



Waipapa
Taumata Rau
**University
of Auckland**



Transportation Engineering Education in New Zealand-

Legacy, Impact and Future

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10/03/2026

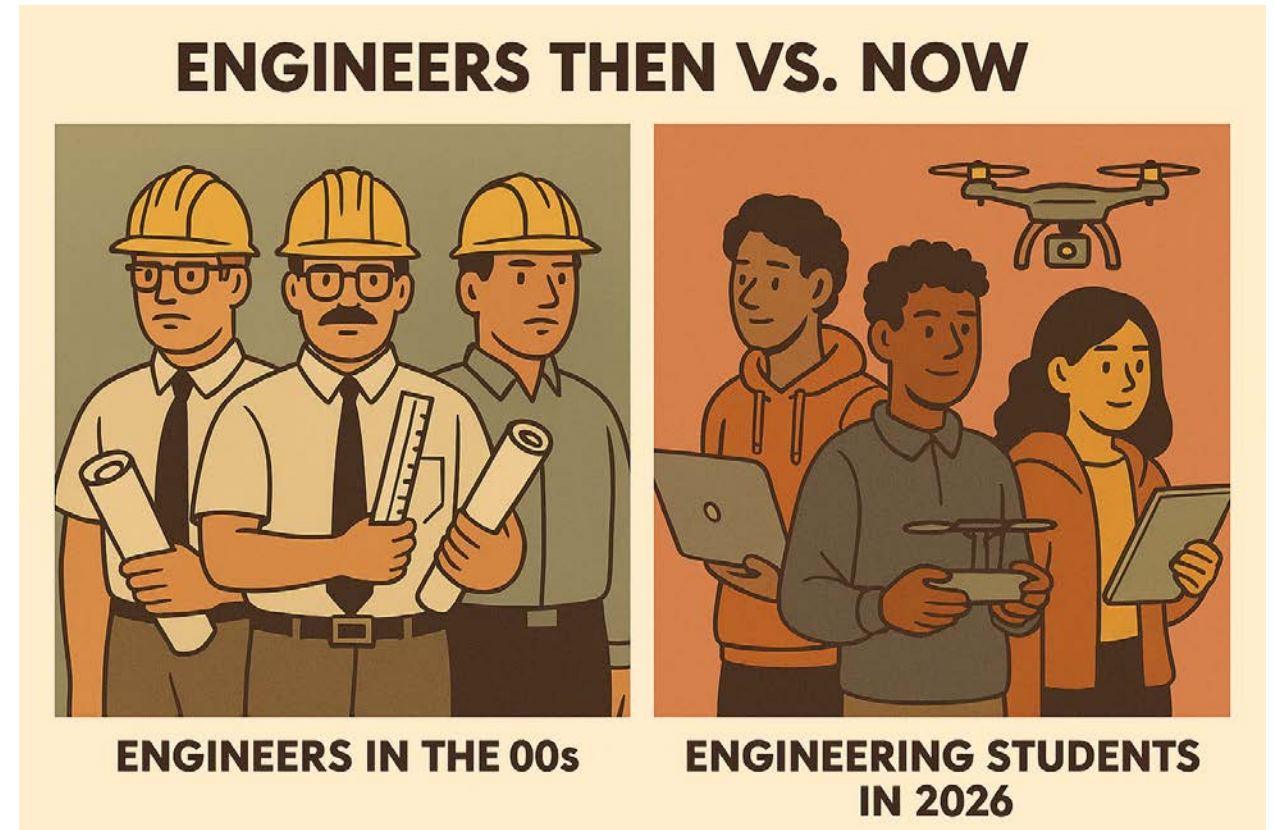


Working with what we have
**Resilience for
the Future**



Overview

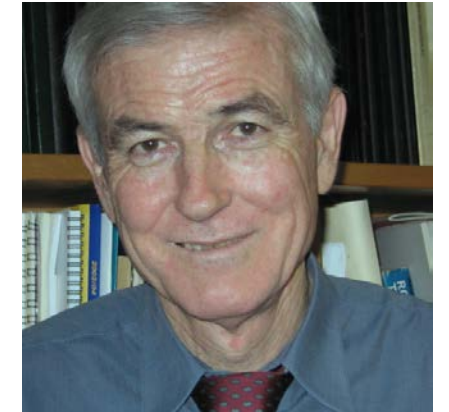
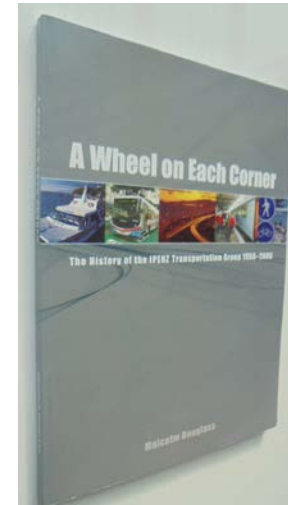
- Why resilience in transport fundamentally begins and ends with people
- Origins of NZ's transportation undergraduate and postgraduate programmes
- Impacts over 25 years
- Current education landscape
- Future capability needs
- Recommendations for building a resilient workforce



