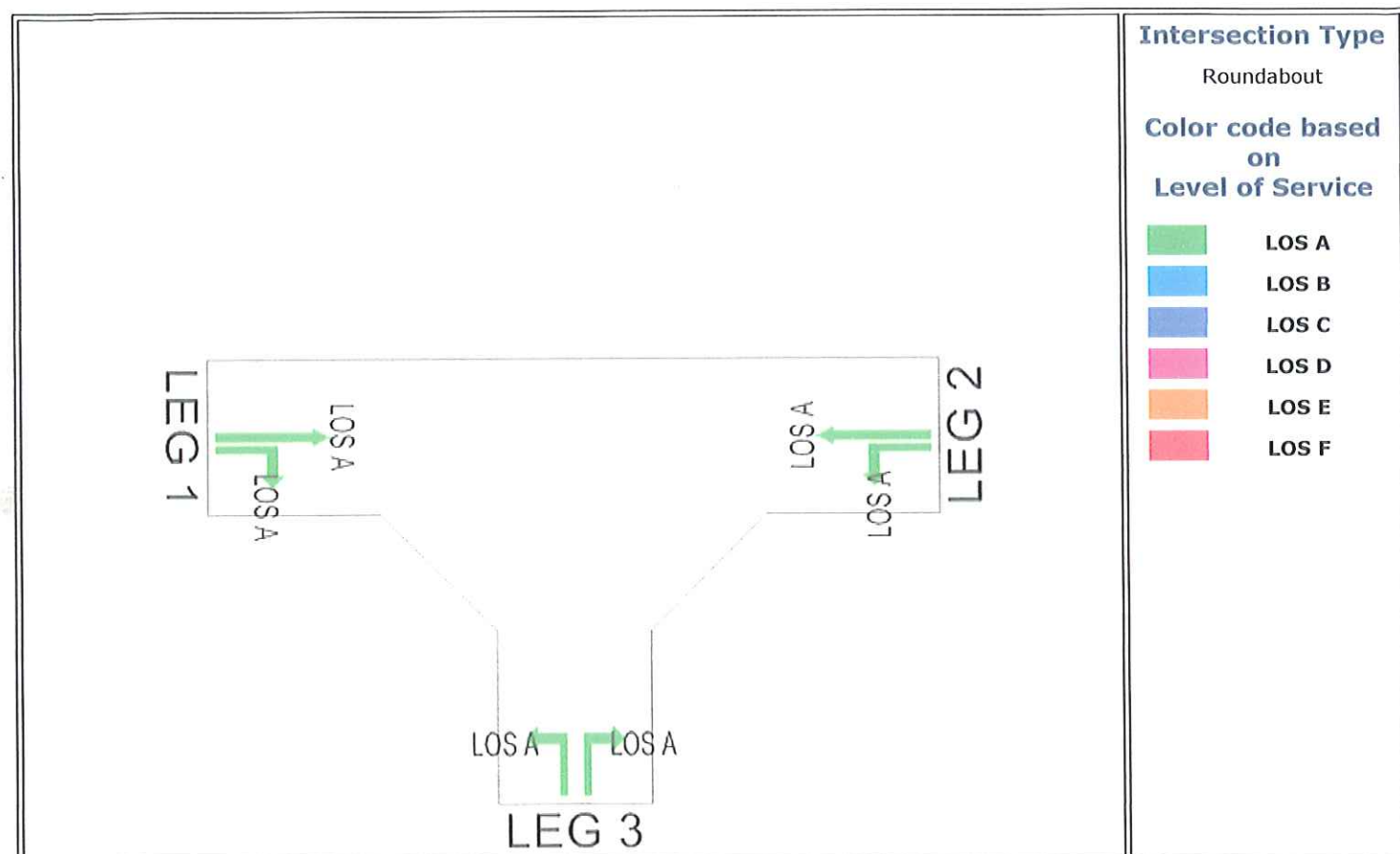
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Level of Service

Based on Delay (HCM method)

