Suburban Equilibrium

finding answers to the disparity between territories in a sprawling metropolis

Benjamin Dohrmann

Title: Suburban Equilibrium: finding answers to the disparity between territories in a sprawling metropolis

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LUND UNIVERSITY

SUDes
Sustainable Urban Design

Suburban Equilibrium

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“The neighborhood shows a strange inability to update itself, enliven itself, repair itself, or to be sought after, out of choice, by a new generation. It is dead. Actually it was dead from birth, but nobody noticed this much until the corpse began to smell.”

- Jane Jacobs

Preface

This research project is the concluding assignment during the final semester of the Master's of Sustainable Urban Design at Lund University, Sweden. The Master's program consists of students from all corners of the globe, each offering a new perspective on urbanism that contributes to a more diverse dialogue in the studio.

The Master's program has given me an appreciation of the deep understanding required of not just the spatial elements of architecture and urban design, but also the human impact and the many patterns and processes at play. I have been lucky to visit many new places on study trips to the Netherlands, Norway and the Philippines in addition to local examples of Scandinavian architecture and landscape in Malmö, Copenhagen and the Öresund region.

For this research project I had a particular topic in mind, one that resonates very closely with the evolution of Australian cities in the 20th Century, a period of significant change and technological advancement. This thesis is dedicated to finding answers to the symptoms of suburban sprawl and how it physically and symbolically creates divides between people on a physical, social and economic level. Although this project finds relevance in Australian cities, specifically Melbourne, many other cities around the world are experiencing similar problems and can look to the answers and solutions presented in this booklet for guidance.

I would like to thank my supervisor Louise Lövenstierne for her guidance and input and I also greatly appreciate the insight from Andy Fergus, the encouragement and assistance from my partner Tina Gnewski as well as all those who have made some form of contribution to my work. It made all the difference!

Left:
View to Melbourne's CBD from the outer suburbs

Contents

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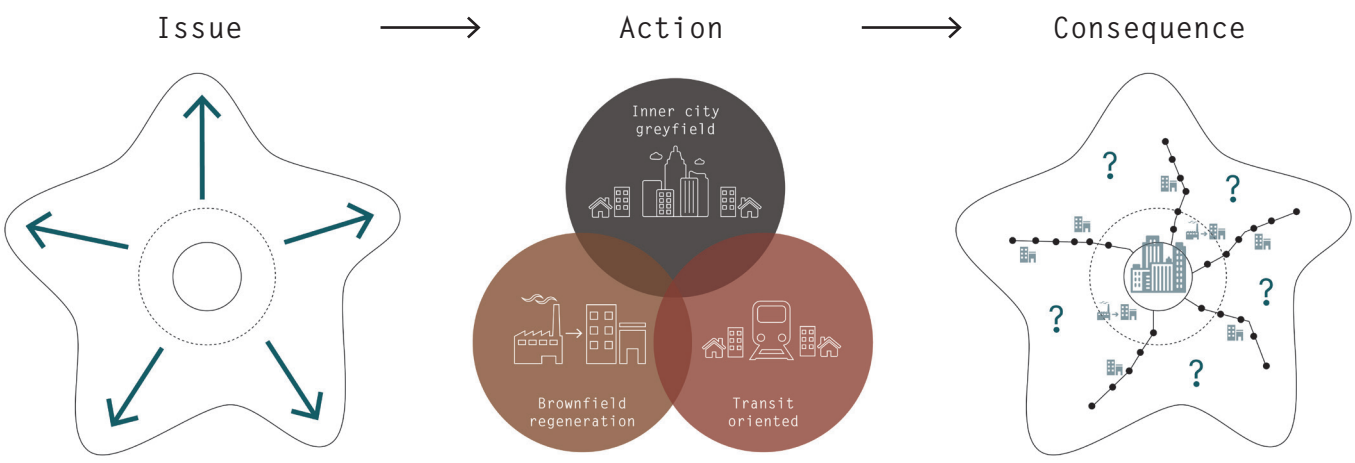
1 Introduction

1.1 Motivation for research

Left:
Outer suburban Melbourne

With the technological advances of the 20th Century and accompanying global shift from a rural to urban society the continued growth and evolution of our cities presents many challenges. One such challenge is the realisation that sustained expansion of city boundaries to accommodate growth is not a sustainable model of development, if one subscribes to the theory that an optimal level of density should be achieved within the existing urban area. The unchecked suburban expansion of many cities in the decades following WW2 was facilitated by rapid growth in car ownership that allowed people to live further from the city centre and commute to work. The low density nature of urban sprawl in Australian cities means that critical urban infrastructure has been spread across large distances.

In response to the demand for more housing and services to meet population growth in cities, planning authorities have sought to direct much of new development to key locations in the inner city, along public transport corridors and to brownfield development sites. As a city growth strategy this makes sense as it seeks to utilise existing infrastructure where a concentration of activity can take advantage of proximity and economies of scale. However, what this fails to consider is what happens in the 'left-over' inbetween places of the city that mostly consists of suburban sprawl. While it is not suggested these areas should contribute in the same way to densification they do require attention to ensure the existing gaps in the standard of living do not widen further.



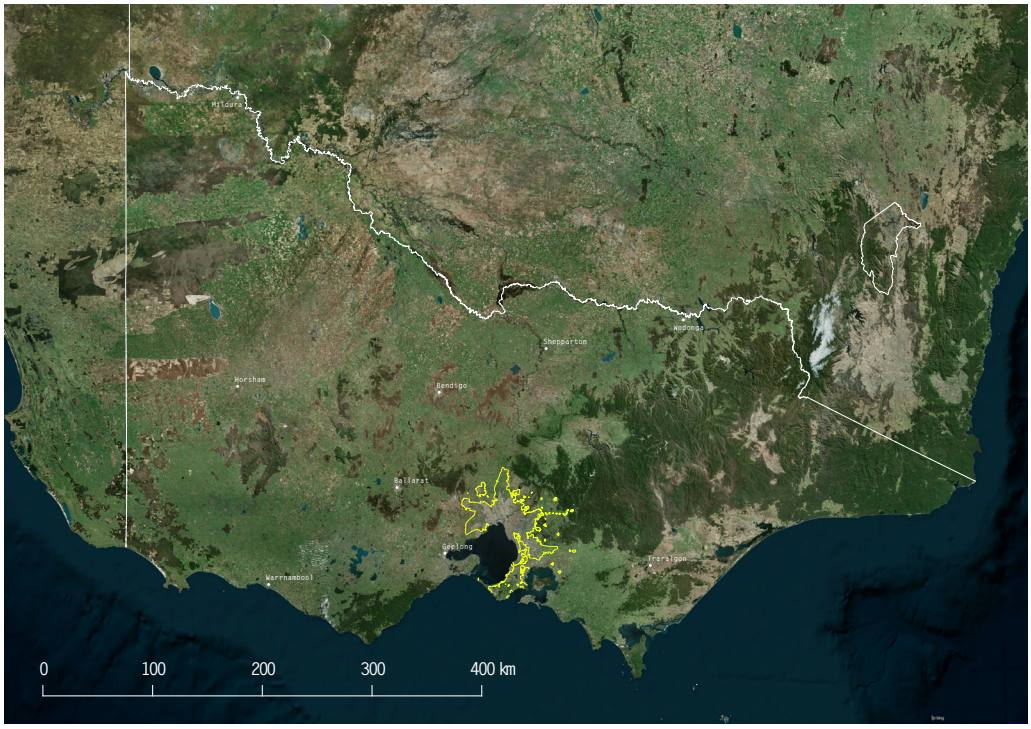
Urban sprawl

Densification of key places

Suburban neglect

1.2 Study location: Melbourne, Australia

Left:
States and major cities of Australia



Left:
State of Victoria with urban boundary of Melbourne

Population: 4.9 million (2018)[1]

Area: ~2,705 km^2 (within urban growth boundary only)[2]

Density: 18.1 persons per hectare

Growth rate: 2.7% per year

Right:
Melbourne urban growth boundary and Central Business District

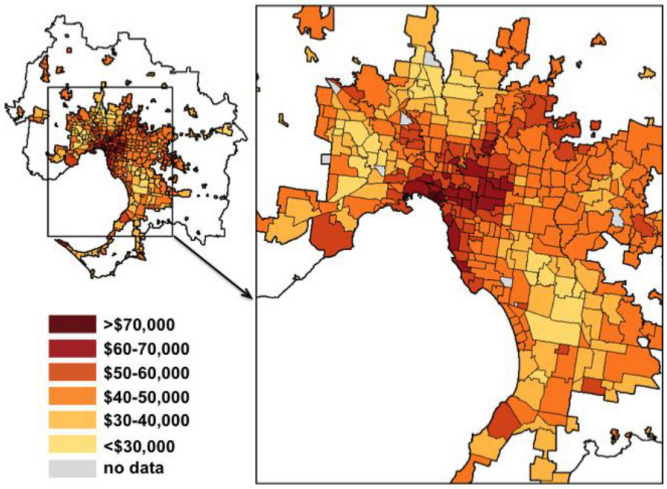
1 Miller, B. (2018)
2 State Revenue Office of Victoria (2018)

Melbourne is an ideal city to study how suburban sprawl has contributed to a disparity between territories in the urban area. First declared a city in 1847, it is relatively young in global terms and has grown along a monocentric development model. The city core (or CBD i.e. central business district) and surrounding inner suburbs are the oldest and most established parts of the city, which operates under a centralised system of transport and employment. In other words, the inner city has the highest concentration of residents, jobs, public institutions and other services that one needs and draws all surrounding places inwards to the CBD and its surroundings.

The disparity between the inner city and outer suburbs is evident in the figures below that illustrate the patterns that emerge when analysing demographic data from the 2011 census of income, education, socio-economic and public transport factors.

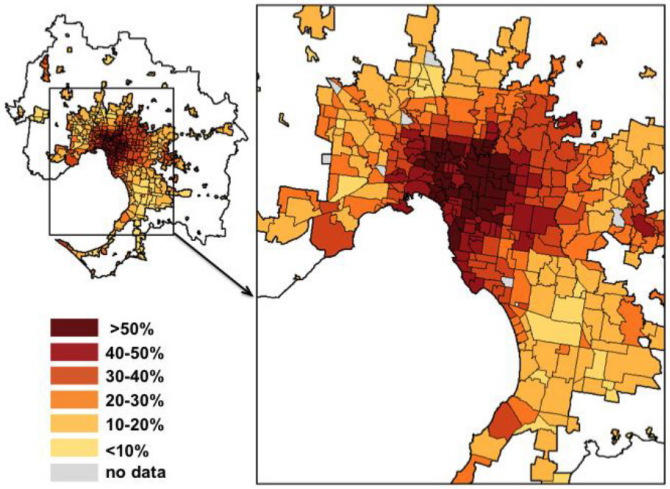
Below:
Patterns of disparity in the urban area from 2011 Census

(Source: Grattan Institute, 2013)



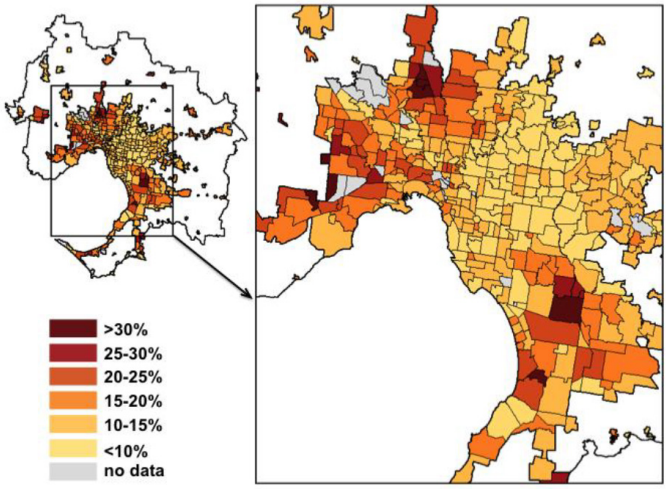
Source: Grattan Institute

Median income (2011)



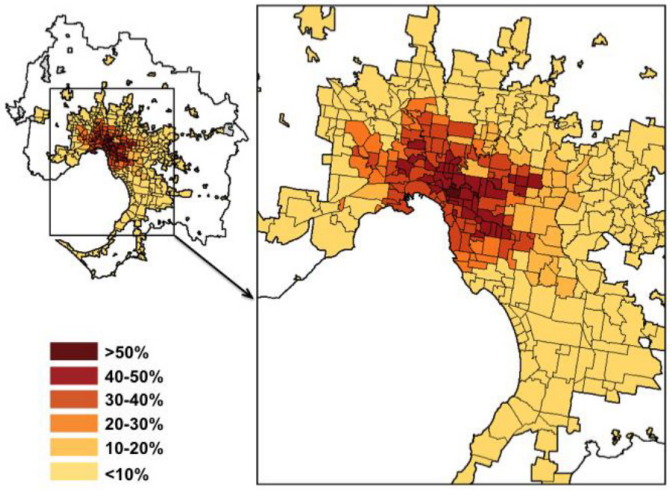
Source: Grattan Institute

University educated (2011)



Source: Grattan Institute

Disconnected youth, ages 17-25 (2011)



Source: Grattan Institute

Jobs reached in 60 mins by public transport (2011)

The distribution of income brackets reveals evidence of polarisation, with higher incomes clustered to inner suburbs and generally towards the eastern side of the city, particularly along the coastline and green river corridors. This pattern is also reflected in the level of education, with those attaining a university degree significantly concentrated to the city core.

The next measure of 'disconnected youth' relates to those which are neither employed nor in education or training (also described as neither earning nor learning). This can be seen as a warning sign for the future, since the consequences of limited education and a lack of work experience can snowball across the life course, coming to affect everything from earnings and self-sufficiency to physical and mental health. There is a notably higher concentration to the west, north-west and south-east suburbs that aligns with similar results for low workforce participation rates and lack of post-school qualifications for all residents, not just those in the youth bracket. This suggests an intergenerational transfer of disadvantage.

The final diagram illustrates the percentage of jobs in the urban area that can be reached from each location by a 60 minute one-way journey. This time period was chosen to represent a reasonable upper limit on commuting times in an Australian context, based on current travel patterns. It shows the clear benefits of an inner city location for improved access to jobs.

1.3 Aim/goal of project

This project aims to find places in the existing urban area - termed the 'forgotten suburbs' - which are disconnected and poorly serviced and thus lacking the opportunities afforded to residents of the more privileged parts of the city. The built environment in the streets and parks of these suburbs lack legibility, diversity and interaction between people.

Focusing on one of these 'forgotten suburbs' in western Melbourne, Deer Park, the aim is to propose strategies and interventions at the metropolitan, district, neighbourhood and block scales to provide the connections, access to services and the quality of housing and public spaces that the suburb needs. This will not just make it a more sustainable place but will give people the opportunity to raise their standard of living without having to move elsewhere, by creating new possibilities for those in future generations.

2 Suburbanisation of Cities

2.1 Origins of suburbia

Left:
suburban sprawl in Texas

(Source: Robert Daemmrich Photography)

Although the concept of a suburb in the city can be traced back to ancient roots[1], the true origins of suburbia as we know it today began to take shape over the course of the 20th Century. In the period of post-war construction and immense population growth the ideology and appeal for suburban living took hold and defined the way cities evolved, most notably in modern western countries such as the United States and Australia, but also taking different forms in other places all around the world.

'Suburb' is defined by Merriam-Webster as:

a : an outlying part of a city or town
b : a smaller community adjacent to or within commuting distance of a city
c suburbs plural : the residential area on the out skirts of a city or large town

The attraction to the suburbs was being able to live in comparative comfort outside the hustle and bustle of the inner city on your own property with a large house and garden, but still be able to commute to work by rail, or increasingly, by car. This appealed to those seeking a quieter lifestyle in a less dense, greener landscape that captured the feeling of being closer to the countryside.

Right:
Classic image of suburban life

(Source: Habitat magazine, 1992)

The quintessential picture of suburban life is one of perfectly manicured lawns, picket fences, multiple cars in the driveway, children playing in the street, neighbours chatting over the fence and washing drying on a hills hoist in the backyard. This utopian ideal of a house on a quarter acre block became known as *The Australian Dream*[2] where owning a home and raising a family are viewed as a sign of success and security in life.

1 Vaughan, L.(ed) (2015)
2 Bluett, R (2017)

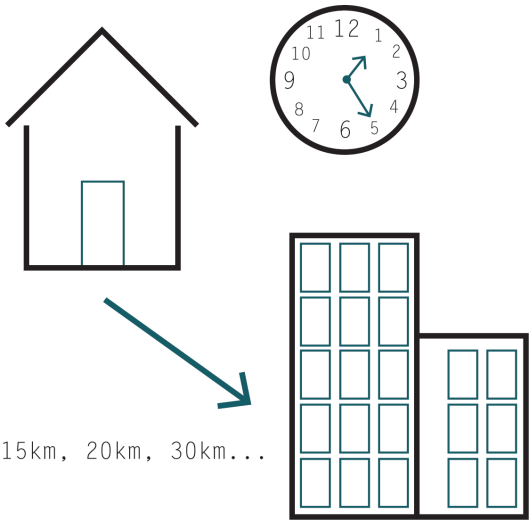
However, as cities have grown outwards and the population has exploded those desirable inner suburbs and neighbouhoords closest to railway stations have given way to ever more distant outer suburbs. All this in a time where investment in critical infrastructure has rarely matched the rate of growth and sheer expanse of land covered. Suddenly, many of those qualities that originally appealed to those seeking suburban living now seemed to be distant. For example, in recent years lot sizes have become smaller in an attempt to reduce the impact of low density detached housing, but the size of dwellings has remained excessively large. This has resulted in new housing subdivisions on the city periphery with high site coverage and houses built almost boundary to boundary. There is barely enough space to breath let alone plant any type of meaningful landscpaping to reflect the 'garden setting' that suburbia came to be.

This hasn't stopped many from continuing to buy properties in outer suburban locations, thereby fueling demand and allowing this type of development to carry on. This can partly be explained by the lack of affordable housing and poor housing choice, where people are forced to look for somewhere else to live as the places they would rather be are out of reach. Therefore, in finding new typologies for suburban living, it is not just about creating more aesthetically pleasing architecture but also making social innovations and changing the way that people live.

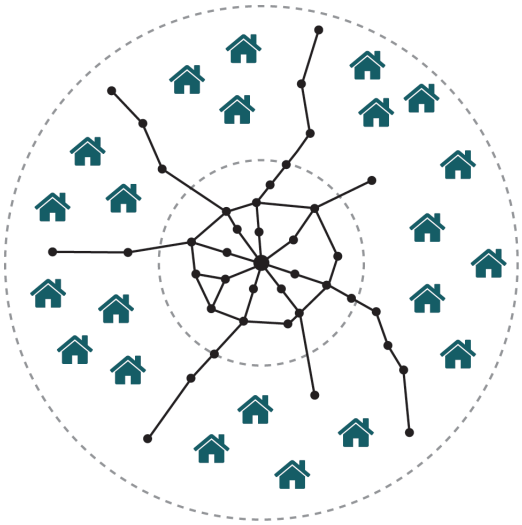
1.2 Symptoms of urban sprawl

What has become clear is that the suburbanisation of cities has led to consequences in the way the city functions and how people live. Although this is a complex subject and is affected by a range of factors, it could be suggested that people's lives are directly affected by their physical environment and what it offers them. The characteristics of urban sprawl are such that its 'symptoms' can have a negative effect on the operation of a city and the day to day activities of humans within that environment.

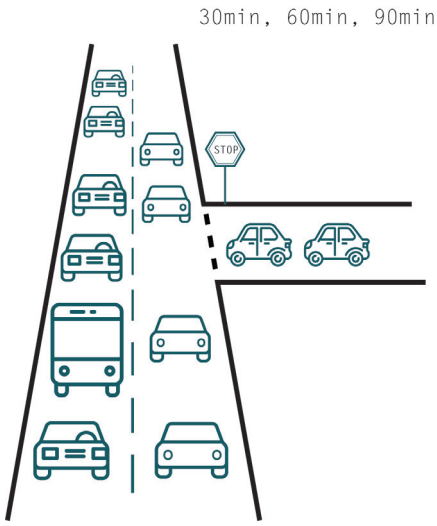
While there are many symptoms of sprawl this research project has identified nine of the most problematic symptoms and seeks to find solutions to the issues they cause. The symptoms have been represented graphically on the following pages in a way to best summarise their impact.



