Machines SBA

From: Gina Makrylos <ginamakrylos@makrylosgroup.com>
Sent: Tuesday, 11 May 2021 11:50 AM
To: Machines SBA
Subject: FW: Proposed development at Lot 7820 (4) Blake Street, The Gardens - ELYSIUM GREEN

Hi Phil,
Could you please print the below email.

Many thanks Gina

Sent from my Samsung Galaxy smartphone.

-------- Original message --------
From: "Conneil L. Brown" <Conneil.Brown@darwin.nt.gov.au>
Date: 11/5/21 11:34 am (GMT+09:30)
To: Gina Makrylos <ginamakrylos@makrylosgroup.com>
Cc: Drosso Lelekis <Drosso.Lelekis@darwin.nt.gov.au>
Subject: RE: Proposed development at Lot 7820 (4) Blake Street, The Gardens - ELYSIUM GREEN

Good morning Gina,

The amend to ensure that all existing on-street parking is maintained is approved.

I can also confirm that City of Darwin will approved the use of a conditions precedent for an updated TIA Report for this development prior to the commencement of the development at 4 Blake Street, The Gardens, taking into considering that it might take a few years before the project commences.

Kind regard

CONNEIL BROWN
TEAM LEADER DEVELOPMENT

CITY OF DARWIN
CIVIC CENTRE Harry Chan Avenue | GPO Box 84 Darwin NT 0801
P 08 8930 0413 | F 08 8930 0311
www.darwin.nt.gov.au

From: Gina Makrylos <ginamakrylos@makrylosgroup.com>
Sent: Monday, 10 May 2021 4:16 PM
To: Conneil L. Brown <Conneil.Brown@darwin.nt.gov.au>

Cc: Drosso Lelekis <Drosso.Lelekis@darwin.nt.gov.au>
Subject: Proposed development at Lot 7820 (4) Blake Street, The Gardens - ELYSIUM GREEN

Hi Conneil,
I hope you had a great weekend!
Thank you so much for your email.

Please find attached an amended plan, showing the 2.3m wide parking bays outside the development and 2.1m parking bays on the opposite side, to ensure that all existing on-street parking is maintained. When you can, could you please let me know if you are happy with this plan.

In addition, as discussed on the telephone today, could you please confirm that you are happy for us to provide the City of Darwin with an updated TIA report as a "condition precedent", prior to the commencement of the development at 4 Blake Street, The Gardens, taking into considering that it might take a few years before the project commences.

If you could please let me know at your earliest convenience, I would greatly appreciate it.

Please do not hesitate to contact me, if you have any questions, or if you require any further information.

Many thanks for your assistance.

Kindest Regards
Gina Makrylos

From: Conneil L. Brown [mailto:Conneil.Brown@darwin.nt.gov.au]
Sent: Monday, 10 May 2021 8:48 AM
To: Gina Makrylos <ginamakrylos@makrylosgroup.com>
Cc: Drosso Lelekis <Drosso.Lelekis@darwin.nt.gov.au>
Subject: Proposed development at Lot 7820 (4) Blake Street, The Gardens - ELYSIUM GREEN

Good morning Gina,

The traffic report has been reviews and have been found to be suitable noting Council's acceptance at the time it was submitted.

However this report will need to be revised to reflect issue in the current year, and not 2016, as well as other areas identified, for example, the design horizon year now being 2031.

Also on in Figures 25, 26 and 27 shows 2.5m wide parking bays on the development side and a road shoulder of 1.9m on the opposite side. Is there proposal to prohibit parking on the opposite side of the road as 1.9m is too narrow for an on-street parking bay? Or could they consideration of 2.3m wide parking bays outside the development and 2.1m parking bays on the opposite to ensure all existing on-street parking is maintained?

Kind regards

CONNEIL BROWN
TEAM LEADER DEVELOPMENT

CITY OF DARWIN
CIVIC CENTRE Harry Chan Avenue | GPO Box 84 Darwin NT 0801
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www.darwin.nt.gov.au

June D'Rozario

From: James Whyte <J.Whyte@darwin.nt.gov.au>
Sent: Thursday, 22 December 2016 11:39 AM
To: 'drozario@ozemail.com.au'
Cc: Infrastructure Records
Subject: FW: 4 Blake Street - Deferral Response

Hello June,

I have been asked to send this on to you.

Regards,

JAMES WHYTE
TEAM LEADER DEVELOPMENT

CITY OF DARWIN
CIVIC CENTRE Harry Chan Avenue | GPO Box 84 Darwin NT 0801
P 08 8930 0413 | F 08 8981 8415 | M 0417 885 709
www.darwin.nt.gov.au

From: James Whyte
Sent: Thursday, 22 December 2016 8:39 AM
To: 'Gina Makrylos'
Cc: Infrastructure Records; 'Adelle Godfrey'
Subject: 4 Blake Street - Deferral Response

Dear Mr Makrylos,

Please find below City of Darwin's response to Deferral notice issued 10 November 2016

Council has reviewed the updated TIA provided on 5 December 2016, including undertaking an independent peer review. The following comments address the items relating to the deferral, with additional comments that will require further discussion at the condition precedent stage also included.

Deferral No. 3 - *"Advice from City of Darwin that a traffic study has been prepared to their requirements and satisfaction as per sub-clause 4 of SD46"*

- *"Undertake new counts on the relevant roads to obtain current data and update modelling"* *This requirement has been satisfactorily met*
- *"12 hour counts of the key and secondary intersections to determine actual AM and PM peak hours, not estimated ones. Note: some developments in the area were not present in 2013 when the original TIA was prepared"* *This requirement has been satisfactorily met*
- *"Revise the 10 year design horizon based on the new opening year of the development"* *This requirement has been satisfactorily met*
- *"Assess the need, based on development traffic and for the revised design horizon, for any upgrade that may be required to the four-way intersection of Blake Street and Gardens Hill Crescent"* *The SIDRA analysis has*

been reviewed as potentially not being calibrated and validated to replicate field conditions, however the impact of this is considered negligible and therefore this requirement has been satisfactorily met.

- *"Consider the need for and/or rationalisation of movements at the Geranium Street intersection / dead-end" This requirement has been satisfactorily met*
- *"Include reference to the City of Darwin's Bike Plan 2015 – 2020 and the Darwin Inner Suburbs Area Plan and assess the impacts of the proposed development, including infrastructure within the road reserve" This requirement has been satisfactorily met*
- *"Assess cyclists and pedestrians as part of the assessment and provide appropriate facilities for them, including sufficient footpath width for the commercial area and connection to adjacent footpaths" This requirement has been satisfactorily met where the kerb line is only amended for the allowance of parallel parking, resulting in a 2.6m min wide verge area. Therefore, the final width to ensure its compliance will be assessed with the design drawings for the road reserve works. A crossing for shared path usage is required to be constructed at the Blake Street and Geranium Street intersection to facilitate connection of the development to the off-road shared path at the eastern end of Blake Street.*
- *"Show current and proposed cross-sections and detail impacts on parking and road pavement as a result of shifting kerb lines" This requirement has been satisfactorily met, noting the commentary in the previous point*

Additional Comments

Council will be requesting to the DCA that the following are incorporated into the relevant Condition Precedent as a result of the TIA, in addition to Council's standard conditions. In addition to their inclusion as condition precedent, these items are required to be satisfied by Council before any clearances or permits for works relating to the development are issued.

1. Prior to the commencement of works, a design of the adjacent road reserves on Blake Street and Gardens Hill Crescent is required to be provided to the satisfaction of Council. This is to incorporate, as a minimum;
    a) road design drawings, including parking bays, traffic lanes and kerb lines
    b) verge design drawings, including landscaping, footpath cross falls, pram crossings and building interface levels
2. Prior to the commencement of works, a Waste Management Plan, including swept paths for the vehicle to enter and exit the property in a forward gear, is required to be provided to the satisfaction of Council

In summary, Council is satisfied that the requirements of the deferral have been met, with any outstanding minor issues to be addressed as Condition Precedent. The clearance of the deferral items do not change Council's previous commentary relating to the development and all items are still required to be resolved through the Development Permit process to the satisfaction of Council.

Regards,

JAMES WHYTE
TEAM LEADER DEVELOPMENT

CITY OF DARWIN
CIVIC CENTRE Harry Chan Avenue | GPO Box 84 Darwin NT 0801
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TRAFFIC IMPACT ASSESSMENT

Elysium Mixed Use Development, Lot 7820 Gardens Hill Crescent, The Gardens, Darwin

Final 2.0

Prepared by i3 consultants WA for
Michael Makrylos
www.i3consultants.com

Project details

Project ID	23606 02
Client	Michael Makrylos
Description	A formal Traffic Impact Assessment prepared in accordance with Austroads "Guide to Traffic Management Part 12: Traffic Impacts of Development' for a proposed mixed use development on Lot 7820 on the northwest corner of Gardens Hill Crescent and Blake Street (SN 4 Blake Street) in the Darwin suburb of The Gardens.

Document Control

Author	David Wilkins
Status	Final 2.0
File name	23606 02 Elysium TIA (F 2_0)

Distribution & Publication Record

	Draft			Final				
	23/08/13			20/11/13	16/11/16			
	0.1	0.2	0.3	1.0	2.0	2.1	2.2	2.3
Mario.Maddalozzo@irwinconsult.com.au	☑	☐	☐	☑	☐	☐	☐	☐
ginamakrylos@bigpond.com	☑	☐	☐	☑	☑	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐
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Revision Status: F2.0 reflects revised development plans and updated 2016 traffic survey data and assessment.

This is not an approved document unless certified here

Digitally signed by David Wilkins
Date: 2016.11.16 17:13:06 +08'00'

CONTENTS

ABOUT THE GARDENS & DARWIN'S INNER SUBURBS

The proposed *Development Site* is located in the City of Darwin suburb of The Gardens which forms part of the Northern Territory Planning Commission's *Inner Suburbs Area Plans* and *Compact Urban Growth* initiatives.

The Northern Territory Planning Commission is using the recently adopted Compact Urban Growth Policy to guide the preparation of *Area Plans* for Darwin's Inner Suburbs. The *Area Plans* aim to:

- identify activity centres and public transport nodes, where higher dwelling and commercial density may be encouraged;
- identify transition areas around these centres and nodes, where dwelling density will become less intense, and will transition to lower densities generally matching the surrounding locality (generally around 400 metres away from the activity centre and public transport node);
- encourage development that is consistent with the predominate housing and building types in the area.

These guiding principles will assist with balancing the demands of a growing population with the lifestyle aspirations of the community.

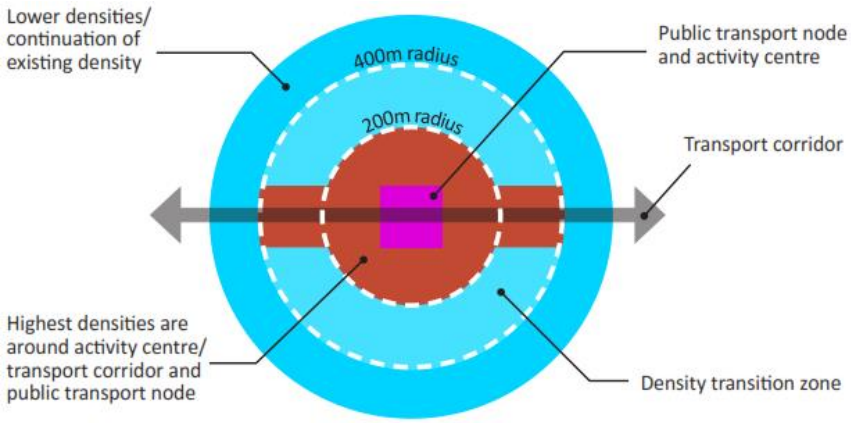
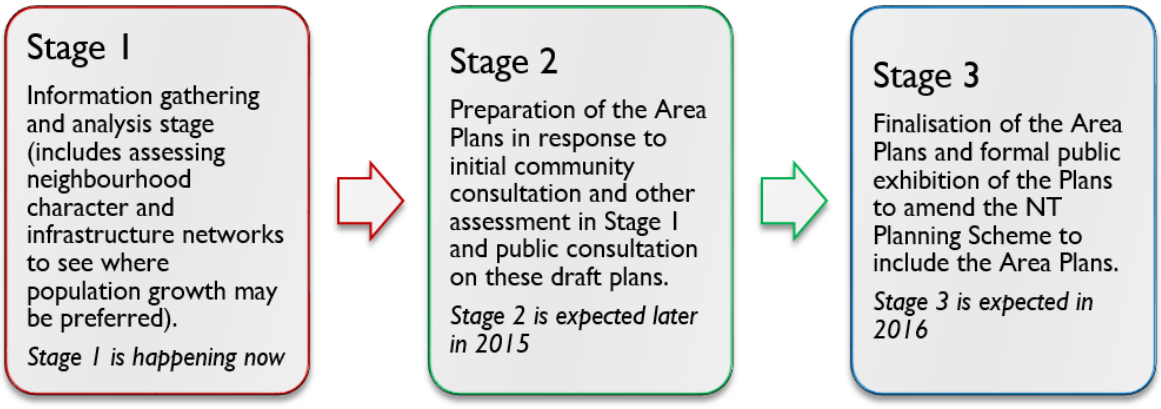


Figure 1 – The Compact Urban Growth Model

Higher densities are encouraged within 400 metres of activity centres and high frequency public transport corridors.

The following flow chart represents the three stages of preparation for the inner suburbs *Area Plans*.



1 INTRODUCTION AND SUMMARY

This Traffic Impact Assessment (*TIA*) report has been prepared for the proposed mixed use (residential, retail and office/ commercial) development (Elysium) on the northwest corner of Blake Street and Gardens Hill Crescent in accordance with the Austroads document *Guide to Traffic Management Part 12: Traffic Impacts of Developments* (*AGTM12)* (1) and follows the report structure provided as Appendix C of *AGTM12*.

1.1. PURPOSE OF REPORT AND STUDY OBJECTIVES

The purpose of this report and the study objective is to assess and document findings and recommendations with respect to the following:

- Traffic on adjacent roads and affected intersections;
- Integration with its surroundings; and
- Parking areas, access and circulation.

This report is intended to support the Development Application and hence provides stakeholders with the relevant information required to adequately assess likely impacts on the road network.

1.2. EXECUTIVE SUMMARY

1.2.1 SITE LOCATION AND STUDY AREA

The proposed development is on Lot 7820 on the north-west corner of Blake Street and Gardens Hill Crescent in the Darwin suburb of The Gardens as shown in the Development Plans listed in **Section 2.2.3** and in Figure 2 on page 9. Its street address is 4 Blake Street, The Gardens.

The greatest impact of the development (i.e. generated volumes greater than 10% of existing volumes) is expected to be vehicular traffic to and from the site through the following two Key intersections (*Ki*):

Ki1: Gardens Hill Crescent/ Blake Street; and

Ki2: Gardens Hill Crescent/ Geranium Street.

There are also expected to be increased volumes of traffic through the following two Secondary intersections although these are not expected to be significant (i.e. less than 10% of existing volumes).

Si1: Geranium Street/ Stuart Highway; and

Si2: Gardens Hill Crescent/ Gardens Road.

Accordingly, the Study Area for this *TIA* comprises of the entire length of Gardens Hill Road including all its intersections as shown in Figure 2 on page 9.

1.2.2 DEVELOPMENT DESCRIPTION

The project provides for a residential development within Darwin's fringe urban environment. It is the intention to provide a small number of convenience retail facilities to the area and enhance an important part of the Darwin community which is located just outside its Central Business District (*CBD*).

The proposed development consists of:

- 24 x 1 Bedroom & 1 Bedroom + Study Residential Units;
- 54 x 2 Bedroom & 2 Bedroom + Study Residential Units;
- 37 x 3 Bedroom & 3 Bedroom + Study Residential Units;
- 100 m^2 (GFA) of Retail; and
- 150 m^2 (GFA) of Commercial

1.2.3 TYPES OF STUDIES UNDERTAKEN

- Detailed simultaneous 12 hour counts (6 AM to 6 PM) at each of the four Key and Secondary intersections on Tuesday 8th November 2016 broken down into 15 minute intervals with light, heavy, pedestrian and cyclist's movements recorded;
- Peak hour trip generation surveys of similar developments nearby;
- 5 Year Crash Records;
- SCATS analysis of nearby traffic signals for 4-year peak hour growth analysis;
- Daily traffic volume analysis over 10 years; and
- *SIDRA* Intersection 6.0 models based on survey data and observed traffic data and behaviour.

1.2.4 PRINCIPAL FINDINGS

There are no road or intersection capacity or performance issues either with the current traffic volumes or with the forecast 2028 and development generated volumes. All roads and intersections within the Study Area are expected to continue to operate with stable free flow conditions where drivers can select desired speeds and easily manoeuvre within the traffic stream except for right turns into and out of Geranium St at Stuart Hwy, as would be expected for a Give Way controlled T intersection with a six-lane highway during peak times.

There are sight lines and hence road safety concerns with the proposed driveways off Gardens Hill Crescent due to the proposed provision of embayed parking areas on the development side. These may be able to be addressed through the detailed design of a traffic calmed Activity Centre section of Gardens Hill Crescent between Blake St and the southern Access Driveway to the development site.

The off-street parking areas generally comply with the requirements of the *NTPS* and relevant Australian Standards.

1.2.5 CONCLUSIONS

This detailed assessment has revealed that the road network is forecast to continue to operate with stable free flow conditions where drivers can select desired speeds and to easily manoeuvre within the traffic stream except for right turns into and out of Geranium St at Stuart Hwy, as would be expected for a Give Way controlled T intersection with a six-lane highway during peak times.

1.2.6 RECOMMENDATION

It is recommended that discussion is held with the City of Darwin aimed at designing and implementing a traffic calmed Activity Centre section of Gardens Hill Crescent between Blake St and the southern Access Driveway to the development site. This has the added benefit of discouraging current through traffic using Gardens Hill Crescent as a short cut between Gardens Road and Stuart Highway and hence has potential to result in an overall reduction in vehicular volumes as a result of this development.

2 PROPOSED DEVELOPMENT

The location of the development site and the *TIA* Study Area is shown in Figure 2 below.

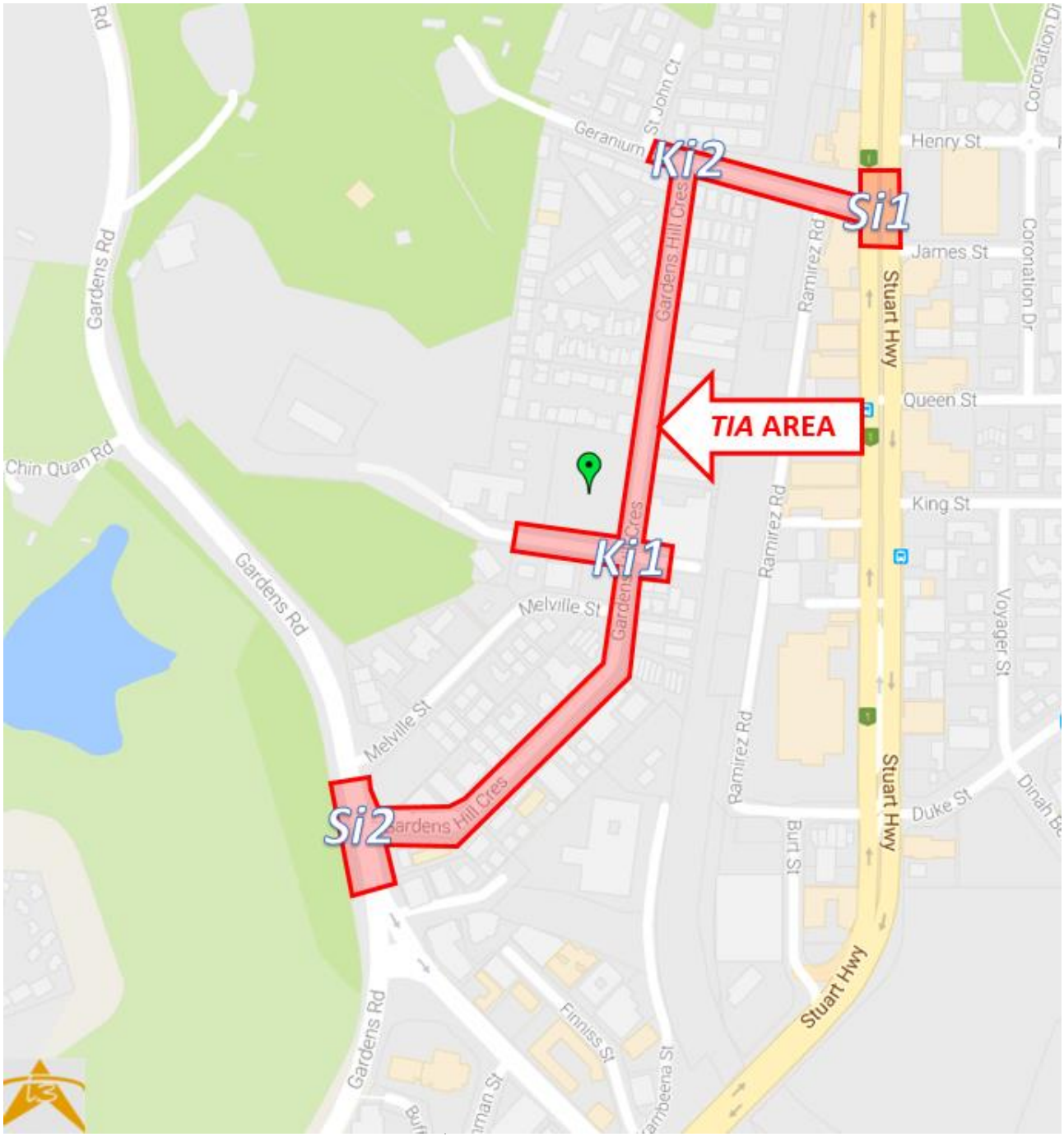


Figure 2 – Location of development , *TIA* Study Area and Key & Secondary intersections

2.1. OFF-SITE (OR BACKGROUND) DEVELOPMENT

The development site is currently a vacant block of land and is believed to have been vacant since Cyclone Tracey destroyed development on the site in 1974. The site indicates that it has recently been accessed off both Blake Street and Gardens Hill Crescent but it is difficult to ascertain how the previous development was accessed.

The current site is a cleared 'brownfield' site with large trees on the corner of Blake Street and Gardens Hill Crescent as shown in Photograph 1 and Photograph 2 below.

Photograph 1 – Existing development (Sat 11 Jun 2016 2:11 PM)

Photograph 2 – Looking north towards development site – note large trees

2.2. DESCRIPTION OF ON-SITE DEVELOPMENT

2.2.1 LAND USE AND INTENSITY

The project provides for a mixed use residential, retail and office/ commercial development within Darwin's fringe urban environment. It is the intention to provide a small number of convenience retail facilities to the area and enhance an important part of the Darwin community which is located just outside its Central Business District (*CBD*).

The proposed development consists of:

- 24 x 1 Bedroom & 1 Bedroom + Study Residential Units;
- 54 x 2 Bedroom & 2 Bedroom + Study Residential Units;
- 37 x 3 Bedroom & 3 Bedroom + Study Residential Units;
- 100 m^2 (GFA) of Retail; and
- 150 m^2 (GFA) of Commercial

A list of the Development Plans used is included in **Section 2.2.3**. It should be noted that this *TIA* is based on these Development Plans. Should these Plans change, it will be necessary for a review of the relevance of this *TIA* report to be undertaken with respect to the changes.

2.2.2 LOCATION

The proposed development is on Lot 7820 on the north-west corner of Blake Street and Gardens Hill Crescent in the Darwin suburb of The Gardens as shown in Figure 2 on page 9. Its street address is 4 Blake Street, The Gardens.

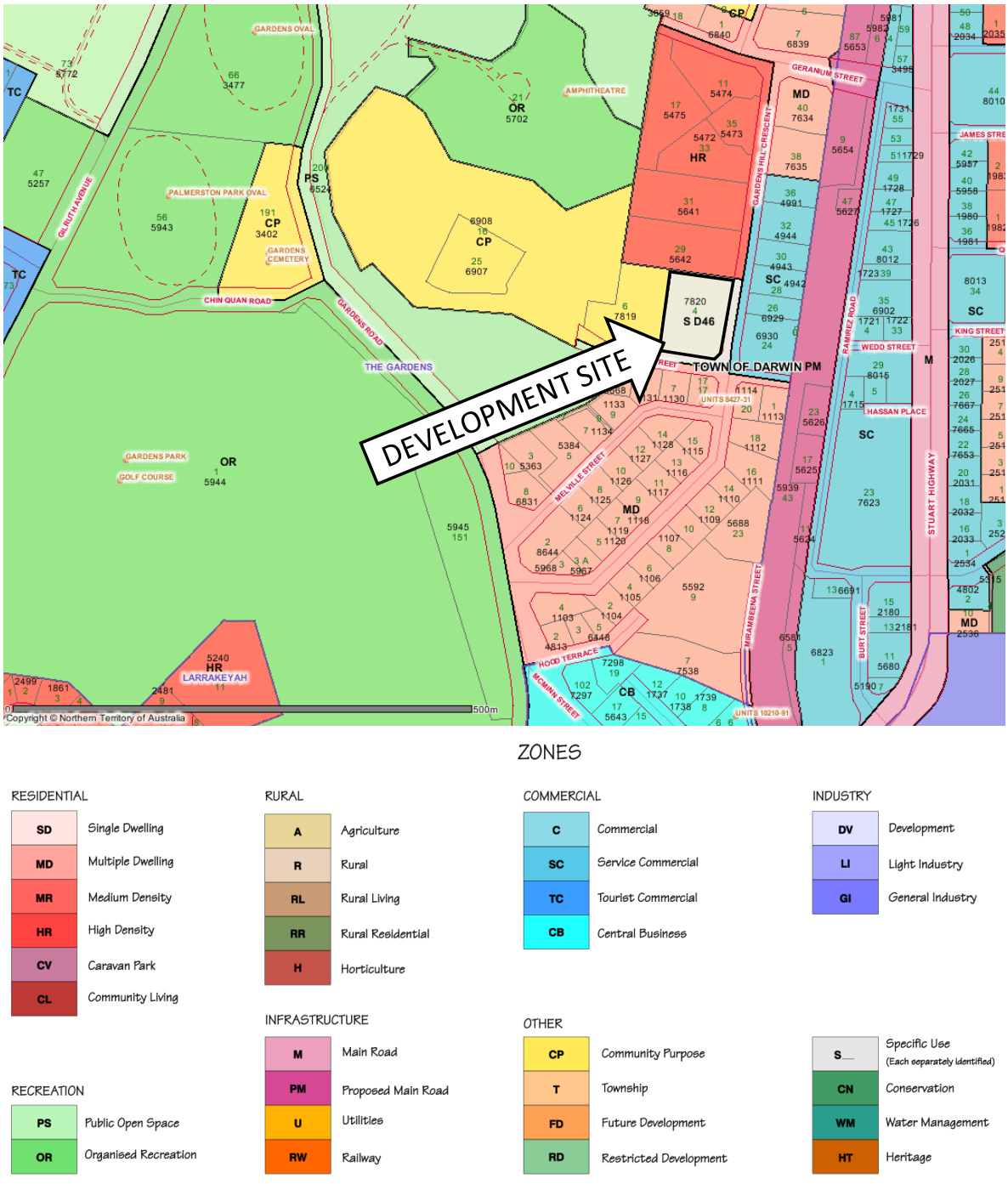
2.2.3 SITE PLANS

The Development Plans used for this *TIA* comprises of the following Archidiom Design Development Application drawings:

Dwg No	Rev	Date	Title
			Cover Sheet (Title & Image)
A-DA-0.01	N	16/11/16	Drawing Schedule
A-DA-1.01	H	26/10/16	Site Location
A-DA-1.02	A	26/10/16	Site Photos
A-DA-1.03	A	26/10/16	Solar, Wind & View Analysis
A-DA-1.04	A	26/10/16	Site Context
A-DA-1.05	A	26/10/16	Urban Connectivity – Pedestrian + Vehicular + Cyclist Movement
A-DA-2.01	H	26/10/16	Perspective 1
A-DA-2.02	H	26/10/16	Perspective 2
A-DA-2.03	H	26/10/16	Perspective 3
A-DA-2.04	D	26/10/16	Architects Statement
A-DA-2.05	M	16/11/16	Development Statistics
A-DA-2.06	K	26/10/16	Basement 1
A-DA-2.07	M	16/11/16	Ground Floor Plan
A-DA-2.08	L	26/10/16	Level 1
A-DA-2.09	L	26/10/16	Level 2-6
A-DA-2.10	L	26/10/16	Roof Plan
A-DA-2.11	J	26/10/16	Tower 1 – Typical Floor Plan
A-DA-2.12	K	26/10/16	Tower 2 _ Typical Floor Plan
A-DA-2.13	H	26/10/16	Section A
A-DA-2.14	I	26/10/16	Section B
A-DA-2.15	I	26/10/16	Section C
A-DA-2.16	H	26/10/16	Section D
A-DA-2.17	I	26/10/16	Elevations – Sheet 1
A-DA-2.18	I	26/10/16	Elevations – Sheet 2
A-DA-2.20	B	26/10/16	External Finishes – Sheet 1
A-DA-2.21	A	26/10/16	External Finishes – Sheet 2
A-DA-2.30	C	16/11/16	Detail of Retail Precinct

2.2.4 ZONING

The redevelopment site is currently zoned "SD 46" in the current *Northern Territory Planning Scheme (November 2016)* and is surrounded by High Density Residential, Community Purposes, Multiple Dwelling Residential and Service Commercial land uses, as shown in Figure 3 below.



ZONES

RESIDENTIAL
- SD Single Dwelling
- MD Multiple Dwelling
- MR Medium Density
- HR High Density
- CV Caravan Park
- CL Community Living

RURAL
- A Agriculture
- R Rural
- RL Rural Living
- RR Rural Residential
- H Horticulture

COMMERCIAL
- C Commercial
- SC Service Commercial
- TC Tourist Commercial
- CB Central Business

INDUSTRY
- DV Development
- LI Light Industry
- GI General Industry

RECREATION
- PS Public Open Space
- OR Organised Recreation

INFRASTRUCTURE
- M Main Road
- PM Proposed Main Road
- U Utilities
- RW Railway

OTHER
- CP Community Purpose
- T Township
- FD Future Development
- RD Restricted Development
- S_ Specific Use (Each separately identified)
- CN Conservation
- WM Water Management
- HT Heritage

Figure 3 – Current zoning near the development site

2.2.5 PHASING AND TIMING

The development is expected to be completed and fully occupied by end of 2018. The City of Darwin has requested that the assessment is based on a 10-year design horizon, i.e. 2028.

3 EXISTING AREA CONDITIONS

3.1. STUDY AREA

3.1.1 AREA OF INFLUENCE

The greatest impact of the development (i.e. generated volumes greater than 10% of existing volumes) is expected to be vehicular traffic to and from the site through the following two Key intersections (*Ki*):

Ki1: Gardens Hill Crescent/ Blake Street; and

Ki2: Gardens Hill Crescent/ Geranium Street.

There are also expected to be increased volumes of traffic through the following two Secondary intersections although these are not expected to be significant (i.e. less than 10% of existing volumes).

Si1: Geranium Street/ Stuart Highway; and

Si2: Gardens Hill Crescent/ Gardens Road.

Accordingly, the Study Area for this *TIA* comprises of the entire length of Gardens Hill Road including Key and Secondary intersections, as shown in Figure 2 on page 9.

3.1.2 AREA OF SIGNIFICANT TRANSPORTATION IMPACT

Based on the above, it is reasonable to assume that the area of greatest transportation impact will be at the Key Intersections (*Ki*) of Gardens Hill Crescent with Blake Street and Geranium Street.

3.2. STUDY AREA LAND USE

3.2.1 EXISTING LAND USES

The existing development site is a cleared 'brownfield' site with a clump of large trees on the southwest corner of the lot.

Land on the west side of Gardens Hill Crescent north of the development site is zoned high density residential and contains over 100 dwellings over six lots. Land on the east side of Gardens Hill Crescent north of Blake Street is zoned Service Commercial over six lots with the last two remaining lots before Geranium Street zoned Multiple Dwelling Residential and contains Studio Motel and Short Stay accommodation development.

All land to the south of the development site fronting Gardens Hill Crescent and Blake Street is zoned Multiple Dwelling Residential.

The Channel Nine Darwin and Territory Television Studios are located on Blake Street at its western end and hence all traffic to and from these studios travels through the Blake Street/ Gardens Hill Crescent intersection (*Ki1*) and along Gardens Hill Crescent.

3.2.2 EXISTING ZONING

As indicated in **Section 2.2.4,** lot 7820 is currently zoned "Special Development 46" (SD46) in the current *NTPS*. This zone was introduced as Amendment No. 384 published in the NT News on 10th July 2015 and is described as follows:

Lot 7820 Town of Darwin (4 Blake Street, Stuart Park).

1. The purpose of this zone is to facilitate the use and development of the land for a predominantly residential development, with complementary commercial activities.
2. With consent, and subject to paragraphs 3 to 13 inclusive, the land may be developed for
    a) caretaker's residence;
    b) home occupation;
    c) multiple dwellings;
    d) office;
    e) restaurant; and
    f) shop.
3. Development is to contribute to improving the amenity of the Blake Street Precinct as an inner-city mixed use area by:
    a) creating a landmark development through high architectural quality and distinctive streetscapes;
    b) providing high levels of pedestrian amenity;
    c) designing buildings with active interfaces;
    d) designing buildings to take advantage of views while taking into account potential view corridors of future development reasonably to be expected in the surrounding precinct;
    e) designing buildings to ensure that all building services, plant rooms, elevator shafts, roof-top elements and the like are integrated in the design of the building.
4. A development application for a permissible development is to include: (a) a master plan for development of the whole site;
    a) a plan showing the stages in which the development is to be completed;
    b) a plan showing the provision of facilities to be shared between stages;

c) a site analysis and urban design study that demonstrates that the proposed development contributes positively to the neighbourhood and meets the requirements of paragraphs 5 to 10 inclusive;
d) a landscape plan for the proposed development and adjoining streets;
e) a schedule of external building materials, including type and colour, to be used in the construction of buildings and streetscapes; and
f) a traffic study by qualified traffic engineering consultants, to the requirements and satisfaction of the City of Darwin, including identification of any upgrade to vehicular, cycle and pedestrian infrastructure required to service the proposed development.

5. Development is to include multiple dwellings in a variety of sizes up to a maximum of 118 multiple dwellings.

6. The total floor space used for office, restaurant, and shop is not to exceed 250m^2.
7. Buildings up to 7 storeys may be constructed on the land.
8. The site coverage ratio of buildings from the third storey above ground level must not exceed 0.5.
9. Development must include landscaped areas equivalent to at least 45% of the site area.
10. Development must include landscaped screens to parking areas at ground level, and landscaping at ground level in the setback from the boundary with Lot 7819.
11. Development should provide a high level of pedestrian amenity at ground level by treatments such as:
    a) providing an active street frontage for at least 75% of the Gardens Hill Crescent boundary;
    b) screening on-site car parking areas from view from adjoining roads;
    c) planting mature shade trees in road reserves adjoining the site; and
    d) provision of footpaths in road reserves adjoining the site.
12. Building setbacks should minimise the effects of building mass, avoid undue overlooking of adjoining properties, and encourage breeze penetration through and between buildings. Buildings are to be set back from lot boundaries in accordance with the table to this paragraph.

Table to Clause 12 - Building Setbacks

1. Minimum building setbacks for a podium of residential building.

Lot Boundary	Minimum Setbacks, in metres
Gardens Hill Crescent	6m
Side boundary (common boundary with Lot 5642)	6.3m
Rear boundary (common boundary with Lot 7819)	2m
Blake Street	2m

2. Minimum building setbacks for a tower of a residential building.

Lot Boundary	Minimum Setbacks, in metres
Gardens Hill Crescent, for a distance of 40m measured from the boundary with Lot 5642	13.50m
Gardens Hill Crescent, beyond 40m measured from the boundary with Lot 5642	4.10m
Side boundary (common boundary with Lot 5642)	7.50m
Rear boundary (common boundary with Lot 7819)	17m
Blake Street	5.75m

3. Shops, restaurants and offices are to be located at the intersection of Blake Street and Gardens Hill Crescent and setback no more than 1m of these site boundaries.

4. Minimum distance between residential towers on the site.

The minimum distance between residential buildings on the site is to be 9m.

For the purposes of this table:

"ground level" means the highest point on the site boundary;

"podium" means the part of a residential building situated between ground level and 5m above ground level; and

"tower" means the part of a residential building situated above a height of 5m, above ground level.

Building setback is measured from site boundaries to:

- the wall of a residential building;
- the outer surface of the railings of a balcony or a verandah of a dwelling; and
- the outer surface of any support column of a ground level verandah of a dwelling.

No part of the roof structure, including gutters and eaves, is to encroach more than 0.9m into the minimum building setback from the lot boundaries.

13. Unless provided for specifically in this zone, the provisions of the NT Planning Scheme applicable to Zone HR (High Density Residential) apply to development in this zone.

3.2.3 ANTICIPATED FUTURE DEVELOPMENT

The Northern Territory Planning Commission is using the recently adopted Northern Territory Compact Urban Growth Policy (*CUGP*) to guide the preparation of Area Plans within the context of the Compact Urban Growth Model shown in Figure 1 on page 5. The stated guiding principles of this model are to:

- Identify activity centres and public transport nodes, where higher dwelling and commercial density may be encouraged;
- Identify transition areas around these centres and nodes, where dwelling density will become less intense, and will transition to lower densities generally matching the surrounding locality (generally around 400 metres away from the activity centre and public transport node); and
- Encourage development that is consistent with the predominate housing and building types in the area.

These guiding principles will assist with balancing the demands of a growing population with the lifestyle aspirations of the community. (2) As indicated in **Section 1**, The Gardens has been identified for development in the context of the *CUGP* and has been identified for higher density development as part of the *Darwin Inner Suburbs Area Plan* (3). As such the Study Area is expected to experience changes in residential density and zoning in areas within 400 m of the nearest Activity Centres (i.e. the Westralia St Activity Centre and Darwin CBD), Service Commercial Corridor (i.e. Stuart Hwy) and Transport Corridors (i.e. Stuart Hwy, Gilruth Ave and Westralia St), as shown in Figure 4 below.

