

Green Urbanism's Design Theory to Combat Housing Shortage

Humphrey M. A. Boogaerdt

Abstract

Green Urbanism design principles should be used when developing new strategies to combat the Perth's housing shortage. Taking these principles into account This would mean that the climate emergency is central to all future development strategies and regulations. A new principle suggested would be to stop any further development on bushland. To address the housing crisis whilst still following this rule, densification can only be achieved using modular prefabricated dwellings be built on top of existing residential and commercial constructions. For developers to embrace this new development model, financial incentives are imperative. To facilitate this transition to more sustainable development that also reduces the housing shortage, will require government assistance and changes in government policies.

1. Introduction

The housing shortages in Perth and across the country have persisted for many years and are projected to continue to worsen (Ryan, 2023), which suggests that the current approaches are ineffective. This essay looks at an alternative approach based on green urban design theory that can address the housing shortage in a sustainable and liveable manner. In this essay I present some of the important background facets that need to be considered when undertake to improve the housing crisis, such as the urban planning and environmental contexts. Then I will explain the general principles of Green Urbanism design theory, before making suggestions as to how this theory should be implemented with the aim of reducing the housing shortage sustainably. The focus is on the built form, green open space and other biophilic designs are deemed to be a given (Beatley, 2016). I will discuss its implementation in terms of development, construction, life cycle assessment and policy. In this essay the words 'housing', 'houses' and 'dwellings' are used interchangeably for all types of dwellings, including single houses, duplexes, townhouses or apartments. The word 'developer' is used to refer to both small investors and institutional investors.

2. Contextual considerations ¹

2.1 Urban planning context

The current framework for urban development in the Perth metro area was laid out in the report titled “*Perth and Peel @ 3.5million*” (WAPC, 2018). This “vision” focuses on greenfield development with only some infill. This approach results in the boundary of urban development being pushed further and further out from the city, with mainly single storey houses being built on smaller blocks with minimal remnant vegetation left. These developments often alter the natural hydrology, amongst other factors, by creating artificial lakes (Department of Water, 2011). Plus, these developments generally lack access to public transport (Kelly, 2023). This contributes to the unsustainability of these types of housing developments.

Given that the housing shortage has persisted indicates that past and current policies have not been optimal. In other words, a new approach is needed. Developers argue that the solution to the housing crisis is to just reduce the ‘red tape’ and to release more land so that they can build more houses (UDIA, 2023). This would look like giving a *carte blanche* to developers to build more in outer suburbs, promoting urban sprawl. However, this approach must solve the housing crisis has previously been unsuccessful (Hewson, 2023), and is unsustainable on environmental and socio-economic grounds. Trudeau (2018) described this approach by saying that “*American suburbs are the posterchildren of unsustainability*”, and the same could be said for these types of developments in Australia. Governments have a role to play beyond policy making in helping to solve the housing crisis because for decades, in addition to the building industry, governments have marketed the “Australian Dream” of owning a house on its own block. Combined with “the biggest is better” attitude (Calthorpe, 2011), this created a “display home culture”. The secondary effect of this “display home culture” is that existing houses are frequently demolished to build McMansions, that is a dwelling as large as possible on a block.

2.2 Environmental context

The current state of the global climate emergency was powerfully captured by UN Secretary General António Guterres who recently said, “*The era of global warming has ended; the era of global boiling has arrived*” (Guterres, 2023). These comments are based on IPCC reports (IPCC, 2023). The environment needs to be central to any solution of any urban

¹ Each section has its own appendix, if needed, at the end of the essay, with more detailed information.

development, that is, construction must be provided in a sustainable way, not just the buildings, but the whole environment. The climate impact on human settlements can be seen all over the world being it bushfires or floods. That means that besides mitigation strategies we need adaption strategies to cope with changing circumstances. After a disaster has struck it is not possible to go back to the situation before. The term ‘resilient’ is used as a way back how it was and how to cope with the impact. From a design and planning viewpoint resilient does not make sense². Rebuilding after a disaster, in fact for all new constructions, should be based on the concept of anti-fragility (Blečić & Cecchini, 2017), that is, building in a way that can withstand potential disasters.

3. Green Urbanism

Green Urbanism is an urban design theory that combines many of the elements of other movements but that also has green infrastructure as a fundamental part of the design (Beatley 2016; Lehman, 2011; Newman, 2010; Weller, 2009 & 2019; Weller et al., 2019). The main advocates of Green Urbanism have slightly different approaches, but the theory can be synthesised in a simple model, as seen in Figure 1. Green Urbanism is like Cradle-2-Cradle (C2C) on an urban scale moving towards a circular economy (CE) (McDonough & Braungart, 2002; Rau et al., 2019).



