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Abstract
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Keywords
safe, islander, system, community, demonstration, project, strait, remote, aboriginal, torres

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Safe System Demonstration Project in a Remote Aboriginal and Torres Strait Islander Community

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ABSTRACT

This paper reports on key findings and recommendations of the first known application of a comprehensive Safe System audit in a remote Aboriginal and Torres Strait Islander community; commissioned by the Indigenous Road Safety Working Group with funding from Austroads. The audit was conducted in Bidyadanga WA in collaboration with the Bidyadanga Community Council during June-August 2010, including: review of policy, management and police records; physical observation of roads, speeds and vehicles; and interviews with community members and local stakeholders including regarding road user issues and vehicle access. Bidyadanga was found to have high quality roads and safe speeds within residential areas, with limited need for upgrades and new work; however, several issues were identified on roads to access the nearest town, including a high crash “blackspot” location. Access to safe vehicles was limited. Unlicensed driving, lack of child restraints, drink driving and fatigue were key road user concerns. Needs for across-government improvements in policy and management were identified. Cost effective actions were identified. This project demonstrated that application of the Safe System was feasible in a remote Aboriginal community, while lessons learned can be adapted and applied nationally to improve Aboriginal road safety.

INTRODUCTION

While road crashes are a significant cause of death and injury for all Australians, on a population basis, Aboriginal and Torres Strait Islander Australians are 2-3 times more likely to have a fatal road injury and 30% more likely to have a serious injury compared to non-Aboriginal Australians (AIHW, 2006; Berry et al, 2007). Despite this and despite all States and Territories adopting a Safe System approach in their road safety strategies, a safe policy and management, safe roads, safe speeds, safe vehicles and safe road users audit is yet to be applied comprehensively in an Aboriginal community.

This research reports on a Safe System audit of a remote Aboriginal community in Western Australia (WA): Bidyadanga. Further details on the background to this project and development of methods are reported elsewhere (Senserrick et al, under review). This paper provides an overview of the audit, key findings and recommendations. (A full report is in preparation for the Austroads website – the following includes extracts from the Executive Summary; Senserrick et al, 2011a, 2011b.)

METHODS

The Safe System audit was conducted in Bidyadanga WA in collaboration with the Bidyadanga Community Council during June to August 2010, including several methods:

- Review of local and Shire (Broome) police records to identify key driving offences, crash types and locations.
- Physical observation of roads, speed limits, and treatments within the Bidyadanga Community and between the Community and local services, with particular attention to identified crash sites.
- Physical observation of vehicles in Community and nearby vehicle sale outlets.
- Interviews with community members and local stakeholders on all aspects of the Safe System, including perceptions of road user issues and key crash factors.
- Comparison of road and vehicle findings to Australian Standards.

Interviews were conducted with one or more representatives from the following:

- Bidyadanga Community Council CEO and Chair.
- Bidyadanga Community Council Representatives (10).
- Local police officers stationed within the Bidyadanga Community.
- Bidyadanga school principal and teachers.
- Bidyadanga community health clinic health manager and staff.
- Bidyadanga Arts Centre artists and employees.
- Bidyadanga contractor for road maintenance.
- Attendees of the Bidyadanga Community Council office.
- Lagrange missionaries.
- Regional police officers.
- RoadWise officer, Shire of Broome.
- Engineer, Broome Shire of Broome.
- Owner/managers of local new and used vehicle outlets in Broome.
- Financial advisor (for vehicles), Broome.
- Regional Main Roads officers, Derby.
- Main Roads Head Office, Perth.
- Regional WA Health.

The project was approved by the University of Sydney Human Research Ethics Committee and Western Australian Aboriginal Health Information and Ethics Committee.

RESULTS

Safe Policy and Management

Bidyadanga is located approximately 190km south along the Federal highway (Great Northern Highway) from Broome (continuing to the Perth region). There is a main State access road into the Community from the highway that is unsealed on entry but sealed closer to the Community. The main core of the road network is a cluster of sealed roads on community-owned land and there are seven unsealed (sandy) access roads from the coastline and roads following the coastline.

Both the Federal and WA Governments have widely embraced the Safe System, and therefore road safety policy and management in the region was of a high standard. However, given that the physical core of the Bidyadanga Community is situated on community-owned land, this raised certain 'grey areas' in terms of the applicability of State and Federal road safety policies beyond the State access road.

Unlike most remote communities, a police station was situated within the residential area and police enforced road safety not only on the State access road but on all sealed roads within the Community. They also sought to prevent driving on the unsealed tracks along/to the coast if aware a driver was intoxicated, a vehicle was overcrowded or young children were unrestrained. They also encouraged drivers not to drink while in these areas if they planned to drive back. This police presence and scope was welcomed and supported by the Community Council and was perceived to be working well.