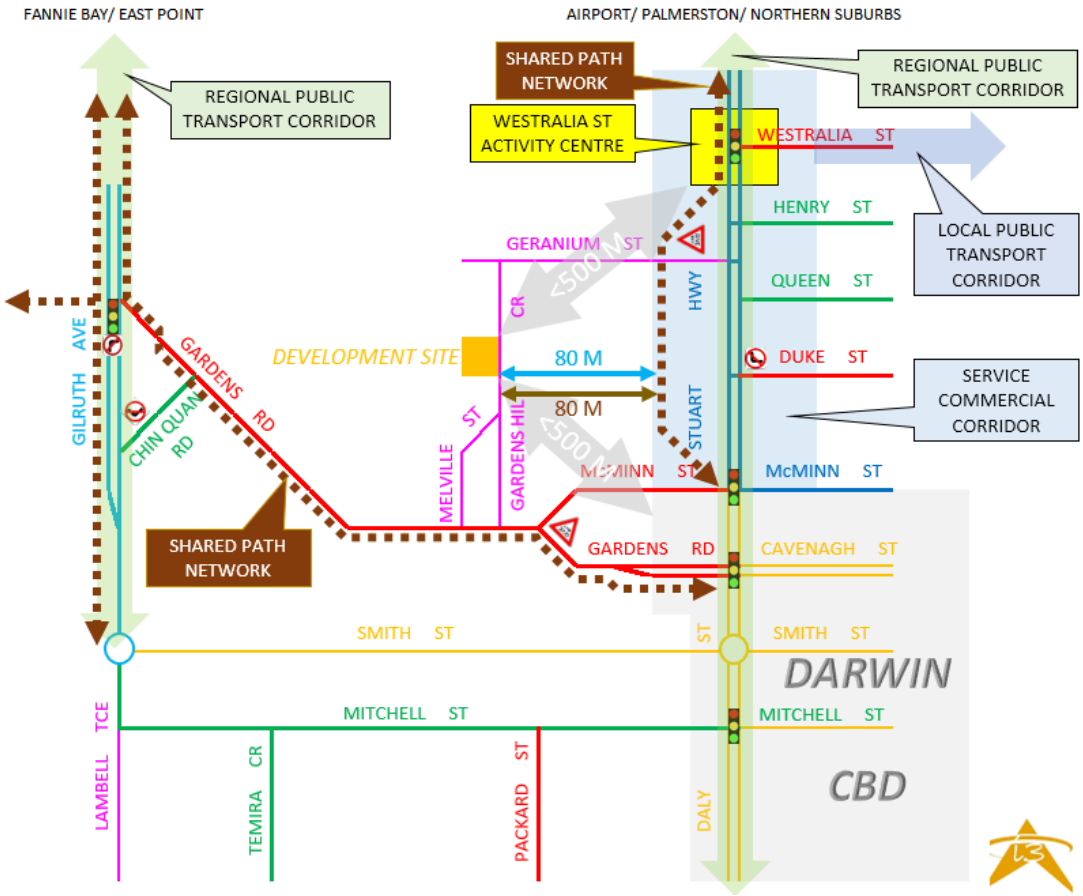


Figure 4 – Development Site in context of Darwin Inner Suburbs Area Plan principles

3.3. SITE ACCESSIBILITY

Vehicular access to the development site is proposed via two access driveways off Gardens Hill Crescent with the northern driveway leading to a 35-bay ground level car park for Towers 1 and 2 residents plus 2 designated bays for people with a disability and a ramp down to a 165-bay basement car park for Towers 1 & 2 residents. The southern driveway leads to a 52-bay ground floor car park for Tower 2 Residents (30 bays), Retail/ Commercial (10 bays) and Visitors (10 bays plus 2 designated bays for people with a disability). This driveway passes a small 4 bay parking area at the front of the development for short term visitors/ couriers, drop-off and pick-up etc. (These bays are included in the 52-bay total).

The access routes between the arterial road network (i.e. Stuart Highway) and Primary Collector Road Network (i.e. Gardens Road) with the proposed development's car parks are shown diagrammatically in Figure 5 on the following page.

There are no bus services along Gardens Hill Crescent or Blake Street. The nearest bus services to the development site are along Stuart Highway and Gardens Road. Refer **Section 3.3.3** for more details regarding public transport services.

Pedestrians and cyclists can access the development site off Gardens Hill Crescent and approximately 20 m of the Blake Street frontage just west of Gardens Hill Crescent. Refer **Section 3.3.4** for more details regarding pedestrian and cycle access.

Figure 5 – Access routes to and from the **Arterial** and **Primary Collector Road** network

Refer **Section 5.1** (Site Access) for a more detailed assessment of the proposed access and egress location and layout.

3.3.1 AREA ROADWAY SYSTEM

3.3.1.1 EXISTING

Figure 5 on the previous page has been prepared based on the Darwin City Council *Road Classification Plan* (4). An extract of this plan near the development site is provided as Figure 6 below.

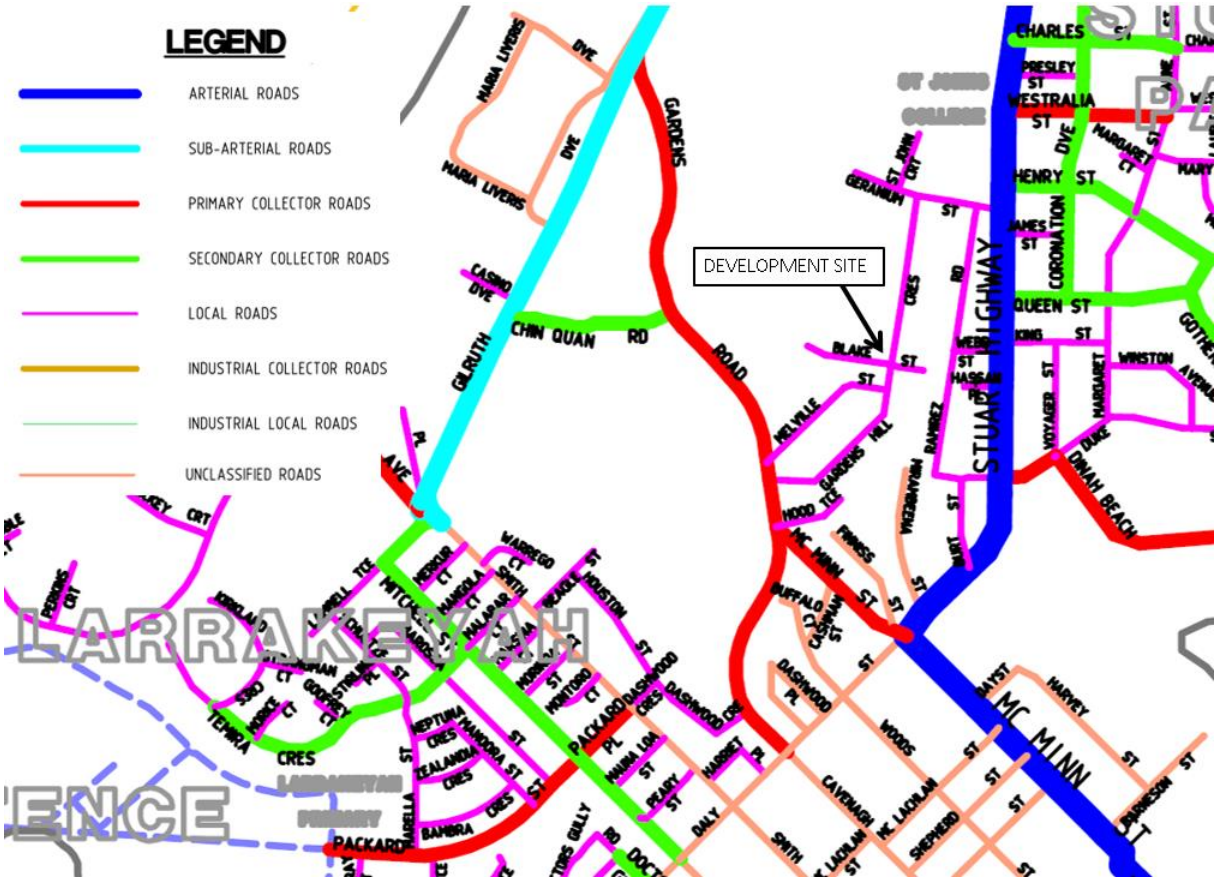


Figure 6 - Darwin CBD Road Classification (Extract)

Figure 6 shows that the arterial road network near the development site (Lot 7820) is made up of Stuart Highway and McMinn Street. It also shows that Gardens Hill Crescent and Blake Street are Local Roads and that these are connected at the northern end to Stuart Highway by a Local Road (Geranium St) and at the southern end by a Primary Collector Road (Gardens Road).

The existing layout of Gardens Hill Crescent and Blake Street near the development site is shown in Figure 7 and in Photograph 3 on the following page.

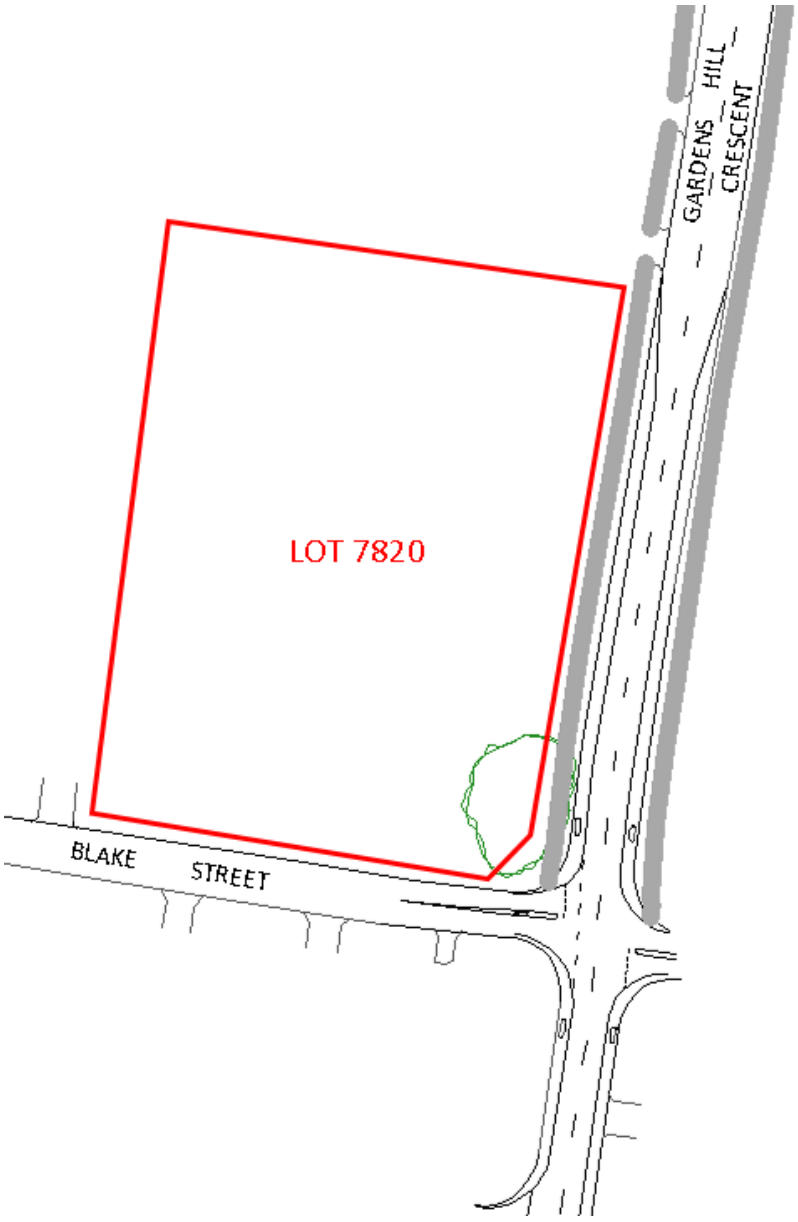


Figure 7 – Existing layout of Blake St & Gardens Hill Cr adjacent to development site

Photograph 3 – Looking north along Gardens Hill Cr from Blake St intersection

As shown in Photograph 3 on the previous page, there are LOCAL TRAFFIC ONLY signs erected along Gardens Hill Crescent. These signs were erected by the City of Darwin to address 'rat running' as traffic has been reported to travel along Gardens Hill Crescent and Geranium Street between Stuart Highway and Gardens Road without stopping in the area. This can be an attractive 'by-pass' route for Gardens Road – Stuart Highway traffic to avoid the signalised intersection of these two streets during peak hours.

Various Local Area Traffic Management (*LATM*) devices measures have been installed along the full length of Gardens Hill Crescent to discourage the use of this local street as a through route. These are shown in detail in Figure 8 below.

Figure 8 – Existing Local Area Traffic Management devices along Gardens Hill Crescent

3.3.1.2 FUTURE

The Movement and Transport Plan within the *Darwin Inner Suburbs Area Plan* (3) indicates the possibility of a "new local road connecting Gardens Road to 16 and 25 Blake Street" and a "future bypass of the Stuart Hwy, active transport and landscaping in the former railway corridor" that runs parallel to Gardens Hill Crescent between it and Stuart Hwy, shown as "T" and "G" respectively in the extract provided as Figure 9 below.

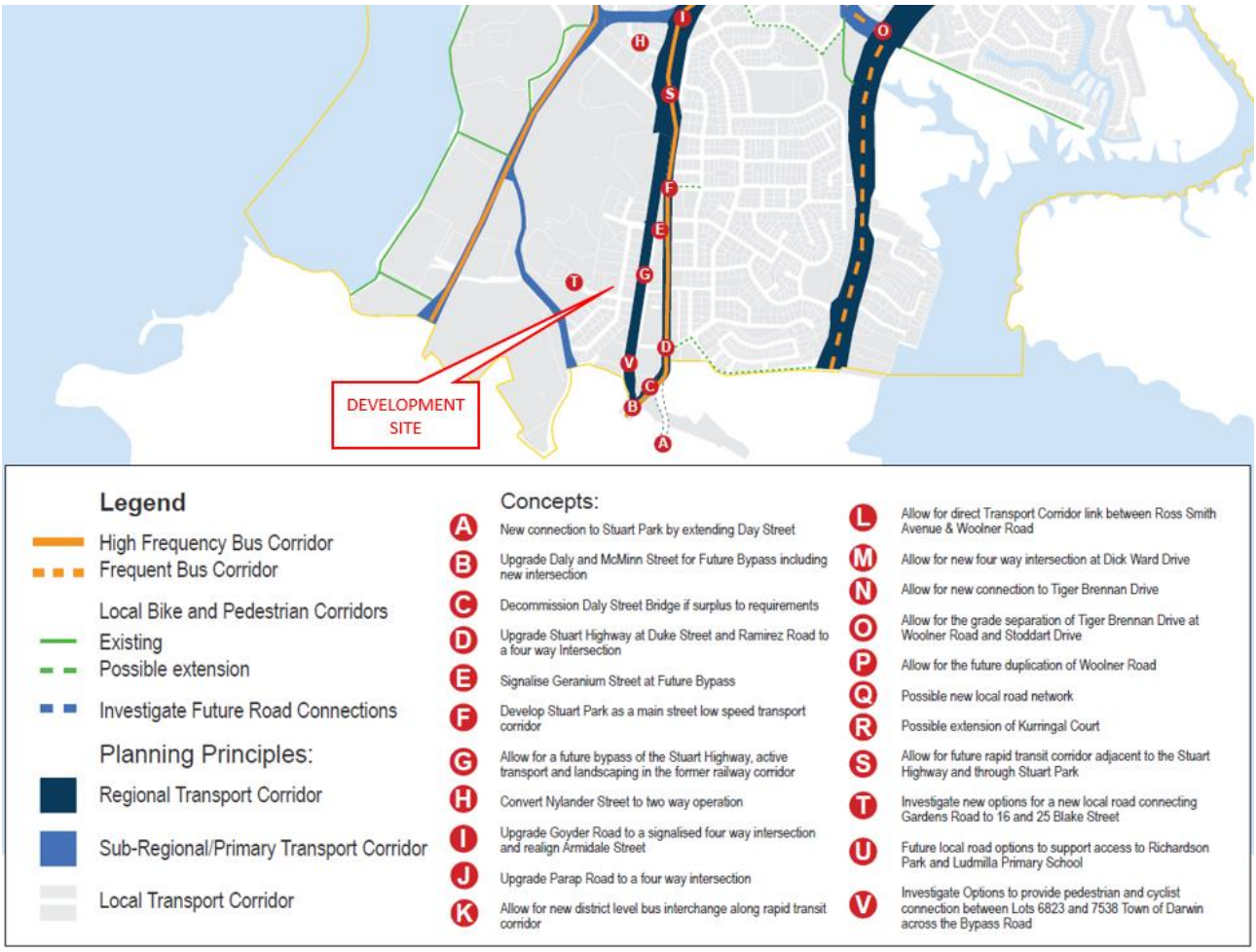


Figure 9 – Movement and Transport Plan extract from Darwin Inner Suburbs Area Plan

As the Area Plan is a long term strategic plan, it is unlikely that the road network within 2 kms of the development site will undergo any significant changes within the assessed *Horizon Year* of 2028 for this *TIA*, as determined in **Section 2.2.5**.

3.3.2 TRAFFIC VOLUMES AND CONDITIONS

Following issue of Final 1.0 of this TIA in November 2013, the City of Darwin requested the following with respect to traffic volumes and assessments within this revised and updated TIA:

- *"Undertake new counts on the relevant roads to obtain current data and update modelling;*
- *12 hour counts of the key and secondary intersections to determine actual AM and PM peak hours, not estimated ones. Note: some developments in the area were not present in 2013 when the original TIA was prepared;*
- *Revise the 10-year design horizon based on the new opening year of the development."*

In accordance with the above, Matrix Traffic & Transport Data was commissioned to undertake detailed 12 hour counts (6 AM to 6 PM) at each of the following intersections simultaneously on Tuesday 8th November 2016:

- Ki1: Gardens Hill Crescent/ Blake Street; and
- Ki2: Gardens Hill Crescent/ Geranium Street.
- Si1: Geranium Street/ Stuart Highway; and
- Si2: Gardens Hill Crescent/ Gardens Road.

The above counts included heavy and light vehicles as well as pedestrian and cyclist's volumes broken down into 15 minute intervals. Relevant data is used and assessed in the remainder of this report with the full data included as **Appendix A**.

Data was also obtained from the Department of Transport's permanent count site on Stuart Highway 10 m south of Duke Street, i.e. UDVDP003 (5), to determine seasonal and annual variations that should be applied to obtain likely average annual weekday traffic volumes and movements at each of the *Key* and *Secondary intersections*.

The 12-hour survey data indicates peak hours for each assessed intersection as shown in Table 1 below.

Intersection	AM Peak Hour	PM Peak Hour
Ki1: Gardens Hill Crescent/ Blake Street; and	7.30 – 8.30	4.45 – 5.45
Ki2: Gardens Hill Crescent/ Geranium Street.	7.30 – 8.30	4.45 – 5.45
Si1: Geranium Street/ Stuart Highway; and	7.30 – 8.30	4.30 – 5.30
Si2: Gardens Hill Crescent/ Gardens Road.	8.00 – 9.00	4.00 – 5.45

Table 1 – Surveyed peak hours at each key and secondary intersection

It is normal practice to adopt the same average peak hour for each intersection however the City of Darwin has indicated that it would prefer each intersection to be assessed based on its actual AM and PM peak hour, hence each intersection is assessed per the peak hours indicated in Table 1 above. This ensures that each intersection is assessed according to its current highest surveyed volumes with the highest forecast volumes from the development site, regardless of whether they coincide, i.e. 'worst case'. The surveyed data for each intersection and each peak hour is shown in Figure 10 to Figure 13 on the following pages.

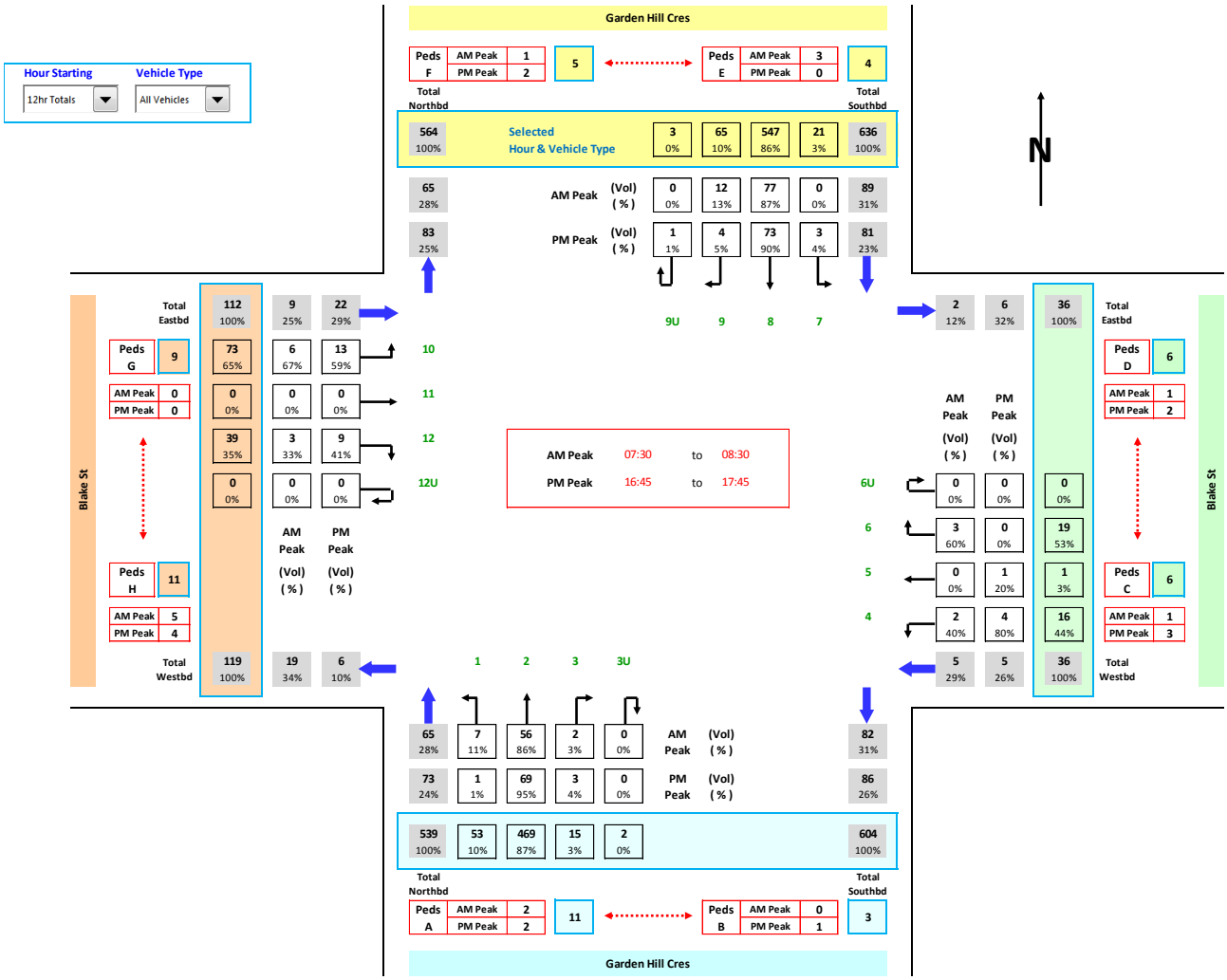


Figure 10 – Ki1: Existing (2016) Surveyed Weekday 12 hour, AM and PM Peak Hour Volumes

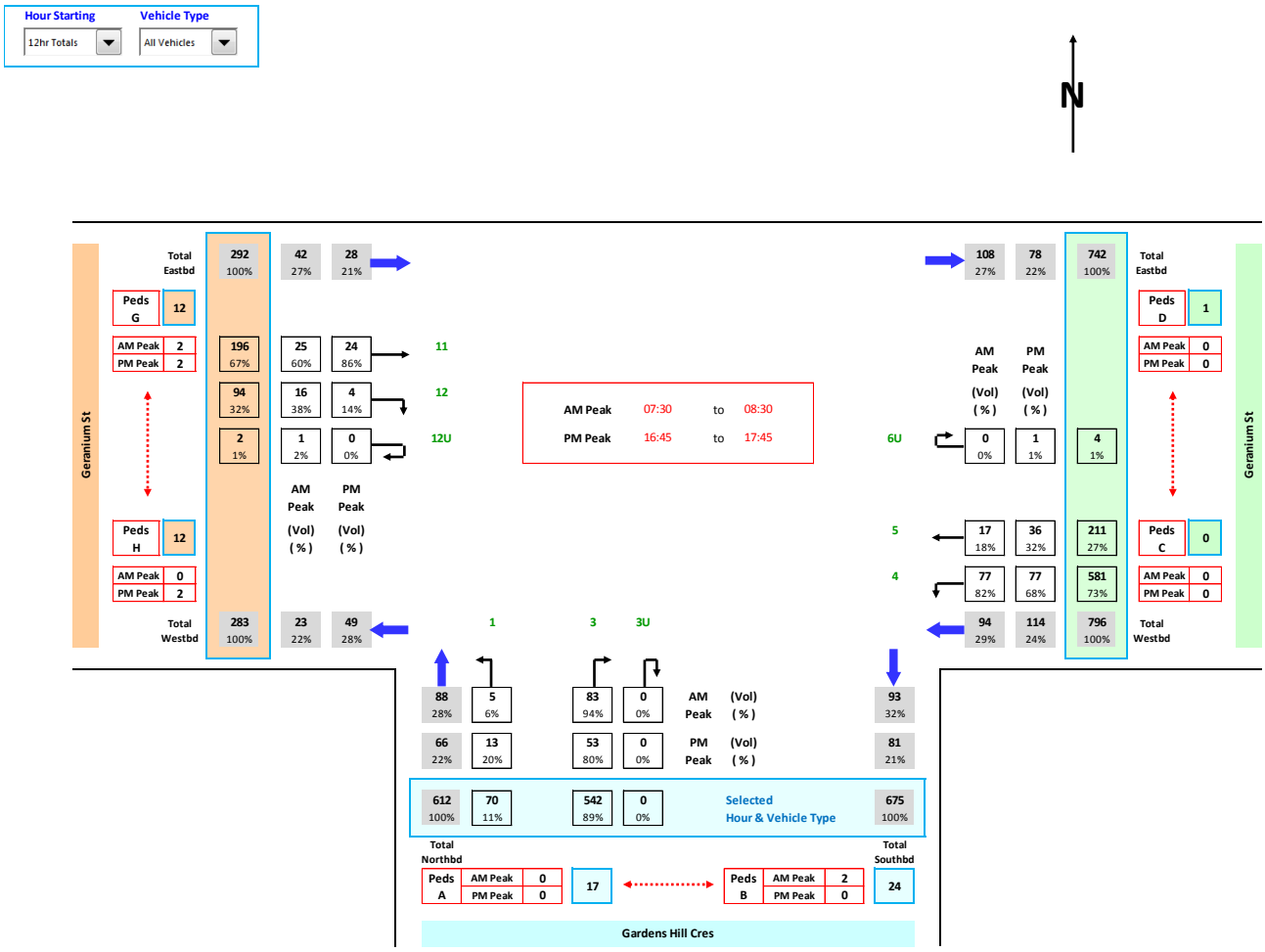


Figure 11– Ki2: Existing (2016) Surveyed Weekday 12 hour, AM and PM Peak Hour Volumes

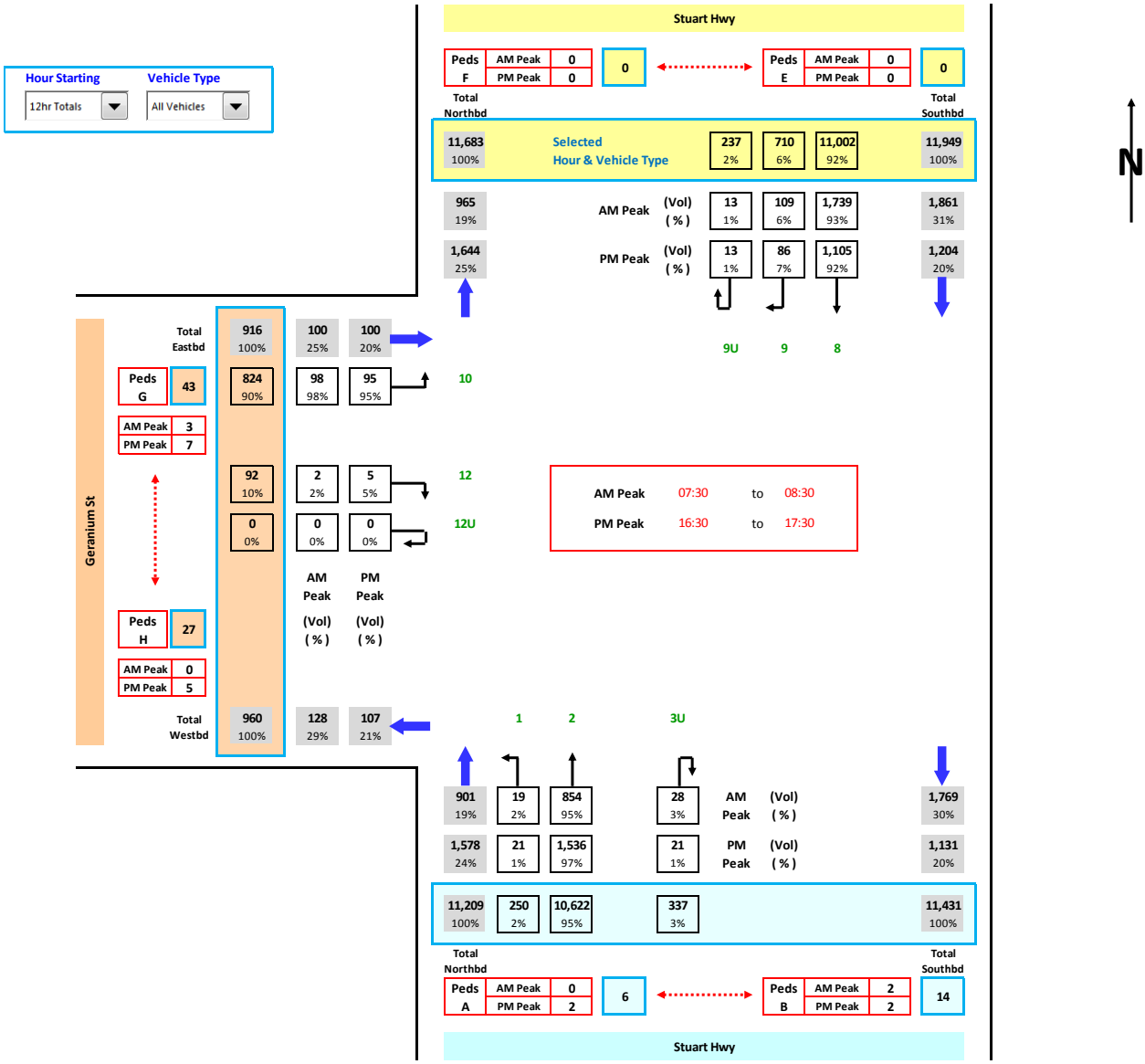


Figure 12 – Si1: Existing (2016) Surveyed Weekday 12 hour, AM and PM Peak Hour Volumes

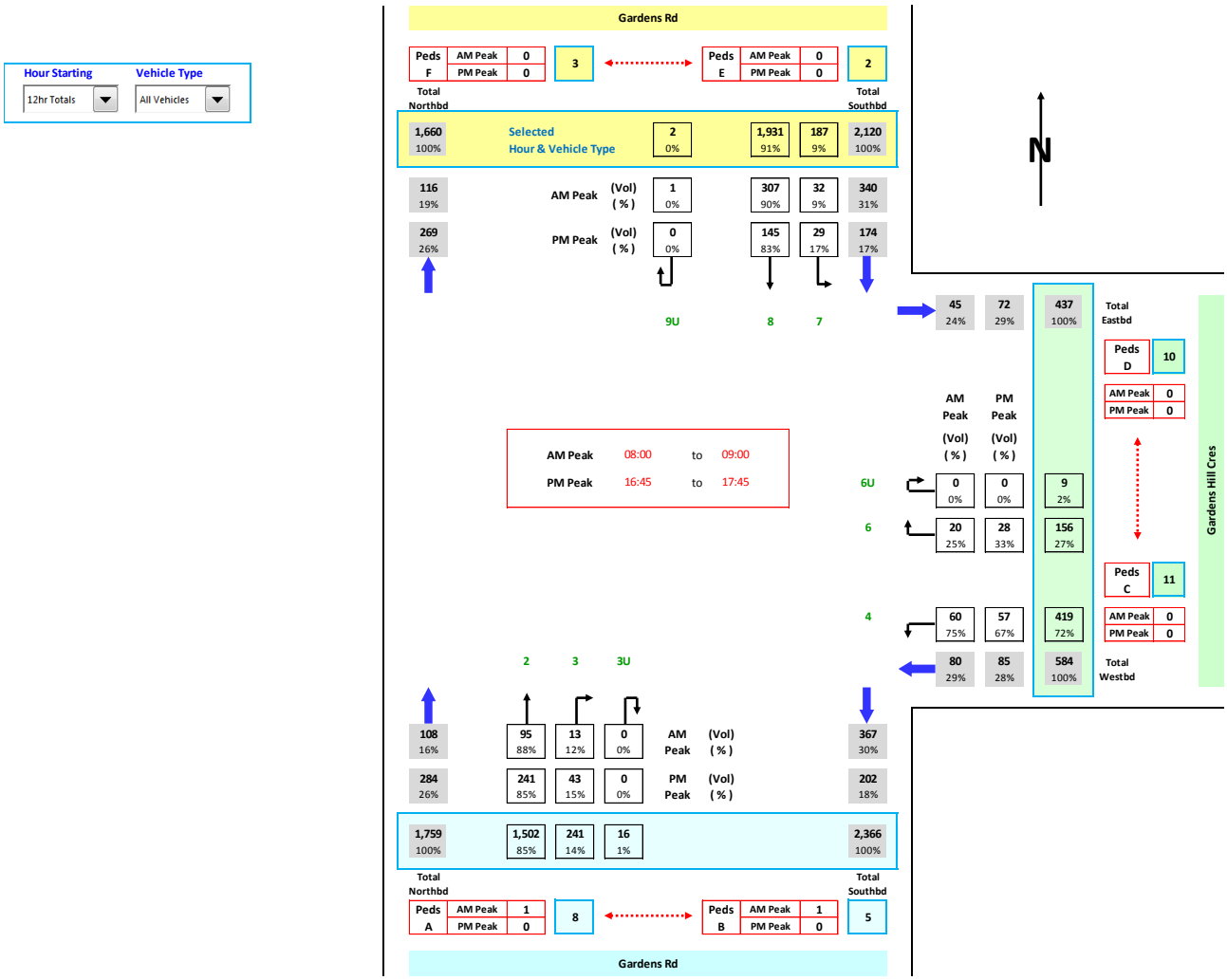


Figure 13 – Si2: Existing (2016) Surveyed Weekday 12 hour, AM and PM Peak Hour Volumes

One of the best indicators of intersection performance for unsignalised intersections is the *Degree of Saturation*. The Austroads document *Guide to Traffic Management Part 3: Traffic Studies and Analysis (AGTM03)* (6) provides guidance with respect to intersection performance criteria. A summary of these is provided in Table 2 on the following page.

The survey data from Figure 10 to Figure 13 has been used to create a *SIDRA Intersection* (7) model for each *Key and Secondary Intersection* for each peak hour.

The models and associated *SIDRA Intersection* Summary Reports are included in **Appendix D**. The assessed *Degree of Saturation* for each intersection, movement and peak hour based on the criteria shown in Table 2 on the following page, is shown graphically in Figure 14 on page 30 for the AM Peak Hour and Figure 15 on page 31 for the PM Peak Hour. This shows that all intersections currently perform within acceptable criteria **except for the right and U turn movement from Stuart Hwy into Geranium St and the right turn out of Geranium St into Stuart Hwy during the afternoon peak hour.** Whilst this is outside acceptable delays, it is what would be expected for a Give Way 'T' junction with a six-lane arterial highway during peak times.

LoS	Average Delay per vehicle (d) in seconds				Degree of Saturation	Comments
	Unsignalised intersections	Roundabouts	Signalised intersections	All (RTA)		
A	**d ≤ 10**	d ≤ 10	d ≤ 10	d ≤ 14.5	≤ 0.44	Stable free flow conditions where drivers can select desired speeds and to easily manoeuvre within the traffic stream.
B	**10 < d ≤ 15**	10 < d ≤ 20	10 < d ≤ 20	14.5 < d ≤ 28.5		
C	**15 < d ≤ 25**	20 < d ≤ 35	20 < d ≤ 35	28.5 < d ≤ 42.5	0.45 - 0.64	Stable flow but most drivers are restricted to some extent in their ability to select their desired speed and to manoeuvre within the traffic stream.
D	**25 < d ≤ 35**	35 < d ≤ 50	35 < d ≤ 55	42.5 < d ≤ 56.5	0.65 - 0.84	Close to the limit of stable flow. All drivers are restricted in their ability to select their desired speed and to manoeuvre within the traffic stream. Small increases in traffic flow may cause operational problems.
E	**35 < d ≤ 50**	50 < d ≤ 70	55 < d ≤ 80	56.5 < d ≤ 70.5	0.85 - 1.04	Traffic volumes are close to capacity and there is virtually no freedom to select desired speeds. Flow is unstable and minor disturbances within the traffic stream will cause breakdown leading to long queues and delays
F	**50 < d**	70 < d	80 < d	70.5 < d	> 1.25	In the zone of forced flow where the amount of traffic approaching the point under consideration exceeds that which can pass. Flow breakdown occurs and extensive queues and delays result.

Table 2 – Various Intersection Performance Criteria and Assessment Thresholds (Source: *AGTM03*)

A full explanation of the various intersection performance criteria is included in **Appendix C**. This should be read in conjunction with the assessed and forecast intersection performance data in the *SIDRA Intersection* Summary Reports included in **Appendix D**.

