



WST

Creating what matters for future generations

*Reconnecting communities of the NIMT
for long term well-being*



- Social-Ecological Systems
- Taha Hinengaro, Papatūānuku
- Shift to a new stable state
- Investment decision making



PICTURE BY ALAIN DELORME

Systems Theory and Complex Adaptive Systems (CAS)

Elements & their connections are equally important	+	Simple algorithms produce simple & predictable responses	+	Components' response is fully determined	=	Simple
Connections are critical; individual agents much less	+	Simple rules result in complex & adaptive responses	+	Agents have latitude of response within the rules	=	Complex

Reproduced from Jones, 2003

Special Properties of CAS:

- Non-linear
- Path-dependency
- Thresholds or tipping points
- Regime shifts and alternative stable states
- Self-organization
- Emergent properties

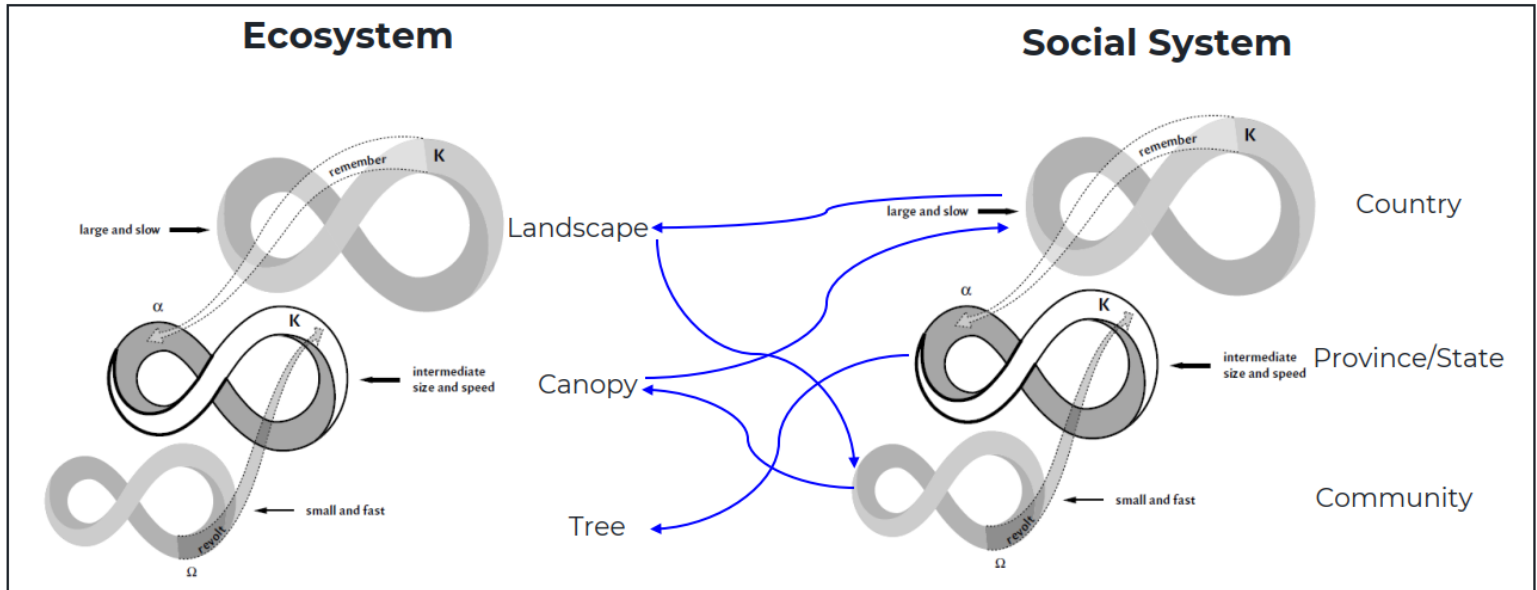


PICTURE BY ALAIN DELORME

Social-Ecological Systems (SEEs)

Other terms :

- Coupled human and natural system (CHANS)
- Human ecosystems
- Ecosocial systems
- Coupled human-environment systems
- Socioecological systems



Adapted from Berkes et al. 2003, p.18

- Coupling creates a new complex adaptive system with its own emergent properties and feedbacks

Incorporating a well-being approach and making explicit links between the natural and social components can overcome gaps and reveal trade-offs, thereby avoiding unforeseen and unintended impacts

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Natural and Social Science Integration Advisor