One policy and management issue concerned the local ambulance, which was lacking signage, sirens or rear seating such that there was limited capacity to safely restrain infants or child passengers, or additional paramedics. Requests to address this had not been met over approximately two years. A new ambulance was eventually delivered at high cost, yet rear seating was still lacking. In addition, while several available road safety-related services/programs were identified (e.g., RoadWise safety campaigns, keys2drive free driving lesson, payment plan schemes to regain driver licences), some were not accessed or underutilised.

Safe Roads

Generally Community roads and road infrastructure were in very good condition. A primary Community concern was lack of a footpath on the main road children used to attend school although work in installing footpath treatments had commenced by the end of the audit. However, the treatment did not include a pedestrian crossing across the main road – the busiest intersection in the Community – which had no pedestrian warning signs. A general lack of road signage, particularly regarding children playing on the road as well as stock on road warning signs, was frequently voiced as a concern.

Street lighting was present and mostly in good working order in residential areas, but provided low, inadequate lighting such that high beam lights were used at night due to concerns with children playing on the road. There was no lighting on the highway end of the main access road. The main access road was also unsealed in one section, in poor condition, and expected to worsen during the wet season. Of approximately 7km of unsealed road, only 1.5km was scheduled for sealing in the current financial year. Residents reported the corrugation on this road contributed to damage to their vehicles.

On the Federal highway, cattle grazing near and crossing at a key point were a significant issue and associated with a high number of crashes. Cattle were also known to wander into the Community areas, but no impacts had yet been recorded within these areas. Reasonably frequent rest stops were identified on the Federal highway between the Broome and Bidyadanga to aid fatigued drivers, but there were no audible tactile line markings (although these were reported to be on another nearby highway).

Safe Vehicles

The general age of vehicles in the Community was 10-15 years. It was not uncommon for vehicles to be unroadworthy or unregistered but there was high awareness of the risk of loss of the vehicle if found driven on public roads and therefore this was extremely rare. Car maintenance facilities were available within Bidyadanga but under-utilised. The vehicles were generally limited to trips to the coast for fishing and camping.

A 12-seater bus had recently been acquired by a resident to assist with Community transport needs and an additional independent service potentially to Broome and other localities was currently under WA Government tender. The Greyhound bus service between Broome and Perth, including a stop at Bidyadanga, ran three times per week.

Access to vehicles was primarily via several car yards in Broome that provided new and used vehicles but there was identified need for increased understanding of choice of vehicle, safety features, quality-price factors, warranties and appropriate finance. There was no awareness of Australian New Car Assessment Program (safety ratings) by car yard managers. Sales of troop carrier vehicles, known to be dangerous for occupants seated in the rear in both frontal and rollover crashes, were reported as popular and there was low awareness of their high risk to rear passengers.

Safe Speeds

Safe speed limits were generally found with an 80km/hr limit on the sealed main access road reducing to 50km/h on approach to the Community and then a 30km/h limit for all central residential roads. In addition multiple speed humps were present in these areas. However, the unsealed section of the main access road had an open speed limit, theoretically defaulting to up to 110km/h despite the poor condition. No authority claimed responsibility for setting the speed on this stretch of road.

Safe Road Users

Unlicensed driving was raised as a common concern although (atypically) considerable local services were available to help gain licences and were working well indicating a greater extent of the problem involved drivers with suspended or cancelled licences (rather than those never licensed). It is possible additional requirements for medical clearance and alcohol-related theory test requirements for re-licensure may contribute to this issue, but this was unable to be confirmed.

Several interviewees referred to a lack of child restraint use and/or awareness of these as an issue of concern. While not raised as an issue by interviewees (except by police), on prompting it was generally agreed that seat belts were also rarely worn by adults or older children, although residents did not necessarily view this as a priority issue. There was a need for improved understanding on the effectiveness of restraints in reducing injury in the event of a crash and appropriate restraint use by age. This was a particular concern to the researchers as new laws regarding child restraints for children up to age 7 years were due to commence in WA at the time of the audit.

While there were mixed views on drink driving, it was generally agreed that alcohol use was a significant issue in the Community. The Community had submitted an application to the Minister, Department of Racing, Gaming and Liquor for full restrictions on any alcohol in the Community, but it was dismissed on a technicality. Both men's and women's shelters were located in the Community and a regional alcohol residential centre was providing treatment and rehabilitation for several residents. However, there had been no access to the men's shelter for several months due to the need to provide the dwelling as temporary housing for other residents. A new program to deliver and install alcohol interlocks in remote areas (currently in planning for WA government trial in another remote community) was identified and presented to the Community Council, there was interest in exploring it as a potential option for Bidyadanga in the near future.

