

TO: Bede Morrissey
FROM: Nathan Stocker
DATE: 31 August 2022
SUBJECT: RESIDENTIAL DEVELOPMENT CAPACITY

1 Background

This memo outlines my responses to evidence provided on behalf of submitters for Hearing 4 of Variation 2 to the Second Generation District Plan (2GP).

This memo refers to the following material:

- National Policy Statement on Urban Development Capacity: Guide on Evidence and Monitoring (Ministry of Business, Innovation and Employment and the Ministry for the Environment, 2017)¹
- Guidance on Housing and Business Development Capacity Assessments (HBAs) under the National Policy Statement on Urban Development (Ministry for the Environment, 2020)²
- Review of Housing and Business Development Capacity Assessments of Dunedin City: Report to the Ministry for the Environment (Principal Economics, 2021)³
- Summary review of Housing and Business Development Capacity Assessments: Report to the Ministry for the Environment (Principal Economics, 2021)⁴

2 Evidence of Emma Peters

The responses outlined in this section relate to a range of evidence provided by Emma Peters. The quoted evidence is taken from the Brief of Evidence of Emma Rayner Peters on behalf of Roger & Janine Southby (Submission 191 – Requested Site 212, 170 Riccarton Rd West Mosgiel), dated 5th August 2022, however I understand her comments on these topics to be generally consistent across her evidence.

2.1 IMPACT OF PRE-1940 DEMOLITION PROVISIONS

Evidence

The s42a report includes an update of the Housing Capacity Assessment. That assessment purports to show a supposed surplus of zoned capacity of 1,280 dwellings in the short term (2022 – 2025) and 350 dwellings in the medium term (2022 – 2032). However, it appears that these figures do not take into account the impact of the Panel's decision that pre-1940s buildings required some level of protection and resource consent is now required to demolish buildings built prior to 1 January 1940 in the General Residential 1 and Township and Settlement (with Council reticulated wastewater) zones as well as Variation 2 Mapped Areas. This rule will operate so that at least some of pre 1940's buildings will now

¹ Available at <https://environment.govt.nz/publications/national-policy-statement-on-urban-development-capacity-guide-on-evidence-and-monitoring/>

² Available at <https://environment.govt.nz/publications/guidance-on-housing-and-business-development-capacity-assessments-hbas-under-the-national-policy-statement-on-urban-development/>

³ Available at <https://www.dunedin.govt.nz/council/district-plan/monitoring-and-research>

⁴ This report is not currently publicly available. The Ministry of the Environment has been approached for permission to share the report.

have to be retained meaning that the number of dwellings resulting from infill development in these existing residential zones and mapped areas will now not be as high as originally anticipated in the Housing Capacity Assessment. (para 14-15)

Response

Of the 6,290 homes that were modelled as being plan-enabled, feasible, infrastructure-ready, and reasonably expected to be realised over a 10 year period under notified Variation 2 changes, 213 would require demolition of pre-1940 buildings within relevant zones and overlays⁵. It is difficult to forecast how many of these would not proceed due to the new pre-1940 demolition provisions, however it could not exceed 3% of total development capacity⁶ even if the provisions prevented all demolition (which is considered unlikely). As a result, I consider it unlikely that the introduction of pre-1940 demolition provisions will have a significant impact of total development capacity.

I note that the pre-1940 demolition provisions were discussed at the hearing in relation to Outram, however do not apply there due to the no DCC reticulated wastewater mapped area.

2.2 MODELLING ISSUES

Evidence

It became apparent during 2GP mediation that there were issues in the modelling producing the Housing Capacity Assessment data. A finer grained analysis of the land with moderate to high zoned capacity (that is, zoned capacity for 6 or more residential units) showed that there were issues with the modelled zoned capacity including things such as historic rubbish tips, slopes of more than 25 degrees, insufficient lot size on slope terrain, access, encumbrances and the like. (para 16)

Response

I have not seen any results from this analysis, so it is difficult to comment on these apparent issues. I provided detailed data to Ms Peters for review and feedback as part of 2GP mediation, however received no feedback from this review.

