



Quarry NZ Conference

Thursday 15th July

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What we do

1

30-Year Strategy

The 30-year strategy will identify systemic issues and use foresight planning to consider a range of future possibilities, before making recommendations.



2

Major Projects and Advisory

Supporting government agencies, local authorities and others to procure and deliver major infrastructure projects.



3

Project Pipeline

The Infrastructure Pipeline aims to deliver a visible, coordinated pipeline of work. This enables industry to plan ahead and co-ordinate.



The Big Picture in 2021: Infrastructure in vogue

Deficits everywhere, pipeline growing

- Estimates vary, but they're all big
- Widening gap between needs and capital
- Binding constraints, demand management
- >\$61 billion in the pipeline

The 4 Capitals

- Human: skills shortages, MIQ
- Financial: stimulus investments coming online, congestion pricing
- Natural: supply chain, prices
- Social: institutions pushing reform

Post-Covid

- Construction booming
- Flexible working
- Domestic travel recovering

Concurrent Policy Reform

- RMA
- 3 Waters
- Local Government
- Climate Change
- Housing



Pipeline



2,586 projects



143 organisations



\$61b total projects



\$24b under construction



\$7.8b water projects



\$27b transport projects



\$5.4b housing projects



\$4.3b education projects



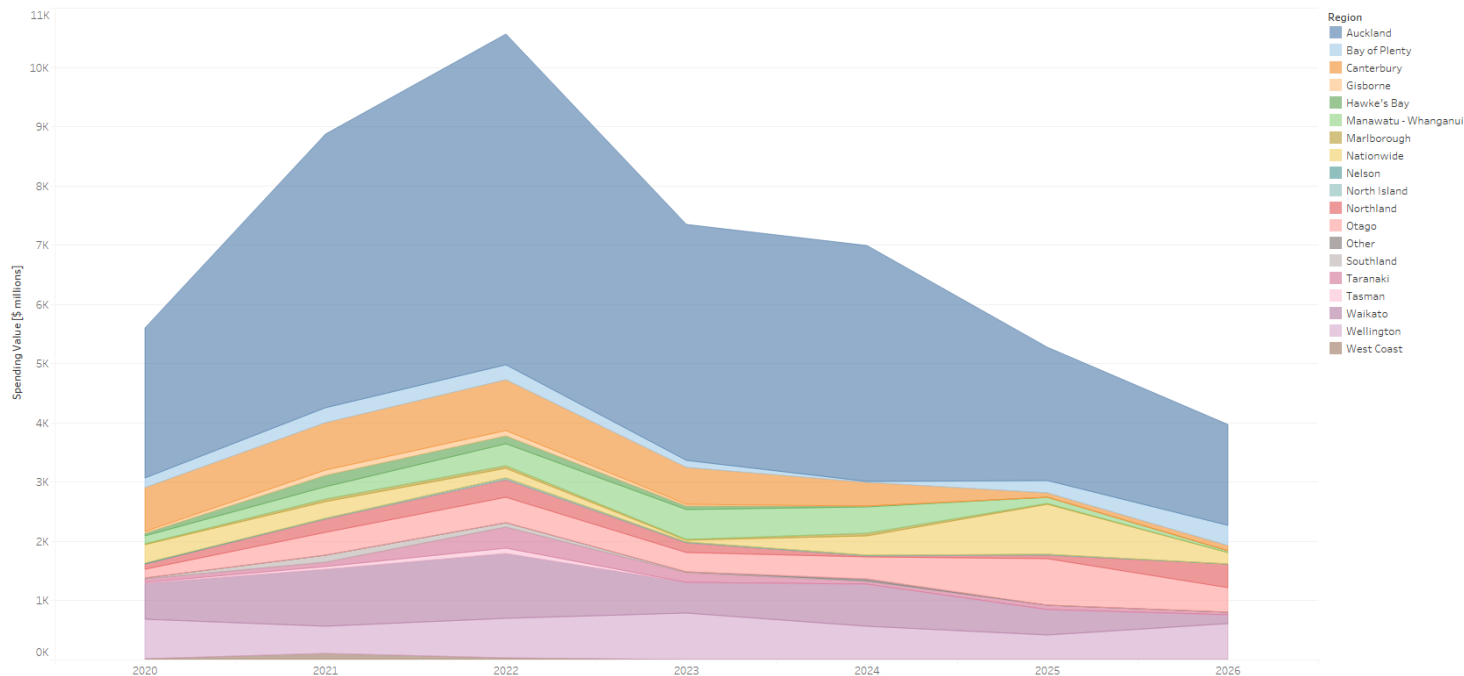
207 shovel ready projects



\$3.4b shovel ready projects

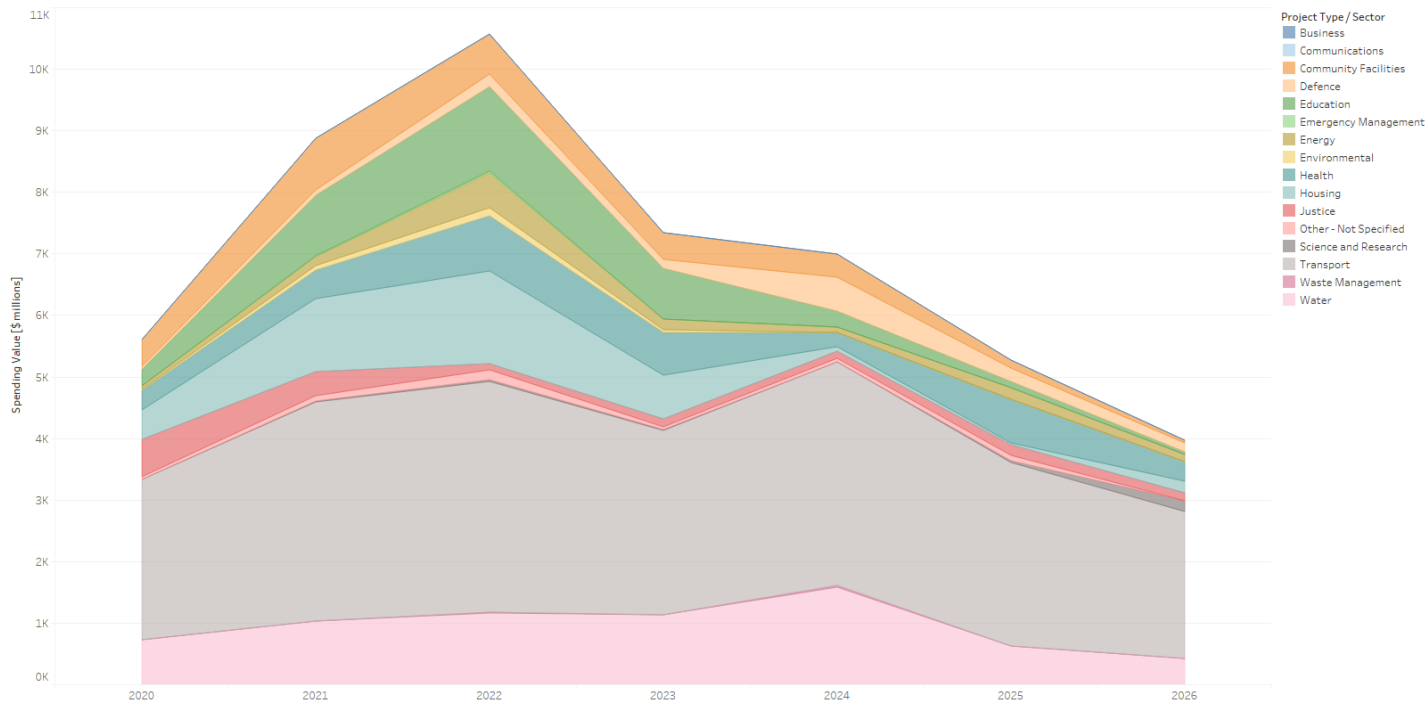
Regional spending

Region Spend



Sector spending

Sector Spend

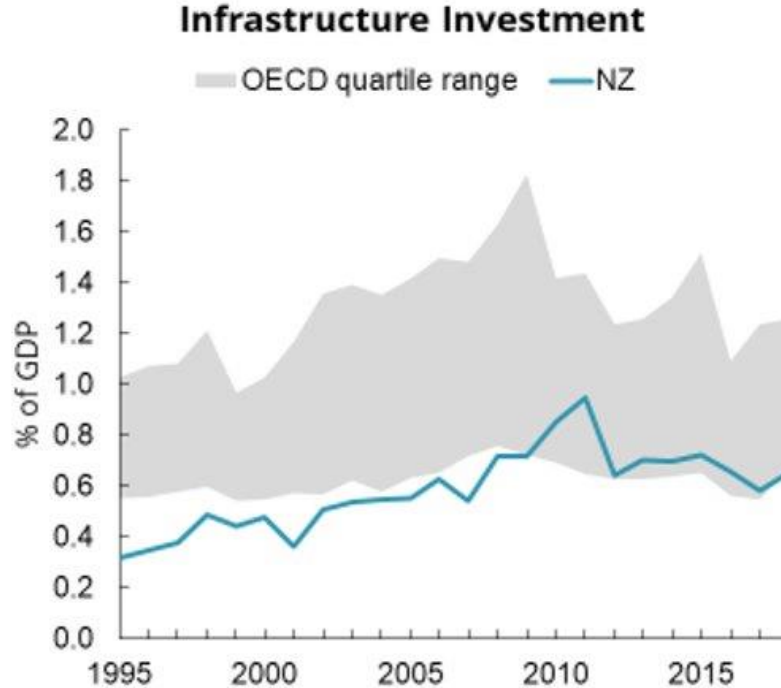


New Zealand doesn't do very well

World Economic Forum: Global Competitiveness Report 2019



A large deficit has built up



Source: OECD, StatisticsNZ, Sense Partners.

\$75+ billion

But that's just the beginning ...

