Our idea is that the combined effect of specific spatial, financial and authorities approval efficiencies will radically reduce the capital and operational cost of housing, while also providing the homes that people need and want.

The housing on which our idea is based is not product, that defined by ease of construction and profitability. Instead it is for a form of dwelling that matches more closely the way people live. The term housing can be traced back to Medieval Latin, meaning *protective covering* and suggests the importance of the close fitting relationship between people & housing & place. This relationship has held through time, as it should today.

Our idea is demonstrated via a pilot housing development called Pixel. The efficiencies our idea targets are played out on this and the following sheets. But first we should introduce some of the people who might appreciate a Pixel project. After all this whole thing is about them.

Michelle
Pixel Owner 1

Steph & Rahul
Pixel Owner 2

Manu
Pixel Owner 3

Tom
Pixel Owner 4

Alice
Pixel Owner 5

Hi, I am 25 years old and currently single. I have no dependents and plan not to have children. I work in a cafe earning $55,000 a year. Over the past 5 years I have foregone smashed avocado toasties and saved $20,000 to put towards my first home.

If I were to buy a studio apartment under the business as usual model, I would need to spend approximately 75% of my income each week on housing. This is not just a difficult scenario, it is impossible. In this regard, I represent a generation of Australian who will never be able to enter the housing market in its current condition.

Even if I were to purchase a typical Pixel (16sqm) it would require 43% of my income in the first year. Fortunately the inherently flexible share structure of Company Title, the ownership structure of a Pixel project, offers the opportunity to buy a smaller Pixel (12sqm), which would require 32.25% of my income and comply with affordable housing objectives, being that no greater than 35% of combined household income is spent of housing costs.

I am 30 years old and my husband Rahul is 31. He is an academic and I am an Engineer. Our combined income is $160,000 per year so we do alright, that said we both work long hours and would like to find a better work/life balance. It is just the two of us, though we are planning to have two children in the coming years.

The Pixel project is very attractive to us due to the flexibility of the spatial and financial structure. It is painfully evident to us that the housing and tax system in NSW incentivises us to purchase a dwelling that will accommodate our family down the track, but that is too big for us now. In the wider context, this is clearly an inefficient use of housing, and closer to home will put us under financial strain in the near term.

Our plan is instead to purchase a single Pixel, which will be perfect for us now. Then once our first child is born, to purchase another, and another with the arrival of our second child. This will give us great flexibility in how we accommodate our family as it grows and means that we only need pay 15% of our current income on our housing needs. Which means that we can do a little travelling and still save more to hopefully pay for the second and third PIXEL without borrowing. Imagine that, having a home and not having to pay all of that money in interest to the bank!
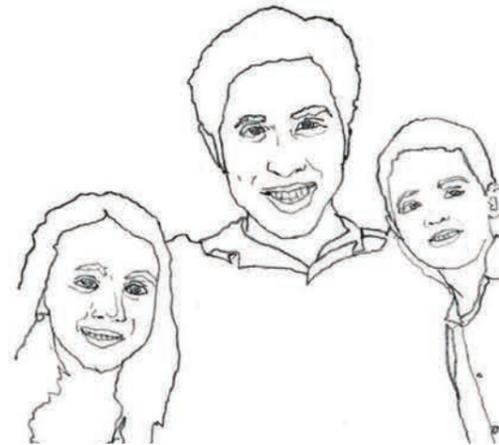
My kids, Sunny and Mable, are my life. It has been pretty difficult for us all recently. They have been doing brilliantly though, through the turmoil. Earlier this year my wife and I separated and only last month the sale of our house settled. We have joint custody and I have been thinking a lot about the kind of environment I want the kids to grow up in. I am an IT Specialist in the finance industry so earn a decent wage, last year it was just under $140K. This gives me a bit of flexibility to determine where we will move, that said there is not a lot of diversity in the market and we will need to remain in the area, close to the kids' school and my ex-wife.

I particularly like the community aspect of the Pixel project and the idea that the kids will have plenty of space to play in the communal areas. I can't quite reconcile the idea of moving into a tiny 3 bedroom flat after their early years in a large house.

I will have $360K from the sale of my home to put down as a deposit. If I were to purchase a 3 bedroom unit under the business as usual model it would require 73% of my income. This is impossible. However I can purchase three Pixels, the repayments for which will equate to only 37% of my income. The partial independence of each Pixel will also allow me to let them on a short term basis on the days Sunny and Mable are at their mother's house.

We had a big party for my 70th at the end of last year. My daughter Beth arranged it, and though I was meant to be the star, my grandchildren William, Chantelle and AJ stole the show! I was grateful actually for a little diversion. My Betty passed shortly before and I have been a little low since.

