User centric design: boon not bane

Professor Helen Lochhead
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human vs environmental needs
human + environment needs
ensure we solve problems that need solving
multiple agendas

thinking about the problem from every angle drives innovation
multiple benefits

1+1=5. The whole is much more than the sum of the parts
Designing for **impact**

**Ask the right questions**
- Question the brief
- Define or reframe the problem, What if...
- Identify real needs, priorities and opportunities

**Tools for understanding** motivations and priorities
- Listen and observe
- Fieldwork
- Research
- Technology- data collection and analysis, scenario modelling, decision support tools,

**Collaborate**
- Involve end users as active partners
- Think holistically
- Co-create, ideate, iterate, test, refine, deliver
4 case studies:

Focus on environmental + human benefits can deliver multiple benefits

- Indigenous Family Centres - Regional Australia
- Teacher Housing - Regional Australia
- Cycling - Sydney
- Urban Renewal - Sydney
Aboriginal Child and Family Centres
Gunnedah Family Centre, NSW, Australia
The brief
- 6 Aboriginal Child and Family Centres in regional Australia

The challenges
- 2008 Closing the Gap report
- To reduce Aboriginal disadvantage in health and educational outcomes
- Failure of previous one size fits all programs

The opportunities
- Collaborative design process - with Aboriginal architect and community
- Combining health + education agendas
- to achieve commitment and buy in from all the local community - Indigenous & non-Indigenous

The impact
- Family centre + community health + pre-school + after- school centre +++
- Record attendance - Fully enrolled with waiting list
- New community partnerships – use of local suppliers, skills and traditions
- A place of belonging for all
1 Community gathering deck under the tree
2 Childcare
3 Playrooms
4 Family Health
5 Clinic and training rooms
Teacher Housing

Flexible Housing model - Broken Hill, NSW, Australia
The brief
• 6 x 4 bedroom houses for school teachers using environmentally sustainable development (ESD) principles

The challenges
• Extreme heat
• Changing itinerant user group - teachers community was very varied!
• one size fits all solution - not a solution

The opportunities
• Understanding real needs, priorities
• Design competition to explore options - Flexible/adaptable housing model to suit different users

The impact
• 12 semi-detached houses - 4 types - 1x 4 beds or 2 x 2 beds, Type B: 1X 4 beds or 3 beds +1 bed
• ESD outcomes + full occupancy + flexibility + adaptability
• New housing model for all teacher housing in regional locations
DESIGN OPTIONS

TEAM 1
8 Houses
Central courtyard & two smaller courtyards to the street/house

TEAM 2
7 Houses
One long courtyard/house

TEAM 3
5 Houses
Two garden courtyards/house with two storey addition & central courtyard

TEAM 4
8 Houses
Two internal courtyards/house

TEAM 5
7 Houses
Two gardens/house

LESSONS LEARNT
• Courtyard house type - most suitable to Broken Hill
• Houses with high thermal mass most suitable to Broken Hill
• Houses can be grouped close together to increase thermal properties
• Rear laneway allows access to the rear of property & greater use of the whole site
• Possibility of the garages converting to breezeways.
PLANNING STRATEGY - ADAPTABLE & FLEXIBLE

- 2 HOUSE TYPES:
  - TYPE A · 2 X 2 BED
  - OR 1 X 4 BED
  - TYPE B · 1 X 3 BED
  - 1 X 1 BED
  - OR 1 X 4 BED

- Meets ADAPTABLE HOUSING CODE
- Garage doubles as extra living space
SITE STRATEGY
6 HOUSES / 12 DWELLINGS
6 x 4 bed dwellings
or
6 x 2 bed dwellings
3 x 1 bed dwellings
3 x 3 bed dwellings
**ESD ORIENTATION**

- Orientation of the house is important as it impacts on the sunlight. It face enters the house. The south facing orientation is recommended to achieve more energy. The western side should be setback to reduce the solar gain.
- Summer allows passive ventilation to provide cooling for living spaces and reduce ventilation from the sun. In summer:
  - NORTHERN SMALL FLOWERS - good solar screens
  - SOUTH FACING SLEEPING FLOORS - increase heat gain

**ESD COOLING & VENTILATION**

- **CROSS VENTILATION** through the house is essential. This is required to prevent the buildings being closed up to reduce solar gain and clear heat. In general, houses should be closed off during the day or the cool period of the day.
- **DAYTIME COOLING** using hot and cold storage
- **BUILDING'S** and **SLEEPING FLOORS** for exfiltration
- **EXCESSIVE HOT** reduces internal temperature by up to 2°C

**ESD MATERIALS**

- **Shade** from overhangs for living spaces. Thermal mass provides daytime cooling with minimal ventilation.
- **Cool or** for sleeping spaces for quick night-time cooling.
- **Common** on the ground for high thermal mass to maintain consistent internal temperatures.
ESD
LANDSCAPING & GREEN COVER

