

# Newcastle Light Rail

## Project detail

### DURATION

The project began in August 2016 and was handed over for commercial operations in February 2019

### PROJECT PARTNERS/STAKEHOLDERS

#### Lead agency:

Downer EDI Works Pty Ltd

#### Main contractors:

- WSP | Parsons Brinckerhoff & Aurecon Joint Venture
- Robson Civil Projects Pty Limited
- Rhomberg Rail Australia
- Daracon Group
- 4Tel

### CONTRACT VALUE

\$252M AUD

### CONTRACT TYPE

Managing contractor

### DESCRIPTION

The Newcastle Light Rail (NLR) project is one of the most innovative and complex transport projects within Australia, and the first full catenary-free (wire-free) system in the southern hemisphere. The NLR has quickly gained world-wide attention for its revolutionary onboard energy storage system and rapid charge systems located at each of its six stations.

Downer EDI Works (Downer) completed the track, maintenance depot, tram stops and electrical infrastructure, recording one million-man hours from commencement in August 2016, to completion in February 2019 meeting the tight 30month timeframe.

Another impressive achievement, considering the scope of the project, was completing the works, testing and commissioning and operational handover within the \$252 million budget and with no recorded lost-time injuries or fatalities.

The project has received an "Excellent" ISCA rating for both design and construction.



## Key project features

- 2.7km in length, running from Newcastle Interchange at Wickham to Newcastle Beach.
- Light rail follows the old rail corridor for approximately one third of the route before moving onto Hunter and Scott Streets.
- Removal of the existing rail infrastructure (track, overhead wiring, and structures) and full site remediation of the former rail corridor.
- Stops are located at Newcastle Interchange, Honeysuckle (near Hunter Street TAFE), Civic, Crown Street, Queens Wharf and Newcastle Beach.
- Extensive utility works involving investigation, space-proofing, integration with design, negotiation and relocation works.
- Road upgrades which included reconfiguration of key intersections and footpaths, upgrades to surrounding roads, and changes to inner city bus and parking arrangements to allow traffic to continue to move efficiently on the completion of light rail.

The contract between Downer EDI Works and the client (TfNSW) was a collaborative contract with a shared risk profile. A design and construct open book contract and collaborative spirit with the client facilitated quick decision making by jointly working through problems, with a lower emphasis on contract letter writing and protecting positions. This transparent cooperative relationship was key to the success of the project.

## Procurement process

Almost all clients and contractors now speak of collaborative behaviours and “best for project” outcomes. It is uncommon for staff to truly engage in this manner unless their behaviour is driven by an appropriate contract model. The contract model is what sets the tone of engagement and is the license that allows staff to truly engage in collaborative behaviours and best for project thinking.

The 18-week Target Cost development phase required both parties to fully understand and align on a cost and risk profile of all aspects of the project. The collaborative framework allowed both parties to be “open book” in all aspects of price development. The iterative nature of the Target Cost development required numerous workshops, working meetings, governance meetings, team building events, etc. which served to strengthen individual relationships and build organisational trust.

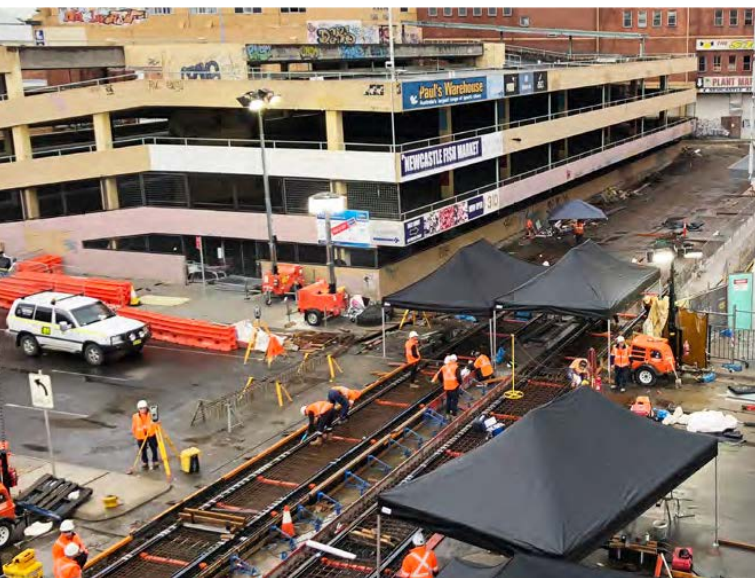
At the beginning of the procurement phase, it is fair to say that the teams were enthusiastic but somewhat guarded. Once interpersonal relationships started to form, and the teams began working closely, barriers started to fall, and the teams started to work very well together towards a common goal.