New Zealand's Infrastructure Deficit, 2021-2051

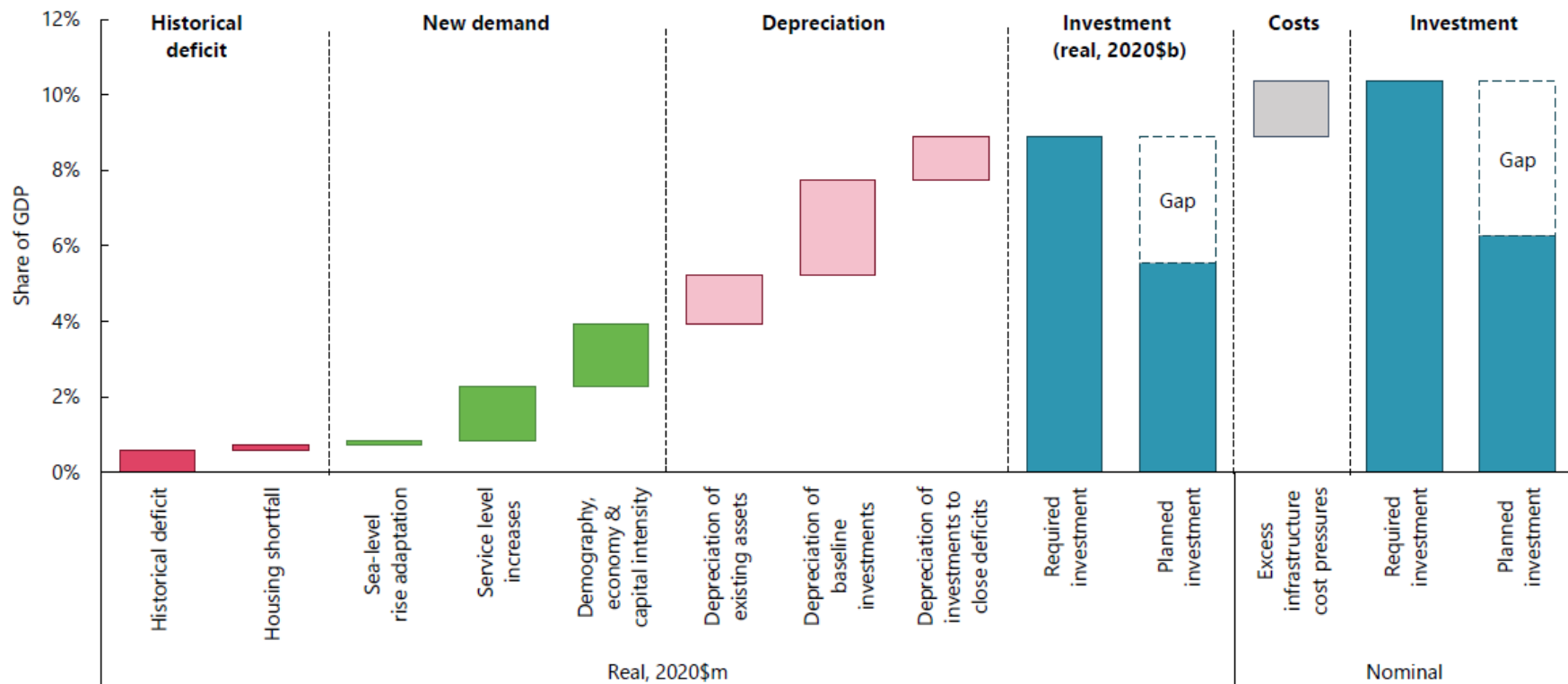
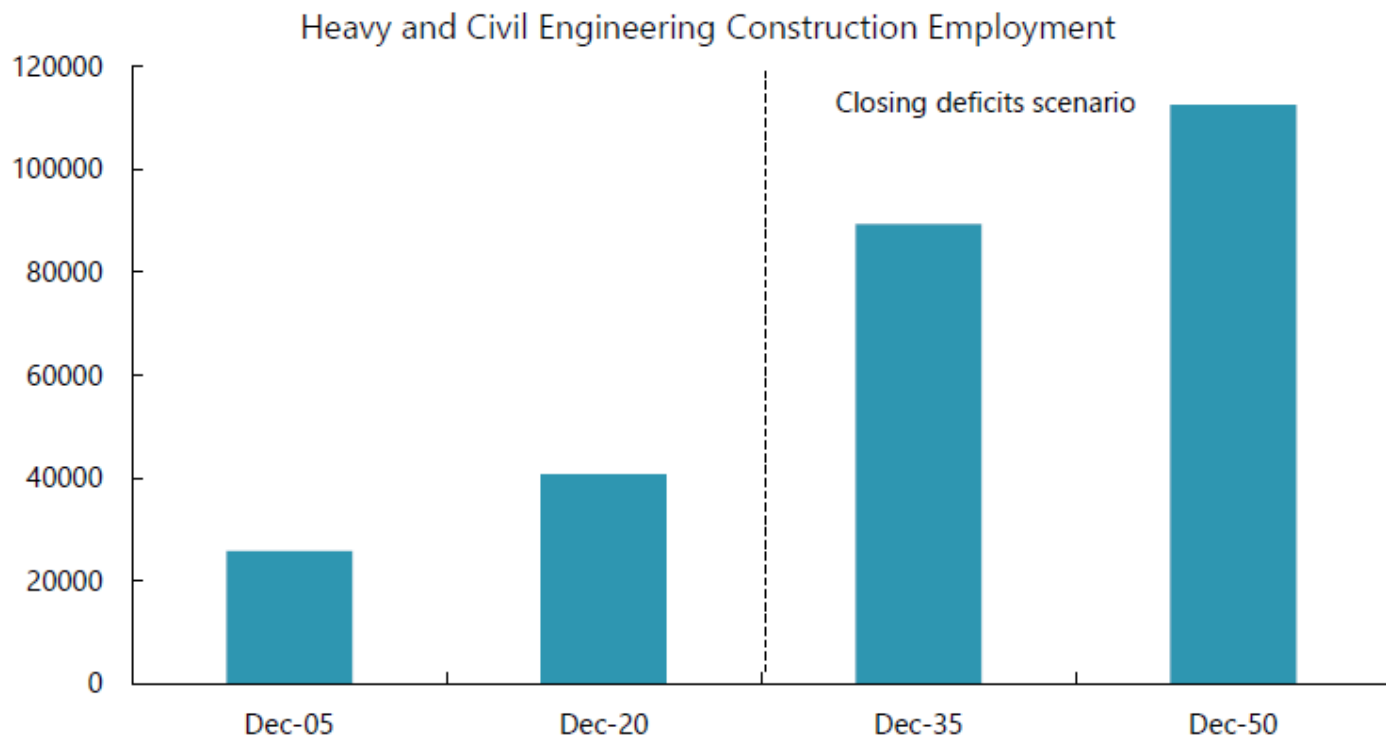


Figure 2: We conservatively estimate significant infrastructure deficits: both historical and future

	Government		
<i>Rounded to nearest \$100m, 2020\$</i>	Local	Central	Total
Historical Deficit			
Starting shortfall based on target private to public capital ratio	65,200	17,800	83,000
Housing shortfall (115k overcrowded)	12,000	8,600	20,600
Total known shortfall 2020	77,200	26,400	103,600
Future Deficit			
Shortfall at current investment rate	132,400	34,000	166,300
Sea-level rise	5,200	7,300	12,500
Estimated future shortfall in 30 years	137,600	41,300	178,800
Estimated total infrastructure deficit	214,800	67,700	282,400
Memo item:			
Net capital stock, 2020	144,586	94,926	239,512