- Landscaping of external areas can absorb & manage stormwater. Hard surfaces in courtyard spaces trap heat & reflect light, whereas soft planting helps to stabilise temperature. Trees have the added advantage of providing shade to the building and courtyard while adding to the street character.
- Deciduous trees to allow sun access in winter and shade in summer.
- Plants chosen are drought tolerant, frost tolerant, and desert proof.
- Courtyards adjacent to living areas provide sheltered outdoor spaces. The close proximity of the houses limit the amount of direct sunlight penetration to the homes. Pergolas over the external doorways further reduce the amount of direct sunlight.
- 90% green cover to each property to reduce heat island effect.
- Fencing along the street front is open wire to allow air movement and reduce heat build up with in the courtyards. The fencing between houses is solid metal for privacy.
Teacher housing ‘going green’ in Broken Hill

By Rona Donaldson

The first teacher accommodation with a focus on environmental sustainability was officially opened in Broken Hill yesterday.

The Eco Village is made up of six four bedroom units and will help to attract teachers to Broken Hill, according to local MP John Williams, while reducing power costs and improving housing flexibility.

One of the architects behind the project, Helen Liston, says this is the first teacher housing of its kind in Australia.

"There are particular aspects," she said, "one is the environmental context and the other is the planning.

"Teacher housing is often about providing for households who are in the early years of their career, sometimes they’re young singles, sometimes they’re families and sometimes they’re blended families or empty nesters, so the housing provided needs to be adaptable and flexible."

She said the houses in the Eco Village can be made into a large range of configurations of one, two, or four bedroom homes, depending on need.
Commuter cycling

Sydney, NSW, Australia
The brief

• Increase commuter cyclist journeys to work in Sydney to decrease traffic congestion

The challenges

• Bicycling activity is low approximately 1% cycle to work in Sydney
• Roads are congested with little room for cyclists
• Low female ridership

The opportunities

• Collaborative design process - with cycling community
• Communicating Riderlog data with CityViz understandable to policy makers and planners
• Using Riderlog app to collect data and assist planning and place-making
• Improve air quality, population health, urban environment and user experience

The impact

• Rider and driver education: more women riders, more commuter cyclists
• Better safer, cycling infrastructure: to suit all users, more end of trip facilities
• Improved environment and air quality, cycling amenity and safety
CityViz – Making urban big data visible

CityViz is a new data visualisation and analytics initiative by City Futures capitalising on our unique access to urban big data for Sydney. Over the next few months a range of data will be presented on this site that will start to build a comprehensive and integrated visual depiction of our changing city.

To start, we have assembled new data on Sydney’s emerging housing market – affordability, strata development and our ‘million dollar property’ map.

In coming months we will be adding to and updating these data with new data on, for example, urban wellbeing, transport and bike use, health services and other newly available datasets. Watch this space!

City Housing Indicators

- Million Dollar Property Sales
- Strata Schemes of Sydney
- Sydney Housing Affordability Index

City Movement Indicators

- Cycling in Sydney
Uni pedals new data on divide in cycling

Matt O'Sullivan
Transport

Middle-aged men in Sydney, or MAMIs, are a familiar sight on Sydney’s roads and cycle paths, especially in the early mornings. But where are all the women cyclists? Until she finally decided to log a bike three years ago, Yvonne Poon harboured deep fears about the safety of cycling.

“I have had to reconcile with the fear,” she said. “It is a little bit hilarious because now I am preaching bikes, whereas before I was just so scared.”

The 35-year-old now cycles to work at Moore Park, in Sydney’s east, from Manly. She covers the 8.5 kilometre distance in about 25 minutes, five days a week, rain or shine.

A University of NSW study of data collected over four years has highlighted the gender divide on Sydney’s streets and cycle paths: only about a quarter of the people who bike up to 10 kilometres are women.

And the further the distance, the fewer the number of women on bikes. Of those who cycle between 5 and 10km, women comprise just 15 per cent.

Chris Pettit, the associate director of UNSW’s City Futures Research Centre, said the statistics showed that women chose safer routes with dedicated cycle paths, whereas men were more likely to divert from cycle paths and opt for their own routes.

“When the cycle paths end, so too do the female cyclists,” he said.

Professor Pettit said the solution to encouraging more women to cycle lay in improved infrastructure such as cycleways, end-of-trip facilities and information campaigns.

Apart from safety, Ms Poon said greater workplace pressures on Sydney’s physical appearance also made them less likely to cycle. They often had to carry more clothing, and needed a place to put on make-up.

“With the cost of living increasing and parking becoming more difficult, it’s just a lot of time that people are spending trying to get ready to go to work,” she said.

One of the other surprises from the data was the small number of cyclists aged between 18 and 25. They made up just over 2 per cent of riders.

Professor Pettit said it reflected the fact that cycling was often not a part of people’s psyche, and it took years before they considered cycling as a regular way to get around.

“A huge win for Sydney would be to get more families and kids on their bikes. There could be some great initiatives made here in increasing cycling numbers,” he said.

