

Business Papers

OPEN

Special Council Meeting

Tuesday, 10 March 2015
5:00 pm



Notice of Meeting

To the Lord Mayor and Aldermen

You are invited to attend an Open Special Council Meeting to be held in the Council Chambers, Level 1, Civic Centre, Harry Chan Avenue, Darwin, on Tuesday, 10 March 2015, commencing at 5.00 pm.

B P DOWD
CHIEF EXECUTIVE OFFICER

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CITY OF DARWIN

OPEN SPECIAL MEETING OF THE TWENTY-FIRST COUNCIL

TUESDAY, 10 MARCH 2015

MEMBERS: The Right Worshipful, Lord Mayor, Ms K M Fong Lim, (Chairman);
Member J M Anictomatis; Member R K Elix; Member H I Galton;
Member J A Glover; Member G J Haslett; Member R M Knox;
Member G A Lambert; Member G Lambrinidis; Member A R Mitchell;
Member S J Niblock; Member R Want de Rowe; Member K J Worden.

OFFICERS: Chief Executive Officer, Mr B P Dowd; General Manager Corporate
Services, Dr D Leeder; General Manager Infrastructure, Mr L
Cercarelli; General Manager Community & Cultural Services, Ms A
Malgorzewicz; Acting Executive Manager, Ms V Green;
Committee Administrator, Mrs P Hart.

Enquiries and/or Apologies: Penny Hart
E-mail: p.hart@darwin.nt.gov.au



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1. MEETING DECLARED OPEN

2. APOLOGIES AND LEAVE OF ABSENCE

2.1 Apologies

2.2 Leave of Absence Granted

THAT it be noted Member H I Galton is an apology due to a Leave of Absence previously granted on 10 February 2015, for the period of 10 February 2015, to 16 February 2015.

3. ELECTRONIC MEETING ATTENDANCE

Common No. 2221528

3.1 Electronic Meeting Attendance Granted

THAT Council note that pursuant to Section 61 (4) of the Local Government Act and Decision No. 21\0009 – 16/04/12, the following member was granted permission for Electronic Meeting Attendance at this Open Special Council Meeting held on Tuesday, 10 March 2015:

- Member H I Galton

4. DECLARATION OF INTEREST OF MEMBERS AND STAFF

4.1 Declaration of Interest by Members

4.2 Declaration of Interest by Staff

ENCL: SPECIAL COUNCIL MEETING/OPEN
YES

AGENDA ITEM: 5.1

ACCESS TO LOT 33 (286) CASUARINA DRIVE, RAPID CREEK, TOWN OF NIGHTCLIFF

REPORT No.: 15TS0037 ND:lc

COMMON No.: 2810627

DATE: 10/03/2015

Presenter: Manager Technical Services, Nadine Douglas

Approved: General Manager Infrastructure, Luccio Cercarelli

PURPOSE

The purpose of this report is to review the use of Willow Way as an access for the development at Lot 33 (286) Casuarina Drive, Rapid Creek, Town of Nightcliff based on an independent traffic study.

LINK TO STRATEGIC PLAN

The issues addressed in this Report are in accordance with the following Goals/Strategies of the City of Darwin 2012 – 2016 as outlined in the 'Evolving Darwin Towards 2020 Strategic Plan':-

Goal

2 Vibrant, Flexible and Tropical Lifestyle

Outcome

2.1 Improved access and connectivity

Key Strategies

2.1.3 Manage the road network to meet community needs

KEY ISSUES

- Application was made for an Exceptional Development Permit (EDP) at Lot 33 (286) Casuarina Drive, Rapid Creek in June 2014.
- Willow Way is an area of road reserve 7.5m wide currently used as a walkway between residential properties.
- The EDP proposed the use of Willow Way as the vehicle access from Casuarina Drive to the proposed residential development.
- A letter from City of Darwin, endorsed by Council, to Department Lands, Planning and Environment dated 04 July 2015 objected to the granting of the EDP for a number of reasons including the proposed use of Willow Way.
- An EDP has been provided to the developer with several Condition Precedents relating to Council, including evidence of approval by Council for the use of Willow Way as an access.
- A Traffic Impact Assessment was provided by the developer to provide reasoning for the use of Willow Way.

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- An independent review was undertaken by Council's consultant to provide comment on the developer's findings and to provide the best solution with any required works associated.
- The report discusses these findings and recommends that Willow Way be utilised as the access to the development at 286 Casuarina Drive, subject to it being upgraded to a shared zone.

RECOMMENDATIONS

- A. THAT Report Number 15TS0037 ND:lc entitled Access to Lot 33 (286) Casuarina Drive, Rapid Creek, Town of Nightcliff, be received and noted.
- B. THAT Council approve the vehicular access to Lot 33 (286) Casuarina Drive, Rapid Creek, Town Of Nightcliff, on to Willow Way subject to it being converted to a shared zone with all works associated with the to will be at the developer's cost and to the satisfaction of Council.

BACKGROUND

On 4 June 2014 City of Darwin received a letter from the Department of Lands, Planning and Environment (DLPE) notifying us of an application for an Exceptional Development Permit (EDP) at Lot 33 (286) Casuarina Drive, Rapid Creek. The proposed development was for a 24 x 2 bedroom multiple dwelling in a 5 storey building. City of Darwin responded to DPLE objecting to the development on a number of points including the use of Willow Way as the main vehicle and pedestrian access for the site.

The Development Application (DA) went to Council in report number 14TS0171 in July 2014, with the submission letter being endorsed at that meeting. The letter is attached (**Attachment D**) for information.

The report included the following analysis and commentary on the development access, which was summarised and reiterated in the letter submitted to the Department of Lands, Planning and the Environment.

Access

The development proposes to utilise the existing Willow Way for vehicular access. The laneway is 7.5 metres wide, with 2 metres dedicated to a raised concrete footpath and adjoining sealed area. Whilst the laneway is a gazetted road, Willow Way was constructed as, and currently functions predominantly as a pedestrian access way between Aralia Street and Casuarina Drive. The laneway is blocked to vehicular traffic from Aralia Street by bollards and a chain barrier. The Casuarina Drive end of the laneway is open and a site visit indicated that the laneway is currently being used for vehicular access to four (4) units at the rear of the existing site.

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The proposal will increase vehicular access from the current four (4) units to 24 units, a significant increase in vehicular movements down the laneway. The increase in vehicular movements would also warrant a two-way access/crossover, which would require the removal of the existing raised footpath section running down the southern side of the lane.

A thorough assessment of the likely impacts this may have on pedestrian safety was not able to be undertaken during the public comment period. Therefore direct access from Willow Way has not been supported in comments to the Consent Authority at this time. As this will significantly affect the design of the development, the proposal as a whole also cannot be supported.

The laneway is predominantly used as a pedestrian thoroughfare and not for vehicles. It is recommended that Council consider not supporting the proposal until further investigations are undertaken into the safety and practicality of it being used as a shared use zone for vehicles and pedestrians. Furthermore, significant community consultation, technical assessment and consideration of services is required.

The access was then included as a condition precedent to the Exceptional Development Permit that was issued in October 2014. Condition 2 states;

"Prior to the endorsement of plans and prior to the commencement of works (including site preparation), the developer must provide evidence of approval from the City of Darwin regarding the acceptance of the proposed vehicle access arrangements off willow way, to the satisfaction of the consent authority."



(Image 01 – Location of Lot 33 (286) Casuarina Drive, Rapid Creek)

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The developer provided their Traffic Impact Assessment (**Attachment A**) to Council in January 2015. The assessment report indicates that the use of Willow Way as an access would be a safe and acceptable solution, including the recommendation of it becoming a shared zone.

The City of Darwin sourced an independent review of the Traffic Impact Assessment (**Attachment B**) on the suitability of the use of Willow Way as a vehicular access and to provide any recommendations regarding its use.

All other aspects of the EDP have been worked through with the developer and their consultant, including stormwater and construction management plans. Waste collection approval requires finalising as it is dependent on the outcome of this report, however it is not considered to be a critical issue to be resolved.

The developer has indicated that they still desire using Willow Way for their vehicular access and are seeking Council's approval. This report discusses the findings of the traffic assessments and the options available to Council in relation to vehicular access for this property.

DISCUSSION

Lot 33 (286) Casuarina Drive, Rapid Creek currently has a single dwelling with access from Casuarina Drive and 5 independent units with an access from Willow Way. As described in the Background section of this report, Willow Way is 5.5 metre wide with a 2 metre wide footpath on the opposite side to the development. Willow Way runs from Aralia Street through to Casuarina Drive but can only be accessed from Casuarina Drive and has bollards shortly after the property boundary of Lot 33 (286) Casuarina Drive preventing through vehicular traffic.



(Image 02 – Willow Way)

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Council officers have indicated to the developer that whilst the investigations and report processes are occurring, that approval could be issued to allow for site works only. However, the developer has not sought this approval as it is the endorsement of plans that is required for the ability to sell the dwellings.

Traffic Assessment

The developer's Traffic Impact Assessment (**Attachment A**) reviewed all aspects of the development and its proposed access to Willow Way, based on the current development plans (**Attachment C**) and provides 4 recommendations;

1. Minor parking bay amendments
2. Maximum height of landscaping within sight lines (at entrances/exits)
3. Consider relocation of waste collection
4. Consider removing the path from Willow Way and providing a shared space laneway.

Council asked the developer's civil consultant if they were considering implementing the recommendation relating to the shared zone. They advised, via email on 29 January 2015, that they are not considering that it is required, as per correspondence below, received from the developer;

"In regards to Clause 8.4 in the traffic management report David has recommended considering this as an option.

As the existing footpath meets current Council requirement in width and disability access the question needs to be asked why this needs to be considered.

The road has been utilised as an access path for vehicles and pedestrian for many years without to our knowledge of an accident report being issued. Having the path above the kerb and gutter protects the pedestrian access path if it becomes a shared zone the line marking becomes the barrier.

By creating the shared zone the path needs to be lowered to the height of the road pavement to maintain two way vehicle movement within the Lane. By doing so modifications to the existing stormwater system will be required as currently the kerb and gutter alignment discharges into a SEP prior to intersecting with the footpath on Casuarina Drive.

I have attached a photograph of Willows Lane for your reference.

Therefore the developer recommends that the current path and lane be maintained and signage be placed at the central bollards that notify pedestrian that the lane is an active road / driveway."

This has been discussed directly with the developer more recently, with a further explanation on what works would be required and the benefits of a shared zone. The photos referenced above have not been attached as they replicate the images within this report and attachments.

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The independent assessment undertaken by Council reviewed the developer's Traffic Impact Assessment, and the development access overall, and provides the following recommendations;

1. Signage on Willow Way to prevent parking
2. Minor parking bay amendments
3. Widening of the Willow Way access driveway by moving the kerb across to accommodate stormwater.
4. Relocation of bin collection
5. Maximum landscaping height within sight lines
6. Removal of handrail at Casuarina Drive end (that is used to prevent access)
7. Replace chain barrier at Aralia Street end of Willow Way with bollards
8. Convert Willow Way to a shared Zone
9. Improve pedestrian and cyclist connections to Willow Way.

Of the independent review, the recommendations relating to the internal parking, landscaping, bin collection and shared zone were all reflected within, and generally consistent with, the developer's Traffic Impact Assessment.

The additional recommendations within the review are all able to be achieved through the development (ie driveway upgrade) or by Council separately (ie Aralia Street access bollards).

The independent assessment undertaken on behalf of Council also indicated that there will be negligible difference in the impact to traffic on Casuarina Drive due to the point of access, whether it is a driveway on to Casuarina Drive or from Willow Way. It is also noted that there will be minimal impact to pedestrian users of Willow Way if Council approves its use as a vehicular access for Lot 33 (286) Casuarina Drive, Rapid Creek. These are both due to the low traffic numbers accessing the site, both current and anticipated.

As the traffic assessments have indicated, it is considered that vehicular access from Willow Way into the development would be able to be satisfactorily achieved by converting the area to a shared zone.

By definition, a shared zone is (from the Austroads Guide to Traffic Management);

"...an area utilised by both pedestrians and vehicular traffic in which vehicles must give way to pedestrians at all times, and where the street environment has been adapted for very low speed vehicles. Shared zones attempt to change the image and character of a street so that drivers are made aware that they are entering a street environment with driving conditions that are quite different to other more common situations. This can be achieved by the use of different coloured and/or textured pavement surfaces, by the use of full width flush paving between property lines and through landscaping."

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Signage for the shared zone is required, and the requirement for vehicles to give way to pedestrians is stipulated within the Australian Road Rules, vehicles are also not able to stop for any period within a shared zone. The speed is typically set at 10km/hr.

The recommendations are also directly responding to the issue of having Willow Way as an access. Council's review also included consideration of access direct off Casuarina Drive and it is considered that there is no difference between the accesses from a purely traffic engineering point of view. The decision can therefore be based on whether the access to Willow Way is preferred from an amenity and development point of view.

It is considered that Council has two options for Willow Way as discussed below:

Option 1 – No direct Willow Way access – access direct from Casuarina Drive

Council could not allow the use of Willow Way for vehicular access to Lot 33 (286) Casuarina Drive, Rapid Creek and installs bollards at the access point from Casuarina Drive. The access would therefore be off Casuarina Drive directly in front of the property.

Benefits

- Separation of vehicular and pedestrian traffic
- Guaranteed unobstructed and safe use of Willow Lane as a thoroughfare for pedestrians and cyclists between Aralia Street and Casuarina Drive

Risks/Disadvantages

- This property currently has vehicular access from Willow Way and Casuarina Drive, so there is a precedent for access
- Willow Way would remain in its current form and condition, which would require significant maintenance in a few years
- The developer would have to significantly redesign the development

This option has been considered by Council's independent review and from a technical traffic perspective; there is no critical difference in impact on Casuarina Drive between this access and the Willow Way access.

This option could be the option if Council decides to use, but it has not been as Council officers have worked on providing a solution that is suitable to all parties, which has also been supported through the assessments.

Option 2 – Willow Way as a shared zone

The developer has requested the use of Willow Way as the access point for Lot 33 (286) Casuarina Drive, Rapid Creek. If the vehicular access is allowed and Willow Way is converted to a shared zone, pedestrian movement will still be catered for. The amenity of Willow Way will also be greatly enhanced as a result of the upgrades.

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There would be some impact to pedestrians and cyclists due to the slight increase in vehicle numbers; however, as mentioned previously the upgrades recommended would provide a safe thoroughfare for users.

Benefits

- Willow Way would be upgraded and the amenity of it in this area would be greatly improved
- Removal of the additional access on Casuarina Drive, providing more clarity around access

Risks/Disadvantages

- Vehicular and pedestrian traffic are combined, albeit in an improved setting to the previous arrangement
- Potential for other adjacent properties to request the use of Willow Way for vehicular access

The independent review of the Traffic Impact Assessment recommends that if access was provided that Willow Way is converted to a shared zone with it upgraded to be wider at the same level, with appropriate signage and pavement markings. If this were to occur, it would be at the cost of the developer and to satisfaction of the General Manager Infrastructure.

Summary

It is recommended that vehicular access to Willow Way is permitted subject to the upgrades listed being conducted by the developer at no cost to Council as detailed above. This is based on the amenity upgrade of the area and that it provides an outcome to meet the Council's, the developers, and the community's needs.

CONSULTATION PROCESS

In preparing this report, the following External Parties were consulted:

- Tonkin Consulting
- Developer – The developer has been kept informed of progression of the development conditions and this report through discussions on site and via email.

Council is not aware of any notification to surrounding properties, which would be required by the developer if the access was approved.

POLICY IMPLICATIONS

City of Darwin Policy No. 056 – Walkways: Council is committed to providing and maintaining a walkway network as part of a wider network that facilitates the movement of pedestrians and cyclists across the municipality.

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BUDGET AND RESOURCE IMPLICATIONS

No budget or resource implications are expected as a result of the decision made.

If a shared zone is decided on, then as it is required as a result of the development, the recommendation, as per normal process, is that the upgrade is at the cost of the developer. The Council could decide however, to contribute to a portion of the upgrade if it so desired. The cost of the upgrade would be in the order of \$30,000 for an asphalt replacement, kerb realignment and signage and marking. This could increase if concrete or different treatments are used.

The chain and bollards at the Aralia Street end of Willow Way will be replaced with bollards to allow cyclist access. This would be undertaken at Council's cost as it is unrelated to the development.

RISK/LEGAL/LEGISLATIVE IMPLICATIONS

There is a potential for the remaining three (3) lots with boundaries adjacent to Willow Way to request similar access to the lane potentially increasing the traffic significantly and preventing the use of Willow Way as a pedestrian thoroughfare.

ENVIRONMENTAL IMPLICATIONS

Additional traffic to Willow Way may impact the amenity of Willow Way for pedestrians.

COUNCIL OFFICER CONFLICT OF INTEREST DECLARATION

We the Author and Approving Officers declare that we do not have a Conflict of Interest in relation to this matter.