In the absence of this analysis, I remain confident in the results of the Dunedin Housing Capacity Assessment. An independent review of the Dunedin Housing Capacity Assessment commissioned by the Ministry for the Environment and undertaken by Principal Economics and Urban Economics found that:

The assessment produces a rigorous estimate of the realisable development capacity for housing provided by current plans and development infrastructure⁷

This review provided DCC with 'High' scores for the following criteria (amongst others):

- Does the assessment reasonably quantify all housing development capacity enabled by relevant proposed and operative RPSs, regional plans and district plans?
- Has a robust assessment of development feasibility been undertaken?
- Does the assessment provide information about how much of the provided capacity is realisable?
- Does the assessment make use of a suitable yield assessment method?

A summary report⁸ comparing the reviews of all HBAs across NZ found that

⁵ This is based on capacity included in the Dunedin City Housing Capacity Assessment (2021).

⁶ $213 / 6290 = 0.033$

⁷ Review of Housing and Business Development Capacity Assessments of Dunedin City: Report to the Ministry for the Environment (Principal Economics, 2021), page 15.

⁸ Summary review of Housing and Business Development Capacity Assessments: Report to the Ministry for the Environment (Principal Economics, 2021), page 20

The HBAs of Dunedin, FPP, Palmerston North and SmartGrowth provided the most useful information for informing decision-makers. This was because they included extensive discussions around the description of their analysis and the implications for policy.

2.3 RELEASE OF DATA

Evidence

Despite repeated requests by Sweep Consultancy Limited (to Council and to the Panel) and by Property Economics (to Council) Council has not released the zoned capacity data for double checking by professionals engaged by submitters. This raises real issues of natural justice particularly if the Panel places weight on the Housing Capacity Assessment Report in any decisions not to rezone requested sites residential. (para 17)

Response

DCC has opted to not make property-level results available, a position shared by many other councils. These results are not publicly available and could provide commercial benefit if partially released. The property-level outputs are not of a sufficient level of accuracy to be made publicly available and could give false indications about the developability of properties if released. While the model generates property-level outputs, these were never intended for any use. The use of averages across the model means that results are only considered to be reliable or accurate at an aggregated scale (generally suburb-level or above).

Releasing property-level outputs could also be a breach of privacy requirements, as land ownership could be inferred by the outputs in instances where the landowners have asked for their details to be kept confidential. The model merges properties which are adjacent and have the same owners, which could reveal ownership information even if the specific ownership details were removed.

Information on the release of property-level capacity results was requested by the Panel and provided by Council in relation to Hearing 2⁹.

The independent review¹⁰ commissioned by the Ministry for the Environment found that:

In general, we find that the HBA has provided a reasonable level (and in some cases more than reasonable) of transparency around its methodology and assumptions used to determine residential capacity with additional details reported in the technical document.

This review also gave Dunedin 'High' scores for the following criteria (amongst others):

- Has local expertise been sought and used?
- Have councils engaged with the development sector, providers of infrastructure, and others with important information?
- Transparency
- Clarity
- Narrative
- Useful to decision-makers

Furthermore, the HBA review summary report¹¹ stated that:

The HBAs of Auckland and Dunedin provided the clearest structure and description of assumptions and modelling techniques.

and

⁹ See Minute 8: Update on Hearing Process, paragraphs 11-12.

¹⁰ Review of Housing and Business Development Capacity Assessments of Dunedin City: Report to the Ministry for the Environment (Principal Economics, 2021), page 20.

¹¹ Summary review of Housing and Business Development Capacity Assessments: Report to the Ministry for the Environment (Principal Economics, 2021), page 19-20

The HBAs of Dunedin, FPP, Palmerston North and SmartGrowth provided the most useful information for informing decision-makers. This was because they included extensive discussions around the description of their analysis and the implications for policy.

2.4 MARKET AVAILABILITY

Evidence

There is also an accepted difference between 'zoned capacity' which is what the Housing Capacity Assessment Report assesses and 'market availability' of that zoned capacity. Seeking a residential rezone of your land is a clear indication that such landowners intend to make the zoned capacity resulting from such a rezone available to the market.(para 18)

Response

It is incorrect that the Dunedin Housing Capacity Assessment only assesses 'zoned capacity'. The assessment includes analysis of capacity that is plan-enabled, feasible, infrastructure-ready, and reasonably expected to be realised. Furthermore, all rezonings supported by landowners are assessed as being both feasible and reasonably expected to be realised.

