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User centric design: boon not bane

Professor Helen Lochhead
Faculty of Built Environment, UNSW Sydney

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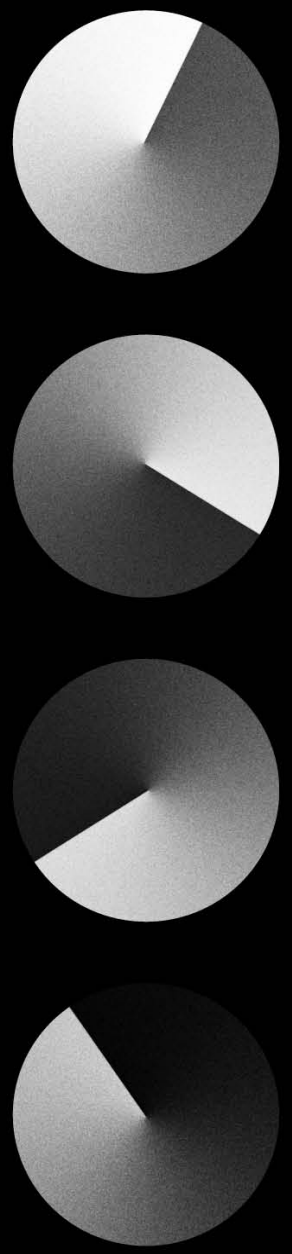


2018
10th GRIHA Exhibition, New Delhi
UNSW Sydney

human ~~vs~~ environmental needs

human + environment needs

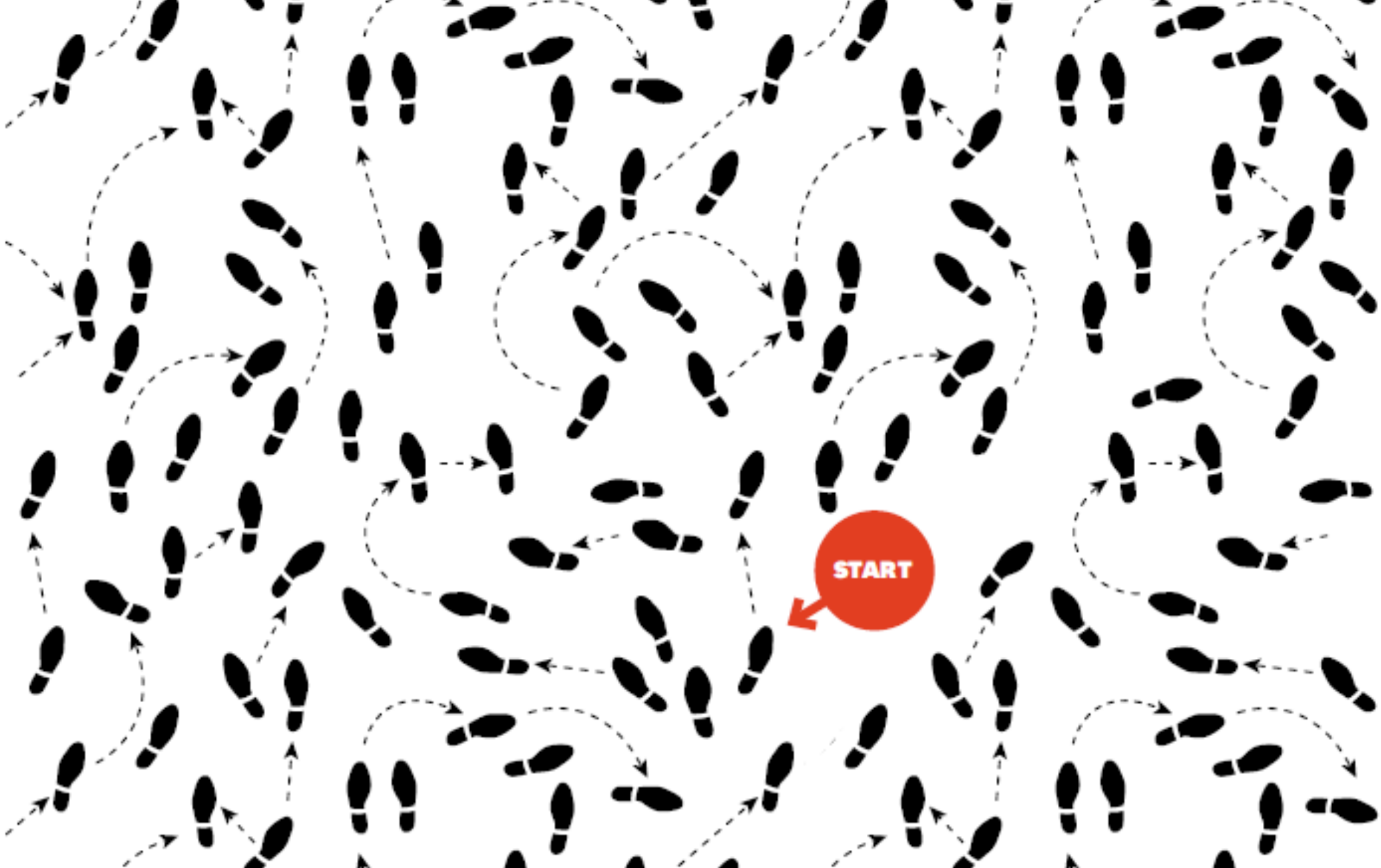
ensure we solve problems that <u>need</u> solving

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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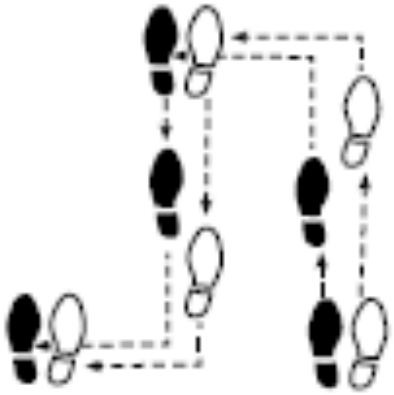

Designing for impact

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

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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

