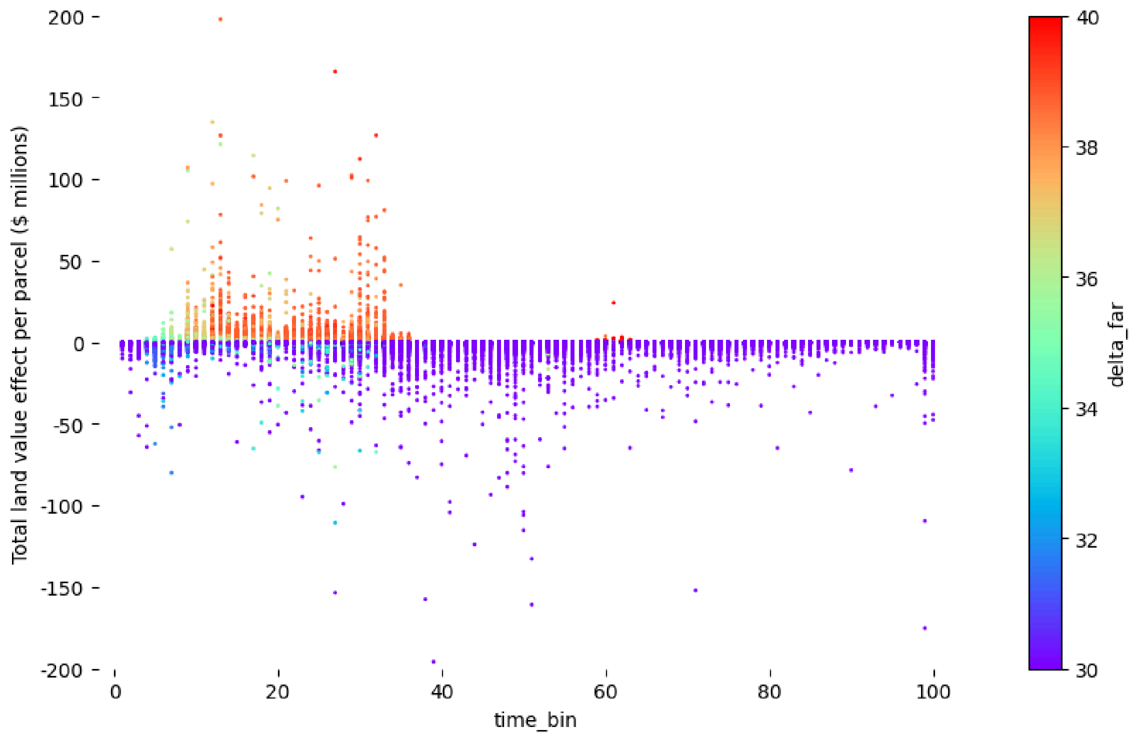
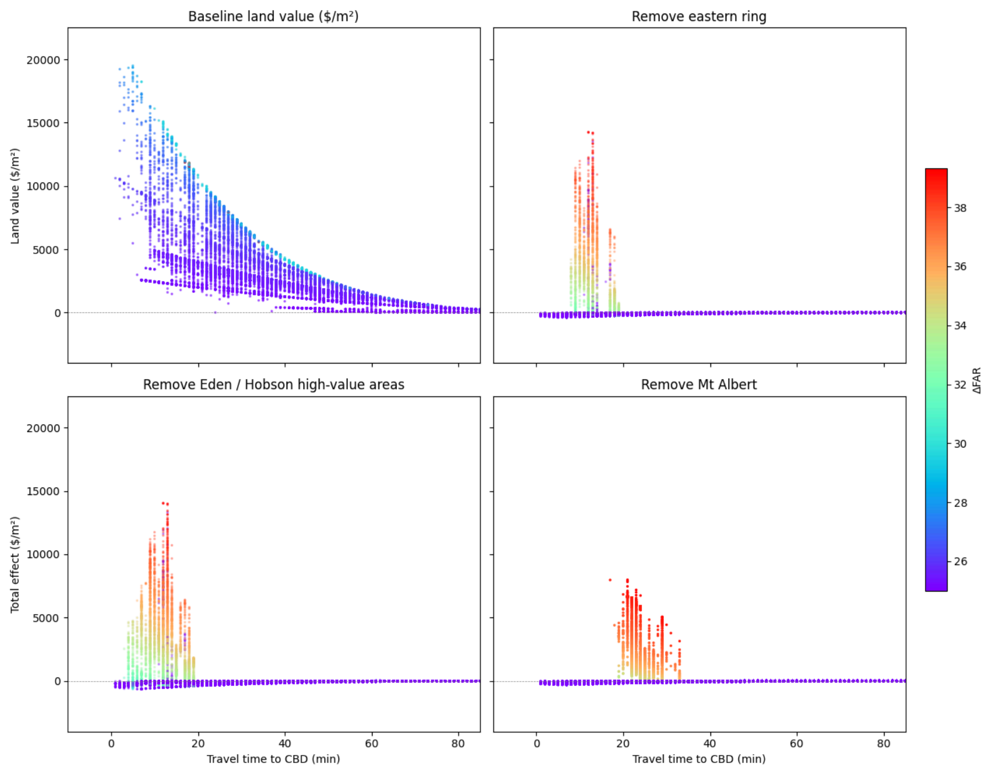
Figure 16: Parcel-level land value effects – remove-all scenario, closed city



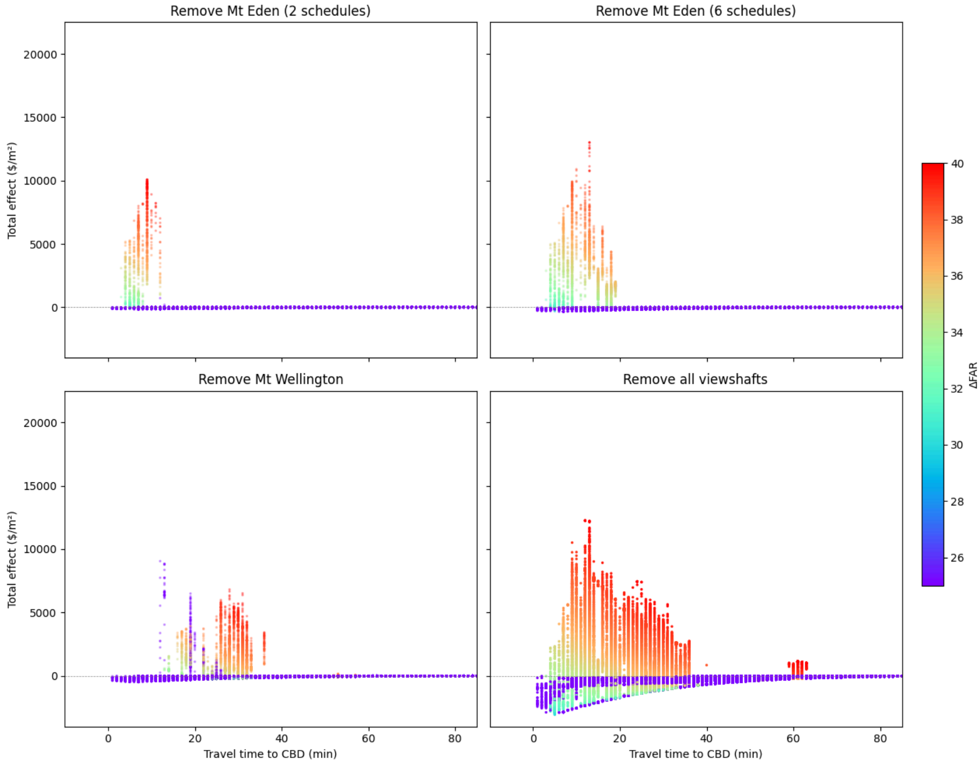
Source: Crow Advisory model estimates.

Figure 17: Parcel-level land value effects ($/m²) – baseline and selected scenarios, closed city



Source: Crow Advisory model estimates. Each point is a parcel; colour indicates the change in FAR restriction.

