

A detailed architectural model of a city or urban development, featuring various building forms, courtyards, and streets, rendered in a light, neutral color palette against a dark background.

SCULPTURE URBAN LAB



Lab Overview

The RMIT Super Urban Lab explores ways of rethinking cities through architectural and urban design.

The lab uses design processes to model and test the implications of economic and social forces on urban development and to speculate on the form that these forces can take.

We pursue both experimental and applied design research through industry partnerships. We aim to impact on real questions facing cities now and in the future.

The lab is committed to the position that reducing the footprint by redesign has numerous benefits for 21st century cities. We work closely with project partners to understand what urban innovations are to transform their business and confront real problems.

We collaborate to develop techniques to combine design, data and policy, translating these to strategies with value to industry.

← Making Vietnam explored the re-integration of manufacturing into the urban life of Ho Chi Minh City



Research Aims + Values

Our design research aims to unlock the value in cities and relies on looking at cities more closely than conventional planning. A key focus of the lab is exploring the benefits of intensifying urban space - making it more productive, efficient, liveable, desirable, greener and less lonely. The lab's design research aims to overcome the opposition between development and planning.

The lab's research engages a series of trajectories each focused toward tighter cities. These trajectories combine through collaborative design projects to demonstrate the potential of a particular focus. The lab is part of the RMIT School of Architecture and Urban Design and is led by Dr John Doyle and Dr Graham Crist - both deeply engaged in design research at architectural and urban scales.

← Making Vietnam



Research Areas + Value Propositions

The Super Urban Laboratory develops new building and urban models that allow for more people to live, work and make close to one another, while reducing our demand on land, resources and energy. Over the last 10 years the lab has produced a series of projects with public and commercial partners, demonstrating the social, environmental and economic benefits of urban density.

The lab specialises in the use of scenario based urban research in which future buildings and urban environments are rapidly modelled and analysed to accurately understand the implications of commercial and government decisions. By rethinking and redesigning everything from the bottom up, the lab generates new opportunities and value in cities.

Current research includes a series of demonstrator projects with public and commercial partners to that evidences the economic opportunities in high density urban models.

↑ Life Saving Victoria



New Urban Economies

Super Urban lab has developed a series of projects exploring the integration of manufacturing and agricultural production into cities, and the development of new building typologies for high intensity urban production. This research has been tested through demonstrator projects in Australia, Vietnam and Hong Kong SAR.

←
Future Food Melbourne



High Density Low Carbon

The lab is developing research that reveal how compact cities and tightly planned architecture can significantly contribute to a reduction in greenhouse gas emissions. This includes case studies and design models that demonstrate how existing technologies and buildings can be intensified and used more effectively to minimise the up front and operational energy requirements of cities per capita.

←
Low Carbon Density Wyndham



Desirable Density

We have undertaken research that establishes value propositions for urban density. Described through international and local case studies and design projects, these highlight the desirable qualities of living and working closely together. By rethinking and redesigning from the bottom up, the lab generates new opportunities and value in cities. Current research includes demonstrator projects with public and commercial partners that evidences the economic opportunities of high density urban models.

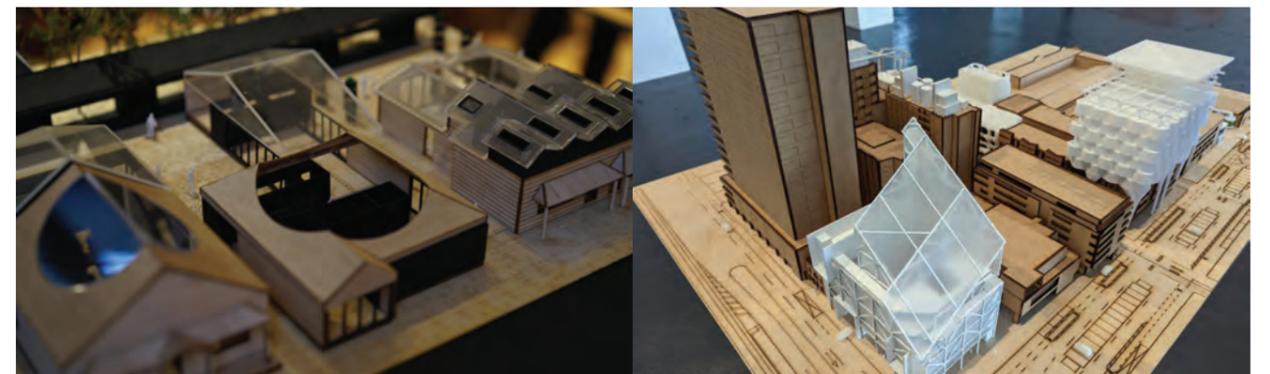
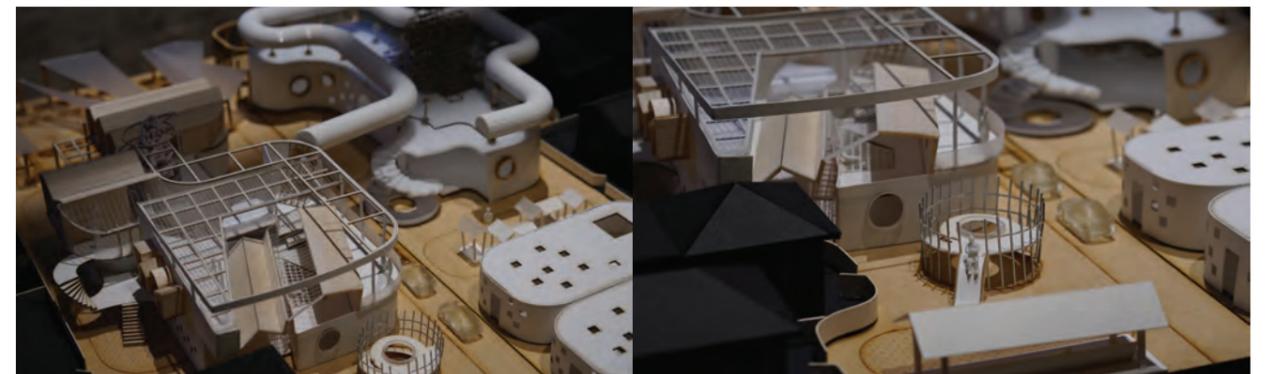
←
Supertight Exhibition 2019



Manifold Building Models

The lab has completed projects exploring the design of buildings for future industries and economies. This includes industry 4.0 vertical, high-density manufacturing facilities; vertical high-density agriculture; facilities for users with extreme needs; public buildings in extreme environments; distributed buildings that replace city infrastructure. We specialise in designing 'supertight' building models that combine multiple uses within single compact footprints.