Figure 1: Three pillars of Green Urbanism. Copied from Lehman, 2011.

² Resilience is a term from engineering describing the movement of a stressed item back to its original state.



Considering the current condition of the climate emergency, even the original Green Urbanism development framework needs to be upgraded to Green Urbanism 2.0 (GU2.0). This means being more prescriptive and aggressive in pursuing climate goals, namely prohibiting development on green public open space and natural bushland. This updated approach also includes the need to increase urban tree canopy (Boogaerdt & Brown, 2019 & 2021; CPP, 2023). Other than greenfield development areas already set aside, Perth has no more land available for this type of development, hence the only way to increase housing stock is by densification. Due to the GU2.0 constraints, densification can only be done in a scattered way throughout the metropolitan area. These constraints suggest that even the “precinct” level of development, as described by Rowley et al. (2017), might not be feasible. However, even the scattered approach to infill that takes advantage of existing infrastructure in existing suburbs can generate many dwellings in a sustainable manner. For example, in a book by Weller (2009) titled “Boomtown 2050 scenarios for a rapid growing city”, he suggests that infill in existing suburbs could give an extra amount dwellings (Figure 2). However, the standard infill approach falls short in sustainability because the carbon footprint is too high, partially due to the lack of good fast public transport and making it car-oriented design. However, by carrying out infill in areas with existing public transport systems means that instead of having to build new infrastructure the existing infrastructure can be adapted to account for the increased population. From an economic and sustainability viewpoint, adequate public transport is essential. This criteria of transport-oriented design (TOD) incorporated in the Green Urbanism design includes “activity centres” redevelopment (Figure 3) which become more walkable amongst others to be more sustainable. In GU2.0 design diagrams it is expected to see green spaces marked. However, in for example existing suburbs there may not be space for large ones, smaller ones can be incorporated on the more detailed design.

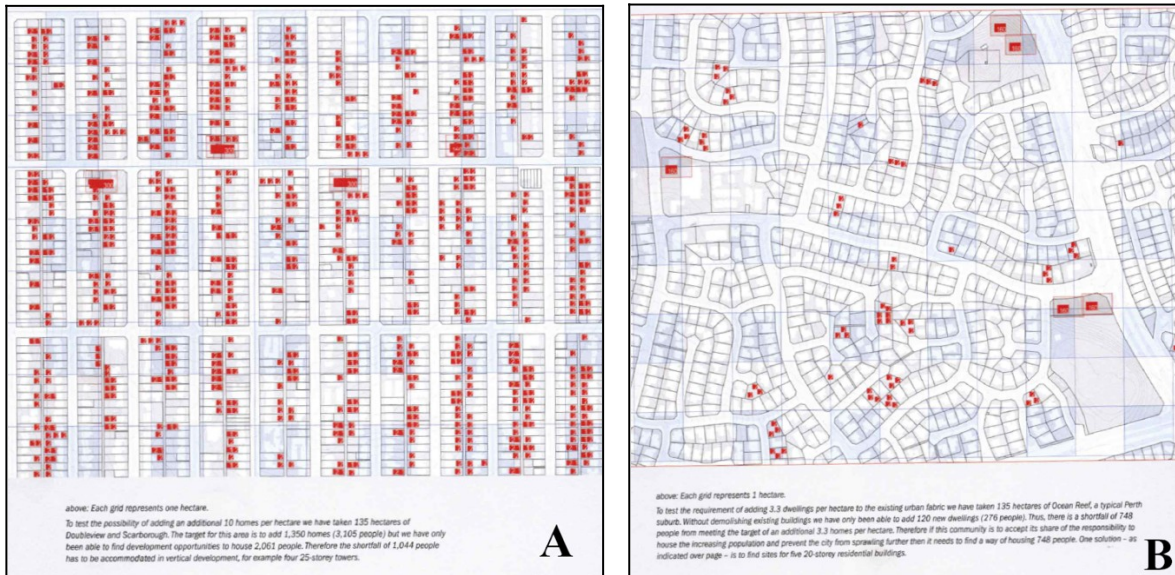


Figure 2: The older suburb of Scarborough with many infill opportunities (A), while in the newer suburb of Ocean Reef there are fewer opportunities (B). Copied from Weller, 2009.

be more difficult in established suburbs. The base for the urban design proposal in figure 3 is based on the proposal by the City of Stirling (CoSt, 2015) which include a tramway along Scarborough Beach Road. This conventional tram can now be replaced with a trackless tram going past this an ideal road to densify around (Newman et al., 2019).

Modern modular prefabricated dwellings can be part of the sustainable Green Urbanism approach, especially in the use of drop-on development (see section 4.2 for definition).