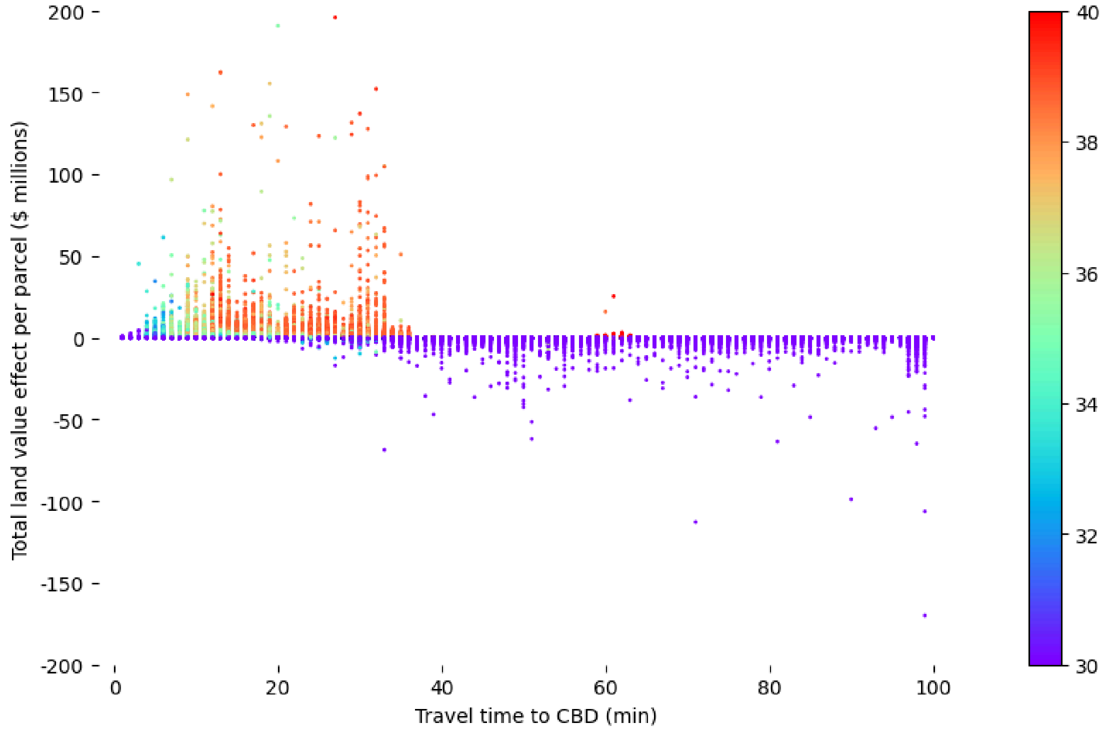
Figure 18: Parcel-level land value effects ($/m²) – remove-all and remaining scenarios, closed city



Source: Crow Advisory model estimates. Each point is a parcel; colour indicates the change in FAR restriction.

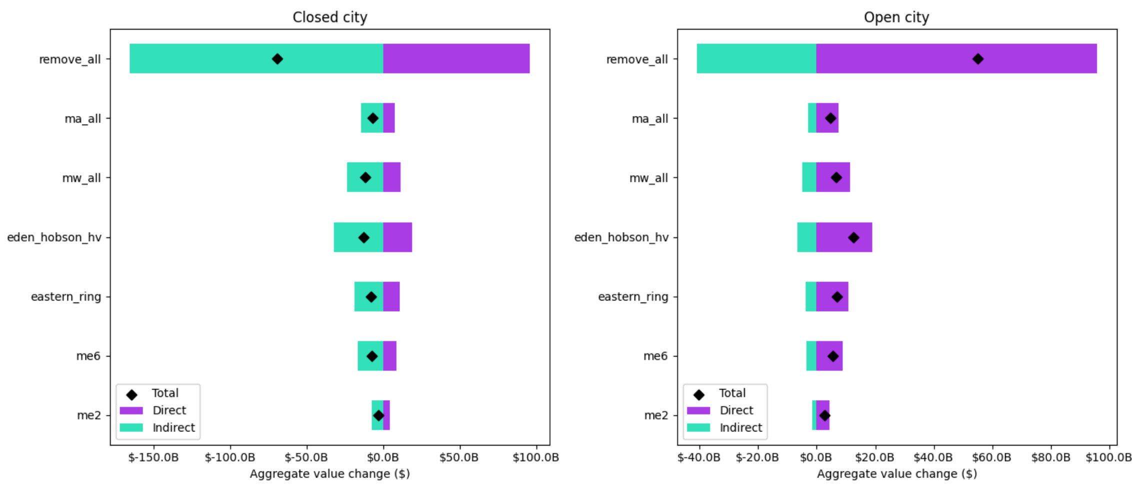
Under the open-city model, the parcel-level land value effects mirror the closed-city pattern but are modified by population growth under the perfect mobility assumption. The larger population increases aggregate housing demand, and higher wages raise willingness to pay for housing citywide. The effect on land values is more concentrated in areas where demand supports more housing per unit of land, leading to the large direct gain on released parcels near the centre. Congestion partially offsets transport savings from a more compact city. Figure 19 decomposes the open-city aggregate land value change; Figure 20 compares the two models side by side.

Figure 19: Parcel-level land value effects – remove-all scenario, open city



Source: Crow Advisory model estimates.

Figure 20: Aggregate land value effects – closed vs open city



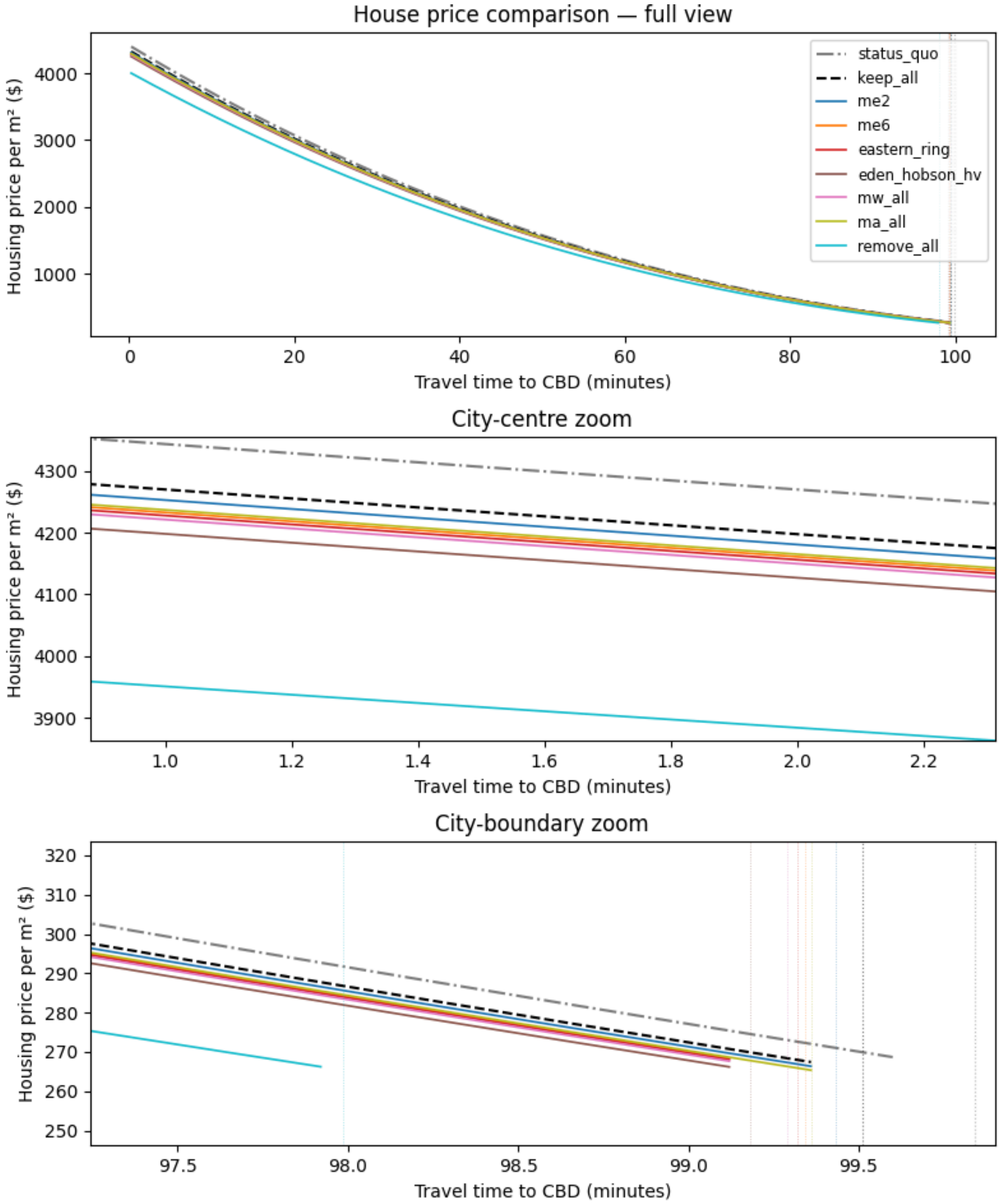
Source: Crow Advisory model estimates.

6.2. House price effects

Figure 21 overleaf compares the house price gradient across scenarios. The price reduction is greatest in the inner city where Maunga Viewshaft constraints are most prevalent, but extends across the entire city as increased central supply lowers prices at all distances.

The remove-all effect is substantially larger than the incremental effects of removing individual maunga groups, reflecting a non-linear response: removing all Maunga Viewshafts at once releases a critical mass of inner-city capacity that has a disproportionate effect on prices. Note that the relevant capacity released is determined by the model's market-driven FAR curve, not the arbitrarily high unconstrained FAR ceiling—raising it from 40 to 1,000 would have no effect, since the market equilibrium resolves well below it at all distances.

Figure 21: House price profile comparison across closed-city scenarios



Source: Crow Advisory model estimates.