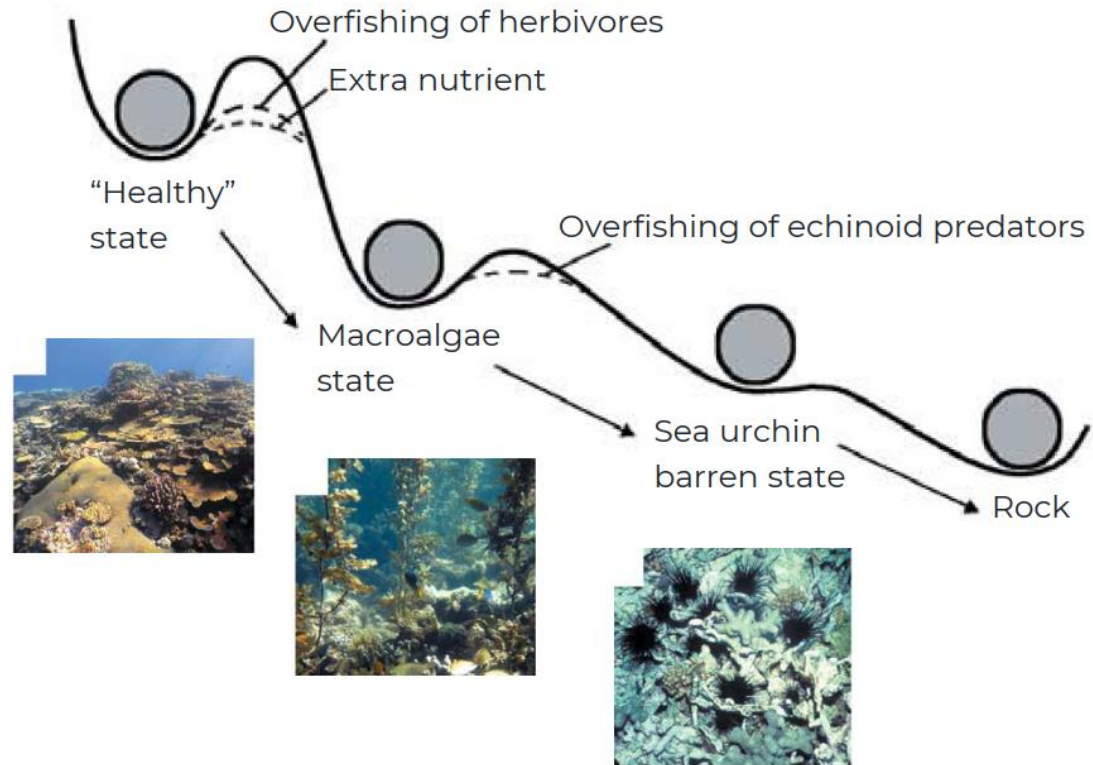
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Social-Ecological Resilience (SER)

Example of Eroding Resilience & Regime Shifts



Reproduced from Bellwood et al. 2004, p. 828

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Social Wellbeing Framework

Definition:

- Both an outcome and a process
- Dimensions:
 - 1) Material
 - 2) Relational
 - 3) Subjective



From Theory to Action

Social Wellbeing:

- 3 dimensions *as defined by people themselves*
- Can uncover often neglected motivating factors and social dimensions (overcome gaps)



Implications:

- Cross-scale analyses linking social wellbeing, resilience and adaptation

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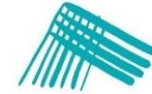
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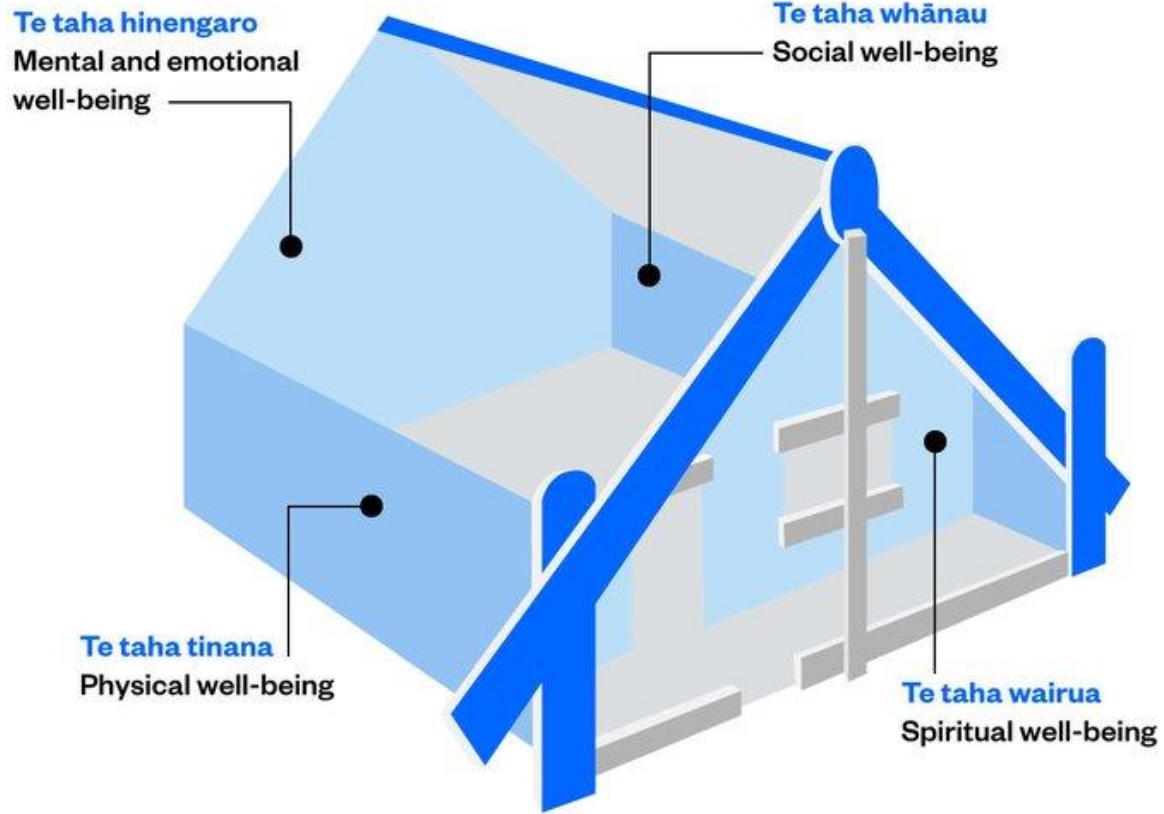


