10.1 PUBLIC CONSULTATION RESULTS - MINI-ROUNDABOUT PILOT PROJECT

Attachments:
1. **Plan of Proposed Locations of Mini-Roundabouts**
2. **Map of Proposed Project Area**
3. **Letter - Mini Roundabouts URSP Consultation - Resident Letter**
4. **Mini-roundabout Correspondence Responses**
5. **Monash Institute of Transport Study - Understanding Safety and Driver Behaviour Impacts of Mini-roundabouts on Local Roads**

RECOMMENDATION:

That Council:

1. **NOTES the public consultation results on the 'mini roundabout' pilot program contained in this report.**

2. **APPROVES the implementation of the Urban Road Safety Program 'mini roundabout' pilot project within the area bounded by Raglan Road, Hyde, Vincent and Fitzgerald Streets, North Perth/Mt Lawley in May/June 2021, as shown on Plan 3612-CP, Attachment 1.**

3. **NOTES that the pilot project will be fully funded by Main Roads WA.**

4. **APPROVES the subject area moving from 50kmh to 40kmh during the pilot project period in liaison with Main Roads WA as shown in Attachment 2.**

5. **REQUESTS Administration to inform the respondents of Council's decision.**

PURPOSE OF REPORT:

To advise Council of the results of the Public Consultation of the proposed installation of nine 'mini-roundabouts' within the area bounded by Raglan Road, Fitzgerald, Vincent, Hyde Streets, North Perth/Mt Lawley, in conjunction with Main Roads WA under their Urban Road Safety Program.

BACKGROUND:

Early in 2020 Main Roads WA approached the City to discuss a new road safety initiative, the Urban Road Safety Program (URSP), and to gauge the level of interest of the City to participate in the program to implement a 'mini roundabout' pilot project, to be funded by Main Roads. Funding is available for this financial year.

The aim of the URSP is to:

'Implement low cost road safety treatments on an area-wide or at least, whole of street basis that will target high casualty and/or high-risk locations'.

The URSP will treat intersections on an area wide approach that have crash risks, but are ineligible for Black Spot funding. The URSP will take a proactive area wide or whole-of-street approach, applying many similar treatments at once, using low-cost standard designs. This will allow for treatment of risks throughout suburbs and neighbourhoods.

In conjunction with Main Roads, the precinct bounded by Raglan Road, Fitzgerald, Vincent and Hyde Streets, North Perth/Mt Lawley was selected for a pilot project comprising a series of mini-roundabouts (nine in total).

A report was subsequently submitted to Council at its Ordinary Meeting of 15 December 2020 where the following, in part, recommendation was adopted:

> *2. APPROVES IN-PRINCIPLE subject to public consultation, the installation of the nine 'mini roundabouts' within the aforementioned area, as shown on Plan 3612-CP, Attachment 1;*

Given that the standard 50kmh urban speed limit currently applies within the pilot project area, Main Roads has advised that they support, through the pilot program, making the area a 40kmh speed zone in conjunction with the introduction of the Mini-Roundabouts treatment. The area where the speed reduction will be applied is shown in attachment 2. This project will support the principles of the City's draft Accessibility Strategy and its aim to reduce speed limits across Vincent to 40kmh.

DETAILS:

In mid-March the City commenced an extensive public consultation process inclusive of a 670 letter drop to all of the properties within the area bounded by Fitzgerald, Forrest, William and Vincent Streets, encompassing the project, an *Image Vincent EHQ* web page, email and written responses. The letter was to inform residents who lived in the proposed pilot area of the consultation but the survey was available to all residents via the website.

The consultation opened 18 March and by the close of consultation on 12 April 2021 some 74 responses had been received. The web portal receiving 52 responses, with the remainder, 22, via email and written correspondence.

One respondent replied via both email and web portal, and therefore the response only included once (hence the total of 73 in the tables below).

The on-line survey asked the following:

1) Do you support the 'mini roundabouts' pilot project and you have any comments or thoughts you'd like to add?

2) Do you live or own property in the area, bounded by Fitzgerald, Forrest, William and Vincent Streets?

3) Do you live or own property within the City of Vincent?

All web portal and email responses were reviewed (see attachments) and results were determined to be as follows:

Support Implementation	30 of 73	41.1%
Oppose Implementation	30 of 73	41.1%
Unsure or did not indicate	13 of 73	17.8%

When only the responses received by directly affected residents within the aforementioned consultation area were tallied, the results from the 50 responses were:

Support Implementation	25 of 50	50.0%
Oppose Implementation	17 of 50	34.0%
Unsure or did not indicate	8 of 50	16.0%

Public Concerns

Respondents that did not support the project were generally of the view that roundabouts were not suitable for pedestrians and cyclists. Further, some noted that the City has indicated that a possible Safe Active Street will be routed through some of the intersections within the pilot project area.

It should be noted that the implementation will be of mini-roundabouts, not standard, or typical, roundabouts. The former having an annulus diameter of 3m, with the latter 6m. The mini-roundabout does not cause cars to deflect out around the annulus as far as if they were negotiating a standard roundabout, which can be disconcerting for cyclists. Secondly, and most significantly, the selected area has low traffic speeds and low traffic volumes with good sight distances which provides significant levels of safety to pedestrians and cyclists alike. A full roundabout already exists just north of the project area. No comments were received about removing it.

Other feedback noted that the effectiveness of a mini-roundabout is yet to be confirmed, in the Western Australian context, which is the point of the pilot project. Main Roads URSP team are of the view that the

grid pattern installation of a mini-roundabout will result in reduced speeds and improved safety for all road users within the 'cell' and that this will be borne out by future traffic data collection and accident statistics

Safe Active Street.

City Officers subsequently met with the Department of Transport Bicycle Network Team in relation to the implementation of the mini-roundabouts at intersections that form part of the proposed Norfolk St Safe Active Street (SAS) route, with the exact route yet to be determined.

While they had some reservations about 'mini-roundabouts' they were scheduled to meet with Main Roads URSP team to discuss the matter. They accepted that the pilot project may aid in the speed reductions necessary to meet the Safe Active Street criteria, and that they would support any SAS implementation program to start at the Walcott Street end of the route rather than Vincent Street while the success, or otherwise, of the pilot project was assessed.

CONSULTATION/ADVERTISING:

Residents and businesses were consulted regarding the proposal in accordance with the City's Community Consultation Policy 4.1.5.

Administration undertook a Public Consultation process initiated by a 670 letter drop, which directed responses to the *Image Vincent EHQ* page, and email or written options. The letter was to inform residents who lived in the proposed pilot area of the consultation but the survey was available to all residents via the website. The consultation was open from the 18 March to the 12 April 2021. All correspondence received are shown in the attachments.

LEGAL/POLICY:

While all of the roads within the project area come under the care and control of the City prior to any works proceeding the associated regulatory lines and signs have to be approved by Main Roads WA Traffic Services Directorate.

RISK MANAGEMENT IMPLICATIONS

Low: It is low risk for Council as the proposed 'mini-roundabouts' should lead to a reduction in both the number and severity of traffic accidents within the precinct as well as a reduction in traffic speeds resulting in an improved level of amenity for the local community.

STRATEGIC IMPLICATIONS:

This is in keeping with the City's *Strategic Community Plan 2018-2028*:

Enhanced Environment

We have minimised our impact on the environment.

Accessible City

We have better integrated all modes of transport and increased services through the City.

Innovative and Accountable

Our community is aware of what we are doing and how we are meeting our goals.

SUSTAINABILITY IMPLICATIONS:

This is in keeping with the following key sustainability outcomes of the *City's Sustainable Environment Strategy 2019-2024.*

Sustainable Transport

PUBLIC HEALTH IMPLICATIONS:

This is in keeping with the following priority health outcomes of the *City's Public Health Plan 2020-2025:*

Reduced injuries and a safer community

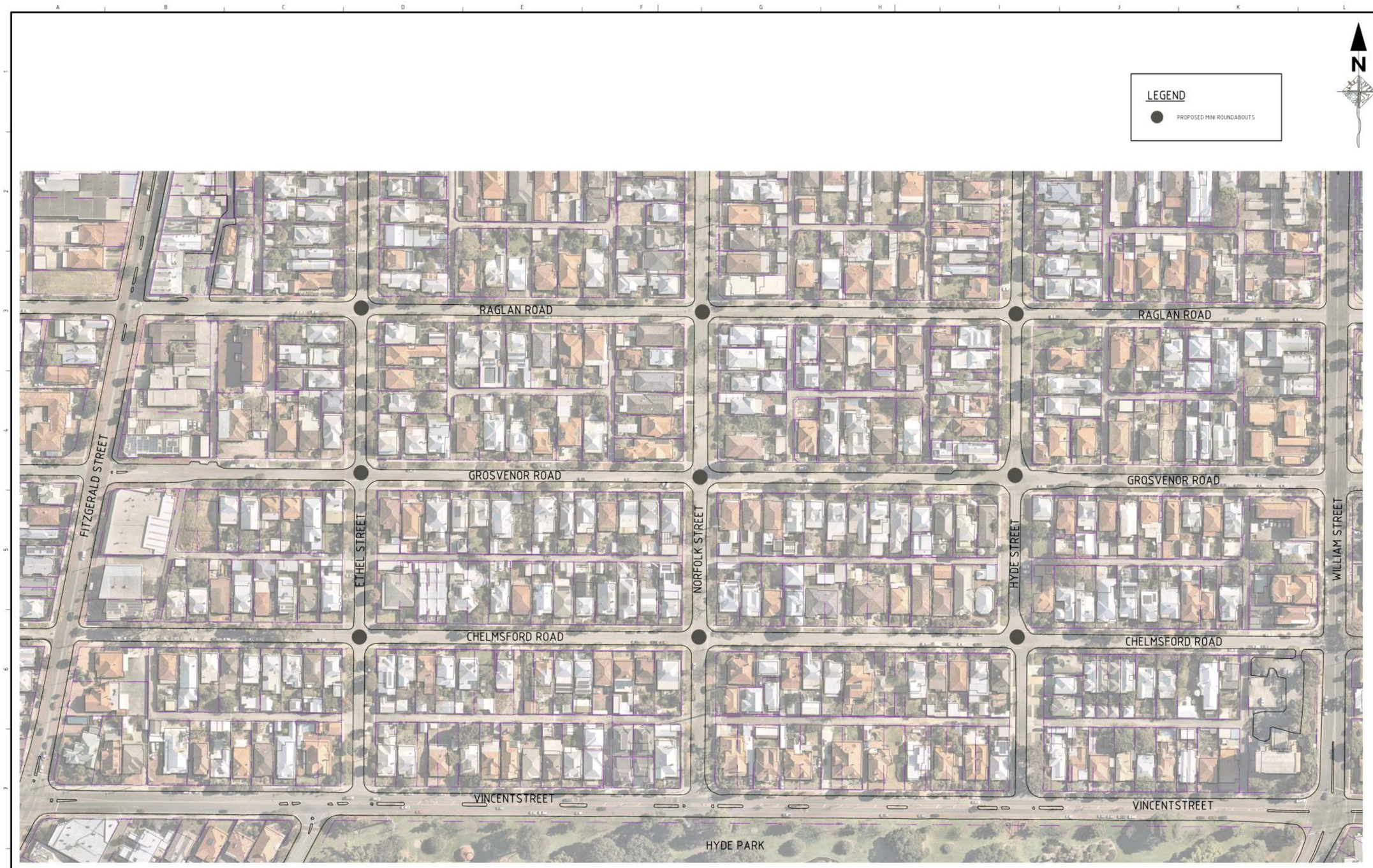
FINANCIAL/BUDGET IMPLICATIONS:

The works, estimated to cost $230,000, would be fully funding by Main Road's WA Urban Road Safety Program.

COMMENTS:

The URSP provides the City the opportunity to participate in an innovative road safety program that will lead to a number of beneficial outcomes for the local community at no direct cost to the City.

If the 'mini-roundabout' project is approved, and proves successful, it would likely lead to a greater acceptance and adoption of the URSP by Local Government across the metropolitan area.



CITY OF VINCENT
244 VINCENT STREET LEEDERVILLE, 6007
TECHNICAL SERVICES

AMENDMENTS

REVISION				DESCRIPTION	AUTHORISED	
B	AJ	23/11/20	CW	CONCEPT ISSUED		
No	DRN	DATE	CHKD		BY	DATE

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BUDGET:	–	DESIGNED: AJ	31/08/20
CHECKED: CW	23/11/20	DRAWN: AJ	31/08/20
APPROVED: DTS / ME			

SURVEYOR: TOPO 31/08/20
GRID: MGA AHD DATUM: GDA1994
SCALE: 1:1000
METRES

PROPOSED LOCATIONS OF
'MINI ROUNDABOUTS'
ETHEL,NORFOLK & HYDE STREETS, NORTH PERTH

A1 | SHEET 1 OF 1 | REVISION 0
DRAWING NUMBER
3612-CP

The area bounded by Fitzgerald St, Vincent St, William St and Alma Rd (covering Chelmsford Rd, Grosvenor Rd and Raglan Rd between Fitzgerald St and William St and Ethel St, Norfolk St and Hyde St between Alma Rd and Vincent St).

ENQUIRIES TO: Andrew Murphy (9273 6000)
Executive Director
Infrastructure & Environment

CITY OF VINCENT

18 March 2021

Dear Sir/Madam,

PROPOSED MINI ROUNDABOUTS PILOT PROJECT – SHARE YOUR THOUGHTS

The City of Vincent and Main Roads have been working collaboratively on a new pilot project for the Urban Road Safety Program (URSP). The program aims to implement low cost road safety treatments on an area wide or whole-of-street basis to assist in the reduction of fatal and serious injury crashes on local roads that are ineligible for funding from other road safety programs (such as the Black Spot funding).

