

Safe System Infrastructure on Mixed Use Arterials

February 2018 Webinar – Questions and Answers



This document addresses questions regarding Safe System Infrastructure on Mixed Use Arterials raised during a webinar broadcast in February 2018. The [recording of the webinar](#) can be accessed on the Austroads website.

I've been told that a proposed safe system treatment can be given a rating. Can you explain what this rating means?

The Safe System rating is a measure of how closely the treatment is to reaching Safe System outcomes (elimination of death and serious injury). If interested in this, please see information in the [Austroads Safe System Assessment Framework report](#).

Slide 14 - How many of the project participants ride bicycles regularly?

For most of the workshops we had representatives from active travel modes who provided specific input from this road user perspective. In addition, many other project participants and study team members are regular bicycle users.

Slide 19 - Did the study include any consideration of amenity/liveability issues for adjacent land users. For example, speed humps are noisy, road diets provide safer roadside access for right-turners.

Yes. These issues are highlighted in the report.

Slide 25 - How are the future requirements for movements considered, or indeed the desired future movement types (e.g. moving from motor transport focus to pedestrian & cyclist focus)?

This is a key part of the Movement and Place approach (to consider future requirements). We also assessed the safety impacts of future requirements using the Safe System Assessment Framework.

Slide 26 - Movement and Place and to an extent speed environment strike me as being strategic/network whereas this document is more about spot / route implementation based. Please comment on whether the speed environment / Move-Place framework should be done first or undertaken as a separate task so it is removed from and considered in isolation from the route treatments.

Ideally a network approach needs to be undertaken first, and this is recommended within the Movement and Place framework. Austroads has also been progressing research over the last year to provide advice on how to consider sustainable treatments from a stereotypical corridor basis as part of a network planning. This information will be available at the end of this year. Also, the process is developed in a way to assist time-poor practitioners.

Slide 26 - Conceptually is every road user category (e.g. pedestrian, car, bus, bicycle and motorcycle) a stakeholder and if so how will they be consulted?

They are all stakeholders, and ideally would be included in consultation. Local government and state road agencies often have access to stakeholder groups who can provide required inputs.

Slide 27 Package of Treatments - Did this study consider other types of treatments, that could be seen as innovative and/or non-standard to determine their effectiveness and benefits for the case study areas?

We have reviewed emerging approaches from overseas as well as around Australia and New Zealand. The project was aimed at providing solutions that can be applied now, so we haven't included much content on this issue. Austroads is proposing an update to the [Austroads Guide to Road Design](#) and updated website content. Emerging treatments, trials and legal liability will be a component of this enhanced guidance.

Slide 28 - Is 30kph an Austroads supported speed now? If not, when?

30km/h has been used as a speed zone by a number of road authorities and Austroads supports the movement and place application of speed zones based on risk (refer to Guide to Traffic Management). One of the key Safe System principles is human tolerance to physical force, and 30km/h and lower is seen to significantly decrease death and serious injury risk. This, however, can be achieved through infrastructure and/or speed limits and decisions should be made on a case-by-case basis. Speed management is one of the many accountabilities of road authorities.

Austroads is currently undertaking a research to provide a compendium of knowledge on speed management practices. Aspects of this topic are already covered in the Austroads' guides and is being strengthened with current projects.

Slides 28 and 36 - What level of national support was there for the adoption of 30km/h speed limits (e.g. associated with the gateway treatments)?

There appears to be growing interest for specific locations, although practical examples are still limited.

The elephant in the room (or on the road!) is SPEED. Why can we not address this better as a community - ARRB to take the lead?

A lot of research has been conducted on the benefits and community engagement is continuing to prove challenging for road authorities here, as it is around the world. Austroads and ARRB are providing inputs to this National discussion. Context considerations, movement and place, and safety risk provide a useful basis for discussion for road authorities with the community. Austroads is enhancing research in this area.

Due to my interest in the administration of these types of projects, I am wondering given no contact from Tasmania (slide 15)? And how, York Street, Launceston became a study site (slide 20)?

Tasmania was not represented on the steering group, although it is often the case that one or more jurisdictional representatives will not be available for involvement for specific Austroads' projects. The York St site was an interesting case study location being a one-way network. We were after a variety of locations when selecting the final 6 locations.