Under the open-city model, house prices at the reference distance are approximately unchanged: the additional supply is absorbed by in-migration, leaving price levels roughly constant. This is the key distinction—in the closed city, the welfare gain takes the form of lower prices; in the open city, it takes the form of a larger, higher-wage economy.

6.3. Spatial distribution of effects

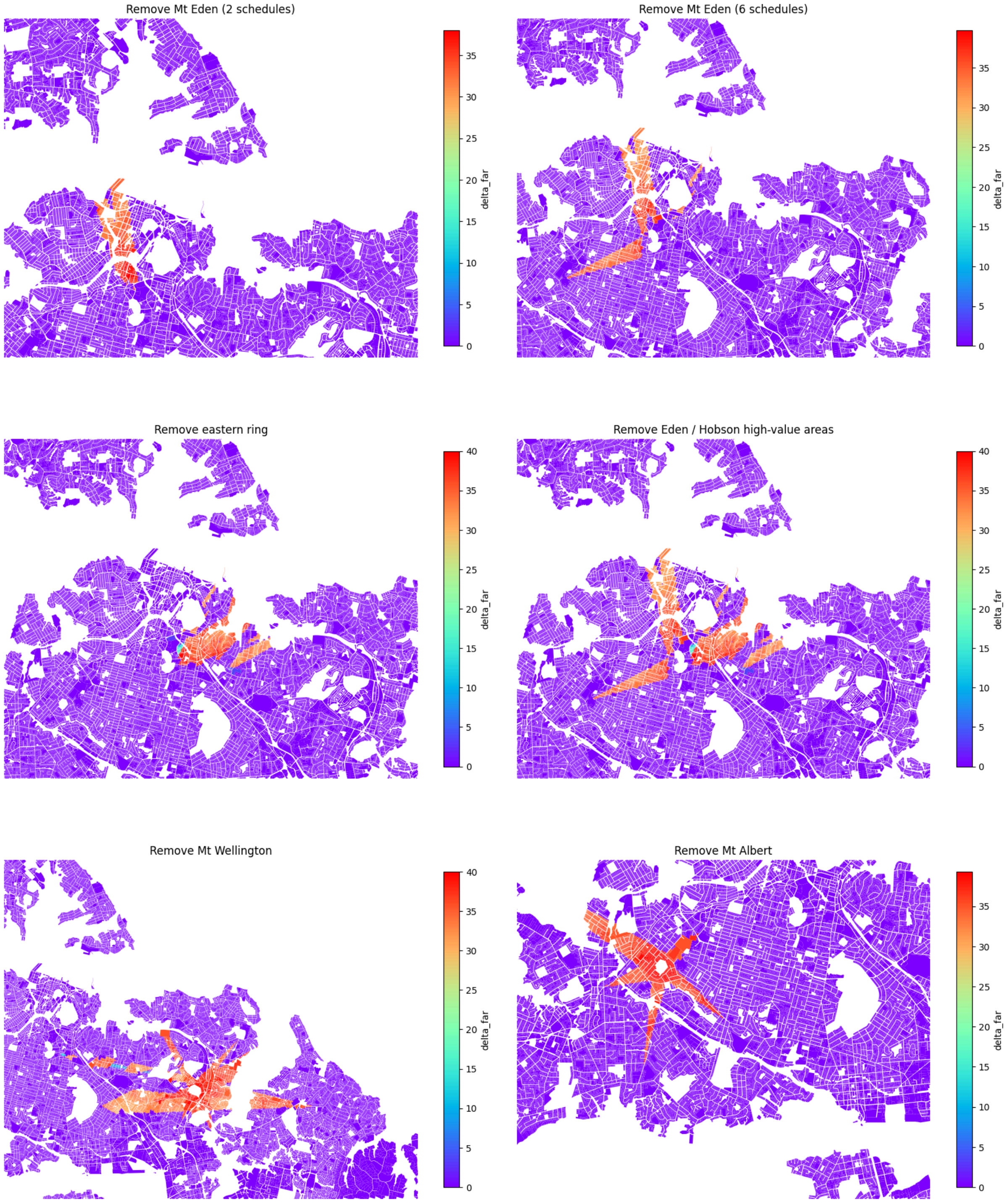
The maps in this section trace the spatial pattern of FAR changes and land value effects across Auckland's urban area. Because the eight scenarios produce distinct spatial footprints, we present them across paired figures for legibility.

Under the remove-all scenario (Figure 22), FAR increases are concentrated in the inner isthmus and extend outward along the Maunga Viewshaft planes. Figure 23 shows individual maunga scenarios: Maungawhau and Ōhinerau viewshafts constrain the most centrally located parcels—closest to the CBD and on the highest-value land—while Maungarei / Mt Wellington's constraints are more dispersed across the eastern suburbs and Ōwairaka / Mt Albert's cluster in the western isthmus.

Figure 22: Spatial distribution of FAR changes – remove all Maunga Viewshafts

Source: Crow Advisory model estimates.

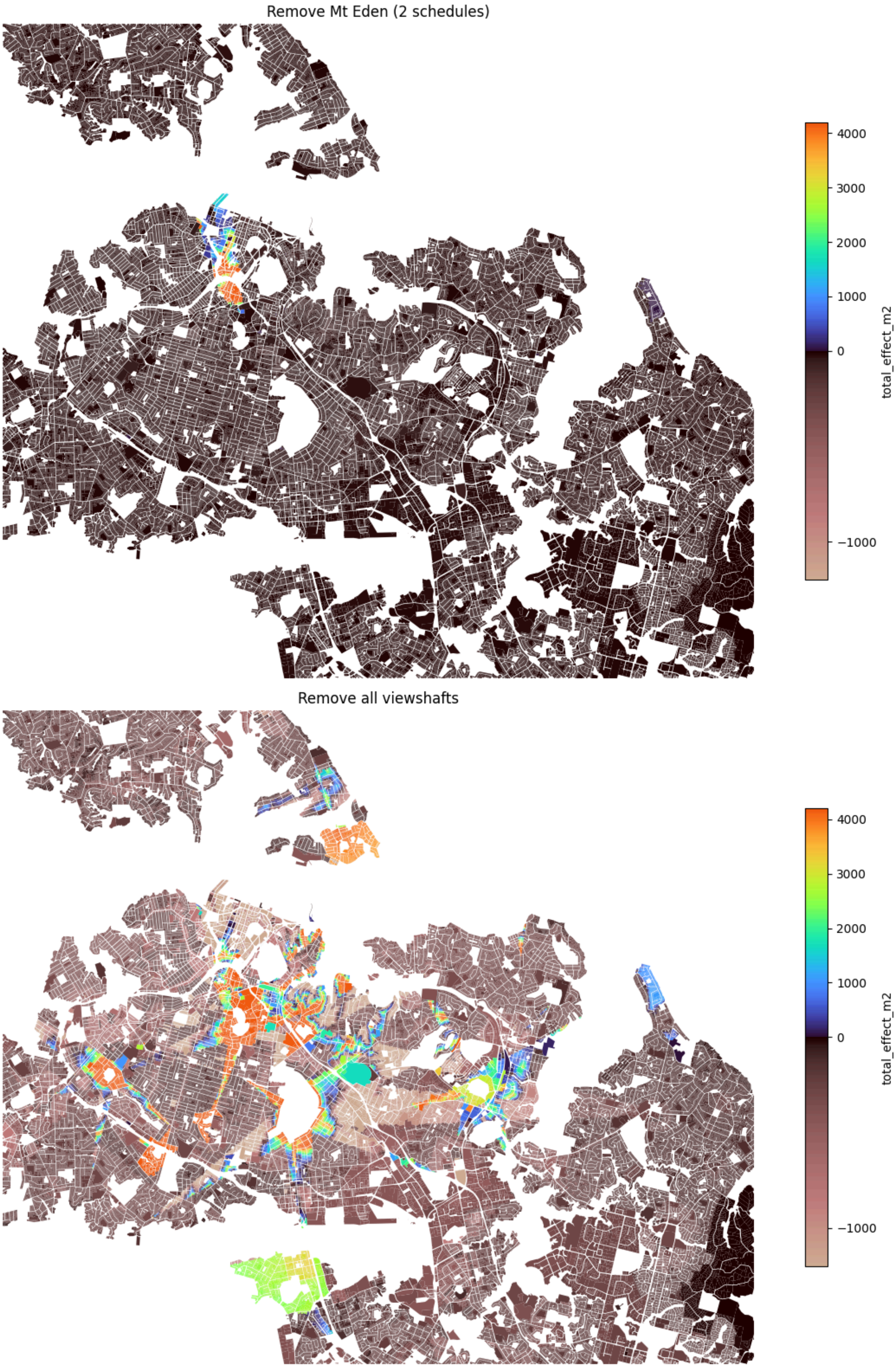
Figure 23: Spatial distribution of FAR changes by scenario



Source: Crow Advisory model estimates.

