

Rotorua Lakes District Future Development Strategy Initial Scenario Testing Outcome

Beca

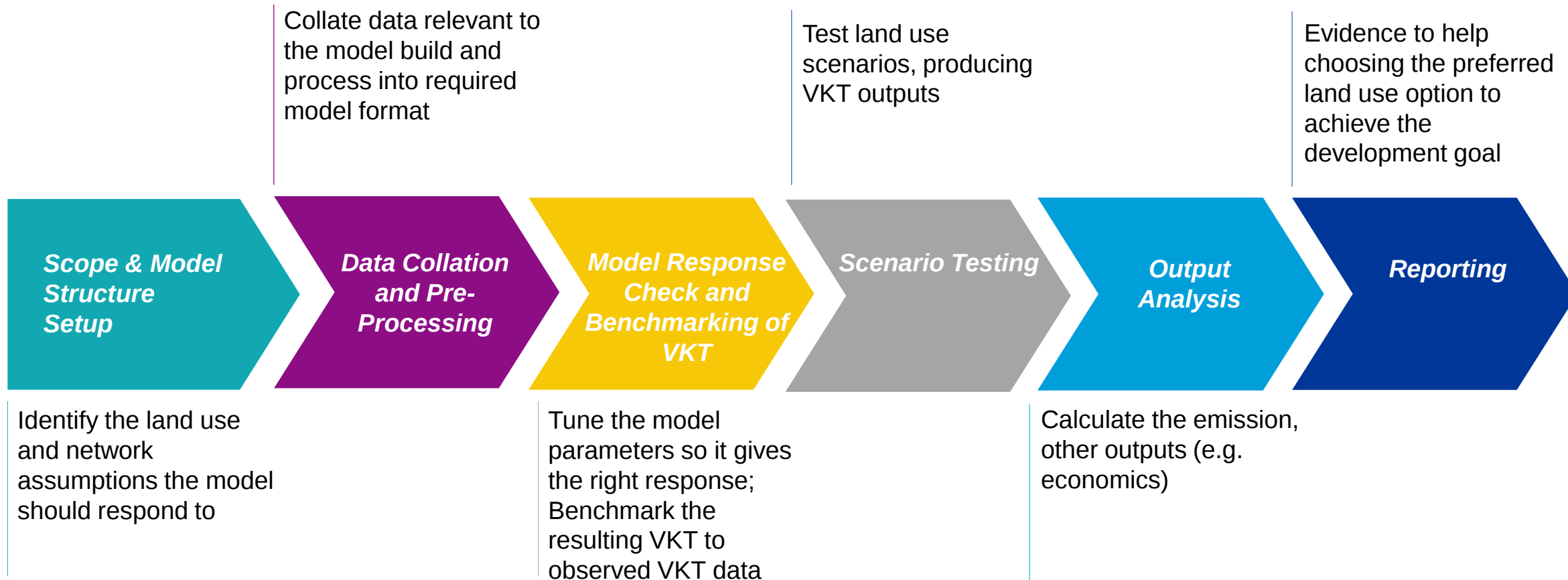
19/12/2022

**make
everyday
better.**

Agenda

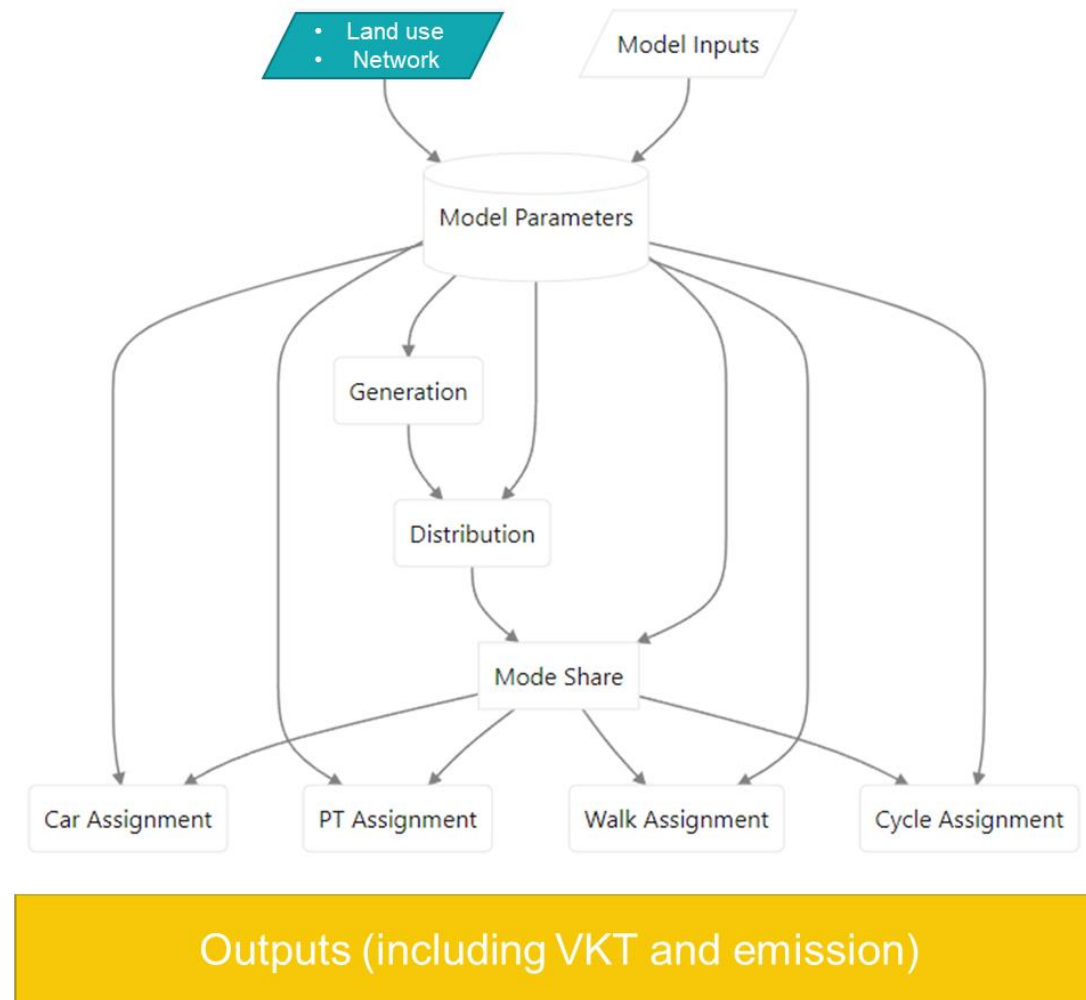
- Introduction / recap
- Sketch planning tool calibration
- Future year scenarios
 - Land use building
 - Scenario results

