

Safety around roadworks. It's a two-way street.

Looking after roadwork safety – Main Roads experience

Neil Doyle
Main Roads, Queensland, Australia

Michelle Addison
Main Roads, Queensland, Australia

1 Introduction

Queensland is Australia's fastest growing state, with the population estimated to have passed 4 million in December 2005 (Department of Local Government, Planning, Sport and Recreation, 2006). Since 2004, around 1,400 extra people call Queensland 'home' each week.

The state is also experiencing strong economic growth, with business and industry investment high. Global demand and high commodity prices are spurring on resource sector growth. The construction industry is also strong in residential and non-residential properties. The value of residential construction work to be completed remains at historically high levels (Office of Economic and Statistical Research, 2006).

Annual road vehicle use (measured by distance travelled) is also high, and is expected to increase from 47.2 billion kilometres in 2002/03 to 68.8 billion kilometres in 2012/13. This is an increase of 45.7 per cent (Apelbaum Consulting Group, 2005).

With more people and a strong economy, the Queensland road system will play an even more vital role in connecting Queensland, now and in the future.

There are many demands on the road system. Around 80 per cent of Queenslanders live within 50 kilometres of the coast in urban environments, adding pressure on this part of the road network.

Freight moves across all parts of the road network and connects to other modes of transport and destinations. Many of the state's lucrative industries are located in regional and remote areas and they place significant demands on the network in getting products to markets.

To deal with the state's growth, the Queensland Government has embarked on a massive infrastructure program that includes transport. Transport infrastructure comprises 37 per cent of all capital outlays. In south-east Queensland alone, the government has committed \$66 billion in the region's updated infrastructure plan, of which \$42 billion (64 per cent) involves road and public transport projects (Leet, 2006).

Main Roads is tasked with delivering a record road construction program in excess of \$10.5 billion between 2005/2006 and 2009/10. Main Roads is responsible for around 20 per cent of the state's roads which carry more than 70 per cent of total traffic in Queensland.

Roads are busy places and roadworks are commonplace. With the increased road construction task come more road worksites. Congestion is already a problem in many urban areas, particularly coastal growth areas in central and northern Queensland as well as the south-east corner. It is likely that roadworks will add to congestion in some areas in the short-term, in order to achieve the long-term benefit of a better road system.

Few work places present as many risks as do road worksites. In built-up areas, speeding motorists, cyclists, pedestrians, construction vehicles, heavy equipment, attenuator trucks, road pavers and other workers all interact within the road construction site. In more remote areas, a roadworker may work alone and may not be visible, protected only by safety cones and lower speed limit signs. In this situation the worker is afforded little protection from a speeding vehicle or a large freight vehicle trying to reach a certain destination on time.

Roadworks in Queensland are undertaken by a number of organisations, including RoadTek (the commercial arm of Main Roads), local government and private construction companies working on major projects on behalf of the Queensland Government. From time to time, other parties many undertake works in the road corridor, such as telecommunication providers. This means that at any one time there could be hundreds of workers on the road. Roadworkers regularly report they experience road user abuse and poor driver behaviour as they undertake their jobs. Worksite safety is often compromised.

This paper outlines the approach being taken by Main Roads to address safety at roadworks. The paper reports on an external advertising campaign, internal policies, programs and practices in Main Roads, and research to address safety at road worksites. The approach taken recognises that worksite safety is a dual responsibility – that of the road user and the roadworker – and change needs to happen, both in driver behaviour and how the department manages worksite safety.

2 Roadwork facts

2.1 Road casualties

There has been considerable progress nationally in reducing the road toll. However, according to Safer Roads coalition (2006), each year on Australian roads there are more than 600,000 reported road crashes, 200,000 reported injuries as a result of road crashes, 22,000 serious injuries as a result of road crashes requiring long term care and treatment, and around 1,600 people killed in road crashes. The Safer Roads coalition estimate this costs the Australian community \$40 million every day or \$15 billion every year, a figure equivalent to Australia's defence budget, three times Australia's higher education budget, and 3 per cent of Australia's Gross Domestic Product.