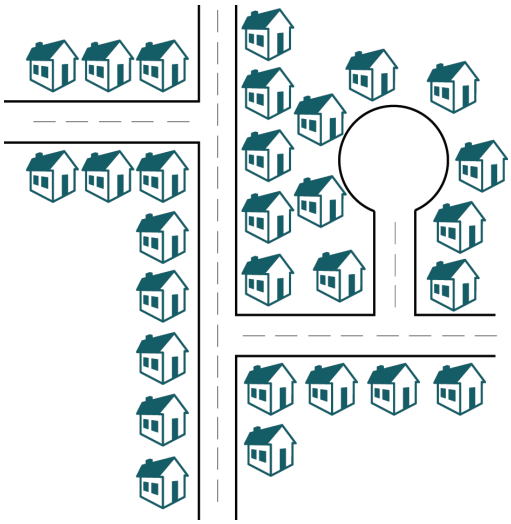
People living far from where they work



Limited public transport connections outside inner city areas

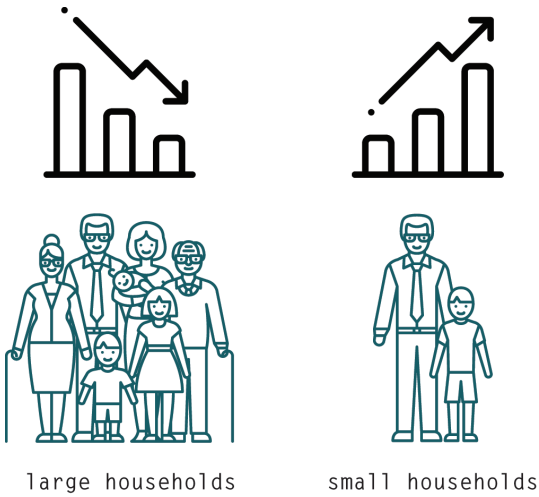


Reliance on car use and resulting traffic congestion

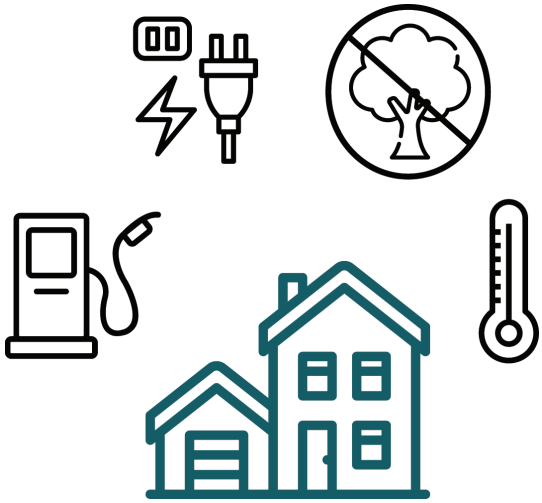


Monofunctional residential neighbourhoods

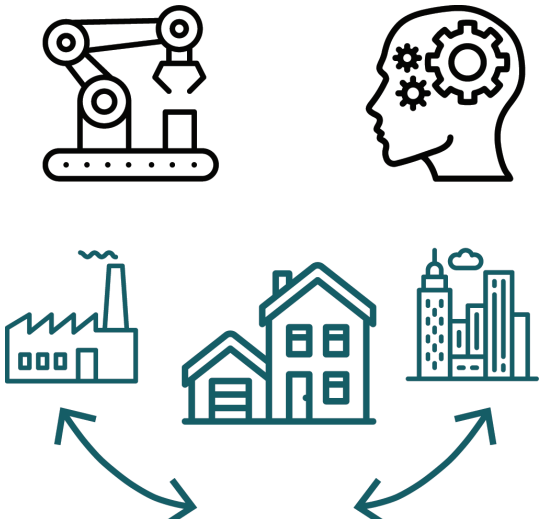
Limited housing choice and poor housing affordability



Failure to address evolving dwelling needs and household sizes

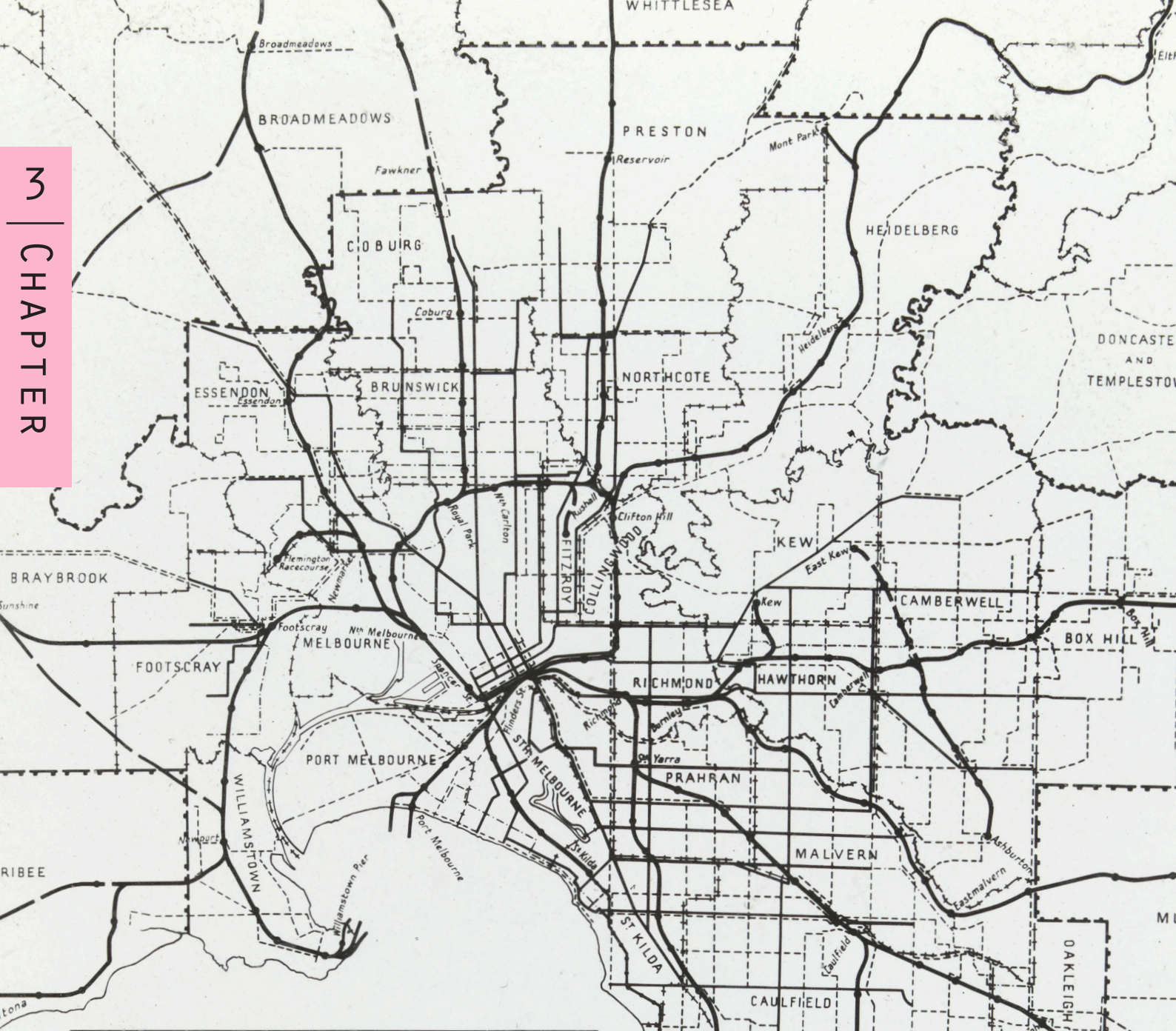


Excessive consumption and impact on ecology and climate



A failure to adapt to a changing, knowledge intensive economy

Social isolation of suburban living



MELBOURNE ELECTRIFIED RAILWAYS

LINE	MILEAGE ROUTE	MAIN TRACK	SIDINGS ELECTRIFIED	SINGLE TRACK
Melbourne — Sandringham	11·04	37·79	30·65	68·44
South Yarra — Dandenong	16·21	43·11	7·46	50·57
Springvale Cemetery Line	1·58	1·61	·14	1·75
Caulfield — Frankston	20·02	41·14	7·99	49·13
Richmond — Lilydale	22·16	37·29	9·08	46·37
Burnley — Glen Waverley	10·33	12·91	2·05	14·97
Hawthorn — Kew	·98	1·43	·46	1·89
Camberwell — Ashburton	3·07	3·94	·31	4·26
Ringwood — Up. F'tree Gully	7·46	7·46	2·38	9·84
Melbourne — Hurstbridge	23·65	29·78	6·21	35·99
Clifton Hill — Thomastown	7·81	13·07	·38	13·45
Rushall — North Carlton(Jct.)	2·36	4·48		4·48
Melbourne — Port Melbourne	3·02	7·45	·15	7·59
Melbourne(Jct.) — St. Kilda	3·44	6·82	·53	7·36
Melbourne — St. Albans	12·12	45·58	13·25	58·82
North Melbourne — Broadmeadows	9·26	21·26	1·33	22·58
Newmarket — Flemington R.C.	1·50	4·11	1·57	5·68
North Melbourne — Fawkner	6·92	11·93	·21	12·14
Footscray — Williamstown Pier	5·97	11·81	2·95	14·76
Newport — Altona	4·07	5·27	2·02	7·29
TOTAL	172·97	348·24	89·12	437·36

MELBOURNE AND SUBURBS

Scale of Chains

REFERENCE

Municipalities	shown thus RICHMOND	Tramways (M.M.T.B)	shown thus
Municipal Boundaries		Tramways (V.R)	
Greater Melbourne Boundary		Motor Bus routes	
Railways and Stations (Electric)		Motor Cab routes (M.C.C)	

3 Case study: Melbourne

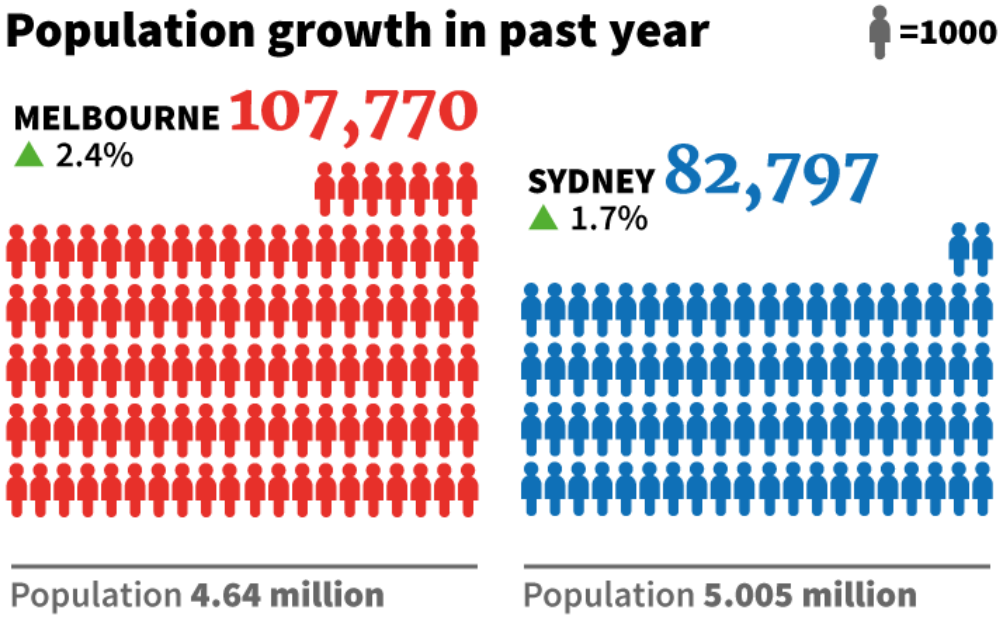
3.1 Historical snapshot

Melbourne was established as a British colony in 1835 and declared a city in 1847, becoming the capital and most populous city in the State of Victoria. With the 1850's gold rush the city became known as 'Marvellous Melbourne' and accumulated great wealth, before being overtaken as the leading city in Australia by Sydney during the 20th Century. The suburbs of the city developed with a rail and tram network that serviced much of the city, as shown in the image on the opposite page.

Left:
Melbourne's electric railways mid 20th Century

(Source: State Library of Victoria)

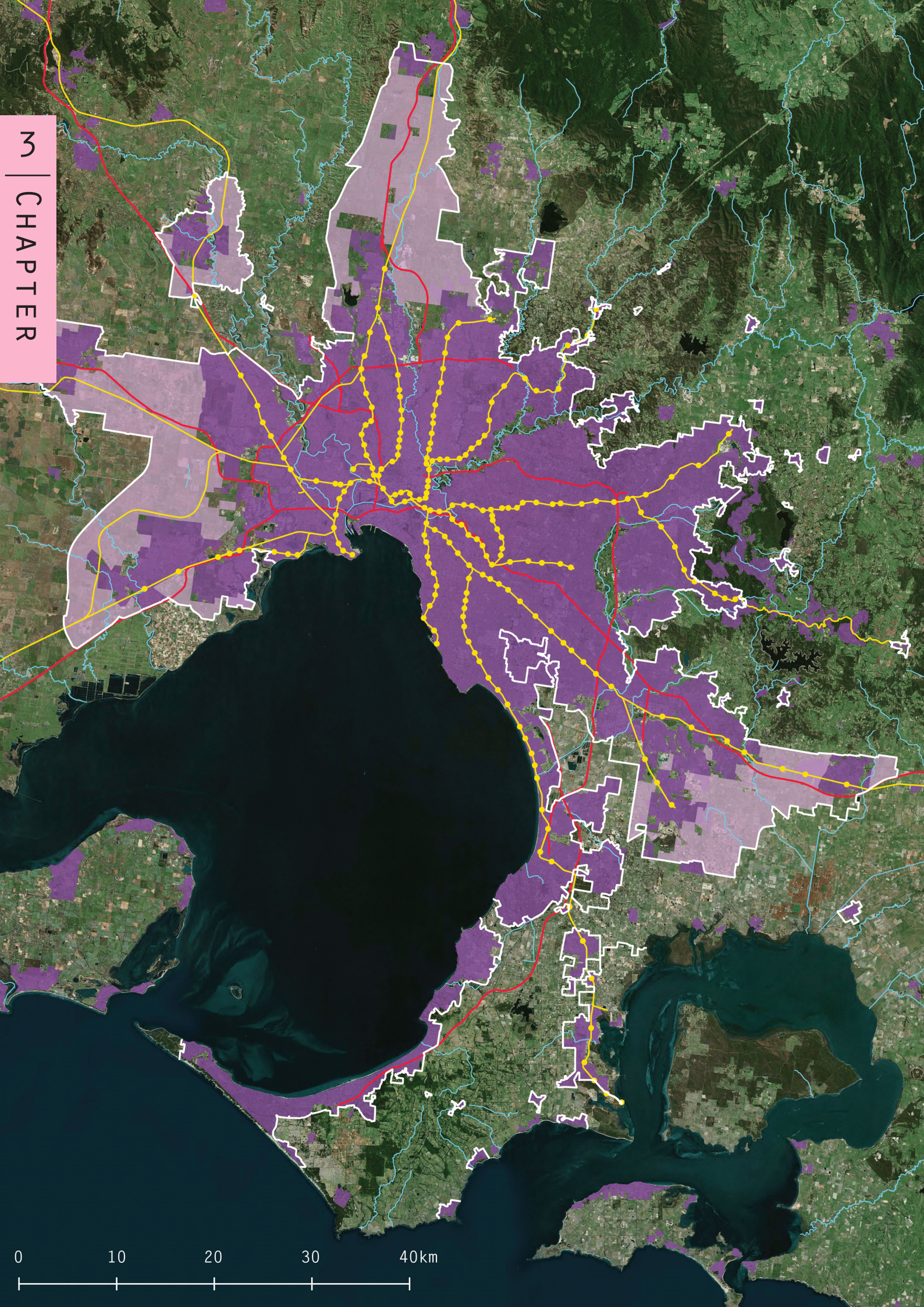
However, since the mid 1990's Melbourne has experienced a sustained population and employment growth. This has led to major inner city renewal projects but also the release of a significant amount of greenfield land on the periphery of the city. This high population growth has fueled historically high property prices and widespread rent increases, along with a demand for more housing to accommodate the influx of residents. As the graph below illustrates, in 2016-17 Melbourne had a growth rate of 2.4% adding 107,770 new residents, outstripping that of Sydney which Melbourne is projected to overtake as the most populous city in Australia by the mid 21st Century[1].



Right:
Comparison of growth in Melbourne and Sydney

(Source: The Age Newspaper)

1 Lucas, C (2017)


0
10
20
30
40km

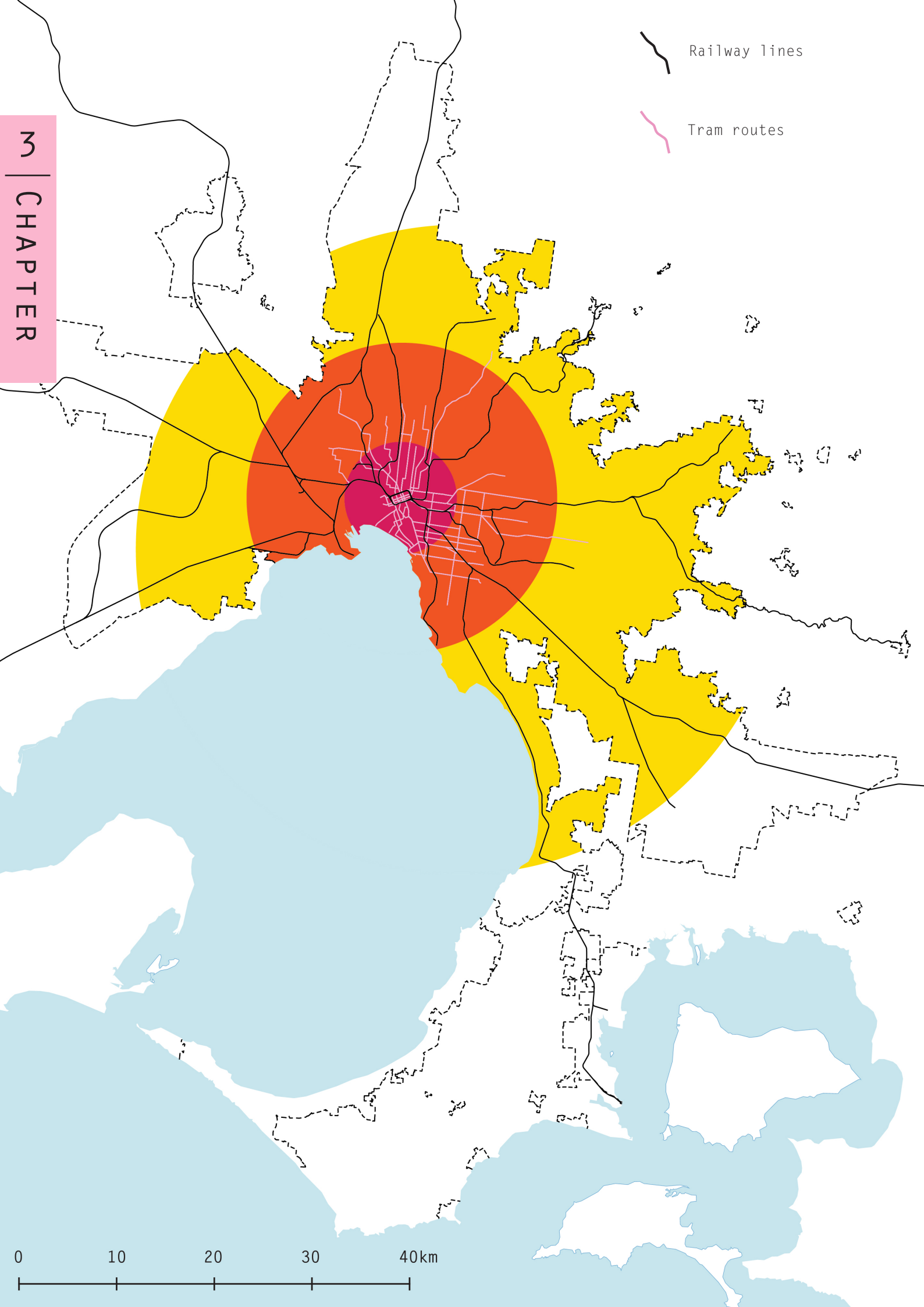
3.2 Key attributes

The Urban Growth Boundary defines the limits of the existing urban area and the vast swathes of greenfield land available for continued subdivision at the fringes of the city. Melbourne has a radial train network that converges at the CBD loop and branches out to the corners of the urban area, the lines and stations becoming more dispersed the further from the city centre. A series of major highways provide vehicle connections through the city and into the surrounding regional landscape.