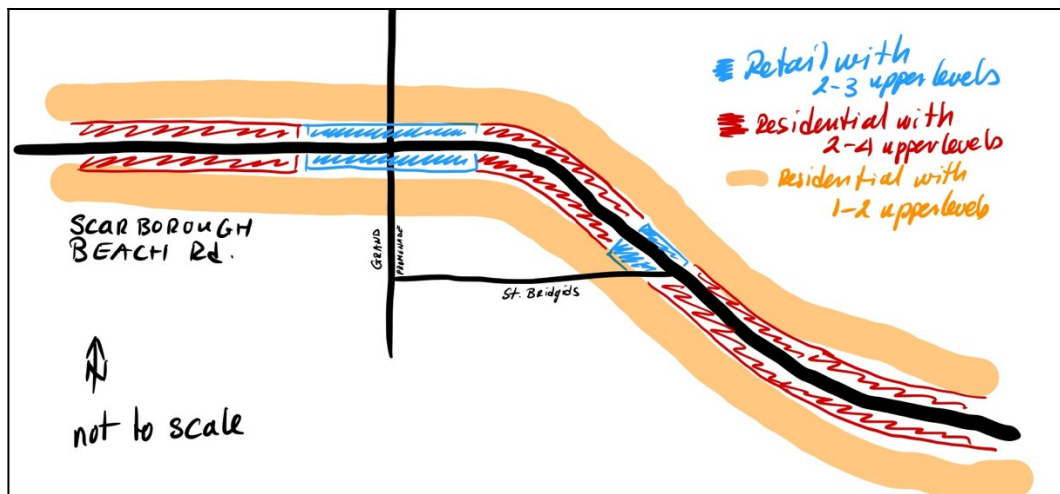


Figure 3. A transport-oriented development along Scarborough Beach Road near activity centres at Grand Promenade and St Brigid's Terrace.

The urban design of planned expansions of new developments – such as those around a town Bullsbrook where population is planned to grow from 6,700 to 85,000 (Swan, 2023) – must

change so they can be constructed according to GU2.0 principles. That is, they must become more sustainable and have access to excellent public transport. Financial incentives are one method to achieve more infill in existing suburbs by creating more appetite for it. How to technically achieve this densification is discussed in section 4.

A potential second type of redevelopment area is at “activity centres”, that is, small local business strips and centres in the suburbs. Here, businesses and surrounding residential building could become multi storey. This could be appealing to business owners because having more residents around, this means there are more potential customers for these businesses.

4. Theoretical implementation

4.1 Development

A major underlying cost of any building is the value of land. Prices keep going up because the amount of land is finite, with increased scarcity. With our “no new bush for development” constraint land values of existing lots will increase. To spread out the cost of land over multiple dwellings, we will need to build multi storey buildings. A solution is to re-purpose old buildings, such as hospitals, into dwellings. An advantage of hospital conversion is that there is already a lot of plumbing installed, hence it was a lost opportunity when Princess Margaret Hospital was demolished. In addition, a solid building like the TAFE on Salvado Road in Subiaco could have been converted for housing, with the incentive for developer allowing to add a third or fourth floor.

A suburb like Warwick is ideal for densification with ‘drop-on’ construction (see section 4.2) due to the existing infrastructure and amenities. In Warwick there is already a primary school, a high school, a shopping centre and a railway station. Following on from the Weller (2009) suburban infill plan (Fig 2), Table 1 contains data from five suburbs in nearby and including Warwick (ABS, 2023). These suburbs have about 20,000 dwelling, which means that if 10% of the owners carry out infill over 5-year period, an extra 2000 houses would be built. Keeping the occupancy rate at a conservative 2 per dwelling, there would be living space created for 4000 people.

Table 1

Suburbs showing the number private dwellings, and the ratio of people per dwelling and the ratio of cars per dwelling

Suburb	Private dwellings	People per dwelling	Cars per dwelling
Warwick	6571	2.3	1.8
Greenwood	3948	2.6	2.1
Hamersley	2139	2.6	2
Padbury	3474	2.6	2
Duncraig	5903	2.8	2.1
Total	22,035	2.6	2

4.2 Construction

To bypass some of the current supply bottlenecks we should build prefabricated modular houses (see also appendix 4). In a factory fewer tradespeople are needed and part of production can be automated. This results in cheaper products, less wastage and improved output efficiency (Lin et al., 2022).



Figure 4: A common local shopping strip (A), and these local shops with drop-on apartments (B).