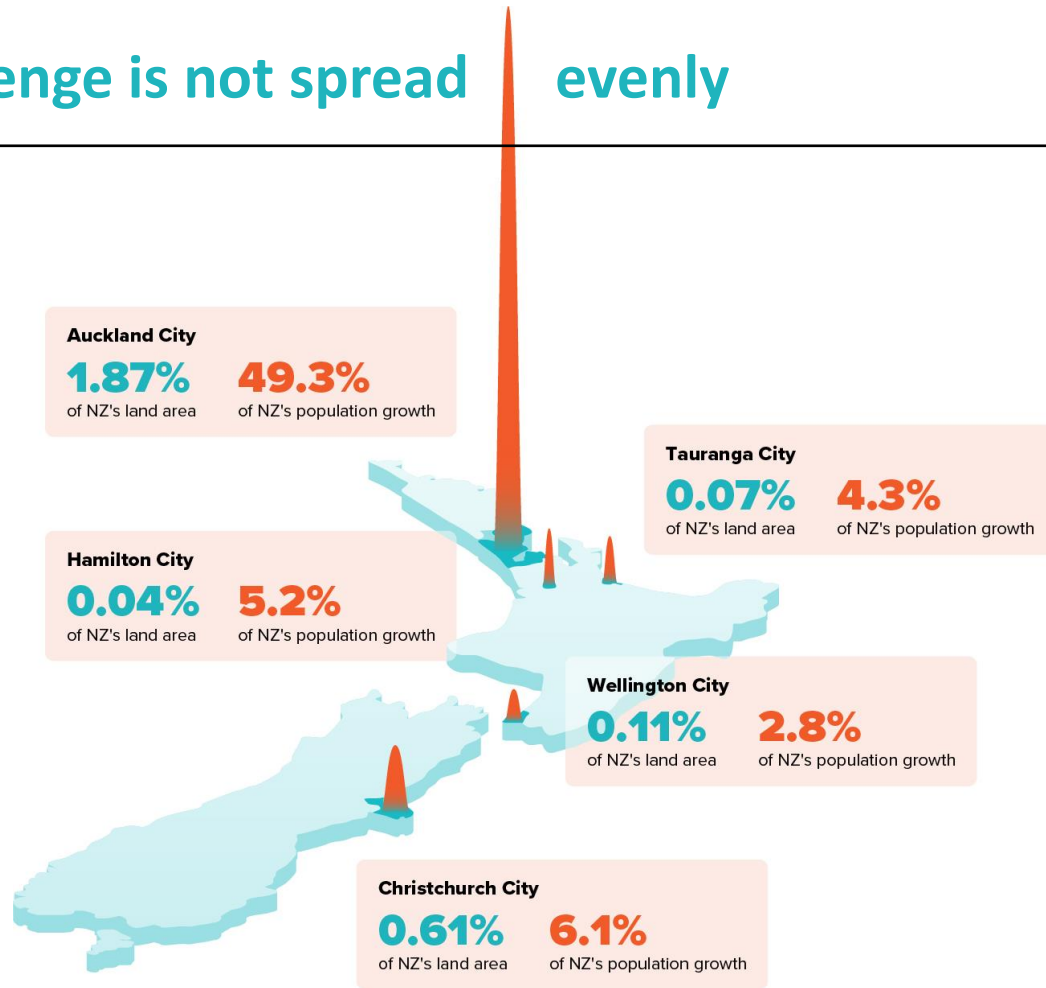
Source: Sense Partners

Figure 3: Closing deficits with investment alone would need the workforce to double