Source: AI generated by Copilot

Legacy

- In 1970's a **BE in Civil Engineering** in NZ had core transportation topics in:
 - Geometric design of roads
 - Pavement materials and construction
 - Traffic flow theory
 - Highway capacity and safety
- Emphasis was on **road building, traffic flow and vehicle movement**, reflecting NZ's car-centric development during this period and the space available in an u/grad degree
- **Transportation Engineering was still an emerging field** - Land Use or Town Planning was largely very separate to Engineering
- Resource Engineering - Mining degrees & Environmental Sustainability not yet known concept, nor was climate change and effects



Resilience Begins With People

- Infrastructure and technology help—but people drive resilience
- Māori perspective: *He aha te mea nui o te ao? He tangata*
- Importance of community-centred transport solutions
- Workforce capability as a strategic asset

Mobility Enables access to opportunities in places for people & communities



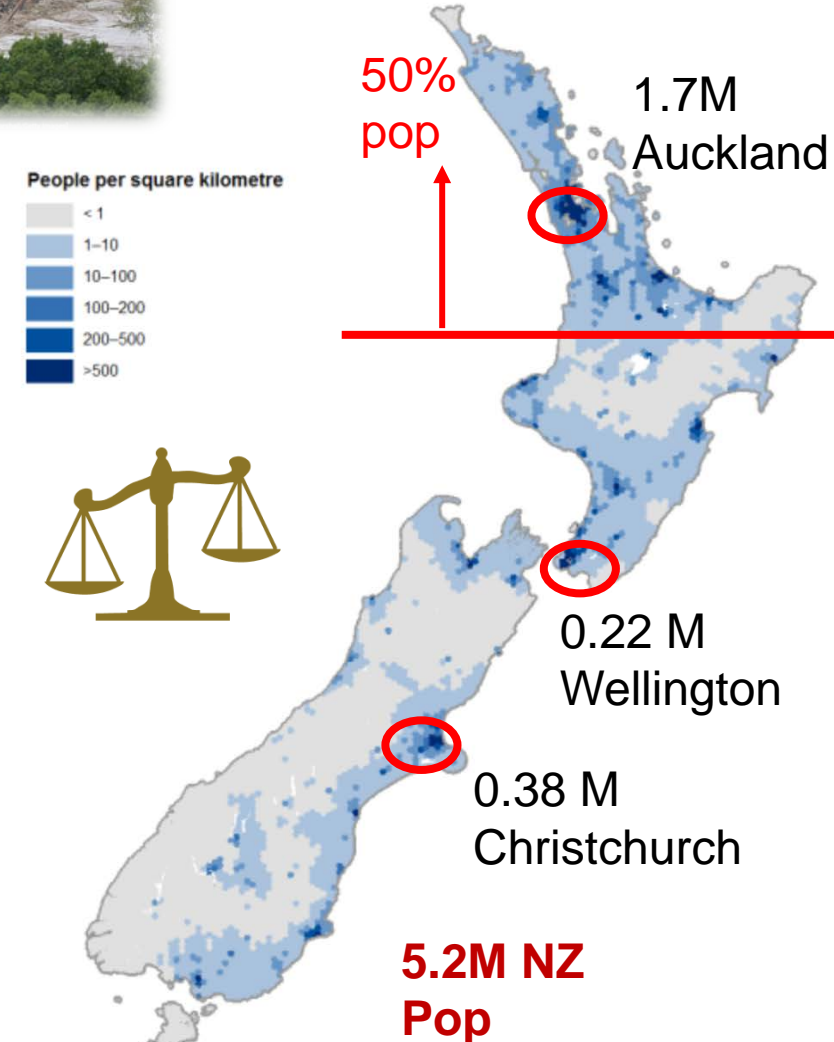
He aha te mea nui o te ao? He tangata he tangata he tangata! 6 February 2011. Evans, Malcolm Paul, 1945- :Digital cartoons. Ref: DCDL-0017011. Alexander Turnbull Library, Wellington, New Zealand. [/records/22703273](https://records/22703273)

