

"It's just tomorrow rather than yesterday. It's a cool train"  
Ray Columbus OBE, CM, 2012

FUTURERAILNZ  
Barry Read



- Self-generating (solar/bio-fuel turbine generators/regen braking & induction charging)
- Electric in-wheel direct-drive system - 92% efficient
- Gyroscopic stabilisation - comfortable and smooth
- Flexi-rim wheel design for improved traction
- Sustainable new technologies for passenger comfort



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SCAN ME  
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21st century railcar Cooltrainz STE: FutureRailNZ  
solar turbine electric

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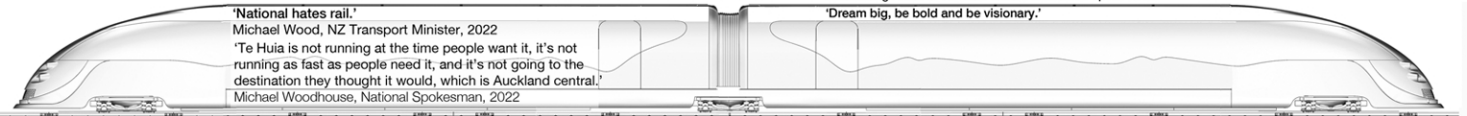
'Cooltrainz is an inspired concept and the central benefits of comfort, energy efficiency, speed of service, stability and adaptability are all important aspects for a passenger service - and it's great these have been considered in the concept.'  
Steven Joyce, NZ Transport Minister, 15 June 2009

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'National hates rail.'  
Michael Wood, NZ Transport Minister, 2022  
'Te Huia is not running at the time people want it, it's not running as fast as people need it, and it's not going to the destination they thought it would, which is Auckland central.'  
Michael Woodhouse, National Spokesman, 2022

Provide free buses, bring back passenger trains ... were among submissions made to the regional council to improve public transport in Taranaki. Urs Signer, on behalf of Climate Justice Taranaki said the millions of dollars spent on upgrading and maintaining roads in Taranaki should instead be spent on rail  
'Dream big, be bold and be visionary.'



ECan councillor and Regional Transport Committee chair Peter Scott said there was 'significant public support for rail transport using the existing rail network in Canterbury and the wider South Island. The lack of non-riding priorities was noted by Horizons councillor and temporary committee chair Sam Ferguson. He wanted to see the council work with the community on new ideas for transport, which could be better rail links between cities or regions.

Not a single academic report, regional council meeting or public forum has addressed the prime issue for public rail. All speak of running 20th century trains that are slow and uncomfortable.  
CT-STE is a 21st century railcar designed to run on Aotearoa/New Zealand's 19th century rail infrastructure.

Welcome aboard!

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QUICK COMFORTABLE SAFE

1. Preface

There's a gap in the thinking regarding public transport that would actually work in Aotearoa/New Zealand. Within most city boundaries there's at least an attempt to enable travel through the suburbs or centres, even though still not climate friendly.  
But if you live outside these boundaries there's no practical way to get to those transport hubs. There's no regional to city connection that will compete with a car. Cooltrainz-STE (solar turbine/electric) is a concept for a quick, comfortable and safe railcar designed to work with our, often winding, 19th century rail network. An electric-drive railcar utilising clean generation and storage. It's designed to get me out of my car.  
**The experience**  
B-Station is a version of a 'half-round-barn' designed to keep people warm and dry while they wait. The entry doors on the railcar are grouped near the middle meaning only a short platform is required for a country station. And B-Station is user-friendly with after-dusk warm solar lighting and shallow-gradient ramping for wheelchair users. Boarding this railcar is seamless.