The city frames the north and east sides of Port Phillip Bay and features several river corridors, the most notable being the Yarra River that runs adjacent to the CBD and continues to the north-east. The eastern suburbs are generally more elevated and heavily vegetated compared to the flatter volcanic plains to the west.

Left:
Metropolitan Melbourne in 2018

(Source: Victorian government data directory)

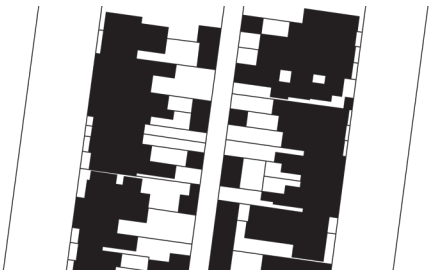

Railway lines
Tram routes
0
10
20
30
40km

3.3 Inner, middle and outer suburbs

As Melbourne has expanded outwards over time the urban morphology of the city has changed. This can generally be categorised into three ‘suburban zones’ in development era’s that are associated with the inner city, middle ring suburbs and outer suburbs. The pattern of development in these era’s has been defined by factors such as method of transportation, housing choice, construction techniques, advances in technology, societal trends etc. For instance, there is a clear distinction between the more compact, public transport and street oriented suburbs of the inner and middle suburbs compared to the changes brought about by car based transportation that led to the outer suburbs becoming ‘internalised’ with detached houses on a lot, privatisation of space and the consolidation of public activities such as shopping into large indoor centres.

Left & below:
The three suburban zones of Melbourne

Mid-late 1800’S

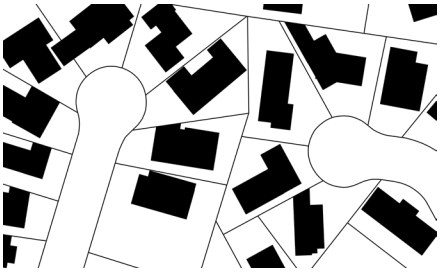


Inner suburbs

Early 1900’S

Middle suburbs

Mid-late 1900’S

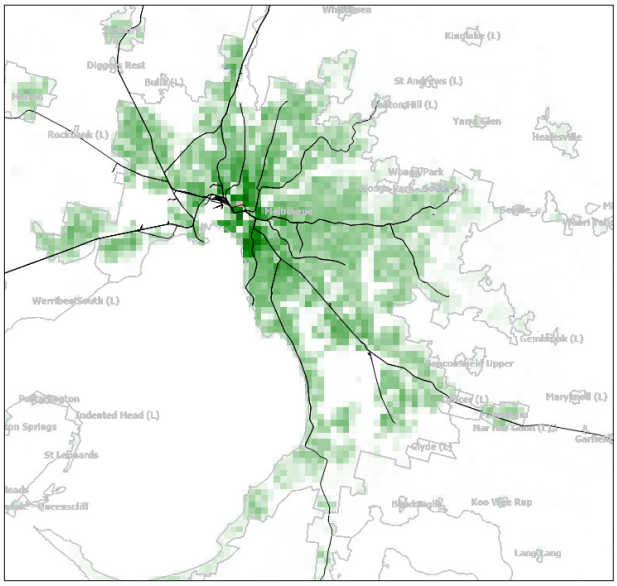


Outer suburbs

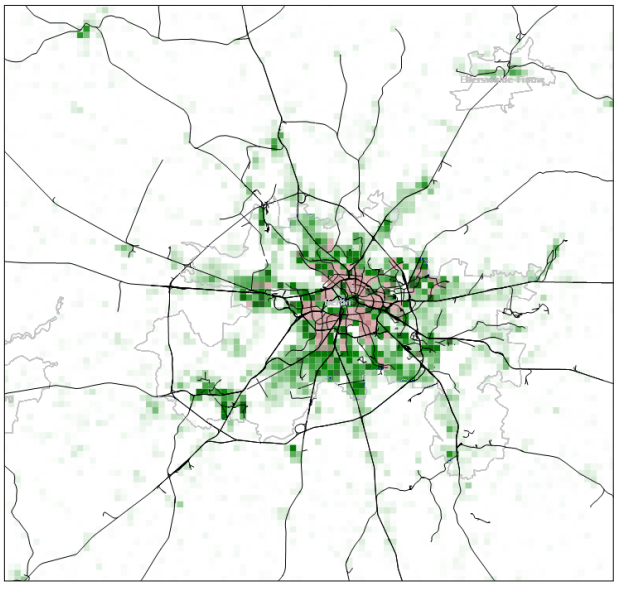
3.4 Scale and density comparison

The low density nature of Australian cities can be put into perspective when comparing the size of the Melbourne metropolitan area and population density with some of the major cities in Europe. This really outlines why the urban boundary of cities such as Melbourne should not be loosened further and there is plenty of opportunity for inward growth, not just in the CBD and innermost suburbs but also in many of the middle ring suburban areas.

Melbourne is much more spread out with low density neighbouhoods in the space between railway corridors, compared to Copenhagen that follows the 'finger plan' of keeping development along these corridors and preserving the green wedges. The area of highest density is also better distributed in the European cities, whereas Melbourne really only has the highest density concentrated to the CBD.



Melbourne
4.9 million



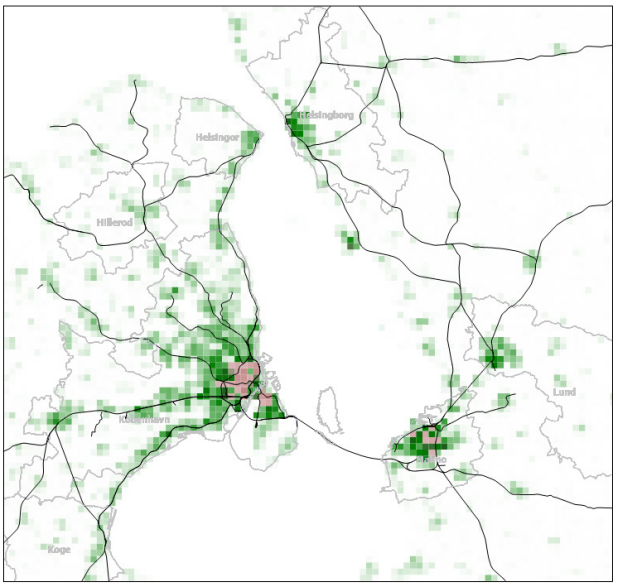
Berlin
3.5 million

Urban Density

persons per hectare

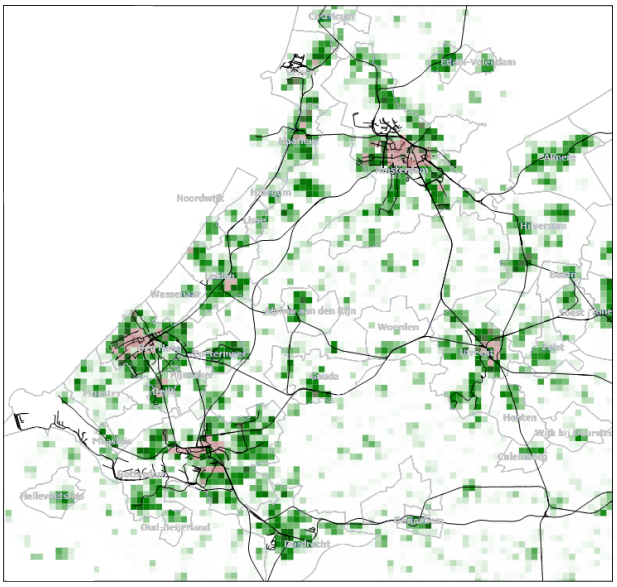
- 20 persons/ha
- 40 persons/ha
- 60 persons/ha
- 80 persons/ha
- 100 persons/ha
- 200 persons/ha
- 300 persons/ha
- 400 persons/ha
- 500 persons/ha

Source: Charting Transport, 2016



Copenhagen
1.3 million

Malmö
340,000



Randstad
8.2 million


PT
SITA
CDC MELBOURNE
Route To
422 Brimbank Central SC
423 Brimbank Central SC
Hail Bus Here
Get on board your new Route 422, the Deer Park Shopper.
60

4 Site Selection

4.1 Finding the ‘forgotten suburbs’

Rather than randomly choosing a site location within the vast swathes of urban sprawl in Melbourne, it is important for this research project to find and classify specific places within the urban area that fit the profile of a ‘forgotten suburb’. A forgotten suburb is thought to be a place that lacks the physical connections, access to and quality of services required for a quality of life that more sought-after places in the city can offer.

This process is undertaken in four steps that progressively narrows down the extent of the existing built up area in accordance with particular criteria, as follows:

Step 1. 15km radius from city core
Step 2. Development era
Step 3. Public transport accessibility
Step 4. Socio-economic index

The final site location is realised by choosing a place within the remaining urban area following Step 4. The subsequent proposals in this thesis are a bespoke design to that particular location, but the intention is that design concepts and principles can be replicated across the other forgotten suburbs spread across the city.

Left:
Sign of suburban neglect in Deer Park

As such, this research project aims to find the answers to the symptoms of urban sprawl by focusing on a particular place, but from which lessons can be applied to other places with similar characteristics not just in Melbourne but cities across the world that must also deal with the problems caused by urban sprawl. This gives the project a more global perspective that requires consideration to the way in which the proposals can be adapted to better suit a particular enrivonment and culture.


0
10
20
30
40km
15km
Port Phillip Bay

Step 1 - 15km radius from city core

The first step in finding the ‘forgotten suburbs’ is to exclude part of the existing urban area within a 15km radius from the CBD. It is this land which contains the inner city and part of the middle ring suburbs. These areas have the highest density, better public transport connections, more jobs, higher income residents, higher land values and generally better access to public facilities and services which are also of a superior quality. The monocentric layout of Melbourne and agglomeration of functions to the city core makes this 15km inner radius some of the most desirable places to live.

The City of Melbourne municipal area is shown in yellow that defines the CBD and its immediate surrounds, which is visible in the photograph below.

Right:
Birds eye view to Melbourne CBD and inner suburbs

(Source: Arup)

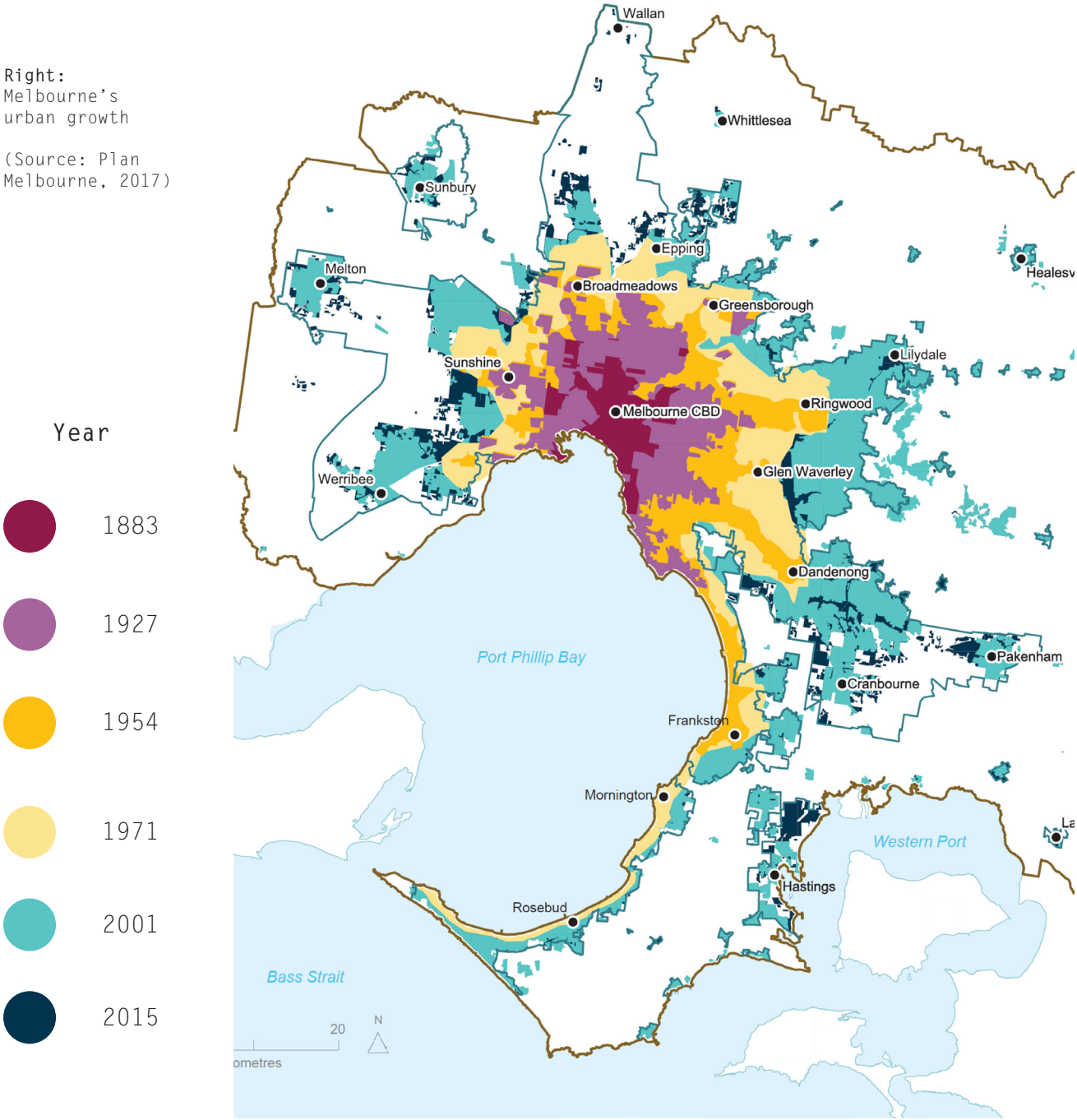

0
10
20
30
40km
15km
Port Phillip Bay

Step 2 - Development era

The next step is to exclude all remaining land in the existing urban area from the time period after 1971, that corresponds to the map below. By excluding the inner 15km core and these subdivisions after 1971 the remaining area (see map to left) generally consists of the post-war 1950's and 60's subdivisions, which was a period of significant growth that essentially signalled the shift from the edge of the middle ring suburbs to the beginning of outer suburbia. This time period 'filled in' the space between railway lines and coincided with little investment in new public transport infrastructure.

Right:
Melbourne's urban growth

(Source: Plan Melbourne, 2017)



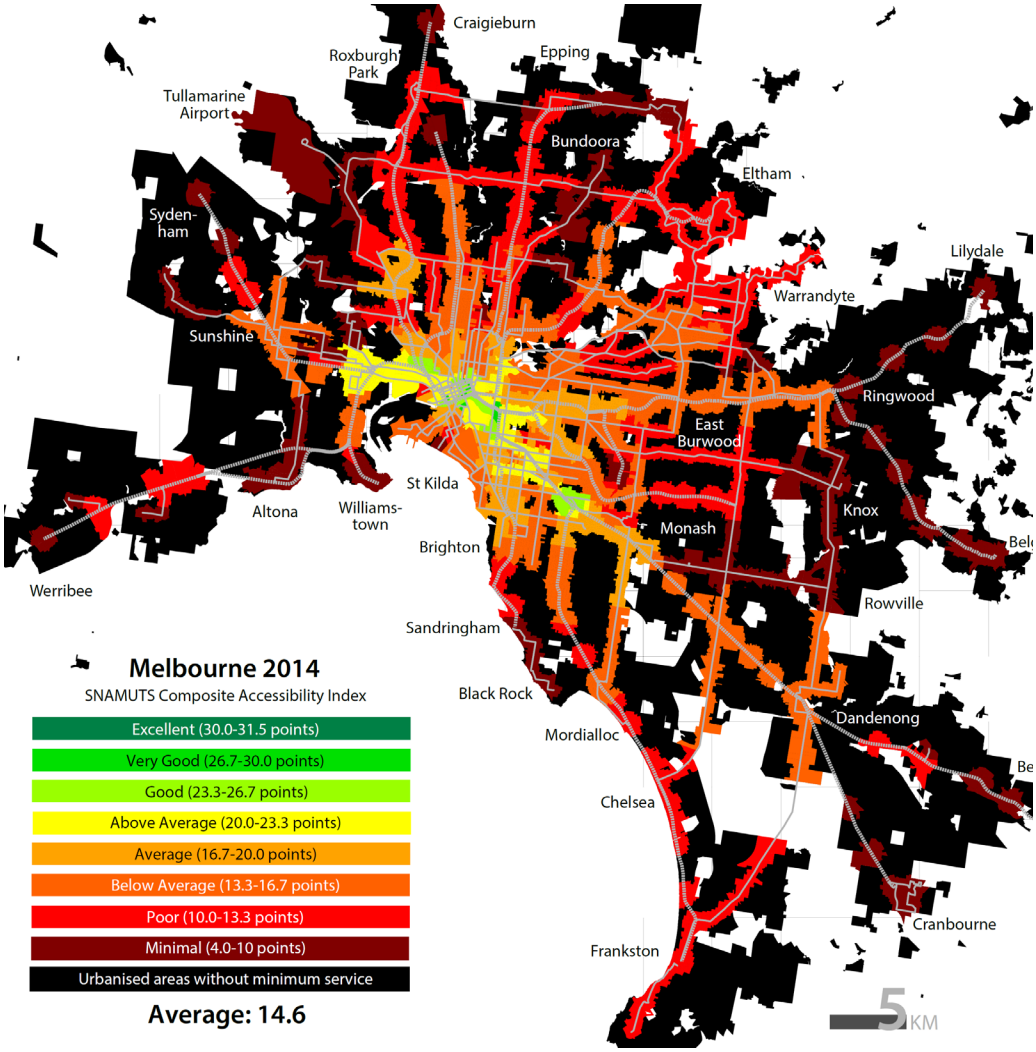

0
10
20
30
40km
15km
Port Phillip Bay

Step 3 - Public transport accessibility

Not all suburbs within the 1950's and 60's era of development were completely devoid of public transport connections, so the next step is to identify those areas that have at least a reasonable level of access to public transport. This mostly consists of land surrounding train stations on railway lines but also those main roads that are better served by a higher number of bus routes and possibilities for interchange between modes of public transport.

The SNAMUTS composite accessibility index (2014) below provided the base data for this step. The urban areas with at least 'poor' and 'minimal' accessibility were excluded, which leaves those 'urbanised areas without minimum service' shown in the map to the left. The public transport 'corridors' (yellow lines) can be seen to intersect the remaining land in the built up area.

