

# REVIEW OF NATIONAL & INTERNATIONAL LOW CARBON PRECINCTS

## Research Question

The global ecological crisis, population growth and finite resources have forced a global rethink of cities, Australia's large and rapidly growing cities are no exception and optimisation will require radical redesign. Looking at successful sustainable precincts this research asks:

1. What component parts/systems enable optimal urban metabolism?
2. What policies/processes can facilitate market acceptable (politically/ financially viable) design and delivery?
3. Can replicable models deliver sustainable or even regenerative (biosphere repairing) Australian cities?

## Methodology

Research draws upon urban metabolism as a way to understand regenerative design in cities. While many technological solutions exist policies and public acceptance are critical to drive change. Therefore a case study approach has been chosen to understand how best practices have been implemented in successful projects. A scoping study of 70 precincts identified many exemplars from which key lessons have been gleaned.

## Results

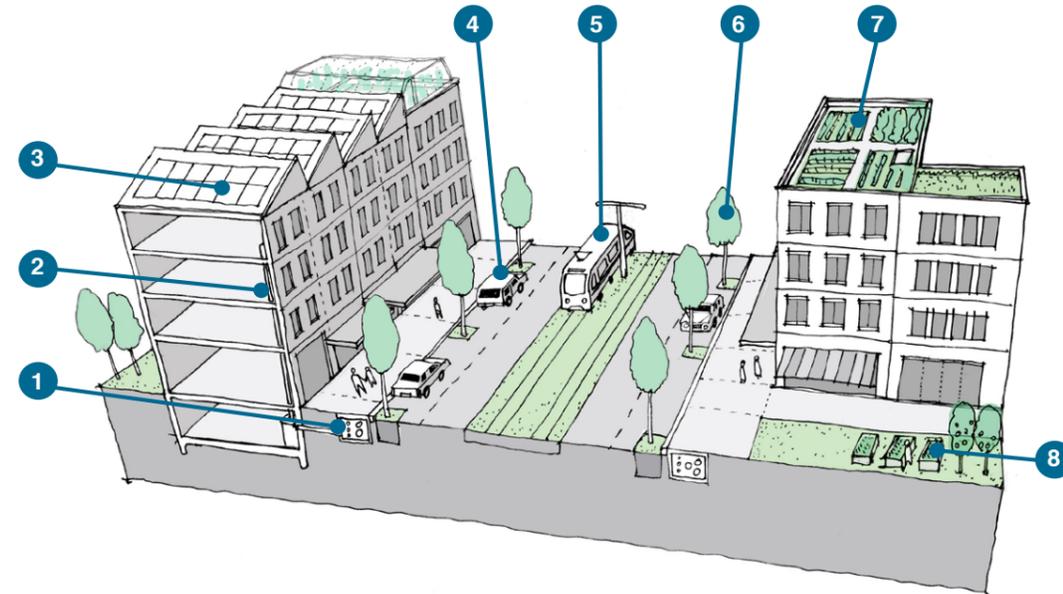
Case studies demonstrate that precinct scale (re)development allows for optimisation of urban fabric and urban services;

designed well they can deliver high quality of life; and with good governance they can deliver continuous improvement.

- **Urban Fabric:** co-location of higher density (residential, commercial and social infrastructure) with transit reduces city-wide transport emissions, density thresholds enable business cases for eco-infrastructure (eg. Tri-generation, transit, ecosystem services).
- **Urban services:** An integrated precinct scale redevelopment can optimise the energy, water, waste and food nexus.
- **Lifestyle and Governance:** Higher rates from higher density provides greater revenue to support on-going management of lifestyle enhancing services such as multi-function open spaces, eco-infrastructure, and social infrastructure (eg. Community spaces, schools, urban agriculture).

Figure 1, illustrates a few policy considerations that can reduce urban metabolism while improving liveability

- |   |  |
|---|--|
| 1 Combined Services corridor (Water, district heating/ cooling, waste vacuum, broadband, electricity etc.)  | 4 Parking district revenue (to fund public realm improvements and green streets) |
| 2 Demand management (eg. Highly efficient thermal envelopes) combined with distributed infrastructure (eg. trigeneration heating/ cooling) (to reduce energy emissions) | 5 Value capture from density uplift (to fund light rail)                         |
| 3 Community Solar on 'Solar-ready roofs'  | 6 Eco-systems services (to mitigate UHI etc.)                                    |
|   | 7 Green Roofs (to insulate buildings and reduce stormwater infrastructure)       |
|   | 8 Urban Agriculture policy (to reduce food miles).                               |



## Conclusions

Radical city redesign in Australia requires:

**Densification:** Higher density provides multiple benefits for decarbonising urban developments and when done well can improve living standards.

**Strong leadership:** Successful low carbon precincts are well designed and well managed.

**New business models:** business cases must justify transition to sustainable precinct delivery which is often deemed more expensive than conventional development.

**New governance models:** Co-ordinated precinct scale governance (where there is more than one owner) is typically absent in Australian cities due to a policy vacuum, falling outside the remit of state or local government, so new policy frameworks will be required along the lines of Quangos, Development Corporations, Sustainability Management Associations or BIDs found in other countries.

## Anticipated impacts

This research will benefit city stakeholders interested in sustainability including policy makers, developers, urban planners and allied professionals, but it has an intrinsic relevance to the broader community.

Optimising urban metabolism requires integrated policy bundling across urban scales; ideally, policies will support entrepreneurial models for precinct governance.

## Contact

Giles Thomson, Curtin University  
gilesrthomson@gmail.com