Currently densification is based on either demolishing existing buildings and building new dwellings from scratch or by having a battle-axe subdivision development. Both outcomes are suboptimal ways of increasing density, because density would still be low, and these approaches reduce green-space. An alternative solution is to have “drop-on” developments where modular prefabricated units are added on top to existing residential and commercial buildings to create extra levels. The foundations can be upgraded with ‘steel pipe screw piles’ (detail in appendix). This the type of development (Figures 4 & 5) fits in with the City of Stirling’s activity corridor plan (CoSt, 2015). A similar drop-on development on a suburban home is shown in Figure 5.



Figure 5: A common suburban 1 storey house (A), and with drop-on 2nd storey added (B).

4.3 Life Cycle Assessment and Embodied Energy

Life Cycle Assessment (LCA) is a vital tool to assess the environmental impact of resources used and to create other scenarios. It is a methodology to assess during the life of a product its environmental impact, that is the period from extraction to when a product gets disposed of. This process is essential in the construction industry considering that new constructions account for 15% of global greenhouse gas emission (Joensuu et al., 2022; Van Stijn et al., 2021).

In Perth, multi-storey developments have traditionally meant that the original building gets demolished. This completely contradicts what sustainable development is about. Furthermore, current project homes have a 20 to 30-year lifespan (Byrne, 2023) – this is not a sustainable path to follow either. To reduce our environmental footprint, all construction should be following the C2C and CE principles (McDonough & Braungart, 2002; Rau et al., 2019). To measure the sustainability of a building design, Life Cycle Assessment (LCA) needs to be carried out (Galal Ahmed et al., 2023; Pullen et al., 2006; Tucker & Ambrose, 1997; Vickers et al., 2021). LCA should be compulsory for each renovation and new build, and a LCA should be performed to calculate embodied energy of any building planned to be demolished. Financial institutions, like superfunds, should be developing with long-term investment in mind. This would be a change of business model since currently the relationship with a project is short term, i.e. develop and get out. This can be referred to as “Develop as a Service” (DaaS), which is based on concepts by Rau and colleagues (2019). If developers follow this DaaS principle, then it is in their interest that the building is sustainable and has low operational costs. This approach is also based on developing according the C2C principles in which carrying out LCA is costing the externalities. It has been done successfully, for example a headquarters of a bank or a council house have effectively used

these principles (Kraaijvanger, 2023; Rau, 2023). Developing sustainable is perceived as expensive, that is because normally the cost of externalities is not incorporated, and all accounting is done for the short term, as shown in the documentation of the Triodos Bank and Venlo council house buildings. LCA can show the benefits of building green. Hence, the advantage of LCA, that a dwelling becomes “desirable” to buyers if it is deemed to be sustainable, should be marketed to show LCA’s appeal to developers.

4.4 Policy formation

To get GU2.0 embedded in policies will be difficult, because there will be a lobby against it by interests that prefer the status quo. The only way to get developers interested in Green Urbanism 2.0 type development is to have financial incentives. These incentives must continue to exist until this type of development has become mainstream. From a government viewpoint, it is short term taxpayers’ money spent for long term benefits (Sandercock, 2004). Having strict building codes is important, but there needs to be a flexibility provision to approve development proposals that do not fit the standard building codes but that still fulfil GU2.0 guidelines. To enable ‘Flexible Building Codes’ in cooperation with Local Government Authorities (LGA), a “Sustainable Development Transition Authority” should be established, since many of these ideas are outside all Local Planning Schemes (LPS). This authority can overwrite the local LPS in the case it meets the new development ideas after consultation with the LGA. So, it is not by-passing the LGA, it is assisting and working together, as if using a consultant.

The “drop-on” redevelopment built at local small commercial/activity centers or commercial buildings, does not mean that the current owner needs to be the developer. The existing owner keeps the ground floor and land, the “drop-on” floors above can be owned by an investor who pays “rent” for the use of the space above the existing to the landowner for the privilege.

Currently, homeowners are benefiting from the highest value of their home since when they sell it does not attract capital gains tax. So, it is an incentive to buy larger and larger house Hence, governments need to incentivise homeowners to build smaller houses, at least make a person to delay building larger then currently needed. If we were to build smaller houses, less labour and materials would be needed. Then the “saved” labour and materials can be used for other buildings to combat the housing shortage. When people plan to build their new homes, they should be given the opportunity to partially build their dwelling. For

example, two extra bedrooms and extra garage and extra bathroom, not needed now but can be added later. This is also a form of modular construction. When the owner at a later time wishes to add those extra modules or extend the dwelling no new building permit is needed. Incentives to forgo the max build home could be: reductions of land-tax and shire rates based on the non-built area or maybe some lower mortgage options. This is where the governments must work with real estate organisations, developer organisations and local governments to work out processes.