Right:
Public transport accessibility by SNAMUTS



Source: Spatial Network Analysis for Multimodal Urban Transport Systems (SNAMUTS)

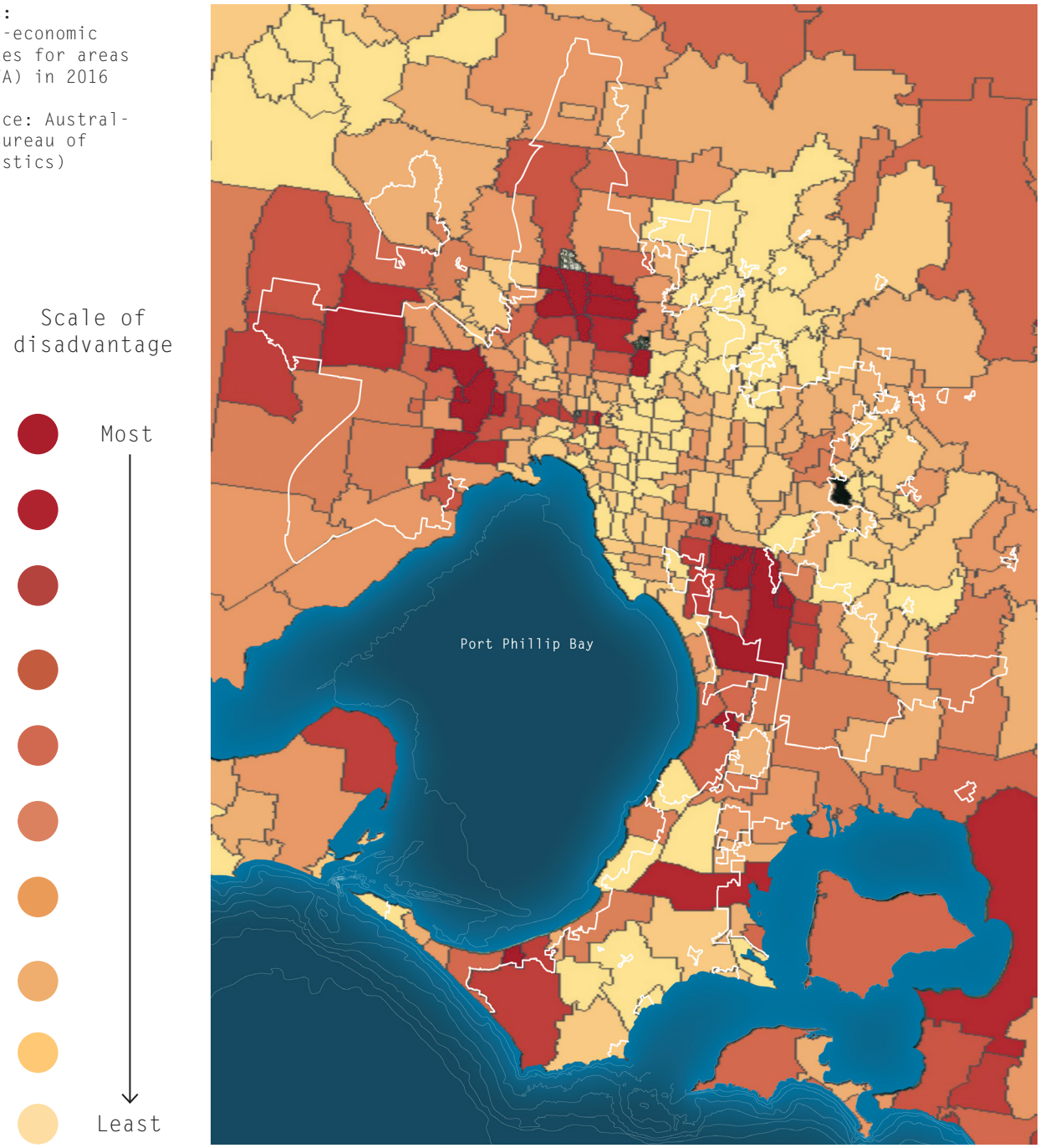

0
10
20
30
40km
15km
Port Phillip Bay

Step 4 - Socio-economic index

The final step in the site identification process considers the socio-economic index of particular suburbs to find those neighbourhoods which have the most disadvantaged residents. As much of the eastern suburbs is of a higher socio-economic index, this leaves four key pockets of the city that could be termed ‘forgotten suburbs’ - two in the west, scattered suburbs in the north and the largest area to the south-east around the vicinity of Dandenong and Springvale.

Right:
Socio-economic indexes for areas (SEIFA) in 2016

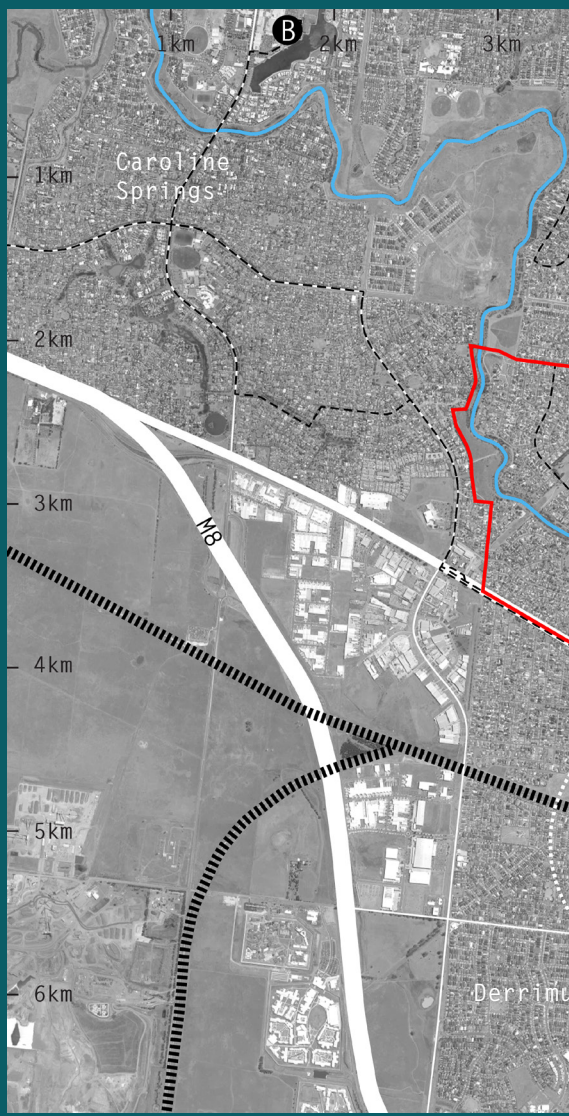
(Source: Australian Bureau of Statistics)



4.2 Site location: metro to district scale

The site is located in the western suburbs, which have historically been thought of in a lesser light than the more wealthy and leafy eastern suburbs. The site is located approximately 16km from the CBD and is sandwiched between railway and freeway corridors. Most notably, the closest railway line to the south of the site is actually a V-Line regional service with limited trains whereas the closest metro station is located at St Albans approximately 3km to the north-east on the Sunbury line. The site is otherwise serviced by bus routes, which although generally well distributed, suffer from a chronic shortage of buses with long wait times and poor infrastructure such as providing shelters and seating at all bus stops. The Kororoit Creek is a noticable natural feature that traverses through much of the western suburbs. Finally, the suburban area has large pockets of industrial land that are generally close to the main highways and provide a vital source of employment for residents.

Below Left:
Site location at Metro scale with forgotten suburbs



Site boundary

Metro train station

V-line train station

Railway line

800m walking distance

Bus routes serving site

Major bus terminus

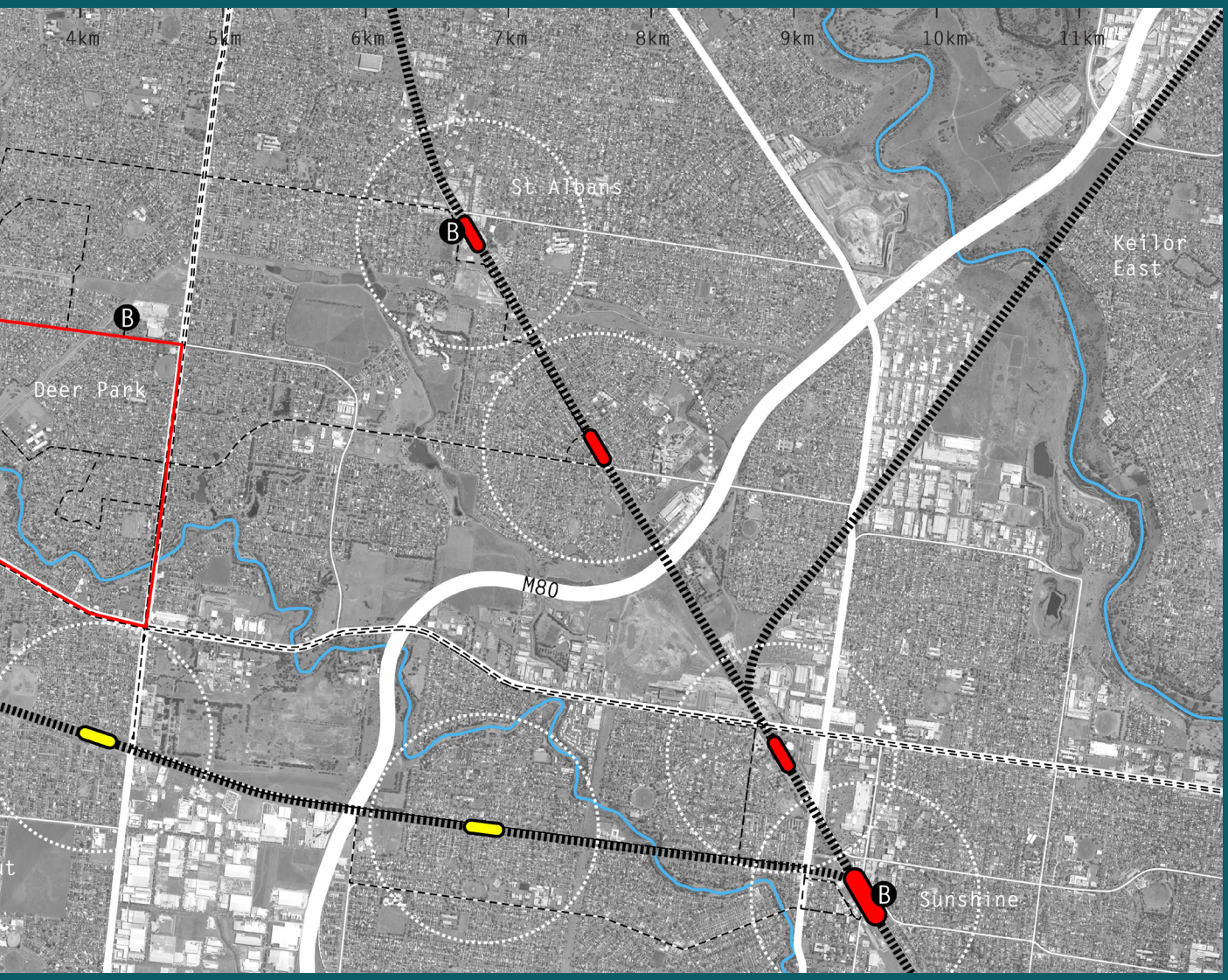
Metropolitan highway

Arterial road

Main road

River

Below Right:
Site location in district scale



4.3 Deer Park: neighbourhood scale

Playground

Typical streetscape

Powerline reserve/easement

Dwelling interface

Kororoit Creek interface

Parkland interface

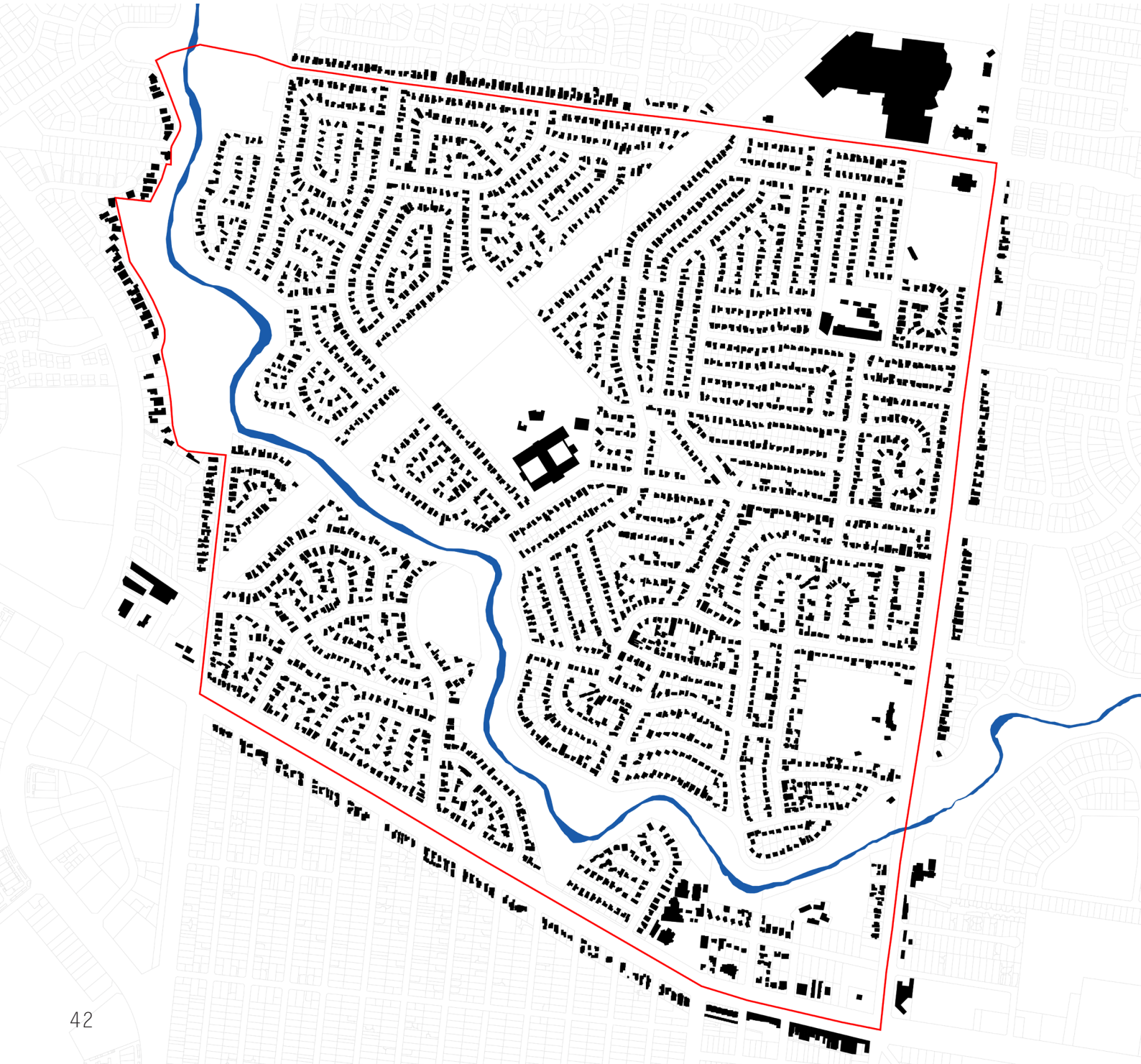
Neighbourhood Centre

Kororoit Creek - entry point


Brimbank Shopping Centre
Neale Road
Powerline reserve
Sports
Primary school
Secondary college
Burnside Hub Shopping Centre
Billingham Road
Station Road
Kororoit Creek
Sports
Ballarat Road
Primary school
Shops

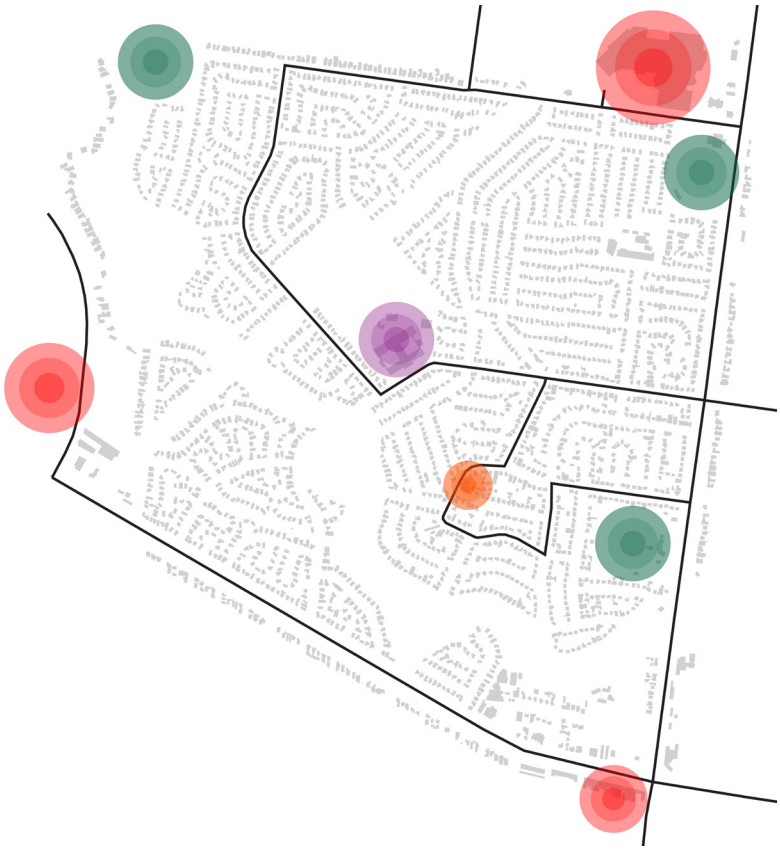
4.4 Spatial analysis of site

The figure ground diagram below shows that Deer Park is characterised by detached building forms. This is consistent with the low density nature of outer suburban Melbourne. Much of the space between buildings, excluding the streets and public parklands, consists of the gardens, driveways and parking areas that makes detached housing generally unsustainable when it comes to effective use of land for a city with a large population. These types of neighbourhoods 'appear' as mostly privatised enclaves where people live behind their facades and fences in their own space with little interaction in the public realm.



Nodes and bus routes

- Larger shopping centres are located on main roads to the edges of the site
- Bus routes (black lines) reach most of the site, close to schools and the small neighbouhood centre



Key shopping centre

Neighbourhood centre

Recreational facility

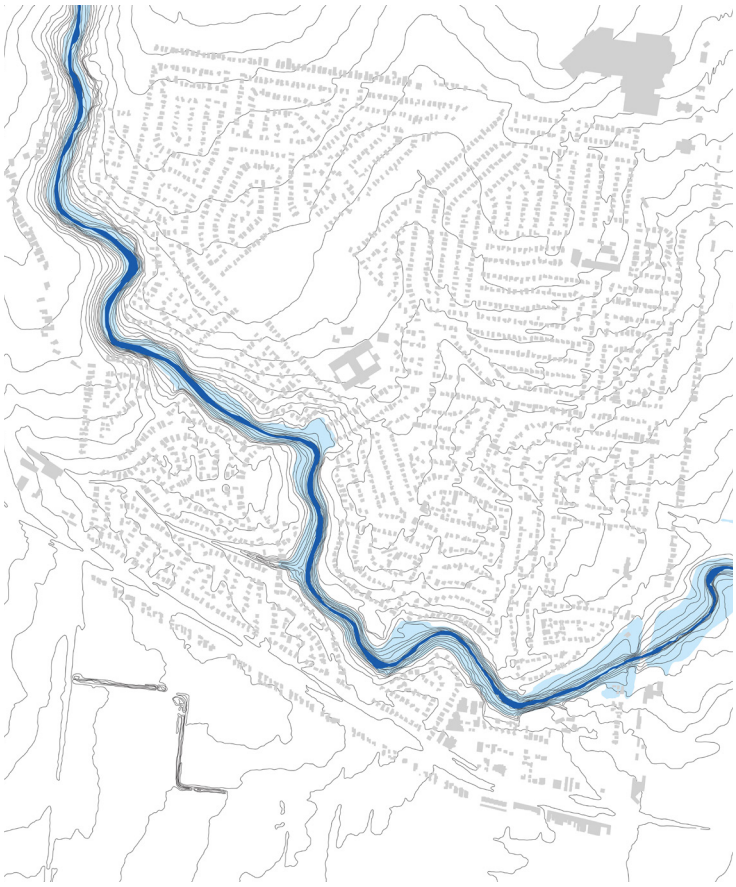
Major school

Roads and paths

- There is a mix of cul-de-sac and regular road typologies associated with different types of subdivisions
- Due to the road layout walking permeability is made more difficult with many private roads that lead nowhere
- However, Kororoit Creek provides a good pedestrian/bicycle corridor, more consistently along the north side

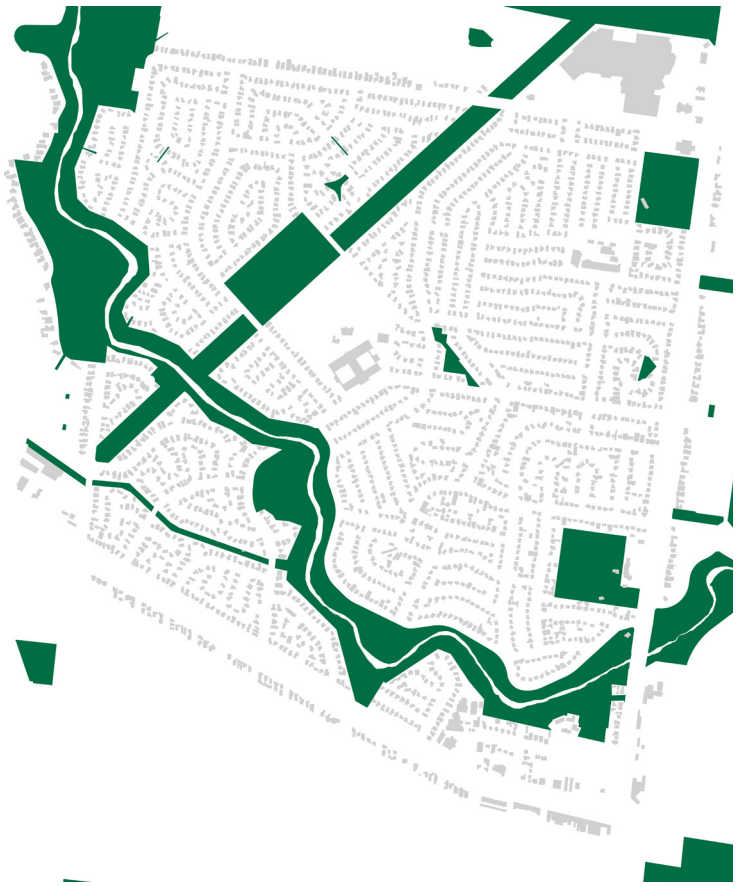
Waterways +
100 year flood level

- Kororoit Creek is a key natural feature of the area and splits the neighbourhood into north and south precincts
- The 100 year flood level poses no threat to housing due to the slope of the river banks
- Land is mostly flat with a light fall towards the Kororoit Creek corridor



Public open space

- The site has two green corridors - the creek environs and powerline reserve
- A number of large parks feature sports facilities and local sporting clubs
- Smaller pocket parks in the neighbourhood provide local clusters of public open space that are poorly utilised



4.5 Existing housing

The most transformative aspect of this research project is housing renewal, which aims to reinvent and change the way that Australians buy and rent property. But first it is important to investigate the existing housing conditions.

