



**ACT**  
Government

Transport Canberra and  
City Services

## FREEDOM OF INFORMATION COVERSHEET

The following information is provided pursuant to section 28 of the *Freedom of Information Act 2016*.

FOI reference: TCCSFOI 20-028

Information to be published	Status
1. Access application	Published
2. Decision notice and schedule	Published
3. Documents	Published
4. Additional information identified	n/a
5. Fees	n/a
6. Processing time (in working days)	20 days
7. Decision made by Ombudsman	n/a
8. Additional information identified by Ombudsman	n/a
9. Decision made by ACAT	n/a
10. Additional information identified by ACAT	n/a



**ACT**  
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and City Services

## Freedom of Information – Access Application Form

### PRIVACY NOTICE

The personal information you supply on this form will only be used for the purpose of processing your request. Your application must include an email or postal address to which the respondent can send notices under the Act. If all or some of this information is not collected, Transport Canberra and City Services may not be able to communicate with you, inhibiting their obligations under the Act. This could mean the request cannot be dealt with. Your personal information will not be disclosed to a third party without your consent unless statutory obligations require otherwise.

The Transport Canberra and City Services Privacy Policy contains information on how you can access or seek to correct any of your personal information that is held by the Transport Canberra and City Services, as well as the process for lodging a complaint about an alleged breach of the *Information Privacy Act 2014*. The Privacy Policy can be found on the Transport Canberra and City Services website at [www.tccs.act.gov.au](http://www.tccs.act.gov.au).

### Applicant details

I wish to make an access application to Transport Canberra and City Services under the *Freedom of Information Act 2016*.

Name

[REDACTED]

Address

(where notices relating to this request can be sent – either postal or electronic)

[REDACTED]@outlook.com.au

Telephone Contact (Business Hours)

[REDACTED]

Telephone Contact (Mobile)

[REDACTED]

Email Contact

[REDACTED]@outlook.com.au

### What documents are you requesting under the Act?

- To help Transport Canberra and City Services process your request, please include enough detail in your application so that we can fully understand what government information you want.
- You may wish to include a statement about how the release of information is in the public interest.
- If your application is for access to your own personal information you must include evidence of your identity. If you are an agent acting for an applicant, please supply evidence of your authorisation and evidence of the identity of the agent.
- If for reasons in section 30 of the Act is not compliant and your application cannot be processed, Transport Canberra and City Services will take reasonable steps to assist you and give you reasonable time to amend your application if you wish.

Minister Steel has advised that a 2.9km length of Barton Highway between William Slim Drive/ Gundaroo Drive and Bellenden Street will have its speed limit reduced from 100km/h to 80km/h based on a Black Spot Feasibility Study of the midblock section.

I am requesting that Black Spot Feasibility Study.

### Fee Waiver

If you wish to apply for a fee waiver, the Act sets out a number of provisions to do so:

- The information being requested was previously publicly available but no longer is.
- The information being requested is of special benefit to the public (Ombudsman guidelines see Section 66).
- The applicant is a concession card holder and demonstrates a material connection with the information requested (concession cards include a current health care or pensioner card issued under the [Social Security Act 1991](#); a current pensioner concession card issued in relation to a pension under the [Veterans' Entitlements Act 1986](#) or [the Military Rehabilitation and Compensation Act 2004](#); a current gold card; or a card prescribed by regulation).
- The applicant is a not-for-profit organisation and the application relates to the activities or purposes of the organisation.
- The applicant is a member of the Legislative Assembly.

Transport Canberra and City Services must waive any fees for providing information if the information was not publicly available and the agency makes the information publicly available before or within 3 working days after giving it to the applicant.

### Fee waiver application (fill in if applicable. Otherwise leave blank)

I would like to apply for a fee waiver because (state reason/s from the list above).

[provide details and evidence of how this reason applies]

I would like

a copy of these documents sent to the above address

OR

to inspect these document

APPLICANTS SIGNATURE

DATE OF REQUEST

14/04/2020



**ACT**  
Government

Transport Canberra and  
City Services

Mr [REDACTED]  
[REDACTED]@outlook.com.au

Dear Mr. [REDACTED],

**Freedom of information request:** Reference 20-028

I refer to your access application made under the Freedom of Information Act 2016 (FOI Act), on 14 April 2020, in which you sought access to a copy of the Black Spot Feasibility Study of the midblock section relating to Minister Steel's announcement of traffic changes to the Barton Highway between William Slim Drive/Gundaroo Drive and Bellenden Street.

I am an officer authorised by the Director-General of the Transport Canberra and City Services to make decisions about access to government information, in accordance with section 18 of the FOI Act.

Transport Canberra and City Services (TCCS) have completed a search and have identified one record in scope of your request. I have decided to grant partial access to this record.

*Reasons for decision*

As an Information Officer, I am required to decide where, on balance, public interest lies. As part of this process I must consider factors favouring disclosure and non-disclosure.

*Favouring disclosure (Schedule 2.1):*

- 2.1(a)(i), promote open discussion of public affairs and enhance the government's accountability;
- 2.1 (a)(ii) contribute to positive and informed debate on important issues or matters of public interest;
- 2.1 (a)(iii), inform the community of the government's operations, including the policies, guidelines and codes of conduct, followed by the government in its dealings with members of the community;
- 2.1(a)(iv) ensure effective oversight of expenditure of public funds; and
- 2.1 (a)(viii) reveal the reason for a government decision and any background or contextual information that informed the decision.

*Favouring non-disclosure (Schedule 2.2):*

- 2.2(a)(ii), prejudice the protection of an individual's right to privacy

I consider that it is in the public interest to release most of the information identified as falling within the scope of your request. Release of the information is in the public interest as it informs the community of the government's operations which can affect members of

the community and the process followed by government in relation to such matters. It also improves the Directorate's accountability for decisions it makes by being transparent in releasing the information.

I note however that this document contains personal information of third parties, and I have decided people's names should not be released because the release could identify an individual and could prejudice their right to privacy. I find the protection of this information outweighs disclosure in this instance. As such, redactions have been applied to information on page 5.

#### *Charges*

In accordance with section 104 of the FOI Act, no fees are having been applied to this request.

#### *Disclosure log*

Section 28 of the FOI Act requires maintains a public disclosure log. This can be viewed at [www.tccs.act.gov.au/about-us/freedom\\_of\\_information](http://www.tccs.act.gov.au/about-us/freedom_of_information).

In this instance, I have decided that the information to be released to you is also of interest to the public. Therefore, publication will occur within 3-10 business days from the date of this letter. The publication will include your original access application, this decision notice and attached documents, with your personal information removed.

#### *Review rights*

You may apply to the ACT Ombudsman to review my decision under section 73 of the FOI Act. An application for review must be made in writing within **20 days** of my decision being published in the disclosure log.

You may submit a request for review of my decision to the ACT Ombudsman by writing in one of the following ways:

Email (preferred): [actfoi@ombudsman.gov.au](mailto:actfoi@ombudsman.gov.au)

Post: The ACT Ombudsman  
GPO Box 442  
CANBERRA ACT 2601

More information about ACT Ombudsman review is available on the ACT Ombudsman website at: <http://www.ombudsman.act.gov.au/Freedom-of-Information>.

#### *ACT Civil and Administrative Tribunal (ACAT) review*

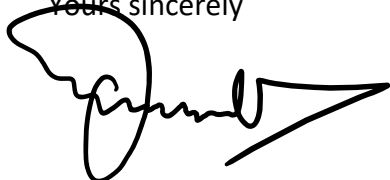
Under section 84 of the FOI Act, if a decision is made under section 82(1) on an Ombudsman review, you may apply to the ACAT for review of the Ombudsman decision.