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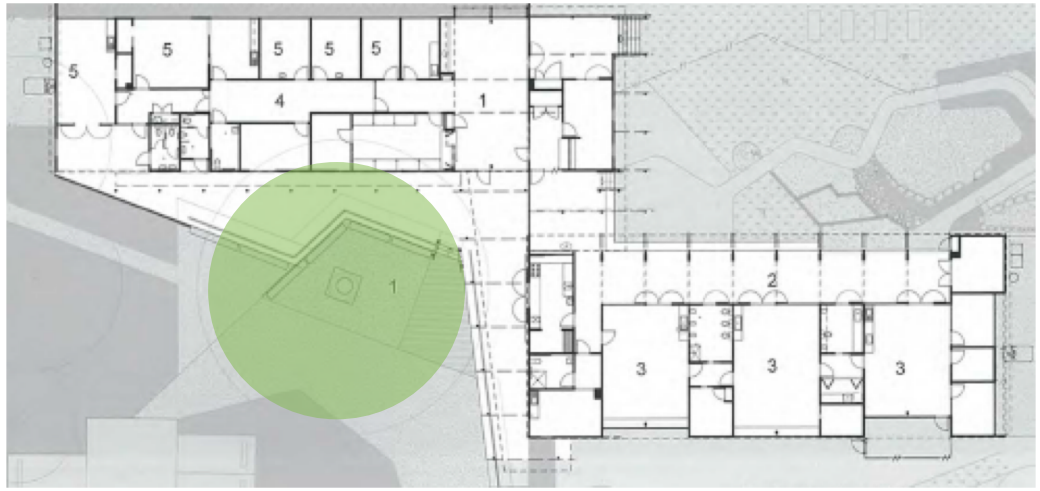

1 Community gathering deck under the tree
2 Childcare
3 Playrooms
4 Family Health
5 Clinic and training rooms


WELCOME


Welcome


KEEP WATCH


FIRE HOSE REEL

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

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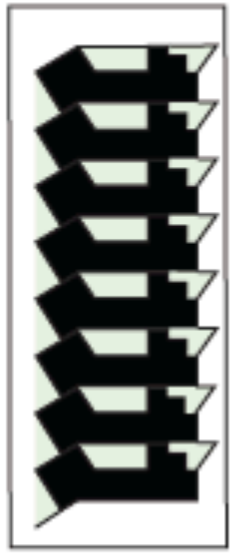
Nine Mile Rd
Wyman Ln
O'Neill St
Rasp St
Radium St
Uranium St
Hall St
Union St
Schlapp St
Tin St
Horsington St
Mann St
Phillips St
Warren St
Silica St
Buck St
Noonan St
Morgan St
Cummins St
Thomas Ln
Williams Ln
Chloride St
Brazil St
Bagot St
Silver St
McCulloch St
Chapple St
Hill St
Sturt St
Calcite St
Brown St
Finn St
O'Farrell St
Jones St
Allendale St
Albert Morris Ave
Wickes St
Marks St
Bromide St
Crystal St
Iodide St
Zinc St
Brookfield Ave
Long St
Wright St
Mica St
Wolfram Ln
Hynes St
Picton Sales Yard Rd
Wolfram St
Kaolin St
Smith St
Beryl Ln
Holten Dr
Newton Ln
Newton St
Pell Ln
Graphite St
Argent Ln
Crystal Ln
Pell St
Cornish Ln
Rowe Ln
Rowe St
Galena St
Lunam St
Creedon St
Cornish St
Harris St
Wills Ln
Wills St
Burke St
South Rd
Lawton St
Barrier Hwy
Gypsum St
Silver City Hwy
Eyre St
Menindee Rd


CUMMINS STREET
SULPHIDE STREET
MORGAN LANE

DESIGN OPTIONS



TEAM 1

8 Houses

Central courtyard & two smaller courtyards to the street/ house

TEAM 2

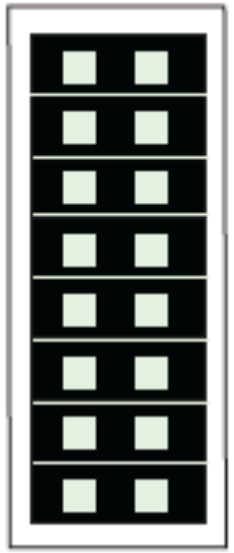
7 Houses

One long courtyard /house

TEAM 3

5 Houses

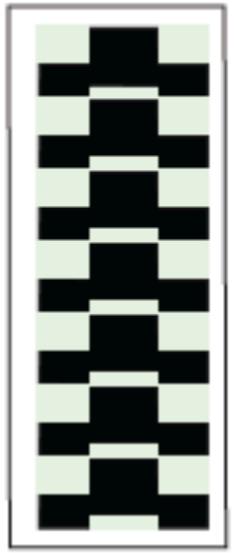
Two garden courtyards/ house with two storey addition & central courtyard



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.