The pilot project involves installing mini roundabouts at nine intersections in North Perth, in the area bounded by Ethel Street, Raglan Road, Hyde Street and Chelmsford Road. The project is fully funded by the Road Safety Commission.

The area proposed for the pilot project was nominated as both a responsive site, for the numerous low-grade traffic incidents recorded between 2014-2019, and as a proactive site based on the traditional 'grid pattern' road network.

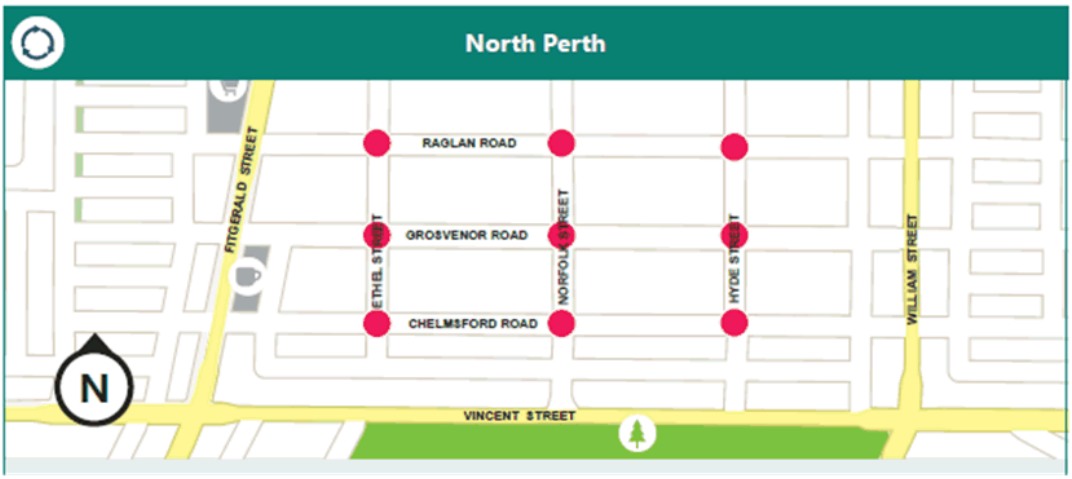

Figure 1: proposed locations for the nine mini roundabouts

Mini roundabouts are regarded as an effective, low cost means of reducing the likelihood of traffic crashes on local roads. They have approximately a 3m diameter, compared to the 6m diameter of typical roundabouts, eliminating the need for road widening and significantly reducing construction costs.

The 'mini roundabouts' pilot project is based on research by Monash University in Victoria using crash data provided by Main Roads (from April 2014 - April 2019), with GHD (Perth) assisting in the project scoping and design

Administration & Civic Centre
244 Vincent Street, (Cnr Loftus), Leederville, Western Australia 6007 | PO Box 82, Leederville WA 6902 | Tel: (08) 9273 6000 Fax: (08) 9273 6099 | Email: mail@vincent.wa.gov.au www.vincent.wa.gov.au

ENQUIRIES TO: Andrew Murphy (9273 6000)
Executive Director
Infrastructure & Environment

CITY OF VINCENT

Figure 2: a typical mini roundabout in metropolitan Melbourne, Victoria

Possible reduction in speed limit to 40 kmh

Given that the standard 50kmh Urban Speed Limit currently applies within the pilot project area, Main Roads has advised that they will consider, through the pilot program, making the area a 40kmh Speed Zone in conjunction with the introduction of the mini roundabouts treatment.

Share your thoughts

The City would like to know what you think about the proposed URSP pilot program, involving the installation of mini roundabouts at nine intersections in the area bounded by Ethel Street, Raglan Road, Hyde Street and Chelmsford Road.

You can share your thoughts by:

- Online survey, available at **www.imagine.vincent.wa.gov.au/mini-roundabouts-pilot-project**
- Direct email, to mail@vincent.wa.gov.au
- Phone, to 9273 6000
- Post, to PO Box 82, Leederville, 6902
- In person at the City of Vincent Library, 99 Loftus Street, Leederville (during opening hours)

Feedback is invited until Monday 12 April 2021. For more information, please contact the City on 9273 6000 or mail@vincent.wa.gov.au

To find out more about the Main Roads Urban Road Safety Program, visit their website below.

www.mainroads.wa.gov.au/projects-initiatives/programs/urban-road-safety-upgrades

Yours sincerely,

Andrew Murphy
EXECUTIVE DIRECTOR
INFRASTRUCTURE & ENVIRONMENT

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CORRESPONDENCE Results (22 Responses)

##########
D21/45490 - 1
##########

Thanks for the information you sent out about the proposed mini roundabouts pilot project in North Perth. I tried to use the online form but it didn't work, so I am responding via email instead.
I am very happy with the proposal. Living on Norfolk Street we often see drivers travelling at high speed down Norfolk Street. I expect they're using the street as a shortcut between main roads.
I am hopeful that both the roundabout proposal and the future 40km speed limit help curb this behaviour.

##########
D21/45824 -2
##########

In response to your mail out regarding proposed mini roundabouts pilot project I wish to advise that I am in agreement to this project.

##########
D21/46054 - 3
##########

We live XXXX Ethel Street North Perth
We are in favour of the mini roundabouts and the permanent kiosk in Hyde Park
We are not so keen on the food vans as the hygiene is questionable from what we have seen and block access most times

##########
D21/47502 - 4
##########

In response to your notification of the Proposed Mini Roundabouts Pilot Project dated 18 March 2021, I wish to comment on the installation of mini roundabouts at nine intersections in the area bounded by Ethel Street, Raglan Road, Grosvenor Road, Norfolk Street, Hyde Street and Chelmsford Road.
From 1958 I grew up at 10 Norfolk Street. During those early years, there were often car crashes at those nine intersections that are being proposed to apply mini roundabouts. The crashes were due to no stop signs or others methods of slowing down traffic speed at those intersections. The action taken to prevent regular crashes was the implementation of stop signs. The stop signs significantly prevented crashes and stopped fatal and serious injuries.
I now reside at 98 Chelmsford Road and in my observations there is a growing number of vehicles accessing the nine intersections that are being used as short cut from Fitzgerald Street and Vincent Street to access William Street. Norfolk Street is also seeing more traffic as a short cut by drivers preventing the use of Fitzgerald Street or William Street. I can say that the speed being used on the roads of the nine intersections is in excess of 50 kmh.
I am in favour of any initiative by the City of Vincent and Main Roads to implement low cost safety treatments in the reduction of fatal and serious injuries and crashes. However, I feel that the main aim should be to prevent / stop and not reduce fatal and serious injuries and crashes. Stop signs have and will continue to prevent fatal and serious crashes.
The implementation to remove stop signs and be replaced with painted islands in those intersection will have little or no impact to slow down traffic and prevent fatal and serious injuries and crashes. A painted circle in the intersection will be ignored and driven straight over without reducing speed. A traditional roundabout with raised islands does slow down traffic and force drivers to negotiate around the island at reduced speed. Bear in mind, any obstacle, such as a traditional roundabout island or speedbump that may cause damage to a vehicle is treated with respect and is negotiated with that in mind.
In my view the cost of removing the current stop signs and installing mini roundabouts would be best served by retaining the stop signs and preventing traffic using the nine intersections as short cuts from Vincent Street, Fitzgerald Street, Norfolk Street and William Street. And to reduced traffic speed from 50 to 30 kmh.
I request acknowledgement of the receipt of my email and comments.

##########
D21/48953 - 5
##########

I am responding to the recent letter about the Mini Roundabouts Pilot Project in North Perth and Mount Lawley.
I believe the solution suggested will not be sufficient to address the issue which is sought to be resolved.
As I understand it what is sought to be resolved is the reduction of the number of low grade traffic incidents.
The solution suggested is to install mini roundabouts in nine locations across three east west streets.
This seems to be unlikely to reduce the speeds in the streets, as most people drive 4 wheel drive vehicles which will just drive over them.
I suggest a better solution may be to install infrangible posts in the suggest locations which may reduce the speed but probably increase the number of traffic incidents.
It is noted that the streets in question have high levels of street parking and constricting the street. I would consider this to be a deterrent to people speeding and inevitably having traffic incidents, however this does not seem to stop people speeding down these streets.
Perhaps regular traffic cameras being installed with fines being issued may slow some people and reduce the number of traffic incidents.
It is possible the installation of the mini roundabouts may reduce the incidents as suggested by the Monash research. However, it is likely to increase the noise from cars driving over and swerving around these obstructions. This will reduce the quality of life of those residents who live near these proposed mini roundabout due to the noise and arrogant drivers bouncing over the mini roundabouts.
It is suggested other options be considered to resolve the traffic incident issues.
Reduce the speed on the streets to be at least as low as Vincent Street, currently Vincent is 10 kph lower than Chelmsford Road and has more traffic calming devices. It is likely that the traffic has increased on Chelmsford, Grosvenor and Raglan since the 40 Kph trial began.
It may be better to find other ways of reducing the traffic from using these roads as rat runs in the first place rather than slowing them down whilst rat running.
These could include more limits on turning, e.g. not being able turn into streets from particular directions from Fitzgerald and William.

I would be happy to discuss this further

##########
D21/48957 - 6
##########

Please find the Paper requested attached. I had been tracking it down.

<snip>

Could you please provide me with a copy or a link to the Monash University article? I'd like to understand the context of the study.

##########
D21/49716 - 7
##########

I just wish to have input into the Mini Roundabouts you are proposing and think that it will be very good for this area.
I use these streets and often see cars pull out from Stop signs not looking and certainly not stopping.

##########
D21/50769 - 8
##########

Thank you for your letter dated 18 March 2021 and for the opportunity to provide comment on the proposal. I am a nearby resident and drive through the study area on most days.
I do not support the proposal. I believe it has little justification, especially when considering (a) other alternative solutions such as reducing the speed limit alone, and removing verge obstructions to view corridors at those intersections and (b) other, more unsafe parts of the City of Vincent road network in more urgent need of remedy.
I strongly question the need for the interventions along Ethel and Hyde Streets, but can see a stronger case for Norfolk Street (but still not compelling enough to support it).
Since the Urban Road Safety Program (URSP) aims to reduce 'fatal and serious injury crashes' on local roads, and the study area proposed has experienced only 'low-grade traffic incidents' – does the project have any strategic justification? Based on the information in the letter, it appears that the Road Safety Commission has some unallocated funds and is scratching around for a way to spend it. No compelling case is presented as to the merits of the proposal based on data and comparison with other study areas within City of Vincent.
The letter sites 'numerous' low grade traffic incidents, but provides no context for this statement and no data to compare with others areas. Does the area have the 'highest' rate, mid-range, it is not clear to me based on the letter.
The letter references one project in Victoria, but does not provide sufficient detail for the reader to fairly determine the effectiveness or otherwise of that project. It would also be interesting to note whether other 'mini roundabout' projects have failed to deliver any safety improvements. The Victorian example could be a very selective example that provides a false indication of the success of this proposed solution.
The letter also suggests a possible reduction in the speed limit from 50km/h to 40km/h. A reduction in the speed limit from 50km/h to 40km/h is a good idea in my view. However, if the reduction in speed limit occurs in conjunction with the mini roundabouts – how will the City fairly evaluate the effectiveness of each intervention? That is, how will it know whether the reduction in speed limits alone would have been sufficient.
If the objective is to reduce the risk of serious road accidents within the City of Vincent, I suggest that the City remove the dangerous on-street car parking bays on Walcott Street near Field Street (outside the cookie shop). These bays consistently cause near misses as cars change lanes to avoid a collision, only to almost drive into a breaking car as it turns right into Field Street. Similarly, there are unnecessary on-street car bays on Fitzgerald Street (near Alma Road and Forrest Street) that obstruct effective traffic movement including buses. Finally, there are on-street bays on Forrest Street near the Fitzgerald Street intersection (outside the chemist) that are a constant source of conflict, congestion, near and actual accidents. I appreciate that removing these bays will be opposed by local businesses and 'their customers use them'. But since each area is well serviced by significant off-street car parks, that argument is weak.

##########
D21/50969 - 9
##########

I do not believe the installation of mini roundabouts is the correct solution to the issue.
Please see the attached as alternate solutions to what you seek to achieve.

##########
D21/51064 - 10
##########

We live on Norfolk Street and fully endorse the plan to add roundabouts. It will reduce speed down Norfolk and possibly traffic. Currently traffic speed is high and some drivers drive down beeping their horns to warn drivers to stop at intersections. We support slowing traffic increasing cycling and walking in this close to the city suburb.

##########
D21/52702 - 11
##########

I am writing to you to request that the current consultation being undertaken by the City on the installation of roundabouts in North Perth, be placed on hold until more comprehensive and unbiased information can be provided to local residents and members of the community about the proposal.
A letter from the City has been distributed to households on the streets where roundabouts are proposed to be installed. This letter mentions nothing about the negative impacts that this proposal will bring. Namely the heightened risk of physical harm and injury to pedestrians and bike riders. In addition, it does not quantify, nor provide evidence on the number of crashes in the area, and it does not describe how the speed and volume of vehicle movements will change on these streets if roundabouts are installed.
The lack of comprehensive information about the impact of this proposal on ALL road users will limit the value of feedback received from members of the public.
In your role as an elected member, it is important that you receive comprehensive and unbiased officer reports and community feedback to inform your decision making. In relation to this issue, to date, the officers have only provided you with information about the impact on people driving vehicles - but nothing about people that walk or ride bikes.
This bias was evident in the December 2020 report to council (a matter that I spoke to during public question time). The bias has now been replicated in the letter to residents and the information presently on the Imagine Vincent website.
You should also note that up until yesterday - nearly a week after the letter was distributed- it was not possible to find information about this proposal on the imagine Vincent website unless you had the specific URL. This URL was only provided to people that received the letter. (This was a similar approach used by officers when seeking comment on the Carr St bike lanes in 2019).
It seems as though it was only when local media contacted the City, asking why this item was not visible to all people that visited the Imagine Vincent website that the veil of secrecy was lifted.
Again, I ask that a new letter be drafted that provides unbiased and comprehensive information on the impact of this proposal on all road users, that this letter be distributed to residents, and that the Imagine Vincent website be similarly updated with this additional and new information.