NZ Context is important

- What works elsewhere does not necessarily work in NZ
- And especially economically
- We often cannot afford many alternative options
- We need transport professionals that can solve our problems



Population density of New Zealand
At 30 June 2017



Source: Stats NZ

Current BE(Hons) Civil Engineering

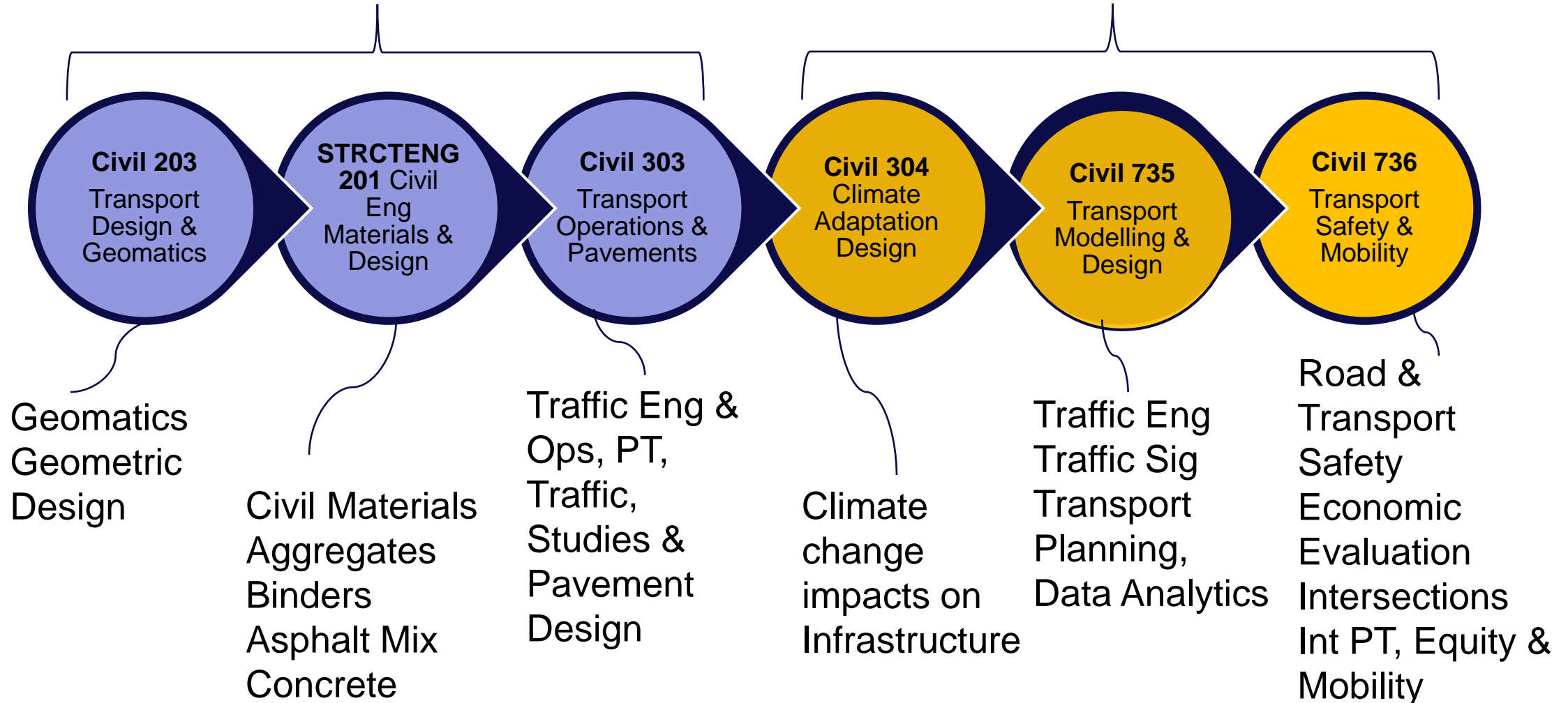
	Semester 1				Semester 2				
Year 1	Gen Ed	WTRENG 100 Engineering & Design for the Built Environ	ENGSCI 111 Mathematical Modelling 1	ENGGEN 121 Engineering Mechanics	CHEMMAT 121 Materials Science	ELECTENG 101 Electrical and Digital Systems	ENGGEN 115 Principals of Engineering Design	ENGGEN 131 Intro to Eng. Computation and Software	0 Credit papers (comp) ENGGEN 199 English Language Competency & Academic Integrity ACADINT A01
Year 2								ENGGEN (CIVIL) 299 workshop practice	
Year 3									
Year 4									