Introduction / Recap



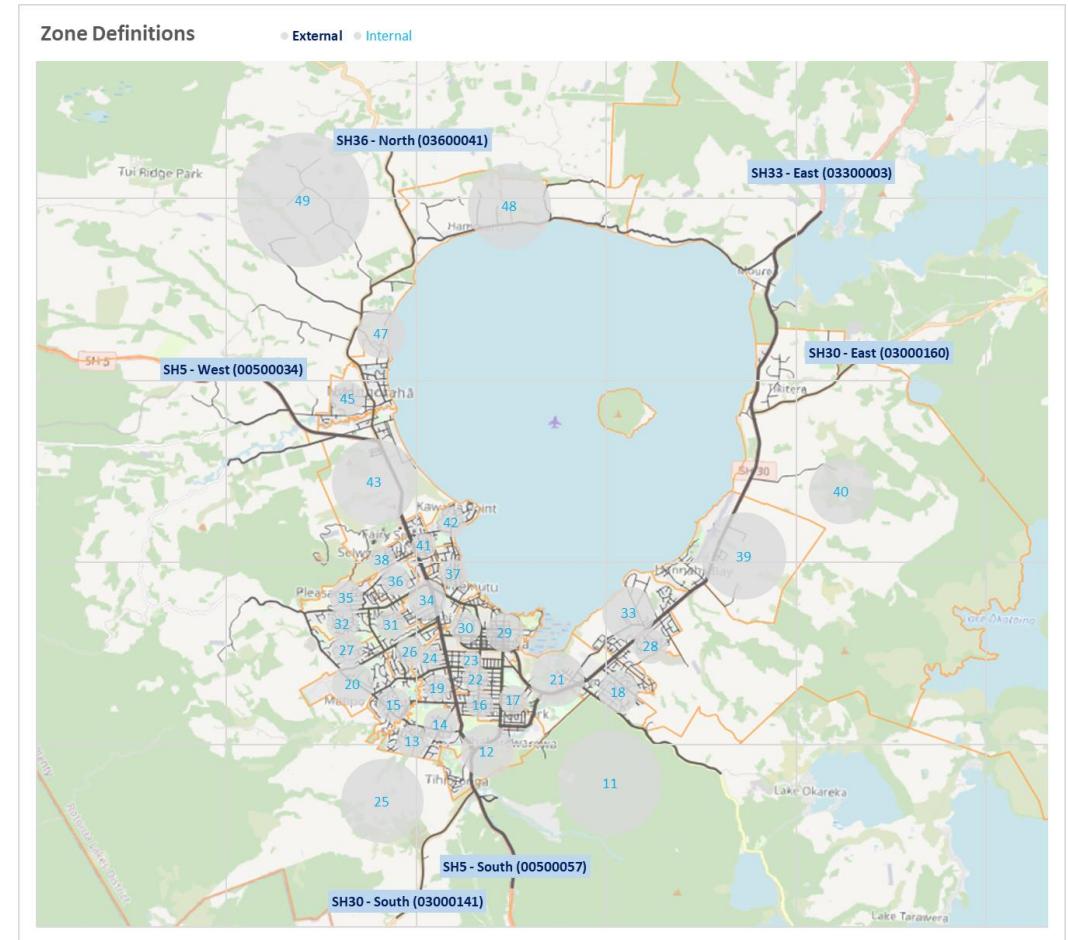
Introduction / Recap

- Zone Definition:
 - Statistical Area 2 (SA2)
- Coverage:
 - all zones within the vicinity of the proposed spatial plans
 - 6 external zones
 - 39 internal zones
- Modes:
 - Car, PT, Walk, Cycle, Trucks



Sketch Planning Tool - Assumptions

- Internal Zones (39) – Census Land Use
 - Population and Household
 - Employment by industry type:
 - Agriculture
 - Education
 - Industry
 - Retail
 - Service
 - School by type:
 - Primary
 - Secondary
- External Zones (6) – TMS counts



Sketch Planning Tool - Assumptions

- Network
 - Car travel time and distance
 - Walk travel time and distance
 - Cycle travel time and distance

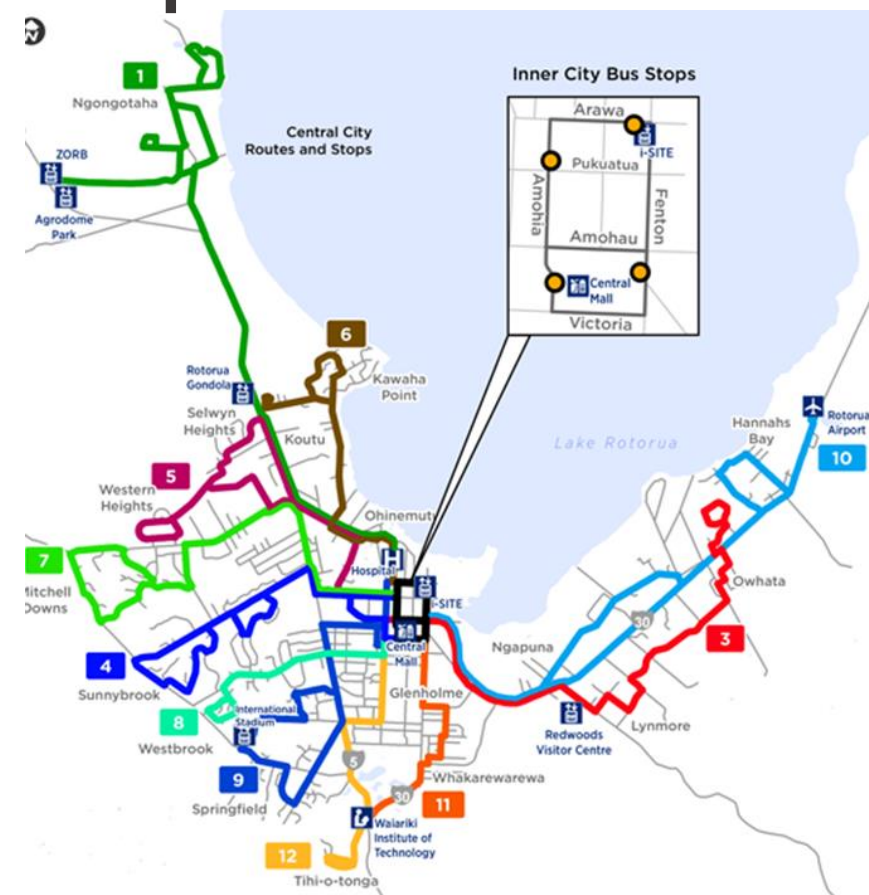
Skimmed, based on shortest path from ONRC network;
Speed limit adjusted to better reflect travel time at a high-level;
Land use loading points in zones based on centroid location;
Minor changes made where there are missing connections.



Sketch Planning Tool - Assumptions

- Network
 - Car travel time and distance
 - Walk travel time and distance
 - Cycle travel time and distance
 - PT travel time (incl. headway) and distance
 - PT fare

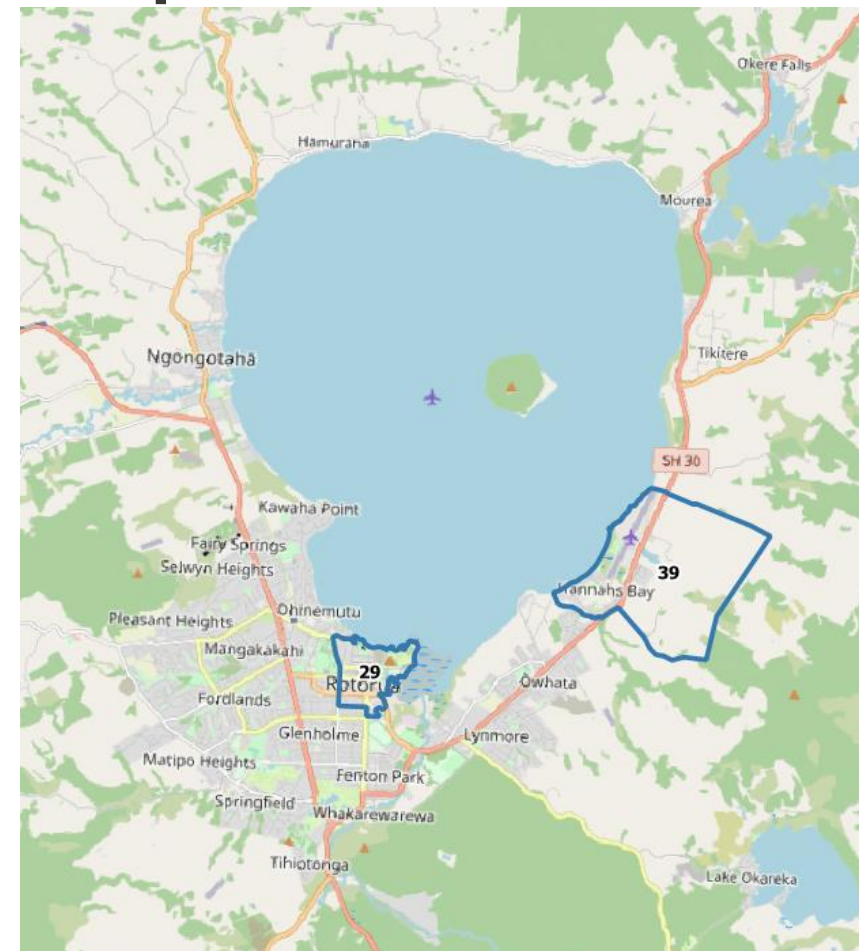
PT headway assumption on roads where bus is available;
If no bus available, walking speed is assumed.



