Future Proof Strategy Peer Review

Report for Hamilton City and Waikato and Waipa District Councils

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The Brief for the Review

1. McGredy Winder & Co have been engaged by the Future Proof Councils to provide a peer review of the proposed sequencing, timing, spatial allocations and type of supply proposed for the Waikato District Council, Waipa District Council and Hamilton City Council areas to meet the revised demographic demand forecasts for the Future Proof Sub-region. The peer review was asked to assess:
    - alignment of the proposed settlement pattern with the RPS
    - alignment of the proposed settlement pattern with the core Future Proof principles
    - alignment of the proposed settlement pattern with Section 5.3 of the Future Proof Growth Strategy and Implementation Plan 2009 – a more compact and concentrated urban form
    - alignment of the proposed settlement pattern with Section 6 of the Future Proof Growth Strategy and Implementation Plan 2009
    - how the proposed settlement pattern supports integrated land use and transport planning
    - how the proposed settlement pattern supports more cost-effective and efficient servicing

2. The reviewer was also asked to make recommendations on:
    - any recommended changes to the sequencing, timing, spatial allocation and type of development in order to ensure alignment with the RPS and Future Proof principles
    - any recommended RPS amendments (noting that implementing the National Policy Statement for Urban Development Capacity would be addressed in the next stage of the Future Proof work programme)
    - any recommendations for future work.

The Review

What Has Been Reviewed?

3. Any peer review can only reflect the information that is made available to be reviewed. This review has considered:

    - the local authority level forecasts of population and households that were developed for the Future Proof partners by Cameron and Cochrane of the University of Waikato[1], including the key assumptions as set out in three relevant reports that record the progressive refinement of the approach and underlying assumptions
    - the closely related report by Alchemists Ltd on the WISE model and the way in which it worked with the demographic models developed by the University of Waikato to develop forecasts of population and households at a sub-local authority level[2]
    - the location, sequencing and timing of growth within each local authority area as set out in spreadsheets and accompanying material from Hamilton City and Waikato and Waipa District Councils
    - the key high level assumptions that were used to derive estimated capacity (development yield) for growth cells that were set out in the material supplied from the councils.

Material Not Reviewed

4. The reviewer has not been provided with:

    - analysis that underpins the assessment of development capacity
    - information about the adequacy of existing infrastructure to support the forecast growth
    - information about the costs of development, or the cost or proposed sequencing and timing of any additional infrastructure required to service the forecast growth
    - consideration of the relative merits or feasibility of alternative development patterns
    - assessment of the capacity of the transport system to deal with the levels of forecast growth, or the costs of developing the transport system to meet the needs of the forecast population

[1] The three relevant reports are:

- 2016 update of area unit population, household and labour force projections for the Waikato Region 2013-2061, Cameron, M.P., Cochrane, W, October 2016.
- 2016 Update of Population, Family and Household, and Labour Force Projections for the Waikato Region, 2013-2063, Cameron, M.P., and Cochrane, W., Ocotber 2016.
- 2016 update of area unit population, household and labour force projections for the Waikato Region 2013-2061, Cameron, M.P., and Cochrane, W., November 2016.

[2] WISE Projections, Land Use Projections and Population Density Modelling by Census Area Unit, Final Report, Fenton, T., Alchemists Ltd, October 2016.

- analysis of the existing development capacity and likely uptake of rural residential/lifestyle settlement across the rural areas of the three local authorities
- analysis of the potential for changes in the forecast demographic structure of the population of the area to drive significant changes in demand for different types of housing – including multi-unit retirement type developments, apartments, or other higher density housing
- analysis of the cost or commercial viability of developing sections at the densities that are used to drive the local area estimates of development capacity.

5. In the absence of this sort of information the peer review is limited in terms of what it can conclude.

Findings

Projections, Forecasts and Uncertainty

6. Forecasting the future is inherently difficult. The future is uncertain. Whilst we can be confident that much of what will be around in twenty years' time already exists (people have been born, buildings and roads have been built, etc.) there is a great deal that can change over that period of time. The more complex the system that you are trying to forecast, the less likely it is that you can reliably predict the future. Forecasting future patterns of economic activity, of where people will live and work, of where houses will be built, and what sort of dwellings might be built, requires the ability to forecast the behaviour of people and of complex economic and political systems. In this context, most forecasters will readily admit that it is unlikely that their forecasts will be correct.

7. One of the key refinements in the approach adopted by the Future Proof partners for this review of their strategy is the use of multiple population projections that reflect different rates of growth and different assumptions about the future. These projections represent an envelope of future possibility. By adopting this approach, it becomes less important whether any one forecast is reliable. Rather, it is important that the envelope of the future possibility that is projected reflects the likely range of what the future could look like. If the strategy copes well with the likely future range of activity then it is a robust strategy.

8. Adopting a range based projection framework is a significant improvement to the Future Proof framework. It provides deeper insights into what the future may look like and the ability of the growth strategy to deal with different futures. This is an important and helpful enhancement of the Future Proof Growth Strategy.

9. Cameron and Cochrane note that:

> *"The projections of total and age and sex-specific populations were prepared using the standard cohort component model and using data from Statistics New Zealand. However, projections of net migration were derived using age and sex-specific net migration rates, a significant departure from the method employed by Statistics New Zealand. Three population projection scenarios (a low-variant, a medium-variant, and a high-variant) were generated, using different (but related) assumptions about future fertility, mortality (survivorship), and net migration. Family and household, and labour force, projections were then*

derived from both population projection scenarios, by applying assumptions about living arrangement type rates and labour force participation rates respectively. In addition, the family and household projections explicitly account for the proportion of the population living in non-private dwellings, which is a departure from previous family and household projections, including those prepared by Statistics New Zealand." [3]

10. Cameron and Cochrane note that *"these projections should be viewed as one possible future, based on known assumptions about future fertility, mortality and net migration, and should not be interpreted as forecasts of the future population distribution. However, the projection assumptions are based on a continuation of previous population trends that can reasonably be expected to continue into the future."* [4]

11. Of the three projections that were developed by Cameron and Cochrane at the territorial authority level, the Medium and Low variants were then translated into more detailed census area unit (CAU) level projections. Whilst the high variant is a valid projection, it is significantly higher than previous projections. Following considerable facilitated debate between the strategic planners of the Future Proof partners and the relevant experts, it was agreed that the high projection did not represent a sufficiently likely scenario for it to be useful for the detailed planning work that was required. The Peer Reviewer supports this conclusion and the decision to progress with both the Low and Medium Variants.