NADINE DOUGLAS
MANAGER TECHNICAL
SERVICES

LUCCIO CERCARELLI
GENERAL MANAGER
INFRASTRUCTURE

For enquiries, please contact Nadine Douglas on 8930 0417 or email:
 nadine.douglas@darwin.nt.gov.au.

Attachments:

- Attachment A:** Traffic Impact Assessment provided by the developer
- Attachment B:** Traffic Impact Assessment provided by independent reviewer
- Attachment C:** Development Plans
- Attachment D:** Council Submission to Development Application, July 2014

DRAFT

**Proposed 24 x 2 Bedroom
Multiple Dwelling in a 5
Storey Building, Lot 33
(286) Casuarina Drive,
Rapid Creek**

Draft 0.1

Prepared by i3 consultants WA for
Irwinconsult/ Makrylos Group
www.i3consultants.com






Project details

Project ID	23609
Client	Irwinconsult/ Makrylos Group
Description	A formal Traffic Impact Assessment (TIA) report for a 24 x 2 bedroom 5 storey residential development on Lot 33 Street No 286 Casuarina Drive in the Darwin suburb of Rapid Creek. It has been prepared in accordance with the Austroads document Guide to Traffic Management Part 12: Traffic Impacts of Developments (AGTM12) and follows the report structure provided as Appendix C of AGTM12.

Document Control

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Proposed 24 x 2 Bedroom Multiple Dwelling in a 5 Storey Building, Lot 33 (286) Casuarina Drive, Rapid Creek	www.i3consultants.com
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ABOUT THE AUTHOR

David Wilkins is an RTA NSW Certified Level 3 Lead Auditor (RSA-08-0178) and Main Roads Western Australia (MRWA) accredited Senior Road Safety Auditor (SRSA 0101). In addition to this, David is an MRWA accredited Crash Investigation Team Leader and Roadworks Traffic Manager (MRWA-RTM-10-RTM20). David has undertaken approximately 70 road safety audits in the last five years and 150 road safety audits since 2011 across the full range of stages from feasibility through to pre-opening, including roadworks, existing roads, schools and mine sites.

David's specialist skills are in the management and development of transport infrastructure and planning, particularly with respect to road safety engineering, roadworks traffic management, traffic engineering, crash investigation, road safety audits, alternative transport systems (TravelSmart, shared paths, cycle facilities), transport statements, transport assessments, parking demand management, local area traffic management, speed management, accessible environments and innovation.

David specialises in undertaking and preparing traffic impact assessments in accordance with either the WAPC document *Transport Assessment Guidelines for Development* ⁽¹⁾ or Austroads *Guide to Traffic Management Part 12: Traffic Impacts of Developments* ⁽²⁾.

A combination of Road Safety Auditing, Crash Investigation and Traffic Impact Assessment skills allows for the impact of traffic generating developments on the likely safety performance of the road network to be fully assessed within an appropriate risk management process.

I INTRODUCTION AND SUMMARY

This Traffic Impact Assessment (TIA) report has been prepared by i3 consultants WA (i3) for a 24 x 2 bedroom 5 storey residential development on Lot 33 Street No 286 Casuarina Drive in the Darwin suburb of Rapid Creek.

It has been prepared in accordance with the Austroads document *Guide to Traffic Management Part 12: Traffic Impacts of Developments (AGTM12)* (2) and follows the report structure provided as Appendix C of AGTM12.

I.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 the above key issues.

DRAFT

I.2. EXECUTIVE SUMMARY

I.2.1 SITE LOCATION AND STUDY AREA

The proposed development is on Lot 33 Casuarina Drive in the City of Darwin suburb of Rapid Creek (Town of Nightcliff). Its street address is 286 Casuarina Drive, Rapid Creek.

Geographic coordinates are: 130° 51' 7.5" E, 12° 22' 33.7" S (130.852, -12.376). UTM 701365, 863116 (Zone 52).

The Development Site and Study Area are shown in Figure 1 on page 9.

I.2.2 DEVELOPMENT DESCRIPTION

Lot 33 currently contains two residential structures. The structure closest to Casuarina Drive is a single dwelling accessed off Casuarina Drive and the structure at the rear contains four 2-storey multiple dwellings accessed off Willow Way that were approved in June 1984.

The current and proposed Development Site remain the same size, i.e. a 1,858 m² lot with a 30.48 m (100') frontage to Casuarina Drive and 60.960 m (200') 'frontage' to Willow Way. There is a 3 m wide easement within Lot 33 along its rear boundary.

The entire lot will be cleared and redeveloped in order to construct 24 x 2-Bedroom Multiple Dwellings in a Five (5) Storey Building with vehicular access off Willow Way.

The proposed Development Site also includes a swimming pool in the front setback and additional communal areas on a first floor landscaped deck. Also within the front setback area, is a single storey gymnasium.

Development Plans showing the scale and layout of the proposed development are included in **Appendix A**

I.2.3 TYPES OF STUDIES UNDERTAKEN

1. Peak weekday morning and afternoon traffic data;
2. Weekly traffic volume and speed data;
3. Survey of similar development nearby with respect to traffic generation;
4. 5 Year Crash Record;
5. Spreadsheet traffic volume models based on survey data; and
6. SIDRA Intersection 6 computer modelling of intersection performance and capacity criteria

1.2.4 PRINCIPAL FINDINGS

There are no concerns with accessing the site.

There are no identified concerns with operational performance of the road network in the vicinity of the Development Site.

There are no warrants or identified need for any improvements to the road network as a direct result of the proposed development.

The current design of the off-street parking area does not completely comply with the requirements of the *NTPS*⁽³⁾. The access arrangement also does not completely comply with the requirements of *AS/ NZS 2890.1*⁽⁴⁾. The improvements indicated in **Sections 6.3** would address these compliance issues.

1.2.5 CONCLUSIONS

There are no concerns with accessing the site.

There are no identified concerns with operational performance of the road network in the vicinity of the Development Site.

There are no warrants or identified need for any improvements to the road network as a direct result of the proposed development.

The current design of the off-street parking area does not completely comply with the requirements of the *NTPS*. The access arrangement also does not completely comply with the requirements of *AS/ NZS 2890.1*. The improvements indicated in **Sections 6.3** would address these compliance issues.

1.2.6 RECOMMENDATIONS

It is recommended that the design of the traffic and transport elements of the proposed development, as shown in the Development Plans included in **Appendix A**, are approved subject to the following improvements being implemented:

1. Provide for a 1.0 m minimum extension of the parking aisle between Bays 31 and 42 by either, or a combination of, reducing bay widths to 2.4 m and providing a clear overhang area, as discussed in Section 5.4.1 of this report;
2. Ensure that there are no objects above 300 mm, including landscaping items other than 100 mm maximum diameter tree trunks, within the sight triangles shown in Figure 24 on page 38 of this report;
3. Consider relocating the Refuse Bin Store away from the *LATM* device in Casuarina Drive and hence closer to Willow Way; and
4. Consider removing the path from Willow Way and providing a 'shared space' laneway in accordance with the relevant standards and guidance.

2 PROPOSED DEVELOPMENT

The location of the Development Site and the *TIA* Study Area is shown in Figure 1 and Figure 2 respectively.

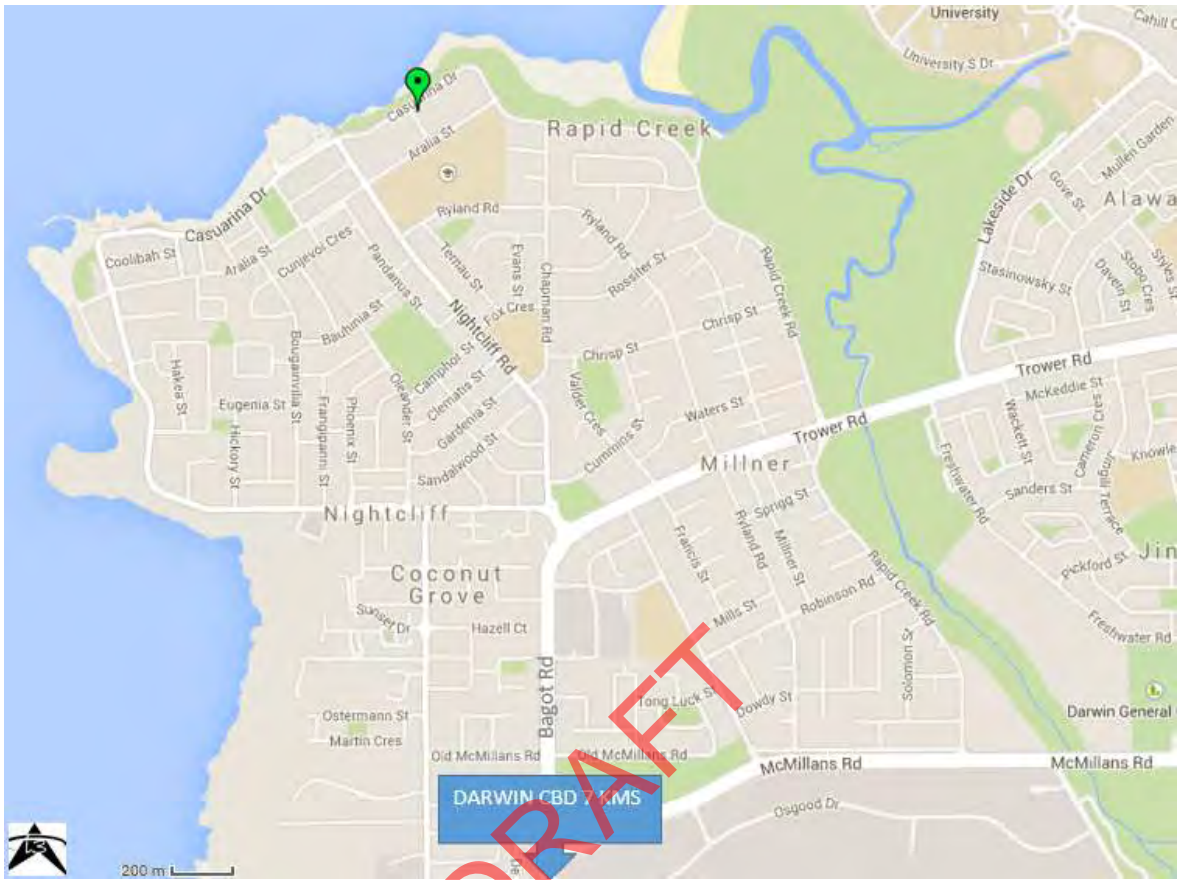


Figure 1 – Location of Development Site



Figure 2 – *TIA* Study Area

2.1. OFF-SITE (OR BACKGROUND) DEVELOPMENT

Lot 33 currently contains two residential structures. The structure closest to Casuarina Drive is a single dwelling accessed off Casuarina Drive and the structure at the rear contains four 2-storey multiple dwellings accessed off Willow Way that were approved in June 1984 ⁽⁵⁾ (refer Photograph 1 and Photograph 2).



Photograph 1 – Background development (Aerial 5th July 2014)



Photograph 2 – Background development (looking southeast from Casuarina Dr)

2.2. DESCRIPTION OF ON-SITE DEVELOPMENT

2.2.1 LAND USE AND INTENSITY

As indicated in **Section 2.1**, Lot 33 currently contains residential dwellings, 1 in a one-storey building at the front of the lot and 4 in a two-storey building at the rear of the lot.

The current and proposed Development Site remain the same size, i.e. a 1,858* m² lot with a 30.48 m (100') frontage to Casuarina Drive and 60.960 m (200') 'frontage' to Willow Way, as shown in an extract from the Survey Plan 1169 in Figure 3. There is a 3 m wide easement within Lot 33 along its rear boundary.



Figure 3 – Lot 33 dimensions (Source: Survey Plan 1169)

* Both the NT on-line Atlas and the Survey Plan indicate a metric area of 1,850 m² which is not consistent with the indicated imperial dimensions or area of Lot 33. The assessed metric area based on the indicated imperial measurements is 1,858 m².

The entire lot will be cleared and redeveloped in order to construct 24 X 2-Bedroom Multiple Dwellings in a Five (5) Storey Building with vehicular access off Willow Way.

The proposed Development Site also includes a swimming pool in the front setback and additional communal areas on a first floor landscaped deck. Also within the front setback area, is a single storey gymnasium.

Development Plans showing the scale and layout of the proposed development are included in **Appendix A**. 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 33 Casuarina Drive in the City of Darwin suburb of Rapid Creek (Town of Nightcliff). Its street address is 286 Casuarina Drive, Rapid Creek.

Geographic coordinates are: 130° 51' 7.5" E, 12° 22' 33.7" S (130.852, -12.376). UTM 701365, 863116 (Zone 52).

2.2.3 SITE PLANS

A full set of Development Plans is included as **Appendix A** and comprises of the following Makrylos/ ArchidiomDesign Development Application Drawings:

Title	Drawing No	Date	Revision Number
Ground Floor	DA-2.00	14/01/14	C
Level 1	DA-2.01	14/01/14	B
Level 2-4	DA2.02	14/01/14	B
Roof Plan	DA-2.03	14/01/14	A
North + West Elevations	DA-3.00	14/01/14	C
Sections	DA-3.01	14/01/14	B
Perspectives	DA-4.00	14/01/14	C

Table 1 – Development Drawings

2.2.4 ZONING

The site is Zoned MR (Medium Density Residential) and a five storey building is prohibited under the *Northern Territory Planning Scheme* (3) (NTPS) in Zone MR. For this reason, a Development Application (DA) has been lodged as an Exceptional Development Permit (EDP).

Current zoning in the vicinity of the Development Site is shown in Figure 4.

There is Medium Density Residential (MR) for the entire area bounded by Casuarina Drive, Jacaranda Avenue and Aralia Street with Community Purposes (CP) on the opposite side of Aralia Street that contains Nightcliff Middle School. There is an area of Organised Recreation (OR) on the northwest side of Casuarina Drive between Jacaranda Avenue and Nightcliff Road that contains the Nightcliff Public Swimming Pool.

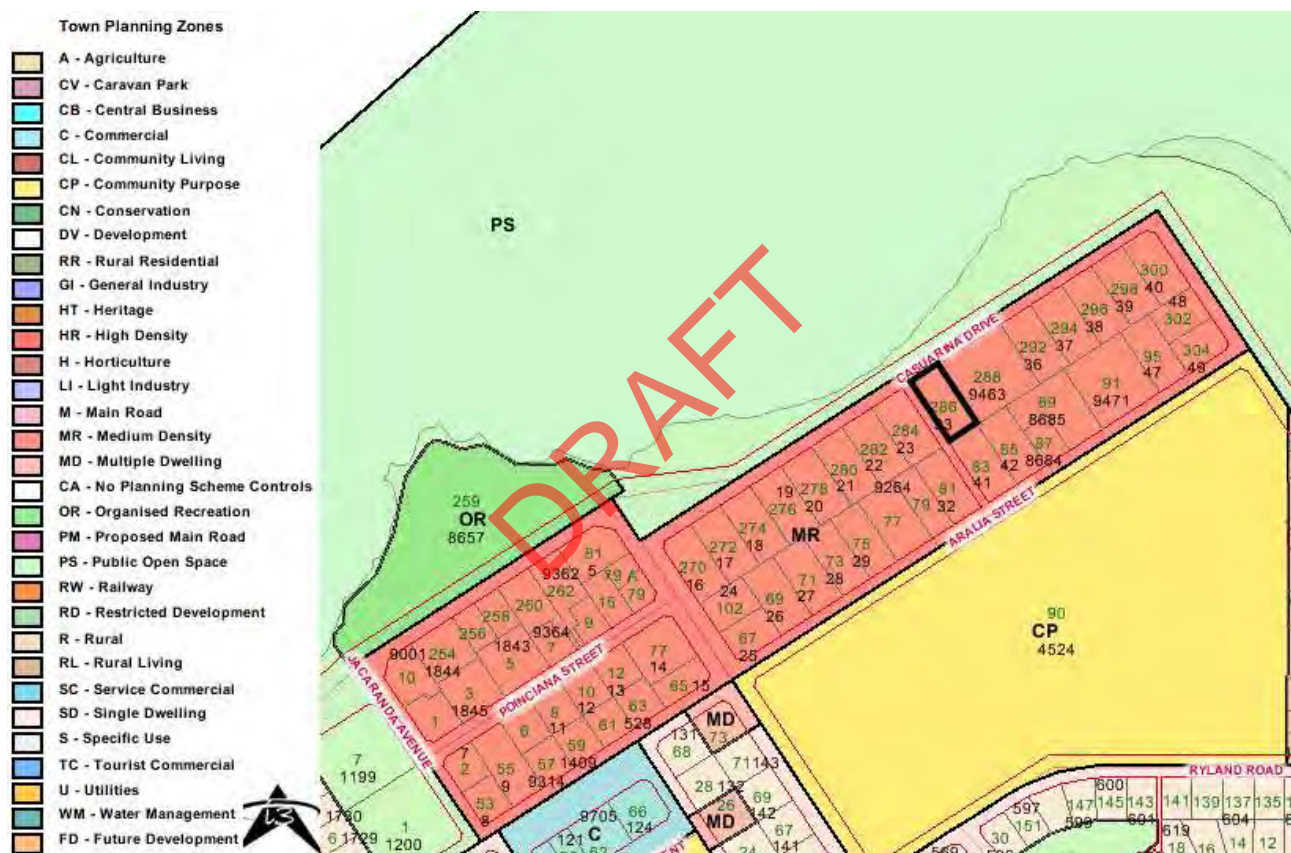


Figure 4 – Current zoning in the vicinity of the Development Site

2.2.5 PHASING AND TIMING

The development is expected to be completed in 2015 in a single stage. This TIA has been prepared based on a forecast *Horizon Year* of 2025, i.e. a 10 Year Horizon.