Once onboard the experience is warm and efficient with an onboard assistant making sure you're comfortable and secure. A person who's also a fabulous barista in the morning or bar tender in the evening. There is also a modern washroom onboard to add to your comfort.  
Your seat has airline-style lighting and a seat-back table and a screen to allow a real-time forward view including speed and GPS mapping or onward travel information and USB ports for your own devices.  
**Safety**  
Cooltrainz-STE has under-floor gyroscopes to level out the ride. It has seatbelts and floor-level escape lighting. Front and back windscreens 'pop' out in a crash and the bumper is designed to give a person or animal the best chance of survival after a low-speed contact.  
'An eco-car is still a car'. It's still taking up space sitting on a motorway. On this railcar you can start work or relax after work instead of grappling with 'driving conditions'. This will get me out of my car.

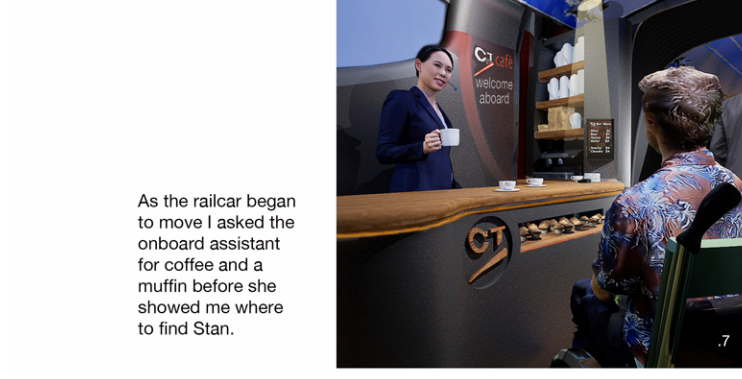


Boz & Stan's Story  
Boz: Stan got on in Whangarei and said he'd meet me onboard. I'm at the local B-Station - wheel chair friendly

2. COMFORT & the PASSENGER EXPERIENCE



Wide doors open...  
... and the floor extends on a 'finger-jointed' mechanism to touch the station platform. The light below guides me to a smooth, easy entry.



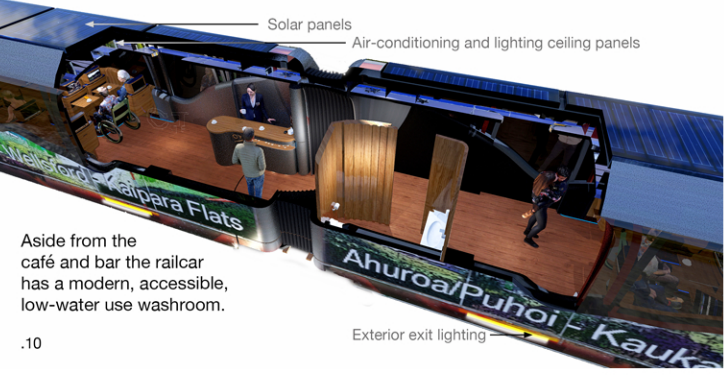
As the railcar began to move I asked the onboard assistant for coffee and a muffin before she showed me where to find Stan.



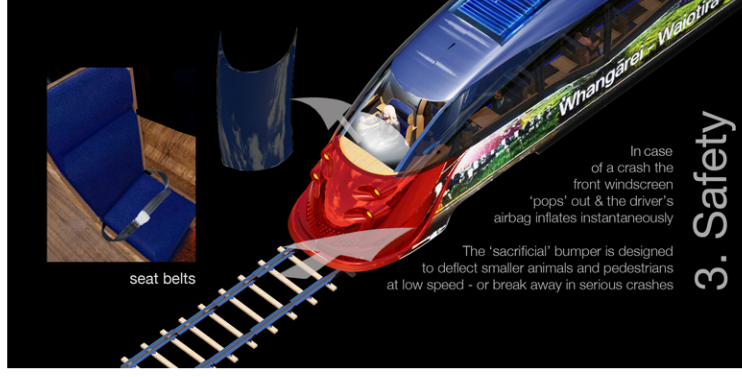
With my chair locked down and the railcar increasing speed Stan and I were free to catch up and plan our day. Meanwhile, up front in the ...