Roundabout with single lane approaches and circulating lanes

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Intersection Summary

Roundabout with single lane approaches and circulating lanes

PM PEAK DO

Performance Measure	Vehicles	Persons
Demand Flows - Total	532 veh/h	798 pers/h
Percent Heavy Vehicles	0.0 %	
Degree of Saturation	0.227	
Effective Intersection Capacity	2344 veh/h	
95% Back of Queue (m)	9 m	
95% Back of Queue (veh)	1.3 veh	
Control Delay (Total)	0.86 veh-h/h	1.29 pers-h/h
Control Delay (Average)	5.8 s/veh	5.8 s/pers
Level of Service	LOS A	
Level of Service (Worst Movement)	LOS A	
Total Effective Stops	278 veh/h	418 pers/h
Effective Stop Rate	0.52 per veh	0.52 per pers
Proportion Queued	0.09	0.09
Travel Distance (Total)	77.1 veh-km/h	115.6 pers-km/h
Travel Distance (Average)	145 m	145 m
Travel Time (Total)	2.4 veh-h/h	3.7 pers-h/h
Travel Time (Average)	16.5 secs	16.5 secs
Travel Speed	31.6 km/h	31.6 km/h
Operating Cost (Total)	85 \$/h	85 \$/h
Fuel Consumption (Total)	13.3 L/h	
Carbon Dioxide (Total)	33.2 kg/h	
Hydrocarbons (Total)	0.062 kg/h	
Carbon Monoxide (Total)	3.64 kg/h	
NOX (Total)	0.089 kg/h	



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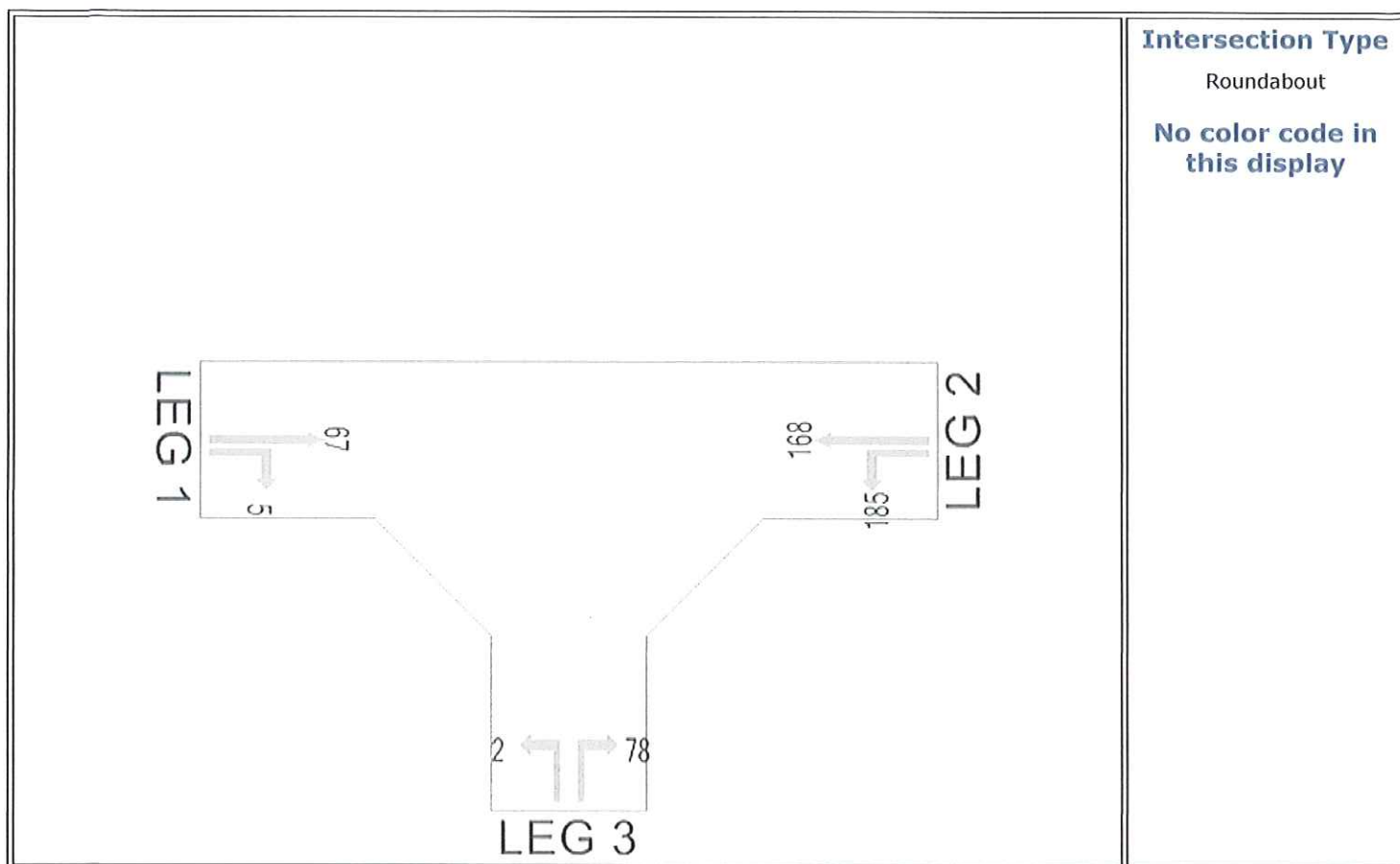
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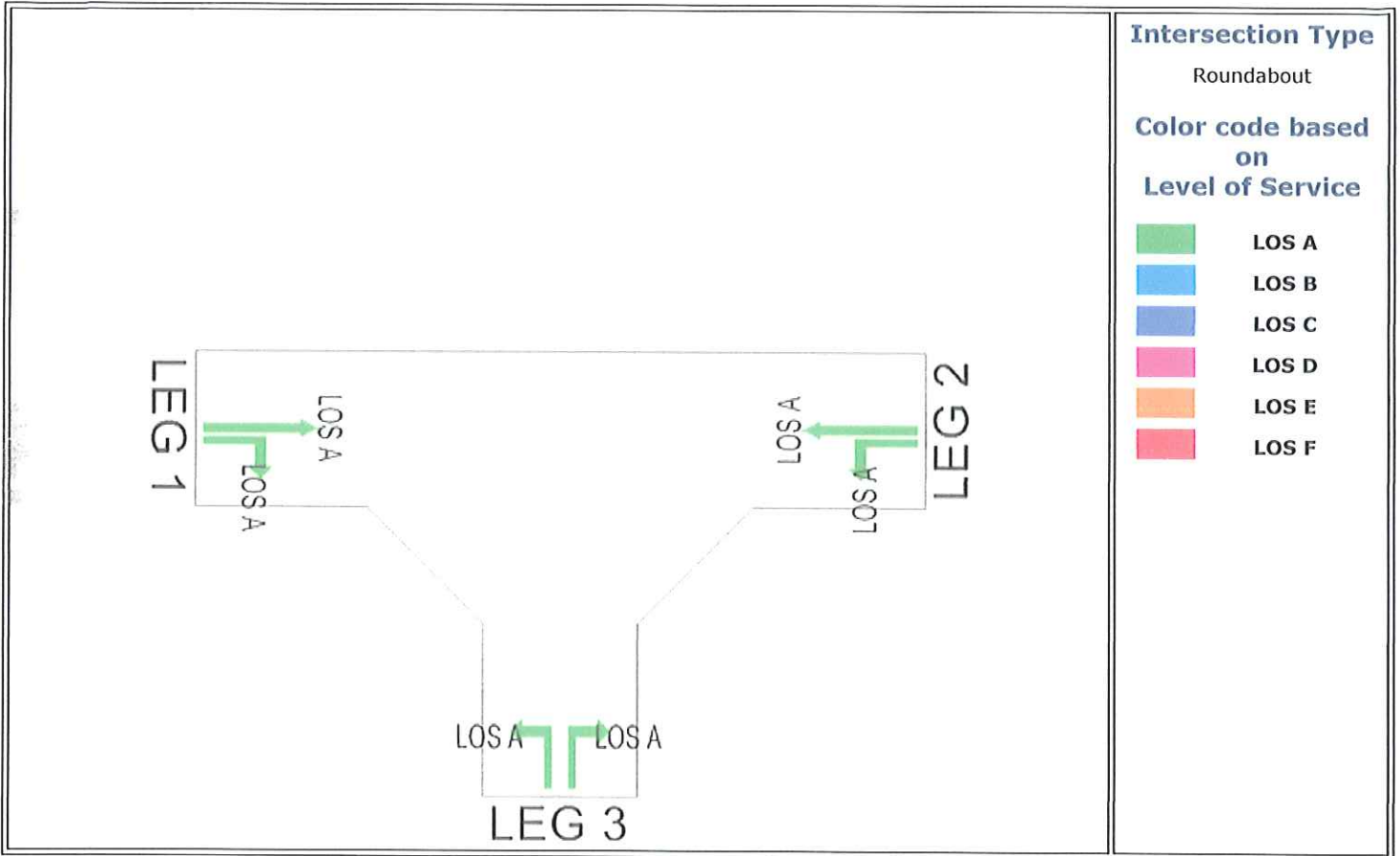
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Level of Service