3 EXISTING AREA CONDITIONS

3.1. STUDY AREA

The development is expected to generate up to 8 additional trips during its peak hour (refer **Section 4**). Accordingly, the traffic impact is considered to be low[†]. The following comments are, therefore to be considered in the context of an overall low impact on the road network.

3.1.1 AREA OF INFLUENCE

The greatest impact of the development is expected to be vehicular traffic along Willow Way.

Willow Way is 7.5 metres wide, with 2 metres dedicated to a raised concrete footpath and adjoining sealed area. Whilst the laneway is a gazetted road, Willow Way currently functions predominantly as a pedestrian access way between Aralia Street and Casuarina Drive. The laneway is blocked to vehicular traffic between Aralia Street and Casuarina Drive by bollards, as shown in Photograph 3.



Photograph 3 – ‘Closure’ of Willow Lane near the rear boundary of Lot 33

The Casuarina Drive end of the laneway is open. The laneway is currently being used for vehicular access to four existing units at the rear of Lot 33, as per approval provided in June 1984.

The intersection of Willow Way with Casuarina Drive is also expected to be impacted due to the increased traffic on Willow Way. Refer **Sections 3.1.2** and **4** for further details regarding this.

It should also be noted that there is an existing vehicular access to Lot 33 off Casuarina Drive that will be removed as part of the redevelopment as all vehicular access will be off Willow Way. This eliminates an existing pedestrian/ vehicular and vehicular/ vehicular conflict point from Casuarina Drive along the Lot 33 frontage without adding another as the Willow Way/ Casuarina Drive access is an existing and proposed pedestrian/ vehicular and vehicular/ vehicular conflict point.

[†] Developments that generate less than 10 trips during the peak hour are considered to be ‘**low**’ impact. Between 10 and 100, ‘**moderate**’ and over 100 ‘**significant**’.

Accordingly, the Study Area for this *TIA* comprises the section of Willow Way between Casuarina Drive and the rear boundary of Lot 33 (i.e. its vehicular closure point) and the section of Casuarina Drive between Lots 22 and 36 as shown in Figure 2 on page 9.

3.1.2 AREA OF SIGNIFICANT TRANSPORTATION IMPACT

On the basis of the above, it is reasonable to assume that the area of greatest transportation impact will be along Willow Way as this laneway is expected to experience an increase in traffic associated with an increase in residential dwellings from the existing 4 accessed off Willow Way to the proposed 24 accessed off Willow Way, i.e. an increase of 20 residential dwellings accessed off Willow Way.

The City of Darwin and the *Northern Territory Government (NTG)*'s *Department of Transport (DoT)* generally require that a detailed assessment of intersections is required when the forecast impact of a proposed development generates more than 5% of the volume of any intersection within the Area of Influence of the proposed development in terms of the road network. Accordingly, the identification of intersections requiring detailed assessment is included in **Section 4** (Projected Traffic).

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3.2. STUDY AREA LAND USE

3.2.1 EXISTING LAND USES

Lot 33 currently contains 5 residential dwellings, 1 in a one-storey building at the front of the lot and 4 in a two-storey building at the rear of the lot.

Lot 9463 (SN 288) Casuarina Drive on the northeast side of Lot 33 contains a 4 storey 32 unit residential development known as “288 Northpoint”, as shown in Photograph 4.



Photograph 4 – Lot 4963 SN 288 Casuarina Drive “288 Northpoint”

Lot 23 (SN 284) Casuarina Drive on the northeast side of Willow Way contains 4 x 2 bedroom ‘townhouses’ with direct vehicular access off Casuarina Drive adjacent to Willow Way.

3.2.2 EXISTING ZONING

The existing zoning within the Study Area is MR (Medium Density Residential).

Section 5.3 of the *NTPS* indicates that:

1. *The primary purpose of Zone MR is to provide for a range of housing options to a maximum height of four storeys above ground level.*
2. *The availability or future availability of services, size of lots and proximity to major roads, schools and other community facilities should be sufficient to support multiple dwelling residential development.*
3. *The scale, character and architectural style of infill development should be compatible with the streetscape and surrounding development.*

As indicated in **Section 2.2.4**, a Development Application (*DA*) has been lodged as an Exceptional Development Permit (*EDP*) as the proposed development is five storeys above ground level.

Proposed 24 x 2 Bedroom Multiple Dwelling in a 5 Storey Building, Lot 33 (286) Casuarina Drive, Rapid Creek	www.i3consultants.com
Traffic Impact Assessment Draft 0.1	Page 16 of 50

3.2.3 ANTICIPATED FUTURE DEVELOPMENT

The NTG published the following notice in the NT News on 2nd February 2012:

PA 2012/0019: *Greater Darwin Plan*

The Minister for Lands and Planning is seeking comment on a proposal to amend the NT Planning Scheme to:

- Include the *Greater Darwin Plan* as policy
- to amend the existing Darwin Planning Principles
- and land Use framework to reflect this policy

An extract of the Darwin Northern Suburbs Concept Plan contained within the *Greater Darwin Plan (GDP)* ⁽⁶⁾ is provided as Figure 5.



Figure 5 – Extract from Darwin Northern Suburbs Concept Plan

The *GDP* indicates that Lot 33 and adjacent residential lots are to be retained as Urban Development but included in an “Activity centre study area” and that there will be a “Local Activity Centre” in the vicinity of the intersection of Nightcliff Road with Casuarina Drive.

The *GDP* supports infill development through residential densification, particularly on underutilised land and land in and around activity centres ⁽⁶⁾.

There are no other known developments within the *Study Area* at the time of preparation of this report.

3.3. SITE ACCESSIBILITY

Vehicular (including bicycle) access to the Development Site is proposed via Willow Way as shown in Figure 6.



Figure 6 – Overlay of proposed access with existing aerial photograph of Casuarina Drive and Willow Way

Pedestrian access is via a lobby off Willow Way approximately 30 m from Casuarina Drive and 90 m form Aralia Street. Separation of vehicular and pedestrian access points is desirable for safety reasons and has been provided.

The access routes between the arterial road network (i.e. Trower Road and Bagot Road) and Collector Road Network (i.e. Casuarina Drive and Nightcliff Road) and the Development Site are shown diagrammatically in Figure 7 on the following page.

There are no bus services along Casuarina Drive. The nearest bus stops and services are along Aralia Street and Ryland Road. Refer **Section 3.3.3** for more details regarding public transport services and **Section 3.3.4** (i.e. Figure 12 on page 26) for details of pedestrian facilities between the Development Site and the nearest bus stops.

Cyclists can access the Development Site via the main entrance or the Car Park entrances off Willow Way. There is an off-road shared path along the coast side of Casuarina Drive that forms the main cycle route along this road. Refer **Section 3.3.4** for more details regarding pedestrian and cycle access.



Figure 7 – Vehicular Access routes to and from the **Arterial** and **Primary Collector Road** network

Refer **Section 5.1** (Site Access) for a more detailed assessment of proposed access arrangements.

3.3.1 AREA ROADWAY SYSTEM

3.3.1.1 EXISTING

Figure 7 on the previous page has been prepared based on the City of Darwin's *Road Classification Plan* (7).

Figure 7 shows that the arterial road network in the vicinity of the Development Site is made up of Bagot Road (south) and Trower Road (East). It also shows that Casuarina Drive, Nightcliff Road and Progress Drive are Primary Collector Roads and that Aralia Street and Ryland Road are Secondary Collector Roads providing connectivity to the Primary Collector and Arterial Roads. Willow Way is a local road.

Casuarina Drive consists of a single 10 m to 12 m wide sealed and kerbed carriageway on a curvilinear alignment with sixteen Local Area Traffic Management (LATM) devices (i.e. chicanes, humps and bends) as indicated in Figure 8. It is currently subject to a 50 km/h posted speed limit. The majority of the adjacent land use is residential on the inland side with a hotel/ bar east of Chapman Road. The foreshore side is recreational and includes recreational areas, paths, parking, the Nightcliff Jetty and the Nightcliff Aquatic Centre. A typical cross section in the vicinity of the development site, with a LATM device, is shown in Photograph 5.



Figure 8 – Current Posted Speed Limits, most recent 85th percentile speeds and LATM devices on the Progress Drive- Casuarina Drive- Rapid Creek Road 'coastal drive' route



Photograph 5 – looking southwest (driver’s eye view) Casuarina Drive just northeast of Lot 33 (note Willow Way on left where U rail is shown)

Willow Way is 7.5 metres wide, with 2 metres dedicated to a raised concrete footpath and adjoining sealed area. Whilst the laneway is a gazetted road, Willow Way currently functions predominantly as a pedestrian access way between Aralia Street and Casuarina Drive. The laneway is blocked to vehicular traffic from Aralia Street by bollards as shown in Photograph 6.



Photograph 6 – ‘Closure’ of Willow Lane near the rear boundary of Lot 33

The Casuarina Drive end of the laneway is open. The laneway is currently being used for vehicular access to the four existing units at the rear of Lot 33, as per approval provided in June 1984.

3.3.1.2 FUTURE

There are no known proposals for changes to the road network in the vicinity of the Development Site.

The *Greater Darwin Plan* indicates that both Bagot Road and Trower Road are to be considered as 'Transit Corridors' (refer Figure 5 on page 17). It does not define what is meant by a Transit Corridor but does advocate "the development of rapid transit services that could include bus and/or light rail when demand warrants". It is therefore assumed that this refers to the 'Transit Corridors'.

As the *Greater Darwin Plan* is a long term strategic plan, has not been adopted to date or supported by the current government, 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 2025 for this TIA.

3.3.2 TRAFFIC VOLUMES AND CONDITIONS

i3 obtained traffic volume and speed data for Casuarina Drive in the vicinity of the Development Site, i.e. outside Lot 9436 which is adjacent Lot 33 on the north side. Full details are included in **Appendix B**. A summary of the data is provided as Table 2 and Figure 9.

Combined Summary	Weekday		Saturday		Sunday	
	Time	Volume	Time	Volume	Time	Volume
AM Peak Hour	11 – 12	91	11 – 12	149	11 – 12	234
PM Peak Hour	18 – 19	228	17 – 18	250	18 – 19	293
Directional ratio	SW-bound	NE-bound	SW-bound	NE-bound	SW-bound	NE-bound
	42%	58%	32%	68%	38%	63%
	38%	62%	34%	66%	35%	65%
Speeds (km/h)	85%ile	95%ile	Median			
	SW-bound	40.3	44.3	34.6		
	NE-bound	38.5	42.1	33.5		

Table 2 – Casuarina Drive near Lot 33 Traffic Volume and Speed Data Summary

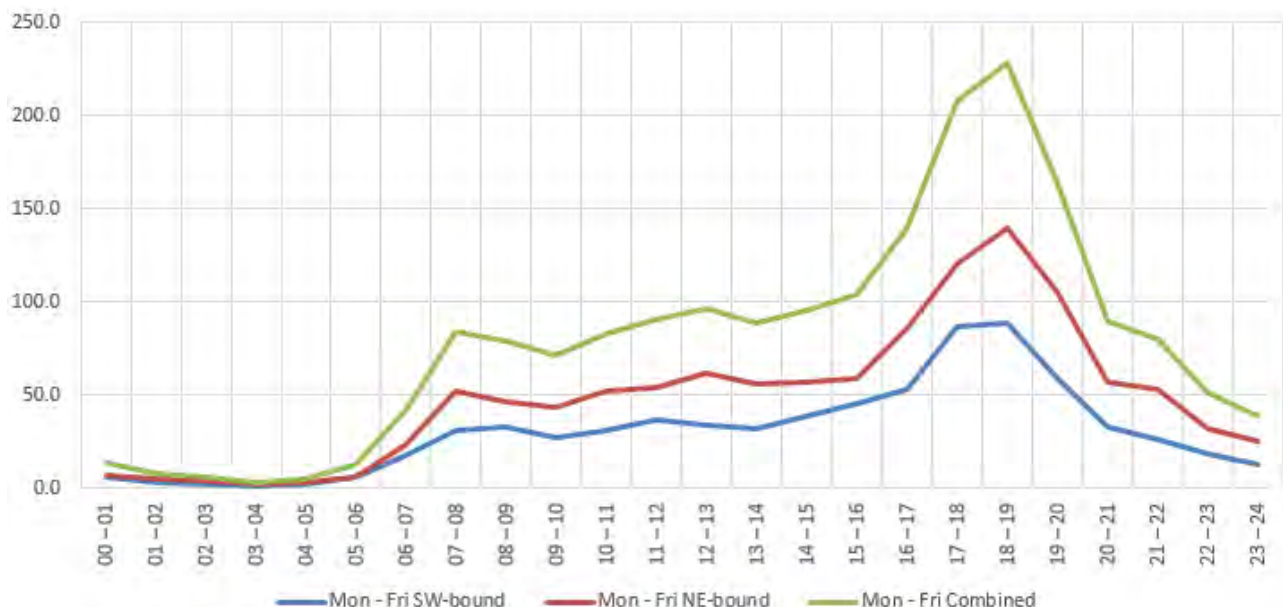


Figure 9 – Casuarina Drive near Lot 33 weekday traffic volume hourly profile

The traffic survey data indicates that peak hour volumes on Casuarina Drive in the vicinity of the development site have different peak hour periods to the general road network weekday peak hours in Darwin, i.e. general road network weekday peak hours in Darwin are 7.30-8.30 AM and 4.30-5.30 PM but the weekday peak hours on Casuarina Drive are 11 AM to 12 noon and 6.00-7.00 PM. Observations on site are that this is most likely due to the recreational attractors along Casuarina Drive that make it a pleasant destination during lunch and after work.

The recorded daily traffic volume on Casuarina Drive of less than 2,000 vehicles on a weekday is well within the functional capacity of this Primary Collector Road (i.e. 3,000 vehicle per day – based on Table 4.1 of *Liveable Neighbourhoods* (8)). The recorded 85thile speeds[‡] of around 40 km/h are 10 km/h less than the posted speed limit and reflect the effectiveness of the *LATM* device located in Casuarina Drive just north of the development site, as shown in Photograph 5 on page 21.

Traffic volumes in Willow Way are low as they provide vehicular access to the 4 two-bedroom units at the rear of the current development site only.

Refer **Section 5.3** for road and community safety comments.

3.3.3 PUBLIC TRANSPORT SERVICES

There are no bus services along Casuarina Drive. The nearest bus stops and service (#4) are along Aralia Street and Ryland Road.

The locations of the nearest bus stops to the Development Site are shown in Figure 10. The frequency and details of Darwin Bus Service #4 is shown in Table 3 on the following page.

[‡] The “85thile” or “85th percentile” speed is a major parameter used by traffic engineers and transport planners. Many standards (e.g. AS1742.3^{Invalid source specified.}) and traffic engineering textbooks define the 85thile speed as “**The speed at or below which 85% of all vehicles are observed to travel under free flowing conditions past a nominated point.**” Note the term “free flowing” in the definition.



Figure 10 – Nearest bus stops to the Development Site

Service		Weekday Frequency to Darwin		Weekday Frequency from Darwin	
		7-9 AM	4-6 PM	7-9 AM	4-6 PM
4	Darwin to Casuarina and return via Charles Darwin University, Alawa, Rapid Creek, Nightcliff and Fannie Bay (Monday to Sunday including public holidays)	7	8	6	8

Table 3 – Frequency and details of weekday peak period bus services in vicinity of the Development Site

The areas served by Darwin Bus Service #4 are shown in the extract from the Darwin Bus Map provided as Figure 11 on the following page.