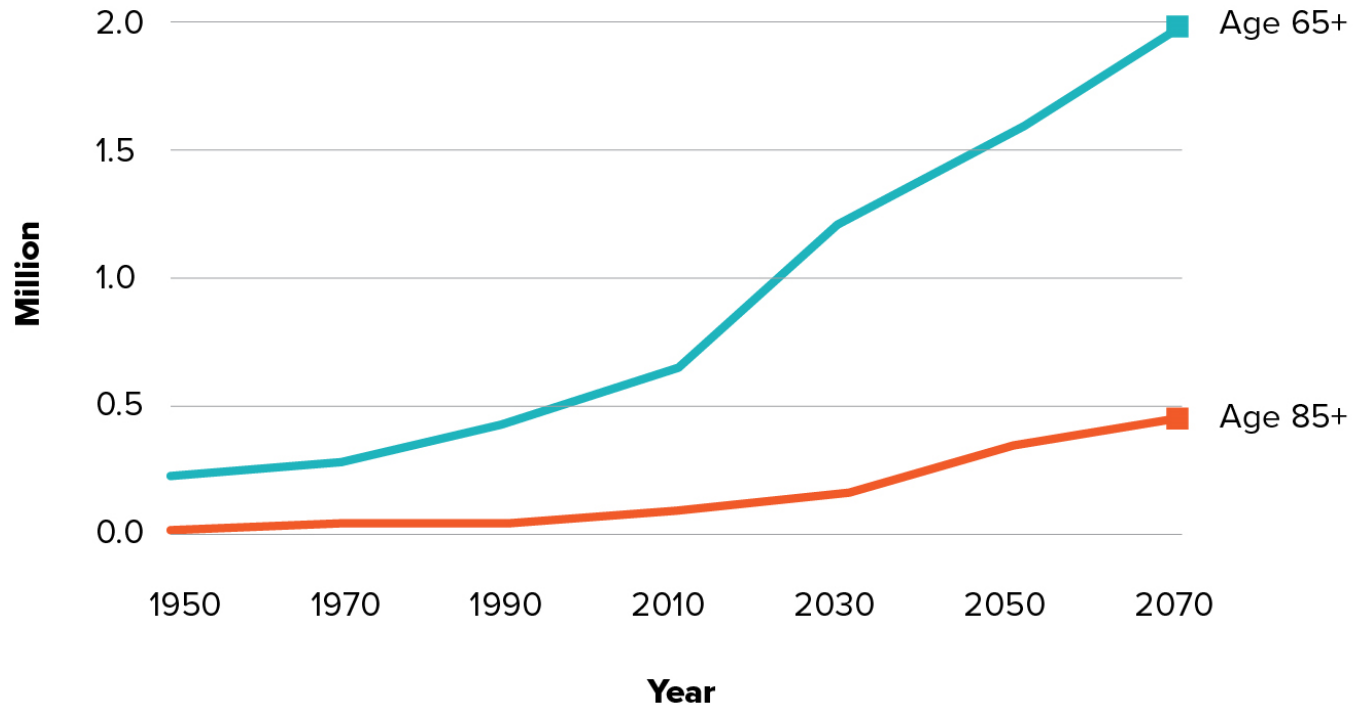
Source: Sense Partners

The challenge is not spread evenly



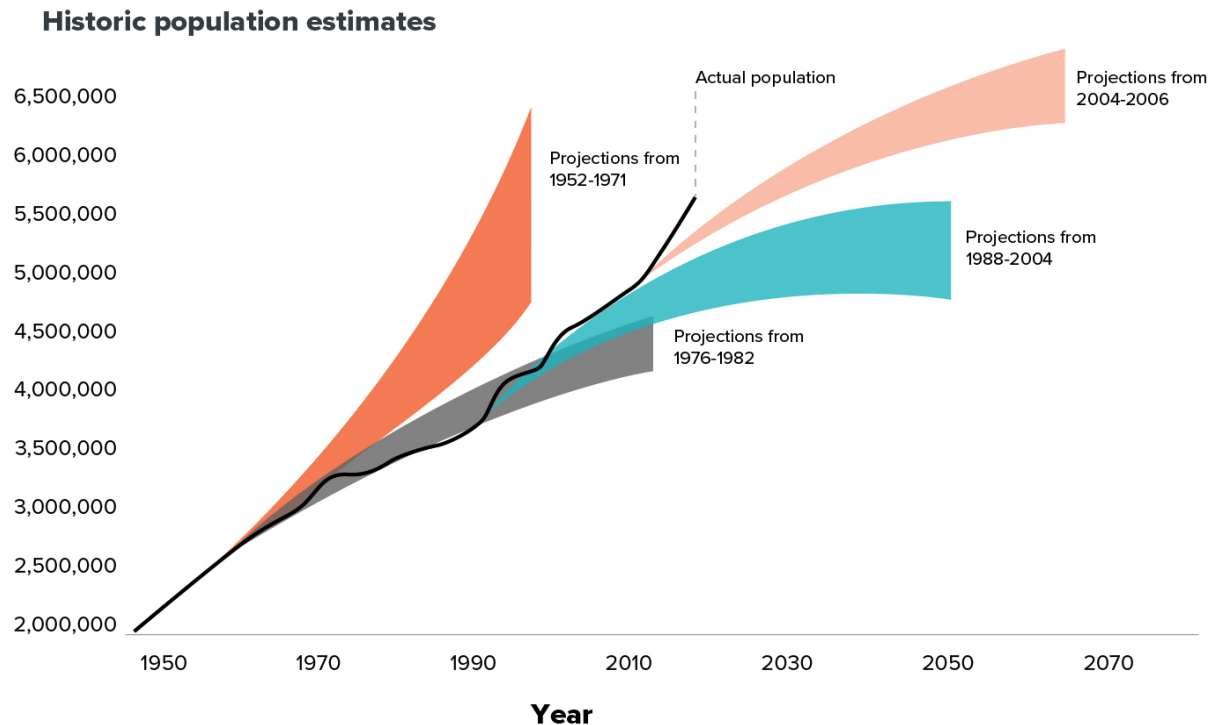
Our infrastructure needs are changing

The population is aging



We're building long-lived assets

But predicting the future is difficult



Demographic change

- **Declining fertility**
 - 1950s high (4.3 births per woman)
 - hit sub-replacement rate in 2017 (1.8)
 - **now 1.61 (November 2020)**
- **Ageing population**
 - soon 25% will be aged over 65
- **Regional decline**
 - Two-thirds of NZ regions will experience population decline
 - Auckland + Waikato + BoP
 - 2018 = 50% NZ's population
 - 2038 = 55%

This is an important moment for infrastructure

- Resource management reform: NBEA, SPA, Managed Retreat
- Three waters reform
- Climate change: Emissions Reduction Plan, National Adaption Plan, Adaptation Act
- National Direction Instrument's
 - Review of NES Fresh Water
 - NPS Indigenous Biodiversity
- Health and disability sector reform
- Waste legislation review and waste strategy development
- Review into the Future for Local Government

Water: turbidity on structure, policy, costs and politics

Challenge: reforms disruptive and complex, local government purpose and capacity, aspirations >> capital, stormwater tricky, NIMBYism a powerful force, standardisation absent, asset data limitations, cultural complexities, and who will pay?

Opportunity: cost efficiencies, resource efficiency, resilience through distributed 'X', environmental restoration and job creation.

Government thinks \$110 billion needed to fix broken water system

Thomas Coughlan · 05:00, Mar 26 2021



STUFF

A pipe burst in Aro Valley in January in one of Wellington's numerous recent pipe failures.

The cost of fixing New Zealand's beleaguered water systems could amount to \$110 billion over the next 30 to 40 years, according to the Department of Internal Affairs.

Resource Management Act: slow, spendy and ineffective

Challenges: series of concurrent workstreams to condense into the timeframe required, massive implications for infrastructure, expectations are immense, what happens in transition period?

Opportunity: a planning regime that is permissive and enabling of infrastructure while managing the tradeoffs inherently necessary when we build something.



If/what/when/where to build: making better decisions

Challenges: infrastructure decision making remains opaque, expensive and slow.

Wellbeing is a complex goal.

Our 'system' of decision making is often bypassed.

The rear-view mirror is seldom used. Zero Net Carbon 2050 will necessitate getting more out of what we have.

Opportunities: procurement discipline occurs in other jurisdictions – it can here too. Sunlight is a powerful disinfectant, transparency is essential.