12. The detailed CAU level projections "*were generated by statistically downscaling the territorial authority projections using the results obtained from a land use change model, embedded within the WISE (Waikato Integrated Scenario Explorer) model. The statistical downscaling method involves generating a regression model that predicts CAU-level population on the basis of the amount of land use of different types that is present in each CAU.*" [5]

13. The territorial authority level Low variant and Medium variant projections were used as an input to the WISE model. *"The WISE model is a systems-based integrated model that incorporates economic, demographic, and environmental components across the entire Waikato Region (Rutledge et al., 2008; 2010; Fenton, 2016). The WISE model begins with a base land use map in 2013, incorporating 24 different land uses, including three different residential land use classes (medium-high density, low density, and lifestyle blocks) (Rutledge et al., 2010). At each (annual) time step, the economic and demographic models generate demands for economic and residential land use, which are inputs into a dynamic, spatially explicit land use change model (Huser et al., 2009; van Delden et al., 2008)."* [6]

14. Cameron and Cochrane helpfully summarise the WISE model as follows:

> *"The land use change model is a Cellular Automata (CA) model specified as one-hectare grid cells (100m x 100m). The CA model apportions land to different uses at each time step based on a combination of four factors: (1) zoning (which*

[3] 2016 Update of Population, Family and Household, and Labour Force Projections for the Waikato Region, 2013-2063, Cameron, M.P., and Cochrane, W., Ocotber 2016, p vii.

[4] 2016 update of area unit population, household and labour force projections for the Waikato Region 2013-2061, Cameron, M.P., and Cochrane, W., November 2016, p 9.

[5] 2016 update of area unit population, household and labour force projections for the Waikato Region 2013-2061, Cameron, M.P., and Cochrane, W., November 2016, p iii.

[6] 2016 update of area unit population, household and labour force projections for the Waikato Region 2013-2061, Cameron, M.P., and Cochrane, W., November 2016, p 4.

constrains the land uses that are available in each cell); (2) suitability (the biophysical suitability of land for different uses); (3) accessibility (assesses the attractiveness of a location for different land uses based on the proximity to desirable or undesirable features); and (4) local influence (assesses the attractiveness of a location for a land use based on the composition of land use in the surrounding neighbourhood). The CA land use model attempts to meet the external demands for land (from the economic and demographic models) by assigning cells with the highest transition potentials (determined by their zoning, suitability, accessibility and local influence) to new land uses. Transitions are made at each (annual) time step.

The demand for residential land of each type is determined by first assigning a given proportion of population in each territorial authority to each residential land use type, and a proportion to all non-residential land uses. The proportions are generally stable but vary over time for some territorial authorities. Second, the number of residential land use cells of each type required is determined by combining the population in each residential land use calculated in the first step with population density values for each residential land use type." [7]

15. The WISE model is complex and well regarded. It has been widely reported and has previously been reviewed. A number of enhancements were made to the WISE model to support this work. These were:

> *"- … changes in the population densities for residential land use types and proportions of population in each residential land use type for FP [Future Proof] councils to reflect the projected reduction in household sizes*
>
> - *a review of the starting (2013) residential population densities and proportions for Hamilton City and Waipa District*
> - *implementing changes to the WISE setup of district plan zoning and growth strategies to reflect preferred development patterns."* [8]

16. These improvements were helpful, but it is important to bear in mind that the WISE model was developed for the broad region-wide testing of land use scenarios. That is why it reflects 24 different land uses of which only 3 are residential. It is probably fair to say that the detailed focus on residential modelling used to produce CAU level population projections pushes the limits of the WISE model.

17. One of the most important inputs to the WISE model is the assumed level of future population density for each of the three residential land use types. This is important and challenging in several respects:

    - The population density is a key input to the WISE model that, along with the area of land available, establishes the development capacity of each cell. Changing the assumed density of development has a marked affect on the allocation of growth within the model.
    - Population densities are the product of the interaction between the housing stock and the population. The same housing stock can be associated with quite

[7] 2016 update of area unit population, household and labour force projections for the Waikato Region 2013-2061, Cameron, M.P., and Cochrane, W., November 2016 p 4.

[8] WISE Projections, Land Use Projections and Population Density Modelling by Census Area Unit, Final Report, Fenton, T., Alchemists Ltd, October 2016, p 5.

different population densities as the population ages and the nature of households change.

- Planners are used to dealing with dwelling densities (which are controlled through District Plan provisions) and have less cause to consider population densities – making the exercise of judgement around future population densities difficult.

18. The reviewer has no basis on which to judge the reasonableness of the population density assumptions that the key council planners have made. It is clear from engagements with them that they genuinely and carefully considered this issue and used their best efforts to develop robust and credible projections. At the end of the day, the detailed CAU level projections are heavily dependent upon this assumption – particularly where all of the available land within a cell is allocated, and modelled growth spreads out into adjacent cells.

What Has Changed?

19. Comparisons between the 2009 Future Proof Growth Strategy and Implementation Plan and the current work are a little difficult because in 2009, Waikato did not include Tuakau, Pokeno and the rest of Franklin District that was joined with Waikato District in 2010.

20. The key differences between the population projections developed for this review, and the published projections in the 2009 Future Proof Growth Strategy and Implementation Plan are set out in Table 1. The 2009 numbers all exclude the parts of Franklin that were merged with Waikato. The 2016 projections all include those parts of Franklin. Table 2 shows the comparison for households. As with Table 1, the 2009 projections exclude parts of Franklin District.