FINAL SCHEME

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

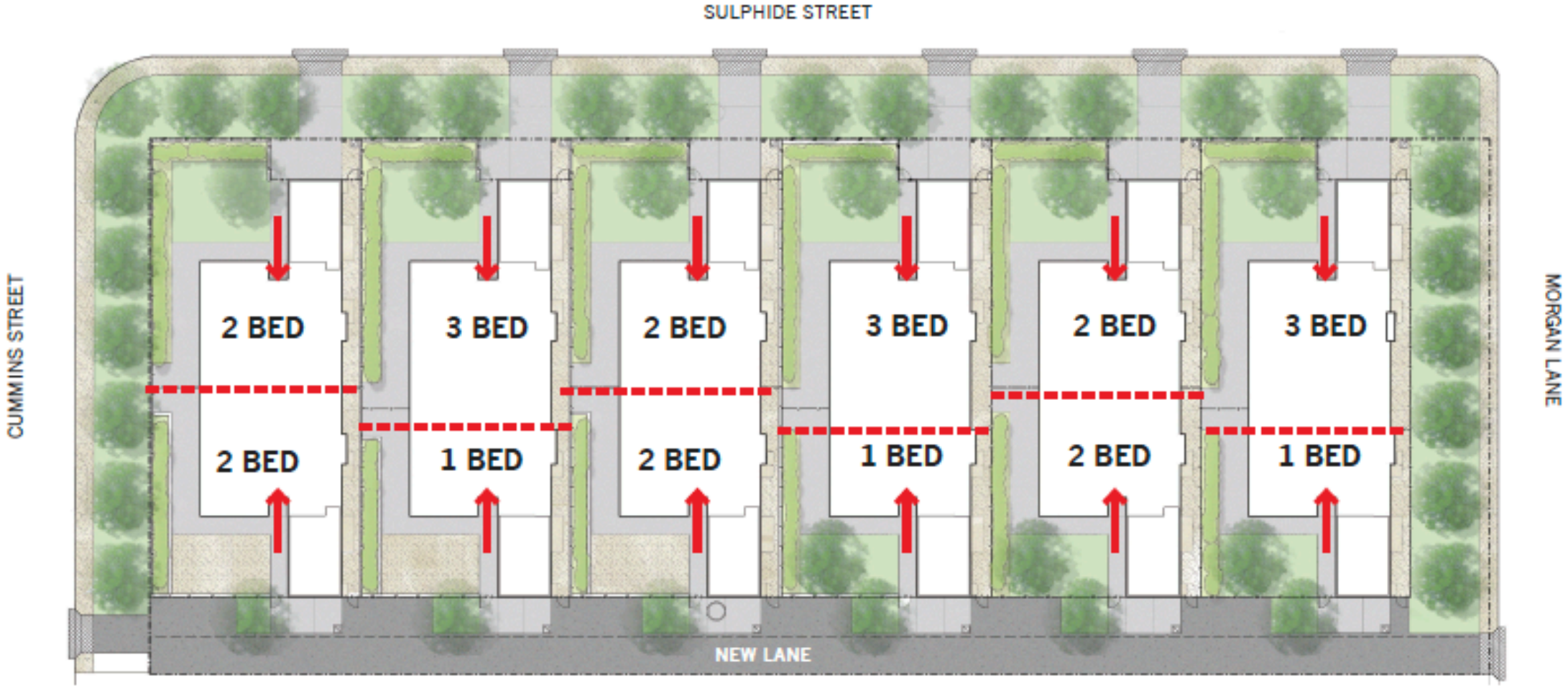
6 x 4 bed dwellings

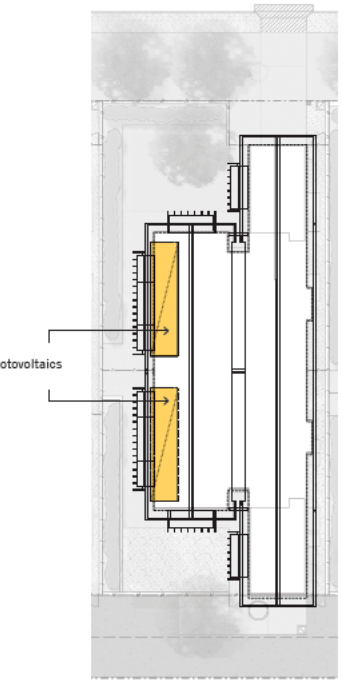
or

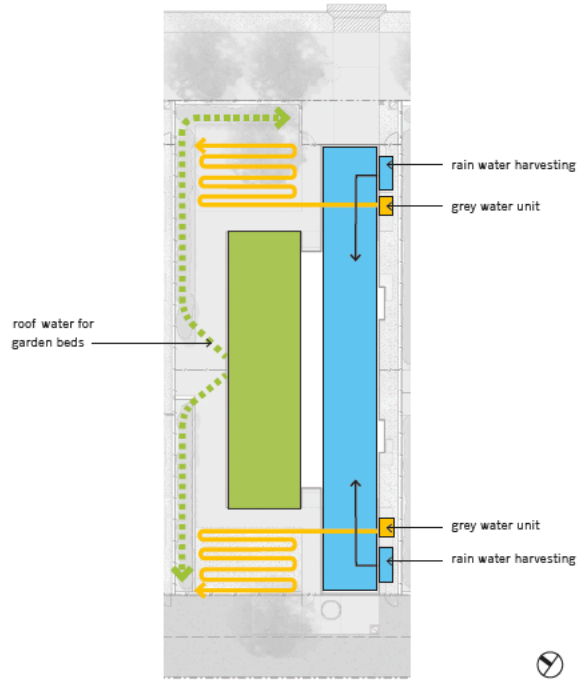
6 x 2 bed dwellings

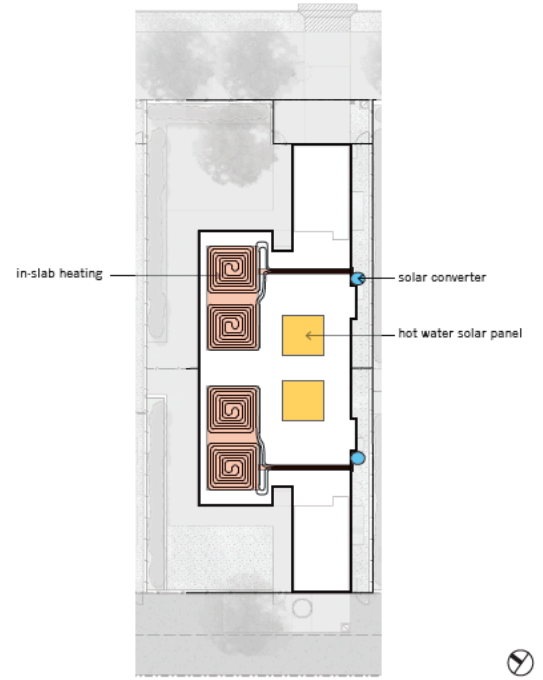
3 x 1 bed dwellings

3 x 3 bed dwellings



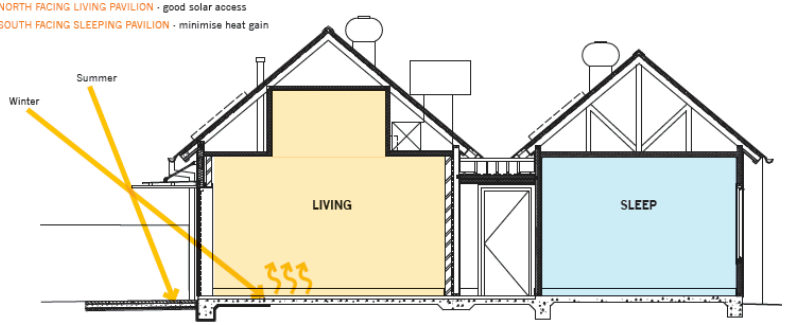






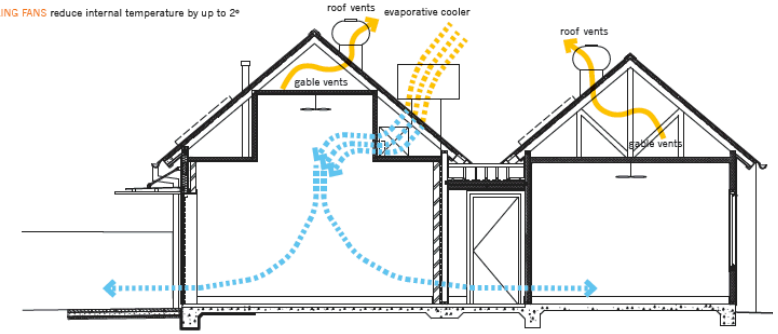
ESD
ORIENTATION

- Orientation of the houses is important as it impacts on how sunlight & heat enters the house. The north facing orientation is controllable & therefore more desirable. The western orientation should be avoided in summer as the suns rays are horizontal & openings are difficult to shade with overhangs. In general unprotected openings outside should be kept to a minimum.
- Sunhood allow solar penetration in winter to warm living spaces and provide protection from the sun in summer and prevent heat gain
- NORTH FACING LIVING PAVILION - good solar access
- SOUTH FACING SLEEPING PAVILION - minimise heat gain



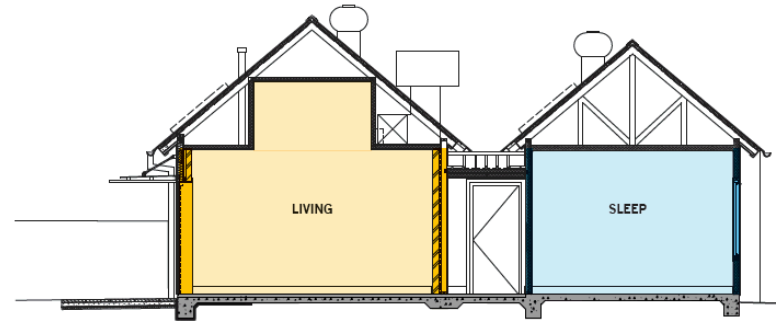
ESD
COOLING & VENTILATION

- CROSS VENTILATION through the house is desirable. However, it is important that the buildings can be closed up completely in case of dust storms and high winds. In general houses should be closed off during the day to prevent the build up of heat and opened up at night, when the temperature falls to allow the house to cool down.
- EVAPORATIVE COOLING suitable for hot arid climate
- ROOF VENTS and GABLE VENTS for airflow in roof space
- CEILING FANS reduce internal temperature by up to 2°



ESD
MATERIALS

- Reverse brick veneer for 'living pavilion': thermal mass provides daytime spaces with climate barrier with small opening to outside, to reduce radiant heat build up.
- Single skin for 'sleeping pavilion' for quick night time cooling
- Concrete slab on ground for high thermal mass to maintain constant 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.
- 30% 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.


Golden Rain Tree


