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The Honourable Scott Emerson MP
Minister for Transport and Main Roads
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Dear Minister

This letter concerns TMR policy on Bicycle Awareness Zones (BAZ) in both a specific implementation in Moggill Road, Kenmore, and as a matter of public policy advice.

Moggill Road BAZ

I write on behalf of the Brisbane Central Business District Bicycle User Group (CBD BUG) concerning the Bicycle Awareness Zone (BAZ) surface treatment installed on Moggill Rd near Blacon St, Kenmore in April 2014. This is the site where on 27 September 2011 while riding his bicycle 25 year old Richard Pollett was tragically and needlessly killed by a concrete truck.

The CBD BUG calls for the removal of these surface markings and their replacement with genuine safe infrastructure, as there is no evidence that these markings improve safety for people riding bicycles.

Your department's 2009 BAZ technical note stated the shortcomings of BAZ as including that "BAZ does not adequately define a cyclist operating space, provides inappropriate road position guidance to riders and provides a poor traffic separation experience to a new rider".

This note also stated "Main Roads is signatory to the Queensland cycle strategy and must be mindful of achieving the 2011 targets to increase the numbers of Queenslanders who choose to cycle".

Tellingly, this note concludes with the statement "Main Roads deems that BAZ provides neither a safe nor attractive facility. To achieve strategic targets Main Roads will strongly pursue the implementation of formal bicycle facilities in lieu of BAZ".

TRUM Technical Note 1.39 *Bicycle Awareness Zones* was changed in December 2013 without public consultation or notification. Although it allows for a significant downgrading of the level of service for people riding bicycles, it did carry forward a number of requirements from the July 2009 version, with the following processes to be completed.

2.3 When should Bicycle Awareness Zones be used?
The appropriateness of existing speed limits should be reviewed in areas where BAZ treatments are required. The road authority should document the options considered and put in place measures to ensure a safer and more attractive treatment can be achieved in the longer term.

3.1.1 Documentation and Approval
Appendix B - Bicycle lane design checklist (Note: in superseded version was "worksheet") must be completed for every BAZ treatment and signed off by an RPEQ.

3.1.2 Design Audit
The design audit is a risk assessment to be carried out pre-installation in order to identify any additional factors or problems that might make the proposed location unsuitable for installation of a BAZ.

3.1.3 Post installation audit
A post installation audit should be undertaken by a qualified road safety auditor in order to identify any safety issues in the operation of the BAZ. Austroads *Guide to Road Design Part 6A* (Appendix C) (Note: in superseded version was "Austroads GTEP Part 14 (Appendix A)") outlines an example of a Bicycle Safety Audit checklist - this should be used as the basis for the whole of route bicycle safety audit. Further information can be obtained from the Austroads *Guide to Road Safety Part 6: Road Safety Audit*.

3.1.4 Education
In order to enhance road users' understanding of the role of BAZs, a local education campaign targeted at motorists and cyclists should be implemented following the infrastructure works.

In relation the above and their application to the Moggill Rd BAZ installation, CBD BUG seeks the following:

- Documentation of the options considered and the measures to be put in place to ensure a safer and more attractive treatment can be achieved in the longer term
- confirmation that this BAZ treatment was signed off by an RPEQ
- a copy of the design audit
- a copy of the post installation audit and the Bicycle Safety Audit checklist that was completed
- details of the local education campaign targeted at motorists and cyclists

As mentioned earlier, in the December 2013 edition of TRUM Technical Note 1.39 your department has substantially "lowered the bar" for the use of BAZ, by changing its policy to allow the wider use of these inferior and potentially dangerous surface markings.

The major changes are summarised as follows.

Former TMR policy limitations for BAZ installation (2009)	**New TMR policy limitations for BAZ installation (2013)**
Single lane roads only	Allowable on single and multi-lane roads
Roads with speed limits of 60 km/h or less	Roads with speed limits of 70 km/h or less
Roads with max traffic volume ≤3,000 AADT*	There is no maximum traffic volume (e.g. 34,333 AADT on Moggill Road in 2012 is now considered acceptable)

*AADT (annual average daily traffic)

Notwithstanding these policy changes, the 2009 policy also stated that BAZ were not "generally appropriate" in the following situations:

- BAZ are not suitable for state-controlled roads (Moggill Road is a state-controlled road); and
- Where the proposed route is part of the cycle network identified within a Principal Cycle Network Plan (Moggill Road is a Future Principal Route according to Map 8 of the South East Queensland Principal Cycle Network Plan).