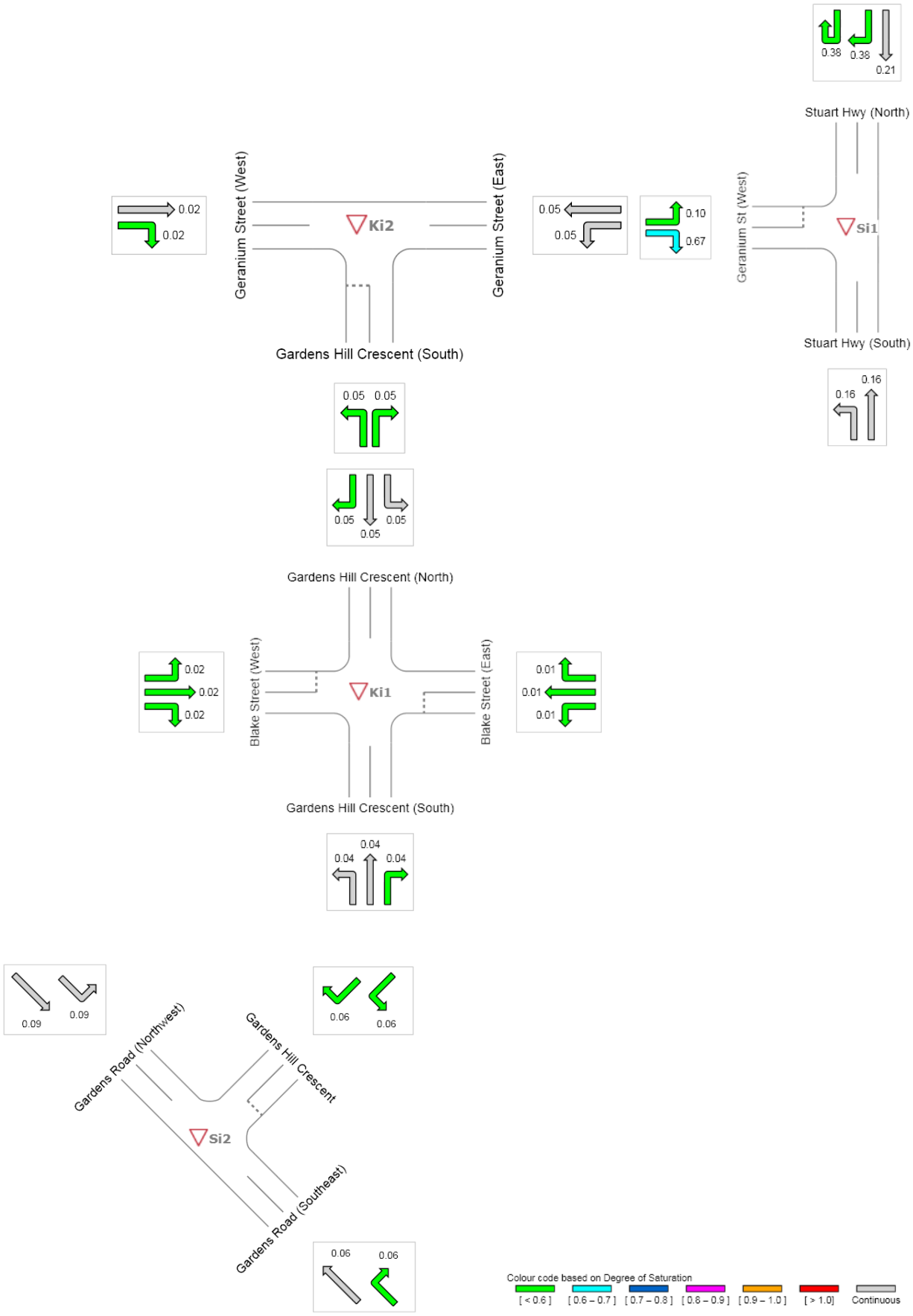


Figure 14 – Existing 2016 AM Peak Hour Intersection Performance (Average Delay)

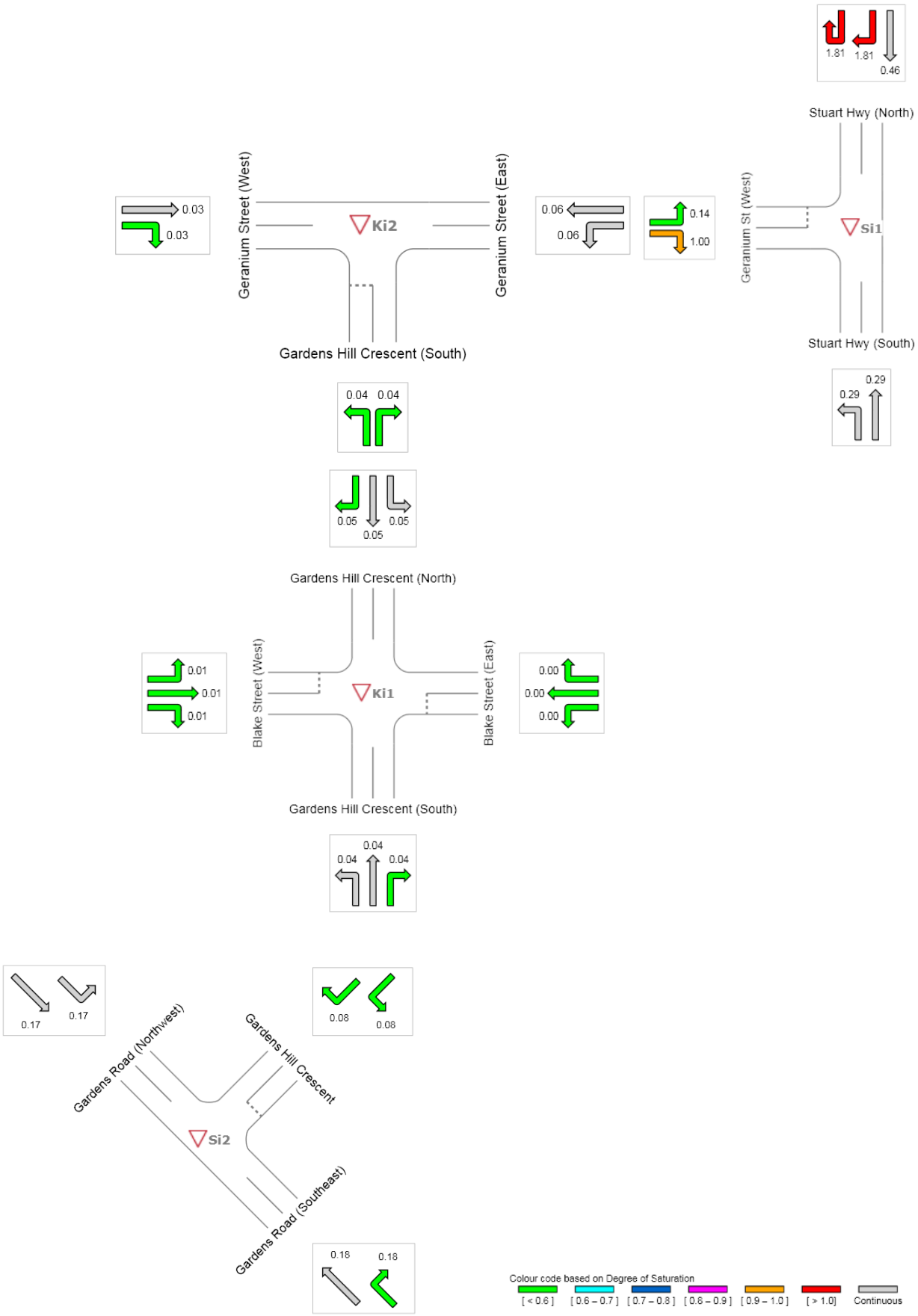


Figure 15 – Existing 2016 AM Peak Hour Intersection Performance (Average Delay)

3.3.3 PUBLIC TRANSPORT SERVICES

There are no bus services along Gardens Hill Crescent or Blake Street. The nearest bus services to the development site are along Stuart Highway and Gardens Road. These are all located within a 400 m Ped Shed (i.e. 5-minute walk) of the development site. The location of these are shown in the 'Alternative Transport Plan' as Figure 17 on page 34. The travel time by bus from these bus stops to the Darwin CBD is approximately 10 minutes. Full details of all weekday services to and from these bus stops are provided in Table 3 below.

- Bus Stop 103 is located on the northbound carriageway of Stuart Highway just south of Queen Street and is served by northbound Darwin Bus Route Services 5, 8, 10, 21 & 22.
- Bus Stop 176 is located on the southbound carriageway of Stuart Highway just south of King Street and is served by southbound Darwin Bus Route Services 5, 8, 10, 21 & 22.
- Bus Stop 601 is located on the westbound carriageway of Gardens Road and is served by Darwin Bus Route Service 15.

Route	Description	Weekday Frequency
5	Casuarina to Darwin via Moil, Marrara, Berrimah and Winnellie Darwin to Casuarina via Winnellie, Berrimah, Marrara and Moil	Southbound: 14 services between 7.05 AM and 6.40 PM Northbound: 13 services between 6.30 AM and 6.10 PM
8	Darwin to Palmerston and return via Winnellie and Berrimah	Southbound: 27 services between 6.36 AM and 9.56 PM Northbound: 27 service between 6.40 AM and 9.40 PM
10	Darwin to Casuarina and return via Alawa, Rapid Creek, Ludmilla, Parap and Stuart Park	Southbound: 42 services between 6.56 AM and 10.00 PM plus 2 services at 10.33 and 10.53 PM on Fridays Northbound: 46 services between 5.55 AM and 9.30 PM plus 3 services at 10.04, 10.39 and 11.14 PM on Fridays
21	am - Hospital Precinct to Darwin via Casuarina pm - Darwin to Hospital Precinct via Casuarina	Southbound: 1 service at 7.46 AM Northbound: 2 services at 4.43 and 5.23 PM
22	am - Leanyer to Darwin pm - Darwin to Leanyer	Southbound: 1 service at 7.42 AM Northbound: 2 services at 4.38 and 5.23 PM
15	Darwin to Mindil Beach Markets and return via Cavenagh St, Daly St, Mitchell St, Lambell Tce and Gilruth Ave and return	(Thursdays during market season only) 17 services between 4.50 PM and 10.10 PM

Table 3 – Nearest Bus Stops: Bus Route Descriptions and Frequency

3.3.4 PEDESTRIANS AND CYCLISTS

Figure 16 below is an extract from Figure 2, Strategic Bicycle Hierarchy, within the City of Darwin's *Darwin Bike Plan 2015 - 2020* (8). It shows the main pedestrian and cycle network near the development site.

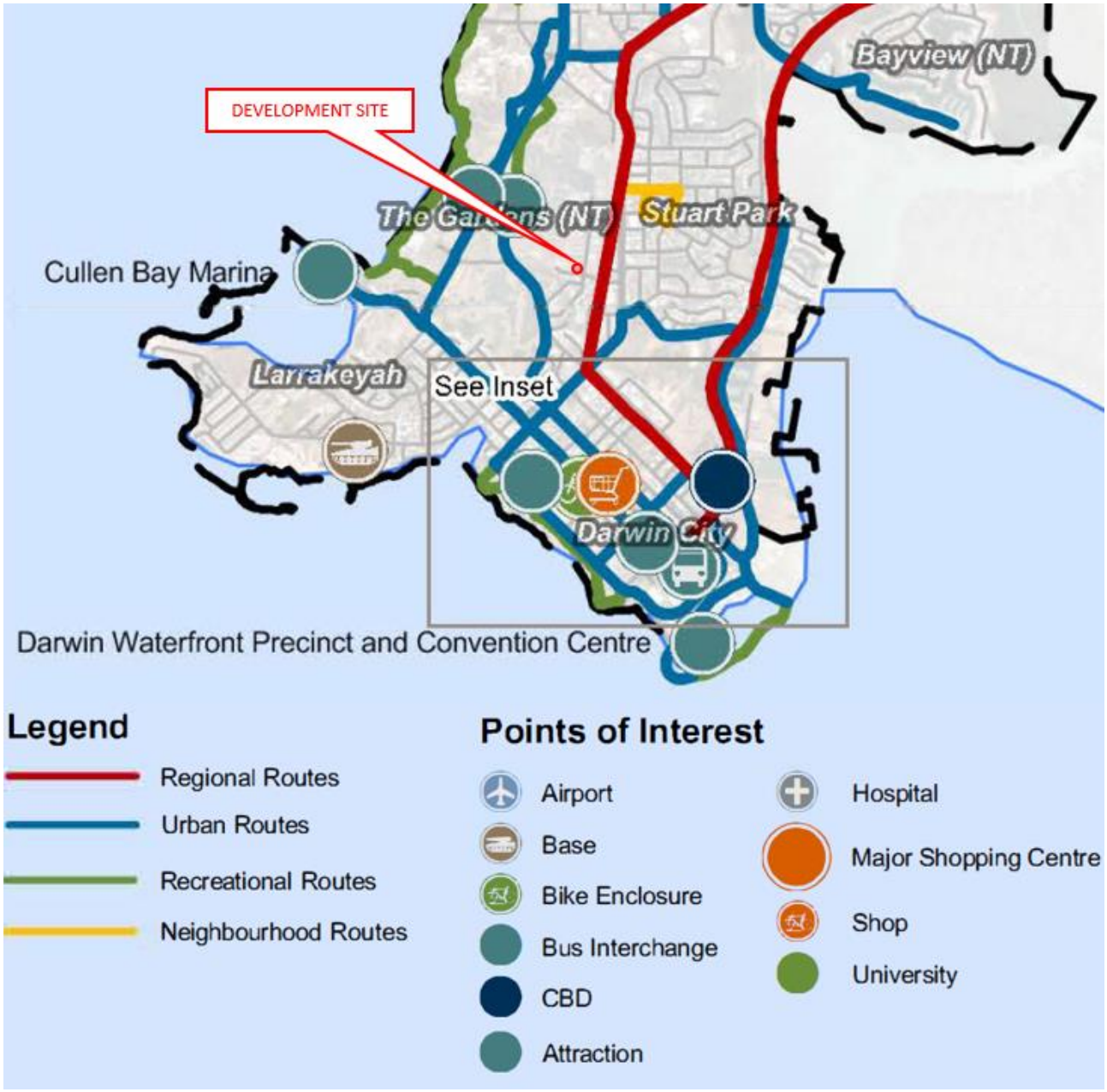


Figure 16 – Major Pedestrian and Cycle Routes in vicinity of the development site

Figure 16 shows that there is a major off-road cycleway (Regional Route) between Stuart Highway and Gardens Hill Crescent. There are currently informal pedestrian links (i.e. tracks) between this and local roads that lead to Stuart Highway. This is shown in more detail in the 'Alternative Transport Plan' as Figure 17 on page 34 and Photograph 4 on page 34.

There is a footpath on both sides of Gardens Hill Crescent between Blake Street and Geranium Street, as shown in Figure 7 on page 21. There is a footpath on the east side of Gardens Hill

Crescent between Blake Street and Gardens Road as well as a path along the northern side of Gardens Road. These paths provide good connectivity to the public bus stops indicated in **Section 3.3.3** as well as nearby recreational areas.

Figure 17 – Alternative Transport Plan showing 400 m Ped Shed* with bus stop and path connections

Photograph 4 – Example of off-road shared path running between Gardens Hill Road and Stuart Hwy

* Ped shed is short for pedestrian shed, the basic building block of walkable neighbourhoods. A ped shed is the area encompassed by the walking distance from a town or neighbourhood centre. Ped sheds are often defined as the area covered by a 5-minute walk (about 400 m).

4 PROJECTED TRAFFIC

4.1. SITE TRAFFIC (EACH *HORIZON YEAR*)

The development is expected to be completed and fully occupied by the end of 2018. The City of Darwin has requested that the assessment is based on a 10-year design horizon, i.e. 2028.

The adoption of a 2028 Horizon Year will also allow an assessment to be made as to whether further development near Gardens Hill Crescent and Blake Street in the intervening years would have an adverse impact on the performance of the assessed intersections and streets.

4.1.1 TRIP GENERATION

Section 4.5.5 (Traffic generation) of *AGTM12* indicates that "Traffic generation can be estimated using trip generation rates established in previous surveys. Locally derived rates are preferred to those applying elsewhere."

Section 3.1 (Land Use Traffic Generation) of the *RTA (NSW) Guide to Traffic Generating Developments* (9) indicates that "The traffic generation potential of developments can be assessed in many situations by referring to the (RTA) Authority's Land Use Traffic Generation – Data and Analysis reports" and that "Surveys of existing developments similar to the proposal can also be undertaken and comparisons drawn."

Traffic generation for the retail and office/ commercial components are based on the *ITE Trip Generation* (9th Edition) database (10) as shown in Table 4 below. The retail land use 'Supermarket' was selected as the nature of the retail component is not known at this stage and the 'supermarket' represents the higher rates of other possible retail uses.

ITE Trip Generation Rates - 9th Edition

Pass-by rates from ITE Trip Generation Handbook - 2nd Edition

Description/ITE Code	Units	ITE Vehicle Trip Generation Rates						
		AM	PM	Pass-By	AM In	AM Out	PM In	PM Out
General Office	KSF^2	1.56	1.49	0%	88%	12%	17%	83%
Supermarket	KSF^2	3.40	9.48	36%	62%	38%	51%	49%

Table 4 – Trip Generation and Distribution Rates for Retail and Office/ Commercial component

In accordance with the above statements, traffic generation for the residential component has been estimated using trip generation rates established from previous surveys undertaken by *i3* at two multiple residential developments within 1,500 m of the development site as described on the following pages. These locally derived rates are preferable to those applying elsewhere as they consider observed and actual practices at similar developments with similar attractors and generators.

'THE IMPERIAL APARTMENTS' (40 UNITS) 144 SMITH STREET (CNR DASHWOOD CRESCENT)

Photograph 5 – looking south at 'The Imperial Apartments', cnr Smith St/ Packard Pl/ Dashwood Cr

Dwellings	AM Peak Hour		AM Rate		PM Peak Hour		PM Rate	
40	IN	OUT	IN	OUT	IN	OUT	IN	OUT
	1	10	0.03	0.25	12	5	0.30	0.13
	9%	91%	9%	91%	71%	29%	71%	29%
	11		0.275		17		0.425	

Table 5 – 'The Imperial Apartments' surveyed peak hour trips

'THE SENTINEL' (43 UNITS) I DALY STREET (CNR DOCTOR'S GULLY ROAD)

Photograph 6 – looking north at 'The Sentinel', cnr Daly St/ Doctor's Gully Rd

Dwellings	AM Peak Hour		AM Rate		PM Peak Hour		PM Rate	
43	IN	OUT	IN	OUT	IN	OUT	IN	OUT
	1	11	0.02	0.26	7	5	0.16	0.12
	8%	92%	8%	92%	58%	42%	58%	42%
	12		0.279		12		0.279	

Table 6 – 'The Sentinel' surveyed peak hour trips

Based on the above surveys, it has been determined that the rates in Table 7 (representing the highest rates and the average IN/ OUT split of those surveyed) are the appropriate rates to use for the proposed development.

AM Peak Hour		PM Peak Hour	
IN	OUT	IN	OUT
0.280		0.425	
9%	91%	65%	55%

Table 7 – Adopted Trip Generation Rates and Split

The rates in Table 7 are comparable to those in the (RTA) Authority's *Land Use Traffic Generation – Data and Analysis* (9) and *RMS (NSW) Update* (11) reports, i.e. 0.4-0.5 per dwelling (Section 3.3.2: Medium density residential flat building Weekday peak hour vehicle trips). The adopted rates reflect Darwin characteristics instead of NSW characteristics, i.e. earlier work and school start times spreading the morning peak hour over two hours instead of one.

4.1.2 TRIP DISTRIBUTION (IN/ OUT SPLIT)

Trip Distribution is based on the proportions of traffic observed to turn into and out of the surveyed residential developments in Section 4.1.1 and the provided rates in the *ITE Trip Generation* (9th Edition) database (10) as shown in Table 4 on page 35.

4.1.3 MODAL SPLIT

Modal split has not been undertaken as all trips are based on surveyed vehicular trips. Refer **Sections 3.3.3** and **3.3.4** for details of public transport, walking and cycling facilities. These, along with the proximity of the development site to the *CBD* are considered attractive enough to encourage use of these alternative forms of transport.

4.1.4 TRIP ASSIGNMENT

Trip assignment is based on the proportion of turning traffic shown in Figure 10 to Figure 13 on pages 25 to 28.

4.2. THROUGH TRAFFIC (*HORIZON YEAR*)

4.2.1 METHOD PROJECTION

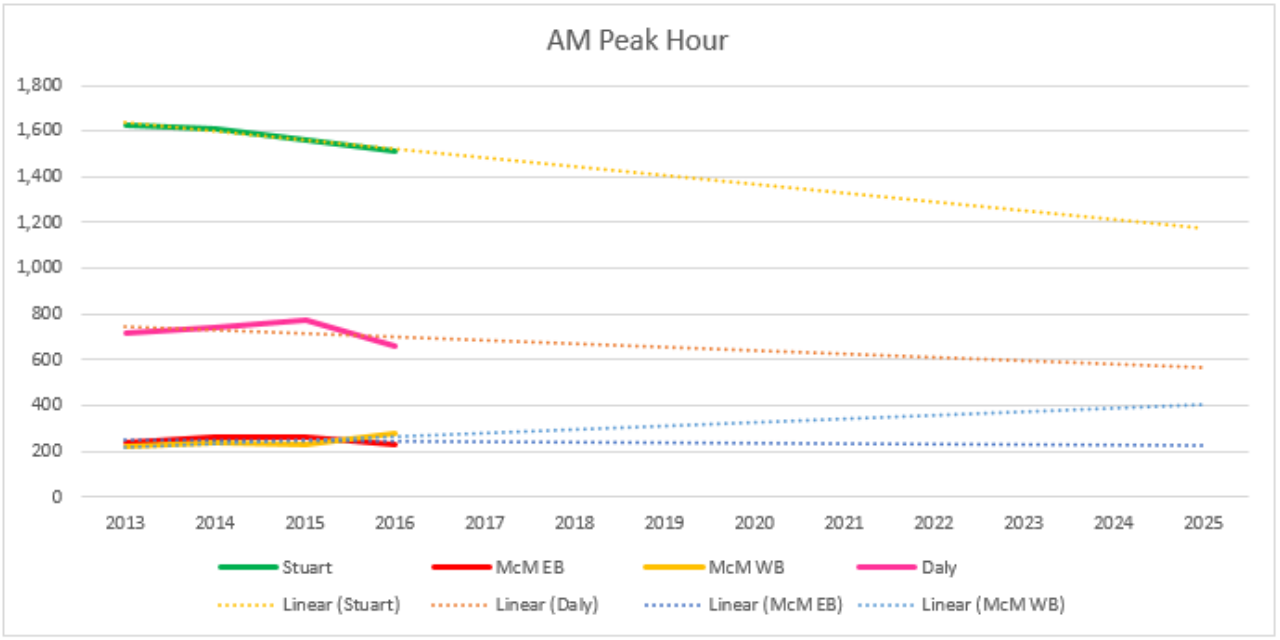
A review of historical traffic volume data, as shown in **Appendix A**, indicated that annual growth of **daily** background traffic on the main arterial road into and out of the Darwin *CBD* near the development site (i.e. Stuart Highway 10 m south of Duke Street) is around 1.8%.

It is important to consider peak hour growth separate from daily growth as it is not uncommon for peak hour volumes to remain static whilst daily volumes increase. This can result from infill development near employment, shopping and educational areas as people chose to avoid driving during commuter peak hours and more peak hour commuter trips are undertaken by walking, cycling and public transport.

Figure 18 on the following page shows peak hour traffic growth over the last four years at the traffic signals at Stuart Hwy/ McMinn St/ Daly Street. Despite significant infill development near this site during this time, peak hour traffic volumes have either remained static or decreased, the only exceptions being a slight increase in Stuart Hwy southbound traffic during the afternoon peak hour and McMinn Street westbound during the morning peak hour.

Despite the above, the City of Darwin and the NT Government generally request that traffic growth of 2% per annum is applied to all roads to consider development in the area. To reflect this request, this TIA assess future performance based on static growth and 2% per annum growth.

The forecast 2028 background volumes based on 2% per annum growth to 2028 are shown in Figure 18 on the following page.



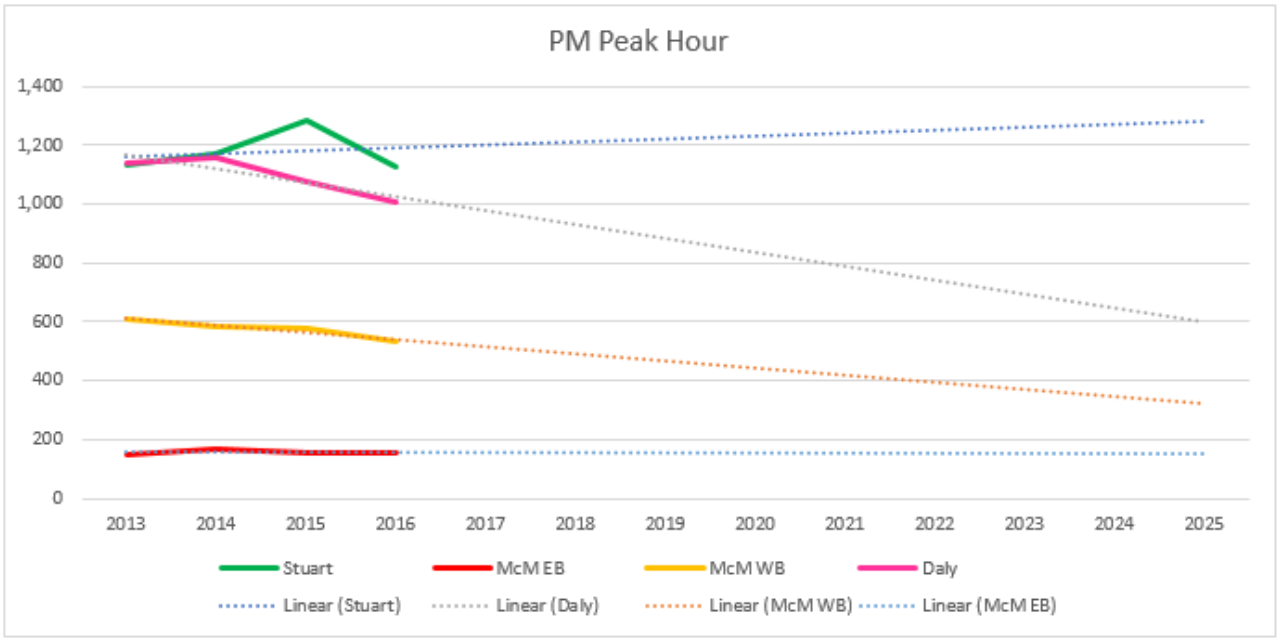


Figure 18 – Assessed traffic growth trendlines to 2025 at Daly/ McMinn/ Sturt (*Ki3*)

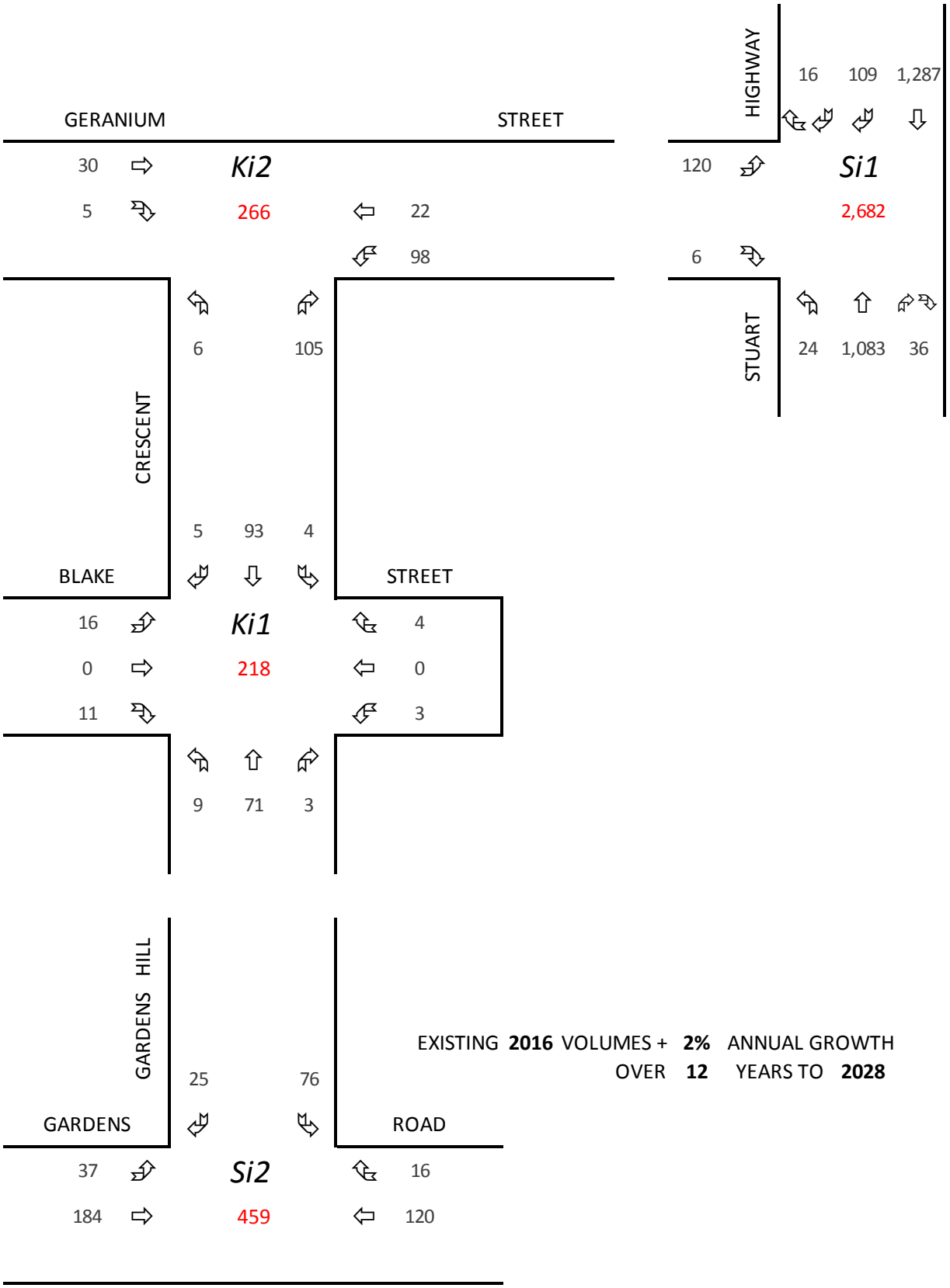


Figure 19 – Surveyed 2016 AM peak hour volumes plus 2% per annum growth to 2028

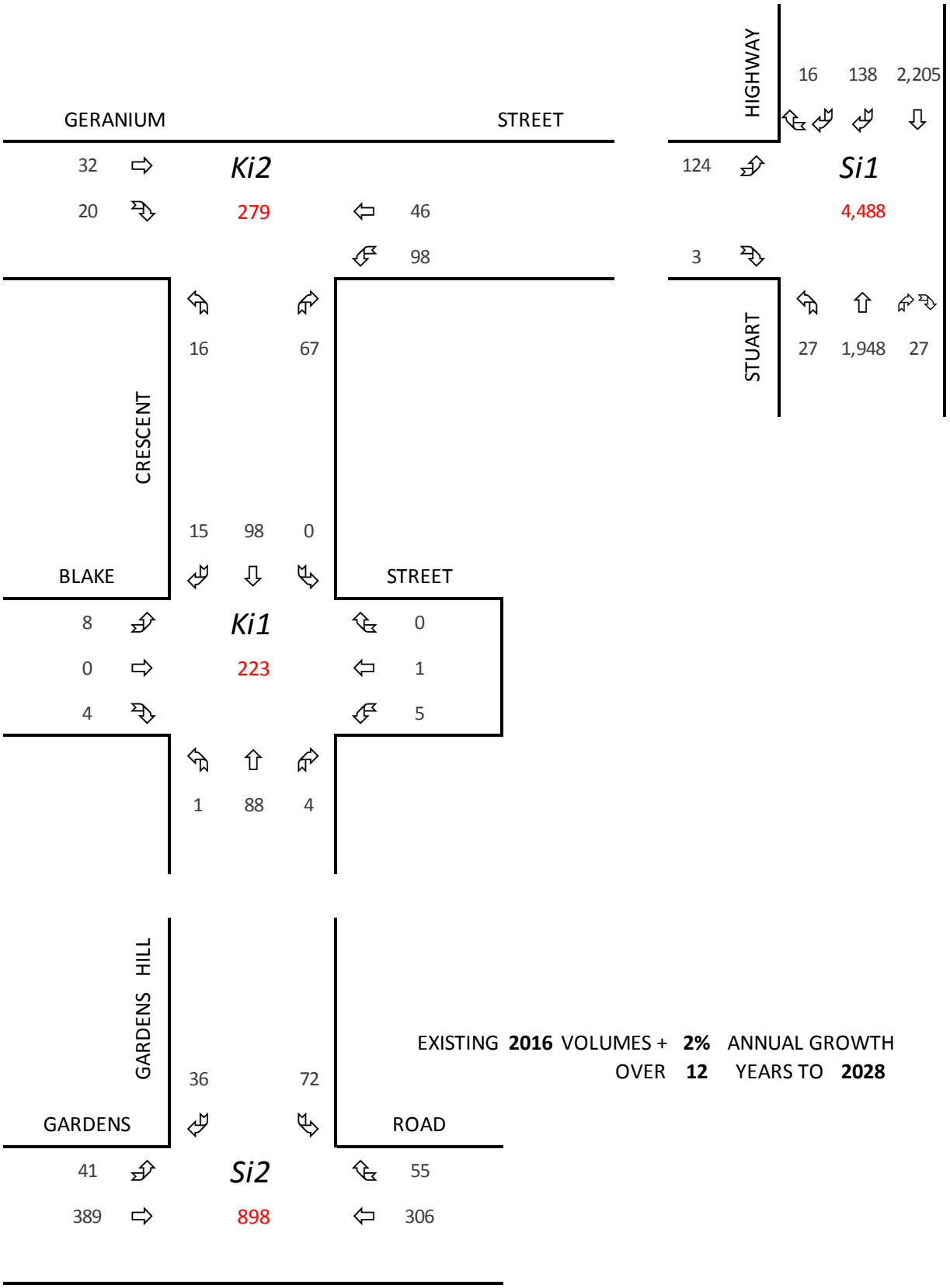


Figure 20 – Surveyed 2016 PM peak hour volumes plus 2% per annum growth to 2028

4.2.2 TRAFFIC FOR PROPOSED DEVELOPMENT IN STUDY AREA

4.2.2.1 METHOD OF PROJECTIONS

The proposed development consists of 115 residential units, 100 m^2 retail and 150 m^2 of office/ commercial with all vehicular access off Gardens Hills Crescent.

By surveying similar sized multiple residential developments near the proposed development site (as described in **Section 4.1.1**), it has been possible to predict likely traffic generation into and out of the site with a high level of confidence. This traffic has then been distributed throughout the *Key* and *Secondary intersections* along Gardens Hill Crescent as per the current proportions for the respective peak hours and then added to the increased base volumes for the adopted *Horizon Year* of 2028 to achieve a total forecast turning movement and volume diagram. This data has then been used as input data to the existing *SIDRA Intersection* model for each peak hour period to obtain an assessment of the forecast performance at the assessed intersections.

4.2.2.2 TRIP GENERATION

The assessed vehicular trip generation, using rates obtained from surveys of existing similar sized developments near the site, and the *ITE* rates for the retail and office/ commercial component, as described in **Section 4.1.1**, and rounded up to the nearest whole number, are shown in Table 8 below.

Land Use	AM	PM
115 Residential Units	32	49
100 m^2 Retail	4	10
150 m^2 Office/ Commercial	3	2
TOTAL TRIPS	**36**	**59**

Table 8 – Adopted Trip Generation

4.2.2.3 TRIP DISTRIBUTION (IN/ OUT SPLIT)

The distribution of the trips shown in Table 8 is based on the proportions of traffic observed to turn into and out of the surveyed residential developments in **Section 4.1.1** and the provided rates in the *ITE Trip Generation* (9th Edition) database (10) as shown in Table 4 on page 35. The data for this is shown in Table 9 below.

Land Use	AM		PM	
	IN	OUT	IN	OUT
115 Residential Units	9%	91%	65%	35%
100 m^2 Retail	62%	38%	51%	49%
150 m^2 Office/ Commercial	88%	12%	17%	83%

Table 9 – Adopted Trip Distribution

4.2.2.4 MODAL SPLIT

As indicated in **Section 4.1.3**, modal split has not been undertaken as all trips are based on surveyed vehicular trips. Refer **Sections 3.3.3** and **3.3.4** for details of public transport, walking and cycling facilities. These, along with the proximity of the development site to the *CBD* are considered attractive enough to encourage use of these alternative forms of transport

4.2.2.5 TRIP ASSIGNMENT

Trip assignment is limited to the *Study Area* and, based on the preceding methodology, is shown in the *Trip Assignment Diagrams* as Figure 21 and Figure 22 on the following pages.

4.2.3 THROUGH TRAFFIC

Through traffic on Gardens Hill Crescent, Blake Street and Geranium Street is included in the 2% per annum growth for background traffic.

