Attachment A

1. Background

At the direction of Coroner Audrey Jamieson, the Coroners Prevention Unit (CPU) prepared a summary of research undertaken on suicide in Victoria. Coroner Jamieson requested information on the following topics:

1. The nature and frequency of jump from height suicide in Victoria, in particular:
    a. jump from height suicide at the West Gate Bridge compared to other locations; and
    b. preliminary findings on the frequency and location of jump from height suicide and the frequency of rail suicide in Victoria since the construction of safety barriers on the West Gate Bridge.
2. The time line for planning and construction of safety barriers on the West Gate Bridge.

The data reported herein is derived from both closed cases (deaths for which the coroner has completed the investigation and made a finding) and open cases (deaths still under investigation by Victorian coroners) as at 21 June 2012. The data is therefore reported only on an interim basis and results may change as coroners complete their investigations.

2. Method

2.1 Definitions

Suicide was defined in accordance with De Leo et al. (2006)[1] as:

> *an act with fatal outcome, which the deceased, knowing or expecting a potentially fatal outcome, has initiated and carried out with the purpose of bringing about wanted change.*

2.2 Inclusion and exclusion criteria

[1] De Leo D, Burgis S, Bertolote J M, Kerkhof A J F M, Bille-Brahe U. Definitions of suicidal behaviour: lessons from the WHO/EURO multicentre study. *Crisis* 2006;27:4-15.

The inclusion criteria for a relevant jump from height suicide were that the death was reported to the Coroners Court of Victoria between 1 January 2000 and 21 June 2012 and:

- the coroner's death investigation was complete and the coroner made an explicit finding that the death resulted from jump from height suicide.
- the coroner's death investigation was complete, no explicit statement as to the deceased's intent was made by the coroner, however there was sufficient evidence that deceased's actions were consistent with jump from height suicide[2].
- the coroner's death investigation was underway, however the available information from the police report of death to the coroner and results of the post-mortem examination offered sufficient evidence that deceased's actions were consistent with jump from height suicide.

The inclusion criteria for a relevant rail suicide were the same as stated above.

If the coroner stated that they were unable to determine the deceased's intent, the case was excluded.

2.3 Case identification

Deaths were identified from searches of the Coroners Court of Victoria Local Case Management System (LCMS) and the CPU Surveillance Database to identify all coroner-determined (closed case) and probable (open case) suicides investigated by the Coroners Court of Victoria between 1 January 2000 and 21 June 2012. The CPU conducted supplementary searches using the National Coroners Information System (NCIS). Each death returned by any search was reviewed to determine whether it met the inclusion criteria.

2.4 Data collection

For each death that met the inclusion criteria, information from the LCMS was reviewed, along with the results of the post-mortem examination and coroner's finding. The year the death occurred and the location incident were recoded in Microsoft Excel to produce a unit record dataset for analysis.

2.5 Data analysis

[2] The *Coroners Act 1985* or *2008* (Vic) does not require coroners to find on intent.

Microsoft Excel was used to perform a descriptive statistical analysis of the annual frequency of jump from height suicide by location and annual frequency of rail suicide.

3. Results

3.1 The frequency and nature of jump from height suicides in Victoria

Jump from height accounts for a small proportion (approximately 3-5%) of all suicides annually in Victoria. Jump from height consistently ranks fifth of twelve separate suicide methods classified after hanging, poisoning, firearm and moving object[3]. During the period 1 January 2000 to 21 June 2012, 313 jump from height suicides were identified in Victoria.

Strategies for reducing the incidence of jump from height suicide at Bridge locations have focused on restricting access to the Bridge or parts of the Bridge. The most commonly advocated and widely studied approach is to restrict access to the edges of the Bridge via the construction of a physical safety barrier. [1-5] Barriers have been found to be highly successful at preventing suicides at the site, and do not appear to cause any shift in suicide to other jumping locations. [2, 4, 6-8] A variation on this approach is to erect nets projecting out from below the Bridge, [9] though this is only suitable in some locations. Other suggested strategies include, where practical, banning passenger vehicles from travelling in the lane closest to the edge of the Bridge. [1]

Turning to interventions that are not predicated on restricting access, two main strategies have been proposed. The first strategy is to encourage media not to report on suicides by jumping. A broad range of research indicates that reporting the method of suicide generally is linked with further such suicides, [10-13] and there is some evidence for such an effect in the case of jumping suicide specifically. [9, 13] The second strategy is to install free telephones linked to a help line at the site of high-frequency jumping suicide locations; [8] the efficacy of this particular intervention has not been empirically established.