Table 1: Comparison Between 2009 and 2016 Population Projections

	2006	2031	2061	2061 as a % of 2009 Projections
Medium Variant				
Hamilton	134,740	199,469	260,434	94%
Waikato	59,510	88,175	115,034	
Waipa	43,690	64,217	74,864	102%
Total	237,940	351,860	450,331	
Low Variant				
Hamilton	134,740	189,390	226,343	82%
Waikato	59,510	82,738	96,061	
Waipa	43,690	59,989	62,857	86%
Total	237,940	332,117	385,260	
2009 Projections				
Hamilton	134,400	198,200	277,600	
Waikato	45,400	67,400	86,600	
Waipa	43,700	62,400	73,500	
Total	223,500	328,000	437,600	

Table 2: Comparison Between 2009 and 2016 Household Projections

Households	2013	2061	2061 as a % of 2009 Projection
Medium Variant	93,551	191,387	116%
Low Variant	93,551	164,584	100%
2009 Projections	79,100	164,500	

21. Once the projected population of Tuakau and Pokeno is added to the 2009 Waikato projection the total projected population of Waikato District is 82,000 – the same as the 2016 Low variant projection. The Medium variant 2016 projection for Waikato is higher than this.

22. The projected 2061 Hamilton population is lower under both the Medium variant and Low variant projections than the 2009 projections, but there is little difference between the 2031 Medium variant projection for Hamilton and the 2009 projection. There is little difference between the any of the projections for Waipa.

23. The major difference between the 2009 and 2016 projections relates to households. The 2016 projections anticipate a considerably larger number of households for the same population than was projected in 2009. Whilst the 2009 Future Proof Strategy and Implementation Plan published projected population by local authority area, it did not do so for households. But the overall difference suggests that the 2009 projection anticipated 2.7 people per household in 2061, whereas both the Low and Medium variant projections anticipate around 2.3 people per household. Assuming broadly one dwelling per household, by 2061 this difference translates to the need for around 20,000 more dwellings than would have been required for the same population with 2.7 people per household. This is the most significant change in the projections.

Conclusions

24. **The projections that have been used for the review of the Future Proof strategy are generally sound and reflect a very careful consideration of the population dynamics that the Future Proof area faces.**

25. Adopting an envelope (or range based) approach to future planning using more than one growth scenario is important and an enhancement to previous work.

26. Having noted the value of the envelope approach to forecasting and future planning, it is equally important to note that the NPSUDC drives councils in medium and high growth areas toward the use of only one view of the future and to deal with uncertainty by providing for substantial future development capacity in excess of that which would be required to meet forecast demand. The Future Proof partners will need to carefully consider this as they move to comply with the NPSUDC.

27. Whilst the projections methodology and approach is appropriate for the current review of the strategy, there are some important issues that warrant attention in future projections, and will need to be addressed to implement the NPSUDC. These are discussed below.

Urban Systems, Urban – Rural Dynamics and Auckland

28. In considering potential future growth and development, the Future Proof partners face some significant methodological challenges.

29. National level age-cohort population models are quite simple forecasting tools. Modelling the aging of a population to reflect the impact over time of age-specific birth and death rates is a straightforward task. Inwards and outwards migration is more difficult to forecast, but at the national level these factors tend to be a less significant part of overall growth (or decline) than might be the case in a quite small geographic area.

30. Understandably, the smaller the geographic area that is being considered, the more important inward and outward migration may become as determinants of the future population. The factors that drive migration are difficult to model. They shift with economic cycles and they can be significantly affected by what is happening in other places. The current shortage of affordable housing in Auckland is having an impact on outwards migration from Auckland. This factor has the potential to have a major impact on the three Future Proof Councils.

31. At the very local, or subdivision level, the potential for in-migration depends upon the capacity of the area to physically accommodate the number of dwellings that would be required to house them. Estimating development capacity can be challenging. The easiest capacity estimate is derived from the maximum capacity that is provided for through the operative District Plan. However, there are many reasons why this capacity may never be realised, or may be rather theoretical, rather than a practical capacity. The economics of development may mean that developing at the maximum allowable capacity does not provide the best return on investment for a land owner or developer. Prevailing market preferences may mean that developing at a lower density than is provided for in the District Plan is more attractive. Also, there will always be a number of existing properties that will not be re-developed. The reasons for this include the personal preference of existing owners and the poor financial return where current buildings have such a high capital value in relation to the value of the underlying land that it is not worth removing them to develop at a higher density. These factors are difficult to model and forecast.

32. The major complication for the Future Proof partners is that the population of each of the three local authority areas is part of a complex interaction between two large urban systems (Auckland and Hamilton), a number of what were once rural towns, productive rural farmland and peri-urban demand for rural residential and lifestyle living. This means that the demand for housing and residential development across all three areas is significantly affected by the pressures within neighbouring areas, the relative availability and cost of land and houses, the availability of employment and the ability to commute to work, possibly over quite large distances.

33. The interactions between neighbouring areas, and in particular the peri-urban shadow that Auckland casts over the northern Waikato, presents significant uncertainty for the Future Proof partners. These interactions are methodologically very difficult to deal with.

34. The approach of projecting the population of each territorial authority separately and then allocating the growth within the geographic area of that authority is not strongly aligned to either market reality or the need to manage growth across the whole of the Future Proof area. With the high levels of accessibility within the sub-region, the market for residents includes much of the sub-region. It is reasonable to assume that residents that cannot find

the sort of property that they are seeking in Hamilton could readily find alternatives in either Te Awamutu or Cambridge, or indeed in rural residential or lifestyle properties across the whole area. The current methodology does not really reflect the reality of the housing market choices that exist, or the urban dynamics within the sub-region.

