Kennedy, Rosemary J. (2007) City Designed for Subtropical Living - Carrying forward the momentum from Subtropical Cities 2006.

City Designed for Subtropical Living - Carrying forward the momentum from Subtropical Cities 2006

At a time when cities around the world are increasingly looking and feeling the same, and similarly adding to mounting environmental crises, the *Subtropical Cities* conference hosted by the Centre for Subtropical Design in Brisbane a few months ago generated keen enthusiasm for ways subtropical environments can produce new models for urbanism and address the problems of the contemporary city.

Subtropical Cities was characterised by a genuine sense of excitement about how, in the subtropics, we can plan and design urbanism that is enriched by commitment to local distinctiveness through attention to climate, cultural values and landscape.

The conference confirmed that if we are to face the challenges of today and the future, we need a framework that accommodates complexity and diversity. Invaluable micro-tactics and subtle incremental changes which dwell on amenity and liveability are necessary; not the tallest, not the biggest, nor the most spectacular! Such excesses are easily achieved!

1 How *Subtropical Cities 2006* conference originated

Back in 2002, with growing concern that growth pressures were impacting negatively on Brisbane's character and identity, the Brisbane City Council established *City designed for subtropical living*, during its visioning process as one of eight strategic directions that it saw as critical to the successful future liveability of this city.

Happily this is still part of the re-worked city vision to 2026…

Council partnered with QUT, and subsequently the State Government's Office of Urban Management to fund a collaborative centre to develop a strong knowledge base in subtropical design, as it pertains to the cultural landscapes and built fabric of Brisbane and South East Queensland.

2. The Place/Identity Agenda

The partners' vision embraces the Place/ Identity Agenda**,** an understanding long-established that successful ideas about the built environment are interconnected with ideas about regional identity, and that regional identity has a significant role in the formation of a built environment which is ecologically sustainable.

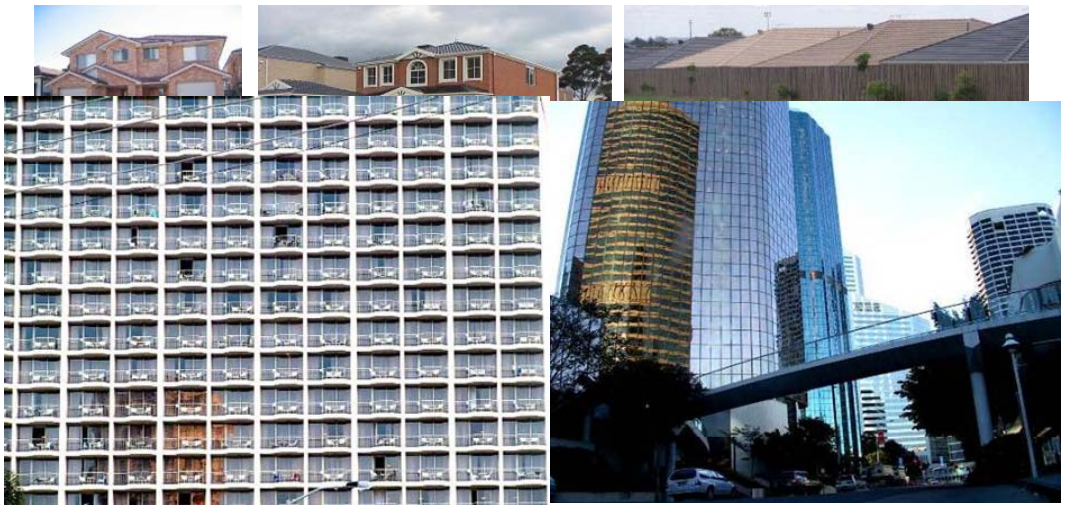
Inevitably, urban development that responds to 'place' by being designed with landscape, lifestyle and climate**,** rather than in conflict with these things, better underpins a vibrant society, a viable economy, a healthy environment, and an authentic sense of place.

Over time, the people of Queensland have developed a synergistic relationship between the built environment and the subtropical setting, creating a unique lifestyle supported by a unique built environment.

In SEQ, It is possible to enjoy the outdoors year round and this is obviously one of the region's biggest attractors.