Te whare tapa whā



**Manaaki
Tāngata**

Caring for
the People Transportation Conference
Teahā Whānui, Tauranga
29 - 31 March 2023



Papatūānuku



In the Māori world view, land gives birth to all things, including humankind, and provides the physical and spiritual basis for life. Papatūānuku, the land, is a powerful mother earth figure who gives many blessings to her children.

Story by Te Ahukaramū Charles Royal

Main image: Papatūānuku in the landscape

<https://teara.govt.nz/en/papatuanuku-the-land>

Tangata whenua – literally, people of the land – are those who have authority in a particular place. This is based on their deep relationship with that place, through their births and their ancestors' births. As tangata whenua express themselves in that place, they gain the authority and confidence to project themselves into the world.

This idea, in turn, underpins the notion of **mana whenua** – spiritual authority in a given area.

The discontinuation of rail services linking rural villages to cities has proven negative effects on the mental health of communities

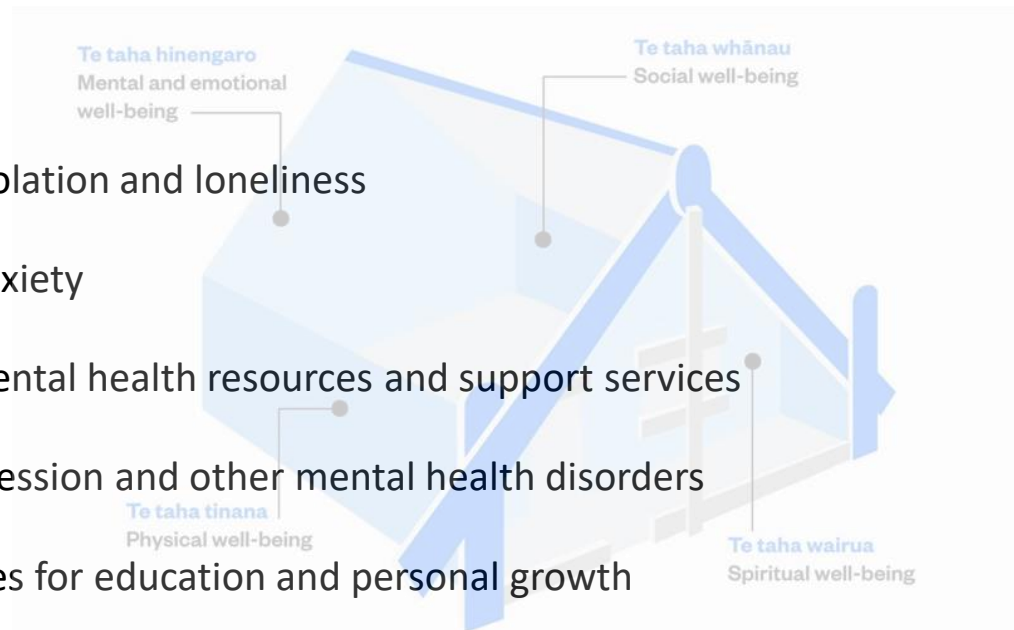
Increased feelings of isolation and loneliness

Increased stress and anxiety

Decreased access to mental health resources and support services

Increased rates of depression and other mental health disorders

Decreased opportunities for education and personal growth

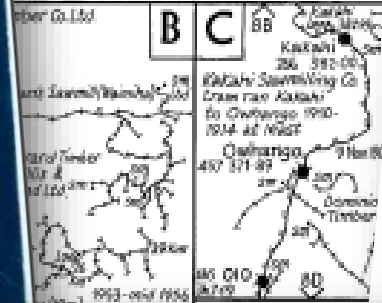


References:

- Simon, M. A., Dearing, J. W., & Mowen, A. J. (2002). Rural Transportation and Well-being. *Rural Sociology*, 67(3), 347-372.
- Marshall, D., & Carter, N. (2010). The economic benefits of rural public transportation. *Journal of Public Transportation*, 13(2), 45-58.
- Frumkin, P. (2001). *Beyond Sprawl: New Patterns of Growth to Fit the New California*. Washington, D.C.: Island Press.