White Cedar


Western Australian Red Flowering Gum


'White Anzac' Bottlebrush


Emu Bush


Geraldton Wax Flower


'Little Jess' Flax Lily


Lomandra Tanika


Happy Wanderer


Bower of Beauty


Convolvulus

ABC Broken Hill visit another location

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13 July, 2012 9:40AM ACST

Teacher housing 'going green' in Broken Hill

By Noah Schultz-Byard

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 improve housing flexibility.

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

"There's two particular aspects," she said, "one is the environmental credentials and the other is the planning.

"Teacher housing is very much about providing for teachers who come to the bush, 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 at the Eco Village can be made into a large range of combinations of one, three or four bedroom homes, depending on need.

Related Photos

Murray Darling MP John Williams cuts the ribbon to open the state's first 'green' teacher housing (Noah Schultz-Byard - ABC Local)

Map Broken Hill 2880

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- Lifestyle
- **Sustainable Living**
- Automobile Enthusiasm
- House And Home

Latest videos

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- Dust storm in White Cliffs
- Dust storms in far west NSW
- Final piece of pipeline in place
- Phil McDonald's epic penny

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

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Grieve Pde
LEFT LANE

City Analytics CFRC

Professor Chris Pettit, Simone Leao

CityViz

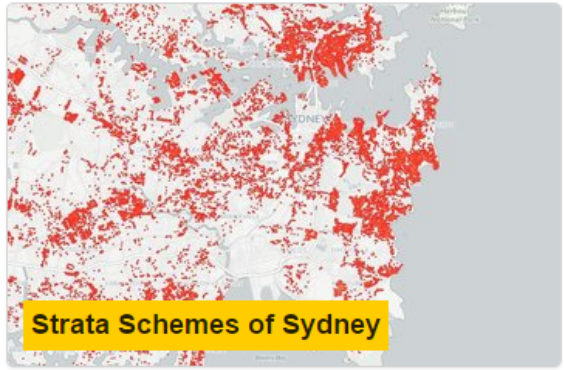
CityViz – Making urban big data visible

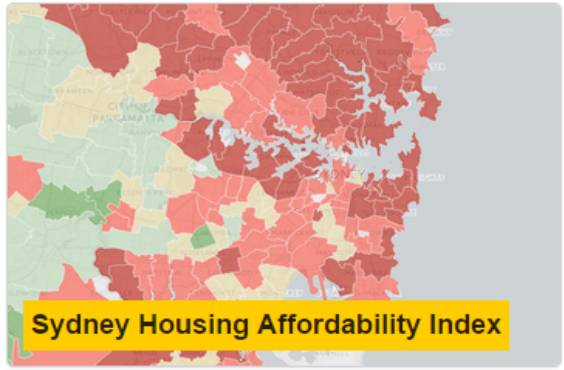
CityViz is a new data visualisation and analytics initiative by City Futures capitalising on our unique access to urban big data for Sydney. Over the next few months a range of data will be presented on this site that will start to build a comprehensive and integrated visual depiction of our changing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