Image by Olivia Martin Macguire

However, in recent decades this locally appropriate response is giving way to developments and buildings that have little regard for the vagaries of climate and an uneasy relationship with their surroundings.



Newer images courtesy Urban Villages

The city's generally pleasant macro-climatic characteristics are negated or aggravated by some contemporary responses in the built environment. As a result, subtropical character and identity,

the very values which make the place so attractive, are considered to be under threat, and these same pressures are threatening water and clean air resources. (Energy seems to be in abundant supply but its continued delivery is inter-connected with an uncertain water supply).

3 South East Queensland Regional Plan 2005 – 2026

The Centre's development coincided with the development of the South East Queensland Regional Plan. The Plan seeks to manage growth sustainability by promoting compact urbanisation, and a shift to a level of density of a scale and type not previously experienced in Queensland.

The Centre for Subtropical Design supports this strategy but has identified the conundrum of 'densification' versus 'character and lifestyle' as one that needs particular attention.

However, high-density infill development only works if the community is receptive. Policies which promote compactness and densification, if not accompanied with appropriate design principles and strategies tailored for the subtropical condition, will lead to a loss of the very qualities, particularly in the public realm, the Plan is seeking to confirm and create, and will inevitably accelerate the strain on resources of all types.

Image courtesy of Deicke Richards

The Centre for Subtropical Design prepared a comprehensive response to the Draft regional plan which:

- Ensured that reference to the subtropical condition was specifically included in the Vision of the final Plan, reinforcing the integral role that local climate plays; and
- Established two clear values that can be applied to planning design and development to achieve authentic outcomes at any scale, whether considering the macro/regional scale, or the micro/local scale.

  These are senses of:
  - Openness and permeability, and
  - Strong engagement with the natural environment.

Translated into principles, these are:

1. Urban development at all scales should contribute to the construction of an open and permeable built environment, and promote an outdoor lifestyle;
2. Urban development at all scales should include the close integration of landscape and other natural elements, and should be developed in response to climate;
3. The opportunity of subtropical urbanism.

The Centre for Subtropical Design also set about asking how we could go about achieving ecologically sustainable urbanism in a subtropical environment – how we could shift the concepts of density and compact development from being seen as a problem, to being an opportunity for a sustainable future that could be received positively.

Even with the climatic attributes of South East Queensland, subtropical urbanism seemed complicated to achieve because of the existing structure of urbanized areas. We realised we had to develop some practice-orientated ideas about "how to think about it" as well as to develop useful ideas for "how to do it".

Knowledge sharing between peer groups is an important way of testing ideas. We organised a conference to bring together people from subtropical cities around the world to exchange experiences on planning and designing for local distinctiveness as the basis of ecological sustainability.

Professor Georgia Butina Watson (2006) places a caveat here: as a starting point in speculating about what can happen to bring about positive change, the place/identity perspective is extremely valuable, but it would be blinkered to focus on it exclusively, and such an approach risks inappropriate outcomes such as inauthentic historicist pastiche which only serve to exacerbate the problem. Watson notes, "Place-identity is not the be-all and end-all of design. Though important, it is only one amongst a myriad of issues which have to be addressed in practical design work," and these were borne out in the conference proceedings. Upheavals are occurring along the known 'fault lines' of;

- Space and density
- Community health and urban form
- Carbon emissions, urban form and building design
- Significance of the urban/rural interface
- Scarcity of resources (notably water) and spurs for large-scale behaviour change.

4 We looked to places with a similar climate and found:

Similar stories of regions subject to population growth, resource use and land development pressures that stress both their ecological integrity and social fabric, and the haphazard patterns of development that have resulted.

