Before the Selwyn District Council

---

under: the Resource Management Act 1991
in the matter of: Proposed Private Plan Change 69 to the Operative District Plan: Lincoln South
and: Rolleston Industrial Developmets Limited (Applicant)

Statement of Evidence of Kathleen Liberty (Climate Change & Flooding / Traffic & Greenhouse Gas Emissions)

Dated: 25 November

Introduction
My full name is Kathleen Allard Liberty.

I have a PhD from the University of Washington in the USA.
I moved to Christchurch with my family in 1990 to take up a position at the University of Canterbury. , and I became a New Zealand citizen in 1996. I retired as an Associate Professor of Health Sciences in 2019. I moved to Lincoln with my family in May this year, and I live in Verdeco Park subdivision.

I am not an expert witness. I speak from a background that included close analysis of statistical data, statistical modelling and analytic arguments.

My original submission in April of this year, PC69-0220, concentrated on three main points: (1) that PC69 under-estimated the effects of climate change and flooding (2) that PC 69 mis-represented traffic data and ignored greenhouse gas emissions and (3) that PC 69 was outside of the My Space boundaries.

I would like to briefly update my submission by considering the expert opinions offered by submitters over the past few days.

First, I'd like to thank you for your service to the Selwyn District, and your patience and attention during these hearings.

Climate-Change and Flooding
1. That PC 69 under-estimated the effects of climate change and flooding in the proposed area.This was due primarily to the use of out-dated data and under-estimation of risk. Underestimation of risk in modelling can be one form of climate-change denial.

2. Subsequently, the council has received a substantially altered development plan, which tacitly acknowledges the flaws in their original application in regards to under-estimating issues relating to storm-water and flooding. The new ODP shows significant changes that were required to meet the requirements of the RFI and respond to submitters. In addition to these substantial changes, Flooding and Storm-water expert Mr. O'Neill presented written submissions (November 4 and 23) and addressed the hearing on these issues.

3. If I may summarise, according to Mr. O'Neill, there are no models that are sufficiently up-to-date and robust to provide solid estimates of the impacts of climate change on flooding in the proposed 190 hectare site during the development period and into the future.

4. Rather than admitting that these issues should mean that the development should not go ahead, it is proposed that that flooding and stormwater issues be considered as each stage of subdivision is submitted for approval. This attitude assumes that, somehow in the future, climate change issues can be somehow "solved".

5. However, COP26 has publicised data that climate change is already here, and that it may be occurring more quickly than expected. It is thus relevant that construction of

the southern stages of Te Whariki—along what would be part of the northern border of PC69 - has already been delayed due to the need to mitigate a number of unexpected groundwater issues.

6. Katherine McCusker, soil expert, this week identified high groundwater in the area of PC 69, both in winter and in summer. High groundwater in an area close to the coast is identified as a much higher flood risk associated with climate change, so this information is also comensurate with the fundamental problem of PC 69—it is proposed for the wrong area.

7. Flooding is the number one natural disaster in New Zealand. Flooding costs councils in terms of damages to infrastructure and impacts on the local economy. You would all be aware of the costs of the floods at the end of May this year – and these floods did not impact a subdivision with more than 2000 housing units. Imagine what the costs would be if that occurred.

<u>Traffic and Greenhouse Gas Emissions</u>
8. The second point of my submission was that the original development plan for PC 69 underestimated the impact of increased traffic and did not address greenhouse gas emissions.

Traffic Modelling
9. My original submission identified the disconnect between the data on traffic in the appendices of the October application and the traffic data in the plan, and questioned some of the assumptions underlying their arguments.

The Amended Transport Plan originally estimated: 14,000 car movements daily are expected to be generated by the proposed 2000 section subdivision or an average of 7 per day for each section, with approximately 2.8 residents each. So, out to work, home from work and out and back for an errand.....[item 49, page 21/ and page 116, Appendix D, dated October 2020.)
However, Appendix 6 , titled "TRICS", identifies the basis for estimating the trips made by residents is a database from the UK, including data from Kent, Isle of Wight, West Sussex, Somerset, Suffolk, East Midlands and etc, collected primarily in 2015-2017. .[p 68-73/116, Appendix 6 of document prior to RFI].

10. Despite the Councils RFI and revised modelling provided by Mr. Smith, Mr. Fuller has continued to use data from the UK, [Appendix 1 this document]. This estimates less than one car per dwelling (0.7). Even Mr. Fuller points out that using the same estimation as used in Rolleston, which was 0.9, would lead to traffic problems FOR COUNCIL, not to mention traffic problems for the developer (Appendix 2, this document, from 23 November submission). He also used a two-hour observation period to "validate" his sustained use of 0.7, which contradicts the one-hour period reported in the modelling and would have the result of reducing the trip per hour. (see Appendix 2).

10. Mr. Dave Smith spoke on Tuesday about changes in the estimates of trips per resident and corrections to other errors in the modelling of their previous submissions,

as well as calculations based on the new roading model. (Three tables from Mr. Smith's reports are shown in Appendix 1 to this submission).