Further information may be obtained from the ACAT at:

ACT Civil and Administrative Tribunal  
Level 4, 1 Moore Street  
GPO Box 370  
Canberra City ACT 2601  
Telephone: (02) 6207 1740  
[www.acat.act.gov.au](http://www.acat.act.gov.au)

If you have any queries concerning the directorate's processing of your request, or would like further information, please contact the TCCS FOI team on (02) 620 72987 or email [tccs.foi@act.gov.au](mailto:tccs.foi@act.gov.au).

Yours sincerely

A handwritten signature in black ink, appearing to read 'Daniel Childs', with a large, sweeping flourish extending to the right.

Daniel Childs  
Information Officer

12 May 2020



**ACT**  
Government

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Transport Canberra and City Services

**BARTON HIGHWAY**  
**BLACK SPOT FEASIBILITY STUDY**  
**ROADS ACT**

**FINAL**

**RG 18026-5/ 1**

**13 JUNE 2018**



**Consulting Engineers**

## BARTON HIGHWAY

### BLACK SPOT FEASIBILITY STUDY

Prepared for Roads ACT

#### Document Register

Revision	Date	Details	Author	Verifier	Approver
Draft	18/05/18	Draft Report	RD	MG	MG
Draft 02	29/05/18	Revised Draft Report	RD	MG	MG
Draft 03	12/06/18	Revised Draft Report - 2	RD	MG	MG
1	13/06/18	Final Report	RD	MG	MG

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## TABLE OF CONTENTS

<b>1.</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Objective .....	1
1.2	The Brief .....	1
1.3	The Project Team.....	1
1.4	Locality Plan .....	2
<b>2.</b>	<b>EXISTING SITE CONDITIONS.....</b>	<b>3</b>
2.1	Road Hierarchy .....	3
2.2	Geometric Layout.....	4
2.3	Traffic Volumes and Speed.....	4
2.4	Collision Statistics .....	5
2.5	Pedestrians .....	9
2.6	Cyclists .....	9
2.7	Motorcyclists.....	9
2.8	Public Transport .....	9
2.9	Lateral Clearance Issues .....	9
2.10	Pavement .....	9
2.11	Traffic Control Devices.....	9
2.12	Future Traffic Volumes.....	9
<b>3.</b>	<b>DISCUSSION AND POSSIBLE IMPROVEMENTS .....</b>	<b>11</b>
3.1	General Overview.....	11
3.2	Predominant Conflicts and Collisions .....	11
3.3	Opportunities for Reduction of Historical Collisions.....	11
<b>4.</b>	<b>PROPOSED IMPROVEMENTS.....</b>	<b>13</b>
4.1	Option 1 – Narrow the median lane and install guide posts in both directions .....	13
4.2	Option 2 – Install street lights.....	13
4.3	Option 3 – Edge drop removal/ seal shoulder .....	13
4.4	Option 4 – Speed reduction to 80 km/h .....	13
4.5	BCR Assessment .....	14
4.6	Audit related modifications .....	17
<b>5.</b>	<b>RECOMMENDATIONS .....</b>	<b>18</b>
5.1	Modifications Addressing Historical collisions. ....	18
5.2	Modifications Addressing Potential Collisions .....	18
<b>APPENDIX 1</b>	<b>FINANCIAL ANALYSES .....</b>	<b>19</b>

**LIST OF FIGURES**

Figure 1-1	Locality Plan .....	2
Figure 2-1	Collision diagram (Sheet 1 of 2).....	7
Figure 2-2	Collision diagram (Sheet 2 of 2).....	8

**LIST OF TABLES**

Table 2-1	Traffic volume and speed data.....	4
Table 2-2	Crash Factor Matrix.....	6
Table 4-1	2015 Crash Cost Estimates for Different Crash Type Codes .....	14
Table 4-2	2015 Average crash costs by crash severity .....	15

**LIST OF PHOTOS**

Photo 2-1	Barton Highway (southbound view south of the roundabout with William Slim Drive/ Gundaroo Drive).....	3
Photo 2-2	Barton Highway (northbound view north of the intersection with Bellenden Street) .....	3

## 1. INTRODUCTION

### 1.1 Objective

R D Gossip (RDG) was commissioned by Roads ACT to undertake a Black Spot Feasibility study of the midblock section of the Barton Highway between William Slim Drive/ Gundaroo Drive and Bellenden Street (circa 2.9 km), Gungahlin, to assist in the assessment process for improvements under the ACT Black Spot Road Safety Program.

### 1.2 The Brief

Specifically, the scope of the brief is to undertake the following:

- Produce a collision diagram of the crash data for the last five (5) years, with consideration of individual traffic lanes.
- Assess the traffic conditions and the extent that road conditions may be contributing to crashes. Day and night road safety audit checks of the surrounding environment are required.
- Document any deficiencies with current layouts for the volume of traffic passing through the site. Undertake an assessment in the short and medium term of traffic growth at each location, or other planning issues which may have a traffic impact.
- Develop practical options to address the deficiencies identified. While no detailed survey is required, service requirements or pavement defects should be identified and assessed. Options are to consider safe systems philosophy and specific needs of all road users including public transport, commercial vehicles, emergency vehicles, pedestrians, on-road cyclists and motorcyclists. If changes to the traffic signal phasing are one of the proposed options for improvement, SIDRA analysis will be required.
- Prepare a cost estimate for each option including preliminaries and contingencies (at least 30%). Treatments that have no chance of being implemented under the Black Spot budget (due to likely financial limitations) should still be considered and recommended for implementation under future Capital Works programs.
- Prepare the economic analysis (Benefit to Cost Ratio) for the agreed option using the base case as the "do nothing" situation. The analysis should consider the benefits and dis-benefits over the life of the improvement works, which can be assumed to be 10 years and Nett Present Value (NPV) @ 7% as per Roads ACT ratio matrix. The average costs of crashes by accident type are to be used in estimating the benefits which result from crash reductions.
- Works are to be undertaken in accordance with the latest versions of the following:
  - ACT Design Standards and specifications.
  - Relevant Austroads Guidelines.
  - Relevant current Australian Standards.

### 1.3 The Project Team

The client is Roads ACT. The Project Officer is Jayanthi Vikneson.

The RDG project team is:

██████████	Project Manager and Senior Traffic Engineer
██████████	Senior Designer
██████████	Senior Draftsperson

### 1.4 Locality Plan

Note that ACTMAPi has been used for all aerial photography used in this report.