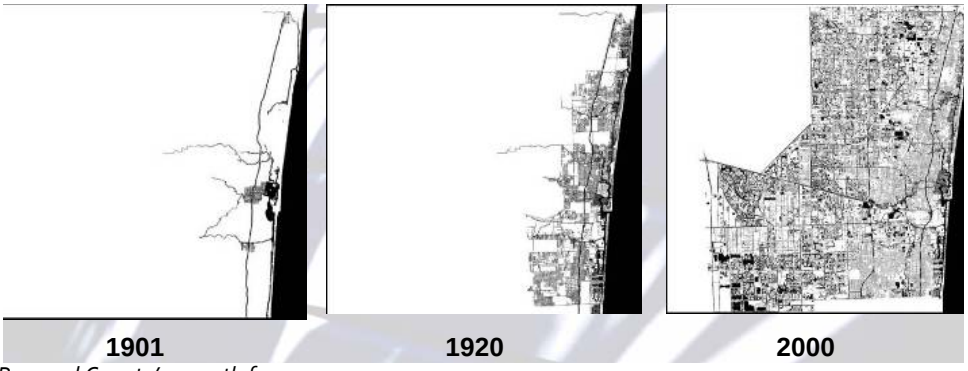
Similarities found:

- **Climate**

  Speakers joined us from maritime/east coast cities: Durban, South Africa, Brisbane, Fort Lauderdale, Florida, Savannah Georgia, and Chonqing

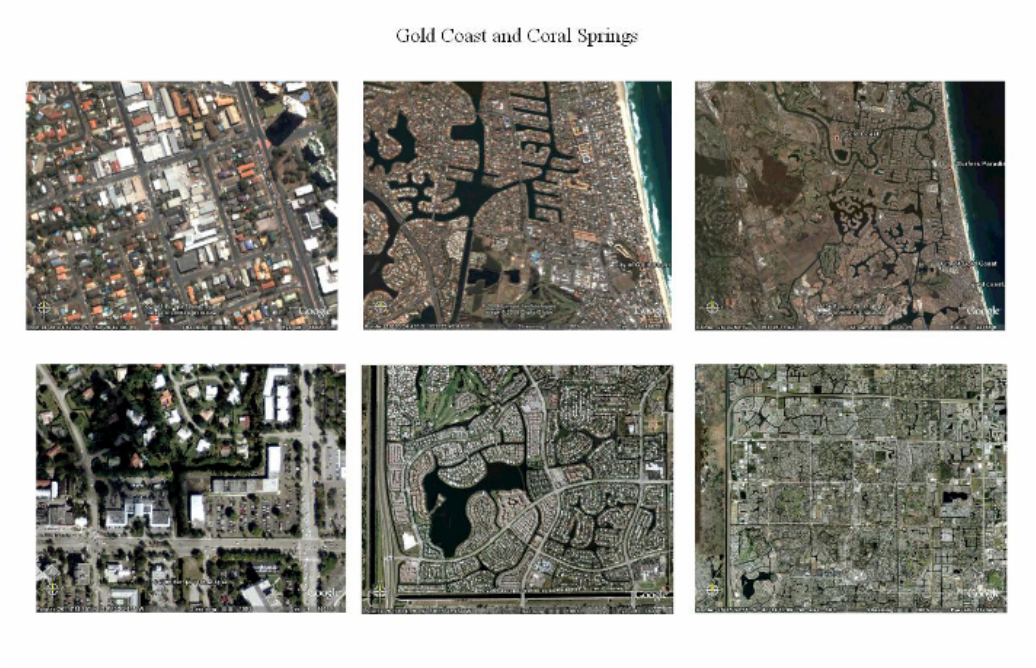
- **Population growth and urban sprawl**

The metropolitan area of Fort Lauderdale (the only region in continental USA with a subtropical climate) encompasses Broward County, part of a sprawling metropolis spanning from Miami to Palm Beach and sandwiched between the Everglades preserve and the Atlantic Ocean. It is also located in high-velocity hurricane zone.
Anthony Abbate graphically illustrated Broward County's stunning transformation from wetlands to sprawling metropolis, from a population of only 5,135 in 1920 to over 1.6 million in 2000.



Broward County's growth from 1901, 1920, 2000

Population density is about 14 inhabitants per hectare. The rapid pace of development is unabated. Anthony Abbate (Broward Community Design Collaboration Florida Atlantic University) simply stated that Broward County has no available greenfield land left for continued expansion, yet it anticipates a population increase from 1.6 million to 2.6 million by 2030. This of course parallels closely local forecasts for growth in the SEQ conurbation over the next 20 years.



Satellite Images Coral Springs, Florida and Gold Coast Queensland, courtesy of Glenn Weiss, downloaded from Google Earth.