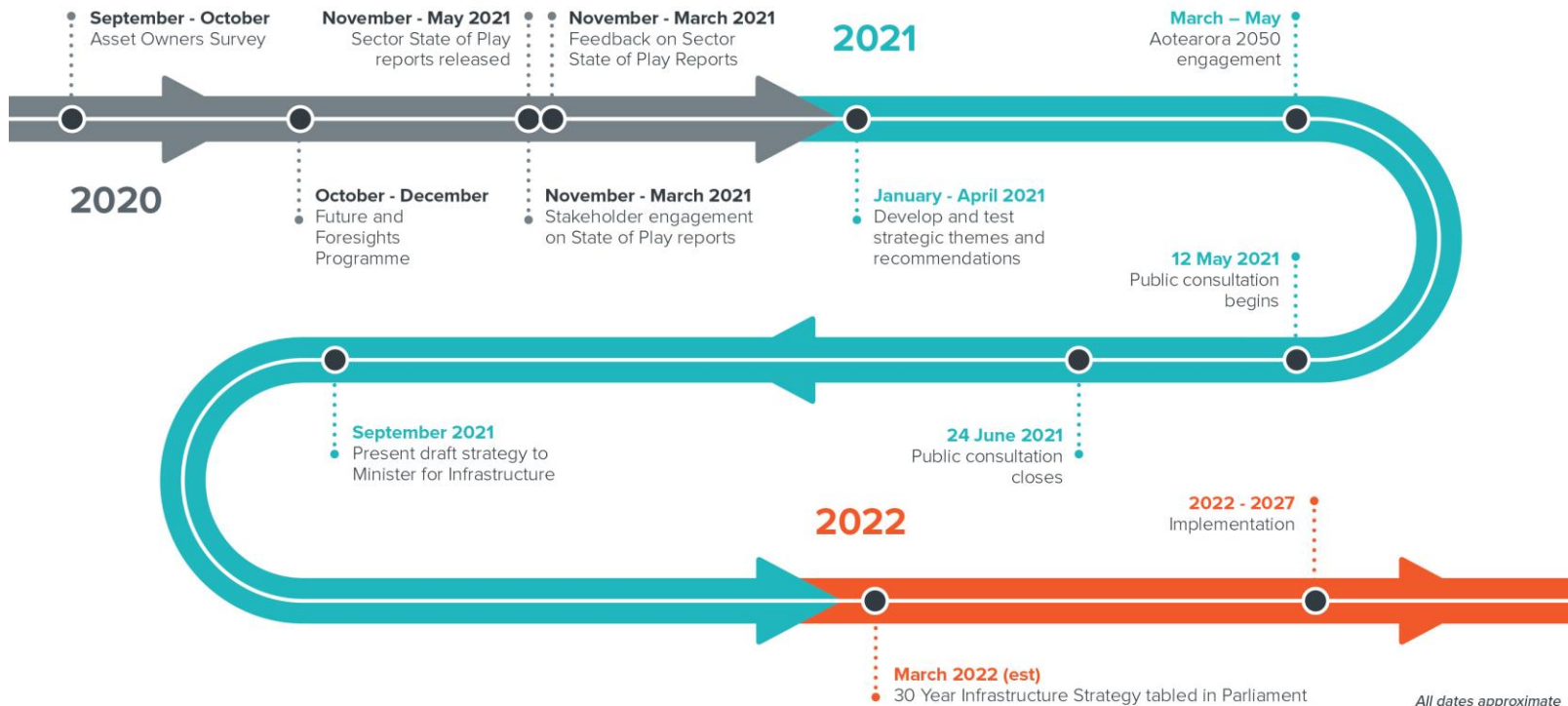


He Tūāpapa ki te ora

Infrastructure for a Better Future

Aotearoa New Zealand Infrastructure Strategy
Draft Consultation Document
26 March 2021





1: Building a Better Future

Delivering infrastructure that is resilient to stresses and shocks and ready for change.

Needs

1. Prepare infrastructure for climate change
2. Transition energy infrastructure for a zero-carbon 2050
3. Adapt to technological and digital change
4. Respond to demographic change
5. Partner with Māori: Mahi Ngātahi
6. Ensure security and resilience of critical infrastructure

2: Enabling Competitive Cities and Regions

Ensuring that our infrastructure systems support the needs of people living in cities and regions and improve our connections both within New Zealand and with our markets overseas.

Needs

1. Enable a responsive planning system
2. Coordinate delivery of housing and infrastructure
3. Improve access to employment
4. Plan for lead infrastructure
5. Improve regional and international connections

3: Creating a Better System

A step change in how we plan, design, fund and deliver infrastructure.

Needs

1. Integrate infrastructure institutions
2. Ensure equitable funding and financing
3. Make better use of existing infrastructure
4. Require informed and transparent decision-making
5. Develop and prioritise a pipeline of work
6. Improve project procurement and delivery
7. Reduce costs and improve consenting
8. Activate infrastructure for economic stimulus

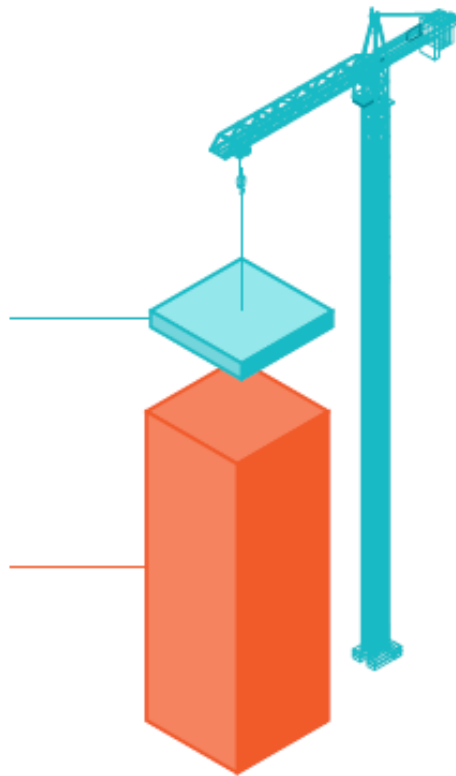
Most of our 2050 infrastructure is already around us

1%

The infrastructure
that's being built

99%

The infrastructure
that's being used



Our future welfare and livelihoods depend increasingly on the less glamorous work of improving our existing infrastructures.

Scotland Infrastructure Commission

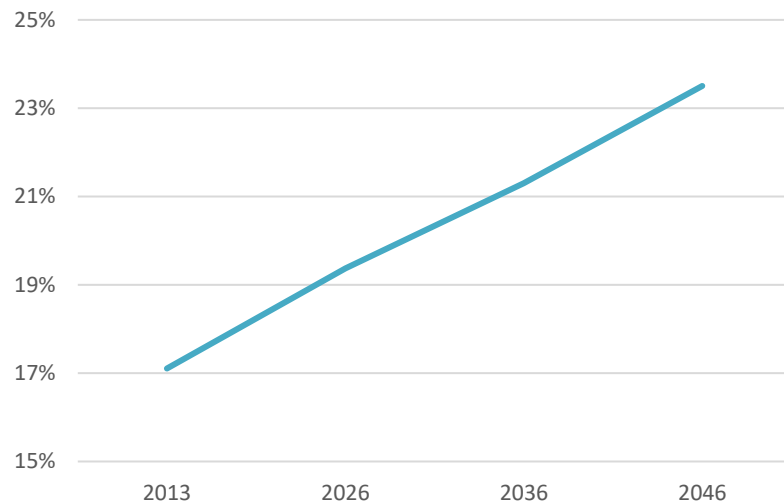
New assets can't solve every infrastructure problem



Photo by Kathy on Unsplash

Billions spent, more time in traffic

% kilometers travelled in severe congestion, 2013-2046



Source: Auckland Forecasting Centre, Macro Strategic Model Outputs, The Congestion Question

