

Submission to the Standing Committee on Environment and Public Affairs Petition 003 – Speed limit on Bussell Highway.

The Shire of Capel is divided by Bussell Highway with high densities of residents living on both sides. Bussell Hwy is used by large volumes of cars and trucks, especially near weekends and holiday times. The latest traffic count by Main Roads WA recorded over 17000 vehicles per day. The number of vehicles has increased consistently each year prompting the construction of an additional 17 km of Bussell Hwy duplication between Capel and north of Busselton and also the Bunbury Outer Ring Road (BORR).

As a major distributor road between Bunbury and Augusta, the speed limit is 110 km/h. Near Capel town this presents a problem for residents attempting to cross the highway, entering on to the highway, or exiting their town, by any of the four main intersections and property access points, to travel between Capel Town and the township of Peppermint Grove Beach, or to go to Bunbury or Busselton. It is particularly difficult for those residents living on the west side of the highway (i.e., Peppermint Grove Beach townsite, tourist park and rural properties) as they must cross four (4) lanes of traffic moving at 110km/h and make multiple decisions to enter Capel to access local services (bank, fuel station, hardware, Post Office, grocery store, etc.). The anxiety associated with using the highway compounds at holiday times with the increase in traffic. Of the nineteen (19) accidents in the years between 2015 and 2019, nine were right angle or sideswipe accidents demonstrating the difficulty motorists have navigating the fast moving traffic.

Eight years ago Main Roads WA was already aware of the road safety issues. In a letter to a local business owner (Ref:05/151-02) dated 4 January 2013, the Director of South West Operations ,Brett Belstead, acknowledged: *"Traffic volumes on the highway will continue to increase significantly in the future which will further increase the potential for vehicle conflicts at all access locations to the highway. Concerns have recently been raised in regard to traffic safety at some existing intersections with the highway in the Capel area including some recent major traffic accidents. In view of ongoing traffic increases and subsequent safety considerations it is anticipated that gradually over time the Bussell Highway will be upgraded ultimately to a freeway standard... The future requirements for the freeway will include provision for separated interchanges for local road intersections."*

The BORR will be completed in early 2024. Bussell Hwy will then resemble an extension of the freeway system from Perth to all points in the southwest. Combinations of ramps and grade separations designed as a system of interconnecting roadways to separate the turning and through movements at the junction of two or more roads will provide the greatest efficiency, safety and capacity for handling large volumes of traffic without disrupting the flow of through traffic. However, these modifications to the Bussell Hwy will take years to plan, fund and build. In the interim, road safety will continue to be an issue for Capel residents and motorists using Bussell Hwy.

Introducing an 80 km/h speed limit for the Capel intersections is a relatively inexpensive and easily implemented option that would allow for safer entries and exits for local traffic and add minimal travel time. In the report, *Driving Change Road Safety Strategy for Western Australia 2020- 2030*, Iain Cameron, Chairman of the Road Safety Council said: *"Safer speeds through revised speed limits and/ or greater compliance, while often sensitive, remain one of the most **powerful, quickest- acting options available** to us that can be progressed in partnership with local governments and local communities."* The body of the report goes on to state, *"There is a direct correlation between speed and road trauma and WA speed limits on rural roads are amongst the highest in Australia"*. The report quoted the statistic that, *"a 10% reduction in mean speed could result in approximately 33% reduction in fatal road crashes."*



There is a community expectation that traffic and local conditions are arranged to reduce the risk of serious injuries and fatalities as far as possible. Arguments for changing the speed limit from 110km/h to 80km/h need to be considered from the combined cognitive psychology and physics perspective.

Firstly cognitively, the period between a driver seeing a potential obstacle in their path, and their application of the brake/and or taking evasive action defines the 'reaction time'. As they are travelling, this can be used to calculate 'reaction distance'. Reaction time varies with age and driving experience typically between 0.5 – 2.0s. Assuming an average reaction time of 1.25 s, the reaction distance travelled at 110km/h is 38 m. In contrast, reaction distance travelled at 80 km/h is 28 metres. Reaction distance is reduced by 10 m.

Another argument from the cognitive aspect is the tendency to take experience at large intersections as input into judgements about speed and distance of other vehicles. The stretch of Bussell Hwy in proximity of Capel includes multiple intersections and access points where the oncoming traffic is routinely travelling at or above 110 km/h (<https://trafficmap.mainroads.wa.gov.au/map>). Given that motorists could plausibly associate vehicles to be traveling 80 km/h given the majority of local major intersections in other Bunbury and Busselton, they are likely to intuitively underestimate the speed of oncoming traffic, making collisions more likely.

From a physics perspective we need to consider the braking distance (assuming there is time and distance to stop) and the energy of collision which has to be dissipated for the vehicles and occupants to come to rest (if there is no time to apply the brake).

After a driver perceives a problem, and applies the brake (having already travelled 38 m at 110 km/h or 28 metres at 80 km/h), we need to consider the braking distance required for the vehicle to come to rest. It can be shown that the stopping distance increases quadratically with speed. This means that when applying the brake travelling at 80km/h the braking distance is almost half that when travelling at 110km/h (irrespective of assumed kinetic friction coefficient). Typical stopping distances (the sum of the reaction distance + the stopping distance) vary between 64 and 91 m for 80 km/h and 106 and 157 m at 110 km/h assuming dry and wet kinetic coefficients of friction of 0.7 and 0.4, respectively.

Given the reaction time, vehicle speed and maneuvers involved it is more appropriate to consider the energy involved in collisions (the high number of accidents corroborates this narrative). The kinetic energy associated with any moving object that has mass (whether that be the vehicle or the occupant) is proportional to the speed squared. This energy must be dissipated in the collision for the object to come to rest. A 30 km/h reduction from 110 km/h to 80km/h will reduce the energy available in the collision by almost half.

In summary, the physics and cognitive science is clear. A lower speed limit will increase the time and distance available to avoid a collision in the inevitable event emerging drivers are careless or distracted enough to make a dangerous miscalculation or break the law. A lower speed limit will reduce the instance of those misjudgments as the speed limit at the Capel intersection will be congruent with the rest of the area. In the event of a collision, the energy brought to bear on the bodies of those involved will be almost halved, in all likelihood increasing their chances of survival.

The voices in our community, through our petition, urge the lowering of the speed limit in proximity of Capel town. This road safety issue has been a concern for our community too long and needs to be addressed immediately. Further reports and investigations only serve to sweep this matter 'under the carpet' rather than implementing a simple and effective solution – as recommended and supported by The Road Safety Commission of WA and evidenced by the science.

Not lowering the speed limit has been, and will have to be, paid for in lives. One is too many.

Yours sincerely,

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