NEW ZEALAND RAILWAY and TRAMWAY ATLAS

Fourth edition



CAN'T GET
THERE
FROM
HERE

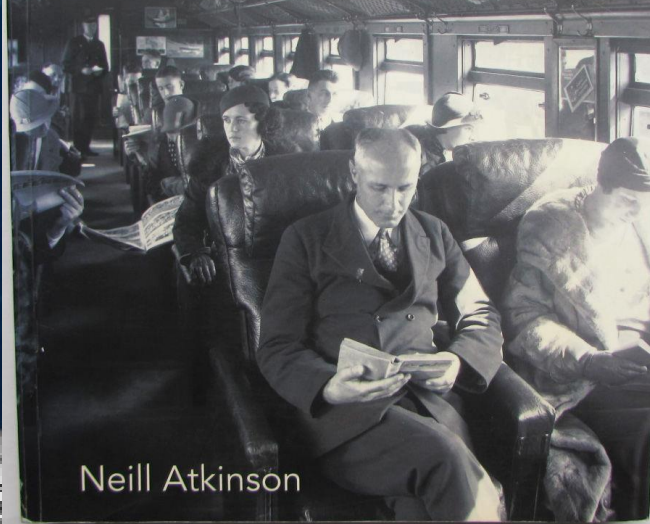
New Zealand
passenger rail
since 1920



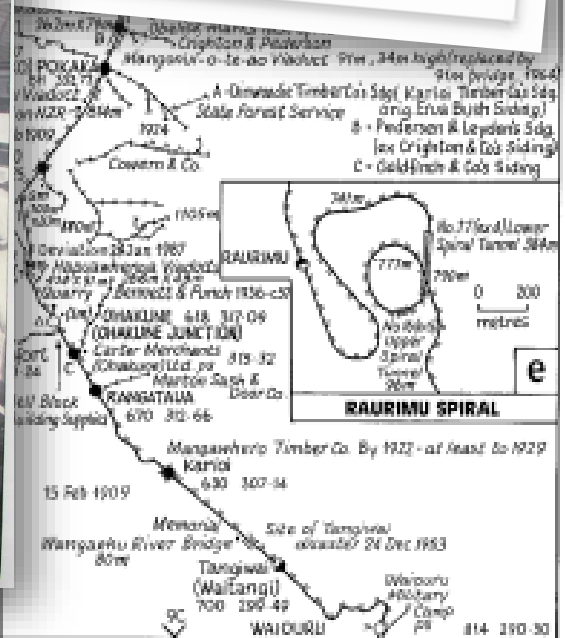
André Brett
Maps by
Sam van der Weerden

TRAINLAND

HOW RAILWAYS MADE NEW ZEALAND

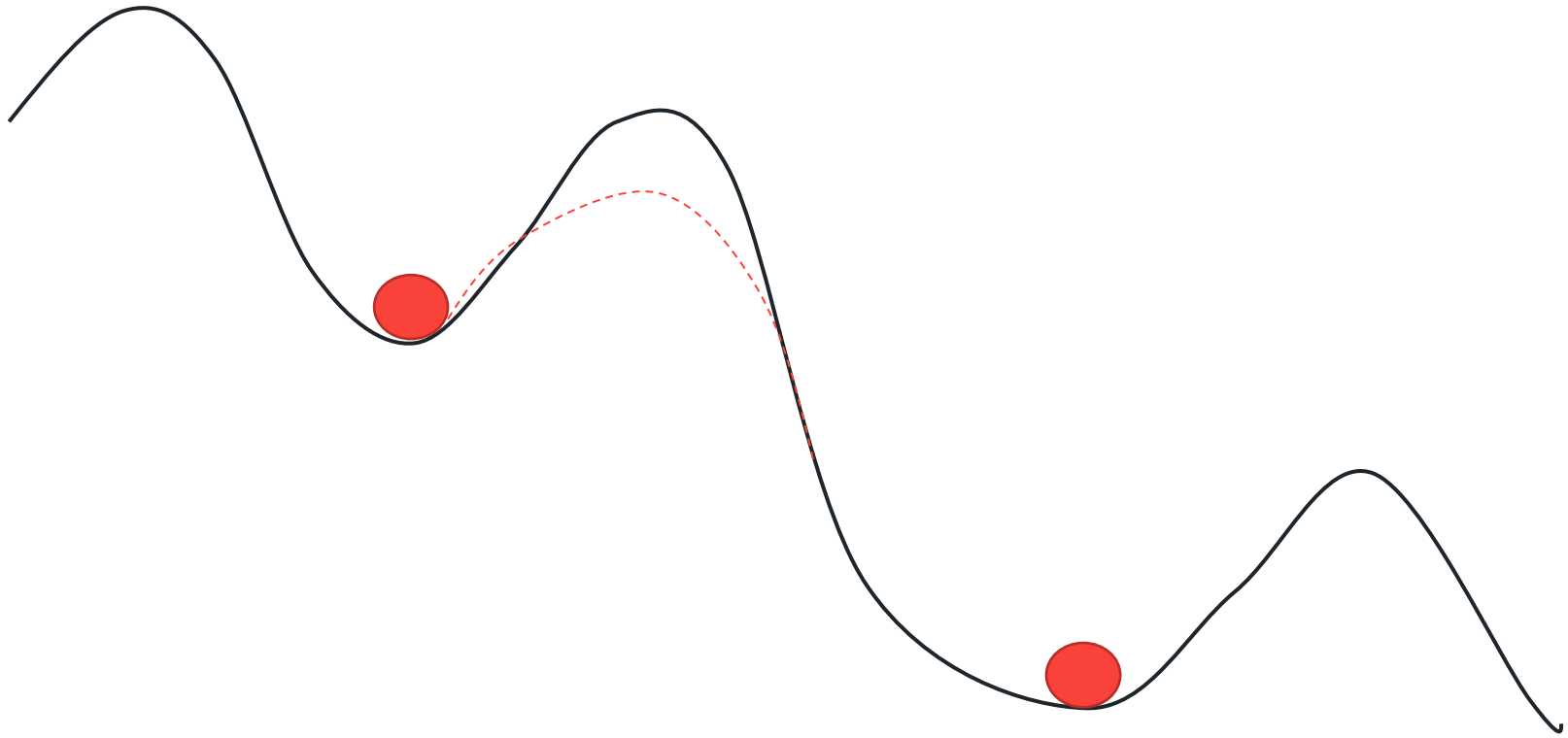


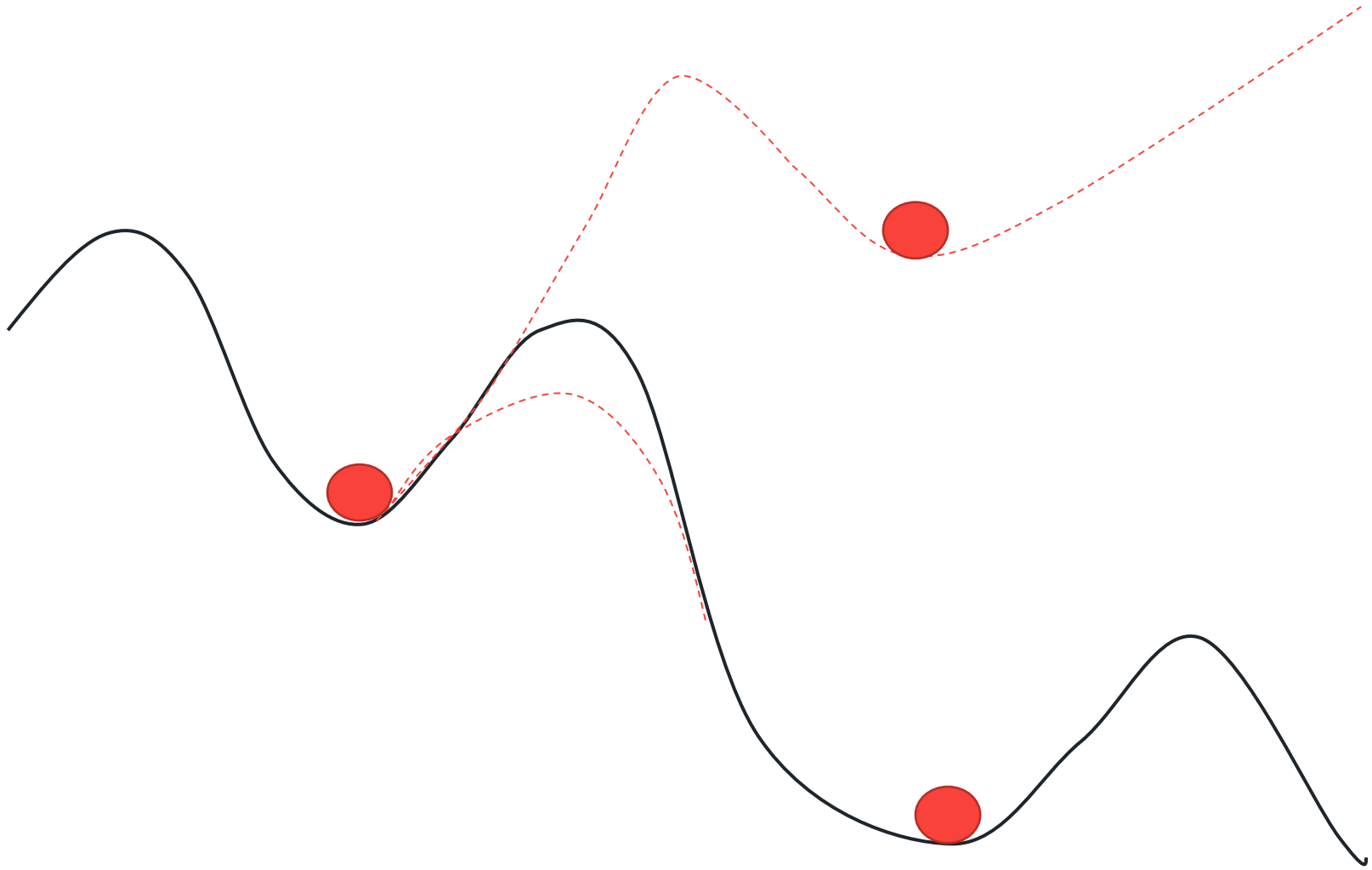
Neill Atkinson



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NIRP

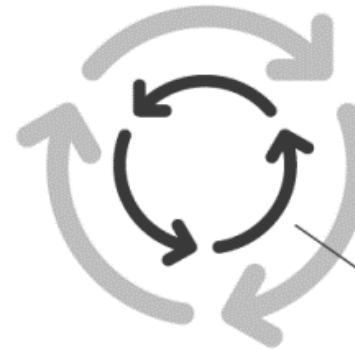
North Island Rail Passenger initiative

SYSTEM APPROACH

The problem is the inability of existing connectivity options to support the equitable development of regional communities.

Billions of dollars are spent constantly “catching-up” on housing, roads, hospitals, schools and utilities in our largest urban centres, while regional infrastructure is under-used.