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

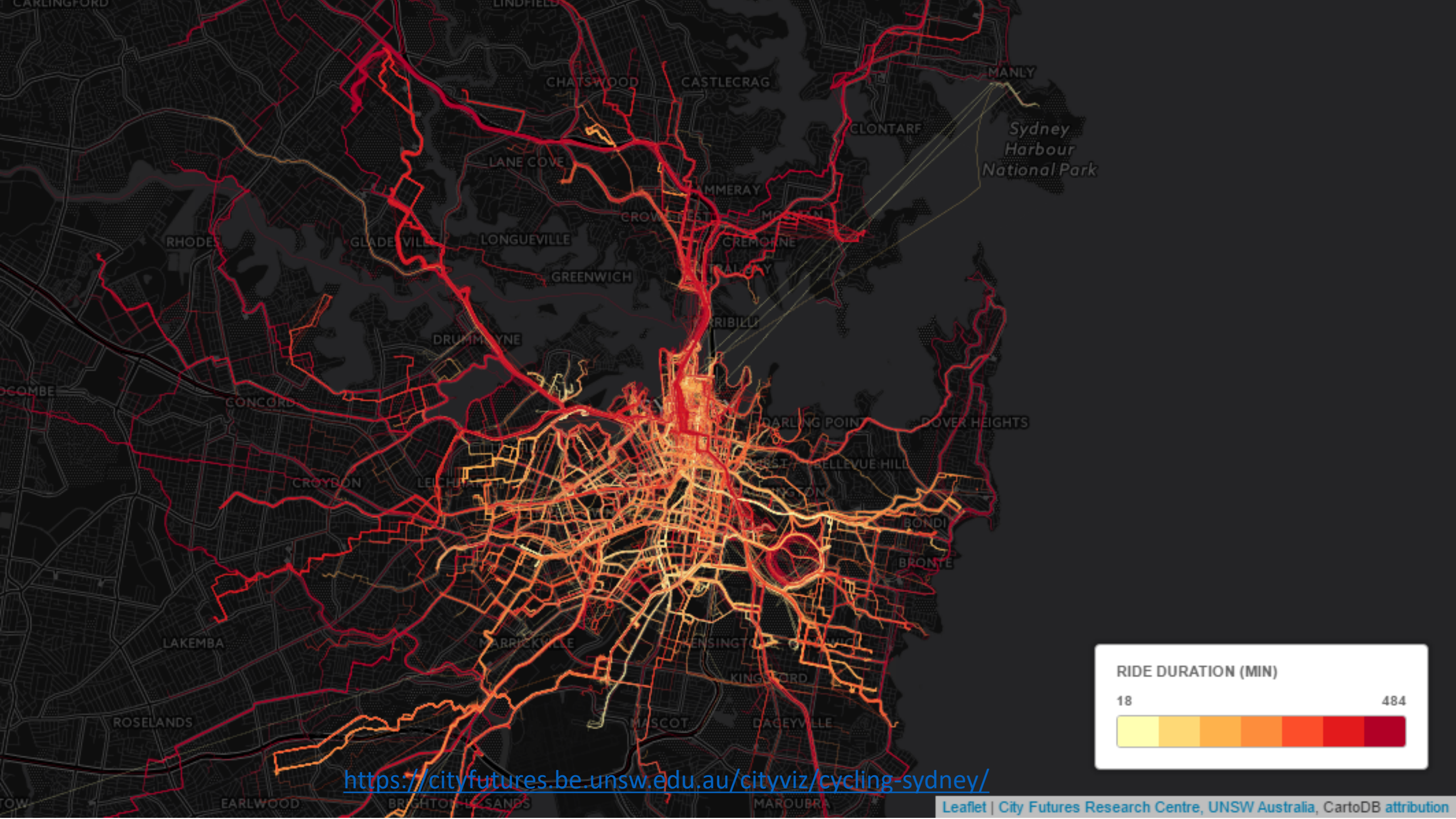
In coming months we will be adding to and updating these data with new data on, for example, urban wellbeing, transport and bike use, health services and other newly available datasets. Watch this space!