The portion of plan-enabled that is assessed as being feasible and reasonably expected to be realised capacity is portrayed in Figure 1 below.

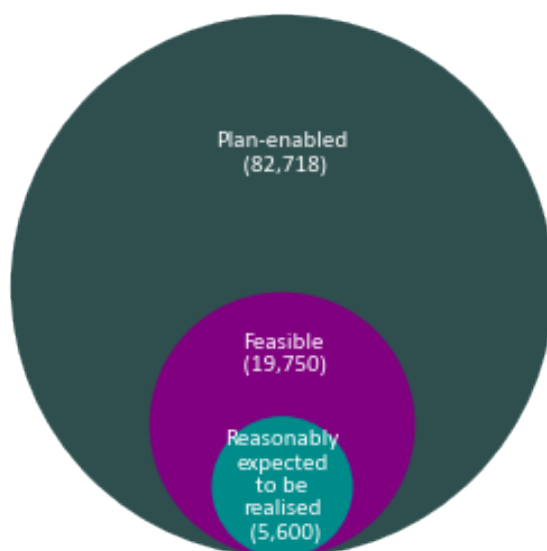


Figure 1: Medium-term development capacity (incorporating notified Variation 2 provisions and rezonings) by category (circles drawn to scale, numbers represent capacity for dwellings)

3 Evidence concerning demand and capacity for specific townships and settlements

The responses outlined in this section relate to evidence from Craig Horne (para 7-12) and Emma Peters (para 15-23) on behalf of CC Otago Limited (Submission 308 – Requested Site 154), Peter Doherty (Submission 307 – Requested Site 154), and Outram Developments Limited (Submission 305 – Requested Site 175). It also applies to discussions at the hearing about Allanton and Brighton.

3.1 CATCHMENT APPROACH TO HOUSING CAPACITY ASSESSMENT

Evidence

Various statements relating to insufficient capacity being provided in specific townships and settlements, particularly Outram, Allanton, and Brighton.

Response

The aggregate development capacity notified in Variation 2 would be sufficient under the National Policy Statement on Urban Development (NPS-UD). Based on projected growth, demographic changes, and housing preferences, demand is expected to be largely spread between inner suburbs, outer

suburbs, and Mosgiel, with smaller amounts of demand in the inner city and outer urban area¹². A significant amount of development capacity that is reasonably expected to be realised has recently been enabled in/around Mosgiel and the outer suburbs through the resolution of appeals¹³, including:

- 27 Inglis Street and Part 58 Ayr Street, Mosgiel (~650 dwellings)
- 636 North Road, North East Valley (~270 dwellings)
- 41 Soper Road and 20-21 Henderson Street, Wingatui (~120 dwellings)

There are also outstanding appeals for residential rezoning in the Mosgiel/Taieri area, including:

- The area zoned Taieri Plain Rural bounded by Hagart-Alexander Drive, Gladstone Rd North, Wingatui Rd (~760 dwellings)
- 5 Main South Road and 2 Braeside (~35 dwellings)
- 50 Franks Place, Outram (~15 dwellings)

As a result of appeal resolutions, the decisions on Hearings 1-3 of Variation 2, and the additional capacity proposed through the notified Variation 2 greenfield rezonings, it is expected that the outer suburbs, Mosgiel, and outer urban areas will all have a surplus of development capacity. To meet shortfalls in areas with most need, additional capacity would be best located in the inner suburbs or inner city.