The data was collected between 2010 and 2014 from the mobile phone app RiderLog, developed by Bicycle Network. The app captures the location of a cyclist every two seconds, allowing for their movements to be mapped.

Professor Pettit will present the research at the university’s Smart Cities Symposium next Thursday.
Urban renewal
Harold Park, Sydney, NSW, Australia
The brief
• Increase dwellings for growing population

The challenges
• competing agendas- land owner/developer - $ city/state- housing policy, community/no change
• Development of open space
• NIMBYism - increased housing density, fear of high rise

The opportunities
• Collaborative planning process- tapping into community aspirations and priorities
• Maintaining open space
• Conserving the heritage
• Improving the ecology

The impact
• New high density, lower rise urban neighbourhood
• new parkland, heritage buildings conserved, ecology improved, affordable housing
3.0 DESIGN PRINCIPLES

Provide public open space & improved habitat

Minimise tall buildings

Provide a critical mass of housing

Create a framework that supports best practice ESD

Ensure the built form works with the topography

Provide more than 35% of the site for multi-purpose open space that links to the open space network running along Johnston’s Creek:
- Create a new open forecourt to the Tram Depot.
- Reveal the cliff edge on the Glebe side of the site.
- Create a biodiversity corridor that provides habitat for local species.
- Manage stormwater overland flows.
- Provide active recreation space (large playing field)
- Capture benefit of ‘up zoning’ and convert private open space into public open space.

Have due regard to the scale and character of the surrounding neighbourhoods and the site location on a valley floor:
- Minimise the number and prominence of tall buildings.
- Ensure that tall buildings relate to areas of appropriate public domain scale and high visual amenity.
- Avoid introduction of tower forms and buildings of greater than 8 storeys in height.

Provide a critical mass of housing and other activity in keeping with transit oriented development principles. A critical mass of more than 90 dwellings per hectare will support transport and services while meeting existing and future quantum and diversity of local housing demand.

Ensure that the future urban design framework supports:
- Adaptive reuse of heritage structures
- Energy efficient building design
- Water sensitive urban design
- Transit oriented development principles (including restraint on use of private motor vehicles and promotion of walking, cycling and use of public transport)

Design built form proposals to take advantage of the site’s unique topography.

The proposal should take advantage of the site’s location between the ridges of Glebe and Forest Lodge with one boundary defined by a dramatic cliff face and another frontage formed by a creek line and parklands beyond.
4.0 THE HAROLD PARK PLAN

Parkland design process

Street (and block) design process

Building form design process

90+ dw/ha = 3 to 8 stores + Planning to public transport + Height controls to minimize impact on adjacent properties + Proposed blocks = Initiative built form
4.1 Overview

The Harold Park Urban Design Study proposes that the site become an extension of the surrounding parkland network and urban fabric.

The study recommends that parkland occupy more than one third of the site (35%) and contribute over 3.5 hectares of public open space to the neighbouring parklands network. The new park will incorporate a forecourt for the historic Tram Depot and extend along the eastern side of the site beside the sandstone cliff enhancing the local habitat. It will create a new pedestrian and cycle connection to the Johnston’s Creek open space network and the extensive foreshore parklands to the north that extend around the bay.

The parkland will provide active and passive recreation opportunities including a new playing field, barbeque areas, playgrounds, community garden, a formal garden and heritage interpretation, play areas, habitat and water quality treatment.

The existing Tram Depot building which occupies more than 7,600 square metres will be retained and adaptively reused for community, retail and commercial uses. A landscaped forecourt and interpretive formal gardens will also be established to enhance appreciation of this significant heritage asset.

The street network will provide leafy tree lined streets and a high quality pedestrian and bicycle priority access network with significant water sensitive urban design elements. The street layout will maximise view lines both within the precinct and from neighbouring streets.

The residential precinct will occupy just over half of the site (55%) and will provide approximately 1,200 new dwellings including a proportion of adaptable and affordable apartments in buildings ranging from 3 to 8 storeys in height.

The building height strategy will keep new buildings generally at or below the level of the surrounding cliff top buildings. Taller buildings are located at the centre of the site to minimise impact on neighbouring areas.
Clay Cliff Creek Parklands is a proposal for expanding and revitalising Jubilee Park to form a much needed local recreational focus in Auto Alley.

Clay Cliff Parklands team

“The park attempts to address three major global challenges: food production, water management and heat island effects while at the same time providing exciting new local experiences.”
Adaptive reuse of tramsheds for markets
Low to midrise market housing + affordable housing
Places for children

Landscape

natural light + air

Low rise

lower energy costs

design quality

Diverse and affordable

livability

ground floor amenity

Communal spaces

Places for children

Landscape
multiple agendas

thinking about the problem from every angle drives innovation
multiple benefits

1+1=5. The whole is much more than the sum of the parts
impact +

broader application, potential to scale up – even greater impact