Moggill Rd was obviously not suitable for BAZ in 2009. As such I trust you will agree that BAZ is still not appropriate in this location. Accordingly, the CBD BUG requests the immediate removal of this BAZ treatment.

Cycling on State Controlled Roads Policy

Appendix A of your department's 2009 technical note titled *Bicycle Awareness Zones* detailed the *Cycling on State Controlled Roads Policy.* This was a critically important policy as it articulated the following policy intention.

'This policy states that "Along priority cycling routes, Main Roads will positively provide for cyclists in road-upgrading projects." BAZ is not considered "positive provision" due to the lack of separation cyclists receive from traffic and the historical severity of cyclist and parked car collisions. Further, BAZ treatments are not considered "cycle friendly" due to lack of safe operating space. As such BAZ treatments are not supported under this policy.'

The CBD BUG is alarmed that the December 2013 revision of this technical note no longer contains the same stated commitment towards providing cycling infrastructure. The timing of this highly significant change is not lost on the CBD BUG, occurring during the Queensland Government's response period for the report from the Cycling Issues Inquiry.

While ensuring the implementation of this policy was typically not an easy task as it was routinely ignored or not honoured in the spirit in which it was written (e.g. the October 2012 removal of the bikeway planned to link Richlands and Springfield) the removal of this policy in its entirety is a major policy retreat and makes a mockery of public statements about fostering increased cycling.

BAZ Policy Advice Evidence Base

The only public reasoning given for the recent changes was a reference to a 2011 study "An Evaluation of Bicycle Awareness Zones".[1] This final year university project consisted of video analysis, a survey of cyclists and motorists, and a traffic crash assessment. One of the excellent positive aspects of the report was an extensive list of hazards faced by cyclists (pages 109-133). The BUG hopes that these kinds of lists are taken seriously by the Department.

The study also cited an earlier 2001 Connell Wagner report on a small public survey which was not available to the BUG, so the following comments refer to the "Evaluation".

The survey part of the "Evaluation" study, which considered responses from "motorists" and "cyclists", found that "BAZ don't seem to be affecting motorists' behaviour"; in fact, "cyclists aren't noticing any changes in motorist's behaviour between BAZ locations and roads without any bicycle symbols or lanes". There was no assessment of cyclists' "behaviour".

The traffic crash assessment in the study, although obviously the product of considerable work, lacked any kind of adjustment for traffic exposure level or any assessment of the statistical significance of the results.[2] It concluded "there is no evidence to suggest BAZ are statistically more dangerous than a bicycle lane". Neither was there a "do nothing" base against which the study was assessed, leaving open to question this conclusion and the methodological basis behind it.

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[1] http://bicyclecouncil.com.au/files/research/AnEvaluationOfBicycleAwarenessZones.pdf

[2] A similar problem was demonstrated in policy advice provided by TMR to the Queensland Parliamentary Inquiry into Cycling in 2013 where TMR implied that cycling is five times safer in Australia than in the Netherlands. This error was committed due to TMR incorrectly calculating fatality rates using total population instead of adjusting it using their own cycling participation figures. In contrast, in peer-reviewed literature, researchers such as Buehler et al and Garrard et al have performed alternative adjustments by examining census data and household travel survey data. These show cycling in the Netherlands is far safer than in Australia.