Sketch Planning Tool - Assumptions

- Network
 - Car travel time and distance
 - Walk travel time and distance
 - Cycle travel time and distance
 - PT travel time (incl. headway) and distance
 - PT fare
 - Parking (CBD and airport)

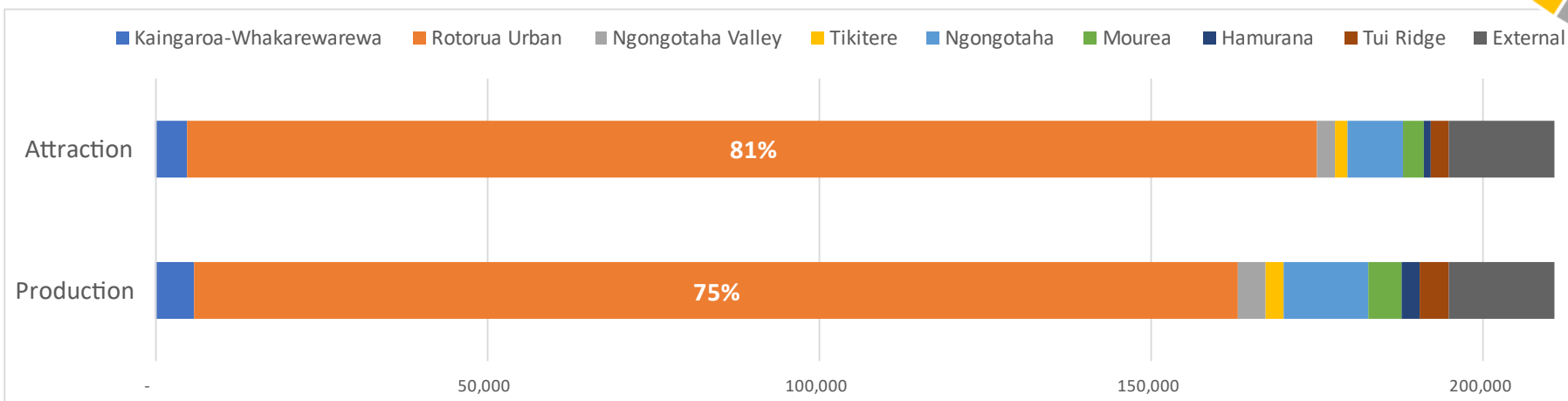
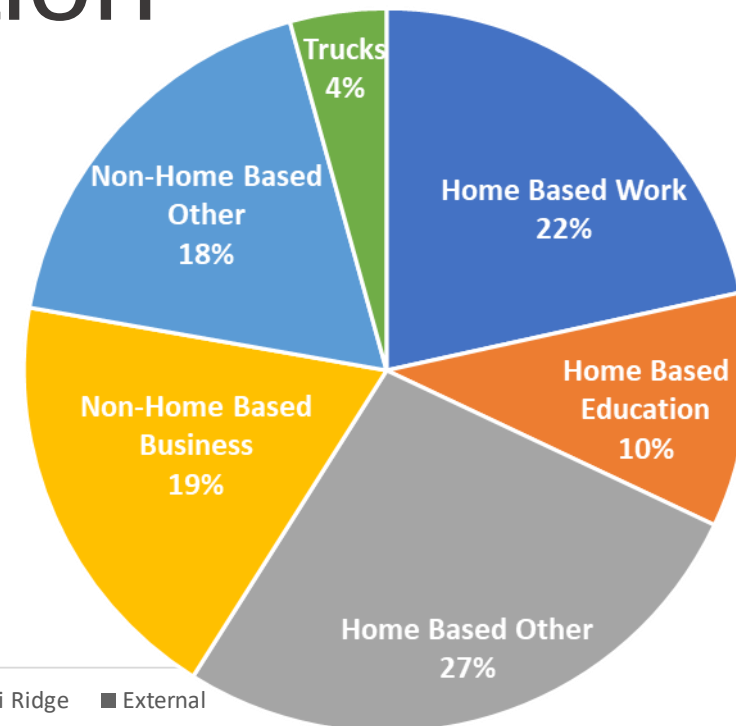
Parking information sourced from publicly available information;
Varying assumptions of participation rate across purposes.



Sketch Planning Tool Calibration

- Generation

- Home based work and home based education trips from internal zones to match census journey to work (~44k) / education (~21k) total for Rotorua



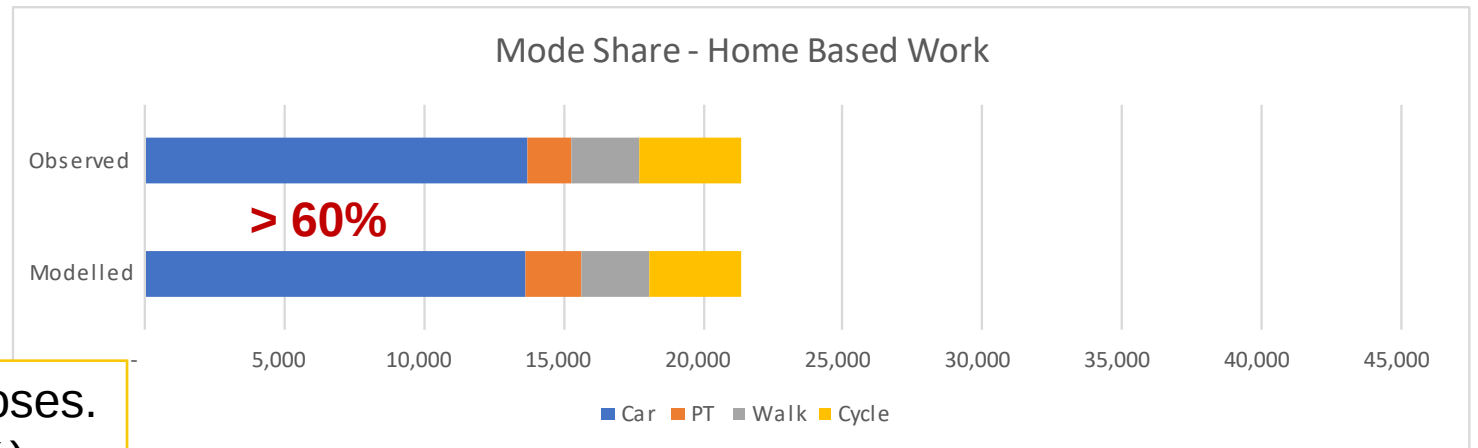
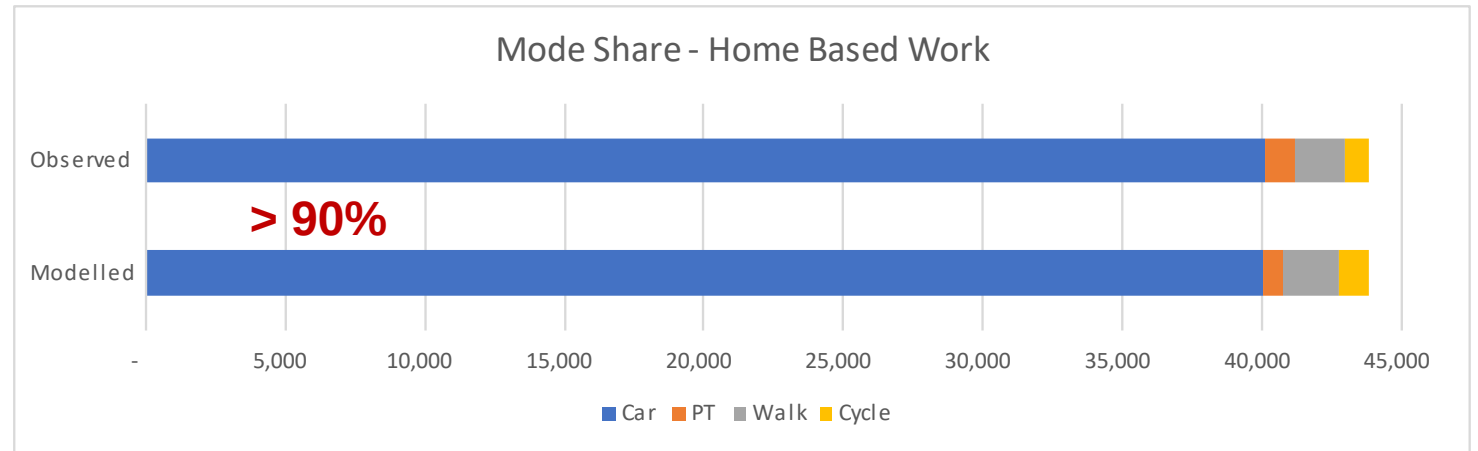
Sketch Planning Tool Calibration