For people adding another level to their house with the purpose of the new top floor being rented out a possible incentive fixed rate of land-tax and shire rates as before the extension for five years. This may need establishment of another style of strata if the people intend to sell of the top floor and when sold in the first five years no CGT applies. Financial incentives need to have a multi prong approach across each level of government. This could look like: a reduction in shire rates by the local government, a reduction in land-tax by the state government and a mortgage reduction assistance by the federal government. Indirect financial benefits for the developer could include lower insurance, energy or maintenance costs. These are just a few ideas that need to be worked out in more detail to make them work as incentives to carry out the described types of developments.

5. Conclusion

In conclusion, the climate emergency should be a central consideration to the approach of new developments including trying to solve the housing shortage. This means that GU2.0 design principles need to be adhered to for any construction. Dropping modular prefabricated houses onto existing buildings is one sustainable solution for densification mentioned in this essay. However, as mentioned, there need to be financial incentives for developers to adapt this this new way of developing and the government has a major role to play in facilitating this transition to sustainable development. This essay focused on Perth as an example but there is no reason that what has been discussed cannot be implemented in other jurisdictions.

Postscript

The origin of this essay is an assignment for the unit 'Contemporary Urbanism' as part of a Master of Urban Design at the University of Western Australia in November 2023. Changes only to cover page and correction a few errors.

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Appendices

There are only appendices for sections where some extra information may be useful.

Appendix 2.1 Urban planning context

The terms urban and suburban are not always used in a consistent way. A general perception is that Australia is an ‘urban nation’. However, Gordon (2016) based on his research model in Canada, proved that Australia like Canada is a suburban country. Urban infill is used for areas closer to the CBD, while most should be focused on suburban infill.

With the car oriented suburban developments there will be an increasing demand for new roads, that is where there is a lack of adequate public transport, resulting in more traffic congestion. The response by engineers is building more roads to alleviate congestion which is counterproductive. An analogy “Building more roads to solve congestion is like fighting obesity by buying bigger pants” (Hipkins, 2014).

Appendix 2.2 Environmental context

In many circumstances it is prudent to consider multiple scenarios with trigger points (Grace & Thompson, 2020). In the case of climate change over the last decades the BUA has been followed, and now the only option is to make drastic changes in the approach to construction. The only acceptable scenario now is to have a ban on any development on native bushland, green POS and a compulsory increase in greenspace. From this scenario with rising sealevel and more frequent storms building along the coast and low lying areas is not preferred. Also, with more extreme weather events predicted which include rain deluges. When these deluges occur in the large catchments areas enormous amounts of water will flow down the rivers that will spill onto low lying banks. Any building on these plains should not be allowed. Any development needs to be done within anti-fragility framework.

Appendix 4.1 Development

The question when trying to solve the housing crisis “Does it matter where we build as long as we build many”? There needs to be a multipronged approach of (i) infill in suburbs, (ii) redevelopment “activity centres” and adjacent residential areas and (iii) high density infill around railway stations.

In the Perth metro area the original railway lines were next to residential and commercial developments, while later additions were built in or next to freeways. The latter makes densification around the newer railway stations difficult and expensive with only a few limited opportunities available. An area around Cottesloe station, along the older railway lines, is an example where it would be possible. GU2.0 design for redevelopment around Cottesloe train station. The railway is sunk so that apartments can be built on top and easy connection in the new precinct. The location of the infill is shown in Figure 5 and Table 2 lists number of potential dwelling. The height of the building in the Cottesloe valley to be restricted so ocean or river views are not interfered with.

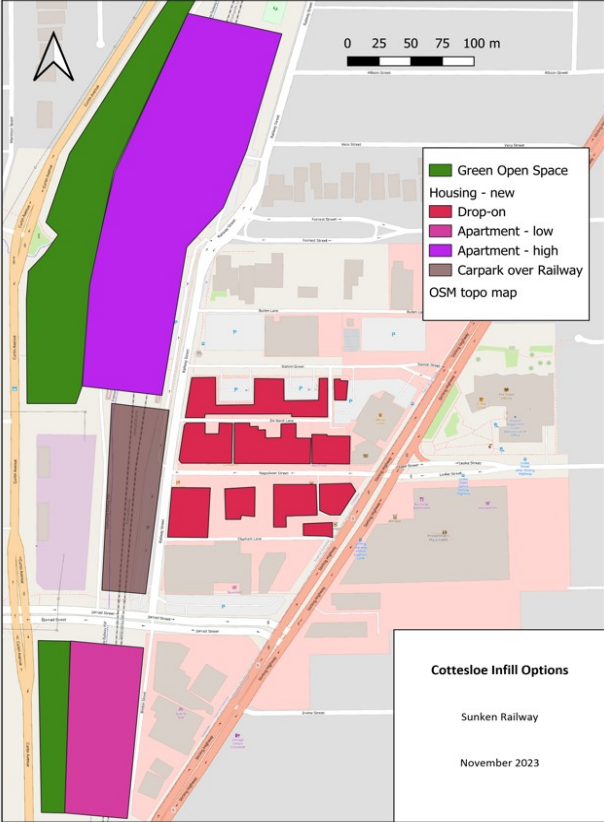


Figure 5. Cottesloe infill options:

Sinking the railway creates an opportunity to build highrise above it.