City Housing Indicators

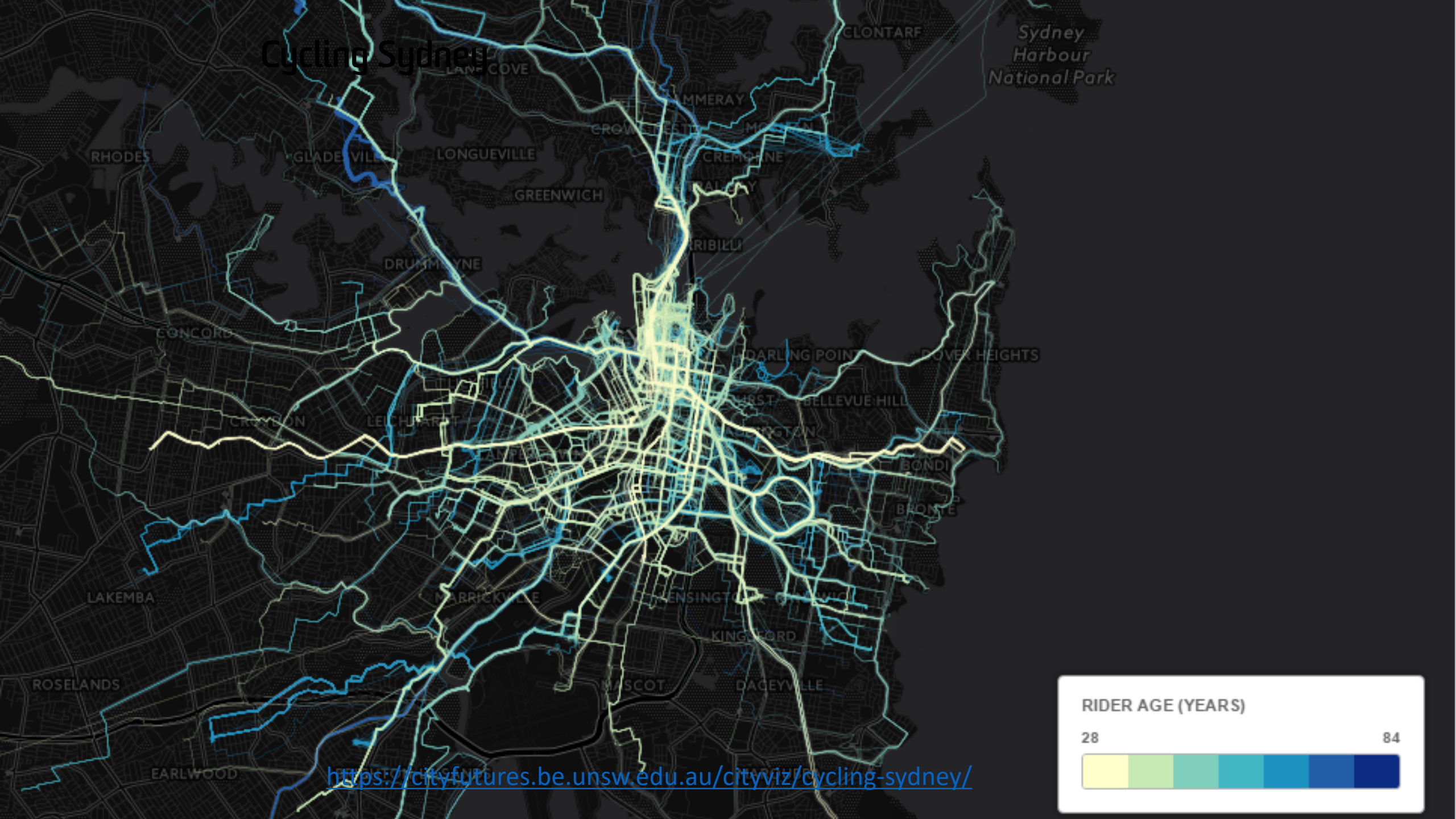




City Movement Indicators


CARLINGFORD
LINDFIELD
CHATSWOOD
CASTLECRAG
MANLY
CLONTARF
Sydney Harbour National Park
LANE COVE
MMERAY
CROWS NEST
MOSMAN
RHODES
GLADESVILLE
LONGUEVILLE
CREMORNE
GREENWICH
DRUMMOYNE
CONCORD
DARLING POINT
DOVER HEIGHTS
BELLEVUE HILL
CROYDON
BONDI
BRONTE
LAKEMBA
MARRICKVILLE
KINGSFORD
ROSELANDS
MASCOT
DAGEYVILLE
EARLWOOD
BRIGHTON-LE-SANDS
MAROUBRA
RIDE DURATION (MIN)
18
484
https://cityfutures.be.unsw.edu.au/cityviz/cycling-sydney/
Leaflet | City Futures Research Centre, UNSW Australia, CartoDB attribution

Cycling Sydney



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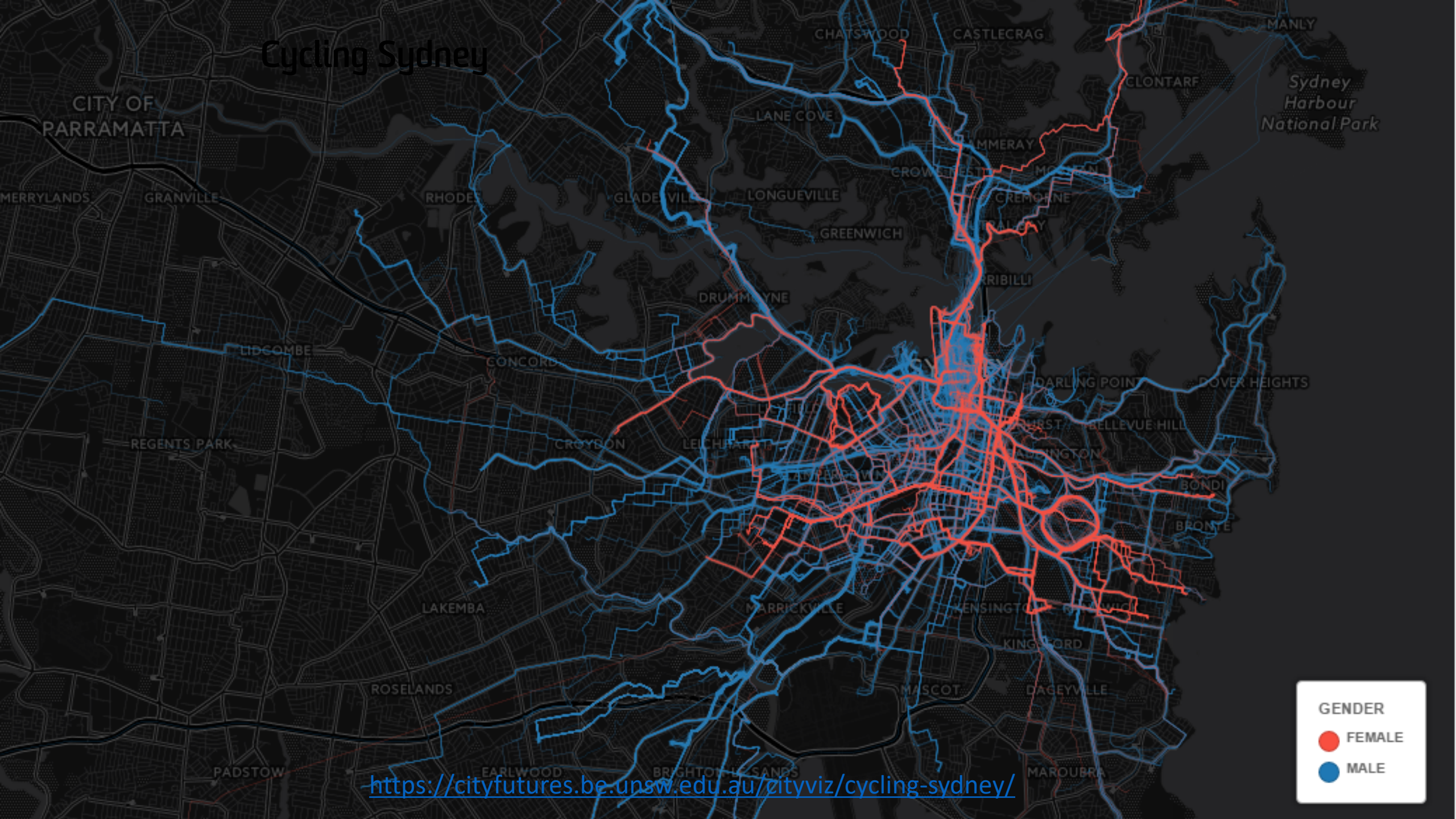
Cycling Sydney



