Urban Sustainability 2.0: Resilient Regions, Sustainable Sprawl and Green Infrastructure

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Abstract

Is there a way to convert the vast, fast growing, low-density urban areas of the world to sustainability other than attempting to contain the growth and increase the density of existing development - hoping that the 'sprawl' will morph into a 'compact city'? This paper suggests 'yes'. An evolving technological and behavioural revolution will see to that. A raft of existing and coming technologies will transform urban infrastructure to the point where the low densities will become both economic and ecological. And this will come with a bonus - these technologies will also increase the resilience of city-regions, an objective which in the light already happening climate change appears even more pressing than sustainability. Before this optimistic scenario can become reality, urban planners will need to reconsider some strong and long-held views. First, a regional approach to the long term planning of any city will have to become standard, rather than the exception: the subject of spatial planning is the city-region, not the city. Second, urban planners need to free themselves of their aversion to 'urban sprawl' and be open-minded about the possibility of low-density suburbia – albeit under specified conditions - being environmentally benign. Lastly, planners should recognize that identifying the remnant ecosystems and landscapes in the city-region is not about excluding them from development; rather it is about engaging them with the development as yet another category of urban infrastructure. These propositions have been developed as an alternative to the Draft Auckland Plan, a document released in 2011 as the strategic spatial plan for New Zealand's largest metropolitan area.

Keywords: Sustainability; resilience; sprawl; density; city-region; green infrastructure.

1 Introduction

In 2010 New Zealand's largest urban area – now generally referred to as 'Auckland', but in fact a conurbation of more than a dozen of towns and cities – became one city. In an administrative sense, what used to consist of four city and three district councils, was now amalgamated into one council – the Auckland Council.

Previous to this local government reform, Greater Auckland was generally seen as a relatively compact cluster of four major cities – Auckland City; Waitakere City (west Auckland); Manukau City (south and east Auckland); and North Shore City (the newer suburbs, across the Waitemata Harbour, one of the city's two natural harbours). The rest was an irregular peri-urban belt squeezed on the land bridge between the Pacific and the Tasman Seas. The belt has many country towns and villages and extensive areas of very low-density development, usually referred to as 'lifestyle blocks'.

One of the key projects that the newly formed 'super-city' council was to undertake was the Auckland Plan (Auckland Council [1]). This is a strategic document which took a decidedly long term view of all major issues in the fast growing metropolis – population; culture; economy; physical environment; housing; infrastructure; implementation and monitoring. Demographic projections were showing that from the present 1.2 million inhabitants, Auckland was likely to reach 2 million soon after 2030, or that another million Aucklanders would be added some time after 2040. Thus the debate about 'growth' – which has been pretty much dominating all debates about Auckland's future for the past 20 years – turned into a debate about 'where will the next million go?'. Will they be accommodated inside the boundaries of the existing continuously built-up city, or outside them?

The Council planning team posed the question in the form of a ratio - the percentage inside, vs the percentage outside – and determined that this ratio should be 75% : 25%. In other words, ¾ of the future growth will be accommodated inside the city limits, and ¼ on new, greenfield suburban development and a few satellite settlements in the region.

To emphasise its literal intent to enforce a clear distinction between 'urban' and 'rural' land, the planners changed the existing term Metropolitan Urban Limits (MULs) into Rural Urban Boundaries (RUBs). The overall term for this vision of the future, denser Auckland was the 'quality compact city'. The process of increasing the density in the existing city, was called 'intensification'.

After the Draft Plan was made public in October 2011, the debate that ensued focused on the idea of a 'compact city' and how desirable, or realistic, it was; on 'intensification' and whether this was a way to improve, or ruin, the quality of

life and the character of Auckland; and, inevitably, on the best ratio between in-the-city and out-of-the-city new development.

