Stephen Reid Consulting
Traffic and Transportation

Amendment Application for 'Site C' Warehousing Development (previously granted under SD19A/0407)

Traffic Impact Assessment
College Lane, Greenogue, Co Dublin

Client: Jordanstown Properties Limited

JULY 2021

Contents

Rev	Date	Purpose of Issue	Approved
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1 INTRODUCTION

1.1 BACKGROUND

Stephen Reid Consulting Traffic and Transportation Limited (SRC) have prepared this report on behalf of Jordanstown Properties in support of an amendment planning application to be submitted to South Dublin County Council (SDCC) for a revised proposal for development of lands (2.7 hectares) known as 'Site C' at Greenogue, to the south side of the R120 College Lane (the Newcastle road), at Greenogue, Rathcoole, Co Dublin. The development will consist of modifications to a permitted warehouse development (as granted under SDCC Reg. Ref SD19A/0407).

The amendments principally comprise:

an overall increase in the commercial floor area by 15,479 sq m from the permitted 13,959 sq m to 29,438 sq m. The permitted scheme has 3 No. internal ancillary office floor levels, and the proposed alterations provide 2 No. mezzanine levels in the warehouse area(i.e a total of 5 No. internal floor levels). The permitted maximum height of the development at 23.7 metres will remain unchanged.

The additional 15,479 sq m development proposed will comprise an increase in the warehouse floor area from 12,369 sq m to 13,353 sq. m, staff facilities from 548 sq m to 2,582 sq m and ancillary office area from 1,042 sq m to 2,437 sq m. Provision of a 2 No. storey mezzanine warehouse area (9,703 sq m), integrated plant room (434 sq m) and plant area on 2 No. floors (929 sq m).

The development will also include the construction of a 2 No. storey car-parking area (4,057 sq m and 7.8m height) to accommodate an increase from the previously permitted 119 No. ancillary car parking spaces to 190 No. car parking spaces; 13 No. designated van parking spaces (no dedicated van spaces previously proposed); 72 No. permitted cycle parking spaces; reconfiguration of the HGV yard and an increase in the number of HGV dock levellers from 12 No. to 14 No. and the provision of 16 No. van loading level entry doors; sprinkler tank and associated underground pumps; repositionedESB substation (15 sq m and 3 m height); bin storage (42 sq m and 2.9 m height); amended lighting layout; signage; modifications to hard and soft landscaping and boundary treatments; and associated site development works above and below ground.

The application site location is indicated in Figure 1.1.

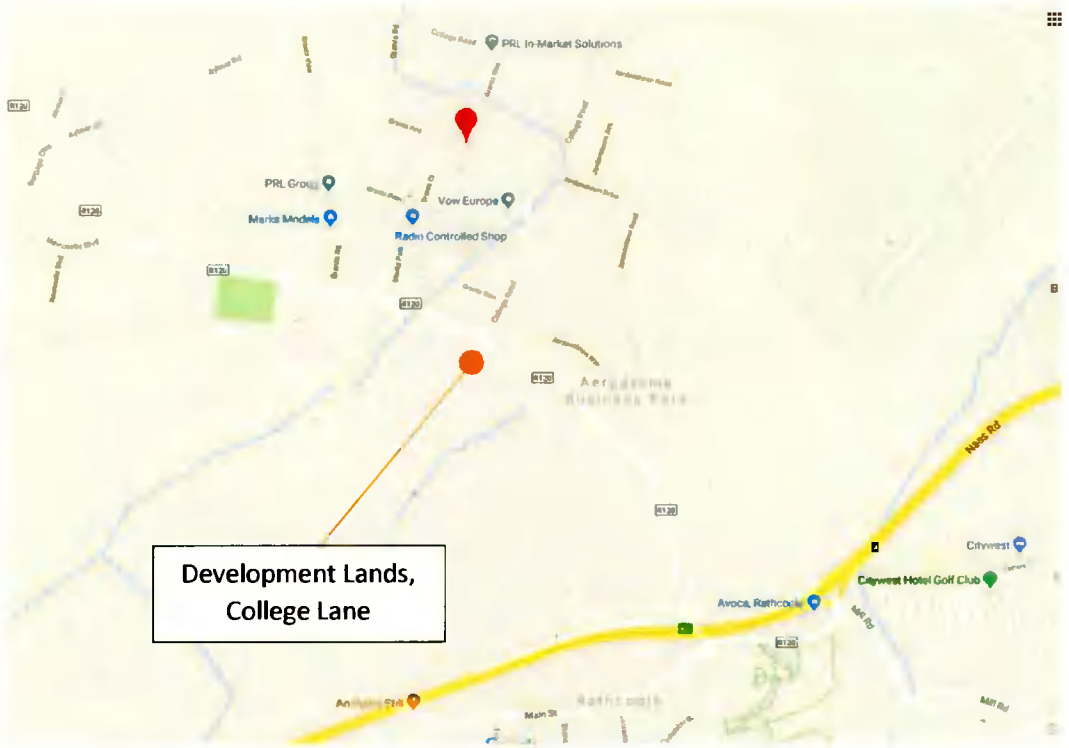


Figure 1.1: Site Location, Greenogue (source: www.google.ie/maps)

1.2 METHODOLOGY

SRC previously carried out Traffic Impact Assessments in 2018 and 2019 for the permitted SD18A/0265, SD19A/0065 and SD19A/0407 developments, which are all to be accessed through a fourth arm on the R120 Greenogue Roundabout and the internal road network of the Greenogue south lands.

These previous TIAs were informed by 2018 weekday traffic counts at the following junctions:

- Greenogue Roundabout;
- Aerodrome Roundabout;
- Advanced Waste Recycling Access;
- N7 eastbound slips/R120 Roundabout (Junction 4, north of Bridge);
- R120/Rathcoole Village/Fitzmaurice Road Roundabout (south of Bridge);
- N7 westbound slips/R120 Fitzmaurice Road/Mill Road Roundabout (Junction 4, south east).

From these counts, SRC determined the network peak hours (when the traffic volumes using the network are highest) and by application of development trip generation from TRICS rates for the proposed land use, and assignment using existing turning proportions for the existing Greenogue lands to the north, the percentage impact on the key road network was determined, due to proposed development traffic, in the opening and future years.

This TIA will compare the traffic generation of the permitted SD19A/0407 development to the current amendment application proposal and determine the additional impact on the network.

Where the impact is greater than defined thresholds, modelling of the junctions has been undertaken to confirm adequate capacity to accommodate the development.

2 SITE LOCATION & EXISTING CONDITIONS

2.1 GENERAL

The site is identified in Figures 1.1 and 2.1, and is located on the south side of the R120 College Lane (the Newcastle road), to the southeast of the Greenogue Roundabout.

Figure 2.1: Site Location and Surrounding Lands (source: www.google.ie/maps)

2.2 ROAD NETWORK

The R120 is a two-lane single carriageway which extends from Rathcoole/Saggart on the south side of the N7 to Newcastle to the north, and forms part of the N7 Junction 4 interchange at the eastern end of Rathcoole Main Street. Between the N7 and Newcastle, there is limited direct frontage development, and there are several roundabout junctions serving the Greenogue lands to the north, and several priority junctions and individual dwelling accesses.

The R120 Greenogue Roundabout has been converted from a three-arm arrangement to a four-arm arrangement under a grant of a previous planning permission for the Site A and B developments adjacent to Site C. The existing northern arm serves the College Road spine section of the Greenogue Business Park. The Greenogue Roundabout has a 29m central island and a 45m outer diameter, with single lane entries and exits.

To the west is the R120 Newcastle Roundabout which is a four arm arrangement serving the Grant's Road spine section of the Greenogue Business Park. This is a 'continental' style roundabout, with single lane entries and a 30m outer diameter. There is an eastbound bypass slip from the R120, turning in towards a yield junction within the Business Park access (into Grant's Road).

The fourth arm on the south side of this road is the L603 Tay Lane, which extends south-eastwards from the roundabout junction on the R120 before turning left as a one-way road and following the eastbound section of the N7, before connecting back to the R120 at the northernmost roundabout of the R120/N7 Junction 4. As there is no access from the N7 onto Tay Lane, the greater proportion of traffic using it is southbound (away from the Newcastle Roundabout).

To the southeast is the R120 Aerodrome Roundabout, this is currently a three-arm arrangement, with the northern arm serving Jordanstown Road which is the spine section of the Aerodrome Business Park. As part of a grant of planning relating to the development of lands on the south side of the Aerodrome Roundabout (SD20A/0258 refers, known as the 'Scahill lands'), this roundabout is to be converted to a four-arm arrangement with the new arm serving the new development lands to the south of the R120.

Conditions of the planning permissions for these developments required new footpaths along the south side of the R120 for the frontage of both sites and resulting in a continuous southern footpath between the Greenogue Roundabout and Aerodrome Roundabout, and to cater for increased activity crossing the R120 from the southern lands, 2no. traffic signal-controlled crossings are to be installed on the R120, located approximately 60m west and 60m east of the centre of the Aerodrome Roundabout.

2.3 Existing Traffic Flows

Baseline data was collected on Thursday 26th April 2018 using continuous traffic counts from 07.00-19.00.

Key flows at the Greenogue Roundabout are as follows:

- 08.00-09.00 AM peak hour (total inflow volume 1,855 pcu):
    - 839 pcu eastbound and 934 pcu westbound on the R120 to the east of the Greenogue Roundabout;
    - 720 pcu eastbound and 491 pcu westbound on the R120 to the west of the Greenogue Roundabout;
    - 522 pcu northbound and 202 pcu southbound on the College Road access arm of the Business Park;
- 16.00-17.00 PM peak hour (total inflow volume 1,631 pcu):
    - 771 pcu eastbound and 807 pcu westbound on the R120 to the east of the Greenogue Roundabout;
    - 438 pcu eastbound and 627 pcu westbound on the R120 to the west of the Greenogue Roundabout;
    - 234 pcu northbound and 387 pcu southbound on the College Road access arm of the Business Park.

The counts were also carried out at the Aerodrome Roundabout, the Advanced Waste Recycling access on the R120, and the three roundabout junctions which form the N7 Junction 4 Interchange and the connections to Rathcoole and Saggart.

Full traffic count data and flow diagrams for each junction is appendicised to this report.

2.4 Pedestrian and Cyclist Accessibility

As noted at 2.2, there are upgrades to pedestrian footpath provisions in the vicinity of the site, with new footpath along the south side of the R120 and crossings to connect these to the footpaths on the north side the R120. There is street lighting along the R120. It is noted that conditions of the SD18A/0265 grant of permission require new dropped kerb crossing points across the R120 at the Greenogue Roundabout.

It is also understood from discussions SRC have had with SDCC Transportation that there is a review of the speed limits in the County area, and it is likely that the existing 60kph section of the R120 between the N7 interchange and the Greenogue Roundabout will be reduced to a 50kph to be consistent with the speed limit at the interchange and Rathcoole/Saggart and on the section towards Newcastle Roundabout/Tay Lane, and more compatible with the with the signal controlled pedestrian crossings and additional arm at the Aerodrome Roundabout.

There are no dedicated cyclist provisions in the vicinity of the subject lands or on the R120. The new signal-controlled crossings to be constructed at the Aerodrome Roundabout (SD20A/0258) are to be installed to accommodate future upgrade to Toucan crossings if cycle infrastructure is developed along the R120. Notwithstanding the lack of formal provision, as there is low volume pedestrian activity on the footpaths in the area, it is likely that cyclists will use the footpath to limit the potential conflict with traffic on the road.

2.5 Public Transport Accessibility

There are Dublin Bus services operating along the R120, with stops to the west of the Greenogue roundabout, approximately 450m and 600m from the roundabout.

There are also stops on College Road to the north of the roundabout, served by the No.68 throughout the day. These stops are within 3-4 minutes walking time of the proposed development access arm on the Greenogue Roundabout and would therefore be within a reasonable distance for staff accessing the proposed Site C building, with accessibility improved by the new dropped kerb crossing points at the roundabout provided under SD18A/0265.

The 68 service operates from the City Centre via Clondalkin and Newcastle, terminating in Greenogue.

68/a

Buses from/to
From Hawkins St. Towards Newcastle / Greenogue Business Park
Operative Date 20/10/2019
Version TT 9 1

From Hawkins St Towards Newcastle / Greenogue Business Park

View on Map

Sraid Hawkins Sraid Camden Bóthar Bulfin Sráidbhaile Chluain Dolcáin Baile na Choill na Silíní An Caisleán Nua / Páirc Ghnó Ghnanóige

Buses leave terminus at:

Monday to Friday				Saturday				Sunday			
06 25v	07 30v	08 30	09 30	06 40v	07 50v	08 20	09 30	09 00	10 15	11 30	12 45
10 30	11 30	12 30	13 30	10 30	11 30	12 30	13 30	14 00	15 15	16 30	17 45
14 30v	15 30	16 00a	16 30	14 30v	15 30	16 30	17 30	19 00v	20 15v	21 30v	22 40
17 00a	17 30	18 15a	18 45	18 30	19 30	21 05v	22 20v	23 30			
20 15	21 15v	22 30v	23 30	23 30							

Route Variations
v Via Baldonnell
a To Bulfin Road (Route 68a)

Hawkins St >> 8mins >> Camden St >> 12mins >> Bulfin Rd >> 16mins >> Clondalkin Village >> 10mins >> Cherrywood Villas >> 15mins >> Newcastle / Greenogue Business Park

All times are off peak estimates

From Newcastle / Greenogue Business Park Towards Hawkins St

View on Map

An Caisleán Nua / Páirc Ghnó Ghnanóige Baile na Choill na Silín Sráidbhaile Chluain Dolcáin Bóthar Bulfin Sraid Camden Sraid Hawkins

Buses leave terminus at:

Monday to Friday				Saturday				Sunday			
06 00	06 30n	07 00	07 45	06 35n	07 10	07 50	09 15v	10 15	11 30	12 45	14 00
08 15a	09 00v	09 15a	10 00	09 45	11 00	12 00	13 00	15 15	16 30	17 45	19 00
11 00	12 00	13 00	14 00	14 00	15 00	16 00v	17 00v	20 15	21 30	22 30	23 45c
15 00	16 00v	17 10v	18 15	18 00	19 00	20 00	21 00	00 25c			
19 15	20 15	21 25	22 25	22 15	23 30	00 15c					
23 35c	00 15c										

Route Variations
v Via Baldonnell
a From Bulfin Road (Route 68a)
n Via Newlands Cross
c To Conyngham Road Garage via Emmet Rd and Islandbridge

Newcastle / Greenogue Business Park >> 16mins >> Cherrywood Villas >> 10mins >> Clondalkin Village >> 15mins >> Bulfin Rd >> 12mins >> Camden St >> 8mins >> Hawkins St

All times are off peak estimates

3 PROPOSED DEVELOPMENT

3.1 GENERAL

As set out in the introduction section of this report, the development is primarily warehousing with an element of support office and staff welfare space, and is an amendment to the previous development granted by SDCC (SD19A/0407 refers).