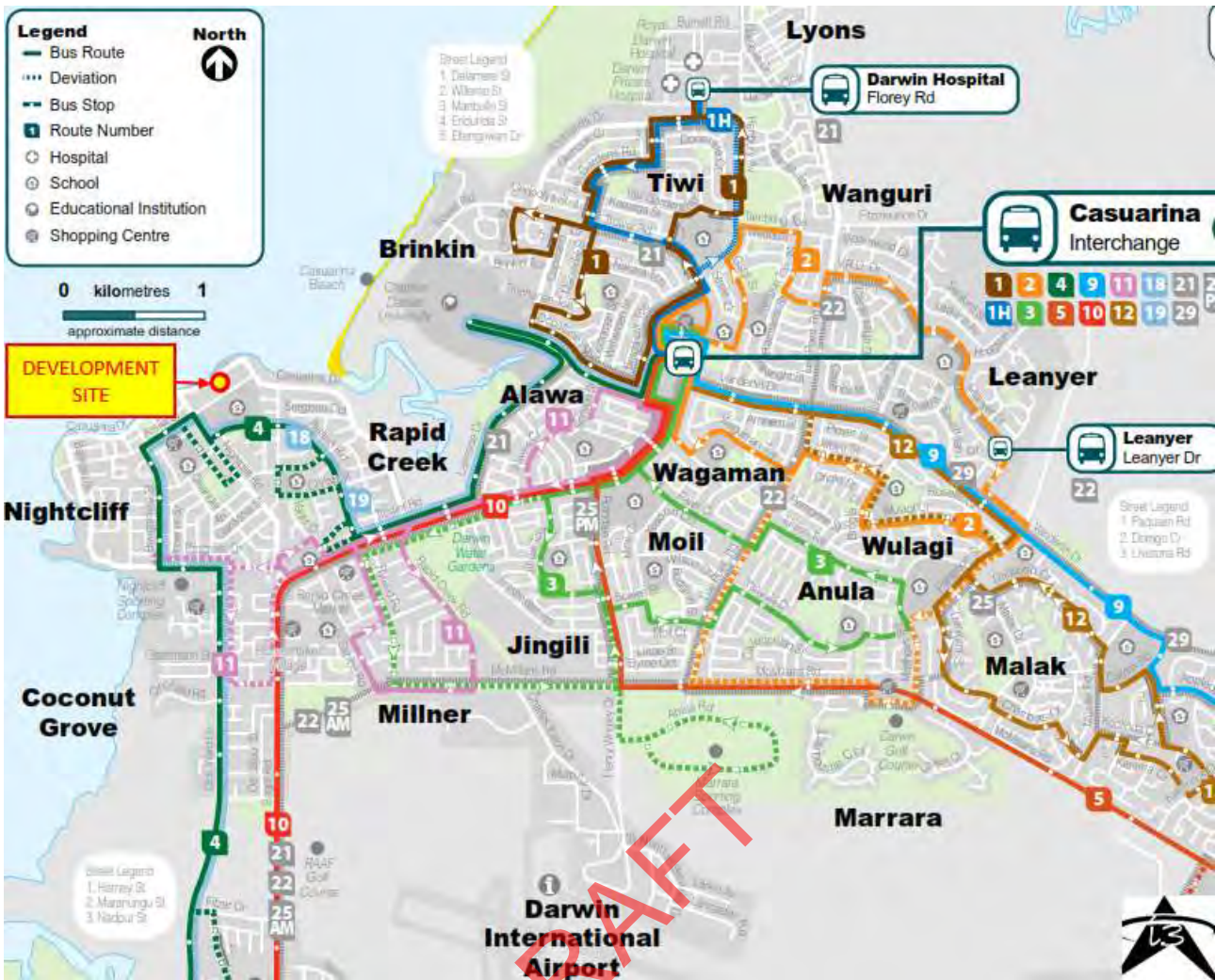


Figure 11 – Extract from Darwin Bus Map showing Bus Service 4 route and Development Site

3.3.4 PEDESTRIANS AND CYCLISTS

Figure 12 on the following page shows the shared paths and paths in the immediate vicinity of the Development Site including to and from the nearest bus stops on Aralia Street and Ryland Road.

Figure 13 on the following page is an annotated extract from the *Darwin Region Cycling and Walking Map* (www.transport.nt.gov.au). It shows the main pedestrian and cycle network in the vicinity of the Development Site.



Figure 12 – Shared Paths and Paths in immediate vicinity of Lot 33 SN 286 including to nearest bus stops



Figure 13 – Major Pedestrian and Cycle Routes in vicinity of the Development Site

There is an off-road shared path along the ‘outside’ of the entire Progress Dr-Casuarina Dr-Rapid Creek Rd route that passes the development site and hence provides excellent cycle and pedestrian access to and from the CBD and suburbs south, north and east of the Development Site. The shared path distance between the Development Site and McMinn Street (i.e. the CBD) is 12.5 kilometres, a 40 minute cycle ride.

4 PROJECTED TRAFFIC

4.1. SITE TRAFFIC (EACH HORIZON YEAR)

The development is expected to be completed in 2015. Accordingly, a *Horizon Year* of 2025 has been selected to reflect full occupancy and to determine whether further development in Rapid Creek and Nightcliff 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." The RTA's Land Use Traffic Generation - Data was updated through the issue of the Roads and Maritime Services (RMS) Technical Direction *Guide to Traffic Generating Developments Updated traffic surveys (TDT 2013/ 04a)* ⁽¹⁰⁾.

In accordance with the above statements, traffic generation for the residential component has been estimated taking into account trip generation rates established from previous surveys undertaken by i3 at a multiple residential development on Dick Ward Drive near Progress Drive (i.e. 'Seabreeze' 15 Unit Development at 171 Dick Ward Drive). Locally derived rates are preferable to those applying elsewhere as they take into account observed and actual practices at similar developments with similar attractors and generators.

Whilst this *TIA* is for the development on Lot 33 Casuarina Drive, there is little relevance in assessing the traffic impact of this development for the indicated *Horizon Year* of 2025 without considering traffic generated by increased developments on other lots in Rapid Creek and Nightcliff that are likely to generate additional traffic from now until 2025.

As indicated in **Section 3.2.3**, there is expected to be increased development density in the vicinity of Casuarina Drive and Nightcliff Road as the result of the promotion of the area as an Activity Centre. At this stage, it is difficult to determine exactly what this increased development would be but it is possible to make an allowance for this by increasing background traffic on Casuarina Drive at a rate of 2% per annum for the 10 year Horizon Period.

Based on the local surveys, it has been determined that the rates in Table 4 (representing the highest rates and the average IN/ OUT split of those surveyed) are the appropriate rates to use for the proposed development.

The rates in Table 4 are comparable to those in the *RMS Technical Direction TDT 2013/04a*, i.e. 0.4-0.5 per dwelling (Section 3.3.2: Medium density residential flat building Weekday peak hour vehicle trips ⁽⁹⁾). The adopted rates reflect Darwin characteristics instead of NSW characteristics,

i.e. earlier employment and school start times spreading the morning peak hour over two hours instead of one.

Percentages of traffic to or from the Central Business District (CBD) are based on the recorded destinations at the Seabreeze Development as the northbound/ southbound percentages recorded on Casuarina Drive are considered to be reflective of recreational origins and destinations and not workplace and/ or school origin and destinations.

	AM PEAK						PM PEAK					
	FROM CBD IN	FROM OTHER IN	TO OTHER OUT	TO CBD OUT	PEDS IN	PEDS OUT	FROM CBD IN	FROM OTHER IN	TO OTHER OUT	TO CBD OUT	PEDS IN	PEDS OUT
'Seabreeze' 15 Unit Development 171 Dick Ward Drive	0	0	2	2	0	4	2	2	0	0	3	0
Equivalent rate per unit (2 bedrooms)	0.00	0.00	0.13	0.13	0.00	0.27	0.13	0.13	0.00	0.00	0.20	0.00
	0.00		0.27		0.27		0.27		0.00		0.20	
	0.27						0.27					
RMS 2013 Guide - Rate per unit							0.22 - 0.42					
ITE Guide - rate per dwelling (Mid-Rise Apartment)	0.30						0.39					
	IN			OUT			IN			OUT		
	31%			69%			58%			42%		
	0.09			0.21			0.23			0.16		

Table 4 – Adopted & RMS Trip Generation Rates

By applying the adopted trip generation rates from Table 4, the proposed 24 unit residential development is expected to generate around 10 trips in each of the morning and afternoon peak hours as shown in Table 5. Note that Table 5 shows 24 x 2 bedroom units and hence ignores the existing four 2 bedroom units on the lot that are accessed off Willow Way that will be demolished and replaced with the 24 unit development, i.e. the 'impact' is that associated with 20 additional units not 24 units which equates to 8 additional trips, not 10.

Table 5 shows that the total Development Site trips can in turn be broken down into 3 trips IN and 7 trips OUT during the morning peak hour and 6 trips IN and 4 trips OUT during the afternoon peak hour. Hence the impact of the proposed development on Lot 33 is assessed as 'low'.

ADOPTED RATES	AM PEAK HOUR				PM PEAK HOUR			
	0.40				0.40			
	IN		OUT		IN		OUT	
	0.12		0.28		0.23		0.17	
	FROM CBD	FROM OTHER	TO OTHER	TO CBD	FROM CBD	FROM OTHER	TO OTHER	TO CBD
	35%	65%	35%	65%	57%	43%	43%	57%
2 BEDROOM UNITS	24				24			
EQUIVALENT TRIPS (ROUNDED UP)	10				10			
	3		7		6		4	
	2	2	3	5	4	3	2	3

Table 5 – Forecast Development Site Trips

4.1.2 TRIP DISTRIBUTION (IN/ OUT SPLIT)

Trip Distribution is based on the recorded IN/ OUT split at the Seabreeze Development.

4.1.3 MODAL SPLIT

Percentages of traffic to or from the *CBD* are based on the recorded destinations at the Seabreeze Development as the northbound/ southbound percentages recorded on Casuarina Drive are considered to be reflective of recreational origins and destinations and not workplace and/ or school origin and destinations.

4.1.4 TRIP ASSIGNMENT

Trip assignment has been determined by applying the surveyed origin/ destination directions of 'to or from *CBD*' and 'to or from other' locations to the existing road layout and proportioning this traffic according to the attractiveness of the route options. This is shown in Figure 7 on page 19 (trip routes) and Figure 14 in **Section 4.3** (trip volumes).

4.2. THROUGH TRAFFIC (2025)

As indicated in **Section 3.3.2**, it is considered appropriate to increase the surveyed traffic volumes on Casuarina Drive by 2% per annum to the 2025 Horizon Year in order to make provision for increased traffic volumes as the result of the desire to create an Activity Centre in the vicinity of the Development Site which would presumably result in increased residential densities and more shops, restaurants and café's. The Casuarina Drive PM peak hour of 6.00-7.00 PM has also been used despite the development's PM Peak Hour being 4.30-5.30 PM. This allows for an assessment to be made of the 'worst case' scenario, i.e. the Development's PM Peak Hour coinciding with the Casuarina Drive PM Peak Hour.

4.3. TOTAL TRAFFIC (2025 HORIZON YEAR)

The forecast total traffic, i.e. surveyed traffic volumes **plus** 2% per annum growth on Casuarina Drive to 2025 **plus** development generated traffic, for each assessed peak hour during the 2025 *Horizon Year* is shown in Figure 14 on the following page.

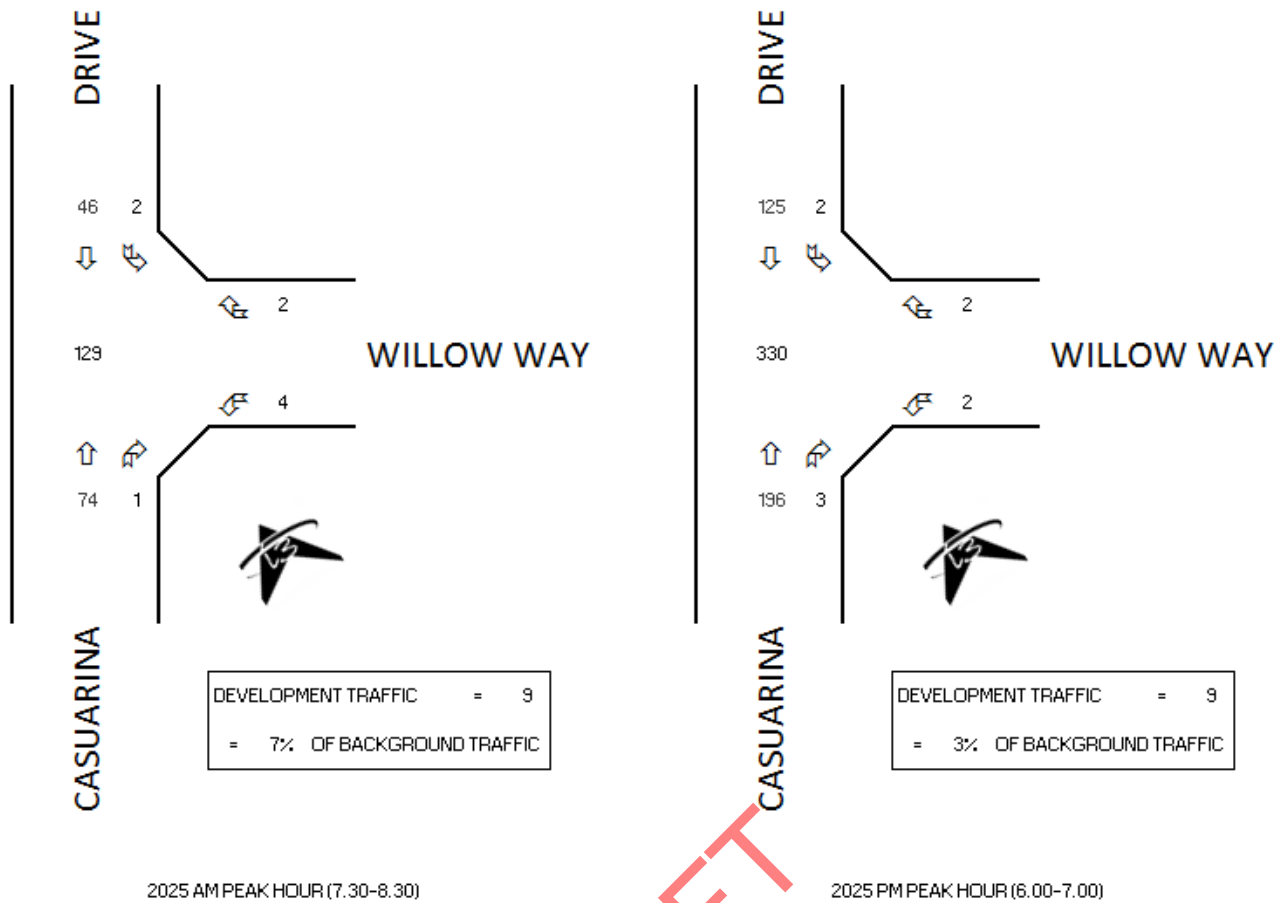


Figure 14 – Forecast AM and PM Weekday Peak Hour – Total Traffic 2025

Figure 14 indicates that the Development Generated Traffic is between 3% and 7% of the total intersection volume. It is generally accepted that where the impact is greater than 5% of the intersection volume that detailed assessment of likely intersection performance is undertaken. Accordingly, this is has been done and is included in **Section 5**.

5 TRANSPORTATION ANALYSIS

5.1. SITE ACCESS

The City of Darwin has indicated the following concerns with site access (5):

“The proposal will increase vehicular access from the current four (4) units to 24 units, a significant increase in vehicular movements down the laneway. The increase in vehicular movements would also warrant a two-way access/ crossover, which would require the removal of the existing raised footpath section running down the southern side of the lane.”

“A thorough assessment of the likely impacts this may have on pedestrian safety were not able to be undertaken during the public comment period. Therefore direct access from Willow Way has not been supported in comments to the Consent Authority at this time.”

The laneway is predominantly used as a pedestrian thoroughfare and not for vehicles. It is recommended that Council consider not supporting the proposal until further investigations are undertaken into the safety and practicality of it being used as a shared use zone for vehicles and pedestrians.”

Willow Lane currently provides vehicular access to 4 x 2-bedroom residential units. Based on the trip generation rates shown in Table 4 on page 28, this results in an average of 2 vehicular trips each peak hour down Willow Lane south of Casuarina Drive. The development is forecast to generate an average of 10 vehicular trips each peak hour, an increase of 8 vehicle trips or 1 vehicle trip every 7.5 minutes. A Laneway such as Willow Way can be expected to accommodate around 30 trips each peak hour (Table 4 *Liveable Neighbourhoods*) and hence whilst the forecast increase in terms of trip volume percentage can be considered significant, this is due to the very low current volumes and does not reflect on the capacity of the Laneway to adequately accommodate the forecast increase.

The Survey Plan indicates that Willow Way is 25 feet wide which equates to 7.62 metres. The existing raised path along Willow Way is located on the southwest side, i.e. the opposite side to the Development Site and is 2.0 m wide, leaving an existing carriageway width of 5.62 m.

Figure 24 in *Liveable Neighbourhoods* (8) makes provision for ‘Laneways’ to be provided with widths of between 3 m to 6.1 m, as shown in Figure 15 on the following page. It is noted however, that these laneways are constructed a shared laneways, i.e. there is no separate path provided, pedestrians share the space with vehicles. This is similar to Magdalene Court in Malak although this consists of a 5.5 m sealed carriageway within an 8.5 m road reserve.