2 An Alternative Auckland Plan

This author took a rather critical view of the 'compact city' vision. In short, I argued that:
1) The whole idea of the 'compact city' was flawed in the case of Auckland for a host of cultural, historical, geographical and economic reasons; it was appropriate for the more traditional, European context, but not for New Zealand; the concept was known to have been used uncritically – as described in the case of Australia; Rogers [2] – simply because this was the dominant discourse: 'urban sprawl' was blamed for almost everything that seemed wrong with the New World Cities;
2) The strict division into 'urban' and 'rural' land was rather idealistic, because a host of factors having to do with technology, lifestyles and business practices, were causing the blurring of the urban/rural dichotomy and it was becoming impossible to say where the city stopped and the countryside started (the very change of the territorial definition of what Auckland was in administrative terms, was proof that the city was now much bigger than its visible continuously built area);
3) the ideals of the 'liveable' and 'sustainable' city were plausible; however, the evidence that either of the two is directly correlated with high density and 'compactness' was at best mixed; Neuman [3];
4) If there was to be a division of land in an urban region based on 'how urban' it was, then the simple binary 'urban-rural' was too crude – as argued by Champion [4] - and a more sophisticated spatial model was needed. We suggested a four-category model of concentric rings (no matter how irregular in Auckland's case they were):
- urban (the four existing cores of density in the main city and three satellite cities);
- suburban (the existing, and future, low-density suburbs);
- peri-urban (the lifestyle blocks and sporadic commercial development);
- ex-urban (satellite towns and villages in the territory of other regional and district councils, which obviously are within the zone of influence of Auckland as the mega-hub at the north end of the country).

Taking a somewhat different view of New Zealand culture and economy, and starting from different assumptions about what the noble goals of 'sustainability' and 'livability', might be about, we then proposed that the four categories of future development be roughly equal:

- 25% - urban, i.e. intensification of carefully selected areas within the existing city and suburbs ('town centres')
- 25% - suburban, i.e. new suburbs along the edges of the current city;

- 25% - peri-urban, i.e. more very low density lifestyle blocks where appropriate, and a large number of country towns and villages as the 'inner satellites' (inside the council territory);
- 25% - ex-urban, i.e. deflecting a significant portion of the future growth to the 'outer satellites' of Auckland, mostly existing towns in the neighbouring regions (including the three small cities - Hamilton, Tauranga, Whangarei), all of which are only 1.5 to 2.5 hrs drive from Auckland, on present roads.

This alternative vision had other elements, such as the idea that an Auckland 2030-2040 should be essentially a linear city, about 100 km long, and the idea that its best suburbs always have been, and should remain in the future, by the water's edge. But the key point was that all these differences amounted to a completely different paradigm of urban planning. In particular, it required a completely new take on what 'urban sustainability' is in the 21st century.

3 The Case for Resilience and a Regional Approach

The most important difference between the Council plan and our plan was that we took the view that the entire region created by the administrative consolidation should be the scope of planning for future development. This is in stark contrast to the Council's concept, based on determined containment of urban development as something inherently 'bad' and therefore undesirable.

We think that our position is defensible on several grounds:

1.1 The way Aucklanders live, work and play these days reflects the mass access to transport, information and communication technology. Households, businesses, playgrounds and shopping centres are free to locate almost anywhere. And many do, seeking cheap land, lots of space, peace and quiet, nice views. This does not mean they should be allowed, nor that this level of affordable mobility will last forever; this just means that this level of dispersion in space is now deeply entrenched in the culture and the economy and it will be very hard to change. Also, if so many individuals and businesses like this, and choose their locations accordingly, then surely it cannot be an entirely bad idea.

1.2 Auckland region is an unusually beautiful, diverse and tame natural landscape. Why not, in principle, make that accessible, on a daily basis, to as many people as possible? Especially if the declared overall vision of the Plan is to attain the status of 'the most liveable city in the world'. It will be very difficult for Auckland to compete on the world stage against heavy-weights like Vienna, Zurich and Geneva, when they are so far ahead with the built environment and other cultural treasures. But based on climate and landscape (and immediate and frequent access to all that), Auckland would stand some chance of becoming the 'world's lifestyle capital'.