←
Advanced Manufacturing Facilities

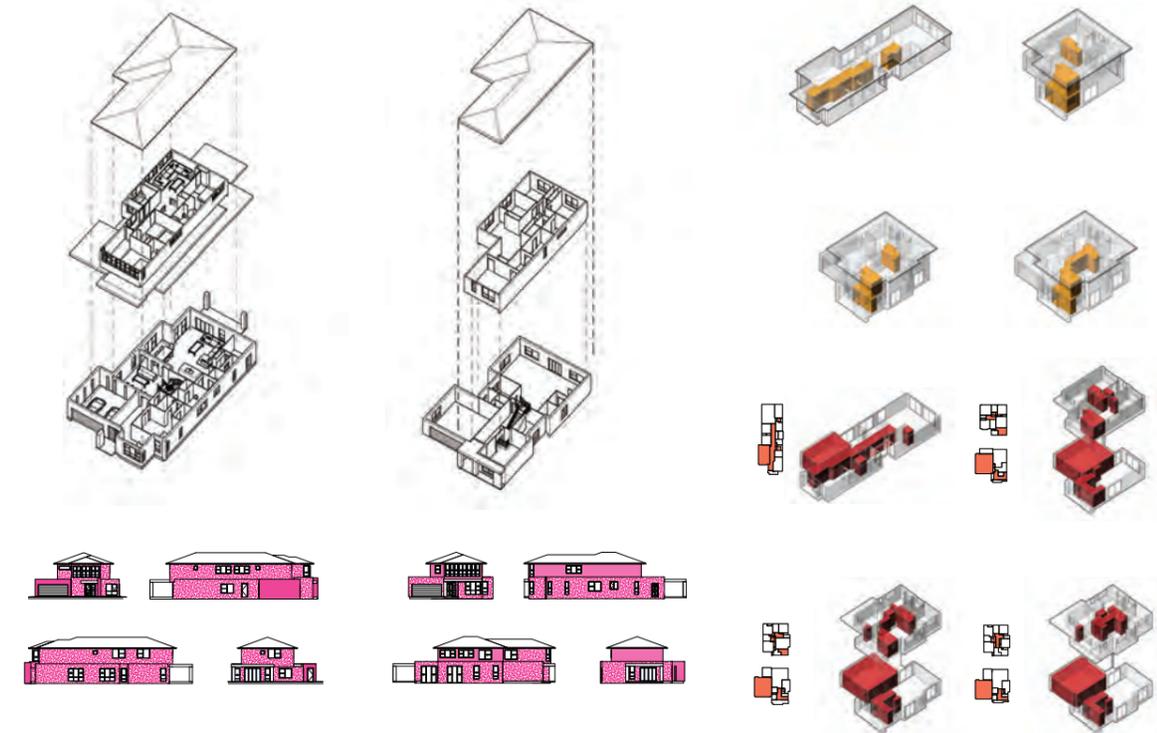


Mini Living

Ian Nazareth

This project was a studio-based research project carried out in partnership with Mini. The project explored the relationship between mobility, energy, and density in urban environments. Initiatives involve strategically retrofitting high-density city blocks to integrate renewable energy, enhance self-sufficiency in food and energy production, and experiment with innovative material processes, while prioritizing pedestrian spaces and sustainable

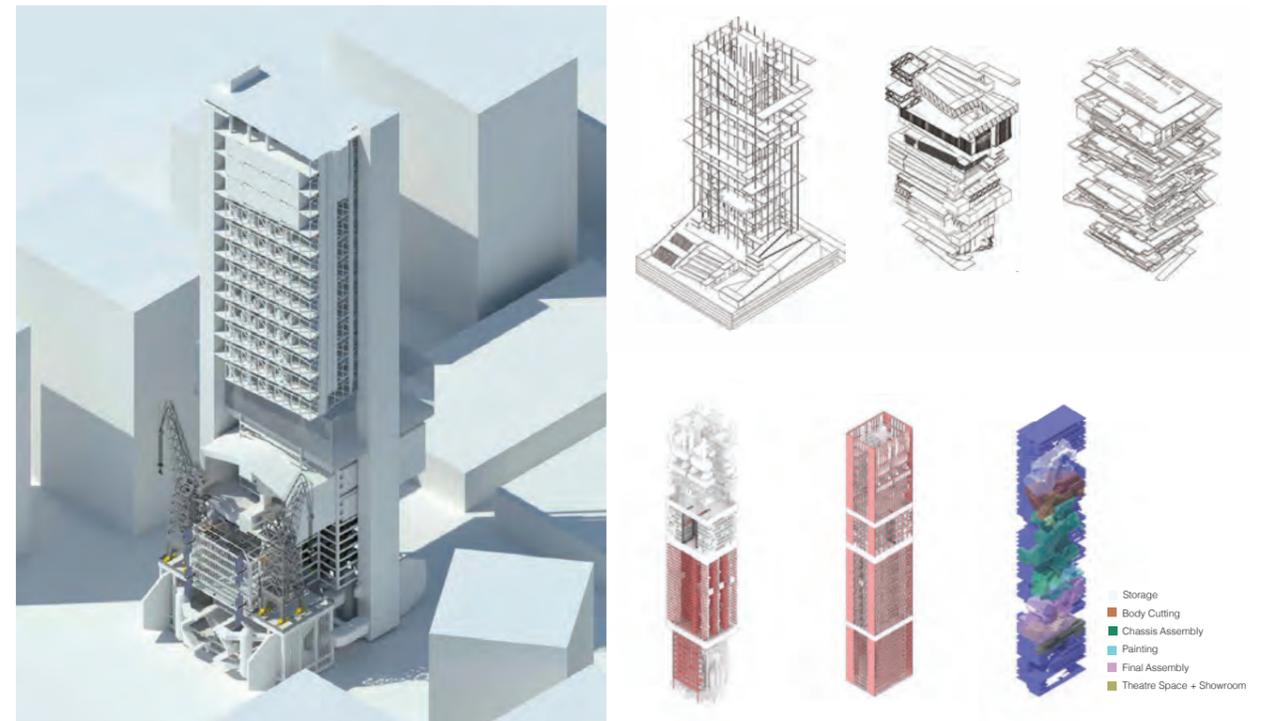
mobility. Suburban projects recognise the potential of evolving blocks for collective engagement and transforming communities. The outcome of the project was a series of exemplar urban precinct designs that offer solutions for housing affordability, land regeneration, and community building at various scales to create a socially sustainable and adaptable built environment.