- Distribution

	Kaingaroa-Whakarewarewa	Rotorua Urban	Ngongotaha Valley	Tikitere	Ngongotaha	Mourea	Hamurana	Tui Ridge	External	Total - Origin
Kaingaroa-Whakarewarewa	0%	2%	0%	0%	0%	0%	0%	0%	0%	2%
Rotorua Urban	1%	67%	1%	0%	2%	0%	0%	0%	4%	77%
Ngongotaha Valley	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%
Tikitere	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Ngongotaha	0%	3%	0%	0%	1%	0%	0%	0%	1%	5%
Mourea	0%	1%	0%	0%	0%	0%	0%	0%	1%	2%
Hamurana	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Tui Ridge	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%
External	0%	5%	0%	0%	0%	1%	0%	0%	1%	8%
Total - Destination	2%	81%	1%	1%	4%	1%	1%	1%	8%	100%

Sketch Planning Tool Calibration

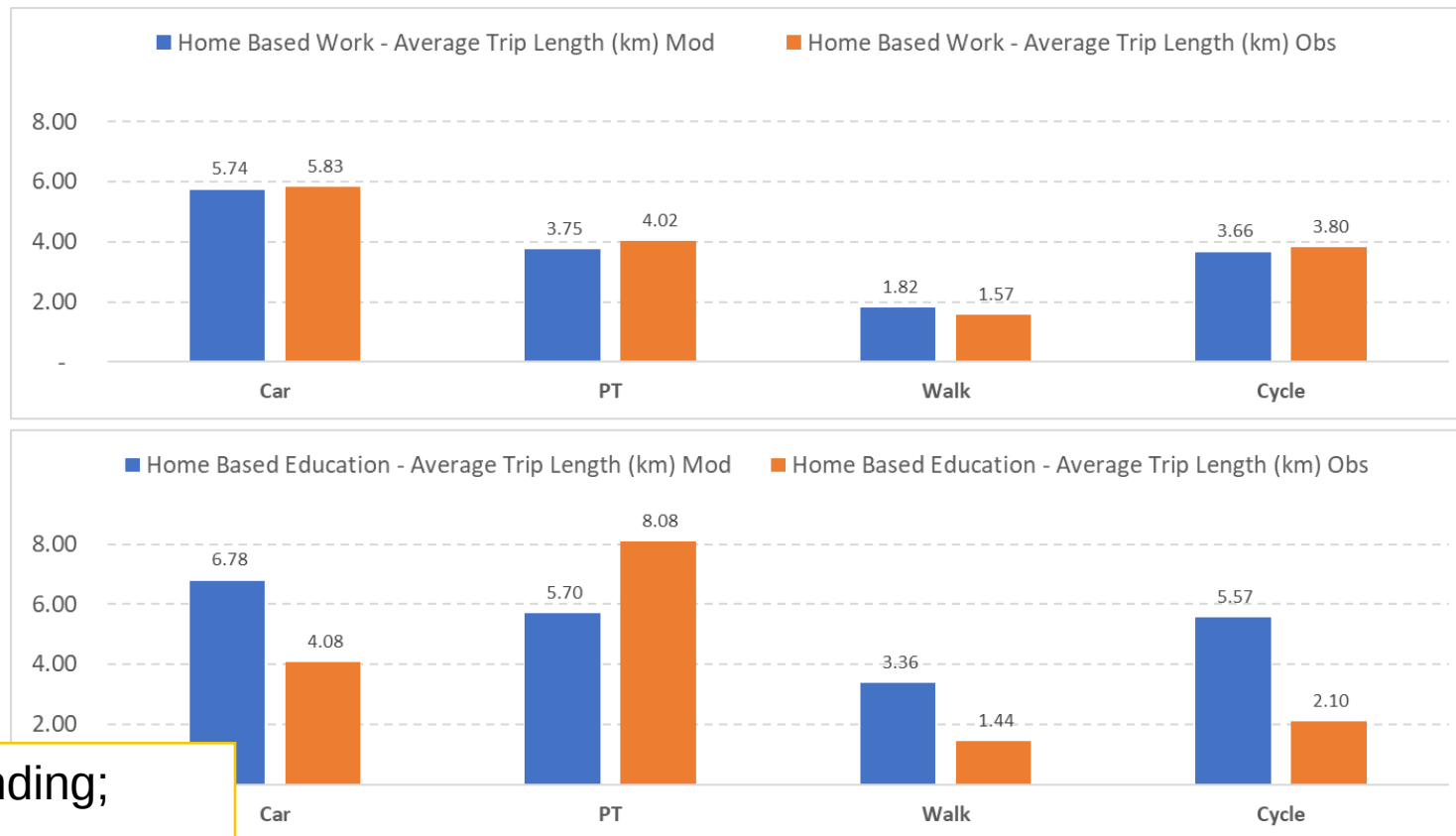
- Mode Share
 - 2018 census journey to work
 - 2018 census journey to education



Overall 91% car journey across all purposes.
High comparing to the CBD survey (74%)

Sketch Planning Tool Calibration

- Trip Length
 - 2018 census journey to work
 - 2018 census journey to education



Significant data loss due to census rounding;
Especially for cycling and walking;
So trip length less reliable for education journeys;
But modelled value still on the high-side.