Block C (on site C) is located to the southwest of Block A and B (currently being constructed, due for completion by end of this year) and south of the Greenogue Roundabout, with HGV access from the new estate road on the east side of the site connecting to the internal estate road network permitted under SD18A/0265, and car/visitor access on the northwest corner of the site, adjacent to the access into the WEEE facility permitted under SD19A/0065 (this is also currently on site and is due for completion in Q1 of 2022).

The building will have a maximum height of 23.7 m with a gross floor area of 29,438 sq. m including a warehouse area (13,353 sq. m + two storey mezzanine warehouse of 9,703 sq. m), staff facilities (2,582 sq. m) and ancillary office area (2,437 sq. m), with integrated plant room (434 sq. m) and plant deck area on two floors (929 sq. m).

The revised Block C proposal will be serviced by the following:

- 190 No. ancillary car parking spaces (part two-storey decked car parking arrangement);
- 13 designated van parking spaces;
- 72 bicycle parking spaces;
- HGV yard with 14 No. loading bays (dock levellers) and 16 no. van level loading doors.

It should be noted that the office space included for the revised Block C is 8.3% of the overall gross floor area, confirming that it is ancillary to the primary function as commercial warehousing.

3.2 ROAD ACCESS

The overall site layout is presented in the Kavanagh Burke site layout plans submitted with the application. This has been tested using AutoTracking software to determine the adequacy of the access road and yard areas.

The proposed access to Site C is from the internal estate roadways being constructed as part of the adjoining planning permissions and these are accessed from the public road network via a new permitted fourth arm which has been constructed on the southern side of the existing Greenogue Roundabout. The access road from the roundabout is 9.0m between kerbs, with a grass verge and footpath behind this on each side.

The access for staff (cars, pedestrians, and cyclists) and visitors is located at the northwest corner of the site and has a 6.0m roadway with footpaths linking to the building entrance. The access for delivery vehicles (vans and HGVs) is located at the southeast corner of the site, with an additional 'vans out' location exiting from a one-way roadway along the southeast elevation of the warehouse building.

Road markings and signage at the accesses to Site C will be installed as part of the development works, in accordance with the Traffic Signs Manual (TSM) with directional signage to advise traffic arriving to the site of the car and delivery accesses.

3.3 Pedestrian Access

Pedestrian access will be at the northwest corner of the site from the estate footpaths. Internal footpaths will also link the staff and visitor car parking to the main entrance foyer area.

3.4 Car Parking

Car parking for the development is to be provided in with reference to the SDCC Development Plan standards, which set out maximum requirements of 1/100 sq. m for commercial warehousing (employment) and 1/50 sq. m for office (employment).

It should be noted that the staff facilities and plant areas are purely ancillary functions of the development and do not generate traffic or parking demands.

Therefore, the maximum requirement for the overall warehouse element (13,353sq. m + 9,703 sq. m = 23,056 sq. m) would be 231 spaces, while the maximum for the office element (2,437 sq. m) would be 49 spaces, equating to an overall maximum requirement of 280 spaces.

However, it should be recognised that the warehouse contains a significant element of mezzanine storage which is unlikely to result in an additional staffing requirement at typical employment densities for warehousing use.

Therefore, for the 13,353 sq. m ground floor warehouse only plus the 2,437 sq. m office element there would be a requirement for 134 (warehouse) and 49 (office) parking spaces, equating to 183 spaces.

It is proposed to provide 190 car spaces in the western car park area (including 10 accessible spaces in accordance with the 5% requirement. A total of 19 spaces will be ducted to allow these to operate as EV charging spaces when demand increases).

The breakdown is as follows:

- Open surface car park at northern end of access roadway (48 spaces);
- Level P0 (lower deck) at southern end of access roadway (74 spaces);
- Level P1 (upper deck) at southern end of access roadway (68 spaces).

It is considered that this is an appropriate level of provision for this development and location.

3.5 Cycle Parking

Cycle parking for the development is to be provided in accordance with the SDCC Development Plan standards, which set out minimum requirements for commercial warehousing (employment) and office (employment). Therefore, it is proposed to provide 72 spaces (36 Sheffield stands).

These are located close to the office/reception entrance of Block C in two groups, and are identified on the KB drawingssubmitted with the application. The spaces will be covered as these are long-stay.

4 DEVELOPMENT TRAFFIC GENERATION

4.1 TRIP GENERATION

In the previous application for SD19A/0407, the predicted development traffic generation was based on TRCIS data of existing surveyed sites for distribution warehouse uses in Dublin and Leinster Regions.

The data in the TRICS site is for the overall floor area, and an element of office space (10% or less would be inherent in these).

Land Use	Rate per	Weekday AM peak (08:00-09:00)		Weekday PM Peak (16:00-17:00)	
		Arrivals	Departures	Arrivals	Departures
Distribution Warehousing	100 sq. m	0.177	0.051	0.101	0.520

Table 4.1 – Trip Rates for Proposed Development

When the above trip rates are used in conjunction with the schedule of accommodation of the proposed development (the warehouse and office elements, excluding the plant areas equate to 25,493 sq. m), the total trips generated can be found. These are compared to the previously permitted scheme in Table 4.2 below.

Please note that the mezzanine warehouse has been included in the proposed GFA for the vehicle trip calculation to provide a robust 'worst-case', although in reality it is unlikely to generate additional trips from staff as it is additional storage to allow greater stockpiling by the future operator, but it may generate an element of additional delivery traffic across the day.

Land Use	GFA	Weekday AM peak (08:00-09:00)		Weekday PM Peak (16:00-17:00)	
		Arrivals	Departures	Arrivals	Departures
SD19A/0407	13,959 sq. m	24	7	14	72
Amendment scheme	25,493 sq. m	45	13	26	133
Change in trip generating area	+11,534 sq. m	+19	+6	+12	+51

Table 4.2 – Vehicle Trips for Proposed Development

Clearly the levels of additional traffic generation during the network AM peak hour are not significant having regard for the scale and capacity of the road network serving the site. This is expected as the staff arrival profile for a distribution warehouse is typically weighted towards 07.00-08.00 when the background flows will be lower on the network.

The impact is clearly more significant in the PM peak hour of 16.00-17.00 when there is a large volume of exiting traffic due to warehouse staff who had arrived earlier in the morning and would be finishing their working shift at that time.

The distribution of development traffic volumes has been based on the directional split assumptions used in the SD19A/0407 TIA.

- AM peak hour trip distribution:
  - Arrivals 87% from R120 east, 13% from R120 west;
  - Departures 92% to R120 east, 8% to R120 west.

- PM peak hour trip distribution:
  - Arrivals 93% from R120 east, 7% from R120 west;
  - Departures 90% to R120 east, 10% to R120 west.

Upstream and downstream of the Greenogue Roundabout junction it is considered that the development traffic will continue through the R120 roundabouts and access the N7 interchange where the traffic will disperse between the N7 westbound and eastbound, and the Rathcoole and Saggart village access roads, or in the other direction, this minor volume of traffic will access the roads connecting to Clondalkin/Grangecastle, etc.

The percentage impact of the development traffic on the R120 at the Greenogue Roundabout and other key junctions is set out in the following section.

5 DEVELOPMENT IMPACT

5.1 ASSESSMENT YEARS

The earliest opening year for the proposed development allowing for planning and construction would be 2023, and a +5 design year (2028) and +15 (2038) has also been considered.

It is assumed that the permitted developments SD18A/0265 and SD19A/0065 will be completed and operating in 2022 at the earliest and therefore this is included as committed traffic in each of the future year flows.

In addition to the traffic generated by the proposed development there is also an expected increase in traffic flows due to general development and an increase in car ownership that needs to be taken into consideration when assessing future year junction capacity.

Traffic growth to 2023, 2028 and 2038 has been developed using the Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections PE-PAG-02017 (May 2019).

Figure 6.1 confirms that the site and the R120/N7 Naas Road which form the key links in the study road network are in the Dublin Metropolitan Area, and therefore Table 6.1. Central Growth Rates for LVs (as the traffic flows are in pcus) are utilised. The appropriate annual rates used are as highlighted in the Table below which is reproduced from the TII document.

Table 6.1: Link-Based Growth Rates: Metropolitan Area Annual Growth Rates

Metropolitan Area	Low Sensitivity Growth Rates						Central Growth Rates						High Sensitivity Growth Rates					
	2016-2030		2030-2040		2040-2050		2016-2030		2030-2040		2040-2050		2016-2030		2030-2040		2040-2050	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
Dublin	1.0146	1.0280	1.0034	1.0116	1.0028	1.0144	1.0162	1.0295	1.0051	1.0136	1.0044	1.0162	1.0191	1.0328	1.0087	1.0172	1.0093	1.0256
Cork	1.0153	1.0279	1.0072	1.0128	1.0065	1.0164	1.0169	1.0294	1.0090	1.0149	1.0083	1.0182	1.0202	1.0328	1.0125	1.0185	1.0166	1.0276
Galway	1.0154	1.0201	1.0077	1.0164	1.0079	1.0203	1.0169	1.0217	1.0097	1.0182	1.0095	1.0220	1.0203	1.0250	1.0131	1.0217	1.0178	1.0313
Limerick	1.0158	1.0313	1.0052	1.0113	1.0050	1.0158	1.0174	1.0329	1.0070	1.0134	1.0069	1.0177	1.0218	1.0364	1.0106	1.0171	1.0146	1.0273
Waterford	1.0123	1.0301	1.0031	1.0131	1.0029	1.0175	1.0140	1.0317	1.0052	1.0153	1.0050	1.0194	1.0173	1.0352	1.0091	1.0194	1.0122	1.0300

Figure 5.1: Table 6.1. of PE-PAG-02017 (TII)

The annual rate for each period is used to develop a compound factor for the required years. Therefore, the 2018 surveyed base year flows were factored up as follows:

- by 8.37% for an Opening year of 2023
- by 17.43% for an Opening Year +5 of 2028
- by 25.42% for an Opening Year +15 of 2038

5.2 PERCENTAGE IMPACT ON KEY JUNCTIONS

The IHT and TII Guidelines for Transport Assessments state that the thresholds for junction analysis in Transport Assessments are as follows:

- *"Traffic to and from the development exceeds 10% of the existing two-way traffic flow on the adjoining highway."*
- *"Traffic to and from the development exceeds 5% of the existing two-way traffic flow on the adjoining highway, where traffic congestion exists or will exist within the assessment period or in other sensitive locations".*

The difference in flows resulting from the amendment application (Do Something) compared with the committed traffic including the previously permitted SD19A/0407 (Do Nothing) are as follows, for the 2023 'opening year':

R120 to north of Greenogue Roundabout (Link 0-J1)
As noted in the previous section, the majority of development traffic will arrive and depart on the southern section of the R120, passing through the N7 interchange and the Aerodrome Roundabout with only a minor element to/from the northwest (i.e. to/from Newcastle).

- R120 north of Greenogue Roundabout 2023 AM peak hour 1,338 v 1,340 pcu = +0.15%
- R120 north of Greenogue Roundabout 2023 PM peak hour 1,226 v 1,232 pcu = +0.49%

R120 to south of Greenogue Roundabout (Link J1-J2)
The majority of development traffic will arrive and depart on the southern section of the R120 through the Aerodrome Roundabout and turning into the new development zone arm on the Greenogue Roundabout.