Suggested types of development:

Apartments 10 Levels	25,000 m ²
Apartments 6 Levels	7,500 m ²
Drop-on 4 levels	9,500 m ²



Table 2

Cottesloe infill proposal results

Type	# floors	Mean apartment size (m ²)	Built area (m ²)	Total # apartments
High rise	10	250	25,000	1,000
Medium rise	6	200	7,500	225
Drop-on	3	150	9,500	190
Total				1,415

The City of Stirling came in (2015) with a proposal for densification along Scarborough Beach Road. There were various public ‘West Activity Corridor Plan – Design Workshop May’ were held in May 2014. The plans included a tramline from Glendalough to Scarborough Beach, the latter is now modified to host a trackless tram. The proposal was not based on the GU2.0 but merely a densification strategy.



Figure 6. Scarborough West Activity Corridor Plan (2015).

Many commercial buildings have a canopy at the front. Instead of canopies one could design porticoes. This should be an incentive to the developers since they can now build over the footpaths on the upper floors. Along shopping strips where highrise is planned by allowing to build porticos. That means an incentive for developers so they can build to the kerb side from 2nd story onwards. Look at portico capital Bologna, total height 5-6 stories (Figures 7 & 8). A concept for this in Perth is shown in Figure 9.



Figure 7. Old and newer porticoes in Bologna, Italy.



Figure 8. Example of a modern portico in Bologna, Italy.

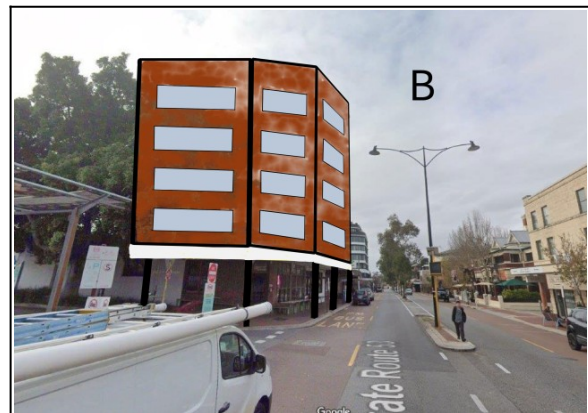


Figure 9. Current streetscape Beaufort Street, Inglewood (A). Concept of residential dwellings above portico along Beaufort Street, Inglewood (B).

New suburbs like Brabham and Dayton have little shopping centres with mini mall that look like a carpark with some buildings plonked in them, these developments are car-focussed. Instead of “standard” local shopping centre create a “mini village square” like e.g. the plazas in Spain with houses above the shops around the square with porticoes. There still can be carpark around the outside. This creates local customers. New suburban developments at for example Bullsbrook need to have a different design. These local shopping centres

should always be connected by good public transport. Make it compulsory to build over shops in new developments. An indicative sketch is of a redesigned shopping centre in Girrawheen (figure 10A). The existing shopping centre has a series of shops back to back at right angle to the supermarket. If the development had instead with the same footprint be like in the concept sketch (figure 10B) with levels of units above the shops and a square in the centre. The area for the units is about 6,400 m², that is about 40 units per floor. With four extra levels that is 160 dwellings. The plaza surrounded by porticoes and greenspace in the middle.

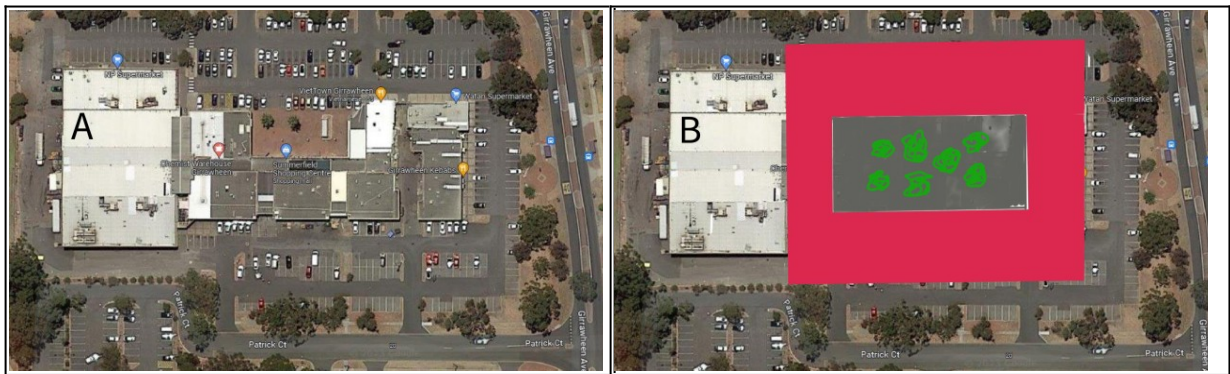


Figure 10. The existing local shopping centre in Girrawheen (A). A reconfigured centre with shops around a plaza and levels of residences on top (B).

