


Technical Services Reports

Committee Consideration – 13 August 2013
Council Resolution – 27 August 2013

Table of Contents

Item No.	Page No.
TS11.13 Request for Street Tree Removal	1
TS12.13 Review of the Proposed Parking and Parking Facilities Local Law	6
TS13.13 Parking Restrictions – Stubbs Terrace.....	10
TS14.13 Bruce Street / Elizabeth Street Black Spot Intersection Improvements	14

TS11.13	Request for Street Tree Removal
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Committee	13 August 2013
Council	27 August 2013
Applicant	City of Nedlands
Officer	Andrew Dickson – Manager Parks Services
Director	Mark Goodlet – Director Technical Services
Director Signature	
File Reference	CRS/073, M13/18843
Previous Item	Item 12.4 - report CP31.12 – Council Minutes 24 July 2012

Executive Summary

The City has received a request for removal of a street tree. Under the Council's Street Trees policy, this is a decision that must be made by Council.

Recommendation to Committee

Council approves the request from the owners of 9-11 Hynes Road, Dalkeith for the removal of one (1) Queensland Box tree (*Lophostemon confertus*) street tree adjacent to 11 Hynes Road, Dalkeith conditional to:

1. the owners accepting all associated costs for removal of the street tree;
2. the owners compensating Council, in accordance with Council's Street Trees policy, the amount of \$ 1,440.00 being the current escalated amenity value of the street tree as independently assessed in 2012; and
3. the owners providing three (3) WA Peppermint trees (*Agonis flexuosa*) in 200 litre planting containers or larger, to be installed at nine metres intervals on the established planting line within the nature strip and maintained for a period of 12 months from installation, with all associated costs to be borne by the owners.

Strategic Plan

KFA: Natural and Built Environment

Background

Council's Street Tree policy allows for the removal of street trees in specific circumstances (refer to Attachment 1, page 40 of Council Policy Manual). All requests for street tree removal are considered by Administration in accordance with policy and delegated authority. In accordance with policy this request is required to be determined by Council.

Key Relevant Previous Council Decisions:

Item 12.4 - report CP31.12 – Council Minutes 24 July 2012

Council approves the following policy:

b. Street Trees.

Discussion

Administration has been approached by a landscape design consultant requesting removal of a Queensland Box street tree adjacent to the property at 9-11 Hynes Road, Dalkeith (refer Figure 1). The request, made on behalf of the adjacent property owners, proposes to remove the street tree and replace it with three advanced WA Peppermint trees on the nature strip, at no cost to the City.

The landscape design consultant's reasoning for the request is based on the Queensland Box tree being "out of place with the proposed landscape design, of which the streetscape is an integral part. The intention is to unify and soften the streetscape, and create an avenue effect through the addition of three additional advanced Peppermint Willows".

The predominant street tree species in Hynes Road is the WA Peppermint and Jacaranda. The Queensland Box tree proposed for removal is currently the only street tree on the nature strip abutting 11 Hynes Road. It is still relatively immature and provides only a minor contribution to the streetscape in the area. The adjacent nature strip at 9 Hynes Road has a mature WA Peppermint tree and a pre mature Jacaranda.

Administration supports the proposal as the net effect will be the nature strip adjacent to 9-11 Hynes will acquire a full allotment of advanced street trees, at no cost to the City, and that integrates with the current local streetscape.



Figure 1 – Tree proposed for removal

Consultation

Required by legislation: Yes No
Required by City of Nedlands policy: Yes No

Ongoing consultation between applicant, Administration and Council.

Legislation / Policy

City of Nedlands Policy – Street Trees

Budget/Financial Implications

Within current approved budget: Yes No
Requires further budget consideration: Yes No

The proposal is at no cost to the City and, if approved, the City will receive compensation to the amount of \$ 1,440.00 for removal of the established street tree, in accordance with policy, in addition to acquiring advanced street tree assets.

Risk Management

Administration has evaluated potential risks with the proposal and assessed these as negligible with no requirement for controls.

Conclusion

It is recommended that Council approve the requested street tree removal proposal in accordance with the proposed conditions and with Administration's recommendation.

Attachments

1. Attachment 1 – Page 40 of Council Policy Manual (Street Trees Policy excerpt)

Attachment 1 – Page 40 of Council Policy Manual (Street Trees Policy)

- To facilitate a Council approved works program (i.e. road works, drainage, utilities etc);
- The Council decides to remove and replace trees on selected main or other streets, to provide an avenue effect, or
- Council may approve requests for street tree removal and replacement, to a similar size, with a preferred species where a property owner agrees to compensate the City the full amenity value of the tree (as determined under an independent valuation) and accepts all associated removal, planting and maintenance costs.
- Prior to the removal of a street tree Administration shall assess the tree and where practicable notify ward Councillors as a matter of courtesy of any proposed street tree removal one week prior to the removal and the reasons why in accordance with above.
- Unless circumstances dictate otherwise a street tree that has been removed shall be replaced by another tree of a suitable size and species.
- Removal of significant trees will only be authorised upon advice of a qualified arboriculturist and approval of Council.
- Leaf, flower, nut or bark fall, protection or enhancement of views or reduction or eradication of shade shall not constitute a reason for street tree removal.
- In the interests of public safety, pruning and removal is only to be undertaken by personnel authorised by the City of Nedlands.

Notification requirements will be as outlined in the Council's Community Engagement Policy and Strategy.

All applications for development shall indicate the location of adjoining street trees on site plans.


Public Safety and Potential Liability

In the interest of public safety and potential liability issues, structures such as, but not limited to, swings, cubby houses, ladders etc are not permitted to be constructed in street trees.

Species Selection

- Tree species will be determined by the Council from time to time.
- The City will develop a Species Selection database of generally available stock suitable to local conditions (to be displayed on the website) from the below Preferred Species Selection List:

TS12.13	Review of the Proposed Parking and Parking Facilities Local Law
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Committee	13 August 2013
Council	27 August 2013
Applicant	City of Nedlands
Officer	Rebecca Forrest – Technical Services Administration Officer Mark Goodlet – Director Technical Services
Director	Mark Goodlet – Director Technical Services
Director Signature	
File Reference	LEG/003-07/01
Previous Item	Council Meeting – PD07.13 – 26 February 2013 Council Meeting – PD36.12 – 28 August 2012 Council Meeting - PD21.12 – 26 June 2012 Council Meeting - T24.10 – 14 December 2010 Council Meeting – Item 13.2 - 22 June 2010 Council Meeting – CP41.09 - 13 October 2009 Council Meeting Notice of Motion – Item 14.2 - 11 August 2009

Executive Summary

The purpose of this report is to approve the proposed Parking and Parking Facilities Local Law (refer to Attachment 1).