Transportation Courses – 3 compulsory Civil 203,
STRCTENG 201, Civil 303 and up to 3 electives
Civil 304: Climate Adaptation
Civil 735: Transport Modelling and Design
Civil 736: Transport Safety and Mobility

Undergraduate Transportation Courses in BEHons(Civil)

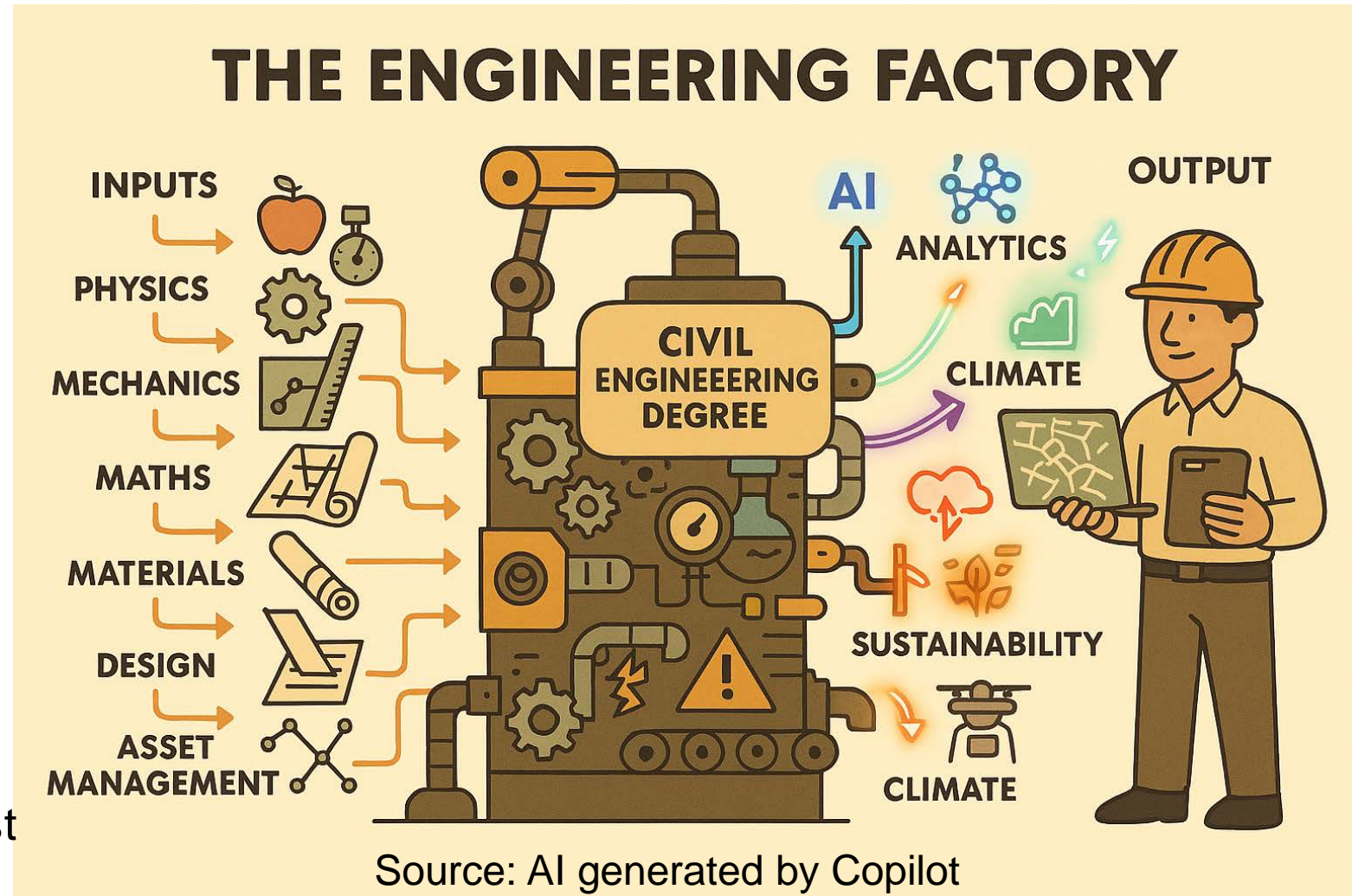
Core courses

Elective courses



What should future transportation professionals look like?