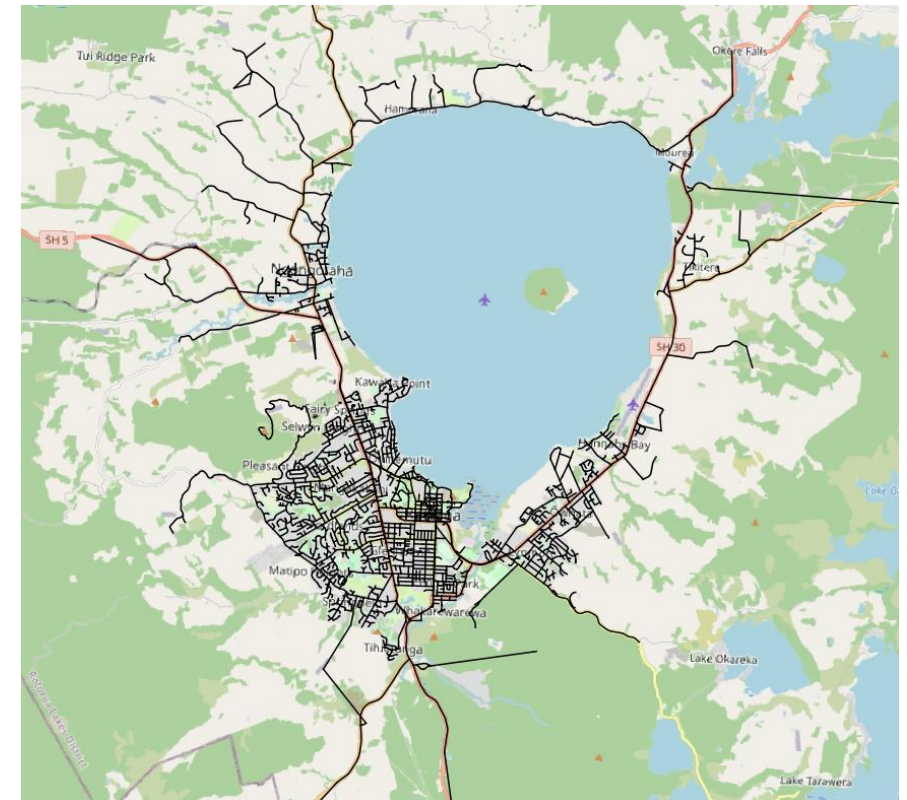
Sketch Planning Tool Calibration

- Vehicle Kilometres Travelled and Emission

- 2018 National Vehicle Emission Dataset (SA2 Level in study area only)

Vehicle Type	Modelled	% Difference
Light VKT	974,000	-20%
Heavy VKT	74,000	-33%

- Multiple VKT sources;
- Model results slightly low for both light and heavy;
- But model only consider limited route choice (shortest);
- Also assume perfect network knowledge (no finding carpark).



Future Year Land Use Building

Scenario
Base Year 2018
Baseline
Spatial_Plan
Ngongotaha Growth
Multi-nodal Intensification
SH36 Growth Corridor
Eastside Growth Corridor
Multi-nodal Intensification A
Multi-nodal Intensification B

Residential	Employment					
Dwelling yield	Industrial business land area					
 • Yield converted to household based on census rate (87%) • Controlled to census population projection.	 <table><tr><th>Business Land Area</th></tr><tr><td>Light Industrial</td></tr><tr><td>Mixed Commercial</td></tr><tr><td>Heavy Industrial</td></tr><tr><td>Industrial</td></tr></table>	Business Land Area	Light Industrial	Mixed Commercial	Heavy Industrial	Industrial
Business Land Area						
Light Industrial						
Mixed Commercial						
Heavy Industrial						
Industrial						
Census	Rotorua Urban Development					
80,500 (2048 projection)	1,073 (Industrial growth 2020-2050)					

Future Year Land Use Building

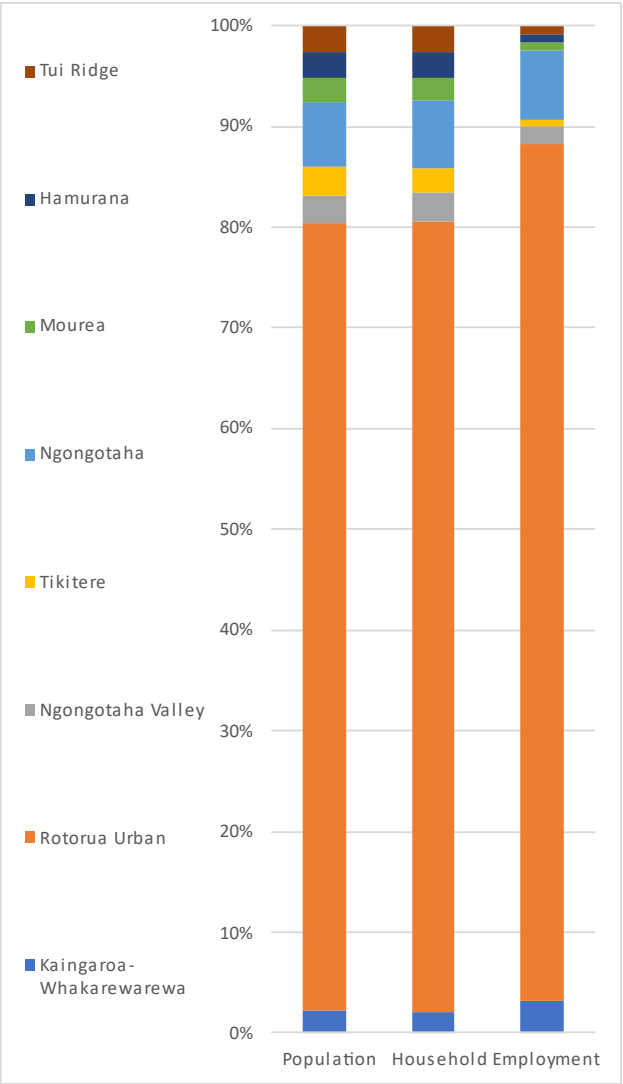
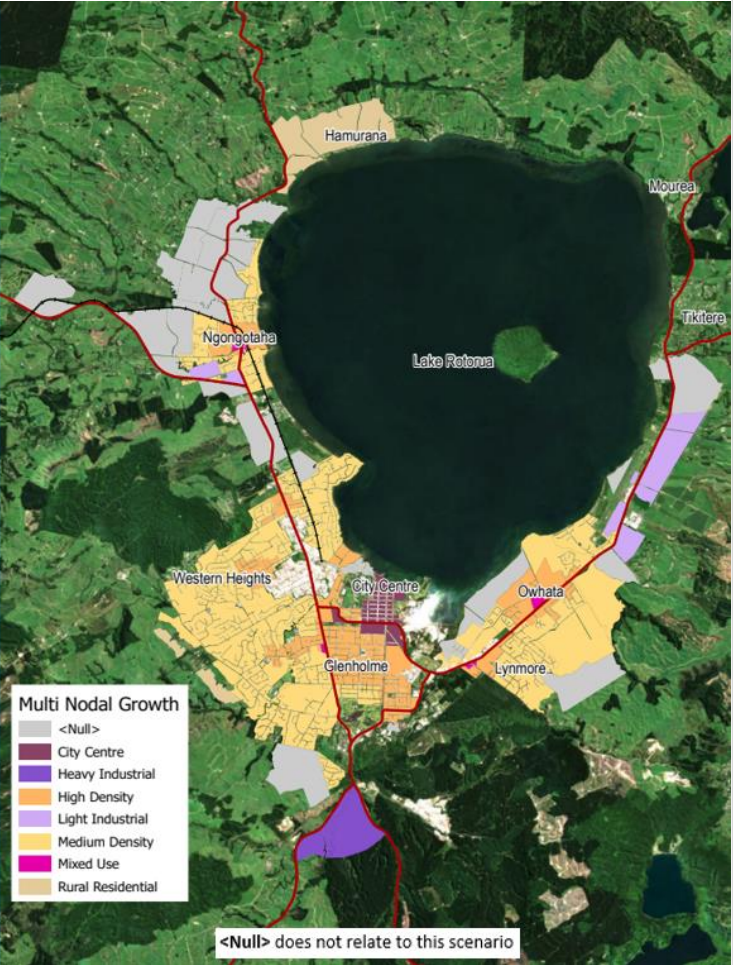
- **22%** employment growth for non-industrial jobs, based on urban development plan total growth;
- People per household fluctuate based on the total dwelling growth to ensure match with population projection;
- School roll increased based on an overall **13%** population increase in this version of outputs.