Table 1: Sufficiency of development capacity by housing catchment

Catchment		Short-term	Medium-term	Long-term
Inner city	Capacity required ¹⁴	150	440	740
	Capacity	80	250	630
	Surplus/shortfall	-70	-190	-110
Inner suburbs	Capacity required	740	2,020	3,160
	Capacity	680	1,340	4,310
	Surplus/shortfall	-60	-680	+1,150
Outer suburbs	Capacity required	940	1,340	1,780
	Capacity	2,340	2,390	4,950
	Surplus/shortfall	+1,400	+1,050	+3,170
Mosgiel	Capacity required	430	1,150	2,040
	Capacity ¹⁵	880	1,310	2,460
	Surplus/shortfall	+450	+160	+420
Outer urban area	Capacity required	110	290	460
	Capacity	120	310	500
	Surplus/shortfall	+10	+20	+40
Total	Capacity required	1,940	5,250	8,180
	Capacity	3,220	5,600	12,860
	Surplus/shortfall	+1,280	+350	+4,680

¹² These catchments are shown in Appendix 1.

¹³ Shown in Appendix 2.

¹⁴ This incorporates the 15-20% competitive margin on top of demand, as required by clause 3.22 of the NPS-UD.

¹⁵ These figures exclude the rezoning of 41 Soper Road / 20-21 Henderson Street, which was approved by the Environment Court after the latest capacity assessment.

The assessment of housing demand (and capacity) at a catchment level is generally acceptable as more appropriate than at a suburb or township level. The NPS-UD guidance on housing capacity assessments¹⁶ states that:

Local authorities have discretion to choose how locations are identified for clauses 3.24 and 3.25.

The National Policy Statement on Urban Development Capacity (NPS-UDC) guidance¹⁷ (which is more comprehensive and is generally taken to be still relevant to NPS-UD assessments) clearly states a preference for analysis at a catchment level:

Dwelling locations – the data can be disaggregated into detailed geographic units such as area units. To ensure the analysis remains manageable, it may make sense to aggregate area units into a more general classification of locations, for example, central business district, inner city suburbs, peripheral suburbs and areas with high amenity (such as beachside property). These general categories may be more useful than individual suburbs, given that households are mobile within urban areas and will accept trade-offs between similar types of suburbs. This will show the revealed preferences of these household sub-groups for different types of housing at different types of locations (such as inner city suburbs or peripheral suburbs), given current market conditions.

The independent review of the Dunedin Housing Capacity Assessment gave DCC ‘High’ scores for the following criteria (amongst others):

- Have all contributions to total housing demand relevant to the urban market been considered?
- Does the assessment use rigorous methods to explore the range of demands for types, locations and price points to the extent relevant in the urban market?
- Does the assessment produce an estimated number of dwellings required in the short, medium and long term for the area (broken down by associated districts if relevant)?

The national summary report¹⁸ states that:

The HBAs of Auckland, Dunedin, FPP, Greater Christchurch, Nelson-Tasman and Queenstown provided comprehensive rigorous methods for exploring the range of demands by type, locations, and price points.

Evidence

Council have not undertaken any data based assessment of the zoned capacity within Outram and likely has not for other townships as well despite these townships being crucial to the rural areas which dominate the area to be serviced by Dunedin City Council and its district plan. (para 17 of evidence by Emma Peters)

Response

Council has undertaken ad-hoc data-based assessments of the demand and capacity within townships and settlements (including Outram, Allanton, and Brighton), however these assessments have not been presented in any finalised reports. The assessments have been relatively basic. Demand was based on the amount of recent development and, where possible, population projections. Neither of these indicators are ideal, as recent development can be influenced by supply constraints and population projections are generally accepted as relatively inaccurate at a fine-grained spatial level. Development capacity was based on results from the Dunedin Residential Capacity Model.

¹⁶ Guidance on Housing and Business Development Capacity Assessments (HBAs) under the National Policy Statement on Urban Development (Ministry for the Environment, 2020), page 21

¹⁷ National Policy Statement on Urban Development Capacity: Guide on Evidence and Monitoring (Ministry of Business, Innovation and Employment and the Ministry for the Environment, 2017), page 33

¹⁸ Summary review of Housing and Business Development Capacity Assessments: Report to the Ministry for the Environment (Principal Economics, 2021), page 16

Ideally the assessment of development capacity at a fine-grained township scale would use a more proactive approach, as the averaging approach inherent within capacity model assumptions is insufficient when applied to a small number of development opportunities. Ideally, there would be discussions with relevant landowners to ascertain future development intentions rather than relying on generic development probabilities or capacity buffers. This detailed assessment has not taken place.