##########
D21/53086 - 12
##########

I do not support the idea.
Has there been a high incidence of near misses of vehicle crashes in this area? Why wouldn't treatments used from this fund look to prioritise walking/cycling? That also makes the street safer for people in cars. Disappointing to see Vincent doing this when they have put in separated bike lanes and signalised pedestrian crossings.
Let's set a challenge to Main Roads to solve something WITHOUT a roundabout.
Does this fit with Vincent's objectives and priorities?
Why not use the paint to narrow the street at intersections (Bulb out/Cub out/bump out)? Then put in a few bollards of some sort, to allow pedestrians to cross more safely while also slowing down cars.

##########
D21/53260 – 13
##########

Following receipt of the advice regarding the Proposed Mini Round a Bouts Pilot Project as requested I make the following comments.
In the opening comments, first paragraph you state "to assist in the reduction of fatal and serious injury crashes" and in the third paragraph you state "was nominated as both a responsive site, for the numerous low-grade traffic incidents recorded between 2014-2019 and as a proactive site"
From 2019 to 2021 have the number of low incidents -grade traffic incidents increased and have any of these in fact been fatal?
As stated this "pilot project is based on research by Monash University in Victoria"
Prior to installation of the mini round a bouts were the intersections in metropolitan Melbourne Victoria sign posted with stop signs or other traffic control devices and if so what were they?
Each of the intersections selected have stop signs in one direction bar one which have give way signs and should stop vehicle movements at the intersection in one direction until it is safe to proceed
With the introduction of the Mini Round a Bouts I assume the signage would be removed or are these to be replaced with give way and or round a bout signs?
Removing the stop signs and installing Mini Round a Bouts will not stop traffic in one direction but will create a "Chicane", except traffic will be moving in all directions through the intersection and potentially at greater speed on the streets that had the stop signs.
Whilst mini round a bouts are a cost effective method by reducing the amount of surrounding works required I don't believe they create enough deviation for through traffic to slow vehicles down with only a 1.5 metre deviation.
Are the mini round a bouts to be kerbed to prevent cars driving over the edge? This could make the deviation at least partly worthwhile, if not the larger vehicles could effectively drive straight through the intersection with minimal deviation and or speed reduction.
The possible reduction in speed limit to 40 kmh was trialled elsewhere within the Council with what appears to be minimal effect.
Signage alone will not reduce speeds on local streets; there needs to be a physical barrier i.e. speed platforms or humps as evidenced by the latest traffic data comparison along Forrest Street where vehicle speeds are slower along the Norfolk to William Streets section, which has speed humps, than between Fitzgerald and Norfolk Streets where no speed humps are installed.
Have other methods of reducing traffic accidents been investigated eg creating a loop road system which eliminated the intersections, as per the eastern side of William Street /
I appreciate this would a more expensive alternative but in the long term may have a great benefit to slowing traffic, reducing accidents and creating a quieter environment for residents
I trust the above comments are taken on board and given due consideration.
I look forward to a response

##########
D21/56066 - 14
##########

Hello! Thank you for allowing me to comment on the mini roundabouts proposal.
I live at XXXX Grosvenor Road, North Perth and have done so for nearly 40 years.
There definitely needs to be something about the volume of traffic that uses the "side streets" in your proposed plan.
I highly support reduction in speed limit to 40 KPH.
As to the number of roundabouts proposed, I believe they would be more a hindrance to locals than those drivers who use these streets to bypass Vincent Street!
I would recommend an appropriate number i.e. 5 - 6 for trial, that ensures speed reduction. Some cars, trucks and motorbikes regularly use these street as a speedway!
The speed humps in Vincent street are not preventing most cars from still speeding, I've observed many simply fly over the speed humps, especially the four wheel drives! And the reason why a lot use the "side streets" is because the flow along Vincent Street can be very slow especially at peak times!
I have been retired for around 5 years and try to walk everywhere as well as driving when necessary. The volume of traffic has increased, I even notice my street quite busy at all times, not just during the day.
Also, visibility is difficult trying to get out of a laneway or cross a street sometimes due to the number of cars that park in this area(close to intersection) and walk to catch a bus!
I know I've see many do it. There are only some sections of these streets that have restricted parking hours, not all.
Hope this helps?

##########
D21/59225 - 15
##########

I' am very much in favour of the proposed mini roundabouts at nine intersections in North Perth incorporating Raglan, Grosvenor and Chelmsford Roads. Cross streets are Norfolk, Hyde and Ethel streets. I'm also in favour of the reduced speed limit to 40 kilometres an hour. It will help reduce the number of cars speeding between Fitzgerald and William streets.
Many thanks for inviting our input. I live in Grosvenor Road between Hyde and Ethel streets.

##########
D21/59269 - 16
##########

Thank you for your email. I very much appreciate your thoughtful and considered response. I would be very grateful if you would clarify two points.

The first point relates to your comment that "Cyclists find that roundabouts become squeeze points, where poor driving ability can make their use of such intersections uncomfortable", whereas "Mini-roundabouts provide more room to negotiate the intersection as they have a smaller central annulus (3m radius as opposed to 6m)) providing more room for cyclists."

- I understand that this means the carriageway will be wider in a mini-roundabout compared to a roundabout. Is that correct? What would be the carriageway widths under each scenario?
- I am not clear how a wider carriageway would be (or would seem) safer for cyclists. I would have thought this would be/feel less safe, since it is more likely that a vehicle will attempt to overtake the cyclist in the intersection. Have I misunderstood? I'd be very grateful if you could clarify.
- The second point relates to the three issues you have identified regarding zebra crossings.
- I understand that these describe the policy of Main Roads, and not the City of Vincent. Is that correct?
- Please could you clarify whether the City has a policy (formal or otherwise) regarding the installation of zebra crossings? (I appreciate that any such policy would be subject to Main Roads as approver.)

##########
D21/59313 - 17
##########

To clarify my comment on options to have any Council decision to proceed on the 'pilot' project reviewed, prima face, it may be it be opined that SAT for example may not have jurisdiction given it is deemed a 'pilot' Project..... there would appear several substantive issues that may well test any such hypothesis.

<snip>

As a resident at XXXX Chelmsford Road North Perth, I am totally opposed to the proposed project.
This will, in my view increase the hazard of road and community safety.
I do not accept that it will improve any aspect of the two factors the residents have been concerned about and raised, without being heard for the last 3 years.
This is regardless of the city's so called traffic and speed counter data, as the facts are we as residents who live here and experience the speed of cars 'rat running'.
I am aware that the issues of speed, road and related community safety is becoming a major issue throughout the City. The residents for example in Forrest St, Alma Road (onto Charles Street) and as I understand throughout areas of Mt Hawthorn continue to raise similar problems. This is a proposal funded by the State Government as I understand.
This roundabout (mini) proposal may well look pretty, and be taken from a Melbourne scenario, however I believe it is totally inappropriate in our suburb.
Should the Council take a unilateral decision to proceed, there remain options to have this decision reviewed, including through SAT.
I also advise that the majority residents between Fitzgerald and Ethel Streets on Chelmsford, met for an Easter get together on Thursday 1/4/21.
This proposal and what we believe is the issue of the supposed Fitzgerald St turn right only out of into Chelmsford Road was universally opposed from all the residents at that gathering.
Finally, is it confusing to have the current stop and give way signs removed in the proposed area to be replaced by the 'mini' roundabouts.
The question I am totally bemused by is...when is the City going to prepare a total strategy for the City on traffic management, road safety and related community safety as opposed to what appears to be a sporadic approach which lacks a coherent approach and in the end result creates a very negative view (albeit apparent) view from rate payers? There appears to be no detailed Traffic Management Plan(TMP)on the mini roundabouts and relying on a Melbourne based scenario as what appears to be the case, is incredulous, without a proper strategic approach in the form of a TMP.
I am happy to discuss any issue on this matter

##########
D21/59315 - 18
##########

I am a resident and an joint owner of a property at XXXX Chelmsford Road North Perth.

I object to the implementation of the project.

I have lived in Chelmsford Road for the past 11 years, and before that I was a resident and an owner of a property in Alma Road for about 13 years.

Traffic calming in Chelmsford Road is urgently required. The recent change to the intersection at Fitzgerald street has made little different to the hoons that drive at excessive speeds down Chelmsford road almost every Saturday or Sunday night. Last Saturday night I was awoken by the sound of yet again two cars racing down our street from Fitzgerald Street, brakes screeching as they approached the giveaway sign at Ethel Street, without stopping or really slowing. As they roared past, I held my breath waiting, as I do when this occurs, for a crash. Fortunately it did not happen.

I accept that the give way sign on the intersection at Ethel Street has made some difference to the traffic issues in our Street as it slows most cars down at the corner. Speed is not so much a problem during the main part of the day in our street because there are a large number of cars parked on either side of the road which inhibits speed as cars often have to stop for approaching cars to past. However, later in the day and in the evenings there are fewer cars, and a capacity to speed unobstructed.

Getting to the proposal, first what is of concern is although the implementation is for a pilot it does not appear to supported by any local traffic study which shows that is is likely to be effective in our streets as opposed to local conditions in Victoria.

Second, it is proposed is that the roundabouts replace a number of stop and give way signs that are more effective in stopping cars than mini roundabouts that do not require a car to stop or reduce their speed to a significant degree.

##########
D21/59319 - 19
##########

I have lived for many years on Grosvenor Rd, in the area proposed for the Mini Roundabouts trial. The amount and speed of traffic, especially in the late afternoon, has turned our street into a noisy and dangerous place.

So I would welcome any measures which slow vehicles down. I am not sure that mini roundabouts are the answer. I frequently cross Fitzgerald street as a pedestrian, and it is rare to see any vehicle, especially the popular four wheel drives, slowed down by the "speed reduction" strips.

I suspect that the proposed mini roundabouts will be treated in the same way. Considerate drivers will still slow down, others will just power across. At present, STOP signs provide some safe times for pedestrians and cyclists to cross intersections. That will disappear with roundabouts

I think it is time to introduce penalties for speeding on our local streets. They are not there to provide quick alternative routes for impatient drivers.

How about
a) Dropping the speed limit to 40km in the trial area, and
b) Putting in a speed camera with a feedback screen to show drivers their actual speed.
After a while, fines could be imposed on serial offenders.
We have so much "smart" technology that tracking the inconsiderate ones should be easy.

Thank you for the opportunity to comment on this proposal,

##########
D21/59346 - 20
##########

We have resided at XXXX Chelmsford Road Nth Perth since August 1998. Our home is the third one from the crossroad with Ethel Street and in all that time neither I nor my husband has seen or heard of an accident having taken place at that particular crossroad.
We are both against having a mini roundabout being erected - it's just a waste of money. When drivers still fishtail over to the west side of Chelmsford over Fitzgerald from east side of Chelmsford and even turn right into Fitzgerald to go north, what are they going to do with a little roundabout?
Regards

##########
D21/59347 - 21
##########

As residents of Chelmsford Road, we object to the mini roundabout pilot proposal for our street and precinct.

It is our understanding roundabouts are designed to ease congestion, reduce crashes and encourage continuous flow of traffic. None of these issues are experienced on the streets proposed to receive the pilot program.

Speed and pedestrian safety on our inner city residential streets are a significant concern. We believe the introduction of a system of mini roundabouts will encourage more non-resident traffic to use these roads to avoid congested main roads.

We note roundabouts increase general average speed by removing the pause of drivers at 'Giveway' or 'Stop' signs. This program will therefore not address our primary concern of traffic speed.

The streets in the pilot precinct require (and have requested repeatedly) traffic calming measures to combat speeding, deter non-resident traffic and increase pedestrian safety.

We support the extension of the 40km/h speed zone in the precinct area.

We strongly object to the removal of the 'Giveway' sign at the intersection of Chelmsford Rd and Ethel St. This recent sign reorientation has started to have the desired effect of slowing traffic and improving safety at this intersection.

We appreciate your time in noting our feedback.

##########
D21/60092 - 22
##########

I see that I am a day late (& a buck short?) for my feedback regarding the mini-roundabouts project.
That's fine, as I don't have particularly strong feelings one way or another about it.

However, I was going to opportunistically feed back to yourselves & Main Roads that I am concerned about your/my street Vincent Street.
Your intersection with Loftus Street I think is pretty safe, as it has right hand turn lanes in every direction.

The 2 intersections (Fitzgerald & more importantly Charles Street) nearer to my house (XXXX) are getting dangerous though.
At both there is no right turn lane, and one has the choice of blocking the large number of people turning left to get onto the Freeway or getting blocked by a single car turning right. Both have massively wide expanses of concrete either side of the road that mean they could easily accommodate a right turn lane, in my humble opinion.

As it stands, the current arrangement (plus the new Beatty Park walk lights) encourages people to duck & weave across lanes regularly. This, plus the recent presence of street people begging on the median strip at Charles, means I think that serious accidents are inevitable until this is addressed. At Charles, there would be the added bonus of removal of a metal sidebar that's only of note because it impaled a stolen Ferrari (that then exploded, killing the second occupant) a few years ago.