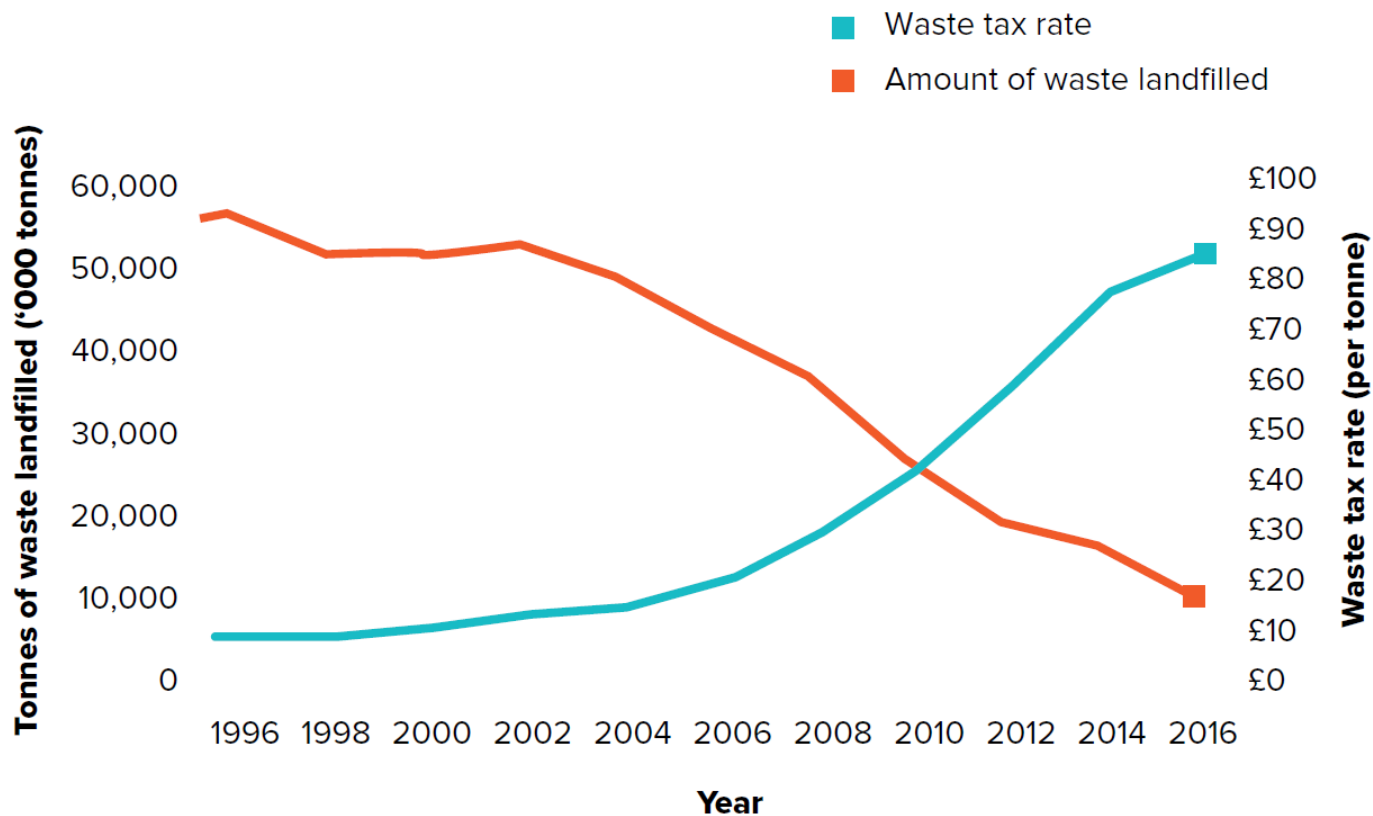
Lessons from Stockholm

Day before and after congestion charging



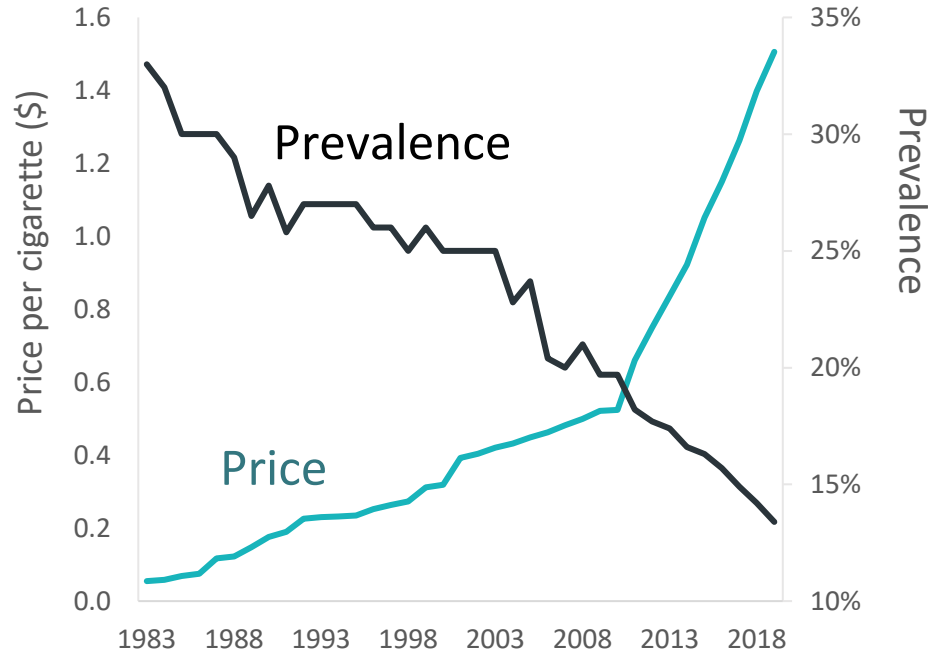
“One in four cars disappeared”

Lessons from the United Kingdom



Up in smoke

Lessons from 30 years of sustained policy effort to reduce smoking



Pricing (demand management)



Alternatives (help to quit)



Education and communication



Non-partisan



Culture shift

What about options to improve infrastructure planning?

Lead infrastructure

In the first ten months, ~4m vehicles used the bridge (1959). The total was 5.5m in 1961, 15m in the year to 1970 and exceeded 32m by the mid-1980s ...

The bridge triggered an explosion of development on the North Shore and the early traffic growth at more than 13 per cent a year led to the decision in 1964 to add two more lanes on each side of the bridge.

Grimes, 2011



Infrastructure Strategy submission feedback

Te Waihanga is currently analysing submissions on the *Infrastructure Strategy*.

A number of submitters highlight challenges with infrastructure delivery costs.

Construction inputs, including aggregate, are under pressure and rising in price:

AQA submission: “13 wind farms, each the size of the country’s largest, will need to be built in the next 15 years to power the country’s new electric cars and boilers. The construction of these wind farms alone will require an additional 1 million tonnes of aggregate and sand.”

The *Strategy* will address these strategic issues.



