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TRAFFIC REVIEW OF IMPLICATIONS OF PROPOSED MIXED USE DEVELOPMENT, 555 BOX ROAD, JANNALI

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1. INTRODUCTION

1.1 Colston Budd Rogers and Kafes Pty Ltd has been commissioned by Fabcot Pty Ltd to review the traffic implications of the proposed mixed use development at 555 Box Road, Jannali. The site location is shown in Figure 1.

1.2 The proposed development will comprise a supermarket, specialty shops, residential units and basement parking, with access from Beatrice Road and Box Road. The development will be built over the existing council car park and the existing supermarket and adjacent shops (which will be demolished). In addition to parking for the mixed use development, parking will be provided for commuters.

1.3 The findings of our traffic review are set down through the following chapters:

- Chapter 2 - describing existing traffic conditions; and
- Chapter 3 - reviewing the traffic implications of proposed development.

2. EXISTING TRAFFIC CONDITIONS

Site Location

2.1 The site is located within Jannali Village on the north side of Box Road. The site is currently occupied by a supermarket (some 1,220m^2) and adjacent shops (some 2,470m^2 GFA). There is a council car park at the northern end of the site (some 130 parking spaces). Surrounding development includes retail within Jannali village to the south and west, retail to the east, residential to the north and Jannali Station to the west. Access to the site is provided from Box Road (via Box Lane) and Beatrice Road.

Road Network

2.2 The road network in the vicinity of the site comprises Box Road, Beatrice Road, Box Lane, Railway Crescent and Jannali Avenue. Box Road runs along the southern frontage of the site and connects Jannali to the suburbs to the east. It provides for one traffic lane in each direction with kerb side parking. It connects with Railway Crescent at a signalised T intersection.

2.3 Railway Crescent is to the west of the site and runs along the eastern side of the train line. It provides one traffic lane in each direction with kerb side parking on both sides of the road. It connects with Beatrice Road at a priority controlled T intersection and the railway overpass at a roundabout controlled intersection.

2.4 The railway overpass connects Railway Crescent to Jannali Avenue. Both intersections are controlled by roundabouts. It provides one traffic lane in each direction.

2.5 Jannali Avenue runs along the western side of the train line and provides one traffic lane in each direction, with kerb side parking on the western side. It connects the railway overpass and Mary Street at a roundabout controlled intersection.

2.6 Box Lane is a one way street northbound, providing access to the council car park from Box Road.

2.7 Beatrice Road provides one traffic lane in each direction with kerb side parking on the southern side of the road. It provides access to the council car park.

Traffic Flows

2.8 Morning and afternoon peak periods are the times of the week that the road network and its intersections are busiest. Retail centres generate more traffic in the afternoon. Thursday afternoon is the busiest afternoon for retail centres. Therefore in order to gauge traffic conditions, traffic counts were undertaken during Thursday afternoon in early December 2019.

2.9 Counts were undertaken at the following intersections:

- Box Road/Box Lane (priority controlled);
- Box Road/Railway Crescent (traffic signals);
- Railway Crescent/Beatrice Road (priority controlled);

- Railway Crescent/Railway overpass (roundabout); and
- Jannali Avenue/Mary Street/Railway overpass (roundabout).

2.10 The results of the surveys are summarised in Table 2.1 and displayed in Figure 2.

Table 2.1: Existing Two-Way (Sum of Both Directions) Peak Hour Traffic Flows

Road	**Thursday Afternoon**
Box Road	
– east of Box Lane	825
– east of Railway Crescent	820
Railway Crescent	
– north of Beatrice road	335
– north of Box Road	490
– north of railway overpass	1,035
– south of railway overpass	825
Railway overpass	
– west of Railway Crescent	1,040
Jannali Avenue	
– north of railway overpass	680
– south of Mary Street	680
Mary Street	
– west Jannali Avenue	55
Box Lane	
– north of Box Road	30
Beatrice Road	
– east of Railway Crescent	155

2.11 Table 2.1 reveals that during Thursday afternoon:

- Box Road carried some 825 vehicles per hour two-way;
- Railway Crescent, north of Box Road, carried some 335 vehicles per hour two-way;
- Railway Crescent, south of Box Road, carried some 825 to 1,035 vehicles per hour two-way;

- the railway overpass carried some 1,040 vehicles per hour two-way;

- Jannali Avenue carried some 680 vehicles per hour two-way;

- Beatrice Road, Mary Street and Box Lane carried some 30 to 155 vehicles per hour two-way.