[3] These methods are adapted from the International Statistical Classification of Diseases and Related Health Problems (ICD10).

3.2 The frequency of jump from height suicides compared to other locations in Victoria

Of the 313 jump from height suicides identified in Victoria, 104 (33.2%) were from the West Gate Bridge and the remaining 209 (66.8%) were from other locations.

3.3 The frequency and location of jump from height suicide in Victoria since the construction of safety barriers on the West Gate Bridge

An examination of all jump from height suicides (n=313) showed that 246 occurred prior to the construction of safety barriers on the West Gate Bridge. Following the construction of safety barriers on the West Gate Bridge, 67 jump from height suicides have occurred (Figure 1). Given the short post-intervention period to date and part-year data, there are limitations with attempting to draw any reliable conclusions regarding the effect of the safety barriers on the frequency of jump from height suicide. However, preliminary analysis reveals that the average annual frequency of all jump from height suicides during the pre-intervention period was 26.2; which dropped to 21.7 in the post-intervention period[4]. This suggests that the temporary safety barriers have contributed to a decline in suicide by this method.

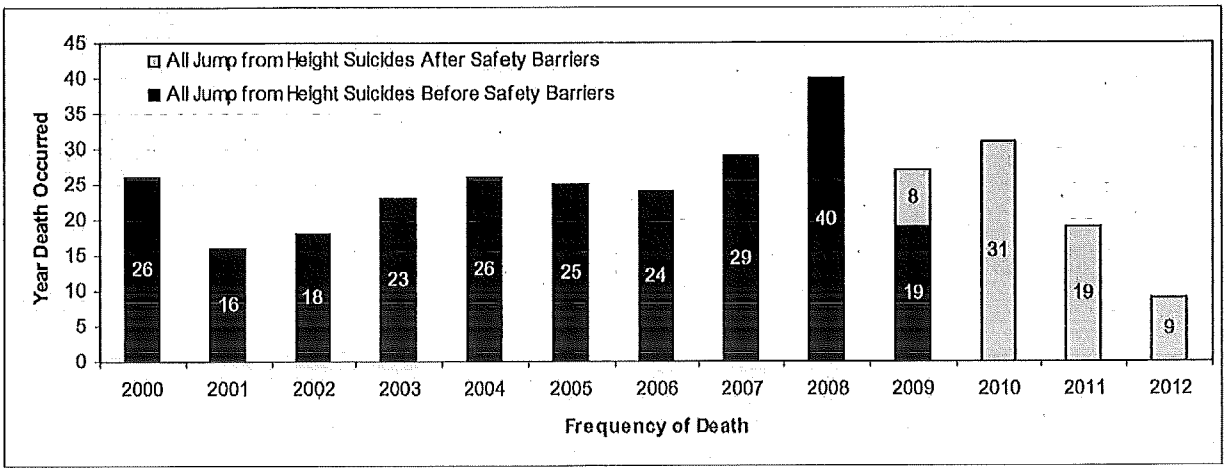

Figure 1: Annual frequency of all jump from height suicide before and after the construction of safety barriers on the West Gate Bridge, Victoria 1 January 2000 - 21 June 2012

When this finding was examined by location, jump from height suicides at the West Gate Bridge declined sharply after the barriers were put in place; the average annual frequency of

[4] The average annual frequency for pre-intervention jump from height suicides was calculated as follows. The total number of suicides in the pre-intervention period was divided by the number of months in the period (113), and the result multiplied by 12. A similar calculation, mutatis mutandis, was conducted for suicides in the post-intervention period (37 months up to June 2012).

suicides at that location dropped from 10.5 pre-intervention to 1.6 post-intervention (Figure 2). However, this was partially off-set by a rise in the average annual frequency of jump from height suicides at other locations, from 15.6 pre-intervention to 20.1 post-intervention (and Figure 3).