Scenario	Dwelling Growth	Population	Household	Ppl/HH
Base Year 2018		68,187	23,766	2.87
Multi-nodal Intensification	10,309	80,500	32,717	2.46
SH36 Growth Corridor	13,823	80,500	35,768	2.25

Scenario 2

2. Multi-nodal intensification

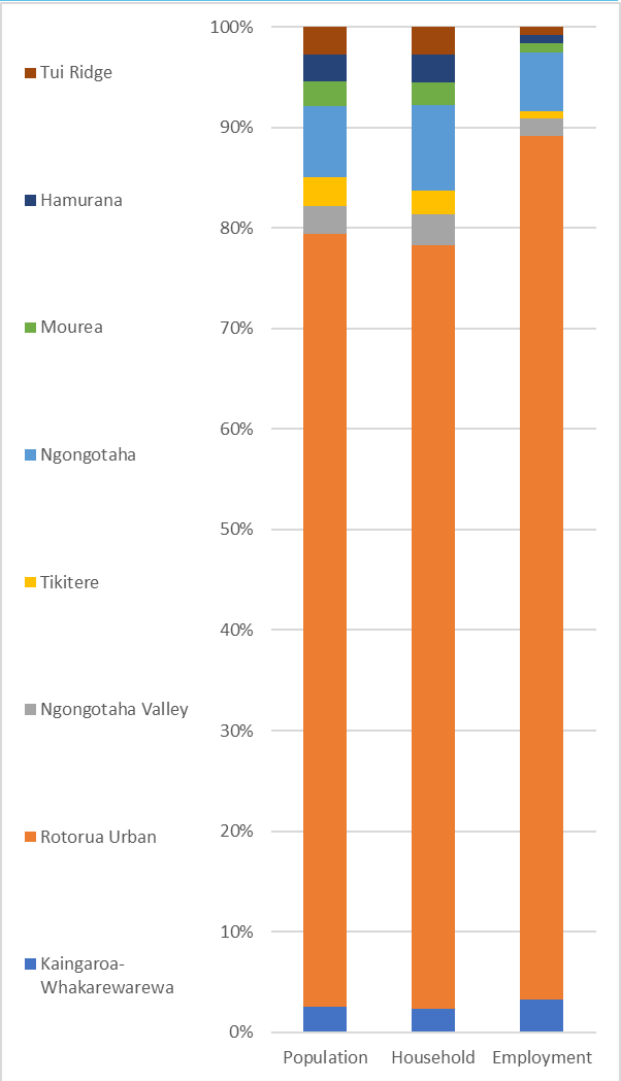
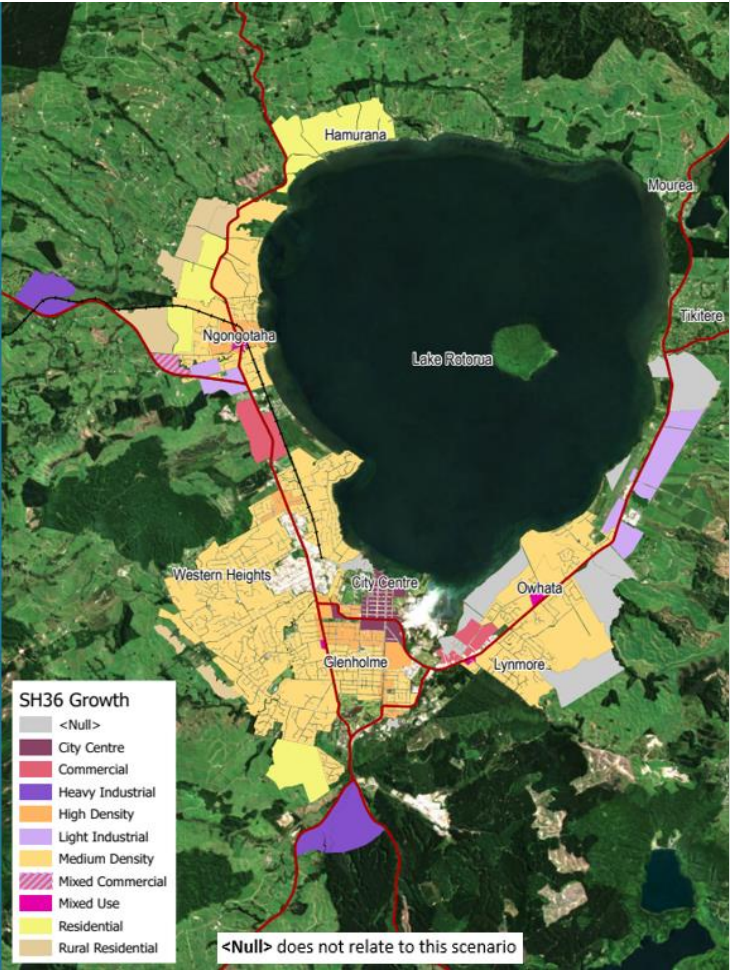
- Intensification aligned with Plan Change but with higher densities proposed around key nodes (e.g. Ngongotahā, Ōwhata, Western Heights)
- Greenfield expansion around Ōwhata/Wharenui
- New industrial/business land along SH30 around airport and SH5
- Improved Public Transport connection with Tauranga
- Frequent bus routes linking key nodes



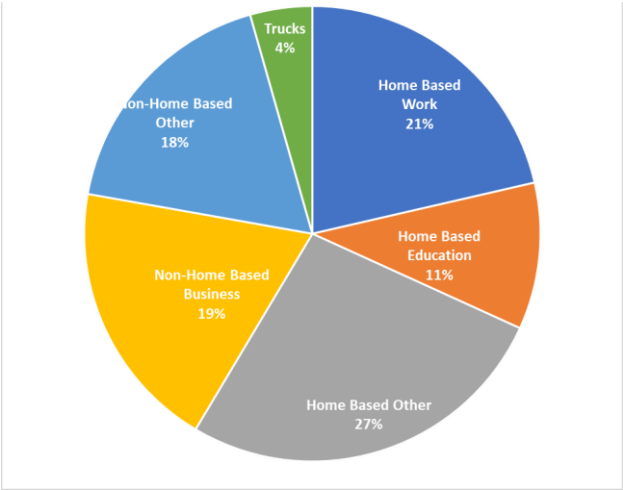
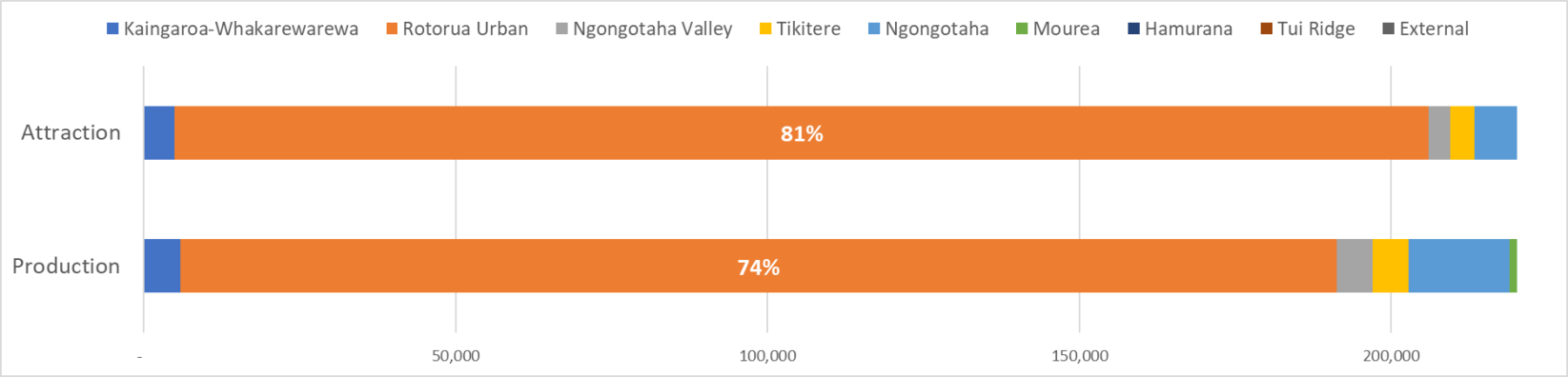
Scenario 3