Recommendation to Committee

Council adopts the proposed Parking and Parking Facilities Local Law as shown in Attachment 1 in accordance with the statutory requirements, Part 3, Division 2, section 3.12 of the *Local Government Act 1995*.

ABSOLUTE MAJORITY REQUIRED

Strategic Plan

KFA: Transport
KFA: Governance and Civic Leadership

Background

The *Local Government Act 1995* Part 3, Division 2 Section 3.16 (1) stipulates that within a period of eight (8) years from the day when a Local Law commenced or a report of a review of the Local Law was accepted under this section, as the case requires, a local government is to carry out a review of the Local Law to determine whether or not it considers that it should be repealed or amended.

The City's current Local Law in this regard entitled "Local Law Relating to Parking and Parking Facilities" was last reviewed on 23 April 2002 and was gazetted on 8 May 2002.

The review of the current local law commenced at the ordinary Council meeting held in August 2009 where it was identified that there was a need to amend the existing Local Law to control parking on nature strips (verges) to address safety matters.

At the ordinary meeting of 28 August 2012 Council approved a Parking and Parking Facilities Local Law 2012. The City's 2012 Local Law was disallowed on 28 November 2012 by the Joint Standing Committee on Delegated Legislation (JSCDL) prompting the need to restart the process.

The JSCDL determined that the 2012 Local Law is invalid because the committee deemed this law to be significantly different from the proposed local law that the City had advertised in the making of the 2012 local law due to the inclusion of a new subclause 5.14(4) which provides that 'the owner or occupier of premises adjacent to a verge shall not charge a fee to authorise a person to stop on a verge ...' (clause 5.14(4)). At the 26 February 2013 Council Meeting, Council resolved to give further state wide public notification on the revised proposed Parking and Parking Facilities Local Law.

Key Relevant Previous Council Decisions:

13 October 2009 – CP 41.09:

Council recommended that Administration undertakes a review of the Local Law and reports back to Council.

To commence the review Administration advertised the current Local Law and requested comments. Following receipt of comments the matter was considered by the Traffic Management Committee.

22 June 2010 – Item 13.2:

Council approves Traffic Management Committee's recommendation to instruct Administration to draft a new Local Law; and repeal the current Local Law.

Administration drafted a proposal which included changes to the existing Local Law and was based on the feedback received during the earlier advertising period.

14 December 2010 – Report T24.10:

Council instructs Administration to give state-wide public notice and advertise the proposed “Local Law” in accordance with the *Local Government Act 1995*; and send a copy of the proposed Local Law to the Minister for Local Government.

26 June 2012 – Report PD21.12:

That this item be referred back to Administration for redrafting to remove all provisions which permit or allow the introduction of pay for use parking.

28 August 2012 – Report PD36.12:

Council approves the proposed Parking and Parking Facilities Local Law as shown in attachment 1 in accordance with the statutory requirements, Part 3, Division 2, section 3.12 of the *Local Government Act 1995*.

26 February 2013 – Report PD07.13

Council gives state-wide public notice and advertises the proposed “Parking and Parking Facilities Local Law 2013” as shown in attachment 1 in accordance with the statutory requirements, Part 3, Division 2, section 3.12 of the *Local Government Act 1995*.

Discussion

The proposed draft Parking and Parking Facilities Local Law 2013 (Attachment 1) varies slightly from the draft that was approved by Council at the 28 August 2012 Council meeting, only in that there were minor formatting amendment recommendations by the Department of Local Government when it was submitted for review following state wide public advertisement. These minor amendments have been included in the final proposed Parking & Parking Facilities Local Law 2013, as per attachment 1.

It is proposed that Council approve the proposed Parking and Parking Facilities Local Law 2013 to allow Administration to proceed with having it published in the Gazette in accordance with the statutory requirements, Part 3, Division 2, section 3.12 of the *Local Government Act 1995*.

Consultation

Required by legislation:

Yes

No

Required by City of Nedlands policy:

Yes

No

In accordance with legislation, the proposed Parking and Parking Facilities Local Law was advertised for a period of six (6) weeks beginning 30 March 2013, in both the Post and the West Australian newspapers. Copies of the proposed Local Law were available at the Administration Office, both libraries and on the City's website. The minor amendments recommended by the Department of Local Government are appended to this report as attachment 2.

Legislation / Policy

Local Government Act 1995, Part 3, Division 2, Section 3

Budget/Financial Implications

Within current approved budget:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Requires further budget consideration:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

The only cost associated with approving the proposed Parking and Parking Facilities Local Law 2013 is the cost to advertise it in the Government Gazette and then in the state and local newspapers to give notice of the gazettal.

Risk Management

The *Local Government Act 1995* Part 3, division 2, section 3.16 requires that a periodic review of local laws is undertaken within a period of eight (8) years from the day when a Local Law commenced or a report of a review of the Local Law was accepted under this section. The 2002 Local Law is outdated and no longer meets the City's requirements. If no new Local Law is made then the City may be subject to questions of legal validity from the Department of Local Government or in court should any infringement be challenged.

Conclusion

As the Parking and Parking Facilities Local Law 2002 is now outdated and given that the proposed Parking and Parking Facilities Local Law 2013 is identical to the draft Parking and Parking Facilities Local Law 2012, except for some minor changes as recommended by the Department of Local Government, it is recommended that the Local Law be approved.

Attachments

1. Proposed Parking and Parking Facilities Local Law 2013
2. Minor amendments recommended by the Department of Local Government.

TS13.13	Parking Restrictions – Stubbs Terrace
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Committee	13 August 2013
Council	27 August 2013
Applicant	City of Nedlands
Officer	Rebecca Forrest – Technical Services Administration Officer Mark Goodlet – Director Technical Services
Director	Mark Goodlet – Director Technical Services
Director Signature	
File Reference	IFM/414
Previous Item	Nil.

