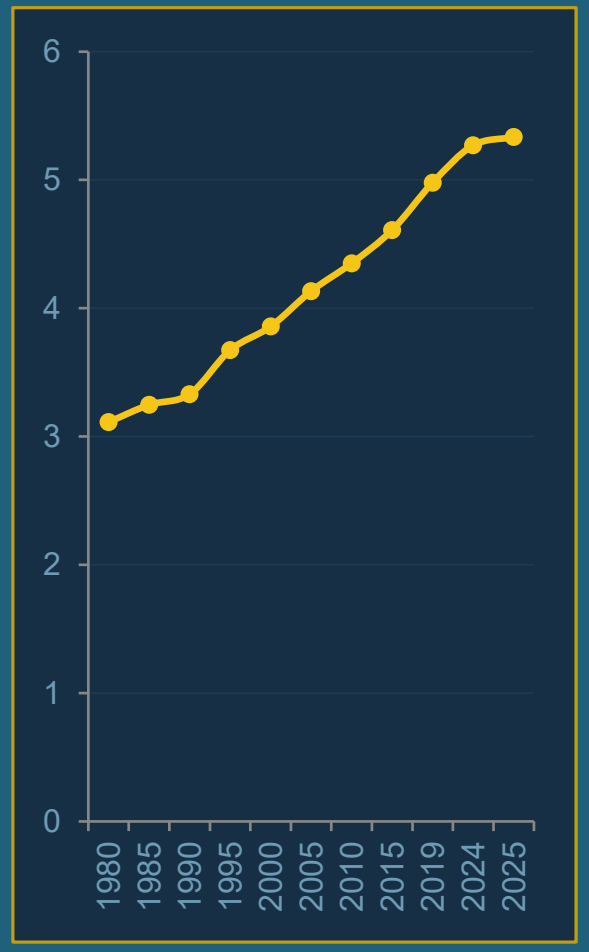
Optimising Visitation project – Key learnings