J. Garrard, S. Greaves and A. Ellison (2010) "Cycling injuries in Australia: Road safety's blind spot?", *Journal of the Australasian College of Road Safety*. http://www.cycle-helmets.com/cycling-blind-spot.pdf
J. Pucher, J. Garrard, S. Greaves (2011) "Cycling Down Under: A Comparative Analysis of Bicycling Trends and Policies in Sydney and Melbourne", *Journal of Transport Geography* 19.2 (2011): 332-345. http://policy.rutgers.edu/faculty/pucher/PucherGarrardGreaves2010.pdf

The sample of cyclists in the study was of particularly questionable value. They were predominantly male, about 90% of them cycled at least one day a week, and the average distance cycled was well over 20 km – almost one half cycled more than 30 km, and just less than one quarter cycled 50 km or more *each time they cycled*. This is not surprising as the primary purpose for almost 90% of them was "For recreation/exercise (not travelling to a destination)". The South East Queensland Household Travel Survey[3] shows the average trip length is 9.1 km for all modes. For cyclists, the average trip length is 4.3 km. The cyclists on whom this study is based are not average – they are travelling even further than the average motorists!

It is also noteworthy that the study has not been published in any peer reviewed journal.

Thus this single small study should not be used to assess the effectiveness of BAZ as a treatment and certainly should not be used, as it appears to have been in 2013, to loosen existing standards still further. Instead, it would be far more prudent for TMR to consider the peer-reviewed literature, of which there is a considerable and growing body.

In similar work, CDM Research prepared advice for VicRoads concerning sharrows in a January 2013 report.[4] Research similar to that of the TMR "Evaluation" was conducted by examining video footage.

That study's conclusion concerning crash risk was transparent and given in the summary: "This study could not establish whether the sharrows would result in an increased crash risk, no change or decreased crash risk."

It has been shown in peer-reviewed research published in the journal "Injury Prevention" in 2013 that shared lane markings offer cyclists no significant protection against injury.[5] Crucially, this research, unlike that conducted by TMR or CDM Research, has been peer reviewed and did control for traffic exposure level.

Professor Kay Teschke, a co-author of the study, was contacted by the BUG and provided with the TMR technical documents.[6] She confirmed that BAZ symbols are functionally equivalent to the "sharrows" used in Vancouver and Toronto, the cities used in the study. Professor Teschke stated that they are "in every way comparable to sharrows as used in the jurisdictions in our study".

Other research on the effect of BAZ/sharrows includes Winters and Teschke in the American Journal of Health Promotion in 2009.[7]

Professor Teschke commented on this study as follows.

Study subjects were shown 3 photos of each of 16 route types, including sharrows. Here they are called "major city streets with bike symbols", with or without parked cars. Figure 2 makes clear that sharrows on streets with or without parked cars received negative ratings from women, potential and occasional cyclists.

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[3] South East Queensland Travel Survey: http://www.tmr.qld.gov.au/~/media/Projects/Q/qld%20household%20travel%20survey/seq%20sections/Brisbane.pdf