Porter Davis
Ian Nazareth

This project was a commercial design research engagement in partnership with Porter Davis. The project addresses the future of housing in Australian cities. Focused on quantity and quality, it explored innovative dwelling types integrating sustainability, buildability, and building services. With architects contributing minimally to housing, the project sought

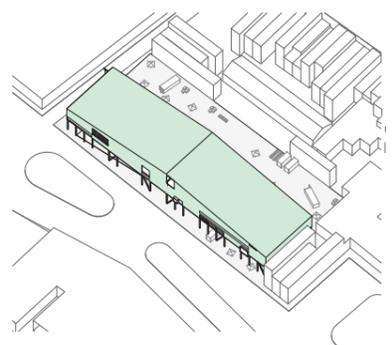
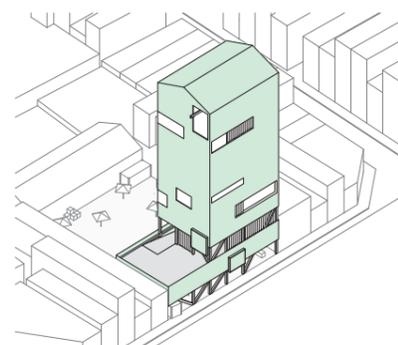
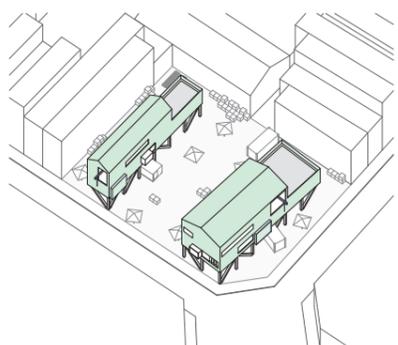
to channel design rigor into the volume housing industry, challenging prevailing models through disruptive design ideation. The outcome of the project was a series of design prototypes that create flexible, adaptable, and sustainable homes responsive to changing demographics and economic trends.



Medini Iskendar Factories
John Doyle

This project was a speculative research project carried out in partnership with Medini Iskendar, Malaysia's largest single urban development in Johor Bahru. The project explored the design advanced manufacturing facilities and vertical factories for the development, speculating that a

vibrant city must be dense and must include production as a component of its urban fabric. The outcome of the project was a series of design prototypes for future vertical manufacturing facilities.

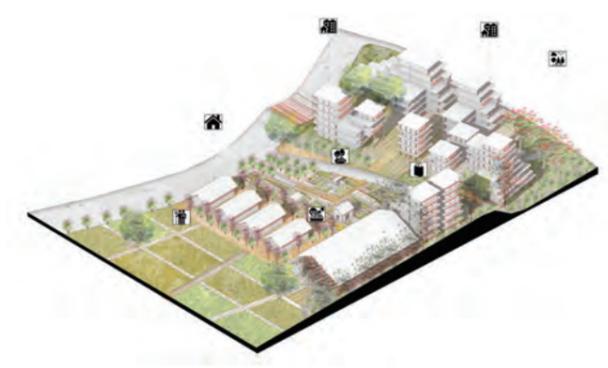
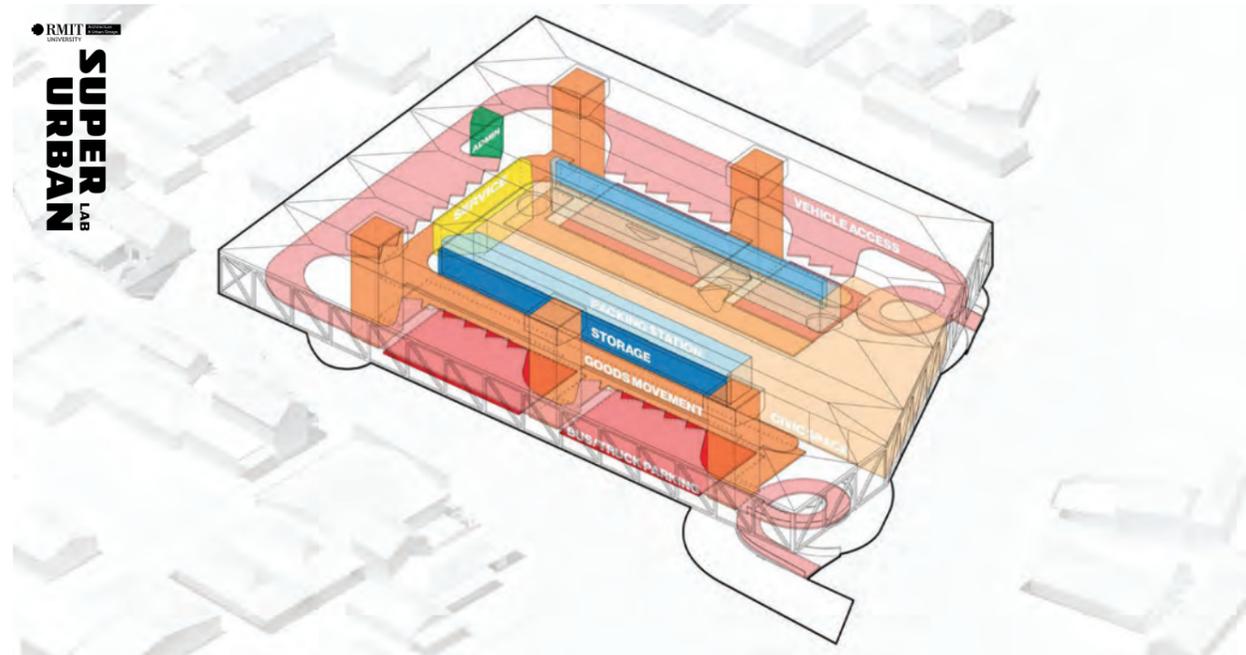