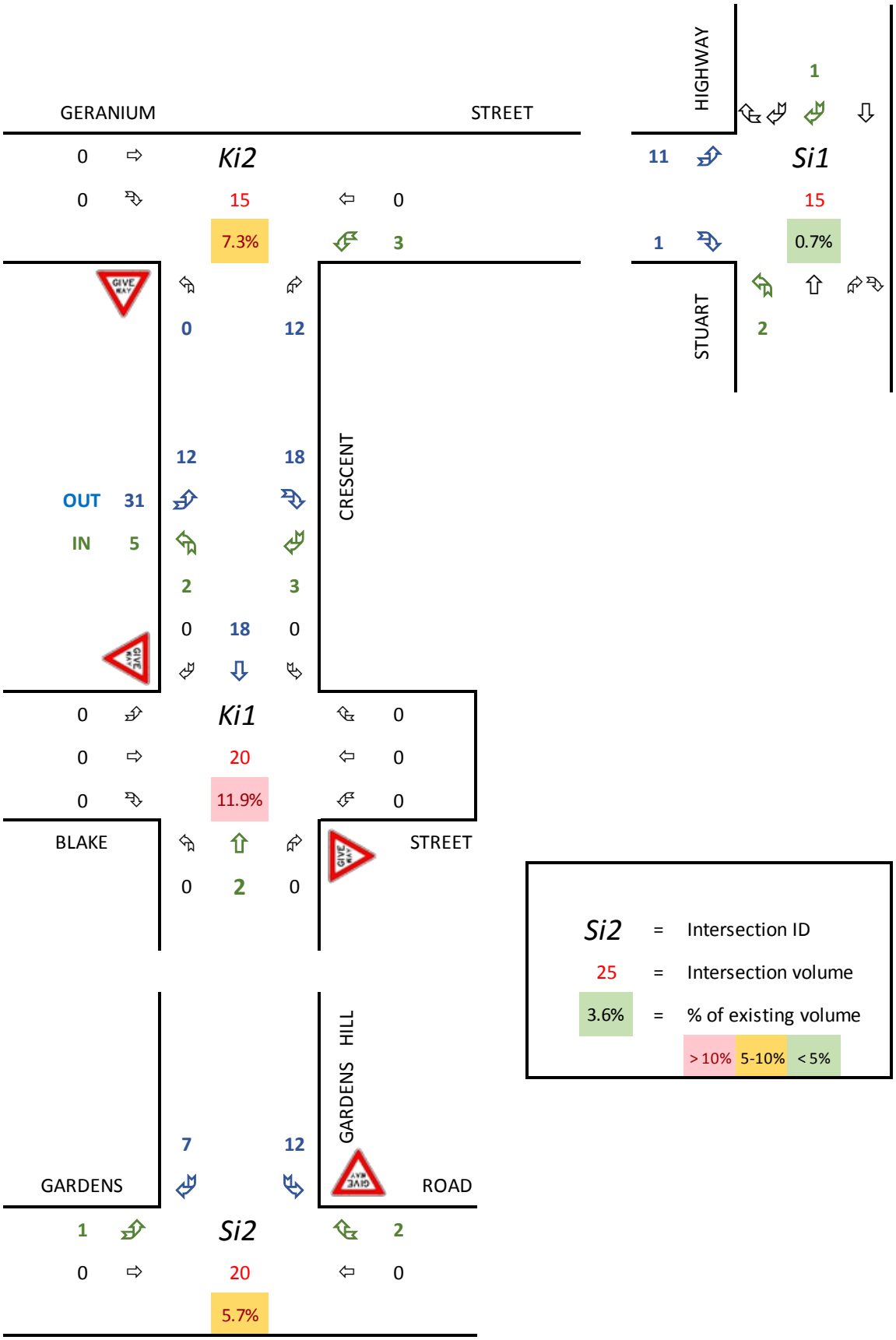


Figure 21 – Trip Assignment AM Peak Hour

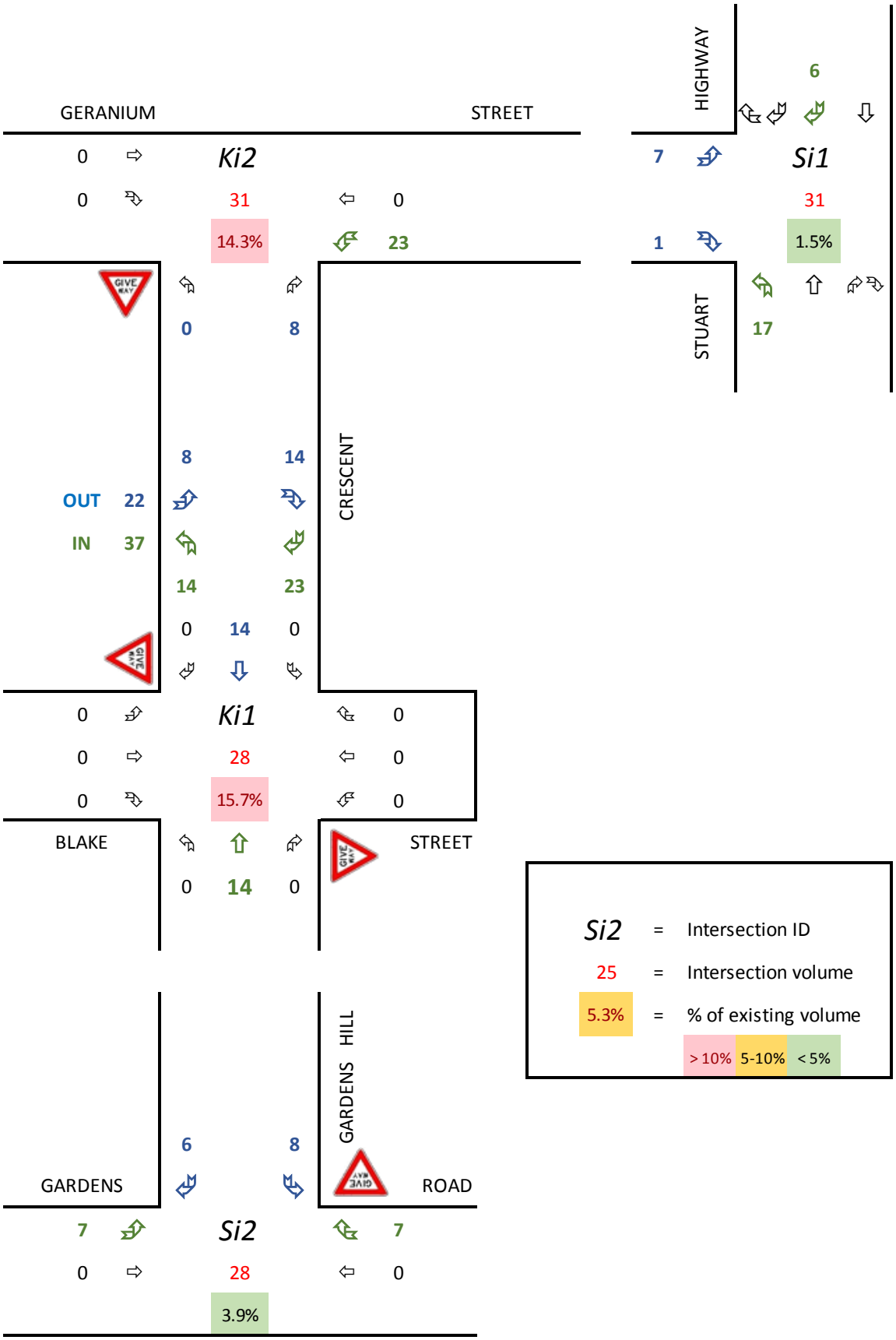


Figure 22 – Trip Assignment PM Peak Hour

Figure 21 and Figure 22 on the previous pages indicate that the forecast volumes through the *Secondary Intersection* (*Si1*) of Stuart Highway with Geranium Street are 0.7% and 0.9% of the total volumes through this intersection during the morning and afternoon peak hours respectively. Generally, volumes less than 5% of the total volume do not warrant detailed analysis as any performance issues would be indicative of current environmental factors and not a direct result of the assessed development.

The forecast volumes through the *Key Intersections* (*Ki1* and *Ki2*) of Gardens Hill Crescent with Blake Street and Geranium Street are between 7.3 and 11.9% of the existing volumes in the morning peak hour and between 14.3 and 15.7% of the existing volumes in the afternoon peak hour and hence warrant detailed assessment. Detailed assessment of the Gardens Hill Cr/ Gardens Rd intersection (*Si2*) has also been undertaken for both peak hours although it is only warranted for the morning peak hour.

4.3. TOTAL TRAFFIC (EACH *HORIZON YEAR*)

The forecast total traffic, i.e. 2016 traffic volumes **plus** 2% per annum growth **plus** development generated traffic, for each peak hour and *Horizon Year* of 2028 is shown in Figure 23 and Figure 24 on the following pages.

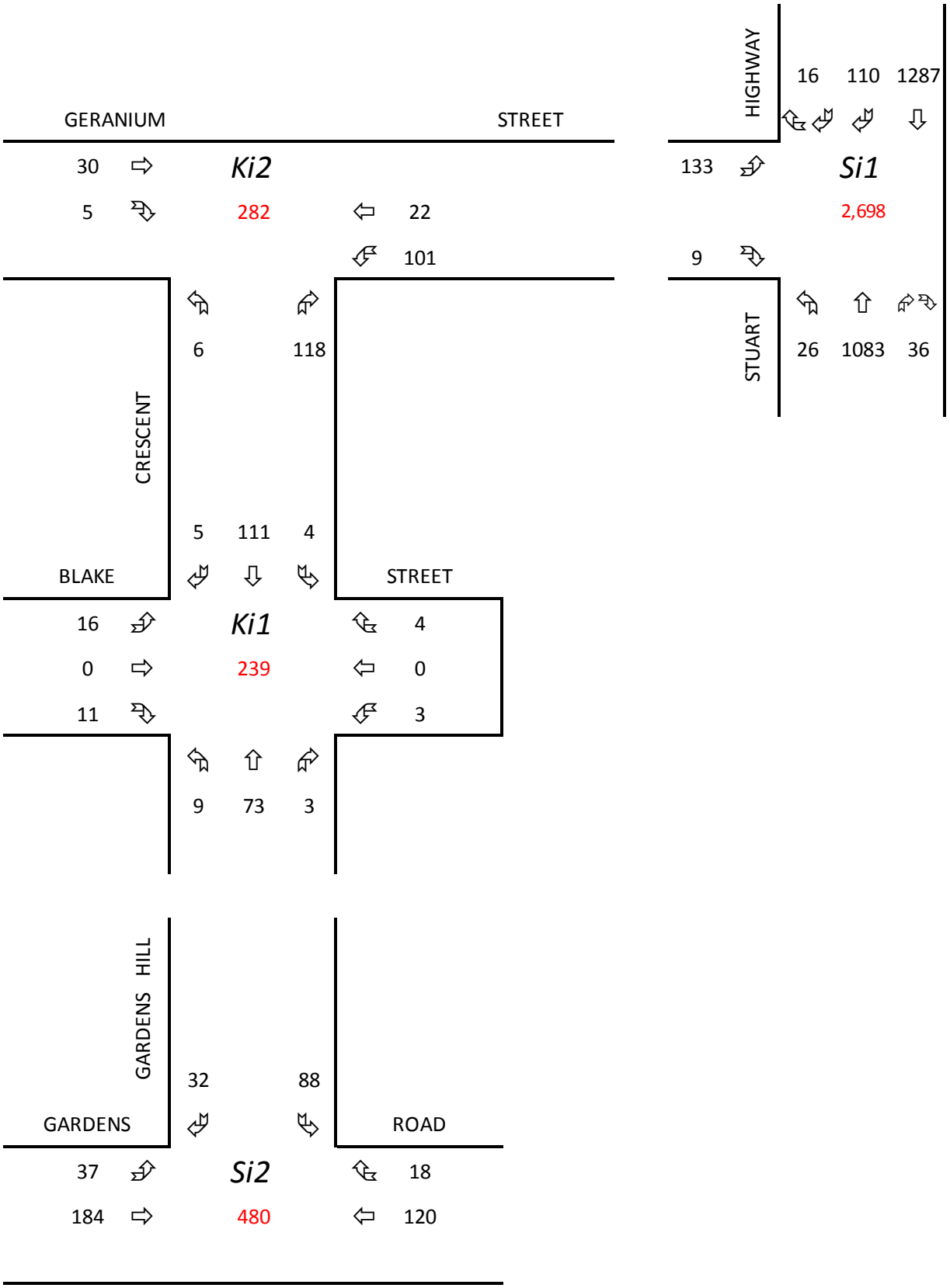


Figure 23 – Forecast AM Peak Hour with 2% per annum growth and development traffic to 2028

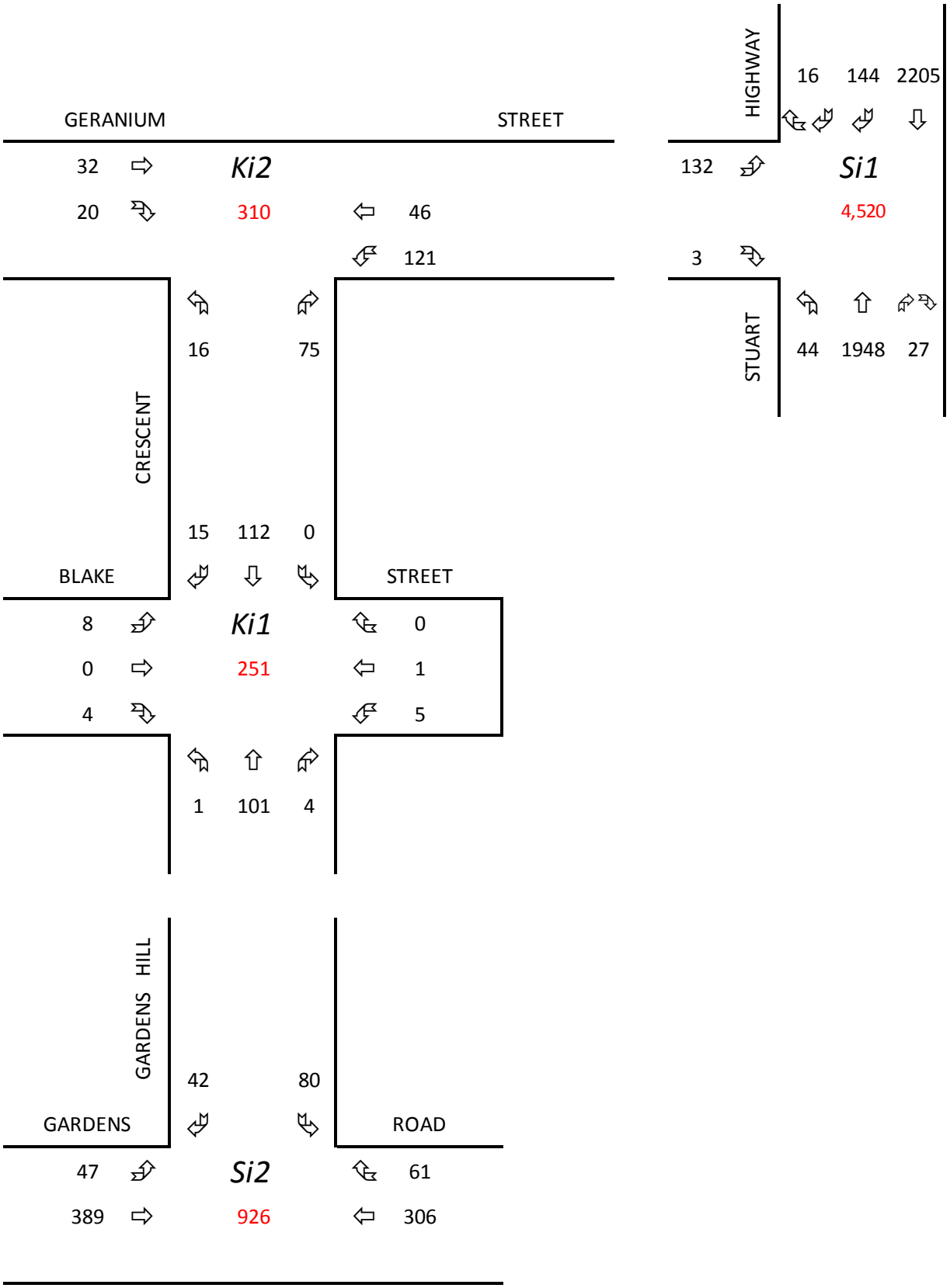


Figure 24 – Forecast PM Peak Hour with 2% per annum growth and development traffic to 2028

5 TRANSPORTATION ANALYSIS

5.1. SITE ACCESS

There are no identified concerns with the proposed access to or from the frontage road (i.e. Gardens Hill Crescent) subject to the required sight lines being provided (refer **Section 5.4**).

Pedestrian and cyclists access is limited by the restrictive path area between the proposed angled parking on Gardens Hill Crescent and the boundary of the development site although it is acknowledged that space has been provided within the property boundary for this. Cycle and pedestrian access to the wider network is envisaged to be primality via Blake St east of Gardens Hill Crescent, i.e. between the development site and the Regional Cycle Route shown in the Darwin Bike Plan (Figure 16 on page 33).

There is an opportunity to address this, as well as the relatively high volumes of through traffic on Gardens Hill Crescent through the provision of a traffic calmed Activity Centre with parking bays and pedestrian/ cycle crossing facilities on Gardens Hill Crescent between Blake St and the southern access driveway, as shown in Figure 25 below and the example shown in Photograph 7 on the following page.

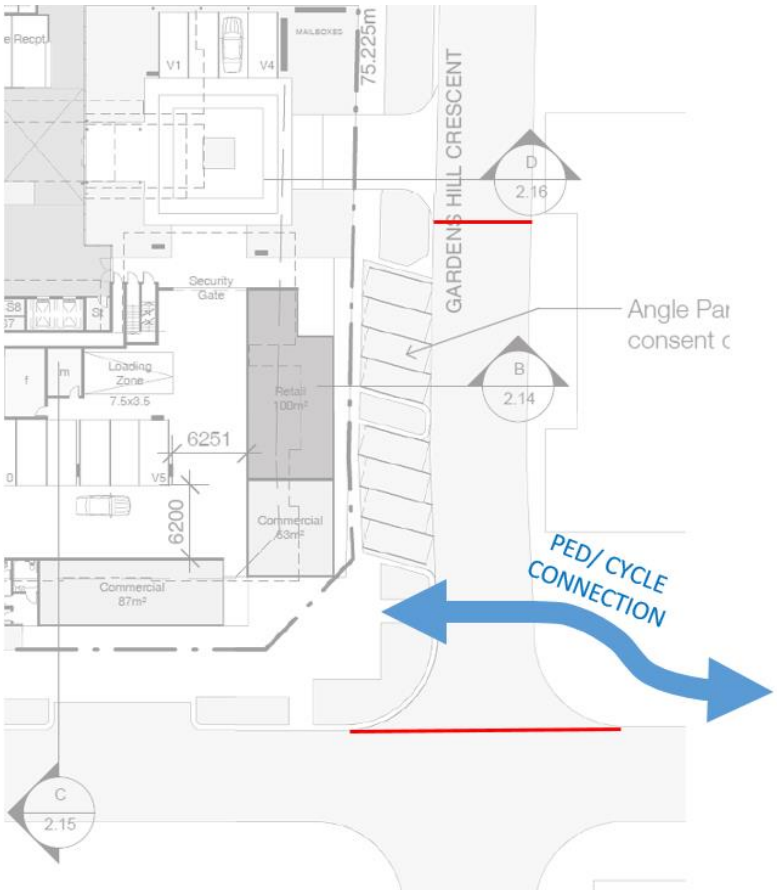


Figure 25 – Suggested traffic calmed 'Activity Centre' section

Photograph 7 -Example of 'Activity Centre' parking treatment (Joondalup, WA)

5.2. CAPACITY AND INTERSECTION PERFORMANCE

An assessment of the forecast intersection conditions and performance for each of the assessed *Key* and *Secondary intersections* for the *Horizon Year* of 2028, with and without 2% per annum growth, is provided in the following sections.

The Intersection Performance Diagrams are based on the Assessed *Degree of Saturation* which is considered to be the most appropriate performance criteria for these types of intersections. Other intersection performance criteria, including queue lengths are included in the *SIDRA Intersection* summary reports in **Appendix D**. Intersection performance criteria in general is discussed in **Appendix C**.

Ki1: GARDENS HILL CRESCENT/ BLAKE STREET (4-WAY GIVE WAY)

Figure 26 below and Figure 27 on the following page show the forecast Degree of Saturation for this intersection during the weekday morning and afternoon road network peak hours for the Horizon Year of 2028.

This data, along with the *SIDRA Intersection* Summary Reports included in **Appendix D,** indicate that the intersection is expected to continue to operate with stable free flow conditions where drivers can select desired speeds and to easily manoeuvre within the traffic stream. There is also plenty of spare capacity.

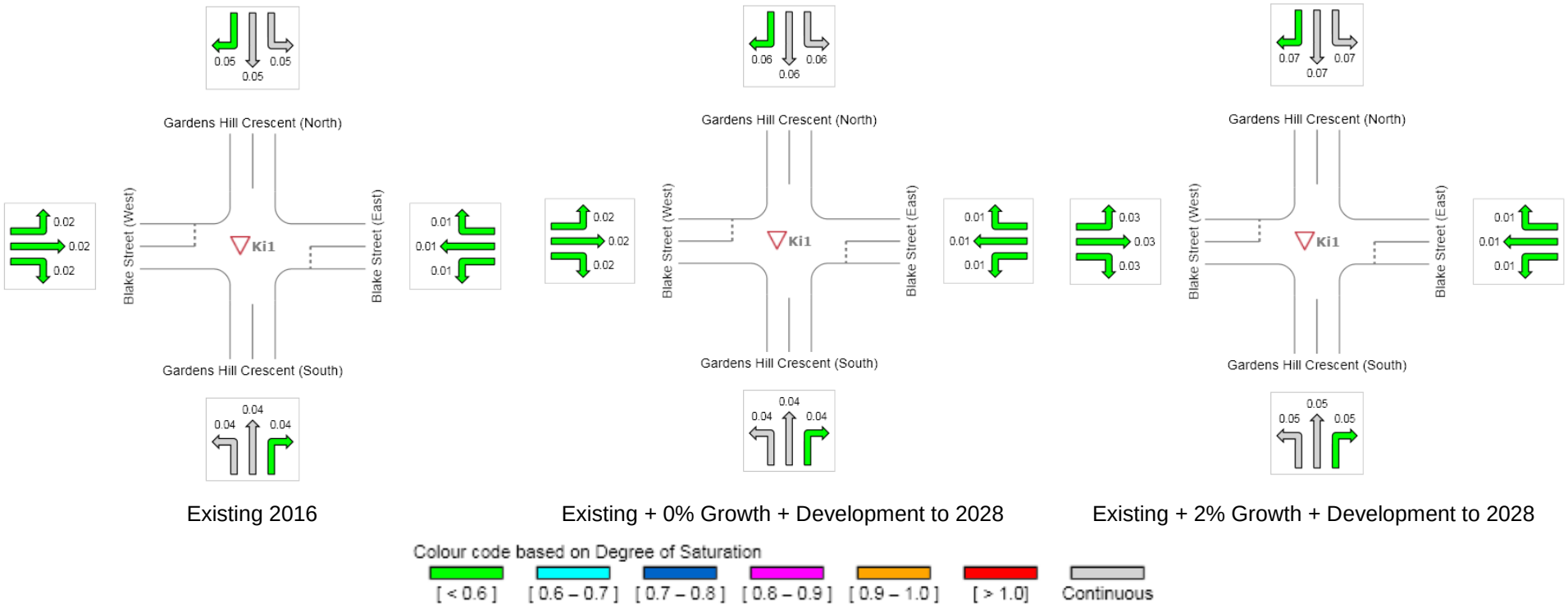
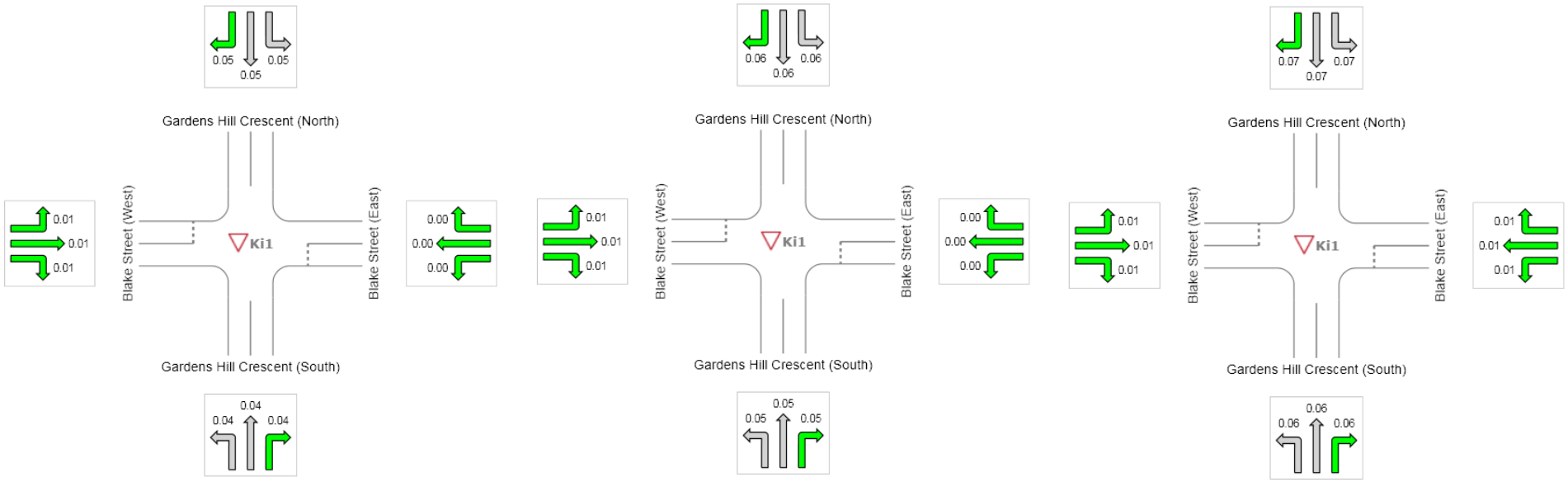


Figure 26 – *Ki1:* AM Peak Hour Intersection Performance Assessment *(Degree of Saturation)*



Existing 2016 | Existing + 0% Growth + Development to 2028 | Existing + 2% Growth + Development to 2028

Figure 27 – *Ki1:* PM Peak Hour Intersection Performance Assessment *(Degree of Saturation)*

Ki2: GARDENS HILL CRESCENT/ GERANIUM STREET (GIVE WAY 'T')

Figure 28 below and Figure 29 on the following page show the forecast Degree of Saturation for this intersection during the weekday morning and afternoon road network peak hours for the Horizon Year of 2028.

This data, along with the *SIDRA Intersection* Summary Reports included in **Appendix D,** indicate that the intersection is expected to continue to operate with stable free flow conditions where drivers can select desired speeds and to easily manoeuvre within the traffic stream. There is also plenty of spare capacity.

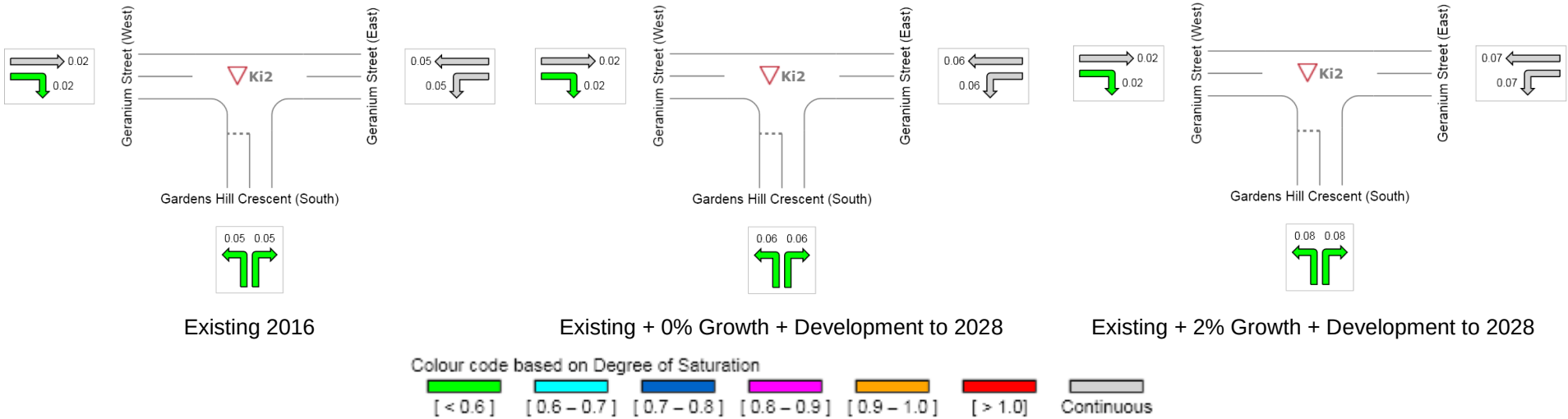
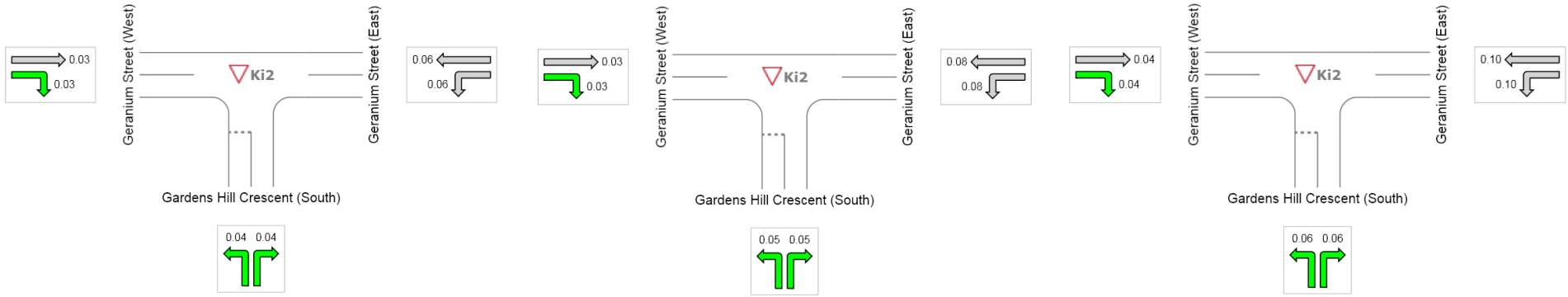


Figure 28 – *Ki2*: AM Peak Hour Intersection Performance Assessment (*Degree of Saturation*)



Existing 2016 | Existing + 0% Growth + Development to 2028 | Existing + 2% Growth + Development to 2028

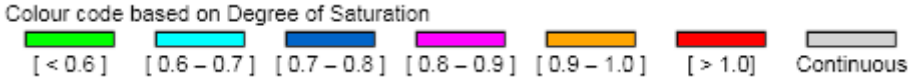
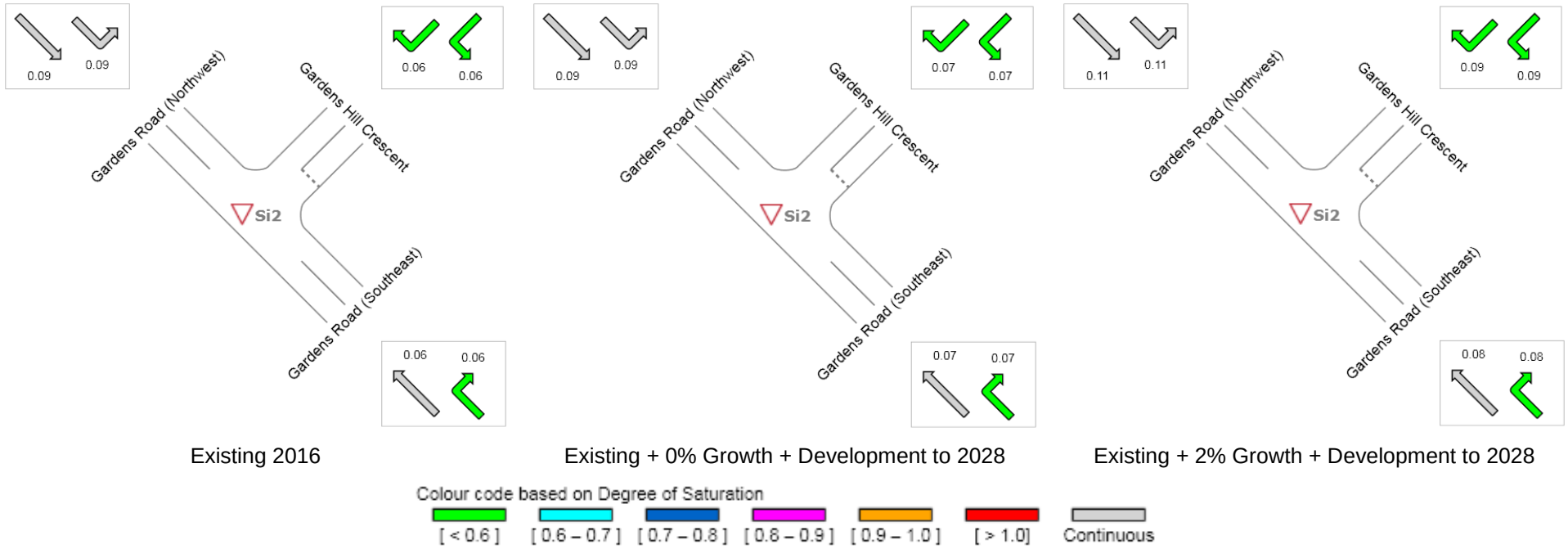


Figure 29 – *Ki2*: PM Peak Hour Intersection Performance Assessment (Degree of Saturation)

Si2: GARDENS HILL CRESCENT/ GARDENS ROAD (GIVE WAY 'T')

Figure 30 below and Figure 31 on the following page show the forecast Degree of Saturation for this intersection during the weekday morning and afternoon road network peak hours for the Horizon Year of 2028.

This data, along with the *SIDRA Intersection* Summary Reports included in **Appendix D,** indicate that the intersection is expected to continue to operate with stable free flow conditions where drivers can select desired speeds and to easily manoeuvre within the traffic stream. There is also plenty of spare capacity.



Existing 2016 | Existing + 0% Growth + Development to 2028 | Existing + 2% Growth + Development to 2028

Figure 30 – *Si2*: AM Peak Hour Intersection Performance Assessment (*Degree of Saturation)*

Existing 2016 | Existing + 0% Growth + Development to 2028 | Existing + 2% Growth + Development to 2028

Figure 31 – *Si2*: PM Peak Hour Intersection Performance Assessment (Degree of Saturation)

All the above assessments indicate that all assessed intersections are forecast to continue to perform with stable free flow conditions where drivers can select desired speeds and easily manoeuvre within the traffic stream, i.e. there is enough spare capacity within each intersection to easily accommodate development generated traffic as well as additional development generated traffic provided for within the 2% annual growth applied to the year 2028.

5.3. TRANSPORTATION SAFETY

The City of Darwin has provided a spreadsheet of all recorded crashes in the City of Darwin for the five-year period ending July 2011. An analysis of this data has revealed that there have been eight (8) reported crashes along Gardens Hill Crescent. One of these crashes occurred at the intersection of Blake Street. All other crashes occurred at locations away from the proposed development site. The reported crash locations are shown in Figure 32 below.

A summary of crashes by time of day/ month/ year/ day of week/ severity/ type/ movement/ lighting and alcohol is shown in Table 10 on the following page. **There is no identified pattern that raises concerns with the safety performance of this road or its intersections and hence the proposed development.**

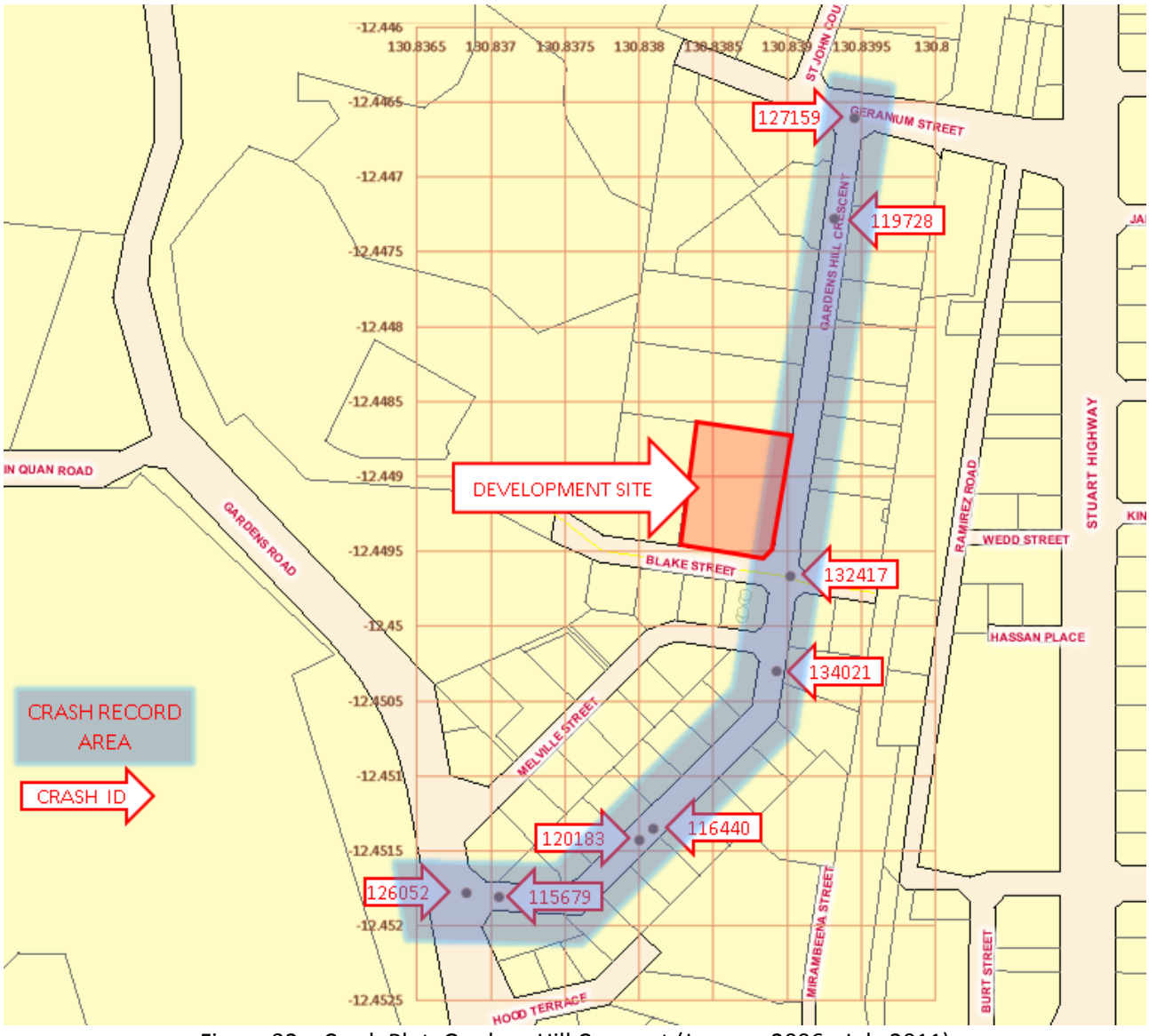


Figure 32 – Crash Plot, Gardens Hill Crescent (January 2006 - July 2011)

Crash ID	Date	Time	Crash Type	Units	Carria-geway ?	Alcoh. Relate ?	Road User Movement	Lighting	Injury	Sequence & Direction	
										1	2
126052	Tuesday, 24 June 2008	5:40:00 PM	ANGLE COLLISION	2	Y	N	CROSS TRAFFIC	DAYLIGHT	INJURED NOT SEEKING TREATMENT	-	-
115679	Saturday, 8 July 2006	9:40:00 PM	RAN OFF ROAD	1	N	N	OFF C'WAY LEFT ON RIGHT BEND	DARK - STREET LIGHTS ON	PROPERTY DAMAGE ONLY	W	-
120183	Tuesday, 13 February 2007	5:00:00 PM	FELL OFF MOTORCYCLE	1	Y	N	OUT OF CONTROL ON CAR'WAY	DARK - STREET LIGHTS ON	TREATED NOT ADMITTED	W	-
116440	Sunday, 27 August 2006	6:30:00 PM	ANGLE COLLISION	2	Y	N	RIGHT REAR	DARK - STREET LIGHTS ON	PROPERTY DAMAGE ONLY	E	E
134021	Monday, 30 August 2010	6:34:00 PM	HIT PARKED VEHICLE	2	Y	N	OTHER ON PATH	DAWN/DUSK	PROPERTY DAMAGE ONLY	S	-
132417	Wednesday, 9 June 2010	7:47:00 AM	HIT PARKED VEHICLE	2	Y	N	REVERSING FROM DRIVEWAY	DAYLIGHT	PROPERTY DAMAGE ONLY	W	S
119728	Friday, 30 March 2007	12:00:00 AM	HIT PARKED VEHICLE	2	Y	N	PARKED	DARK - STREET LIGHTS ON	PROPERTY DAMAGE ONLY	-	N
127159	Saturday, 8 November 2008	1:22:00 PM	HIT PARKED VEHICLE	2	Y	N	PARKED	NOT KNOWN	PROPERTY DAMAGE ONLY	-	-

Table 10 – Crash Record for Gardens Hill Crescent (January 2006 - July 2011)

5.4. SITE CIRCULATION AND PARKING

A review of the Development Plans listed in **Section 2.2.3** by the author has revealed that parking spaces are 2.5 m wide by 5.5 m long and that all spaces are provided at 90 degrees.