Executive Summary

The purpose of this report is to implement permanent parking restrictions around Shenton College bus stop (adjacent to the railway line) at Stubbs Terrace, Shenton Park.

Recommendation to Committee

Council approves the following parking restrictions:

1. “No Stopping on Bus Zone and Verge” at all times; and
2. “No Stopping on Road or Verge, 7.30 am – 9.30 am, 2.30 pm – 4 pm, Monday to Friday”, for approximately 40m on both sides of the Bus Zone on Stubbs Terrace, adjacent to the railway line.

Strategic Plan

KFA: Transport

This proposal improves pedestrian and vehicular safety adjacent to a school.

Background

The City received a request to assist in reducing parking congestion on Stubbs Terrace, directly outside Shenton College. There has been an increase in verge parking around this area and the children’s crossing point. The City met with the college on site to discuss the issue. As a result, the proposed parking restrictions are advised.

Key Relevant Previous Council Decisions:

There are no previous Council decisions relating to this matter.

Discussion

Following discussion with the Shenton Park College principal the City was able to make small improvements to the parking restrictions on the college side of Stubbs Terrace and Selby Street. This involved placing the existing parking restriction signage in locations that are visible to road users and are compliant with standards.

However, the principal also requested that parking restrictions be added on the railway side of Stubbs Terrace to assist children as they leave school and to assist vehicles as they exit the college car park. Currently vehicles park behind the bus stop area on the verge, directly opposite the exit to the college carpark and on the railway side of the Stubbs Terrace nature strip directly opposite the Selby Street intersection.

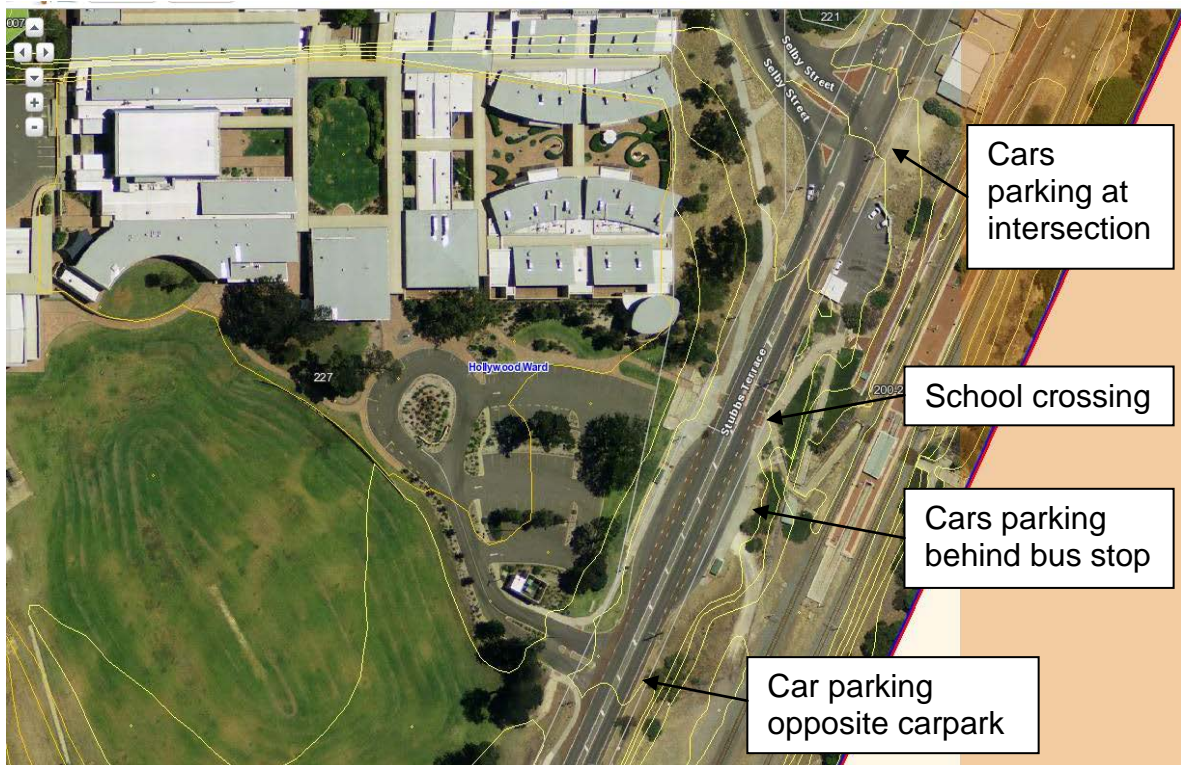


Figure 1. Existing Parking on the nature strip at Stubbs Terrace

City officers attended the site at the end of the school day and have observed the mix of children leaving the school to cross Stubbs Terrace to catch the bus or train. There is clearly a potential for conflict between the parked cars and the children. There is also a potential for obstruction of sight lines due to parked cars. For these reasons the request to ban the nature strip parking towards Selby Street and behind the bus stop is supported.

The Austroads Off-street parking guidelines recommend that the positioning of crossovers opposite intersections is avoided where possible as this creates a potential conflict point for vehicles turning at the intersection and vehicles coming from the crossover.

During school start up and end periods this situation is replicated as the college carpark entry behaves like an intersection in terms of the number of vehicles entering and leaving the carpark. For this reason the prevention of vehicles parking opposite the carpark entry during school start up and end periods is supported.

This principle extends to the nature strip opposite Selby Street where vehicles are parked on the nature strip and in the Public Transport Authority's railway land shown as the bear patch of dirt in Figure 1. The City has written to the Public Transport Authority in this regard to indicate that while it has no objection to use of the extended parking that formalizing and increasing 'park and ride' facilities in the railway reserve area may improve safety at the intersection of Selby Street and Stubbs Terrace. This safety improvement would come about by creating a larger carpark with controlled entry points in safe locations.

The response from the Public Transport Authority was supportive but indicating that there was no budget for this, unless the City opted to assist with funding. The City has not taken up this suggestion.