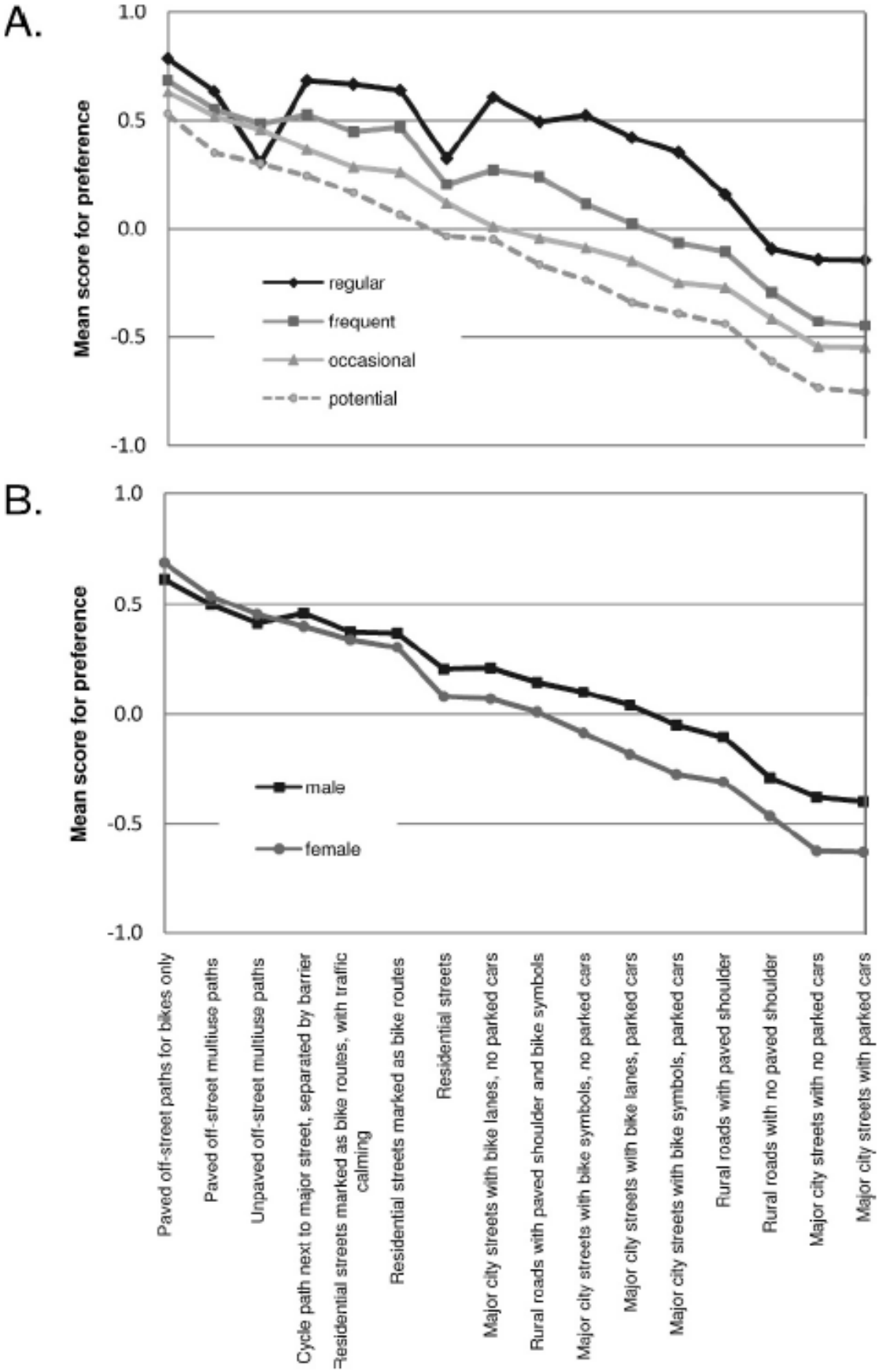
[4] http://rcaforum.org.nz/sites/public_files/images/130208-VicRoads%20Sharrows%20_0.pdf

[5] Harris, M. Anne, et al. (2013) "Comparing the effects of infrastructure on bicycling injury at intersections and non-intersections using a case–crossover design." *Injury Prevention* 19(5):303-310.

[6] Professor Teschke is a professor of public health and the studies concern the appeal of and public health effect of bicycle markings and infrastructure. In contrast, TMR has not considered the public health effects of the poor quality of transport infrastructure provided in Queensland; the first concern is on moving high volumes of motorized traffic as quickly as possible. Griffith University's 2006 report "Urban Environments & Health: Identifying the Key Relationships & Policy Imperatives" looks at some of these effects.

[7] M. Winters and K. Teschke (2009) "Route Preferences Among Adults in the Near Market for Bicycling: Findings of the Cycling in Cities Study" American Journal of Health Promotion 25(1):40-47.

Figure 2
Mean Preference Score for 16 Route Types According to Cyclist Segment (A) and Gender (B)



The results for women and men parallel those for people with children and those without, respectively,

though the results are not shown. Sharrows on streets with parked cars received negative ratings from all groups except regular cyclists. The upshot is that sharrows do not encourage cycling, and therefore have no value as an addition to a "bike network".

Bike lanes, particularly without parked cars were better than sharrows, but our conclusion, based on the results of the preferences study and the injury study, is that the only route type that both is safe and encourages cycling on collectors or arterials is cycle tracks (physically separated bike lanes).

The BUG is not surprised by these findings as Brisbane, together with a proliferation of BAZ in place of separated infrastructure, has the lowest percentage of female cyclists of any of the eight capital cities of Australia (17% in 2013). The corresponding figure in Toronto and Vancouver is 33-37%. The 2011 "Evaluation" study mentioned the gender of (existing) cyclists on just one page (page 105).