For clarity, the information used to assess the sufficiency of development capacity in specific townships is not taken from the Dunedin Housing Capacity Assessment, which aggregates results to housing catchments.

Evidence

There is a clear demand for more residential zoned land to be made available to the market in Outram. (para 23 of evidence by Emma Peters)

I disagree with the statement in the s42A report (page 283) that: “Outram township does not have a shortage of residential capacity and there is no immediate need for rezoning”. Outram may technically have some zoned capacity within the existing Township and Settlement zoning but if property owners are not prepared to sell their land then that zoned capacity is not available to the market and any need/demand for residential sections cannot be met. This appears to be the case in Outram. (para 11 of evidence by Craig Horne)

Response

Based on the evidence provided by submitters, I acknowledge that there may be demand for additional homes in specific townships and settlements (such as Outram, Allanton, and Brighton) that is not currently being met by available development capacity coming to market. However, as discussed above, there is no requirement under the NPS-UD for the sufficiency of development capacity to be assessed at a township or settlement scale, with NPS-UD guidance suggesting that a catchment approach is more appropriate. This reflects the fluidity of decision-making in the housing market (i.e. the choices and trade-offs made by people deciding where to live) instead of presuming that people would only choose to live in one particular location. It also allows for the consideration of a full range of planning factors when determining where to provide development capacity.

4 Evidence of Philip Osborne

The responses outlined in this section relate to evidence from Philip Osborne on behalf of CC Otago Limited (Submission 308 – Requested Site 154), Peter Doherty (Submission 307 – Requested Site 154), and Outram Developments Limited (Submission 305 – Requested Site 175). I note that Appendix 2 (Review of Dunedin City Housing and Business Capacity) to Philip Osborne’s evidence has wider relevance across Council’s Variation 2 evidence.

4.1 EMPLOYMENT TRAVEL TRENDS ECONOMIC MEMORANDUM

Evidence

See Appendix 1 to the Brief of Evidence of Philip Osborne (Employment Travel Trends Economic Memorandum).

Response

This employment travel trends assessment aligns with the commute-related carbon emissions analysis undertaken by Council¹⁹. While it is not explicit, it is presumed that the Statistics New Zealand data used in the assessment is the same data used in the carbon emissions analysis, namely Census 2018 data on ‘Main means of travel to education and educational institution’ and ‘Main means of travel to work’. If so, the points raised in the employment travel trends assessment (e.g. the relatively high

¹⁹ See Appendix D.7 of the Section 42A Report on Part 3 – Sites Proposed for Rezoning (greenfield, residential transition overlay zones, requested sites)

proportion of people working in Outram and surrounds or commuting to Mosgiel) are incorporated into the carbon emissions analysis.

It is a valid observation that the Momona Statistical Area 2 (SA2) is large and may be spatially heterogeneous, with Outram potentially having different characteristics to the wider SA2. This limitation creates a moderate degree of uncertainty in the travel patterns of Outram residents. However, it is difficult to estimate the extent of these differences without further evidence.

4.2 IMPACT FROM USE OF LONG-TERM ECONOMIC TRENDS

Evidence

Notably, the long-term capacity estimate of the Operative Plan has increased from the 2,567 dwellings published in the 2019 HBA to 9,280 dwellings published in the most recent update. Although this may partially be a result of updated property values for the 2022 base year, the main reason for this change is that the latest published results are based on Dunedin's long-term projections on annual increases in land values, property improvement values and construction and development costs. (p.5 of Appendix 2)

...

These new values would place their rates of economic change somewhere in-between the half and full rates of economic change scenarios outlined in Table 4. Unfortunately, DCC has not published an updated table in their 2022 HBA showing the impact these assumptions have on their new Feasible Capacity. Rather, this new full rate of economic change is inherent in the published capacity results. However, Table 4 from the 2019 HBA gives a strong indication that a significant majority of the Feasible Capacity over the Medium and Long term is the result of this projected increase in land and improvement values. (p. 9 of Appendix 2)

Response

While the use of long-term economic trends contributed to the increase in long-term development capacity between the 2019 HBA and the 2021 HBA (and 2022 addendum), it is incorrect that it is the main reason for the change. The changes in baseline development costs and revenues are a significant factor, with property prices rising 47.2% between June 2019 and June 2022²⁰. This change alone has resulted in a significant increase in feasible development capacity.