11. The changes appear to all be in one direction – with each new model showing a lower volume at the Springs Road/Gerald Street/Elesmere Junction road, despite the changes to the roading plan by the removal of roads such as Weedons extention through the University and Te Whariki, and dependency on two new sets of traffic signals on Springs Road. The new traffic map shows traffic increasing along a modified Moirs Road, with connections to the Ellesmere Junction Road/HWY75 intersection at Tai Tapu, for which detailed models are not yet available.

12. Due to the multitude of interacting variables involved in predicting the future, even experts who are working on the same project can easily contradict each other. Mr. Fuller, on Tuesday morning, described the need to install signals at various points along Ellesmere Junction Road, Springs Road and Gerald Street as "inevitable", even without PC69, due to increased traffic volumes. (I know that signals are planned.)

However, Mr. Farrelly, in his Greenhouse Gas Emissions report, predicts a gradual decrease in volume, due to (1) improved public transport between Lincoln-Rolleston-Hornby and the CBD; (2) increased numbers of people working at home either a few days per week or full time (3) increased number of residents being retirees, and/or students who do not need to drive to work (4) the new areas for convenience businesses, services and amneities to be provided locally in Lincoln (and in the revised PC69), and, (5) new employment opportunities locally associated with the already planned and consented growth.

13. Therefore, if Mr. Farrelly's analysis is correct, it appears that there may not be an "inevititable" need to install traffic lights at between one to four intersections as per Mr. Fuller's submission. I offer this analysis to highlight how the evidence of experts may be contradictory.

14. Regardless of the exact number of trips, there would be plenty more than there are at present, and my original point about Greenhouse Gas emissions remains.

15. Over 1 km of road, this would be 110 tons of <u>additional</u> green house gas emissions at one intersection in one year. Over the number of intersections and the kilometres in the Lincoln area alone, this would be more than the 2194 tonnes of emissions Mr. Farrelly reports as associated with the existing dairy farm on an annual basis. This excludes the emissions associated with construction. Construction constitutes 20% of NZ's emissions.

16. Mr. Fuller dismissed these issues of greenhouse gas emissions by saying that the people would be (a) driving wherever they were and that (b) construction would be happening no matter what. Both of these statements are overly dismissive of alternatives to PC69. There is no evidence given by Mr. Fuller to support his bias about the lack of desirability of infill housing. I would briefly like to deconstruct these statements.

Infill housing in Christchurch v. PC 69.

17. The CCC submission highlights the plan for infill housing. Contrary to Mr. Fuller's comments on infill, my brother has worked with planners in Portland Oregon, which has had an Urban Growth Boundary since 1972, and has significant infill housing and development. This has prevented any large areas of decaying warehouses or uncleaned industrial sites from destroying city neighbourhoods, and Portland has had lower cost housing and high 'livability' ratings, as well as enviable economic growth for many decades. People want to live in Portland, rather than the more sprawling far away suburbs.

18. In addition, how much people drive depends on where they live in relationship to their place of work as well as access to the amenities. People living within Christchurch in "infill housing" would not be driving the distances projected for the residents of PC69. In addition, they would be using existing roading, reducing the emissions associated with construction of new roading. Construction cossts might be less, as truck and work deliveries might require shorter distances, and infill might include up-grading existing housing rather than new construction. This means that infill within Christchurch would be likely to produce substantially fewer emissions than building the proposed PC69, contrary to Mr. Fuller's opinion.

Density and Greenhouse Gas Emissions

19. PC 69 is medium density, with a MINIMUM of 12 units per hectare, while Mr. Farrelly recommends 15 units per hectare (Mr. Farrelly Numbered item 46.7, page 7, dated 4 November, Appendix 2). It seems likely that the following issues will motivate the developer to increase the density to at least 15 per hectare (25% increase):

20. The loss of the larger sections and the reduction in available land for units caused by reported changes requiring the provision of additional land over than originally planned for (a) stormwater issues, (b) reserves, (c) pedestrian/cycling ways, (d) within-subdivision roading, (e) provision of land for schools, (f) three commercial centres, as well as developer-associated (g) costs for traffic signals and road changes on Springs Road, and so forth. In order to maintain "profitability", it is likely that density will be increased, but also costs per section will rise. If you approve PC69, it is likely you will be asked in future to approve much increased density (e.g., from 2100 units at 12 per hectare to 2625 units at 15 per hectare).

The increase in density will further increase greenhouse gas emissions, as compared with infill development in Christchurch, with the lower costs and travel associated with infill.

<u>Conclusion</u>

There are more points that can be argued as shown in my original submission, but it is a dispiriting exercise. It seems no matter what the consideration and challenges, these paid experts can modify their data and models to support any number of revisions to PC69. They seem to assume it is inevitable that PC69 will be approved. As they are being paid by the proposer, it seems unlikely that they would be able to admit that the proposal is unsuitable for development.

While the experts keep on with their blah blah blah and their paid-to-be-rosy view of the future, climate change is here, and, as a grandmother and citizen, I worry about the future of my grandchildren and their friends and all of the young children I see in our community every day.

