

STONE WHEELER

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HAVING YOUR CAKE AND EATING IT TOO: RESTRUCTURING SUBURBIA TO MAKE IT SUSTAINABLE

19th Century Australian cities were largely compact and efficient, but by the 20th century they had become largely suburban, and quite unsustainable. The challenge of the 21st century is to restructure this vast suburbia to make sustainable cities.

Suburbia offers wonderful amenity: individual identity, freedom of design, access to sun, private landscape, and utility over time; all of which provides an ideal platform for passive climate design, giving rise to the typical “sustainable house”. This is our “cake”.

However suburbia has also been a major headache for holistic sustainability: it consumes enormous areas of often-fertile land, it promotes excessive car transport and encourages waste. It demands restructuring as climate change, carbon taxes and peak oil bite. The key question is: how can we maintain all the good aspects of suburbia, in a more sustainable pattern, or “how can we have the cake and eat it too”?

There are a number of ways in which we could restructure the suburb to make it far more sustainable, including: radical re-subdivisions of low rise/high density houses; low rise, high density apartments; the introduction of micro apartments and the development of “new urbanism” village centres. Together, these will dramatically increase dwelling density whilst maintaining the beneficial suburban qualities, particularly good passive climate design principles (often lost in conventional high density housing schemes with overshadowing, poor orientation, and loss of productive land).

In the re-subdivisions of the future, 2 typologies can be very beneficial: the courtyard house and the

narrow row house. These two typologies allow for privacy and importantly access to ground on far smaller site areas than are traditionally used. The courtyard house is ideal at a single storey as this permits maximum sun penetration into the courtyard but it is also possible to build it at 2 storeys with the appropriately pitched roofs, often skillion, to allow equitable sun between adjacent houses. These courtyard forms often benefit from having rear access for cars off small driveways or laneways so that the pattern of subdivision separates pedestrians and the principal address of the house and car circulation for garaging.

Row houses, often referred to as terraces, have the advantage of providing a tiny garden address to the street which historically can be reduced to a front that is close to, or right on, the pedestrian path. Similarly to courtyard houses, the car circulation should be handled by rear lanes creating an internal back garden space between the garage and the house that allows for direct contact with the earth.

Both forms give direct access to ground whilst taking so little area of it, a key issue in raising densities and efficiencies whilst retaining the suburban ideal of individuality and contact with the earth (for food production), and encouraging passive climate design characteristics of orientation and access to sun, appropriate shading (in Australia's hot climate) and high levels of thermal mass and insulation. The key outcome is to provide the identity and utility of a suburban house, with access for sun and water, but at substantial higher densities.

The "sixpack" approach (replacing one house with 6 or more terraces or courtyards) is not new, but what can be different now is design without a loss of amenity to neighbours, and critically, maintaining extreme passive design performance in tight configurations. The resultant forms are critical to their success: a case of "Form Follows Climate" (a new design adage for the 21st century!). For instance steep, single pitch skillion roof forms can be used to allow equitable sun allocation and also to promote efficient water collection.

Another typology that allows for far greater density without the loss of suburban amenity is the low-rise, high density apartment model. In this approach, the cars are parked under the building with a single driveway to service 12-20 apartments. The building form is no more than 2-3 storeys, mimicking the scale of the 1930's-1960's walk up apartments, which famously can be hidden behind a landscape screen to reduce their impact to the street. In this model, the lower level apartments can have direct access from the garage and have small courtyard garden spaces, the one to two levels above that can be provided with very large terraces to maintain the indoor/outdoor connection that Australians find so desirable in suburban living. With their large roof areas, these buildings can still act in the same way as houses in maintaining high levels of water collection and reuse and large roof areas for solar thermal and solar electricity.

The micro-apartment is a possibility that has been rarely developed in Australia. Indeed, many Councils have limitations on the size of apartments, which would be unthinkable in European Cities. It is now possible with clever use of built in furniture that can fold away, and a sensible design for bathrooms, to generate an apartment of less than 35sqm, down as low as 15sqm. Dubbed the "micromaisonette", a prototype showed how full scale furniture including beds, tables, stools and bathroom areas can be built into a 15sqm area, not in the same way that mobile homes and caravans scale down the size of the furniture, but in using full scale furniture that folds away.

The advantage of the micro apartment is its offering of greater densities of occupation above a level of communal shared facilities. Ideally suited to students, generation Y, couples and individuals both young and old, the micro apartment relies on access to external facilities such as cafes, restaurants, public libraries, parks etc as well as the amenity of a fully furnished tiny house. In this way we can bring some of the amenity that is experienced in the inner city areas to suburban locations where the village centres, using retail areas underneath a 3-4 storey building of micro-apartments can provide a vibrant centre focus

to the new suburbs.

These typologies form the basis for whole subdivisions, focusing on village centres, where the ideas of “New Urbanism” or “Traditional Neighbourhood Design” are adapted to the service of sustainability (without the historical pastiche). The neighbourhood village centre has a much finer grain than traditional shopping centres, providing community services within walking distance for residents, lowering fuel demand, and coupled with local food production to reduce “food miles”.

A new convergence of several current trends in urban design is now urgently sought: we should be using familiar village forms together with guiding principles of passive climate design, and some radical rethinking of residential typologies to render our existing suburbs far more sustainable.