In the last few weeks, Beth and I have been talking about living arrangements. Betty and I had never been ones for retirement villages, or nursing homes, we always said we were way too young for that kind of thing.

We had to sell our home to pay for Betty's treatment and care in the final months. I have $200K of the house money I could use to buy a little place for me, but there is nothing on the market for that amount. I am told I could purchase a Pixel and that the repayments would be only 33% of my pension. This sounds pretty good to me. Especially as there will be plenty of space for Beth and the grandkids to visit. The project I visited the other day had a fantastic diversity of people, of all ages. As I get older it becomes more and more apparent to me just how important community is.
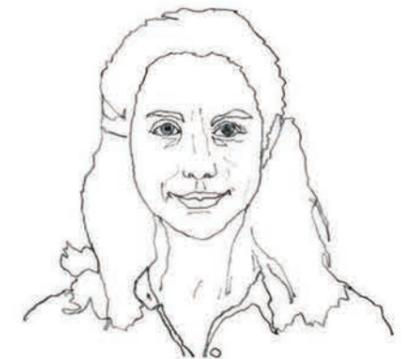
I run my own business. I suppose you could call us an enviro tech startup. We advise people about different forms of urban farming. It may seem niche but there are three of us these days and the phone keeps ringing! I run a lot of my expenses through the business and still manage to take home around $80K a year.

For the past 4 years I had been running the business from the spare room in my apartment, but I was kicked out a couple of weeks ago for operating a going concern in a residential premises. How ridiculous in this day and age!

I have done a lot of research and it seems I cannot afford both a commercial and residential property with my current income. So I have decided to engage an emerging designer to transform my Pixel into a multi use space that is homely from 6pm to 8am and can easily transition into a work-zone for me and my fantastic part-time employees. Under the Pixel methodology I only need to spend 1/17th of my income on housing needs, not to mention the potential savings on commercial rent, so I have plenty of money to re-invest in my business and to help save the world!
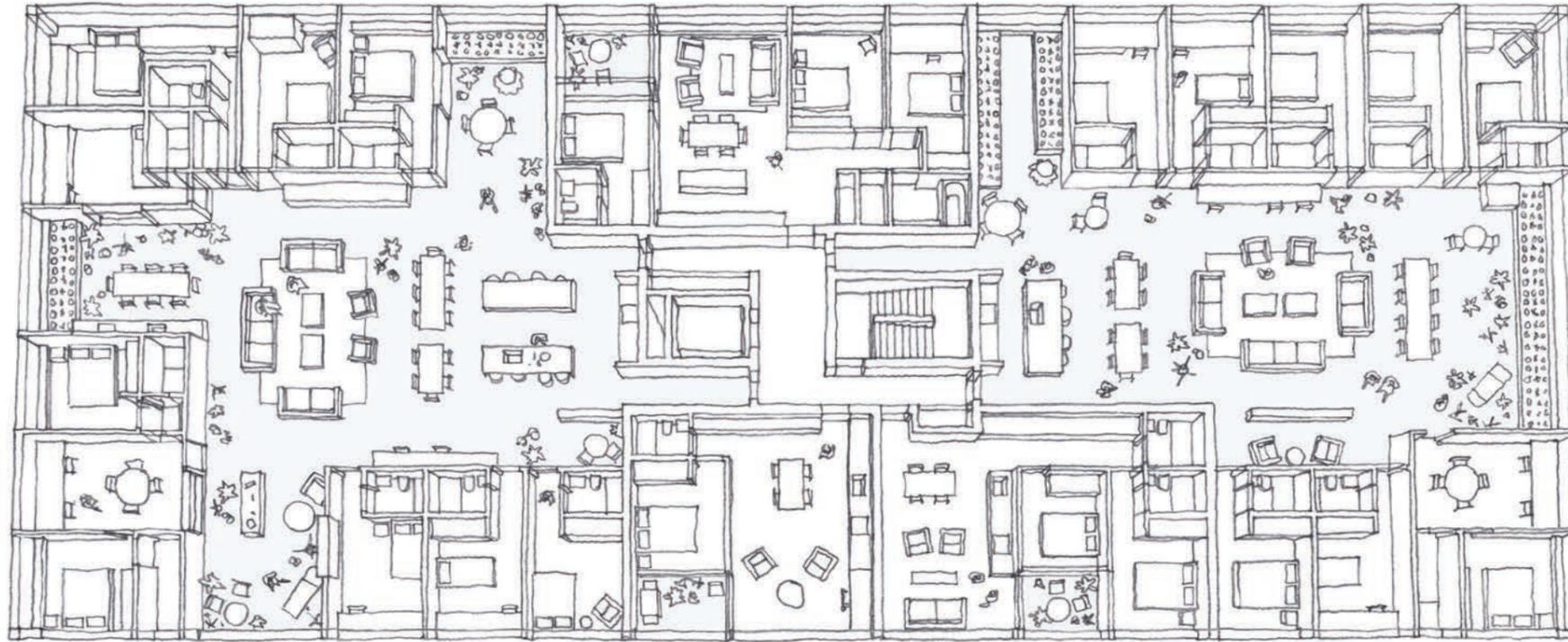
A PIXEL PLAN