2.2 Roadwork casualties

Australia has a relatively good safety record at roadworks, compared to the United States which experienced a 50 per cent increase in work zone fatalities between 1997 and 2004. In the United States in 2004, there were 1,068 work zone fatalities, representing 2.5 per cent of all roadway fatalities for the year (Federal Highway Administration, 2006).

In Queensland, police crash data shows that "reported" accidents, where roadworks were able to be identified as a contributing circumstance, have decreased over time. In 1995 there were 134 incidents reported involving either hospitalisation, medical treatment, minor injury and property damage. By 2005 total incidents had decreased to 24. The crash data supports the safety measures that have been put in place over the past decade, and is a trend which Main Roads wants to continue in an environment of increased construction. There is no room for complacency in the current road construction environment.

2.3 Driver behaviour at roadworks

While there are improvements, roadworkers, including traffic controllers, have reported increasing levels of poor driver behaviour at roadworks. This includes spontaneous driving-related acts of violence, spontaneous driver hostility and selfish driving. The Drugs and Crime Prevention Committee (2005 cited in Smith, 2005:5) identified person-related factors, situational factors, car-related factors and cultural factors as "factors it believed influenced the decision to act violently on the road to a greater or lesser extent. These factors include traffic congestion (Smith, 2005; AAMI, 2004).

With more vehicles on Queensland's roads and more roadworks about to take place, there is real potential for increased incidents of undesirable driver behaviour towards roadworkers.

Queensland roadworkers report:

- near misses as vehicles drive dangerously close to Main Roads' workers (57 cases reported in 2004) — these include failure to stop at a traffic controller's instructions, trucks not obeying signs, vehicles overtaking on the wrong side of the road, vehicles overtaking in a work zone, motorists colliding with Main Roads' vehicles, and erratic driving causing injury to line marker and brush cutter workers
- verbal abuse, with bad language often accompanied by rude body language
- projectiles and hurling objects with the potential to maim.

As Tasca (2000) notes, some behaviours may be viewed as criminal behaviour and are more appropriately dealt with through existing criminal statutes, rather than through traffic laws and road safety programs.

2.4 Speed at roadworks

Excessive speed through worksites is an ongoing issue. Monitoring by Main Roads and Queensland Police shows that drivers do not take speed limits seriously at roadworks, with the number of incidents on the increase.

For example, at one worksite greater than 15 per cent of vehicles travelled through it in excess of the designated speed limit over a given time period. Many vehicles travelled in excess of 30 kilometres above the speed limit, with some recorded travelling at least double the speed limit. There are many reasons why people speed and at roadworks. This is due, in part, to drivers not understanding that speed limits are enforceable, why speed limits are lower, the hidden dangers at roadworks and whether signage is correct.

2.5 Damage to property

In the south-east Queensland region, since 1998 there have been 22 reported incidents of third party vehicles colliding with attenuator "barrier" trucks. The cost for repairs/replacements was approximately \$500,000. Damage was also sustained to safety barriers, signage, equipment and safety cones.

3 Market research

Market research continues to be a valuable means to assess stakeholder levels of satisfaction with roads and identify issues about roadworks safety. The department regularly undertakes market research across Queensland with businesses and residents. In respect of roadworks, the research indicates that Queenslanders want:

- to be better informed about the road program – current and future
- improved communication and to be well informed about traffic delays such as roadworks, incidents and flooding
- disruption kept to a minimum during roadworks
- congestion reduced
- road signage removed once roadwork has finished.

When asked, participants indicated that they slowed down at road worksites, but rarely slowed to the limit. Many thought speed signs at worksites were only recommended limits and that 'ghost signage' occurred too often. As a result, they generally ignored road worksite signage. Participants indicated that enforcement of signed speed limits would make motorists obey the speed limit.