Making Vietnam

Graham Crist

Vietnam is a growing economic centre of global manufacturing with a parallel tradition of small scale workshop production. This project seeks to re-integrate medium scale production with urban form. To this end we developed and modelled a series of urban types aimed at inserting industry into cities. This included mixing housing with

workshops, and using building to shield gardens from factories. Amplified the vibrant urban market culture by developing flexible big roof models as well as infill models between the street and the big box factory. Together these aimed to counter the tendency to separate production from urban life in the Vietnam context.



Indonesia Logistics Hub

Ben Milbourne & John Doyle

This proposal explores the design of a network of small-scale decentralised community infrastructure hubs in Central Java, Indonesia. The project was carried out as a part of the Metro Java 2045 project in partnership with the Dynamic Cities Foundation and UTSEUS (Shanghai University). The project identified a series of critical node points in the peri-urban desakota landscape of Central Java where small-scale rural production connects

to the national transit network. In contrast to capital intensive infrastructure upgrades, the project proposes a series of architectural scale logistics hubs that allow rural enterprise to access global markets. As an outcome the project produced a series of design prototypes that could be implemented in towns and cities across Indonesia.



Life Saving Victoria
John Doyle & Ben Milbourne

This project was a design research study commissioned jointly by Life Saving Victoria and the Victorian Government Emergency Services Infrastructure Authority (ESIA). The project conducted a survey of existing lifesaving facilities in Victoria and developed

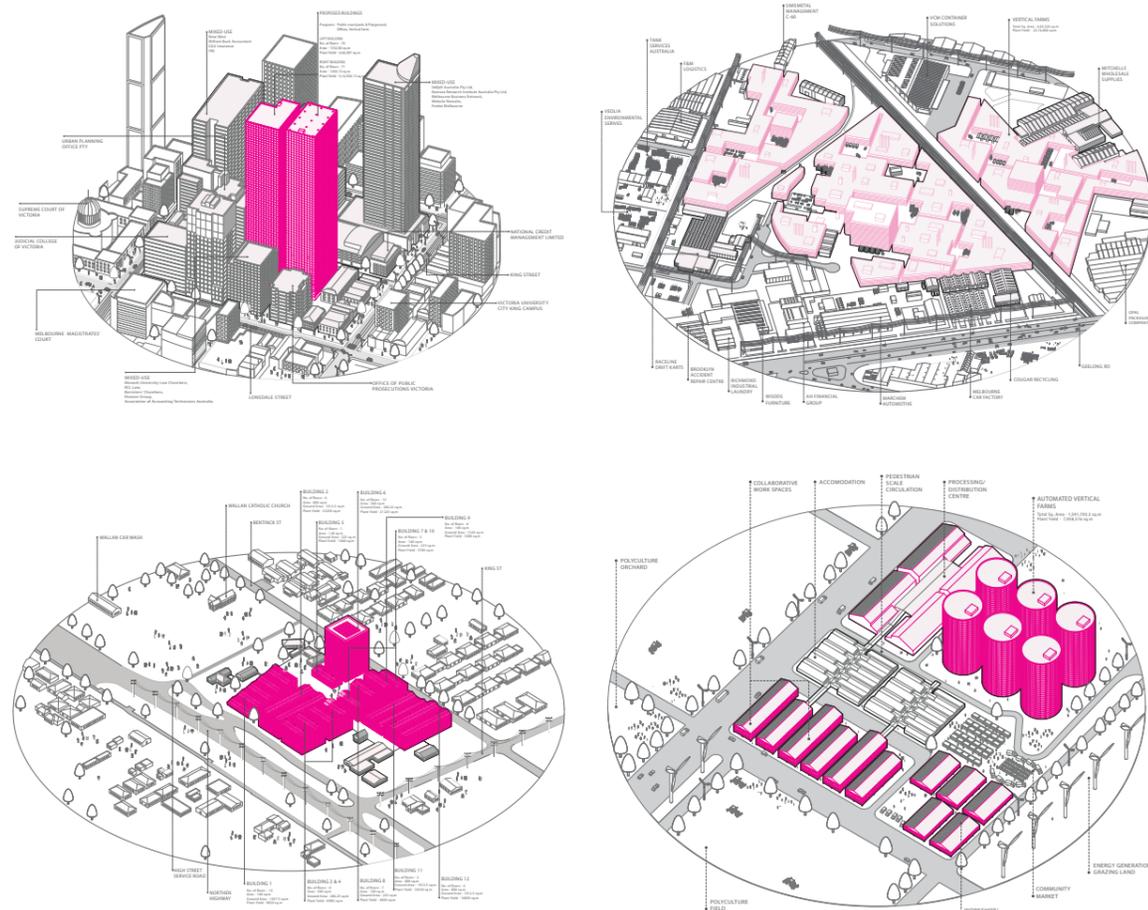
a series of innovative new prototype buildings that aimed to provide templates for future lifesaving facilities that could deliver public value, while addressing future coastal conditions influenced by climate change.