5.....and we found differences which are just a matter of scale

Speakers drew our attention to different scales and complexity. There were challenging contributions from mega cities. Carlos Leite (MacKenzie Presbyterian University, Sao Paulo) described 100 years of environmental mass destruction in the Brazilian mega-city Sao Paolo.

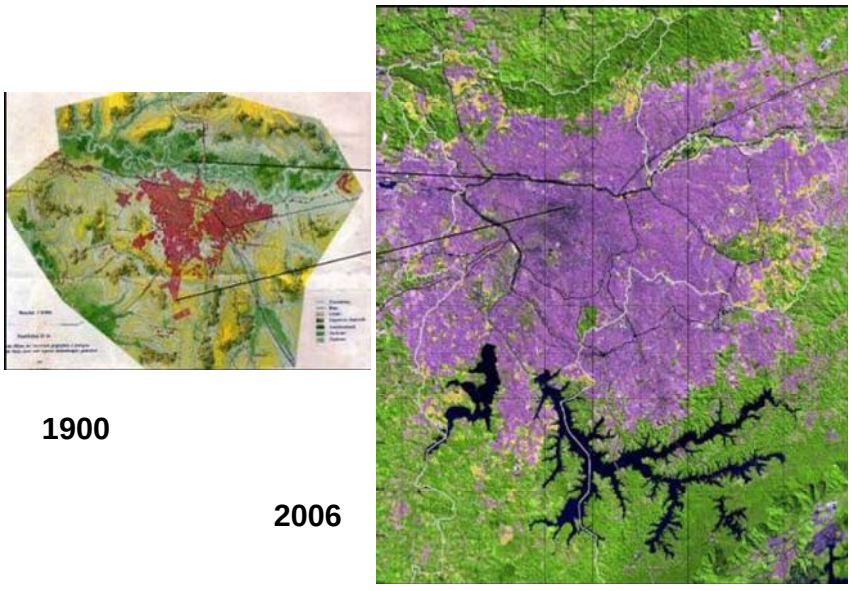


Image courtesy of Carlos Leite

...Sao Paolo growth over a century

This image shows growth of urbanized area over 100 years – original territory in 1900, and in 2006. The population in 1900 was 0.2 million; now the population of the metropolitan region is estimated at 20 million people – 11% of total Brazil's population.

The area of the metropolitan region is 3,100 sq miles [802,900 hectares]. The density 6,100 inh/sq miles [2,300 inh/km2] 23 people per hectare Gross Domestic Product US $ 76 billion [17% of Brazil's GNP]

And we encountered cultural, heritage, lifestyle and landscape differences.
Sao Paolo headquarters more American companies than any other city outside the USA. It has the most crowded air space both in Latin America and the Southern Hemisphere and the highest per capita helicopter ownership.
The facts are illustrative of the extremes between Sao Paolo's rich and poor – anecdotally the city's wealthiest citizens no longer inhabit the public realm at the ground plane.

6 Other similarities : Urban Infrastructure

- The supremacy of the car - universal acceptance of the automobile

  There are about 5.1 million cars in Sao Paolo generating 5.6 tons of pollutants per day in the atmosphere (vehicle emissions contribute 90% of total air pollution in the city). An impact that intensifies respiratory diseases, especially in winter, as the climatic inversion keeps air pollution at the lower strata.

Images courtesy of Carlos Leite and Anthony Abbate

…Sao Paulo City Centre with canalised river and Florida Freeway System.

The condition of the two main rivers in Sao Paolo is precarious due to discharge of sewerage from households, industry and storm water. What could be opportunities for outdoor leisure and water transportation are perceived by the Paulistas as degraded open sewers.

Heavy machinery hire business on Durban street Image courtesy of Rodney Harber

7 Demand for potable water

African cities are similarly plagued by lack of sanitation infrastructure and largely an inability to meet demand for potable water.
Prefaced by a chilling picture of how AIDS is decimating communities, Rodney Harber described life on the streets as convivial despite grinding poverty with street trading, traffic chaos, and visual chaos.