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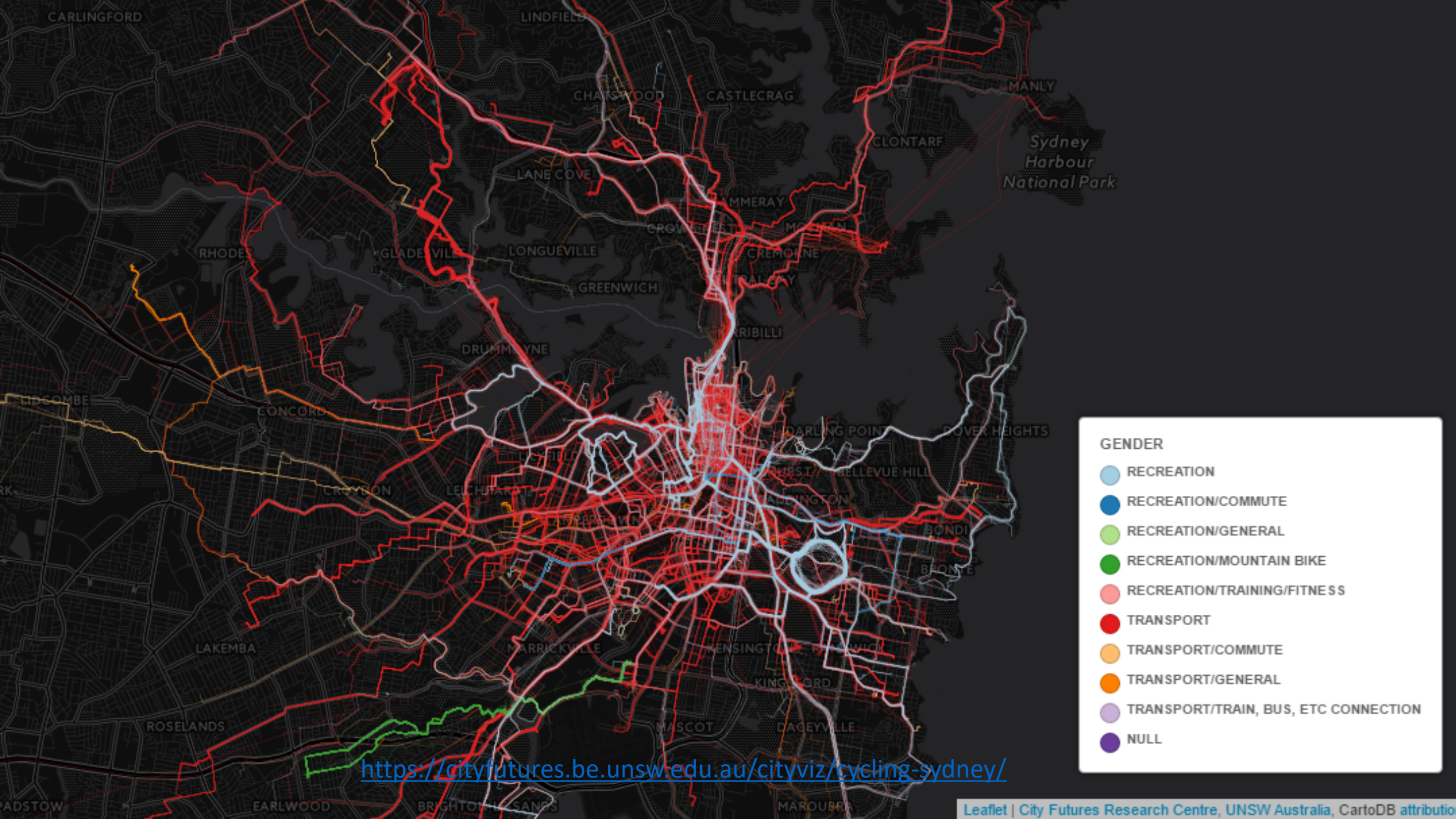

https://cityfutures.be.unsw.edu.au/cityviz/cycling-sydney/

Fear factor on roads

Uni pedals new data on divide in cycling

Matt O'Sullivan
Transport

On track: Yvonne Poon, who had a fear of cycling, now rides to work from Maroubra to Moore Park. Photo: Peter Rae

Middle-aged men in lycra, or MAMILs, 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 buy a bike three years ago, Yvonne Poon harboured deep fears about the safety of cycling.

"I have had to reconcile with the fear of it," 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 Maroubra. She covers the 8.5 kilometre distance in about 25 minutes, five days a week – rain or sunshine.

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 five kilometres are women.

And the further the distance, the fewer the number of women on bikes. Of those who cycle between 5lkm 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 route.

"When the cycle paths end, so too do the female cyclists," he said. "It comes down to the fact that women are more safety conscious than men."

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 women's physical appearances also made them less likely to cycle. They often had to carry more clothing, and needed a place at work to put on make-up.

"There is a lot of fear about judgment because cycling in Sydney is still seen as a sports activity. We haven't quite moved to a culture of using bicycles as a form of transport."

Ms Poon, a member of BIKEast, said more women were cycling but Sydney still had a long way to go before it mirrored cities in Europe, where there was a more even gender split.

"I probably know most of the women who cycle in Sydney because it's such a small group," she quipped.

"But I think it is changing. The benefits outweigh the scary parts for me."

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 inroads 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.