Otago Policy School 26-27 March 2026

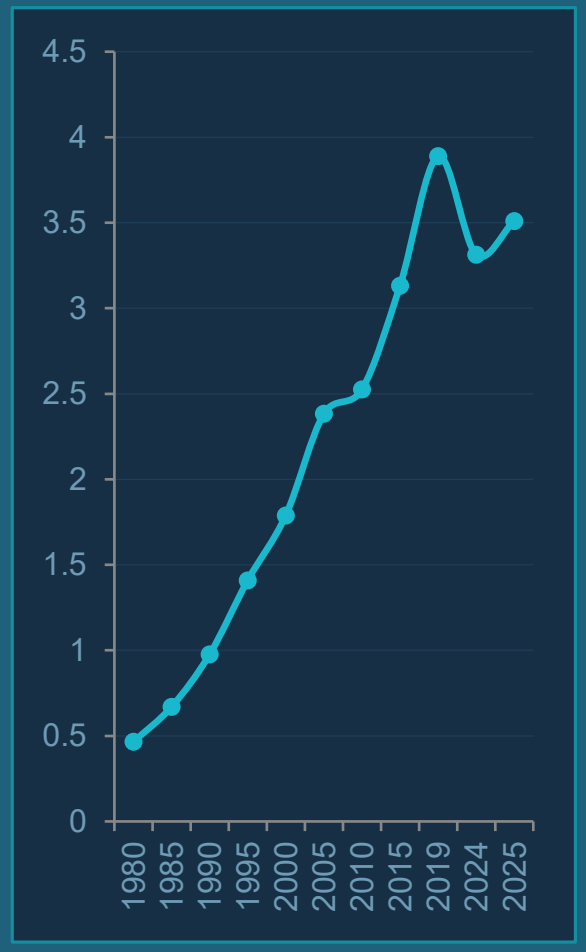
Presented by: Prof Susanne Becken

The Great Acceleration - NZ Macro Parameters

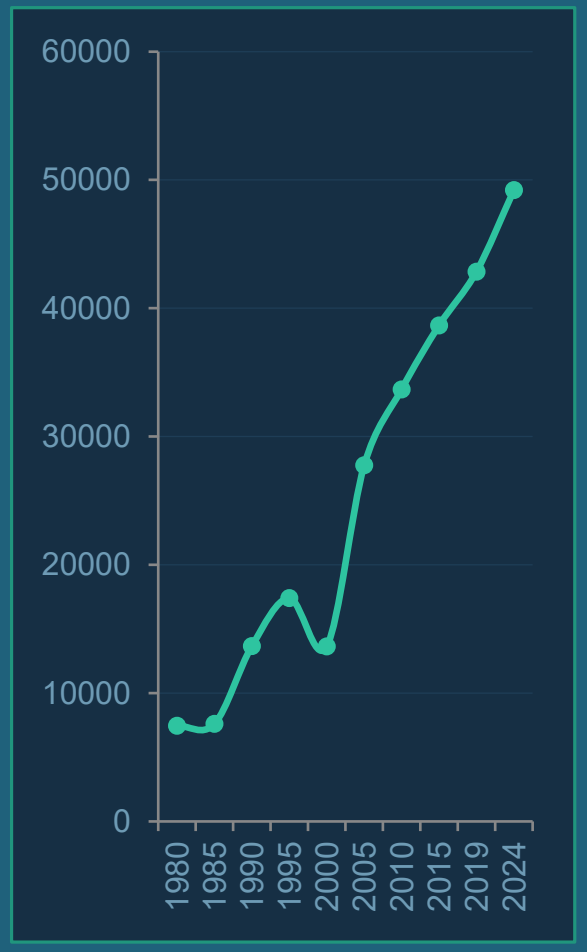
1980 → 2025



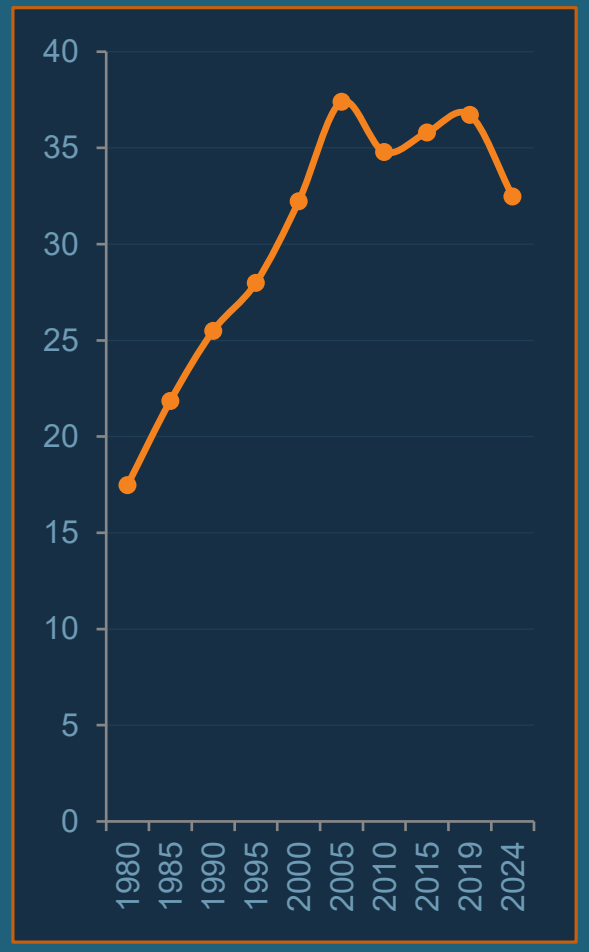
NZ Population (millions)



International Visitor Arrivals (millions)



GDP Per Capita (in US$ current prices)



CO_2 Emissions (million tonnes)

Macro Trends Matter Locally – Media Headlines

WASTEWATER

Newsroom / ODT · March 2025

Emergency powers mulled to divert resort's wastewater into river

QLDC invoked emergency RMA provisions after its Frankton treatment plant failed — discharging 12 million litres of treated effluent daily into the Shotover. Enforcement notices, community protests, and Environment Court action followed.

COMMUNITY

ODT · April 2025

How do Queenstown residents feel about increasing tourism and its impact?

Mayor Lewers: council spending $470m on infrastructure for expected tourism growth alone. "That is just for us to get by and probably with a diminishing visitor experience. Over the next 10 years, just under $1 billion to accommodate expected growth — not to create growth."

HOUSING

Crux NZ · July 2025

The true size and scale of Ladies Mile development

Fast-tracked development at Ladies Mile will add population equivalent to 10% of the Shotover plant's entire capacity — before the existing system is fixed. Infrastructure checkmate: houses can't be occupied until schools and services are built.

INFRASTRUCTURE DEBT

Newsroom · March 2026

New council benchmarking figures show high debt levels, inability to meet rates cap

QLDC's 10-year plan forecasts debt doubling to $1.21b by 2034, with $979m earmarked just to meet growth demands — not improve services. "There is little-to-no money available to deal with downstream infrastructure effects" of fast-tracked developments.

At what level, timing and form of visitation does Queenstown-Lakes optimise outcomes across economic, social, environmental and cultural dimensions?

Three connected workstreams

Destination context

- Understand pressure points
- Embed aspirations of rūnaka
- Connect to other planning work

Demand Model

- Data-driven
- Derive optimisation metrics
- Build scenario functionality

Dynamic Model

- Stakeholder-driven
- Captures the logic of how the system behaves

Study Area

- 3M+ visitors per year
- Ca 50,000 residents
- 2 RTOs within the Destination Southern Lakes (DSL) governance framework
- QLDC: single territorial local authority

1 Document Analysis & Context

Strategies, plans & policy documents
Tourism statistics; secondary research data and media commentary
System boundary definition

2 Stakeholder Engagement

Steering group meetings (stress points)
MICMAC workshops (3× November)
55 variables → directionality matrix
CLD validation (2× February)

3 Causal Loop Diagram

Variable condensation into loops
Vensim DSS: 20 loops (12R + 8B)
Manual verification (3 authors)
Stakeholder validation & refinement

4 Iceberg Analysis & Leverage Points

3 focal stress points identified
Iceberg layers: events → mental models
Leverage points (stakeholder-grounded)

Tuawhenua Partnership

(7 Kāi Tahu Rūnaka)