Other changes from the 2019 Housing Capacity Assessment include the resolution of some large appeal areas (discussed in section 3 of this memo) and changes in how slope is incorporated in the model (discussed in the Reporting Officer's Opening Statement in response to panel questions).

Of the long-term development capacity for 9,280 homes under the operative 2GP, 7,120 (77%) is feasible as of 2022 and is not reliant on future economic trends, such as house price changes.

4.3 APPROPRIATENESS OF USING LONG-TERM ECONOMIC CHANGE ASSUMPTIONS

Evidence

However, Property Economics disagrees with the assumption of long-term increases in house prices and also considers that Dunedin's approach to assessing realisable capacity adds more volatility, increasing the margin of error on the capacity estimates. (p. 6 of Appendix 2)

...

This approach requires house price increases for capacity to increase. This would be challenge affordability aspirations and cause tension with the fundamental issue the NPS UD is attempting to address. (p. 9 of Appendix 2)

...

²⁰ Based on CoreLogic data provided at www.propertyvalue.co.nz

Property Economics prefer DCC's original approach of basing capacity on what is feasible under the existing market conditions rather than attempting to project long term increases in house prices. (p. 10 of Appendix 2)

Response

The use of adjustments to assumed future development costs and revenue is considered appropriate, particularly as the NPS-UD explicitly allows for this in the definition of 'feasible':

feasible means:

*... for the long term, commercially viable to a developer based on the current relationship between costs and revenue, **or on any reasonable adjustment to that relationship** (emphasis added)*

Guidance on the NPS-UD states that the change (from the NPS-UDC) of allowing adjustments to feasibility assumptions is to 'create a balance between realistic and prudent assessments of commercial viability across time'²¹.

It is true that the long-term feasibility calculations presume some house price increases over the long-term, consistent with historic trends²². To reflect the theoretical potential for increases in development capacity to reduce house price growth, the Dunedin Residential Capacity Model assumes a 5.1% annual increase in land values instead of relying on the 6.1% average annual increase seen over 1995-2016 (or updating the assumption to the 7.6% growth rate seen over 1995-2019). I do not believe it is appropriate to extrapolate the current short-term trend of house price decreases for long-term projections.

It is also noted that the economic trend assumptions are only applied to long-term development capacity, which is not required to be included in a district plan²³. The incorporation of sufficient long-term development capacity in the 2GP reflects Council going above and beyond requirements set out in the NPS-UD.

4.4 DEVELOPMENT PROBABILITIES

Evidence

The recently released (June 2022) memorandum on Residential Development Capacity does not indicate whether or not these development probabilities have been updated. We therefore assume that the updated residential capacity numbers are based on the same development probabilities outlined in the 2021 HBA. (p. 6 of Appendix 2)

Although DCC's approach is not without its merits, the limitation that they only have two years of data on which to base 30 years' worth of growth adds additional volatility to the total capacity estimates. (p. 7 of Appendix 2)

Response

Development probabilities were updated in the July 2022 memorandum on Residential Development Capacity, with annual probabilities of 3.62% for greenfield and 2.17% for brownfield now being used. Take-up probabilities are amended over time as methodological changes are made to the Dunedin Residential Capacity Model.

It is a valid observation that there is uncertainty arising from the limitation of having only two years data on which to base development probabilities. However, the volatility in annual changes to take-up

²¹ Guidance on Housing and Business Development Capacity Assessments (HBAs) under the National Policy Statement on Urban Development (Ministry for the Environment, 2020), page 26

²² Based on historic DCC rating data (and compared with general inflation using on the Statistics New Zealand consumers price index)

²³ National Policy Statement on Urban Development, Clause 3.4(1)

(shown in Figure 1 of the evidence of Philip Osborne²⁴) goes both ways. Based on the volatility shown in Figure 1 of the evidence, the take-up rates would be just as likely to increase as decrease. In the medium-long term, it is likely that take-up in any given year will be higher or lower than the assumed take-up rates, but that this will average out over time.

