FUTURE AUCKLAND: The Case for Flat Urbanism

City Futures Programme
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Auckland’s official plan has recently adopted the ‘compact city’ model. The council intends to pursue an aggressive policy of ‘intensification’ in order to contain horizontal growth. We think this will be an epic failure of planning. Not only because too many forces are stacked against the planning regime, but also because the plan deliberately ignores the regional nature of the new, super-city Auckland. Thus sprawl will happen precisely because the plan wants to ban it - alas, in a haphazard manner. What is the alternative? To plan with sprawl, not against it. Auckland Council should see Auckland for what it is - a city-region, not a city - and acknowledge its inevitable linear shape and flat suburban form. This option is not just easier politically - it is also safer in the face of climate turmoil, which seems inevitable some time after 2020.
Unitec – main campus, Mt Albert, Auckland
New Zealand: small; insular; distant... relevant?
Downtown Auckland, with the central city waterfront
The city as a ‘spectacle of verticality’
A typical suburb of Auckland
The downtown (city centre) and the suburbs
The city centre (CBD), the suburbs, and the regional landscape
Auckland – a city in a stunning natural setting
Sarajevo, Bosnia and Herzegovina – a city shaped by landscape
• **Nature** shapes cities.... always..
Only cities which understand their natural setting (the physical context) can hope to achieve Sustainability & Resilience
The fundamental paradox:

• How do you integrate ‘nature’ with the city, when densities are high and there is little room for nature’s presence?
Is low density good then?

Could even ‘urban sprawl’ be good in some sense... that is, could it be sustainable and resilient - subject to certain conditions...?

NO! says the mainstream of the planning profession
Urban sprawl = the enemy!
Urban sprawl = the enemy!

Compact City = the solution!
Urban sprawl = the enemy!

Compact City = the solution!
Urban sprawl = the enemy?

Technology evolution >>> urban infrastructure transformation...
New technologies could make urban sprawl environmentally responsible (‘sustainable’) and socially safe (‘resilient’).
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‘green’ and ‘smart’
New technologies could make urban sprawl environmentally sustainable and more resilient

- Both the *existing sprawl* – retrofitting it with ET & IT
- and the *new sprawl* – designing differently, by enabling a massive uptake of ET & IT
WHAT IS A SUSTAINABLE HOUSE?

1. Conservatory for winter heating with shade blinds for summer heat control (passive solar design)
2. Generous eaves to the north to minimise sun penetration during summer (passive solar design)
3. Concrete wall to provide thermal mass for heat storage (passive solar design)
4. Double glazed joinery (to minimise heat loss)
5. Solar hot water panels to reduce energy consumption
6. Breathable walls to help control interior condensation
7. Locally made bricks to minimise embodied energy content
8. Plantation grown renewable timber
9. Minimal earthworks by designing the house to follow the contours of the land
10. Permeable paving to driveway to minimise impermeable areas
11. Water tank for rainwater collection
12. On-site wastewater treatment and dispersal (for rural and semi-rural sites)
13. Surface water from drive to rain garden for absorption
14. Grey water recycling (collection & re-use)
15. Photovoltaic solar panels for electricity generation

Selected features of a sustainable, energy efficient & healthy home

Interior: use of natural (or low VOC) paints, carpet free floors - careful electrical wiring to minimise electromagnetic fields. Modular design dimensions to minimise waste. Roof and wall insulation exceeding minimum requirements. Approved woodburner fireplace with wetback for efficient space & water heating.

bernhardt architecture
EQUINOX DESIGN LTD
The Death of Sprawl
Designing Urban Resilience for the Twenty-First-Century Resource and Climate Crises

By Warren Karlenzig
Christchurch rebuild: A city stalled

JOHN MCCCRONE

Last updated 07:00 08/03/2014
Suburban development killing CBD

LIZ MCDONALD

Last updated 05:00 24/03/2014
Coal's share of world energy demand at 44-year high

3:43 PM Tuesday Jun 17, 2014

Coal's share of global energy use reached 30.1 per cent. Photo / Thinkstock

Coal dominated world energy markets last year by supplying the biggest share of demand since 1970, making it the fastest growing fossil fuel, according to an annual review by BP.

Consumption grew 3 per cent last year, driven by coal use in developing nations, according to a statement on Monday from Europe's third-largest oil company. Use of renewables such as solar and wind also reached a record, accounting for 2.7 per cent of all energy demand.
MOVING MOUNTAINS

Tens of square kilometres of land have been created by levelling hills in several cities in mainland China. Work began in 2012 to make nearly 80 square kilometres of flat ground in Yan’an.

Air pollution halted construction; work resumed despite environmental assessment still pending.

Soft soil could subside when wet, causing structural collapse.