When asked how participants preferred to receive information about the department and its activities, the most popular methods identified were television, radio and the newspaper. Participants prefer to receive fact sheets, newsletters and mail-outs for local and generic issues and about projects in their community. Information technology such as variable message signs, internet information and hot lines are preferred for local issues, with internet information for a more general audience.

4 Consultation with key stakeholders

Main Roads initially consulted with roadworkers and project managers about their safety issues. They alerted senior management to a number of workplace health and safety issues. The department also consulted with Queensland Police and Emergency Services to discuss enforcement issues – for example, the need to have safe acceleration and deceleration zones and the need for correct speed signage to allow enforcement to take place.

The Royal Automobile Association of Queensland indicated that some members are frustrated with speed limits and incorrect signage, road users require better roadwork information to plan their trips, and would expect to experience roadworks in a similar way across both state and local government roads. The peak union bodies representing roadworkers continued to express strong concerns for the ongoing safety of their workers, the correct installation use of road safety barriers, erratic driver behaviour and contractors that do not comply with safety standards and compromise worker safety.

5 Review of mass media campaigns

The Monash University Accident Research Centre (MUARC, 2004) review of mass media campaigns in Australia and elsewhere found that the use of persuasive, emotive messages and a combination of public relations and associated publicity ensures a more effective campaign.

A difficulty with safety campaigns is the attempt to change behaviour rather than encourage consumption of a new product or a change to a new brand. For example, drivers may perceive little or no relevance to adopting behavioural change and their direct experience may run counter to the evidence being presented (Global Road Safety Partnership, 2002). A driver who regularly speeds through roadworks and has not had an accident due to, for example, loose stones or a heavy works vehicle entering the road area, does not necessarily accept that the risk applies to him/her.

6 Main Roads' approach

In addressing roadwork safety, Main Roads looked at the issues raised above and successful approaches elsewhere. In their extensive review, Lonero *et al* (1995) described past efforts to change road user behaviour focused on four practical approaches - legislation, enforcement, reinforcement and education. They concluded that each of these approaches works better when used in conjunction with one or more of the others.

It was determined that a media campaign on its own will likely have only modest impacts on attitudes and behaviour. To achieve the best safety outcome, other interventions would need to take place and be combined with visible government support and community support, including enforcement.

The department developed a successful submission to the Queensland Government Cabinet Budget Review Committee to undertake an external advertising campaign. The campaign will run for five years with a budget of \$1 million per annum to address safety at roadworks. In the submission the department recognised that both roadworkers and road users must be involved in addressing safety together, as safety is a joint responsibility. The ultimate goal is to get the best safety outcome for roadworkers and road users at road worksites.

6.1 Marketing

A fundamental objective of social marketing is to influence behavioural change, not just the marketing of ideas. Some behaviours are much more resistant to change than others. Therefore, influencing behavioural change is complicated, difficult and takes time. The department recognises that achieving changes in road user behaviour will need a collaborative multi-agency approach, introduced and applied gradually and consistently over time.

Social marketing focuses on social objectives, such as health, quality of life and safety. The approach taken by Main Roads is to recognise that we, as road constructors, and the driving public need to change to achieve improved workplace safety outcomes.

Often people equate promotion with marketing. However, they are not the same, and promotions alone are never enough to create social change. Advertising and public relations are just two parts of the mix. The approach the department is taking is two-pronged:

- External — social marketing, education and enforcement
- Internal — consistent systems, processes, signage, information, reporting.

6.2 A challenge

While it is true that motor vehicles are now safer through the introduction of seatbelts, airbags and anti-lock brakes, it could be argued that combined with advertising communication, a false sense of driver security may have developed. There is some evidence that when inside their car, some drivers consider themselves protected from the external environment. This presents a challenge for the development of workplace campaigns that aim to highlight the risks associated with travelling near and through roadworks.

Other commercial advertising and the advertising of car and tyre manufacturers promote the safety benefits of their product and social marketing advertising has to compete equally with them. If drivers now believe they are safe in their vehicles, the task for marketers is to remind people of the everyday risks that still exist on the road.