Current approach to suburban housing redevelopment

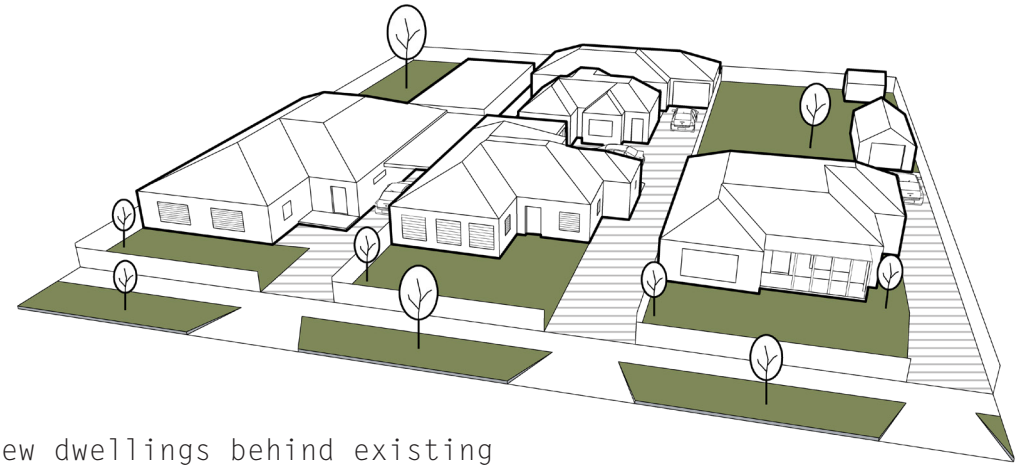
For many Australians it is normal to just buy a property and either move in as it is, to undertake renovations or to demolish and rebuild a new house. The classic Australian home from the 20th Century is on a quarter acre block, single storey height, weatherboard or face brick construction with at least 3 bedrooms, plenty of space for parking and with a large front and rear garden.

Right:
Typical mid 20th Century weatherboard home

The current status quo for housing development in Australia primarily aims to achieve maximum financial yield for the developer. For suburban densification the most straightforward approach has been to construct as many houses as possible on the property, either by demolishing the existing dwelling or by building new houses behind the existing. The unfortunate consequence of this is the attempt to replicate the characteristics and design of a 'detached dwelling' in a higher density form.

This has led to poor outcomes in terms of design, amenity and efficiency - but which are so ingrained into the system of housing development in Australia that it will take cultural change and a visionary approach in order to shift attitudes. The diagrams on the following page show two of the most common suburban densification approaches today.

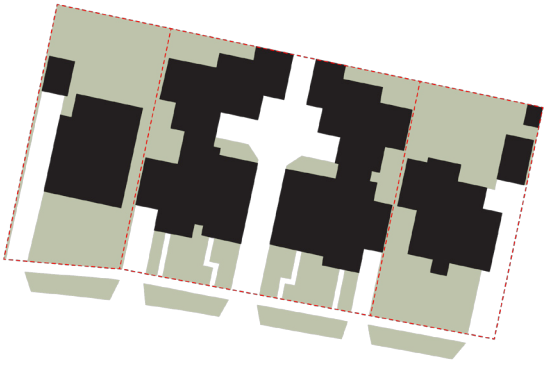
Multi-dwelling ‘battle axe’ typology



- New dwellings behind existing
- Inefficient site plan
- Excess of driveway and garages
- Small, poorly located private courtyards
- Poor sense of address for dwellings at the rear
- Limited space for planting of taller canopy trees
- Unwelcoming street interface

Multi-dwelling ‘central driveway’ typology

- New dwelling arragement with central driveway leading to individual houses
- Inefficient site plan
- Focus on central driveway as only ‘communal space’
- Poor sense of address for dwellings at the rear
- Limited space for planting of taller canopy trees
- Small gardens



4.6 Key demographics of Deer Park

Deer Park has a high proportion of overseas born residents compared to Melbourne as a whole, most from Vietnam and other Asian countries. It is a suburb with lower household income, has less university qualified residents and a higher rate of unemployment than the average of both Melbourne and the state of Victoria. Deer Park also features more family households, which corresponds with a lower percentage of medium and high density housing due to detached dwellings being the primary suburban typology.

Right:
Demographic data from 2016 Census

(Source: .id population experts)

Overseas born

49% ▲ (3.8%)

City of Brimbank	48% ▲
Greater Melbourne	34% ▲
Victoria	28% ▲

Medium and high density Housing

13% ▲ (3.3%)

City of Brimbank	18% ▲
Greater Melbourne	33% ▲
Victoria	27% ▲

Median weekly household income

$1,225 ▲ ($123)

City of Brimbank	$1,261 ▲
Greater Melbourne	$1,539 ▲
Victoria	$1,416 ▲

Unemployment rate

11.2% ▲ (1.3%)

City of Brimbank	10.4% ▲
Greater Melbourne	6.8% ▲
Victoria	6.6% ▲

Couples with children

38% ▲ (3.2%)

City of Brimbank	38% ▼
Greater Melbourne	33% ◂▸
Victoria	31% ◂▸

University qualification

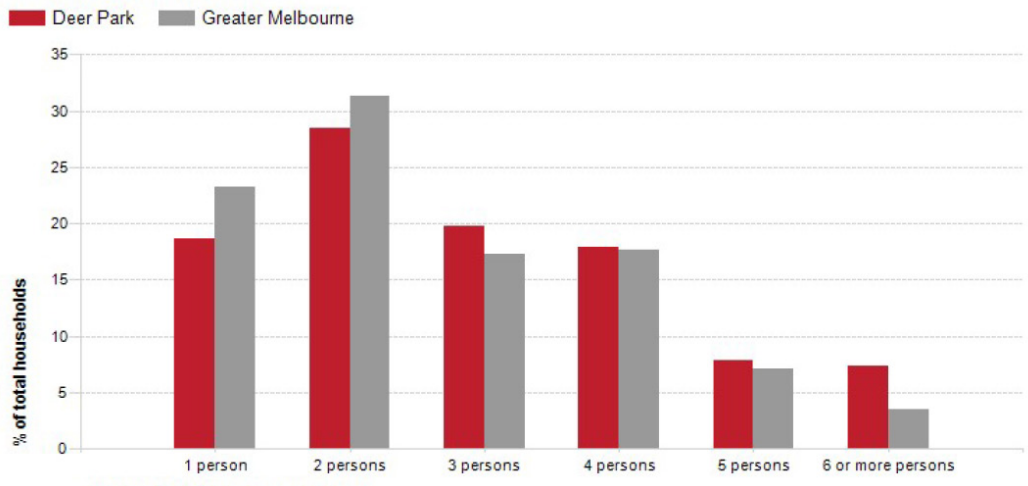
16% ▲ (3.4%)

City of Brimbank	16% ▲
Greater Melbourne	27% ▲
Victoria	24% ▲

With the higher number of 'couples with children' households compared to the Melbourne average it is no surprise to find that there are more households above 3 persons and, most notably, approximately double the number of 6+ person households than Greater Melbourne. However, in terms of sheer numbers the most common household size is 2 persons and many single person households, which is reflective of the overall trend for smaller households in developed countries such as Australia.

There is a disparity between the number of 1-2 person households and the number of bedrooms per dwelling, which are overwhelmingly 3-4 bedroom houses. This indicates a lack of smaller housing units and/or an assumption of smaller households growing into family units. This reflects a gap in housing choice that fails to account for changing household patterns, where smaller households are often restricted to live in expensive flats in the inner suburbs or in cheaper, larger houses in the outer suburbs that are not suited to their needs.

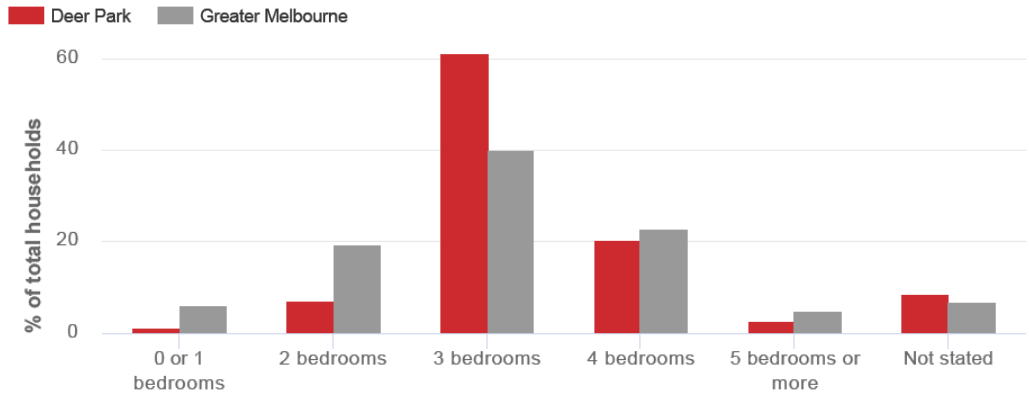
Household size, 2016



Left:
Demographic data from 2016 Census

(Source: Australian Bureau of Statistics)

Number of bedrooms per dwelling, 2016

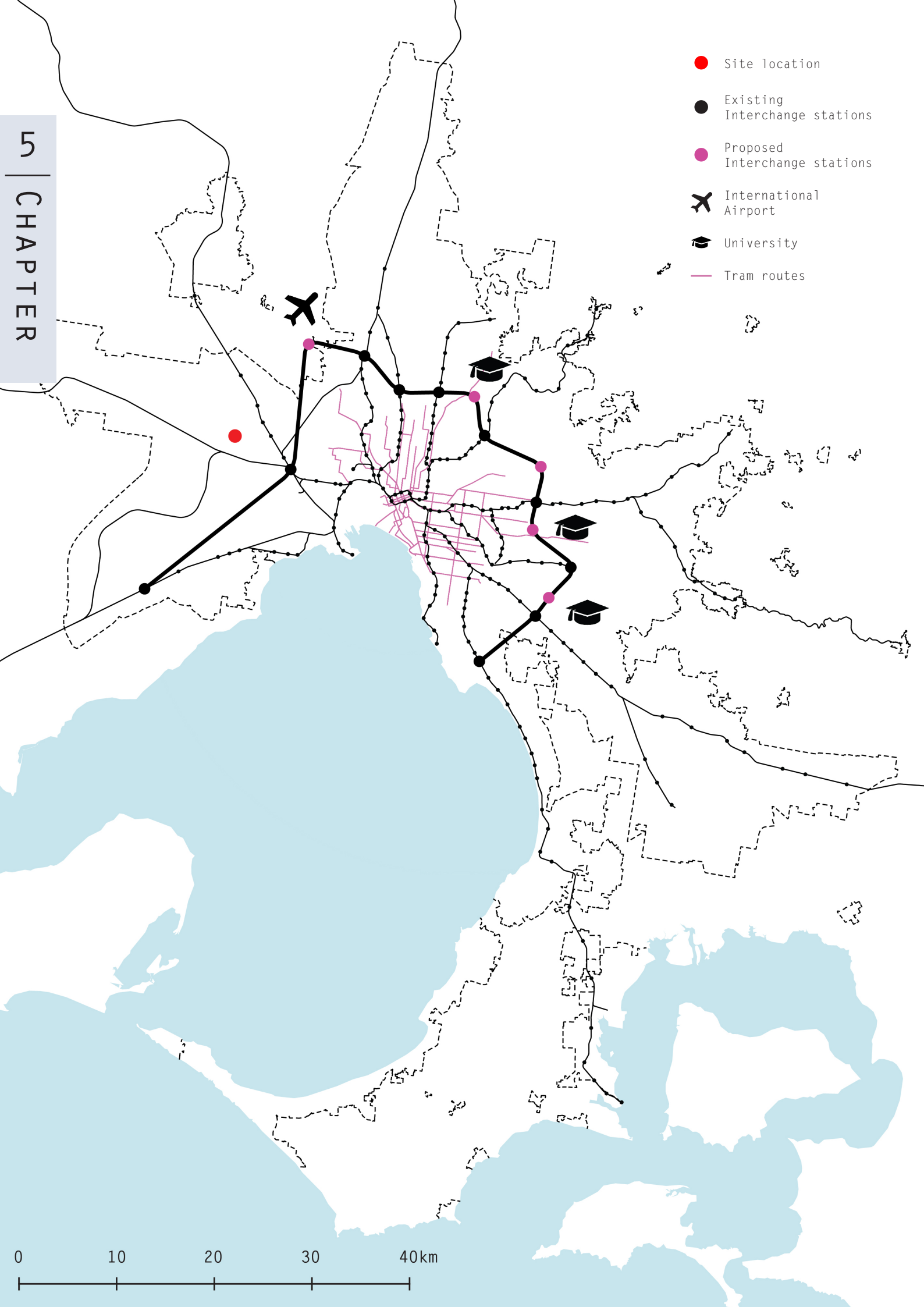


Source: Australian Bureau of Statistics & id. population experts, 2016

4.7 Summary of neighbourhood issues

In order to prepare a site proposal that responds to the symptoms of urban sprawl, it is important to first define the existing issues in Deer Park that need to be resolved. These issues serve as a blueprint for other similar sub-urban areas in Melbourne and across the world. This pro-cess ensures that the development concepts and strategies of this research project address particular needs with a more evidence based approach that has clear directives and outcomes. Thus, the key issues are:

- Limited public transport options with infrequent bus services and location of the nearest train stations more than reasonable walking distance.
- Shortage of local job opportunities with long commute times to the city centre and other major employment hubs in the western suburbs,
- Educational facilities that cater to youth that fail to provide further education for adults, in order to acquire new skills in a changing economy.
- Reliance on large internalised shopping centres for shopping and most public activities, putting more emphasis on car use.
- Lifeless street environments with anonymous, unfriendly thresholds between public vs private land.
- Walking and bicycle use is discouraged due to the low density urban morphology, lack of suitable infrastruc-ture and concern over safety.
- Lack of local meeting places and neighbourhood hubs where people can meet and interact.
- Underutilised green network along the Kororoit Creek and small public parks with poorly developed and maintained infrastructure.
- Limited housing choice with predominance of single storey detached dwellings on a lot, or poorly designed multi-unit developments.
- Energy inefficient homes reliant on artificial heating and cooling from unsustainable energy sources.
- Widespread areas of low density housing requiring an excessive land area, including space for car parking on private property.
- Light tree cover with an inconsistent landscape character to streetscapes and private property.


Site location
Existing Interchange stations
Proposed Interchange stations
International Airport
University
Tram routes
0
10
20
30
40km

5 Metropolitan & District Strategies

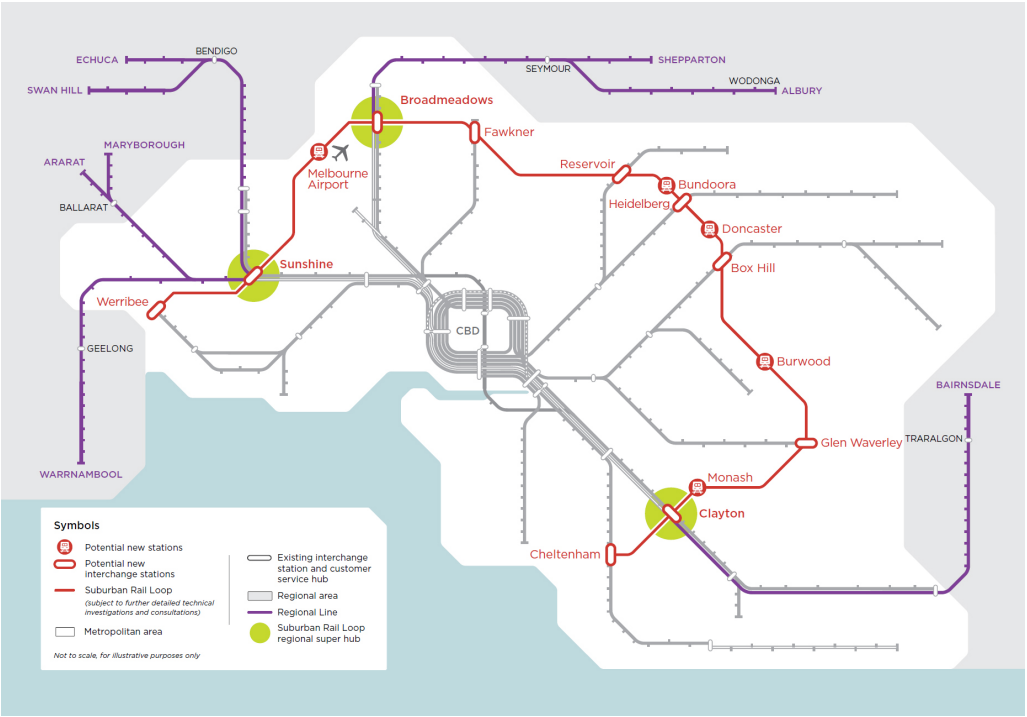
5.1 Metropolitan Strategy

Suburban Rail Loop

To combat the difficulty people living in outer suburbs face getting to other places in Melbourne without enduring a long car trip through traffic it is proposed to construct a 90km circular railway through the middle-ring suburbs of the city. This railway will link with some exitsing stations, but will also require the construction of some new stations, in particular at three of the large universities outside the city centre: Monash University, Deakin University and Latrobe University. The rail loop connects the places beyond the tram network by linking the radial train lines across the city.

This proposal will open up more possibilities to those living outside the inner city and breaks down the monocentric pattern of Melbourne's rail system. More people will have access to to jobs, education, health services and other major infrastructure. Furthermore, the proposed suburban rail loop will be connected to regional centres through key hubs at Sunshine, Broadmeadows and Clayton that allow transit from V-Line services.