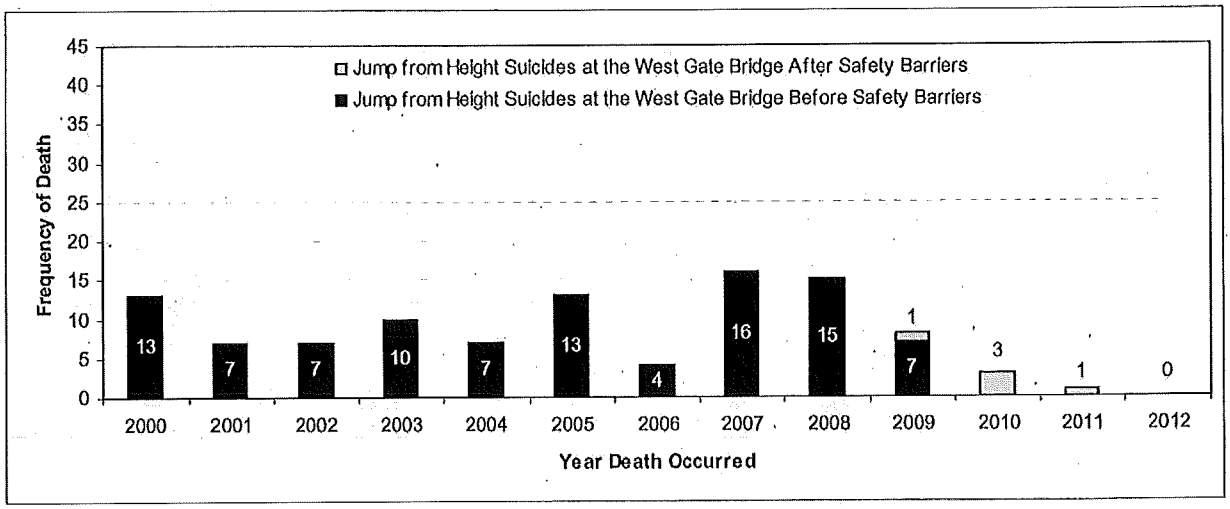

Figure 2: Annual frequency of jump from height suicide at the West Gate Bridge before and after the construction of safety barriers on the West Gate Bridge, Victoria 1 January 2000 - 21 June 2012

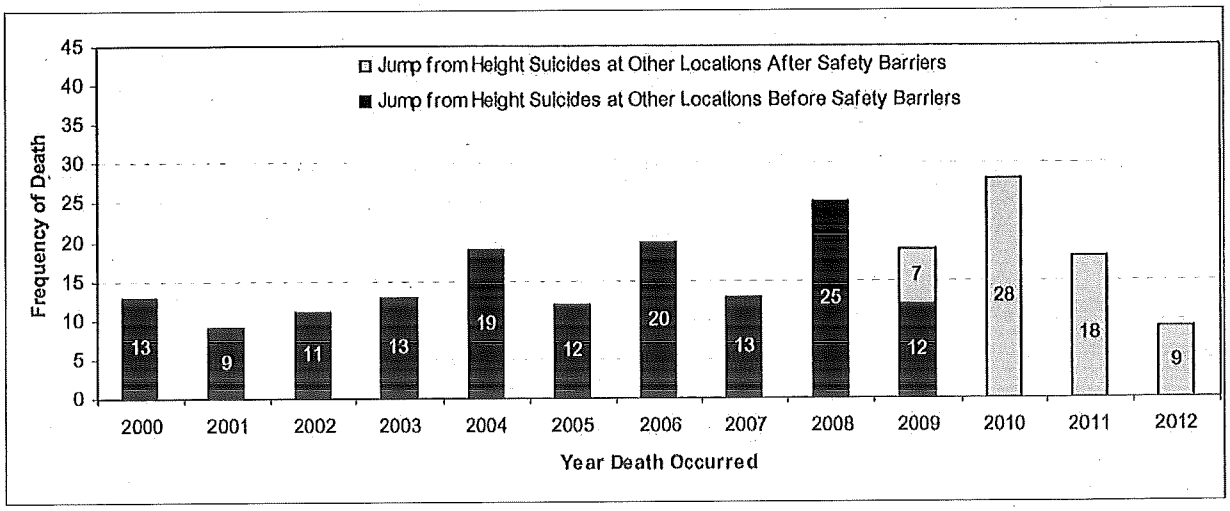

Figure 3: Annual frequency of jump from height suicide at locations other than the West Gate Bridge before and after the construction of safety barriers on the West Gate Bridge, Victoria 1 January 2000 - 21 June 2012

