



**FUTURE
READY®**

Case Study



Image Courtesy of Level Crossing Removal Project

CAULFIELD TO DANDENONG LEVEL CROSSING REMOVAL

Project Overview

As part of the Victorian Government's initiative to improve public rail safety, 75 dangerous and congested level crossings are being removed across Melbourne by 2025.

The Caulfield to Dandenong (CTD) project involved replacement of nine rail level crossings by using an elevated rail design, including five new stations, upgraded signalling and power along 72km of track and creating 22.5 hectares of new vibrant linear parkland.

The project was delivered by a project alliance consisting of WSP, Lendlease, CPB Contractors and Aurecon together with Metro Trains Melbourne and the Level Crossing Removal Project.

WSP's role included the detailed design and construction phase design services, replacing the nine level crossings with 'rail-overs' where the rail line is elevated above the existing corridor. By using this type of design, road and rail are separated, eliminating major community barriers.



Image Courtesy of Level Crossing Removal Project

What Future Trends Did We Consider?

 Society	 Technology	 Resources
 Health & Wellbeing	 Digital Expectations	 Circular Economy
 Densification		 Water Scarcity

How Did We Consider These Trends?

Society



- **Health & Wellbeing** – keeping community at the heart of the design was at the very core of this project. Featuring a 'sky rail' solution, the CTD project provided the land surrounding five new stations and underneath the elevated rail sections to be repurposed to create station precincts and places of community value – playgrounds, walking and cycling tracks, dog parks, basketball courts and more.

Project designs were provided to Victoria Police, Metro Trains Melbourne, the local councils, Public Transport Victoria to be viewed through the Crime Prevention Through Environmental Design (CPTED) principles lens — natural access control, natural surveillance, and people's natural sense of owning the infrastructure.

Workshops were undertaken, and outcomes incorporated into the project design including new lighting strategies; pod buildings created instead of linear buildings to generate visual permeability; and small spaces were removed to make the stations as open as possible.

Designers opted to use more glass within the station concourses to improve view distances. Pillars were given rounded edges to help reduce blind corners. Soft landscaping and urban design elements were incorporated to remove hard surfaces and discourage graffiti. Community elements were integrated into the precincts, such as a nature play and outdoor gym area bordering the existing Noble Park skate park precinct. This further encouraged the community's sense of ownership.

- **Densification** – this was the first time (in Australia) that an elevated railway of this scale was built in a live rail corridor. The solution freed up a huge swathe of public land, which was transformed into 22.5 hectares of new parks, paths and open space. The land re-gifted to the community is the largest return of land to the people of Melbourne since the establishment of the Royal Botanic Gardens in 1846.

Technology



- **Digital Expectations** – the project team used state-of-the-art digital techniques to design and visualise the proposed works, manage program costs, and develop innovative methods for installing the overhead track structures while working around busy railway operations in a tight urban corridor.

Resources



- **Circular Economy** – our work avoided the need to excavate approximately 300,000 m³ of spoil and truck this material on local roads. We also reduced the number of truck movements (by up to 70,000) when compared to an open cut trench solution.
- **Water Scarcity** – we introduced water efficiency initiatives and improved stormwater management.

How Was Our Approach Better?

More than 2,000 residents live right up against the corridor boundaries and constructing through such densely populated areas brought new challenges that required the designers and constructors to seek technology not previously used in Australia. This was to ensure minimal disruption to the surrounding environment while delivering a result that would serve the needs of the growing local community.

The unique elevated design of the project meant that more advanced techniques in minimising operational noise needed to be developed. WSP collaborated with international experts at the Institute of Sound and Vibration Research Lab at the University of Southampton in the UK to develop complex analytical and computational models that could assess vibration levels.

WSP was able to make design decisions that alter how noise is generated throughout the rail corridor, supporting a more comfortable customer experience on the platform.

The Outcomes

The first of three sections of elevated rail opened in early 2018. As one of the first programs for removing 75 dangerous level crossings throughout Melbourne, the CTD project's successful implementation of rail-over methodology will be used on some of the remaining projects.

To date the project has attained 13 major industry accolades including:

- 2020 Australian Engineering Excellence Award – Caulfield to Dandenong Level Crossing Removal Alliance
- 2020 Rail Technical Society – Australasia's 2020 Biennial Project Award
- 2019 Consult Australia Gold Award – Sustainability in Design and Project Team Collaboration
- 2019 Infrastructure Partnership Australia – Industry Choice Award
- 2019 Infrastructure Partnership Australia – Government Partnerships Excellence Award

Overall, as well as reducing congestion, the project has improved safety for drivers and pedestrians, reunited communities and created lasting benefits such as new open space and art, cultural and sustainability features.

For More Information

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