Image courtesy of Rodney Harber

Image courtesy of Rodney Harber

Compare this with our (developed nation) scenario, where increasing demand for water has also seen existing potable supplies struggle to meet demand, but in comparison with developing nations, is not always related to necessity.

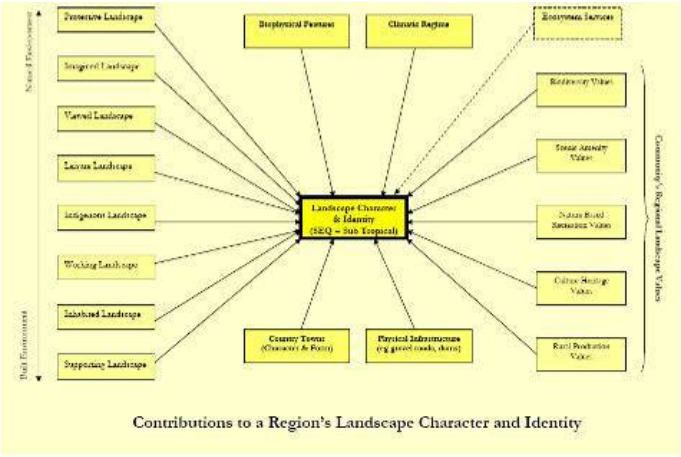
8 Open Space – issues and trends

Several speakers drew our attention to the contribution that open space makes to inhabitants' quality of life and the educational role of open space in providing models for responsible environmental behaviour (the model for individual action).

Images by Kennedy, Seto, Martin-Mcguire

Professor Georgia Butina Watson from UK's Oxford Brookes University argued that the manner in which people actually identify with place is through common experiences in open space.

Associate Professor Darryl Low Choy (Griffith University) built on the core subtropical values of permeability and strong connection to nature, to alert us to the importance of the regional landscape's contribution to character and identity and the challenges of appropriate planning in the urban and rural interface. He noted that open space is not meeting the increasing outdoor recreational demands of the SEQ population.



Contributions to a Region's Landscape Character and Identity

Daryl Low Choy (2006)

Professor Catherin Bull compared the urban/rural interface of urban sprawl in SEQ with space throughout, with China's Pearl River Delta where the pattern is one of dense urban development interspersed with open space.

Images courtesy of Catherin Bull *- Gold Coast Brisbane, SEQ*

Images courtesy of Catherin Bull *- Pearl River Delta, China*

Her analysis of Australian cities and urban regions revealed:

- increasing conflict between the social role and the environmental role of urban open space
- continuing difficulties in achieving and maintaining open space linkages in most urban regions from the regional through to the local / suburban unit level, especially in regions experiencing rapid expansion
- actual open space provisions below those that characterise many international cities (for example, she mentioned New York, Boston, San Francisco).

Carlos Leite also described a deficit of green space in São Paulo. The city has only 4m²/inhabitant when the minimum suggested by the World Health Organization (WHO) is 12m²/inhabitant.

Image courtesy of Carlos Leite - Sao Paolo; open space is at a premium where favelas denude hillsides

In comparison, Rio de Janeiro has 60m²/inhab, Curitiba 55m²/inhab, and Brasília 120m²/inhab. The open space deficit is aggravated by the illegal formation of favelas in environmentally protected areas, resulting in devastating loss of Atlantic Tropical Forest.

9 Continuing the theme of sameness and differences

- **Current Mainstream Building Design**

Tony Abbate of Florida reminded us of the work of the Olgyay's who in the 1950's and early 60's comprehensively investigated the relationship between climate and environmental factors and human comfort, regional variation and character in the built environment. These explorations of a bioclimatic approach to architectural regionalism, featuring various scales from buildings to cities, were intended as an exploratory step toward influencing modern design expression, rather than as now, a means of saving energy. In contrast, current mainstream design has largely developed within a modernist tradition but has evolved as part of the globalising form-production system which has so far seemed mostly to erase established place identities, rather than creating positive new ones.

Not surprisingly, many mainstream values and working practices make it hard for planners, designers and others to engage creatively with place-identity issues. Abbate described how the affordability of and huge demand for air-conditioning, along with the rise of the private vehicle, significantly shaped the urban form of South Florida during its most intensive period of population growth. Air-conditioning eventually became so pervasive that it was actually written into the building codes as a requirement.