2.12 During the Thursday afternoon the existing Council car park generated some 240 vehicles per hour two-way.

Intersection Operations

2.13 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections have been analysed using the SIDRA for the traffic flows shown in Figure 2.

2.14 SIDRA provides a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle.

2.15 Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode
>70	=	"F"	Unsatisfactory and requires additional capacity

- For give way, stop signs and roundabouts, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required
43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode
>70	=	"F"	Unsatisfactory and requires other control mode

2.16 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

2.17 The intersections have been analysed using the SIDRA network function. For Thursday afternoon the analysis found that:

- traffic signals at the intersection of Railway Crescent and Box Road operate with average delays of less than 25 seconds per vehicle. This represents level of service B;

- roundabout at the intersection of Railway Crescent and the railway overpass operates with average delays of less than 35 seconds per vehicle for the movement with the highest delay (right turn from railway overpass onto Railway Crescent). This represents level of service C;

- roundabout intersection of Jannali Avenue, Mary Street and the railway overpass operates with average delays of some 15 seconds per vehicle for the movements with the highest delay. This represents level of service A/B;

- intersection of Box Road and Box Lane operates with average delays of less than 15 seconds per vehicle for the movements with the highest delay. This represents level of service A/B, a good level of service;

- intersection of Railway Crescent and Beatrice Road operates with average delays of less than 15 seconds per vehicle for the movements. This represents level of service A/B, a good level of service.

2.18 It should be noted that the intersection of Railway Crescent and the Railway Overpass is the critical intersection within the area and delays at this intersection

can affect the operation of the adjoining intersections of Railway Crescent/Box Road and Mary Street/Jannali Avenue.

3. TRAFFIC IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 This chapter sets down the traffic implications of the proposed development through the following sections:

- proposed development;
- traffic effects; and
- summary.

Proposed Development

3.2 The proposed development includes a Woolworths supermarket (some 3,750m^2 GFA), some 800m^2 specialty retail and 150 residential units. A basement car park is provided for some 600 spaces, including 200 commuter spaces. Access is from Beatrice Road, Box Road and Box Lane.

Traffic Effects

3.3 As noted in Chapter 2, traffic generated by the proposed development would have its greatest effects during Thursday afternoon.

3.4 Taking into account passing trade and linked trips, a rate of 10 trips per 100m^2 GFA has been adopted for the traffic generation of the supermarket during Thursday afternoon. A rate of four trips per 100m^2 GFA has been adopted for the specialty retail. A rate of 0.3 trips per unit has been adopted for the residential component. For commuter parking, a rate of 0.4 trips per space would typically be adopted. However, as the proposed commuter car park would cater for existing commuters who currently park on street, a rate of 0.2 trips per parking

space has been adopted. Table 3.1 shows the traffic that will be generated by each component.

Table 3.1 : Thursday Afternoon Traffic Generation				
Component	Area /unit /spaces	Rate	Vehicles per hour	Split (%, in/out) PM
Supermarket	3,750	1/10m^2 GFA	375	50/50
Specialty Retail	800	1/25m^2 GFA	32	50/50
Residential	150	0.3/unit	45	80/20
Commuter parking	200	0.2/space	40	10/90
Total			**492**	

3.5 The proposed development will generate some 490 vehicles per hour, two-way. Taking into account the existing site generation of some 240 vehicles, the proposed development will generate an additional some 250 vehicles per hour, two-way.

3.6 This additional traffic has been assigned to the road network based on existing travel patterns. The results are summarized in Table 3.2 and displayed in Figure 2.