SITE 2000m² - FOOTPRINT 1000m² - NSA 830m² - GFA 880m²
93% NSA to GFA

Floor Plate Potential 25 Pixels, Bedrooms or Offices	1 x 1B (50x1=50) 20%	1.5 ppl/1B (1x1.5=1.5)		
	1 x 2B (70x1=70) 20%	1.7 ppl/2B (1x1.7=1.7)		
	1 x 3B (90x1=90) 20%	1.8 ppl/3B (1x1.8=1.8)	=	31 Owners
	1 x 9P (290x1=290) 20%	12 ppl/9P (1x12=12)		
	1 x 10P (330x1=330) 20%	14 ppl/10P (1x14=14)		

Spatial

The base unit (literally) of typical new housing in the City of Sydney are the Studio, 1B, 2B and 3B Unit. The size and mix of this base unit is codified by the Apartment Design Guide via SEPP 65 and SDCP2012. When combined with tightly defined amenity controls and honed to maximum efficiency by industry, the resulting typical housing floor plate, or neighbourhood, currently being delivered in the government area is remarkably homogenous.

In 1932 Karel Teige proposed a new unit of housing called the Minimal Dwelling. His idea was a reaction to what he saw as the problematic miniaturisation of middle class housing types when built for lower income people. Instead he suggested a dwelling should contain only a single private room, with the remaining acts of domesticity shared amongst others in a similar situation. This housing model was the forerunner to contemporary versions of the boarding house, student housing and hotels.

His idea is our idea, but tuned for today's world. Our base unit is called the Pixel. It is a nominally 16sqm unit which contains a room, with all the wonderful multiplicity and liberty such a thing entails, an ensuite and storage. The spatial efficiency of the Pixel enables a wonderful generosity in the arrangement of communal living space, while still offering a radical aggregate spatial efficiency, when compared with Business As Usual product.

The above planning arrangement plays out a typical Pixel project floor plate. To the left is business as usual, a typical SEPP 65/ADG project floor plate, for comparative analysis. And to the right is an alternate Pixel project floor plate demonstrating the mutability of the spatial arrangement and possible uses, including a WeWork like facility. The above planning arrangement is generally applicable for much smaller, or larger floor plates, for floor plates of great variability in shape due to the formal flexibility of the communal areas, and for buildings utilising stacking of floor plates of only a few storeys, or those of tall towers. The above spatial arrangement is intended to mediate both specificity and scalability/repeatability.
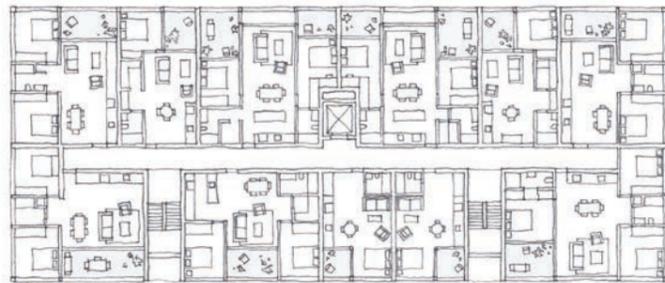
BUSINESS AS USUAL

SITE 2000m² - FOOTPRINT 1000m² - NSA 680m² - GFA 805m²
84% NSA to GFA

2 x Studio (35x2=70) 18%	1.5 ppl/Studio (2x1.5=3)
2 x 1B (50x2=100) 18%	1.4 ppl/1B (2x1.4=2.8)
6 x 2B (70x6=420) 55%	1.6 ppl/2B (6x1.6=9.6)
1 x 3B (90x1=90) 9%	1.6 ppl/3B (1x1.6=1.6)