The land value maps in Figure 24 reveal the two-tone pattern across all scenarios: parcels released from constraints gain value (direct effect), while the citywide adjustment pushes values down elsewhere (indirect effect). The direct uplift is intense but localised; the indirect adjustment reaches every corner of the city.

Figure 24: Spatial land value effects - closed city (Maungawhau / Mt Eden 2 vs Remove all)

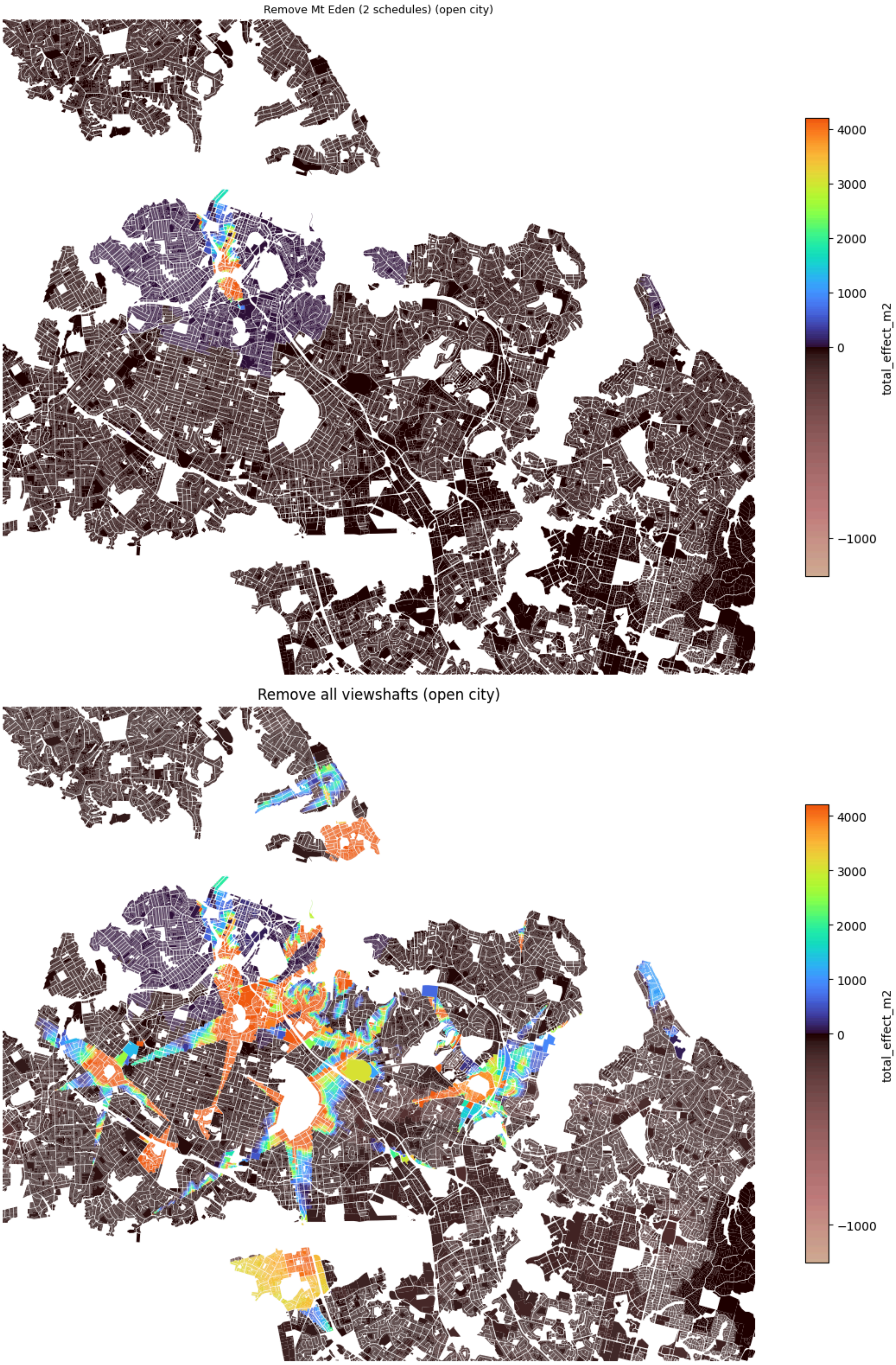


Source: Crow Advisory model estimates.

When the aggregate increase in enabled capacity is large enough, even parcels released from Maunga Viewshafts can see a net decrease in land value, especially under closed-city assumptions. In the Maungawhau / Mt Eden 2 scenario, all released parcels experience net gains because the indirect effect from that limited release is modest. In the remove-all scenario, however, the massive expansion of supply produces an indirect effect that overwhelms the direct gain on many released parcels—especially those whose constraints were only mildly binding. The net land value effect on any given parcel depends on both its local characteristics and the scale of the citywide supply response.

The spatial distribution of open-city land value effects (Figure 25) follows a similar broad pattern, but in-migration supports higher land values citywide, partially offsetting the indirect decline.

Figure 25: Spatial land value effects – open city (Maungawhau / Mt Eden 2 vs Remove all)



Source: Crow Advisory model estimates.

6.4. Effect of removing selected Maunga Viewshaft combinations

The remove-all result can be decomposed by maunga group. Table 6 summarises the key outcomes, ranked by welfare effect. The Maungawhau / Mt Eden and Ōhinerau / Mt Hobson group (eden_hobson_hv) shows the largest effect apart from the remove-all scenario, with a welfare improvement of 0.68% and a house price reduction of 1.7%—reflecting the concentration of these Maunga Viewshafts over the highest-value inner-isthmus land.

Maungarei / Mt Wellington ranks second (0.46% welfare gain, 10,631 affected parcels). Despite its larger spatial footprint, the effect is smaller because it affects parcels farther from the CBD where land values and development pressures are lower. Ōwairaka / Mt Albert produces a more modest 0.31% gain across 3,189 parcels.

The direct/indirect decomposition follows the same pattern across all scenarios: direct effects are positive, but the indirect equilibrium adjustment exceeds them, producing a net decline in aggregate land values. The ratio of indirect to direct effects is approximately 2:1, reflecting the broad distribution of the price adjustment relative to the concentrated spatial incidence of FAR changes.

Table 6: Summary of scenario outcomes (closed city)

Scenario	$\Delta\overline{x}$ (km)	Δ Welfare (%)	Δ HP/m² (%)	Direct ($B)	Indirect ($B)	Net ($B)
Remove all	−0.64	3.15	−7.5%	$95.1B	$−162.3B	$−67.1B
Maungawhau & Ōhinerau	−0.14	0.68	−1.7%	$18.9B	$−32.8B	$−13.9B
Maungarei / Mt Wellington	−0.09	0.46	−1.1%	$11.5B	$−22B	$−10.4B
Ōwairaka / Mt Albert	−0.06	0.31	−0.8%	$7.6B	$−14.7B	$−7.1B
Eastern ring	−0.08	0.4	−1%	$10.8B	$−18.9B	$−8.1B
Maungawhau / Mt Eden (6)	−0.07	0.35	−0.9%	$8.7B	$−16.6B	$−7.9B
Maungawhau / Mt Eden (2)	−0.03	0.16	−0.4%	$4.2B	$−7.6B	$−3.4B

Source: Crow Advisory analysis.

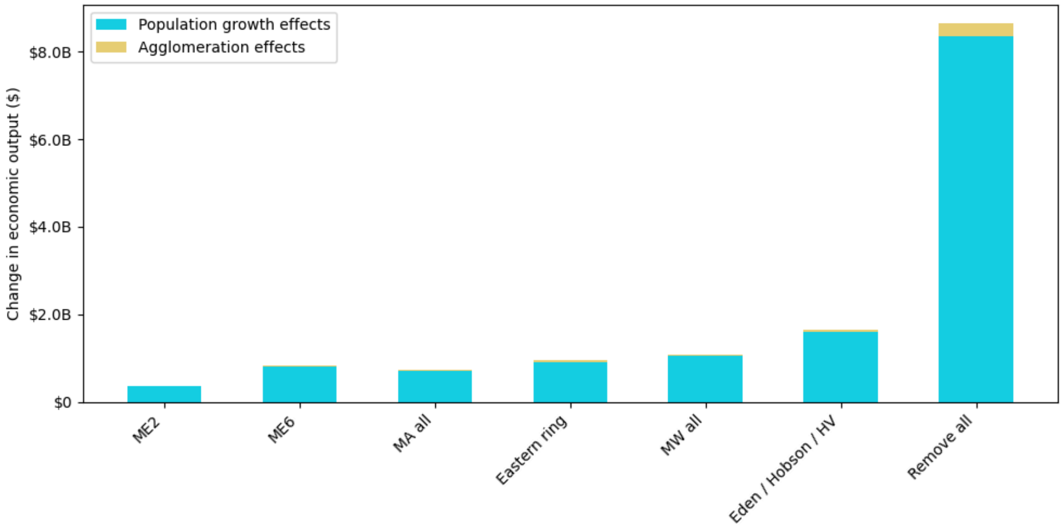
The companion open-city results reveal additional channels. Table 7 summarises population change, wage gain, economic output growth, city boundary adjustment, and house price effects. Removing all viewshafts attracts approximately 54,112 additional households (8.6% growth), raises wages by $446/year, and increases Auckland's economic output by $8.6B (8.9%). Figure 26 illustrates the relationship between population growth and output.