Left:
Proposed Suburban Rail Loop



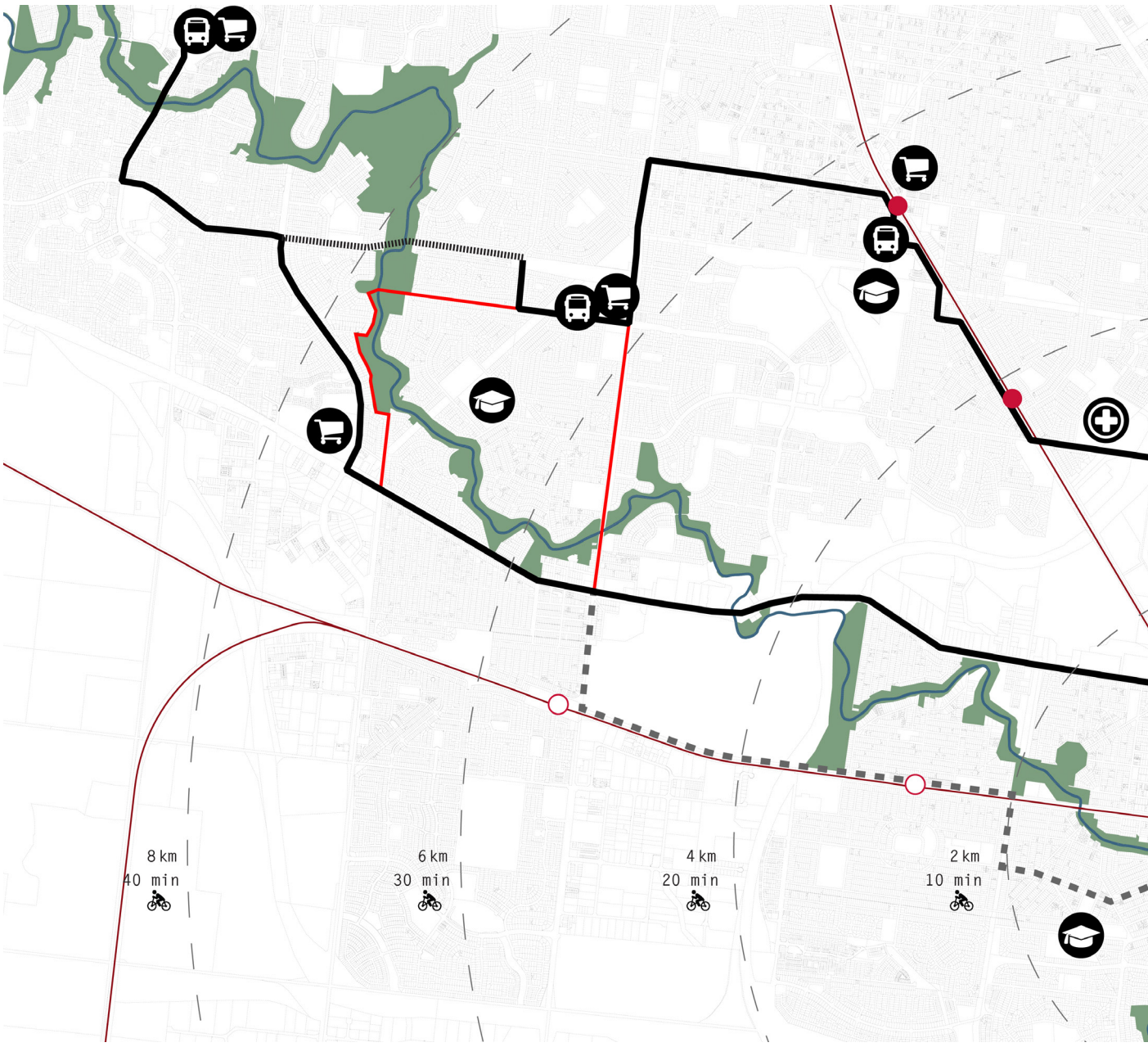
Right:
Regional connections to Suburban Rail Loop

Source: Victorian Government (Big Build), 2018

5.2 District Strategy

Connect Sunshine

The western suburbs will be anchored to the National Employment and Innovation Centre at Sunshine, with better connectivity from the site by a green-blue corridor along the Kororoit Creek and high frequency bus service linking metro train stations and other key facilities in the local area. There is a possibility for extension of the bus service in the future should the regional railway line be utilised within the metropolitan train network. The Kororoit Creek transit corridor will allow for cyclists to more safely and quickly travel the western suburbs, while also providing a valued recreational asset,



Sunshine NEIC

Metro train station

Regional train station

Kororoit Creek

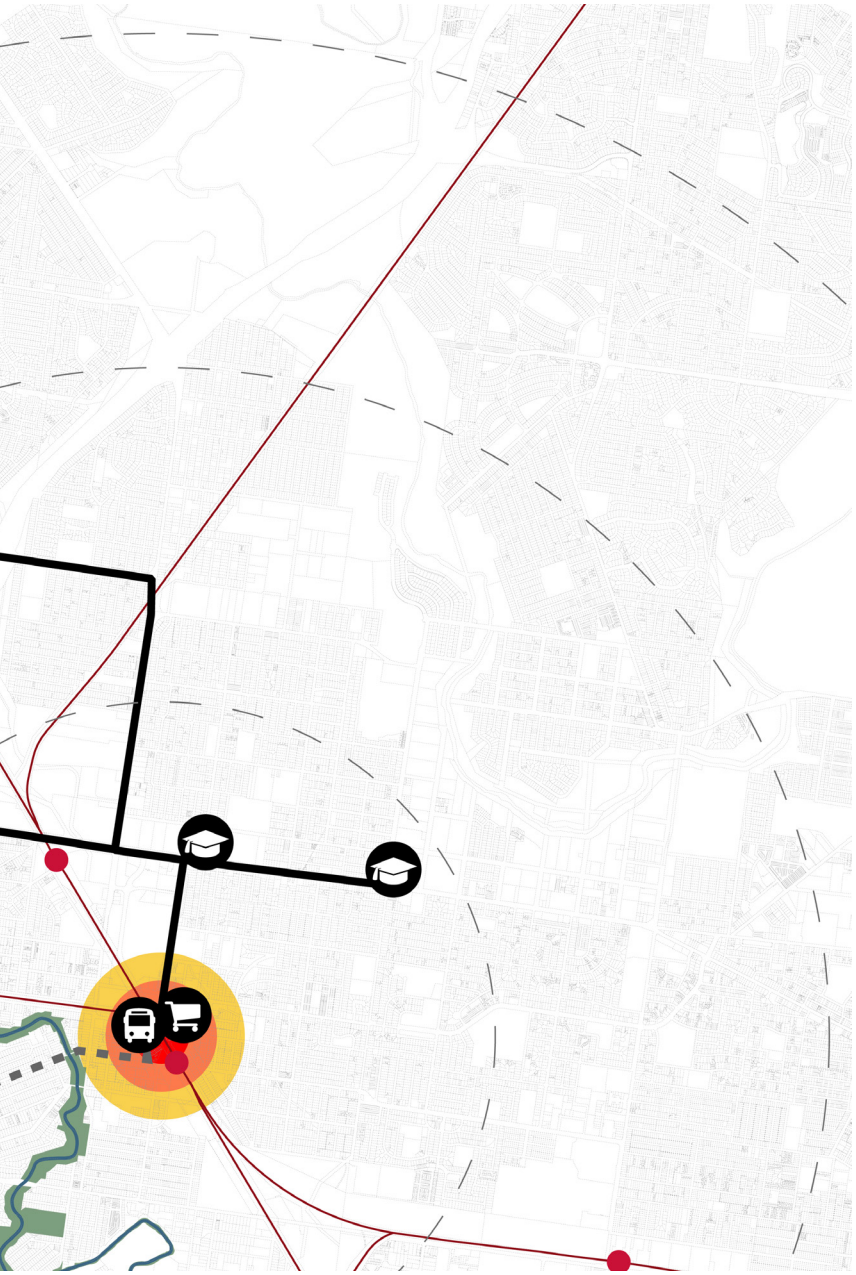
Bus service

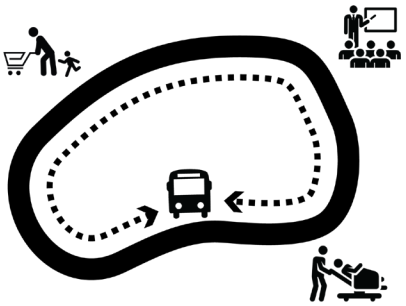
Bus terminus

Shopping centre

Education

Hospital

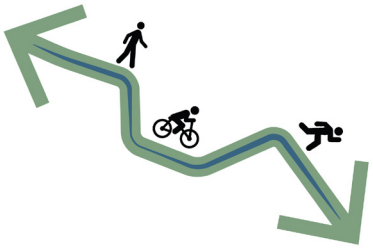




High frequency bus loop
to key infrastructure

New link required

Future extension



Blue-green corridor
along Kororoit Creek

6 Vision

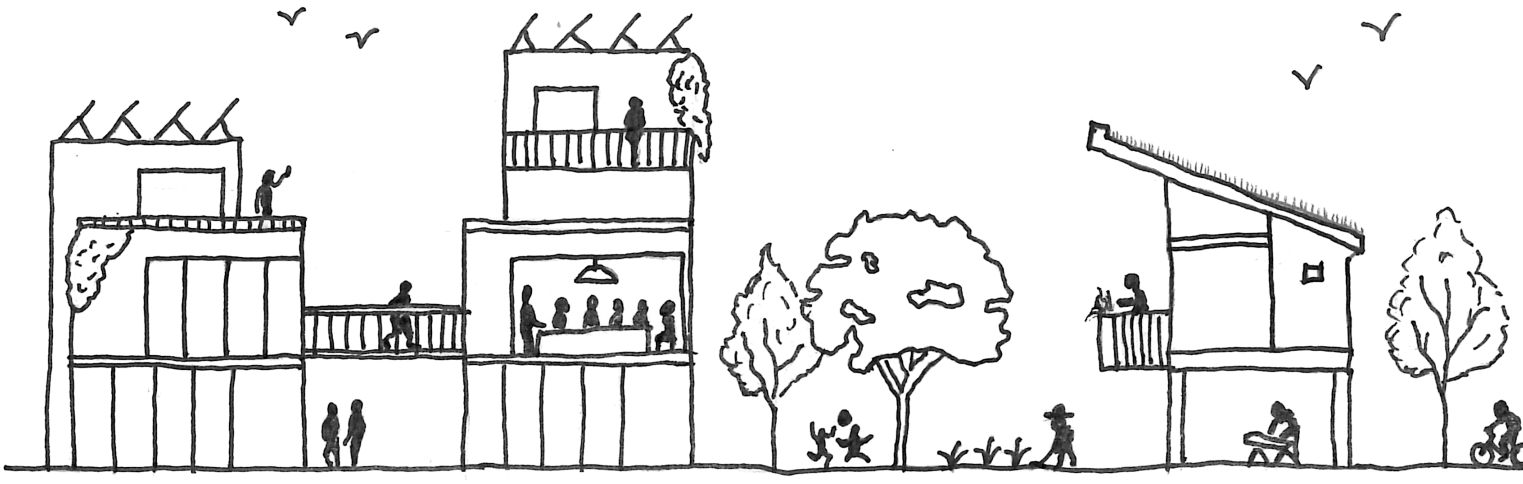
re·pair & re·new

6.1 Vision Statement

The residents of Deer Park will enjoy improved transport links to the city centre and key places in the western suburbs, giving them access to more jobs and opportunities. With new possisiblities for adult education in the local area, this will help build resilience in a changing employment market and utilise urban farming as a springboard to a more sustainable lifestyle choice.

With a focus on repairing the local streetscapes and parkland, the new neighbourhood will feature more places for people to meet and interact. Deer Park will be a suburb where people feel safe, accommodating for families and children and a place where everyone gets to know their neighbour so that no one feels alone.

Finally, Deer Park will be a place where the concept of suburban living will be reinvented with collective housing in affordable, sustainable architecture that fosters a culture of collaboration and action.



Connectivity

NEW BUS + BICYCLE LINKS | LOCAL SHOPS | SCHOOLS + ADULT EDUCATION

Streetscape Repair

BUS STOP UPGRADES | STORMWATER SYSTEM | ACTIVE THRESHOLDS | NEW PLANTING

Parkland Repair

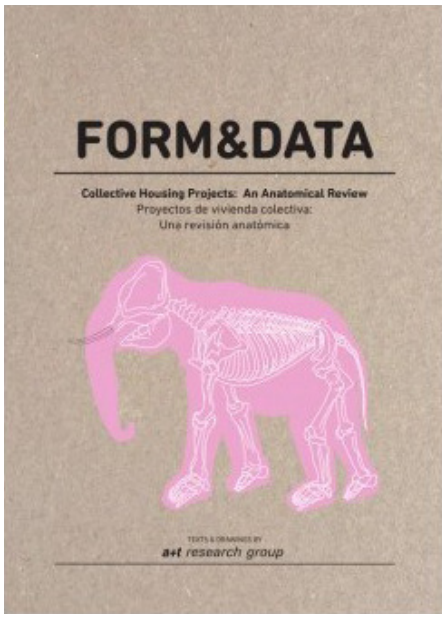
URBAN FARMING | WETLANDS | CREEKSIDE GATHERING PLACES | SAFETY + ACCESS

Housing Renewal

COLLECTIVE HOUSING | ECO FRIENDLY | HOME EMPLOYMENT

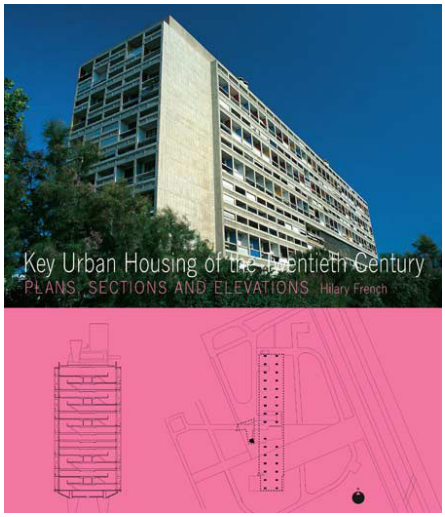
6.2 Reference projects

In order to propose solutions to the symptoms of urban sprawl it is first beneficial to take some lessons and inspiration from reference projects that share some relevance to the task at hand. The following is a snapshot of a selection of literature that provided the insight and background to the specific question of what form of housing could be proposed in the context of renewal. Four key reference projects have been chosen, which have given particular inspiration to the physical and administrative context for housing renewal. With this information, the rationality and detail of the housing proposals in this research project should become clearer.



Form & Data - Collective housing projects: an anatomical review
a+t research group (2016)

- Review of 20 different types of collective housing projects, built between 2013 - 2016
- Plans, sections and axonometries
- Includes concept data and detail on floor space program, including shared space, circulation etc
- Comparison between projects gives a breakdown of the typologies and compares their density and land use efficiency



Key Urban Housing of the 20th Century
Hilary French (2008)

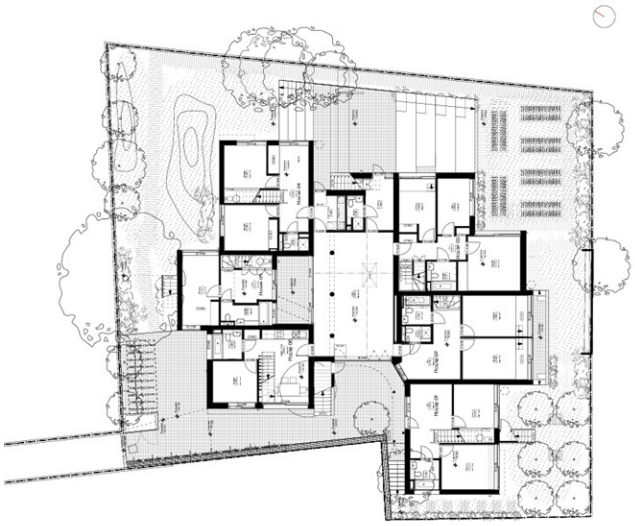
- 87 of the most influential modern housing designs in the 20th Century
- In chronological order tracing the history of public and private housing across the century
- Scale drawings, plans and sections
- Text explaining the concept and design language of the proposals
- Ranges from single dwellings to low-rise terraces and high-rise towers

Copper Lane Co-housing, London (2013)
Henley Halebrown Rorrison Architects

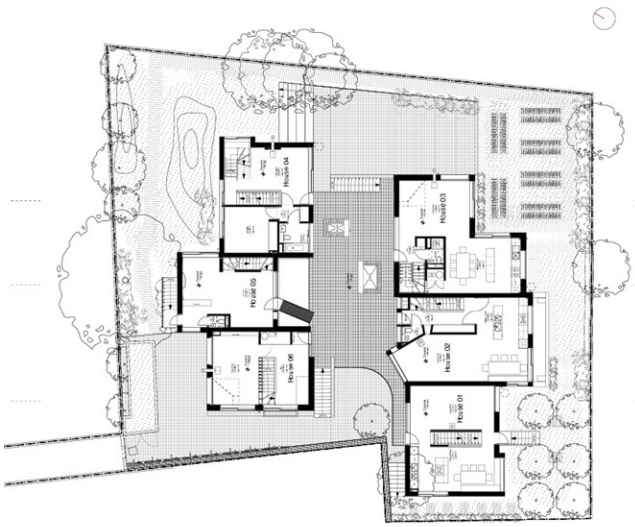
A group of 6 households living in a 'self-build' cohousing project in Stoke Newington, London. The people involved already lived in the surrounding area and shared a common interest in such a project, so collectively purchased a plot of land as a limited company. Every member was given the role of 'director' of the limited company that owns the freehold, while the individual householders own the leaseholds of each unit within the project. This required the participants to fund the purchase by the sale of their own homes in the area.

In design terms, the houses are laid out in a cluster with a central communal space - a common room at the lower ground level and open terrace at the upper ground level. Each unit shares access onto the terrace that encourages interaction between residents. The periphery of the site provides space for landscaping and other activities such as urban farming and play.

Lower Ground Floor



Upper Ground Floor



Right:
Floor plans

(Source:
Architects
Journal, 2014)

Left:
East Elevation detail

(Source: Architects Journal, 2014)

The common spaces are central to the design and allow people to form a mini community - something that is not facilitated at all by the current approach to multi-unit suburban housing in Australia. This project is a shining example of how a group of like minded people with a common objective can band together to achieve something that would otherwise not be possible. However, it does demonstrate the difficulties that collective housing projects face with securing finance, for instance dealing with the risk associated with having to sell their current property and moving into temporary rental accommodation.

Left:
Common terrace at upper ground level

(Source: Architects Journal, 2014)

Mehr als Wohnen, Zurich (2014)
Duplex Architekten

Hunziker Areal House A

Just one of a collection of buildings in this development precinct outside of Zurich, which is a new model for co-op housing. The floor plan experiments with units in a 'cluster' arrangement that takes reference from the site masterplan. This creates a dynamic layout with varying degrees of privacy and automony with a mix of shared spaces (purple & green, right) including seating and communal dining. The ground floor tenancies are activated by small businesses that are owned and operated by local residents. The outdoor spaces of the precinct are welcoming and encourage residents to participate and play together, with events and parties such as below.

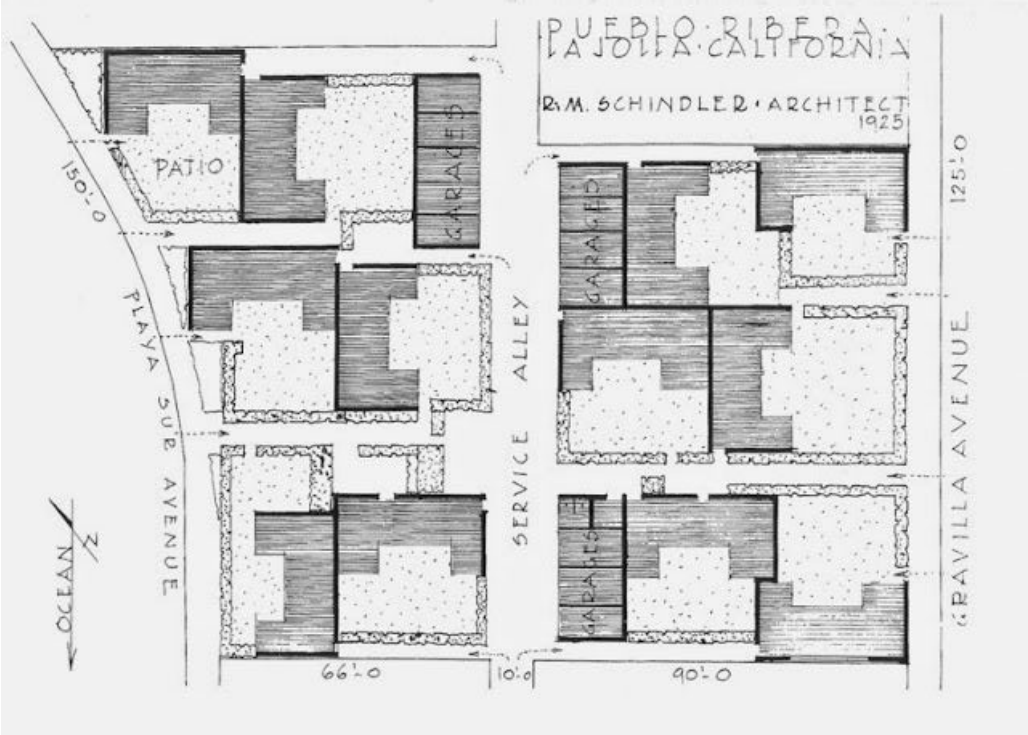
Right:
Typical floor plan of House A

(Source: Duplex Architects)

Right:
Outdoor gathering place for residents

El Pueblo Ribera, San Diego (1923)
Rudolf Schindler

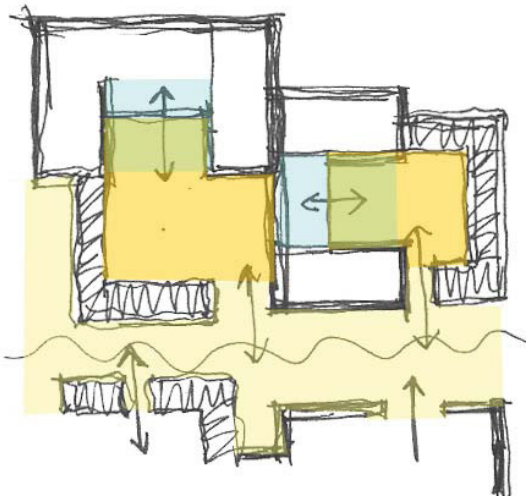
Also known as the Schindler courtyard houses, a collection of 12 identical dwellings laid out carefully to maintain privacy and facilitate outdoor living through the concept of an 'outdoor room' facing a courtyard. By arranging parking along a shared service alley the remainder of the site is preserved for common pedestrian walkways and ensures that the floorplans are not restricted by needing to provide individual access to integrated garages.