35. Another key area for consideration is how to best explore the potential impact of Auckland on projections for the Future Proof area. The discussion above, in essence, argues that there are not three distinct populations within the Future Proof area, there is one population that has a wide set of choices with respect to where to live. It can just as easily be argued that much of the northern part of the Future Proof area is within the choice set for Auckland residents. The current growth of Tuakau and Pokeno is not fuelled by the organic growth of the population of Waikato District, it is driven by the growth dynamics of Auckland and the relative attractiveness of those locations in relation to the cost, accessibility and attractiveness of alternatives within Auckland. The revision of the Future Proof Strategy to give effect to the NPSUDC will need to more specifically address the shadow that Auckland casts over the northern Waikato and the potential for far more rapid migration of the Auckland population towards the south than is reflected in the current projections. This will be methodologically challenging. It will also require explicit consideration of the impact on the Future Proof area of Auckland's revised growth strategy following the adoption of the Unitary Plan and its work to implement the NPSUDC.

Understanding Demand for Housing

36. The second significant methodological challenge for the Future Proof Councils is how to understand the nature of demand for housing. The approach that has been adopted by Cameron and Cochrane for the Future Proof Councils uses age-sex cohort models to forecast total population, which is then used to forecast households using "*additional assumptions regarding the rates of people living in different living arrangements (e.g. couples without children, couples with children, etc.), the average number of families per household, and the average number of people per multi-person household (see Cameron et al., 2007 for further details on the method). The numbers of households were then derived from the number of people in each living arrangement type.*" [9]

37. Cameron and Cochrane further refine the forecasts be addressing the number of people that reside in non-private dwellings (NPD). They used "*the projected age-sex distribution and the average age-sex-specific rates of NPD living for each TA from the past three Censuses.*" [10] They note that *"This explicitly assumes that the proportion of people of each age and sex who are living in NPDs will remain constant over time, although the total number and proportion of the total population living in NPDs will change as the age-sex distribution changes over time. In particular, we expect an increasing proportion of the population to be living in NPDs over time, as the proportion of people in older age groups increases over time and older people are (in most TAs) more likely to be living in NPDs."* [11]

38. Over the forecast period there will be a significant shift in the nature of the population as it ages. This is likely to result in considerable changes to the nature of households. There will

[9] 2016 Update of Population, Family and Household, and Labour Force Projections for the Waikato Region, 2013-2063, Cameron, M.P., and Cochrane, W., Ocotber 2016, page 8.

[10] 2016 Update of Population, Family and Household, and Labour Force Projections for the Waikato Region, 2013-2063, Cameron, M.P., and Cochrane, W., Ocotber 2016, page 10.

[11] 2016 Update of Population, Family and Household, and Labour Force Projections for the Waikato Region, 2013-2063, Cameron, M.P., and Cochrane, W., Ocotber 2016, page 10.

be a marked increase in the number of single person older households. There will be changes to the nature and size of families. Older people are likely to be more active later in life than previous generations of the same age. Patterns of work and demand for different types of employment will also change. These broader societal changes mean that it is feasible that the assumption that current age-specific rates of residence in NPD will continue over the forecast period may not hold true.

39. Demand for NPD is only one of the areas where future demand might vary from what has been seen historically. The spill over of what is essentially Auckland demand into the north of Waikato District is discussed above, but there will be other changes in demand. Clearly demand for housing does not reflect a single market. There are complex and overlapping market demand segments which interact with, and place differing pressures on, different types of property, different styles of housing and different locations.

40. Over the forecast period these changes are likely to result in significant shifts in both housing and location preference for different age groups. For instance, it is likely that:

    - the aging of the population results in increased pressure for rural lifestyle type dwellings for those approaching retirement that are very active, and may well include demand from people shifting their capital out of the Auckland property market in anticipation of retirement
    - the aging of the population will result in increasing demand for multi-unit retirement homes
    - older single people may have a marked preference to live closer to tertiary medical care than is possible within a number of the rural towns within the Future Proof area
    - there will be increasing demand for smaller dwelling units (i.e. not 3 to 4 bedrooms with large living areas).

41. The emerging guidance for implementing the NPSUDC recognises the importance of understanding the housing market and the demand segments which have quite different needs, preferences and ability to pay. The current WISE model methodology is unlikely to offer the sort of complexity in the analysis of the demand for housing (market segmentation) that will be required to meet the requirements of the NPSUDC.

Understanding the Supply of Housing

42. The actual future pattern of settlement across the Future Proof area will reflect the interaction between the demand for, and supply of, housing. The forecasts that the Future Proof partners are using strongly reflect the demand side but are limited in terms of their assessment of likely supply.

43. The approach that has been used reflects what has been common planning practice in New Zealand for some years. It considers the current zoning and planning for both the existing urban areas and planned growth cells. It uses GIS based analysis of the potential for subdivision and judgement over yield to estimate development capacity for each type of modelled residential activity in each growth cell.

44. Estimating future yield is complex. In addition to the planning considerations, a key issue is the likely financial return from development. Geographic areas which offer the greatest potential margin for developers with the least risk will tend to be developed first. This applies equally to housing styles. This means that despite the potential for demand for

more single person households to grow over the forecast period, the types of housing that will be developed will tend to be those that can sell well at the time that they are developed.

45. Estimating the future timing of development is also complex. Despite the plans of public agencies, the timing of future developments will be significantly affected by the potential for return, the fragmentation of ownership (the more fragmented an area is the slower the pace of future development), and the motivation and appetite for risk from current owners.

46. The current approach by the Future Proof Councils does not really deal with the complexities of the supply side of the planning for growth. Addressing the supply side will require some careful and quite sophisticated work. Whilst this sort of work was always beyond what could be achieved in the current review of the Future Proof Growth Strategy it is an area that the councils will need to address in order to comply with the National Policy Statement for Urban Development Capacity.

Capacity for Growth

47. As is noted above, the reviewer has not been provided with details of the analysis that was undertaken to estimate development capacity. Therefore, no comment is made over the robustness of those estimates. Equally, no comment is made as to whether or not the identified capacity would be considered feasible development capacity in terms of the NPSUDC. What has been considered is whether or not the estimated capacity provides sufficient capacity to accommodate forecast growth.

48. Overall, the revised forecasts demonstrate that there is sufficient capacity for growth over the period to 2045, but that picture is not uniform across the Future Proof area, or over the three decades that are forecast.