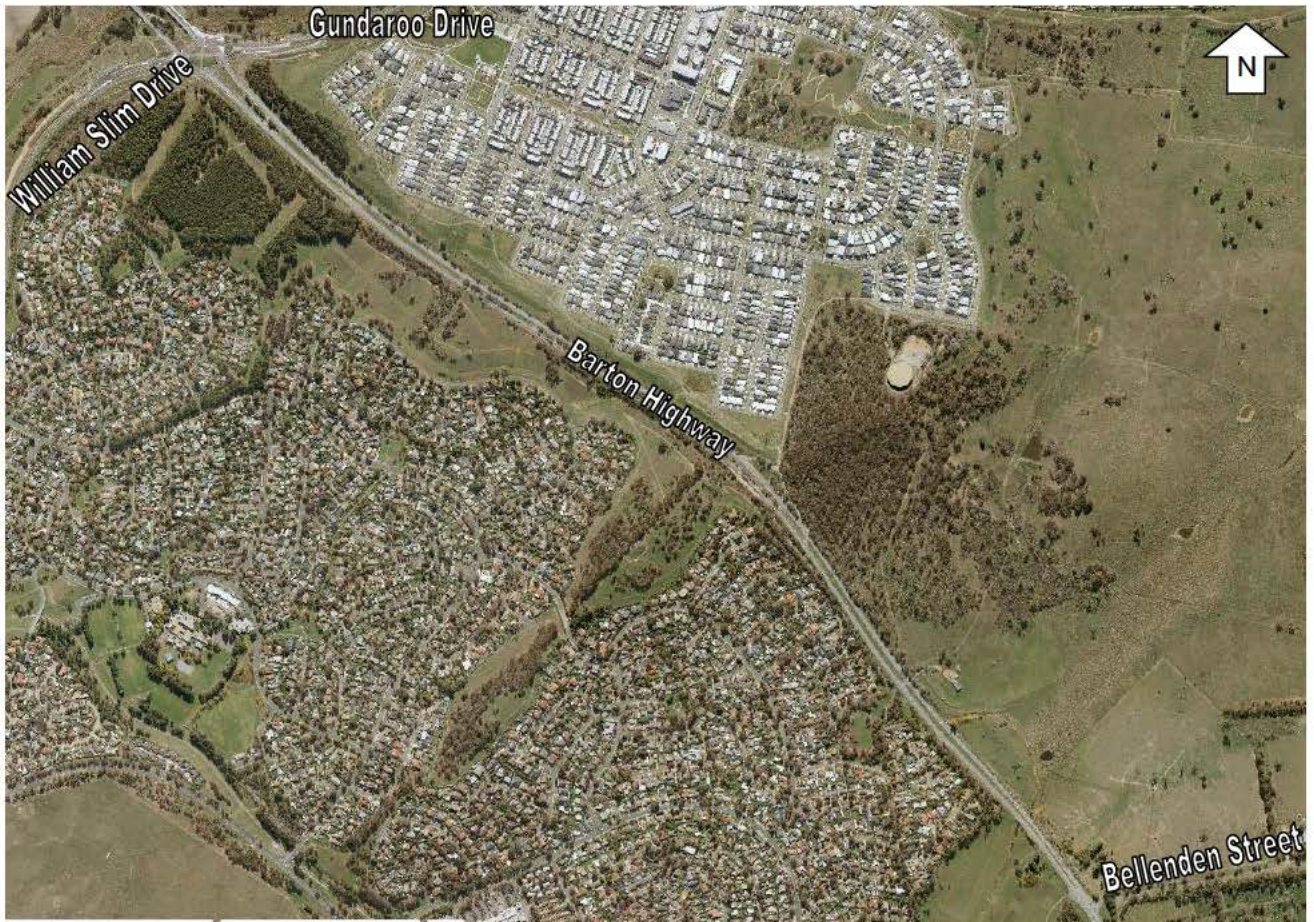


Figure 1-1 Locality Plan

## 2. EXISTING SITE CONDITIONS

### 2.1 Road Hierarchy

The Barton Highway is classified as an arterial road. It is a two-way four-lane divided road. In the northbound direction it has a speed limit of 80 km/h circa 200 m north of the intersection with Bellenden Street then changes to 100 km/h to circa 850 m south of the William Slim Drive/ Gundaroo Drive intersection where it changes to 80 km/h. In the southbound direction it has a speed limit of 100 km/h from the William Slim Drive/ Gundaroo Drive intersection to circa 700 m north of the intersection with Bellenden Street where it changes to 80 km/h

There are several gated access points along the road, with access to a radio station circa 700 m north of the intersection with Bellenden Street. This access has a median opening.



**Photo 2-1 Barton Highway (southbound view south of the roundabout with William Slim Drive/ Gundaroo Drive)**



**Photo 2-2 Barton Highway (northbound view north of the intersection with Bellenden Street)**

The Barton Highway is classified as Principal Cycle Training route and Main On-road Cycle route by the ACTive Travel Infrastructure Practitioner Tool. A connection to a Main Community Route is provided on the northern side of the road circa 1.7 km south of the William Slim Drive/ Gundaroo Drive intersection. An equestrian trail is also shown to cross the Barton Highway near the intersection with Bellenden Street.

## 2.2 Geometric Layout

### 2.2.1 Road Layout

The Barton Highway is a divided two-way four-lane road. The median is gravel and circa 12.5 m wide (as shown in Photos 2-1 and 2-2).

### 2.2.2 Intersection Layout

There are no intersections along this midblock section. One driveway has a formal median opening. The acceleration lane from Bellenden Street extends circa 420 m from the intersection.

## 2.3 Traffic Volumes and Speed

Traffic data was collected over a two week period from Sunday 26 November 2017 on the Barton Highway circa 1.7 km south of the William Slim Drive/ Gundaroo Drive intersection. The attached data identified the following characteristics:

- Traffic volumes and speed were consistent over the two week period;
- The speed data indicated that the average road user is travelling below the speed limit with an average of 85 km/h; and
- The 85<sup>th</sup> percentile speed indicated an average of 102 km/h indicating a high conformance with the posted speed limit on this section of road.

The provided speed data is shown in Table 2-1

**Table 2-1 Traffic volume and speed data**

Date	Towards	Weekday Average (VPD)	Weekday Mean Speed (km/h)	Weekday 85th %ile Speed (km/h)
<b>Barton Highway between William Slim Drive/ Gundaroo Drive and Bellenden Street</b>				
26/11/2017	William Slim Drive/ Gundaroo Drive	12,573	87.8	102.9
	Bellenden Street	12,561	83.8	99.8
03/12/2017	William Slim Drive/ Gundaroo Drive	12,531	84.4	102.1
	Bellenden Street	12,356	84.3	102.9

## 2.4 Collision Statistics

A total of 53 collisions occurred in the five year period from 1 January 2012 to 31 December 2016 inclusive. These included 9 injury collisions (two admitted to hospital and 7 received medical treatment).

A rough guide to the performance of this intersection compared to the average for the ACT in 2000 can be obtained from the following approximate percentages for the ACT as a whole:

- approximately 14.7% of collisions occur in wet weather;
- approximately 23.5% occur in the peak hours, taken as 8.00-9.00 and 17.00-18.00.
- approximately 20% occur in the hours of darkness.

The collision history identified that:

- 10 collisions (19%) occurred in wet weather, marginally above the average.
- 28 collisions (53%) occurred in the peak periods, which is circa double the average.
- 18 collision (34%) occurred in hours of darkness, greater than the average.

It should be recognised that 27 of the 28 collisions that occurred during the peak periods occurred on weekdays.

The highest collision statistic along the midblock over the five year period was 29 rear end collisions in the intersection (RUM code 301). Two of these collisions resulted in injuries requiring medical treatment. Note that there were a number of rear end collisions on the approach to the William Slim Drive/ Gundaroo Drive intersection. This type of collision may have reduced since the signalisation of the roundabout in December 2016 due to significantly reduce queue lengths.

Other collisions that resulted in an injury are as follows:

- One collision between a northbound vehicle and a pedestrian crossing the road in a westbound direction (RUM code 1);
- A head on collision between two northbound vehicles in the northbound direction and a southbound vehicle on the wrong side of the road (RUM Code 201). There was also a second northbound vehicle involved in this collision;
- Two rear end collisions in the northbound direction (RUM Code 301);
- One northbound vehicle leaving the carriageway to the right (RUM Code 702);
- One northbound vehicle leaving the carriageway to the left and collided with an object (RUM Code 703); and
- Three separate occurrences where a northbound vehicle leaving the carriageway to the right collided with an object (RUM Code 704).

There was one collision involving a pedestrian crossing Barton Highway with a northbound vehicle. The collision resulted in an injury with the pedestrian admitted to hospital.