- The problem is we want our civil / transportation engineers to:
 - Have wide multi-disciplinary knowledge,
 - specialist transport skills,
 - be more rounded,
 - be better communicators and... and...
- So what can be removed to create space?
- Most would say definitely not the fundamentals
- This leads to needing specialist Post Grad studies



NZ's Skills Shortage (Early 2000s)

- Critical shortage of transport engineering expertise
- Ageing workforce; lack of specialist postgraduate training
- Sector needs: modelling, safety, design, policy, systems thinking
- Demand exceeded the supply of locally trained specialists
- Led to in 2002 Transfund NZ and later Transit NZ funding the Master of Engineering Transportation programmes at the UoA and UoC



Masters Courses in Transportation Engineering

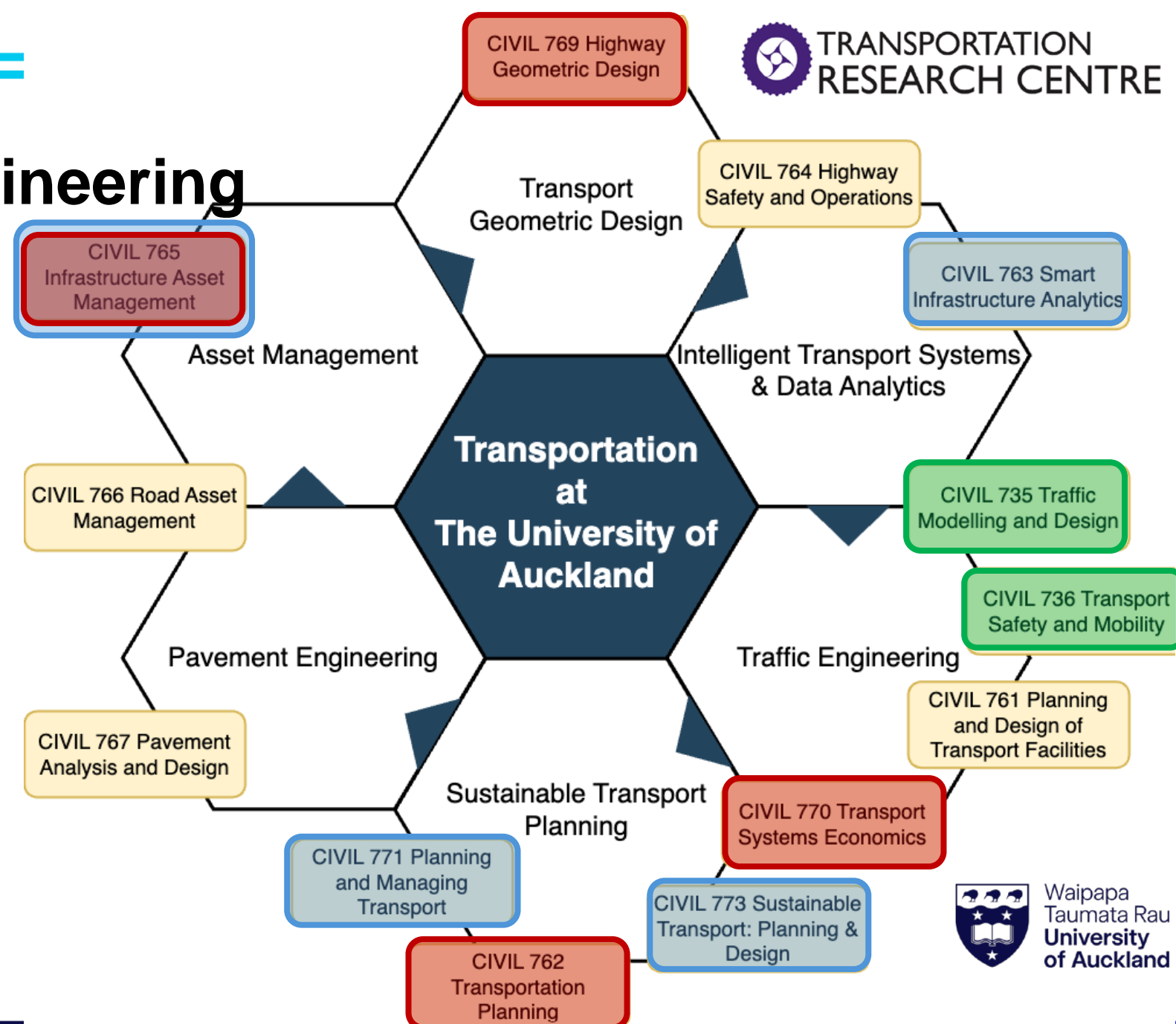
- Transit NZ (now NZTA) initiated a strategic investment (circa 2000)
- Masters programmes at UoA and UC
- ~\$250,000 per year per university—small investment, big impact
- Focus on NZ-specific transport problems & applied learning