Waipa

49. On the basis of these forecasts, Waipa has sufficient capacity for growth. In each of the first two decades, the forecast growth in Cambridge and Te Awamutu uses around half of the forecast capacity. The availability of additional capacity in the second two decades is such that by 2045, there is still sufficient capacity to provide for between 2,000 and 3,500 additional dwellings.

Waikato

50. As Table 3 shows, Waikato District appears (in aggregate) to have sufficient development capacity to deal with growth – but its development capacity is not necessarily aligned to demand and a large proportion of total capacity is not planned to be available until the third decade. For most of the forecast period, the bulk of Waikato's development capacity is in Pokeno, Tuakau and Te Kauwhata. Despite the implementation of Tuakau Stage 1 in the first decade and Stage 2 in the second, Tuakau is shown as being, in essence, full until the advent of Stage 3 in the third decade. This additional capacity for around 4,700 dwellings is then only partially used by 2045.

Table 3: Waikato District Growth in Dwellings and Development Capacity

	2025			2035			2045		
Low Growth	Increase	Capacity	Spare Capacity	Increase	Capacity	Spare Capacity	Increase	Capacity	Spare Capacity
Tuakau	817	1202	385	755	725	-30	485	4698	4213
Pokeno	750	1200	450	1360	1450	90	1222	1090	-132
Te Kauwhata	353	2579	2226	248	2398	2150	75	2741	2666
Huntly	333	300	-33	333	643	310	57	310	253
Ngaruawahia	147	163	16	133	322	189	60	873	813
Raglan	371	200	-171	167	129	-38	-35	162	197
Total Urban	**2771**	**5644**	2873	**2996**	**5667**	2671	**1864**	**9874**	**8010**
Taupiri	54	183	129	33	231	198	12	198	186
Horitiu	73	102	29	76	29	-47	61	-47	-108
Gordonton	41			-10			-76		
Matangi	102			67			83		
Tamahere-Tauwhare	284			176			260		
Whatawhata	186			119			134		
Te Kowhai	78	129	51	51	60	9	78	71	-7
Total Hamilton Urban Area	**818**	**414**	-404	**512**	**320**	-192	**552**	**222**	-330
Rest of District	**1774**	**2881**	**1107**	**1194**	**2881**	**1687**	**829**	**2881**	**2052**
Total	**5363**	**8939**	**3576**	**4702**	**8868**	**4166**	**3245**	**12977**	**9732**
Medium Growth									
Tuakau	839	1202	363	909	725	-184	823	4698	3875
Pokeno	1110	1200	90	1945	1450	-495	991	1090	99
Te Kauwhata	369	2579	2210	255	2398	2143	48	2741	2693
Huntly	412	300	-112	247	643	396	67	310	243
Ngaruawahia	152	163	11	130	322	192	62	873	811
Raglan	386	200	-186	122	129	7	-82	162	244
Total Urban	**3268**	**5644**	**2376**	**3608**	**5667**	**2059**	**1909**	**9874**	**7965**
Taupiri	58	183	125	39	231	192	9	198	189
Horitiu	113	102	-11	121	29	-92	84	-47	-131
Gordonton	55			12			-53		53
Matangi	119			75			126		
Tamahere-Tauwhare	343			260			446		
Whatawhata	228			157			218		
Te Kowhai	90	129	39	77	60	-17	133	71	
Total Hamilton Urban Area	**1006**	**414**	**-592**	**741**	**320**	**-421**	**963**	**222**	**-741**
Rest of District	**2136**	**2881**	**745**	**1776**	**2881**	**1105**	**2104**	**2881**	**777**
Total	**6410**	**8939**	**2529**	**6125**	**8868**	**2743**	**4976**	**12977**	**8001**

51. The forecasts show Pokeno growing to meet or exceed available development capacity in each decade, with all projected capacity being utilised by 2045. In contrast, Te Kauwhata has significant development capacity early in the period (almost 2,600 dwellings) which is projected to be largely unused through the whole forecast period. The projections show development capacity across the Waikato rural towns to be very tight across the whole of the forecast period.

52. It is possible that the picture presented in the projections is rather more an artefact of the WISE model and the assumption that it uses, but it is concerning that this strategy shows early investment in council infrastructure in Te Kauwhata that then goes unused through the whole of the period. Even under the Medium Growth Scenario, Te Kauwhata has unused development capacity of around 2,700 dwellings at 2045.

53. The balance and timing of growth and investment between Tuakau, Pokeno and Te Kauwhata warrants reconsideration. If the demand reflected in the projections is to be believed, it could be wiser to bring forward Tuakau Stage 3 than to develop Te Kauwhata early. Alternatively, with the influence of Auckland and the potential for greater southward growth pressure than is reflected in the current projections, it is possible that none of the growth scenarios used here provide sufficient development capacity to cater for possible growth in the north of Waikato District.

Hamilton

54. It is more difficult to determine whether or not Hamilton City has sufficient development capacity under the new forecasts. The projections for Hamilton City are based on a central assumption – that, consistent with current policy, 50% of Hamilton's growth will be within the existing Hamilton urban area. This assumption is critical to whether or not the growth cells that Hamilton has identified are sufficient to accommodate projected growth.

55. The material that the reviewer has been provided with gives no insights into how reasonable this assumption might be. Rather, the spreadsheets that present future growth almost suggest circular reasoning, where the projected growth is consistent with the policy because it is assumed that 50% of growth will take place within the existing urban area.

56. Without seeing the more detailed assessment of infill or redevelopment capacity within the existing Hamilton urban area, it is not possible for the reviewer to assess the reasonableness or robustness of the assumption, or the overall availability of development capacity. However, this is a critical assumption. If it is not possible to achieve that level of growth within the existing urban area, then total growth could exceed greenfields capacity toward the end of the forecast period. Table 4 below sets out the consequences of achieving 50%, 40% and 30% of Hamilton's projected growth as infill within the existing urban area. It demonstrates that under the medium growth scenario if only 30% of growth is infill, greenfields development capacity is inadequate throughout the whole forecast period. Even at the assumed 50% growth by infill, greenfields development capacity runs out in the last decade of the forecast under the medium scenario.