Future Food Melbourne
Graham Crist & John Doyle

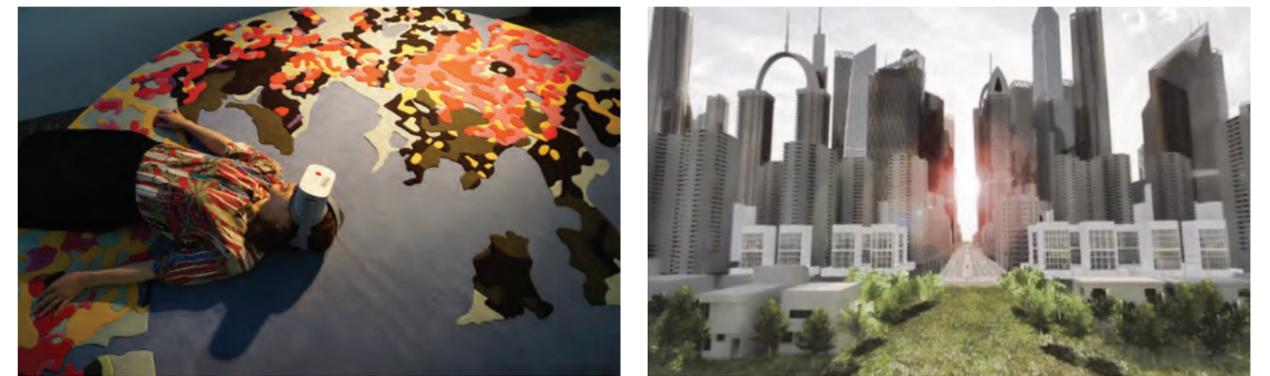
Future Food tests Melbourne as a self-sufficient food city. Can Melbourne produce enough food within its own metropolitan boundary to sustain its population of 5 million? Modelling this proposition co-opts three knowledge fields- agricultural technology, nutrition and urban land use planning. Fast developing technologies of

high intensity multi level agriculture, and recommended nutritional profiles increasing our proportion of plant based diet, creates a smaller footprint for production. This, along with Melbourne's very large metropolitan growth boundary, makes this viable.



Analysing land use allocations, we excluded all land currently for housing, public buildings, or green reserves and established a total available land footprint for urban agriculture. Once establishing that the broad proposition was viable, we tested the architectural types of vertical agriculture in a range of urban settings.

Ultimately well designed models where food is produced close to home, rather than transported great distance is of enormous benefit to urban liveability.

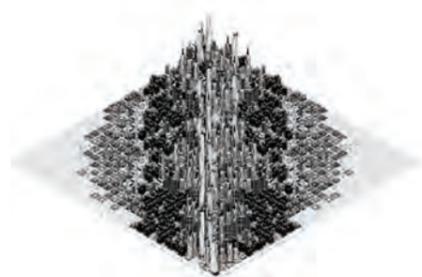
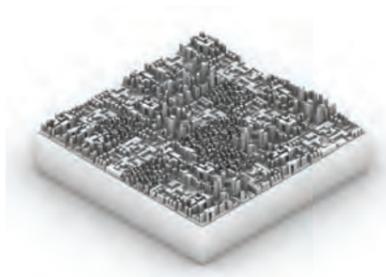
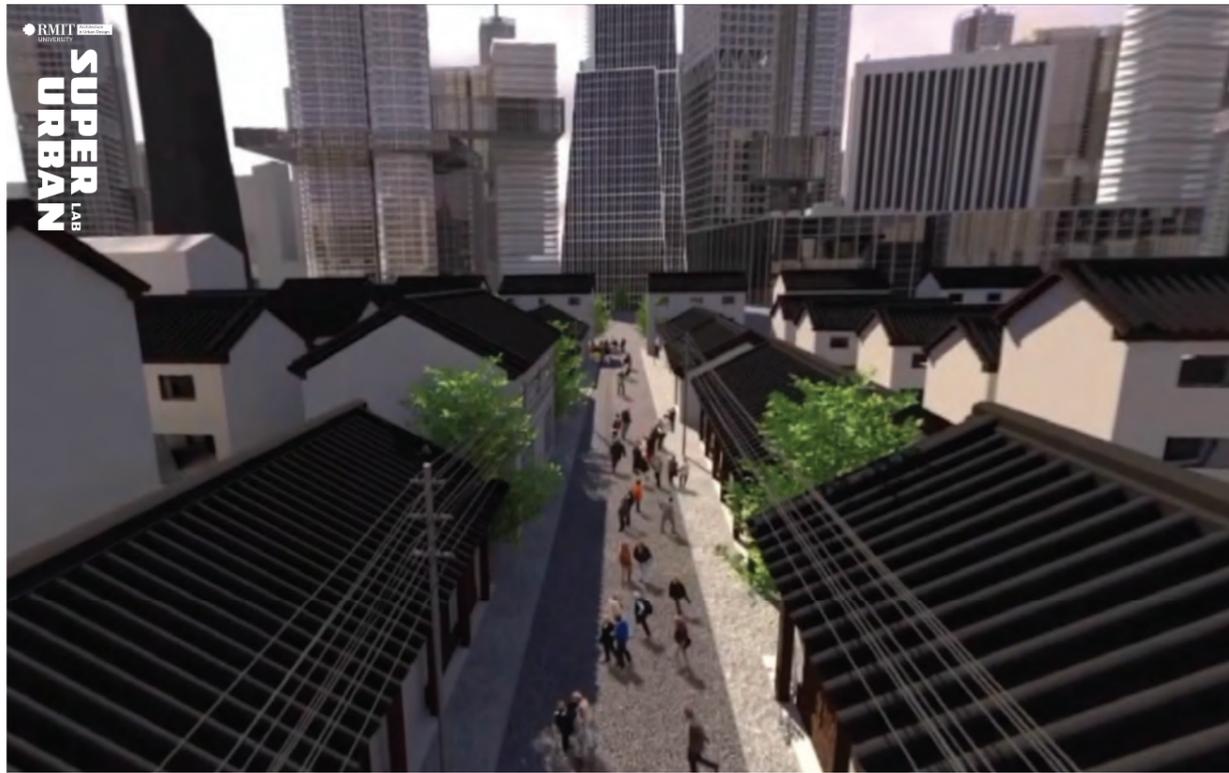