3.7 Table 3.2 reveals Thursday afternoon the following modest increase in traffic flows:

- Box Road increase of some 10 to 90 vehicles, two-way;
- Railway Crescent increase of some 40 to 150 vehicles, two way;
- The Railway Overpass increase of some 110 vehicles per hour;
- Jannali Avenue increase of some 50 vehicles, two way;

- Mary Street increase of some 10 vehicles per hour, two way;

- Box Lane increase of some 30 vehicles per hour, two way; and

- Beatrice Road increase of some 180 vehicles per hour, two way.

Table 3.2: Existing Two-Way (Sum of Both Directions) Peak Hour Traffic Flows Plus Additional Development Traffic

Road	Thursday Afternoon	
	Existing	Plus Development
Box Road		
– east of site access	880	+90
– east of Box Lane	825	+30
– east of Railway Crescent	820	+10
Railway Crescent		
– north of Beatrice road	335	+40
– north of Box Road	490	+140
– north of railway overpass	1,035	+150
– south of railway overpass	825	+40
Railway overpass		
– west of Railway Crescent	1,040	+110
Jannali Avenue		
– north of railway overpass	680	+50
– south of Mary Street	680	+50
Mary Street		
– west Jannali Avenue	55	+10
Box Lane		
– north of Box Road	30	+30
Beatrice Road		
– east of Railway Crescent	155	+180

3.8 Signalisation of the critical Railway Crescent/Railway Overpass intersection would improve traffic conditions and cater for traffic from the proposed development. In association with the signalisation, a second approach lane on the railway overpass would be provided. This would be achieved by removal of the footpath on the southern side of the overpass. The footpath on the northern side of the overpass would be retained and connect with a pedestrian crossing on the

northern side of Railway Crescent (as part of the traffic signals). Some on street parking on the eastern side of Railway Crescent would be removed to provide two approach lanes to the new signals.

3.9 The intersections have been analysed using the SIDRA network function for existing plus development traffic with this signalization and a second approach lane on the railway overpass. The analysis found that:

- traffic signals at the intersection of Railway Crescent and Box Road would continue to operate with average delays of less than 25 seconds per vehicle. This represents level of service B;

- traffic signals at the intersection of Railway Crescent and the railway overpass would operate with average delays of less than 25 seconds per vehicle. This represents level of service B. This is an improvement from the existing level of service (LOS C);

- roundabout intersection of Jannali Avenue, Mary Street and the railway overpass would operate with average delays of less than 20 seconds per vehicle for the movements with the highest delay. This represents level of service B;

- intersection of Box Road and Box Lane would continue to operate with average delays of less than 15 seconds per vehicle for the movements with the highest delay. This represents level of service A/B, a good level of service;

- intersection of Railway Crescent and Beatrice Road would continue to operate with average delays of less than 15 seconds per vehicle for the movements. This represents level of service A/B, a good level of service.

3.10 Thus with the proposed signalisation of the intersection of Railway Crescent and the railway overpass, a second approach lane on the railway overpass, and development traffic in place, all intersections operate at level of service B or better in the Thursday afternoon peak hour. In particular the operation of the critical intersection of Railway Crescent/railway overpass has been improved from LOS C to LOS B.

Summary

3.11 In summary:

i) the proposed mixed use development includes some Woolworths supermarket (some 4,000m^2), some 800m^2 specialty retail and 150 residential units;

ii) it provides basement parking for some 600 spaces, including 200 commuter spaces;