Left:
East Elevation detail

(Source: Rudolf Schindler Architects)

While this example does not feature much in the way of useable common space, it does illustrate how the division between private and public space can be merged to allow for possibilities for interaction between neighbours. The diagram to the right demonstrates the different zones and how using openings and sightlines helps to break up the enclosed nature of the housing layout. This is a model for suburban living that can be adapted today.



Left:
Common terrace at upper ground level

(Source: Rudolf Schindler Architects)

Solar Settlement at Schlierberg, Freiburg (2000)
Rolf Disch Solar Architektur

The worlds first housing community that produced a positive energy balance and which is emissions free and CO_2 neutral. This is achieved primarily by the solar panels that generates around 420,000 kWh of clean solar electricity per year. An example of how sustainable design solutions can be integrated into the design of housing in an attractive way. The development includes both bicycle and carsharing and the neighborhood has an extensive car-free zone with many public transportation connections.

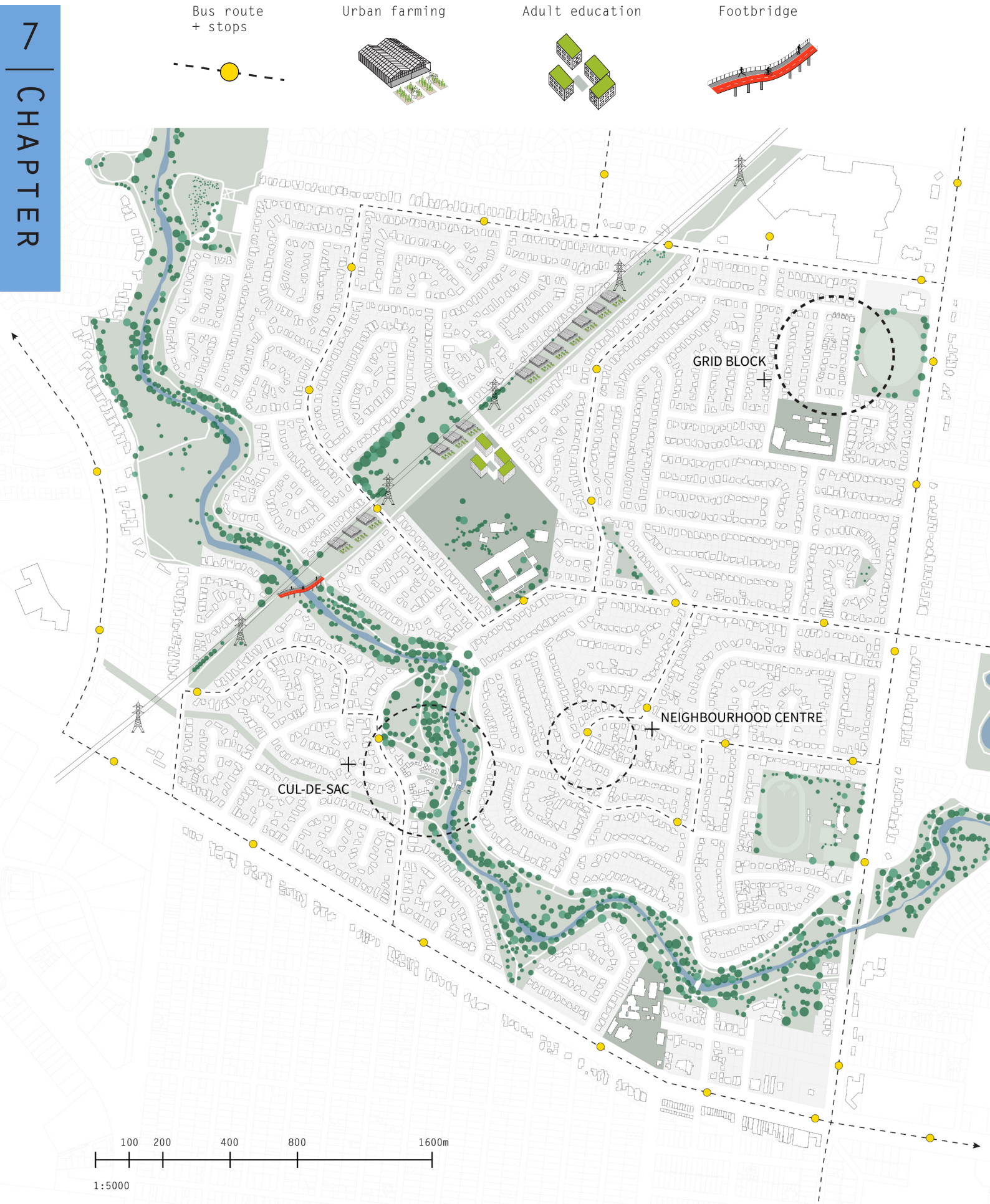
Right:
View over the townhouses with solar panels

(Source: Rolf Disch Solar Architektur, 2018)

Originally conceived with flat roofs, the technical requirements were resolved that allowed asymmetrical gable roofs with larger roof spaces and overhangs on the south face to provide shading against the sun during warmer months. Although the project was successful, the cost of buying or renting these houses was high and therefore failed to make any contribution to affordable housing.

Right:
Site plan

(Source: Solarsiedlungs GmbH, 2017)


Bus route
+ stops
Urban farming
Adult education
Footbridge
GRID BLOCK
NEIGHBOURHOOD CENTRE
CUL-DE-SAC
100
200
400
800
1600m
1:5000

7 Neighbourhood Plan

7.1 Overview

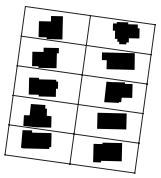
Left:
Deer Park
Neighbouhood Plan

This proposal is about finding ways to repair the urban fabric of typical suburban areas using small interventions and housing renewal rather than wholesale transformation. It is thought that transformative projects are more suited to brownfield redevelopment and major development sites in the city, which is more realistically aligned with the level of investment that would be possible.

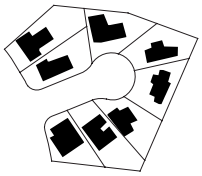
Therefore, the Neighbourhood Plan does not propose many significant changes to Deer Park in terms of block transformation or realignment of roads etc. However, there are some proposed interventions that aim to improve the liveability of the neighbourhood, three of which - an adult education facility, urban farming and creekside activties - are outlined in more detail on the following page. Furthermore, a focus has been placed on the parkland and areas of public open space, such as the creek and powerline reserve.

Three local places are identified on the plan, each of which represent a different block typology that can be commonly found in suburban areas. These local places will be used to test pilot developments (see Chapter 8) for housing renewal. Importantly, the principles and concepts tested can be reapplied to other similar locations in the suburban areas of Melbourne.

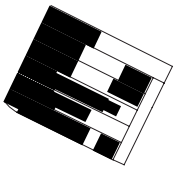
Grid block
- Regular lot pattern
- Detached houses



Cul-de-sac
- Irregular lot pattern
- Detached houses
- Private ‘no through’ road



Neighbourhood centre
- Local shops
- Corner ‘milk bar’
- Servicing and vehicle access



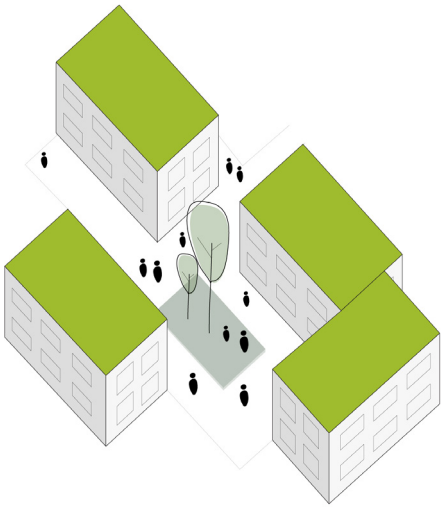
The proposed adult education facility is located adjacent to Victoria University Secondary College, which creates the possibility for collaboration and partnerships between institutions. This location also makes use of the expanse of open land opposite the powerline reserve, which makes it possible for future expansion of the facilities. The empty grass space along the powerline reserve will also be activated by the proposed urban farming and by the strengthened connectivity with the priority bicycle path.

By giving local people, in particular adults, a place where they can develop new skills and learn, their resilience can be strengthened in a changing economic and working landscape. Many of those living in Deer Park work in the manufacturing sector and do not have a university degree. Their needs are best served by such an educational facility that places more emphasis on smaller scale education rather than the larger universities and institutes spread across the metropolitan area that may be too far for some to realistically be able to attend and maintain a normal life schedule.

The urban farming is proposed along the powerline reserve as it does not require permanent structures to be built and presents an opportunity to bring people together and offer a more sustainable lifestyle choice. There is also the space available for temporary events such as farmers markets or other community activities.

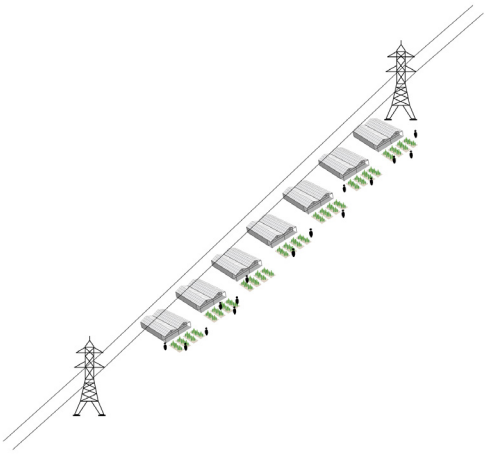
Adult education facility

- Provides further education possibilities for adults, particularly those working in declining industries such as manufacturing
- Aims to combat the shift to a knowledge intensive economy by giving people new skills relevant to growing industries



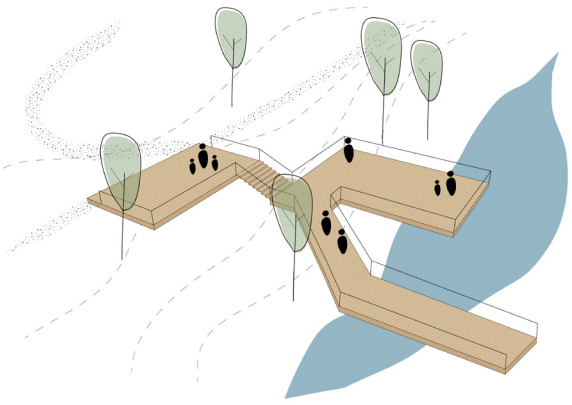
Urban farming

- Provides a local source of food and income generation
- Promotes a more sustainable lifestyle by people buying direct from source
- Local production reduces the need for goods transport and other costs



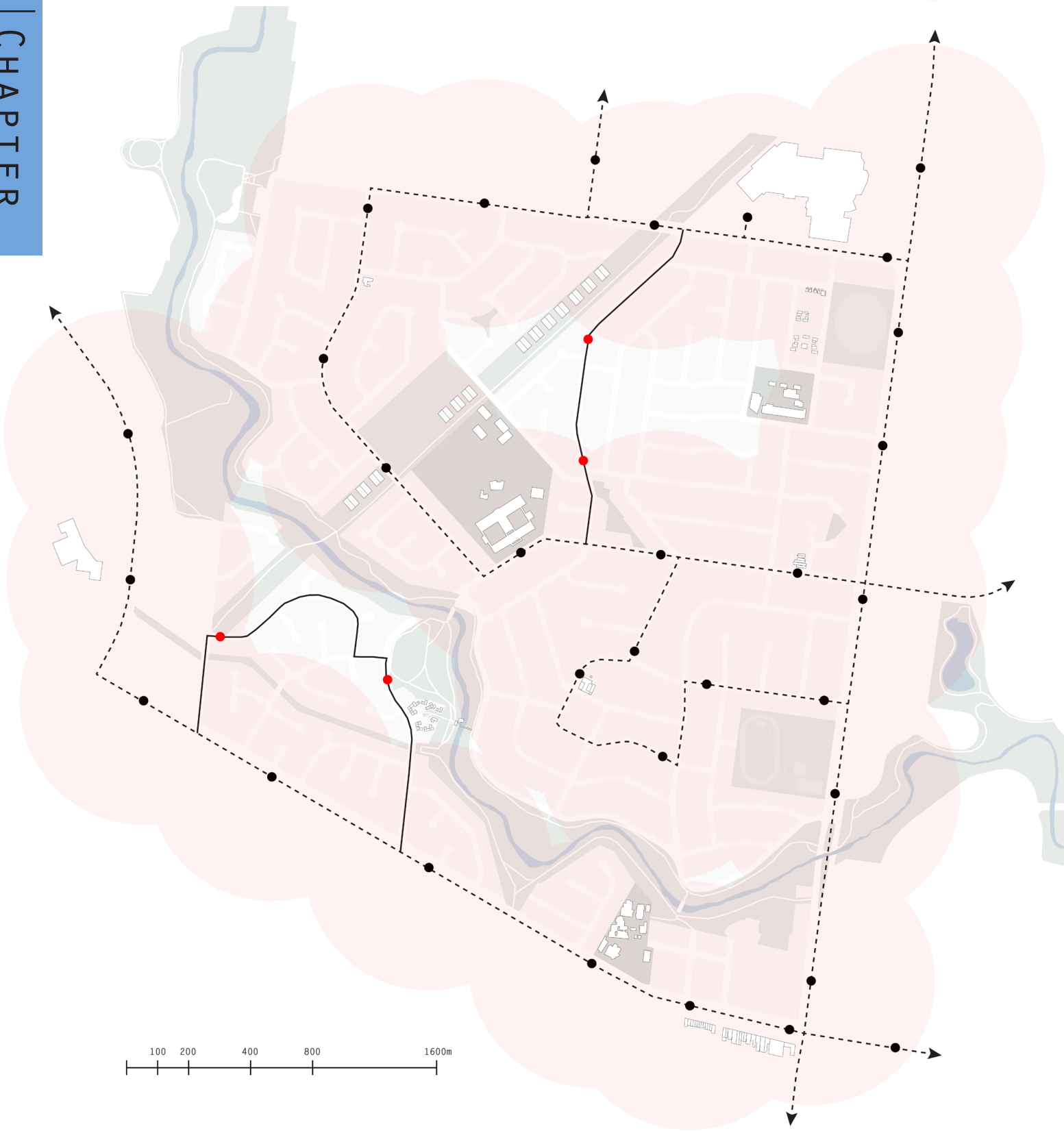
Creekside activities

- Provides new places for people to enjoy the natural landscape
- Encourages people to meet and interact with others outside their home
- Activates the water edge and makes the green spaces safer with more people



The following pages provide further detail on aspects of the neighbourhood plan on the four key strategies from the vision: connectivity, streetscape repair, parkland repair and housing renewal.

Bus service improvements

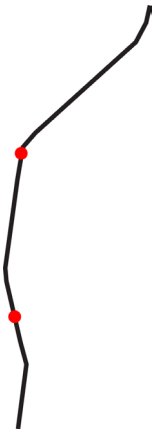


7.2 Connectivity

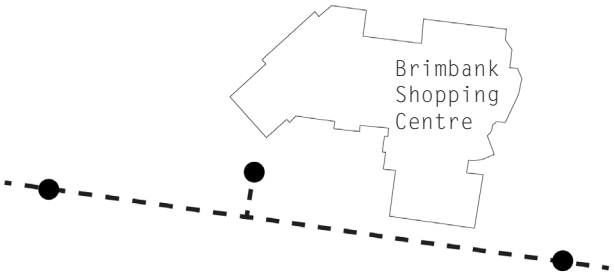
The aim for this strategy is to give people living in Deer Park the opportunity to travel further and easier without having to use the car. Those places in the neighbourhood that are further from the current bus network will be reached through new connections, but otherwise the existing bus routes are already in place. The key for this strategy is about increasing the frequency and quality of services to encourage people to use the bus, which is underutilised as a form of public transport in Melbourne. The most important bus route connects with Sunshine as a National Employment and Innovation Centre (as outlined in the district proposal), but also other train stations in the metropolitan network closest to Deer Park, such as St Albans 3km to the north-east.