PC69 should not be built on this land, as it poses a risk not only to the future of children and their families, but to the economic health of Selwyn District, and it increases greenhouse gas emissions while removing irreplaceable agricultural land. Yes, people need places to live. Those places include Te Whariki, Rosemerryn, Flemington, Christchurch, Farringdon, Cashmere Hills, Prebbleton, Rolleston, Rangiora—and all those places identified in MY SPACE– but they should not include this farmland. Given that the proposal is outside of the planned growth boundary for 2048, I urge the Council to decline PC69 outright.

Thank you for the opportunity to make this submission.

Appendix 1

Mr. Fuller (November 4 submission).

57 The traffic generation rate adopted was selected because it represents 'village' locations where it is expected that residents will spread their departures based upon the trip purpose (i.e. local trips to education but employment further afield). Whilst I accept this is UK based data, it has been selected to relate to the characteristics of the proposed development and I consider it to be applicable. This was based on data from nine sites with twelve weekdays of data. The traffic generation rate obtained from the UK data was increased from an initial survey rate of 0.53 and 0.55 to 0.7 vehicles per dwelling to strike a balance between the two sources of data and provide a more robust assessment than simply adopting the UK data.

58 Overall, I consider that the traffic generation rate adopted is sufficiently robust for the assessment of traffic effects associated with the Plan Change.

In defending the use of 0.7, Mr. Fuller submitted the following this week (Nov 23):

Traffic Generation Rates

4 The Transport Assessment for the Plan Change was prepared on the basis of the residential development generating 0.7 vehicle movements per dwelling per hour in the AM and PM peak hours. Other traffic assessments, including those undertaken in Rolleston, have adopted a rate of 0.9 vehicles per dwelling per hour. Council's concern is that a higher traffic generation rate would lead to additional traffic effects above that which have been assessed.

5 Traffic surveys were undertaken at Millstream Drive in Lincoln to validate the use of a trip rate of 0.7 vehicles per dwelling in the peak hours. The surveys were undertaken on three days[1], for two hours in the morning (07:00 to 09:00) and two hours in the evening (16:00 to 18:00) and identified the following range of peak hour trip rates:

Mr. Smith: First revised Table 4.3 (submitted April 7, Appendix D, Amended Application)

Table 4.3 Intersection Performance at Key Intersections in the Morning Peak (08:00-09:00)

Intersection	No Development			With Development			With Western Arterial		
	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS
Springs / Gerald / Ellesmere Jct Signals	1626	17	B	2373	34	C	2098	26	C
Gerald / James / Edward Signals	1298	12	B	1545	13	B	1546	13	B
Weedons / Ellesmere Jct RAB	957	5	A	1125	6	A	1313	8	A

Modified data (submitted by Mr.Smith on Nov 4.)

Table 4.3 Intersection Performance at Key Intersections in the Morning Peak (08:00-09:00)

Intersection	No Development			With Development			With Development and Central Link		
	Vol	Delay	LOS	Vol	Delay	LOS	Vol	Delay	LOS
Springs / Gerald / Ellesmere Jct Signals	1617	19	B	2320	40	D	2301	39	D
Gerald / James / Edward Signals	1275	12	B	1538	13	B	1575	1413	B

Second modification data (submitted by Mr. Smith on 23 November)

APPENDIX – UPDATED MODELLING OUTPUTS

Table 1 Morning Peak (8-9am) Sensitivity Test Modelling Results

Intersection	EIC Modelling with PC69			Sens. Test with PC69		
	Vol	Delay	LOS	Vol	Delay	LOS
A. Springs / Gerald / Ellesmere Jct Signals	2301	39	D	2211	34	C
B. Gerald / James / Edward Signals	1575	14	B	1536	13	B

In addition, the data included in Mr. Fuller's November 4 /22 report on the increases in "link volume" [Table 2, excerpt below] do not appear to match any of the data presented by Mr. Smith in his 4 November report.

Table 2: Increases in Link Volumes

Link	Peak	Base	With Development	
		Model	Model	Change
Ellesmere Junction Rd	AM	935	1,130	+195
	PM	816	922	+106
Springs Rd (north of Gerald St)	AM	608	1,050	+442
	PM	512	617	+105

Appendix 2

Mr. Paul Farrell: Submission dated 22 November.

> 3 When considering the GHG emissions of a proposed development or land change it is appropriate to consider the life-cycle emissions of the proposed development, and the net change in emissions compared to the emissions arising from the current land use.
>
> 4 In the context of GHG emissions arising from housing related developments, I believe that GHG assessments should be based primarily on the basis of how the development's net life cycle emissions (that is an evaluation of emissions before and after the development) compared to alternative development options, as opposed to whether the development, in of itself actually reduces GHG emissions.

and Submission dated 4 November.

> 46.7 From an infrastructure emissions intensity perspective (that is the emissions per resident), there is a real benefit in increasing the density of housing in a development, and with the PC69 development having a housing density of 12 houses/hectare I consider it's infrastructure will be relatively emissions efficient. However this could be further improved were the density increased to 15 houses/hectare.