Willow Lane does not need to be widened from 5.5 m to accommodate two-way flow as suggested by the City of Darwin. As indicated in **Section 4**, Willow Way is expected to accommodate up to 10 trips during its peak hour. Clause 3.2.2 of AS/ NZS 2890.1 (4) states that:

“Where the circulation roadway leading from a Category 1 access driveway is 30 m or longer, or sight distance from one end to the other is restricted, and the frontage road is an arterial or sub-arterial road, both the access driveway and the circulation roadway for at least the first 6 m from the property boundary shall be a minimum of 5.5 m wide. In other cases subject to consideration of traffic volumes on a case-by-case basis, lesser widths, down to a minimum of 3.0 m at a domestic

property, may be provided. As a guide, 30 or more movements in a peak hour (in and out combined) would usually require provision for two vehicles to pass on the driveway, i.e. a minimum width of 5.5 m. On long driveways, passing opportunities should be provided at least every 30 m.”

It is important to not arrive at an immediate conclusion that increased vehicle trips results in a reduction in safety as low vehicular traffic volumes can, in some instances, reduce the expectations of conflict with vehicles for pedestrians and hence pedestrians can take less care. Road and community safety issues are discussed in greater detail in **Section 5.3**.

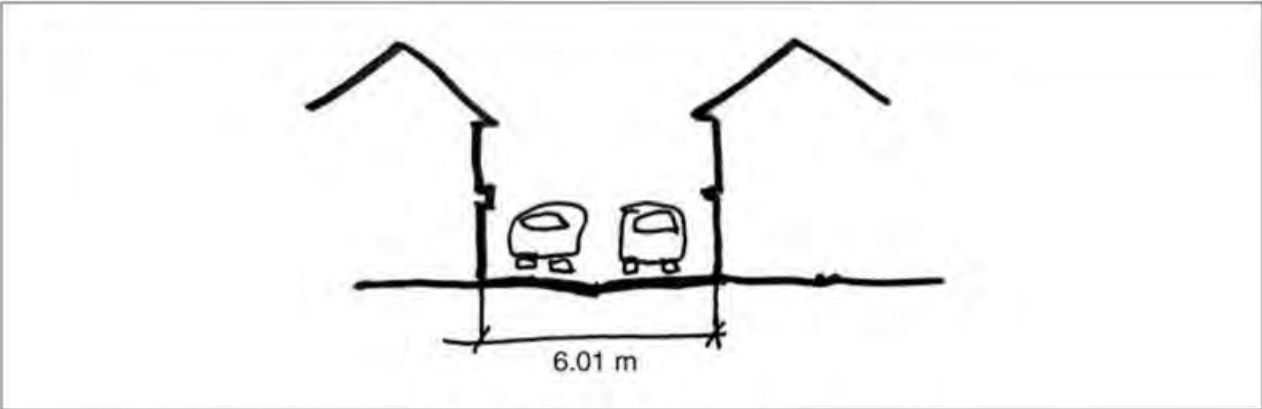


Figure 24: Laneway – for rear vehicle access – Target speed 15 km/hr.

Two-way. Normally no parking. Normally central-invert drainage. Wide enough to allow vehicle access into garages located on the property boundary. Studio units above garages. In some circumstances, studios may have balconies projecting over the lane, provided that they are a minimum of 2.7 m above the pavement. Pavement may be narrowed to 3 m or 5 m at laneway entries. This improves sightlines to footpaths.

Figure 15 – *Liveable Neighbourhoods* ‘Laneway’ characteristics

The Development Plans included in **Appendix A** do not show the intended treatment of Willow Way, however, the associated Landscaping Plans do. An annotated extract from the Landscaping Plans showing the proposed Willow Way treatment has been prepared by i3 and is provided as Figure 19.



Figure 16 – Willow Way: Proposed Layout

The critical element with the determination of an appropriate carriageway width, assuming that a separate 2.0 m wide Path is retained, is the ability of vehicles to enter and exit each of the two vehicular access points without encroaching onto the path. The appropriate design vehicle to use for this is the B99 Design Vehicle, as described in Australian Standard *AS/ NZS 2890.1* ⁽⁴⁾. An assessment of the swept paths of the B99 Design Vehicle has been undertaken by *i3* and is shown as Figure 17. This demonstrates that all B99 movements, including IN and OUT of Casuarina Drive can be easily accommodated.

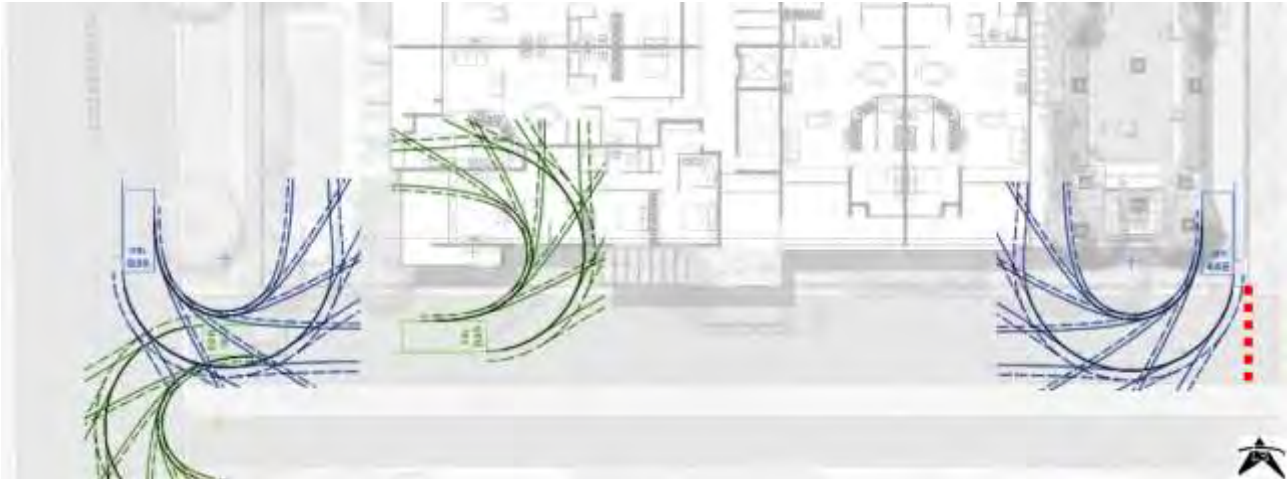


Figure 17 – Swept Path Assessment of the B99 Design Vehicle Accessing & Egressing the Development Site and Willow Way

The B99 Design Vehicle was adopted for the Willow Way assessment as waste collection is proposed to occur kerbside on Casuarina Drive adjacent to the proposed Refuse Bin Enclosure shown in Figure 18 on the following page.



Figure 18 – Existing Adjacent Lot and Proposed Lot 33 Bin Enclosures and Layout of Casuarina Drive

Figure 18 shows that it is not possible for the Side Loading Waste Collection Vehicle to stop on Casuarina Drive adjacent to the proposed Bin Enclosure due to the presence of the LATM device. Options to address this are for either the vehicle to collect the bins from the same location on Casuarina Drive that it does for the adjacent Lot or for the Lot 33 Bin Enclosure to be relocated close to Willow Way. The cycle time for bins to be loaded using a Side Loading Waste Collection Vehicle is approximately 10 seconds per bin. It should be noted however that not all bins are collected at the same time as general refuse bins are emptied separately to the recycling bins.

5.2. CAPACITY AND LEVEL OF SERVICE

This *TIA* has determined that the proposed development on Lot 33 Casuarina Drive could result in increased traffic through the Casuarina Drive/ Willow Way intersection of between 3% and 7% of the forecast traffic through this intersection in 2025 and hence a detailed assessment of intersection performance is warranted.

The forecast volumes from Figure 14 on page 30 were modelled in *SIDRA Intersection*[§] software to determine the likely performance of the Casuarina Drive/ Willow Way intersection with full development on Lot 33 as described in this *TIA* report. The results of this assessment are shown in the Average Delay (seconds) & Level of Service Diagrams in Figure 19 . The assessment indicates that the intersection is expected to perform at a very good level with plenty of spare capacity.

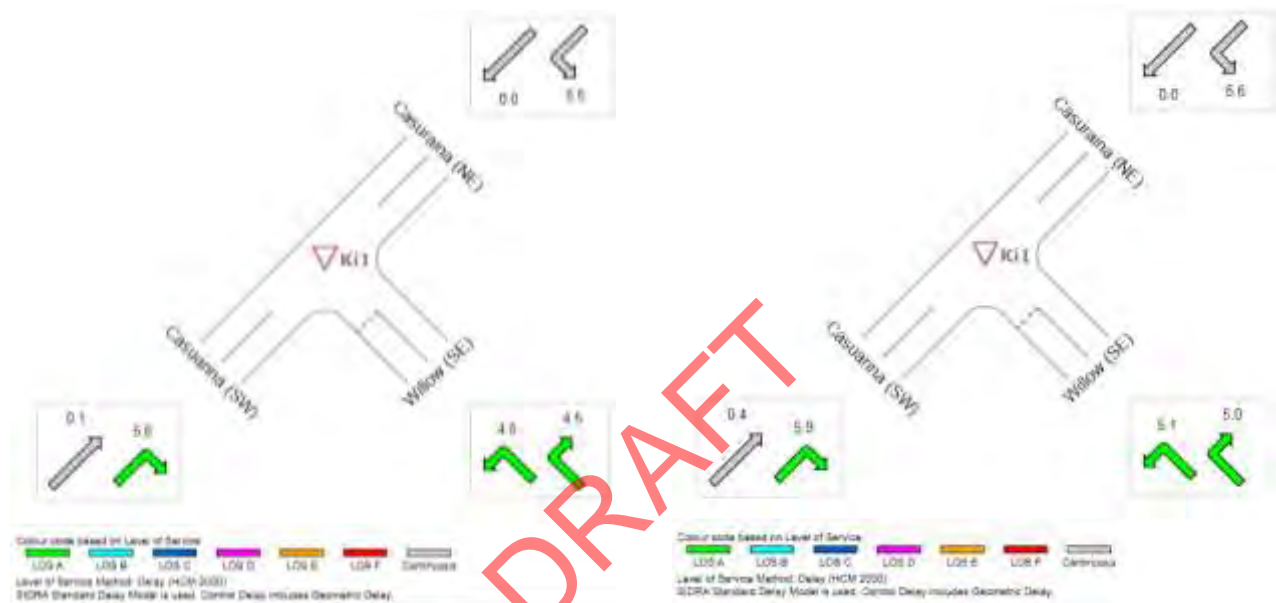


Figure 19 – Forecast 2025 AM & PM Peak Hour Delay & Level of Service

More detailed *SIDRA Intersection* summary reports are included as **Appendix C**.

[§] *SIDRA*: Signalised (and unsignalised) Intersection Design and Research Aid. The *SIDRA Intersection* software (older versions known as *SIDRA* and *aaSIDRA*) is an advanced lane-based micro-analytical tool for the design and evaluation of individual intersections and networks of intersections including modelling of separate Movement Classes (Light Vehicles, Heavy Vehicles, Buses, Bicycles, Large Trucks, Light Rail / Trams etc...). It provides estimates of capacity, level of service and a wide range of performance measures including delay, queue length and stops for vehicles and pedestrians, as well as fuel consumption, pollutant emissions and operating cost.

5.3. TRANSPORTATION SAFETY

A review of the reported crash data for Casuarina Drive, Willow Way, Nightcliff Street and Aralia Street between and including the intersections of these roads for the five year period ending 16 November 2011 indicates that there have been no reported crashes on Casuarina Drive within 100 m of the Development Site. The reported locations of the crashes are shown in Figure 20. This data suggests that there is no warrant for safety concerns with the access off Willow Way provided that all of the required sight lines are met (refer **Section 5.4**).

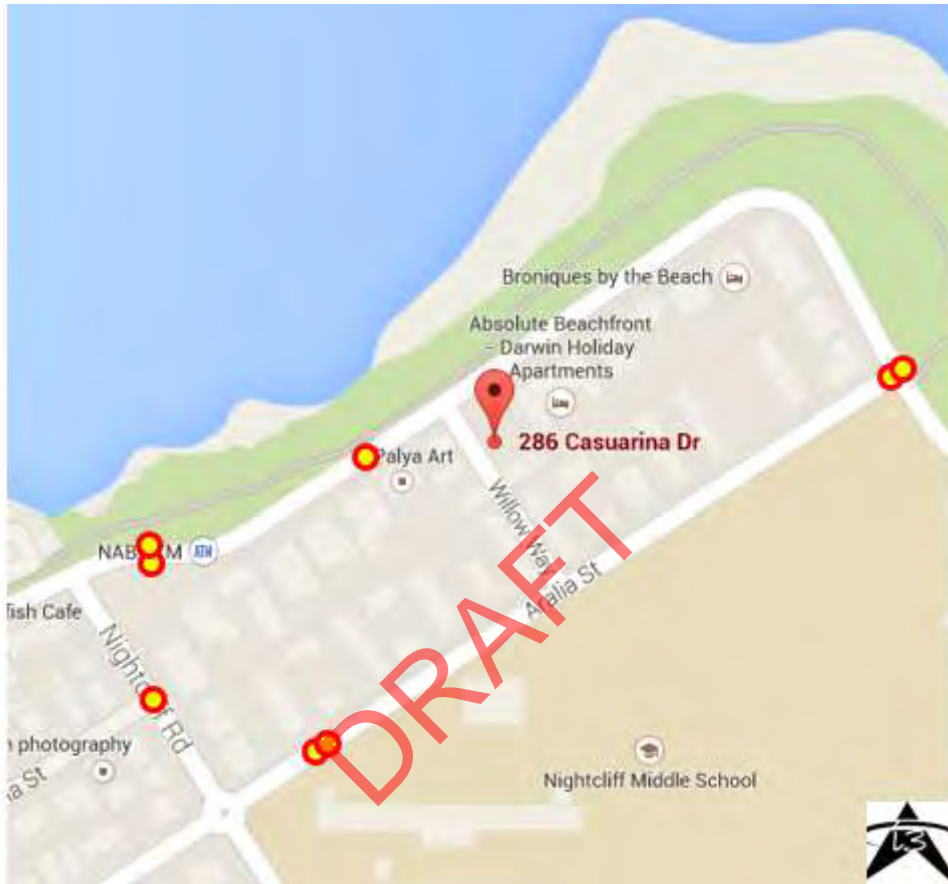


Figure 20 – Reported Crashes in vicinity of the Development Site for 5 Year Period ending 16/11/11

The issue of increased vehicular activity in Willow Lane and the effect that this may have on the safety performance of Willow Lane is more difficult to adequately assess given that there have been no reported incidents on Willow Lane in the past (hence it cannot be made 'safer'). The author is aware of many instances where changes have been made to an intersection or road because it *felt* dangerous despite the fact that there had not been any reported incidences in the past. Subsequently crashes have occurred on the modified road or intersection which indicates that driver's perception of a hazard may have resulted in greater care being taken. This theory of risk compensation behaviour is termed *risk homeostasis*** (11)

A review of reported crashes on the Magdalene Court 'shared laneway' in Malak, which serves 34 residential dwellings, and hence has approximately 14 peak hour trips, indicates no reported crashes on this laneway despite the higher vehicular volumes.

** Risk homeostasis. Theory that suggests that individuals subconsciously have a level of risk that they are prepared to accept and they adjust their risk-taking behaviour towards that level of perceived risk. When safety measures are imposed they may relax their cautious behaviour because they perceive that the risk has been ameliorated.



Photograph 7 – Existing layout of Willow Lane from Casuarina Drive



Figure 21 – Proposed layout of Willow Lane from Casuarina Drive

Photograph 7 and Figure 21 on the previous page show 'before' and 'after' layouts of Willow Lane. The environment of a laneway such as Willow Way is a key element in the safety performance of the lane, not just in terms of traffic safety, but also in terms of environmental or social safety. The City of Darwin has adopted the practice of addressing anti-social behaviour using principles of Crime Prevention Through Environmental Design ⁽¹²⁾ (*CPTED*). The NTG has published a guideline based on *CPTED* principles titled *Community Safety Design Guide* ⁽¹³⁾. A review of this Guide against the 'before' and 'after' layouts shown for Willow Way suggests that the proposed layout is more compliant with the principles of *CPTED* than the existing layout. On this basis, and on the review of the crash record at this location and in Magdalene Court, it is reasonable to ascertain that the proposal will not have any adverse impact on the safety and amenity of Willow Way.

5.4. SITE CIRCULATION AND PARKING

5.4.1 PARKING LAYOUT

A review of the Development Plans included in **Appendix A** against the requirements of Clause 6.5.3 (Carparking) of the *NTPS* has been undertaken by *i3* and is summarised in Table 6.