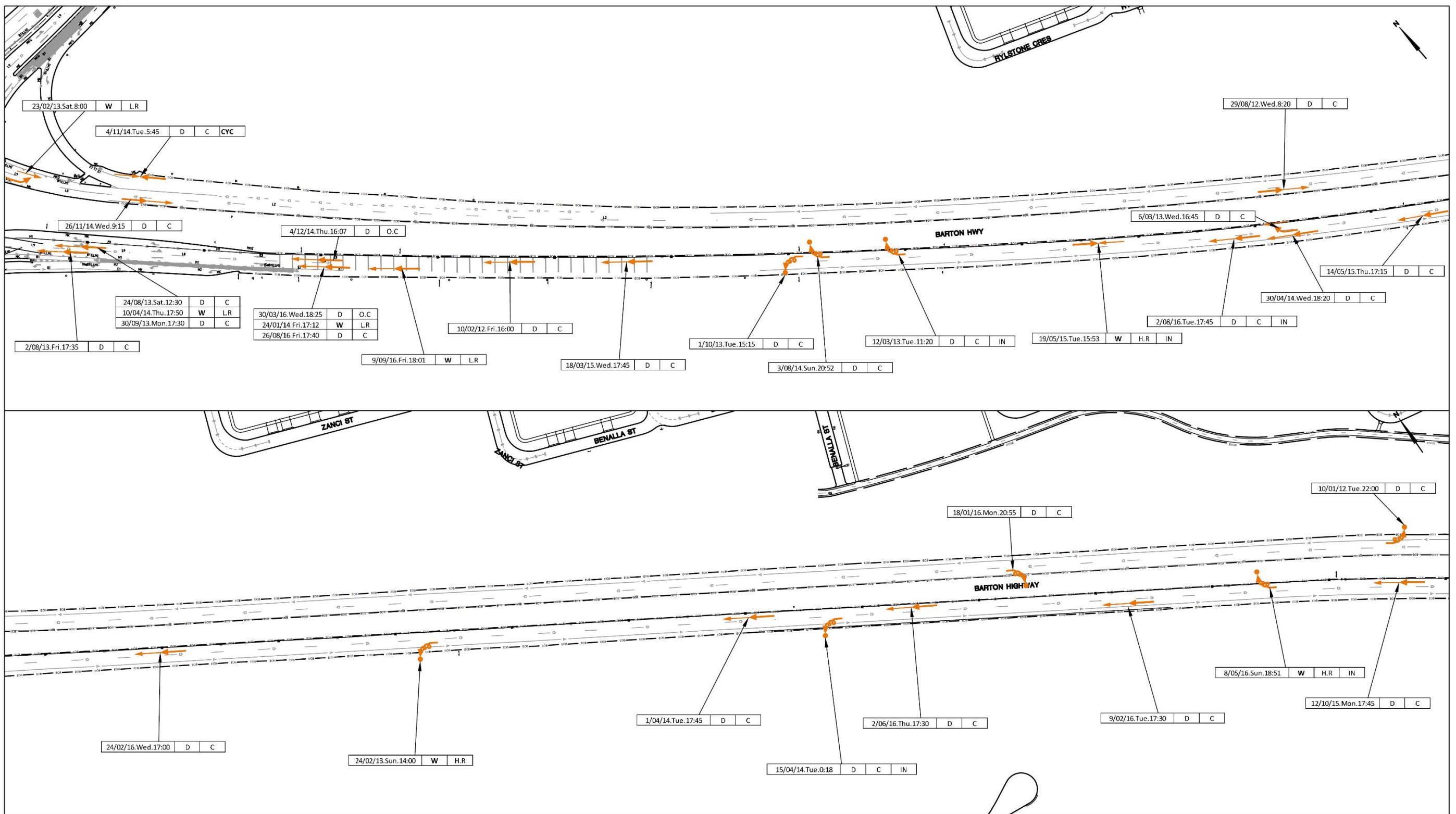
There was one collision involving two bicycles. This was a head on collision involving bicycles only.

There were no collisions involving motorcycles.

Table 2-2 provides a collision factor matrix used to highlight particular recurring features of the collision history with a collision diagram provided in Figure 2-1 and Figure 2-2.

Table 2-2 Crash Factor Matrix

DCA CODE Accident-type (Dominant ones first)	KEY DIRECTION (To)	NUMBER OF ACCIDENTS EACH YEAR					TOTAL for this combination of DCA Code & Key Direction	DIRECTION OF OTHER VEHICLE				SURFACE		Day			PERIOD			SEVERITY				
		2012	2013	2014	2015	2016		To North	To East	To South	To West	Dry	Wet	Weekday	Saturday	Sunday	Night time	AM Peak	Daytime	PM Peak	Fatality	Major Injury (admitted to hospital)	Minor Injury (received medical treatment)	Property Damage
1	NB		1				1				1	1	1			1						1		
201	SB			1	1		2			3	1	1	2			1		1					1	1
301	NB	1	3	6	3	9	22			28		18	4	21	1		4		1	17			2	20
	SB	2		1		4	7				9	7		6	1		1	5	1					7
306	NB		1				1			1		1								1				1
307	SB		1				1				1		1				1							1
502	SB					1	1					1			1	1								1
609	SB			1	1		2					2		2		2								2
702	NB				1		1						1		1		1						1	
	SB		1				1					1		1			1							1
703	NB		2	1	1	1	5					2	3	3		2	3			2		1		4
	SB	1	1				2					2		2		2								2
704	NB		1	2		1	4					3	1	1		3	3		1				3	1
	SB					2	2					2		2			1	1						2
705	NB			1			1					1		1					1					1
<b>TOTALS</b>		4	11	13	7	18	53	32	0	10	1	42	11	43	4	6	20	8	5	20	0	2	7	44