3.4 The frequency of rail suicide in Victoria since the construction of safety barriers on the West Gate Bridge

In February 2012, a concern was voiced in the Victorian media that rail suicides in regional areas had dramatically increased after safety barriers were installed on the West Gate Bridge. This inferred that the safety barriers have resulted in a shift from jump from height suicide to rail suicide[5].

To examine whether the coronial data supports this link, all rail suicides reported to the Coroners Court between 1 January 2000 and 20 June 2012 were identified. There were 419 rail suicides, with 317 occurring prior to the construction of the safety barriers on the West Gate Bridge and 102 occurring after the safety barriers were installed. Re-expressed as average annual frequencies, there were 33.7 rail suicides per annum on average in the pre-intervention period and 33.1 rail suicides per annum in the post-intervention period. These findings do not support the contention that the West Gate Bridge safety barriers have resulted in a shift to rail suicide in Victoria.

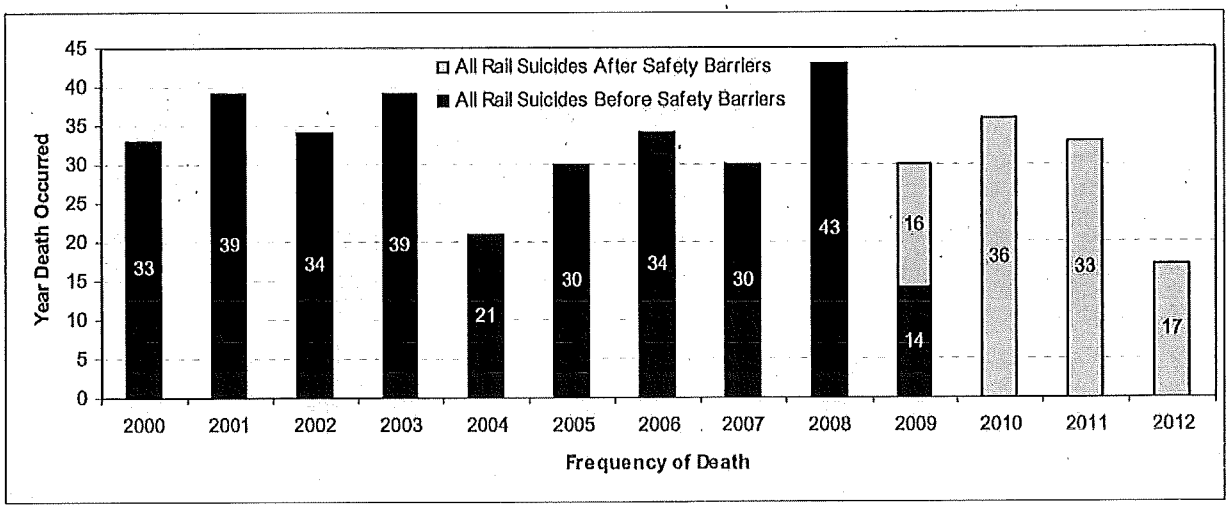

Figure 4: Annual frequency of rail suicide before and after the construction of safety barriers on the West Gate Bridge, Victoria 1 January 2000 - 21 June 2012

3.5 Timeline for planning and construction of safety barriers on the West Gate Bridge.

In 2004, a report on West Gate Bridge suicides was prepared for Victorian coroners by the then suicide research officer at the State Coroner's Office (now Coroners Court of Victoria). The major findings of the report were that:

- there is clear evidence that erecting safety barriers on a Bridge prevents people from using that particular structure as a site for suicide;

[5] See for example Tim McIlroy, "Increase in V/Line rail suicides", The Courier, 15 February 2012