With respect to the two responses from businesses concerning parking the primary issue was parking scarcity. To this end the proposed restrictions opposite the college carpark are only during the school start and end periods, to allow at least medium term parking to occur on the nature strip in this area. Secondly the parking restrictions are to remain unrestricted on the nature strip further to the south east along the railway side of Stubbs Terrace. This will then shift parking opportunities away from the pedestrian and intersection areas, while still providing for short to long term parking opportunities.

Consultation

Required by legislation:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Required by City of Nedlands policy:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

In accordance with Council Policy, Administration consulted with all relevant stakeholders in the surrounding area, this included:

- Public Transport Authority (PTA)
- Department of Fire and Emergency Services (DFES)
- Department of Education

A letter drop was also conducted which included all of the business along the railway, Dalglish Fire Station and the Autism Association of WA.

Five responses were received back. PTA supports the parking restrictions, the Department of Fire and Emergency doesn't have any concerns regarding the proposed restrictions and the Department of Education supports the proposed parking restrictions.

Two other feedback responses were received, both of which expressed their concerns regarding the parking situation currently on Stubbs Terrace, one was not supportive of the proposed parking restrictions and the other just requested the City look at the parking issue all along Stubbs Terrace.

Legislation / Policy

Local Government Act 1995

Budget/Financial Implications

Within current approved budget:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Requires further budget consideration:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Minimal cost for erecting signage.

Risk Management

The college has identified risks to the children that in the opinion of Administration are valid and should be mitigated by controlled parking. Further risks to vehicles at the intersection with Stubbs Terrace and opposite the college car park have been identified and should also be mitigated by controlled parking.

Conclusion

The proposed changes to the parking on Stubbs Terrace have a clear benefit to the safety of children at Shenton College to vehicles at the intersection of Stubbs Terrace and Selby St and to vehicles entering and leaving the carpark of Shenton College.

There will still be unrestricted parking opportunities on the nature strip of Stubbs Terrace, albeit some 60 metres further away from the light industrial precinct and the railway station.

It is therefore recommended that Council approves the proposed changes to parking as per attachment 1.

Attachments

1. Outline of proposed parking restriction zones

TS14.13	Bruce Street / Elizabeth Street Black Spot Intersection Improvements
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Committee	13 August 2013
Council	27 August 2013
Applicant	City of Nedlands
Officer	Mark Goodlet – Director Technical Services
Director	Mark Goodlet – Director Technical Services
Director Signature	
File Reference	IFM/414
Previous Item	T22.11 – 13 December 2011 Council Meeting 23 July 13 – Petition on Elizabeth Bruce Intersection

Executive Summary

This report is a response to Council’s resolution in December 2011 to consider other options for the Blackspot treatment of the intersection of Bruce Street and Elizabeth Street. It also responds to Council’s resolution to consider the petition (July 2013) requesting that the intersection speed be lowered to improve safety.

Seven (7) options were considered. Two (2) options are considered viable for the intersection and meet Main Roads WA approval requirements. The roundabout remains the preferred option, however a median island in Bruce Street preventing right hand turns and preventing traffic from proceeding across Bruce Street along Elizabeth Street, will meet the crash reduction aims of the works.

Recommendation to Committee

Council approves the installation of a roundabout, lighting upgrade and associated works at the intersection of Bruce Street and Elizabeth Street, Nedlands as approved under the Main Roads WA Blackspot Program (refer to Attachment 1).

Strategic Plan

KFA: Transport.

The proposed works improves the road network and meets the strategic aim of providing safe roads.

Background

The intersection of Bruce Street and Elizabeth Street qualified as a Blackspot intersection in 2011/12. Subsequently a roundabout was designed in response to the crash data. This was the solution derived from analysis of the accident frequency, type and directions in accordance with the standardized evidence based mitigations enunciated in the Main Roads WA Crashtool program.

A review of the intersection was also carried out by an independent auditor who investigated alternative solutions including signalisation, four way stop signs and road termination in one direction. His conclusion was also that a roundabout was the appropriate solution.

Key Relevant Previous Council Decisions:

Council was presented with a report (TS22.11) on a proposal to upgrade the intersection of Bruce Street and Elizabeth Street to a roundabout the matter on 13 December 2011 with a concept for a roundabout at the intersection.

Council Resolution

1. That this matter be referred back to Administration for reconsideration of further alternative design.
2. Administration review the traffic condition and parking arrangements along Bruce Street.

Council received a petition (July 2013) on the intersection of Bruce Street and Elizabeth street, seeking a reduction in speed at the intersection to improve its safety. Council resolved to have a report brought to it on the matter.

Discussion

Council rejected the roundabout option and requested that further investigation be carried out to find alternative solutions. This has now been done. A total of seven (7) options have now been considered as presented below.

The seven (7) options are:

1. Roundabout, as shown in attachment 1;
2. Median Island in Bruce St, forcing Elizabeth St to terminate in each direction at Bruce Street, as shown in attachment 2;
3. Traffic calming along Bruce Street by way of mid-block (between intersections) ovals or the like at approximately 100m to 130m intervals;
4. Do nothing;
5. Four way stop sign;
6. Signalisation; and
7. Intersection Hump.

Option 1 - Roundabout (Preferred)

Description

A roundabout is installed at the intersection to control vehicle movements and speeds in all directions.

How it Works

Give way signals at the roundabout entries establish priority. A central island directs traffic around the intersection.

Advantages

- Simplifies conflicts;
- Reduces intersection speed;
- Is very likely to reduce crash severity and numbers; and
- Complies with the Blackspot Crashtool solutions.

Disadvantages

- Roundabouts can be difficult for cyclists and pedestrians on high volume and multi-lane roundabouts;
- Is better for balance flow (equal traffic volumes in each street); and
- Two existing box trees will require removal.

Option 2 – Bruce Street Median Island (2nd Preference)

Description

Attachment 2 shows an island placed in Bruce Street which straddles the intersection. There is a break in the island which provides a staging point for pedestrians and cyclists crossing Bruce Street.

How it Works

This solution works by preventing vehicles from turning across each other's path therefore eliminating accidents. The island caters for pedestrians and cyclists crossing Bruce Street by protection them and allowing a staged crossing of Bruce Street.

Advantages

- Relatively inexpensive;
- No loss of trees;
- Very likely to reduce crash numbers and severity; and
- The lines and signs plan has Main Roads WA approval.