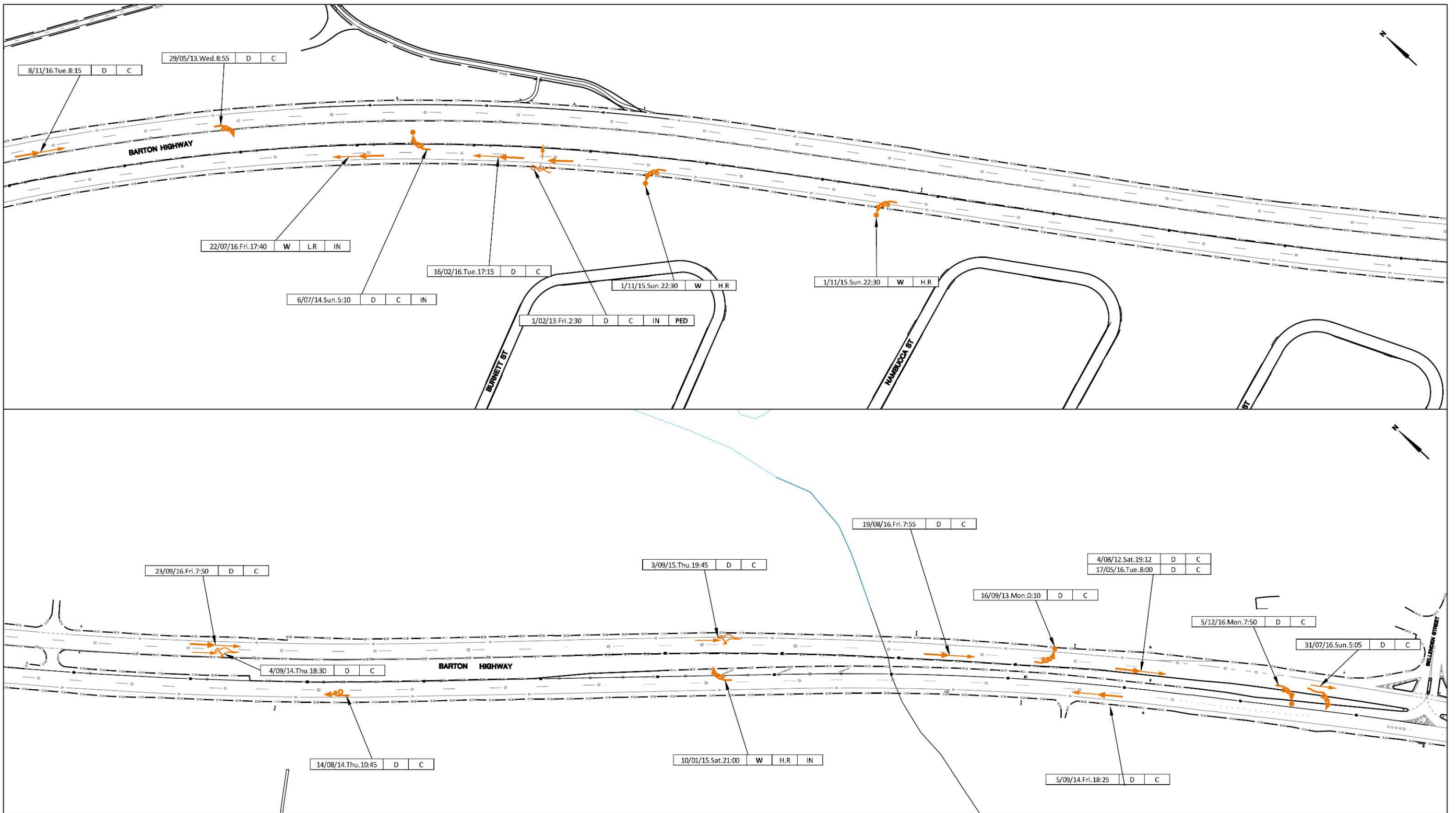


ACCIDENT DATA PERIOD - 01/01/12 TO 31/12/16

ABBREVIATION AND SYMBOL SCHEDULE

DAY	ROAD SURFACE	WEATHER	SEVERITY	ROAD USER CODE	SYMBOLS
MO : Monday		C : Clear	IN : Injury	PED : Pedestrian	: Pedestrian
TU : Tuesday	W : Wet	O.C : Cloudy or Overcast	F : Fatal	CYC : Cyclist	
WE : Wednesday	LS : LOOSE	H.R : Heavy Rain		MC : Motorcycle	
TH : Thursday		L.R : Light Rain		BUS : Bus	
FR : Friday		FOG : FOG			
SA : Saturday					
SU : Sunday					

Figure 2-1 Collision diagram (Sheet 1 of 2)



ACCIDENT DATA PERIOD - 01/01/12 TO 31/12/16

ABBREVIATION AND SYMBOL SCHEDULE

DAY	ROAD SURFACE	WEATHER	SEVERITY	ROAD USER CODE	SYMBOLS
MO : Monday	D : Dry	C : Clear	IN : Injury	PED : Pedestrian	⊠ : Pedestrian
TU : Tuesday	W : Wet	O.C : Cloudy or Overcast	F : Fatal	CYC : Cyclist	
WE : Wednesday	LS : LOOSE	H.R : Heavy Rain		MC : Motorcycle	
TH : Thursday		L.R : Light Rain		BUS : Bus	
FR : Friday		FOG : FOG			
SA : Saturday					
SU : Sunday					

Figure 2-2 Collision diagram (Sheet 2 of 2)

## 2.5 Pedestrians

There are no paths along the Barton Highway.

There was one collision involving a pedestrian crossing the Barton Highway. The collision resulted in an injury.

## 2.6 Cyclists

On road cycling is permitted on the shoulder with “cycle” stencils provided. The Barton Highway is classified as Principal Cycle Training route and Main On-road Cycle route by the ACTIVE Travel Infrastructure Practitioner Tool.

A connection to a Main Community Route is provided circa 1.7 km south of the William Slim Drive/ Gundaroo Drive intersection on the northern side of the road. This requires northbound cyclists to cross the Barton Highway to access the community path. There are currently no provisions or warning signs provided to warn other road users of the crossing movement.

Cyclists were observed travelling in both directions on the Barton Highway.

There was one collision involving two cyclists colliding with each other.

## 2.7 Motorcyclists

There were no collisions involving motorcycles on the midblock section.

## 2.8 Public Transport

Transport Canberra does not provide bus services on this midblock of the Barton Highway.

## 2.9 Lateral Clearance Issues

The clear zone for an 80 km/h speed limit with traffic over 6,000 vehicles per day is 6.5 m for a flat verge and 10 m for a 100 km/h speed limit. There are numerous established trees, large rocks and fences within the clear zone of the road section.

An onsite assessment of available sight distance at the location where cyclists cross the road (617 m Crossing Sight Distance (CSD) for 100 km/h speed limit and 10 km/h crossing speed) is achieved in the northbound direction. However, it not achievable in the southbound direction due to the geometry of the road.

## 2.10 Pavement

Generally the pavement condition along the midblock is of an acceptable standard. It was noted that the shoulder along the median had eroded away from the pavement edge creating a lip. There is potential that if a vehicle was to leave the road at these locations they would not be able to control the vehicle.

## 2.11 Traffic Control Devices

Traffic signs within the midblock appear to be generally satisfactory. Multiple guideposts in both directions appear to be missing.

Linemarking appears to be in reasonable condition. However, the transverse bars on the approach to the Gundaroo Drive/ William Slim Drive intersection need to be remarked.

## 2.12 Future Traffic Volumes

It is difficult to predict changes to traffic volumes on the Barton Highway as it is an arterial road connecting the north western NSW and the Gungahlin area to North Canberra. An increase of peak

traffic volume on Barton Highway would have minimal influence to the current operation of the road in the short to medium term. The extent of future development in NSW that would impact on the future capacity of the road is unknown.

### 3. DISCUSSION AND POSSIBLE IMPROVEMENTS

#### 3.1 General Overview

The collisions being experienced at this location meet the criteria set by the Commonwealth Department of Infrastructure for consideration within the Black Spot Program of a minimum of three injury collisions within a 5 year period.

There has been an average of 3.7 collisions per kilometre per year based on the length of the midblock section. Accounting for the bidirectional daily volume, the total collision rate per 100 million vehicle kilometres travelled (Mvkt) is 39.8 per 100 Mvkt, with 6.8 per 100 Mvkt injury crashes. This is higher than the average Mvkt for persons injured in the ACT between 2001 and 2010.

#### 3.2 Predominant Conflicts and Collisions

The collision data identifies that the most common class of collision involved rear end collisions (RUM Codes 301) at 55% (29 of 53), with 10 associated with the northbound approach to the William Slim Drive/ Gundaroo Drive intersection. The rear end collisions on the approach to the intersection may have declined as a result of the signalisation as approaching road users are more aware of the slowing and stopping conditions. The signalised roundabout became operational in December 2016, within the time period of the provided collision data.

There are a number of issues that could have contributed to a number of these rear end collisions. These could be as follows;

- Potential sun glare associated with the PM peak.
- Vehicles tailgating.
- Due to the rural environment, there is potential that a vehicle manoeuvring or braking to avoid an animal could have resulted in a collision (either collision with another vehicle or losing control).
- Road users becoming complacent along the midblock easily distracted by phones and other devices.

It was observed that some road users would become disgruntled at vehicles in the right lane even though they would be overtaking a slower vehicle in the left lane. Several road users were observed driving erratically to overtake (and undertake) vehicles.

The next most common type of collision involved single vehicle off the path collisions (RUM Code 702 – 7015), with 16 collisions. 10 of these collisions occurred during hours of reduced light/ darkness. It is expected that the side swipe collisions are associated with turning movements at the intersection and vehicles avoiding the slow turning vehicle.

The collision involving the pedestrian is expected to be associated with inadequate pedestrian facilities along the road. Also as it occurred at night time (2:30 am) the visibility of the pedestrian could have been limited.

#### 3.3 Opportunities for Reduction of Historical Collisions

The focus of the proposed improvements are aimed at reducing the common collisions that occur on the midblock section. The following design options are available for implementation:

**Option 1 – Narrow the median lane and install guide posts in both directions.** There is opportunity to narrow the median lane in both directions to 3.5 m to provide a shoulder along the median and install audio tactile linemarking. There are also multiple missing guide posts in both directions. Guide posts assist to delineate the road, partially in reduced light conditions. This would provide a reduction in loss of control collisions.