3. State highway 36 Growth Corridor

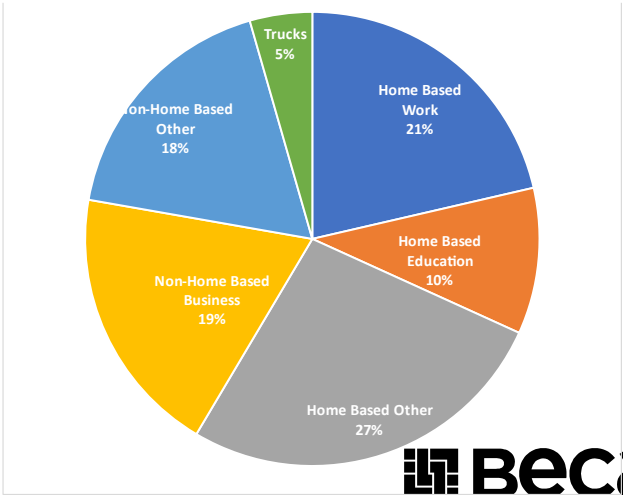
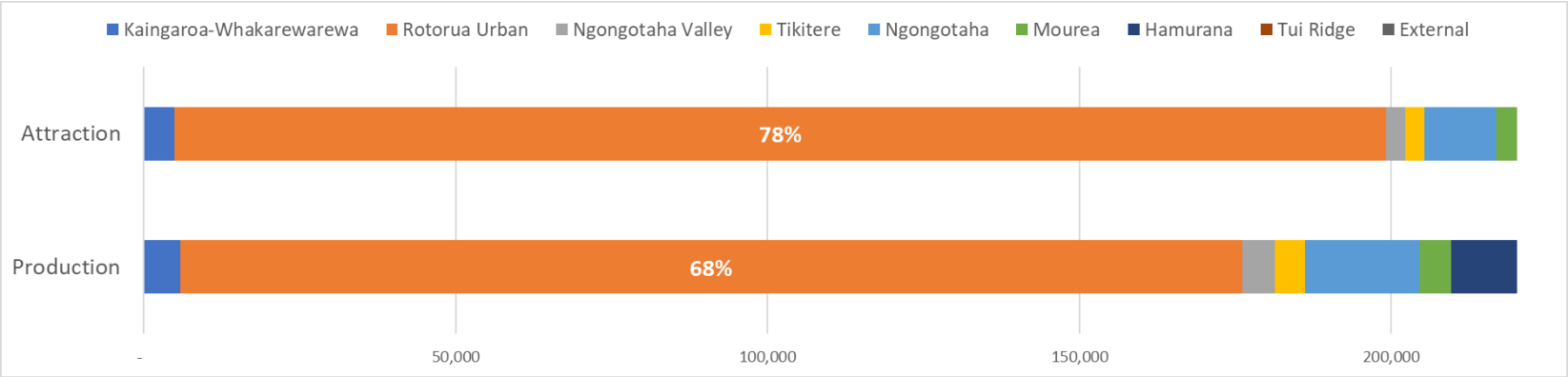
- Intensification aligned with Plan Change 9
- Greenfield expansion along SH36 north of Ngongotahā to Hamurana and south to Fairy Springs (2,000 – 2,500 homes)
- New/ enlarged centres at Hamurana and Oturoa Road
- New industrial / business land along SH30 around airport and SH5
- Frequent Public Transport connection between Tauranga and Rotorua
- Potential to refine further to focus growth closer to Ngongotahā



Scenario 2 - Generation



Scenario 3 - Generation



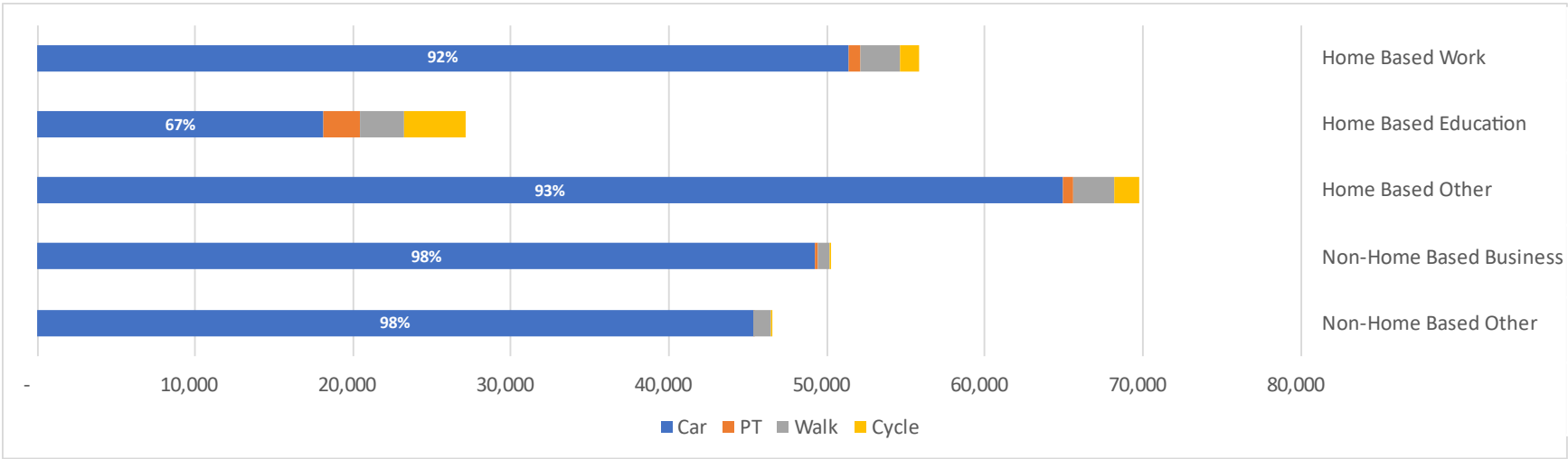
Scenario 2 – Distribution - Overall

	Kaingaroa-Whakarewarewa	Rotorua Urban	Ngongotaha Valley	Tikitere	Ngongotaha	Mourea	Hamurana	Tui Ridge	External	Total - Origin
Kaingaroa-Whakarewarewa	0%	2%	0%	0%	0%	0%	0%	0%	0%	2%
Rotorua Urban	1%	66%	1%	1%	2%	1%	0%	0%	4%	77%
Ngongotaha Valley	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%
Tikitere	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%
Ngongotaha	0%	4%	0%	0%	1%	0%	0%	0%	1%	6%
Mourea	0%	1%	0%	0%	0%	0%	0%	0%	1%	2%
Hamurana	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Tui Ridge	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
External	0%	5%	0%	0%	0%	0%	0%	0%	1%	7%
Total - Destination	2%	81%	1%	2%	4%	1%	0%	1%	7%	100%