Disadvantages

- A disruptive effect on traffic flow through the suburb as vehicles will need to divert into surrounding streets. Implementing a single measure in an area in isolation may have implications for the neighbouring streets in terms of traffic volumes and safety.

Consultation has not been carried out for this option. It would need to target all of the affected streets with about 860 surrounding properties needing to be consulted to determine their thoughts on the matter.

Option 3 – Bruce St Traffic Calming (not recommended)

Description

Under this proposal traffic calming devices such as chicanes are inserted at regular intervals (mid-block) of about 100m to 130m along the street. In particular there are traffic calming devices located close to Elizabeth Street.

How it Works

This solution reduces the incidence and severity of accidents at the intersection by slowing the average speed of vehicles in Bruce Street. Under normal circumstances mid-block treatments are complimented by intersection traffic calming solutions such as roundabouts. In this case however, placing the traffic calming device near the intersection of Bruce Street and Elizabeth Street might slow vehicles coming into the intersection.

Advantages

- Reduces speed in Bruce Street; and
- Reduces severity of accidents.

Disadvantages

- Blackspot funding not provided and the City will need to fund this itself;
- May not achieve crash frequency reduction. Typically mid-block treatments are placed in as a follow up to intersection treatments rather than the other way round, as this proposal suggests. There is a potential for this mitigation to fail to achieve the desired results.
- May have impacts on neighbouring streets if done without precinct planning; and
- Difficult to design due to cycle preferred route and bus route in Bruce Street.

The traffic calming option would need careful design and consultation prior to implementation. Bruce Street is a preferred bicycle route and a bus route so designing traffic calming devices and locating them in positions that don't interfere with driveways and trees is difficult. Again it is likely to only provide an improvement of the accident issue but without a solution actually on the intersection itself it is unlikely to solve the Blackspot issue entirely. When done without precinct planning it may lead to unintended consequences for side streets.

Option 4 - Do nothing (not recommended)

Description

Under this option no work is carried out and the City monitors ongoing performance of the intersection.

How it Works

This is the business as usual scenario.

Advantages

- Costs nothing (construction costs); and
- Defers to consideration of more strategic precinct planning.

Disadvantages

- Accidents will continue to occur; and
- Adds to City risk.

Option 5 - Four Way Stop Sign (not recommended)

Description

Two more stop signs are added to the intersection, in Bruce Street, in addition to the two already in place in Elizabeth Street. This solution is available under Austroads.

How it Works

All vehicles must stop at the intersection and give way to the right.

Advantages

- Costs little to implement; and
- Is likely to reduce crash severity.

Disadvantages

- This approach is not used in WA and is very likely to cause confusion and may lead to an increase in the number of low speed accidents; and
- Is not supported by Main Roads WA, who has considered this option.

Option 6 - Signalisation (not recommended)

Description

Traffic lights are installed at the intersection to control vehicle movements in all directions.

How it Works

Vehicles comply with traffic signal direction.

Advantages

- Is very likely to reduce crash severity and numbers.

Disadvantages

- This solution is extremely expensive and would cost in excess of \$1million to implement;
- This is out of step with the surrounding intersection treatments; and
- Is not supported by Main Roads WA, who has considered this option.

Option 7 - Intersection Hump (not recommended)

Description

A raised hump is placed at the intersection of Bruce Street and Elizabeth Street.

How it Works

Vertical displacement of the vehicles occurs as they cross the intersection. Vehicles slow down prior to entering the intersection to avoid the discomfort of the hump.

Advantages

- It can highlight the presence of the intersection; and
- Is very likely to reduce crash severity and numbers.

Disadvantages

- This solution is suitable in high pedestrian vehicle interaction areas such as shopping precincts. In this case there is a short period of high pedestrian vehicle interaction but the majority of the day is vehicular traffic only;
- This is out of step with the surrounding intersection treatments, which may therefore result in confusion;
- Humps can be uncomfortable for vehicle occupants;
- They may create confusion for pedestrians in terms of who has priority if the raised section is at the pedestrian crossing point and is not strongly delineated; and
- Humps can be annoying for nearby residents due to the impact noise of vehicles entering and leaving the hump.

Roundabout – the Preferred Solution

The roundabout solution was originally developed by City of Nedlands' Technical Services staff based on analysis of the intersection accidents and the treatment recommended by the Austroads standards, which represent the peak road design guidelines in Australia. It was also the most appropriate solution derived from the Main Roads WA Crashtool program.

A review of the intersection was also carried out by an independent road safety auditor who investigated alternative solutions including signalisation, four way stop signs and road termination in one direction. His conclusion was also that a roundabout was the appropriate solution. A summary of this auditor's assessment is attached and is instructive in its analysis of the crash history, patterns and nominated solution.

A review of the data and the proposed solutions has also been carried out by the Director Technical Services (report author) and the same conclusion has been reached regarding the most appropriate treatment based on the Austroads Guidelines.

Blackspot treatment effectiveness compared with the literature has shown that roundabouts are slightly more effective than even the literature is suggesting. Roundabouts have shown to reduce casualty crashes by 70% and property damage only (PDO) by 50%. The Benefit Cost Ratio for roundabouts is approximately 9, indicating strong positive benefit to the community. (Harvey M, 2007, *Evaluation of the National Black Spot Program*, Australian Government, Department of Infrastructure and Transport, Canberra).

Liveable Neighbourhoods on Roundabouts

Liveable Neighbourhoods indicates a general steering away from the use of roundabouts on high volume arterial roads. It specifically indicates a preference for signalisation over roundabouts for major roads (2009, Element 2 p.2) although considers they may be considered 'where pedestrian and cyclist volumes are very low' (2009, Element 2 p.9).

For minor roads it encourages the use of four-way junctions with priority control (stop signs etc) in place (2009, Element 2 pp. 31-34). This is what exists now at the intersection of Elizabeth Street and Bruce Street, and it has proven to be insufficient to reduce accidents to an acceptable level.

Liveable Neighbourhoods then goes on to suggest that where the four-way junction control is not used roundabouts are appropriate provided they are designed to suit the swept path of the vehicles they are serving, including buses.