Future Taihu

John Doyle

Future Taihu was a speculative urban design and regional planning research project undertaken in partnership with the Dynamic Cities Foundation in China. The project explores a speculative proposal for the future of the Lake Taihu in China. The area of investigation is a 100km² region centred on Lake Taihu with 7 major cities and a population of more than 20 million.

With the growth of networked urban mega clusters, such as the Greater Bay Area and Yangtze River Delta, it is essential to develop a model of rapid urbanisation that moves beyond a self-contained nodal understanding to a sharing model of urban integration. As mono-centric cities rapidly morph to form multi-nodal systems, what are the planning models that can be applied to facilitate integrated development?



Future Taihu proposes a new model of metropolis in which multiple cities are networked together around the periphery of the Lake Taihu. By dramatically limiting the land available for urbanization, and creating a no build zone of reforested land around the city, we have created a hypothetical scenario in which growth is limited to hyperdense band that spans urban cores.

The project was exhibited at the 2019 Seoul Biennale of Architecture & Urbanism.



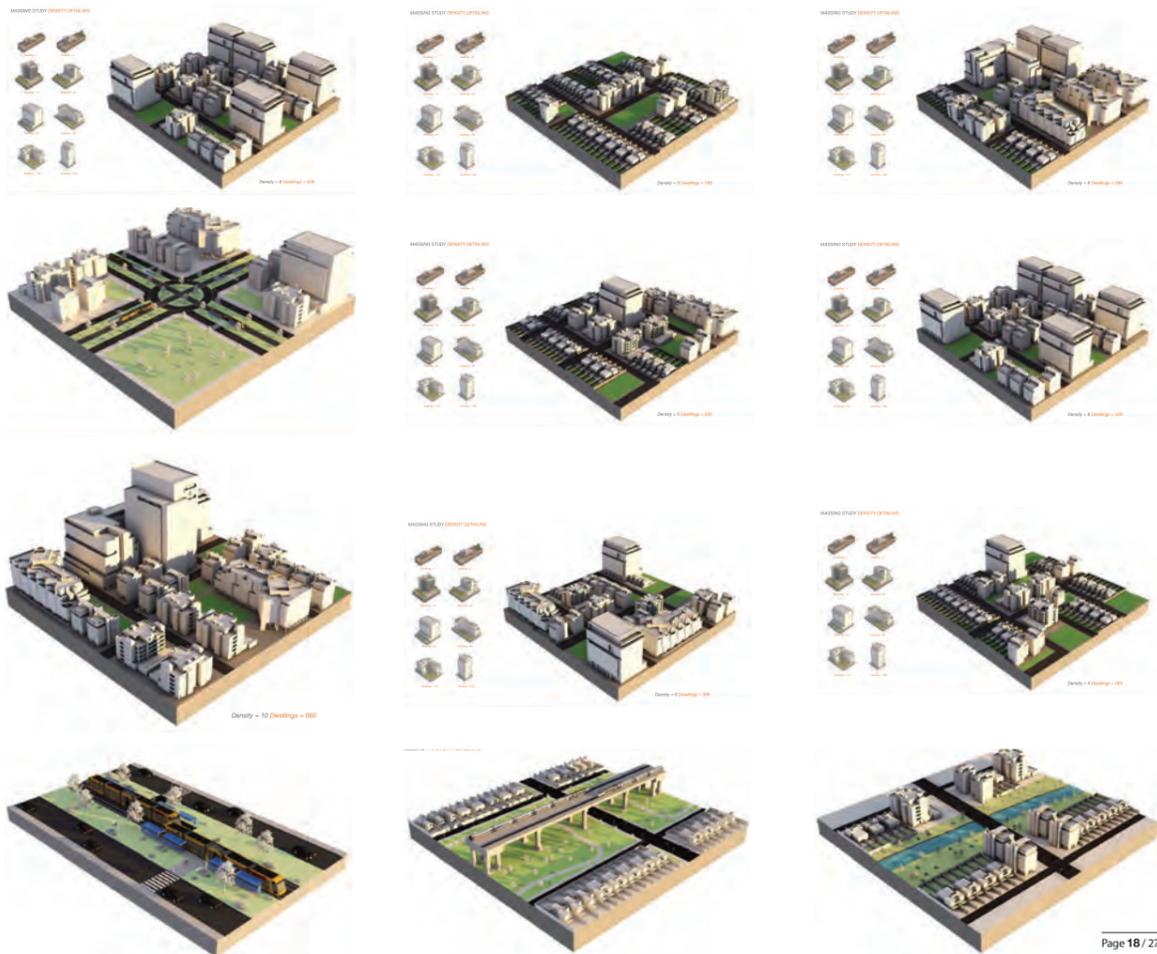
CLARA New Towns

Paul Minifie

Establishing fast rail lines between cities is a trigger for consolidating urban settlement. It is an instrument to bring population closer to vital infrastructure, and to build the passenger catchment for the rail network.