Anyway, if you could please pass my concerns re: Vincent Street on to the appropriate Main Roads people, it would be greatly appreciated.

##########

ENGAGEMENT HQ Results (52 Responses)

##########
Engagement HQ Response 1
##########

As a resident of one of these streets I am in support of the proposal as I think it will be an elegant solution to at least slowing the traffic and making it safer. I wonder if it is within budget to create little gardens in the middle of each to beautify them and continue the policy of greening the area. I have added a photo of some I found online..

##########
Engagement HQ Response 2
##########

Having risked life and limb when driving along these roads for over 32 years, I am 100% in favour of this mini roundabout trial. I have seen so many near misses as cars try to "rat race" and hardly even slow down at the stop signs. Also there are often parked cars to your right, making visibility very hard. One question would be this: are cyclists more at risk on a roundabout? I think it may be safer for them as they may be more visible. Needs to be a huge push to have cyclists wear highly visible safety gear. I see cyclists in dark clothing with no lights at all as I come home in the winter at 6-30pm. Be seen, be safe .

##########
Engagement HQ Response 3
##########

I support the project.
The current system of give ways can lead to quite a bit of stop start driving depending on the route you are taking, adding to vehicle emissions at start up.
The present priorities are not as they have always been (egg Chelmsford:Ethel) and that's led to a few near misses.
In these streets traffic can travel at excessive speed and I suspect some cars are making short-cuts to avoid Vincent, William and Fitzgerald streets, the 40kmph limit is welcome.
I envision that the pilot will result in slower, more constant speeds for traffic.
I trust that bicycles will continue to be encouraged, as part of the traffic that makes use of the roundabouts and not displaced to pavements."

##########
Engagement HQ Response 4
##########

I live on Alma Road and as a resident of this immediate area, I am on these roads travelling in all directions at different times of the days. I 100% support the mini-roundabouts pilot project. It is long overdue and will go a long way to improving safety in this area, not just for motorists, but also for cyclists and pedestrians - particularly the elderly and small children. I hope that this goes beyond the pilot stage and that the roundabouts become permanent. We really do need them. Thank you for the opportunity to comment, and thank you for supporting our local community.

##########
Engagement HQ Response 5
##########

Definitely better than speed humps. Hate going over those things on a bicycle. We get a bit worried about the additional travel time to and from work or coffee shops or community events. Your recent 40km/hr zone trial report on page 39 highlights that more respondents believe the speed reduction has made the community less liveable than more liveable. The city of Subiaco did substantial works of a similar nature everywhere 15 years ago. The place became a ghost town very quickly. We chose to live near the city was travel times so we could minimise travel time to spend more time with the family (and playing video games).
The commute times are really important to us and if they increase then we are unhappy.
With regard the mention of a 40km/hr zone. I read the report you released for doing the same thing nearby. It was painful.
The speed change in that 40km/hr zone was particularly ineffective at changing the vehicle speeds. They reduced by less than 1km/hr. This was supported by the survey in the report indicating way more people feel it is ok to speed now the speed limit is 40km/hr. In summary, everyone is still doing the same speed.
Failing to change the speed cars travel at makes the report bonkers because they are comparing when cars were going 50 km/hr to now when they are still going 50km/hr.
Despite cars still travelling the same speed, they are claiming the change in speed has improved safety which is impossible. All those conclusions regarding improved safety or changes to traffic profiles have to be a result of uncontrolled variables, placebo effect or cherry picked nonsense.
All those survey respondents who said they now feel safer definitely weren't safer. There is F-all difference between a car hitting you at 48km/hr or 49km/hr. Reaction distance changes are also imperceptible for such a speed change. They seem more effected by the belief they are safer than any actual improvement in their safety. Hence, the only logical way to guarantee improved safety stats and perceptions is to pretend we changed the speed limit. Send an all staff email and community facebook message telling everyone you'll change the speed limit on Monday. Then on Monday, call in sick and go to the beach. Never change the speed limit. No one will notice.
Everyone wins!

##########
Engagement HQ Response 6
##########

I disagree with the proposed mini roundabouts project.
By having stop signs at one face of the intersection, at least one party is required to stop and look. I think drivers tend to be more careless/reckless at roundabouts as they are lulled into a false sense of security - they may approach the roundabout 5 times with no other cars approaching. Then on the 6th time they are confident there won't be other cars but it's the one time there is."

##########
Engagement HQ Response 7
##########

Approve of the initiative

##########
Engagement HQ Response 8
##########

We support safety measures and think that the roundabouts will slow down cars which often travel too fast in the area.

##########
Engagement HQ Response 9
##########

Dangerous for pedestrians and cyclists. Stupid idea! The fact you have already started preparing the streets is disgraceful. Worst council in WA.

##########
Engagement HQ Response 10
##########

I am interested that this form of "traffic management" is being used in an Urban Road Safety Program. Generally roundabouts are used to improve the flow of vehicle traffic. In this case the proposal is put forward as a method of reducing "numerous low-grade traffic incidents". Nowhere in the mail out to residents is there any information on the actual data which underpins this project: which intersections were involved in crashes, when, what the actual incidents were, and who was involved, pedestrian, cyclist, motor vehicle driver?
The "look but fail to see" phenomenon which involves entering or exiting vehicle drivers crashing into cyclists who are already on the roundabout are the major cause of injury and mortality in these spaces.
More broadly there are numerous studies worldwide and in Australia to show that roundabouts are not safe places for other users, pedestrians and cyclists. Both Norfolk (part of the Perth Bike Network route) and Ethel Streets are used frequently by both commuting and everyday cyclists.
As an Urban Road Safety project it would be impressive to see something that included the needs of all these users, those on foot (or in wheelchairs/gophers), those cycling and those who drive motor vehicles. One way to improve safety for all would be to introduce Pedestrian Crossings at all the intersections in the "trial" area, East/West and North/ South preferably with raised platforms. This would not only provide much safer spaces for those on foot but act to slow vehicle drivers, particularly if a 30kph was introduced across the area. No need for roundabouts, mini or otherwise.
This trial of mini roundabouts only introduces more hazards for those walking and those cycling. I live in Vincent but not in this area, although I cycle along a number of these streets each week.

##########
Engagement HQ Response 11
##########

Whilst I understand the logic, it seems to create a more dangerous environment for pedestrians and cyclists, which is not inclusive, or in keeping with the area. As someone who lives on the other side of Fitzgerald Street, and walks often to Hyde Park, this proposal makes crossing each street far more dangerous than it currently is. It also seems as though it is not much of a deterrent for people speeding.

##########
Engagement HQ Response 12
##########

I live at 130A Raglan Road, close to Fitzgerald Street and am all for proposed Mini Roundabouts. This street is a 'rat run' for traffic from William to Fitzgerald streets and often hard to get out of my driveway safely. A roundabout at corner of Ethel Street would slow cars down. I also, agree with reducing speed limit to 40 km/hour for same reason.

##########
Engagement HQ Response 13
##########

There is not enough vehicle traffic to warrant introducing pedestrian inhibiting roundabouts

##########
Engagement HQ Response 14
##########

Understand the Council's motivation to participate in the trial, given it is funded by MRWA and presumably will be removed if not successful.
I have two concerns with the project:
1. The higher crash occurrences are due to higher traffic volumes in the area from rat running and through traffic, not design of intersections. In my opinion the roundabouts are quicker and easier for motorists to traverse than the current stop signs which require a complete stop. This could encourage even more rat running, as it is now easier to cut through, thereby increasing traffic volumes and likelihood of crashes. Ultimately this is counterproductive to the goals of the program and the focus should instead be on reducing rat running, through traffic and traffic volumes to reduce occurrences, or likelihood, of crashes.
2. Norfolk Street is a main cyclist route in the Perth bike network and popular pedestrian route to Hyde Park. The Monash study acknowledges roundabouts reduce safety of cyclists and pedestrians. Therefore, the project is not consistent with the City's Accessible City Strategy to encourage active transport, such as walking or cycling, and instead favours motorists.

##########
Engagement HQ Response 15
##########

Glad to see urban areas with poor street design being addressed. Concerned however, with the impact these roundabouts will have on rat running. Also concerned (as a pedestrian and cyclist) with having to give way to vehicles along Norfolk Street.

##########
Engagement HQ Response 16
##########

Mini Roundabouts could be positive if pedestrians are given priority over vehicles and cyclists are properly considered in the design. If not, they will make it harder for pedestrians and cyclists, and encourage more driving.
In my opinion, the City of Vincent should adopt a formal policy of only constructing roundabouts with either zebra crossings or pedestrian signals on all approaches."

##########
Engagement HQ Response 17
##########

I think the project is great but have concerns for the roundabout proposed on the corner of Ethel St and Raglan Rd.
Raglan Rd, between Fitzgerald St and Ethel St, is close proximity to the shops and the church and has a high volume of street parking which may create bottlenecks at the roundabout.
This would be similar to the situation at the corner of Fitzgerald St and Raglan Road where currently parked cars overrun the street and creates bottlenecks for traffic entering to/from Fitzgerald St."

##########
Engagement HQ Response 18
##########

What is the evidence of the crash data via Main Roads 2014-19? This is key info in determining if this project is worthwhile- i.e. evidence based approach. The letter says this is 'to assist in the reduction of fatal and serious injury crashes'. Later, the letter refers to low grade incidents: 'the numerous low-grade traffic incidents between 2014-19'. Were there fatal crashes, only low-grade ones, or no crashes? Why not show us the evidence to make up our own minds whether this project is worth it?
How much is the City paying GHD, on an annual basis, to find solutions to problems that may not exist (for all I can tell, they've provided no evidence)."

##########
Engagement HQ Response 19
##########

We are thrilled to hear about this project. We live on Norfolk Street and have witnessed vehicles and cyclists speeding down the hill towards Raglan Road. Some drivers beep their horns to warn other drivers they are moving through the intersection (Norfolk/Raglan). We have also seen police officers talking to drivers about not stopping at the stop signs on Raglan Road. We welcome the mini-roundabouts and the reduction in the speed limit. Suggestion: If possible, would like to see a suitable tree, low shrub, or a patch of green plants in the middle of the roundabout. (Visibility is important.) Cheers.

##########
Engagement HQ Response 20
##########

I'm unsure how this is really going to make a difference other than to encourage some to use these as an obstacle course (cars) and create confusion for pedestrians. Perhaps in other streets like on Vincent or William but not those proposed.

##########
Engagement HQ Response 21
##########

These roundabouts are desperately needed as we have noticed cars traveling extremely fast and above the speed limit on our street - grosvenor road.

##########
Engagement HQ Response 22
##########

The value of the project is not clear; what is the measurable improvement expected from this change?
The anticipated disruption during construction has not been articulated as part of the proposal.
The anticipated noise during construction has not been articulated.
In closing - it is more appropriate for the City of Vincent to utilize these resources to improve bicycle access. Through deployment of bike lanes, designated bike paths, etc. Further, I would prefer the City of Vincent utilize these resources for recycling opportunities. "

##########
Engagement HQ Response 23
##########

Whatever happened to stop signs? Find something better to do with the money. If it' ain't broken don't fix it

##########
Engagement HQ Response 24
##########

You got to be kidding????? Really that is what you spent our rates on?
Wasley Street is a no right turn street. So everybody comes into Forrest Street u turns to them get into Wasley Street. That is a much bigger problem then the one you are proposing to spend money on with this project. Plus it bloody dangerous to cross William Street to get to the bus stop. But yes according to your desk top study people need to sustain injury and possible death before considering safety for the crossing of William Street by the council. Honestly if you are bored and need to build mini round snouts please give consideration to roads with cars travelling at much higher speeds
Thank you. I hope I will not see mini round abouts before you fix William Street.

##########
Engagement HQ Response 25
##########

Seems a good idea if will reduce traffic incidents in the area, streetscape should be disturbed as little as possible

##########
Engagement HQ Response 26
##########

Very disappointed to see once again that the streets such as Elma which are constantly being used as speeding rat runs are ignored for traffic mitigation strategies. It makes me wonder exactly what we have to do (or live near) for the council to stop ignoring this very real problem some of us deal with every day.

##########
Engagement HQ Response 27
##########

Great idea!

##########
Engagement HQ Response 28
##########

Love it. You should introduce more in the neighbourhood, like at Lincoln and Stirling intersection.

##########
Engagement HQ Response 29
##########
I think it will make the streets less attractive and they are unnecessary- these roads aren't busy enough to need roundabouts- waste of money and time

##########
Engagement HQ Response 30
##########

< no comments recorded>

##########
Engagement HQ Response 31
##########

Good idea. There are blind spots due to cars parking on road. Coming from a stop sign you have to creep out very carefully as people do about 70km/hour down Grosvenor to get to William Street. Dodging traffic on Vincent Street.
This whole area everyone speeds. Even the 40 zone on Vincent next to Hyde Park, by the time people are going down the hill and passed the speed bumps they are doing 70 in a 40. I cross the street every day to get to Hyde Park. Only a matter of time before someone dies here. Never seen a cop or speed camera once in this area"

##########
Engagement HQ Response 32
##########

I am in favour of installation of these 9 mini roundabouts for safety reasons, provided they are in proportion to the width of all intersecting roads.
For the roundabout itself could it please be either:
1. Paved with red brick pavers or 'faux' scored red brick pavers, which is in keeping with the neighbourhood. Please do not use any light/reflective surfaces for the roundabout itself which will dramatically increase glare for motorists, cyclists and pedestrians alike.
OR
2. If any vegetation is planned for the centre of these mini roundabouts, could it please only be a water wise ground cover, no higher than 30 cm? If taller vegetation is being considered, this could become a visual traffic hazard down the track.
It would be fantastic if the speed limit could also be reduced to 40 kmh throughout the pilot program zone, thank you.