Scenario 3 – Distribution - Overall

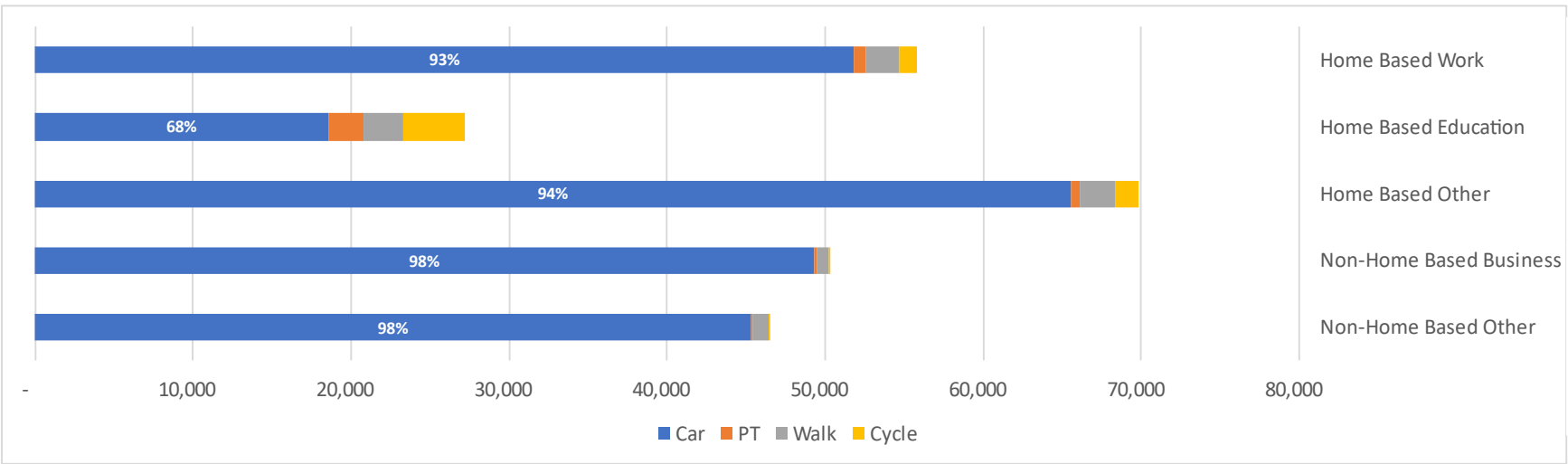
	Kaingaroa-Whakarewarewa	Rotorua Urban	Ngongotaha Valley	Tikitere	Ngongotaha	Mourea	Hamurana	Tui Ridge	External	Total - Origin
Kaingaroa-Whakarewarewa	0%	2%	0%	0%	0%	0%	0%	0%	0%	2%
Rotorua Urban	1%	61%	1%	1%	2%	0%	1%	1%	4%	72%
Ngongotaha Valley	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%
Tikitere	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%
Ngongotaha	0%	4%	0%	0%	1%	0%	0%	1%	1%	6%
Mourea	0%	1%	0%	0%	0%	0%	0%	0%	1%	2%
Hamurana	0%	1%	0%	0%	1%	0%	0%	1%	0%	3%
Tui Ridge	0%	2%	0%	0%	1%	0%	0%	1%	0%	3%
External	0%	5%	0%	0%	0%	0%	0%	0%	1%	7%
Total - Destination	2%	78%	1%	1%	5%	1%	2%	3%	7%	100%

Scenario 2 – Mode Share & Trip Length (km)



5.89	3.85	1.75	3.66
7.03	5.83	3.39	5.65
7.00	4.59	1.80	4.00
5.85	2.39	0.92	2.23
5.77	2.36	0.90	2.15
Car	PT	Walk	Cycle

Scenario 3 – Mode Share & Trip Length (km)



6.42	3.87	1.81	3.77
7.76	6.03	3.44	6.04
7.68	4.66	1.85	4.18
5.90	2.38	0.92	2.23
5.81	2.36	0.90	2.15
Car	PT	Walk	Cycle

Scenario 2 – VKT and Emission

Vehicle Type	Daily VKT	Emission (CO2-e kilo-tonnes)
Light	1,193,000	92.7
Heavy	92,000	58.1
Total	1,285,000	150.8

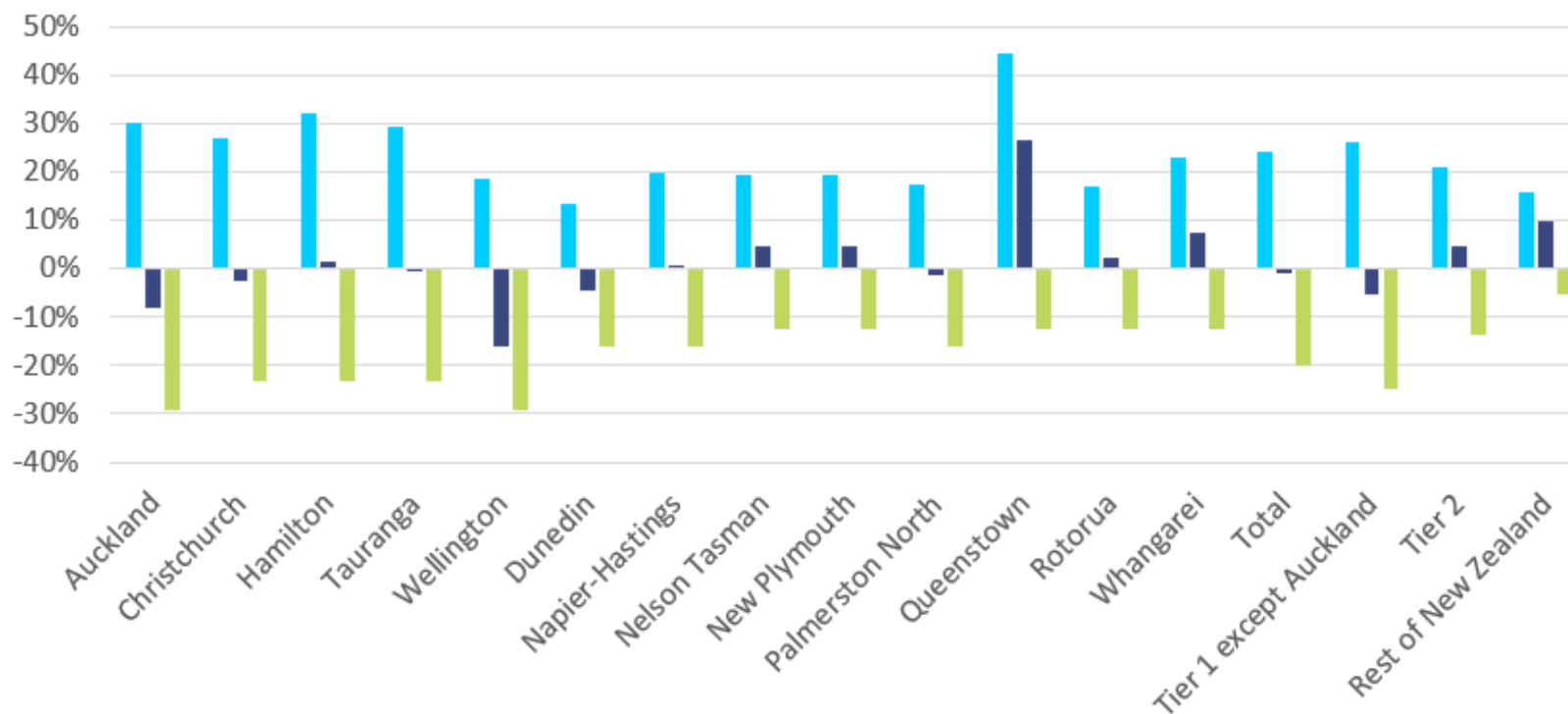
Scenario 3 – VKT and Emission

Vehicle Type	Daily VKT	Emission (CO2-e kilo-tonnes)
Light	1,270,000	98.0
Heavy	97,000	60.5
Total	1,367,000 (+6%)	158.5 (+5%)

VKT Reduction Target

- Rotorua to reduce 12% from 2035 baseline VKT

Figure 3: VKT percentage change comparisons (%)



■ 2035 Baseline % change against 2019 Benchmark ■ 2035 Target % change against 2019 Benchmark

■ 2035 Target % change against 2035 Baseline

Next Steps

- Fine tuning of parameters
- Testing of additional scenarios (1 and 4)
- Gathering feedback on existing outputs / assumptions

Questions / Discussions

- Circulate list of assumptions
- Add note to emission target for RLC
- Add polytechnic land use
- New school land use distribution for scenario 1 and 3 (check capacity increase for other scenarios with Cam)