Migration of businesses and people towards urban area



Population growth in urban area

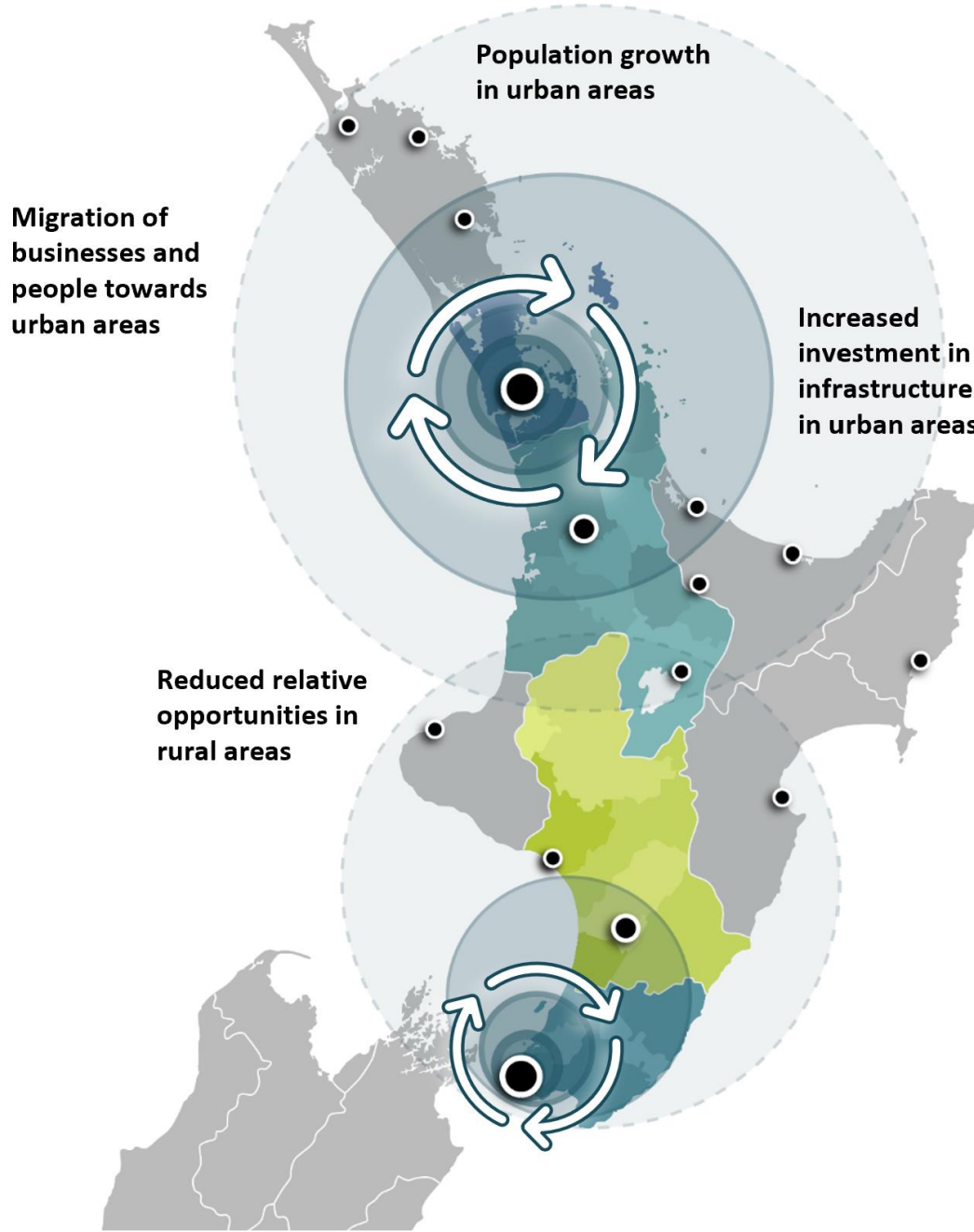
Increased investment in infrastructure in urban area

Reduced relative opportunities in rural area

Change is required to reverse the trend and relieve urban pressure while enhancing the attractiveness of the NIMT communities



Reactive Investment



Proactive Investment

Who will benefit from NIRP?

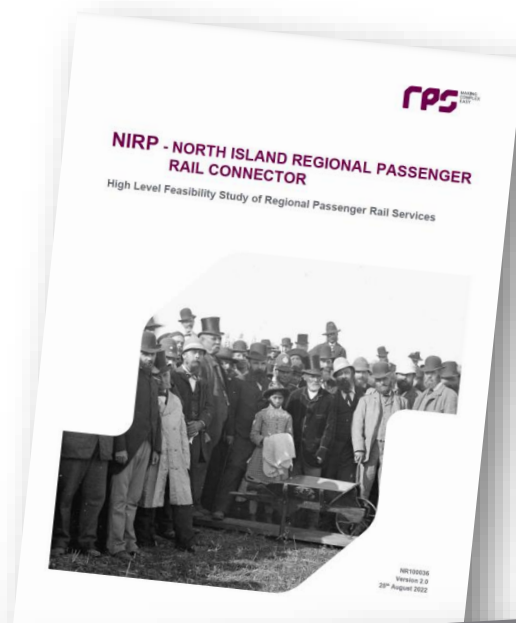
Aotearoa New Zealand will benefit through balanced development that defuses the current demographic pressures contrasted across the urban – rural divide.