- R120 south of Greenogue Roundabout 2023 AM peak hour 2,036 v 2,059 pcu = +1.13%
- R120 south of Greenogue Roundabout 2023 PM peak hour 1,830 v 1,887 pcu = +3.11%

R120 to south of Aerodrome Roundabout (Link J2-J3)
As with link J1-J2, the majority of development traffic will arrive and depart on the southern section of the R120 on this link. The additional traffic impact is as follows:

- R120 south of Aerodrome Roundabout 2023 AM peak hour 2,379 v 2,402 pcu = +0.97%
- R120 south of Aerodrome Roundabout 2023 PM peak hour 2,199 v 2,256 pcu = +2.59%

R120 to South of Advanced Waste Access (Link J3-J4)
As with link J1-J2 and link J2-J3, the majority of development traffic will arrive and depart on the southern section of the R120 on this link. The additional traffic impact is as follows:

- R120 south of Advanced Waste 2023 AM peak hour 2,381 v 2,414 pcu = +1.39%
- R120 south of Advanced Waste 2023 PM peak hour 2,209 v 2,266 pcu = +2.58%

R120 Overbridge at N7 Junction 4 (Link J4-J5)
The additional impact on the R120 overbridge at the N7 Junction 4 during weekday peak hour conditions is as follows:

- R120 south of N7-J4 Northern Roundabout 2023 AM peak hour 2,173 v 2,196 pcu = +1.06%
- R120 south of N7-J4 Northern Roundabout 2023 PM peak hour 1,939 v 1,996 pcu = +2.94%

R120 to east of Rathcoole Village Roundabout (Link J5-J6)

The additional impact on the R120 to the east of Rathcoole Village Roundabout (passing Avoca) during weekday peak hour conditions is as follows:

- R120 east of Rathcoole Village Roundabout 2023 AM peak hour 1,846 v 1,860 pcu = +0.76%
- R120 east of Rathcoole Village Roundabout 2023 PM peak hour 1,866 v 1,891 pcu = +1.34%

N7 Westbound Exit Slip to J6

The additional impact on the N7 Junction 4 westbound exit slip during weekday peak hour conditions is as follows:

- N7-J4 Westbound Exit Slip 2023 AM peak hour 841 v 853 pcu = +1.43%
- N7-J4 Westbound Exit Slip 2023 PM peak hour 804 v 811 pcu = +0.87%

It should be noted that the percentage impact at each junction in the 2023 opening year will diminish slightly in the 2028 and 2038 design years as the background traffic growth increases the Do-Nothing total flow, while the development trips remain constant for each assessment year.

From the foregoing, it is clear that the proposed development will not have any significant traffic impacts on the road network during the AM or PM peak period, and the volume of off-peak movements are also at a level which will not result in operational issues for the road network or impact on road user safety.

It is submitted that there are no specific traffic mitigation measures required to accommodate the additional traffic from the amendments to the previously permitted development under SD19A/0407.

6 SUMMARY

6.1 GENERAL

Stephen Reid Consulting Traffic and Transportation Limited (SRC) have prepared this report on behalf of Jordanstown Properties in support of a planning application to be submitted to South Dublin County Council (SDCC) for an amendment development of lands known as Site C, at Greenogue, to the south side of the R120 College Lane (the Newcastle road), at Greenogue, Rathcoole, Co Dublin.

The development comprises commercial warehousing with ancillary office accommodation and staff welfare, serviced by 190 car parking spaces, 72 cycle parking spaces, and a separate service yard with loading dock bays for tucks and delivery vans. The site will be accessed from the internal road network and the new arm on the R120 Greenogue Roundabout, utilising the infrastructure being constructed as part of SD18A/0265 and SD19A/0065.

It can be seen from the comments in this TIA that the volumes of additional traffic generated by the proposed development will not be significant during the network AM peak hour, and while there is a higher volume of traffic during the network PM peak hour, this can be accommodated by the proposed access arrangements and internal layout measures without excessive queuing or delays.

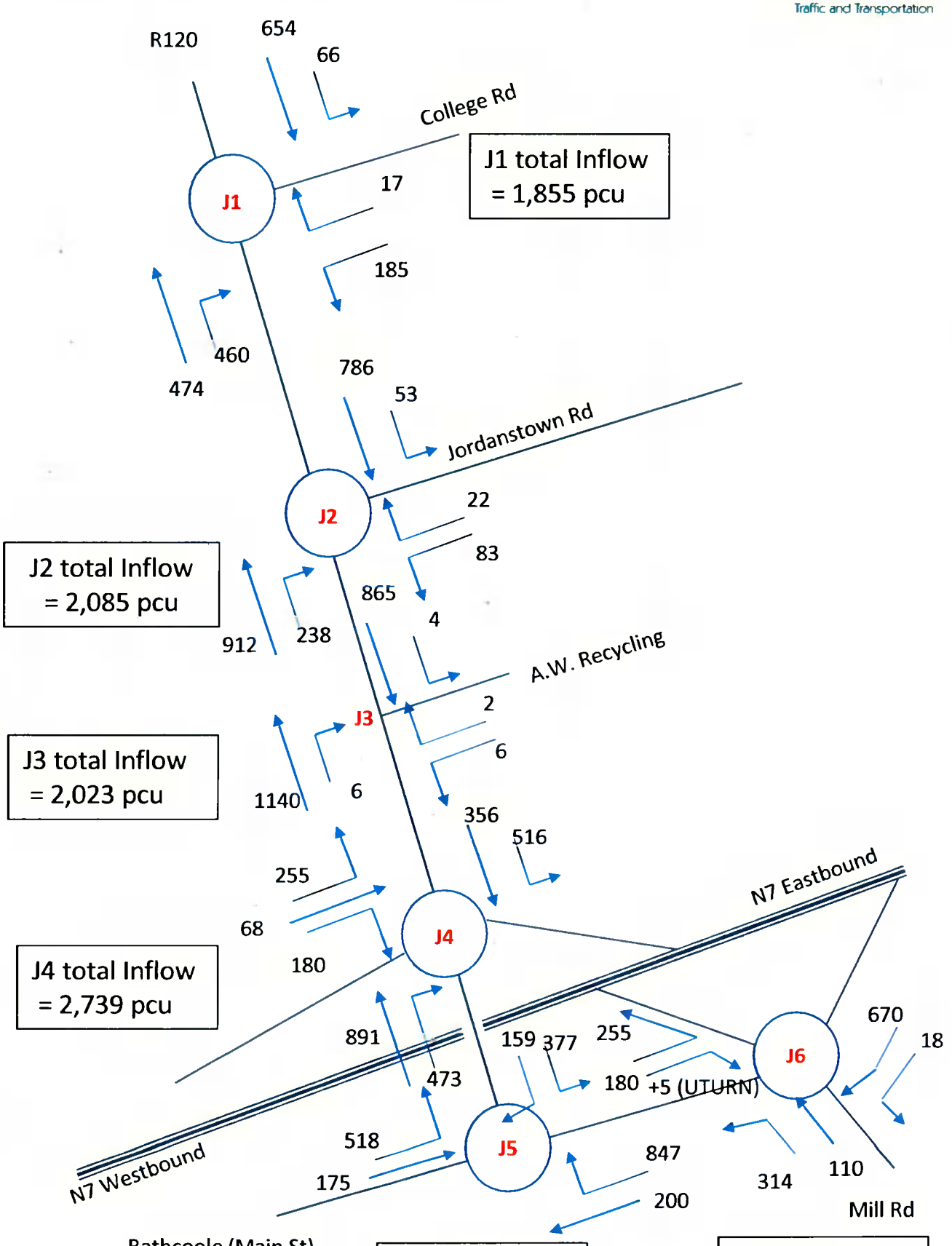
Therefore, it is submitted that the development as proposed is in accordance with the proper planning and sustainable development of the area.

Stephen Reid Consulting Traffic and Transportation

08.07.2021

Appendices

Stephen Reid Consulting
Traffic and Transportation



J1 total Inflow = 1,855 pcu

J2 total Inflow = 2,085 pcu

J3 total Inflow = 2,023 pcu

J4 total Inflow = 2,739 pcu

J5 total Inflow = 2,275 pcu

J6 total Inflow = 1,552 pcu

Traffic Counts Thur 26th April 2018
flows in pcu/hr

Diagram 1(a) : 2018 Weekday AM Peak Hour 08.00-09.00

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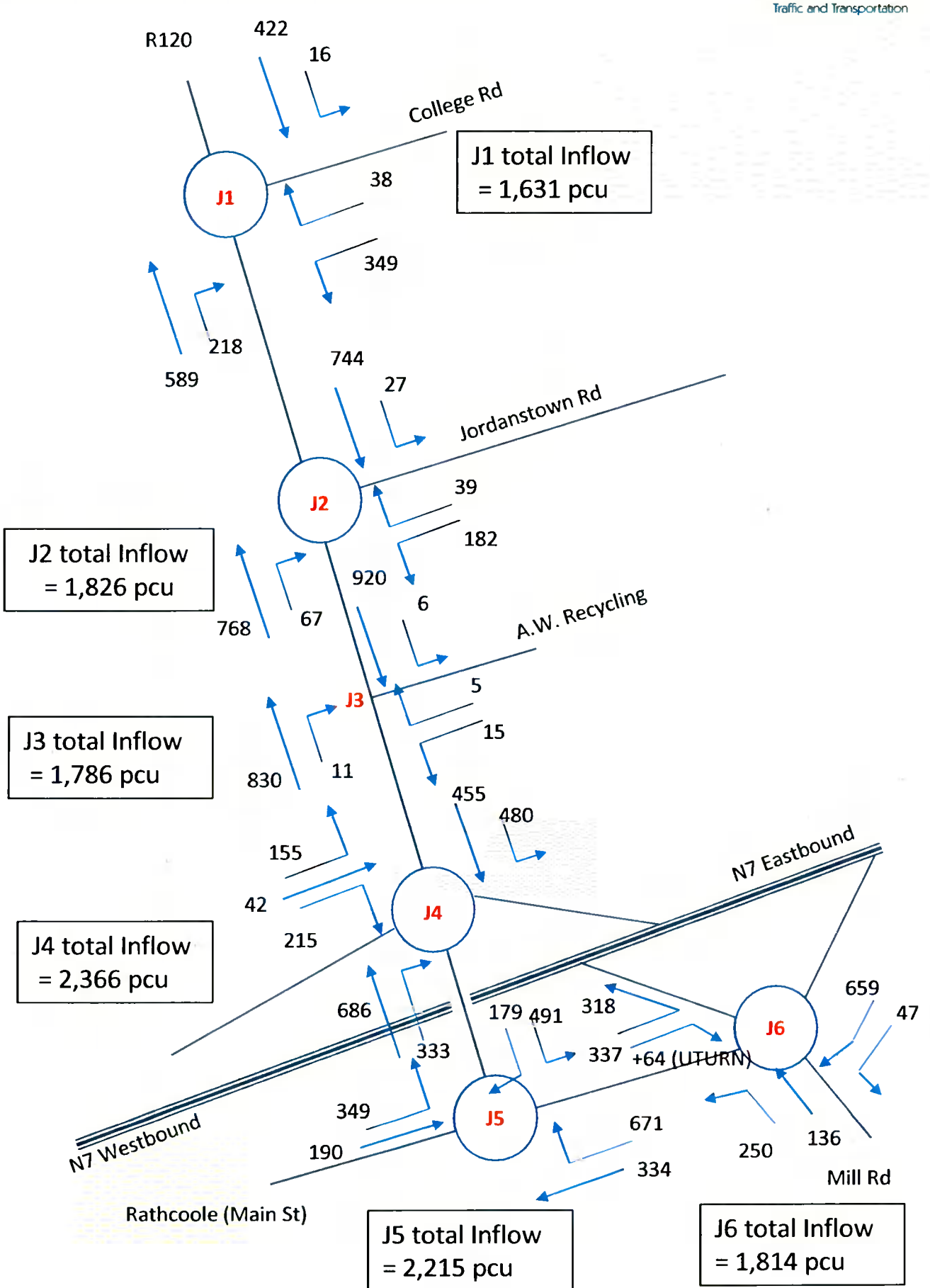
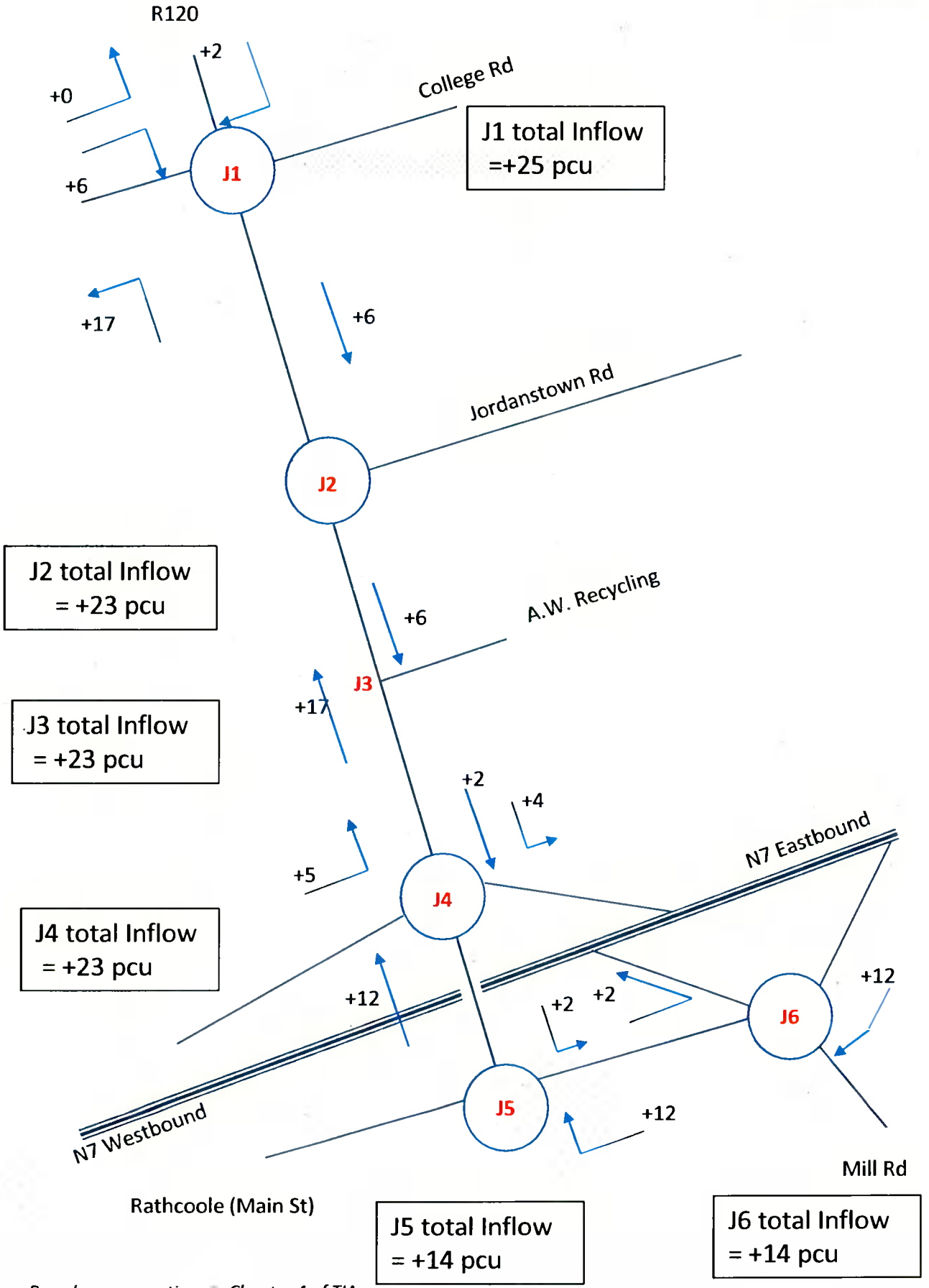