The Diagram To Clause 6.5.3 (Carparking) of the *NTPS* indicates that for 90 degree parking spaces, the required dimensions are 2.5 m wide and 5.5 m long and hence the spaces comply with this requirement.

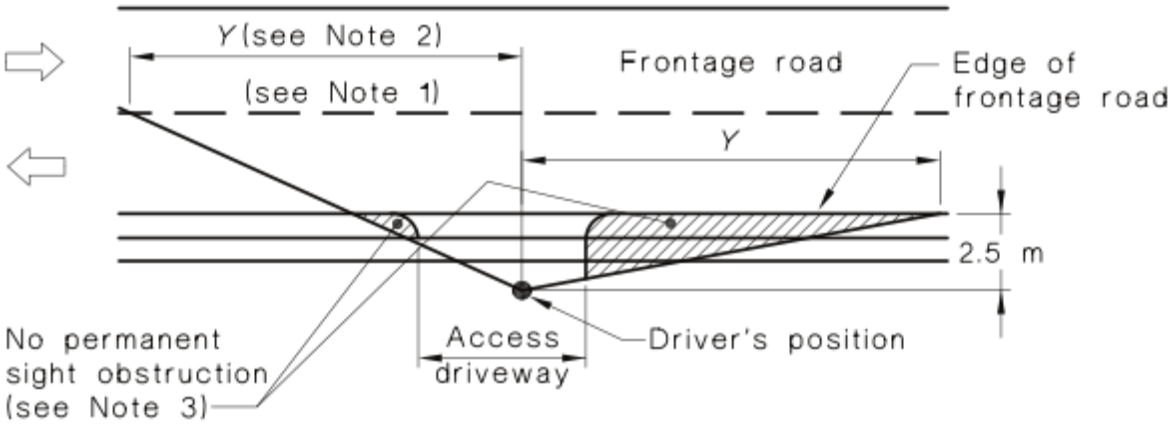
The Australian Standards for off-street parking (i.e. *AS/ NZS 2890.1* (12), *AS 2890.2* (13) and *AS/NZS 2890.6* (14)) contain more specific requirements with respect to manoeuvring throughout car parking areas including required clearances to side walls and sight distances around aisles and ramps. An initial review for Draft 1.0 of this *TIA* revealed that there were issues with sight lines at the ends of the ramp between the Ground Floor Level and the Basement Level as well as to the right for existing vehicles from both proposed driveways off Gardens Hill Crescent due to parked cars. Because of this, changes were made to the design and an assessment based on these changes (as per the revised Development Plans listed in **Section 2.2.3**) is discussed below.

Sight distance at access driveway exits

Section 3.2.4 of *AS/ NZS 2890.1-2004* indicates that:

Access driveways need to be located and constructed so that there is adequate entering sight distance to traffic on the frontage road and sight distance to pedestrians on the frontage road footpath for traffic entering the frontage road, as follows:

a) *Entering sight distance: Unsignalised access driveways shall be located so that the intersection sight distance along the frontage road available to drivers leaving the car park or domestic driveway is at least that shown in Figure 3.2* (reproduced as Figure 33 on the following page)*; and*
b) *Sight distance to pedestrians: Clear sight lines as shown in Figure 3.3* (reproduced as Figure 35 on page 63) *shall be provided at the property line to ensure adequate visibility between vehicles leaving the car park or domestic driveway and pedestrians on the frontage road footpath.*



Frontage road speed (Note 4) km/h	Distance (Y) along frontage road m		
	Access driveways other than domestic (Note 5)		Domestic property access (Note 6)
	Desirable 5 s gap	Minimum SSD	
40	55	35	30
50	69	45	40
60	83	65	55
70	97	85	70
80	111	105	95
90	125	130	Use values from 2nd and 3rd columns
100	139	160	
110	153	190	

Figure 33 - Sight distance requirements at access driveways (Fig 3.2 *AS/ NZS 2890.1*)

NOTES to Figure 33:

1. Centre-line or centre of road (undivided road), or right hand edge of right hand through lane (divided road).
2. A check to the left is not required at a divided road where the median is wide enough to shelter a vehicle leaving the driveway.
3. Parking on this side of the frontage road may need to be restricted on either side of the driveway so that the sight distance required by the above table to an approaching vehicle is not obstructed.
4. This is the posted or general speed limit unless the 85th percentile speed is more than 5 km/h above the limit in which case the tabulated speed nearest the 85th percentile shall be adopted.
5. The values in the table apply only to left turn and right turn manoeuvres into two-way roads up to four lanes wide and one-way streets regardless of width, either for a 5 s gap, desirable at lower frontage road speeds, or minimum stopping sight distance based on 2 s reaction time.
   Crossing manoeuvres (e.g. from an access opposite the steam of a T-junction) over four lanes or more, and turning manoeuvres into a six lane two-way road would require longer gaps unless there was a median wide enough to store a vehicle and allow a two stage manoeuvre.
6. These distances are based on stopping sight distances with reaction time of 1.5 s for traffic approaching along the frontage road and are applicable to a frontage road speed of up to 80 km/h only. Wherever practicable sight distance provided at domestic property accesses should meet the values given in the second or third columns of the Table.
7. When checking sight distance the driver's eye height and the height of the object (approaching vehicle) are to be taken as 1.15 m above the road surface.

An analysis of the traffic data previously provided by the City of Darwin has revealed that the recorded 85%ile speed on Gardens Hill Crescent (i.e. the frontage road) is 65 km/h, although it is noted that this was recorded mid-way between Blake Street and Geranium Street. Recorded speeds are lower close to the bend south of Blake Street, i.e. around 60 km/h. It is also likely that with increased activity around the development site, as well as the proposed embayed parking immediately adjacent to the development site, that the 85th percentile speeds will reduce to 55 km/h, as per the default urban speed limit of 50 km/h.

Based on Figure 33 on the previous page and the adoption of a frontage road speed of 55 km/h and a non-domestic property access driveway classification, the assessed minimum Stopping Sight Distance (*SSD*) is 55 m. An overlay of this sight line requirement on the design plan for each driveway is shown in Figure 34 on the following page. This figure shows that the assessed required sight distances would be blocked by vehicles parked or stopped in the embayed and 90° parking areas shown. As mentioned previously, there is benefit to be had in controlling speeds and through traffic on Gardens Hill Crescent through activation of this section of the road by the provision of embayed parking. **It would therefore be better to provide a wide embayment for parallel parking rather than to remove on-street parking bays. Wide embayment's would result in parked vehicles located further west and hence outside the required sight lines.**

Figure 34 – Assessed Stopping Sight Distance at access driveways

An assessment of the minimum sight lines for pedestrians, based on the requirements of *AS/ NZS 2890.1* as shown in Figure 35 has revealed that the proposed substation on the north side of the northern driveway is near the area to be kept clear of obstructions to visibility to and from the path. Following an earlier assessment, this sub-station has been setback and truncated to ensure that the required sight lines are met (as shown in Figure 36).

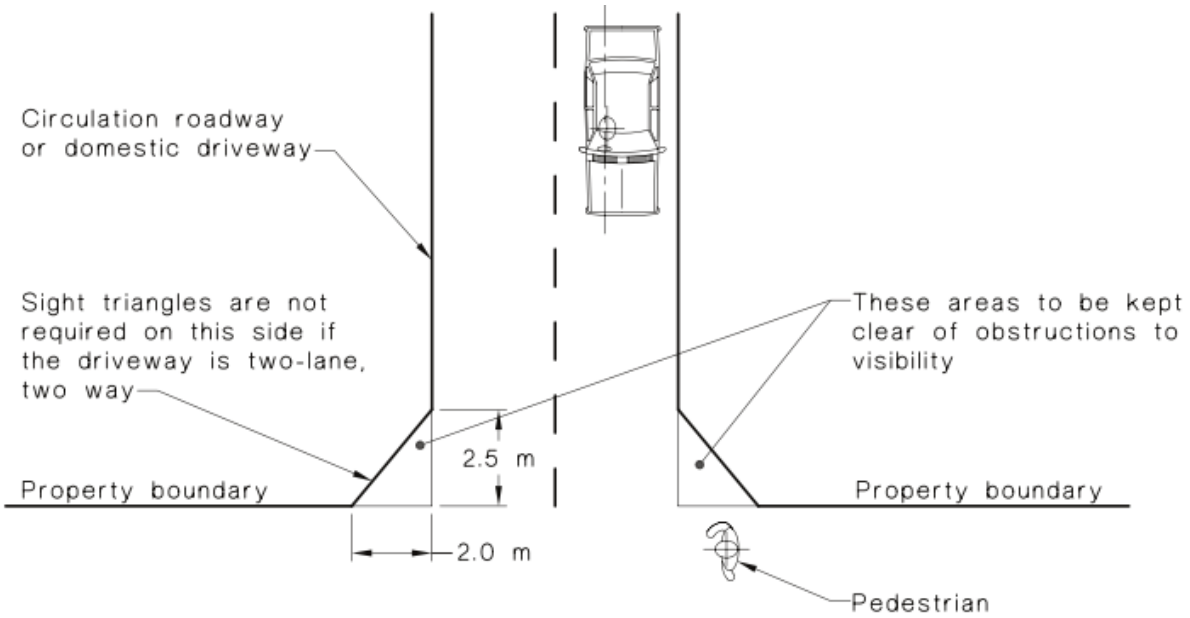


Figure 35 - Minimum sight lines for pedestrian safety (Fig 3.3 *AS/ NZS 2890.1*)

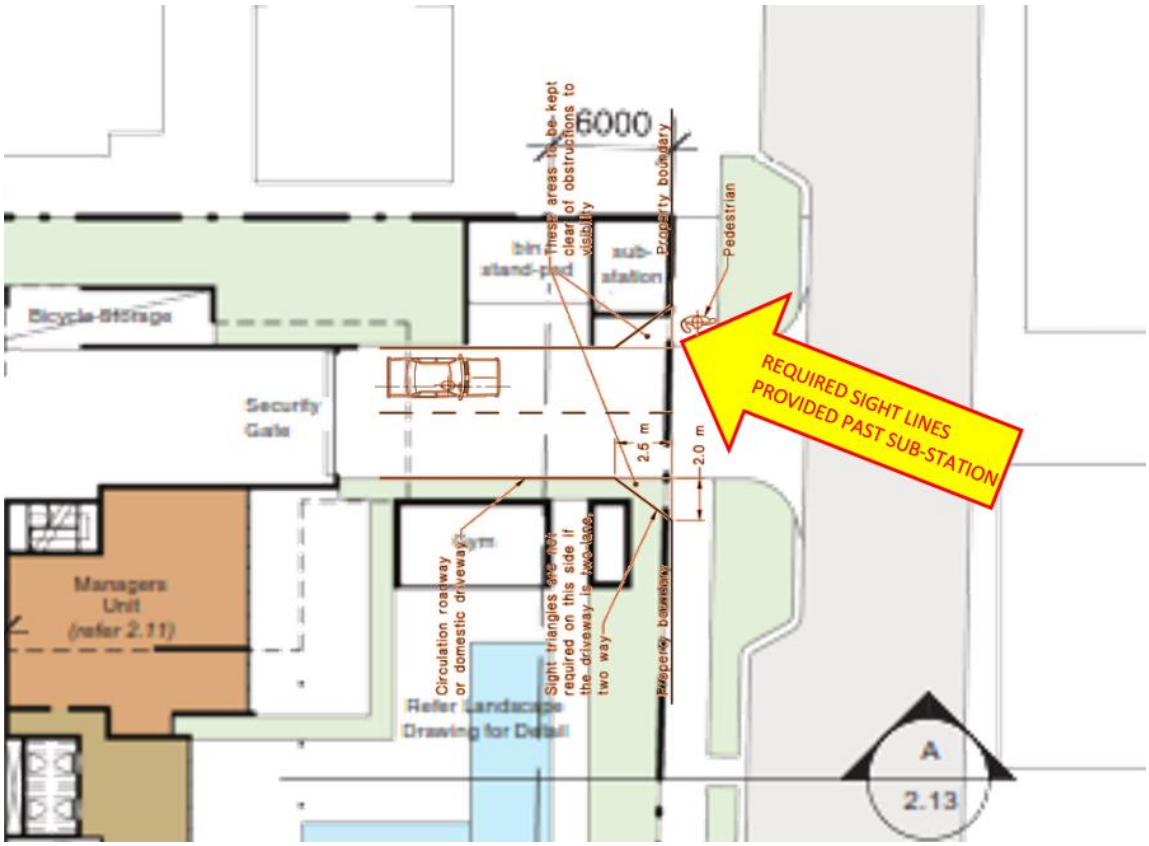


Figure 36 - Assessed pedestrian sight line obstruction at northern access driveway

Sight lines at ramp ends

Paragraph c) (Intersections) of Section 2.5.2 (Layout design of circulation roadways and ramps) of *AS/ NZS 2890.1* states that:

Intersections between circulation roadways and ramps, and with parking aisles shall be designed so that both the approach roadways and the intersection area are wide enough to accommodate turning vehicles and there is adequate intersection sight distance.

Based on Equation 2 from the Austroads document *Guide to Road Design Part 4A* (15) the assessed Safe Intersection Sight Distance (*SISD*), adopting a car park operating speed of 10 km/h, is 15 m, as shown in Calculation 1.

$$SISD = \frac{D_T \times V}{3.6} + \frac{V^2}{254 \times (d + [0.01 \times a])}$$

$SISD$	=	Safe Intersection Sight Distance		
D_T	=	Decision Time (s) = observation time (3s) + reaction time (1.5 alert, 2.0-2.5 other)	=	5.0
V	=	Vehicle operating (85%ile) speed (km/h)	=	10
d	=	coefficient of deceleration (night car: 0.46, night truck: 0.29)	=	0.46
a	=	longitudinal grade (%: +uphill, -downhill)	=	0

$$SISD = \frac{5.00 \times 10}{3.6} + \frac{100}{254 \times (0.46 + [0.01 \times 0])}$$

$$SISD = 13.8889 + 0.8559$$

$$\mathbf{SISD = 15}$$

Calculation 1 – Safe Intersection Sight Distance (*SISD*) for the ends of the ramp

The application of the calculated *SISD* of 15 m to the design plans for each end of the ramp is shown in Figure 37 on the following page.

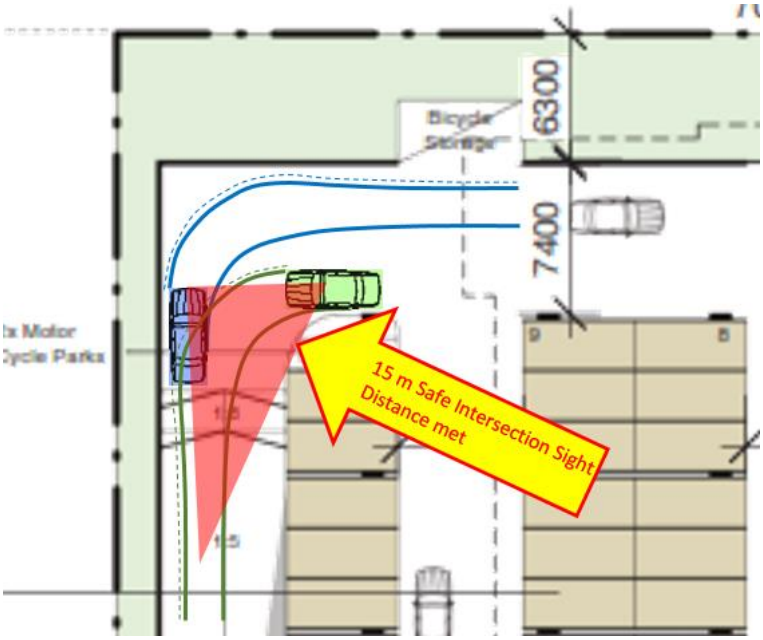


Figure 37 – Assessed Safe Intersection Sight Distance – end of ramp example

It is acknowledged that the above assessment is based on each vehicle approaching the ramp from the far-left side and that in doing so, each vehicle would not be able to pass each other if they both arrived at this intersection point at the same time. An assessment of the swept paths of approaching B85 Design Vehicles based on approaches aimed at passing each other within the intersection area is shown in Figure 38 below. This shows that whilst sight lines are reduced (due to a different approach path to that shown in Figure 37 above) it is possible for two vehicles to pass each other in this intersection area.

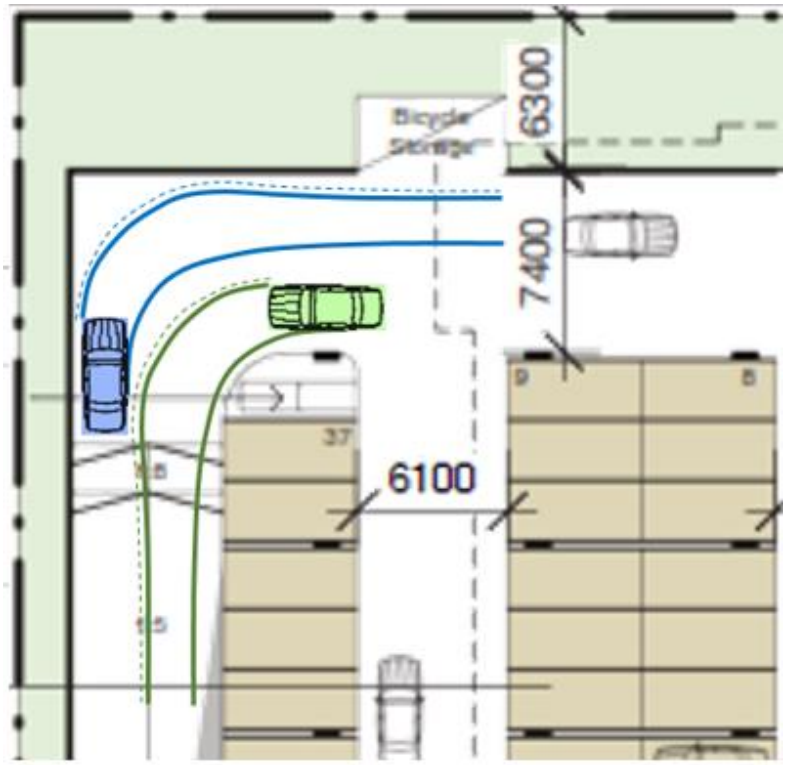


Figure 38 – Assessed swept paths of B85 Design Vehicles at intersection area

The parking space provision requirement for the development is indicated in the "Table To Clause 6.5.1" of the *NTPS* (16), an extract of which is reproduced as Table 11 below. The development site is outside Zone CB, hence column 2 applies.

TABLE TO CLAUSE 6.5.1		
COLUMN 1	COLUMN 2	COLUMN 3
Use or Development	**Minimum Number of Car Parking Spaces Required**	**Minimum Number of Car Parking Spaces Required Within Zone CB in Darwin**
multiple dwellings	2 per **dwelling**	1 per bed-sitter and one bedroom **dwelling** 1.5 per two bedroom **dwelling** 1.7 per three bedroom **dwelling** 2 per **dwelling** with four or more bedrooms
office (not elsewhere referred to in this table)	2.5 for every 100m² of **net floor area**	3 for every 100m² of **net floor area**
shop	6 for every 100m² of **net floor area**	3 for every 100m² of **net floor area**

Table 11 – Parking Requirements (Extract from Table to Clause 6.5.1 of *NTPS*)

An assessment of the required spaces under the *NTPS* is provided as Table 12 below.

LAND USE	QUANTITY	RATE	SPACES REQ'D		SPACES PROVIDED
1B & 1 B+1	24 dwellings	2 /dwelling	48	230	230
2B	54 dwellings	2 /dwelling	108		
3B	37 dwellings	2 /dwelling	74		
Retail	100 m²	6.0 /100 m²	6	10	12
Office/ Commercial	150 m²	2.5 /100 m²	4		
Visitors	- visitors	-	-		8
	1 disabled	1	1		4
TOTALS			241		254

BASEMENT 1		GROUND FLOOR		TOTAL
T1 Residential	88	T1 Residential	22	230
T2 Residential	77	T2 Residential	43	
		Retail	5	10
		Commercial	5	
		Visitors	10	14
		Disabled	4	
165			89	254

Table 12 – Assessment of *NTPS* Parking Space provision requirement

Table 12 indicates that the proposal to provide 254 off-street spaces is 13 spaces more than that required under the *NTPS*.

Loading Bay

The *NTPS* has the following requirement regarding loading bays:

LOADING BAYS

1. The purpose of this clause is to provide for the loading and unloading of vehicles associated with the use of land.
2. A **general industry**, **hospital**, **hotel**, **licensed club**, **light industry**, **motel**, **office**, **restaurant**, **shop**, **showroom sales**, **transport terminal** or **warehouse** use or development on a **site** must provide areas wholly within the **site** for loading and unloading of vehicles at the ratio of:
   (a) if for a **general industry**, **hospital**, **hotel**, **licensed club**, **light industry**, **motel**, **showroom sales**, **transport terminal** or **warehouse** use or development:
      i. 1 loading bay for a single occupation of a **net floor area** of 10 000m^2 or less; and
      ii. 1 loading bay for every 5 000m^2 of **net floor area** or part thereof in excess of 10 000m^2; or
   (b) if for an **office**, **restaurant** or **shop** use or development, 1 loading bay for every 2 000m^2 of the total **net floor area**.
3. A loading bay is to:
   (a) be at least 7.5m by 3.5m;
   (b) have a clearance of at least 4m; and
   (c) have access that is adequate for its purpose.

The Development Plans show a loading bay compliant with this requirement (i.e. near the intersection of cross section lines B and C on Drawing A-DA-2.07M).

The *NTPS* indicates that for many (car park) uses the Building Code of Australia (*BCA*) requires the provision of parking for disabled people. Whilst such spaces are not normally required for residential developments, they are usually required for retail land uses and, for a development of this size, would normally result in a requirement for at least one bay for use by people with disabilities.

The proposed development shows the provision of 4 dedicated parking spaces with a shared area for use by persons with disabilities in accordance with the requirements of *AS/ NZS 2890.6* (14).

6 IMPROVEMENT ANALYSIS

6.1. IMPROVEMENTS TO ACCCOMODATE EXISTING TRAFFIC

There are no identified improvements required to accommodate existing traffic in this *TIA*. A previous *Gardens Hill Crescent Safety Review* Report prepared by *i3* for the City of Darwin in February 2012 identified some minor issues with respect to sign maintenance.

6.2. IMPROVEMENTS TO ACCOMODATE BACKGROUND TRAFFIC

There are no identified improvements required to accommodate the nominal 2% per annum growth in background traffic.

6.3. ADDITIONAL IMPROVEMENTS TO ACCOMODATE SITE TRAFFIC

This assessment has not identified any improvements that are required to accommodate the extra traffic likely to be generated by the proposed development.

6.4. ALTERNATIVE IMPROVEMENTS

There is an opportunity to address identified sight line issues associated with on-street parking bays, as well as the relatively high volumes of through traffic on Gardens Hill Crescent, through the provision of a traffic calmed Activity Centre with parking bays and pedestrian/ cycle crossing facilities on Gardens Hill Crescent between Blake St and the southern access driveway, as shown in Figure 25 bon page 49 and the example shown in Photograph 7 on page 50.

6.5. STATUS OF IMPROVEMENTS ALREAY FUNDED, PROGRAMMED OR PLANNED

There are no known improvements already funded, programmed or planned near the development site.

6.6. EVALUATION

The recommended traffic clamed Activity Centre section of Gardens Hill Crescent will require evaluation once it has been designed and agreed with the City of Darwin.

7 FINDINGS

7.1. SITE ACCESSIBILITY

There are no concerns with accessing the site other than the obstruction of sight lines at the driveways due to parked vehicles within the proposed embayed parking areas on Gardens Hill Crescent and restrictive space for pedestrian and cyclists between the proposed angled parking bays and the property boundary.

7.2. TRANSPORTATION IMPACTS

There are no identified concerns with operational performance of the frontage roads and the assessed Key and Secondary intersections other than existing delays with turning right into and out of Geranium St at Stuart Hwy during peak periods, as would be expected with a Give Way controlled 'T' intersection with a 6-lane arterial highway.

7.3. NEED FOR ANY IMPROVEMENTS

This *TIA* has identified improvements required to ensure that the required sight lines at the driveways are not obstructed and that appropriate space iof provided for cyclists and pedestrians on the Gardens Hill Crescent frontage.

7.4. COMPLIANCE WITH APPLICABLE LOCAL CODES

This *TIA* has determined that the off-street parking areas generally comply with the requirements of Australian Standards *AS/ NZS 2890.1* (12), *AS 2890.2* (13) and *AS/ NZS 2890.6* (14).

The proposed loading bay has been assessed as complying with the requirements of Section 6.6 of the *NTPS*.

The proposed provision of 254 off-street spaces is 13 spaces more than that required under the NTPS.

8 RECOMMENDATIONS

It is recommended that discussion is held with the City of Darwin aimed at designing and implementing a traffic calmed Activity Centre section of Gardens Hill Crescent between Blake St and the southern Access Driveway to the development site. This has the added benefit of discouraging current through traffic using Gardens Hill Crescent as a short cut between Gardens Road and Stuart Highway and hence has potential to result in an overall reduction in vehicular volumes as a result of this development.

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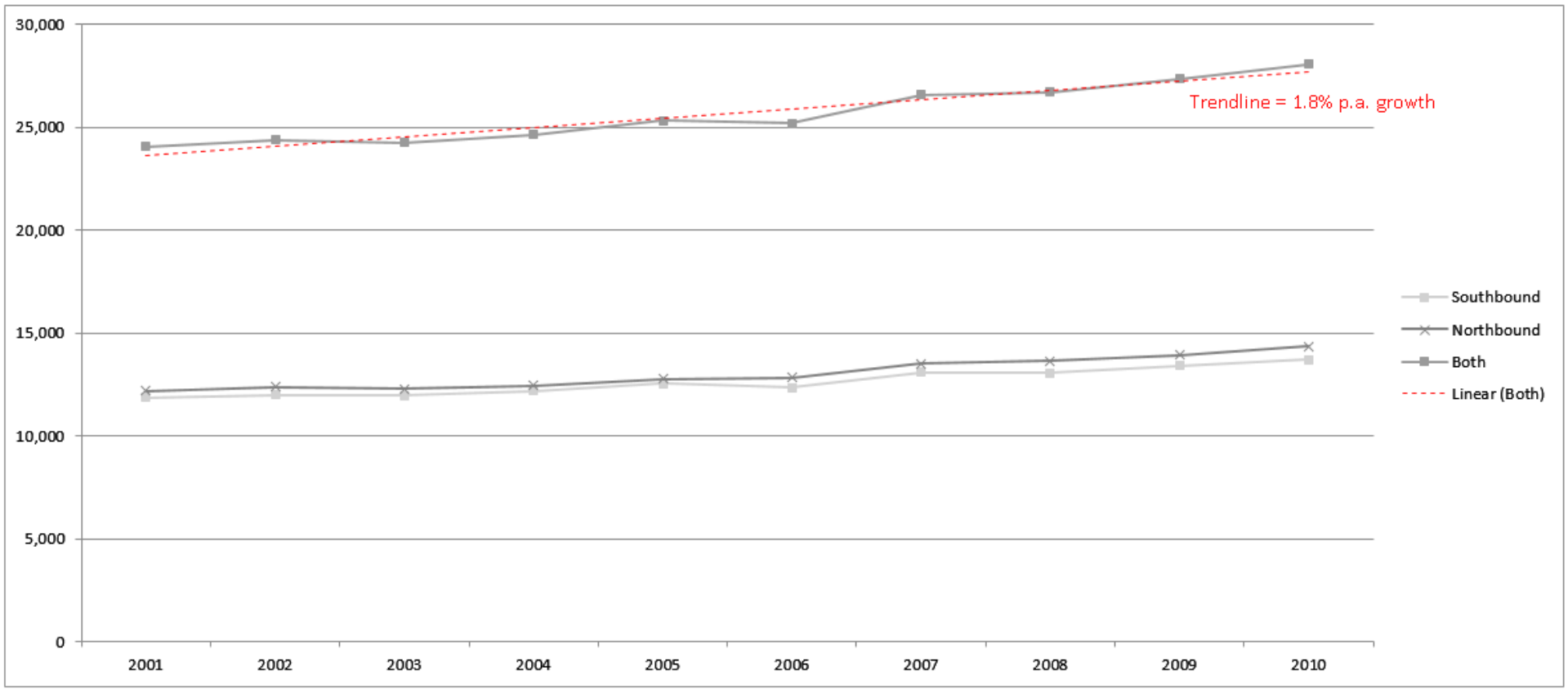
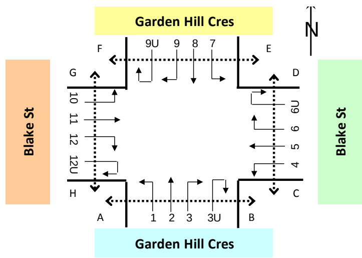
APPENDIX A TRAFFIC VOLUME DATA

Road Name/ Location	ADT Station	Direction	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Stuart Highway	UDVDP003	Southbound	11,875	12,005	11,949	12,190	12,531	12,336	13,077	13,050	13,422	13,696
10 m south of Duke Street		Northbound	12,199	12,369	12,294	12,456	12,781	12,847	13,514	13,650	13,934	14,358
		Both	24,074	24,374	24,243	24,646	25,312	25,183	26,591	26,700	27,356	28,054

Road Name/ Location	ADT Station	Direction	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AADT
Stuart Highway	UDVDP003	Both	23,684	26,165	26,608	27,502	29,154	29,664	30,673	29,752	28,618	28,152	28,373	25,677	28,054
10 m south of Duke Street	Seasonal Factor (2010)		1.1845	1.0722	1.0543	1.0201	0.9623	0.9457	0.9146	0.9429	0.9803	0.9965	0.9888	0.9153	



Job No.	: i3c 23606 02
Client	: i3 consultants WA
Suburb	: The Gardens, Darwin
Location	: Ki1 - Blake St / Garden Hill Cres
Day/Date	: Tue, 8th Nov 2016
Weather	: Fine
Description	: Classified Intersection Count
	: Hourly Summary

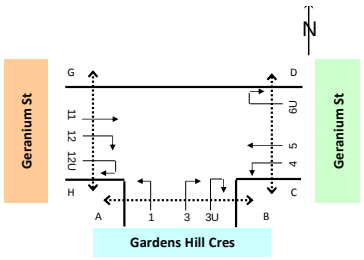


Approach	Garden Hill Cres																Blake St															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total
06:00 to 07:00	0	0	0	**0**	17	1	0	**18**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
06:15 to 07:15	0	0	0	**0**	25	1	0	**26**	0	0	1	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
06:30 to 07:30	0	0	0	**0**	30	1	0	**31**	0	0	1	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
06:45 to 07:45	2	0	0	**2**	49	1	0	**50**	0	0	1	**1**	0	0	0	**0**	1	0	1	**2**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
07:00 to 08:00	3	0	0	**3**	55	0	1	**56**	1	0	1	**2**	0	0	0	**0**	1	0	1	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
07:15 to 08:15	5	0	0	**5**	53	0	1	**54**	1	0	0	**1**	0	0	0	**0**	0	0	1	**1**	0	0	0	**0**	2	1	0	**3**	0	0	0	**0**
07:30 to 08:30	7	0	0	**7**	54	0	2	**56**	2	0	0	**2**	0	0	0	**0**	1	0	1	**2**	0	0	0	**0**	2	1	0	**3**	0	0	0	**0**
07:45 to 08:45	9	0	0	**9**	38	0	2	**40**	2	0	2	**4**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	4	1	0	**5**	0	0	0	**0**
08:00 to 09:00	10	0	0	**10**	34	1	1	**36**	1	0	2	**3**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	4	1	0	**5**	0	0	0	**0**
08:15 to 09:15	9	0	0	**9**	32	2	1	**35**	1	0	2	**3**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
08:30 to 09:30	7	0	0	**7**	32	2	0	**34**	0	0	2	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	1	**3**	0	0	0	**0**
08:45 to 09:45	3	0	0	**3**	30	3	0	**33**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	1	**1**	0	0	0	**0**
09:00 to 10:00	3	0	0	**3**	31	2	0	**33**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	1	**1**	0	0	0	**0**
09:15 to 10:15	3	0	0	**3**	27	2	0	**29**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1	0	1	**2**	0	0	0	**0**
09:30 to 10:30	3	0	0	**3**	25	2	0	**27**	0	0	1	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
09:45 to 10:45	5	0	0	**5**	24	1	0	**25**	0	0	1	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
10:00 to 11:00	4	0	0	**4**	25	1	0	**26**	1	0	1	**2**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
10:15 to 11:15	4	0	0	**4**	29	0	0	**29**	1	0	1	**2**	0	0	0	**0**	1	0	1	**2**	0	0	0	**0**	0	0	1	**1**	0	0	0	**0**
10:30 to 11:30	5	0	0	**5**	29	1	0	**30**	1	0	1	**2**	0	0	0	**0**	1	0	1	**2**	0	0	0	**0**	0	0	1	**1**	0	0	0	**0**
10:45 to 11:45	3	0	0	**3**	33	1	0	**34**	1	0	1	**2**	0	0	0	**0**	1	0	1	**2**	0	0	0	**0**	1	0	1	**2**	0	0	0	**0**
11:00 to 12:00	5	0	0	**5**	32	1	0	**33**	0	0	1	**1**	0	0	0	**0**	0	0	2	**2**	0	0	0	**0**	1	0	1	**2**	0	0	0	**0**
11:15 to 12:15	4	0	0	**4**	36	3	0	**39**	1	1	1	**3**	0	0	0	**0**	0	0	1	**1**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
11:30 to 12:30	3	0	0	**3**	39	2	0	**41**	1	1	0	**2**	0	0	0	**0**	0	0	1	**1**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**
11:45 to 12:45	6	0	0	**6**	35	2	0	**37**	1	1	0	**2**	0	0	0	**0**	0	0	1	**1**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
12:00 to 13:00	8	0	0	**8**	33	3	0	**36**	1	1	0	**2**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
12:15 to 13:15	9	0	0	**9**	37	1	0	**38**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
12:30 to 13:30	10	0	0	**10**	38	1	0	**39**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
12:45 to 13:45	9	0	0	**9**	37	1	0	**38**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
13:00 to 14:00	8	0	0	**8**	38	0	0	**38**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
13:15 to 14:15	12	0	0	**12**	35	1	0	**36**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
13:30 to 14:30	12	0	0	**12**	33	1	0	**34**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
13:45 to 14:45	10	0	0	**10**	34	1	0	**35**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
14:00 to 15:00	6	0	0	**6**	36	2	0	**38**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
14:15 to 15:15	1	0	0	**1**	29	1	0	**30**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
14:30 to 15:30	1	0	0	**1**	28	1	0	**29**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
14:45 to 15:45	2	0	0	**2**	29	1	0	**30**	0	0	0	**0**	0	0	0	**0**	1	0	1	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
15:00 to 16:00	2	0	0	**2**	36	2	0	**38**	1	0	1	**2**	0	0	0	**0**	2	0	1	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
15:15 to 16:15	3	0	0	**3**	43	2	0	**45**	1	0	1	**2**	0	0	0	**0**	1	0	1	**2**	0	0	0	**0**	0	0	3	**3**	0	0	0	**0**
15:30 to 16:30	2	0	0	**2**	44	4	0	**48**	1	0	1	**2**	1	0	0	**1**	1	0	1	**2**	0	0	0	**0**	1	0	3	**4**	0	0	0	**0**
15:45 to 16:45	2	0	0	**2**	50	4	0	**54**	1	0	1	**2**	1	0	0	**1**	2	0	0	**2**	0	0	0	**0**	1	0	3	**4**	0	0	0	**0**
16:00 to 17:00	3	0	0	**3**	52	2	1	**55**	1	0	0	**1**	1	0	0	**1**	1	0	0	**1**	1	0	0	**1**	1	0	3	**4**	0	0	0	**0**
16:15 to 17:15	2	0	0	**2**	53	2	1	**56**	2	0	0	**2**	1	0	0	**1**	2	0	0	**2**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**
16:30 to 17:30	2	0	0	**2**	61	0	1	**62**	2	0	0	**2**	0	0	0	**0**	3	0	0	**3**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**
16:45 to 17:45	1	0	0	**1**	68	0	1	**69**	3	0	0	**3**	0	0	0	**0**	3	0	1	**4**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**
17:00 to 18:00	1	0	0	**1**	62	0	0	**62**	2	0	0	**2**	0	0	0	**0**	4	0	1	**5**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
12hr Totals	**53**	**0**	**0**	**53**	**451**	**15**	**3**	**469**	**8**	**1**	**6**	**15**	**2**	**0**	**0**	**2**	**11**	**0**	**5**	**16**	**1**	**0**	**0**	**1**	**13**	**1**	**5**	**19**	**0**	**0**	**0**	**0**