Changing hills to plains has caused landslides and flooding.
China Bulldozing Hundreds Of Mountains To Expand Cities

BY ARI PHILLIPS @ JUNE 5, 2014 AT 9:19 AM UPDATED: JUNE 5, 2014 AT 11:36 AM

[Image of a mountainous landscape with a cityscape nestled among the mountains.

Aerial view of a city with a backdrop of mountains.

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Global survey: Climate change now a mainstream part of city planning

Survey reveals cities are planning for climate change, but still searching for links to economic growth.

Peter Dizikes | MIT News Office
May 29, 2014
The Auckland Plan (2011)
Auckland amalgamation in 2010: A city becomes a region
The Auckland Plan

CREATING THE WORLD’S MOST LIVEABLE CITY

by pursuing the policy of urban containment, i.e. by ‘curbing the sprawl’. The “compact city” model was adopted: 70% - 30% split between in-city and out-of-city development (inside/outside RUBs).
The main driver: containment of urban sprawl.

The ‘compact city’ model is good because it:
• enhances the social nature of the city;
• stimulates the exchange of ideas > helps the knowledge economy;
• reduces the transport distances > lowers the GHG emissions implementation – via ‘intensification’
MULs became RUBs
There are two problems with ‘urban boundaries’ and ‘intensification’...
1. ‘Urban boundaries’? In the 21st century??
Old Sarum, near Salisbury (3000 to 500 BC)
20th century transport revolution...
2. ‘Intensification’ often negatively impacts on the capacity of infrastructure, and on the appearance (‘character’) of the area... which triggers local hostility
Hard to change the negative perception after 25 years of ‘cheap and nasty’ architecture....
Turua Street protests and demolition

9:38 AM Thursday Dec 16, 2010

Photos of the protests and demolition of the art deco houses in St Heliers.

3 of 16
3. risk – vulnerability - resilience
Resilience

- At the same time, challenges posed by climate change and resource shortages will render dispersed development as safer. Lower density of population reduces the overall societal vulnerability. Reversely, most resilience parameters better perform at lower densities.
The Akl Plan: 70% inside, 30% outside

Unlikely!

More likely, the reverse: 30% - 70%
The Akl Plan: 70% inside, 30% outside

Unlikely!

More likely, the reverse: 30% - 70%

Not just more REALISTIC - also more DESIRABLE!
An Alternative Vision...
(2012, with M. Bradbury)
An Alternative Vision...  
(2012, with M. Bradbury)

• Starting with the world-wide trend of simultaneous concentration of population at the national scale AND the population dispersion at the regional scale...
UK: population concentration in SE England
London: deconcentration of population in all directions
This is a powerful trend, it is hard to see anything that might stop it in the foreseeable future...
Decentralisation and low density urbanisation are driven by powerful forces (culture, technology) and therefore inevitable. It is too hard to contain these trends. To a degree, they might be even desirable...

There is a ‘logic’ in NZ’s northward population drift... climate, landscape, connectivity, economies of scale...
The ‘Banana theory’… (DB, 1995)

The ‘Little Banana’ …
The ‘Big Banana’
Auckland – the bigger picture:
the city > the region > the super-region...obvious linearity
The reason: the origins of the current metropolis are in the conurbation that grew over some 100 years along a single traffic corridor.
The Auckland conurbation: from Manukau to Takapuna, and beyond...
What is the future of this trend?
Drivers and shapers of future growth are strong... as the natural landscape both attracts and resists further urbanisation.
The direction of growth is very clear....

...and the overall linearity very pronounced.
CONCLUSION: Auckland is an expanding metropolis, but not really ‘sprawling’.... Auckland is growing in a linear fashion, in the shape of corridors, rather than ‘carpet sprawl’.
Urban sprawl of this type is extremely unlikely in Auckland!
AN ALTERNATIVE TO A SINGLE COMPACT CITY:
Polycentric development, with a range of densities, and with excellent connectivity between the nodes. Retaining a reasonable level of mobility, while building up resource self-sufficiency.
Also – new, green technologies make it possible to reduce the suburbs’ heavy energy dependence and massive carbon footprint.

Instead of being insatiable consumers of resources, the suburbs could become net producers. Self-sufficiency in food, water, sanitation, stormwater management, power, some fuel & fibre.... But this is possible only when the intensity of development (‘density’) low.

The Compact City cannot be self-sufficient.
The power of suburbia

New research suggests installing photovoltaics on roofs and driving electric cars could transform low-density suburbia from a high-energy consumer to an energy provider for the city.

It is a commonly held belief that a compact city is a more energy-efficient city. In Auckland, like many other cities, this has become enshrined in policy.

Compact housing is believed to have a lower surface to volume ratio and will therefore lose less heat. The low-density urban form of suburbia is also believed to be energy inefficient because of high oil-dependent private transport use.