Why would shopping centre owners not be in favour of this? Very large centres like Karrinyup are likely not be suitable to this type development but for small ones like the one in Girrawheen could increase return investment. For the investor it would spread the risk, even in an economic downturn people still have to live somewhere and so rents are paid for the apartments.

Appendix 4.2 Construction

As mentioned in the essay the current way of building too slow, that is on top of the trades shortages. The GU2.0 environmental constraints put in place will slow down building in the conventional way even more. The mentioned modular prefabricated construction can be the answer. Normally these “stackable” systems are constructed on a clear site. Part of the GU2.0 constraints the aim is to reduce the waste of embodied energy and use materials as an input for new buildings and to keep demolition to a minimum. As pointed out before solution is to have drop-on construction. The advantage is that existing businesses and residences can continue to operate with a minimum of disturbance. Since these existing buildings were designed for a single storey, the foundations need to be strengthened before drop-on modules can be put on top.

Here is some background information regarding the inspiration of the drop-on developments concept. The famous Concertgebouw in Amsterdam was built in 2000 wooden piles. After about a century it was noticed that there was a problem with an unstable foundation. So, in the 1980s the remedy to the sinking foundation was to replace all the wooden piles, with ‘steel pipe screw piles’, which were then filled with reinforced concrete. While this was all happening, all concerts could go ahead in the evening. Machinery had to be altered to fit through doors and work underground. Segments of the screwpile are welded together to get a continuous pipe. When the piles had reached the required depth, taking about 8 hours to complete, they were filled with rebar and concrete. In this way the 2000 wooden piles were replaced by 400 steel pipe screw piles. A major advantage of the screw piles is that they go down with little vibration and noise, and they make the surrounding soil stronger. Here is a link to a documentary about the about explained process. Even though it is in Dutch you will be able to follow the concepts of the Foundation replacement Concertgebouw, Amsterdam (van Alphen, 1985). The importance of this story is that the same principle of steel cased screw piles can be used to create the extra foundation strength for the drop-on developments. Instead of using indoor machinery one may use larger machinery from the outside to minimise the disruption to the occupant of the building. One example of technics that can be used can be seen on the website of Vroom Funderings Technieken with a video how steel cased screw piles work (Vroom, 2023 ³).

The result of drop-on development at a local shopping strip, corner Scarborough Beach Road and Grand Promenade in Scarborough, as shown in figure 4 creates of 460m² per level; this could result in 18 – 21 apartments. Potential positions of the piles from above are shown in figure 6. Inside the building where the piles are to be positioned a temporary floor to ceiling cover is built, the piling procedure can be carried out from outside without further disturbance inside (figure 8). The exact number and type of piles need to be decided by engineers. The roof of the existing building can then stay in place for that the piles need to be higher than the roof so that the drop-on can be placed on the piles. The idea is captured in figure 7 which shows the steel pipe screw pile sticking out above the roof and a support beam connecting them. On top of these support beams the modular drop-on units can be placed. In principle existing ceiling can stay to become a “false ceiling” between downstairs and

³ I have no financial interests in any of the organisations mentioned.

upstairs. Depending on the roof type may be even the roof can stay in place, as indicated in figure 7B, the gap between the roof and the drop-on is just closed.