Based on Delay (HCM method)

Roundabout with single lane approaches and circulating lanes

PM PEAK DO





Intersection Summary

Roundabout with single lane approaches and circulating lanes

AM PEAK DO

Performance Measure	Vehicles	Persons
Demand Flows - Total	530 veh/h	795 pers/h
Percent Heavy Vehicles	0.0 %	
Degree of Saturation	0.158	
Effective Intersection Capacity	3357 veh/h	
95% Back of Queue (m)	6 m	
95% Back of Queue (veh)	0.8 veh	
Control Delay (Total)	0.97 veh-h/h	1.46 pers-h/h
Control Delay (Average)	6.6 s/veh	6.6 s/pers
Level of Service	LOS A	
Level of Service (Worst Movement)	LOS A	
Total Effective Stops	296 veh/h	445 pers/h
Effective Stop Rate	0.56 per veh	0.56 per pers
Proportion Queued	0.17	0.17
Travel Distance (Total)	78.4 veh-km/h	117.6 pers-km/h
Travel Distance (Average)	148 m	148 m
Travel Time (Total)	2.6 veh-h/h	3.9 pers-h/h
Travel Time (Average)	17.7 secs	17.7 secs
Travel Speed	30.1 km/h	30.1 km/h
Operating Cost (Total)	91 \$/h	91 \$/h
Fuel Consumption (Total)	13.8 L/h	
Carbon Dioxide (Total)	34.6 kg/h	
Hydrocarbons (Total)	0.066 kg/h	
Carbon Monoxide (Total)	3.79 kg/h	
NOX (Total)	0.092 kg/h	



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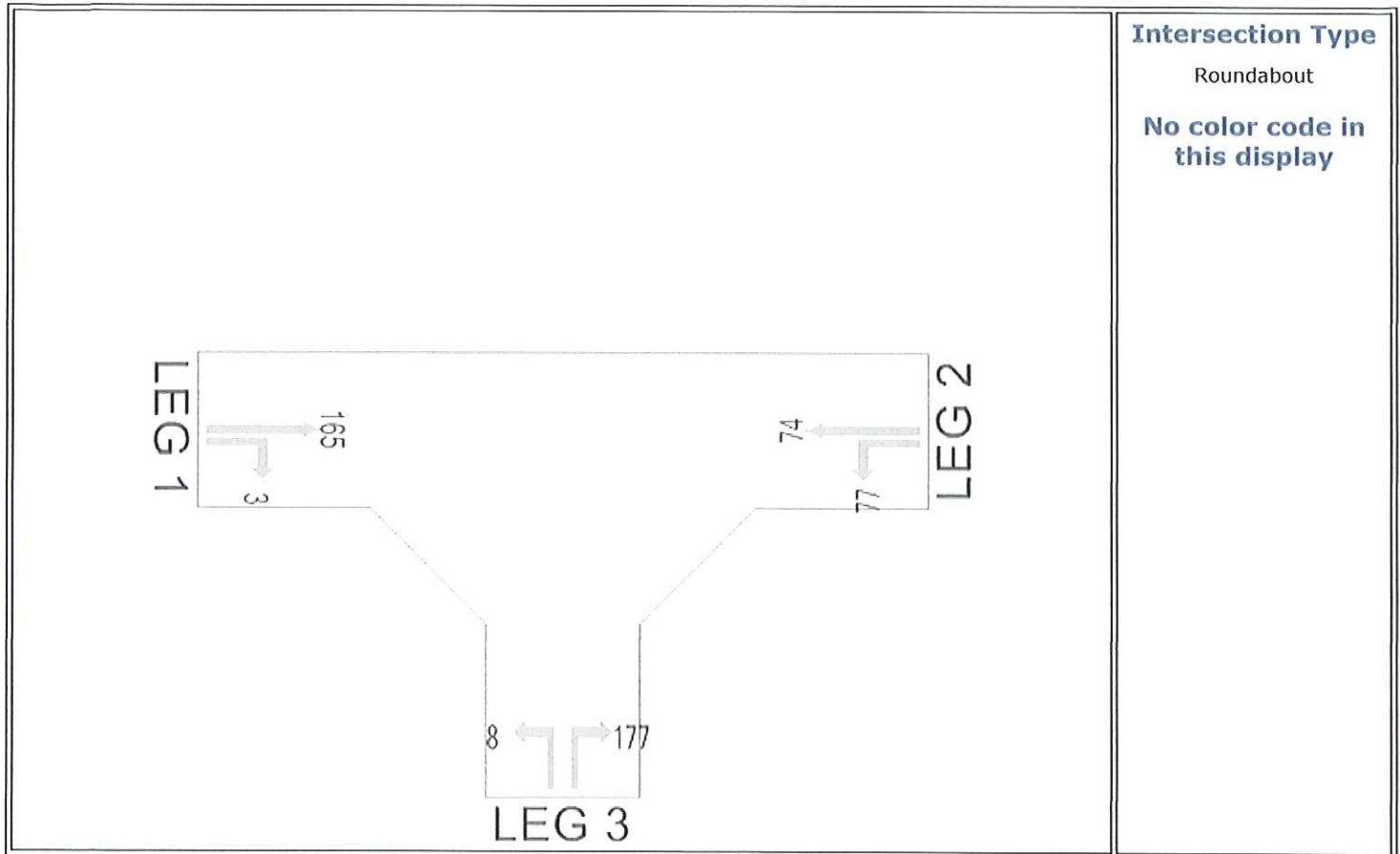
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