2026 Courses

Semester 1

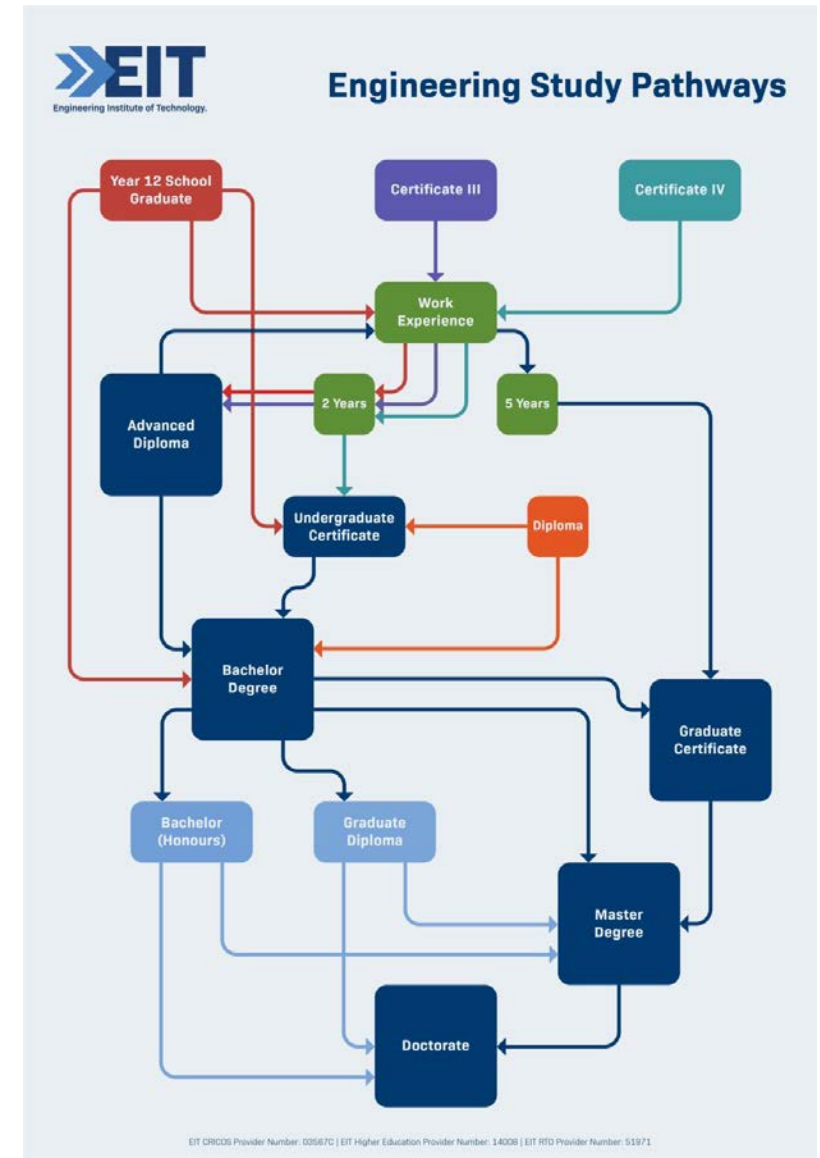
Semester 2

Refer <https://www.trc.ac.nz/study/>



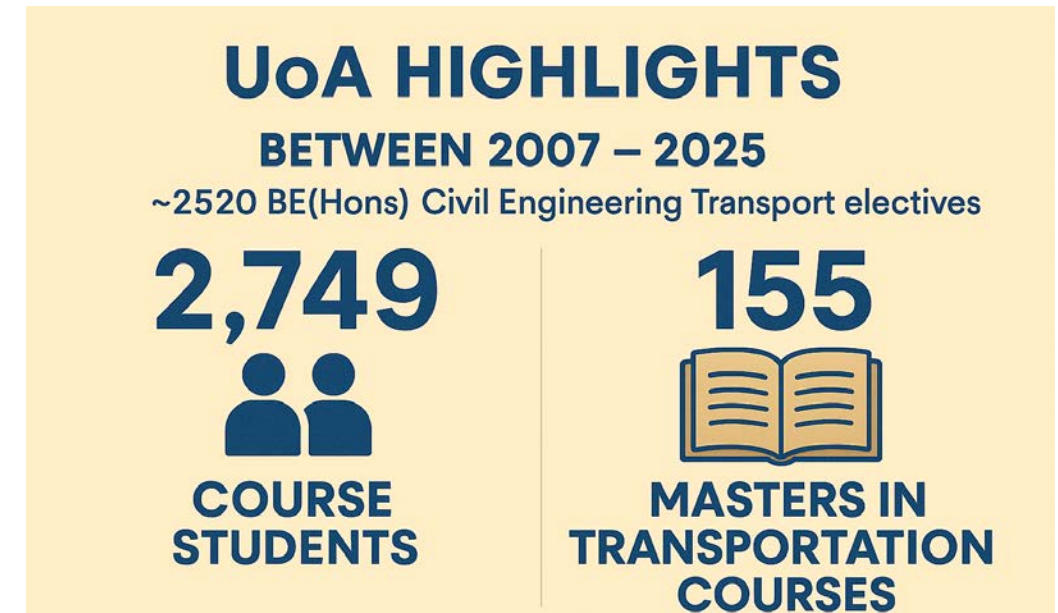
Multiple Masters programmes

- Masters of Transportation Engineering (taught and by research Thesis)
- Master of Engineering Studies (MEngSt) Transportation), 120 and 180pts
- Masters of Civil Engineering – (MCivilEng)with Transportation specialisation
- Masters of Professional Engineering (MProfEng)
- Masters of Engineering Management (MEM)
- 13 courses across spectrum (>8 per year) – some alternate years
- Most courses on block course mode (e.g. 3 x 2days), some extended
- Masters of Research projects (30,60, 90 and 120pts)



What the Investment Built

- Enduring postgraduate teaching capacity (UoA & UoC increased academic staff)
- Research capability aligned with national needs
- A pipeline of transport engineers, planners, analysts
- Strengthened industry–university partnerships
- Hundreds of graduates now in leadership roles across NZ
- Contributions to safety, modelling, network resilience, PT, cycling
- Influence across the Asia–Pacific region
- Long-term uplift in professional capability
- Continuity of expertise through disruptive periods (quakes, reforms, COVID)