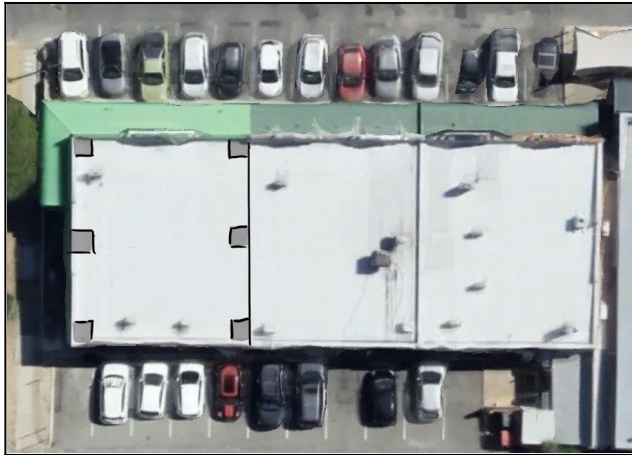
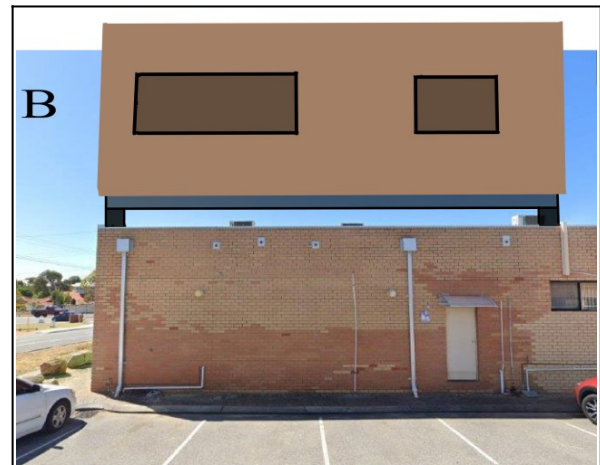


Figure 6. The roof of the shop building in Figure 4 from above marked where the piles can be placed through the roof.



Images and drawings not to scale.

Figure 7. View from the rear of the building shown in figure 4 showing the principle of a drop-on development. The Steel Pipe ScrewPiles sticking above the roof, connected with a support beam (A). A modular drop-on unit placed on top support beam. Gap between roof and 1st level to be closed off.

Modular building could also be re-assembled, buildings do not have to be permanent, so buildings relocated to a location where they are needed. An ideal opportunity for relocating school buildings when the demographics of a suburb changes. This idea fit with C2C principles of sustainable development. Once there is momentum for modular construction in Australia it is also ideal to create quick accommodation after natural disasters.



Figure 8. The steel pipe screwpile in the left corner (A). Image B shows the temporary cover through which the pile is drilled.



Figure 9. A couple of images of machine that can be used for the ‘steel pipe screw pile’ (Vroom, 2023)

Here some links to examples of different approaches to modular houses. “Exploring Modular Homes - Cheapest Path to Net Zero?” (<https://www.youtube.com/watch?v=tOy1rk8QHt4>), “Is modular construction the future?”(<https://www.youtube.com/watch?v=ItCToQSSdhQ> , “The MiTek Modular Story” (<https://www.youtube.com/watch?v=Ia28eNHMuKg>).

The paradigm shift to GU2.0 will be a challenge for architects and engineers. This raises the question if they have been extensively schooled in sustainability and redevelopment of existing buildings?

Appendix 4.4 Policy formation

At LGA and State Government level part of revamp or reporting requirement for individual developments accounting required need to include externalities. The City of Vincent requires for new developments to use a simple form of LCA (Rapid LCA, 2023). In general, green assets are not incorporated in the main balance sheet of LGAs. Even a secondary-balance sheet about green asset would be a great advancement. Green assets are not capture in LCA.

Any urban design is dependent on government policy. As pointed out the current policies do not appear to encourage enough construction to lower housing shortage. Besides the physical ability to build more dwellings there need also to be an incentive for owners and investors to build more and differently. Part of the response to the shortage is the call for less red tape. Certainly, there is always a need to re-assess compliance requirements. The question now is why we need regulations in the first place. In part it is to set standards and guidelines for developments. The other part is to ensure that developers do the “right” thing, e.g. building dwelling to a certain star rating.

The implementation of the drop-on construction may initially be done by private investors with underwriting by the government through partnering with Development WA (2023). This is likely necessary since first attempts are probably more expensive. Universities need to be involved as well for the analysis of design, modelling and performance monitoring.

There could be many more different types of incentives than listed in the essay. There also needs to be a time frame how long these incentives are valid and in place. May a staged approach, like ‘full 0-5 years’, ‘partial 5-10 years’ and ‘longer 10 years loose it’. This is to reduce the longterm liabilities for the governments The governments should spend money on schemes that just increases the number of dwellings. Some of the issues to be sorted when the developer of floors above the existing building is different from the one owning the existing building, they ‘do not own land’, ‘have right to exist above groundfloor’ and “may not pay no land tax for 10 – 20 years”. Benefits for the owner of the existing buildings need not only to be acknowledged and but also documented.

How to incentivise all investors, large and small, to build drop-on development or other more sustainable forms. More flexible in that the current regulations and codes are in place unless a proposed developments full fill the FGU (Flexible Green Urban) design criteria. It also means a need for different legal frameworks, for example “drop-on strata”.

The development of drop-on construction in the suburbs could be ideal for people wanting to get investment income. The split of large double storey houses may be ideal for people that want to downsize but want to stay in the neighbourhood.