NIRP enhances connectivity and economic growth by enabling regional land use plans to support balanced growth outside of urban areas.

NIRP

North
Island
Rail
Passenger
initiative



BACKING FROM THE 20 COUNCILS ALONG THE NIMT

The North Island Regional Passenger (NIRP) Rail Connector has the support of the 4 regional councils and 16 territorial authorities along the NIMT.

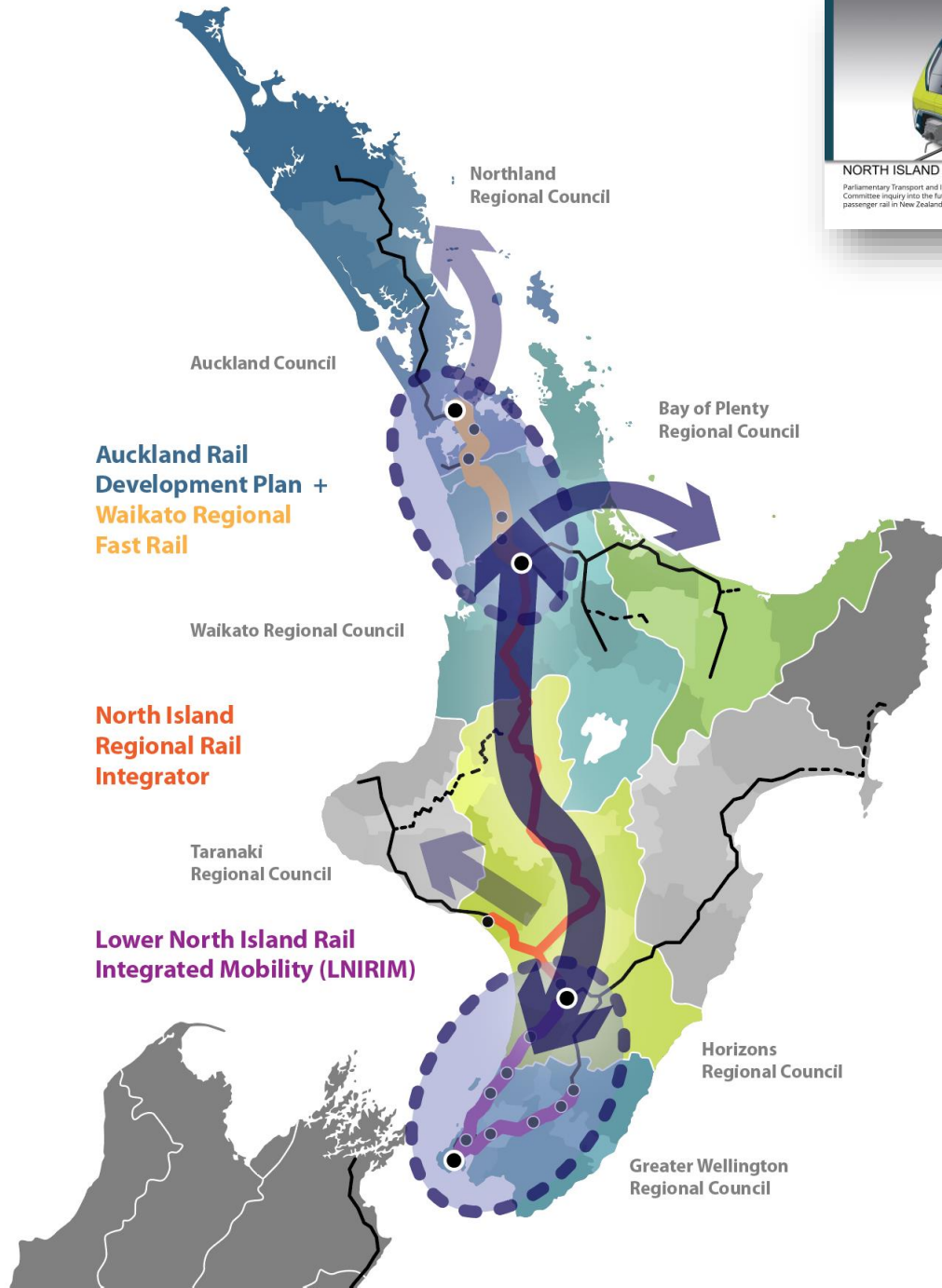


horizons
REGIONAL COUNCIL



NIRP

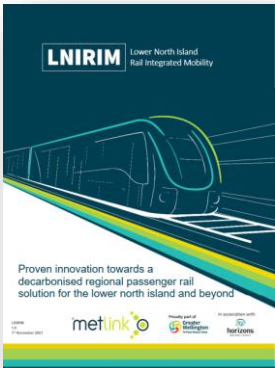
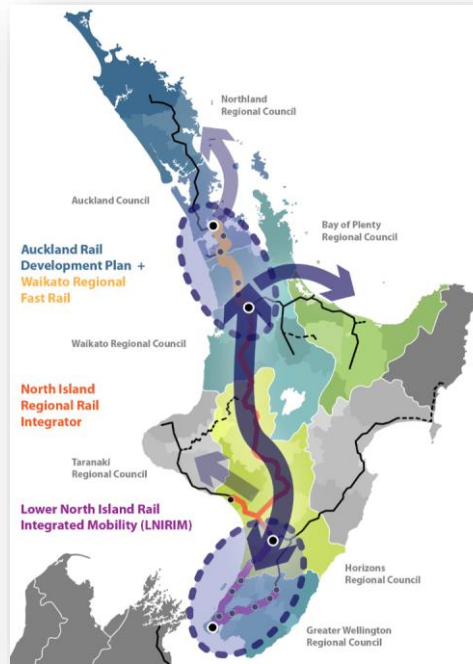
INTEGRATOR