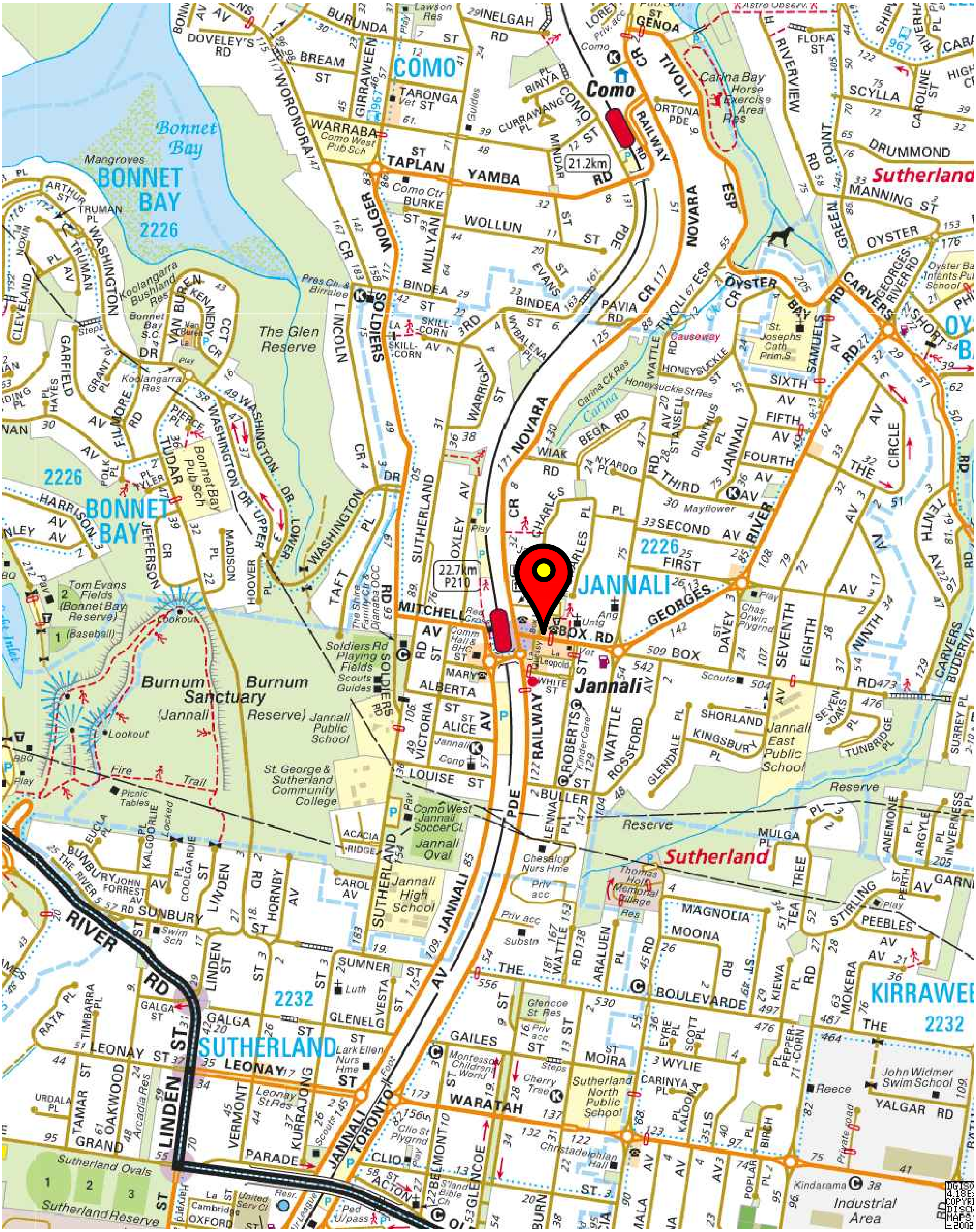
iii) access is from Beatrice Road, Box Lane and Box Road ;

iv) the existing one lane roundabout at the intersection of Railway Crescent/railway overpass is the critical intersection within the area and delays at this intersection can affect the operation of the adjoining intersections of Railway Crescent/Box Road and Mary Street/Jannali Avenue;

v) the proposed development will generate an additional 250 vehicles per hour, two-way, during Thursday afternoon peak period;

vi) signalisation of the intersection of Railway Crescent and the railway overpass would improve traffic conditions and cater for the proposed development. In association with the signalisation, a second approach lane on the railway overpass would be provided. This would be achieved by removal of the footpath on the southern side of the overpass; and

vii) A single footpath would be provided on the northern side of the overpass and connect with a pedestrian crossing on the northern side o Railway Crescent (as part of the traffic signals).



