To:	1. A/ Senior Policy Manager (Vulnerable Road Users), Safer People Branch 20-06-08 25/6/08 mgilliott 2. A/ General Manager, Safer People Branch 3. A/ Director, NSW Centre for Road Safety
Cc:	1. Derek Wainohu, Test Laboratory Manager, Safer Vehicles Branch
From:	A/Senior Research & Policy Analyst, Safer People Branch
Date:	20-06-2008
Pages:	2
File no:	7M2609
Subject:	Bicycle helmets for preventing brain and head injuries

Memo

RTA

Maureen was A/Dir so did not sign brief again but signed letter.

Issue

Bicycle helmets for preventing brain and head injuries.

Background

Recent correspondence from Mr William Curnow refers to an article he has recently had published in the Health Promotion Journal of Australia which criticised the use of compulsory helmet wearing legislation in Australia as a means of reducing brain injuries to bicyclists (see **Attachment** A).

Mr Curnow is the President of the Cyclists Rights Action Group (CRAG). CRAG was formed in 1992, one year after the introduction of compulsory helmet wearing. The aim of CRAG is to oppose legislation compelling cyclists to wear helmets.

Comment

Curnow has written several previous articles based on the premise that bicycle helmets are designed on an inaccurate understanding of brain injury. He argues that diffuse injury to the brain resulting from angular or rotational acceleration is the main cause of brain injury for pedal cyclists, and that the increased mass of the head associated with wearing a bicycle helmet may increase the risk of brain injury.

Curnow's claims are not supported with epidemiological evidence. Case-control studies have consistently demonstrated the efficacy of helmets in reducing head and brain injuries in cyclists. The 1999 Cochrane Review[1] into helmets for preventing head and facial injuries in bicyclists found that helmets reduce serious head injuries by 63-88%. Atwell et al. [2] estimate that helmets reduce head injury by 60% and brain injuries by 58%. Further evidence of bicycle helmet efficacy is provided in population studies, many of which have demonstrated the effectiveness of bicycle helmet legislation in reducing head injuries.

More recently, research has been conducted to test whether brain injury is caused by angular or rotational acceleration, and the impact of wearing a helmet. King et al.[3] found that American football helmets have no impact on angular acceleration but significantly reduces linear acceleration of the head. St Clair and Chinn[4] tested a range of bicycle helmets to evaluate their potential to cause brain injury through linear and rotational acceleration. They concluded that helmets can provide life saving protection during typical linear impacts, with the ability to provide protection at high impact speeds

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[1] Thompson DC, Rivara FP, Thompson R (1999). Helmets for preventing head and facial injuries in bicyclists. *Cochrane Database of Systematic Reviews, Issue 4.*

[2] Attewell RG, Glase K, McFadden M (2001). Bicycle helmet efficacy: A meta analysis. *Accident Analysis and Prevention, 33,* 345-352.

[3] King AI, Yang KH, Zhang L, Hardy W (2003). *Is head injury caused by linear or angular acceleration?* IRCOBI Conference, Lisbon, Portugal.

[4] St Clair, VJM, Chinn, BP (2007). *Assessment of current bicycle helmets for the potential to cause rotational injury.* PPR213 TRL Limited, United Kingdom.

which would typically result in compound skull fractures and significant brain injury if not wearing a helmet.

They also concluded that levels of rotational acceleration of a helmeted head would be no more injurious than expected for a bare, non-helmeted head in the majority of cases. Their study did find, however, that there is the possibility that some helmets, in combination with particular size headforms, may have a small disbenefit with regards to rotational acceleration. They recommend consideration of an oblique impact test in bicycle helmet standards testing to ensure that they do not provide an increased risk of rotational head injury.

The manufacture and testing of bicycle helmets in Australia is governed by the Australian and New Zealand standard AS/NZA 2063 Pedal cycle helmets.

The Centre for Road Safety recommends forwarding a copy of Mr Curnow's letter to the CS-014 Pedal Cycle Helmets committee and request they assess the suitability of including an oblique impact test into the standard testing protocols for bicycle helmets. A letter has been prepared for your signature and is appended as **Attachment B.**

Recommendation

That you sign the attached letter to the SC-014 Committee, Standards Australia.

Arem Gavin
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NSW Centre for Road Safety, Safer People Branch