Actual take-up rates will continue to be monitored and changes will be made to the Residential Capacity Model as further data becomes available. Changes will be included in future housing capacity assessments, which are required to be undertaken every three years.

5 Hearing questions and discussion points

5.1 IMPACT OF SLOPE ON MODELLED PROBABILITY OF DEVELOPMENT OCCURRING

Question

How does slope impact on the modelled probability of development occurring?

Response

The Residential Capacity Model does not directly change the probability of development depending on slope, however there are indirect connections. These connections are primarily through feasibility calculations, as steeper sites are expected to have greater development costs (particularly earthworks) and lower sale values (which are affected by the combination of slope and aspect). As steeper sites will (on average) have greater costs and lower sale values, model results will show a lower proportion of plan-enabled capacity on steeper sites being feasible compared to flatter sites.

5.2 FACTORS IN ASSESSMENT OF DEVELOPABILITY

Question

What practical considerations are taken into account when determining development capacity?

Response

In addition to assessments on what is enabled by 2GP provisions, the financial feasibility of developments, infrastructure readiness, and probabilities of take-up, various practical considerations are factored into the Dunedin Residential Capacity Model. These include:

- Property shape (removal of properties too thin or small to develop)
- Location and size of existing buildings (for infill assessments)
- Age of existing buildings (removal of properties with a house built after 2000)
- Current use (removal of properties used for utility services, community services, or recreation)
- Slope (removal of areas >30°)
- Tenure (removal of cross-lease and unit title properties)
- Subdivision history (properties presumed to be developable if recently subdivided, vacant, residentially zoned, and of an appropriate size)
- Need for areas to be set aside for stormwater attenuation, landscaping, and roading (30% of greenfield sites)

5.3 CARBON EMISSIONS ASSESSMENT METHODOLOGY

Question

The carbon emissions data/map seems to indicate that people commute from Brighton into the city. Is this able to be confirmed?

Does the commuting data indicate *where* people commute to?

Does the carbon emissions data take into account commutes NOT to Dunedin city?

²⁴ Brief of Evidence of Philip Osborne on behalf of CC Otago Limited (Submission 308 – Requested Site 154), Peter Doherty (Submission 307 – Requested Site 154), Outram Developments Limited (Submission 305 – Requested Site 175)

Response

The commute data used in carbon emissions analysis includes where people live and where they work/study, to a Statistical Area 2 (SA2) level. Most SA2s have a population between 1,000 and 3,000, which means that SA2s in the urban form are relatively small in geographic size while SA2s in rural areas are relatively large in extent.

A visual representation of the commute data used in the carbon emissions analysis is available on the Commuter Waka²⁵ webpage. The Commuter Waka tool allows users to click on an SA2 and see where residents work/study and their modes of travel (as well as the data on the people who work in that SA2). This data is derived from responses to the 2018 census. While the available data is likely to be accurate, it is not comprehensive. For the Momona SA, 2018 census data suggests that there are 564 residents in education and 1,368 in employment²⁶. Of these, data on both the main mode of travel to work/education and workplace/education location is held for 441 (78%) residents in education and 1,029 (75%) residents in employment. It is presumed that the data for the remaining population is consistent with the known population, however this is an assumption and does introduce some uncertainty.

The data does not account for commutes outside of the Dunedin City boundary, as the scope of the roading network dataset used is constrained to Dunedin City. However, the data suggests that only 16 people live in the Momona SA2 and have a work address outside of Dunedin City²⁷. As a result, this limitation is considered unlikely to significantly affect the calculated commute-related carbon emissions.