Of the case study sites and the 40+ sites nominated, what was the split between state roads and local government roads?

This was fairly evenly split. Half of the sites from each group were included which again gave us good variety.

Safety improvements often result in travel time disbenefits. How were business cases for these projects generated to allow funding with these conflicting outcomes?

Impacts on travel times were assessed, but only in a qualitative manner. Information is provided on this in the report.

Slide 29 - Not all crashes will have been reported. How to account for this?

What about all the minor crashes which still impact people (personally and costs) which are not reported?

There is considerable under-reporting of crashes in many jurisdictions especially for less severe crashes, and for those involving vulnerable road users. This is why a pro-active approach (the Safe System Assessment Framework) is used to assess potential infrastructure risk.

Changing priorities at intersections may assist motorcycle safety (e.g. small roundabouts to change T intersections) should help to reduce intersection approach speeds on the higher priority road.

Please comment.

Yes, we have an evidence base that supports this. This is one of the reasons why roundabouts are very effective (along with reduce conflict points and reduced impact angles).

Slide 34 - Raised Intersections - How was the crash reduction determined?

This is based on some of our previous Austroads research. We conducted a 'before and after' analysis using control groups to cater for extraneous variables. Please refer to this published report for details: Makwasha, T & Turner, B 2017, *Safety of raised platforms on urban roads*, Journal of the Australasian College of Road Safety, vol. 28, no. 20-7 (available on the internet).

We have a mixed use arterial route where we have a high number of pedestrian activity, high number of crossing/turning crashes at intersection and a few pedestrians and cyclists crashes along a 500 m mixed use arterial route. There was only a very small number of DSI (1 fatal and 1 serious over the last 5 years), however a high number of injury crashes. Due to the number of injury crashes along this section of route, the predicted risk on this route/intersections were high.

In this type of situation, would you recommend major infrastructure changes on these route (i.e. raising signalised intersection)? Or because they are only a predicted risk (i.e. more minor injury than actual DSI) would you look at a lower cost solution?

The context, road function, access, mix of vehicles, and types of crashes are just some of the elements for consideration. Any one of these elements could influence a different solution. If there are minor injuries that involve vulnerable road users, and if speeds are above desired maximum levels, they could have just as easily been fatal or serious. The function, movement and place, Safe System Assessment Framework would be useful to help decide on the right approach at this location.

Slide 35 - How effective are small/compact/semi mountable roundabouts?

We have previously reviewed this issue. The evidence is good from the UK – there is a sizeable benefit. We also have examples from Australia, but have not yet conducted a full evaluation.

Slide 35 - Are you aware of any research and analysis has been done on pedestrian safety at higher speed/volume multilane roundabouts vs lower speed / volume single lane?

The individual risk to vulnerable road users is increased in moving from low speed to higher speed.

Why are grade separation of pedestrians and cyclists from powered vehicles not considered?

They were considered, but not included in any of our case study locations given the types of road environments we were working with. This is a legitimate option in some location, although obviously of higher cost.

Can you please provide an explanation of what CMF is and how it is determined for various treatments?

A CMF is 'crash modification factor'. This a type of multiplier, so for instance if there were 10 crashes before a treatment was installed, and the CMF was 0.7, then we would expect 7 crashes afterwards (10 x 0.7). The estimate is based on evaluation research (usually evaluating examples of where the treatment has been applied in 'before' and 'after' studies, or using more complex evaluation techniques). There are documents from Austroads that provide figures for different safety treatments, and also in some states.

What is the reference used to estimate the risk reduction of each treatment?

Much of the research was based on previous Austroads project work. This typically gathers information from Australian and international research on specific road safety treatments. The report includes these references for the treatments highlighted.

How would you make a multi-lane zebra crossing safer for pedestrians?

Zebra crossings are generally not recommended for multi-lane roads. Narrowing would be a good option, as would speed management (especially through raising the crossing), increased visibility and/or a switch to a signalised crossing. Of course, removing at-grade crossing in lieu of grade separated crossings has been implemented in many multi-lane higher speed locations (also school zone management).