##########
Engagement HQ Response 33
##########

I concur with the mini-roundabouts on Hyde and Ethel St, however, I don't agree on Norfolk. Norfolk has enough delineation as a more major road. If anything is required in Norfolk, some line marking.
I have witnessed interaction between bikes and cars on Hyde and Ethel, as it is quite stop start. As a cyclist on Norfolk, I feel much safer, as it is much clearer who has right of way, and there is less start stop.
I would be reluctant to see the priority of Norfolk Street changed."

##########
Engagement HQ Response 34
##########

It seems that City of Vincent is embarking on traffic management solutions in an ad hoc manner without a clear and holistic traffic plan for North Perth and how to manage the flow of cars but also, crucially, providing for the safety of pedestrians and cyclists. The mini roundabouts pilot project is another example of a project that is looking at one part of the issue only instead of the overall issue of increasing cars travelling at speed throughout North Perth. Suggest a traffic study is conducted for the area bounded by Charles St, Vincent St, William St and Angove St/Burt St. The recent and planned modifications to stop all right turning traffic out of Chelmsford, Grosvenor, Raglan and View streets mean that it's not possible to turn right onto Fitzgerald St between Angove Stand Bulwer St- forcing more cars to travel on the local roads to get to a post where they can turn right. Suggest considering traffic lights at Alma St or Raglan to provide for safe turning of cars and cyclists onto Fitzgerald and a dedicated crossing point for pedestrians. Also suggest funnelling traffic down Charles St and narrowing Fitzgerald St, similar to Scarborough beach road in Mt Hawthorn.

##########
Engagement HQ Response 35
##########

I live on a corner of a Chelmsford Road & Ethel Street, North Perth. The speed of some vehicles has increased noticeably along Ethel Street since the 'Give way' signs were removed and placed in Chelmsford Road. I doubt very much that the mini roundabouts will make the really fast drivers slow down. Although they are in the minority, and most drivers are ok, I think it might be more of an incentive to slow down (and it would cost less) if the word "Slow" was painted on the road surfaces approaching the crossroads at Ethel Street.
I dislike the heavily-painted road markings associated with mini roundabouts too! No roundabouts please."

##########
Engagement HQ Response 36
##########

Seems like a good idea to me. Roundabouts are better than stop signs

##########
Engagement HQ Response 37
##########

Sounds like a good idea. I do find the inconsistency of stop signs running in perpendicular directions around here a little confusing.

##########
Engagement HQ Response 38
##########

It's good that Main Roads is considering innovative, low cost initiatives to reduce crashes. However the reasoning put forward by Main Roads to support its pilot project in North Perth appears to focus only on the outcomes for driving. It does not sufficiently consider the outcomes for people walking and cycling. A Monash University study into mini roundabouts in Melbourne found there were limitations of their use and question marks on the benefits for those walking and cycling. See below (and attached):
2.2 Mini-roundabouts: Limitations
For all their benefits, mini-roundabouts share the same disadvantages as traditional roundabouts. The primary concern is for vulnerable road users – pedestrians and cyclists. There are conflicting results on the impact of mini-roundabout on cyclist crashes (Austroads 2013). Mini-roundabouts should not be placed at intersections with known large pedestrian volumes, while cyclists are considered "just as vulnerable" on roundabouts as any other cross- road system (Bode and Maunsell 2006).
7. Conclusion
.....In particular, mini-roundabouts may not be appropriate in areas with high cyclist movements on local roads. ""
Given that Norfolk Street is slated to become a Safe Active Street it would be unwise to install mini roundabouts along this street. If both the Safe Active Street and the roundabouts were to go ahead, it would make it difficult to meaningfully assess the impact of each intervention.
The roundabout pilot will likely promote slower traffic speeds but it will not reduce traffic volumes and rat running (identified as problems in this area of North Perth.)
There are other innovative, low cost options - such as the Low Traffic Neighbourhood approach or filtering on residential streets - that the city could implement that would reduce speeding, cut out rat running and make the streets much nicer for walking, for bike riding and for living.

##########
Engagement HQ Response 39
##########

In my experience roundabouts are generally more dangerous than junctions for cyclists as motorists are less likely to slow appropriately.

##########
Engagement HQ Response 40
##########

They are all MOST WELCOME. I have had problems at the intersection of Raglan and Norfolk (speed, sightlines and camber/divots within the intersection) and at Norfolk/Grosvenor where stop signs are ignored, especially. The speed limit of 40kmh is sensible and very much needed where speed (especially Raglan, btwn William and Norfolk) is an issue. Evasion of roads with speed humps, or heavy parking, results in more traffic/speed in the others. The presence of home-businesses adds to spikes in daytime parking which in consequence add to the frustration of through-drivers and damage to wing-mirrors on parked cars.
The speed reduction is very welcome."

##########
Engagement HQ Response 41
##########

We live on Ethel Street and support the pilot project

##########
Engagement HQ Response 42
##########

I am opposed to this pilot project as it does not advance the Accessible City Strategy's commitment that 'In upgrading and/or making changes to [Vincent's] roads, pedestrian infrastructure will be the first focus'.

Rather than making pedestrian infrastructure the first focus, the proposed roundabouts put pedestrians last. The roundabouts will have the legal effect of removing the priority currently given pedestrians at these intersections, and instead requiring pedestrians to give way to all vehicles in all directions. The City has noted that the proposal will only reduce the speed of car vs pedestrian collisions, rather than lessening their likelihood.

The proposed roundabouts incorporate a low 'mountable' central island in order to allow long vehicles to pass. The island will thus not present an obstacle to large 4WDs and utes which are now quite common in the City. Drivers of such 4WDs and utes are likely to abuse this and pass straight across the roundabout without slowing down. At the same time, narrower cars and motorbikes would be able to 'straight line' through the roundabout at speed without touching the island. These two issues create a considerable risk to pedestrians who would expect all vehicles to slow down as they approach.

Roundabouts are over-represented in cyclist injury crashes. As such, they are acknowledged by Main Roads as being inappropriate for high-cycling areas. It is therefore concerning that roundabouts are proposed for the City's own planned cycling routes along Ethel Street, Raglan Road, and Norfolk Street.

If the City is intent on proceeding with this proposal, it should incorporate zebra crossings across all legs of all the proposed roundabouts. Contrary to the City's assertions, zebra crossings are feasible at mini-roundabouts and implementations do exist with minimal signage 'clutter'. On example exists in Fremantle at the intersection of Queen Street and Adelaide Street, and the attachment shows another example where zebra crossings fit in despite the small size of the central island. Such a treatment would show that the City is considering pedestrians in its road projects and would further the Accessible City Strategy's aim to put pedestrian infrastructure first.

Thank you for the opportunity to comment on the proposal."

##########
Engagement HQ Response 43
##########

I support the Mini Roundabouts Project provided:
1. There is no reduction in street parking
2. Signage and other visual impact to the street scape is minimal
I also support reducing the speed limit to 40km/hr."

##########
Engagement HQ Response 44
##########

1. fatal and serious injury crashes on local roads"" are not there same as numerous low grade traffic incidents between 2014 -2019.
2. If ""numerous low grade traffic incidents between 2014 -2019"" are to be cited and used in support of this project it appears to be necessary to (a) define what an incident is because accident and incident are not synonymous (b) quantify the number that constitutes ""numerous"" (c) identify the source of these statistics (d) the area in which the incidents occurred. In short the project should be supported by evidence based logic not assertion coupled to use of the area as a test site.
3. It is noted the ""mini roundabouts"" pilot is based on research Monash University using crash data -accident not incident- without identifying location or providing any material suggesting similarity between the research sites and inner city Vincent streets.
4. That the project is fully funded by the Road Safety Commission should, in itself, NOT persuade Vincent to participate.
4. Possible reduction in speed limit to 40kmh. It is noted that Main Roads it would consider during the pilot program reducing the speed limit to 40kmh. While this may be supported by some councillors and staff as personal views the GHD report did NOT provide statistical evidence to support the proposition that a 40kph speed limit results in less accidents.
5. Vincent should be guided by the feedback provided by consultation. It should not mindlessly accept Main Roads money and accept it is providing value to all residents at the cost of those in the pilot program area.
6. A reality check for Vincent should be ""would be running this pilot scheme if we had to pay for it?""

##########
Engagement HQ Response 45
##########

I don't support this Project as installing mini roundabouts on local roads is only about improving car movement, particularly higher speed through a roundabout, and not having to stop, give way or be aware of other more vulnerable users of the street. The safety and security of movement for pedestrians and cyclists will be severely compromised where they have to negotiate movement across the street intersection where there is a mini roundabout. The car has priority in the Program and the pedestrian/cyclist is downgraded - please do not implement this Main Roads program in our traditional neighbourhood streets and, instead, consider other safety measures such as reducing the street curb radii (about reducing car speed and raising awareness of others in the street), adding more street trees and improving upon the quality of footpath surfaces.

##########
Engagement HQ Response 46
##########

I support initiatives to reduce traffic speeds in this area, however I am a bit concerned about comments I have seen from cycling groups saying that these pose a danger to cyclists because of forcing traffic into a narrower stream.
I am not sure a roundabout is required at every intersection in order to achieve traffic calming. One every two blocks should be sufficient to induce motorists to slow down, while posing less of a nuisance to cyclists. I would suggest roundabouts at the following four intersections: Grosvenor & Ethel, Grosvenor & Hyde, Raglan & Norfolk, Chelmsford & Norfolk. Four roundabouts would cost less than nine, which might allow more to be spent on each one, for example making them larger with a planting in the centre, similar to the existing roundabout at the intersection of Norfolk and Forrest streets."

##########
Engagement HQ Response 47
##########

Not a good idea at all.
I STRONGLY suggest a roundabout be at cnr Auckland and Haynes Street, North Perth.
A very, VERY dangerous cross road.
Thank you."

##########
Engagement HQ Response 48
##########

I do not support this as it only addresses car safety and does nothing to improve pedestrian or cyclist safety, it is inconsistent with the future plan to make Norfolk Street a Safe, Active Street and it will increase the travelling speed of cars as their movement through intersections is made easier, to the detriment of all other road and footpath users. The indicative image shows NO pedestrian crossings marked. Also NO provision for landscaping. I am also annoyed that the crash data has not been provided. I walk and cycle through this area frequently.

##########
Engagement HQ Response 49
##########

I use the streets probably five times a week either riding walking by myself or with my young daughter.
There has been no evidence provided as to why roundabouts are needed here. My own research indicates that the number of crashes at the nine intersections is very low with approximately 5 over the past 5 years. That is, 1 per year - or roughly 0.1 crashes per intersection per year.
Streets in the project area have high levels of pedestrian and bike rider usage. For example Norfolk Street is a key route for local residents and visitors to access Hyde Park, and Norfolk Street is similarly a local bike route and therefore has a high number of bike riders. Active transport users include older people, and young people walking or riding to the primary and secondary schools in the City. These members of the community are the most vulnerable road users and every effort should be made to ensure their safety.
This proposal increases their risk of physical harm when using the streets.
Pedestrians have no right of way at a roundabout, and will have to give way to vehicles. Recognising the safety issue to pedestrians, the RACWA recommends that pedestrians do not cross a street at a roundabout.
In relation to bike riders, there is documented evidence and research that demonstrates that roundabouts to high rates of injury to bike rider through collisions with vehicles.
The very purpose of roundabouts is to facilitate the continuous movement of vehicles. As such this proposal will have the effect of increasing the overall speed of vehicles in the project area. By making the streets easier to use, it will also likely increase the volume of vehicles using the streets in the project area.
The proposal is in conflict with the City's own transport strategy which places the needs and safety of active transport users at the top of the road transport hierarchy. It is also at odds with the safe active street proposed in this area. Roundabouts are actively discouraged on SAS due to the danger they pose for bike riders and pedestrians.
The Austroads report, "Bicycle safety at roundabouts" is relevant.
https://austroads.com.au/latest-news/better-understanding-bicycle-safety-at-roundabouts
This report highlights the vital importance of making sure that vehicles enter a roundabout at a slow speed 20-30kph. They recommend traffic calming measures before the intersection to slow down drivers - speed humps or plateaus. (Page 148, section 4).
The North Perth will not achieve slow speeds, and in fact, the type of roundabout being proposed will make it easier to travel through the intersection at high speed as there is little horizontal displacement for drivers to negotiate and navigate. This will particularly be the case for larger vehicles - which are of course more dangerous and potentially deadly to vulnerable road users.
I urge the city to drop this proposal. The danger that it will pose to active transport users is too high and may in fact result in serious injury or the death of vulnerable road users.
In the unfortunate instance that the proposal goes ahead - at a minimum the speed limit should immediately be lowered to 30 kph in the area. There also needs to be traffic calming measures introduced so that drivers travel at the posted speed limit. At a minimum, this should include raised plateaus across all legs of the intersections, and for zebra crossings to be painted on these plateaus so that pedestrians are given priority over vehicles at the intersection."

##########
Engagement HQ Response 50
##########

It does not make sense to pick an area that is proposed to become a Safe Active Street, assuming that the SAS treatment will happen next financial year - it is not a valid trial if the two happen at the same time.
It does not make sense to pick an area with low accident statistics - only 5 at intersections in the 2015-2019 period. Even the 2016-2020 statistics show that 6 of the 7 intersection accidents are on Norfolk Street, which is due to become a SAS.
Are you saying that mini roundabouts are an acceptable treatment on a SAS?
I think you should have chosen a better area to do the test."