Table 7: Open-city scenario outcomes: population, wages, and economic output

Scenario	Δ Pop	Δ Wages ($)	Δ Output ($B)	$\Delta\overline{x}$ (km)	Δ HP/m² (%)
Remove all	54,112	446	$8.6B	−1.06	0.1%
Maungawhau & Ōhinerau	10,420	89	$1.7B	−0.2	0%
Maungarei / Mt Wellington	6,839	58	$1.1B	−0.13	0%
Ōwairaka / Mt Albert	4,605	39	$734.6M	−0.09	0%
Eastern ring	5,984	51	$954.6M	−0.12	0%
Maungawhau / Mt Eden (6)	5,235	45	$835.1M	−0.1	0%
Maungawhau / Mt Eden (2)	2,376	20	$379.1M	−0.05	0%

Source: Crow Advisory analysis.

Figure 26: Open-city economic output: population growth and agglomeration



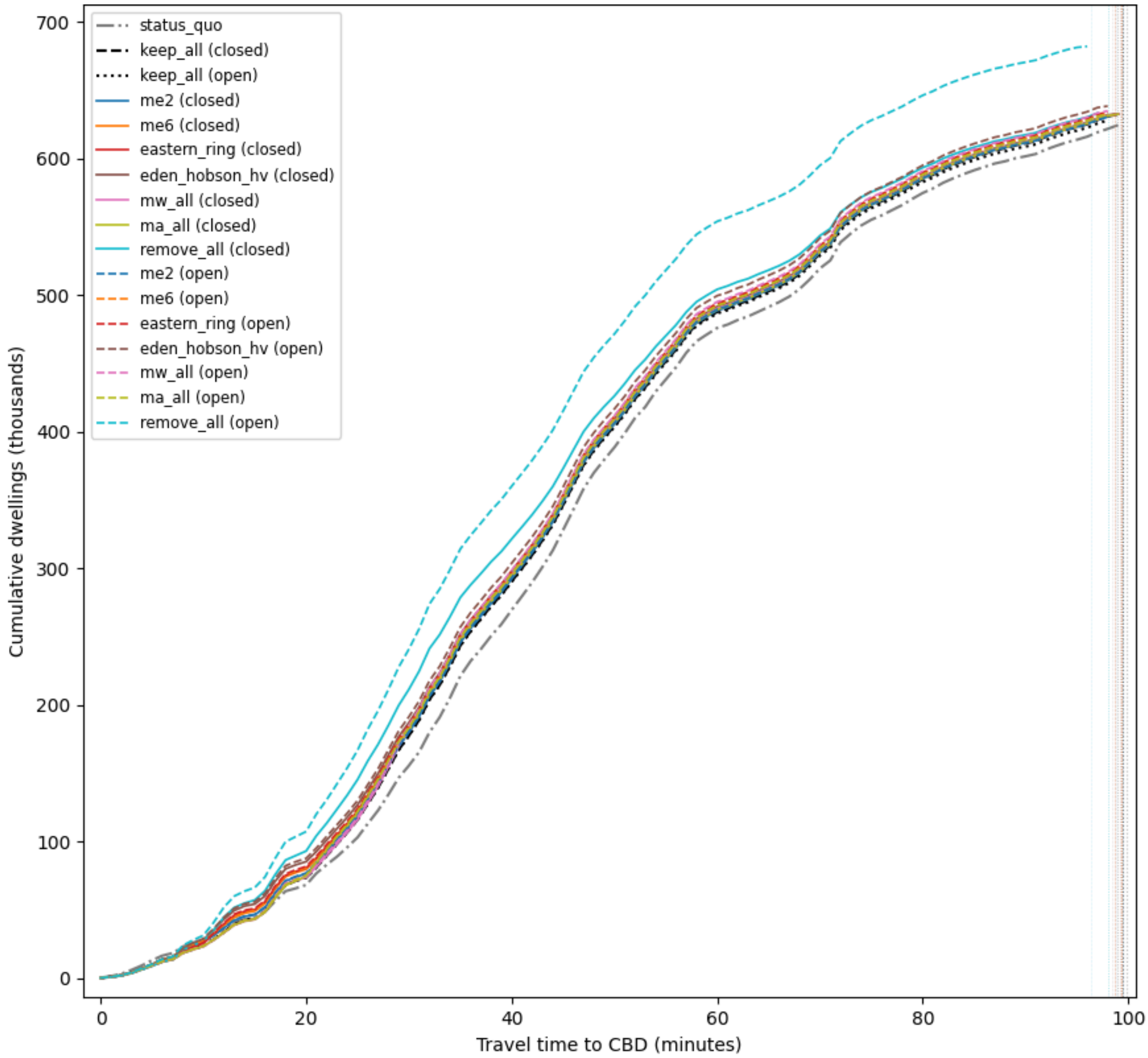
Source: Crow Advisory model estimates.

6.5. Population, city boundary, and household welfare

In the closed city, removing Maunga Viewshaft constraints increases inner-city capacity, drawing population inward and reducing peripheral development (Figure 27). Under the remove-all scenario, the modelled city boundary contracts by 0.64 km while accommodating the same total population. Dwellings that would have been built at the fringe are instead absorbed in the released inner-isthmus capacity.

The maunga scenarios show proportional effects: Maungawhau & Ōhinerau 0.14 km, Maungarei / Mt Wellington 0.09 km, Ōwairaka / Mt Albert 0.06 km. In each case the contraction is modest in absolute terms but reflects genuine reallocation from the fringe to more efficient central locations.

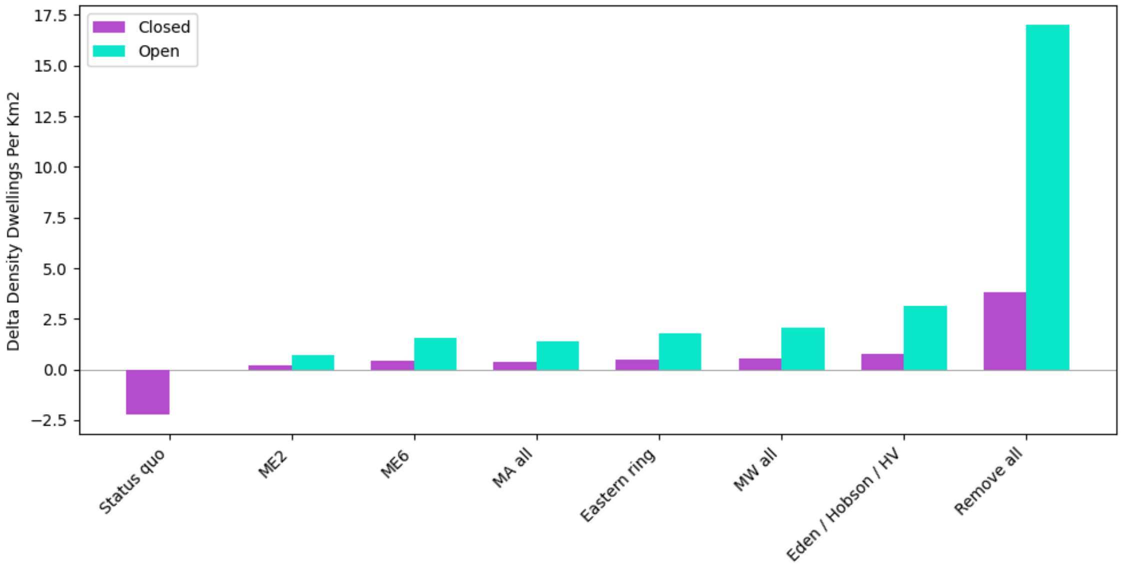
Figure 27: Cumulative population distribution by distance – all scenarios



Source: Crow Advisory model estimates.

The increased compactness can also be expressed in terms of dwelling density. Figure 28 shows the change in average dwelling density across scenarios for both the closed- and open-city cases.

Figure 28: Change in modelled dwelling density vs the keep-all scenario



Source: Crow Advisory model estimates.

The city boundary and household welfare are jointly determined. Table 8 reports both for each scenario. Welfare gains are monotonically related to released capacity: remove-all produces the largest improvement (3.2%), followed by Maungawhau & Ōhinerau (0.68%), Maungarei / Mt Wellington (0.46%), and Ōwairaka / Mt Albert (0.31%).