Traffic Counts Thur 26th April 2018
flows in pcu/hr

Diagram 1(b) : 2018 Weekday PM Peak Hour 16.00-17.00



Based on assumptions in Chapter 4 of TIA
flows in pcu/hr

Diagram 2(a) : Additional Development Traffic to Previously Permitted – AM Peak Hour

Stephen Reid Consulting
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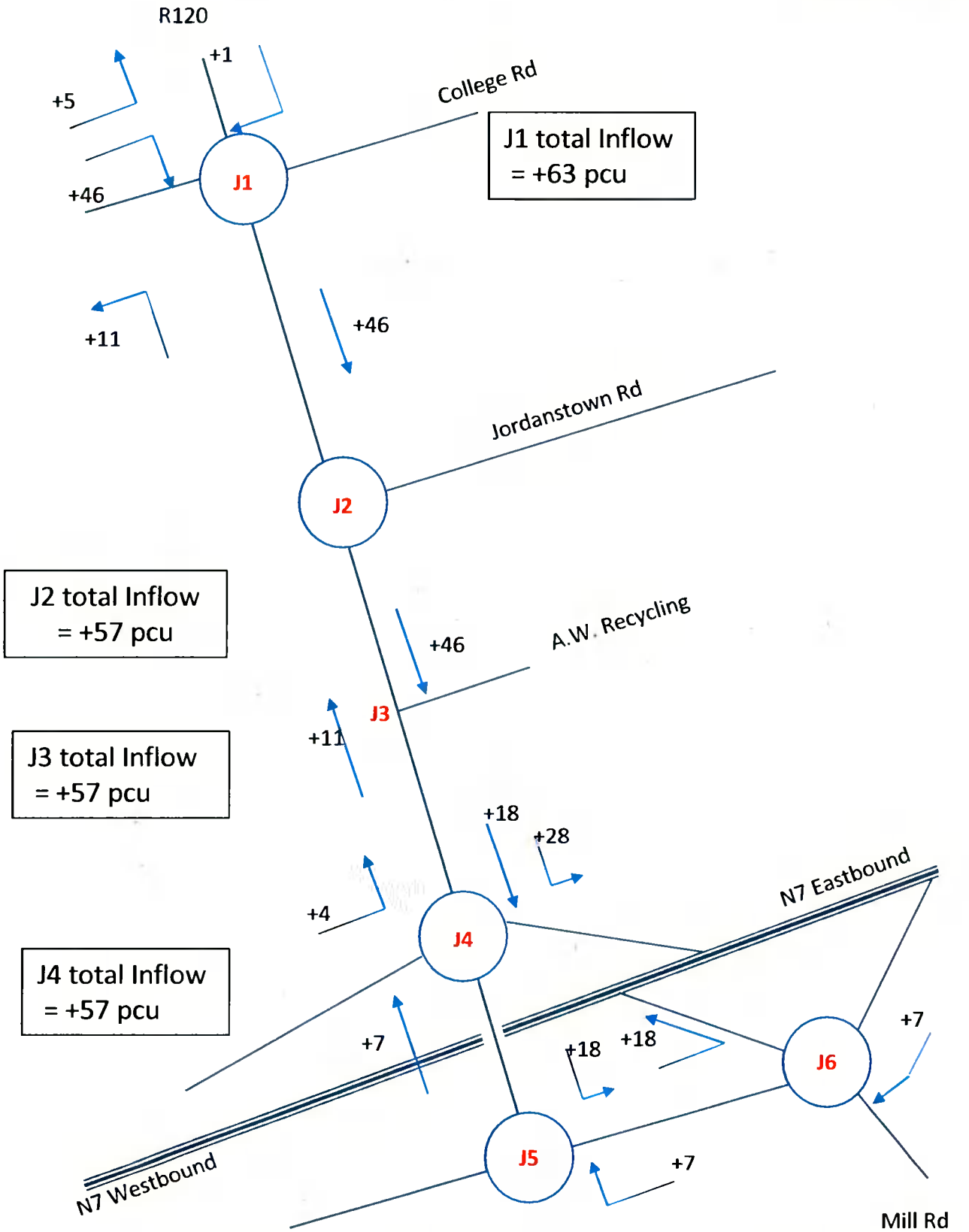
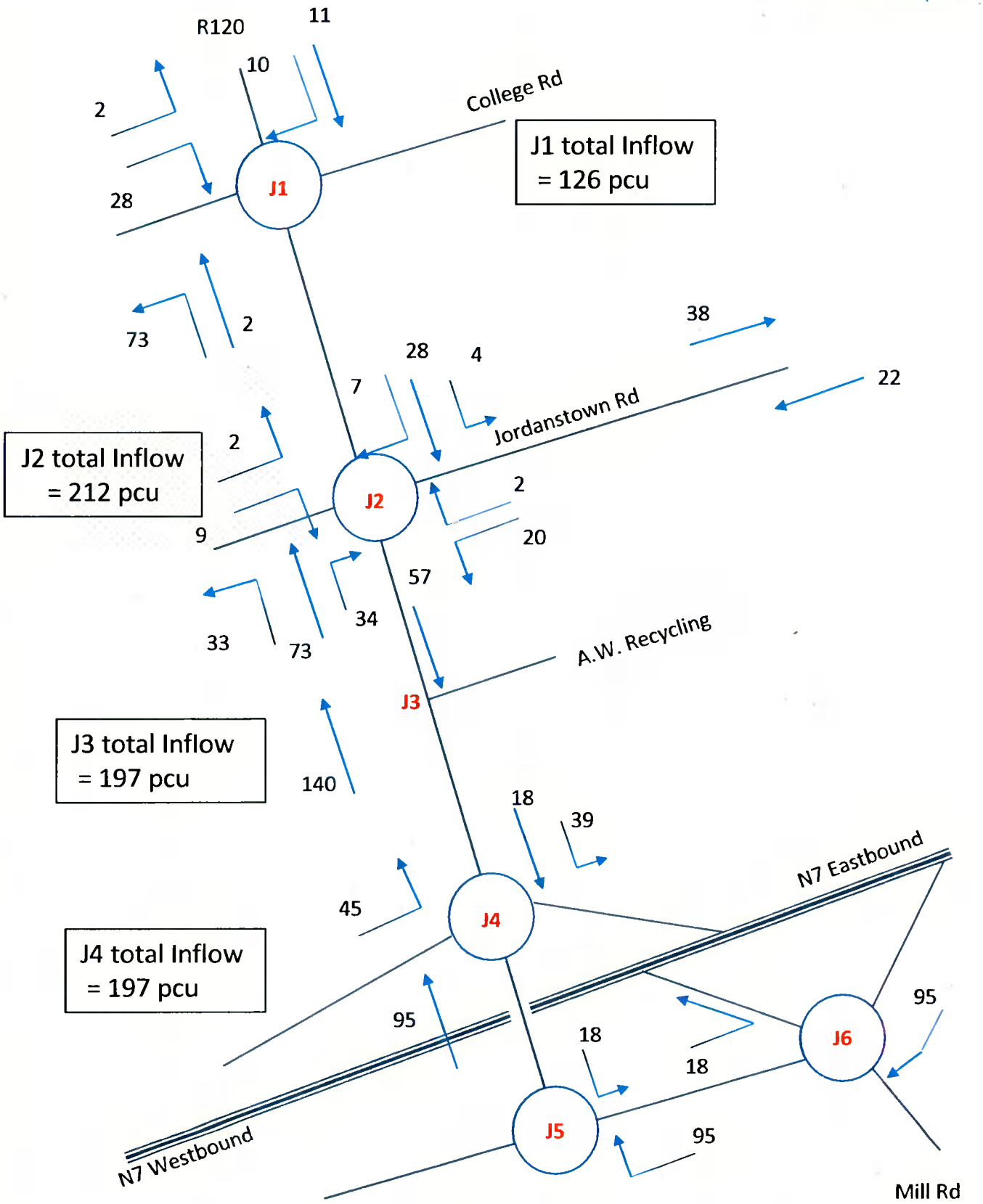


Based on assumptions in Chapter 4 of TIA
flows in pcu/hr

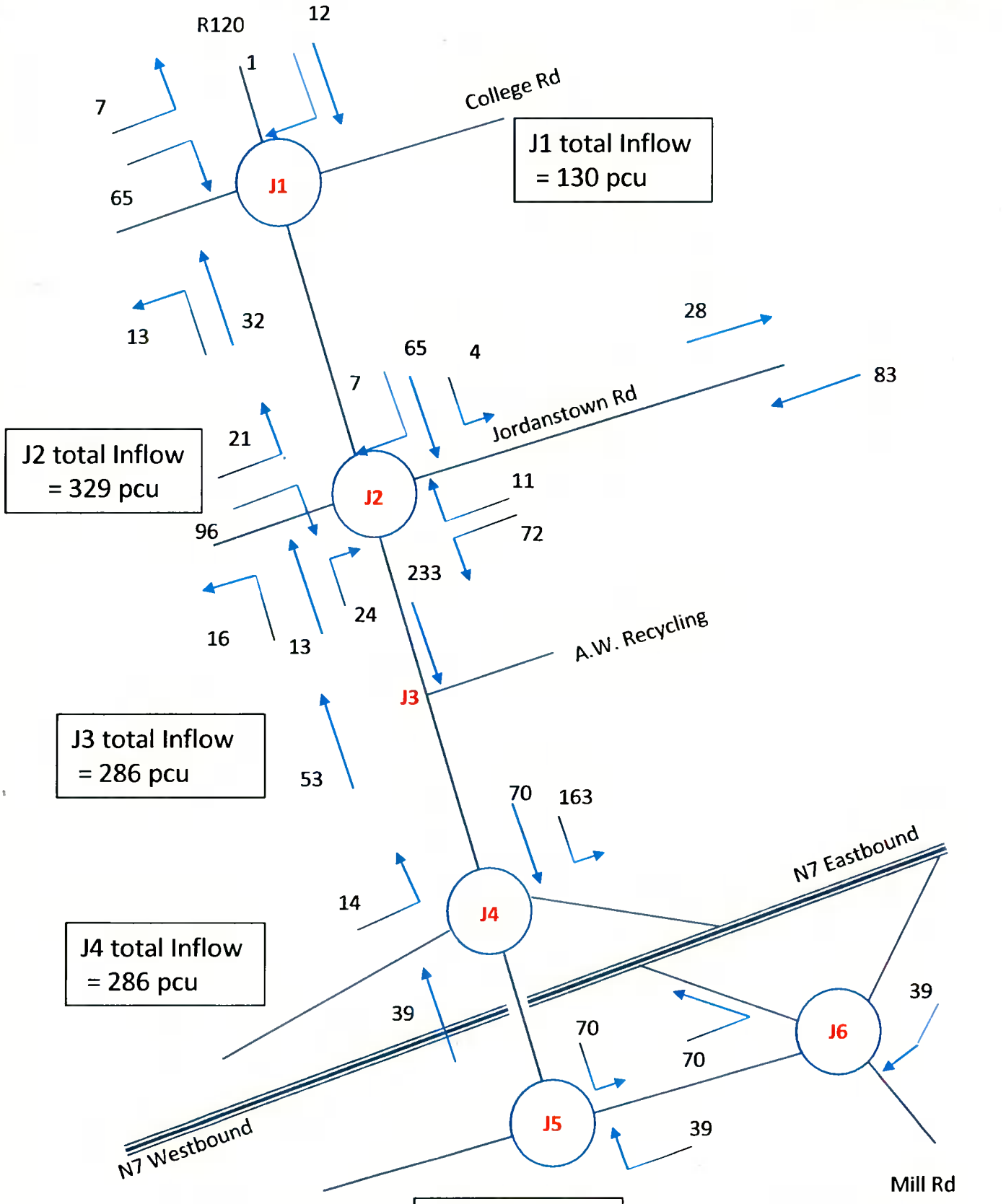
Diagram 2(b) : Additional Development Traffic to Previously Permitted – PM Peak Hour

Stephen Reid Consulting
Traffic and Transportation



See Chapter 4 of TIA for details of Committed Developments
flows in pcu/hr

Diagram 3(a) : Committed Development Traffic AM Peak Hour 08.00-09.00 (includes SD19A/0407)



See Chapter 4 of TIA for details of Committed Developments
flows in pcu/hr

Diagram 3(b) : Committed Development Traffic AM Peak Hour 16.00-17.00 (includes SD19A/0407)