Approach	Garden Hill Cres																Blake St																Crossing Pedestrians								
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)												
Time Period	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	A	B	C	D	E	F	G	H	Total
06:00 to 07:00	0	0	3	**3**	14	1	0	**15**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	0	0	2	2	0	0	5	0	**9**
06:15 to 07:15	0	0	0	**0**	17	1	0	**18**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	0	2	2	0	1	7	0	**12**
06:30 to 07:30	0	0	1	**1**	27	1	0	**28**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	0	0	1	1	0	2	7	1	**12**
06:45 to 07:45	0	0	1	**1**	41	0	0	**41**	3	0	0	**3**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	2	0	1	1	2	2	7	6	**21**
07:00 to 08:00	0	0	1	**1**	53	0	0	**53**	5	0	0	**5**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	2	0	1	1	2	2	2	6	**16**
07:15 to 08:15	0	0	1	**1**	67	0	0	**67**	7	0	0	**7**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	2	0	1	1	2	1	0	6	**13**
07:30 to 08:30	0	0	0	**0**	76	1	0	**77**	12	0	0	**12**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	2	0	1	1	3	1	0	5	**13**
07:45 to 08:45	1	0	0	**1**	75	1	0	**76**	15	0	0	**15**	0	0	0	**0**	7	0	0	**7**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	0	1	0	0	1	1	0	0	**3**
08:00 to 09:00	1	0	0	**1**	73	1	0	**74**	17	0	0	**17**	0	0	0	**0**	7	0	0	**7**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	1	0	0	1	1	0	0	**3**
08:15 to 09:15	1	0	1	**2**	63	1	1	**65**	18	0	0	**18**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	1	0	0	1	1	0	0	**3**
08:30 to 09:30	1	0	1	**2**	48	0	3	**51**	14	0	0	**14**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	1	0	0	0	0	0	0	**1**
08:45 to 09:45	0	0	1	**1**	40	1	3	**44**	8	0	0	**8**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	0	0	0	0	0	0	0	**0**
09:00 to 10:00	1	0	1	**2**	32	1	3	**36**	4	0	0	**4**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	0	0	0	0	0	0	0	**0**
09:15 to 10:15	2	0	0	**2**	28	1	2	**31**	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	0	0	0	0	0	0	0	0	**0**
09:30 to 10:30	2	0	0	**2**	33	1	0	**34**	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	0	0	0	0	0	0	0	0	**0**
09:45 to 10:45	2	0	0	**2**	28	0	0	**28**	2	0	0	**2**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	0	0	0	0	0	0	0	**0**
10:00 to 11:00	1	0	0	**1**	26	0	0	**26**	2	0	0	**2**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	0	0	0	0	0	0	0	**0**
10:15 to 11:15	0	0	0	**0**	30	0	0	**30**	2	0	0	**2**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	3	0	0	0	0	0	0	0	**3**
10:30 to 11:30	0	0	0	**0**	23	0	0	**23**	1	0	0	**1**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	3	0	0	0	0	0	0	0	**3**
10:45 to 11:45	0	0	0	**0**	32	1	0	**33**	0	0	0	**0**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	4	0	0	0	0	0	0	0	**4**
11:00 to 12:00	0	0	1	**1**	42	1	0	**43**	2	0	0	**2**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	0	0	0	0	0	0	0	**4**
11:15 to 12:15	2	0	1	**3**	46	1	0	**47**	3	0	0	**3**	0	0	0	**0**	8	0	0	**8**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1	0	0	0	0	0	0	0	**1**
11:30 to 12:30	3	0	1	**4**	59	1	0	**60**	5	0	0	**5**	0	0	0	**0**	7	0	0	**7**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	1	0	0	0	0	0	0	0	**1**
11:45 to 12:45	3	0	1	**4**	60	1	0	**61**	7	0	0	**7**	1	0	0	**1**	8	0	0	**8**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	0	0	0	0	0	0	0	0	**0**
12:00 to 13:00	3	0	0	**3**	56	2	0	**58**	9	0	0	**9**	1	0	0	**1**	9	0	0	**9**	0	0	0	**0**	7	0	0	**7**	0	0	0	**0**	0	0	0	0	0	0	0	0	**0**
12:15 to 13:15	1	0	0	**1**	56	2	0	**58**	10	0	0	**10**	2	0	0	**2**	11	0	0	**11**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	0	0	0	0	0	0	2	0	**2**
12:30 to 13:30	0	0	0	**0**	48	2	0	**50**	8	0	0	**8**	2	0	0	**2**	11	0	0	**11**	0	0	0	**0**	8	0	0	**8**	0	0	0	**0**	0	0	0	0	0	0	2	0	**2**
12:45 to 13:45	0	0	0	**0**	44	1	0	**45**	7	0	0	**7**	1	0	0	**1**	13	0	0	**13**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	0	0	0	0	0	0	2	1	**3**
13:00 to 14:00	0	0	0	**0**	44	0	0	**44**	4	1	0	**5**	1	0	0	**1**	11	0	0	**11**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	0	0	0	0	0	0	2	1	**3**
13:15 to 14:15	0	0	0	**0**	31	0	0	**31**	3	1	0	**4**	0	0	0	**0**	8	0	0	**8**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	0	0	0	0	0	0	0	1	**1**
13:30 to 14:30	1	0	0	**1**	29	0	0	**29**	7	1	0	**8**	0	0	0	**0**	9	0	0	**9**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	0	1	0	0	0	0	0	1	**2**
13:45 to 14:45	1	0	0	**1**	32	0	0	**32**	7	1	0	**8**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	1	1	0	0	0	0	0	0	**2**
14:00 to 15:00	1	0	0	**1**	34	0	0	**34**	7	0	0	**7**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1	1	0	0	0	0	0	0	**2**
14:15 to 15:15	1	0	0	**1**	39	0	0	**39**	7	0	0	**7**	0	0	0	**0**	5	1	0	**6**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1	1	0	0	0	0	0	0	**2**
14:30 to 15:30	0	0	0	**0**	42	0	0	**42**	6	0	0	**6**	0	0	0	**0**	6	1	0	**7**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	0	0	0	0	0	**2**
14:45 to 15:45	1	0	0	**1**	36	0	0	**36**	6	0	0	**6**	0	0	0	**0**	8	1	0	**9**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	0	0	0	0	0	**1**
15:00 to 16:00	1	0	0	**1**	36	0	1	**37**	5	0	0	**5**	0	0	0	**0**	7	1	0	**8**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	0	0	0	0	0	**1**
15:15 to 16:15	1	0	0	**1**	43	0	1	**44**	4	0	0	**4**	0	0	0	**0**	7	0	0	**7**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1	0	0	0	0	0	0	0	**1**
15:30 to 16:30	3	0	1	**4**	46	0	1	**47**	1	0	0	**1**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	0	0	1	0	0	0	**1**
15:45 to 16:45	2	0	1	**3**	54	0	1	**55**	2	0	0	**2**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	1	0	0	0	1	0	0	0	**2**
16:00 to 17:00	3	0	1	**4**	57	0	0	**57**	3	0	0	**3**	0	0	0	**0**	8	0	0	**8**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	2	1	0	0	1	1	0	0	**5**
16:15 to 17:15	3	1	1	**5**	61	0	1	**62**	3	0	0	**3**	0	0	0	**0**	12	0	0	**12**	0	0	0	**0**	9	0	0	**9**	0	0	0	**0**	2	1	1	1	1	1	0	4	**11**
16:30 to 17:30	2	1	0	**3**	63	0	1	**64**	4	0	0	**4**	1	0	0	**1**	13	0	0	**13**	0	0	0	**0**	10	0	0	**10**	0	0	0	**0**	2	1	2	1	0	1	0	4	**11**
16:45 to 17:45	2	1	0	**3**	71	0	2	**73**	4	0	0	**4**	1	0	0	**1**	13	0	0	**13**	0	0	0	**0**	9	0	0	**9**	0	0	0	**0**	2	1	3	2	0	2	0	4	**14**
17:00 to 18:00	2	1	0	**3**	68	0	2	**70**	5	0	0	**5**	1	0	0	**1**	9	0	0	**9**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	1	0	3	3	0	1	0	4	**12**
12hr Totals	**13**	**1**	**7**	**21**	**535**	**6**	**6**	**547**	**64**	**1**	**0**	**65**	**3**	**0**	**0**	**3**	**72**	**1**	**0**	**73**	**0**	**0**	**0**	**0**	**39**	**0**	**0**	**39**	**0**	**0**	**0**	**0**	**11**	**3**	**6**	**6**	**4**	**5**	**9**	**11**	**26**

Job No. : i3c 23606 02
Client : i3 consultants WA
Suburb : The Gardens, Darwin
Location : Ki2 - Geranium St / Gardens Hill Cres

Day/Date : Tue, 8th Nov 2016
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary

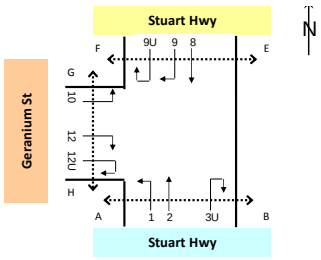


Approach	Gardens Hill Cres												Geranium St											
Direction	Direction 1 (Left Turn)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6U (U Turn)			
Time Period	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total
06:00 to 07:00	1	0	0	**1**	38	1	0	**39**	0	0	0	**0**	12	1	0	**13**	8	0	0	**8**	0	0	0	**0**
06:15 to 07:15	1	0	0	**1**	49	1	0	**50**	0	0	0	**0**	11	1	0	**12**	9	0	1	**10**	1	0	0	**1**
06:30 to 07:30	5	0	0	**5**	49	1	0	**50**	0	0	0	**0**	17	1	0	**18**	9	0	1	**10**	1	0	0	**1**
06:45 to 07:45	5	0	0	**5**	69	1	0	**70**	0	0	0	**0**	29	0	0	**29**	9	0	2	**11**	1	0	0	**1**
07:00 to 08:00	6	0	0	**6**	84	0	1	**85**	0	0	0	**0**	46	0	0	**46**	12	0	2	**14**	1	0	0	**1**
07:15 to 08:15	7	0	0	**7**	82	1	1	**84**	0	0	0	**0**	61	0	0	**61**	13	0	1	**14**	0	0	0	**0**
07:30 to 08:30	5	0	0	**5**	80	1	2	**83**	0	0	0	**0**	76	1	0	**77**	16	0	1	**17**	0	0	0	**0**
07:45 to 08:45	5	0	0	**5**	64	1	2	**67**	0	0	0	**0**	80	1	0	**81**	18	0	1	**19**	0	0	0	**0**
08:00 to 09:00	4	1	0	**5**	53	1	1	**55**	0	0	0	**0**	76	1	0	**77**	17	1	1	**19**	0	0	0	**0**
08:15 to 09:15	4	1	0	**5**	45	1	1	**47**	0	0	0	**0**	68	2	0	**70**	20	1	1	**22**	0	0	0	**0**
08:30 to 09:30	4	1	0	**5**	46	1	0	**47**	0	0	0	**0**	54	2	0	**56**	16	1	1	**18**	0	0	0	**0**
08:45 to 09:45	3	2	0	**5**	38	1	0	**39**	0	0	0	**0**	41	2	0	**43**	11	1	0	**12**	0	0	0	**0**
09:00 to 10:00	5	1	0	**6**	32	2	0	**34**	0	0	0	**0**	31	2	0	**33**	13	0	0	**13**	0	0	0	**0**
09:15 to 10:15	4	2	0	**6**	34	1	1	**36**	0	0	0	**0**	27	1	0	**28**	11	0	0	**11**	0	0	0	**0**
09:30 to 10:30	3	2	0	**5**	34	1	1	**36**	0	0	0	**0**	25	0	0	**25**	13	0	1	**14**	0	0	0	**0**
09:45 to 10:45	4	1	0	**5**	32	1	1	**34**	0	0	0	**0**	24	0	0	**24**	16	0	1	**17**	0	0	0	**0**
10:00 to 11:00	2	1	0	**3**	37	0	1	**38**	0	0	0	**0**	27	0	0	**27**	12	0	1	**13**	0	0	0	**0**
10:15 to 11:15	2	0	0	**2**	37	0	0	**37**	0	0	0	**0**	29	0	0	**29**	11	0	1	**12**	0	0	0	**0**
10:30 to 11:30	3	1	0	**4**	35	0	0	**35**	0	0	0	**0**	29	0	1	**30**	10	0	0	**10**	0	0	0	**0**
10:45 to 11:45	4	1	0	**5**	43	0	0	**43**	0	0	0	**0**	32	2	1	**35**	10	0	0	**10**	0	0	0	**0**
11:00 to 12:00	5	1	0	**6**	37	1	0	**38**	0	0	0	**0**	44	2	1	**47**	11	0	0	**11**	0	0	0	**0**
11:15 to 12:15	5	1	0	**6**	44	3	0	**47**	0	0	0	**0**	49	2	1	**52**	10	0	0	**10**	0	0	0	**0**
11:30 to 12:30	4	0	0	**4**	49	3	0	**52**	0	0	0	**0**	62	2	0	**64**	18	0	0	**18**	0	0	0	**0**
11:45 to 12:45	2	0	0	**2**	46	3	0	**49**	0	0	0	**0**	71	1	0	**72**	19	0	0	**19**	0	0	0	**0**
12:00 to 13:00	2	0	0	**2**	46	3	0	**49**	0	0	0	**0**	64	2	1	**67**	18	0	0	**18**	0	0	0	**0**
12:15 to 13:15	5	0	0	**5**	45	1	0	**46**	0	0	0	**0**	66	2	1	**69**	21	1	0	**22**	1	0	0	**1**
12:30 to 13:30	5	0	0	**5**	41	1	0	**42**	0	0	0	**0**	52	2	1	**55**	12	1	0	**13**	1	0	0	**1**
12:45 to 13:45	7	0	0	**7**	37	1	0	**38**	0	0	0	**0**	41	1	1	**43**	11	1	0	**12**	1	0	0	**1**
13:00 to 14:00	6	0	0	**6**	36	0	0	**36**	0	0	0	**0**	41	1	0	**42**	12	1	0	**13**	1	0	0	**1**
13:15 to 14:15	4	0	0	**4**	34	1	0	**35**	0	0	0	**0**	30	1	0	**31**	10	0	0	**10**	0	0	0	**0**
13:30 to 14:30	6	0	0	**6**	38	1	0	**39**	0	0	0	**0**	31	1	1	**33**	8	0	1	**9**	0	0	0	**0**
13:45 to 14:45	5	0	0	**5**	37	1	0	**38**	0	0	0	**0**	34	1	1	**36**	8	0	2	**10**	0	0	0	**0**
14:00 to 15:00	6	0	0	**6**	38	2	0	**40**	0	0	0	**0**	33	0	1	**34**	10	0	2	**12**	0	0	0	**0**
14:15 to 15:15	7	0	0	**7**	30	2	0	**32**	0	0	0	**0**	38	1	1	**40**	12	0	2	**14**	0	0	0	**0**
14:30 to 15:30	5	0	0	**5**	26	3	0	**29**	0	0	0	**0**	44	1	0	**45**	19	0	2	**21**	0	0	0	**0**
14:45 to 15:45	5	0	0	**5**	29	3	0	**32**	0	0	0	**0**	43	1	0	**44**	21	0	1	**22**	0	0	0	**0**
15:00 to 16:00	7	1	0	**8**	30	3	0	**33**	0	0	0	**0**	44	1	1	**46**	21	0	1	**22**	0	0	0	**0**
15:15 to 16:15	6	1	0	**7**	40	2	0	**42**	0	0	0	**0**	50	0	1	**51**	25	0	1	**26**	1	0	0	**1**
15:30 to 16:30	6	1	1	**8**	40	2	0	**42**	0	0	0	**0**	53	0	1	**54**	25	0	0	**25**	1	0	0	**1**
15:45 to 16:45	7	1	1	**9**	40	2	0	**42**	0	0	0	**0**	68	0	1	**69**	27	0	2	**29**	1	0	0	**1**
16:00 to 17:00	7	0	1	**8**	46	1	0	**47**	0	0	0	**0**	72	0	0	**72**	32	0	3	**35**	1	0	0	**1**
16:15 to 17:15	10	0	1	**11**	44	1	0	**45**	0	0	0	**0**	71	1	1	**73**	32	0	3	**35**	0	0	0	**0**
16:30 to 17:30	12	0	0	**12**	47	0	0	**47**	0	0	0	**0**	74	1	1	**76**	33	0	3	**36**	0	0	0	**0**
16:45 to 17:45	13	0	0	**13**	53	0	0	**53**	0	0	0	**0**	75	1	1	**77**	33	0	3	**36**	1	0	0	**1**
17:00 to 18:00	13	0	0	**13**	48	0	0	**48**	0	0	0	**0**	75	1	1	**77**	31	0	2	**33**	1	0	0	**1**
12hr Totals	**64**	**5**	**1**	**70**	**525**	**14**	**3**	**542**	**0**	**0**	**0**	**0**	**565**	**11**	**5**	**581**	**197**	**2**	**12**	**211**	**4**	**0**	**0**	**4**

Approach	Geranium St												Crossing Pedestrians						
Direction	Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)										
Time Period	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	A	B	C	D	G	H	Total
06:00 to 07:00	14	0	0	**14**	2	0	1	**3**	0	0	0	**0**	1	2	0	0	2	0	**5**
06:15 to 07:15	19	0	0	**19**	3	0	0	**3**	0	0	0	**0**	0	2	0	0	2	0	**4**
06:30 to 07:30	25	0	1	**26**	6	0	1	**7**	0	0	0	**0**	2	1	0	0	0	0	**3**
06:45 to 07:45	28	0	2	**30**	8	0	1	**9**	0	0	0	**0**	2	2	0	0	0	0	**4**
07:00 to 08:00	24	0	3	**27**	11	0	1	**12**	0	0	0	**0**	2	3	0	0	0	0	**5**
07:15 to 08:15	24	0	4	**28**	15	0	2	**17**	0	0	0	**0**	2	2	0	0	2	0	**6**
07:30 to 08:30	22	0	3	**25**	15	0	1	**16**	1	0	0	**1**	0	2	0	0	2	0	**4**
07:45 to 08:45	24	0	2	**26**	15	0	1	**16**	1	0	0	**1**	0	1	0	0	2	0	**3**
08:00 to 09:00	26	1	1	**28**	14	0	1	**15**	1	0	0	**1**	0	0	0	0	2	0	**2**
08:15 to 09:15	21	1	0	**22**	11	0	0	**11**	1	0	0	**1**	0	0	0	0	0	1	**1**
08:30 to 09:30	14	1	0	**15**	8	0	0	**8**	0	0	0	**0**	0	3	0	0	1	4	**8**
08:45 to 09:45	10	1	1	**12**	7	0	0	**7**	0	0	0	**0**	1	3	0	0	5	4	**13**
09:00 to 10:00	9	0	1	**10**	6	0	0	**6**	0	0	0	**0**	4	4	0	0	5	4	**17**
09:15 to 10:15	8	0	1	**9**	4	0	0	**4**	0	0	0	**0**	4	4	0	0	5	3	**16**
09:30 to 10:30	12	0	1	**13**	9	0	0	**9**	0	0	0	**0**	4	2	0	0	4	0	**10**
09:45 to 10:45	18	0	0	**18**	8	0	0	**8**	0	0	0	**0**	3	2	0	0	0	0	**5**
10:00 to 11:00	16	0	0	**16**	6	0	0	**6**	0	0	0	**0**	2	1	0	0	0	0	**3**
10:15 to 11:15	16	0	0	**16**	7	0	0	**7**	0	0	0	**0**	3	3	0	0	0	0	**6**
10:30 to 11:30	14	0	0	**14**	3	0	0	**3**	0	0	0	**0**	3	2	0	0	0	0	**5**
10:45 to 11:45	8	1	0	**9**	7	0	0	**7**	0	0	0	**0**	4	2	0	0	0	0	**6**
11:00 to 12:00	9	1	0	**10**	9	0	1	**10**	0	0	0	**0**	2	2	0	0	0	0	**4**
11:15 to 12:15	11	1	0	**12**	11	0	1	**12**	0	0	0	**0**	1	1	0	1	0	0	**3**
11:30 to 12:30	10	1	0	**11**	10	0	1	**11**	0	0	0	**0**	1	1	0	1	0	0	**3**
11:45 to 12:45	9	0	0	**9**	8	0	1	**9**	0	0	0	**0**	0	1	0	1	0	0	**2**
12:00 to 13:00	10	0	0	**10**	7	0	0	**7**	0	0	0	**0**	0	1	0	1	0	0	**2**
12:15 to 13:15	9	1	0	**10**	6	0	0	**6**	0	0	0	**0**	0	0	0	0	0	0	**0**
12:30 to 13:30	12	1	1	**14**	7	0	0	**7**	0	0	0	**0**	0	0	0	0	0	0	**0**
12:45 to 13:45	13	1	1	**15**	5	0	0	**5**	0	0	0	**0**	0	0	0	0	0	0	**0**
13:00 to 14:00	14	1	1	**16**	6	0	0	**6**	0	0	0	**0**	1	1	0	0	0	0	**2**
13:15 to 14:15	12	1	1	**14**	4	0	0	**4**	0	0	0	**0**	1	3	0	0	0	1	**5**
13:30 to 14:30	9	1	0	**10**	6	0	0	**6**	0	0	0	**0**	1	3	0	0	0	1	**5**
13:45 to 14:45	9	1	0	**10**	9	0	0	**9**	0	0	0	**0**	1	3	0	0	0	3	**7**
14:00 to 15:00	8	1	0	**9**	9	0	0	**9**	0	0	0	**0**	1	5	0	0	0	3	**9**
14:15 to 15:15	14	0	1	**15**	9	0	0	**9**	0	0	0	**0**	1	4	0	0	0	2	**7**
14:30 to 15:30	14	0	1	**15**	6	0	0	**6**	0	0	0	**0**	2	6	0	0	0	3	**11**
14:45 to 15:45	16	0	1	**17**	5	0	0	**5**	0	0	0	**0**	2	6	0	0	0	1	**9**
15:00 to 16:00	15	0	1	**16**	7	0	0	**7**	1	0	0	**1**	1	3	0	0	1	1	**6**
15:15 to 16:15	16	0	0	**16**	7	0	0	**7**	1	0	0	**1**	2	2	0	0	1	1	**6**
15:30 to 16:30	16	0	1	**17**	9	0	1	**10**	1	0	0	**1**	1	0	0	0	1	1	**3**
15:45 to 16:45	14	0	1	**15**	11	0	1	**12**	1	0	0	**1**	3	0	0	0	1	1	**5**
16:00 to 17:00	19	1	1	**21**	8	0	1	**9**	0	0	0	**0**	3	0	0	0	0	1	**4**
16:15 to 17:15	17	1	1	**19**	10	0	1	**11**	0	0	0	**0**	2	0	0	0	1	3	**6**
16:30 to 17:30	21	1	1	**23**	8	0	0	**8**	0	0	0	**0**	2	0	0	0	2	2	**6**
16:45 to 17:45	21	1	2	**24**	4	0	0	**4**	0	0	0	**0**	0	0	0	0	2	2	**4**
17:00 to 18:00	17	0	2	**19**	4	0	0	**4**	0	0	0	**0**	0	2	0	0	2	3	**7**
12hr Totals	**181**	**5**	**10**	**196**	**89**	**0**	**5**	**94**	**2**	**0**	**0**	**2**	**17**	**24**	**0**	**1**	**12**	**12**	**42**

Job No. : i3c 23606 02
Client : i3 consultants WA
Suburb : The Gardens, Darwin
Location : Si1 - Stuart Hwy / Geranium St

Day/Date : Tue, 8th Nov 2016
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary

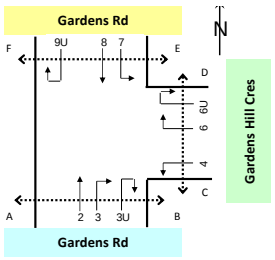


Approach	Stuart Hwy											
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3U (U Turn)			
Time Period	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total
06:00 to 07:00	5	1	2	**8**	428	22	3	**453**	25	0	0	**25**
06:15 to 07:15	4	1	2	**7**	512	29	2	**543**	18	0	0	**18**
06:30 to 07:30	8	2	2	**12**	592	35	2	**629**	16	0	0	**16**
06:45 to 07:45	11	1	2	**14**	660	37	2	**699**	17	0	0	**17**
07:00 to 08:00	15	1	0	**16**	777	36	1	**814**	19	1	0	**20**
07:15 to 08:15	17	2	0	**19**	799	34	2	**835**	18	1	0	**19**
07:30 to 08:30	18	1	0	**19**	818	35	1	**854**	27	1	0	**28**
07:45 to 08:45	17	1	0	**18**	796	30	1	**827**	31	1	0	**32**
08:00 to 09:00	21	1	0	**22**	719	35	1	**755**	36	0	0	**36**
08:15 to 09:15	23	0	0	**23**	693	35	1	**729**	37	0	0	**37**
08:30 to 09:30	22	1	0	**23**	678	26	1	**705**	32	0	0	**32**
08:45 to 09:45	23	1	0	**24**	674	31	1	**706**	31	0	0	**31**
09:00 to 10:00	19	1	0	**20**	697	29	1	**727**	22	0	0	**22**
09:15 to 10:15	18	1	0	**19**	794	37	1	**832**	21	1	0	**22**
09:30 to 10:30	16	1	0	**17**	814	42	1	**857**	23	1	0	**24**
09:45 to 10:45	17	1	0	**18**	848	40	1	**889**	22	1	0	**23**
10:00 to 11:00	15	1	0	**16**	843	37	1	**881**	27	2	0	**29**
10:15 to 11:15	14	1	0	**15**	862	25	0	**887**	27	1	0	**28**
10:30 to 11:30	16	0	0	**16**	868	26	0	**894**	28	1	0	**29**
10:45 to 11:45	13	1	0	**14**	835	23	0	**858**	27	1	0	**28**
11:00 to 12:00	17	1	0	**18**	849	29	0	**878**	26	0	0	**26**
11:15 to 12:15	25	2	0	**27**	787	32	0	**819**	30	0	0	**30**
11:30 to 12:30	29	2	0	**31**	817	28	0	**845**	31	0	0	**31**
11:45 to 12:45	34	3	0	**37**	841	33	0	**874**	31	0	0	**31**
12:00 to 13:00	30	4	0	**34**	861	33	0	**894**	38	0	0	**38**
12:15 to 13:15	25	4	0	**29**	856	33	0	**889**	43	1	0	**44**
12:30 to 13:30	18	5	0	**23**	861	41	0	**902**	48	1	0	**49**
12:45 to 13:45	13	3	0	**16**	855	34	0	**889**	44	1	0	**45**
13:00 to 14:00	15	2	0	**17**	850	34	0	**884**	39	1	0	**40**
13:15 to 14:15	12	1	0	**13**	876	33	0	**909**	27	0	0	**27**
13:30 to 14:30	14	0	1	**15**	852	27	0	**879**	27	0	0	**27**
13:45 to 14:45	17	0	1	**18**	858	27	0	**885**	31	1	0	**32**
14:00 to 15:00	19	0	1	**20**	863	25	0	**888**	30	1	0	**31**
14:15 to 15:15	24	0	1	**25**	853	28	0	**881**	36	1	0	**37**
14:30 to 15:30	33	0	0	**33**	855	30	0	**885**	27	1	0	**28**
14:45 to 15:45	31	0	0	**31**	858	34	0	**892**	30	0	0	**30**
15:00 to 16:00	33	0	0	**33**	830	32	0	**862**	24	0	0	**24**
15:15 to 16:15	29	0	0	**29**	876	32	0	**908**	20	0	0	**20**
15:30 to 16:30	25	0	0	**25**	938	27	1	**966**	21	0	0	**21**
15:45 to 16:45	24	1	0	**25**	1,135	29	2	**1,166**	19	0	0	**19**
16:00 to 17:00	22	1	0	**23**	1,341	31	2	**1,374**	23	0	0	**23**
16:15 to 17:15	23	1	0	**24**	1,460	27	2	**1,489**	26	0	0	**26**
16:30 to 17:30	20	1	0	**21**	1,500	35	1	**1,536**	21	0	0	**21**
16:45 to 17:45	23	0	0	**23**	1,350	30	1	**1,381**	16	0	0	**16**
17:00 to 18:00	23	0	0	**23**	1,180	31	1	**1,212**	23	0	0	**23**
12hr Totals	**234**	**13**	**3**	**250**	**10,238**	**374**	**10**	**10,622**	**332**	**5**	**0**	**337**

Approach	Stuart Hwy												Geranium St												Crossing Pedestrians				
Direction	Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 12 (Right Turn)				Direction 12U (U Turn)								
Time Period	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	A	B	E	F	G	H	Total
06:00 to 07:00	393	25	0	**418**	23	1	0	**24**	2	0	0	**2**	53	0	0	**53**	4	1	0	**5**	0	0	0	**0**	0	2	0	0	7	1	**10**
06:15 to 07:15	522	29	0	**551**	29	0	0	**29**	2	0	0	**2**	69	0	0	**69**	4	0	0	**4**	0	0	0	**0**	0	1	0	0	7	0	**8**
06:30 to 07:30	741	34	0	**775**	37	1	0	**38**	3	0	0	**3**	75	0	0	**75**	4	0	0	**4**	0	0	0	**0**	0	2	0	0	1	2	**5**
06:45 to 07:45	1,017	37	0	**1,054**	59	2	0	**61**	3	0	0	**3**	92	1	0	**93**	4	0	0	**4**	0	0	0	**0**	0	1	0	0	1	2	**4**
07:00 to 08:00	1,303	34	0	**1,337**	83	2	0	**85**	9	0	0	**9**	97	1	0	**98**	1	0	0	**1**	0	0	0	**0**	0	2	0	0	2	2	**6**
07:15 to 08:15	1,558	39	0	**1,597**	95	3	0	**98**	9	0	0	**9**	99	2	0	**101**	3	0	0	**3**	0	0	0	**0**	0	3	0	0	2	2	**7**
07:30 to 08:30	1,698	41	0	**1,739**	107	2	0	**109**	13	0	0	**13**	94	4	0	**98**	2	0	0	**2**	0	0	0	**0**	0	2	0	0	3	0	**5**
07:45 to 08:45	1,624	39	0	**1,663**	101	3	1	**105**	17	0	0	**17**	86	3	0	**89**	2	0	0	**2**	0	0	0	**0**	0	2	0	0	3	0	**5**
08:00 to 09:00	1,420	39	0	**1,459**	91	5	1	**97**	17	0	0	**17**	72	4	0	**76**	2	0	0	**2**	0	0	0	**0**	0	1	0	0	2	0	**3**
08:15 to 09:15	1,194	38	0	**1,232**	85	6	1	**92**	18	0	0	**18**	56	4	0	**60**	1	0	0	**1**	0	0	0	**0**	0	0	0	0	1	1	**2**
08:30 to 09:30	971	42	0	**1,013**	68	8	1	**77**	19	0	0	**19**	50	3	0	**53**	3	0	0	**3**	0	0	0	**0**	0	0	0	0	0	1	**1**
08:45 to 09:45	864	39	0	**903**	57	6	0	**63**	22	0	0	**22**	36	3	0	**39**	4	0	0	**4**	0	0	0	**0**	0	0	0	0	0	1	**1**
09:00 to 10:00	800	38	0	**838**	50	4	0	**54**	21	0	0	**21**	43	3	0	**46**	5	0	0	**5**	0	0	0	**0**	0	0	0	0	1	1	**2**
09:15 to 10:15	760	35	0	**795**	42	3	0	**45**	22	0	0	**22**	43	2	0	**45**	4	0	0	**4**	0	0	0	**0**	0	0	0	0	2	0	**2**
09:30 to 10:30	738	31	0	**769**	44	1	0	**45**	19	0	0	**19**	48	1	0	**49**	4	0	0	**4**	0	0	0	**0**	0	0	0	0	2	1	**3**
09:45 to 10:45	697	35	0	**732**	40	2	0	**42**	18	0	0	**18**	52	2	0	**54**	5	0	0	**5**	0	0	0	**0**	0	2	0	0	3	3	**8**
10:00 to 11:00	711	32	0	**743**	34	2	0	**36**	22	0	0	**22**	47	1	0	**48**	10	0	0	**10**	0	0	0	**0**	0	2	0	0	4	3	**9**
10:15 to 11:15	737	31	0	**768**	36	1	0	**37**	25	0	0	**25**	49	1	0	**50**	12	0	0	**12**	0	0	0	**0**	0	2	0	0	4	3	**9**
10:30 to 11:30	735	32	0	**767**	36	1	0	**37**	28	0	0	**28**	44	2	1	**47**	13	0	0	**13**	0	0	0	**0**	0	1	0	0	6	2	**11**
10:45 to 11:45	790	29	0	**819**	42	0	0	**42**	29	0	0	**29**	48	2	1	**51**	11	0	0	**11**	0	0	0	**0**	0	1	0	0	5	0	**6**
11:00 to 12:00	797	33	0	**830**	49	1	0	**50**	25	0	0	**25**	48	4	1	**53**	9	0	0	**9**	0	0	0	**0**	0	2	1	0	3	1	**7**
11:15 to 12:15	814	37	0	**851**	60	3	0	**63**	28	0	0	**28**	58	6	1	**65**	10	0	0	**10**	0	0	0	**0**	0	2	1	0	3	1	**7**
11:30 to 12:30	824	33	0	**857**	64	3	0	**67**	27	0	0	**27**	62	6	0	**68**	11	0	0	**11**	0	0	0	**0**	0	1	1	0	1	1	**4**
11:45 to 12:45	800	33	0	**833**	71	3	0	**74**	29	0	0	**29**	55	6	0	**61**	13	0	0	**13**	0	0	0	**0**	0	1	1	0	1	1	**4**
12:00 to 13:00	802	27	0	**829**	66	3	0	**69**	30	0	0	**30**	60	5	0	**65**	11	0	0	**11**	0	0	0	**0**	0	0	0	0	2	2	**4**
12:15 to 13:15	806	21	0	**827**	60	2	0	**62**	25	0	0	**25**	63	4	0	**67**	15	0	0	**15**	0	0	0	**0**	0	0	0	0	1	2	**3**
12:30 to 13:30	821	19	0	**840**	52	2	0	**54**	31	0	0	**31**	66	4	0	**70**	17	0	0	**17**	0	0	0	**0**	0	0	0	0	2	2	**4**
12:45 to 13:45	805	19	0	**824**	44	2	0	**46**	30	0	0	**30**	67	4	0	**71**	17	0	0	**17**	0	0	0	**0**	0	1	0	0	2	2	**5**
13:00 to 14:00	813	20	0	**833**	47	2	0	**49**	31	0	0	**31**	67	3	0	**70**	19	0	0	**19**	0	0	0	**0**	0	1	0	0	2	1	**4**
13:15 to 14:15	803	25	0	**828**	38	2	0	**40**	33	0	0	**33**	63	3	0	**66**	13	0	0	**13**	0	0	0	**0**	0	1	0	0	2	1	**4**
13:30 to 14:30	781	28	0	**809**	41	2	0	**43**	28	0	0	**28**	64	2	1	**67**	9	1	0	**10**	0	0	0	**0**	0	2	0	0	1	1	**4**
13:45 to 14:45	802	29	0	**831**	36	4	0	**40**	25	0	0	**25**	67	1	1	**69**	9	1	0	**10**	0	0	0	**0**	0	1	0	0	3	1	**5**
14:00 to 15:00	792	29	0	**821**	33	3	0	**36**	25	0	0	**25**	62	3	1	**66**	6	1	0	**7**	0	0	0	**0**	0	3	0	0	3	0	**6**
14:15 to 15:15	786	26	0	**812**	40	3	0	**43**	21	0	0	**21**	52	3	1	**56**	9	1	0	**10**	0	0	0	**0**	0	3	0	0	4	1	**8**
14:30 to 15:30	780	27	0	**807**	41	3	0	**44**	22	0	0	**22**	51	4	0	**55**	7	0	0	**7**	0	0	0	**0**	0	2	0	0	5	1	**8**
14:45 to 15:45	791	28	0	**819**	41	1	0	**42**	23	0	0	**23**	54	5	0	**59**	7	0	0	**7**	0	0	0	**0**	0	1	0	0	5	3	**11**
15:00 to 16:00	810	31	0	**841**	42	1	0	**43**	18	0	0	**18**	52	3	0	**55**	9	0	0	**9**	0	0	0	**0**	0	1	0	0	4	6	**11**
15:15 to 16:15	821	30	0	**851**	46	3	0	**49**	25	0	0	**25**	62	3	0	**65**	7	0	0	**7**	0	0	0	**0**	0	1	0	0	5	6	**12**
15:30 to 16:30	920	28	0	**948**	49	3	0	**52**	22	0	0	**22**	70	5	0	**75**	8	0	0	**8**	0	0	0	**0**	0	1	0	0	5	8	**14**
15:45 to 16:45	992	23	0	**1,015**	64	3	0	**67**	21	0	0	**21**	72	4	0	**76**	7	0	0	**7**	0	0	0	**0**	0	2	2	0	0	6	7	**17**
16:00 to 17:00	1,051	19	0	**1,070**	71	3	1	**75**	19	0	0	**19**	88	6	0	**94**	6	0	0	**6**	0	0	0	**0**	0	2	2	0	0	7	5	**16**
16:15 to 17:15	1,111	22	0	**1,133**	70	1	2	**73**	16	0	0	**16**	92	5	0	**97**	4	0	0	**4**	0	0	0	**0**	0	2	2	0	0	8	6	**18**
16:30 to 17:30	1,085	20	0	**1,105**	83	1	2	**86**	13	0	0	**13**	93	2	0	**95**	5	0	0	**5**	0	0	0	**0**	0	2	2	0	0	7	5	**16**
16:45 to 17:45	1,039	24	0	**1,063**	86	1	3	**90**	14	0	0	**14**	103	3	0	**106**	8	0	0	**8**	0	0	0	**0**	0	1	0	0	7	4	**12**
17:00 to 18:00	961	22	0	**983**	89	1	2	**92**	18	0	0	**18**	99	1	0	**100**	7	1	0	**8**	0	0	0	**0**	0	1	0	0	6	5	**12**
12hr Totals	**10,653**	**349**	**0**	**11,002**	**678**	**28**	**4**	**710**	**237**	**0**	**0**	**237**	**788**	**34**	**2**	**824**	**89**	**3**	**0**	**92**	**0**	**0**	**0**	**0**	**6**	**14**		**0**	**0**	**43**	**27**	**20**

Job No. : i3c 23606 02
Client : i3 consultants WA
Suburb : The Gardens, Darwin
Location : Si2 - Gardens Rd / Gardens Hill Cres

Day/Date : Tue, 8th Nov 2016
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