1.3 The new concern over climate change as a fact of life, and no longer a scientists' forecast, has brought forward the issues of risk, vulnerability, security and resilience. If indeed resilience is the 'new sustainability', i.e. the issue that appears poised to replace ecological sustainability as issue number one in urbanism, then clearly higher density and the 'compact city' are bad ideas. It is much safer to have a dispersed, polycentric city, than a compact one.

1.4 Studies of urban sustainability – understood as an issue of both efficiency and sufficiency – show that it is virtually impossible for a city on its own (within its territory proper) to be self-sufficient with sources and sinks and thus claim an ecological footprint equal to its actual footprint. It needs some territory in its immediate hinterland, if it wants to be able to produce everything it needs, and dump (sustainably) everything it does not (see, for example Jenks [5] and Frey [6]).

Based on these considerations – I have concluded that the Auckland Plan, in its present draft:

a) inexplicably, ignores the territory of the city-region that now comprises the new, amalgamated Auckland and, apart from four satellite towns, does not propose development in outer parts of the region;
b) has an obsolete idea of what urban sustainability is: it sees it as mainly about GHG emissions from too much traffic, the loss of soil and habitat, and the 'ugliness of sprawl'; and a rather one-dimensional idea of what resilience is about: 'car dependence/fossil fuel addiction'.

Therefore in my view the Plan is seriously flawed. It neglects some of the best opportunities Auckland has and it has a limited view of two critical objectives for cities in the 21st century - sustainability and resilience. In contrast, my alternative seems to better reflect the new, regional-scale geography of Auckland; it strives to engage the natural landscape and regional ecosystems; and it has a better idea of the sustainability-resilience agenda and its complex nature, which encompasses not just transport/mobility, but also food, fuel, fibre, power, water, stormwater and sanitation.

4 Is 'Sustainable Sprawl' Possible?

Just like urban sprawl has a long history - going back to the Roman times, according to Bruegmann [7] - so has the narrative of the need to contain or prevent it been around for a while. Especially among the town/urban/city planners.

The obvious driver of the official plan's 'compact city' vision is the fear of more 'urban sprawl'. This is understandable – to a degree. Metropolitan Auckland is one vast suburbia, and if it was not for some rather strong natural features, like volcanoes, estuaries, gullies, cliffs and remnant patches of native bush, it could

have been an oppressive sight as the legendary sprawl of Phoenix, Arizona, Houston, Texas, and Melbourne in Australia.

But beside the fact that Auckland's suburbs are not as offensive and endless as the examples above (many are in fact very beautiful), it must be also borne in mind that the relatively fast rise of the resilience agenda is now calling for a different perspective on low density. The fact that we do not use the abundance of open space in suburbs for productive purposes (food, water, energy, waste recycling) does not mean we could not and should not. The present Auckland plan fails to address the possibility of a massive retrofitting of the existing suburbs, so that it becomes capable of a more productive mode of operation. It equally ignores the possibility of designing new suburbs in such a manner that they become productive suburban landscapes - as suggested by Vale [8] - rather then fresh copies of the parasitic, dangerously dependent creatures we constructed throughout the 20th century.

The same applies to the peri-urban belt. Of course, it already is productive and in many instances serves well the city in its midst. But in future it could do much better. So much better, that Auckland would become able to satisfy about 90% of its demand in almost all key resources with a different use of land and a more intensive deployment of new technologies of farming and the processing of farm products (e.g bio-fuels).

In sum, our suburbia and peri-urbia is one big farm. That we are not using this farm to its full potential – is something we need to think about.

5 Local Nature as the Only Reliable Urban Infrastructure

Lastly, in its eagerness to protect nature (which in the Auckland region is mostly 'rural character landscape', rather than true remnant nature), the Draft Auckland Plan fails to propose an active, productive, symbiotic engagement with natural ecosystems and landscapes. The concept of 'green infrastructure' is mentioned in the Draft, but it has not been actually used in a plan-generating sense. Rather, nature is mainly seen as a 'don't touch' item and the idea of reserving large tracts of green open space has mostly to do with pure conservation – for habitat and visual amenity reasons. This only exacerbates the 'perverse' effects of urban containment policies by in fact stimulation the expansion of metropolitan areas, as explained by Blais [9].