Continuous strand across all phases

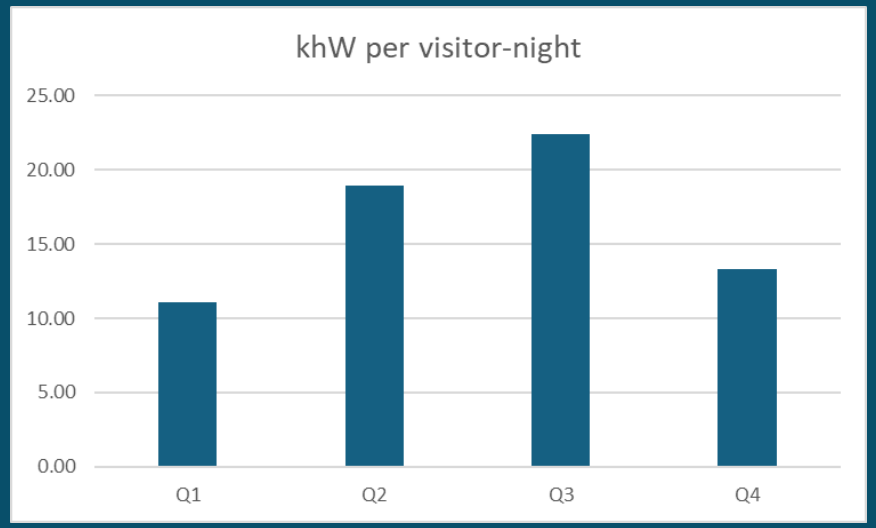
Demand Model - Fundamentals

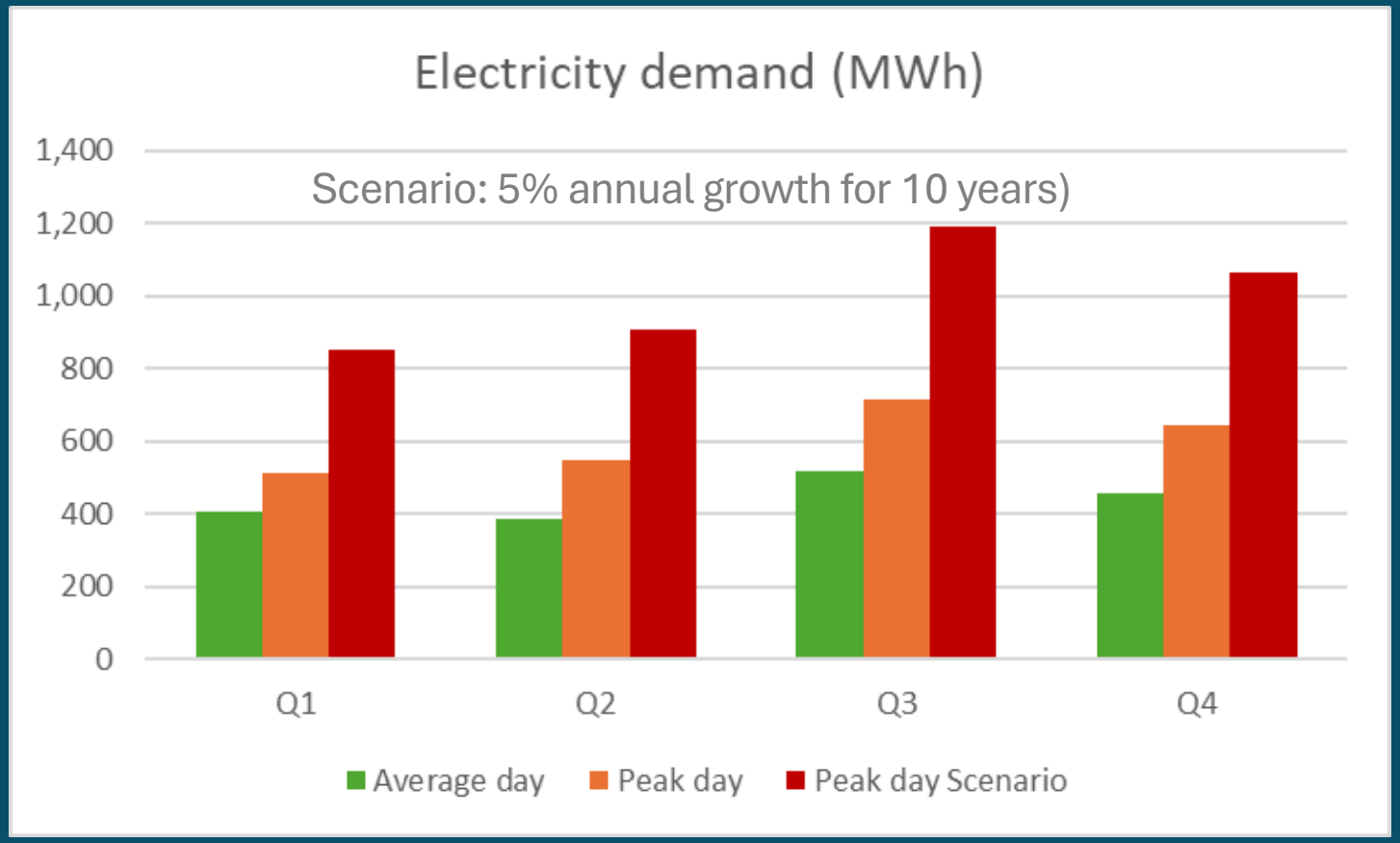
Six markets X
Four seasons

- Provide a ‘baseline’ (2019) view of tourism demand in the Queenstown-Lakes District
- Link baseline visitor demand to selected supply-side variables (e.g. water, electricity)

Peak Electricity Demand

- Visitor arrivals across 2019 seasons combined with derived kWh per visitor-night in Queenstown
- ‘Average’ demand versus peak using daily mobile phone data





Dynamic Model – Prototype

SCOPE

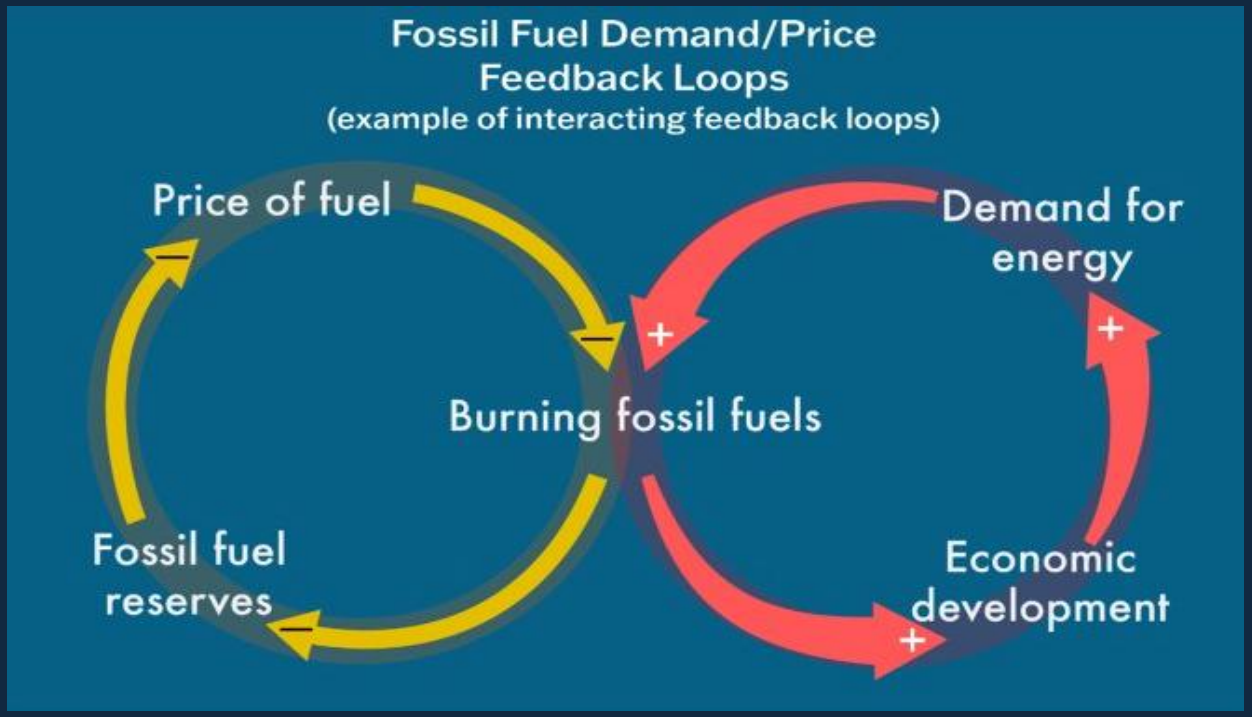
Systems Thinking scoped to the Southern Lakes Region