A car parking area is to:	Complies?	Comment
(a) be of a suitable gradient for safe and convenient parking;	<input checked="" type="checkbox"/>	Single level gradient
(b) be sealed and well drained;	?	Assumed concrete surface. Drainage details not shown.
(c) be functional and provide separate access to every car parking space;	<input checked="" type="checkbox"/>	Complies.
(d) limit the number of access points to the road;	<input checked="" type="checkbox"/>	Has two accesses onto Willow Way (refer comment below).
(e) allow a vehicle to enter from and exit to a road in a forward gear;	<input checked="" type="checkbox"/>	Drivers will use their allocated bays to turn around. Two access/ egress points accommodate through forward movements.
(f) maximise sight lines for drivers entering or exiting the car parking area	<input checked="" type="checkbox"/>	Requires checking against Section 3.2.4 of <i>AS/ NZS 2890.1-2004</i> . Refer Section 5.4.2 .
(g) be not less than 3 m from a road, and the area between the car parking area and the road is to be landscaped with species designed to lessen the visual impact of the car parking area;	?	First parking bays located 3 m from edge of road. Landscaping plans show planting along the development side of Willow Way in the vicinity of the vehicular access/ egress points that may affect the required sight lines as per Section 3.2.4 of <i>AS/ NZS 2890.1</i> . Refer Section 5.4.2 .
(h) be in accordance with the dimensions set out in the diagram to this clause	<input checked="" type="checkbox"/>	90° bays 5.5 m x 2.5 m with 6 m aisle as per Diagram to Clause 6.5.3 of <i>NTPS</i> .
(i) have driveways with a minimum width of 6 m for two-way traffic flow or 3.5 m for one-way traffic flow; and	<input checked="" type="checkbox"/>	6 m wide two-way driveways provided.
(j) be designed so that parking spaces at the end of and perpendicular to a driveway be either 3.5 m wide or so that the driveway projects 1 m beyond the last parking space.	<input checked="" type="checkbox"/>	Aisle between Bays 42 and 31 extended by only 200 mm and these bays are 2.5 m wide.

Table 6 – Assessment of compliance against Clause 6.5.3 of the *NTPS*

Limiting accesses onto Willow Way to one access has no obvious benefit. By providing two driveways access to and from the car park can be maintained even when one access is blocked (e.g. by a malfunctioning gate or maintenance works). It also allows for through movement in the event that a visitor cannot find an empty bay. Without the two driveways there is a possibility of

reversing manoeuvres onto Willow Way (in the event that all parking bays are full) resulting in an adverse impact on the safety performance of Willow Way.

It is important that a form of aisle extension or bay widening is provided for bays 42 and 31 in order to accommodate movements into and out of these bays. Whilst the *NTPS* has a requirement for bays to be 2.5 m wide and for the aisle extension to be 1 m (or bays to be 3.5 m wide with no aisle extension), Australian Standard *AS/ NZS 2890.1* ⁽⁴⁾ has a requirement for the residential parking bays to be a minimum width of 2.4 m wide (User Class 1A) and for a minimum aisle extension of 1.0 m.

Reducing the bay widths of spaces 31, 32, 33, 40, 41 and 42 to 2.4 m, as per *AS/ NZS 2890.1*, would allow for an aisle extension of 0.3 m, which, with the existing 0.2 m extension, would result in a 0.5 m extension which is half of the minimum requirement under both the *NTPS* and *AS/ NZS 2890.1*. Allowing an 'overhang' of 0.5 m beyond the end of the aisle, in conjunction with reducing the bay widths to 2.4 m as described above, would result in compliance. The maximum B85 and B99 Design Vehicle overhangs are 0.6 m.

Refer **Section 5.4.2** below regarding assessment of the required sight distance at the two access driveways.

5.4.2 SIGHT DISTANCE AT ACCESS DRIVEWAY

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 22 on the following page); and*
- b) *Sight distance to pedestrians: Clear sight lines as shown in Figure 3.3 (reproduced as **Error! Reference source not found.** on page **Error! Bookmark not defined.**) 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.*

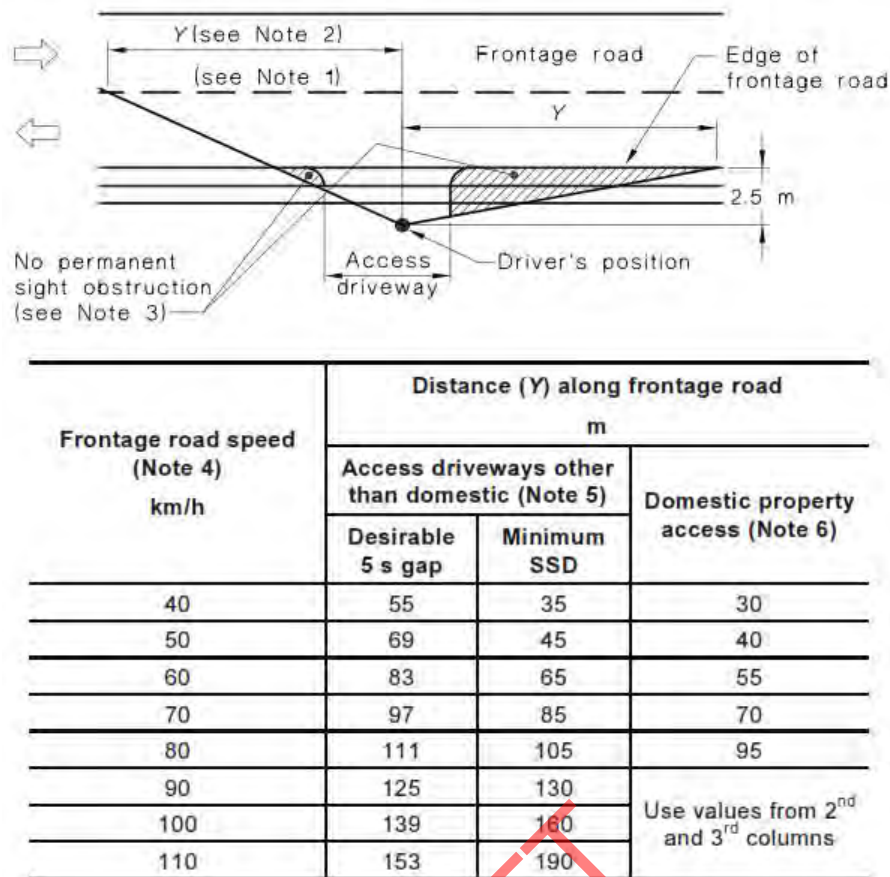


Figure 22 - Sight distance requirements at access driveways (Fig 3.2 AS/ NZS 2890.1)

NOTES to Figure 22:

- Centre-line or centre of road (undivided road), or right hand edge of right hand through lane (divided road).
- 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.
- 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.
- 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.
- 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 stem 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.
- 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.
- 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.

From a traffic engineering point of view, it is important to consider Willow Lane as a very low speed laneway and not a regular frontage road.

The Table of speeds and 'Y' values provided in Figure 22 do not provide 'Y' values for speeds less than 40 km/h, however, interpolation of this data reveals that for a speed of 20 km/h, which is a reasonable operating speed to adopt for Willow Lane, the 'Y' (Minimum SSD) value is 12 m, as shown in Figure 23 on the following page.

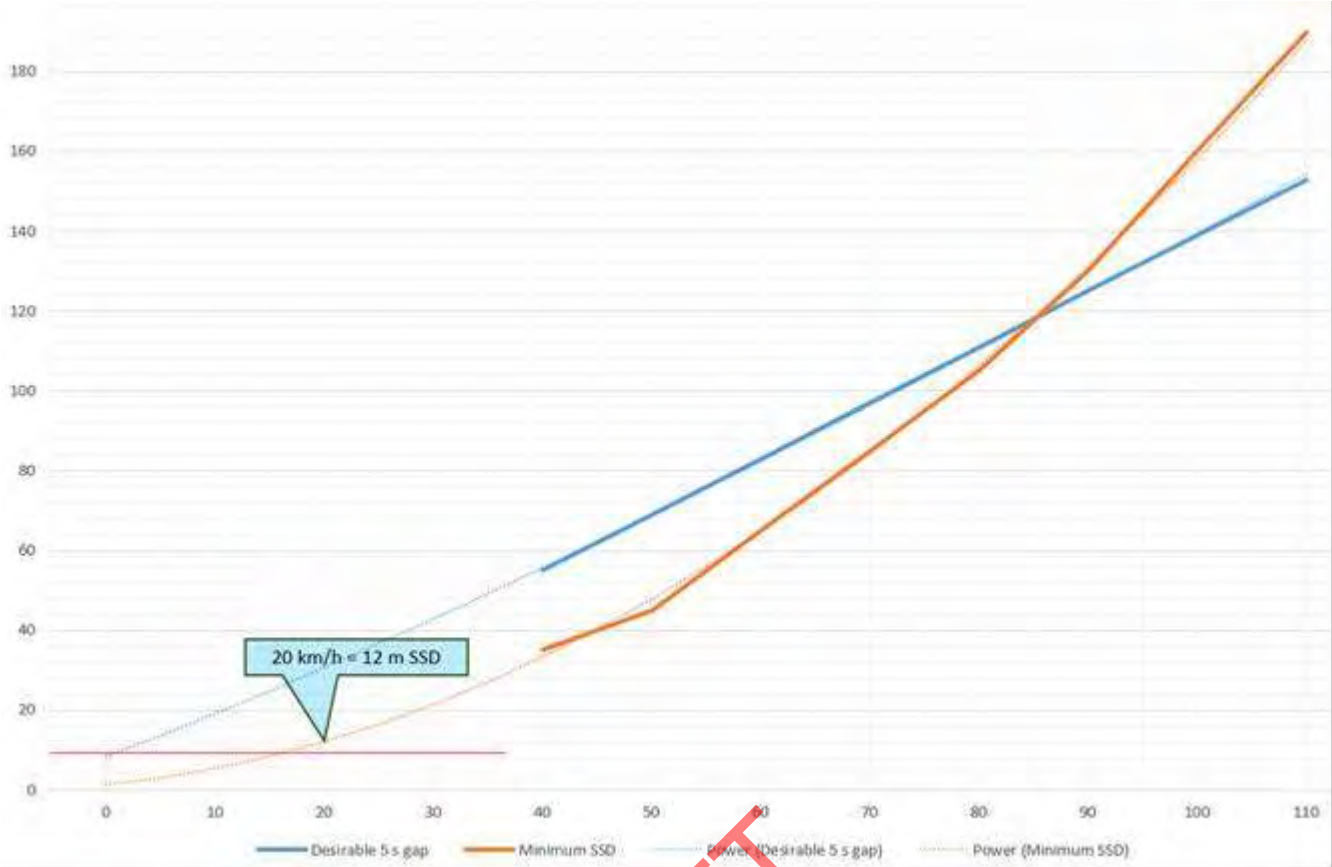


Figure 23 – Assessed sight distance requirements for frontage road speeds less than 40 km/h

Based on the short length (60 m) and minimum carriageway width (5.5m) of Willow Way i3 believes it is reasonable to adopt an operating speed of 20 km/h for this Laneway and hence a 'Y' or SSD value of 12 m. An overlay of this is shown in Figure 24.



Figure 24 – Assessed areas to be kept clear of obstructions higher than 300 mm

5.4.3 PARKING SPACE PROVISION

The parking space provision requirement for the development is indicated in the “Table To Clause 6.5.1” of the *NTPS*, an extract of which is reproduced as Table 7.

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

Table 7 – Parking Requirements (Extract from Table to Clause 6.5.1 of *NTPS*)

An assessment of the required spaces under the *NTPS* (with the Development Site located outside Zone CB – i.e. column 2) is provided as **Table 8**.

	1 Bed	2 Bed	3 Bed	Required	Provided
Multiple Dwellings	0	24	0	48	48

Table 8 – Assessment of *NTPS* Parking Space provision requirement

Table 8 indicates that the proposal to provide a total of 48 spaces complies with the parking requirements of the *NTPS*.

6 IMPROVEMENT ANALYSIS

6.1. IMPROVEMENTS TO ACCOMMODATE EXISTING TRAFFIC

There are no identified improvements required to accommodate existing traffic in this *TIA* other than general improvements to Willow Lane in accordance with *CPTED* principles.

6.2. IMPROVEMENTS TO ACCOMMODATE BACKGROUND TRAFFIC

There are no identified improvements required to accommodate background traffic in this *TIA* to the Horizon Year of 2025 other than those indicated above.

6.3. ADDITIONAL IMPROVEMENTS TO ACCOMMODATE SITE TRAFFIC

This assessment has identified that the following improvements that are required:

6.3.1 Provide for a 1.0 m minimum extension of the parking aisle between Bays 31 and 42 by either, or a combination of, reducing bay widths to 2.4 m and providing a clear overhang area, as discussed in **Section 5.4.1** of this report; and

6.3.2 Ensure that there are no objects above 300 mm, including landscaping items other than 100 mm maximum diameter tree trunks, within the sight triangles shown in Figure 24 on page 41 of this report.

6.4. ALTERNATIVE IMPROVEMENTS

6.4.1 Locating the Refuse Bin Store away from the *LATM* device in Casuarina Drive and hence closer to Willow Way would reduce travel distance between the waste management vehicle and the bin store area and hence the length of time taken to service the bins, which in turn reduces the time the vehicle stops in any one location on Casuarina Drive; and

6.4.2 Removing the path from Willow Way and providing a 'shared space' laneway in accordance with the relevant standards and guidance is also a viable improvement. Although not common in Darwin there are some existing examples of shared spaces such as Magdalene Court in Malak and Kilgour Lane (rear of Quest Serviced Apartments) in Palmerston.

6.5. STATUS OF IMPROVEMENTS ALREADY FUNDED, PROGRAMMED OR PLANNED

There are no known improvements to Casuarina Drive or Willow Way that are already funded, programmed or planned. *i3* aware of a desire by the City of Darwin to rationalise the various speed limits along the 'costal drive route' of Progress Drive-Casuarina Dr-Rapid Creel Rd, however this will not have an impact on any of the assessments within this *TIA* report.

6.6. EVALUATION

i3 has determined that the proposed development, as indicated in the Development Plans included in **Appendix A**, will not have an adverse impact on the traffic or transport environment and can be safely accommodated within the current road network and layout provided that the improvements indicated in **Sections 6.3** are implemented and those in **Section 6.4** are considered.

7 FINDINGS

7.1. SITE ACCESSIBILITY

There are no concerns with accessing the site.

7.2. TRANSPORTATION IMPACTS

There are no identified concerns with operational performance of the road network in the vicinity of the Development Site.

7.3. NEED FOR ANY IMPROVEMENTS

There are no warrants or identified need for any improvements to the road network as a direct result of the proposed development.

7.4. COMPLIANCE WITH APPLICABLE LOCAL CODES

The current design of the off-street parking area does not completely comply with the requirements of the *NTPS*. The access arrangement also does not completely comply with the requirements of *AS/NZS 2890.1*. The improvements indicated in **Sections 6.3** would address these compliance issues.

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8 **RECOMMENDATIONS**

It is recommended that the design of the traffic and transport elements of the proposed development, as shown in the Development Plans included in **Appendix A**, are approved subject to the following improvements being implemented:

- 8.1 Provide for a 1.0 m minimum extension of the parking aisle between Bays 31 and 42 by either, or a combination of, reducing bay widths to 2.4 m and providing a clear overhang area, as discussed in **Section 5.4.1** of this report;
- 8.2 Ensure that there are no objects above 300 mm, including landscaping items other than 100 mm maximum diameter tree trunks, within the sight triangles shown in Figure 24 on page 38 of this report;
- 8.3 Consider relocating the Refuse Bin Store away from the *LATM* device in Casuarina Drive and hence closer to Willow Way; and
- 8.4 Consider removing the path from Willow Way and providing a ‘shared space’ laneway in accordance with the relevant standards and guidance.