**Option 2 – Install street lights.** The installation of street lights along this section of road would assist road users in identifying the travel route and detect road hazards. As the majority of loss of control collisions occurred in reduced light conditions it should result in a reduction of loss of control collisions. It would also assist with road users identifying animals on the side of the road and pedestrians/ cyclists at night.

**Option 3 – Edge drop removal/ seal shoulder.** The shoulder within the median is not sealed and does not provide an area for vehicles to recover should they lose control. Reinstating the shoulder will increase the chance of a vehicle recovering if a wheel was to become trapped when a vehicle leaves the carriageway.

**Option 4 – Speed reduction to 80 km/h.** As the speed limit is 80 km/h on the approaches to the midblock section, with the 100 km/h section circa 2.4 km in both directions, there is an opportunity to reduce the speed to 80 km/h for the entire midblock section. The reduction of speed has the potential to:

- Reduce the number of loss of control crashes;
- Decrease the stopping distance of a vehicle after the driver reacts to a situation, reducing the chance for a collision to occur;
- Decrease the clear zone distance; and
- Reduce the crash severity.

However, the roadside environment along the midblock section is currently considered to be farmland/ undeveloped. Although residences from Giralang, Kaleen and Crace are visible from the road they do not have frontage to the Barton Highway and there are no access roads. Based on AS 1742.4 the speed limit for this type of environment should be 100 km/h. Therefore, regular enforcement would be required for this option to be effective. The provision of a point to point camera would be an effective way to provide continuous monitoring of the speed on this section of road. It would also assist in the reduction of other collisions such as rear end collisions

The installation of point to point cameras has not been costed as the implementations of the point to point speed cameras are the control of JACS.

## 4. PROPOSED IMPROVEMENTS

### 4.1 Option 1 – Narrow the median lane and install guide posts in both directions

This option has the potential to reduce the number of loss of control collisions by narrowing the median lane to shift the traffic away from the median edge and improving the delineation of the travel route. The improvement in delineation and the installation of guide posts along the midblock can be expected to reduce loss of control collisions by 30% (based on Austroads Guide to Road Safety Part 8 Treatment of Crash Locations, Appendix F). It is estimated that at least 40 guideposts are required.

A preliminary assessment of the economic worth of installing guide posts and relocating the median edge side line along the midblock has been undertaken using assumptions detailed in the following section.

A preliminary estimate for installing guide posts and relocating the median edge line (including site works, 20% consultancy fees and 30% contingency) is \$73,200 excluding GST.

### 4.2 Option 2 – Install street lights

This option has the potential to reduce the loss of control collisions, assist with road users identifying animals on the side of the road, and assist in the identification of pedestrians/ cyclists in reduced light conditions. The installation of lighting along the midblock can be expected to reduce loss of control collisions that occur during reduced lighting conditions by 40%, collisions involving pedestrians by 30% and collisions with animals by 30% (based on Austroads Guide to Road Safety Part 8 Treatment of Crash Locations, Appendix F and engineering judgement). It is estimated that 48 street lights are required.

A preliminary assessment of the economic worth of installing street lights along the midblock has been undertaken using assumptions detailed in the following section.

A preliminary estimate for installing traffic calming treatments (including site works, 20% consultancy fees and 30% contingency) is \$720,000 excluding GST.

### 4.3 Option 3 – Edge drop removal/ seal shoulder

This option has the potential to reduce the number of loss of control collisions by providing the opportunity for a vehicle to recover should they leave the travel lane. Reinstating/ sealing the shoulder along the median edge will assist with loss of control collisions in the median lane. This option can be expected to reduce loss of control collisions by 40% (based on Austroads Guide to Road Safety Part 8 Treatment of Crash Locations, Appendix F). It is estimated that approximately 4 km of shoulder at 1 m wide is required.

A preliminary assessment of the economic worth of constructing a sealed the shoulder along the midblock has been undertaken using assumptions detailed in the following section.

A preliminary estimate for sealing the shoulder (including site works, 20% consultancy fees and 30% contingency) is \$1,290,000 excluding GST.

### 4.4 Option 4 – Speed reduction to 80 km/h

This option has the potential to reduce the number of loss of control collisions and reduce the severity of collisions. This option can be expected to reduce loss of control collisions by 15% (based on Austroads Road Safety Engineering Tool).

A preliminary assessment of the economic worth of reducing the speed limit from 100 km/h to 80 km/h has been undertaken using assumptions detailed in the following section.

A preliminary estimate for reducing the speed limit from 100 km/h to 80 km/h (including site works, 20% consultancy fees and 30% contingency) is \$3,500 excluding GST.

#### 4.5 BCR Assessment

The following details the financial assessment of the costs and benefits of undertaking these modifications based on the projected extent of the reduction in accidents due to the modifications. Assumptions used in our assessments and in particular for the potential benefits for the Barton Highway midblock are detailed below.

Roads ACT has provided the following summary data in relation to the cost of various types of collisions in the ACT.

**Table 4-1 2015 Crash Cost Estimates for Different Crash Type Codes**

Crash Type Code	ACT Equivalent Crash Types	Description	Costs (\$)	
			HC <sup>1</sup>	WTP <sup>2</sup>
001-009	10,16	Vehicle Hits Pedestrian	218,600	304,084
101-109	2	Adjacent Approaches	34,155	39,775
201	4,5	Head On	177,530	260,285
202	1	Opposing Turns	60,821	68,254
203-207	9	Hit Parked / Parking Vehicle	25,170	23,497
301-304	6	Rear End	12,170	12,763
305-309	3,9	Lane Change	16,275	15,686
401-403	9	Hit Parked / Parking Vehicle	10,725	10,624
404	8,9,17	Loss of Control - L or R turns	9,601	9,642
405	9,19	Loss of Control - L or R turns	42,305	36,870
406-408	9,12,13,19	Hit Parked / Parking Vehicle	17,499	16,890
501-506	9,13,15,17,19,20,21	Overtaking	35,597	53,212
601,602,604	7	Hit Parked / Parking Vehicle	15,521	15,093
603	9	Hit Parked / Parking Vehicle	13,316	15,376
605-607	12,15	On path, hit object	36,344	32,801
609	11	Struck Animal	13,837	13,394
610	9,15	Loss of Control - L or R turns	9,732	9,856
701-708	9,13,14,15,16,17,19,20,21	Loss of Control - L or R turns	70,489	94,322
801-805,808	9,13,14,15,17,19,20,21	Loss of Control - L or R turns	72,360	106,048
901	14,15	Fell from moving vehicle	176,358	154,367

Crash Type Code	ACT Equivalent Crash Types	Description	Costs (\$)	
			HC <sup>1</sup>	WTP <sup>2</sup>
902-907	7,9,10,16,17,19	Loss of Control - L or R turns	19,394	18,548
Misc	4,5,8,19	Miscellaneous	9,537	9,537

**Table 4-2 2015 Average crash costs by crash severity**

Costs by crash type	Costs (\$)	
	HC <sup>1</sup>	WTP <sup>2</sup>
Fatal crashes	2,848,449	8,182,076
Serious injury crashes	698,488	587,437
Minor injury crashes	28,013	38,670
Property Damage Only crashes	9,537	9,537

Note: 1 – Human Capital, 2 – Willingness-to-pay

The above costs are calculated using accident records for the Period of 2011-2015. In the calculation of BCR the Willingness-to-pay costs are used, with the Human Capital cost provided for comparison.

Assumptions of the effectiveness of countermeasures in reducing recorded accidents were taken from the Austroads publication Guide to Road Safety Part 8 Treatment of Crash Locations, Appendix F. In situations where particular circumstances are not detailed in the Austroads Guidelines, engineering judgement has been applied.