##########
Engagement HQ Response 51
##########

I don't feel that these areas require mini roundabouts. It would be worthwhile if the council provided the number of low grade traffic incident so that it would provide and inform anyone commenting on this proposal with an informed view.
The city has steadily over the last 10-15 years placed many speed humps and reduced the ability to turn left or right from some of the surrounding streets bound by Fitzgerald and William street. This may discourage other road users who do not live in the suburb but it frustrates some local's in particular excessive number of speed humps.
What is the requirement to spend more taxpayer money on these mini roundabouts and what will be the benefits from this exercise. It appears to be a much targeted response for a small number of suburban streets. These mini roundabouts for these locations will achieve very little as the traffic in these streets is low. I sincerely hope the council reconsiders this proposal and not pursue this project.

##########
Engagement HQ Response 52
##########

Community needs to be properly consulted. All positive and negative impacts need to be clearly communicated. Along with case examples where this has been implemented before.

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Understanding safety and driver behaviour impacts of mini-roundabouts on local roads

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Abstract

The City of Monash historically had many local four-way intersections controlled by 'Stop' and 'Give Way' signs. Since 2004, 43 of these intersections have been replaced by 'mini-roundabouts', small, fully mountable roundabouts. This study uses a variety of methods to analyse the impact of mini-roundabouts on road safety and driver behaviour. It does this through analysing crash records three years before and after 40 mini-roundabouts were installed. It also incorporates a case study of two adjacent mini-roundabouts installed in 2016. Observations of driver behaviour were recorded and a questionnaire survey was also conducted to assess community acceptance. Significant road safety benefits were recorded. Crashes reduced 78.9% with serious crashes reducing from 6 to 0. Fewer vehicles exceeded the speed limit after the introduction of new mini-roundabouts, and more motorists complied to giving way than in the traditional give-way system. Surveys suggested the number of conflict and avoidance manoeuvres declined as well. The lower speed and nature of mini-roundabouts meant that crashes, if they were to occur, would be 'safer'. The improvements were also supported by residents of area, with respondents feeling safer driving and walking at the intersection than before. In the context of improved driver behaviour and safety, mini-roundabouts have changed the landscape of local roads in the City of Monash.

1. Introduction

Roundabouts have long been recognised as a safe and efficient form of traffic control as they reduce conflict points, increase the visibility of the intersection and provide greater clarity of traffic priority (Austroads 2013). Historically, local four-way intersections in the City of Monash, Victoria, Australia employed give way signs and stop signs to assign priority. However, the number of crashes occurring in these local streets continued to be a concerning issue. Traditional roundabouts were not an option at many of these intersections as they carried high volumes of heavy vehicles.

As a response, beginning in 2004 the council progressively installed over 40 'mini-roundabouts'. Mini-roundabouts are small, flushed or raised (up to 6mm) fully mountable roundabouts that can be traversed by larger vehicles. Their use in Australasia is still relatively new and it may be questioned whether a mini-roundabout can provide the same safety benefits of a traditional roundabout.

The aim of this paper is to assess the impacts of mini-roundabouts on driver behaviour and road safety on local roads in the City of Monash. There are two major components of the study. A crash analysis was conducted for all mini-roundabout locations in the City of Monash to assess the overall road safety impacts. This was followed by a case study examining the impacts of installing two adjacent mini-roundabouts in 2016. The case study assessed the potential change in vehicle volumes, speeds, driver behaviour and also community attitudes.

The next section reviews the existing literature on mini-roundabouts and describes the case study area. We then outline the methodology used in the crash analysis and before-and-after case study. The results of these studies demonstrate the road safety benefits and the driver behaviour changes associated with implementing mini-roundabouts. We then discuss the findings in the context of past literature.

2. Literature Review

While roundabouts and other circular junctions have been incorporated even in Gregorian architecture as early as the 18th century such as the Circus in Bath, U.K. (visitBath.co.uk 2016), mini-roundabouts did not appear until 1969 (Peterborough Telegraph 2008). They employ either a flush or raised (up to 6mm) central domed island (Austroads 2013). The central island is typically 1m-4m in diameter, and can either be painted or consist of a traversable pad allowing for larger vehicles such as buses or trucks to drive over (see Figure 1). It is sometimes referred to as a 'humpabout'.

The cost of retrofitting an existing intersection with a mini-roundabout is far lower than a traditional roundabout due to its reduced footprint (Austroads 2015). It is particularly suited to physically constrained locations (Rice 2010).

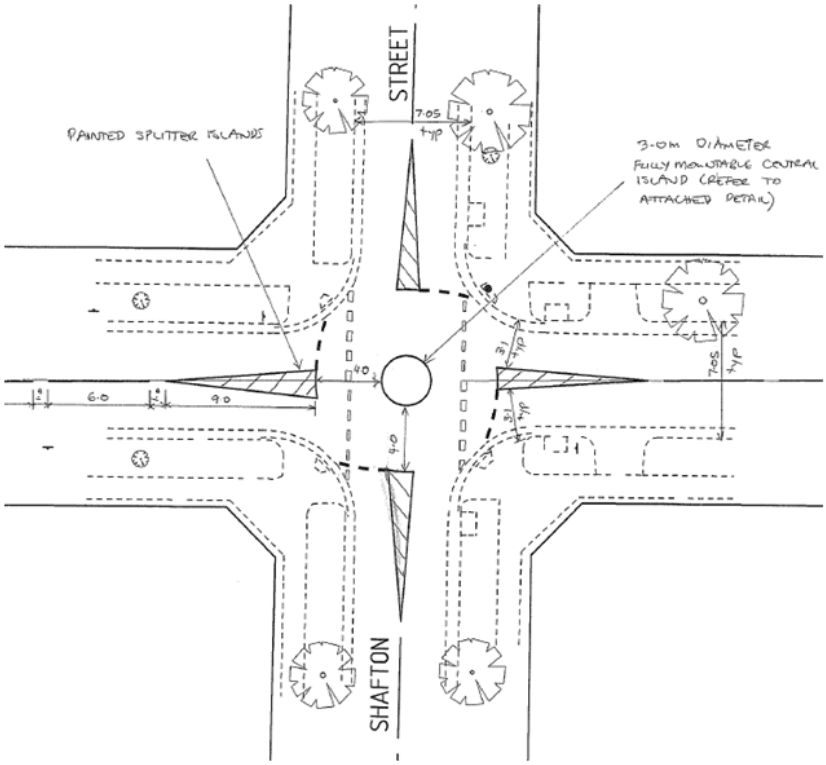


Figure 1 Plan drawing of mini-roundabout (Source: Tillotson 2015)

2.1. Existing Studies: Safety Benefits

Research has been previously conducted on the safety benefits of mini roundabouts and found that the severity and number of crashes is lower compared to those at signalised intersections. The conversion of 13 unsignalised intersections to mini-roundabouts in Germany found a 29% reduction in crash rate (Brilon 2011).

In the Australian context, a study in South Australia found a 62% drop in 85th percentile speeds through intersections with mini-roundabouts (Zito and Taylor 1996). Mini-roundabouts help reduce vehicle approach speeds. This, combined with lower impact angles due to the nature of mini-roundabouts, lead to lower impact energies in the event of a crash – leading to "safer" crashes if they do occur (Candappa 2015). Overall it appears that mini roundabouts reduce injury crashes by an average of 30% (Austroads 2013).

Less is known about *how* mini-roundabouts result in road safety improvement. As a traffic calming device, it is interesting that an object that requires little to no physical deviation can have such a significant impact on road safety. This is likely due, in part, to the sharing of responsibility at a roundabout compared to a give-way intersection.

At an intersection with a give-way system the motorists assuming right of way maintains their travel speed, providing less lime to react to unexpected situations (such as another motorist failing to give way), (Summala and Rasanen 2000). In contrast, motorists at the minor intersection must process dynamic and static objects in both directions in the perpendicular road. Focusing on "too many objects" can lead to inattentiveness (Miller 2015), while trying to analyse so many dynamic events lead to poorer decisions and longer decision-making times (Dalton and Fraenkel 2012).

When compared to the give-way system, a roundabout requires drivers to share responsibilities, allowing for better and safer decision-making at intersections. This is mostly because motorists from all four directions must give way to traffic coming from one direction only, allowing for drivers to make decisions based on a smaller field of view (Dalton and Fraenkel 2012).

Although most of these studies analysed regular roundabouts, the Federal Highway Administration in the United States (Rice 2010) suggests that these benefits also occur for mini-roundabouts.

2.2. Mini-roundabouts: Limitations

For all their benefits, mini-roundabouts share the same disadvantages as traditional roundabouts. The primary concern is for vulnerable road users – pedestrians and cyclists. There are conflicting results on the impact of mini-roundabout on cyclist crashes (Austroads 2013). Mini-roundabouts should not be placed at intersections with known large pedestrian volumes, while cyclists are considered "just as vulnerable" on roundabouts as any other cross-road system (Bode and Maunsell 2006). The same study also argues the case that mini-roundabouts have no effect on drunk and reckless drivers because of a lack of a physical barrier. However, these problems are no different than other intersection treatments, notably the Give Way and All-Way Stop systems (Waddell and Albertson 2005).

3. City of Monash Mini-Roundabouts

The City of Monash's experiment with mini-roundabouts began in 2004 with Shafton Street, a road with direct access to a major arterial (Princes Highway) which has eleven intersections (see Figure 2). The road used to operate with the Give-Way system. There were complaints about speeding traffic and vehicles failing to give way, and since all the priority was given to Shafton Street, it is likely that vehicles approaching from minor roads faced delays.

Figure 2 Mini-roundabout locations in the City of Monash

Since implementing mini-roundabouts on Shafton Street, the reduction in crashes was significant – dropping from 14 crashes in 10 years prior to construction to 2 crashes 8-9 years after construction. It encouraged the City of Monash to further implement them across the council. The most recent installation, on Connam Avenue, was completed in 2016.

4. Methodology

This project was conducted as part of a final-year undergraduate research project. It is made up of two components:

- Analysis of crash records for all mini-roundabouts installed between 2004 and 2014
- A 'before and after' assessment of two case study mini-roundabouts installed in 2016

4.1. Crash Records Analysis

All crashes at mini-roundabouts install in the City of Monash between 2004 and 2014 were identified and analysed (40 roundabouts). The analysis focussed on crashes occurring within 3 years before and after installing a roundabout.

Two main data sources were used:

- CrashStats data extract, to identify all crashes since 2006.
  - The database included over 150,000 crashes and contained information such as accident details, people and/or vehicle(s) involved, weather and road conditions etc.
- PDF Extracts of Road Crash Statistics, to identify crashes before 2006.
  - The information provided for each crash involved time, location, traffic control, atmospheric conditions and details of injuries amongst other records.

An initial total of 101 crashes occurred near a mini-roundabout in the City of Monash. Of these, 23 occurred within 3 years before or after the installation of a mini-roundabout. Using the database information, the type of each crash was established using the DCA (Definitions for Classifying Accidents) code. The crash severity was also noted.

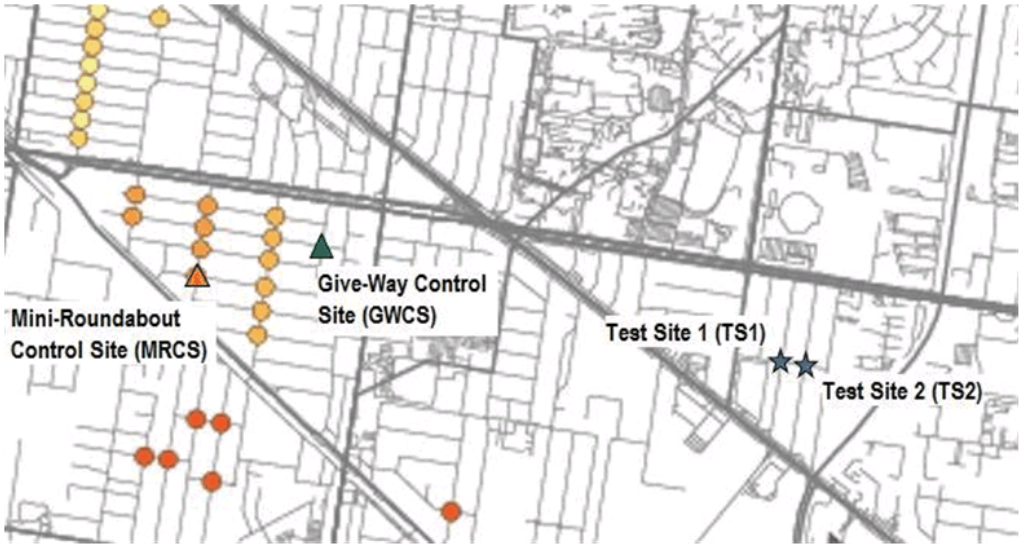
4.2. Before and After Case Study

An in-depth analysis was conducted at a case study location where two mini-roundabouts were installed in 2016 along Connam Avenue (see Figure 3). Mini-roundabouts were installed in adjacent intersections in August of 2016.

Two control sites were also selected for comparison: one that was controlled by a mini-roundabout installed in 2008 and one that was controlled by 'give way' signs. These sites were selected for their similar traffic volumes, geometric characteristics and proximity to the test sites.

To summarise, the four sites were:

- Test Site 1 (TS1): Connam Avenue and Cambro Rd intersection
- Test Site 2 (TS2): Connam Avenue and Renver Rd intersection
- Give-Way Control Site (GWCS): Banksia Street x Manton Road
- Mini-Roundabout Control Site (MRCS): Colin Rd x Margaret St



Note: Circles represent mini-roundabouts installed before 2016

Figure 3 Case study test and control sites

The impacts of the new mini-roundabouts were studied from several perspectives. Three key tasks were accomplished for this component of the study.