Drivers may consider themselves safe within their vehicles and as consumers of the road network, have established an expectation of their on-road experience. Approaching roadworks for example, creates an interruption to the journey and fails to provide the "instant gratification" the consumer seeks. It is difficult for a driver to link the present inconvenience of road worksites with the long-term benefits of improved road conditions. Ultimately, the short-term benefit of obeying safety rules at roadworks is that the driver will arrive at their destination safely.

A successful roadworks campaign, therefore, should aim initially to address the 'short-term' or 'instant' benefits or consequence of a driver's actions in road worksites and challenge the view that "our car is our castle". Drivers are not completely protected from the external environment, even with the best of vehicles and road engineering. A campaign should also reinforce good driver behaviour at roadworks and the benefits of this.

7 External advertising campaign

The current campaign takes a workplace health and safety approach to roadwork safety. The approach taken will outline what Main Roads must do to ensure roadworks are safe, and what road users must do to ensure their safety and the safety of roadworkers.

7.1 Key message

The campaign has a clear and simple message that is credible and designed to build empathy for roadworkers. It helps road users connect with and identify that roadworkers are real people within the community who have an important job to do. The key message is:

"Slow down. Safety around Roadworks. It's a two-way street."

The message creates an expectation for the government to properly meet its responsibilities, while giving drivers personal responsibility for their own safety at roadworks.

7.2 Campaign objectives

Over five years, the campaign will aim to:

- raise awareness of safety issues around roadworks for road users and roadworkers
- raise awareness that drivers are breaking the law and could be fined when they do not obey the speed signs around roadworks
- encourage people to plan their journey and allow more time when there are roadworks on route
- change attitudes to roadwork safety issues, by improving public acceptance of roadwork safety messages
- influence driver behaviour as part of a broader package of measures, including enforcement and engineering design.

The campaign signals to roadworkers that the department cares about their safety. It signals to road users that roadworks are vital for future traffic flow, that they need to slow down and take care, plan their journey and allow more time. It also signals that roadwork speed limit signage is enforceable.

7.3 Target audience

7.3.1 Initial audience

The initial primary target audience is all drivers in Queensland, as roadworks affect both urban and remote/rural drivers of all age groups. In the first round of advertising, the main objectives are to raise awareness and to communicate the need to take more care and slow down around roadworks.

7.3.2 Future audiences

In future, there will be a focus on narrowing the target audiences, recognising that drivers fall into different generations and the motivations behind their behaviours will differ. For example, research shows that young drivers are most likely to react to other motorists and exhibit anti-social driving tendencies (AAMI, 2004). With road user aggression and speeding through roadworks a key problem for roadworkers, an opportunity arises to pay particular attention to this target group.

Another potential target group are older drivers, who are more likely to have eyesight difficulties and benefit directly from improved roadworker visibility and media approaches that raise awareness of visibility issues. Research currently underway between Main Roads and the Queensland University of Technology (see Section 10 in this paper) will assist in improving visibility of roadworkers. Improvements to road signage currently underway by Main Roads take into consideration the requirement for appropriate colours, font size and layout.

Caravan and motorhome drivers are yet another significant target audience. According to the Caravan and Camping Industry Association, up to 80,000 caravanners are travelling Australia at any one time on extended tour (Adria, 2006). An estimated 17,000 caravans will

be sold in Australia in the next 12 months and 80 per cent of those will be bought by people aged over 50.

The "Grey Nomads" have become a recent phenomenon in the tourism industry, with baby boomers regularly travelling the road network as part of their lifestyle. Ensuring their safety while travelling and towing vehicles around roadworks, and providing information to better plan their trips will be essential. In June 2006, the department participated in the Caravan, Camping & Touring Holiday Show in Brisbane. Visitors to the Main Roads display expressed the need for improvements to, and consistency of, roadwork signage. They also identified there was a need to access "real-time" information to help formulate travel plans.

