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Technical Report · October 2022

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Chickens, roosters and helicopters: Emissions, noise, flying cars and a fair transition

Paul Callister & Sandra Callister

October, 2022



A research note

Chickens, roosters and helicopters

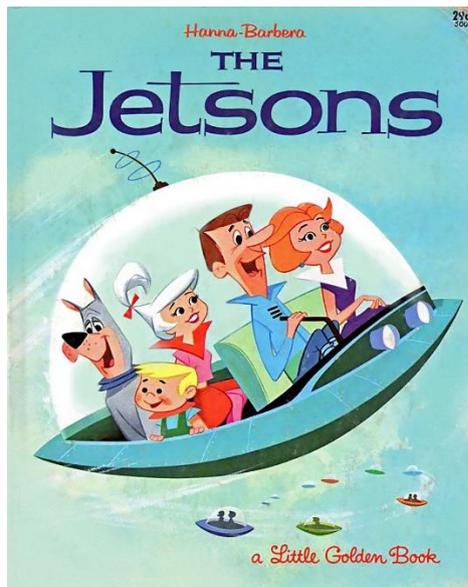
Paul Callister and Sandra Callister

I became interested in the debate about the use of helicopters in Tāmaki Makaurau when reading about the residents of Herne Bay and other areas of the region opposing landings and take-offs from private properties. There was talk “of decks shaking, crying babies and flying deck chairs – with early morning noise breaking the peace for neighbouring properties” and the disturbance to nesting birds. There were also some safety worries. There were concerns expressed on offshore islands in the Hauraki Gulf as well. Now a new concern has been raised in the [media](#).

Auckland Council has been accused of holding [different standards on cutting climate emissions](#), asking people to reduce car use but not helicopter use.

Council's Transport Emissions Reduction Plan (TERP) calls for Aucklanders to cut car use in half, but [does not address private aircraft](#).

But while a few noisy internal combustion engine helicopters coming and going from a few private properties in Tāmaki Makaurau have attracted attention, there are some futurists, some might say fantasists, who see the potential for thousands of electric powered flying vehicles creating a new level of ‘low emission’ mobility within Aotearoa New Zealand’s cities and regionally. This would herald a new era of personal mobility, or as the enthusiasts describe it, “advanced air mobility” (AAM)”. No longer would we need light rail to the airport in Wellington or Auckland. Flying taxis would be used. And in fact, with vertical take-off inter-regional planes as part of this green growth future, the airport for regional flights might be in the centre of town. The currently uneconomic Kāpiti airport would again be thriving. And autonomous flying machines would be dropping off our pizza orders. For those old enough, this is how the Jetsons lived.



There are clearly some new policy issues emerging as we try and dramatically reduce emissions, while at the same time trying to make our cities better places for all people to live in.

I thought it would be good first get a ground up perspective of my sister. Sandy Callister is Tāmaki Makaurau based and more to the point, has a home on Medlands Beach, Aotea Great Barrier Island, impacted by the current helicopter debate.

An Auckland resident's perspective: Sandra Callister

What do chickens, roosters and helicopters have in common when it comes to the current Hauraki Gulf helicopter debate? One could say that loosely, they all fall into the category of birds of the hovering type. And they all make noises that are not always acceptable to neighbours. Weirdly, there are more restrictions around chickens and roosters disturbing the neighbourhood peace, than there are around helicopters disrupting the peace.

I have chickens in urban Auckland. We have a family home on Medlands beach. Perhaps I'm not the only one that finds it a very upside-down world that I have to comply with best practice chicken keeping. Urban properties of up to 2000 square metres can keep up to six chickens -but roosters aren't allowed due to noise concerns around crowing. Councillor Wayne Walker, at the time Auckland's Council's Regulatory Committee Deputy Chair says "before you get chickens, it's a good idea to talk to your neighbours about it. If they have concerns about noise, for example, you'll have the chance to address them -

and it won't hurt to offset their concerns by promising them occasional free eggs."