4.2.1. Volume and Speed Surveys

The City of Monash Council provided tube count surveys of vehicle volumes and speeds adjacent to the test sites before and after installation of the mini-roundabouts in 2016.

4.2.2. Driver Behaviour Field Surveys

Driver behaviour was observed using field surveys conducted in the May-July and September-October periods of 2016. Most surveys were conducted for 30 minutes each, some more and some less depending on the traffic volume and judgement on the surveyor's part regarding data adequacy (see Appendix).

The results presented in this paper focus on motorist behaviour. Initially, pedestrian and cyclists behaviour was also going to be observed but an insufficient number of pedestrians and cyclists were observed during the surveys. The following information was recorded for each vehicle that approached the intersection:

- Give Way (GW): A vehicle was classified as giving way if they slowed down or came to a full stop when approaching an intersection.
- Assumed Right of Way (ROW): A vehicle was classified as assuming ROW if they failed to slow down while approaching an intersection, regardless of the presence or absence of other dynamic objects on the street
- Encroachment: This is used to observe physical compliance to a mini-roundabout. A light vehicle was classified as 'encroaching' if the vehicle tyres crossed over the painted area of the mini-roundabout. It was classified as 'complying' if it fully deviated around the mini-roundabout. Larger light vehicles (e.g. anything larger than a family SUV) were classified as 'complying' if they clearly deviated in the lane. Note that heavy vehicles (buses, trucks) were always classified as 'complying' as mini-roundabouts are designed to be mountable for these vehicles.

- Avoidance manoeuvre: Avoidance has been defined as any gentle unintended/unnecessary turning manoeuvre or slowing down due to the presence of others.
- Conflict: Conflict has been defined as rapid deceleration or sudden change in direction or both due to the presence of others.

4.2.3. Residential Questionnaire

Further to the observations made in traffic count surveys, residential surveys were carried out following the construction of the mini-roundabouts on Connam Avenue. The aim of the survey was to judge community opinion and acceptance of the mini-roundabouts.

Pedestrians and residents of households adjacent to the test sites were approached and asked to participate. They could fill out their own survey or answer as the questions were read out. The survey was kept deliberately short (9 questions).

5. Results and Analysis

5.1. Crash Records Results

In total, 19 crashes occurred three years before the installation of any of the 40 mini-roundabouts within the City of Monash; within three years after installation this dropped to 4 crashed (78.9% reduction).

Table 1 provides a breakdown of the types of crashes occurring before and after a mini-roundabout was installed. The most common crash type before installation was 'cross traffic' and 'right far'; both of these can result in fairly severe crashes due to the angle of incidence. These crash types virtually disappeared post-implementation with only 1 cross-traffic crash recorded.

Table 1 Crash types before and after mini-roundabouts installed

DCA Code	Crash Type	Before	After
		Frequency	
107	Driveway	0	1
110	Cross Traffic	15	1
111	Right Far	2	0
120	Head on (Not overtaking)	1	0
160	Parked	1	0
173	Right off carriageway into object – parked vehicle	0	1
199	No information available	0	1

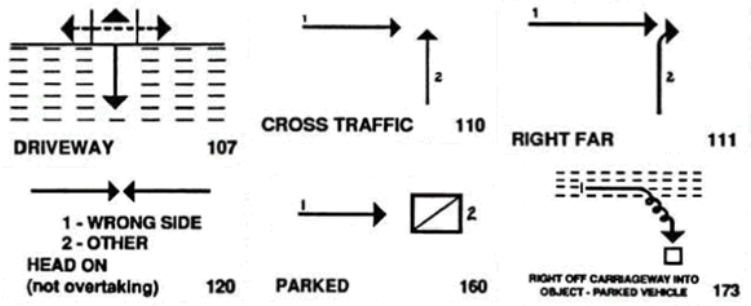


Figure 4 Relevant DCA crash diagrams (Source: VicRoads)

Echoing these findings, the severity of crashes reduced significantly. No fatal crashes were recorded, but 6 serious crashes occurred within 3 years before installation whereas no serious crashes have occurred within 3 years of implementing a mini-roundabout. 'Other' injury crashes reduced 69.2% from 13 to 4.

Table 2 Crash severity before and after mini-roundabouts installed

Severity	Before	After	Difference
	Frequency		
Serious	6	0	100%
Other	13	4	69.2%

5.2. Before and After Case Study Results

The CrashStats analysis suggests that the mini-roundabouts have significantly reduced cross-traffic crashes. This section examines the influence of mini-roundabouts on driver behaviour which may be contributing to these results.

5.2.1. Volume and Speed Surveys

The tube count data provided by the City of Monash helped determined average vehicle approach speeds at the intersection and how many heavy vehicles approached the intersection at the time of recording.

The tube counts were analysed to see changes in speed (if any) brought by the mini-roundabout (see Table 3). The volume of vehicles dropped slightly but the 85th percentile speeds and average speeds did not reduce significantly. However the proportion of speeding vehicles saw a significant drop from 5.4% to 3.4%.

Table 3 Vehicle volume and speed on Connam Avenue (weekday data)

	Connam Avenue	
	Before (May 2016)	After (October 2016)
85th Percentile Speed	44 km/h	43 km/h
Average Speed	39.3 km/h	38.5 km/h
Vehicles > speed limit	5.4 %	3.4 %
Vehicles > limit by 10 km/h	0.80 %	0.28 %
Average Weekday Volume	890 veh	800 veh
Volume% = Heavy Vehicles	13.48 %	17.24 %

Note: Speed limit is 50kph

5.2.2. Driver Behaviour Field Surveys

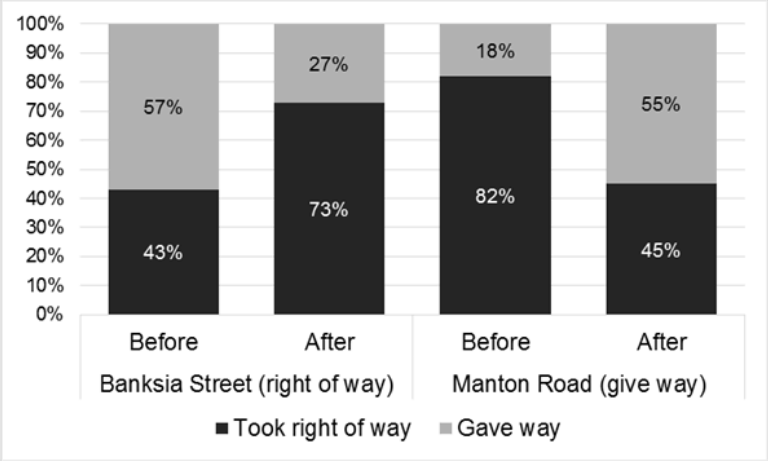
Driver behaviour was examined for the two Test Sites (Connam Avenue) and the two Control Sites (Give-Way Control Site and Mini-Roundabout Control Site). Analysis will include:

- Give-way (GW) versus right of way (ROW) behaviour
- Vehicle encroachment on the mini-roundabouts
- Avoidance and conflict behaviour

5.2.3. Control Sites Give Way Behaviour

Banksia Street was the designated major road at the GWCS, and vehicles on this road have the Right of Way according to the Give Way system. Motorists from Manton Road are supposed to Give Way according to the system in place. The data collected for these streets are presented in *Note: No change in road configuration took place 'before' and 'after' at this control site*

Figure 5 below.

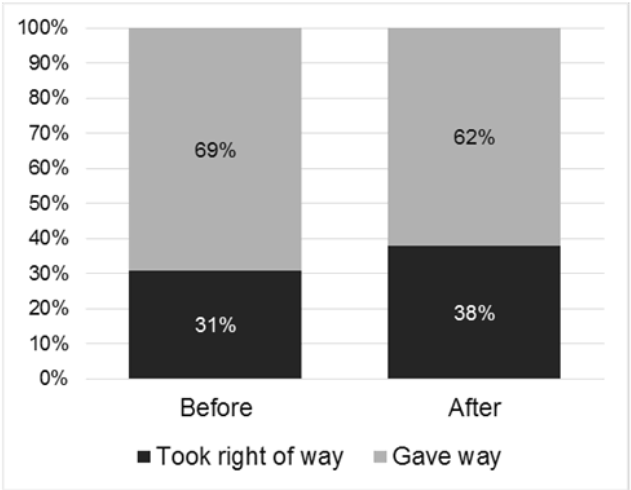


Note: No change in road configuration took place 'before' and 'after' at this control site

Figure 5 Give Way Control Site (GWGS) change in give-way behaviour

The ambiguity at Give Way signs discussed earlier in the literature review is clearly present in the data. Although drivers on Banksia Street have right of way, between 27% and 57% of drivers gave way. Even more interesting is that between 45% and 82% of drivers on the minor road (Manton Road) showed no signs of giving way. Also, surveys on different days tended to yield different results, with no apparent logical explanation.

The mini-roundabout at the Colin Road and Margaret Street intersection yielded better driver behaviour when compared to the Give-Way Control Site, as presented in Figure 6 below. The graph includes motorists approaching from both directions. Over 60% of motorists gave way at this site, far higher than at the GWCS.



Note: No change in road configuration took place 'before' and 'after' at this control site

Figure 6 Mini Roundabout Control Site (MRCS) change in give-way behaviour

5.2.4. Test Sites Give Way Behaviour

Connam Avenue was initially the major road prior to the construction of the mini-roundabout and runs through both test sites. Figure 7 shows that before the mini-roundabouts were installed, the majority of motorists took right of way (73% to 87%). After the installation, the majority of motorists gave way – even to a greater degree than the Mini Roundabout Control Site (Figure 6).

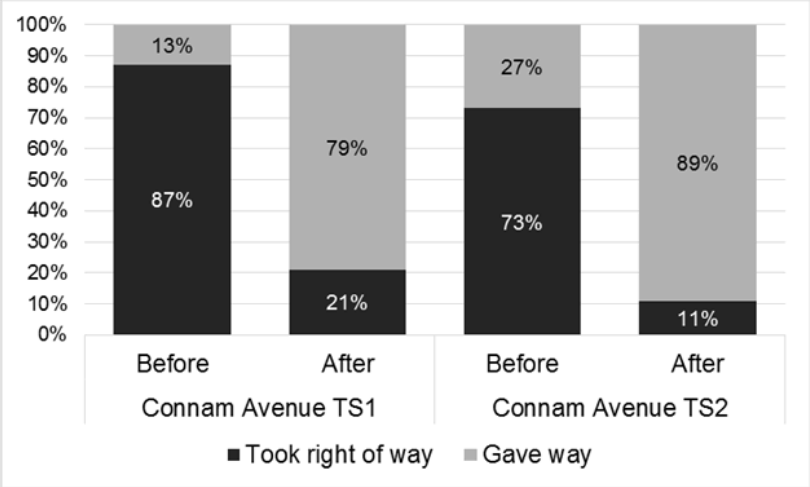


Figure 7 Connam Avenue Test Site change in give-way behaviour

Similarly, motorist behaviour at the minor approaches to the test sites also improved. Figure 8 shows that before the mini-roundabouts, 27% to 39% of motorists did not slow to give way; this dropped to 0%.

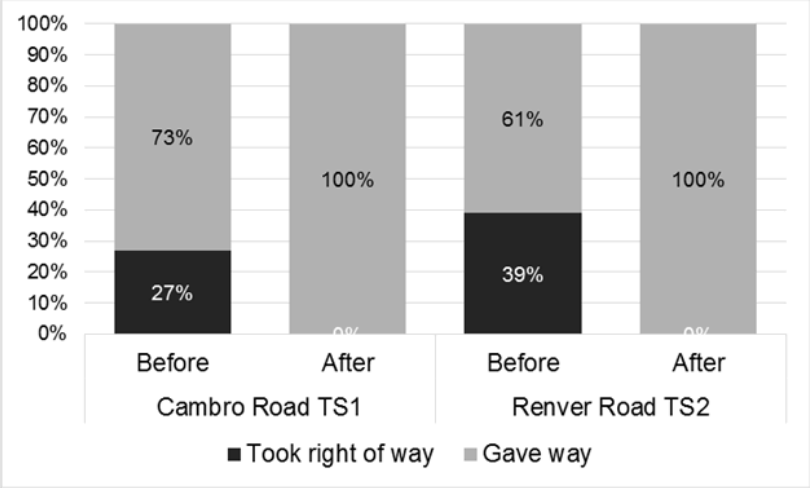


Figure 8 Minor Approach Test Site change in give-way behaviour

The figures can be used to observe how mini-roundabouts better enforce drivers to share responsibilities, as shown by the increasing number of vehicles giving way.

5.2.5. Encroachment, Avoidance and Conflict Behaviour

Driver encroachment was compared between the MRCS and the Test Sites (Figure 9). In the control site (which was installed in 2008), the majority of drivers at least partially encroached on the mini-roundabout (61%). In contrast, the majority of drivers at the test site complied and did not drive over the new mini-roundabouts.