Table 4: Hamilton City Infill Growth Assumptions

		Assumed	Greenfields		
	Year	Infill Growth	Capacity	Growth	Spare Capacity
Assuming 50% of Household Growth is Infill					
Low Growth	2025	6148	9340	6148	3192
	2035	5871	11332	5871	5461
	2045	7961	7961	4575	3386
Med Growth	2025	7151	9340	7151	2189
	2035	7221	10329	7221	3108
	2045	5608	5608	6217	-609
Assuming 40% of Household Growth is Infill					
Low Growth	2025	4918	9340	7378	1962
	2035	4697	11332	7045	4287
	2045	5014	7961	7522	439
Med Growth	2025	5721	9340	8581	759
	2035	5777	10329	8665	1664
	2045	4730	5608	7095	-1487
Assuming 30% of Household Growth is Infill					
Low Growth	2025	3689	9340	8607	733
	2035	3523	11332	8219	3113
	2045	3761	7961	8775	-814
Med Growth	2025	4291	9340	10011	-671
	2035	4333	10329	10109	220
	2045	3548	5608	8278	-2670

Conclusions

57. Beyond the difficulties noted above, the overall conclusion that the Reviewer has reached with respect to development capacity is that there is probably sufficient capacity for growth over the period to 2045, but that it is difficult to be certain because the infill development capacity of Hamilton is not quantified in the material under review.

58. What is not clear from the work that has been reviewed is whether the identified capacity would be considered **feasible** development capacity in terms of the NPSUDC.

59. The NPSUDC requires local authorities in medium and high growth areas to provide an additional margin of **feasible** (commercially viable) development capacity over and above expected demand of at least 20% in the short to medium term (10 years) and 15% over the long term (30 years). If the identified capacity is indeed feasible development capacity, then the proposed strategy and settlement pattern may broadly comply with the capacity requirements of the NPSUDC. Broadly, there is more than 20% additional development capacity in each decade in both Waikato and Waipa. The identified greenfields capacity in Hamilton would comply with the NPSUDC requirement under the Low variant projection, but not the Medium variant projection. This means the assessment as to whether Hamilton would have sufficient development capacity depends on the capacity of the existing urban area to accommodate infill or redevelopment.

60. However, it is recommended that the Future Proof partners proceed using the projections that they currently have. Current indications are that the council under the greatest pressure is Waikato District. In order to respond to growth pressures, it will need to put in place both the District Plan provisions and infrastructure required to support growth. The delays that would stem from reviewing or changing the current approach would limit Waikato's ability to progress the provisions and investments that it needs.

61. The other conclusions are:

- that Waikato reconsider the timing of the development of Te Kauwhata in relation to development at Tuakau and Pokeno, and
- Hamilton needs to consider its ability to meet half of all projected growth as infill.

Specific Questions

Alignment of the Proposed Settlement Pattern with the RPS

62. The proposed settlement pattern has been compared with the key provisions of Part 6 of the operative Waikato Regional Policy Statement (RPS).

63. Method 6.12.3 of Policy 6.12 Implementing the Franklin District Growth Strategy requires the expansion of the Future Proof Growth Strategy to include the part of the Waikato District that was the Franklin District. The proposed settlement pattern meets this requirement by specifically dealing with Tuakau and Pokeno.

64. Policy 6.14 sets a requirement to accommodate new urban development within the urban limits indicated on Map 6.2. This policy is general and its direct effect is limited by both the scale of Map 6.2 (with indistinct boundaries) and the fact that it is clearly titled as *"indicative only"*. From the general maps provided to the reviewer, it seems that the proposed settlement pattern broadly meets the requirements of Policy 6.14 a).

65. Policy 6.14 b) requires the release of new residential land to be managed in accordance with the timing and population growth for the areas set out in Table 6-1. Table 6-1 sets out expected residential growth for each growth area between 2006 and 2061. The Future Proof proposed settlement pattern relates to the period to 2045. The key issues with compliance with this policy stem from the revised population forecasts that have been used in the Future Proof refresh.

66. The revised forecasts anticipate higher populations in Waipa growth areas than were contemplated in the RPS. This results in a combined total population in Te Awamutu and Cambridge for 2025 that exceeds the RPS future residential populations for 2021 by 4,036 (Low) and 5937 (Medium). This pattern is repeated in the comparison of the 2041 RPS populations with the 2045 Low (1,765 more than the RPS) and Medium (6,714 more than the RPS) scenarios.

67. The opposite is true for the Waikato growth areas. Tuakau and Pokeno are not included in Table 6-1. The current Future Proof forecast populations for Huntly, Ngaruawahia, Raglan and Te Kauwhata are lower (2025 compared with 2021 and 2045 compared with 2041) than the populations expected in the RPS.

68. In contrast, the new Future Proof forecasts for Hamilton sit on either side of the RPS population growth. The new medium forecast for 2045 is almost 11,000 higher than the RPS forecast for 2041, whereas the low forecast is just over 9,000 lower than the RPS 2041 population.

69. One of the other key aspects of RPS Table 6-1 is the balance of growth between rural areas and cities, towns and rural villages. Broadly, the new Future Proof forecasts reflect a similar balance as is reflected in the RPS. Within Waipa District, the RPS sets out to provide for around 35% of population in rural areas. The new Future Proof projections show between 36% and 32% of population in rural areas (with variation between the growth forecasts and the forecast year in question). Comparisons for Waikato District are more challenging, because Table 6-1 does not include the population of Waikato District that was previously part of Franklin District, including Tuakau and Pokeno. The RPS anticipates that 57% of the Waikato population would live in rural parts of the District by 2021, and that the proportion of rural residents would decline to 53% by 2045. The revised Future Proof forecasts show rural residents consistently around 60% of the district's population.

70. Policy 6.14.2 clearly anticipates that growth could be reallocated between growth cells where specific criteria are met. To the extent that the revision of the Future Proof forecasts and pattern of development meet those criteria, it can be said to be consistent with the RPS.

71. Insufficient information has been provided to the reviewer to meaningfully comment on the extent to which the new proposed Future Proof pattern of development meets the density targets set out in Policy 6.15 of the RPS.