Buses

Bruce Street is used by buses and the Public Transport Authority has indicated its willingness to allow the use of its buses to test the turning paths of the Transperth fleet, in order to ensure that the buses are able to negotiate roundabout, intersections and mid-block treatments. To this end the roundabout has been designed to incorporate the bus swept paths.

Swept paths will not be of concern should the median island option be adopted.

Tree Removal and Replacement

The roundabout option requires removal of two box trees on the south side of Elizabeth Street. These would be replaced in appropriate locations. Another tree would also be planted in the centre of the roundabout.

The median island solution does not require removal of any trees. However it should be noted that if separate cycle lanes in Bruce Street are added through the intersection, taking the lane widths from 3.5m to 4.7m, then three box trees would be removed. The cycle lanes are not shown in the proposed plan.

Bruce Street Vehicle Speeds

Traffic data shows vehicle speeds in Bruce Street at 56kph north of Elizabeth Street, increasing to 58 kph south of Elizabeth Street. Dealing with vehicle

speed through the intersection is therefore warranted. The speed problem creates longer stopping distances, which in the case of Bruce Street is further exacerbated by the down grade of the road, increasing stopping distances even further.

Pedestrian and Cyclists at Roundabouts

Concerns with respect to roundabout proposals are based, in part, on the lower safety and amenity provided for pedestrians and cyclists. Austroads, 2011, *Guide to road design part 4b: roundabouts*, 2nd edn, Austroads, Sydney, p.4, agrees with these concerns and makes the following statement based on empirical data collected on roundabouts:

A well designed roundabout is the safest form of intersection control. Numerous 'before and after' type studies have shown that in general, fewer motor vehicle casualty crashes occur at roundabouts than at intersections containing traffic signals, stop, or give-way signs. Unfortunately, this same safety record does not apply to cyclists or pedestrians.

With respect to pedestrians the following is noted:

Special consideration must be given to pedestrian movement/s at roundabouts. While roundabouts are not necessarily less safe than other intersection types, children and elderly pedestrians feel less safe at roundabouts, particularly at exits. This is because, unlike traffic signals, roundabouts do not give priority to pedestrians over through traffic or right-turning traffic and some pedestrians may suffer a reduction in accessibility.

With respect to cyclists the following is noted:

It is also important to note that several studies have shown that roundabouts increase the risk of cyclists being involved in a crash, compared to other types of intersection. Roundabouts designed with good entry curvature require entering drivers to slow down, provide more time for motor vehicle drivers to scan for cyclists, and consequently minimise cyclist crashes.

In summary:

It should be noted that although treatments can be provided for pedestrians and cyclists at roundabouts they may not be the most appropriate intersection treatment at locations where there are high levels of cycle and pedestrian traffic and alternative treatments should be considered.

The 2011 update to the Austroads roundabouts design guidelines features a separate chapter on pedestrian and cyclist treatments. Austroads (2011, p. 50) indicates that:

The results of various studies indicate that a separated cycle path, located outside of the circulating carriageway, is the safest design when there are high vehicle flows.

Pedestrian and cyclist count analysis and observations

Pedestrian and cyclist traffic movements have been studied over three days, primarily during school start and end times to identify volumes, type and direction of movements. The results were as shown in the figures below.

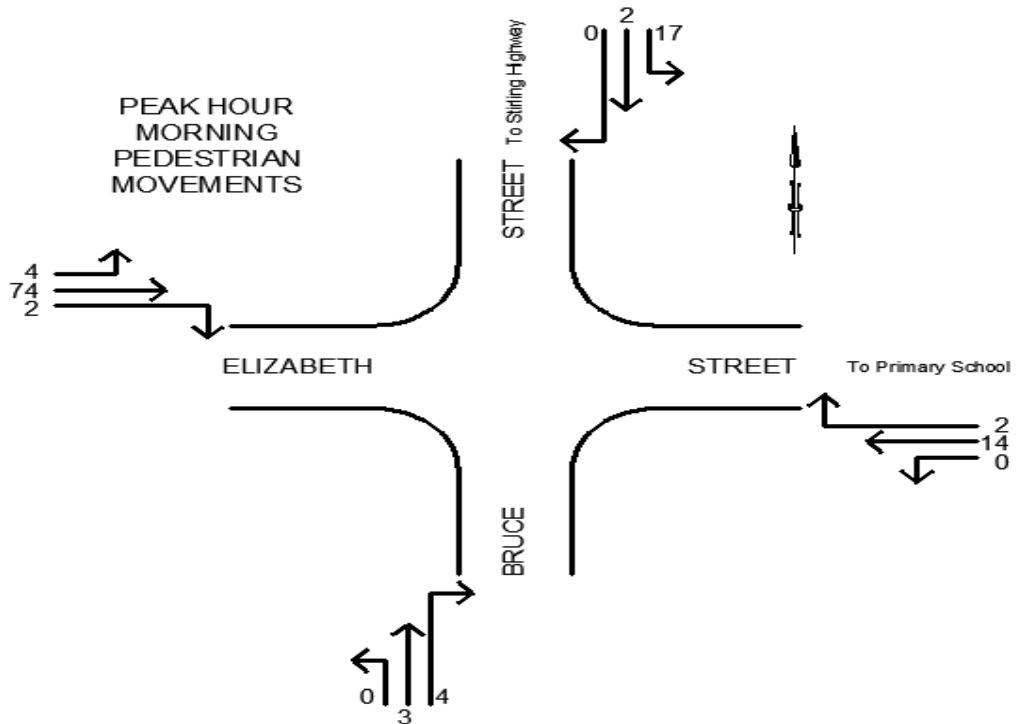


Figure 1. Peak Hour Morning Pedestrian Movements (includes all on-footpath pedestrians, bicycles, skateboards etc.)

