



Case Study

The 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 that was opened to traffic in June 2015.

The twin two-lane tunnels include thirty-seven 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.

Clevertronics as specialists in Emergency and Evacuation systems were contacted to discuss their product options that could be engineered into the overall solution.

The Challenge

If an emergency situation occurs, it is critical to have an evacuation system that ensures that motorists can find the emergency exits within the tunnel as quickly as possible. 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.

Human behaviour can become challenged in time-stressed situations and can become a life-threatening safety issue. Therefore, 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 dark and smoke-filled spaces.

The Solution

Strobing Exits and Directional / Locatable sound dramatically reduce the time for motorists to locate and move to a Cross Passage exit and Clevertronics were selected as the partner suitable product to assist in the evacuation system and Clevertronics were selected to provide these products.

Recessed strobe fittings were installed 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.

Project Name

Legacy Way Tunnel

Location

Brisbane, QLD, Australia

Industry Application

Transport

Project Type

New Emergency Lighting Installation

Year

2014

Number of Fittings

370

Contractor

MECCA

Product Range

L10 Lithium Nanophosphate

Multi-function Cross Passage Exits, Down Lights, Strobe and Directional/ Locatable Sounder units were installed above the Cross Passage doors. The cross passage exit signs operate permanently and include 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. incorporate A sound referred to as "Dinner Bells" that is intuitively understood without additional explanation and includes the annunciation "EXIT Here" is incorporated into the Directional / Locatable Sounders.



The Result

Independent trials in tunnels show that incorporating the locatable/ directional sound at exit points improves successful evacuation in smoke impaired situations (visibility one -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.

Find Out More

Legacy Way Tunnel is another quality project delivered by Clevertronics. If you would like further information about this case study or are interested in understanding more about Emergency and Exit lighting within your building, contact Clevertronics for a site audit, demonstration, and cost analysis report.