The findings of Winters and Teschke are also in line with those received in focus group research conducted by Fishman et al[8] from female participants concerning CityCycle.

> *Another criticism, which echoes many of the comments made by participants in other groups, was that Bicycle Awareness Zones were insufficient in terms of providing a reasonable level of safety for bicyclists. The following extracts illustrate this point:*
> *"People have to realize that painting a bicycle on a road does not make it a cycle lane". (Female, mid thirties, CityCycle group)*
> *"To me the bicycle symbols in Brisbane are just a token. They don't improve safety" (Female, late thirties, non and infrequent rider group)*

Another paper under review from the Teschke study found that cycling crashes involving sharrows were more likely to involve motor vehicles, especially "doorings", and injuries involving motor vehicles were more severe.

In response to this work, the City of Vancouver sought data from the government automobile insurance agency which reinforced the results. Streets with sharrows were frequently tagged as high collision zones for cyclists. The City of Vancouver is no longer installing sharrows on arterials and collectors and will not be maintaining those installed on those streets in the past.

Other research (submitted) by Bean et al indicates that the length of off-road facility surrounding a CityCycle station is correlated positively with the usage rate of that station and that no such significant effect exists concerning the length of BAZ facility surrounding a station.[9] This is in line with the findings of Professor Teschke and her co-authors.

The major "achievement" of Bicycle Awareness Zones, objectively, seems to be providing local councils and state government departments a cheap way to give the impression that cycling facilities are being provided and that cycling safety is being carefully considered. These markings have been used extensively by the Brisbane City Council (BCC) as a cheap substitute for building genuinely safe infrastructure for cyclists. Brisbane City Council regularly proclaims that they have "more than 1,100 km of bike lanes" where more than 300 km of this figure is BAZ (counted on both sides of the road wherever these symbols occur, in order to increase the total length).[10]

It is the CBD BUG's view that along with the ambiguous "Share the Road" signs, these markings are part of the current window dressing applied in Brisbane to give the impression there is genuine

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[8] Fishman, E., Washington, S., and Haworth, N. (2012) "Barriers and facilitators to public bicycle scheme use: a qualitative approach." Transportation Research Part F : Traffic Psychology and Behaviour, 15(6), pp. 686-698. http://eprints.qut.edu.au/53329/1/Focus_group_paper_on_barriers_and_facilitators_to_PBSS_use_Revision_2_29.06.12_V3.pdf

[9] Bean, R., Mateo-Babiano, I., and Corcoran, J. (submitted). "The Effect of Land Use, Cycling Infrastructure and Topography on Public Bicycle Sharing Program Usage Patterns".

[10] http://www.cbdbug.org.au/wp-content/uploads/1970/01/0/CBD-BUG-Letter-from-BCC-LM-re-claimed-1100km-bikeway-20140514.pdf

commitment by the Queensland Government and BCC to encourage more people to ride bikes instead of driving private motor cars.

The public evidence base for the recent relaxation of BAZ criteria is non-existent. In contrast, the international peer-reviewed evidence indicates that shared-lane markings have no objective safety benefit, nor do they lead to an increase in the number of people riding bicycles. In fact, the current ad-hoc implementation of BAZ, and the policy of allowing motor vehicles to park in BAZ zones in many instances leads to them encouraging people to cycle in the door zone.

In recent correspondence with CBD BUG, a TMR representative wrote "unless there is compelling evidence that demonstrates sharks teeth perform better than the existing Australian give-way line it's unlikely any change in practice could be justified".[11]

The "compelling evidence" regarding BAZ is that it is of no use and leads to more severe injury crashes. As such, CBD BUG calls for an immediate review of the BAZ policy in the light of this evidence, resulting in a significant tightening of the policy (as in the City of Vancouver) or for it to be discarded altogether.

We look forward to your response on these issues.

Yours sincerely

Dr Richard Bean
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Brisbane CBD BUG
10 October 2014

[11] http://www.cbdbug.org.au/wp-content/uploads/1970/01/0/CBD-BUG-letter-fr-TMR-re-Archer-St-20140902.pdf