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APPENDIX A DEVELOPMENT PLANS

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APPENDIX B TRAFFIC VOLUME DATA

MID-BLOCK TRAFFIC FLOW ASSESSMENT

Location Lot 9463 SN 288 Casuarina Dr							Date Feb 2008		
Time	Mon - Fri			Saturday			Sunday		
	SW-bound	NE-bound	Combined	SW-bound	NE-bound	Combined	SW-bound	NE-bound	Combined
00-01	6.4	7.2	13.6	24.0	27.0	51.0	12.0	24.0	36.0
01-02	3.4	5.0	8.4	10.0	13.0	23.0	6.0	21.0	27.0
02-03	2.2	4.4	6.6	3.0	9.0	12.0	3.0	9.0	12.0
03-04	1.6	2.0	3.6	2.0	4.0	6.0	3.0	5.0	8.0
04-05	2.4	3.0	5.4	5.0	6.0	11.0	6.0	5.0	11.0
05-06	6.4	6.2	12.6	6.0	12.0	18.0	8.0	3.0	11.0
06-07	17.8	24.0	41.8	9.0	26.0	35.0	4.0	19.0	23.0
07-08	31.0	52.8	83.8	25.0	34.0	59.0	20.0	32.0	52.0
08-09	33.2	46.2	79.4	39.0	59.0	98.0	45.0	45.0	90.0
09-10	27.4	44.0	71.4	54.0	59.0	113.0	60.0	82.0	142.0
10-11	31.2	52.0	83.2	53.0	91.0	144.0	75.0	125.0	200.0
11-12	36.8	54.0	90.8	48.0	101.0	149.0	83.0	151.0	234.0
12-13	34.0	62.4	96.4	59.0	113.0	172.0	59.0	119.0	178.0
13-14	31.8	56.6	88.4	61.0	95.0	156.0	70.0	107.0	177.0
14-15	39.0	56.8	95.8	58.0	117.0	175.0	70.0	130.0	200.0
15-16	45.2	59.2	104.4	67.0	112.0	179.0	97.0	170.0	267.0
16-17	53.6	86.4	140.0	83.0	133.0	216.0	105.0	138.0	243.0
17-18	87.2	120.4	207.6	101.0	149.0	250.0	109.0	173.0	282.0
18-19	88.6	139.8	228.4	84.0	156.0	240.0	122.0	171.0	293.0
19-20	58.6	105.0	163.6	85.0	115.0	200.0	47.0	102.0	149.0
20-21	33.0	56.8	89.8	34.0	59.0	93.0	37.0	60.0	97.0
21-22	26.6	53.4	80.0	34.0	59.0	93.0	23.0	48.0	71.0
22-23	18.6	32.6	51.2	23.0	55.0	78.0	15.0	20.0	35.0
23-24	13.2	25.6	38.8	20.0	44.0	64.0	7.0	5.0	12.0
TOTALS	729	1,156	1,885	987	1,648	2,635	1,086	1,764	2,850

Combined Summary

	Weekday		Saturday		Sunday	
	Time	Volume	Time	Volume	Time	Volume
AM Peak Hour	11-12	91	11-12	149	11-12	234
PM Peak Hour	18-19	228	17-18	250	18-19	293
Directional ratio	SW-bound	NE-bound	SW-bound	NE-bound	SW-bound	NE-bound
AM Peak Hour	42%	58%	32%	68%	38%	63%
PM Peak Hour	38%	62%	34%	66%	35%	65%
Speeds (km/h)	85%ile	95%ile	Median			
SW-bound	40.3	44.3	34.6			
NE-bound	38.5	42.1	33.5			

APPENDIX C SIDRA INTERSECTION REPORTS

MOVEMENT SUMMARY

▽ Site: 2025 AM Peak Hour

Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows 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: Willow (SE)											
1	L2	4	0.0	0.005	4.5	LOS A	0.0	0.1	0.12	0.53	54.6
2	R2	2	0.0	0.005	4.5	LOS A	0.0	0.1	0.12	0.53	54.3
Approach		6	0.0	0.005	4.5	LOS A	0.0	0.1	0.12	0.53	54.5
NorthEast: Casuarina (NE)											
3	L2	2	0.0	0.024	5.5	LOS A	0.0	0.0	0.00	0.02	31.9
4	T1	48	2.0	0.024	0.0	LOS A	0.0	0.0	0.00	0.02	59.9
Approach		51	1.9	0.024	0.2	NA	0.0	0.0	0.00	0.02	58.7
SouthWest: Casuarina (SW)											
5	T1	78	2.0	0.038	0.1	LOS A	0.2	1.5	0.14	0.01	59.7
6	R2	1	0.0	0.038	5.6	LOS A	0.2	1.5	0.14	0.01	30.2
Approach		79	2.0	0.038	0.2	NA	0.2	1.5	0.14	0.01	59.2
All Vehicles		136	1.9	0.038	0.4	NA	0.2	1.5	0.08	0.04	58.9

MOVEMENT SUMMARY

▽ Site: 2025 PM Peak Hour

Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows 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: Willow (SE)											
1	L2	2	0.0	0.004	5.1	LOS A	0.0	0.1	0.24	0.54	54.3
2	R2	2	0.0	0.004	5.0	LOS A	0.0	0.1	0.24	0.54	54.0
Approach		4	0.0	0.004	5.1	LOS A	0.0	0.1	0.24	0.54	54.1
NorthEast: Casuarina (NE)											
3	L2	2	0.0	0.064	5.6	LOS A	0.0	0.0	0.00	0.01	32.0
4	T1	132	2.0	0.064	0.0	LOS A	0.0	0.0	0.00	0.01	59.9
Approach		134	2.0	0.064	0.1	NA	0.0	0.0	0.00	0.01	59.5
SouthWest: Casuarina (SW)											
5	T1	206	2.0	0.101	0.4	LOS A	0.6	4.4	0.25	0.01	59.4
6	R2	3	0.0	0.101	5.9	LOS A	0.6	4.4	0.25	0.01	30.1
Approach		209	2.0	0.101	0.5	NA	0.6	4.4	0.25	0.01	58.9
All Vehicles		347	1.9	0.101	0.4	NA	0.6	4.4	0.16	0.02	59.1

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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 SIDRA INTERSECTION 6.0.24.4877 www.sidrasolutions.com
 Project: C:\Users\David\Documents\I3o 2014 Projects\Current\236 Inwinconsult\236009 SN 288 Casuarina Drive
 \Technical\SIDRA\236009 Lot 33 Casuarina Dr TIA.sip6
 8000963, 6016723, I3 CONSULTANTS WA, PLUS / 1PC

**SIDRA
INTERSECTION 6**

20150094DL1D/BAS/RB

2 March 2015

Team Leader Development
City of Darwin
GPO Box 84
Darwin NT 0801

Attention: James Whyte

Dear Sir

286 CASUARINA DRIVE – REVIEW OF TRAFFIC IMPACTS

Tonkin Consulting have undertaken a review of the Traffic Impact Assessment (TIA) prepared by i3 Consultants on behalf of the developer for 286 Casuarina Drive.

The TIA report reviewed is stamped draft and dated 19 November 2014.

It is noted that the TIA refers to drawings dated 14/01/2014. However, the drawings provided and assessed by this review are dated 15/11/2013 (architectural drawings) and 1/11/2013 (landscape drawings).

Background

The existing development at 286 Casuarina Drive consists of a single dwelling with access provided from Casuarina Drive and a multiple dwelling building consisting of four 2-storey residences with access onto Willow Way.

The site is zoned MR (medium density residential), the proposed development would not alter the zone.

Casuarina Drive is defined as a Primary Collector Road under the City of Darwin Road Hierarchy. Willow Way is classified as a Local Road.

Casuarina Drive is approximately 10.8m wide in the vicinity of Willow Way. The road generally has a single lane in either direction separated by a centre line. An angled slow point with raised medians and road humps is provided approximately 15m east of Willow Way.

Willow Way is approximately 5.5m wide and connects Casuarina Drive to Aralia Street. The junctions at each end of Willow Way are configured as driveways. However, access to Willow Way is restricted at both the midpoint and at the Aralia Street access (that is, vehicular access is currently available only to and from Casuarina Drive). A 2m wide raised footpath is provided on the western side of Willow Way. No verges are provided on Willow Way (the road and footpath run directly alongside the property boundaries).



Willow Way From Midpoint (286 Casuarina Drive on Right)

Proposed Development

The proposed development includes clearing of the existing site to provide 24 x 2 bedroom apartments in a 5 storey building. Car parking will be provided on the ground floor.

The existing driveway on Casuarina Drive will be removed and two driveways provided on Willow Way.



Willow Way from Casuarina Drive Path Showing Driveway to be Removed

Traffic Generation

The TIA compares surveys of a nearby development as well as rates derived from the NSW RMS Guide to Traffic Generating Developments (RMS Guide) and the ITS Guide. A 2% 'background' growth rate for Casuarina Drive is assumed to take future development into account.

It is noted that the RMS Guide to Traffic Generating Developments Updated Traffic Surveys (TDT 2013/04a, August 2013) referred to in the TIA does not include rates for medium density residential developments. The RMS Guide (2002) has therefore been adopted in this review. The identified rates for medium density residential developments for the weekday peak hour vehicle trips generated are 0.4-0.5 trips per dwelling (for dwellings with 2 or fewer bedrooms).

A generation rate of 0.4 trips per dwelling per peak hour is adopted in the TIA. This rate is at the lower end of the range suggested by RMS but exceeds surveyed rates at similar developments and therefore is considered appropriate.

The additional traffic has been identified by applying a discount rate for the existing 4 units (4 units at 0.4 trips equates to 2 vehicle trips). It is noted that no discount has been applied for the existing house on the property as this traffic would use the Casuarina Drive driveway.

The identified total traffic generation in the TIA is 10 vehicles per hour for each of the AM and PM peak periods. It is unclear why the report text identifies a total traffic generation of 10 vehicles per hour but the figures and SIDRA analysis adopt a total of 9 vehicle trips.

If the higher end of the standard generation rates (i.e. 0.5 trips per dwelling) were adopted for all cases, the total anticipated traffic generated by the site would be 12 vehicle trips in each of the peak periods. The existing site generation is approximately 3 vehicles per peak hour. This would result in a total additional traffic generation of 9 vehicles per peak hour.

The traffic volume data provided as Appendix B of the TIA identifies the peak traffic volume on Casuarina Drive occurs on a Sunday for both the AM and PM peak periods. No assessment has been made of traffic impacts for weekend traffic volumes within the TIA.

Parking Provision

There are a total of 2 parking spaces provided for each dwelling. This meets the requirements of the NTPS.

However, it is not clear if any visitor parking would be provided as part of the development. If no designated visitor parking is provided, appropriate controls (line marking and signage) should be provided on Willow Way to ensure this access remains clear of parked vehicles.

Parking Layout

The parking area has 6m wide circulation aisles. Each parking space measures 2.5m wide by 5.5m long. This meets the requirements of the NTPS and AS2890.1.

Measurements to building columns are not shown on the drawings provided. The locations appear to be outside of the required clear design envelope identified in Figure 5.2 of AS2890.1. However, it should be confirmed that columns are outside of the required clear design envelope to ensure car doors can be opened.

Parking spaces 1,9,18,19,24,30,31,42 and 43 are all against obstructions such as walls or fences. It should be confirmed that an additional 300mm clearance has been provided for each of these spaces to allow for opening of doors.

The aisle providing access to parking spaces 31 and 42 should be provided with a 1m extension to allow vehicles to turn from these parking spaces.

Junction Performance

The SIDRA Intersection modelling program has been used to assess the operation of the Casuarina Drive and Willow Way junction. The junction is modelled as two lanes on each junction leg but while there is space for two vehicles to pass on Willow Way, there is not space for a vehicle to make a turn alongside another vehicle as shown in Figure 17 from the TIA (reproduced below). There is the potential that the through movement on Casuarina Drive would be delayed.

It is also noted that no assessment of the performance within the weekend peak period has been undertaken (and the weekend peak period on Casuarina Drive exceed the weekday peak).

A total of 12 vehicles per hour equates to an average of 1 vehicle every 5 minutes and it is unlikely that delays on Casuarina Drive would occur.

The increase in traffic volume may have an impact on safety due to the potential interaction between vehicles exiting Willow Way with vehicles exiting the angles slow point.

If access were provided to Casuarina Drive directly from the site rather than from Willow Way, the junction of the driveway and Casuarina Drive would experience the same performance as described above.



TIA Figure 17 (partial) Showing Vehicle Movements In/Out of Willow Way

Garbage Collection

It appears that the existing garbage collection occurs with the garbage vehicle parked across Willow Way and the garbage bins placed along Willow Way.

The proposed garbage bin area is shown at the northern corner of the site. This would not allow the existing arrangement to continue.

There is the potential that the garbage vehicle could service both #286 and the adjacent allotment in the location where the adjacent allotment is currently serviced. However, this location blocks access to the driveway and may impact negatively on residents of the adjacent allotment.

The TIA recommends relocation of the bin collection area closer to Willow Way to allow servicing of the allotment from Casuarina Drive across Willow Way and this is supported.

Service Vehicles

The width of Willow Way does not allow a vehicle to turn around. Whilst it is possible that a service vehicle could enter one of the proposed car park driveways to turn around, this would be tight and more likely would result in any large service vehicle that enters Willow Way being required to reverse onto Casuarina Drive.

It is not anticipated that there would be large vehicles servicing the property other than garbage vehicles. There is the potential that moving trucks or similar vehicles would enter Willow Way from time to time and these vehicles would be required to reverse onto Casuarina Drive.

Due to the low frequency of service vehicles anticipated, this arrangement is acceptable.

Site Access

Vehicles

The access driveway from the allotment onto Casuarina Drive is proposed to be removed and this will consolidate all access from the site to Casuarina Drive at the Willow Way junction.

The driveways on Willow Way are well separated (approximately 28.5m). The provision of two driveways allows for circulation through the car park without the need for vehicles to reverse.

Each driveway is shown as 6m wide with no taper or radius. Turn paths for a B99 vehicle provided in the TIA report show that vehicles entering either driveway would use the entire driveway width.

Sight distance to oncoming vehicles from each of the driveways was reviewed with a 20km/h design speed. This is considered acceptable for the length and width of Willow Way. It is noted that landscaping appears to be provided within the areas required to be clear from sight obstructions. Any landscaping in these areas should be maintained at a level below 300mm.

A total of 2 spaces are provided for each unit. There is the potential that some occupants will use one space for the storage of a boat/trailer. Vehicle turn paths for a car with boat trailer have been reviewed and indicate that a vehicle could enter and exit the site (although, as with the B99 vehicle, the entire road width and driveway width would be used).

Pedestrians and cyclists

The TIA identifies that the main route for pedestrians would be from the Casuarina Drive footpath through the front access of the development. However, it appears that the lift access is closer to the Willow Way access (provided between the two driveways) and as residents become familiar with the building they would be more likely to use this access. No footpath is provided for access to this gate on the developer side of the road and pedestrians would be forced to cross Willow Way. There is insufficient space on the footpath to provide a suitable kerb ramp to facilitate this crossing and pedestrians in wheelchairs or with prams would be required to walk on the Willow Way roadway.

Access to the development for pedestrians is primarily provided from the Casuarina Drive footpath.

Access to the development for cyclists is through the main (pedestrian) access or the car park access driveways. The majority of cyclists are likely to use Willow Way and provision should be made at the Aralia Street road closure for cyclists to enter Willow Way.

The existing footpath on Willow Way requires pedestrians and cyclists to negotiate around a rail which blocks the footpath. It is recommended that this rail is removed regardless of the 286 Casuarina Drive development.



Willow Way Footpath – Casuarina Drive Connection



Willow Way Footpath – Aralia Street Connection

The TIA recommends consideration of a 'shared space' laneway for Willow Way. The current laneway likely operates in this manner due to the restricted number of motor vehicles, restricted access to the footpath and level of debris on the footpath. As identified within the TIA, any shared treatment would need to meet relevant standards and guidelines.

Willow Way

The above section "Site access" and the TIA are based on the assumption that Willow Way is suitable to handle the traffic generated by the development (12 vehicles per peak hour versus the existing 2 vehicle trips per peak hour). This section provides comment on this assumption.

Current Operation - Vehicles

Willow Way currently operates as an access driveway for the rear building on the 286 Casuarina Drive allotment, no other motor vehicle access is provided to Willow Way.

If Willow Way is considered as a driveway, to meet current Australian Standards a width of 3 to 5.5m should be provided (assuming class 1A parking, access to 25-100 spaces, driveway to a local road including collector road).

Whilst Willow Way is approximately 5.5m wide, the section between the Casuarina Drive footpath and the kerb on Casuarina Drive is less than this width and this reduces the junction with Casuarina Drive to one way operation. The driveway should be widened to 5.5m to match the width of Willow Way.

Willow Way has a width of 5.5m and therefore meets the minimum width requirement of AS2890.1.

No clearance is provided between the edge of road and the property boundary on the eastern side.

The Austroads Guide to Road Design deals with higher speed roads and recommends referring to the requirements of the local authority on roads with a limit of 50km/h or lower. The City of Darwin subdivision guidelines require 4.5m verges and 6m carriageway (total 15m road reserve) for a cul-de-sac or local road of less than 250m length. Clearly the existing road reserve width of approximately 7.5m could not accommodate this cross section.

Parking is observed to occur within the laneway (refer TIA Photograph 3). This would restrict access to one way.

The existing bollards and chain forming the road closures have limited visibility, particularly at times of low visibility (i.e. night). It is recommended that the bollards and chain are replaced with bollards that meet current standards and are visible at night.

Current Operation – Pedestrians & Cyclists

With the exception of 286 Casuarina Drive, the primary users of Willow Way are pedestrians and cyclists, the laneway is located opposite the Nightcliff Middle School and the popular foreshore path runs along the opposite side of Casuarina Drive. However, pedestrians and cyclists are forced to use the road as the northern footpath connection is blocked.

Pedestrians are provided with a 2m footpath against a fence on the western side of Willow Way, this footpath cannot be accessed from Casuarina Drive without travelling onto the Willow Way road pavement. The footpath is located between the back of kerb and a fence, the useable space is approximately 1.6m (allowing 200mm clearance to the road and to the fence). This is appropriate for use as a pedestrian path but is narrow for use as a shared use path.

Cyclists could also use the footpath. However, access to the Casuarina Drive footpath is blocked by the hand rail and cyclists are therefore more likely to use the road.

Cyclists can use the road pavement between Casuarina Drive and Aralia Street. The existing road closure at the midpoint allows cyclists to travel between the bollards. However, at the Aralia Street end of Willow Way, cyclists would need to dismount as there is limited space either side of the bollards and chain.