72. The strongest conclusion from the analysis of the RPS future settlement provisions is that the revised Future Proof forecasts are different. The population forecasts that underpin the new Future Proof pattern of growth reflect both a different starting point and different key assumptions about the pace and quantum of population growth expected within the area governed by the Future Proof Councils. Despite this, the approach that the RPS anticipates is broadly the same as the revised Future proof growth forecasts. The additional capacity that is planned aligns growth with the city, towns and rural villages that the RPS targets for growth. The proportion of growth that is contemplated in urban areas is similar, but differs geographically, and with the medium growth forecast, is greater than that expected in the RPS.

73. Rather than consider the extent to which the revised Future Proof strategy is aligned to the RPS, in this regard, it is probably wiser to consider how the RPS can be changed to reflect better and more recent information and expectations of growth. This would be consistent with both Policy 6.19 of the RPS (review of Future Proof maps and tables) and the need to implement the NPSUDC.

74. The experience of developing markedly different population forecasts so soon after the adoption of the RPS could also serve to question the wisdom of expressing the expected future growth pattern in the RPS in terms of population rather than the number of dwellings. After all, territorial authorities do have direct levers in their District Plans to manage the number of dwellings in any area. They have few, if any, tools that directly manage population. Such a change would also be consistent with the NPSUDC requirement for regional councils to set minimum targets for sufficient, feasible development capacity for housing (Policy PC5).

Conclusion

75. **The proposed settlement pattern is broadly aligned with the relevant provisions of the RPS.**

Alignment of the proposed Settlement Pattern with the Core Future Proof Principles

76. The core Future Proof Principles are set out in Section 3 of the 2009 Growth Strategy and Implementation Plan. The principles are broad and address a far wider range of matters than are directly related to the projections of population and households and the location of development.

77. Achieving what is sought from core Future Proof principles like *"Protection of the natural environments, landscapes and heritage and healthy Waikato River as heart of region's identity"* will depend in part on the pattern of growth. However, they also depend upon a wide range of other policies and initiatives, including the detailed design and layout of new greenfields development. Those matters are well beyond the scope of this review.

78. Whilst all of the Future Proof core principles are interrelated the most directly relevant principle is:

Diverse and Vibrant Metropolitan Centre linked to Thriving Town and Rural Communities and Place of Choice – Live, Work, Invest and Visit

- *Maintain the Metropolitan Hamilton CityHeart as the vibrant retail, business, arts, and social "heart" of the sub-region with it becoming the primary residential intensification area.*
- *Ensure the sub-region's towns and villages retain their individual and distinct identities with thriving town centres that support people to "live, work, play and visit".*
- *Promote increased densities in new residential development and more intensive redevelopment of existing urban areas.*
- *Encourage development to locate adjacent to existing urban settlements and nodes in both the Waikato and Waipa Districts and that rural-residential development occurs in a sustainable way to ensure it will not compromise the Future Proof settlement pattern or create demand for the provision of urban services.*
- *Ensure commercial and industrial development is located in selected sub-regional areas and that it is not located where it undermines the areas of influence of the Hamilton CityHeart, Cambridge, Te Awamutu, Ngaruawahia, Raglan and Huntly.*
- *Ensure that the areas identified within the strategic agreement between Hamilton City Council and Waikato District Council are transferred to the City Council with sequencing agreed between the City Council and Waikato District Council, and noting that additional boundary adjustments may be negotiated in the future.*
- *Provide housing and lifestyle choice within defined locations, including papakāinga, with greater emphasis on good urban design outcomes.*
- *Maintain the separation of urban areas by defined greenbelts and open space.*

- *Recognise and provide for the growth of rural towns and villages within agreed urban limits.*
- *Ensure a cohesive commercial and retail strategy that supports existing commercial centres, towns and villages within the sub-region is developed so these places remain vibrant and valued.*

79. The proposed settlement pattern following the current review is broadly consistent with this principle and has been designed to reflect the Future Proof Growth Strategy. The extent to which the objectives will actually be met will depend on the detailed implementation of the strategy and the specific plan provisions that are used to give effect to it.

Alignment of the Proposed Settlement Pattern with Section 5.3 of the Future Proof Growth Strategy and Implementation Plan 2009 – More Compact and Concentrated Urban Form

80. Section 5.3 of the Future Proof Growth Strategy and Implementation Plan identifies that the preferred approach to the development of the Future Proof area is a combination of the Compact Settlement and Concentrated Settlement scenarios that were evaluated.

81. The review has concluded that the revised settlement pattern and projections embody the intent of Section 5.3, but does so in the context of faster and greater growth in households than was previously contemplated.

Alignment of the Proposed Settlement Pattern with Section 6 of the Future Proof Growth Strategy and Implementation Plan 2009

82. Section 6 of the Future Proof Growth Strategy and Implementation Plan 2009 deals with the quantum, sequencing and timing of growth and development across the sub-region. It also sets out the intended role and nature of settlements. The population targets that are identified for growth cells are those reflected in the operative RPS.

83. Much of Section 6 of the 2009 growth strategy and implementation plan deals with matters other than the residential development pattern that has been the subject of this review. No comment is made with respect to the extent to which the proposed settlement pattern and strategy aligns with those parts of the 2009 strategy.

84. The new proposed development pattern is different from that proposed in 2009, but as is discussed above in relation to the operative RPS, the proposed pattern broadly aligns with Section 6 of the 2009 growth strategy and implementation plan.

How the Proposed Settlement Pattern Supports Integrated Land Use and Transport Planning

85. Given the limited material that has been reviewed, it is not possible to comment on the extent to which the proposed settlement pattern supports integrated land use and transport planning other than to note that the settlement pattern is very similar to that proposed in 2009 and is consistent with the Future Proof Principles. Therefore, it should be similar to the previous Growth Strategy in terms of its ability to support integrated land use and transport planning.