As a result developers could now utilise standardised designs that no longer needed to be modified for Florida's subtropical climate and the local context could be sublimated for conformance to those standards.

His assessment of the result is a built environment that since the 1970s bears little connection to the area's subtropical climate and natural environment, and that architectural knowledge has been made obsolete by air conditioning.

Image courtesy of Anthony Abbate

The dual phenomena of affordable air-conditioning in Queensland and regulations requiring that residences be air-conditioned, in the guise of energy-efficiency provisions in the Building Code of Australia, have occurred later in Brisbane but are gaining pace with no less veracity as we default to the thermostat for comfort control.

Professor Richard de Dear, Macquarie University expert on thermal comfort, spoke about the international standards prescribed for thermal comfort in air conditioned spaces and how these are universal regardless of place, climate, culture, lifestyle, gender or age.

Although technically there are not many days in South East Queensland, on average that move away from the comfortable range of temperature and humidity, many more people are demanding that their homes, schools and workplaces are artificially cooled or heated.

Andrew Aitken of ARUP and Scott Losee of Maunsell/AECOM teamed up to do some analysis on energy growth and population growth in SEQ. They say that population is growing at 1.6%;

- air conditioner sales are growing at 20%; and
- peak demand for electricity is growing at up to 14%;
- yet, total energy demand is only growing at 1.9%

Their assessment is that existing houses are currently far more important than new homes when considering energy impacts. High performance does not necessarily mean "high tech" – insulation and sealing of homes is essential yet lacking in a high number of houses where air conditioning is retrofitted.

Aitken and Losee also point out that heating water is still the biggest user of household energy in Queensland (34% of total consumption) and this presents the greatest opportunity for reducing demand, and greenhouse gas emissions, by using readily available renewable energy alternatives.

Aitken and Losee argue that direct regulation on retrofitting air-conditioning to existing homes, and improvements in minimum energy performance ratings are more appropriate than further regulation of new homes in reducing peak energy demand and greenhouse gas emissions.

But with 575,000 new dwellings expected in SEQ over the next 19 years, regulation of the new homes sector is obviously important as well.

The message over and over by presenters at the conference was that if the current rates of non-renewable energy use in building operations and transport across far-flung suburbs are allowed to continue, the quality of life in our communities, and the environment generally, will be severely compromised in the future.

10 Common theme: reconnection to place

A common theme amongst all the keynotes was that local knowledge is a key instrument of re-connection to place – from local issues – such as lack of shade at bus stops; to global issues – connectivity to the rest of the world through airports (often a 'could be anywhere else but the subtropics' experience).

Long term sustainability education with significant local content in terms of ecology, economy, society and heritage is required to nurture knowledge of, and connection to, one's bioregion. This point was illustrated by Abbate as Broward County is grasping the prospect of reversing the processes of disconnection. His work values the mobilisation of social capital through grass roots consultation to achieve meaning and experience in establishing local design guidelines.

Abbate and colleague Glenn Weiss of Coral Springs heavily criticised the reconstruction in Louisiana and Mississippi post-Hurricane Katrina which they saw as "identity by pattern book" that lacks authenticity and is just another form of standardisation.

Jude Munro, Brisbane City Council CEO reminded us of the value of oordinary distinctiveness - subtle incremental changes that have transformed Brisbane over the past decade - biodiversity, suburban centres re-imagined as villages for people, clean up of waterways and so on.

Alan Chenoweth, Landscape Architect, reasoned that the traditional subtropical garden, with a rich diversity of plants in multiple layers, and an emphasis on their architectural form and foliage offers the greatest opportunities for a sense of place which is both instantly recognisable and part of our landscape heritage.

However he agrees this paradigm is challenged by the perceived need for more compact urban areas, and by the current water crisis.

Yet, a compact urban form needs to use every opportunity for 'greening' the city and character reinforcement. He asserts that:

- We need mosaics of biodiversity –not monoculture; and
- Planting strategies which promote lush growth during wet periods, and which are reliable during dry.