We follow the rules. We have five chickens and we do share eggs. But my neighbours on Medlands do not have to be mindful of noise when it comes to landing and taking off of helicopters. Nor are they encouraged to consult with neighbours about what they think of the noise of helicopters. My family have had a home on Aotea Great Barrier Island for some thirty years. We love the island. I am a trustee on the AoteaOra Trust social enterprise board that seeks to make our island community both more sustainable and resilient. I run the artist-in-residence programme as this is a wonderful environment for creative people to have the luxury of time and space. What a shock then to read in the NZ Herald that a number of resource consent applications for helicopters had been notified for the island. Four of the five are along Greensides Road, across and up the hill from the creek at the eastern end of our beach. This is when there is a perfectly good airport, 10 minutes driving time, in the next-door bay. This is where the fixed wing commercial planes and the Westpac Rescue helicopter come and go. Immediately I wrote to the chair of our local board, Issy Fordham, and to the then Councillor Pippa Coom, Waitemata and Gulf ward Auckland council expressing my wish to see this issue opened up for wider community consultation. More private helicopters coming and going, and more noise are at odds with our off-the-grid ethos, and the desire of so many of us to live more sustainably. Both people responded sympathetically, gave me an overview of the rules as they currently stand, and what has to happen if the regulatory framework and controls for helicopters which sits with the government/CAA are to be reformed.

Helicopters should be treated like roosters in neighbourhood settings. In my view they are worse than roosters. If they have an equivalence, they are more like the Targaryen dragons in the House of the Dragon.

A sustainable transport researcher's perspective: Paul Callister

Our current helicopters are, of course, an amazing piece of technology. They can rush people from remote rural locations directly to hospital, pluck injured trampers off hillsides, or lift distressed sailors from a churning sea.

Increasingly, helicopters are likely to be used to rescue people affected by climate induced flooding or fighting fires that are becoming more common in a

warming climate. They are also vital in conservation work in Aotearoa. Recognising their value in these roles, I am a supporter of the Life Flight Trust.



But we know that helicopters are a very high emission way to travel. And we are all being asked to reduce emissions by driving less, flying less, and walking, cycling, and taking trains and buses more. There is also much concern about a fair transition to a low emission transport sector.

An article entitled [Natural Wonders to Appreciate Before They're Gone](#), without any trace of irony, stated:

Here today, possibly gone tomorrow. New Zealand's marine glaciers are noticeably changing their mass year to year and have been on the decline for the past two decades. According to an article by [The Guardian](#), the Franz Josef glacier "has been retreating rapidly and lost a massive 1.56km in length, at the fastest rate ever recorded." Fox Glacier is facing the same fate, and since 2019, its access road was closed due to repeated flooding and a massive landslide and is now only accessible by helicopter.

Helicopter based tourism, including heliskiing in the South Island, wine tours to Waiheke Island, and Forest & Bird advertised trips that include helicopter transfers, is one of the many reasons why New Zealand has lots of helicopters. According to Civil Aviation Authority of New Zealand data, there were 889 registered civilian helicopters in New Zealand in 2019, up from 761 in 2010.

According to international data, the civilian fleet in the United States of America in 2019 was 9,348. On a per capita basis, this means we have roughly six times as many helicopters.

Helicopters use lots of fuel and as a result are heavy emitters of CO₂ and other greenhouse gases. Helicopters use much more fuel than fixed-wing airplanes because their rotors are responsible for creating all the lift. A fixed-wing aircraft uses the engine to propel the plane forward, with the wings generating most of the lift. In addition, the rotating rotor blades of a helicopter will cause a lot of drag when the helicopter cruises at high speed.

In Aotearoa New Zealand, there are a variety of helicopters operated from the small Robinsons to the larger turbine powered Bell or Hughes helicopters. These turbine powered helicopters are safer but use more fuel. They are the ones most likely to be used flying to private properties.

It is possible to get a rough estimate of emissions from Aotearoa's total helicopter fleet. It is estimated a [Bell Jet Ranger](#) will consume about 114 litres of aviation fuel per hour. Robinsons less and some bigger turbine helicopters much more. One litre of aviation fuel burnt produces about 2.3 kg of CO₂. So a helicopter, on average, might be producing about 260 kg of CO₂ per hour. [New Zealand Civil Aviation](#) data shows civilian helicopters flew about 200,000 hours in 2019 (pg24)

This suggests emissions were about 52 kilo tonnes. Total domestic aviation CO₂ emissions in 2019 were 1,016 kilo tonnes making helicopters responsible for about 5% of total [domestic aviation emissions](#).