INPUT

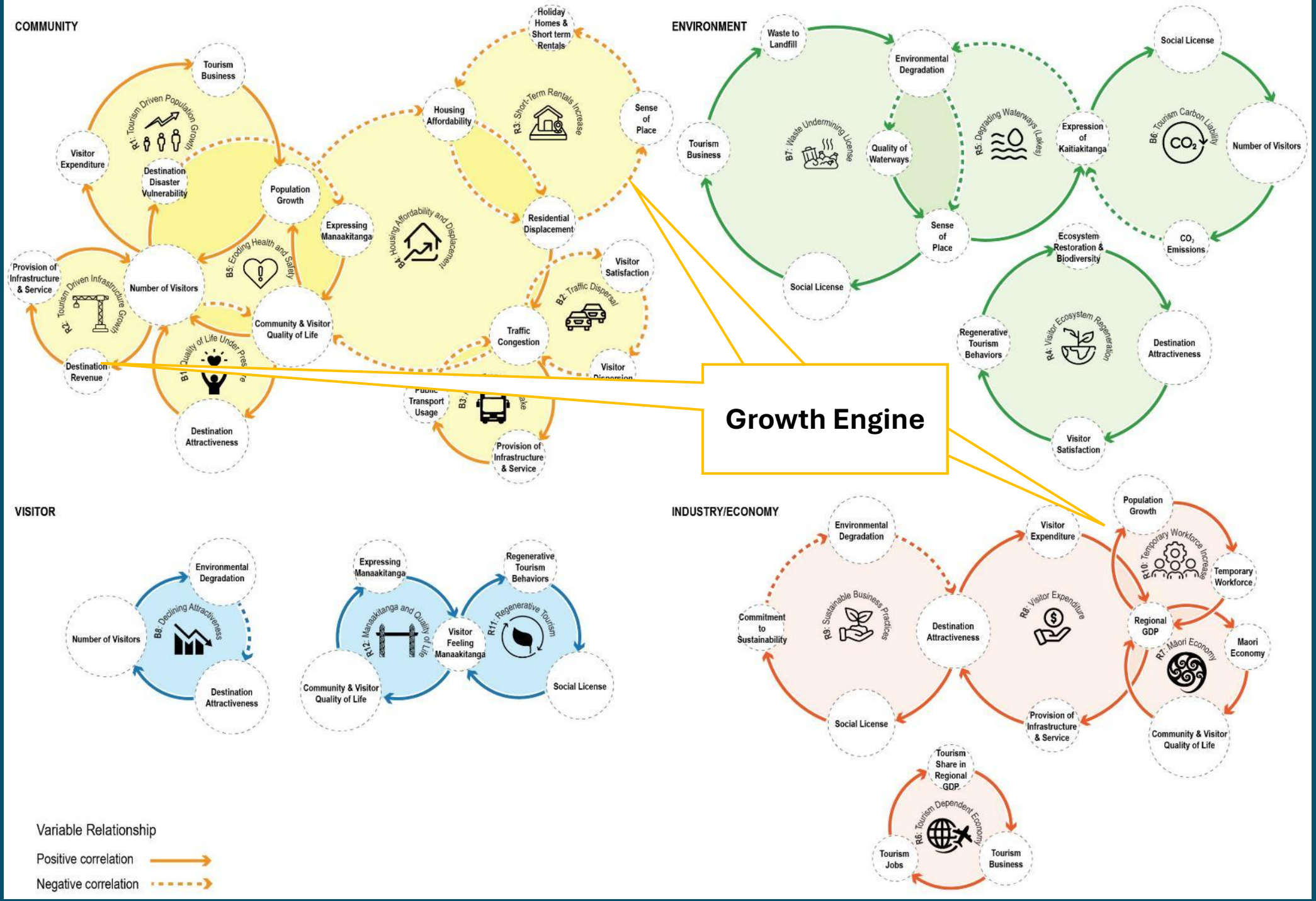
Captures wide stakeholder input to identify key pressure points

VARIABLES

Describes the system with 55 variables and their relationships



Systems Thinking tools, Source: Humber, https://humber.ca/innovativelearning/wp-content/uploads/systems-thinking/05/sec05-04.html


COMMUNITY
Tourism Business
R1: Tourism Driven Population Growth
Visitor Expenditure
Destination Disaster Vulnerability
Population Growth
Holiday Homes & Short term Rentals
Housing Affordability
R3: Short-Term Rentals Increase
Sense of Place
Expressing Manaakitanga
R4: Housing Affordability and Displacement
Residential Displacement
Provision of Infrastructure & Service
R2: Tourism Driven Infrastructure Growth
Number of Visitors
B5: Eroding Health and Safety
Community & Visitor Quality of Life
Visitor Satisfaction
B2: Traffic Dispersal
Traffic Congestion
Destination Revenue
B1: Quality of Life Under Pressure
Visitor Dispersion
Public Transport Usage
B3: Public Transport Uptake
Destination Attractiveness
Provision of Infrastructure & Service
ENVIRONMENT
Waste to Landfill
Environmental Degradation
Tourism Business
B7: Waste Undermining License
Quality of Waterways
R5: Degrading Waterways (Lakes)
Sense of Place
Social License
Expression of Kaitiakitanga
Social License
B6: Tourism Carbon Liability
Number of Visitors
CO2 Emissions
Ecosystem Restoration & Biodiversity
Regenerative Tourism Behaviors
R4: Visitor Ecosystem Regeneration
Destination Attractiveness
Visitor Satisfaction
Growth Engine
VISITOR
Environmental Degradation
Number of Visitors
B8: Declining Attractiveness
Destination Attractiveness
Expressing Manaakitanga
R12: Manaakitanga and Quality of Life
Visitor Feeling Manaakitanga
Regenerative Tourism Behaviors
R11: Regenerative Tourism
Community & Visitor Quality of Life
Social License
INDUSTRY/ECONOMY
Environmental Degradation
Commitment to Sustainability
R9: Sustainable Business Practices
Destination Attractiveness
Visitor Expenditure
R8: Visitor Expenditure
Provision of Infrastructure & Service
Social License
Population Growth
R10: Temporary Workforce Increase
Temporary Workforce
Regional GDP
R7: Maori Economy
Maori Economy
Community & Visitor Quality of Life
Tourism Share in Regional GDP
R6: Tourism Dependent Economy
Tourism Jobs
Tourism Business
Variable Relationship
Positive correlation
Negative correlation