Proximity matters when it comes to rock

- Moving bulky, low value resources is the expensive.
- A big chunk of that cost is diesel.
- Diesel = carbon = cost.
- There is a very strong environmental case for locating quarries closer to markets.
- The tradeoff here is often pitched as “quarries vs the environment”
- The reality is more likely to be “amenity vs the environment”
- The Auckland ‘quarry belt’ is heavily restricted and under threat from NIMBY’s

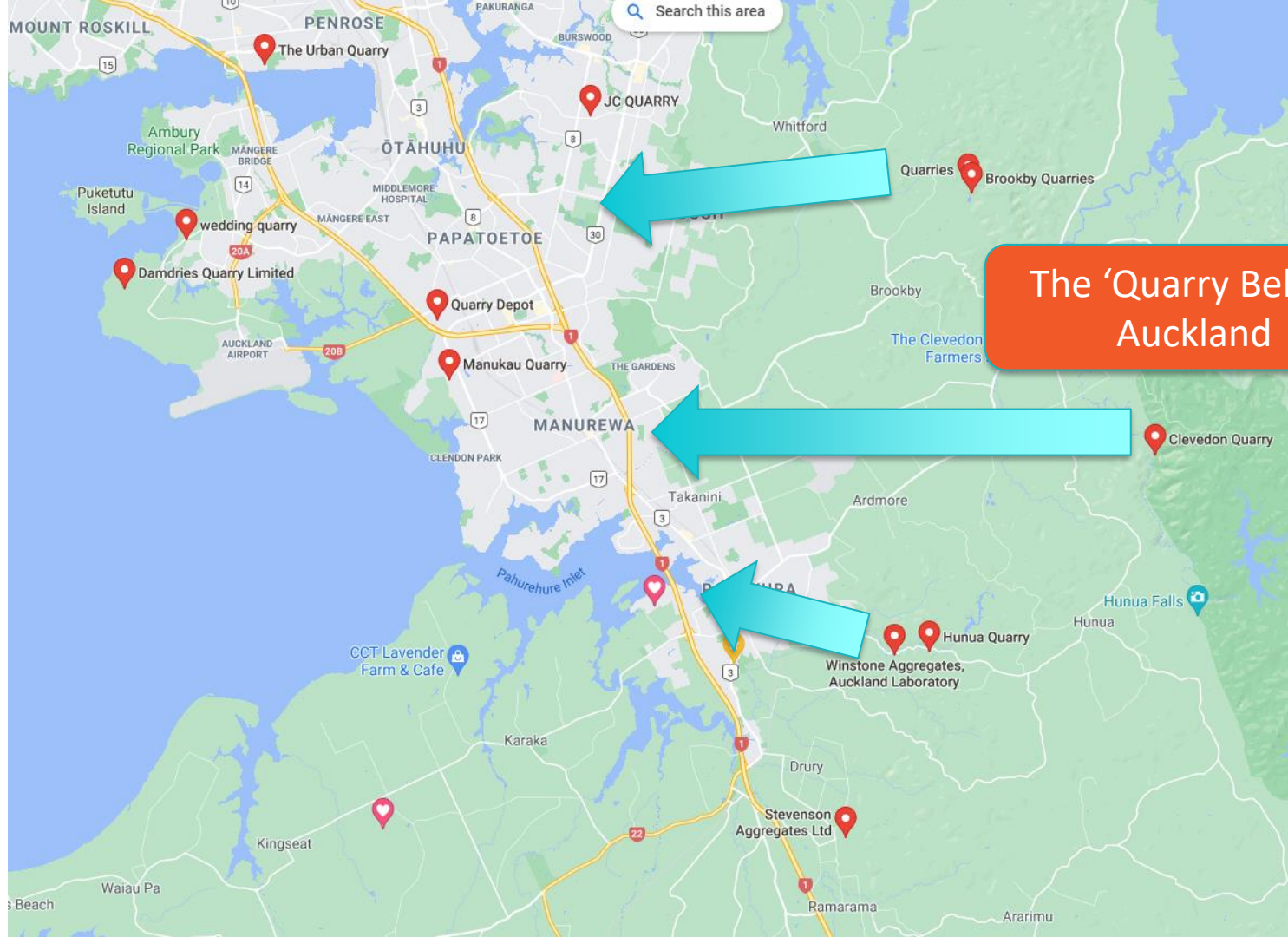
Previous

Mt Wellington quarry

Next



During the 19th and 20th centuries many of Auckland’s volcanoes and lava fields were quarried for stones, walls, roading metal, and kerb edging. This is the Mt Wellington quarry in the 1920s. By the 1980s it was the country’s largest quarry for aggregate (a mixture of crushed rock). Growing concern about the loss of the region’s volcanoes led to the quarry’s closure the following decade. A new residential suburb for 6,000 people, Stonefields, is being developed on the site.



The 'Quarry Belt' in
Auckland

Aggregate Mapping of New Zealand: GNS & Infracom

New Zealand is well endowed with good quality hard rock and gravel

But due to other factors, some parts of the country may face aggregate shortages

Study looks at:

- source rock
- land use (areas where quarrying is feasible)
- future demand (aggregates must be sourced close to demand)
- supporting infrastructure
- social objections

Quarries must be close enough to demand centres, but not too close to people.



Physical Resources Study

Te Waihanga has nearly completed a study into the supply of aggregate, cement/concrete, steel and timber.

The study draws on public information and wide range of interviews with companies

Key findings:

- Aggregates and timber often do not have sufficient capacity to meet spikes in demand
- More can be done to manage our aggregate endowment
- Carbon costs will have a big impact
- Vertical integration warrants deeper investigation
- Key issues are roading infrastructure and resource consents



NES Freshwater Review

- No earthworks in natural wetlands
- Affects most 'wet land' irrespective of ecological value
- Exception for "specified infrastructure"
- Unforeseen infrastructure needs?
- Govt is seeking a "consenting pathway"
- For quarries, mines, clean/managed fills, urban
- Amendments to regulation
- Due by end of this year
- 10% wetland extent remaining is wrong
- Concern over problem definition
- Better wetland definition also needed



Flat Top quarry expansion problems

Future Quarry?

- Grid-electric quarrying?
- Battery-electric plant?
- Moving bulk materials more efficiently – conveyors, rail, cable-cars etc?
- Supply chain efficiency – where is the low hanging fruit?
- Driverless vehicle technology?
- Coastal shipping direct to market?
- Recycled aggregates – sensible future crushing and recycling scenario?
- Are there barriers or enablers we should be thinking about for 30 Year Strategy?
- How would a ‘zero noise’ quarry change consent conditions?



Source: Volvo



Ngā mihi

Discussion/questions?