Stephen Reid Consulting
Traffic and Transportation

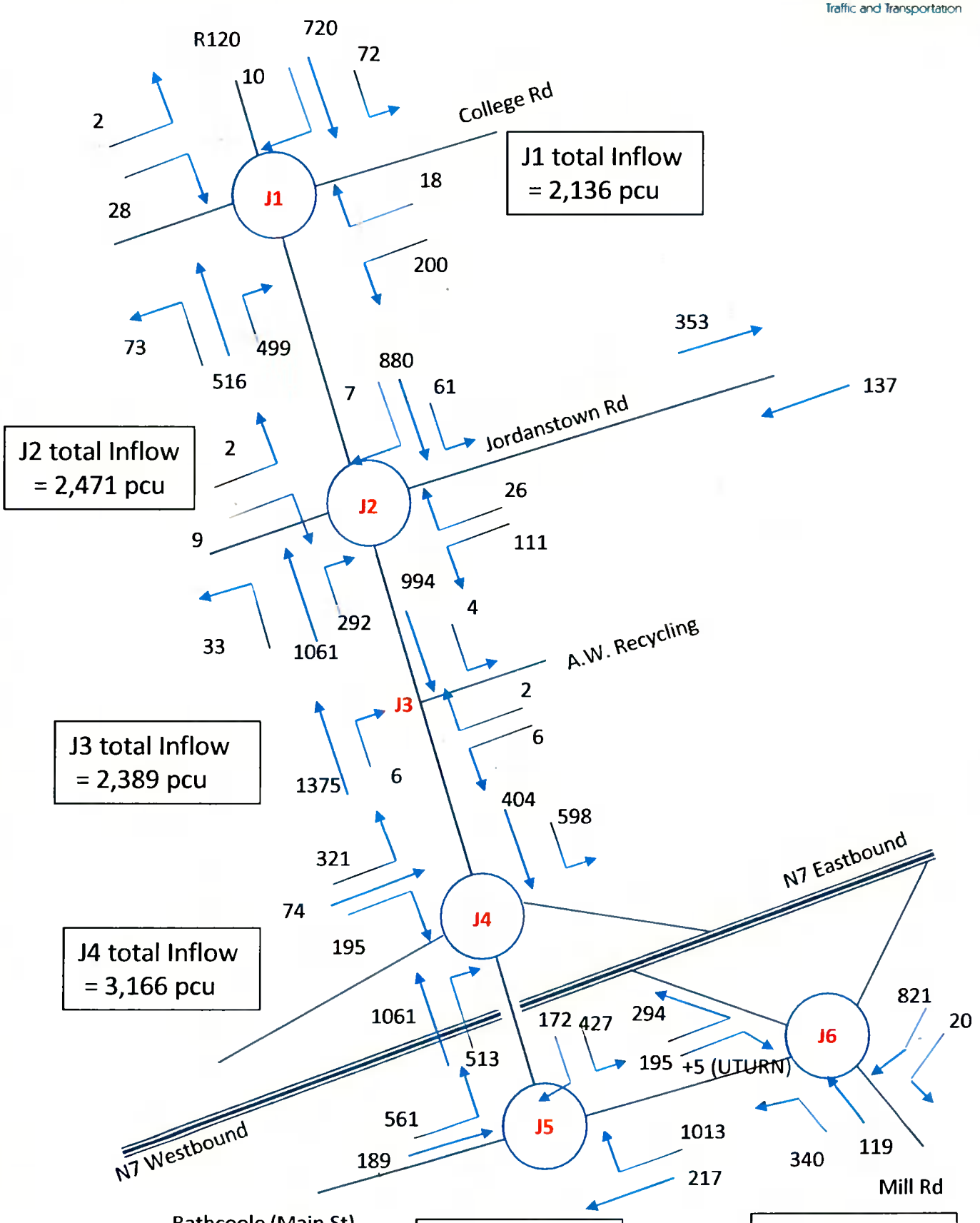


Diagram 1(a) x TII Growth Factor
+ 3(a) committed traffic, flows in pcu/hr

Diagram 4(a) : 2023 Weekday AM Peak Hour 08.00-09.00 – Do Nothing (includes SD19A/0407)

Stephen Reid Consulting
Traffic and Transportation

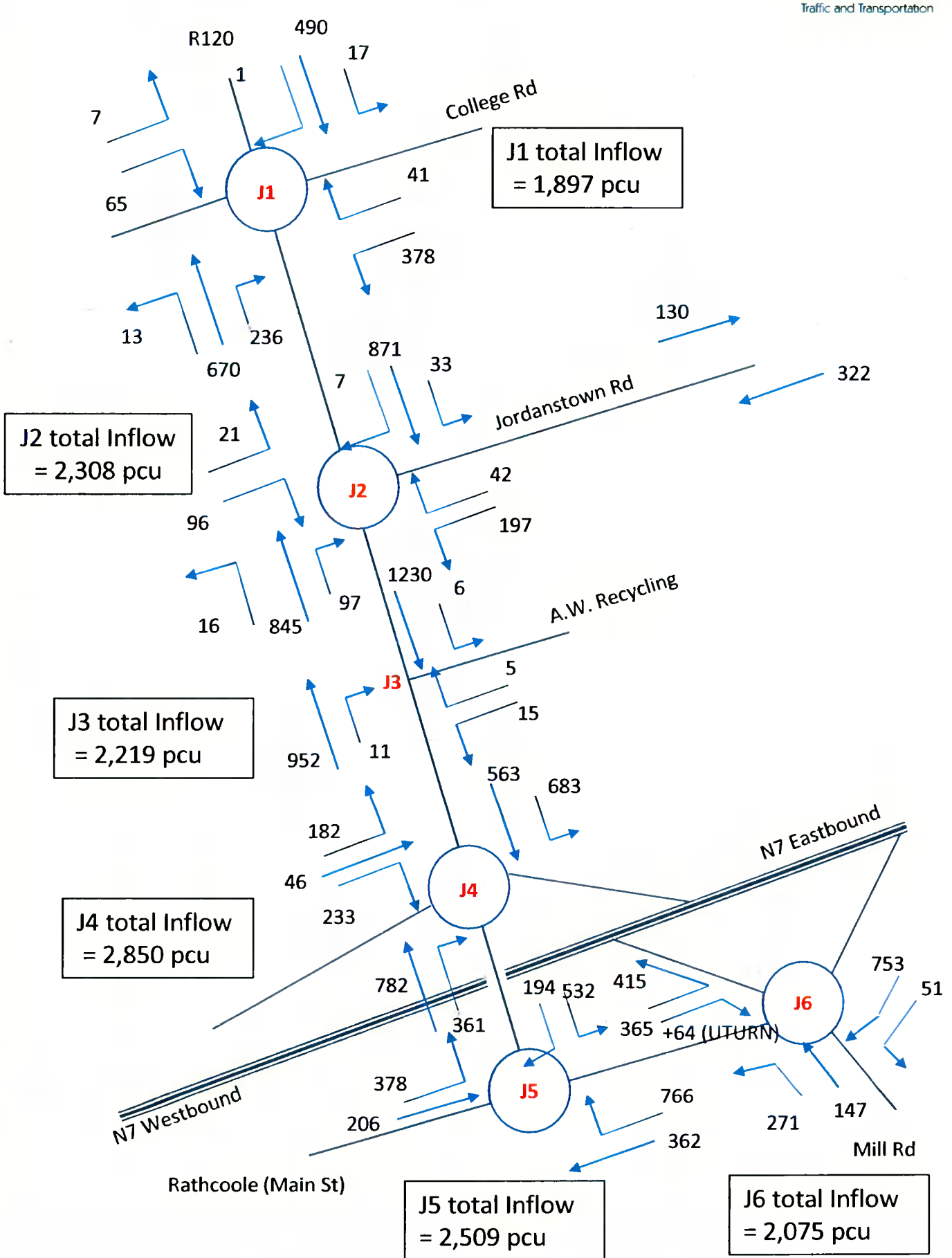
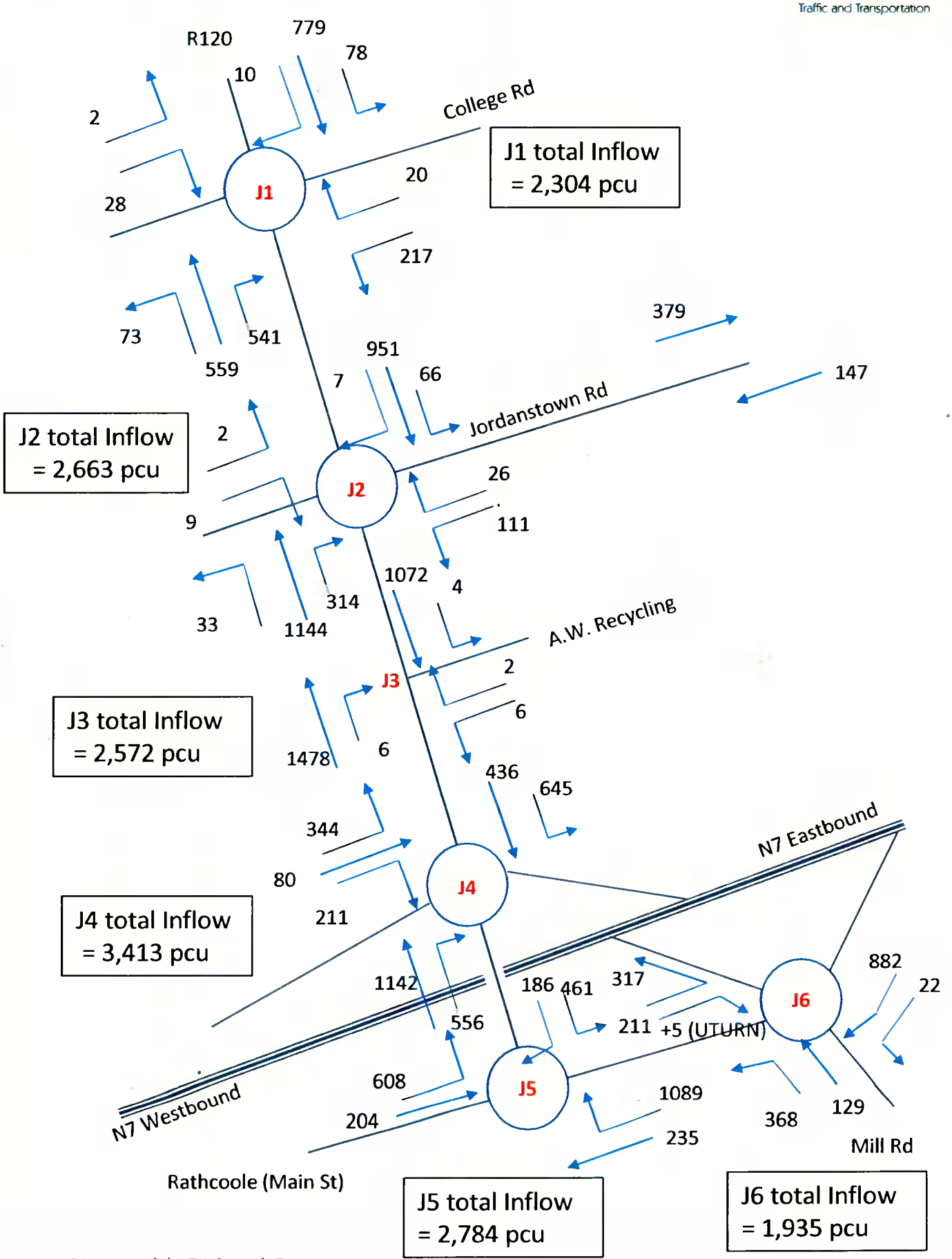


Diagram 1(b) x TII Growth Factor
+ 3(b) committed traffic, flows in pcu/hr

Diagram 4(b) : 2023 Weekday PM Peak Hour 16.00-17.00 - Do Nothing (includes SD19A/0407)

Stephen Reid Consulting
Traffic and Transportation



J1 total Inflow = 2,304 pcu

J2 total Inflow = 2,663 pcu

J3 total Inflow = 2,572 pcu

J4 total Inflow = 3,413 pcu

J5 total Inflow = 2,784 pcu

J6 total Inflow = 1,935 pcu

Diagram 1(a) x TII Growth Factor
+ 3(a) committed traffic, flows in pcu/hr

Diagram 5(a) : 2028 Weekday AM Peak Hour 08.00-09.00 – Do Nothing (includes SD19A/0407)