The assessment of the value of collision reductions due to improvement treatments at the intersection is summarised in the table below:

Accident Type	Number Recorded in 5 years	Annual Accident Cost (\$)		Proportion Reduction	Annual Benefit (\$)	
		HC	WTP		HC	WTP
<b>Option 1 – Install guide post in both directions</b>						
701-708 Loss of Control - L or R turns	15	\$211,467	\$282,966	0.3	\$63,440	\$84,890
Injury - 701-708 Loss of Control - L or R turns	1	\$139,698	\$117,487	0.3	\$41,909	\$35,246
<b>TOTAL</b>					<b>\$105,349</b>	<b>\$120,136</b>
<b>Option 2 – Install street lights</b>						
609 Struck Animal	2	\$5,535	\$5,358	0.3	\$1,660	\$1,607
701-708 Loss of Control - L or R turns	8	\$112,782	\$150,915	0.4	\$45,113	\$60,366
Injury - 001 Vehicle Hits Pedestrian	1	\$139,698	\$117,487	0.3	\$41,909	\$35,246
Injury - 701-708 Loss of Control - L or R turns	1	\$139,698	\$117,487	0.4	\$55,879	\$46,995
<b>TOTAL</b>					<b>\$144,561</b>	<b>\$144,214</b>
<b>Option 3 – Edge drop removal/ seal shoulder</b>						
701-708 Loss of Control - L or R turns	9	\$126,880	\$169,780	0.4	\$50,752	\$67,912
Injury - 701-708 Loss of Control - L or R turns	1	\$139,698	\$117,487	0.4	\$55,879	\$46,995
<b>TOTAL</b>					<b>\$106,631</b>	<b>\$114,907</b>
<b>Option 4 – Speed reduction to 80 km/h</b>						
701-708 Loss of Control - L or R turns	9	\$126,880	\$169,780	0.15	\$19,032	\$25,467
Injury - 701-708 Loss of Control - L or R turns	1	\$139,698	\$117,487	0.15	\$20,955	\$17,623
<b>TOTAL</b>					<b>\$39,987</b>	<b>\$43,090</b>
<b>Option 5 – Combined Options 1 and 4</b>						
701-708 Loss of Control - L or R turns	6	\$84,587	\$113,186	0.3	\$25,376	\$33,956
701-708 Loss of Control - L or R turns	9	\$126,880	\$169,780	0.41	\$51,386	\$68,761
Injury - 701-708 Loss of Control - L or R turns	1	\$139,698	\$117,487	0.41	\$56,578	\$47,582
<b>TOTAL</b>					<b>\$133,340</b>	<b>\$150,299</b>

The analysis indicated the following BCR and net present value (at 7% over 10 years) for the treatments with both Human Capital costs and Willingness-to-Pay.

Treatment	Approach	Estimated Costs	NPV	NPV/Capital Cost	BCR
Option 1 – Install guide post in both directions	HC	\$73,200	\$671,165	9.16	10.76
	WTP		\$775,023	10.58	12.27
Option 2 – Install street lights	HC	\$720,000	\$342,088	0.48	1.51
	WTP		\$339,650	0.47	1.50
Option 3 – Edge drop removal/ seal shoulder	HC	\$1,290,000	-\$457,027	-0.35	0.62
	WTP		-\$398,900	-0.31	0.67
Option 4 – Speed reduction to 80 km/h	HC	\$3,500	\$277,230	78.09	77.54
	WTP		\$299,024	84.23	83.55
Option 5 – Combined Options 1 and 4	HC	\$76,700	\$864,491	11.26	13.00
	WTP		\$983,604	12.82	14.65

The analysis indicates that there would be benefit gained from each of the proposed options except for Option 3. Note that BCR values have been provided for both approaches for comparison. However, as the WTP approach is adopted for the Black Spot Program these values are further commented on below.

The BCR calculations are provided in Appendix 1.

#### 4.6 Audit related modifications

The correction to the median shoulder has been included in Option 3, while an alternative solution is proposed in Option 1.

It is required to remark the transverse bars on the approach to the Gundaroo Drive/ William Slim Drive intersection.

There was one head on collision in the northbound direction on the approach to the intersection prior to the Gundaroo Drive/ William Slim Drive intersection. The installation of a “No Left Turn” sign and “Wrong Way Go Back” sign on the Barton Highway to near the Gundaroo Drive/ William Slim Drive intersection would provide an indication to road users that it is a dual carriageway road.

The trees within the clear zone should either be removed or barriers installed to reduce the severity of a loss of control collision.

The provision of a safe location for northbound cyclists to cross the road is required. There are various options that could be implemented for this option such as extending the Main Community Route further to the south and encouraging cyclists to cross the road where acceptable sight distance is provided in both directions, provide a signalised crossing within the 80 km/h zone, or overpass. This options would require further consideration.

## **5. RECOMMENDATIONS**

### **5.1 Modifications Addressing Historical collisions.**

The analysis indicates that Options 1, 2, 4 and 5 would result in adequate benefit gained. As each option provides benefit to different types of collisions, it is considered that each option should be pursued and implemented.

If Option 4 is selected for implementation, enforcement of this midblock is of utmost importance to maintain the projected collision reduction and discourage unsafe overtaking manoeuvres.

The National Capital Authority (NCA) have not been advised of the proposed options as they are considered minor works.

### **5.2 Modifications Addressing Potential Collisions**

Outside what has been proposed as part of the proposed options, it is required to remark the transverse bars on the approach to the Gundaroo Drive/ William Slim Drive intersection.

A “No Left Turn” sign should be installed on the kerb side edge of the signalised roundabout and a “Wrong Way Go Back” sign facing the southbound direction should be installed in the northbound side of the Barton Highway south of the Gundaroo Drive/ William Slim Drive intersection.

A review of the clear zone is required to identify where trees within the clear zone should either be removed or barriers installed.

A feasibility study into the safety of the Main Community Route connection to the Barton Highway and viable improvements is required.

## APPENDIX 1 FINANCIAL ANALYSES

Note: Benefit Cost Analysis has only been provided for the WTP approach

**BENEFIT COST ANALYSIS USING DISCOUNTED CASH FLOWS**

LOCATION	Option 1 – Narrow the median lane and install guide posts in both directions										
	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	
<b>BASE CASE</b> to Do Nothing											
<b>BENEFITS</b>	120,136	120,136	120,136	120,136	120,136	120,136	120,136	120,136	120,136	120,136	
<b>Total benefits(B)</b>	120,136	120,136	120,136	120,136	120,136	120,136	120,136	120,136	120,136	120,136	<b>TOTAL</b>
<b>NPV @ 7%</b>	120136.0	112276.6	104931.4	98066.8	91651.2	85655.3	80051.7	74814.7	69920.2	65346.0	<b>902849.9</b>
<b>COSTS</b>											
project/capital outlay	73,200										
maintenance costs	50	50	50	50	50	50	50	50	50	50	
other											
<b>Total costs( C )</b>	73,250	50	50	50	50	50	50	50	50	50	<b>TOTAL</b>
<b>NPV @ 7%</b>	73250.0	46.7	43.7	40.8	38.1	35.6	33.3	31.1	29.1	27.2	<b>73575.8</b>
<b>Total B-C</b>	46886	120086	120086	120086	120086	120086	120086	120086	120086	120086	
<b>NPV @ 7%</b>	43818.692	104887.8	98025.95	91613.03	85619.66	80018.37	74783.53	69891.15	65318.83	61045.63	<b>\$775,023</b>
<b>NPV @ 8%</b>	43412.963	102954.4	95328.14	88266.79	81728.51	75674.55	70069.03	64878.73	60072.9	55623.05	<b>\$738,009</b>
<b>NPV @ 4%</b>	45082.692	111026.3	106756	102650	98701.94	94905.71	91255.49	87745.66	84370.83	81125.8	<b>\$903,620</b>

**Summary**

<b>NPV @ 7% over 10 years</b>	<b>NPV/Capital cost</b>	<b>B/C</b>
<b>\$775,023</b>	<b>10.58</b>	<b>12.27</b>