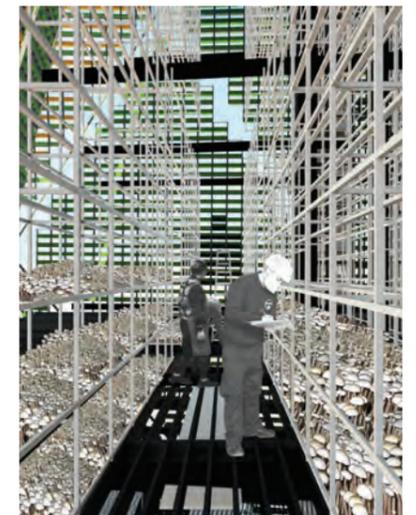
The urban design question becomes focused around the establishment of new settlements around that line and to intensify existing places which are sprawling and

underpopulated. The question of how to create new urban models which are highly liveable and with very good access to the line connecting major cities is an important one for regional development. This was examined through a series of design studio projects which model the possibilities of these scenarios.



Farm HD
Graham Crist & John Doyle

A collaboration with the Chinese University of Hong Kong, this project tested very high density farming in Hong Kong. These designs examined both the productive capacity of intensive agriculture techniques for urban populations like Hong Kong (which rely almost entirely on imports), and also their capacities to enhance



the urban environment. One project looked at opportunistically locating a greenhouse tower directly above the Haiphong temporary wet market, and the other converted the existing dead space of multilevel car parks to intensive food production. The latter tactic, while almost mute in its urban form, was massively impactful in its potential to make fresh food



Advanced Manufacturing Facilities

John Doyle

This project was a speculative design research project in partnership with Gilmour Space Technologies, exploring the design of advanced manufacturing facilities. The project examined the specific design and

manufacturing requirements of emerging technologies, specifically orbital rockets and satellites. The outcome of the project was a series of prototype manufacturing facilities that could be integrated into Australian

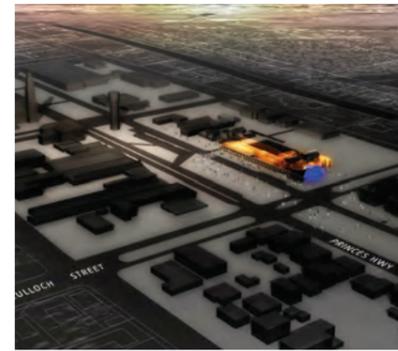
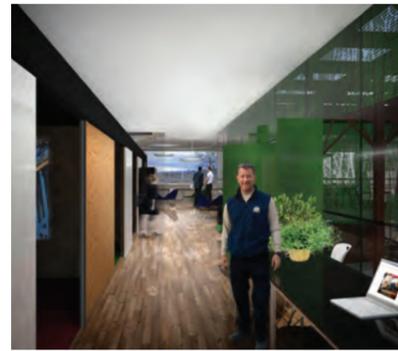
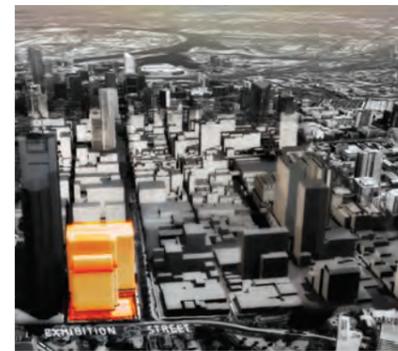


Regional Work Hubs

Graham Crist

Victorian state government engaged RMIT Architecture to research ways of reducing the footprint of workplaces for its very large staff cohort. The project asked: what if we developed co-workspaces distributed through Victoria and shared between government departments? A hybrid between home and the city office, located strategically near home and near transport. The benefits would be many - regional development around the hubs,

relieving pressure on CBD infrastructure and reducing daily commutes, creating flexible venues for collaboration- with communities and between departments. This project prototyped these spaces long before working from home was prevalent. Our work developed designs for the spaces and for the online interface connecting these spaces. We gathered data on the spatial distribution of work populations and existing facilities, while also developing protocols for reduced office footprint.



☐ The Regional Hubs project examined the implications of distributing Victorian government staff through flexible work places.



COLLABORATION + INDUSTRY PARTNERS

The Super Urban Lab is a collaborative organisation, working closely with government and commercial partners, as well as allied disciplines and institutions.

The design and realisation of cities is interdisciplinary, requiring engagement with government, capital and development, planning and policy, engineering, construction and other sectors. The lab has expertise in architecture and urban design through spatial modelling and works closely with partners and thought leaders to ground our work in the reality of contemporary urban environments. The lab has close, active collaborations with numerous other schools within RMIT, notably the School of Property, Construction and Project Management. We have established a strong reputation and numerous partnerships with institutions in Asia, where issues of rapid urbanisation, urban density and climate change are most pressing.

Super Urban lab was established to provide platforms for engagement with industry and government. The lab is funded through a mixture of government grants and commercial contracts between external partners and RMIT University. The majority of industry funded projects take the form of design research reports in which a particular problem or situation is investigated, with one or a series of design outcomes prepared and presented to the partner for commercial or public application.

The lab has a cohort of RMIT supported PhD candidates based in Melbourne and in Asia undertaking speculative design research into high density urban models, that will inform the next generation of industry partnered research.