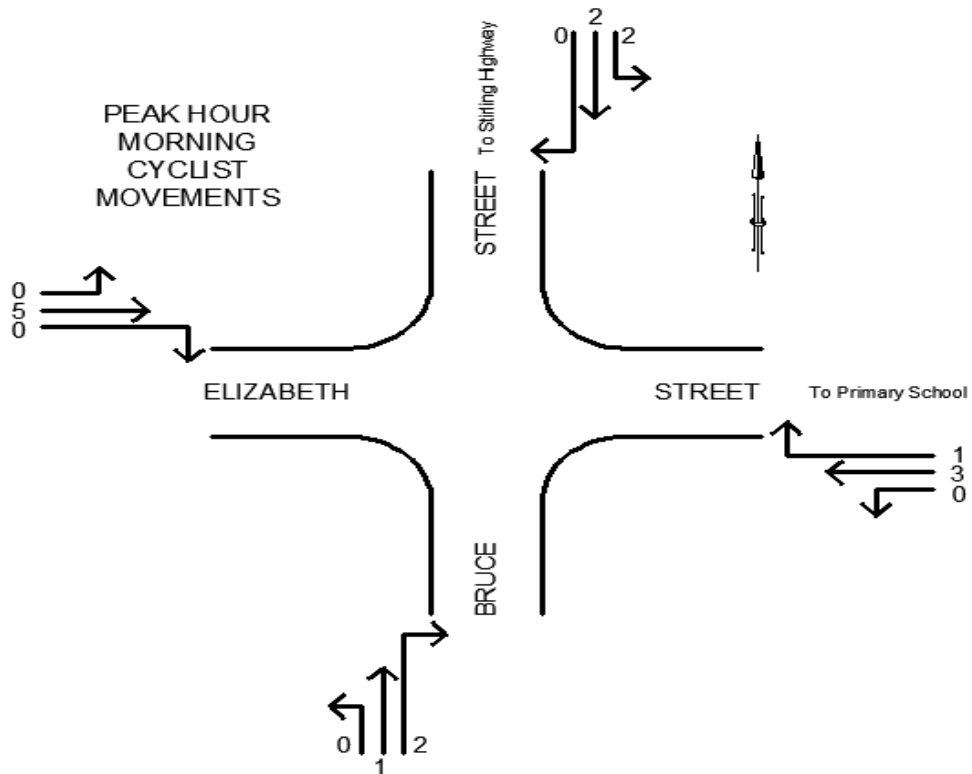


Figure 2. Peak Hour Morning Cyclist Movements (includes all on-road bicycles)

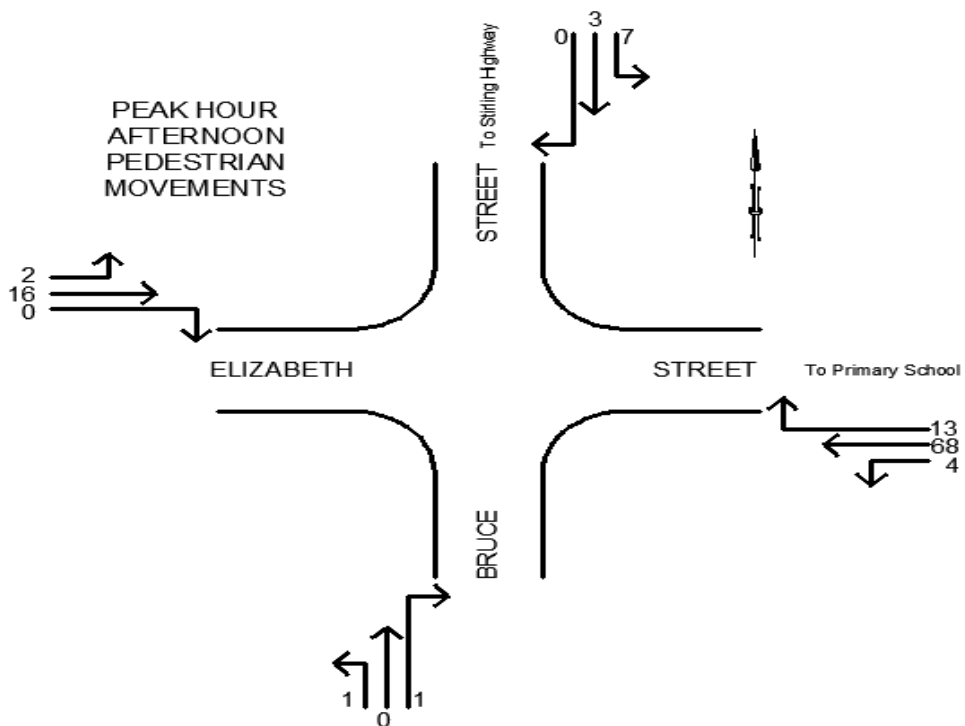


Figure 3. Peak Hour Afternoon Pedestrian Movements (includes all on-footpath pedestrians, bicycles, skateboards etc.)

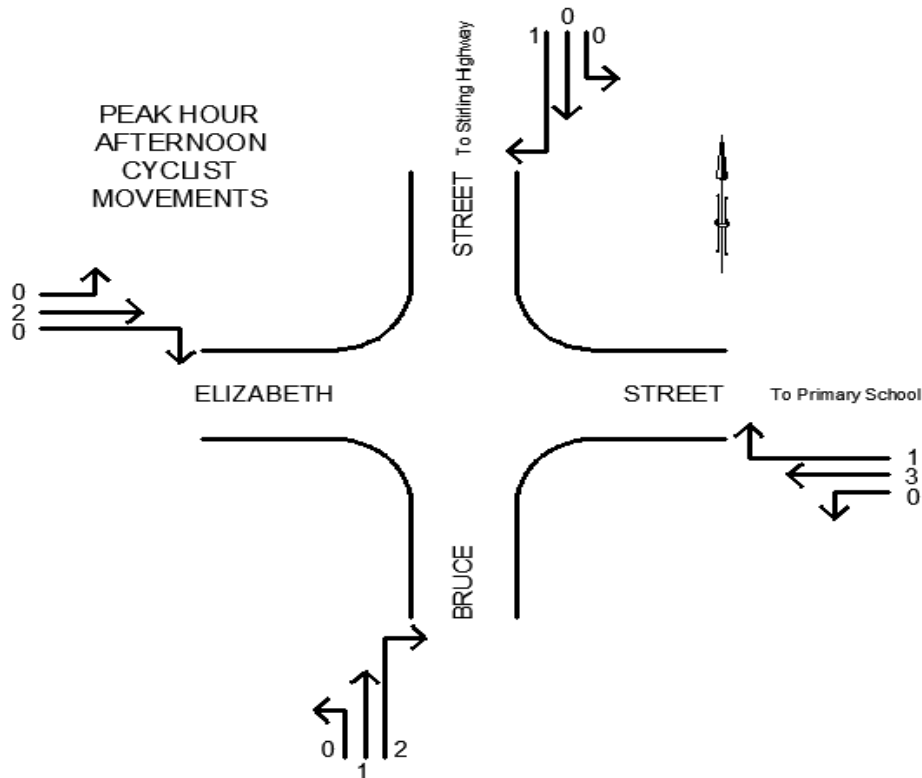


Figure 4. Peak Hour Afternoon Cyclist Movements (includes all on-road bicycles)