Research shows that work-related road crashes account for 30 per cent of all fatalities, making up the most common types of work-related deaths in Australia. Two out of every three vehicles on the road make a work-related trip. Many drivers who use their work vehicle may be on tight schedules and will be targeted in the future. It is expected that they may be more likely to respond to messages that discuss the consequence for speeding through roadworks (for example, a crash, broken windscreen, speeding ticket/loss of merit points, injury to roadworker and/or driver).

7.4 Creative approach

The campaign takes two creative approaches.

The first approach aims to raise awareness of the road construction task ahead and long-term plans for Queensland's roads put in place by Main Roads to support growth.

The advertisement is set in a Main Roads' traffic control centre, supported by images of major projects happening across Queensland (see Figure 1). The advertisement alerts road users to take extra caution with the significant roadworks Main Roads will be undertaking over the next five years to meet the rapid growth happening in Queensland. The key message from this advertisement is for motorists to heed the directions of roadworkers who are working to ensure "a better road system is just around the corner."



Figure 1: Main Roads' Traffic Control Centre

The second approach features a Main Roads' RoadTek roadworker (See Figure 2). This is to stimulate empathy for the roadworker by having the worker plead their case, and by reminding the audience that roadworkers are regular everyday members of the community with a job to do. The roadworker spells out the words "Slow Down" with the safety cones to remind road users of what they need to do (see Figure 3).



Figure 2: Roadworker image from campaign



Figure 3: Campaign safety cone message

7.5 Media strategy

The media strategy takes a structured multi-media mix in order to effectively communicate the safety message in environments that are newsworthy and credible and most likely to build empathy. There is state-wide coverage, with more concentration in the south-east corner where around two-thirds of the population live and the significant bulk of the roadwork program is planned.

Television is being used for mass coverage and radio is being used to tactically support the television campaign.

In determining placement, initial research on motorists showed that Monday to Friday placement of radio advertisements offered the opportunity of greatest reach for the target audience between 5.30am and 8pm, with metropolitan radio the dominant media across the day. Optimal levels to reach the target audience for commercial television are achieved from 5pm to 11pm. The media schedule reflects this research.

7.6 Traffic reports

Main Roads is working with the Australian Traffic Network to provide regular traffic reports that include the roadwork safety message. Three messages have been provided for the reports:

- Roadwork hazards are not always visible to motorists. Please slow down for everyone's safety.
- If roadworkers are out during peak hour, it's for a very good reason. Please slow down for everyone's safety.
- Please slow down and be patient around roadworks. Remember, safety around roadworks. It's a two-way street.

7.7 Outdoor

Outdoor is a secondary, but important, support medium to the television and radio elements. Sites are strategically chosen based on location, timing of roadworks and availability. Similar to radio, the message will be communicated to the driver's mindset (driving a vehicle) that is most conducive to encouraging behavioural change.

The billboard reaffirms the dual nature of safety at roadworks to reinforce the message “We put these out for your safety and ours” (see Figure 4). The department has purposely shown the cones as a safety device to signify ownership of these in the advertising domain. This is because in the recent past, some advertisements have used the cones to show cars speeding and weaving through them, an issue for roadworkers who have indicated that this happens from time to time at roadworks.



Figure 4: Billboard advertising

7.8 Variable message signs

Variable message signs have been utilised in south-east Queensland over the past three months to display four key messages to motorists:

- Roadworks safety. It's a two way street.
- Please slow down around roadworks.
- Please be patient around roadworks.
- You slowed down around roadworks. Thank you.

Initial feedback to the department has been encouraging, with the feedback being that positive messages to drivers are favourable.

7.9 Internet presence

An estimated 77 per cent of Queenslanders now have access to a computer at home, 67 per cent have internet at home and an estimated 42 per cent prefer to use the internet to find out information about government services, laws and policies (Queensland Government, 2005).

Coupled with our market research findings around stakeholder requirements for provision for more communications, the department's website is being reviewed to provide an improved stakeholder focus. Information about the campaign will be provided, along with real-time and up-to-date information about roadworks and road closures to enable motorists to better plan their trips.