Key Partnerships

RMIT Cross Disciplinary Collaborations

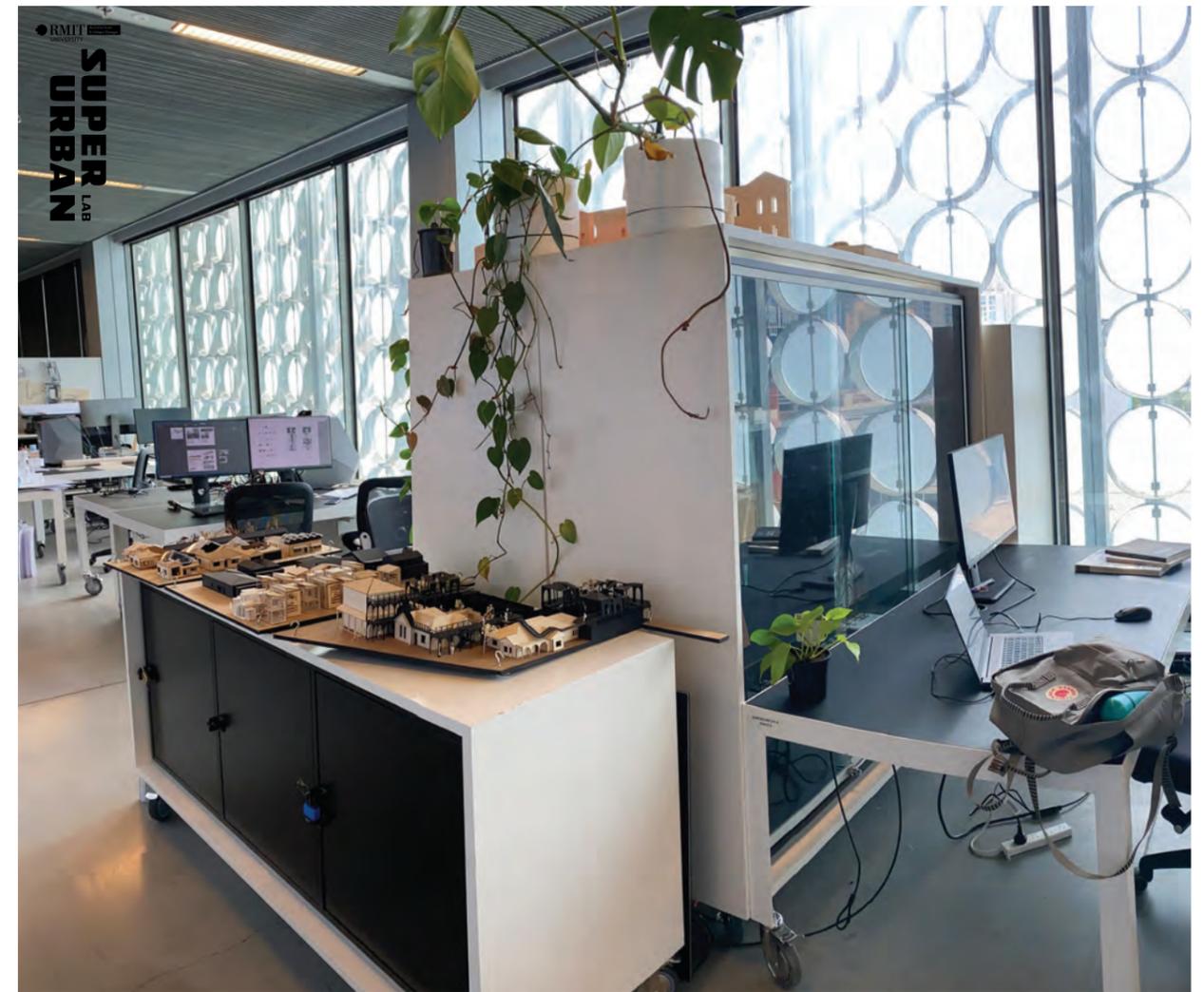
RMIT University School of Property Construction and Project Management
Dr. Mary Myla Andamon
Professor Priya Rajagopalan
Sustainable Building Innovation Laboratory
Architecture and Building
Dr. Rafael Luna
Institute for Advanced Architecture of Catalonia
Dr. Areti Markopoulou

Cross-Institutional Collaborations

University of Queensland School of Architecture
The Chinese University of Hong Kong
Tokyo Institute of Technology; Department of Architecture and Building Engineering
Professor Yoshiharu Tsukamoto
Associate Professor Taishin Shiozaki
Hongik University Graduate School of Architecture and Urban Design
Dongwoo Yim
UTS Faculty of Design

Industry Partners

Vision Australia
Focus Life Support Services
Gilmour Space Technologies
Life Saving Victoria
Emergency Services Infrastructure Authority
Mini Consolidated Land and Rail Australia



Research Space + Facilities

Research Space

The Speculative Urbanism Laboratory is housed with the RMIT Design Hub as part of RMIT Architecture discipline within the School of Architecture and Urban Design. The lab space consists of workstations, meeting areas, a maker space and an exhibition space. These spaces provide a platform for collaboration amongst our researchers, and engagement with industry and research partners.

Facilities & Equipment

Multiple high performance workstations for spatial modelling
3 Oculus Go VR headsets for immersive project visualisation
Microsoft Hololens Augmented Reality headset for project visualisation
Large format 3D printing and rapid prototyping facilities
5 axis CNC for concept model milling and prototyping
Desktop laser cutting facilities for rapid prototyping
Full staffed and equipped works shop spaces for concept model production
Large format presentation printing
Facilities
Meeting rooms, lecture theatre, exhibition and event spaces

RMIT Design Hub housing the Super Urban Lab



↑
John Doyle
 Associate Professor



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Graham Crist
 Associate Professor



↑
Paul Minifie
 Associate Professor



↑
Vicky Lam
 Associate Lecturer



↑
Ben Milbourne
 Senior Lecturer



↑
Ian Nazareth
 Lecturer



↑
Anna Jankovic
 Associate Lecturer



↑
Asma Siddika
 PhD candidate

The Super Urban Team

The Super Urban Laboratory team is made up of architects and urban designers with diverse backgrounds and experience. The team have a background in commercial architectural and urban design practice, and experience in the design and delivery of projects in Australia, Asia and the USA.

The lab provides collaborative framework that enables us to build project teams with specialist expertise in different areas. This expertise includes architectural and urban modelling; computational and algorithmic urban modelling; urban and building data analysis; digital fabrication workflows; specialist typological knowledge in offices, housing, factories, schools, and community buildings.

Our team brings a deep understanding of cities with experience working in Tokyo, Hong Kong, Seoul, Shanghai, Ho Chi Minh City, Denpasar & Dhaka. The team are experts in generating specialist knowledge through architectural design.

The researchers are a combination of permanent faculty from RMIT Architecture, PhD candidates and Research Assistants.



RMIT Architecture
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