- evidence provided by engineers contracted to VicRoads to review safety issues on the West Gate Bridge suggests that installing safety barriers is structurally feasible;
- evidence suggests that not all those who suicide would use a different means if they were unable to suicide using their first preference; and
- a significant proportion of Victorian suicides are impulsive acts, and measures restricting access to the means of suicide may reduce the extent of those suicides that are impulsive acts.[14]

Coroners referred to this report in eight West Gate Bridge suicide findings between 2004 and 2006. These findings included repeated recommendations that expert agencies consider the erection of safety barriers to prevent further such suicides from occurring. Following these recommendations, the West Gate Bridge Strengthening Alliance (WGBSA) was formed with VicRoads as its chair. The WGBSA voiced two central concerns around erecting safety barriers: (1) movement of the problem to another location; and (2) how erecting barriers would impact the structural stability of the West Gate Bridge.

The coroners shared the WGBSA's concern that erecting safety barriers on the West Gate Bridge might relocate the suicide problem to another Bridge. To clarify this potential risk, VicRoads commissioned an expert review of the scientific research evidence from the University of Otago on prevention strategies for jump from height suicides from other landmark sites around the world. In the 2007 confidential report, it was concluded that safety barriers and other measures to impede access to jump sites clearly reduce suicide from those sites, and there is no evidence to suggest that there is a corresponding increase in suicides by jumping from other sites. In response to the second concern, the WGBSA determined that the sides of the West Gate Bridge needed to be strengthened before safety barriers could be installed. In 2007, VicRoads commissioned a detailed structural analysis to establish how this strengthening would be achieved.

The research study findings and the results of the structural analysis formed the basis for VicRoads to recommend to the Victorian Government that the West Gate Bridge should be strengthened and that safety barriers should be erected. In January 2008, the Victorian government announced a $120 million strengthening project for the West Gate Bridge, [15] which was expected to be completed by mid 2011. This project was not explicitly linked with safety barriers and suicide prevention (the media release only mentioned traffic flow and

future traffic volumes), but the works would sufficiently strengthen the West Gate Bridge to allow the subsequent installation of safety barriers.

In early 2009, VicRoads were preparing to make a case to the Victorian Government regarding funding for the installation of West Gate Bridge safety barriers after the strengthening works were completed. However, this process was in a sense pre-empted by two high-profile fatal incidents at the West Gate Bridge in June 2008 and January 2009, which resulted in further widespread urgent calls for safety barriers to be constructed. The Victorian Government and VicRoads responded to these calls by introducing a number of preventative strategies to mitigate West Gate Bridge suicides.

With Victorian Government support, in March 2009 VicRoads implemented a combination of prevention measures at the West Gate Bridge. These are summarised in Table 1.

Table 1: Summary of West Gate Bridge interventions

1. Temporary public safety barriers	The purpose of temporary public safety barriers was: (a) to provide separation between the cars and the 200 workers due to be engaged in strengthening works beginning June 2009, and (b) a temporary measure to prevent suicide. These barriers vary in height from 2.0 to 2.4 metres. The timeline for installation of these barriers was: - April 2009 – Concrete barriers installed over the full length of the West Gate Bridge. - May 2009 – Wire fencing was installed on top of the concrete barriers. - June / July 2009 – Razor wire loops were installed on top of the wire fencing. Emergency Services access gates (fitted with DISPLAN locks) installed. - January 2010 – Three strands of barbed wire installed above the razor wire loops. Vehicle access gates fitted with locking bold mechanism (in lieu of chains) as well as small aperture wire mesh (in lieu of chain mesh fencing). Works on installing temporary safety barriers in both the inbound and outbound emergency lanes began in April 2009.
2. Permanent public safety barriers	A design for permanent safety barriers was finalised in March 2010 at

		which stage most of the structure for attaching the barriers was also completed. The Coroners Court of Victoria was advised by VicRoads on 9 May 2012 that the permanent safety barriers were complete and operating as intended.
3. Night time security patrol		A continuous circuit patrol across and below the West Gate Bridge by VicRoads.
4. Closed Circuit Television (CCTV) monitoring		Increased use and monitoring of the West Gate Bridge using CCTV technology.

4. References

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