7.10 Events, merchandising

Promoting roadwork safety at community events has been an important element of activity in 2005 and 2006. This has included the annual Royal National Association (RNA), the Caravan, Camping & Touring Holiday Show, regional events and LexMark Indy. Main Roads has also produced vehicle litter bags with the message "Slow Down at roadworks for everyone's safety."

7.11 Educating young people and future drivers

Educating future drivers is an important element of any campaign about roads. Main Roads has developed a variety of materials that promote a roadwork safety message targeted at different age groups. For primary age children these include electronic games, flashing lapel lights, book marks, word games, and a travel activity book "Are we there yet?"

For new drivers the department has incorporated roadwork safety into Queensland Transport's "Your keys to driving in Queensland"; a publication that combines essential information about the Queensland driver licensing system and road rules (Queensland Transport, 2005).

Other initiatives are being explored that target different age groups and will be implemented over the duration of the campaign.

8 Internal initiatives to support safer roadworks

8.1 Improvements to systems and processes

In response to a whole-of-government workplace health and safety audit in 2005 and as part of the department's recent internal realignment, a Safer Workplaces Audit Implementation Plan was developed. This was endorsed by Main Roads' senior management group in December 2005 and involves integrating workplace health and safety (WHS) planning into strategic and business plans. It includes WHS objectives in achievement plans, performance management plans and conducting a department re-audit in 2006.

In 2005 the department's senior management group endorsed a number of proposals to ensure that the health and safety of staff is a core value within the department. Included in the endorsed proposals, was a single safety program for the department covering both its corporate area and commercial arm, RoadTek. This is a development project to be run over two years, with a project manager appointed to lead the change. The program manager will ensure:

- commitment and accountability at all levels
- integration of WHS in all aspects of business
- measurement and benchmarking
- a consistent and centralised safety program management and systems and policy.

8.2 Incident reporting

Leading into the campaign, incident reporting was highlighted as an area requiring improvement. In recent years Main Roads implemented a Road User Aggression Hotline for roadworkers to use. However, this has had limited success. While there is much valuable qualitative and anecdotal information about incidents at worksites, workers have expressed genuine concerns about having more suitable ways to report incidents as they happen and for receiving feedback about outcomes of issues from management.

As Tasca (2000) suggests, attempts to collide with, kill or injure workers may be more appropriately treated as a criminal act. There is a need to work with Queensland Police to document the extent of incidents more precisely. Once the evidence base is improved, efforts can then be made to devise appropriate strategies to reduce the extent of the problem. As Smith (2006) points out, there is no shortage of potential solutions, but care is needed in choosing measures that are proportionate to the extent of the problem.

8.3 Signage

Roadwork signs are legal and enforceable. For road worksites, signage represents a point-of-contact between Main Roads and customers – the road user. When drivers enter and leave roadworks, roadwork signage is one important way they judge Main Roads. Signage should provide an advanced warning, convey the correct speed limit for motorists to obey and help to efficiently guide traffic through, around or past the work area to minimise confusion and risk. Signage should also indicate the end of roadworks and confirm when normal speed limit can be resumed.

It is understood that improved and consistent signage may well be one of the most significant issues to be addressed. For a safety campaign to be accepted by the audience, the consumer's experience within the risk environment must emphasise the legitimacy and importance of safety regulations. The implementation of reduced speed signage, for example, must also be supported by real evidence of safety risks for a driver to view them as significant enough to alter behaviour. The introduction of "explanatory" signage should aim to modify driver behaviour through reinforcement and by providing practical motivation.

Road users have highlighted their frustrations with roadwork signage in departmental and other market research. With RoadTek, local government, private construction companies and third parties all working in road corridors, consistent and credible roadwork signage is an ongoing priority and issue for Main Roads. Erection and removal of roadwork signs is also of particular importance, if effective enforcement is to take place. Queensland Police need to know that the speed limits are correct and suited to the changed road conditions.