Speeding was reported to be more common on higher speed roads, straight stretches of road in the residential area and mostly a concern at the main intersection where local school children cross the road at several locations without a pedestrian crossing. A hand-held speed camera was used by local police but generally only on the highway due to inadequate locations to operate within the residential area.

Overcrowding of vehicles was initially raised as a significant issue, particularly for travel to funerals and when transporting large families to school. However, by the end of the audit, it was identified that a local shuttle bus service seemed likely to be in operation in the near future to help address this issue. Bicycles and motorcycles were rare in the Community. There had been an allocation of children's bicycles delivered some years earlier but no maintenance program was in place and few remain. No culture of helmet use was present among children, nor adults who were reported to use ATV/quad bikes on coastal roads. Other risky driving behaviours identified related to driving in the centre of residential roads, with concern no centre lines were painted on these roads, and 'hooning' type behaviour on weekend nights particularly involving young people and alcohol. Fatigue was not raised as a key road safety issue by any stakeholder, but when prompted, it was agreed that fatigue was an issue on the long drive back to Bidyadanga from Broome and considerable fatigue levels and crashes that likely were due to the driver falling asleep were subsequently reported.

DISCUSSION – RECOMMENDATIONS

Safe Policy and Management

Safe policy and management is key to sustainability of the recommended initiatives (Tingvall & Haworth, 1999). It was clear that many services and programs available to the Community were not accessed or underutilised due to a lack of knowledge of either availability or how/when to access these. The purchase of a new but inadequate ambulance at high cost was a key example of a breakdown in what should be coordinated efforts to improve safety. To establish a sustainable coordination system between the Bidyadanga Community and service/program providers to ensure requests for these are made or delivered in a regular manner, and to monitor their cultural relevance, it was recommended coordination requirements be established as essential

components of job descriptions (for example in key performance indicators) of key Government and Shire of Broome personnel and the Bidyadanga Community Council.

Safe Roads

Several recommendations were made for road infrastructure improvements. An appropriate pedestrian crossing treatment was needed at the main intersection where children cross for school. A wombat crossing was identified as a potential solution including supporting stop signs and pedestrian crossing signs and adequate lighting (AS1742.10 Manual of Uniform Traffic Control Devices, Part 10).

The point on the Federal highway associated with a high number of crashes with cattle needed treatment as a “blackspot” with immediate lowered speed and signage regarding stock on road, with concurrent consultation undertaken between Main Roads WA and the pastoralist to reach agreement on the installation, upgrade or repair of existing fencing to prevent cattle access (Main Roads Operational Guidelines No 81 *Fencing Road Reserves on Highways & Main Roads in Pastoral Areas*). If settlement could not be reached, or in a timely manner, speed limits should be lowered to 60km/h until such time that the cattle were prevented from wandering onto the highway.

Further, the unsealed section of the main access road needed assessment for further sealing given these roads are known to be associated with suspension systems deteriorating more rapidly. However, speed calming measures were also recommended due to speeding concerns in this area, including low-cost measures such as visual countermeasures such as road painting and signage (e.g., see Allpress & Leland, 2010).

A potential upgrade of residential lighting also needed assessment in conjunction with speed calming needs in areas of concern. As a more immediate solution to increasing visibility of children on the road, a Community project to create retroflective wristbands with local artwork was proposed (previous RoadWise initiative). Options for intermittent street lighting on the main access road also needed assessment, such as for low-cost solar powered options, as well as the potential for a solar-powered emergency phone.

It was recommended that the Federal highway be assessed for tactile line markings. Tactile line markings (also known as ‘rumble strips’) are considered to be highly effective (with a high cost-benefit ratio) in reducing ‘run-off-road’ crashes due to driver fatigue or poor visibility due to rain or fog for example (DTEI, 2009).

Safe Vehicles

Review was urged to ensure the recently acquired ambulance and shuttle bus were in keeping with Australian Standards and allowed for appropriate restraints for children and infants as well as adults (including paramedics in the rear of the ambulance). It was also recommended that regulations be reviewed to phase out production or import of troop carrier vehicles in Australia and to prevent these vehicles being sold on the second-hand market as passenger vehicles. Troop carrier vehicles are particularly dangerous in frontal crashes, especially due to the sideway seating in the rear (Zou et al, 1999). They

usually have no restraints in the rear and even if they do are dangerous in crashes resulting in multiple fatalities and/or serious injuries. The roof of these vehicles is also often weak, providing inadequate survival space in rollover crashes.