Looking to the future

At face value, compact houses and urban forms appear to be the solution for a sustainable Auckland. But while these beliefs may be true for now, consider the future when:

- the climate will be warmer
- emerging technologies will replace the internal combustion engine
- harvesting energy from rooftop photovoltaics will be cheaper than the grid.

Should we be designing buildings and cities for the present or for future conditions?

Non-compact vs compact housing

The three significant aspects to energy use and housing are the:

- form of the building
- heating and cooling system
- energy used in the common areas.

Comparing the same size units with the same insulation values, there is very little difference between a unit in the centre of a block of flats or a detached house. In both cases, heat loss is dominated by ventilation and glazing area.

Of greater significance is the problem of cooling, especially with the growing penetration of heat pumps in New Zealand housing. Less compact housing tends to allow cross-ventilation and remain cool without any mechanical systems. Compact forms can restrict airflow and result in a higher cooling load.
The Solar Potential of Auckland
What should determine the extent (contours) of future development?
Auckland: a city-region shaped by water and terrain
Auckland – City on the water
Water and linear growth: the coastal condition for amenity, and the linearity for efficiency.
• The **physical geography** (‘landscape’) is one strong driver of the future form...

• The other is the continuing evolution of the technology of **urban infrastructure**...
Infrastructure

- ‘clean’ IS
- ‘green’ IS
- ‘smart’ IS
• ‘clean’ IS – renewables, green-tech, eco-tech..
• ‘green’ IS – ‘working nature’: ecol. services
• ‘smart’ IS – IT and CT (ICT): efficiencies
'clean'
‘green’
‘smart’
Green Infrastructure
GO TO 2040 proposes a green infrastructure network that follows waterway corridors, expands existing preserves, and creates new preserves in the region.
World-leading cities now have green infrastructure plans
Smart Infrastructure
di Telecom Italia.
• Small device + big network = huge impact
The ‘smart city’ trend enabling more intelligent decisions in the daily functioning of individuals, households and businesses
Decentralisation: an all powerful force; could have a profound effect on the configuration of urban infrastructure...
Clean Technology

- Energy
- Water
- Waste
How To Install The Power4Home System & Save $1000's

How To Build A High Power Wind Generator
• **geography (landscape)**
  The physical geography – a narrow isthmus with lots of volcanoes, ridges, harbours and estuaries – inevitably generates a city which crawls wherever it can; add the fact that most of the city was created in the latter half of the 20th century when automobile became dominant transport mode, the decentralisation trend became the overwhelming force.

• **technology (infrastructure)**
  Current developments in IT and ET and TT indicate that centrifugal forces in the shaping of urban form will remain strong, and probably will successfully resist the centripetal forces that are expected to regain some strength in a carbon-constrained, post-peak oil world.

• **culture (lifestyle)**
  NZ-ers, overall, continue to express preference for single-dwelling living and owning a section. This is even true with some of the immigrants. Aucklanders are also resisting change (intensification) in their local communities.
Urban Form: long and flat

Urban infrastructure: clean, green and smart
Auckland – The Long, Flat City...
Conclusion

- Auckland 2040 will be a linear city, with a 100 km long ‘infrastructure spine’ running through its middle. On both sides of the spine, there will be suburbs, with town and suburban centres. The spine itself is like a necklace - a corridor of fast-transit and other high order infrastructure connects a dozen of city-hubs. The suburbs are endowed with all the local and natural amenities and supported by a mix of green and technical infrastructure, with varying degrees of independence from the municipal networks.
The new urban sustainability paradigm sees horizontality as a strength, not a weakness. It is about:
- regional scale of planning;
- smarter use of low density areas (‘productive sprawl’); and
- hybrid infrastructure (on and off-grid; green, clean and smart)

In other words, the sustainable, resilient city of the future is about a symbiotic relationship between the city and its region; about polycentric development with a range of densities across the entire region; and about an integrated mix of green, blue and grey infrastructure.
Repercussion

- Most of the global urban landscape in the 21st century will be suburban and peri-urban. However this does not have to be the parasitic suburbia of the 20th century, completely dependent on urban infrastructure. This could be a productive low-density landscape, consisting of partly autonomous properties, which are supported by a highly decentralized, ‘smart’, ‘clean’ and literally green infrastructure.
LEAVING THE LAND

China’s Great Uprooting: Moving 250 Million Into Cities

Articles in this series look at how China’s government-driven effort to push the population to towns and cities is reshaping a nation that for millennia has been defined by its rural life.

250,000,000
The Chinese government plans to move 250,000,000 people from farms to cities. It plans to do this over the next twelve to fifteen years.
Urban sprawl of Beijing

1. 1951年北京城市建设用地情况
2. 1959年北京城市建设用地情况
3. 1983年北京城市建设用地情况
4. 1991年北京城市建设用地情况
5. 2000年北京城市建设用地情况