MATRIX Traffic and Transport Data

Approach	Gardens Rd												Gardens Hill Cres							
Direction	Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total
06:00 to 07:00	43	5	2	**50**	3	1	0	**4**	1	0	0	**1**	18	1	0	**19**	6	0	0	**6**	2	0	0	**2**
06:15 to 07:15	50	2	3	**55**	8	1	0	**9**	1	0	0	**1**	26	1	0	**27**	4	0	0	**4**	2	0	0	**2**
06:30 to 07:30	56	1	1	**58**	11	1	0	**12**	1	0	0	**1**	34	1	0	**35**	6	0	0	**6**	2	0	0	**2**
06:45 to 07:45	62	1	1	**64**	22	1	0	**23**	1	0	0	**1**	43	0	0	**43**	9	0	0	**9**	1	0	0	**1**
07:00 to 08:00	68	0	1	**69**	26	0	0	**26**	1	0	0	**1**	46	0	0	**46**	13	0	0	**13**	0	0	0	**0**
07:15 to 08:15	76	0	0	**76**	24	0	0	**24**	0	0	0	**0**	53	0	0	**53**	19	0	0	**19**	0	0	0	**0**
07:30 to 08:30	90	0	0	**90**	25	0	0	**25**	0	0	0	**0**	61	1	0	**62**	21	0	0	**21**	0	0	0	**0**
07:45 to 08:45	95	1	0	**96**	17	0	0	**17**	0	0	0	**0**	61	1	0	**62**	20	0	0	**20**	0	0	0	**0**
08:00 to 09:00	93	2	0	**95**	13	0	0	**13**	0	0	0	**0**	59	1	0	**60**	20	0	0	**20**	0	0	0	**0**
08:15 to 09:15	95	4	0	**99**	15	0	0	**15**	0	0	0	**0**	50	1	0	**51**	15	0	0	**15**	1	0	0	**1**
08:30 to 09:30	81	4	0	**85**	12	0	0	**12**	0	0	0	**0**	38	0	0	**38**	11	0	0	**11**	1	0	0	**1**
08:45 to 09:45	81	5	2	**88**	12	0	0	**12**	1	0	0	**1**	32	1	0	**33**	12	0	0	**12**	1	0	0	**1**
09:00 to 10:00	91	7	2	**100**	20	0	0	**20**	1	0	0	**1**	26	1	0	**27**	9	0	0	**9**	1	0	0	**1**
09:15 to 10:15	93	10	2	**105**	17	0	0	**17**	3	0	0	**3**	27	1	0	**28**	7	0	0	**7**	0	0	0	**0**
09:30 to 10:30	107	11	2	**120**	17	0	0	**17**	4	0	0	**4**	30	1	0	**31**	8	0	0	**8**	0	0	0	**0**
09:45 to 10:45	113	10	0	**123**	17	0	0	**17**	4	0	0	**4**	27	0	0	**27**	6	0	0	**6**	0	0	0	**0**
10:00 to 11:00	108	9	0	**117**	15	0	0	**15**	4	0	0	**4**	29	0	0	**29**	5	0	0	**5**	0	0	0	**0**
10:15 to 11:15	106	5	0	**111**	17	0	0	**17**	2	0	0	**2**	27	0	0	**27**	8	0	0	**8**	1	0	0	**1**
10:30 to 11:30	115	7	0	**122**	18	0	0	**18**	2	0	0	**2**	22	0	0	**22**	7	0	0	**7**	1	0	0	**1**
10:45 to 11:45	112	7	0	**119**	18	0	0	**18**	1	0	0	**1**	23	1	0	**24**	10	0	0	**10**	3	0	0	**3**
11:00 to 12:00	123	5	1	**129**	16	0	0	**16**	1	0	0	**1**	24	1	0	**25**	12	0	0	**12**	3	0	0	**3**
11:15 to 12:15	129	4	1	**134**	14	2	0	**16**	3	0	0	**3**	26	1	0	**27**	16	0	0	**16**	2	0	0	**2**
11:30 to 12:30	125	2	1	**128**	14	2	0	**16**	2	0	0	**2**	35	1	0	**36**	16	0	0	**16**	2	0	0	**2**
11:45 to 12:45	132	2	3	**137**	16	2	0	**18**	4	0	0	**4**	36	1	0	**37**	18	0	1	**19**	0	0	0	**0**
12:00 to 13:00	126	4	2	**132**	16	2	0	**18**	4	0	0	**4**	39	2	0	**41**	15	0	1	**16**	0	0	0	**0**
12:15 to 13:15	125	5	2	**132**	20	0	0	**20**	2	0	0	**2**	39	2	0	**41**	9	0	1	**10**	0	0	0	**0**
12:30 to 13:30	123	5	2	**130**	22	0	0	**22**	3	0	0	**3**	35	2	0	**37**	12	0	1	**13**	0	0	0	**0**
12:45 to 13:45	109	4	1	**114**	22	0	0	**22**	1	0	0	**1**	34	1	0	**35**	10	0	0	**10**	0	0	0	**0**
13:00 to 14:00	108	2	1	**111**	22	0	0	**22**	1	0	0	**1**	29	0	0	**29**	12	0	0	**12**	0	0	0	**0**
13:15 to 14:15	112	3	1	**116**	22	0	0	**22**	1	0	0	**1**	23	0	0	**23**	11	0	0	**11**	1	0	0	**1**
13:30 to 14:30	105	2	1	**108**	20	0	0	**20**	1	0	0	**1**	19	0	0	**19**	11	0	0	**11**	1	0	0	**1**
13:45 to 14:45	116	2	0	**118**	17	0	0	**17**	1	0	0	**1**	20	0	0	**20**	9	0	0	**9**	2	0	0	**2**
14:00 to 15:00	129	3	0	**132**	15	0	0	**15**	1	0	0	**1**	23	0	0	**23**	9	0	0	**9**	2	0	0	**2**
14:15 to 15:15	132	1	0	**133**	14	0	0	**14**	1	0	0	**1**	27	0	0	**27**	11	0	0	**11**	1	0	0	**1**
14:30 to 15:30	149	3	0	**152**	17	0	0	**17**	2	0	0	**2**	29	0	0	**29**	9	0	0	**9**	1	0	0	**1**
14:45 to 15:45	156	3	0	**159**	19	0	0	**19**	2	0	0	**2**	26	0	0	**26**	8	0	0	**8**	0	0	0	**0**
15:00 to 16:00	151	3	0	**154**	24	0	0	**24**	2	0	0	**2**	25	0	0	**25**	8	0	0	**8**	0	0	0	**0**
15:15 to 16:15	156	3	0	**159**	22	0	0	**22**	2	0	0	**2**	28	0	0	**28**	9	0	0	**9**	1	0	0	**1**
15:30 to 16:30	153	2	1	**156**	21	0	0	**21**	0	0	0	**0**	31	0	0	**31**	11	0	0	**11**	1	0	0	**1**
15:45 to 16:45	159	3	1	**163**	24	0	0	**24**	0	0	0	**0**	36	0	0	**36**	17	0	0	**17**	1	0	0	**1**
16:00 to 17:00	174	2	1	**177**	27	0	0	**27**	0	0	0	**0**	41	0	0	**41**	21	0	0	**21**	1	0	0	**1**
16:15 to 17:15	195	2	1	**198**	33	0	0	**33**	0	0	0	**0**	45	0	0	**45**	27	0	1	**28**	0	0	0	**0**
16:30 to 17:30	229	1	0	**230**	38	0	0	**38**	0	0	0	**0**	49	0	0	**49**	27	0	1	**28**	0	0	0	**0**
16:45 to 17:45	241	0	0	**241**	43	0	0	**43**	0	0	0	**0**	57	0	0	**57**	26	0	2	**28**	0	0	0	**0**
17:00 to 18:00	236	0	0	**236**	41	0	0	**41**	0	0	0	**0**	54	0	0	**54**	23	0	2	**25**	0	0	0	**0**
12hr Totals	**1,450**	**42**	**10**	**1,502**	**238**	**3**	**0**	**241**	**16**	**0**	**0**	**16**	**413**	**6**	**0**	**419**	**153**	**0**	**3**	**156**	**9**	**0**	**0**	**9**

Approach	Gardens Rd												Crossing Pedestrians						
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9U (U Turn)										
Time Period	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	Lights	Heavies	Cyclists	Total	A	B	C	D	E	F	Total
06:00 to 07:00	3	0	0	**3**	72	5	3	**80**	0	0	0	**0**	2	0	2	4	1	2	**11**
06:15 to 07:15	4	0	0	**4**	96	5	8	**109**	0	0	0	**0**	2	0	4	5	1	2	**14**
06:30 to 07:30	7	0	0	**7**	113	5	10	**128**	0	0	0	**0**	4	1	3	3	1	2	**14**
06:45 to 07:45	19	0	0	**19**	143	5	9	**157**	0	0	0	**0**	4	1	2	2	1	1	**11**
07:00 to 08:00	27	0	0	**27**	170	2	7	**179**	0	0	0	**0**	3	1	2	1	0	1	**8**
07:15 to 08:15	33	0	0	**33**	216	1	3	**220**	0	0	0	**0**	3	1	0	0	0	0	**4**
07:30 to 08:30	36	0	0	**36**	258	0	1	**259**	0	0	0	**0**	1	0	0	0	0	0	**1**
07:45 to 08:45	33	0	0	**33**	294	0	3	**297**	0	0	0	**0**	1	0	0	0	0	0	**1**
08:00 to 09:00	31	1	0	**32**	303	0	4	**307**	1	0	0	**1**	1	1	0	0	0	0	**2**
08:15 to 09:15	24	1	0	**25**	263	0	4	**267**	1	0	0	**1**	0	1	0	0	0	0	**1**
08:30 to 09:30	19	1	0	**20**	231	0	4	**235**	1	0	0	**1**	0	1	0	2	0	0	**3**
08:45 to 09:45	12	2	0	**14**	176	0	3	**179**	1	0	0	**1**	0	1	0	2	0	0	**3**
09:00 to 10:00	8	1	0	**9**	142	5	2	**149**	0	0	0	**0**	0	1	0	3	0	0	**4**
09:15 to 10:15	8	2	0	**10**	135	6	1	**142**	0	0	0	**0**	0	1	0	3	0	0	**4**
09:30 to 10:30	7	2	0	**9**	133	6	1	**140**	0	0	0	**0**	0	1	0	1	0	0	**2**
09:45 to 10:45	6	1	0	**7**	148	6	0	**154**	0	0	0	**0**	1	1	0	1	0	0	**3**
10:00 to 11:00	7	1	0	**8**	143	1	0	**144**	0	0	0	**0**	1	0	0	0	0	0	**1**
10:15 to 11:15	9	0	0	**9**	148	0	0	**148**	0	0	0	**0**	1	0	0	0	0	0	**1**
10:30 to 11:30	9	1	0	**10**	143	3	0	**146**	0	0	0	**0**	1	0	0	0	0	0	**1**
10:45 to 11:45	9	1	0	**10**	128	4	0	**132**	0	0	0	**0**	0	0	0	0	0	0	**0**
11:00 to 12:00	8	1	0	**9**	144	5	0	**149**	0	0	0	**0**	0	0	0	0	0	0	**0**
11:15 to 12:15	11	2	0	**13**	150	6	0	**156**	0	0	0	**0**	0	0	0	0	0	0	**0**
11:30 to 12:30	14	1	0	**15**	164	4	0	**168**	0	0	0	**0**	0	0	0	0	0	0	**0**
11:45 to 12:45	12	1	0	**13**	173	6	0	**179**	0	0	0	**0**	0	0	2	1	0	0	**3**
12:00 to 13:00	16	1	0	**17**	171	6	0	**177**	0	0	0	**0**	0	0	2	1	0	0	**3**
12:15 to 13:15	15	0	0	**15**	171	5	0	**176**	0	0	0	**0**	0	0	2	2	0	0	**4**
12:30 to 13:30	13	0	0	**13**	168	5	0	**173**	1	0	0	**1**	1	1	2	2	0	0	**6**
12:45 to 13:45	14	0	1	**15**	170	5	1	**176**	1	0	0	**1**	1	1	4	1	0	0	**7**
13:00 to 14:00	10	0	1	**11**	160	4	1	**165**	1	0	0	**1**	1	1	4	1	0	0	**7**
13:15 to 14:15	13	0	1	**14**	139	6	1	**146**	1	0	0	**1**	1	1	4	0	0	0	**6**
13:30 to 14:30	13	0	1	**14**	125	5	2	**132**	0	0	0	**0**	0	0	4	0	0	0	**4**
13:45 to 14:45	13	0	2	**15**	130	2	1	**133**	0	0	0	**0**	0	0	0	0	0	0	**0**
14:00 to 15:00	12	0	2	**14**	142	2	1	**145**	0	0	0	**0**	0	0	1	0	0	0	**1**
14:15 to 15:15	5	0	2	**7**	161	0	1	**162**	0	0	0	**0**	0	0	1	0	1	0	**2**
14:30 to 15:30	3	0	2	**5**	173	0	2	**175**	0	0	0	**0**	0	0	1	0	1	0	**2**
14:45 to 15:45	3	0	0	**3**	164	1	2	**167**	0	0	0	**0**	0	1	1	0	1	0	**3**
15:00 to 16:00	6	2	0	**8**	148	1	2	**151**	0	0	0	**0**	0	1	0	0	1	0	**2**
15:15 to 16:15	10	2	0	**12**	147	1	2	**150**	0	0	0	**0**	0	1	0	0	0	0	**1**
15:30 to 16:30	16	2	0	**18**	140	1	0	**141**	0	0	0	**0**	0	1	0	0	0	0	**1**
15:45 to 16:45	20	2	0	**22**	141	0	0	**141**	0	0	0	**0**	0	0	0	0	0	0	**0**
16:00 to 17:00	25	0	0	**25**	144	1	0	**145**	0	0	0	**0**	0	0	0	0	0	0	**0**
16:15 to 17:15	26	0	0	**26**	146	1	0	**147**	0	0	0	**0**	0	0	0	0	0	0	**0**
16:30 to 17:30	26	0	0	**26**	149	1	0	**150**	0	0	0	**0**	0	0	0	0	0	0	**0**
16:45 to 17:45	29	0	0	**29**	144	1	0	**145**	0	0	0	**0**	0	0	0	0	0	0	**0**
17:00 to 18:00	24	0	0	**24**	140	0	0	**140**	0	0	0	**0**	0	0	0	0	0	0	**0**
12hr Totals	**177**	**7**	**3**	**187**	**1,879**	**32**	**20**	**1,931**	**2**	**0**	**0**	**2**	**8**	**5**	**11**	**10**	**2**	**3**	**34**

APPENDIX B TRIP GENERATION CALCULATIONS

ITE Trip Generation Rates - 9th Edition

Pass-by rates from ITE Trip Generation Handbook - 2nd Edition

Description/ITE Code	Units	ITE Vehicle Trip Generation Rates						
		AM	PM	Pass-By	AM In	AM Out	PM In	PM Out
General Office	KSF^2	1.56	1.49	0%	88%	12%	17%	83%
Supermarket	KSF^2	3.40	9.48	36%	62%	38%	51%	49%

Surveyed Trip Generation Rates - Residential Developments in Larrakeyah

Residential	Dwellings	0.280	0.425	na	9%	91%	65%	35%

Trip Generation & Distribution Volumes	Units	AM	PM	Pass-By		AM In	AM Out	PM In	PM Out
General Office (m^2)	150	3	2	AM	PM	2	0	0	2
General Office (KSF^2)	1.61			0	0				
Development Retail (m^2)	100	4	10	AM	PM	2	1	5	5
Development Retail (KSF^2)	1.08			1	4				
Residential	115	32	49	na		3	29	32	17
	TOTAL	**36**	**59**	**1**	**4**	**5**	**31**	**37**	**22**

APPENDIX C INTERSECTION PERFORMANCE CRITERIA

INTERPRETATION OF TRAFFIC IMPACTS

The existing and projected traffic volumes have been assessed within *SIDRA Intersection* traffic modeling software.

The interpretation of the resulting traffic impact is discussed here and guidelines are presented which assess the degree of each effect. Traffic can have an impact in several ways e.g.: impact on traffic efficiency, impact on amenity, impact on safety and impact on road pavement life. In addition, the *Traffic Impact Assessment* needs to consider implications on public transport and pedestrian movement. Private vehicle movements must be viewed in the context of the overall transport task.

Where appropriate, impacts have been assessed against appropriate performance standards. The assessment has considered the function of roads within the road hierarchy. Traffic efficiency primarily involves the performance of major roads. Amenity is primarily a concern of minor roads, although it can also be an issue on major roads (e.g. where strip shopping centres are located on major roads). Safety is a concern affecting all roads. Safety is arguably the most important, although its assessment does not lend itself to quantitative review. Finally, road pavement effects can occur on all classes of road. However, assessment is only required when substantial numbers of heavy vehicle movements are proposed. Car traffic has little impact on road pavements.

IMPACT ON TRAFFIC EFFICIENCY

LEVELS OF SERVICE

An important consideration in determining the impact of a development proposal on the road system is to assess the effect on traffic efficiency, the objective of which is to maintain the existing level of service. Adverse effects must be identified and corrective measures designed. The level of service is used as the performance standard. This is a qualitative assessment of the quantitative effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays and freedom to manoeuvre.

There are six levels of service (LOS), as described below, from the Austroads document *Guide to Traffic Engineering Practice - Part 2: Roadway Capacity* (17).

Level of Service A: This, the top level is a condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.

Level of Service B: This level is in the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is little less than that of the level of Service A.

Level of Service C: This service level is also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.

Level of Service D: This level is close to the limit of stable flow but is approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.

Level of Service E: This occurs when traffic volumes are at or close to capacity and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause a traffic-jam.

Level of Service F. This service level is in the zone of forced flow. With it, the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow break-down occurs and queuing and delays result.

Strictly, the above descriptions characterise levels of service for uninterrupted flow conditions, i.e. no interruption to traffic occurs because of factors external to the traffic stream, such as intersection controls. However, the concept of level of service can also be applied to other situations through different measures of effectiveness, as summarised in Table 13 on the following page.

Facility		Measures of effectiveness
Intersections	Sign or merge control	Average delay (secs/veh) Delay to critical movements Queue Length for critical movements
	Traffic Signals	Average delay (secs/veh) Delay to critical movements Degree of Saturation Cycle Length Queue Length for critical movements
	Roundabouts	Average delay (secs/veh) Delay to critical movements Degree of Saturation Queue Length for critical movements
Urban/ sub-urban arterials (with interrupted flow)		Average travel speed (km/h) Volume/ capacity ratio
Multi-lane highway (including freeways)		Density (pcu/km/lane) Volume/ capacity ratio
Two-lane highway		Average travel speed (km/h) Percent time delayed (%) Volume/ capacity ratio

Table 13 - Measures of effectiveness for level of service Definition (source: Table 4.1 (9))

INTERSECTIONS

The effect of differing levels of traffic flow on the operating performance of intersections has traditionally been assessed by considering the intersection volume/ capacity ratios (referred to as Y values), and intersection degrees of saturation (referred to as X values). The X value eliminates the variability caused by lost time within an intersection. It does not however always adequately describe operating conditions, such as when minimum phase times are determined by pedestrian facilities.

While computer based intersection assessment programs may be effective they are not perfect. These programs rely on accurate input data and interpretation of the output by a skilled user. Programs such as SIMSET, INSECT, SCATES, *SIDRA Intersection* and INTANAL provide as output the measures of effectiveness shown in Table 13 above.

The intersection degree of saturation (DoS) is commonly used to measure the performance of isolated intersections. The DoS value can be determined by computer based assessment programs. When DoS exceeds 0.8 - 0.85, overflow queues start to become a problem. Satisfactory intersection operation is generally achieved with a DoS of about 0.7 - 0.8.

URBAN ROADS

The capacity of urban roads is generally determined by the capacity of the intersections. Where major reconstruction of intersections is proposed, the ability of the approach roads to feed the intersection at appropriate flow rates may need to be reviewed. As set out in Table 8, typical one-way mid-block lane capacities on urban arterial roads under interrupted flow conditions are 900 – 1,000 veh/ hr/ lane. This calculation assumes Clearway conditions. The capacity falls to 600 veh/ hr/ lane for a kerbside lane with occasional parked vehicles. These capacities at times may increase under ideal conditions to 1,200 – 1,400 veh/ hr.

The mid-block level of service on urban roads is assessed on a vehicle's average travel speed. Travel speed surveys may be undertaken to determine the existing level of service. Table 14 sets out levels of service for different travel speeds.

Type of Road	One-way Mid-block Lane Capacity (pcu/h)	
Median or inner lane	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane	With Adjacent parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided	Clearway Conditions	1,900

Table 14 - Typical mid-block capacities for urban roads with interrupted flow (source Table 4.3 (9))

Level of Service (LoS)	One Lane (veh/h)	Two Lanes (veh/h)
A	200	900
B	380	1,400
C	600	1,800
D	900	2,200
E	1,400	2,800

Table 15 - Urban road peak hour flows per direction (source Table 4.4 (9))

The figures in **Table 15** are provided for strategic planning purposes only, and are not intended as a substitute for basic exercises in intersection analysis. In summary, when assessing a development application (and road works that may be required because of that application) the intersection upgrading requirements must be determined. If additional capacity is required, then additional works which are needed to maintain appropriate levels of traffic flow must be identified.

ENVIRONMENTAL CAPACITY

Environmental Capacity is best estimated by considering a range of differing perceptions and attitudes to traffic impacts in a particular area. The environmental expectations of residents often vary significantly, even within the same district. It is accepted that the performance standard usually occurs at the top end of a range. While it can be argued that there is no particular threshold beyond which problems may emerge, this standard is subject to the same constraints as all other standards. Engineering standards are often based on concepts of good practice, with a concerted focus on safety factors. While it is generally accepted that a departure from this standard may be accommodated to a degree, developers must justify plans where designs significantly exceed the standard. Table 10 sets out the recommended Environmental Capacity performance standards. This table relates to streets with direct access to residential properties. Trunk collector and spine roads with no direct property access can carry higher traffic flows.

Road class	Road type	Maximum Speed (km/h)	Maximum peak hour volume (veh/h)
Local	Access way	25	100
	Street	40	200 environmental goal
			300 maximum
Collector	Street	50	300 environmental goal
			500 maximum

Table 16 - Environmental capacity performance standards on residential streets (source Table 4.6 (9))

In the performance standards set out in Table 16 above, two levels are given - one for the desirable maximum (the environmental goal), and one for the absolute maximum. There may be situations where alterations to these levels might be appropriate; however it is up to the developer to justify a departure from the standards.

For example, a road with a wide central-median, and with separate carriageways of approximately 5 metres width would have less impact on pedestrian safety than an undivided road of width 7 metres, and hence could accommodate a higher traffic flow for the same degree of safety. Table 10 indicates that the functional classification of the street is important. While two streets may be similar, if one street functions as a collector street, then local access, safety and amenity are not the only issues to be considered. The movement of traffic along the street from adjoining areas also becomes a planning issue. Since it is still a residential area both traffic movement and planning issues need to be accommodated. Table 16 takes into account both amenity and safety considerations.

The maximum speeds given are design speeds for new residential areas. They might not be achieved in existing areas without the assistance of traffic calming methods. In assessing a proposed development, the existing average speed (even if over the desirable limit), is the starting point in determining the existing level of hazard. The Environmental Capacity of a street can be increased through a reduction in speed. For example, on an existing residential street where traffic volumes reach the Environmental Capacity maximum (and a proposed development could cope with the volume over the standard), traffic speed may be reduced by the introduction of traffic calming methods.

In general, the distance required by a vehicle to stop when unexpectedly confronting a pedestrian on the road is proportional to the speed of the vehicle squared. Thus a reduction in speed can cause a disproportionate improvement in pedestrian safety. In situations where Environmental Capacity standards are already exceeded, rather than allowing the situation to be made slightly worse with additional traffic, speed reduction measures can be introduced. These may have a positive effect on traffic noise, and ensure that the existing level of pedestrian safety remains the same, or is reduced.

APPENDIX D *SIDRA INTERSECTION* REPORTS

MODEL LAYOUTS

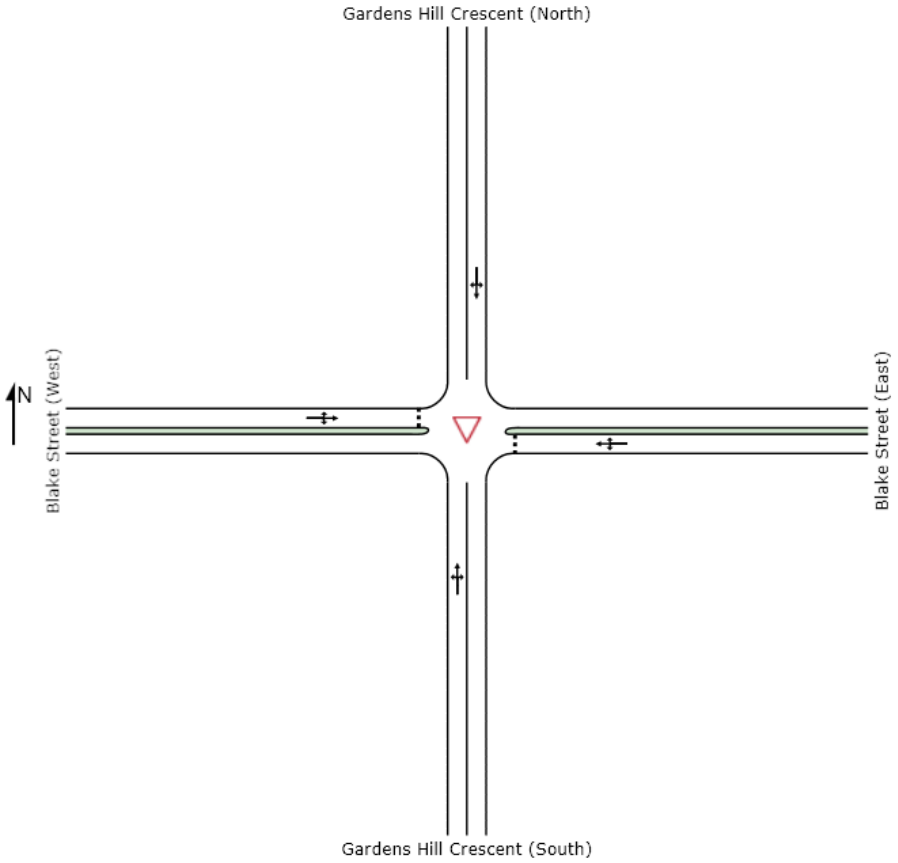


Figure 39 – *Ki1: SIDRA Intersection* model layout

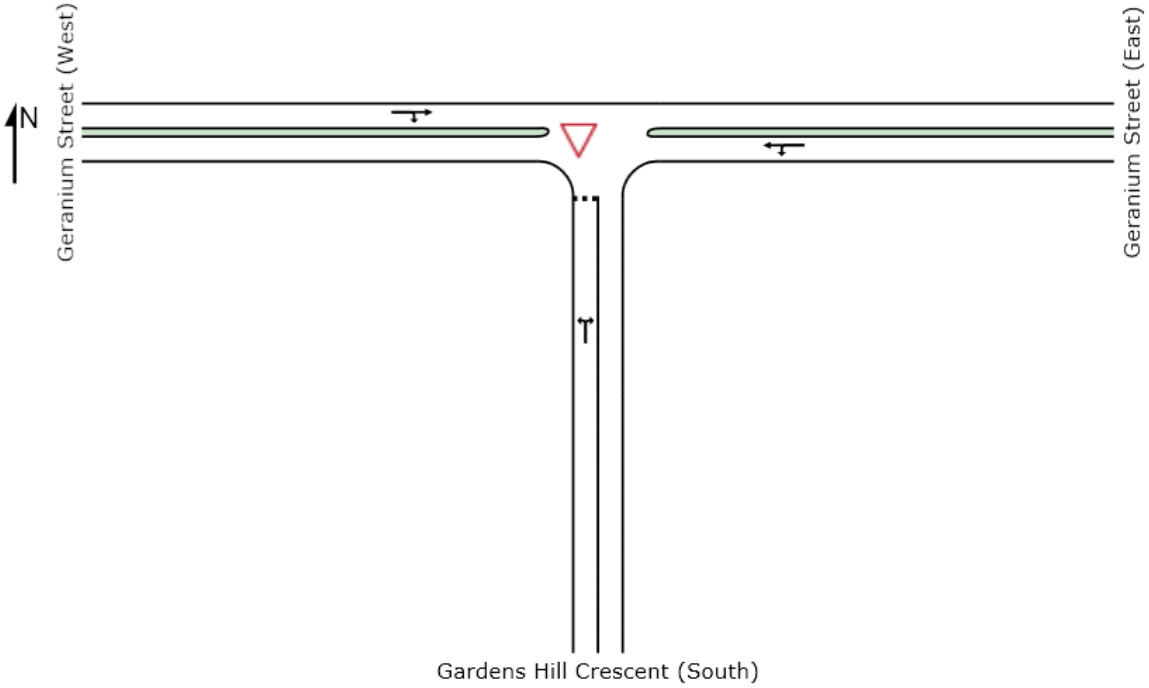


Figure 40 – *Ki2: SIDRA Intersection* model layout

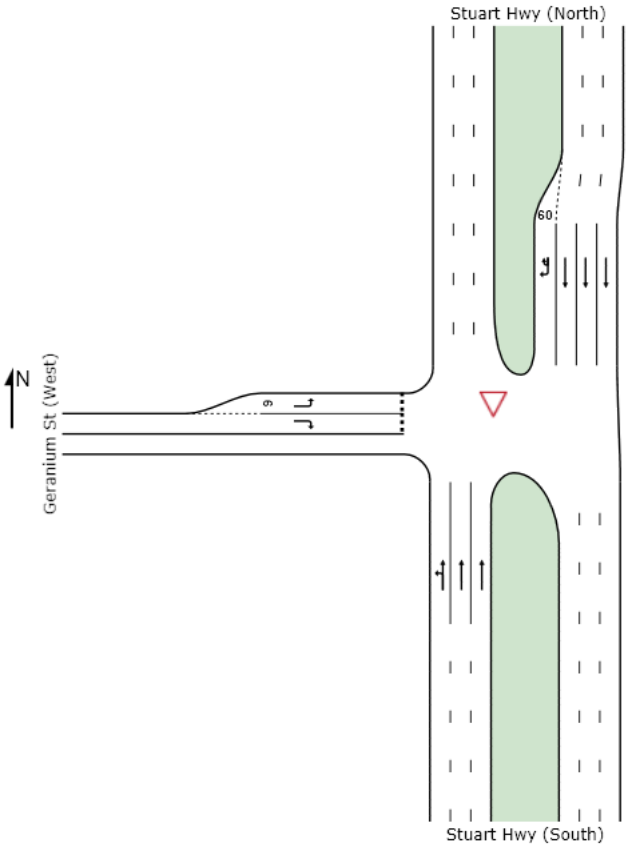


Figure 41 – *Si1: SIDRA Intersection* model layout

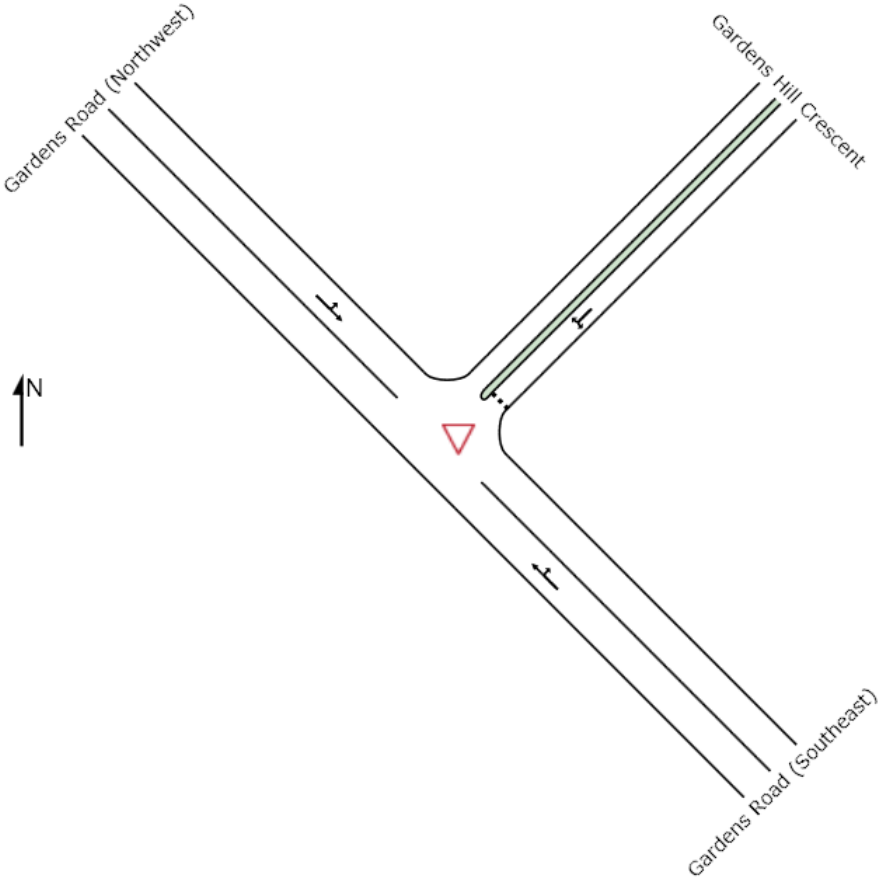


Figure 42 – *Si2: SIDRA Intersection* model layout

INTERSECTION MOVEEMNT ID'S

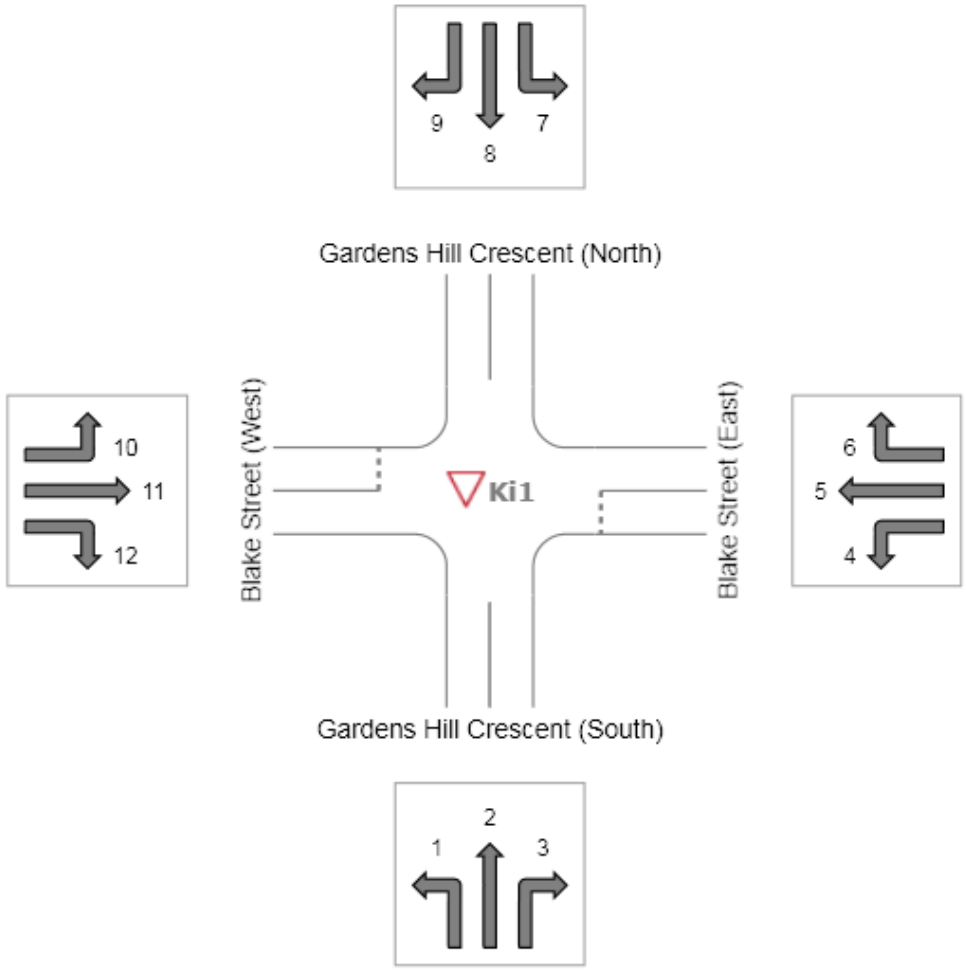


Figure 43 – *Ki1: SIDRA Intersection* Movement ID's

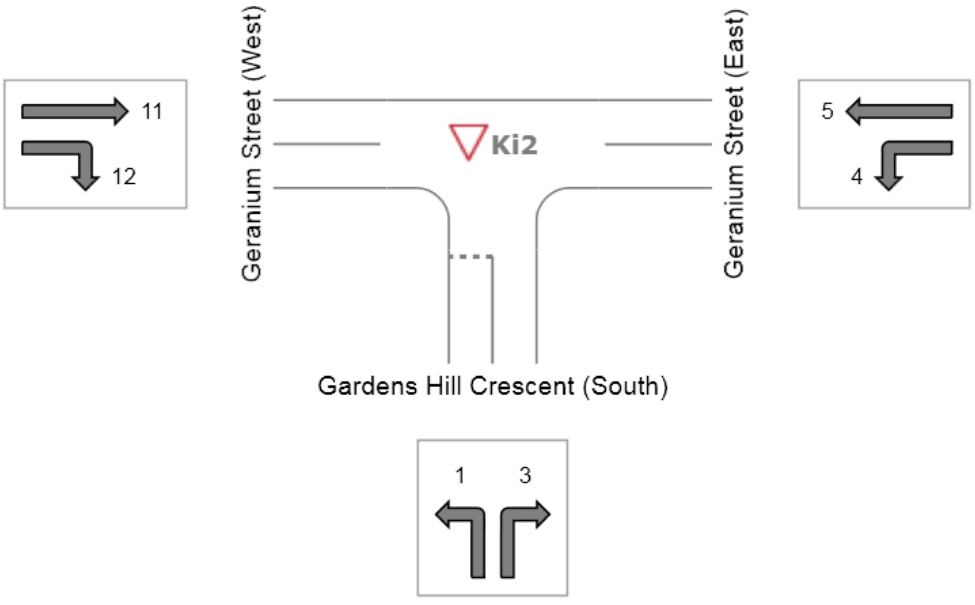


Figure 44 – *Ki2: SIDRA* Intersection Movement ID's

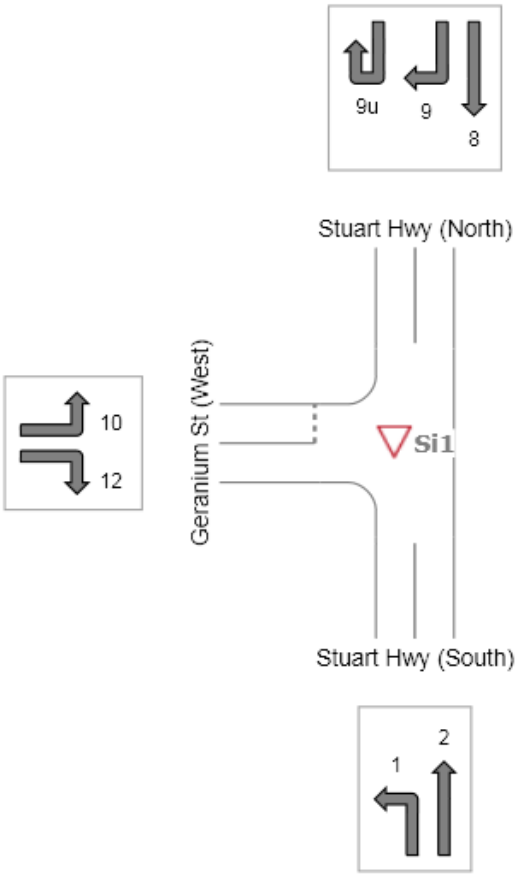


Figure 45 – *Si1: SIDRA* Intersection Movement ID's

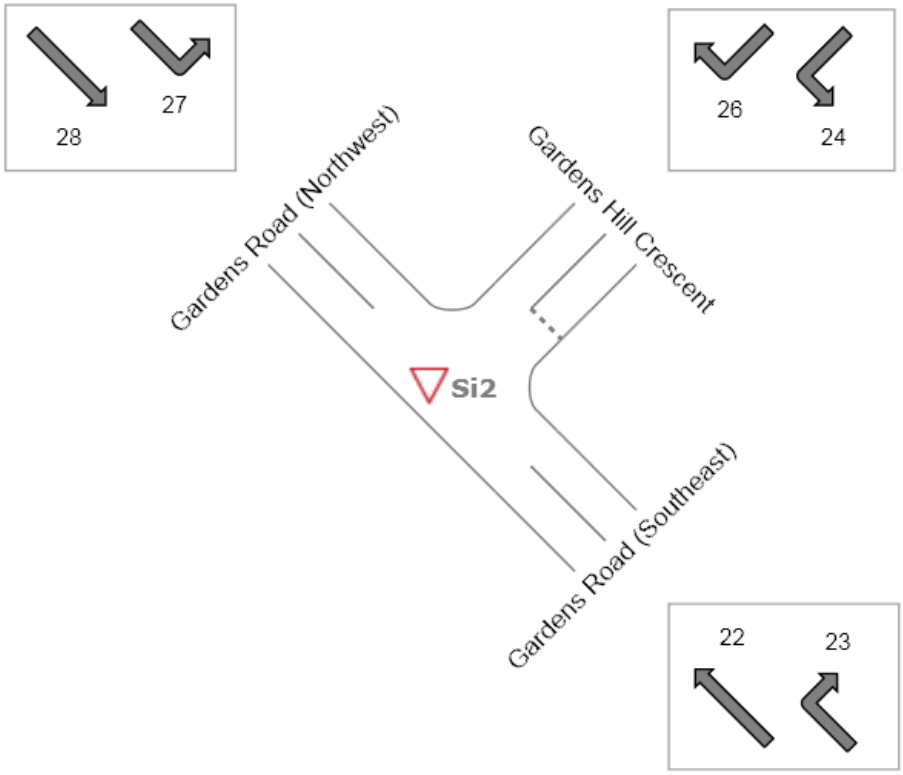


Figure 46 – *Si2: SIDRA* Intersection Movement ID's

EXISTING (2016)