Stephen Reid Consulting
Traffic and Transportation

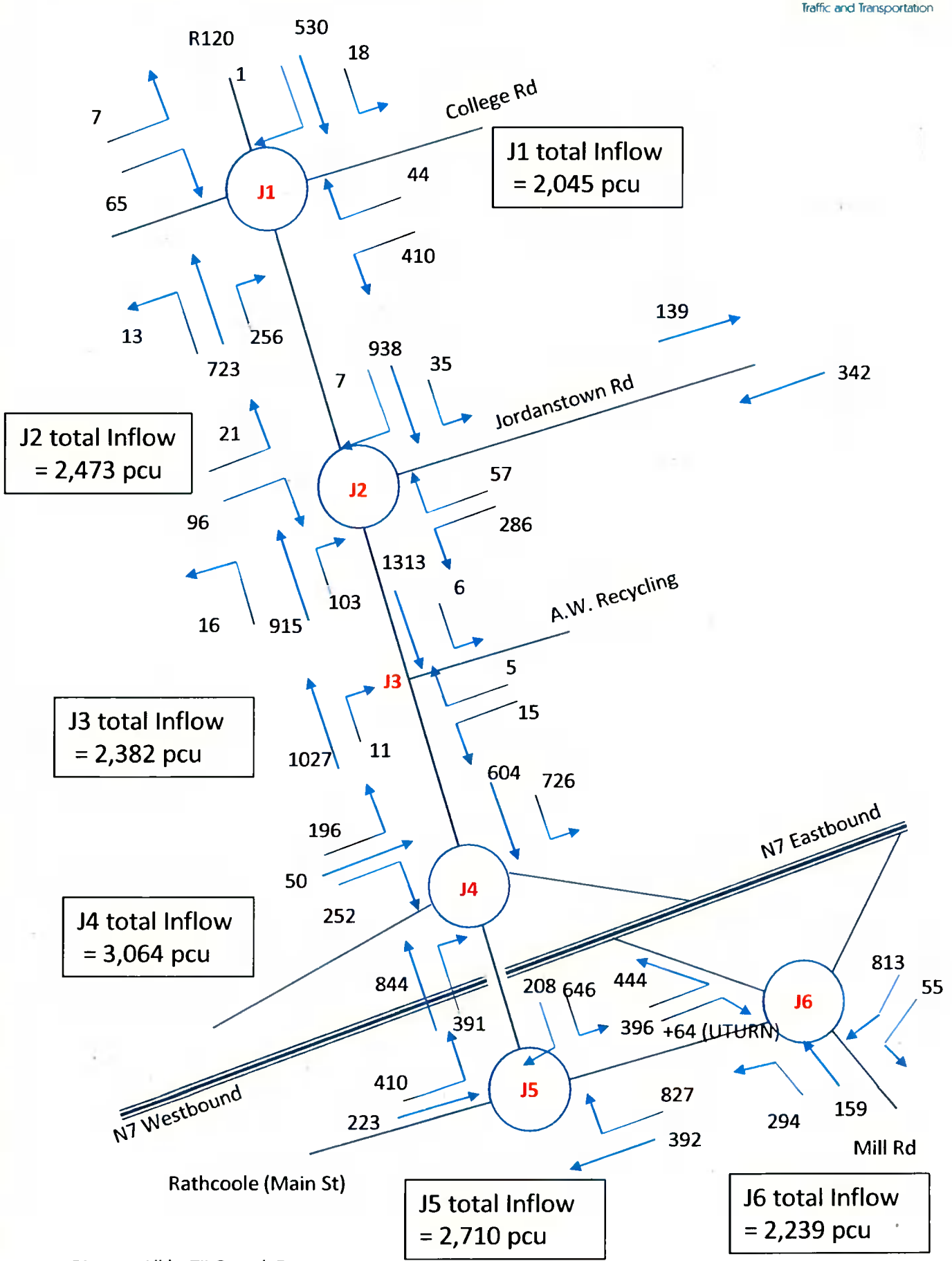


Diagram 1(b) x TII Growth Factor
+ 3(b) committed traffic, flows in pcu/hr

Diagram 5(b) : 2028 Weekday PM Peak Hour 16.00-17.00 - Do Nothing (includes SD19A/0407)

Stephen Reid Consulting
Traffic and Transportation

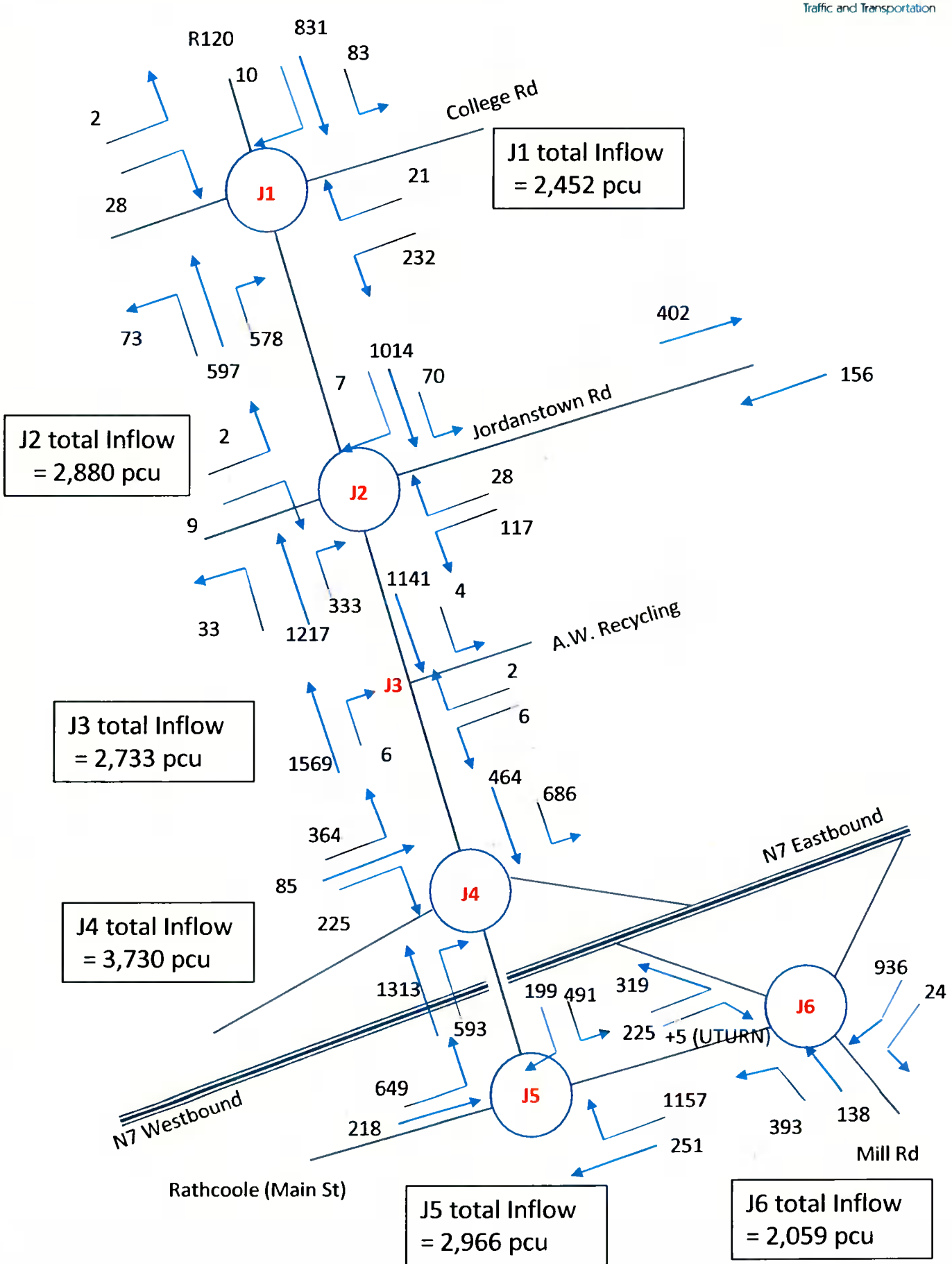


Diagram 1(a) x TII Growth Factor
+ 3(a) committed traffic, flows in pcu/hr

Diagram 6(a) : 2038 Weekday AM Peak Hour 08.00-09.00 – Do Nothing (includes SD19A/0407)

Stephen Reid Consulting
Traffic and Transportation

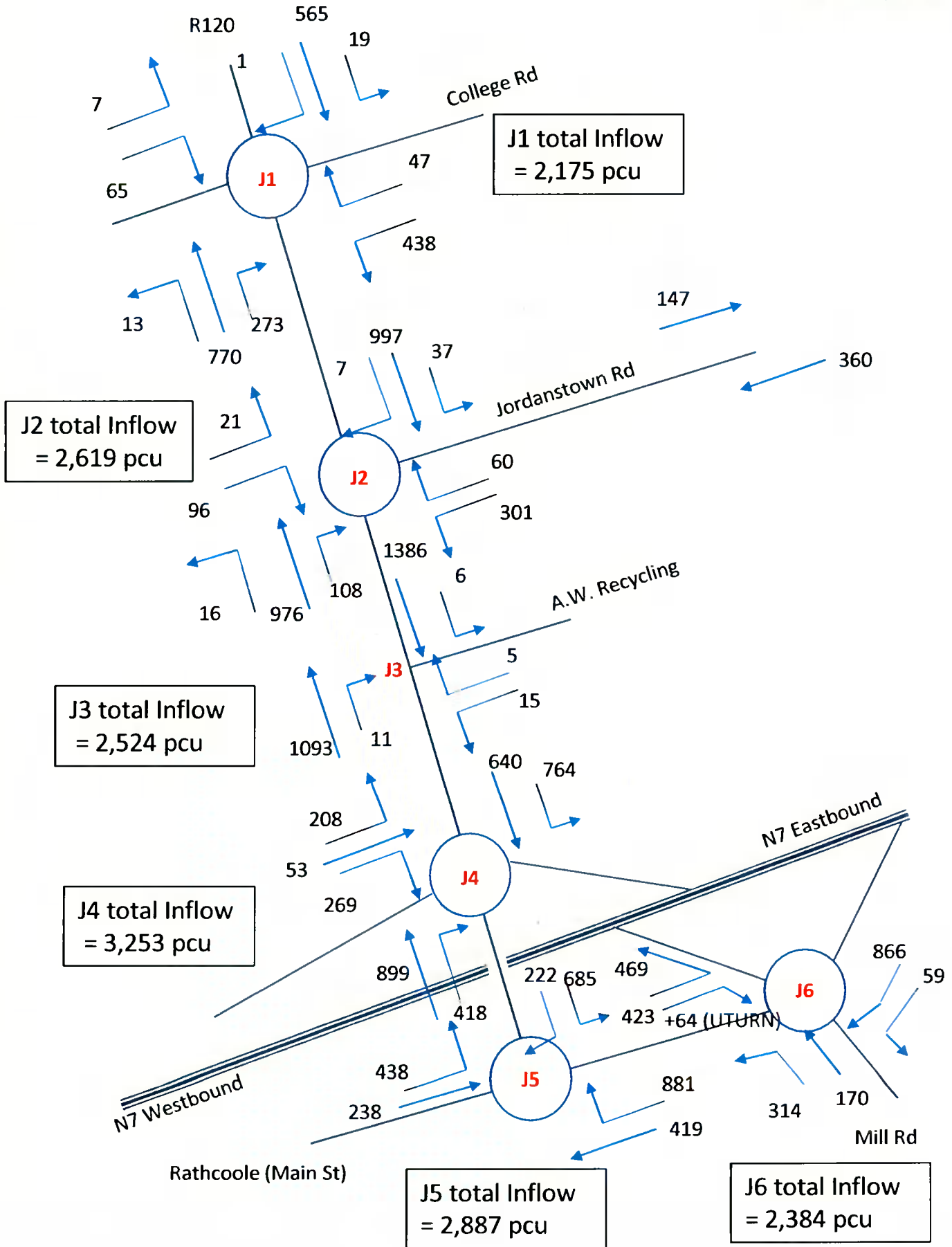


Diagram 1(b) x TII Growth Factor
+ 3(b) committed traffic, flows in pcu/hr

Diagram 6(b) : 2038 Weekday PM Peak Hour 16.00-17.00 - Do Nothing (includes SD19A/0407)

Stephen Reid Consulting
Traffic and Transportation

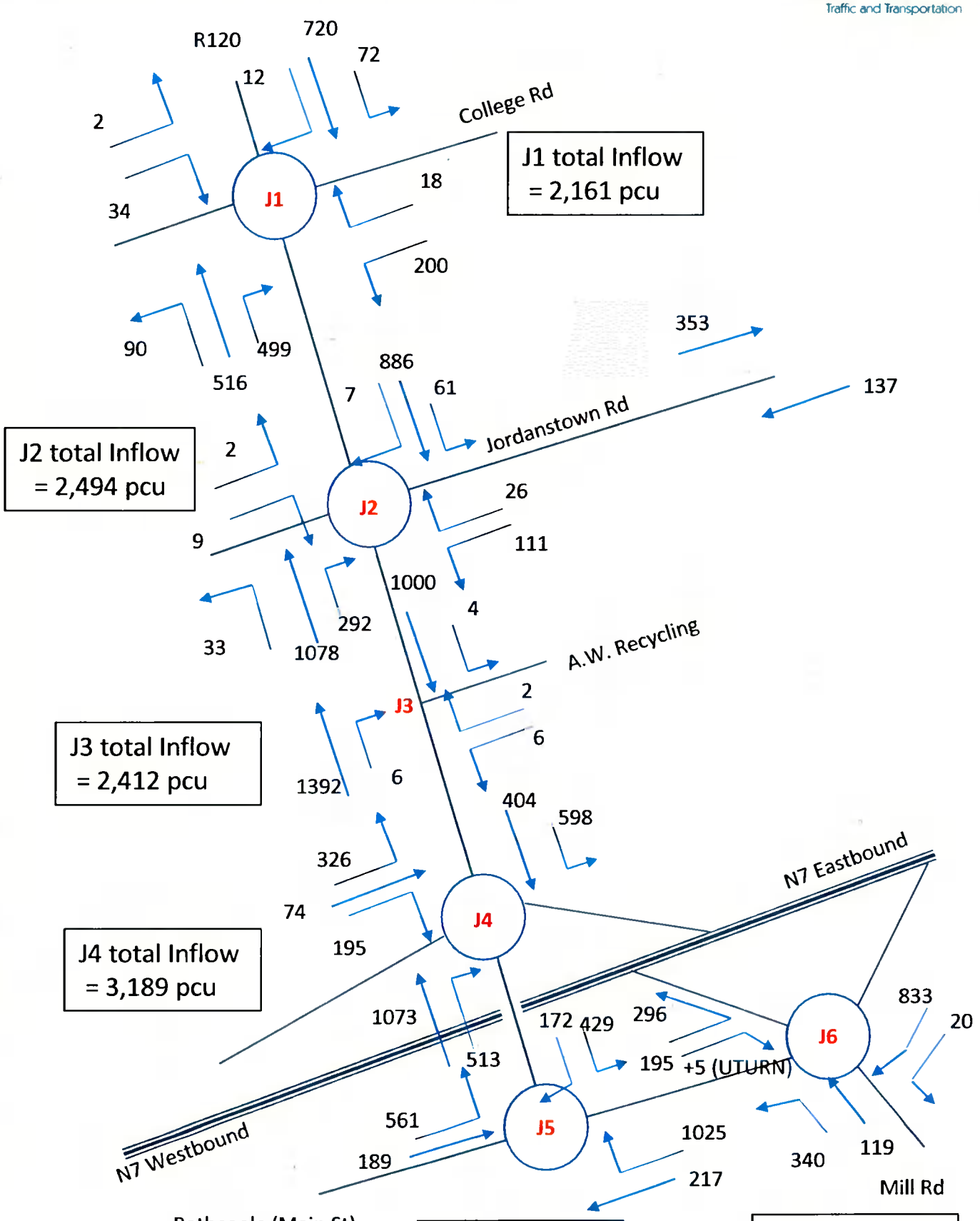


Diagram 4(a) + 2(a), flows in pcu/hr

Diagram 7(a) : 2023 Weekday AM Peak Hour 08.00-09.00 – Do Something (inc SD19A/0407+additional)

