



Photo credit: <http://transcityjv.com.au/>

LEGACY WAY TUNNEL - BRISBANE, QLD

BACKGROUND

Legacy Way is a 4.6km road tunnel connecting the Western Freeway at Toowong with the Inner City Bypass (ICB) in the suburb of Kelvin Grove in Brisbane, Australia.

The twin two-lane tunnels include 37 underground cross passages, which connect Legacy Way's two tunnels every 120m to provide safe access between the tunnels in the event of an incident.

CHALLENGES

A critical question is how to ensure that motorists are able to find the emergency exits of the tunnel as quickly as possible if an emergency situation occurs. Tunnel areas can easily become congested (including smoke), so motorists then need quick access to spaces with ventilation and protection against dangerous smoke and heat.

Adequate human behaviour is a life threatening safety issue in time-stressed situations. Additional measures are required to reduce the time for motorists to locate and move to a Cross Passage Exit - despite feeling disorientated or with potentially impaired senses in the darkness and smoke.

RESULTS

- Independent trials in tunnels show that incorporating the locatable/directional sound at exit points improves successful evacuation in smoke impaired situations (visibility 1 -2 metres).
The trials, using the specific sound incorporated into the Clevertronics multi-function EXIT, showed that when participants stepped on the roadway one by one, most went straight to the nearest emergency exit; a success rate of 87%.
- Further studies have shown that some brain cells respond over 1,000% better when light and sound are used together. Combining the locatable/directional sound, used in the research studies, with strobed EXIT signage provides people with the optimal sensory cues for evacuation and ensures even faster evacuation time when compared to light or sound alone both in smoke conditions and no-smoke conditions.
- This solution and associated results achieved the desired outcome being sought by the tunnel operator, namely improving escape provisions to meet the highest modern safety standards.

SOLUTION

Clevertronics Strobing Exits and directional/locatable sound dramatically reduce the time for motorists to locate and move to a Cross Passage exit.

- **Install Recessed strobe fitting** onto the architectural panels either side of the cross passage doors at a height of 1.5m above the roadway. Strobes are activated via a switched active input from the Tunnel's Control System and do not include battery backup.

- **Install Multi-function Cross Passage Exit, Down Light, Strobe and Directional/Locatable Sounder unit** above the Cross Passage doors. The exit sign operates permanently and includes emergency battery backup. The downlight and strobes are activated under normal conditions by a switched active input from the Tunnel's Control System but also include emergency battery backup in the event of power loss. The Directional/Locatable Sounders are operated via a second switched active input from the Tunnel's Control System but do not include battery backup. The Directional/Locatable Sounders incorporate a sound referred to as "Dinner Bells" that is intuitively understood without additional explanation and includes the annunciation "EXIT Here".