The Deep Roots of Tourism Impact: An Iceberg Analysis

Visible Events and Crises
Surface Symptoms
(The Visible Tip)

Economic: COVID-19 Border Closures
Representing immediate external shocks that disrupt the entire economic flow of a region.

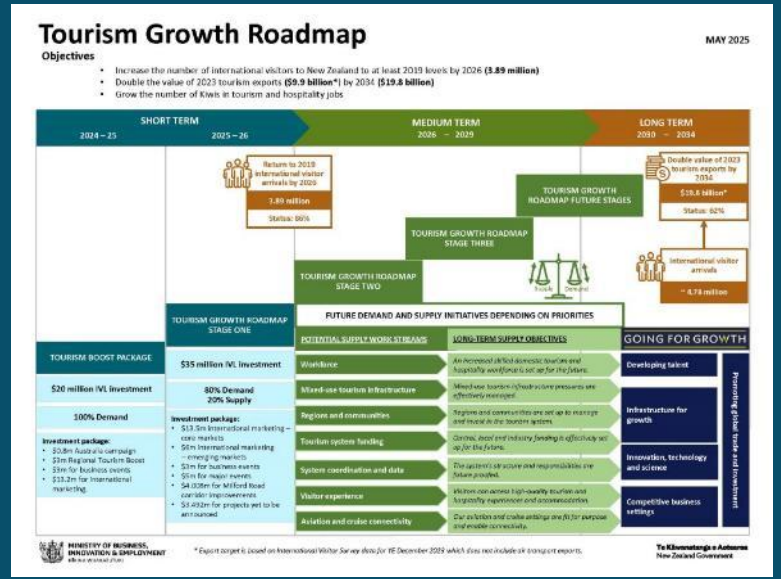
Social: Decline in Community Acceptance
The visible friction and loss of "social license" as residents grow weary of tourism's presence.

Environmental: Decline in Lake Water Quality
A tangible and measurable degradation of the natural resources that often draw tourists in the first place.

The Iceberg Model – employed to understand visible and less visible dynamics of the destination

NZ Tourism Growth Roadmap

- Increase visitor spend from $9.9 b to $19.8 (2023 to 2034) ; and grow visitor numbers to 4.8 million in 2034
- This means a 2.6% compound annual growth rate (total growth of 22.8%) until 2034
- We assume: Domestic arrivals grow 0.5% (total growth of 4.1%)