Our ambiguous relationship with shade trees did not go unmentioned

Large trees fulfil a number of important roles in the subtropical urban environment (relief from the sun's direct heat, cooling immediate environs through shade and convection, Carbon Dioxide sink, air filter, and haven for urban biodiversity) yet they are regarded as disposable, rather than as essential infrastructure for the ecology of a subtropical city.

Much of the population values the 'green' image of the city yet condones the removal of trees on both public and private land. Power and telecommunications utilities whose plethora of poles and cables dominate streetscapes, regularly drastically cut out the canopy of shade trees which flourish along many Brisbane streets, thus ensuring their certain destruction. Small lot subdivisions in the inner suburban areas often result in the loss of significant trees, and the outcomes are buildings which are over-scaled for site, noise, privacy and natural ventilation are issues, and there is no space left for vegetation, the considered and skilful integration of which, can mitigate some of the problems created.

11 Looking to the Future

- Climate change – what are the implications for a region like SEQ?

We were confronted by futurist Sohail Inayatullah's riveting description of imagined alternative futures for SEQ:

- Still Livable
- Hot and paved
- Wired and miserable
- Transformed – where concern for the long term future of SEQ becomes a passion for many…

Professor Catherin Bull threw down a difficult challenge when she pointed out that we will probably have to come to terms with multi-nodal cities of extensive urbanized landscapes.

According to Bull, cities of the future will be expansive rather than compact; growth is fastest at the city's margins, where the exurbs lure residents with larger and larger houses, and new big-box shopping. Development is likely to leapfrog and resist containment by peripheral greenbelts if vigilance is not maintained.

Bull also argues that existing urban areas will require extensive retrofitting to achieve sustainability goals. Post-industrial and post-rural lands could provide us with opportunities for a new model for urban landscapes – working landscapes that remediate, clean, store water and address carbon emissions. According to her assessment, the urban landscape should move beyond colourful parklands with horticultural displays. Her proposition is that within mega-cities it is possible to develop a new landscape aesthetic – a working landscape made up of newly connected continuous open space which ensures a closed-loop urban metabolism.

This proposal accords with the Centre for Subtropical Design's ideas for subtropical urbanism which embraces open permeable environments, strongly connected with nature. But this requires different forms of urban consolidation, not copied from North America but reinterpreted to respond to this place.

12 So what is subtropical design?

Over the course of three days, delegates and speakers reminded us of;

- The power of good examples;
- The complexity of the issues; and
- That local level action can have large scale repercussions;

Despite this, there is ongoing debate about what constitutes subtropical design.

Subtropical design is NOT a style and is not NEW, and not an add-on or something extra that can generate a bonus!

The concept of subtropical design is not new. Traditional lifestyles in warm humid regions conceived unique architectures which responded to climate. Buildings were naturally ventilated, enabling occupants to sense and connect with their climate and culture. Brisbane's urban fabric has been enriched by such empathetic typologies.

The concept of subtropical design is attached to the broader principles of good design – paying attention to experiential qualities of life in this climate as well as issues of privacy, territoriality, orientation, street relationship and neighbourhood context. Within the context of Brisbane's subtropical climatic conditions, the crucial issues are to give meaning and scale to built form, providing user-friendly spaces and fulfilling other environmentally responsible considerations. Design which is a result of consideration of landscape, lifestyle and climate in SEQ may be considered Subtropical Design. It is not a concept to be used with casual abandon to mean 'relaxed and informal'.

So what is subtropical design?
If the two overarching values of permeability and connection to nature remain as essential ingredients of our new, denser, more sustainable urban environment, not as some skin-deep style**,** but rather permeating deeply through all aspects of the urban environment, from the individual dwelling to the entire region, then the subtropical character and identity of the place can be sustained.

Establishing the connection between the core values of subtropical character and identity and the urban form of the city, and the lifestyle this frames, will have positive consequences for the city's future.

13 Implementation of subtropical design thinking

The first of the values is supported by the following strategies:

- Urban development at all scales should include significant (and appropriate) levels of public and private open space, both outdoor and semi-outdoor.

- Networks of open space add to permeability and the perception of openness. Incorporate an open space continuum between private outdoor space, semi-private and semi-public and public space.

Image courtesy of Chenoweth King and Irish

- Urban development should be located to allow easy and convenient access to open space and open space networks.