Ecological services are also mentioned, but there is little evidence that this principle is used in determining the spatial arrangement of activities and of urban infrastructure.

Both the sustainability and resilience agendas demand a more engaged relationship with the remnant natural systems in the region. The Auckland Region is a fundamentally urban(ised) region and not a place for national parks and other forms of strictly protected nature. If Auckland City is to achieve a substantial degree of ecological sustainability, then the Auckland region needs a lot more 'working nature'. The decorative and the conservationist function will come with it by default.

The whole urban infrastructure concept needs to be re-examined in the light of new, decentralized, distributed, clean technologies. Many of them can function off-the-grid. They are undergoing a wave of R&D effort worldwide. We can expect that their effectiveness, reliability and affordability will go up and up. The end of this process is very likely to be a situation where a well-equipped household will be largely self-sufficient in terms of power, fuel, water, food and sanitation.

These environmental technologies (ET), in combination with information and communication technologies (ICT), will in all likelihood increase the trend for remote locating, as the dependence on reticulated systems diminishes. Add to this the improvements in transport technology (TT) such as electric and hybrid cars, and it becomes clear that decentralisation will remain a powerful force in shaping the city of the 21st century. These trends have been described both for the North American – Lerup [10] – and the European scene – Sieverts [11].

The decentralization trend will certainly put pressure on fertile and ecologically and visually valuable land. But it will also reduce reliance on big technical systems, which have serious carbon, water and land footprints of their own. In the end it will be a matter of minimising the local effects of decentralization by encouraging 'intensification' and a degree of higher density in the new peri-urban development itself, and by discouraging excessive mobility across the now-expanded regional distances by simply making driving more expensive (which is bound to happen on its own anyway, over the next decade and beyond!)

6 Conclusion No 1

The new urban sustainability paradigm is about a regional approach; smarter use of low density; and hybrid infrastructure. In other words, it is about creating a symbiotic relationship between the city and its region; enticing polycentric development with multiple densities across the entire region; and an integrated mix of green, blue and grey infrastructure in which the boundary between the natural and the technical networks and is blurred. In this vision of the city – or city-region, rather - only small pockets of truly urban, high-density fabric are envisaged. Most of the urban landscape is suburban and peri-urban. However this is not the parasitic suburbia of the 20th century, completely dependent on

urban infrastructure. This is a productive, low-density landscape, populated with partly autonomous properties which supported by a highly decentralized, 'smart', 'clean' and literally green infrastructure.

After all, this is also about realism. Urban sprawl is notoriously difficult to contain or control. In the words of Rober Bruegmann [12], 'the record of attempts to stop it are not promising'.

7 Conclusion No 2

My overall vision for Auckland 2040 is not much different from the Council's vision – indeed we could and should strive to achieve a city-region with the best quality of life in the world. But spatially, I believe this should be a linear city, with a 100 km long 'infrastructure spine' running through its middle. On both sides of the spine, there are suburbs, with town and suburban centres. The spine itself is like a necklace, with a dozen city-hubs – local CBD zones – along a fast-transit route (and other main infrastructure). On its flanks, both along the sea and the land side, are suburbs with various densities. They are endowed with all the local and natural amenities and supported by a mix of green and technical infrastructure, with varying degrees of independence/reticulation.

Such an Auckland could become a template for the rest of the world. This is of great potential significance, as most urban areas worldwide are low-density. In most cases there is neither money nor time - if you believe climate change to be already an emergency, as Gleeson [13] argues convincingly - to convert them into compact cities. Therefore the only realistic strategy is to make Global Urban Sprawl sustainable while retaining its present density, as it is easier to change the design of buildings and infrastructure than the entire urban form and structure. In the end, on top of being more sustainable such urban sprawl would be also more resilient too - a claim hard to make for the compact urban areas.

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