

BIM supports complex national rail project

In delivering New Zealand's largest, most complicated transport project to date, seven-company consortium Link Alliance leveraged BIM technologies and established a new digital approach to infrastructure development.

The City Rail Link project doubles public transport capacity into Auckland city center. With a 3.5 km track, a twin tunnel, three stations, and interconnection with the existing network, it required intricate design models that had to be frequently updated to reflect new needs as construction progressed.

The coordination of up to 1,600 people from 30 countries and 16 disciplines to deliver a large-scale transport project with reduced embodied carbon, energy emissions, and waste to landfill.

The results

The project owners and design team relied on BIM Collaborate Pro and multiple Autodesk design tools, streamlining engineering complexities and enabling real-time collaboration that significantly improved costs and scheduling.



3,000 hours slashed from design time
Computational modelling and virtual reviews enabled real-time design updates and efficient approvals



Negligible downtime reduced costs
Online collaboration streamlined project phases and kept work going through Covid-19 restrictions



Optimization to meet sustainability targets
The project team holistically tracked project performance to optimize design and construction according to goals

“ We rely on BIM 360 Design to make collaborative design possible. With Covid the transition to remote work was seamless. ”

Cameron Schaefer, HDR Digital Design lead

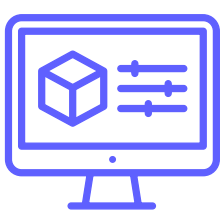
How they did it



Training initiatives

Establish digital ways of working

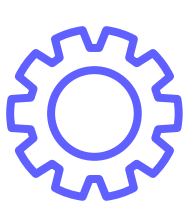
City Rail Link is the first major infrastructure project in New Zealand to be managed digitally. To upskill project participants in BIM tools and set new processes, Link Alliance developed intensive training sessions.



Streamlined design and construction

React to feedback between project phases

Complex tunnel design required project models to be continuously refreshed as construction proceeded, so the team used Dynamo Studio and Revit for computational updates instead of making time-consuming manual modifications.



Time-saving tool customisation

Improve ease of use for project teams

Digital engineers leveraged Revit API tools to create a custom interface for processing data, updating project models, and automating documentation, slashing 3,000 hours from design time.



Generative design

Use software to optimize construction

With the Project Refinery generative design tool, the team created a model of the tunnel boring machine to simulate tunnelling works, optimize segments based on track geometry, and identify where to minimize deviations from design intent.

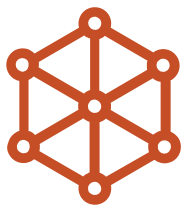
“ Linking the physical and digital worlds is a game changer. With BIM, we can automatically update the models, allowing a real-time feed to continuously update the design for optimized scheduling, time, and cost. ”

Brice Gaudin, BIM Manager at Link Alliance

The bottom line

Key benefits of BIM

Image Courtesy of City Rail Link



Real-time collaboration across countries



Time-saving tools for complex engineering



Project tracking for sustainability goals

“ City Rail Link will not only make a huge impact on our transportation system but will also provide new standards and inroads for the use of BIM throughout the country. ”

Jon Varndell, Design Director at Link Alliance

[Read the full case study >](#)