- Accompany increasing levels of density with increasing proximity to significant open space. Ensure ready access to useful open space.

- Compact building design limits overall site cover and allows space between buildings and between buildings and streets for large shade trees.

- Shaded and useable outdoor and semi-outdoor open spaces should be provided in public places to encourage community interaction and a vibrant life outdoors.

- Outdoor open space and enclosed habitable space should be designed to allow for the penetration of breezes, a non-disruptive connection with landform, the presence and inclusion of the natural environment, and a sense of openness and movement.

The second value is supported by the following strategies:

- Identify and protect critical open space sites (including waterways), and linkages between these sites, as part of the process of designation of areas to be developed.

- Natural elements and the natural environment should be integrated within the development of the built environment from the regional scale of development down to the scale of the individual site.

Image courtesy of Chenoweth, King and Irish

- Design for appropriate climate-based orientation, and allow for the penetration of breezes, daylight, and the natural environment.

- Balance building heights and vegetation. Allow trees to dominate building form. Preferred height for development is similar to heights of mature shade trees four to six storeys.

- Balance urban growth with increased tree cover. Accompany increasing urban growth/expansion/consolidation with increasing growth, expansion, consolidation and incorporation of substantial urban tree cover.

- 'Green' transport corridors. Major arterials and highways should incorporate and reflect the values of the communities they pass through. Incorporate typical local vegetation in planned and existing transport corridors including rail corridors, freeways, motorways and busways.

- Foster tree planting and continuous vegetation. Plant native trees extensively throughout the built environment, and preserve existing trees during new construction. Allow for large shade trees to flourish in private and public space.

- Develop shaded streets and median strips. Develop pedestrian footpaths in all new developments with continuous tree cover. Locate utilities under ground in new developments, or when upgrading existing infrastructure.

- Vegetation is important throughout the city to cool ambient air temperatures, shade buildings and support pedestrian journeys. Permeable ground surfaces are in turn important for surface water penetration to support vegetation.

- Integrate green walls and rooftop gardens. Advocate green walls and rooftop gardens wherever site cover constrains planting large trees for shade.

- Reflect the importance of water as a significant feature of the subtropical environment. Intensify awareness of its presence by rejuvenating and maintaining riparian corridors and drainage corridors.

- Design for water. Celebrate the importance of clean water to the functioning of our environment by adopting water-sensitive urban design strategies to support existing and new vegetation.

The strategies outlined can guide subtropical design decisions in planning the region, city, neighbourhood, street, individual site.

An overarching consideration is the importance of quality design and detail integrating well-planned and maintained vegetation to the achievement of subtropical identity and sense of place and comfort.

It is apparent that appropriate vegetation in the landscape and in the urban setting must be valued as essential infrastructure and strategies for substantially increasing tree cover in both the private and public realms, are high priority to off-set the effects of greater urbanisation.

Can we imagine a preferred future for this region, rather than the inevitable one that only the wealthy can afford as fuel, energy and water becomes more and more expensive?

The Subtropical Cities conference 2006 was a chance to stand back assess gains and losses, celebrate the positives. It is a sensuous city – seeing Brisbane through Glenn Weiss' eyes helped us see it through the eyes of an outsider.

With its mild climate and its usually moderate rainfall, SEQ is currently well-placed amongst aspiring world cities to achieve low-energy, and low-water strategies in urban development. We don't have extremes to battle, yet we can be outdoors year round, provided we have adequate sun protection.

Green development works best when the developer's team spends more time on planning and design, and involves the community to create a common vision.

Design may take longer or cost a bit more up front, but in the end, the general public's interest in healthier living environments, improved indoor air quality and a growing awareness of the cost and scarcity of energy and water resources will all hasten the dialogue about environmentally responsible development.

The first subtropical cities conference was conceived to look at the question of how "Subtropical urbanism" can be achieved. "Subtropical urbanism" beautifully sums up our desire to inhabit a lively city which is environmentally responsible, where respect for the environment influences everything.

The Centre is focussed on design because design is about problem-solving with ingenuity, and about speculating on what can happen to bring about change.
The design professions have an important role to play in achieving the sustainable future we need to create.