The department has undertaken audits of roadwork signage and traffic management as part of an ongoing improvement process. A number of areas for improvement have been identified, including erection and removal of signage, correct covering of signage, improvements to staff training and greater awareness of the Manual of Uniform Traffic Control Devices (MUTCD). Main Roads is taking a lead in addressing signage and this will be a key priority for the department.

A suite of roadwork signage is being developed that conveys not only budget and timing of projects, but the outcome of the roadwork. Other signs will include the safety cone images used in the campaign to reinforce the safety issue at roadworks. This is work in progress and example of signs under review are shown in the figures below.



Figure 5: Draft project signage

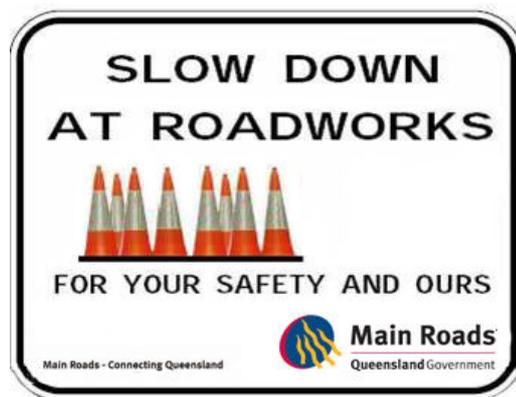


Figure 6: Draft roadwork safety signage

8.4 Involving roadworkers and contractors

Achieving improved safety outcomes around roadworks must also involve roadworkers and contractors undertaking work on behalf of the Queensland Government in developing and implementing workplace health and safety initiatives.

An ongoing activity throughout the five-year campaign will be education and awareness raising activities with road workers and contractors about the effects of worksite practice on driver behaviour. For example, the motoring public may well question the enforceability and need for speed limits when roadwork vehicles do not keep to the speed limit in workzones.

Initial awareness-raising sessions have been undertaken on workplace health and safety and support from roadworkers is strong. Roadworkers recognise they also have a responsibility to contribute to safer worksites and that their actions can impact on road users (for example, using appropriate and consistent signage in and around roadworks, 'ghost signage', speeding through worksites counter to speed signage).

9 Taking a collaborative approach

Initially, the campaign is targeted at Main Roads' worksites. However, the department will also work closely with local government, private contractors and third parties undertaking activities in road corridors (for example, utility providers, electricity, gas). The relationship with local government will be critical, as road users do not differentiate who owns the road and would seek to experience roadworks in the same way across Queensland.

Addressing workplace health and safety issues at roadworks needs a multi-agency, multi-organisation approach that includes relevant Queensland Government agencies, local government, peak road user bodies, the road construction sector and unions. Main Roads is establishing a taskforce to deal with this.

A protocol has been established formalising agreement for an ongoing cooperative relationship between Main Roads, Queensland Police Service and Queensland Transport in respect of traffic and road use management. Under the agreement, participating agencies: provide a whole-of-government view to respective Ministers on optimal use and performance issues of the road system; consult with other agencies in developing policy; participate in joint forums to facilitate planning and decision making; coordinate external relations

management of major issues in which all agencies have involvement; consult on matter of mutual interest; and consult and where appropriate agree on actions or decisions that significantly impact on other agencies.

In addition, the Director-General of Main Roads has initiated regular industry and key stakeholder roundtable meetings, including unions, as a forum to discuss a number of issues, including roadwork safety.

A further initiative is the safety of government vehicle drivers. Over 13,000 government vehicles are on the road throughout Queensland, with the number of potential drivers being significantly greater. As part of ensuring government drivers do not experience work-related crashes, Main Roads will be working closely with QFleet, the Queensland Government's fleet vehicle arm, to promote positive driver behaviours and reduce the risk of injury.

Finally, a roadworker safety reference group has been established to progress resolution to issues raised in this paper and provide advice to senior management on new technologies and traffic management and control issues.

10 Research

Roadworker visibility is an ongoing issue due to vulnerability to injury from traffic. In 2005 Main Roads partnered with the Queensland University of Technology on an Australian Research Council project. The project is investigating ways to improve the visibility of roadworkers (including police and emergency personnel), as well as pedestrians and cyclists.