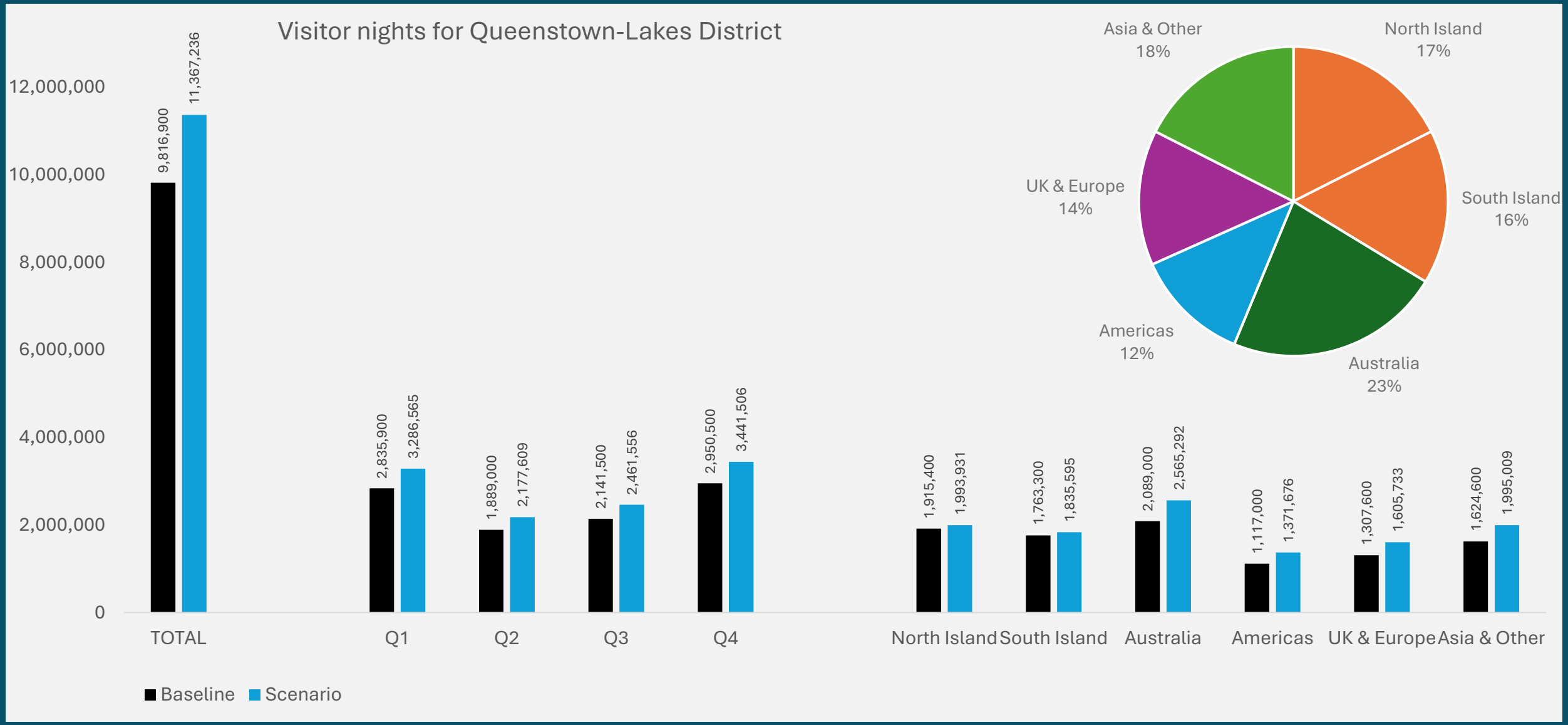


Summary of Impacts

	Indicator	Baseline 2026	Roadmap (N)	Difference
ECONOMIC	Overnight visitors	2,533,100	2,895,485	14%
	Visitor nights	9,816,900	11,367,236	16%
	Visitor spend ($M)	3,125	3,634	16%
	Employee count	14,236	16,634	17%
	Employee earnings ($M)	494	577	17%
RESOURCE USE	Electricity consumption (MWh)	154,485	178,656	16%
	Water consumption (kL)	4,280,168	4,956,115	16%
	Wastewater produced (kL)	1,855,394	2,148,408	16%
	Solid waste to landfill (tonnes)	16,394	18,983	16%
CARBON	CO_2-e: long-distance transport (t)	575,759	675,791	17%
	CO_2-e: while in destination (t)	430,497	588,375	37%
	Total tonnes of CO_2-e	1,006,255	1,264,166	26%