... driver's cab the driver controlled the 12 in-wheel motors and the railcar accelerated smoothly away



Aside from the café and bar the railcar has a modern, accessible, low-water use washroom.



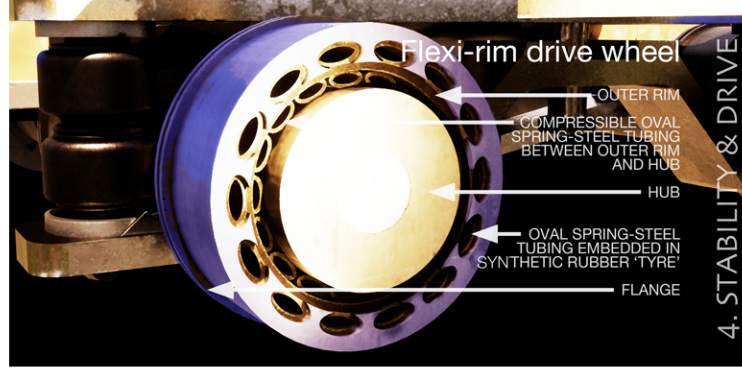
seat belts

In case of a crash the front windscreen 'pops' out and the driver's airbag inflates instantaneously  
The 'sacrificial' bumper is designed to deflect smaller animals and pedestrians at low speed - or break away in serious crashes

3. Safety

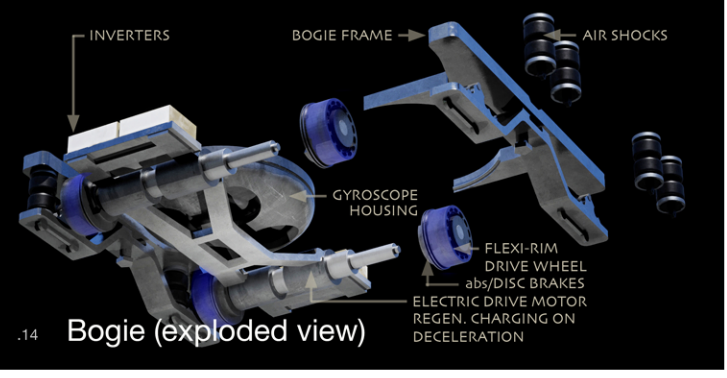


Side lights pulse as the railcar approaches crossings

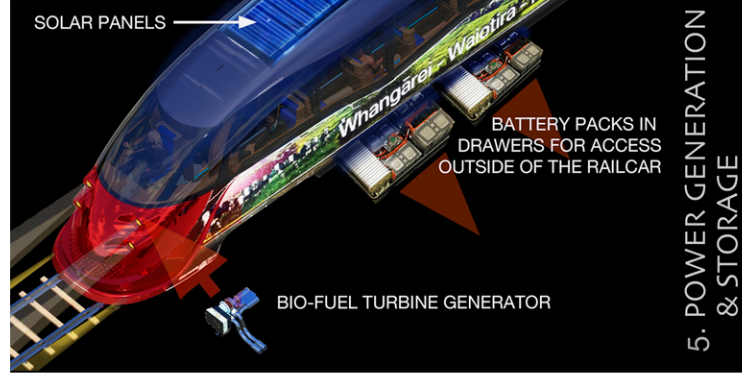


Flexi-rim drive wheel  
OUTER RIM  
COMPRESSIBLE OVAL SPRING-STEEL TUBING BETWEEN OUTER RIM AND HUB  
HUB  
OVAL SPRING-STEEL TUBING EMBEDDED IN SYNTHETIC RUBBER 'TYRE'  
FLANGE