Source: AI generated by Copilot

International & Domestic Visiting Lecturers

- Prof Martin Snaith (University of Birmingham)
- Emeritus Prof John Morral (University of Calgary, Canada)
- Prof Susan Tighe (McMasters / Waterloo – Canada)
- Dr John McClean (ARRB – Australia)
- Prof Bhagwant Persaud (Ryerson Univ, Canada)
- Prof Khair Jadaan (Jordan)
- Prof Benjamin Heydecker (UCL – London)
- Prof Sebastian Stichel (KTH Stockholm)
- Dr Glen Koorey (Viastrada – NZ)
- Dr Fergus Tate (WSP – NZ)
- Dr Shane Turner (Abley – NZ)
- Guests from NZTA, MOT, AT, Beca, WSP, AECOM, Aurecon, AECOM, KiwiRail, Downer, Stantec, Railize,



Funding Shift (2017) & Current State

- NZTA moved away from direct education funding
- Loss of dedicated annual support
- Programmes maintained—but with reduced capacity
- Less ability to scale, innovate, and respond to emerging needs and have visitors

- Ongoing demand for postgraduate training
- Growing need for interdisciplinary skills
- Education providers facing resource constraints
- Increasing complexity: climate, equity, decarbonisation, automation, AI
- International talent competition



[Māori proverb](#) (whakataukī) meaning "walking backwards into the future".