Is this too small to worry about? The problem is so many activities are small. But they all add up. We need to consider ways of reducing emissions from all transport options

As already discussed, some of this is essential flying. But another part is for personal travel and tourism. On a per person, per kilometre, basis, this is an extremely high emission activity. In a fair transition, we cannot continue to sanction such flying while asking the rest of the population to reduce their emissions. In a [Stuff](#) article an example of helicopter use relative to car use was given.

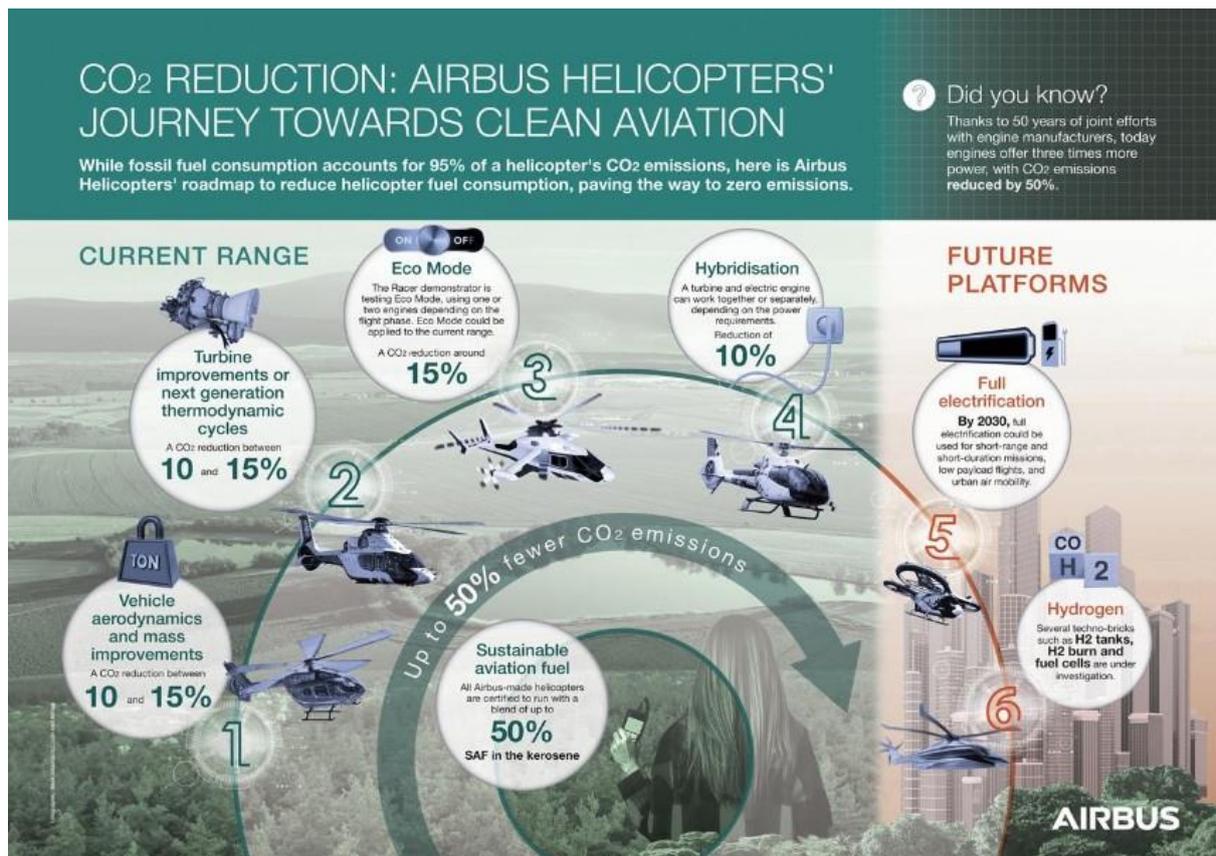
A trip in an Airbus H130 [helicopter to the Tara Iti golf course near Mangawhai](#), for example, would take 20 minutes and expel around

113kgs of CO2. Driving there would take an hour and a half and produce 17.1kgs.