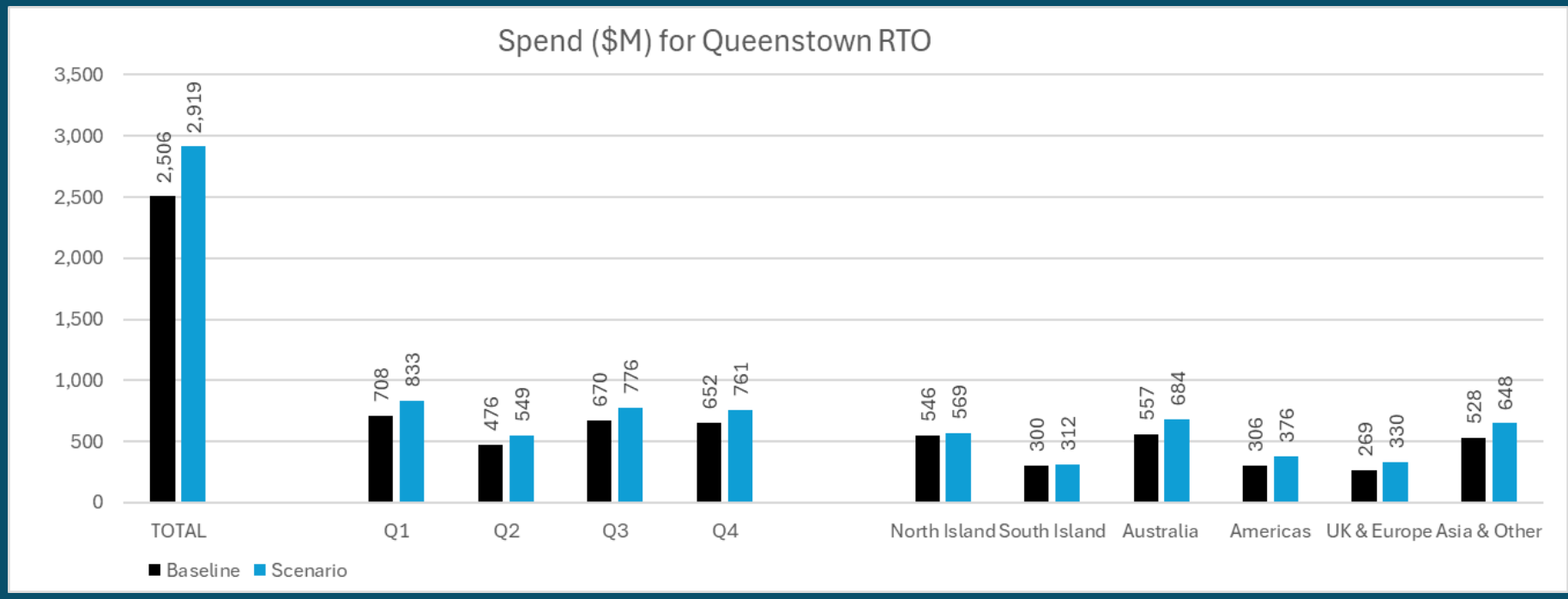
Visitation projections

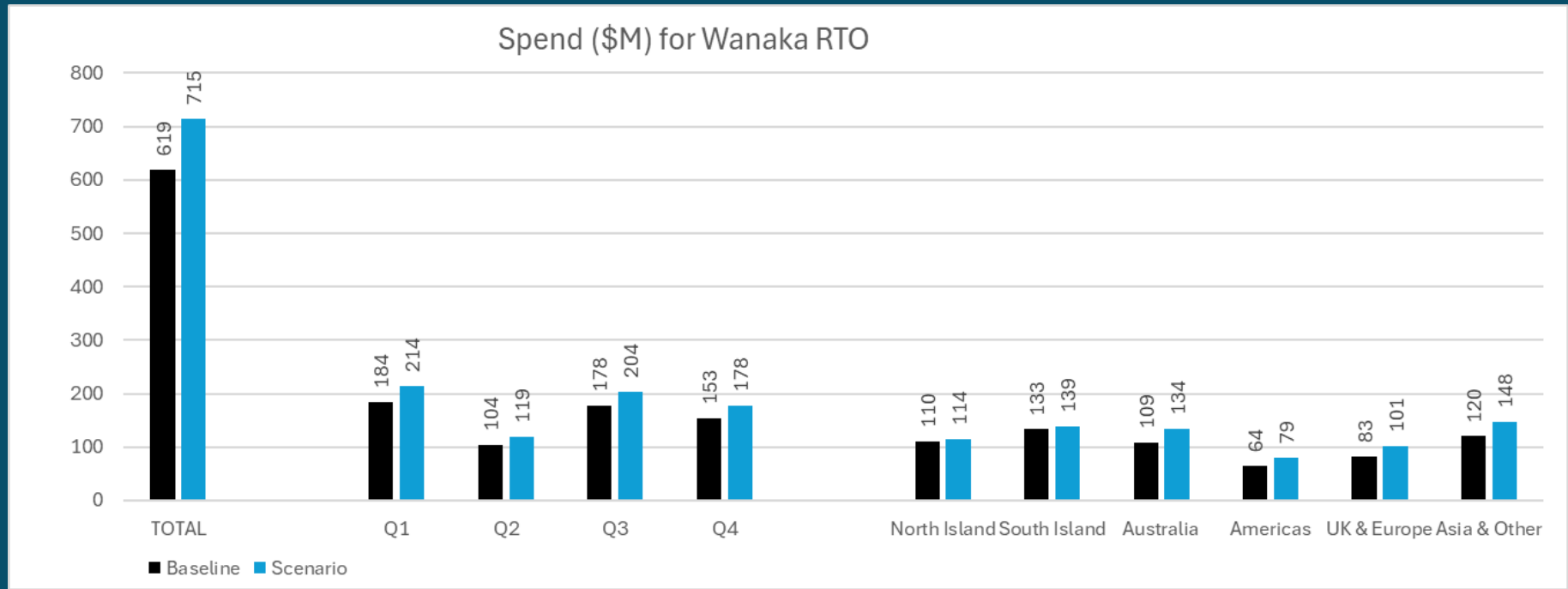
International visitors' nights share increases from 62.5% in baseline to 66.3% in Roadmap scenario.



Economic impacts

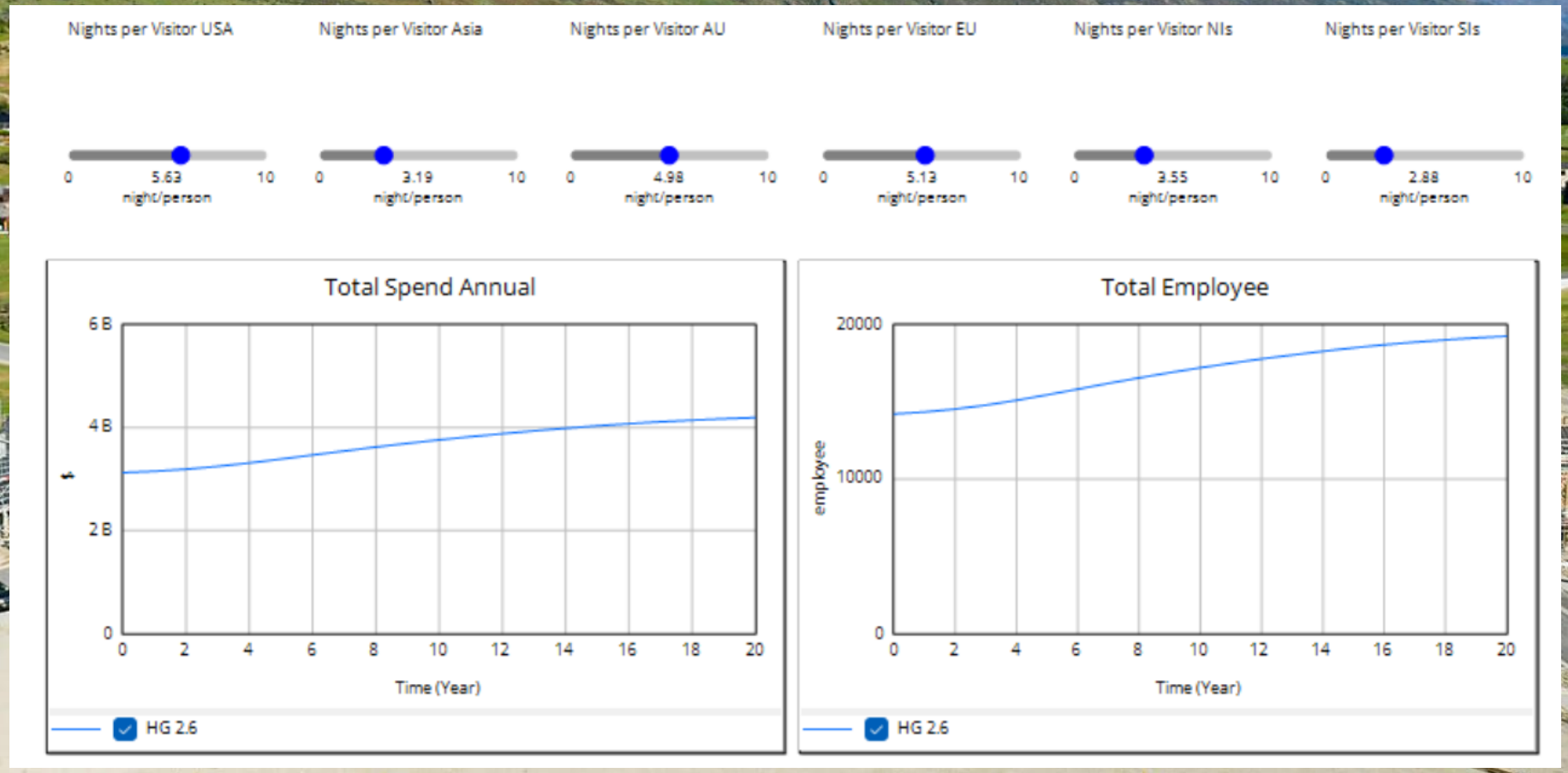
- Queenstown will see $125 million more expenditure
- Wanaka $96 million