An education program regarding all aspects of vehicle purchase, particularly attention to safety features and vehicle finance, was also recommended. In addition, attention was needed on improved regulation of the vehicle finance industry to prevent unscrupulous vehicle finance loans. This was highlighted as an issue by the owner/managers of the car yards and agreed by other stakeholders, including government. We were also told of a private company that was planning to implement a radio-based education program, but were unable to contact them to confirm.

Safe Speeds

It was recommended that the unsealed section of the main access road that had no posted speed limit be assessed for reduction to an 80km/h speed limit and posted as such in keeping with previous research recommendations regarding these types of rural roads (Kloeden et al, 2001). Further, additional speed humps should be installed on some longer straight road stretches in the main residential area and all speed humps required painting or re-painting and with signage posted according to Australian Standards (AS1742.13-2009, Manual of Uniform Traffic Control Devices, Part 13: Local area traffic management). It was also recommended that a speed limit reduction from 110km/h to 100km/h on the Federal highway be assessed in accordance with the current WA Road Safety Strategy and based on previous research demonstrating fatality reductions (e.g., Sliogers, 1992).

Safe Road Users

For road user safety, it was recommended that support be provided for the Community to update available education programs (e.g., RoadWise programs) to be tailored to fit the context of Bidyadanga and become truly community-owned programs. These should be supported by police enforcement initiatives matching the education themes (e.g., enforcement targeting non-use of restraints when conducting the restraints education program; see Cameron & Delaney, 2006). The Community selected restraint use and drink driving as the first preferred themes. The latter was also identified as able to be supplemented by a trial of the new program to deliver and install alcohol interlocks in remote areas identified in the audit.

Implementation Plan, Potential Costs and Benefits

An implementation plan, in successive stages according to availability of resources, was developed based on the above recommendations as prioritised and unanimously supported by the Bidyadanga Community Council. A full cost assessment for work to State and Federal roads was required. While some costs were likely to be extremely high (e.g., road sealing), a recent report by the Office of Road Safety (2010) costed a serious injury due to a crash in WA at $425,000. A more detailed estimate of national averages by the Bureau of Infrastructure, Transport and Regional Economics (2009)

estimated as much as $2.4m per crash fatality, $214,000 per hospitalised injury, and $2,200 per non-hospitalised injury; with these estimates increasing substantially if the injury results in impairment. As these costs are averages, they may well be higher in remote settings. Considering these varying costs and based on differing local and regional police and Main Roads WA data sources obtained in the study, the current cost of crashes in the Bidyadanga area was estimated to range between $1.5m to $2.6m per year, suggesting spending to these levels was justified if able to reduce injury.

The low number of crashes in the Bidyadanga region in statistical terms, lack of itemised details for other factors, and lack of evaluation of such initiatives in remote Indigenous settings rendered it difficult to quantify tailored potential cost savings (e.g., specific cost-benefit ratio) for the measures recommended in the implementation plan. However, key measures informed by extensive previous research suggest:

- The main intersection treatment will reduce the currently increased potential for injuries to school children in particular (Oxley, 2005).
- The black spot on the highway conservatively contributes to approximately $30,000 in costs but would likely cost less than $5,000 to treat (BITRE, 2009).
- Reducing the Federal highway posted speed limit from 110km/h to 100km/h would likely lead to one less fatality and 3-4 fewer serious injuries over the five-year crash period examined (Nilsson, 2004).
- Installing audible tactile line markings would likely increase this to 2 fewer fatalities and 6-8 serious injuries with a cost benefit ratio ranging from 10:1, 20:1 and 30:1 for different road segments (Woolley & McLean, 2006).
- Alcohol interlocks will reduce recidivist drink driving considerably, thereby reducing potential for drink driving crashes (O'Hare, 2005).

CONCLUSIONS AND IMPLICATIONS

While comprehensive road infrastructure audits have been previously conducted, this is the first known comprehensive Safe System audit of an Aboriginal and Torres Strait Islander community. As a national demonstration project, this research demonstrated that application of the Safe System was feasible in a remote Aboriginal community.

While the methods applied necessarily included reliance on interviews, which can be prone to bias, further monitoring and evaluation will reveal if certain road safety issues were overlooked. Further adaptations of the method may also be necessary to apply the approach to differing communities, such as large urban-based Aboriginal communities. Nonetheless, this demonstration project intentionally included a methodology that can be readily replicated across Australia, at least in communities where geographical boundaries can similarly be readily defined. More interspersed communities might first need to take additional steps to ascertain the scope of the audit, such as via meetings to reach agreement between community and stakeholder representatives. Working in partnership with communities and road authorities, agreements can be achieved on staged implementation plans.