There would be some ways of discouraging such flying. For example, banning tourist helicopters in national parks and in other conservation areas. And in cities, having landing and take off zones being restricted to a few defined heliports rather than private properties. Or having no fly zones for other than essential services. Those wanting wine tours to Waiheke would instead travel by low emission, hopefully soon to be electric, ferries to the island.



Helicopter manufacturers are aware of the need to decarbonise and offer up the same set of solutions as for fixed wing aircraft, promoted as moving to 'zero emissions'. But as we know for fixed wing planes, none of these solutions are without major challenges. For example, it is possible that the biofuel used to run them might be made primarily with food crops or palm oil and contribute to our [environmental problems](#) rather than solve them.



Advanced air mobility

There are start ups all over the world promoting [flying cars](#) in various forms and small electric planes for regional travel. In an [interview](#) in late 2021, the CEO of Volocity set out his vision for AAM.

Volocopter is working on three types of eVTOL vehicles: the VoloCity, a two-seater urban air taxi; the VoloConnect, for traveling between cities and suburbs; and the VoloDrone, for transporting cargo. VoloIQ, the company's digital platform, is designed to connect all of these services and allow consumers to book flights easily. Volocopter is one of several eVTOL companies that have recently gotten considerable traction in the investor community; the company has raised more than \$350 million in equity and has formed partnerships to bring its services to a number of cities, including Los Angeles and Paris.

If one thinks this is only the vision of fantasists, look at the just released [Victoria state government](#) AAM strategy document. In a ministerial forward it is stated:

Globally, the Advanced Air Mobility (AAM) sector is moving fast, with several companies seeking to enter the market from 2024-25. This fast-approaching horizon further emphasises the necessity for governments to develop the foundational structures, systems and market frameworks required for AAM.

The use of AAM in Victoria has the potential to revolutionise logistics, service delivery, emergency services, regional connectivity and passenger transport – providing opportunities for improvements in safety, time, cost and noise. As a zero-emission transport mode, AAM will also support the decarbonisation of our society.

In its [Innovation for a Green Transition 2022 Environmental Report](#), the United Nation's International Civil Aviation Organization (ICAO) has a chapter on flying cars.

Archer Aviation, based in Palo Alto, California, USA, is working to build an electric vertical takeoff and landing (eVTOL) aircraft and aerial ridesharing service, that will move people throughout congested cities in a quick, safe, sustainable, and cost-effective manner. Through their work both on their eVTOL aircraft, and with partner cities such as Los Angeles and Miami, they are laying the groundwork to curb the growth of urban congestion, and the resulting historic levels of emissions in populous areas.

[Closer to home](#), Tātaki Auckland Unlimited is working with [Wisk Aero](#), creator of autonomous air taxis, to help bring them to Auckland one day.

There are also regular media stories about larger [electric planes](#), including those that can take off vertically.



Such visions gloss over many challenges. Many of these electric flying machines turn out to be harder to produce than initially advertised, with often major range issues.

Another is the huge amount of renewable electricity required to keep these machines in the air. The laws of physics still apply to these descendants of helicopters. It will not be 'zero emissions'. Scarce renewable electricity would be better used to heat houses, power our buses and electrify our whole rail network.

There are also serious concerns as to whether there are enough minerals and other materials available for these vehicles along with all the other batteries required for decarbonisation of our economies.

But even more importantly, even if possible, is this a future we really want? While probably quieter than helicopters, having our skies increasingly filled with flying machines would create other problems, including safety. And would this be only an option for the well off, while most of us wait in a queue for the bus?

Conclusion

Keeping chickens in many cities and towns is highly regulated. We now need to carefully consider how we manage, helicopters, and the flying machines that may eventually replace them. The ground rules and the rules about what happens in the airspace above are vastly different leading to hugely different

outcomes for neighbourhoods, for emissions and for a just transition to a low emission society.