4. STABILITY & DRIVE

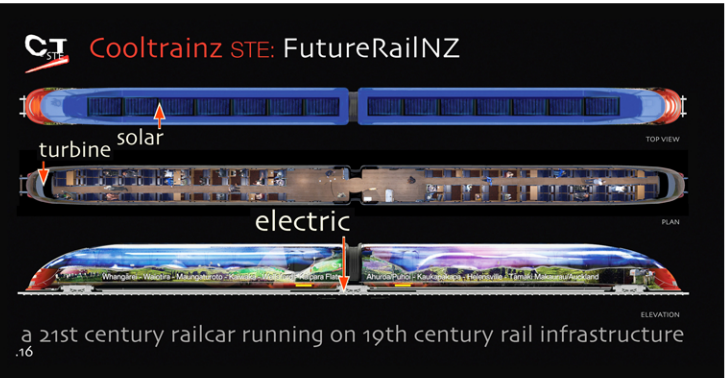


Bogie (exploded view)

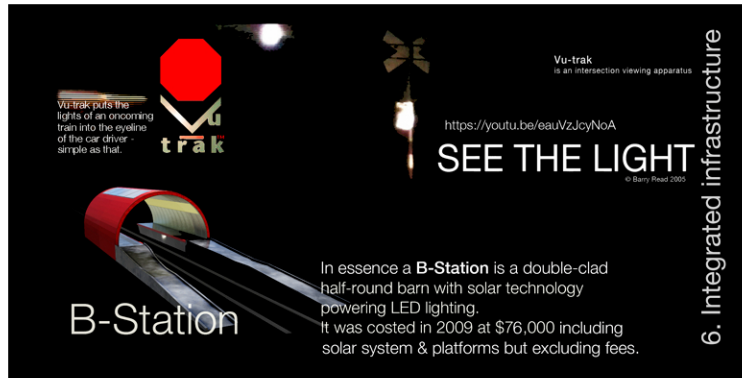


BATTERY PACKS IN DRAWERS FOR ACCESS OUTSIDE OF THE RAILCAR  
BIO-FUEL TURBINE GENERATOR

5. POWER GENERATION & STORAGE



a 21st century railcar running on 19th century rail infrastructure



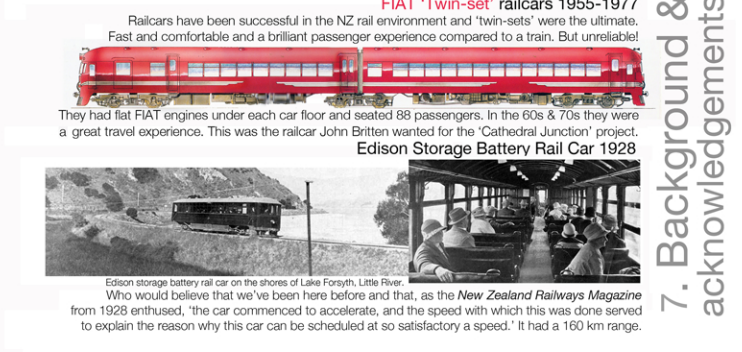
SEE THE LIGHT  
In essence a B-Station is a double-clad half-round barn with solar technology powering LED lighting. It was costed in 2009 at \$76,000 including solar system & platforms but excluding fees.

6. Integrated infrastructure

Background & acknowledgments

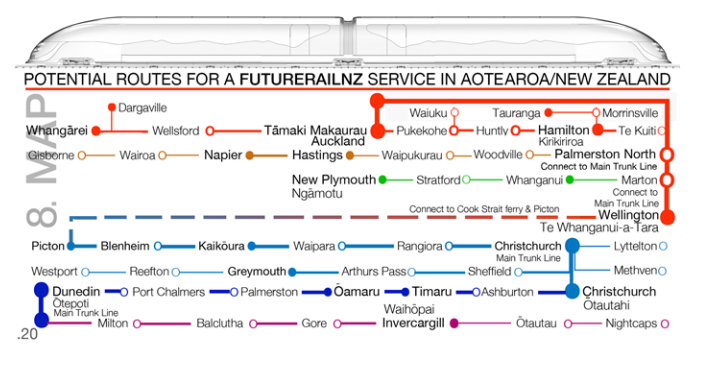
Ray Columbus OBE, CM. Ray had personal contact with several Prime Ministers and was an enthusiastic advocate for these ideas and tireless in his pursuit of official uptake. I miss his energy.  
I worked with John Britten in the mid-90s pursuing the idea for 'Cathedral Junction' - a transport hub for Christchurch that proposed to use the tram system linked to the rail line between the new railway station and Lyttelton. So much of my design ethos comes from John's in his essential pragmatism for good design.  
In the early days of these concepts I realised that Ian Wright, who heads Wrightspeed in the US, originally came from Dargaville. Their website [wrightspeed.com](http://wrightspeed.com) is well worth exploring and an inspiration. The turbine-generators are used as 'range-extendors' for the trucks.