Future Operation – Current Configuration

The proposed development would result in a total of approximately 12 vehicles per hour using Willow Way in both the AM and PM peak hour periods.

The turn paths provided in the TIA assume that a vehicle entering Willow Way from Casuarina Drive would stop and give way to a vehicle exiting Willow Way. This could result in delays on Casuarina Drive.

The paved width of Willow Way meets the requirements for a driveway but not for a road. This arrangement is acceptable if only the single property is provided with access (i.e. no other property accesses are provided in future).

Any service vehicles accessing Willow Way would need to reverse back out onto Casuarina Drive.

If the hand rail at the Casuarina Drive footpath was removed, the provision for pedestrians along Willow Way meets minimum required provisions. However, pedestrians accessing the proposed development from Willow Way would be required to use the road pavement.

Cyclists should be provided with access through the road closure at Aralia Street to facilitate improved access to the site.

There is likely to be a tendency for motorists leaving the development not to look for oncoming traffic from the south (the closed section of Willow Way) and this would present a risk to cyclists.

It is anticipated that the majority of pedestrians and cyclists accessing the development site would do so via the road pavement rather than the footpath. It is therefore recommended that a shared zone is implemented along Willow Way (north of the mid-block road closure).

Future Operation – Shared Zone

The TIA identified the potential to alter Willow Way to a shared zone to increase the useable space for pedestrians, cyclists and motor vehicles.

The reopening of the Aralia Street access would not be supported based on the available sight distance to Willow Way being restricted by vegetation and electrical infrastructure and this assessment has reviewed the section between Casuarina Drive and the midpoint road closure only.

The Australian Road Rules (ARR) require specific signage to identify a shared zone. In addition, controls to maintain motor vehicle speeds at walking pace and a pavement treatment to identify the area as different from other roads in the area would be required.

It is noted that the legal framework (beyond the ARR) within the NT to require motor vehicles to give way to pedestrians in shared zones may not be fully developed and this would need to be considered as part of the process.

The potential for conflict between cyclists and motor vehicles remains similar to the current configuration. However, there is a greater potential for motorists to be aware of the potential presence of pedestrians on the roadway.

As with the existing configuration, service vehicles would still not be able to turn around.

The existing footpath is raised and has a kerb and gutter which appears to collect surface runoff from Willow Way as well as storm water connections from properties on the western side of the laneway. Any design would need to appropriately deal with this storm water.

It is recommended that if a shared zone is to be developed, the existing footpath should be removed and the kerb and gutter relocated to 0.5m from the existing fence (western side of Willow Way). This will allow the existing drainage to be maintained and provide a measure of protection to avoid the fence being struck by turning vehicles.

The existing road closures should be maintained and the existing bollards replaced with bollards that meet current standards and are visible at night. In addition, a pedestrian path (preferably on the development side of Willow Way) should be defined with a contrasting pavement material. This path would be at the same level as the road pavement.

Consideration should be given to the improvement of the southern section of Willow Way to provide a suitable pedestrian and cyclist link to the proposed shared zone. This may include landscaping and replacement of the footpath.

Summary

The Traffic and Parking components of the proposed development as described in the design drawings dated 15/11/2013 (architectural drawings) and 1/11/2013 (landscape drawings) are generally compliant with the requirements of the NTPS. The following key points should be noted:

Traffic Generation

- Site traffic generation rates and background growth rates adopted are acceptable.

Parking Provision

- Parking provision meets the minimum requirements of the NTPS. Visitor parking has not been provided and appropriate signage will be required on Willow Way to ensure two-way traffic flow can be maintained.

Parking Layout

- A number of parking spaces (1,9,18,19,24,30,31,42 and 43) have a wall or fence alongside the space and it should be ensured that these spaces provide a minimum 300mm widening.
- The aisle providing access to parking spaces 31 and 42 should be provided with a 1m extension to allow vehicles to turn from these parking spaces.

Junction Performance

- Access to Willow Way and the proposed development requires the B99 vehicle to use the entire width of Willow Way and there is the potential that this may cause minor delays on Casuarina Drive. This is acceptable given the anticipated traffic volume (as a vehicle can wait to let another vehicle turn).
- The existing Willow Way driveway at Casuarina Drive is less than the width of the laneway and should be widened to match the laneway width.

Garbage Collection

- The bin collection area should be relocated closer to Willow Way to facilitate garbage trucks parking away from the LATM device on Casuarina Drive.

Site Access

- Sight distance should be maintained by ensuring landscaping in the identified areas is kept below 300mm height.
- Pedestrian access to the footpath is currently restricted by a handrail at the Casuarina Drive footpath and this should be removed to improve access for all users.

- No pedestrian access is provided from the Willow Way footpath to the pedestrian access gate on the Willow Way frontage of the development. This would require pedestrians to travel along the Willow Way road pavement.

Willow Way

- The chain and bollards at the Aralia Street end of Willow Way should be replaced with bollards to allow cyclist access.
- To accommodate pedestrian and cyclist access to the proposed development, it is recommended that Willow Way is converted to a shared zone. To facilitate this change, the following should be provided:
 - Relocate kerb along Willow Way to 0.5m from fence (i.e. remove the existing footpath)
 - Increase driveway width to match the new width of Willow Way (7m)
 - Replace bollards at the midblock road closure with bollards meeting current standards
 - Provide appropriate shared zone signage to meet current standards and guidelines
 - Provide appropriate no parking signs to restrict parking on Willow Way
 - Provide a pedestrian path along the eastern side of Willow Way at the same height as the pavement (with contrasting pavement material)
- Undertake improvements to the southern section of Willow Way to link to provide a suitable pedestrian and cyclist link to the proposed shared zone (including replacing the chain and bollards at the Aralia Street as discussed above).

Yours faithfully
TONKIN CONSULTING



B Smith, MIEAust
Project Engineer

DRAWING SCHEDULE

A-DA-1.00	A	Site Plan + Statistics
A-DA-2.00	A	Ground Floor
A-DA-2.01	A	Level 1
A-DA-2.02	A	Level 2+4
A-DA-2.03	A	Roof Plan
A-DA-3.00	A	Elevations
A-DA-3.01	A	Sections
A-DA-4.00	A	Perspectives



Landscape Design

Ground Floor Masterplan



- 1 ENTRY ARBOUR
- 2 PAVED COURTYARD
- 3 GREENWALL
- 4 FEATURE TREE TO ENTRY
- 5 POOL ENTRY GATE
- 6 COMMUNAL POOL
- 7 SUNLOUNGE AREA
- 8 RESIDENT POOL LOUNGE
- 9 DENSE TROPICAL PLANTING
- 10 ENTRY

4 July 2014

Please quote: 2810627 CR:dj
Your reference: PA2013/0931

Linda Henning – Acting Manager Urban Planning
Department of Lands, Planning and the Environment
GPO Box 1680
DARWIN NT 0801

Dear Ms Henning

Parcel Description: **Lot 33 – Town of Nightcliff**
 286 Casuarina Drive, Rapid Creek

Proposed Development: **24 x 2 Bedroom Multiple Dwellings in a Five (5)**
 Storey Building

Thank you for the Exceptional Development Permit Application referred to this office 6 June 2014, concerning the above. This matter has not been heard at a City of Darwin, Ordinary Council Meeting at the time of sending this letter. It is currently scheduled for Council's First Ordinary meeting to be held 15 July 2014. Should this letter be varied or not endorsed by Council, you will be advised accordingly.

The following issues are raised for consideration by the Authority:

- i). **The City of Darwin objects to the granting of an Exceptional Development Permit, under Section 49 of the *Planning Act*, for the following reasons:**

- a). **Access**

- The development proposes to utilise the existing Willow Way for vehicular access. Willow Way currently functions as a pedestrian access way between Aralia Street and Casuarina Drive. The laneway is blocked to vehicular traffic from Aralia Street by bollards and a chain barrier. The Casuarina Drive end of the laneway is open and a site visit indicated that the laneway is currently being used for vehicular access to four (4) units at the rear of the existing site.

- The proposal will increase vehicular access from the current four (4) units to 24 units, a significant increase in vehicular movements down the laneway.

A thorough assessment of the likely impacts this may have on pedestrian safety were not able to be undertaken during the public comment period.

Therefore Council is unable to support direct access from Willow Way at this time. As this will significantly affect the design of the development, the proposal as a whole cannot be supported.

b). **Height and precedent**

This Exceptional Development Permit is to allow the construction of a five (5) storey multiple dwelling building in Zone MR that would otherwise be prohibited under the Planning Scheme. The Statement of Effects, submitted with the application, provides examples of a number of older existing developments in the area that contain five (5) storeys. It is noted however, that the examples given are largely of buildings with four (4) storeys of above ground multiple dwellings with semi-basement parking.

Whilst the overall height and bulk of some of the examples given are similar to the proposal, the Planning Scheme does not use height or plot ratios to limit development in Zone MR. Therefore, it is considered that approving a new development with five (5) storeys of development above ground level, under the current planning controls, will set a precedent for further development of this kind in the area.

If this is considered an appropriate form of development then a planning scheme amendment to facilitate this type of development may be more appropriate. Formalising controls for residential development between four (4) and eight (8) storeys through specific planning provisions, will also allow public comment to be made prior to any significant shift in the current planning mechanisms.

c). **Density**

The development proposes 24 multiple dwellings on a site which under Zone MR of the Northern Territory Planning Scheme has a maximum density of 21 x 2 bedroom dwellings. The development exceeds the maximum density by three (3) dwellings. Council is concerned that the increased density of the development has resulted in reductions to setbacks and this may impact upon the amenity of adjoining sites.

d). **Setbacks**

The proposal fails to meet the required Zone MR setbacks on three (3) sides. In addition to the standard required setbacks the building is over 18 metres in length and over four (4) storeys in height and therefore requires additional setbacks under clause 7.8.

In this respect the western boundary to adjoining Lot 9463 is most disadvantaged, being approximately 36 metres abutting the boundary and five (5) storeys high, it would require up to 4.5 metres of additional setbacks under clause 7.8. The western boundary also contains a first floor landscaped terrace directly abutting the neighbouring boundary. Details of screening are not adequately detailed in the proposal and may result in inappropriate loss of privacy for the adjoining property. Raised communal open space may also have implications for noise transmission to adjoining residential properties.

The proposed gymnasium is located less than one (1) metre from the front setback and is inconsistent with the existing front setbacks along this section of Casuarina Drive. For this reason, the City of Darwin does not support the proposed Gymnasium being built within the standard setback required within Zone MR.

Should access be granted from Willow Way, appropriate setbacks from the laneway will be required for vehicular sightlines.

ii). **Should the Minister decide to issue a permit, the City of Darwin offers the following comments:**

The City of Darwin comments on issues for which it is the sole responsible authority, under the Local Government Act and associated By-Laws:-

- a). **The crossover and driveway shall meet City of Darwin requirements.**
- b). **The City of Darwin requests that the Authority require a schematic plan demonstrating all stormwater to be collected on the site and discharged underground to the City of Darwin's stormwater drainage system.** The applicant's plans fail to demonstrate how on-site stormwater will be collected and discharged underground to the City of Darwin's drainage network.
 - 1). The plan shall include details of site levels and the City of Darwin's stormwater drain connection point/s. The plan shall also indicate how stormwater will be collected on the site and connected underground to the City of Darwin's system.

- 2). The City of Darwin requires a stormwater drainage plan to confirm that it is technically feasible to collect stormwater on the site and dispose of it into the City of Darwin's stormwater drainage system. It is also necessary to ensure that no stormwater will sheet-flow into the road reserve or onto adjoining properties.

c). **Waste**

The City of Darwin requests that the Authority require a Waste Management Plan demonstrating waste disposal, storage and removal in accordance with the City of Darwin's Waste Management Policy 054. The applicant's plans fail to demonstrate adequate waste management, this includes:

- any access gates to the bin enclosure not being locked,
- there shall be no step between the bin enclosure and the collection area to allow for ease of access,
- the bin enclosure shall include a hose and wash down area with a drain connected to the City of Darwin's stormwater system, and
- an unimpeded concrete access path to the bin enclosure from the development.

A copy of the City of Darwin's Waste Management Policy 054 may be viewed on the City of Darwin's website or by contacting the City of Darwin's Infrastructure department.

d). **Site Construction**

The City of Darwin requests that an Environmental and Construction Management Plan (ECMP) be required. The ECMP should specifically address the following:

- waste management,
- traffic control,
- haulage routes,
- storm water drainage,
- use of City of Darwin land, and
- how this land will be managed during the construction phase;

to the satisfaction of the General Manager, Infrastructure, City of Darwin.

Note: Sediment control measures are to be established and maintained, to prevent silt and sediment escaping the site or producing erosion.

Building rubbish or debris must not be placed, or be permitted to be placed, on any adjoining public reserve, footway, road or private land, without first obtaining a works approval from the City of Darwin.

e). **Protection of Street Trees**

All street trees shall be protected at all times during construction. Any tree on the footpath, which is damaged or removed during construction, shall be replaced, to the satisfaction of the General Manager Infrastructure, City of Darwin.

A Tree Protection Zone (TPZ) shall be constructed for all existing trees to be retained within the development, in accordance with Australian Standards - AS 4970-2009 Protection of Trees on Development Sites.

Copies of AS 4970-2009 Protection of Trees on Development Sites can be obtained from the Australian Standards web site.

f). **Building Identification**

In accordance with City of Darwin By-Laws, prior to occupation, the applicant shall ensure that a building number is displayed in a position clearly visible from the street. The number must be visible against the background on which it is placed, to the satisfaction of the General Manager Infrastructure, City of Darwin and at no cost to the City of Darwin.

The City of Darwin comments in relation to the Planning Act, the Northern Territory Planning Scheme and Land Use Objectives:-

a). **Traffic**

The City of Darwin requires a comprehensive **Traffic Impact Assessment Report**, to be prepared by a suitably qualified traffic engineer in accordance with the *Austroads Document Guide to Traffic Management Part 12: Traffic Impacts of Developments*, in the report structure provided as Appendix C of that document, with particular attention to vehicular, pedestrian, cyclist and public transport issues and opportunities.

The Traffic Impact Assessment report is to also include swept paths for waste collection vehicles entering and exiting the site.

The report should identify any necessary upgrades to the surrounding street network as a result of the implications of the development. The developer will be required to institute all required upgrade measures resulting from the traffic assessment at no cost to the City of Darwin.

Should this application be approved, the following conditions pursuant to the Planning Act and the City of Darwin's responsibilities under the Local Government Act are also recommended for inclusion in the Development Permit issued by the Development Consent Authority.

- Designs and specifications for landscaping of the road verges adjacent to the property shall be submitted for approval by the General Manager Infrastructure, City of Darwin and all approved works shall be constructed at the applicant's expense, to the requirements of the City of Darwin.
- The location, design and specifications for proposed and affected crossovers shall be provided at the applicant's expense, to the satisfaction of the General Manager Infrastructure, City of Darwin.
- Kerb crossovers and driveways to the site shall be provided and disused crossovers removed, public footpath and cycleways shall be provided, stormwater shall be collected and discharged into the City of Darwin's drainage network, and reinstatement works carried out, all of which is to be provided at the applicant's expense and to the requirements and satisfaction of the General Manager Infrastructure, City of Darwin.
- Sight lines shall be provided at crossovers to public streets, to the satisfaction of the General Manager Infrastructure, City of Darwin. No fence or tree exceeding 0.6 metres in height shall be planted in front of the sight line.
- Any gate over an access to a public road shall be placed on the subject site at least 4.5 metres from the face of the kerb line of the adjoining public road.
- Car parking spaces and internal driveways shall meet the requirements of the relevant Australian Standard and be line-marked and sealed with an impervious material.
- The total number of required disabled car parking bays shall be met on site.
- All developments on/or adjacent to any easements on-site, in favour of the City of Darwin shall be carried out to the requirements and satisfaction of the General Manager Infrastructure, City of Darwin.
- Waste bin storage and pick-up shall be provided in accordance with City of Darwin Policy Number 54 - Waste Management.
- Further, subject to conditions of subdivision to the satisfaction of service authorities.

- Any proposed signage for the site shall be subject to a separate assessment in accordance with City of Darwin Policy Number 42 – Outdoor Advertising Signs Code.
- Any proposed works on/over City of Darwin property shall be subject to separate application to the City of Darwin and shall be carried out to the requirements and satisfaction of the General Manager Infrastructure, City of Darwin.
- Any proposed stormwater connections to the City of Darwin stormwater system or proposed works on/over City of Darwin property shall be subject to separate application to the City of Darwin and shall be carried out to the requirements and satisfaction of the General Manager Infrastructure, City of Darwin.

In considering this application, the Reporting Body is requested to take into account any implications of the *Disability Discrimination Act* (Cth) or the *Anti-Discrimination Act* (NT) with regard to access for the disabled.

If you require any further discussion in relation to this application please feel free to contact me on 8930 0528.

Yours faithfully



CINDY ROBSON
STRATEGIC TOWN PLANNER