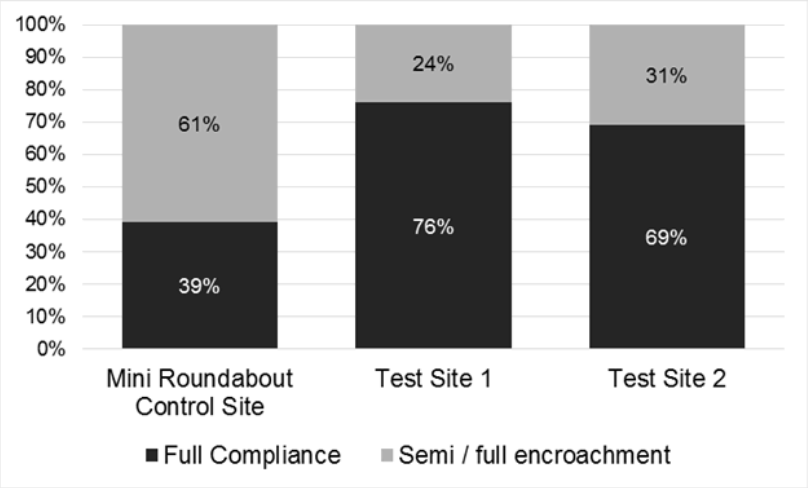


Figure 9 Driver encroachment over mini-roundabouts

Avoidance and conflict manoeuvres were recorded at all sites as defined earlier, and is presented in Table 4.

Table 4 Avoidance or Conflict manoeuvres before and after mini-roundabout construction

	Before				After			
Site	**Vehicles**	**Avoidance Manoeuvres**	**Conflicts Observed**	**Combined (%)**	**Vehicles**	**Avoidance Manoeuvres**	**Conflicts Observed**	**Combined (%)**
GWCS	80	1	1	2.50	98	0	1	1.02
MRCS	89	2	0	2.25	85	1	1	2.35
TS1	157	2	1	1.91	152	0	2	1.32
TS2	114	3	0	2.63	147	0	0	0.00

The before and after comparison for the test sites shows a decrease in avoidance and conflicts as expected from literature. While MRCS shows similar before and after rates, GWCS shows a significant reduction. It could be because of the higher volumes which encouraged motorists to drive safer.

Lower combined avoidance and conflict manoeuvres were observed at both test sites after construction, although they could not be determined as statistically significant. Chi-squared tests suggest it was because of the construction of mini-roundabouts and hence, it was statistically significant. Avoidance manoeuvres themselves were significantly reduced, while the statistical significance of conflict manoeuvres could not be determined due to the limited data collected.

There were more recorded conflicts observed after construction at TS1. Observations from the “after” data suggests both the conflicts were because of the mini-roundabout. One was a pedestrian waiting to cross by standing on the mini-roundabout, while the second was a car performing a U-turn at the mini-roundabout leading to the vehicle following to perform a hard

stop, neither of which was likely prior to construction due to the nature of the intersection control.

5.3. Residential Questionnaire Results

In total, 32 surveys were completed; 16 were pedestrians, 16 were residents of nearby properties and 1 was an employee at a local shop. The results are presented Figure 10.

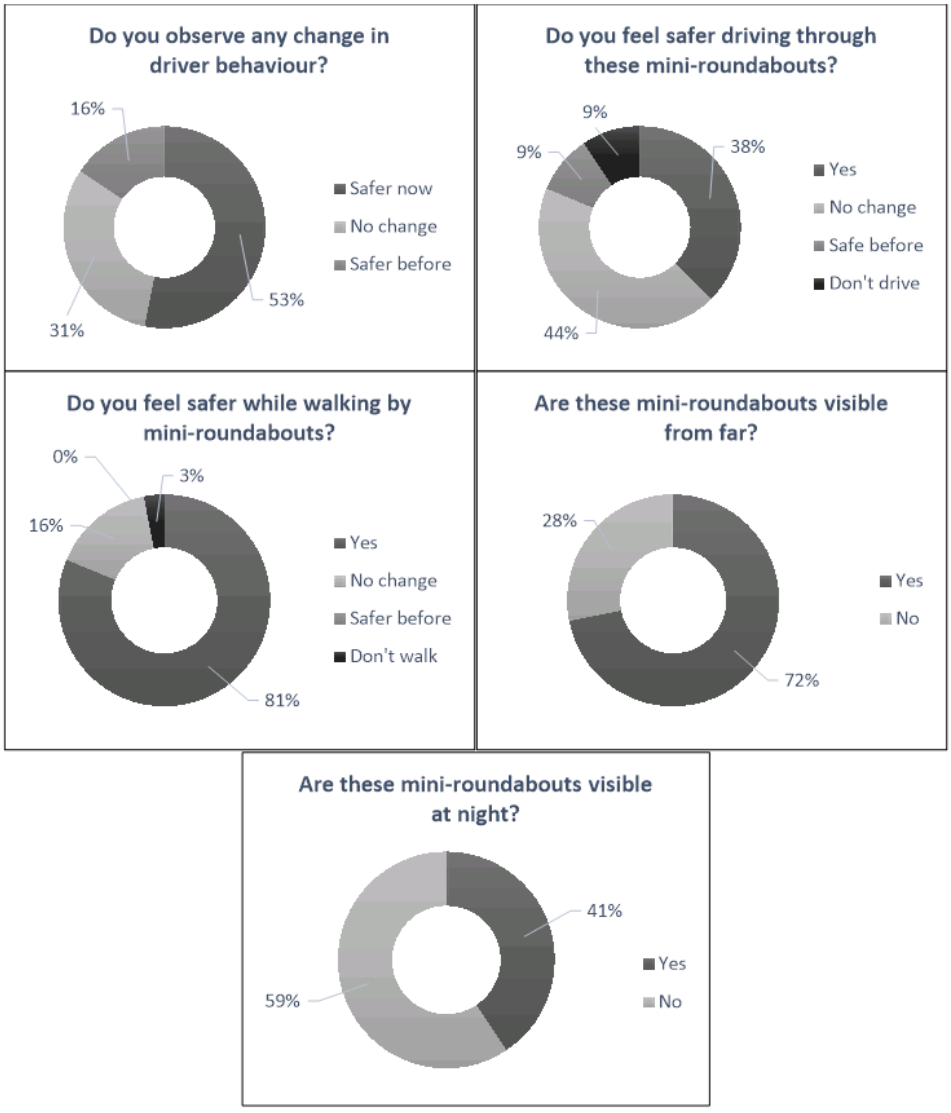


Figure 10 Residential Questionnaire Responses

Community sentiment for the mini-roundabouts is generally positive. Mini-roundabouts seem to bring two major benefits according to the respondents – safety for pedestrians and visibility from a distance. None of respondents thought that the Give Way system was safer than mini-roundabouts. The first is important to know because very few pedestrians were observed crossing the intersections. Furthermore the benefits of mini-roundabouts to vulnerable road

users such as pedestrians and cyclists is still an open question. Interestingly, visibility at night seems to be questionable, possibly due to lack of a physical presence.

6. Discussion

Overall this study confirmed many findings from previous research into mini-roundabouts.

6.1. Crash Rates and Reduction

The road safety benefits were significant, reducing crashes by 78.9% in the three-year window before and after implementation. More significantly, serious crashes reduced from 6 to none, most likely due to the significant reduction in cross-traffic crashes (DCA code 110). This was significantly higher than the overall estimate of 30% reduction from Austroads (2013). This could be due in part to two characteristics of local roads in the City of Monash. First, some local roads have significant movements of heavy vehicles due to industrial land uses. Second, some of the first roads targeted for mini-roundabouts were particularly long, straight sections of a historic grid-based network (see Figure 1) which encouraged high travel speeds.

The case study surveys of driver behaviour unpacked some of the reasons for the decrease in crashes. Survey data found that significantly more vehicles give way on a mini-roundabout than the Give Way system. This holds particularly true when considering the Give-way control site. On Manton Rd (Give-way road), only 37% of motorists gave way which was actually *lower* than on Banksia Street (Right of Way road, 39% gave way).

6.2. Residential Questionnaires

Residential questionnaires found that members of the community felt quite positive about the mini-roundabouts. In particular they felt that drivers were being safer and that they felt safer walking near them than before.

6.3. Familiarity with the new mini-roundabouts

There is some evidence that the new mini-roundabouts are treated differently to older roundabouts, most likely because they are still a novelty to residents. For example, a higher proportion of motorists fully complied with the test site mini-roundabouts, compared to the control site where encroachment was much more common.

Similarly, a common observation in locations with no mini-roundabout was vehicles performing mid-block U-turns, something which mini-roundabouts now enable motorists to do safely. However, one observed conflict was a car performing a U-turn on the roundabout leading to another vehicle coming to a hard brake. But this could be simply because motorists are still familiarizing themselves with the mini-roundabout. The second conflict recorded post-construction involved a pedestrian standing on the mini-roundabout while crossing the street. However, whether such incidences are common occurrences remains debatable, especially since no such observations were made at the Mini Roundabout Control Site. Familiarity, therefore, is likely to play a key role in a motorist's decision making at an intersection.

This issue is probably the biggest limitation of this study. Due the timeframe of the study project and construction of the mini-roundabouts, the surveys were conducted soon after construction, which results in data suggesting exceptional driver behaviour. A longer time frame for data collection would confirm whether this was the case.

7. Conclusion

The study findings suggest that mini-roundabouts are an effective (and cost-efficient) method to control the right of way in four-way intersections on local roads. They may be particularly appropriate in locations with significant bus or heavy vehicle traffic, or in grid-based local road networks.

However it should be noted that very few pedestrians or cyclists were observed during the survey. Although the resident survey suggested that people felt safer walking around mini-roundabouts, further research is clearly needed. In particular, mini-roundabouts may not be appropriate in areas with high cyclist movements on local roads.

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8. Appendix

The data presented in this section of the report is already presented in the main report. The tables here are to indicate when the surveys were undertaken, and their duration. Additional data, such as tube count analysis, has not been presented here.

Table A1. GW and ROW for Right of Way Approach (Banksia Street - GWCS)

Date	Duration	ROW	GW	Ratio (RW% -GW%)
9 Jun	20 mins	12	9	57 – 43
11 Jul	20 mins	3	11	21 – 79
9 Sep	20 mins	19	9	68 – 32
4 Oct	35 mins	17	4	81 – 19
Total	95 mins	51	33	61 – 39

Table A2. GW and ROW for Give Way Approach (Manton Road - GWCS)

Date	Duration	ROW	GW	Ratio (RW% - GW%)
9 Jun	20 mins	16	2	89 – 11
11 Jul	20 mins	21	6	78 – 22
9 Sep	20 mins	12	12	50 – 50
4 Oct	35 mins	10	15	40 – 60
Total	95 mins	59	35	63 – 37

Table A3. GW and ROW for mini-roundabout approaches (Colin Rd and Margaret Rd - MRCS)

Date	Duration	ROW	GW	Ratio (RW% - GW%)
3 May	30 mins	24	36	40 – 60
11 Jul	20 mins	4	25	14 – 86
9 Sep	20 mins	11	20	35 – 65
4 Oct	45 mins	21	33	39 – 61
Total	115 mins	60	114	34 – 66

Table A4. Motor Vehicle Encroachment (MRCS)

Date	Compliance	
	Full (%)	Semi/None (%)
3 May	40	60
11 Jul	21	79
9 Sep	52	48
4 Oct	39	61
Average	39	61

Table A5. GW and ROW for Right of Way Approach (Connam Ave - TS1)

Date	Duration	ROW	GW	Ratio (RW% - GW%)
B 4 May	30 mins	45	6	88 – 12
B 12 Jul	30 mins	28	5	85 – 15
A 2 Sep	30 mins	3	17	15 – 85
A 5 Oct	30 mins	12	39	24 – 76
Total	B 60 mins	73	11	87 – 13
	A 60 mins	15	56	21 – 79

Table A6. GW and ROW for Give Way Approach (Cambro Road - TS1)

Date	Duration	ROW	GW	Ratio (RW% - GW%)
B 4 May	30 mins	12	33	27 – 73
B 12 Jul	30 mins	8	20	29 – 71
A 2 Sep	30 mins	0	26	0 – 100
A 5 Oct	30 mins	0	55	0 – 100
Total	B 60 mins	20	53	27 – 73
	A 60 mins	0	81	0 – 100

Table A7. GW and ROW for (Connam Ave - TS2)

Date	Duration	ROW	GW	Ratio (RW% - GW%)
B 4 May	30 mins	24	6	80 – 20
B 12 Jul	30 mins	9	6	60 – 40
A 2 Sep	30 mins	2	24	8 – 92
A 5 Oct	30 mins	7	51	12 – 88
Total	B 60 mins	33	12	73 – 27
	A 60 mins	9	75	11 – 89

Table A8. GW and ROW for Give Way Approach (Renver Road - TS2)

Date	Duration	ROW	GW	Ratio (RW% - GW%)
B 4 May	30 mins	9	39	19 – 81
B 12 Jul	30 mins	18	3	86 – 14
A 2 Sep	30 mins	0	28	0 – 100
A 5 Oct	30 mins	0	35	0 – 100
Total	B 60 mins	27	42	39 – 61
	A 60 mins	0	63	0 – 100

Table A9. Motor Vehicle Encroachment (TS1, TS2) after construction of mini-roundabout

Site	Survey Date	Compliance	
		Full (%)	Semi/None (%)
TS1	2 Sep	63	37
TS1	5 Oct	81	19
TS2	2 Sep	81	19
TS2	5 Oct	62	38
Average		72	28

Table A10. Avoidance and Conflict Data for all sites

	"Before"						"After"					
	Set 1			Set 2			Set 1			Set 2		
Site	V	A	C	V	A	C	V	A	C	V	A	C
GWCS	39	0	1	41	1	0	52	0	0	46	0	1
MRCS	60	0	0	29	2	0	31	0	0	54	1	1
TS1	96	2	1	61	0	0	46	0	2	106	0	0
TS2	78	3	0	36	0	0	54	0	0	93	0	0

Table A11. Avoidance/Conflict percentage before and after

	Vehicle Volume		Avoidance/Crash %	
Site	Before	After	Before	After
GWCS	80	98	2.50	1.02
MRCS	89	85	2.25	2.35
TS1	157	152	1.91	1.32
TS2	114	147	2.63	0