How the Proposed Settlement Pattern Supports More Cost- Effective and Efficient Servicing

86. Given the limited material that has been reviewed, it is not possible to comment on the extent to which the proposed settlement pattern supports more cost-effective and efficient servicing other than to note that the settlement pattern is very similar to that proposed in 2009 and is consistent with the Future Proof Principles. Therefore, it should be similar to the previous Growth Strategy in terms of its ability to support more cost-effective and efficient servicing.

Conclusions and Suggestions

87. Forecasting the future is difficult and there will always be significant uncertainty. The current suite of projections reflect credible and sound efforts to deal with future uncertainty and present a coherent and technically sound approach.

88. The most significant uncertainty and major risk that the Future Proof partners face is the potential impact that Auckland may have on demand for development in the Waikato. It is possible that growth pressure from Auckland could overwhelm the north of Waikato District. The potential for this and interactions between the Future Proof growth strategy, the Auckland Unitary Plan, and any changes to the Auckland growth strategy arising from the implementation of the NPSUDC, should be addressed further as the Future Proof partners implement the NPSUDC.

89. The major difference between the 2009 and 2016 projections relates to households. The 2016 projections anticipate a considerably larger number of households for the same population than was projected in 2009. The 2009 projection anticipated 2.7 people per household in 2061, whereas both the Low and Medium variant projections anticipate around 2.3 people per household. Assuming broadly one dwelling per household, by 2061 this difference translates to the need for around 20,000 more dwellings than would have been required for the same population with 2.7 people per household. This is the most significant change in the projections.

90. One of the most important inputs to the WISE model is the assumed level of future population density for each of the three residential land use types. The reviewer has no basis on which to judge the reasonableness of the population density assumptions that the key council planners have made. It is clear from engagements with them that they genuinely and carefully considered this issue and used their best efforts to develop robust and credible projections. The detailed CAU level projections are heavily dependent upon this assumption – particularly where all of the available land within a cell is allocated, and modelled growth spreads out into adjacent cells.

91. The projections that have been used for the review of the Future Proof strategy are generally sound and reflect a very careful consideration of the population dynamics that the Future Proof area faces.

92. Adopting an envelope (or range based) approach to future planning using more than one growth scenario is important and an enhancement to previous work.

93. It is important to note that the NPSUDC drives councils in high growth areas toward the use of only one view of the future and to deal with uncertainty by providing for substantial

future development capacity in excess of that which would be required to meet forecast demand. The Future Proof Partners will need to carefully consider this as they move to comply with the NPSUDC.

94. Whilst the projections, methodology, and approach is appropriate for the current review of the strategy, there are some important issues that warrant attention in future projections, and will need to be addressed to implement the NPSUDC.

95. The reviewer has concluded that there is probably sufficient development capacity to cater for growth over the period to 2045, but that it is difficult to be certain because the infill development capacity of Hamilton is not quantified in the material under review.

96. What is not clear from the work that has been reviewed is whether the identified capacity would be considered **feasible** development capacity in terms of the NPSUDC.

97. The NPSUDC requires local authorities in medium and high growth areas to provide an additional margin of **feasible** (commercially viable) development capacity over and above expected demand of at least 20% in the short to medium term (10 years) and 15% over the long term (30 years). If the identified capacity is indeed feasible development capacity, then the proposed strategy and settlement pattern may broadly comply with the capacity requirements of the NPSUDC. Broadly, there is more than 20% additional development capacity in each decade in both Waikato and Waipa. The identified greenfields capacity in Hamilton would comply with the NPSUDC requirement under the Low variant projection, but not the Medium variant projection. This means the assessment as to whether Hamilton would have sufficient development capacity depends on the capacity of the existing urban area to accommodate infill or redevelopment.

98. It is recommended that the Future Proof partners proceed using the projections that they currently have. Current indications are that the council under the greatest pressure is Waikato District. In order to respond to growth pressures it will need to put in place both the District Plan provisions and infrastructure required to support growth. The delays that would stem from reviewing or changing the current approach would limit Waikato's ability to progress the provisions and investments that it needs.

99. The other conclusions are:
    - that Waikato should reconsider the timing of the development of Te Kauwhata in relation to development at Tuakau and Pokeno
    - that Hamilton needs to consider its ability to meet half of all projected growth as infill.

100. The proposed settlement pattern is broadly aligned with the relevant provisions of the RPS.

101. The proposed settlement pattern following the current review is broadly consistent with the core Future Proof principles and has been designed to reflect the Future Proof Growth Strategy. The extent to which the objectives will actually be met will depend on the detailed implementation of the strategy and the specific plan provisions that are used to give effect to it.

102. The review has concluded that the revised settlement pattern and projections embody the intent of Section 5.3, but does so in the context of faster and greater growth in households than was previously contemplated.

103. Given the limited material that has been reviewed, it is not possible to comment on the extent to which the proposed settlement pattern supports integrated land use and transport planning.

104. Given the limited material that has been reviewed, it is not possible to comment on the extent to which the proposed settlement pattern supports more cost-effective and efficient servicing.

105. The overall conclusion is that the proposed Settlement Pattern and Growth Strategy is adequate for current purposes and there is no strong reason for the Future Proof partners not to proceed to adopt it.

106. However, there a number of methodological issues and considerations that will need to be addressed as the Future Proof partners implement the NPSUDC. These include:

- The way in demand for, and supply of, housing are understood and modelled – the NPSUDC will require considerable effort to address the economics of the market and reflect that in assessing both demand and supply.
- Being able to assess feasible (commercially viable) development capacity.
- Explicitly exploring the potential impact of Auckland on the demand for housing within the Future Proof area.
- Shifting away from the practice of treating each local authority area as a discrete population and treating the whole area as one population and one market with complex sub-markets.
- Determining how to provide for any additional feasible development capacity that may be required to meet the requirements of the NPSUDC.

107. The challenges presented by the requirements of the NPSUDC are significant. However, the growth pressures facing the Future Proof partners are immediate and must be responded to. Delaying the process of adopting the strategy and implementing appropriate changes to District Plans would most likely put the councils in a worse position than if they proceed with the current settlement pattern and growth strategy and then review and refine it as may be required in the next stage when they implement the NPSUDC.