Emerging Skills Gaps

- Data analytics, AI, digital twins
- Climate adaptation and resilience to extreme events,
- Community resilience and access needs
- Multimodal design & behaviour change
- Te ao Māori integration in transport practice
- Systems thinking, policy literacy
- Community engagement and social outcomes



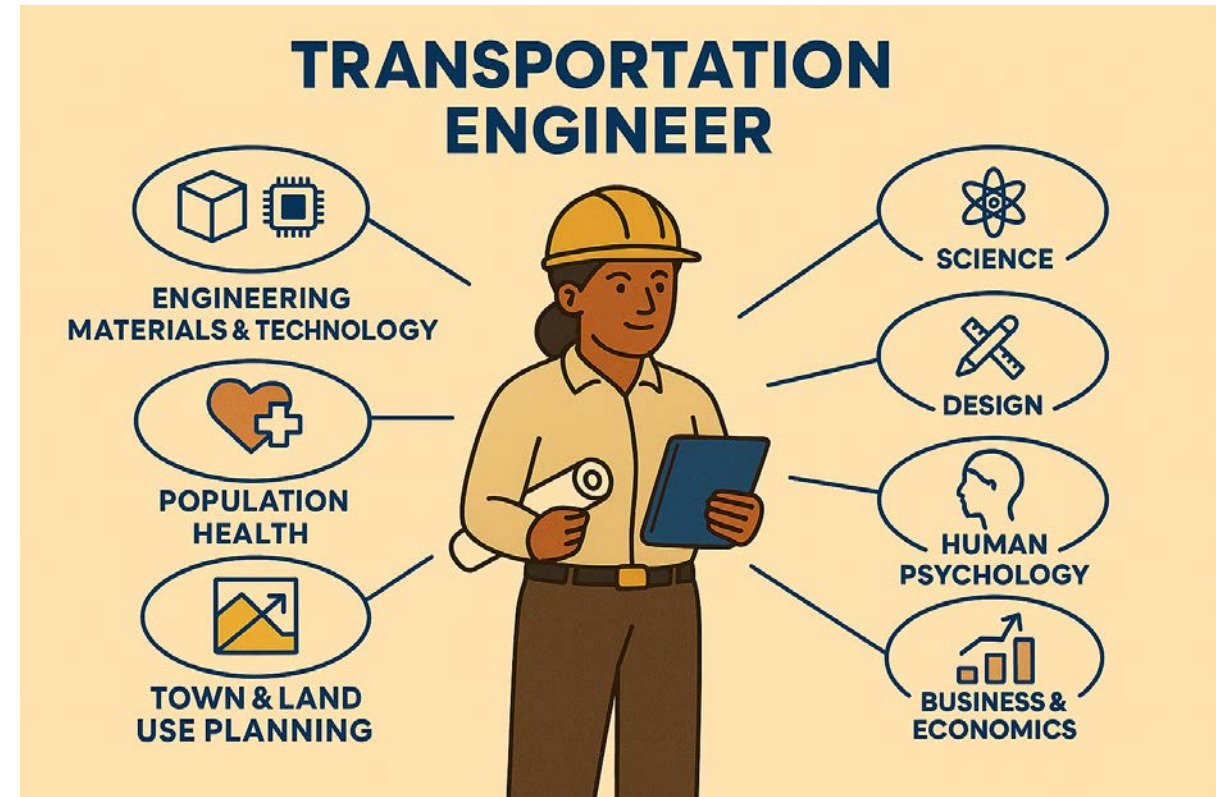
Wheelchair-bound people are being rescued from a flooded area in the North Island city of Napier. [AFP]



Civil 769 CRL Class
Site Visit, 2024

The Workforce needs for Tomorrow

- Ability to work across engineering, planning, health, data science and business, but keeping in our lanes of expertise
- Cultural competence and partnership with Māori
- Ethical and responsible use of technology and using AI appropriately
- Skills for a decarbonised transport future
- Adaptability, agility, curiosity, and lifelong learning



Source: AI generated by Copilot

Strategies for a future Workforce

- Reinvest in postgraduate multi modal transport education – need more rail content (passenger and freight)
- Strengthen industry–university collaborations
- Support flexible learning pathways & microcredentials
- Build Māori and Pasifika workforce capability
- National talent pipeline strategy for transport
- Treat capability as critical resource infrastructure
- Transportation Industry Survey – fundamentals vs new knowledge, skills and capabilities



Summary and Conclusions

- Transport resilience = investing in people
- The Masters programmes were a highly successful, low-cost intervention
- Their legacy between UoA and UoC still underpins NZ's transportation expertise
- But emerging challenges demand renewed commitment
- Respecting overlapping knowledge domains, building our own competent workforce and working together across disciplines
- Our greatest resource remains: *He tangata, he tangata, he tangata.*

Transportation Professionals

What are the fundamentals that Engineering professionals offer :

- Design & Build, Analytical Modelling & Problem solving skills



Working together with Other Tr Professionals (e.g. TPP):

- Planning
- Health
- Psychology
- Science
- Business & Economics





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