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Location Plan

Colston Budd Rogers & Kafes Pty Ltd

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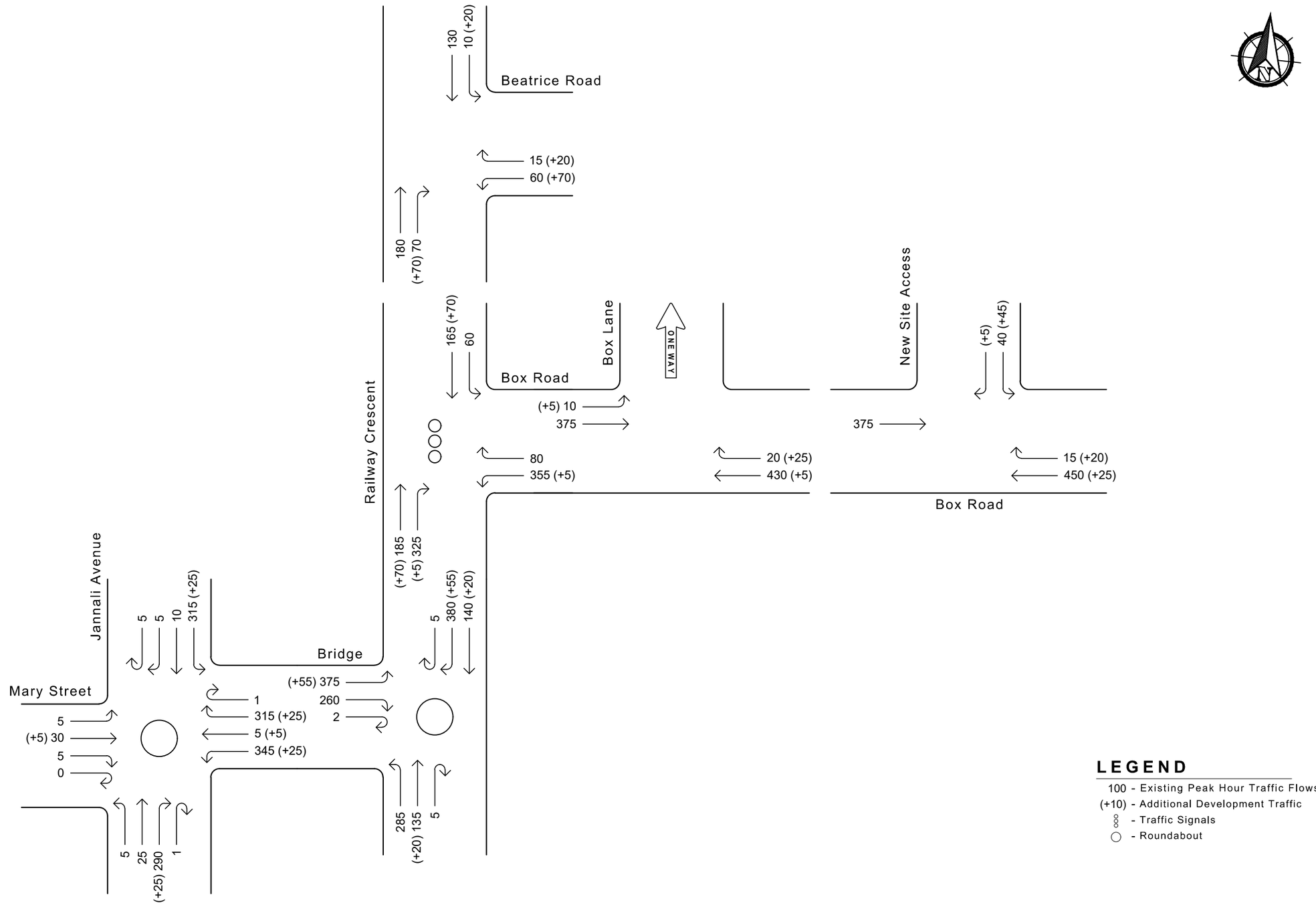
Figure 1



Existing weekday afternoon peak hour traffic flows plus development traffic

Figure 2

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