## Project delivery

The team agreed early to co-locate which was a significant contributing factor to the project's success. The client and contractor project managers and SMEs interacted daily on key issues and gained an understanding of each other's drivers and constraints.

The project initiated a multi-layered approach to governance. The site teams met weekly to resolve issues. Anything that could not be resolved within that forum, was escalated to the monthly Project Controls Group meeting which was attended by a senior manager of Downer and TfNSW. The senior managers worked closely to resolve the more difficult issues to keep the project team focused on project delivery. The structured approach to engagement and decision making meant that decisions were made quickly and that neither party became entrenched.



The team combated project issues through early decision making and ensuring 'the right people were in the room at the right time,' including subcontractors. By focusing on the solution rather than whose problem it was, we created a culture where brave decision making was encouraged, even if the decision didn't always work out as planned. This underpinned the mindset of the team's 'dare to fail' motto.

The challenges faced throughout the project were pre-empted through our robust risk assessment process, which began by identifying over 175 potential risks prior to construction, in areas of community, environment, operations, safety, rail



safety, site establishment and the wider road network. Because of the variety of skills and experience the team brought to the project, it was proved there was no problem identified that the team couldn't find a solution to.

It was found by increasing resources in the Downer team and subcontractor teams when a new issue appeared, the arising problems were quickly dealt with, without distracting the existing team. As an example, the new footpaths were proving more complex than first perceived, so the team increased internal and subcontractor resources to create a dedicated day and nighttime footpath team.

The quantum of some risks were underestimated, such as the extensive contamination and coal tar found throughout the light rail environment. Through detailed monthly reviews of risks and opportunities, which also encompassed looking at the range of possible impacts to the financial outcome, the team were able to mitigate many of the risks identified as well as capitalizing on many opportunities.

One of the highest-rated and most likely risks was the community, with the potential for complaints, protests, negative press, business income loss and pedestrians unlawfully accessing the site. These risks were combated by engaging closely with the community and having a plan B in place to quickly implement another solution should something not go as planned. By having a large proactive communications team of six Downer and five TfNSW team members, the team facilitated an extensive range of community campaigns, programs, safety and engagement.

## Outcomes and achievements

- The NLR was handed over for commercial operations on the original contract date of February 15, 2019 – a first for light rail in Australia.
- Despite a major change at post 70% design stage from overhead power to a wire-free system (the first catenary free light rail system in the Southern Hemisphere), Downer delivered the NLR on time and within the original \$252 million budget.
- No recorded lost time injuries or fatalities during the project delivery.
- A commendation from SafeWork for our safety performance, driven in part by the collaborative Safety Action Plan agreement between Downer / TfNSW / SafeWork.
- Overall customer satisfaction of light rail was an impressive 96%.
- Achieved the "Excellent" ISCA rating for both design and construction.



While the client stipulated an on time KPI, many said it couldn't be done. The project was achieved without compromising on quality or safety, as demonstrated with no serious defects or issues since it opened and no recorded lost-time injuries or fatalities during the project delivery.

This project is an excellent example of meeting critical milestones safely through successful relationships and communication between contractor, client, city, council and community. By utilising the broad experience and technical acumen of those living and breathing the NLR project, a focused culture was created, encouraged and maintained, which ultimately produced the on-time delivery of an innovative solution.