The important next steps to this research include support for the Bidyadanga Community to progress through the implementation plan and to evaluate the impact on road safety, particularly supporting further grants and applications for funding support. Guidelines for other communities will be developed together with the Bidyadanga Community and distributed via sources such as the HealthInfoNet, to ensure there is wide dissemination. This will also raise awareness of road safety as a challenge but one that can be addressed rather than accepting road “accidents” as fate.

The Safe System is essential in highlighting the confluence of factors that contribute to safety, beyond former perceptions that blamed road users for the majority of crashes and injuries. Empowering communities and road authorities to apply the Safe System ‘best practice’ approach to road safety is likely to be an important step in improving Aboriginal and Torres Strait Islander road safety and reducing the current differentials in road fatalities and serious injuries.

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REFERENCES

Allpress JA, Leland LS (2010). Reducing traffic speed within roadwork sites using obtrusive perceptual countermeasures. Accident Analysis and Prevention, 42(2):377-83.

AIHW: Australian Institute of Health and Welfare (2006). Australia’s health 2006. *AIHW cat. no. AUS 73*: Canberra ACT: AIHW; June.

Berry, J., Nearmy, D. & Harrison, J. (2007). Injury of Aboriginal and Torres Strait Islander people due to transport, 1999-00 to 2003-04. *AIHW Catalogue no. INJCAT 100.* Canberra ACT: AIHW and ATSB; May.

Bureau of Infrastructure, Transport and Regional Economics (2009). *Cost of road crashes in Australia 2006 - Report 118.* Canberra: : Department of Infrastructure, Transport, Regional Development and Local Government, Commonwealth of Australia.

Cameron M, Delaney A (2006). *Development of strategies for best practice in speed enforcement in Western Australia: Final report. MUARC Report 270.* Clayton, VIC: Monash University Accicent Research Centre. MUARC Report 270.

DTEI: Department for Transport, Energy and Infrastructure (2009). *Audio-Tactile Line Marking: Operational Instruction 2.13.* Adelaide SA: SA Government; May.

Kloeden CN, Ponte G, McLean AJ (2001). *Travelling speed and the risk of crash involvement on rural roads. Research Report No CR 204 for Department of Transport and Regional Services, ATSB*: Road Accident Research Unit Adelaide University.

Nilsson G (2004). *Traffic safety dimensions and the power model to describe the effect of speed on safety. Bulletin 221.* Lund Institute of Technology, Lund University, Sweden.

Office of Road Safety WA Government. Series injuries (2010): http://www.ors.wa.gov.au/TopicsRoadSafety/Pages/SeriousInjuries.aspx. Accessed 20 August 2010.

O'Hare M (2005). *Alcohol Interlocks as a Management Option for Recidivist Drink-Drivers. Road Safety Handbook*: Austroads

Oxley J (2005). *Managing the safety of young pedestrians and cyclists. Road Safety Handbook*: Austroads.

Senserrick T, Ivers R, Martiniuk A, Clapham K, Lyford M, Grzebieta R. (2011a). *Indigenous Safe System Demonstration Project, Final report – Volume I: Literature Review and Methods*. Report to Austroads and the Indigenous Road Safety Working Group. The George Institute for Global Health, Sydney NSW; March.

Senserrick T, Yip P, with Grzebieta R, Ivers R, Clapham K, Lyford M. (2011b). *Indigenous Safe System Demonstration Project, Final report – Volume II: Audit and Implementation Plan*. Report to Austroads and the Indigenous Road Safety Working Group. The George Institute for Global Health, Sydney NSW; March.

Senserrick T, Yip P, Grzebieta R, Ivers R, Clapham K, Lyford M (under review). Implementing Safe System Research in Aboriginal and Torres Strait Islander Communities. 'A Safe System, Making it Happen'. Biannual conference of the Australasian College of Road Safety, Melbourne, 1-2 September 2011.

Sliogers J (1992). *110 Kilometre Per Hour Speed Limit – Evaluation of Road Safety Effects, Report No: GR 92-8.* Kew VIC: Vicroads.

Tingvall C, Haworth N (1999). Vision zero - an ethical approach to safety and mobility. *6th ITE International Conference Road Safety & Traffic Enforcement: Beyond 2000*. Melbourne VIC.

Woolley J, McLean A (2006). *Edge delineations. CASR Report No. CASR025.* Adelaide SA: Centre for Automotive Safety Research, The University of Adelaide; August 2006

Zou R, Richardson S, Grzebieta RH (1999). Occupant protection in side facing seats. 1999 Australian MADYMO users meeting, AVEA Engineering, Melbourne, June.