How is BCR fit in the context of case studies?

Access to project costs was not available and therefore BCR was not able to be generated.

Can you please discuss findings regarding on-street parking?

This came up in a number of case studies, and removal of parking spaces is obviously a very contentious issue. Although the issue is highlighted in the report, further advice is not able to be provided. We did in some cases discuss the inclusion of alternative parking arrangements (i.e. relocation rather than straight-out removal).

Slide 37 - Narrowing can certainly enforce speed limits, but if the vehicles are approaching at high speed, it will have to manoeuvre at narrowing section which may put the vehicle in safety hazard. Please comment.

Yes, this could be an issue. One way to address this is to ensure speeds are reduced in advance of pinch points to mitigate these sorts of issues (e.g. stepping down the speed in stages).

I am curious why none of your safety measures incorporates flashing beacon or half signals? Is it because physical changes are more effective?

There is evidence that there are benefits from beacons and other warning devices. However, in these busy urban environments it is thought that the physical changes will produce more sustained safety benefits.

Is there any information any increase in nose to tail type accidents where raised pedestrian tables have been installed where there is no separated left turn deceleration lane provided?

We haven't seen any evidence of this as far as we are aware.

How is the 40% crash reduction factor determined for raised intersections / safety platforms?

Please refer to this published report for details: Makwasha, T & Turner, B 2017, *Safety of raised platforms on urban roads*, Journal of the Australasian College of Road Safety, vol. 28, no. 20-7 (available on the internet).

Trams - what sort of treatments would you implement on a mixed use arterial with trams (aside from lower speeds and gateway treatments)?

Do you have any further thoughts about treatments for tram/pedestrian crashes?

The report includes one example which was a tram route (Glen Huntly Rd). You could also search up information on the super tram stops used in Melbourne.

How will the flow on impact of these measures (e.g. road narrowing, diets, raised hump crossings etc on Urban traffic congestion be managed? (most slides). Driver frustration and phone etc distraction whilst stationary is a known risk.

This is where the Movement and Place approach is critical. In some cases there are parallel routes which can be better designated as traffic corridors. Please review the material on Movement and Place and [Austroads Guide to Traffic Management](#) for information on this topic.

If the system requires mutual responsibility, how do you police and enforce pedestrian behaviour around distractions when using the infrastructure such as mobile phone and the use of headsets? Drivers are policed under law when using the infrastructure. What about vulnerable users?

This does seem to be a growing issue of concern. We understand that some jurisdictions are acting to address this issue, through education, enforcement and infrastructure measures. Note that the National Strategy adopts the Safe System approach, whereby each of the elements are addressed to improve safety.

Slide 38 - In relation to the speed reduction achieved in the road diet treatment, what was the spacing of the centre traffic islands? Also, were there any road diet sites in the case study that did not have edge lines present?

I assume this relates to the studies we reviewed and not the case study location where this treatment was included. Unfortunately this information was not available in the studies we reviewed.

Road diet/two traffic lanes down to one traffic lane with a central turning lane - what is the highest speed you would implement this?

Generally these would be applied for up to 60 km/h routes. We don't have evidence on effectiveness above that speed limit, so unsure of the safety outcomes.

Road diet/two traffic lanes down to one traffic lane with a central turning lane - is there Australian evidence of increased head on crashes (like in the US) or has the Australian experience shown that this is not an issue?

Our evaluation didn't identify this as an issue, although note we only included 11 sites, and so statistical power was not ideal for this sort of break-down. The evaluation for this can be found in the following publication: Makwasha, T & Turner, B 2016, *Road diet safety: an Australian viewpoint*, ARRB conference, 27th, 2016, Melbourne, Victoria, Australia, ARRB Group, Vermont South, Vic, 10 pp.

What is the effective maximum daily traffic volume for road diets?

This would depend on many factors such as function, types of vehicles, numbers of turning movements. Research indicates that the treatment maybe effective up to 20,000 AADT in some situations.

Slide 40 - This design may be an issue for cyclists as it squeezes them into the lane with vehicle due to road blisters. Please comment.

Good point. This is quite an old photo, and we think newer designs would have catered to cyclists by providing a bicycle bypass.

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