Stephen Reid Consulting
Traffic and Transportation

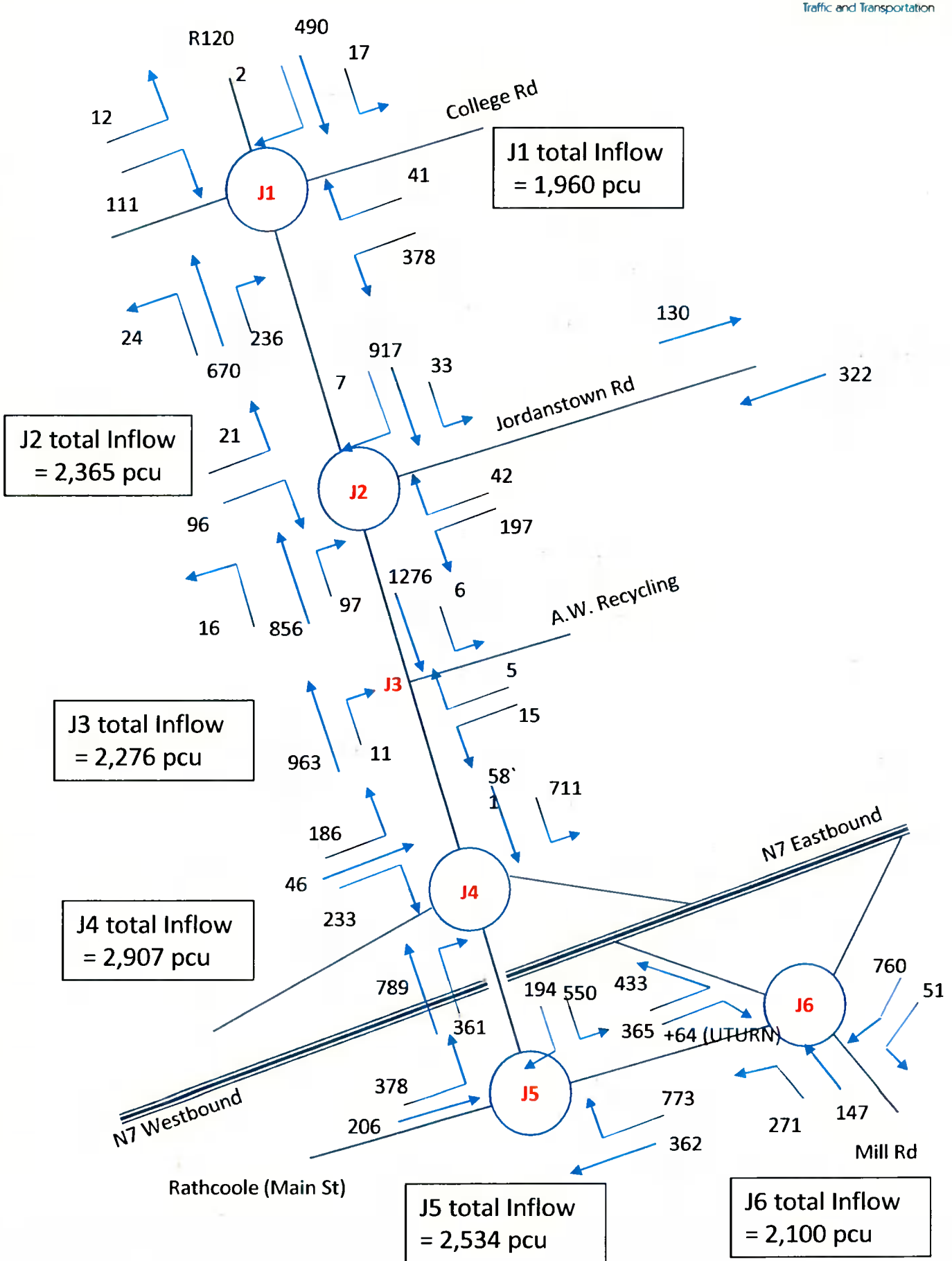
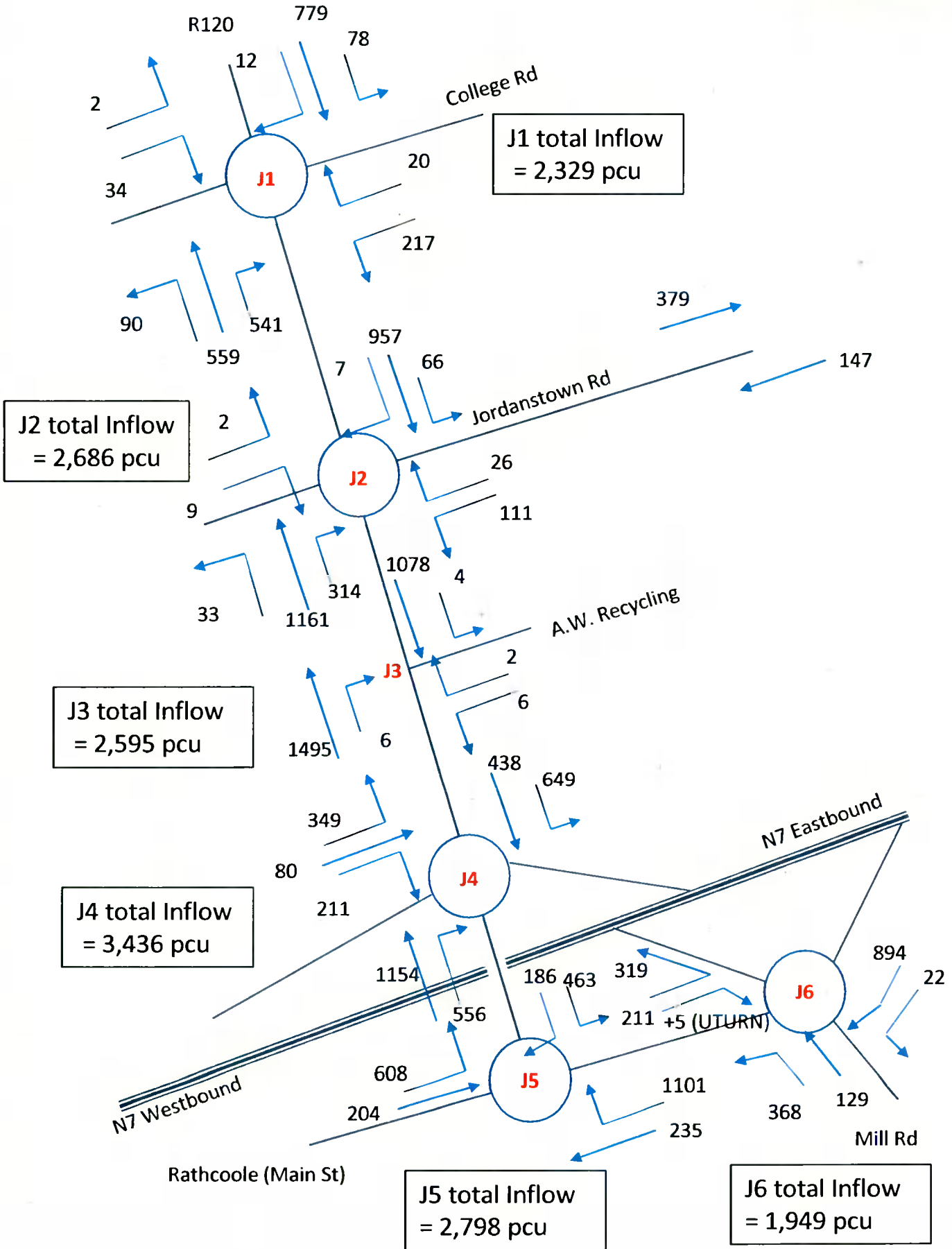


Diagram 4(b) + 2(b), flows in pcu/hr

Diagram 7(b) : 2023 Weekday PM Peak Hour 16.00-17.00 - Do Something (inc SD19A/0407+additional)

Stephen Reid Consulting
Traffic and Transportation



J1 total Inflow = 2,329 pcu

J2 total Inflow = 2,686 pcu

J3 total Inflow = 2,595 pcu

J4 total Inflow = 3,436 pcu

J5 total Inflow = 2,798 pcu

J6 total Inflow = 1,949 pcu

Diagram 5(a) + 2(a), flows in pcu/hr

Diagram 8(a) : 2028 Weekday AM Peak Hour 08.00-09.00 - Do Something (inc SD19A/0407+additional)

Stephen Reid Consulting
Traffic and Transportation

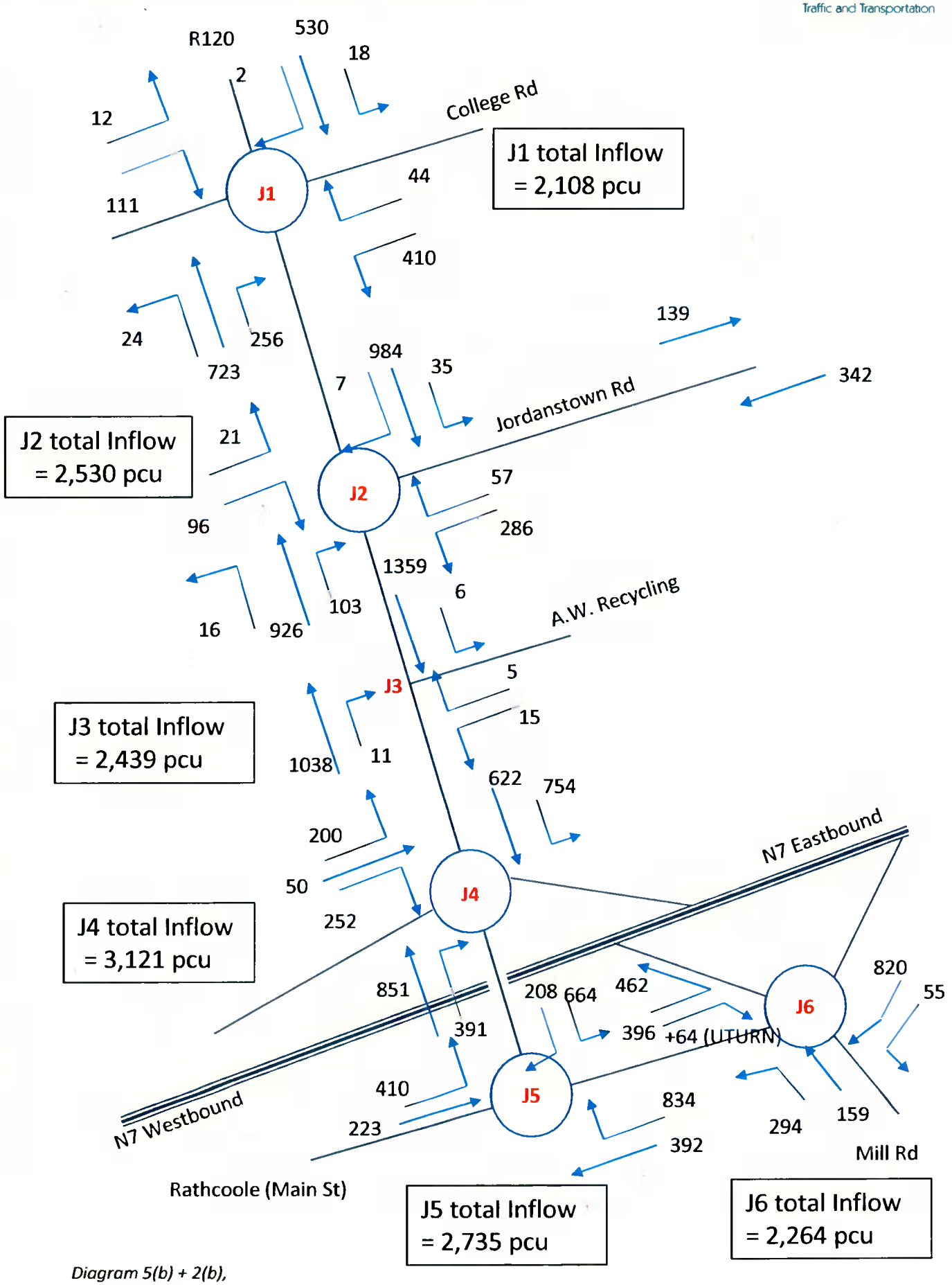


Diagram 5(b) + 2(b), flows in pcu/hr

Diagram 8(b) : 2028 Weekday PM Peak Hour 16.00-17.00 - Do Something (inc SD19A/0407+additional)