Also an inspiration is the story of Croatian, Mate Rimac, who formed Rimac Automobile after designing a 1,900 hp hypercar - an incredible example of the beauty that comes from 'form following function'. I first came across Mate Rimac's ideas when he converted an '84 BMW to electric-drive. To see more just Google him.  
[www.youtube.com/watch?v=rDnSmAIXA](http://www.youtube.com/watch?v=rDnSmAIXA) is a good video to start with. Amazing work. Amazing story.  
And a New Zealander is Street Dog by FTNmotion, based in Wellington. I've been an 'early adopter' and my numbered motorbike is arriving soon. [ftnmotion.com](http://ftnmotion.com) and my numberred motorbike is arriving soon.  
Going online and looking to see what's been done that's as exciting as [futurerailnz.com](http://futurerailnz.com) shows just how innovative some people are. If a hypercar and EV innovation can come out of Croatia then a solar/turbine/electric railcar can come from Aotearoa/New Zealand.

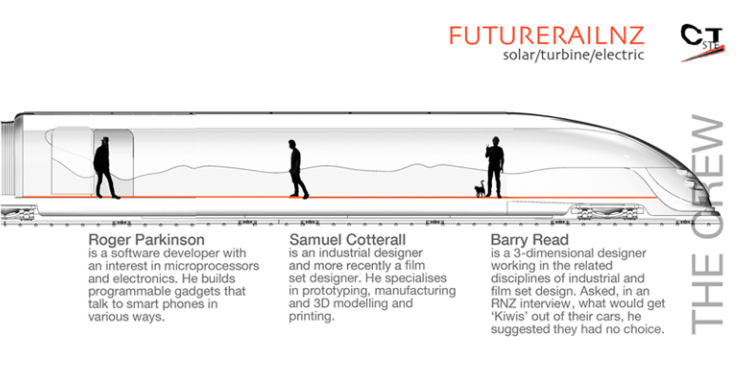


FIAT 'Twin-set' railcars 1955-1977  
Railcars have been successful in the NZ rail environment and 'twin-sets' were the ultimate. Fast and comfortable and a brilliant passenger experience compared to a train. But unreliable!  
They had flat FIAT engines under each car floor and seated 88 passengers. In the 60s & 70s they were a great travel experience. This was the railcar John Britten wanted for the 'Cathedral Junction' project.  
Edison Storage Battery Rail Car 1928  
Edison storage battery rail car on the shores of Lake Forsyth, Little River.  
Who would believe that we've been here before and that, as the *New Zealand Railways Magazine* from 1928 enthused, 'the car commenced to accelerate, and the speed with which this was done served to explain the reason why this car can be scheduled at so satisfactory a speed.' It had a 160 km range.

7. Background & acknowledgments



POTENTIAL ROUTES FOR A FUTURERAILNZ SERVICE IN AOTEAROA/NEW ZEALAND



THE CREW  
Roger Parkinson is a software developer with an interest in microprocessors and electronics. He builds programmable gadgets that talk to smart phones in various ways.  
Samuel Cotterall is an industrial designer and more recently a film set designer. He specialises in prototyping, manufacturing and 3D modelling and printing.  
Barry Read is a 3-dimensional designer working in the related disciplines of industrial and film set design. Asked, in an RNZ interview, 'what would get Kiwis' out of their cars, he suggested they had no choice.

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