Table 8: City boundary and household welfare by scenario (closed city)

Scenario	$\overline{x}$ (km)	Welfare index	$\Delta\overline{x}$ (km)	Δ Welfare (%)
Baseline (all VS)	41.46 km	48	–	–
Status quo	41.6 km	47.6	0.14	−0.68
Remove all	40.83 km	49.5	−0.64	3.15
Maungawhau & Ōhinerau	41.33 km	48.3	−0.14	0.68
Maungarei / Mt Wellington	41.37 km	48.2	−0.09	0.46
Ōwairaka / Mt Albert	41.4 km	48.1	−0.06	0.31

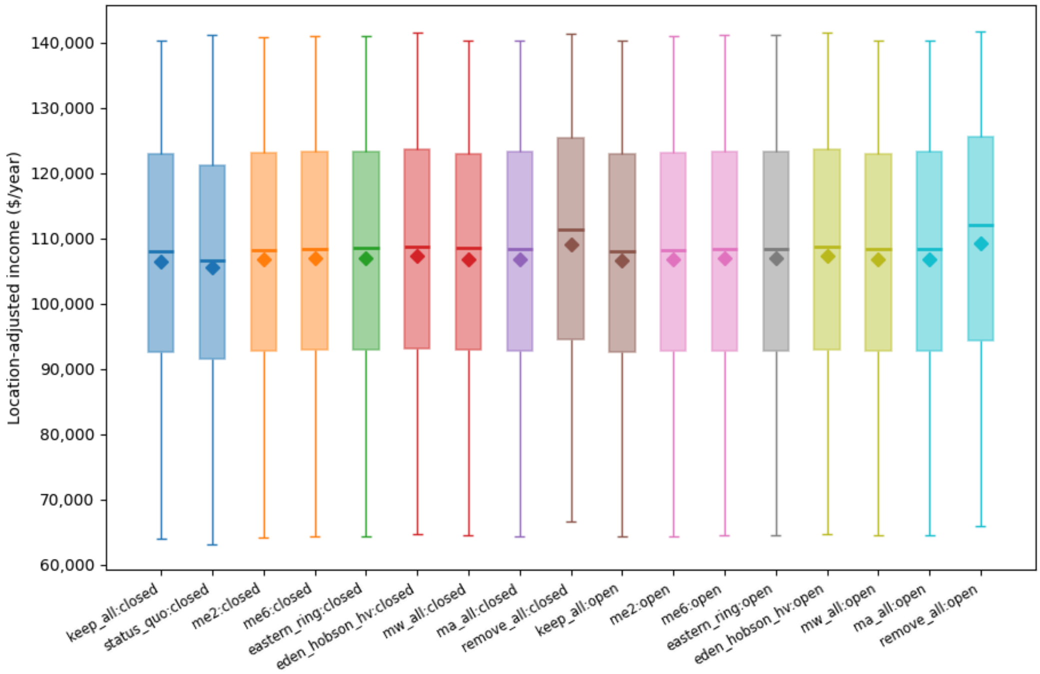
Source: Crow Advisory.

Under the open-city model, the population response amplifies the compactness effect. Removing all Maunga Viewshafts attracts approximately 54,100 additional households, yet the modelled city boundary contracts by 1.06 km—more than under the closed-city case—because the additional population is absorbed in the expanded inner-city capacity. Household welfare is held constant at the national reservation level; the gains materialise through a larger, more productive city rather than through higher welfare for existing residents.

6.6. Location-adjusted income

Following Bertaud and Brueckner (2005): in a closed city where all households achieve equal welfare, a household at the city edge captures the welfare gain entirely through reduced commuting costs. The change in $W - t\overline{x}$ provides a dollar-valued measure of the per-household gain. Under remove-all, mean location-adjusted income increases by $2,548/year—a tangible interpretation of the percentage welfare figures above. Figure 29 illustrates this across scenarios.

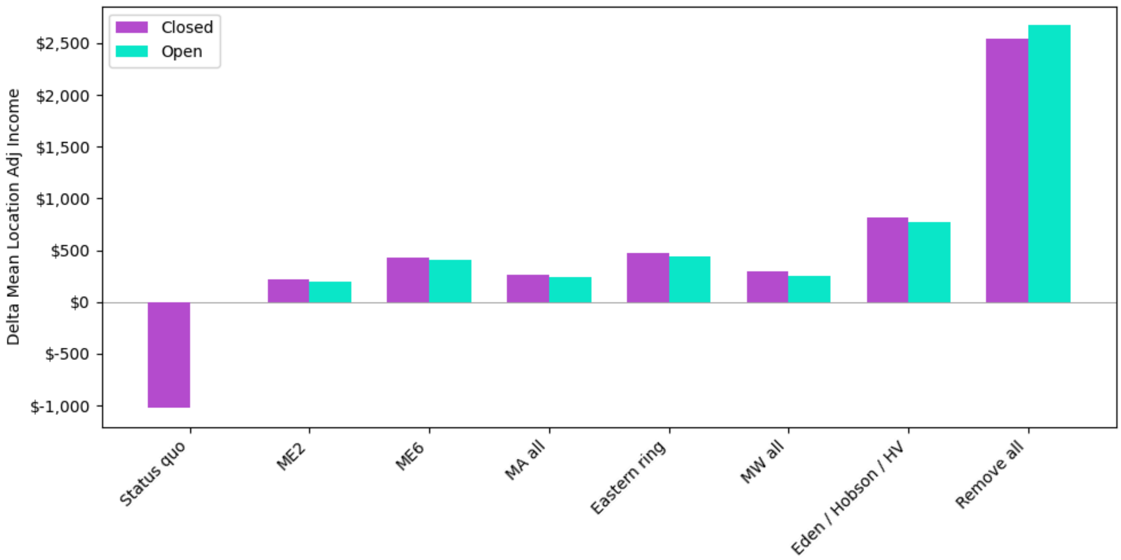
Figure 29: Location-adjusted income by scenario



Source: Crow Advisory model estimates.

Figure 30 shows the change in location-adjusted income before housing expenditure across scenarios, comparing the closed- and open-city cases. The pre-housing income gain represents the improvement in the budget available for both housing consumption and other goods; the portion absorbed by housing costs is the difference between the pre-housing and post-housing figures.

Figure 30: Location-adjusted income effects before housing

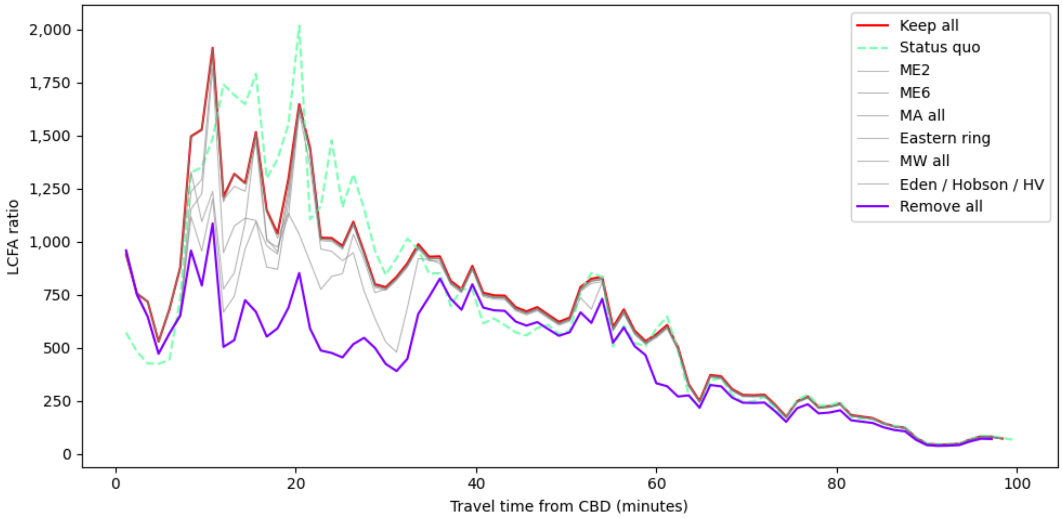


Source: Crow Advisory model estimates.

6.7. Land cost to floor area (LCFA)

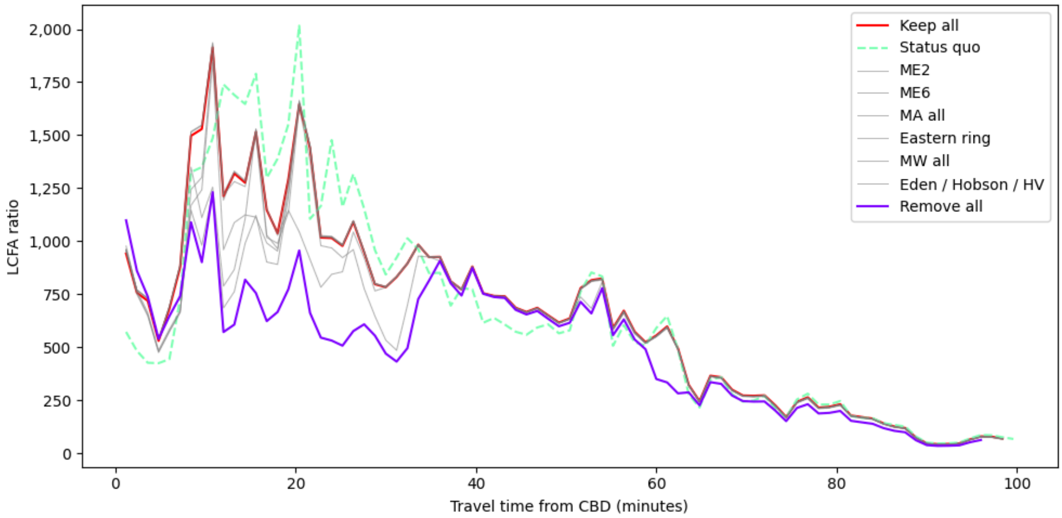
The LCFA ratio, introduced by Cooper et al. (2026), divides land price per square metre by the permitted FAR, capturing the cost of the land input per unit of housing. Unlike raw land prices—which may rise when restrictions are relaxed because land becomes more productive—the LCFA may rise or fall when intensification is enabled, depending on whether the increase in permitted floor area more than offsets any land price appreciation. Figure 31 and Figure 32 show the LCFA by travel time for each scenario.