11 Units
16 bedrooms &   =   17 Owners
16 bathrooms
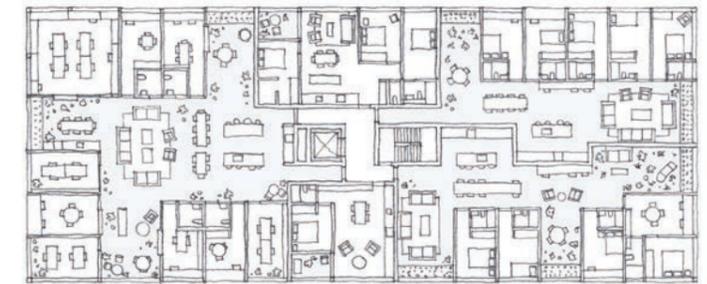
WORKSPACE PIXEL PLAN

SITE 2000m² - FOOTPRINT 1000m² - NSA 830m² - GFA 880m²
94% NSA to GFA

1 x 1B (50x1=50) 20%
1 x 3B (90x1=90) 20%
1 x 5P (170x1=170) 20%
1 x 5P (180x1=180) 20%
1 x 10P (330x1=330) 20%

Floor Plate Potential
24 Pixels, Bedrooms or Offices

Model Efficiency			Land Ownership						Total Price of Development											Sustainability
Model	Standard SEPP65 efficiency per floor	Pixel House efficiency per floor	Land Ownership	Landowner Income Yr 1	Landowner Income Yr 10 (not including escalation/ inflation)	Landowner Income Yr 20 (not including escalation/ inflation)	Landowner Income Yr 99 (not including escalation/ inflation)	Holding Costs	Cost of Works	Construction Loan based on 1 year full interest	Building Design Professionals	Authorities Cost	Marketing	Sales Commission	Developer/ Organiser Overhead	Developer Profit	Subtotal of Total Price excluding GST and Stamp Duty	Cost per person	Operational Costs per person (maintenence/ Council/energy/ water)
Business as Usual - Typical Development	17	n/a	Purchase	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,510,000	$4,200,000	$189,000	$252,000	$84,000	$42,000	$63,000	$84,000	$630,000	$9,054,000	$532,588	$4,835
Pixel	n/a	31	99 Year Ground Lease	$66,667	$666,667	$1,333,333	$6,600,000	$66,667	$4,500,000	$202,500	$270,000	$90,000	$13,860		$90,000		$5,233,027	$168,807	$2,926

Owners		Purchase of Asset							Year 1							Year 2							Adjust Pixels Home Loan	Year 3					
	Income (2019)	Deposit/ Savings	Purchase	Stamp Duty	GST	Total	Loan Amount	Repayments	Ground Lease	Operational $	Income (Net)	Costs	% of Income	Comment	Repayments	Ground Lease	Operational $	Income (Net)	Costs	% of Income	Comment		Repayments	Ground Lease	Operational $	Income (Net)	Costs	% of Income	Comment
Owner 1 - Michelle - First Home Buyer																													
Standard (Studio apartment)	$45,733	$20,000	0	$0	0	$0	-$20,000	$29,952	$0	0	$45,733	$29,952	65%	Impossible	$29,952	$0	0	$46,648	$29,952	64%	Impossible		$29,952	$0	0	$47,581	$29,952	63%	Impossible
Pixel (1 pixel)	$45,733	$20,000	0	$0	0	$0	-$20,000	$13,980	0	0	$45,733	$13,980	31%	Difficult	$13,980	0	0	$46,648	$13,980	30%	Difficult		$13,980	0	0	$47,581	$13,980	29%	Difficult
Owner 2 - Rahul & Stephanie - First Home Buyers															$0	0	0						$0	0					
Standard (2 bedroom apartment)	$123,216	$45,000	0	$50,992	0	$50,992	$5,992	$62,700	$0	0	$123,216	$62,700	51%	Impossible	$62,700	$0	0	$125,680	$62,700	50%	Impossible		$62,700	$0	0	$128,194	$62,700	49%	Impossible
Pixel (1 pixel - transition to 2nd pixel after 3 years and 3rd pixel after 10 years)	$123,216	$45,000	0	$0	0	$0	-$45,000	$11,256	0	0	$123,216	$11,256	9%	Affordable	$11,256	0	0	$125,680	$11,256	9%	Affordable	$367,000	$22,308	0	0	$128,194	$22,308	17%	Affordable
Owner 3 - Manu and his children Sunny & Mable															$0	0	0						$0	0					
Standard (3 bedroom apartment)	$97,903	$360,000	0	$65,908	0	$65,908	-$294,092	$62,256	$0	0	$97,903	$62,256	64%	Impossible	$62,256	$0	0	$99,861	$62,256	62%	Impossible		$62,256	$0	0	$101,858	$62,256	61%	Impossible
Pixel (3 pixels)	$97,903	$360,000	0	$32,748	0	$32,748	-$327,252	$22,092	0	0	$97,903	$22,092	23%	Possible	$22,092	0	0	$99,861	$22,092	22%	Possible		$22,092	0	0	$101,858	$22,092	22%	Possible
Owner 4 - Tom visited regularily by his daughter Beth and grandchildren William, Chantelle, AJ															$0	0	0						$0	0					
Standard (1 bedroom apartment)	$24,081	$200,000	0	$35,014	0	$35,014	-$164,986	$34,500	$0	0	$24,081	$34,500	143%	Impossible			0												
Pixel (1 pixel)	$24,081	$200,000	0	$6,836	0	$6,836	-$193,164	$2,424	0	0	$24,081	$2,424	10%	Possible	$2,424	0	0	$24,563	$2,424	10%	Possible		$2,424	0	0	$25,054	$2,424	10%	Possible
Owner 5 - Alice joined during the day by her 3 staff															$0	0	0						$0	0					
Standard (1 bedroom apartment)	$100,000	$40,000	0	$35,014	0	$35,014	-$4,986	$44,220	$0	0	$100,000	$44,220	44%	Difficult	$44,220	$0	0	$102,000	$44,220	43%	Difficult		$44,220	$0	0	$104,040	$44,220	43%	Difficult
Pixel (1 pixel)	$100,000	$40,000	0	$6,836	0	$6,836	-$33,164	$11,976	0	0	$100,000	$11,976	12%	Affordable	$11,976	0	0	$102,000	$11,976	12%	Affordable		$11,976	0	0	$104,040	$11,976	12%	Affordable