Image Source: City of Sydney

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

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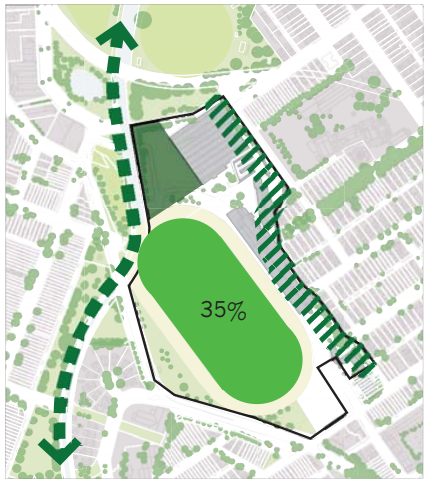
Harold Park, Rozelle Bay, Sydney


3_THINKING BIG
THE REGIONAL PLANNING APPROACH

3.0 DESIGN PRINCIPLES

Provide public open space & improved habitat



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.

Minimise tall buildings

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

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.

Create a framework that supports best practice ESD

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)

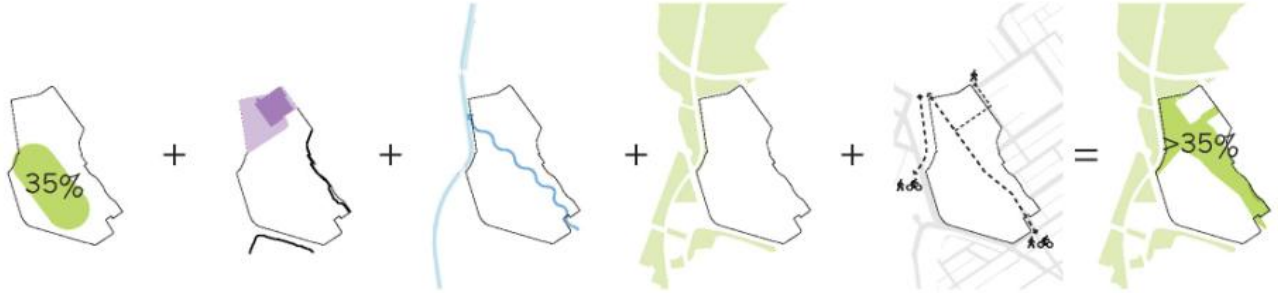
Ensure the built form works with the topography

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

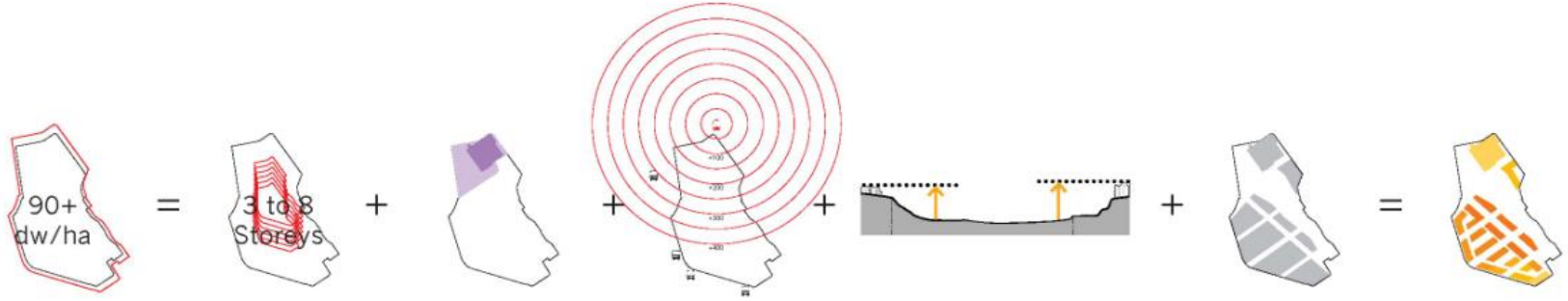


Strategic open space provision | Tram Depot Curtilage & unique cliff elements | Flood overland flow path | Adjacent parkland network | Pedestrian and bicycle desire lines | Proposed parklands

Street (and block) design process

Surrounding street network | Pedestrian and bicycle desire lines | Proposed view corridors | Proposed parkland and overland flow | Proposed street network | Proposed blocks (development zones)

Building form design process



Strategic dwelling target | Gross floor space stacked | Tram Depot Curtilage | Proximity to public transport | Height controls to minimise impact on adjacent properties | Proposed blocks | Indicative built form

4.0 THE HAROLD PARK PLAN

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.

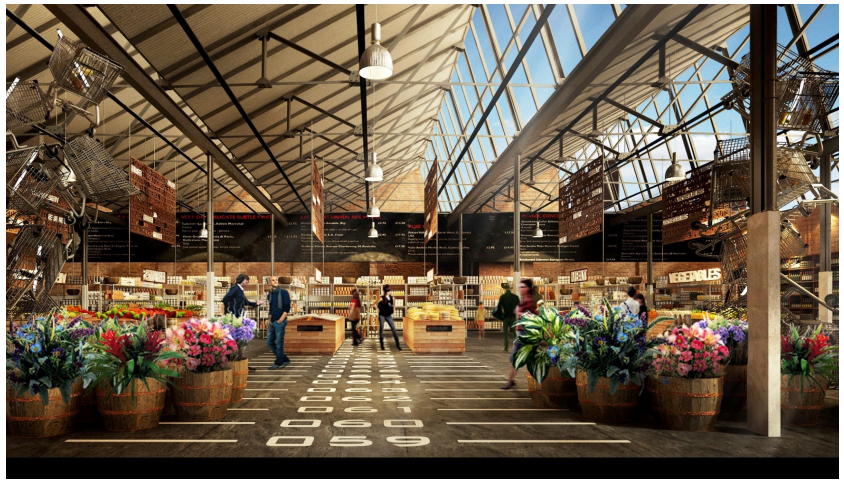
The **residential precinct** will occupy just over half of the site (55%) and will provide approximately 1,200 new dwellings including a proportion of adaptable and affordable apartments in buildings ranging from 3 to 8 storeys in height.

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


Low rise
natural light + air
lower energy costs
design quality
Diverse and affordable
livability
ground floor amenity
Places for children
Communal spaces
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