The research is using survey-based approaches to determine visibility problems experienced by roadworkers, the effectiveness of visibility aids; vulnerable road user perceptions of their own visibility and that of others, driver perceptions and behaviour towards roadworkers, cyclist and pedestrians, and the effect of these factors on drivers, pedestrians, roadworkers and cyclists.

The project is being undertaken in two stages. Stage One involves a sample of roadworkers, cyclists, drivers and pedestrians completing a questionnaire. The issues being investigated in this stage include:

- roadworkers — emergency personnel's previous experience and attitudes towards their own visibility, use of visibility aids, perceived usefulness, estimated distances.
- pedestrians and cyclists — beliefs regarding issues of visibility, especially under low light levels, visibility aids used and perceived effectiveness, distances at which they believe they are seen, lighting used, clothing and reflective materials.
- drivers — attitudes, perceptions and experiences of pedestrians, cyclists and roadworkers, visibility aids which make pedestrians and cyclist most visible and those that are confusing, suggestions for enhancing visibility.

Stage Two involves on-road studies that will investigate:

- roadworker and emergency personnel evaluation and estimated visibility of clothing configurations, optimal configurations
- pedestrian clothing configurations (actual versus estimated)
- cyclist visibility (lighting and clothing configurations)

- pedestrian and cyclist visibility assessed as a function of driver characteristics
- estimated pedestrian and cyclist visibility assessed as a function of pedestrian and cyclist characteristics.

Project outcomes will include:

- new information on the visibility of pedestrians, cyclists and roadworkers
- data on the optimisation of visibility aids based on a cost-benefits analysis coupled with risk-based assessment
- guidelines for improving the visibility and safety of roadworkers and other personnel who through their employment have greater exposure on road systems under reduced visibility
- recommendations for the design of new visibility aids to enhance visibility
- recommendations for road design standards that take account of visibility issues to improve the overall safety of the road system.

Main Roads expects that the research will benefit all road agencies and help contribute to targets for deaths and injuries identified in the National Road Safety Strategy (Australian Transport Council, 2000).

11 Evaluating the outcome

The campaign is in its early stages. An evaluation will be undertaken to measure the levels of awareness and assess, where possible, the degree to which the campaign has had an impact on behaviour or behavioural intentions. The department will also measure the relative effectiveness of different campaign elements (for example, television vs. radio, radio vs. press, and press vs. outdoor advertising).

The research will seek to measure short-term effects (such as, attitudes, beliefs, self-reported behaviours among key segments or target sub-groups) using periodic surveys, as well as long-term effects (such as, reported crashes/deaths, other third party data) using Queensland Police crash data, Workcover data and other available statistics.

However, it is recognised that sustainable driver behaviour change will take time to achieve and that any short-term changes should be treated cautiously, and surveys should be done well down stream (Global Road Safety Partnership, 2002).

Main Roads also acknowledges the difficulties associated with isolating the effect of the external campaign from an enforcement effect, a point raised by MUARC (2004) in their review.

12 Conclusion

Extensive road construction activity will take place in Queensland over coming years aimed at improving road congestion and providing a better road system. This will mean more roadworkers on the state's roads, and their lives will be potentially at risk unless motorists watch out for workers and obey road signage and rules. Equally motorists will experience changed road conditions and delays and their driving behaviour around roadworks may put them at risk.

Workplace health and safety remains an ongoing priority for Main Roads. Ensuring Queensland's roads are safe for all road users is also an ongoing priority.

In the next phase of the campaign over 2006-2007, Main Roads will build on the awareness raised by the first phase. This may include responsibilities for injuring a roadworker or vehicle occupant, exposing the pain and anguish of accidents at roadworks, or highlighting the enforcement consequences of a failure to obey speed signage. The choice will be made based on a review of the initial phase of the campaign, consultation with key stakeholders, and an evaluation of the effectiveness of other road safety and roadwork media campaigns in Queensland and elsewhere.

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