**BENEFIT COST ANALYSIS USING DISCOUNTED CASH FLOWS**

LOCATION	Option 2 – Install street lights										
	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	
<b>BASE CASE</b> to Do Nothing											
<b>BENEFITS</b>	144,214	144,214	144,214	144,214	144,214	144,214	144,214	144,214	144,214	144,214	
<b>Total benefits(B)</b>	144,214	144,214	144,214	144,214	144,214	144,214	144,214	144,214	144,214	144,214	<b>TOTAL</b>
<b>NPV @ 7%</b>	144214.0	134779.4	125962.1	117721.6	110020.2	102822.6	96095.9	89809.2	83933.9	78442.9	<b>1083801.7</b>
<b>COSTS</b>											
project/capital outlay	720,000										
maintenance costs	50	50	50	50	50	50	50	50	50	50	
other											
<b>Total costs( C )</b>	720,050	50	50	50	50	50	50	50	50	50	<b>TOTAL</b>
<b>NPC @ 7%</b>	720050.0	46.7	43.7	40.8	38.1	35.6	33.3	31.1	29.1	27.2	<b>720375.8</b>
<b>Total B-C</b>	-575836	144164	144164	144164	144164	144164	144164	144164	144164	144164	<b>TOTAL</b>
<b>NPV @ 7%</b>	538164.49	125918.4	117680.8	109982	102786.9	96062.56	89778.09	83904.76	78415.66	73285.67	<b>\$339,650</b>
<b>NPV @ 8%</b>	533181.48	123597.4	114442	105964.8	98115.6	90847.77	84118.31	77887.32	72117.89	66775.83	<b>\$300,686</b>
<b>NPV @ 4%</b>	553688.46	133287.7	128161.3	123232	118492.3	113934.9	109552.8	105339.2	101287.7	97392.03	<b>\$476,991</b>

**Summary**

<b>NPV @ 7% over 10 years</b>	<b>NPV/Capital cost</b>	<b>B/C</b>
<b>\$339,650</b>	<b>0.47</b>	<b>1.50</b>

**BENEFIT COST ANALYSIS USING DISCOUNTED CASH FLOWS**

LOCATION	Option 3 – Edge drop removal/ seal shoulder										
	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	
<b>BASE CASE</b> to Do Nothing											
<b>BENEFITS</b>	114,907	114,907	114,907	114,907	114,907	114,907	114,907	114,907	114,907	114,907	
<b>Total benefits(B)</b>	114,907	114,907	114,907	114,907	114,907	114,907	114,907	114,907	114,907	114,907	<b>TOTAL</b>
<b>NPV @ 7%</b>	114907.0	107389.7	100364.2	93798.3	87662.0	81927.1	76567.4	71558.3	66876.9	62501.8	<b>863552.8</b>
<b>COSTS</b>											
project/capital outlay	1,290,000										
maintenance costs	50	50	50	50	50	50	50	50	50	50	
other											
<b>Total costs( C )</b>	1,290,050	50	50	50	50	50	50	50	50	50	<b>TOTAL</b>
<b>NPC @ 7%</b>	1290050.0	46.7	43.7	40.8	38.1	35.6	33.3	31.1	29.1	27.2	<b>1290375.8</b>
<b>Total B-C</b>	-1175143	114857	114857	114857	114857	114857	114857	114857	114857	114857	<b>TOTAL</b>
<b>NPV @ 7%</b>	1098264.5	100320.6	93757.53	87623.86	81891.45	76534.07	71527.17	66847.82	62474.6	58387.47	<b>\$398,900</b>
<b>NPV @ 8%</b>	1088095.4	98471.36	91177.19	84423.32	78169.74	72379.39	67017.96	62053.66	57457.1	53201.01	<b>\$423,745</b>
<b>NPV @ 4%</b>	1129945.2	106191.8	102107.5	98180.24	94404.08	90773.16	87281.88	83924.88	80697	77593.27	<b>\$308,791</b>

**Summary**

**NPV @ 7% over 10 years**  
**-\$398,900**

**NPV/Capital cost**  
**-0.31**

**B/C**  
**0.67**

**BENEFIT COST ANALYSIS USING DISCOUNTED CASH FLOWS**

LOCATION	Option 4 – Speed reduction to 80 km/h										
	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	
<b>BASE CASE</b> to Do Nothing											
<b>BENEFITS</b>	43,090	43,090	43,090	43,090	43,090	43,090	43,090	43,090	43,090	43,090	
<b>Total benefits(B)</b>	43,090	43,090	43,090	43,090	43,090	43,090	43,090	43,090	43,090	43,090	<b>TOTAL</b>
<b>NPV @ 7%</b>	43090.0	40271.0	37636.5	35174.3	32873.2	30722.6	28712.7	26834.3	25078.8	23438.1	<b>323831.4</b>
<b>COSTS</b>											
project/capital outlay	3,500										
maintenance costs	50	50	50	50	50	50	50	50	50	50	
other											
<b>Total costs( C )</b>	3,550	50	50	50	50	50	50	50	50	50	<b>TOTAL</b>
<b>NPV @ 7%</b>	3550.0	46.7	43.7	40.8	38.1	35.6	33.3	31.1	29.1	27.2	<b>3875.8</b>
<b>Total B-C</b>	39540	43040	43040	43040	43040	43040	43040	43040	43040	43040	
<b>NPV @ 7%</b>	36953.271	37592.8	35133.46	32835.01	30686.93	28679.37	26803.15	25049.67	23410.91	21879.35	<b>\$299,024</b>
<b>NPV @ 8%</b>	36611.111	36899.86	34166.54	31635.68	29292.3	27122.5	25113.43	23253.17	21530.72	19935.85	<b>\$285,561</b>
<b>NPV @ 4%</b>	38019.231	39792.9	38262.4	36790.77	35375.74	34015.14	32706.86	31448.91	30239.33	29076.28	<b>\$345,728</b>

**Summary**

**NPV @ 7% over 10 years**  
**\$299,024**

**NPV/Capital cost**  
**84.23**

**B/C**  
**83.55**

**BENEFIT COST ANALYSIS USING DISCOUNTED CASH FLOWS**

LOCATION	Option 5 - Combined Options 1 and 4										
	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	
<b>BASE CASE</b> to Do Nothing											
<b>BENEFITS</b>											
	150,299	150,299	150,299	150,299	150,299	150,299	150,299	150,299	150,299	150,299	
<b>Total benefits(B)</b>											
<b>NPV @ 7%</b>	150299.0	140466.4	131277.0	122688.8	114662.4	107161.1	100150.6	93598.7	87475.4	81752.7	<b>TOTAL</b> 1129531.9
<b>COSTS</b>											
project/capital outlay	76,700										
maintenance costs	50	50	50	50	50	50	50	50	50	50	
other											
<b>Total costs( C )</b>											
<b>NPC @ 7%</b>	76,750	50	50	50	50	50	50	50	50	50	<b>TOTAL</b> 77075.8
	76750.0	46.7	43.7	40.8	38.1	35.6	33.3	31.1	29.1	27.2	
<b>Total B-C</b>											
	73549	150249	150249	150249	150249	150249	150249	150249	150249	150249	
<b>NPV @ 7%</b>	68737.383	131233.3	122647.9	114624.2	107125.5	100117.3	93567.53	87446.29	81725.5	76378.97	<b>TOTAL</b> \$983,604
<b>NPV @ 8%</b>	68100.926	128814.3	119272.5	110437.5	102256.9	94682.36	87668.85	81174.86	75161.91	69594.36	<b>TOTAL</b> \$937,165
<b>NPV @ 4%</b>	70720.192	138913.6	133570.8	128433.5	123493.7	118744	114176.9	109785.5	105563	101502.8	<b>TOTAL</b> \$1,144,904

**Summary**

<b>NPV @ 7% over 10 years</b>	<b>NPV/Capital cost</b>	<b>B/C</b>
<b>\$983,604</b>	<b>12.82</b>	<b>14.65</b>