Stephen Reid Consulting
Traffic and Transportation

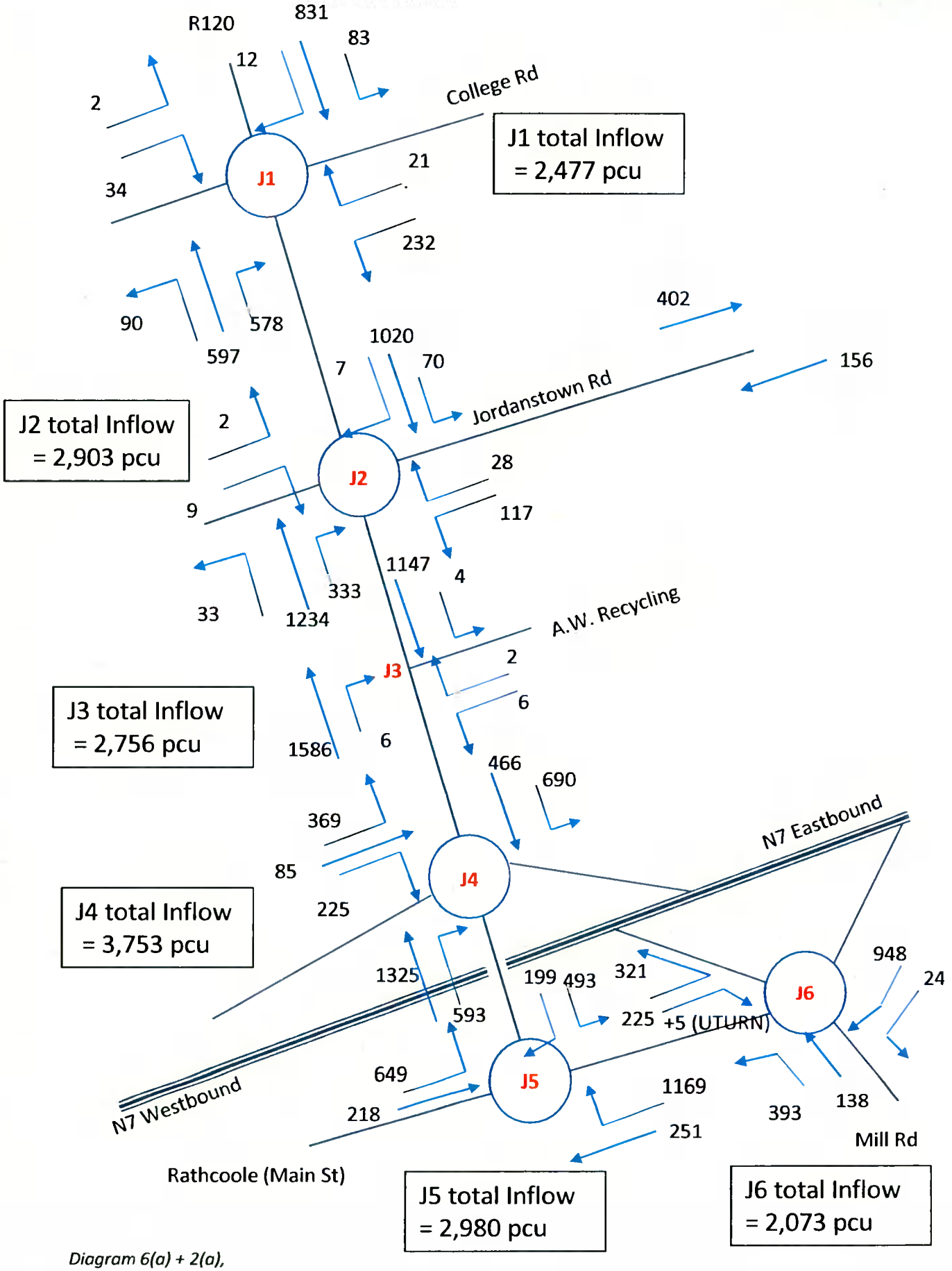


Diagram 6(a) + 2(a),
flows in pcu/hr

Diagram 9(a) : 2038 Weekday AM Peak Hour 08.00-09.00 - Do Something (inc SD19A/0407+additional)

Stephen Reid Consulting
Traffic and Transportation

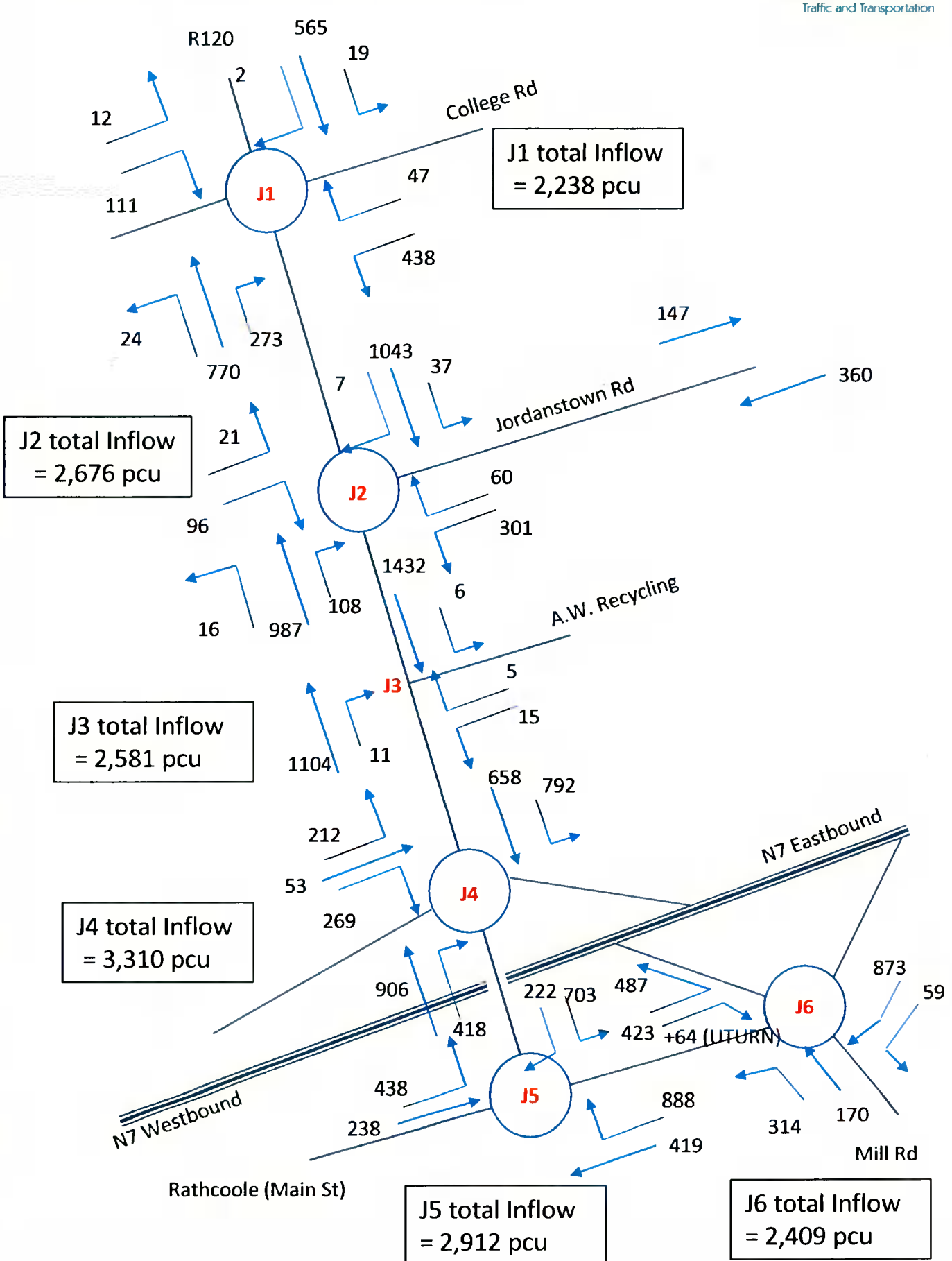


Diagram 6(b) + 2(b), flows in pcu/hr

Diagram 9(b) : 2038 Weekday PM Peak Hour 16.00-17.00 - Do Something (inc SD19A/0407+additional)

Calculation Reference: AUDIT-758001-180704-0720

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
Category : F - WAREHOUSING (COMMERCIAL)

VEHICLES

Selected regions and areas:

14	**LEINSTER**		
	CC	CARLOW	1 days
	LU	LOUTH	1 days
15	**GREATER DUBLIN**		
	DL	DUBLIN	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area
Actual Range: 3950 to 10500 (units: sqm)
Range Selected by User: 3760 to 10500 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/10 to 25/05/16

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Wednesday	1 days
Thursday	1 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	3 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Edge of Town	2
Free Standing (PPS6 Out of Town)	1

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Industrial Zone	2
No Sub Category	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

B2	1 days
B8	2 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,000 or Less	1 days
15,001 to 20,000	1 days
25,001 to 50,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

25,001 to 50,000	2 days
50,001 to 75,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	1 days
1.1 to 1.5	1 days
2.1 to 2.5	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	3 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	3 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 **CC-02-F-01** **HYDRAULIC CYLINDERS** **CARLOW**
O'BRIEN ROAD

CARLOW
Edge of Town
Industrial Zone
Total Gross floor area: 10500 sqm
Survey date: WEDNESDAY *25/05/16* *Survey Type: MANUAL*

2 **DL-02-F-02** **DISTRIBUTION CEN** **DUBLIN**
TURVEY AVENUE
DONABATE
DUBLIN
Free Standing (PPS6 Out of Town)
Industrial Zone
Total Gross floor area: 3950 sqm
Survey date: THURSDAY *29/09/11* *Survey Type: MANUAL*

3 **LU-02-F-01** **PACKAGING COMPANY** **LOUTH**
MATTHEWS LANE
LAGAVOOREN
DROGHEDA
Edge of Town
No Sub Category
Total Gross floor area: 5350 sqm
Survey date: FRIDAY *19/06/15* *Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)
VEHICLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	TOTALS				
Time Range	Trip Rate	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00					
01:00 - 02:00					
02:00 - 03:00					
03:00 - 04:00					
04:00 - 05:00					
05:00 - 06:00					
06:00 - 07:00					
07:00 - 08:00	**0.662**	0.045	**3**	**6600**	**0.707**
08:00 - 09:00	0.177	0.051	3	6600	0.228
09:00 - 10:00	0.091	0.071	3	6600	0.162
10:00 - 11:00	0.071	0.091	3	6600	0.162
11:00 - 12:00	0.066	0.076	3	6600	0.142
12:00 - 13:00	0.066	0.126	3	6600	0.192
13:00 - 14:00	0.197	0.136	3	6600	0.333
14:00 - 15:00	0.207	0.136	3	6600	0.343
15:00 - 16:00	0.106	0.152	3	6600	0.258
16:00 - 17:00	0.101	**0.520**	3	6600	0.621
17:00 - 18:00	0.020	0.116	3	6600	0.136
18:00 - 19:00	0.035	0.232	3	6600	0.267
19:00 - 20:00					
20:00 - 21:00					
21:00 - 22:00					
22:00 - 23:00					
23:00 - 24:00					

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	3950 - 10500 (units: sqm)
Survey date date range:	01/01/10 - 25/05/16
Number of weekdays (Monday-Friday):	3
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)
TAXIS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	6600	0.000	3	6600	0.000	3	6600	0.000
08:00 - 09:00	3	6600	0.000	3	6600	0.000	3	6600	0.000
09:00 - 10:00	3	6600	0.000	3	6600	0.000	3	6600	0.000
10:00 - 11:00	3	6600	0.000	3	6600	0.000	3	6600	0.000
11:00 - 12:00	3	6600	0.000	3	6600	0.000	3	6600	0.000
12:00 - 13:00	3	6600	0.000	3	6600	0.000	3	6600	0.000
13:00 - 14:00	3	6600	0.000	3	6600	0.000	3	6600	0.000
14:00 - 15:00	3	**6600**	**0.005**	3	**6600**	**0.005**	3	**6600**	**0.010**
15:00 - 16:00	3	6600	0.000	3	6600	0.000	3	6600	0.000
16:00 - 17:00	3	6600	0.000	3	6600	0.000	3	6600	0.000
17:00 - 18:00	3	6600	0.000	3	6600	0.000	3	6600	0.000
18:00 - 19:00	3	6600	0.000	3	6600	0.000	3	6600	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.005			0.005			0.010

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	3950 - 10500 (units: sqm)
Survey date date range:	01/01/10 - 25/05/16
Number of weekdays (Monday-Friday):	3
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)
OGVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	6600	0.020	3	6600	0.015	3	6600	0.035
08:00 - 09:00	3	6600	0.020	3	6600	0.020	3	6600	0.040
09:00 - 10:00	3	6600	0.020	3	6600	0.005	3	6600	0.025
10:00 - 11:00	3	6600	0.015	**3**	**6600**	**0.025**	3	6600	0.040
11:00 - 12:00	3	6600	0.010	3	6600	0.020	3	6600	0.030
12:00 - 13:00	3	6600	0.015	3	6600	0.015	3	6600	0.030
13:00 - 14:00	3	6600	0.005	3	6600	0.005	3	6600	0.010
14:00 - 15:00	3	**6600**	**0.035**	3	6600	0.015	**3**	**6600**	**0.050**
15:00 - 16:00	3	6600	0.005	3	6600	0.015	3	6600	0.020
16:00 - 17:00	3	6600	0.015	3	6600	0.025	3	6600	0.040
17:00 - 18:00	3	6600	0.005	3	6600	0.010	3	6600	0.015
18:00 - 19:00	3	6600	0.005	3	6600	0.000	3	6600	0.005
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.170			0.170			0.340

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*