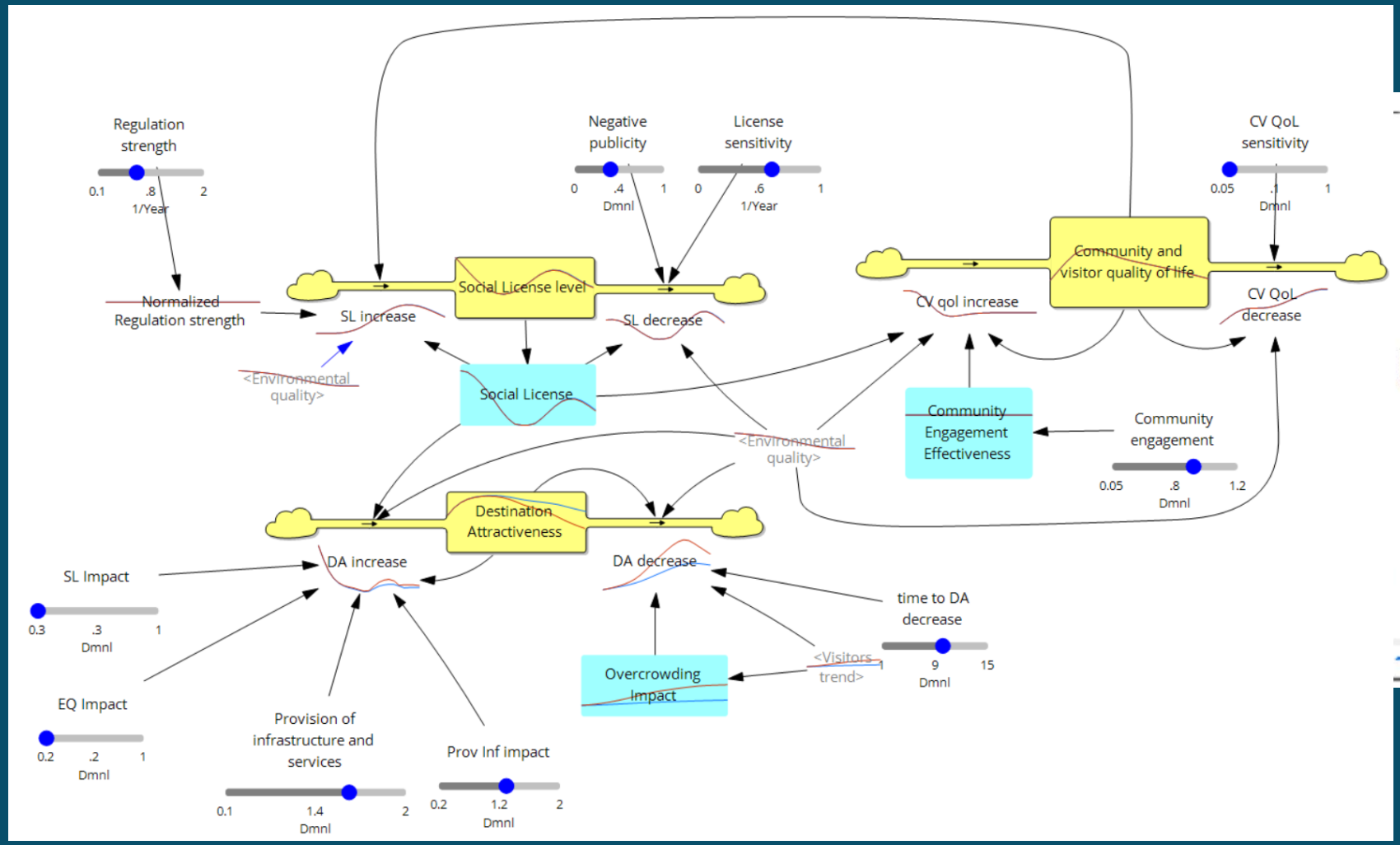


Dynamic model added insights

- Allows to see trend over any period of time and adjust key parameters
- Translate employee growth into housing requirements (not modelled yet)



Destination attractiveness and social license



What this model is — and isn't

- Tourism activity is constrained by the carrying capacity of the tourism system.
- Visitor behaviour is not fixed — responses to price, availability and constraint will alter demand over time and space (e.g. Central Otago).
- Policy and macro shocks are not modelled — external interventions sit outside this framework.
- These are scenarios, not forecasts — the model is built to explore, not to predict.

Risk of Tipping Points

QUEENSTOWN

Infrastructure failure

Emergency powers invoked to discharge treated effluent into the Shotover. A system built for a smaller town, unable to cope with peak demand.

FRANKTON

Transport at capacity

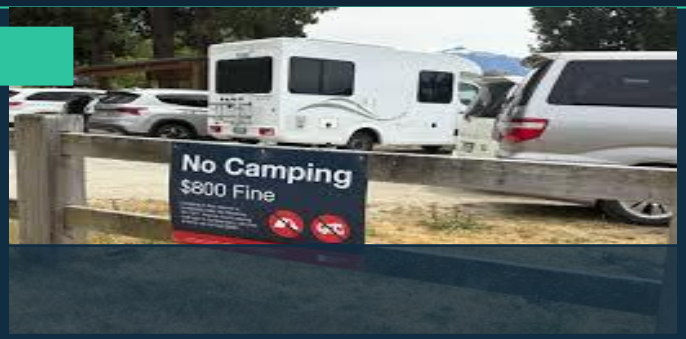
Frankton intersection exceeds capacity on 140+ days per year. A $250m upgrade underway — congestion is projected to worsen regardless.

QUEENSTOWN

Social license eroding

Residents take to the waterfront. AirBnB displacing long-term tenants. The workforce that runs the tourism economy cannot afford to live here.

WĀNAKA



Freedom camping pressure

$800 fines and enforcement signs proliferate around the lake. The natural draw of the region becomes the source of its friction.

Key Insights

If we don't invest in infrastructure...

INSIGHT	MANAGEMENT IMPLICATION FOR THE DISTRICT
1 Tourism's impacts are not linear but they compound into system-wide pressures.	Congestion, environmental degradation, and community stress can escalate faster than visitor numbers alone suggest — overwhelming infrastructure and public spaces before planners can respond.
2 We cannot yet measure what we are managing — data gaps mean key impacts stay invisible.	Without investment in monitoring and data infrastructure, the district will be forced into reactive, costly emergency responses.
3 Tourism expansion demands infrastructure investment that often outpaces revenue generated.	Continued underinvestment will widen the infrastructure deficit and push debt beyond the rates cap. Adequate funding is needed to improve services for residents or visitors.
4 The closer to capacity, the smaller the margin for error.	The district risks various tipping points: visitor experience, social licence, quality of place; mitigating action is urgent.