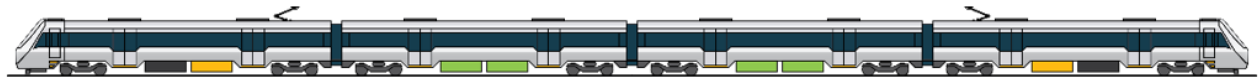


NIRP

INTEGRATOR



Underfloor layout proposed in LNIRIM DBC: 1.6kV DC equipment in blue, Batteries in green, CI engine/genset in black



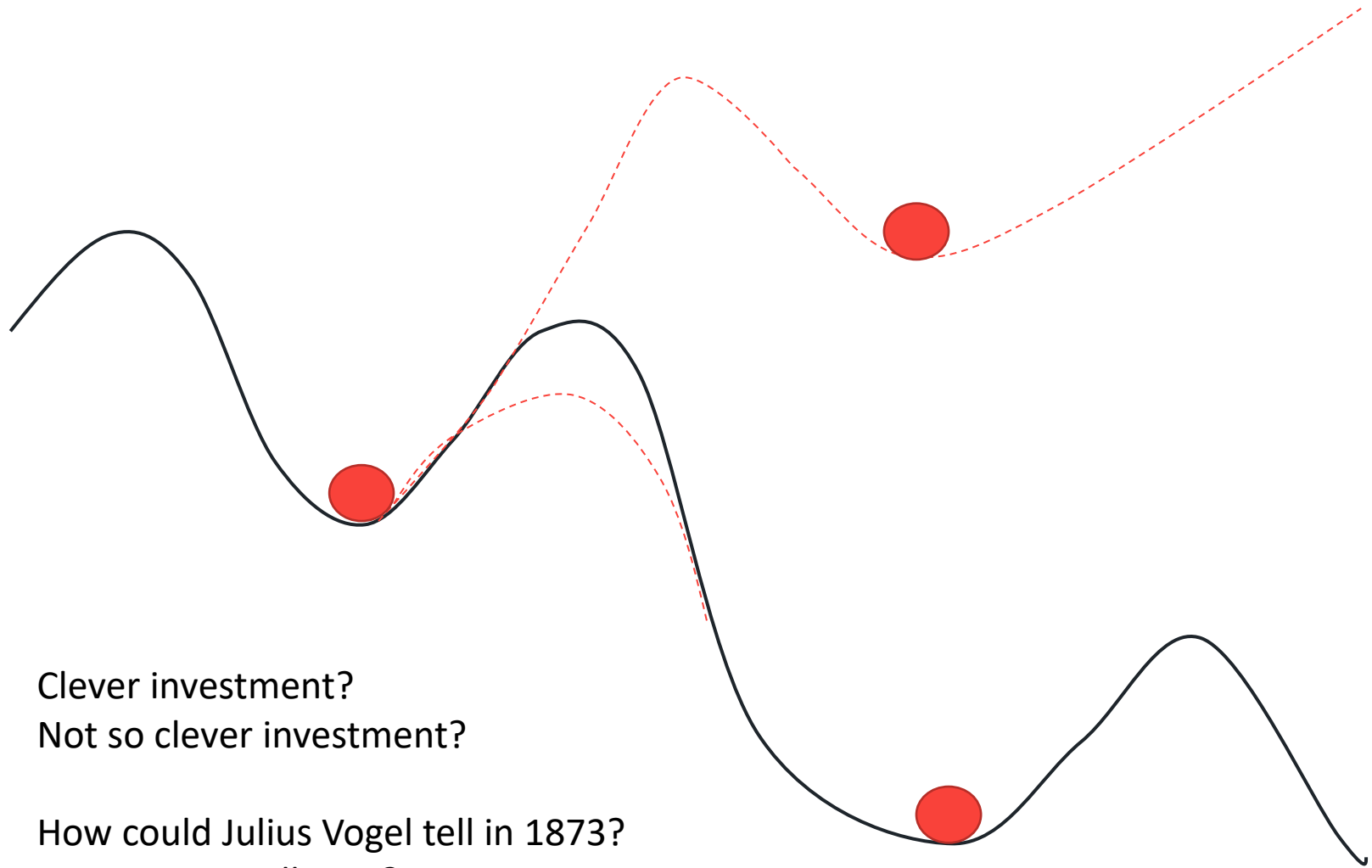
NIRP / Te Huia proposed underfloor layout: 25kV AC equipment in gold, Batteries in green, CI engine/genset in black



INTEGRATOR MODE: Due to advancing battery technology, this rolling stock underfloor layout, will become viable regarding range resilience, at the time of procurement and/or future fleet upgrade: 1.6kV DC equipment in blue, 25kV AC equipment in gold, Batteries in green



PHOTO: ALAIN DELORME



Clever investment?
Not so clever investment?

How could Julius Vogel tell in 1873?
How can we tell now?

Thank you

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