The observations confirmed that:

- Nedlands Primary School is a significant generator for pedestrian movements;
- Pedestrian directly crossing Bruce Street along Elizabeth Street is the mayor movement;
- On road cyclist numbers were relatively small; and
- The existing footpath network serves the children (accompanied and unaccompanied) well and caters for the directions travelled.

As a precautionary measure many vehicles would brake as they proceeded along Bruce Street through the Elizabeth Street intersection, particularly in the presence of pedestrians. In just one observation period there were instances where vehicles needed to slow to allow groups of children, with and without parents, to cross Bruce Street. On one occasion a vehicle had to come to a standstill in Bruce Street in order to avoid a group of children crossing the road, though no guards were present.

Design implications for the observed pedestrian and cyclist numbers are:

- Slowing vehicles at the intersection is recommended;
- Mid-road propping (at a median island) for pedestrians is recommended; and
- The proposed footpath locations are appropriate for the various movements.

The footpaths have been designed to guide the pedestrians to specific crossing points and importantly provides for the staged crossing of Bruce Street. A median island allows pedestrians to prop at the northern approach island.

Roundabouts and Balanced Flow

Balanced traffic volumes are desirable for roundabouts. The right turn movements create breaks in the traffic for other lanes to enter the intersection. Austroads (2013, Guide to Traffic Management Part 6, p.175) indicates that unbalanced flow is mostly problematic in the case of rural high speed high volume roads intersecting very low volume roads (Austroads, 2013). In this case there is unbalanced flow, however the speed is not high and the intersection is not rural. In this case the increase in the traffic volume in Elizabeth Street coincides with increased pedestrian flows, (school start and finish) which provides the flow disruption at the intersection needed to control vehicle speeds at the optimum time, and which is when pedestrians are attempting to cross Bruce Street.

Bruce Street Median Island

The roundabout option has the distinct advantage over the Bruce Street Median Island option of slowing traffic in Bruce Street, which is important for vehicle crashes and for pedestrian safety.

Like the roundabout option the Bruce Street Median Island option provides a staging point for pedestrians crossing Bruce Street, thus improving pedestrian safety.

Prevention of all right hand turn movements and prevention of the through movement along Elizabeth Street, will reduce vehicular accidents.

The installation of a median island across Bruce Street will cause diversion of traffic into adjoining streets. About 800 vehicles per day use Elizabeth Street west of Bruce Street, while about 1500 vehicles per day use Elizabeth Street east of Bruce Street.

The overall scale of discontinuity that the median will cause is not known. However, observation of the intersection showed a significant increase in vehicular activity moving across Bruce Street along Elizabeth Street during the school pickup time. This traffic will divert mostly down to Princess Road and possibly up to Edwards Street.

The intersection of Princess Road and Bruce Street has a roundabout, so it should not present difficulties in coping with the added traffic. The intersection of View Way and Princess Road has only had two (2) reported accidents in the past five years. This intersection is a four way intersection with stop signs and a median in the northern leg of View Way. To the east along Princess Road is a traffic hump which should control vehicular speed and the sight distances in both directions along Princess Road are adequate.

There is a small environmental price to pay for the extra distance vehicles will have to travel by diverting around the Bruce Street Elizabeth Street intersection with a median present in Bruce Street. Note elsewhere in this report the discussion with respect to the trees.

In summary, the Bruce Street median island is a viable option for the intersection with Elizabeth Street. Should Council elect to further this option, the following recommendation is appropriate:

“Council instructs the CEO to undertake consultation on the installation of a median island and associated works in Bruce Street at the intersection with Elizabeth Street (refer to Attachment 2). If the consultation is supportive of the design overall then the proposal is to be constructed and if not the matter is to be brought back to Council for further consideration.”

While the median island options has the disadvantage over the roundabout of not slowing traffic, it could be constructed as a median island and if there are ongoing speed issues then the installation of road cushions in Bruce Street at the intersection. Road cushions allow buses to straddle them but require careful negotiation by cars, thus reducing speeds.

Consultation

Required by legislation:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Required by City of Nedlands policy:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

Community consultation has been undertaken. A mail out was sent to all surrounding residents and stakeholders containing the following:

- A letter providing informing about the proposed works;
- An information sheet showing before and after artist impression images of what the proposed works will look like;
- A comment form; and
- A Black Spot flyer providing information on Black Spots.

Should the median island proposal be adopted then further consultation will be undertaken for this option.

Legislation / Policy

Local Government Act 1995, s3.21, 3.51

Budget/Financial Implications

Within current approved budget:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Requires further budget consideration:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Cost breakdown:

Blackspot program 2/3 \$130,000 – Approved

Council 1/3 \$65,000 – Approved

Project has been approved in the 2013/2014 capital works budget.

Risk Management

Should Council not approve the proposed roundabout and lighting upgrade to the intersection of Elizabeth and Bruce Street, the risk is that the intersection, as identified by Main Roads WA crash statistics will continue to be unsafe for all road users.

Conclusion

This report provides two viable options for improving the safety of the intersection of Bruce Street and Elizabeth Street. The first of these is the roundabout, previously presented to Council. The second is a median island in Bruce Street at the intersection with Elizabeth Street.

While the preference remains with the roundabout, there are some legitimate concerns about the protection of pedestrians at roundabouts, who lose the protection of priority over vehicles turning right.

On the other hand the median island solution will not lower speeds as much as the roundabout solution and it will divert traffic into other streets.

Attachments

1. Plan - Previously proposed roundabout solution.
2. Plan - Island solution.
3. Auditor's assessment and recommendation.