MOVEMENT SUMMARY

Site: Ki1: Existing 2016 AM Peak

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gardens Hill Crescent (South)											
1	L2	7	3.3	0.037	4.6	LOS A	0.0	0.1	0.02	0.08	48.4
2	T1	59	2.0	0.037	0.0	LOS A	0.0	0.1	0.02	0.08	49.3
3	R2	2	2.0	0.037	4.9	LOS A	0.0	0.1	0.02	0.08	45.6
Approach		68	2.1	0.037	0.7	NA	0.0	0.1	0.02	0.08	49.2
East: Blake Street (East)											
4	L2	2	2.0	0.006	4.3	LOS A	0.0	0.1	0.20	0.50	42.6
5	T1	1	2.0	0.006	3.2	LOS A	0.0	0.1	0.20	0.50	40.4
6	R2	3	2.0	0.006	4.9	LOS A	0.0	0.1	0.20	0.50	41.3
Approach		6	2.0	0.006	4.4	LOS A	0.0	0.1	0.20	0.50	41.6
North: Gardens Hill Crescent (North)											
7	L2	4	2.0	0.046	4.7	LOS A	0.0	0.3	0.03	0.06	25.3
8	T1	77	2.0	0.046	0.0	LOS A	0.0	0.3	0.03	0.06	49.4
9	R2	5	2.0	0.046	4.9	LOS A	0.0	0.3	0.03	0.06	47.5
Approach		86	2.0	0.046	0.5	NA	0.0	0.3	0.03	0.06	48.0
West: Blake Street (West)											
10	L2	14	2.0	0.020	4.8	LOS A	0.1	0.5	0.16	0.52	43.9
11	T1	1	2.0	0.020	3.7	LOS A	0.1	0.5	0.16	0.52	25.5
12	R2	9	2.0	0.020	5.3	LOS A	0.1	0.5	0.16	0.52	43.4
Approach		24	2.0	0.020	4.9	LOS A	0.1	0.5	0.16	0.52	43.0
All Vehicles		185	2.1	0.046	1.3	NA	0.1	0.5	0.05	0.14	47.6

MOVEMENT SUMMARY

▽ Site: Ki1: Existing 2016 PM Peak

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gardens Hill Crescent (South)											
1	L2	1	3.3	0.041	4.8	LOS A	0.0	0.2	0.02	0.03	48.7
2	T1	73	2.0	0.041	0.0	LOS A	0.0	0.2	0.02	0.03	49.7
3	R2	3	2.0	0.041	4.9	LOS A	0.0	0.2	0.02	0.03	46.1
Approach		77	2.0	0.041	0.3	NA	0.0	0.2	0.02	0.03	49.6
East: Blake Street (East)											
4	L2	4	2.0	0.005	4.3	LOS A	0.0	0.1	0.18	0.49	42.7
5	T1	1	2.0	0.005	3.3	LOS A	0.0	0.1	0.18	0.49	40.6
6	R2	1	2.0	0.005	5.0	LOS A	0.0	0.1	0.18	0.49	41.4
Approach		6	2.0	0.005	4.2	LOS A	0.0	0.1	0.18	0.49	42.2
North: Gardens Hill Crescent (North)											
7	L2	1	2.0	0.051	4.8	LOS A	0.1	0.6	0.05	0.08	25.2
8	T1	81	2.0	0.051	0.0	LOS A	0.1	0.6	0.05	0.08	49.1
9	R2	13	2.0	0.051	4.9	LOS A	0.1	0.6	0.05	0.08	47.2
Approach		95	2.0	0.051	0.7	NA	0.1	0.6	0.05	0.08	48.6
West: Blake Street (West)											
10	L2	6	2.0	0.008	4.8	LOS A	0.0	0.2	0.17	0.51	44.0
11	T1	1	2.0	0.008	3.8	LOS A	0.0	0.2	0.17	0.51	25.6
12	R2	3	2.0	0.008	5.4	LOS A	0.0	0.2	0.17	0.51	43.4
Approach		11	2.0	0.008	4.9	LOS A	0.0	0.2	0.17	0.51	42.1
All Vehicles		188	2.0	0.051	0.9	NA	0.1	0.6	0.05	0.10	48.5

MOVEMENT SUMMARY

Site: Ki2: Existing 2016 AM Peak

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gardens Hill Crescent (South)											
1	L2	5	2.0	0.054	4.6	LOS A	0.3	1.8	0.12	0.53	46.1
3	R2	87	2.0	0.054	4.8	LOS A	0.3	1.8	0.12	0.53	45.1
Approach		93	2.0	0.054	4.8	LOS A	0.3	1.8	0.12	0.53	45.2
East: Geranium Street (East)											
4	L2	81	2.0	0.054	4.6	LOS A	0.0	0.0	0.00	0.44	46.7
5	T1	18	2.0	0.054	0.0	LOS A	0.0	0.0	0.00	0.44	44.2
Approach		99	2.0	0.054	3.8	NA	0.0	0.0	0.00	0.44	46.4
West: Geranium Street (West)											
11	T1	25	2.0	0.018	0.1	LOS A	0.0	0.2	0.06	0.08	48.4
12	R2	4	2.0	0.018	5.1	LOS A	0.0	0.2	0.06	0.08	48.2
Approach		29	2.0	0.018	0.8	NA	0.0	0.2	0.06	0.08	48.4
All Vehicles		221	2.0	0.054	3.8	NA	0.3	1.8	0.06	0.43	46.0

MOVEMENT SUMMARY

Site: Ki2: Existing 2016 PM Peak

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gardens Hill Crescent (South)											
1	L2	14	2.0	0.042	4.7	LOS A	0.2	1.4	0.16	0.53	46.0
3	R2	56	2.0	0.042	4.9	LOS A	0.2	1.4	0.16	0.53	45.0
Approach		69	2.0	0.042	4.9	LOS A	0.2	1.4	0.16	0.53	45.2
East: Geranium Street (East)											
4	L2	81	2.0	0.065	4.6	LOS A	0.0	0.0	0.00	0.37	47.1
5	T1	38	2.0	0.065	0.0	LOS A	0.0	0.0	0.00	0.37	45.1
Approach		119	2.0	0.065	3.1	NA	0.0	0.0	0.00	0.37	46.7
West: Geranium Street (West)											
11	T1	26	2.0	0.031	0.3	LOS A	0.1	0.8	0.16	0.22	46.0
12	R2	17	2.0	0.031	5.2	LOS A	0.1	0.8	0.16	0.22	47.2
Approach		43	2.0	0.031	2.2	NA	0.1	0.8	0.16	0.22	46.7
All Vehicles		232	2.0	0.065	3.5	NA	0.2	1.4	0.08	0.39	46.2

MOVEMENT SUMMARY

Site: Si1: Existing 2016 AM Peak

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stuart Hwy (South)											
1	L2	20	2.0	0.163	5.6	LOS A	0.0	0.0	0.00	0.04	57.5
2	T1	899	6.0	0.163	0.0	LOS A	0.0	0.0	0.00	0.01	59.8
Approach		919	5.9	0.163	0.1	NA	0.0	0.0	0.00	0.01	59.8
North: Stuart Hwy (North)											
8	T1	1163	6.0	0.207	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	91	2.0	0.378	19.0	LOS C	1.5	10.5	0.80	0.98	41.9
9u	U	14	1.0	0.378	30.2	LOS D	1.5	10.5	0.80	0.98	44.0
Approach		1267	5.7	0.378	1.7	NA	1.5	10.5	0.07	0.08	58.2
West: Geranium St (West)											
10	L2	100	2.0	0.101	5.9	LOS A	0.4	2.7	0.37	0.60	48.5
12	R2	5	2.0	0.673	668.1	LOS F	1.7	11.9	1.00	1.03	4.2
Approach		105	2.0	0.673	39.0	LOS E	1.7	11.9	0.40	0.62	31.8
All Vehicles		2292	5.6	0.673	2.8	NA	1.7	11.9	0.06	0.08	57.0

MOVEMENT SUMMARY

Site: Si1: Existing 2016 PM Peak

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stuart Hwy (South)											
1	L2	22	2.0	0.291	5.6	LOS A	0.0	0.0	0.00	0.02	57.6
2	T1	1617	6.0	0.291	0.0	LOS A	0.0	0.0	0.00	0.01	59.9
Approach		1639	5.9	0.291	0.1	NA	0.0	0.0	0.00	0.01	59.8
North: Stuart Hwy (North)											
8	T1	1631	6.0	0.464	2.4	LOS A	3.5	26.0	0.05	0.00	57.7
9	R2	115	2.0	1.809	810.1	LOS F	41.6	296.2	1.00	2.94	3.5
9u	U	14	1.0	1.809	880.0	LOS F	41.6	296.2	1.00	2.94	4.2
Approach		1959	5.7	1.809	55.9	NA	41.6	296.2	0.11	0.19	31.1
West: Geranium St (West)											
10	L2	103	2.0	0.142	7.7	LOS A	0.5	3.6	0.52	0.74	47.3
12	R2	2	2.0	1.000	2035.3	LOS F	2.0	14.3	1.00	1.03	1.5
Approach		105	2.0	1.000	48.3	LOS E	2.0	14.3	0.53	0.75	29.0
All Vehicles		3703	5.7	1.809	31.0	NA	41.6	296.2	0.07	0.13	39.5

MOVEMENT SUMMARY

▽ Site: Si2: Existing 2016 AM Peak

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Gardens Road (Southeast)											
22	T1	100	2.0	0.063	0.2	LOS A	0.1	0.9	0.09	0.07	59.2
23	R2	14	2.0	0.063	6.5	LOS A	0.1	0.9	0.09	0.07	51.7
Approach		114	2.0	0.063	1.0	NA	0.1	0.9	0.09	0.07	58.3
NorthEast: Gardens Hill Crescent											
24	L2	63	2.0	0.056	5.1	LOS A	0.3	1.8	0.28	0.52	48.4
26	R2	21	2.0	0.056	5.5	LOS A	0.3	1.8	0.28	0.52	51.2
Approach		84	2.0	0.056	5.2	LOS A	0.3	1.8	0.28	0.52	49.3
NorthWest: Gardens Road (Northwest)											
27	L2	31	2.0	0.088	5.6	LOS A	0.0	0.0	0.00	0.10	58.3
28	T1	153	2.0	0.088	0.0	LOS A	0.0	0.0	0.00	0.10	59.3
Approach		183	2.0	0.088	0.9	NA	0.0	0.0	0.00	0.10	59.1
All Vehicles		381	2.0	0.088	1.9	NA	0.3	1.8	0.09	0.18	56.5

MOVEMENT SUMMARY

▽ Site: Si2: Existing 2016 PM Peak

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Gardens Road (Southeast)											
22	T1	254	2.0	0.183	0.8	LOS A	0.6	4.2	0.19	0.10	58.6
23	R2	45	2.0	0.183	8.0	LOS A	0.6	4.2	0.19	0.10	51.2
Approach		299	2.0	0.183	1.9	NA	0.6	4.2	0.19	0.10	57.5
NorthEast: Gardens Hill Crescent											
24	L2	60	2.0	0.077	5.8	LOS A	0.3	2.4	0.44	0.61	48.0
26	R2	29	2.0	0.077	7.2	LOS A	0.3	2.4	0.44	0.61	50.9
Approach		89	2.0	0.077	6.3	LOS A	0.3	2.4	0.44	0.61	49.2
NorthWest: Gardens Road (Northwest)											
27	L2	34	2.0	0.171	5.6	LOS A	0.0	0.0	0.00	0.06	58.5
28	T1	323	2.0	0.171	0.0	LOS A	0.0	0.0	0.00	0.06	59.6
Approach		357	2.0	0.171	0.6	NA	0.0	0.0	0.00	0.06	59.4
All Vehicles		745	2.0	0.183	1.8	NA	0.6	4.2	0.13	0.14	57.3

FORECAST 2028 WITHOUT BACKGROUND GROWTH

MOVEMENT SUMMARY

▽ Site: Ki1: Forecast 2028 AM Peak + 0% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gardens Hill Crescent (South)											
1	L2	7	3.3	0.038	4.7	LOS A	0.0	0.1	0.02	0.07	48.4
2	T1	61	2.0	0.038	0.0	LOS A	0.0	0.1	0.02	0.07	49.3
3	R2	2	2.0	0.038	5.0	LOS A	0.0	0.1	0.02	0.07	45.6
Approach		71	2.1	0.038	0.6	NA	0.0	0.1	0.02	0.07	49.2
East: Blake Street (East)											
4	L2	2	2.0	0.006	4.3	LOS A	0.0	0.1	0.22	0.51	42.5
5	T1	1	2.0	0.006	3.3	LOS A	0.0	0.1	0.22	0.51	40.3
6	R2	3	2.0	0.006	5.0	LOS A	0.0	0.1	0.22	0.51	41.2
Approach		6	2.0	0.006	4.5	LOS A	0.0	0.1	0.22	0.51	41.5
North: Gardens Hill Crescent (North)											
7	L2	4	2.0	0.056	4.7	LOS A	0.0	0.3	0.02	0.05	25.4
8	T1	96	2.0	0.056	0.0	LOS A	0.0	0.3	0.02	0.05	49.5
9	R2	5	2.0	0.056	4.9	LOS A	0.0	0.3	0.02	0.05	47.6
Approach		105	2.0	0.056	0.4	NA	0.0	0.3	0.02	0.05	48.3
West: Blake Street (West)											
10	L2	14	2.0	0.020	4.8	LOS A	0.1	0.5	0.16	0.52	43.9
11	T1	1	2.0	0.020	3.8	LOS A	0.1	0.5	0.16	0.52	25.5
12	R2	9	2.0	0.020	5.5	LOS A	0.1	0.5	0.16	0.52	43.4
Approach		24	2.0	0.020	5.0	LOS A	0.1	0.5	0.16	0.52	43.0
All Vehicles		206	2.0	0.056	1.2	NA	0.1	0.5	0.04	0.13	47.9

MOVEMENT SUMMARY

Site: Ki1: Forecast 2028 PM Peak + 0% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gardens Hill Crescent (South)											
1	L2	1	3.3	0.049	4.8	LOS A	0.0	0.2	0.02	0.03	48.8
2	T1	87	2.0	0.049	0.0	LOS A	0.0	0.2	0.02	0.03	49.7
3	R2	3	2.0	0.049	4.9	LOS A	0.0	0.2	0.02	0.03	46.1
Approach		92	2.0	0.049	0.2	NA	0.0	0.2	0.02	0.03	49.6
East: Blake Street (East)											
4	L2	4	2.0	0.005	4.3	LOS A	0.0	0.1	0.20	0.49	42.6
5	T1	1	2.0	0.005	3.4	LOS A	0.0	0.1	0.20	0.49	40.5
6	R2	1	2.0	0.005	5.1	LOS A	0.0	0.1	0.20	0.49	41.3
Approach		6	2.0	0.005	4.3	LOS A	0.0	0.1	0.20	0.49	42.1
North: Gardens Hill Crescent (North)											
7	L2	1	2.0	0.059	4.8	LOS A	0.1	0.6	0.05	0.07	25.3
8	T1	96	2.0	0.059	0.0	LOS A	0.1	0.6	0.05	0.07	49.2
9	R2	13	2.0	0.059	4.9	LOS A	0.1	0.6	0.05	0.07	47.3
Approach		109	2.0	0.059	0.7	NA	0.1	0.6	0.05	0.07	48.8
West: Blake Street (West)											
10	L2	6	2.0	0.009	4.8	LOS A	0.0	0.2	0.19	0.51	43.9
11	T1	1	2.0	0.009	3.9	LOS A	0.0	0.2	0.19	0.51	25.5
12	R2	3	2.0	0.009	5.6	LOS A	0.0	0.2	0.19	0.51	43.3
Approach		11	2.0	0.009	5.0	LOS A	0.0	0.2	0.19	0.51	42.1
All Vehicles		218	2.0	0.059	0.8	NA	0.1	0.6	0.05	0.09	48.7

MOVEMENT SUMMARY

▽ Site: Ki2: Forecast 2028 AM Peak + 0% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gardens Hill Crescent (South)											
1	L2	5	2.0	0.061	4.6	LOS A	0.3	2.0	0.13	0.53	46.1
3	R2	100	2.0	0.061	4.8	LOS A	0.3	2.0	0.13	0.53	45.1
Approach		105	2.0	0.061	4.8	LOS A	0.3	2.0	0.13	0.53	45.1
East: Geranium Street (East)											
4	L2	84	2.0	0.056	4.6	LOS A	0.0	0.0	0.00	0.44	46.6
5	T1	18	2.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.44	44.1
Approach		102	2.0	0.056	3.8	NA	0.0	0.0	0.00	0.44	46.4
West: Geranium Street (West)											
11	T1	25	2.0	0.018	0.1	LOS A	0.0	0.2	0.06	0.08	48.4
12	R2	4	2.0	0.018	5.1	LOS A	0.0	0.2	0.06	0.08	48.2
Approach		29	2.0	0.018	0.8	NA	0.0	0.2	0.06	0.08	48.3
All Vehicles		237	2.0	0.061	3.9	NA	0.3	2.0	0.06	0.44	45.9

MOVEMENT SUMMARY

▽ Site: Ki2: Forecast 2028 PM Peak + 0% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gardens Hill Crescent (South)											
1	L2	14	2.0	0.047	4.7	LOS A	0.2	1.5	0.16	0.53	46.0
3	R2	64	2.0	0.047	4.9	LOS A	0.2	1.5	0.16	0.53	45.0
Approach		78	2.0	0.047	4.9	LOS A	0.2	1.5	0.16	0.53	45.2
East: Geranium Street (East)											
4	L2	105	2.0	0.078	4.6	LOS A	0.0	0.0	0.00	0.39	46.9
5	T1	38	2.0	0.078	0.0	LOS A	0.0	0.0	0.00	0.39	44.7
Approach		143	2.0	0.078	3.4	NA	0.0	0.0	0.00	0.39	46.6
West: Geranium Street (West)											
11	T1	26	2.0	0.032	0.4	LOS A	0.1	0.8	0.18	0.22	45.9
12	R2	17	2.0	0.032	5.3	LOS A	0.1	0.8	0.18	0.22	47.2
Approach		43	2.0	0.032	2.3	NA	0.1	0.8	0.18	0.22	46.6
All Vehicles		264	2.0	0.078	3.6	NA	0.2	1.5	0.08	0.40	46.1

MOVEMENT SUMMARY

▽ Site: Si1: Forecast 2028 AM Peak + 0% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stuart Hwy (South)											
1	L2	22	2.0	0.164	5.6	LOS A	0.0	0.0	0.00	0.04	57.4
2	T1	899	6.0	0.164	0.0	LOS A	0.0	0.0	0.00	0.01	59.8
Approach		921	5.9	0.164	0.2	NA	0.0	0.0	0.00	0.01	59.8
North: Stuart Hwy (North)											
8	T1	1163	6.0	0.207	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R2	92	2.0	0.382	19.1	LOS C	1.5	10.6	0.81	0.98	41.9
9u	U	14	1.0	0.382	30.3	LOS D	1.5	10.6	0.81	0.98	43.9
Approach		1268	5.7	0.382	1.7	NA	1.5	10.6	0.07	0.08	58.2
West: Geranium St (West)											
10	L2	112	2.0	0.113	5.9	LOS A	0.4	3.0	0.37	0.60	48.5
12	R2	6	2.0	0.812	749.7	LOS F	2.1	15.0	1.00	1.05	3.8
Approach		118	2.0	0.812	45.8	LOS E	2.1	15.0	0.41	0.63	29.7
All Vehicles		2307	5.6	0.812	3.3	NA	2.1	15.0	0.06	0.08	56.4

MOVEMENT SUMMARY

▽ Site: Si1: Forecast 2028 PM Peak + 0% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stuart Hwy (South)											
1	L2	40	2.0	0.294	5.6	LOS A	0.0	0.0	0.00	0.04	57.4
2	T1	1617	6.0	0.294	0.0	LOS A	0.0	0.0	0.00	0.01	59.8
Approach		1657	5.9	0.294	0.2	NA	0.0	0.0	0.00	0.01	59.8
North: Stuart Hwy (North)											
8	T1	1831	6.0	0.465	2.4	LOS A	3.4	25.2	0.05	0.00	57.8
9	R2	121	2.0	1.944	931.0	LOS F	46.9	333.8	1.00	3.05	3.1
9u	U	14	1.0	1.944	1000.1	LOS F	46.9	333.8	1.00	3.05	3.7
Approach		1965	5.7	1.944	66.5	NA	46.9	333.8	0.11	0.21	28.5
West: Geranium St (West)											
10	L2	113	2.0	0.152	7.6	LOS A	0.6	3.9	0.52	0.74	47.3
12	R2	3	2.0	1.000	1435.6	LOS F	2.1	14.7	1.00	1.05	2.0
Approach		116	2.0	1.000	46.6	LOS E	2.1	14.7	0.53	0.75	29.5
All Vehicles		3738	5.7	1.944	36.5	NA	46.9	333.8	0.07	0.14	37.2

MOVEMENT SUMMARY

▽ Site: Si2: Forecast 2028 AM Peak + 0% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Gardens Road (Southeast)											
22	T1	100	2.0	0.065	0.2	LOS A	0.1	1.0	0.10	0.08	59.1
23	R2	16	2.0	0.065	6.5	LOS A	0.1	1.0	0.10	0.08	51.6
Approach		116	2.0	0.065	1.1	NA	0.1	1.0	0.10	0.08	58.1
NorthEast: Gardens Hill Crescent											
24	L2	76	2.0	0.069	5.1	LOS A	0.3	2.2	0.28	0.53	48.4
26	R2	28	2.0	0.069	5.5	LOS A	0.3	2.2	0.28	0.53	51.2
Approach		104	2.0	0.069	5.2	LOS A	0.3	2.2	0.28	0.53	49.3
NorthWest: Gardens Road (Northwest)											
27	L2	32	2.0	0.089	5.6	LOS A	0.0	0.0	0.00	0.10	58.3
28	T1	153	2.0	0.089	0.0	LOS A	0.0	0.0	0.00	0.10	59.3
Approach		184	2.0	0.089	1.0	NA	0.0	0.0	0.00	0.10	59.1
All Vehicles		404	2.0	0.089	2.1	NA	0.3	2.2	0.10	0.21	56.1

MOVEMENT SUMMARY

▽ Site: Si2: Forecast 2028 PM Peak + 0% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Gardens Road (Southeast)											
22	T1	254	2.0	0.194	0.9	LOS A	0.7	4.9	0.21	0.11	58.4
23	R2	53	2.0	0.194	8.1	LOS A	0.7	4.9	0.21	0.11	51.0
Approach		306	2.0	0.194	2.1	NA	0.7	4.9	0.21	0.11	57.1
NorthEast: Gardens Hill Crescent											
24	L2	68	2.0	0.090	5.8	LOS A	0.4	2.8	0.45	0.62	48.0
26	R2	36	2.0	0.090	7.3	LOS A	0.4	2.8	0.45	0.62	50.9
Approach		104	2.0	0.090	6.3	LOS A	0.4	2.8	0.45	0.62	49.2
NorthWest: Gardens Road (Northwest)											
27	L2	41	2.0	0.175	5.6	LOS A	0.0	0.0	0.00	0.07	58.4
28	T1	323	2.0	0.175	0.0	LOS A	0.0	0.0	0.00	0.07	59.5
Approach		364	2.0	0.175	0.7	NA	0.0	0.0	0.00	0.07	59.3
All Vehicles		775	2.0	0.194	2.0	NA	0.7	4.9	0.14	0.16	56.9

FORECAST 2028 WITH 2% ANNUAL BACKGROUND GROWTH

MOVEMENT SUMMARY

Site: Ki1: Forecast 2028 AM Peak + 2% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gardens Hill Crescent (South)											
1	L2	9	3.3	0.048	4.7	LOS A	0.0	0.2	0.02	0.08	48.3
2	T1	77	2.0	0.048	0.0	LOS A	0.0	0.2	0.02	0.08	49.3
3	R2	3	2.0	0.048	5.0	LOS A	0.0	0.2	0.02	0.08	45.5
Approach		89	2.1	0.048	0.7	NA	0.0	0.2	0.02	0.08	49.1
East: Blake Street (East)											
4	L2	3	2.0	0.008	4.4	LOS A	0.0	0.2	0.25	0.52	42.3
5	T1	1	2.0	0.008	3.5	LOS A	0.0	0.2	0.25	0.52	40.1
6	R2	4	2.0	0.008	5.2	LOS A	0.0	0.2	0.25	0.52	41.0
Approach		8	2.0	0.008	4.7	LOS A	0.0	0.2	0.25	0.52	41.5
North: Gardens Hill Crescent (North)											
7	L2	4	2.0	0.067	4.7	LOS A	0.0	0.3	0.02	0.04	25.4
8	T1	117	2.0	0.067	0.0	LOS A	0.0	0.3	0.02	0.04	49.6
9	R2	5	2.0	0.067	4.9	LOS A	0.0	0.3	0.02	0.04	47.7
Approach		126	2.0	0.067	0.4	NA	0.0	0.3	0.02	0.04	48.6
West: Blake Street (West)											
10	L2	17	2.0	0.025	4.8	LOS A	0.1	0.6	0.19	0.52	43.8
11	T1	1	2.0	0.025	4.0	LOS A	0.1	0.6	0.19	0.52	25.5
12	R2	12	2.0	0.025	5.7	LOS A	0.1	0.6	0.19	0.52	43.3
Approach		29	2.0	0.025	5.1	LOS A	0.1	0.6	0.19	0.52	43.0
All Vehicles		254	2.0	0.067	1.2	NA	0.1	0.6	0.05	0.13	48.0

MOVEMENT SUMMARY

Site: Ki1: Forecast 2028 PM Peak + 2% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gardens Hill Crescent (South)											
1	L2	1	3.3	0.059	4.9	LOS A	0.0	0.2	0.02	0.03	48.8
2	T1	106	2.0	0.059	0.0	LOS A	0.0	0.2	0.02	0.03	49.7
3	R2	4	2.0	0.059	5.0	LOS A	0.0	0.2	0.02	0.03	46.1
Approach		112	2.0	0.059	0.3	NA	0.0	0.2	0.02	0.03	49.6
East: Blake Street (East)											
4	L2	5	2.0	0.006	4.4	LOS A	0.0	0.2	0.22	0.49	42.5
5	T1	1	2.0	0.006	3.6	LOS A	0.0	0.2	0.22	0.49	40.3
6	R2	1	2.0	0.006	5.4	LOS A	0.0	0.2	0.22	0.49	41.2
Approach		7	2.0	0.006	4.4	LOS A	0.0	0.2	0.22	0.49	42.1
North: Gardens Hill Crescent (North)											
7	L2	1	2.0	0.073	4.9	LOS A	0.1	0.7	0.06	0.07	25.2
8	T1	118	2.0	0.073	0.1	LOS A	0.1	0.7	0.06	0.07	49.2
9	R2	16	2.0	0.073	5.0	LOS A	0.1	0.7	0.06	0.07	47.3
Approach		135	2.0	0.073	0.7	NA	0.1	0.7	0.06	0.07	48.8
West: Blake Street (West)											
10	L2	8	2.0	0.012	4.9	LOS A	0.0	0.3	0.21	0.51	43.8
11	T1	1	2.0	0.012	4.1	LOS A	0.0	0.3	0.21	0.51	25.5
12	R2	4	2.0	0.012	5.9	LOS A	0.0	0.3	0.21	0.51	43.2
Approach		14	2.0	0.012	5.1	LOS A	0.0	0.3	0.21	0.51	42.3
All Vehicles		267	2.0	0.073	0.8	NA	0.1	0.7	0.06	0.09	48.7

MOVEMENT SUMMARY

▽ Site: Ki2: Forecast 2028 AM Peak + 2% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gardens Hill Crescent (South)											
1	L2	6	2.0	0.077	4.6	LOS A	0.4	2.6	0.15	0.53	46.0
3	R2	124	2.0	0.077	4.8	LOS A	0.4	2.6	0.15	0.53	45.0
Approach		131	2.0	0.077	4.8	LOS A	0.4	2.6	0.15	0.53	45.1
East: Geranium Street (East)											
4	L2	106	2.0	0.071	4.6	LOS A	0.0	0.0	0.00	0.44	46.6
5	T1	23	2.0	0.071	0.0	LOS A	0.0	0.0	0.00	0.44	44.2
Approach		129	2.0	0.071	3.8	NA	0.0	0.0	0.00	0.44	46.4
West: Geranium Street (West)											
11	T1	32	2.0	0.022	0.1	LOS A	0.0	0.3	0.08	0.08	48.3
12	R2	5	2.0	0.022	5.3	LOS A	0.0	0.3	0.08	0.08	48.2
Approach		37	2.0	0.022	0.9	NA	0.0	0.3	0.08	0.08	48.3
All Vehicles		297	2.0	0.077	3.9	NA	0.4	2.6	0.07	0.44	45.9

MOVEMENT SUMMARY

▽ Site: Ki2: Forecast 2028 PM Peak + 2% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Gardens Hill Crescent (South)											
1	L2	17	2.0	0.058	4.7	LOS A	0.3	1.9	0.18	0.53	45.9
3	R2	79	2.0	0.058	5.0	LOS A	0.3	1.9	0.18	0.53	45.0
Approach		96	2.0	0.058	4.9	LOS A	0.3	1.9	0.18	0.53	45.1
East: Geranium Street (East)											
4	L2	127	2.0	0.096	4.6	LOS A	0.0	0.0	0.00	0.39	47.0
5	T1	48	2.0	0.096	0.0	LOS A	0.0	0.0	0.00	0.39	44.8
Approach		176	2.0	0.096	3.3	NA	0.0	0.0	0.00	0.39	46.6
West: Geranium Street (West)											
11	T1	34	2.0	0.041	0.5	LOS A	0.1	1.1	0.21	0.22	45.8
12	R2	21	2.0	0.041	5.5	LOS A	0.1	1.1	0.21	0.22	47.1
Approach		55	2.0	0.041	2.5	NA	0.1	1.1	0.21	0.22	46.6
All Vehicles		326	2.0	0.096	3.6	NA	0.3	1.9	0.09	0.40	46.1

MOVEMENT SUMMARY

Site: Si1: Forecast 2028 AM Peak + 2% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stuart Hwy (South)											
1	L2	27	2.0	0.207	5.6	LOS A	0.0	0.0	0.00	0.04	57.4
2	T1	1140	6.0	0.207	0.0	LOS A	0.0	0.0	0.00	0.01	59.8
Approach		1167	5.9	0.207	0.2	NA	0.0	0.0	0.00	0.01	59.8
North: Stuart Hwy (North)											
8	T1	1355	6.0	0.241	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
9	R2	116	2.0	0.738	41.0	LOS E	3.6	25.7	0.94	1.20	31.8
9u	U	17	1.0	0.738	61.9	LOS F	3.6	25.7	0.94	1.20	34.4
Approach		1487	5.6	0.738	3.9	NA	3.6	25.7	0.08	0.11	56.2
West: Geranium St (West)											
10	L2	140	2.0	0.155	6.5	LOS A	0.6	4.2	0.44	0.66	48.2
12	R2	9	2.0	1.579	1377.6	LOS F	5.7	40.4	1.00	1.20	2.1
Approach		149	2.0	1.579	93.4	LOS F	5.7	40.4	0.47	0.69	20.3
All Vehicles		2804	5.6	1.579	7.1	NA	5.7	40.4	0.07	0.10	53.3

MOVEMENT SUMMARY

Site: Si1: Forecast 2028 PM Peak + 2% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Stuart Hwy (South)											
1	L2	46	2.0	0.373	5.6	LOS A	0.0	0.0	0.00	0.04	57.4
2	T1	2051	6.0	0.373	0.1	LOS A	0.0	0.0	0.00	0.01	59.8
Approach		2097	5.9	0.373	0.2	NA	0.0	0.0	0.00	0.01	59.7
North: Stuart Hwy (North)											
8	T1	2321	6.0	0.610	2.0	LOS A	3.3	24.4	0.01	0.00	58.1
9	R2	152	2.0	6.936	5498.3	LOS F	107.2	762.5	1.00	2.33	0.5
9u	U	17	1.0	6.936	5739.4	LOS F	107.2	762.5	1.00	2.33	0.7
Approach		2489	5.7	6.936	375.5	NA	107.2	762.5	0.08	0.16	8.3
West: Geranium St (West)											
10	L2	139	2.0	0.232	9.4	LOS A	0.9	6.2	0.61	0.83	46.1
12	R2	3	2.0	1.000	1314.7	LOS F	1.9	13.5	1.00	1.04	2.2
Approach		142	2.0	1.000	38.4	LOS E	1.9	13.5	0.62	0.83	32.0
All Vehicles		4728	5.7	6.936	198.9	NA	107.2	762.5	0.06	0.11	13.9

MOVEMENT SUMMARY

▽ Site: Si2: Forecast 2028 AM Peak + 2% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Gardens Road (Southeast)											
22	T1	126	2.0	0.083	0.3	LOS A	0.2	1.3	0.11	0.08	59.1
23	R2	19	2.0	0.083	6.8	LOS A	0.2	1.3	0.11	0.08	51.6
Approach		145	2.0	0.083	1.2	NA	0.2	1.3	0.11	0.08	58.1
NorthEast: Gardens Hill Crescent											
24	L2	93	2.0	0.088	5.3	LOS A	0.4	2.9	0.33	0.55	48.3
26	R2	34	2.0	0.088	5.9	LOS A	0.4	2.9	0.33	0.55	51.1
Approach		126	2.0	0.088	5.4	LOS A	0.4	2.9	0.33	0.55	49.2
NorthWest: Gardens Road (Northwest)											
27	L2	39	2.0	0.112	5.6	LOS A	0.0	0.0	0.00	0.10	58.3
28	T1	194	2.0	0.112	0.0	LOS A	0.0	0.0	0.00	0.10	59.3
Approach		233	2.0	0.112	0.9	NA	0.0	0.0	0.00	0.10	59.1
All Vehicles		504	2.0	0.112	2.1	NA	0.4	2.9	0.11	0.21	56.1

MOVEMENT SUMMARY

▽ Site: Si2: Forecast 2028 PM Peak + 2% Growth + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Gardens Road (Southeast)											
22	T1	322	2.0	0.255	1.4	LOS A	1.1	7.8	0.25	0.12	57.9
23	R2	64	2.0	0.255	9.5	LOS A	1.1	7.8	0.25	0.12	50.6
Approach		386	2.0	0.255	2.8	NA	1.1	7.8	0.25	0.12	56.7
NorthEast: Gardens Hill Crescent											
24	L2	84	2.0	0.128	6.3	LOS A	0.5	3.9	0.52	0.69	47.6
26	R2	44	2.0	0.128	8.6	LOS A	0.5	3.9	0.52	0.69	50.6
Approach		128	2.0	0.128	7.1	LOS A	0.5	3.9	0.52	0.69	48.9
NorthWest: Gardens Road (Northwest)											
27	L2	49	2.0	0.220	5.6	LOS A	0.0	0.0	0.00	0.06	58.5
28	T1	409	2.0	0.220	0.0	LOS A	0.0	0.0	0.00	0.06	59.5
Approach		459	2.0	0.220	0.6	NA	0.0	0.0	0.00	0.06	59.4
All Vehicles		974	2.0	0.255	2.3	NA	1.1	7.8	0.17	0.17	56.8