Figure 31: LCFA ratio by travel time – closed city



Source: Crow Advisory model estimates. Max FAR clipped at 12.5 (the city centre unconstrained density level in the status quo) to avoid overstating the LCFA reduction based on the arbitrarily high modelled unconstrained FAR ceiling.

Figure 32: LCFA ratio by travel time – open city



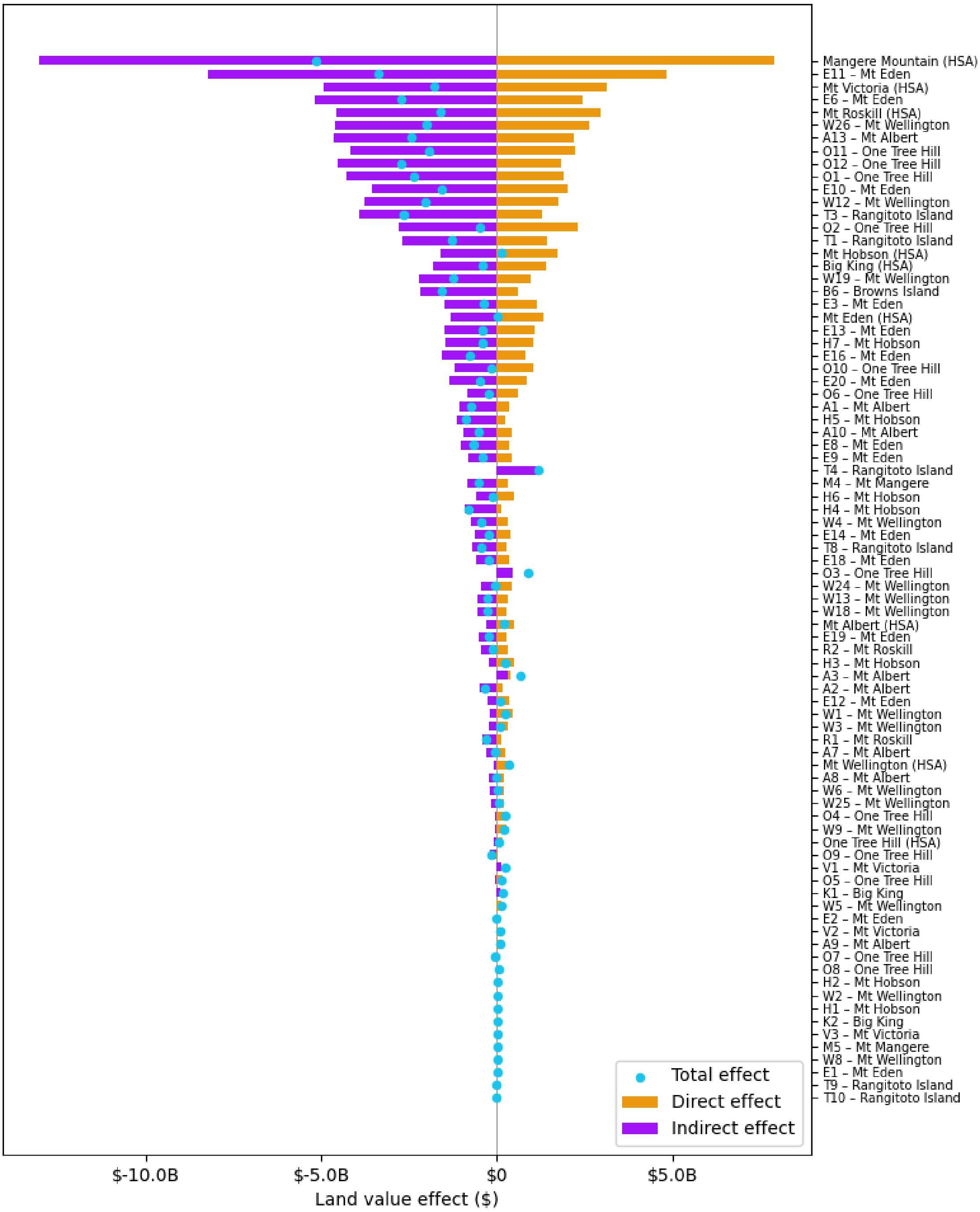
Source: Crow Advisory model estimates. Max FAR clipped at 12.5 (the city centre unconstrained density level in the status quo) to avoid overstating the LCFA reduction based on the arbitrarily high modelled unconstrained FAR ceiling.

Removing viewshafts reduces the LCFA in the inner city where constraints bind, lowering the land input cost per dwelling and signalling improved conditions for new construction. The LCFA perspective captures why housing can become more affordable even in places where land values rise: the cost of producing a dwelling can fall despite higher land prices because permitted density more than compensates.

6.8. Individual Maunga Viewshaft schedule effects

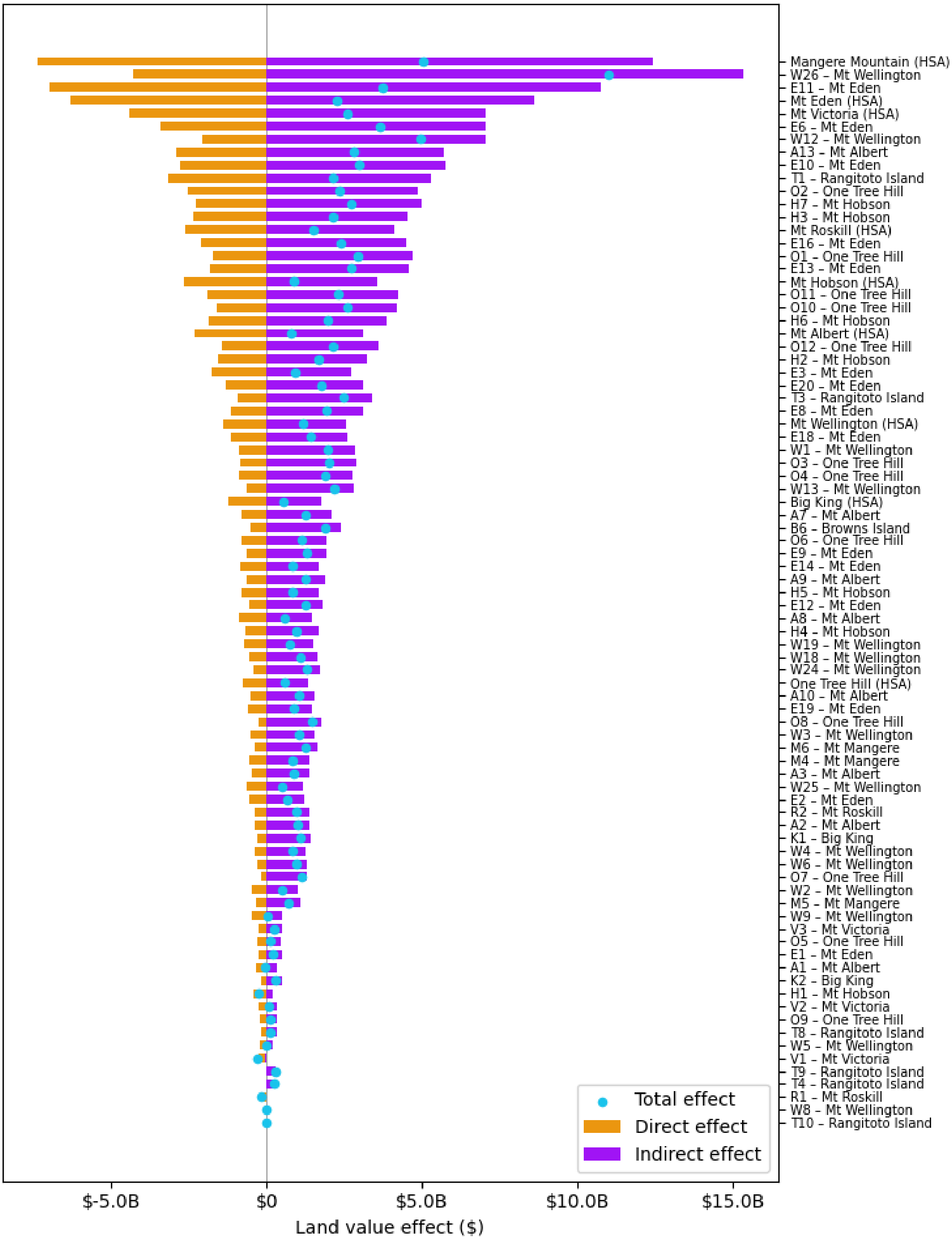
The analysis of individual schedules reveals the contribution of each of the 79 Maunga Viewshafts and 10 HSAs. Figure 33 shows the land value effects for each schedule removed in isolation (all other viewshafts retained); Figure 34 shows the effects when each is the only one retained. The "removed" approach estimates the marginal effect of removing a single viewshaft; the "kept" approach estimates the total effect attributable to a single viewshaft in isolation. The differences in effects between these approaches are driven by two factors: the change in counterfactual baseline (removing one viewshaft from the full set vs keeping one viewshaft while removing all others) and the interaction between overlapping viewshafts, which can reduce the volume of released FAR under the "removed" approach. This is particularly relevant for HSAs, which often overlap with multiple Maunga Viewshafts, and which impose a uniform height limit of 9m. Note we assess individual schedule effects in the closed-city model only.