The financial modelling is based on average costs and should be used for preliminary feasibility purposes only. Further detailed site specific feasibility is required at a future stage to confirm all financial assumptions.

Financial

A Pixel project would result when a collective of people come together, organising themselves under existing Company Title legislation and adopting the following organisational principles.

The company agrees in perpetuity to pay a 99 year ground lease to the land owner, with first right of refusal to continue ground lease at market value at the term of the agreement. Each share holder will be given exclusive use of a designated area equal to their share holding within the company. If share holders' exclusive use area is sub let, it must meet the performance requirements of SEPP (Affordable Rental Housing) 2009 - Part 1(6)1(a). The development will not provide car spaces for individual car-use. If car-parking is to be provided onsite, it must be for vehicle share purposes, or the provisions of multi-use space for visitor parking, or for delivery/moving/maintenance vehicles, etc. The development will be constructed to meet world's best practice for its sustainable construction and operation.

To understand the unique benefits of a Pixel project we must consider the total life-cycle of a development, comparing business as usual with a mixed-use, communal living and working space. The model delivers great spatial efficiency, long term returns to land owners and greater quality, more sustainable, buildings via a design and building methodology very similar to the Nightingale model.

Approvals

A Pixel project would be permissible under current state and local government legislation. The design would meet SEPP65 and the Apartment Design Guide recommendations for certain parts, though utilise SEPP(ARH)2009, Boarding House standards for the majority. The design would also meet the requirements of SLEP 2012, SDCP2012 relating to Residential Flats and to Boardings houses and student accommodation, as well as the City of Sydney Development Guidelines for Boarding House (including student accommodation).

Our review of SEPP(ARH)2009 suggests that there is no control that would limit a collective to fund a development approved under that legislation and for the land owners to also be tenants paying peppercorn rent. The development standards of the legislature offers great flexibility in spatial arrangement and building form, which will increase the replicablility and scalability of Pixel projects. The state based legislation permits such housing under a range of zoning, which will enable the establishment of Pixel projects in a wide range of locations, offering crucial dwelling diversity across the state.

Pixel projects would require the COS to relax car parking requirements, which are contrary to the shared economy and possible transition to an automated vehicle future. It should also be noted that the current COS Development Guidelines for Boarding houses prohibits strata sub-division, however this is not applicable as Pixel is organised under company title.

What makes Pixel more affordable is:

Ground lease land costs over a 99 year period which **greatly reduces the interest paid to banks** as part of home ownership.

Spatial efficiency of **shared communal spaces** that encourage socialisation, sharing and community.

Lower stamp duty (current plans are afoot for "stamp-duty" exemptions via the Nightingale-Baugruppen model, however the below modelling demonstrates that affordable ownership is possible even without decreasing government contributions.

No developer profit. The development is co-ordinated and managed under the company title charter.

Reduced marketing costs.

No sales commission costs.

Reduced capital costs via ground lease **allowing for greater investment** in energy, thermal comfort and water **to reduce operational expenses.**