Nathan Stocker

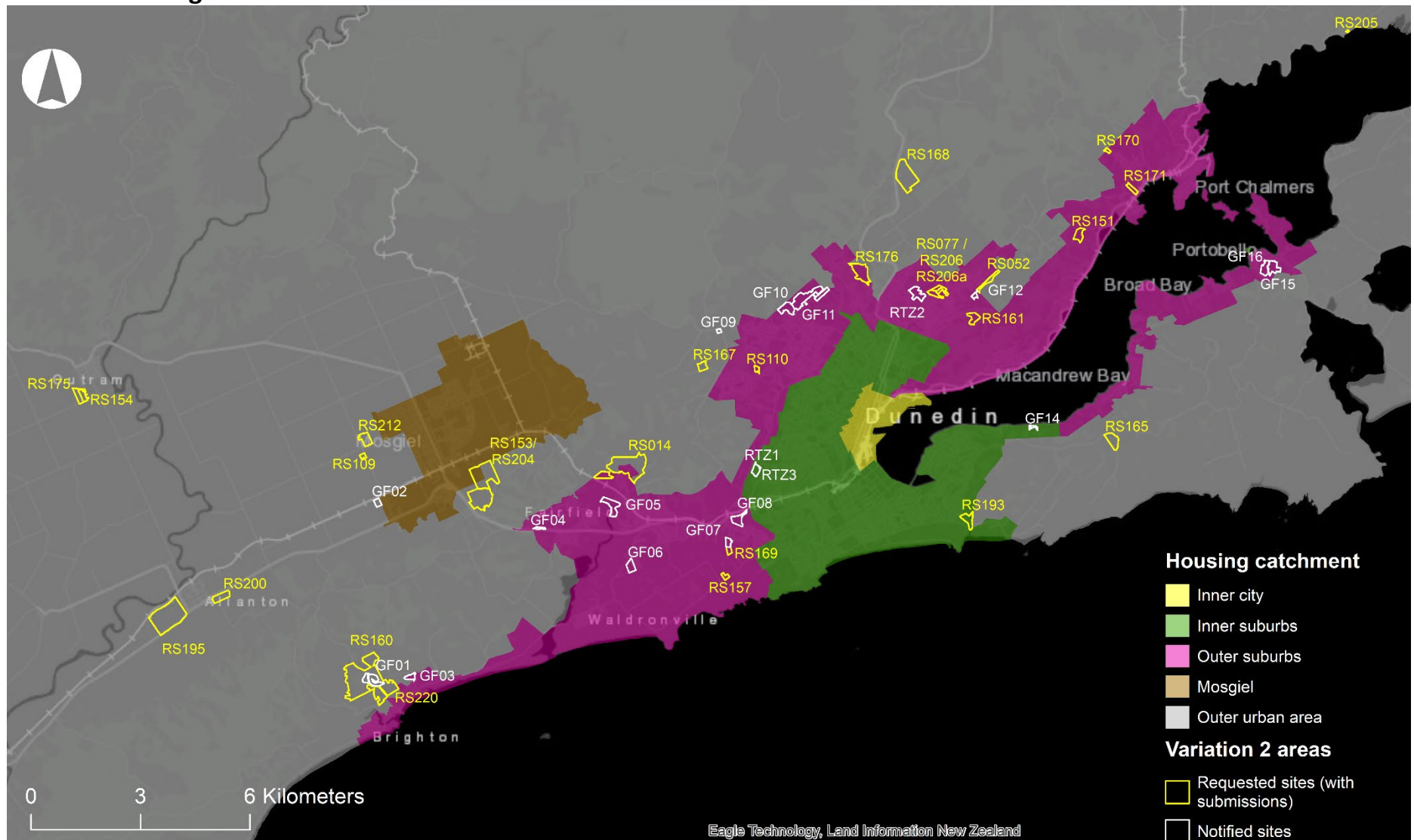
TEAM LEADER – RESEARCH AND MONITORING

²⁵ <https://commuter.waka.app/>

²⁶ This is considered to be reasonably accurate, as the 'Census usually resident population count' data has a 'Very high' data quality score, 'Status in employment' has a 'High' data quality score, and 'Study participation' has a 'Moderate' data quality score.

²⁷ This is based on an extrapolation of known data (12 workers) to account for the 25% of workers without data. The Momona SA2 encompasses both Allanton and Outram, as well as the wider area. Outram comprises 33% of the Momona SA2 population and Allanton comprises 13%.

Appendix 1: Housing catchments with Variation 2 areas



Appendix 2: Housing catchments with 2GP appeals