Figure 33: Direct and indirect land value effects by HSA and Maunga Viewshaft (removed)



Source: Crow Advisory model estimates. Each bar represents a single Maunga Viewshaft schedule removed while all others remain.

Figure 34: Direct and indirect land value effects by HSA and Maunga Viewshaft (kept)



Source: Crow Advisory model estimates. Each bar represents a single Maunga Viewshaft schedule retained as the only constraint.

7. Limitations and assumptions

The results of this analysis should be interpreted with an understanding of several limitations inherent in the modelling approach.

7.1. Monocentric assumption

The AMM framework assumes a single employment centre. Auckland is mildly polycentric, but as Glaeser (2008), Liotta and co-authors (2021) have shown, the monocentric model is observationally equivalent to models with dispersed employment when lower wages and expenditures at secondary centres are captured through travel costs as a function of distance from the CBD. The model adequately replicates the pattern of declining prices and densities with distance regardless of whether commutes stop short of the CBD in practice. Greenaway-McGrevy and Jones (2025) present evidence that this is the case in Auckland specifically.

7.2. Perfect mobility assumption

Both versions of the model assume perfect mobility within the city, in alignment with the static equilibrium assumption described below. The open-city version of the model assumes perfect mobility across cities, so all welfare gains are absorbed by new households moving to Auckland. In practice, household preferences and moving costs limit mobility. The open-city results should be interpreted as an upper bound on the potential population and economic gains from removing viewshafts, all else equal. However, the distortionary effects of Maunga Viewshafts become more severe as population grows, so a larger baseline population could make the economic gains greater than what is estimated here.

7.3. Homogeneity of households and housing

The model assumes identical households with identical preferences and a single type of housing varying only in quantity. In practice, households differ in income, size, and preferences, and housing varies in quality and type. The model cannot capture differences in willingness to pay for views, neighbourhood character, or other amenities correlated with viewshaft protections—notably, the very views the overlays protect may be capitalised into property values, an effect this model does not capture. Perfect mobility means every household instantaneously relocates to its optimal location; in practice, moving costs and tenure arrangements create frictions that slow adjustment.

7.4. Static equilibrium

Each scenario represents a long-run spatial equilibrium. For counterfactual scenarios, the model does not capture the transition path, the time required for adjustment, or the irreversibility of existing development. The results approximate the eventual effect of full market adjustment, or equivalently, the cost of past policy decisions compared to counterfactual alternatives—not a short-term forecast.

7.5. Zoning removal as an isolation strategy

By removing zoning for viewshaft-affected parcels, we isolate the viewshaft effect but alter the baseline substantially. The resulting costs are those in a hypothetical locally unconstrained world, not a direct estimate of marginal costs under the current regime. This is deliberate: under current zoning, many viewshaft limits do not bind because zone-based limits are already more restrictive—often as a consequence of planners treating viewshafts as non-negotiable. Removing zoning reveals the latent cost that would otherwise remain hidden. The estimated costs should be interpreted accordingly.

7.6. Calibration uncertainty

The model is calibrated using a metaheuristic optimiser (CMA-ES) to minimise a composite residual. The resulting parameter set is not guaranteed to be a global optimum, and the multi-objective nature of the residual means that trade-offs exist between fitting different targets (population, FAR, land values, house prices).

7.7. Citywide agglomeration coefficient

Our approach to estimating agglomeration effects is based on the citywide shock to population, which likely understates the value of a shock of density right in the central city. Agglomeration benefits are spatial in nature, but these elasticities are typically estimated at a citywide level, so models capture the average effect of a change in city size but not the disproportionate effect of a change in density in the most central locations where agglomeration benefits are strongest. This is a limitation of our simplified approach, and it means that our estimates of the welfare gain from agglomeration benefits are likely conservative.

7.8. Excluded land uses and areas

The model focuses on residential development and does not explicitly model commercial, industrial, or public land uses beyond their share of floor area in mixed-use zones. Maunga Viewshaft overlays also affect non-residential development, and those effects are not captured here.

A further unmodelled benefit: the height limits near volcanic reserves reduce the number of households within walking distance. Enabling more intensive development close to the maunga could meaningfully increase pedestrian access to these green and cultural spaces—furthering the very goal of preserving connection to the maunga. Quantifying this effect is a promising area for further study.

7.9. Fixed economic parameters across scenarios

In our closed-city counterfactual scenarios, we hold economic parameters (α, γ, A, r_a, t, W, p_K)[6] fixed at their calibrated values and re-solve only the spatial equilibrium under new FAR constraints. This is a standard approach, but it means we assume that removing viewshafts does not change wages, construction costs, or the rural land rent. The open-city version partially relaxes this by allowing wages and population to adjust endogenously through agglomeration, but construction costs and the rural land rent remain fixed.

8. Conclusion

Auckland's Maunga Viewshaft overlays suppress housing supply on some of the most valuable land in the city. The effects are substantial and unambiguous in direction. They reduce household welfare, raise house prices, and encourage sprawl by pushing development to the periphery. Removing them would reverse these effects, improving welfare, reducing prices, and creating a more compact urban form. The effects have been assessed against the 2024 population, but only become more severe as population grows and development pressures intensify. The costs of the current regime are thus likely to grow over time, while the benefits of removing it are likely to grow as well.

Under the closed-city model, removing all viewshafts improves household welfare, reduces house prices, and produces a more compact urban form. The 38,830 parcels affected by Maunga Viewshafts gain $95.1B in land value, offset by $162.3B in indirect reductions elsewhere as displaced demand shifts back to released capacity. The viewshaft restrictions intensify scarcity in the most desirable locations, transferring surplus from households to landowners. Removing them reverses the transfer.

Under the open-city model, the gains take a different form. Improved spatial efficiency attracts approximately 54,100 additional households, raising wages by $446/year through agglomeration, and increases economic output by $8.6B per year. The closed and open-city models present the two extremes of the household mobility spectrum–perfect immobility and perfect mobility. Together they present bounds on the plausible range of estimates.

At the maunga level, Maungawhau and Ōhinerau viewshafts show the largest effect, followed by Maungarei / Mt Wellington and Ōwairaka / Mt Albert. Effects are spatially concentrated in the inner isthmus, where viewshaft planes overlap with the highest-value land.

Several qualifications apply. These estimates are for a locally unconstrained development environment; under current zoning, many viewshaft limits are less binding than existing zoning and overlays. The model does not capture the amenity value of the protected views—a complete assessment would need to weigh these costs against that value. And the monocentric structure, homogeneous households, and static equilibrium assumptions mean results should be interpreted as indicative magnitudes rather than forecasts.

The AMM framework could be extended to incorporate amenity value directly, as Greenaway-McGrevy and Jones (2025) have demonstrated for Auckland's Special Character Areas. Under the AMM assumptions, the only way to improve welfare in the presence of outstanding amenities is to allow greater density nearby so that more households can share proximity to them. Whether the viewshaft overlays as currently configured are the most efficient instrument for achieving their cultural goals—or whether alternative configurations could deliver comparable value at lower economic cost—is a natural direction for further work.

Auckland's path to prosperity is defined by the race between productivity and living costs. Maunga Viewshafts appear to stack the odds in the wrong direction. This analysis provides an internally consistent estimate of

[6] Respectively, the proportion of income spent on housing, the elasticity of substitution between housing and other goods, the productivity of land, the rental rate of land, the commuting cost per unit distance, the wage rate, and the price of capital. See the technical appendix for a full description of these parameters.

the economic costs of these protected views individually, as a whole, and in selected combinations. The results should be considered both from the perspective of preserving the goals of the protections by highlighting which viewshafts have the least economic cost, and from the perspective of mitigating the costs by identifying where the greatest gains could be achieved through targeted adjustments to the current regime.