Left:
Bus network with 800m walking distance to bus stops

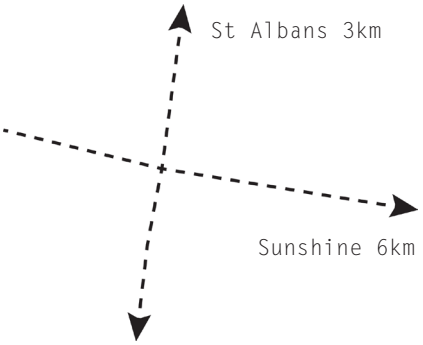
Fill the gaps in the existing bus service



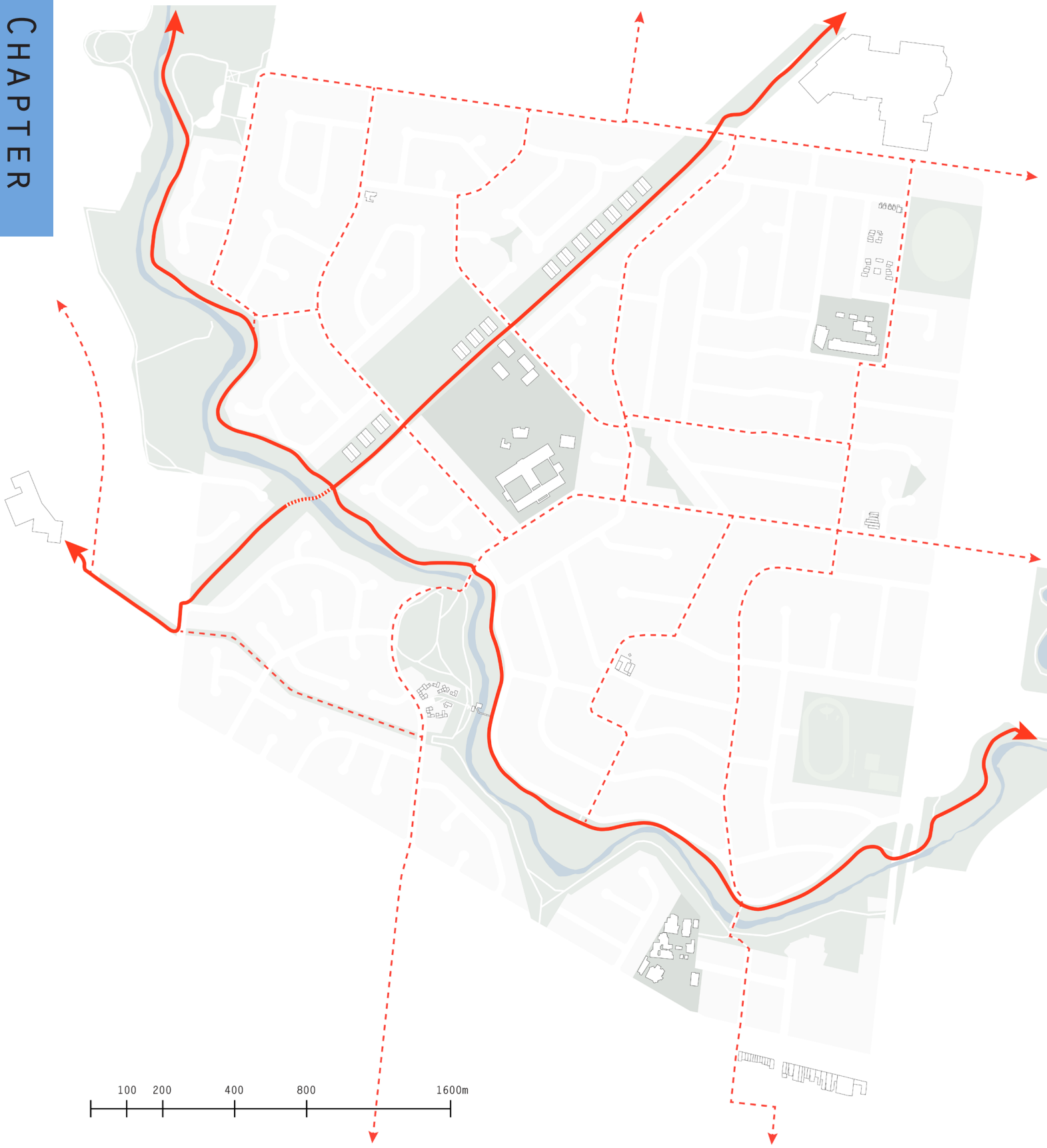
Improve accessibility to local shops and schools



Connect with train stations and major district centres in other suburbs



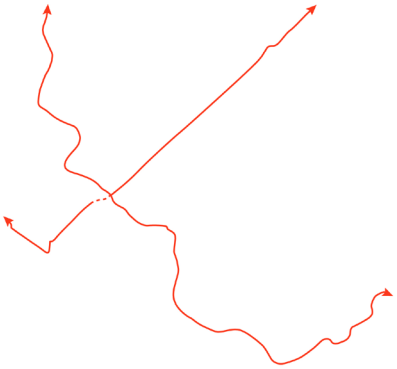
New bicycle infrastructure



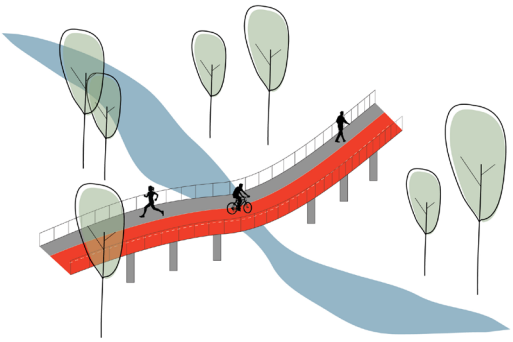
With regard to bicycle and pedestrian improvements, it is proposed to utilise and highlight the key transit corridors along Kororoit Creek and the powerline reserve that both intersect through Deer Park. These corridors allow for mostly uninterupted paths of movement that facilitate more efficient bicycle use and shortens travel time to places such as Sunshine, approximately a 30 minute bicycle ride away. The key junction of both corridors will be joined by a new bridge over the Kororoit Creek. In addition, bicycle lanes will be established on key roads that provide a safe path through the quieter streets in the neighbourhood away from the heavy traffic along main roads such as Ballarat Road.

Left:
Key bicycle routes through parkland and on-street lanes

Improvements to key bike routes through park corridors



New bicycle/foot bridge for creek at key junction



Bike lanes on quiet through roads avoiding busy highways

7.3 Streetscape repair

The streets of Deer Park currently suffer from a lack of human interaction and poorly utilised spaces across the width of the road reserve. This strategy for streetscape repair aims to improve the qualities of the street environment to make walking and cycling more comfortable and to make better use of the available infrastructure, mainly the grass verges between the road and pavement edge.

With new bus stop shelters that provide seating and protection from the elements, along with more frequent services, people are encouraged to leave the car at home. The conversion of grass verges into bio-swales will help capture stormwater runoff from the asphalt road surface and help treat the water from pollutants while allowing it to flow naturally to retarding basins in local parklands, before finally ending up in wetlands along the Kororoit Creek and into the water body itself.

The following section includes photographs taken of the current situation and conceptual details of what the proposed works could look like in principle.

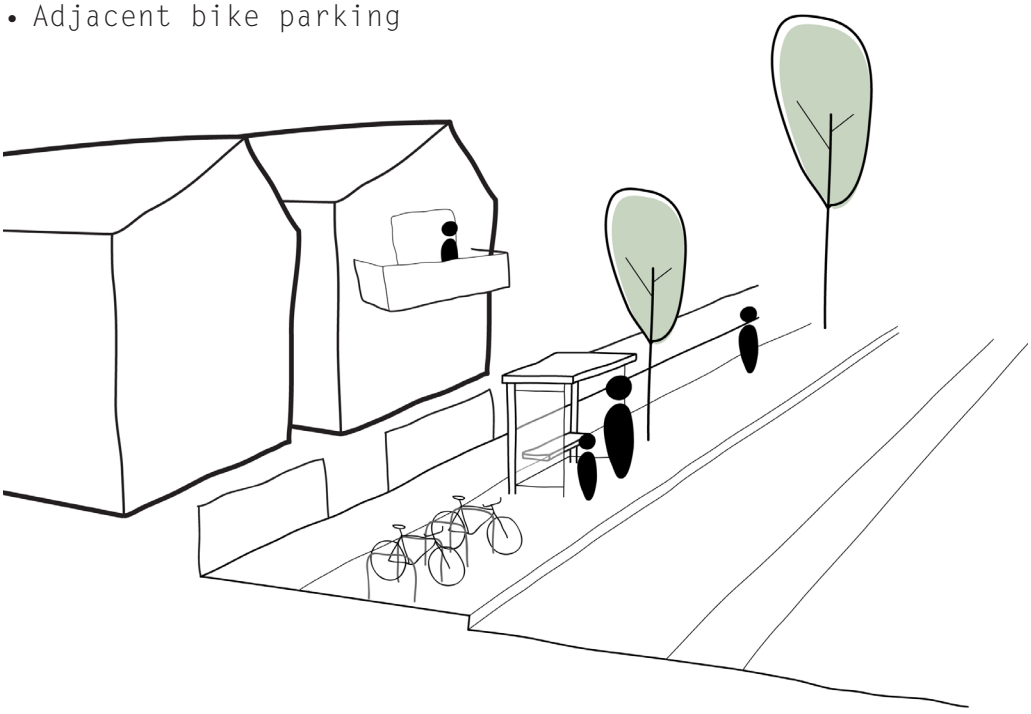
Bus stop upgrades

Current situation

- Poor placement of bus stops
- Insufficient weather protection
- Lack of seating

Proposal

- New bus shelter with canopy and seating
- Less hard surfacing/driveways
- Adjacent bike parking

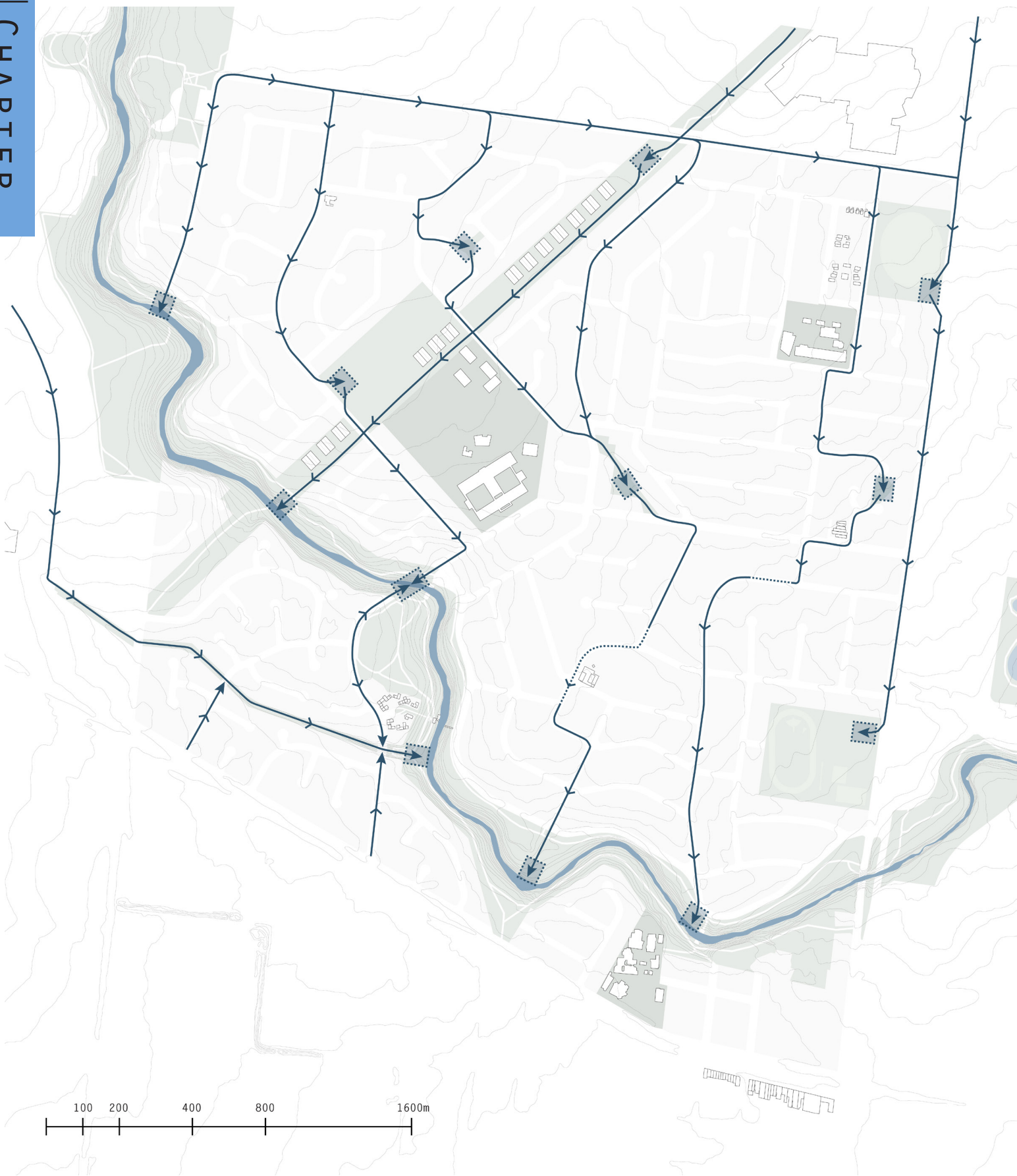


Stormwater swales

Current situation

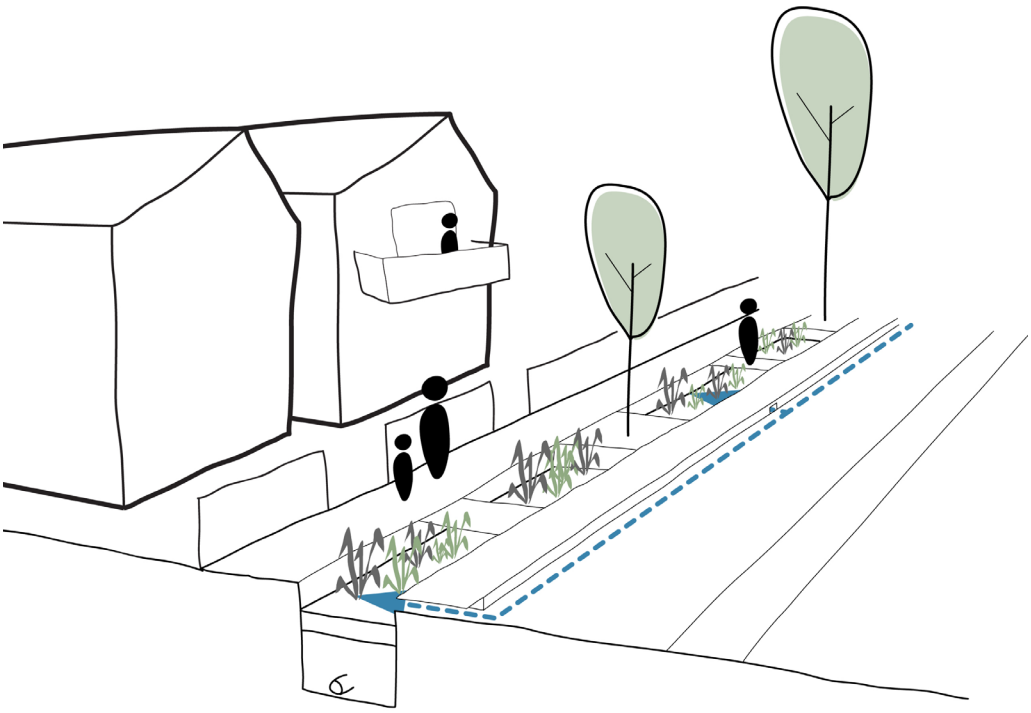
- Excessive hard surfaces
- Urban runoff into drains leading to waterways
- Underutilised grass verge within street reserve

Stormwater system



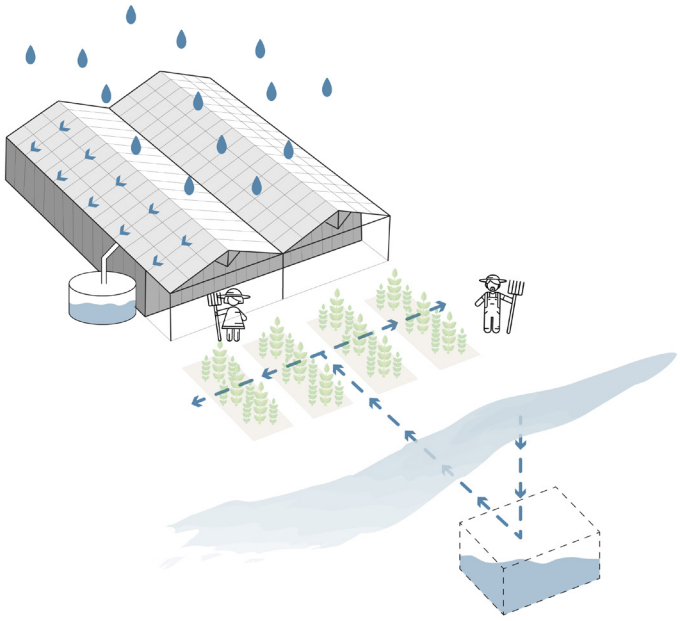
Proposal

- Bio-swale replacing grass verge treats water from road surface and off-site runoff
- Street trees maintained
- Access to cars parked on road



Left:
Network of bio-swales and retarding basins

The connection of the treated water from the stormwater swales and retarding basins could also have additional benefits for irrigation of urban farming along the power-line reserve. This would also be supplemented by rainwater tanks captured from the roof of greenhouses.

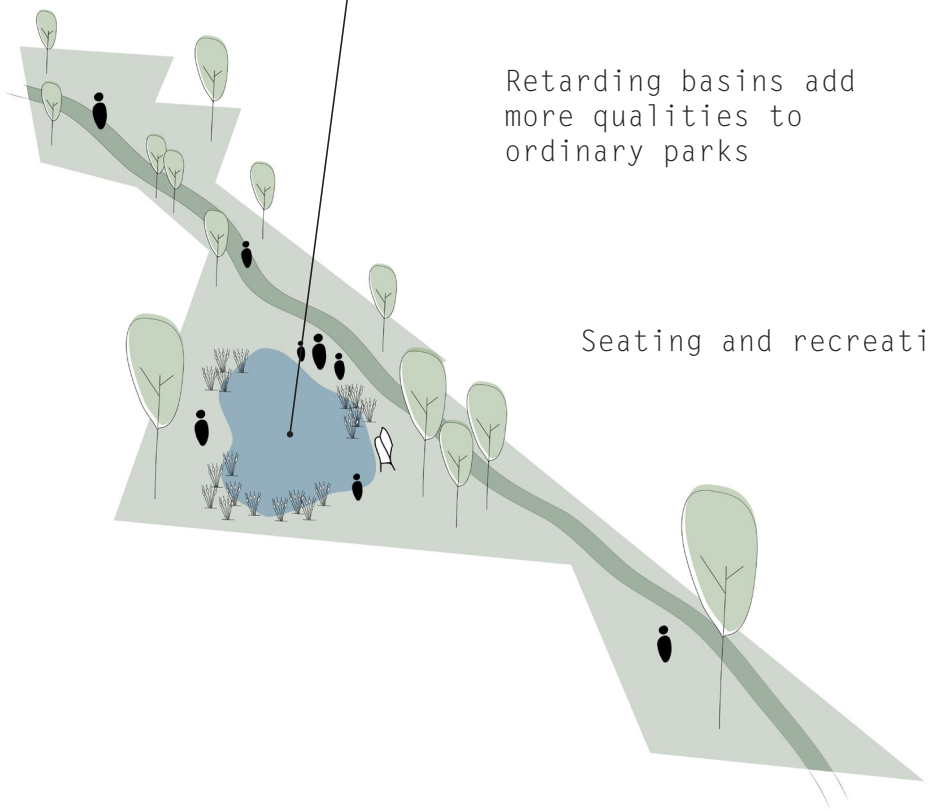


Right:
Treating and using stormwater for farming irrigation

Retarding basins

As part of the stormwater network the runoff is directed through bio-swales into retarding basins located in the parks spread around the neighbourhood. These smaller parks are often just areas of open grass with some sparse trees and would benefit from the added qualities of a water feature that could provide a focal point for seating and other activities.

Proposal

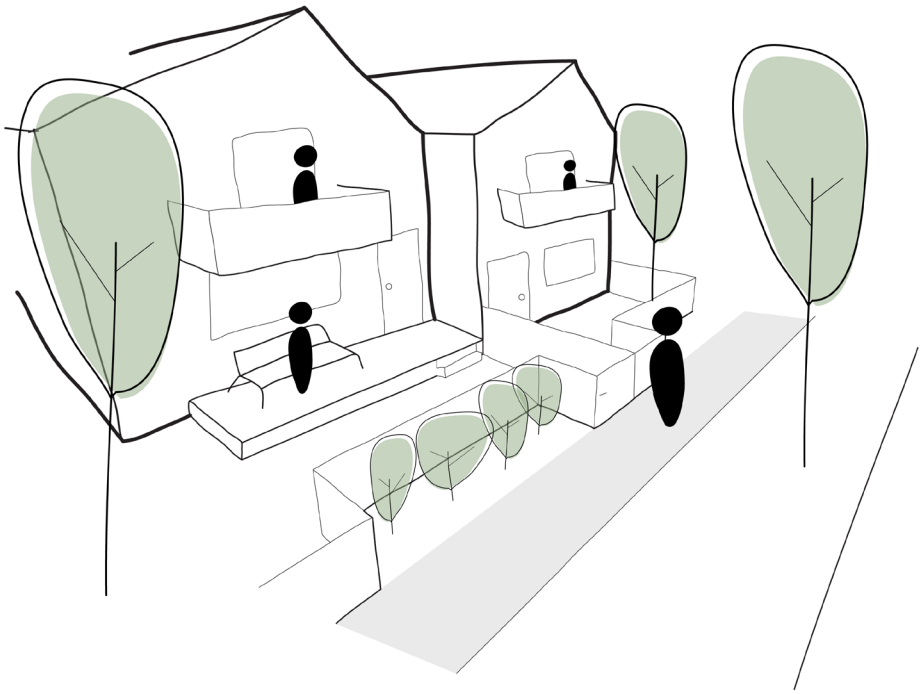


Active thresholds

At present the threshold between private property and the street suffers from a closed dialogue with large building setbacks, shutters on windows and limited human activity in the front gardens. There is often hard surfaces for car parking, which reduces tree planting opportunities.

Proposal

- No car parking in front gardens
- Low fences and small planting gestures to pavement edge
- Balconies and raised entry platforms with seating

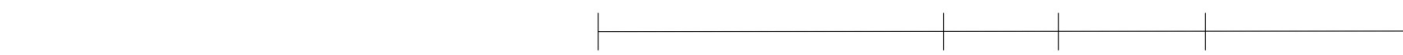


Street section

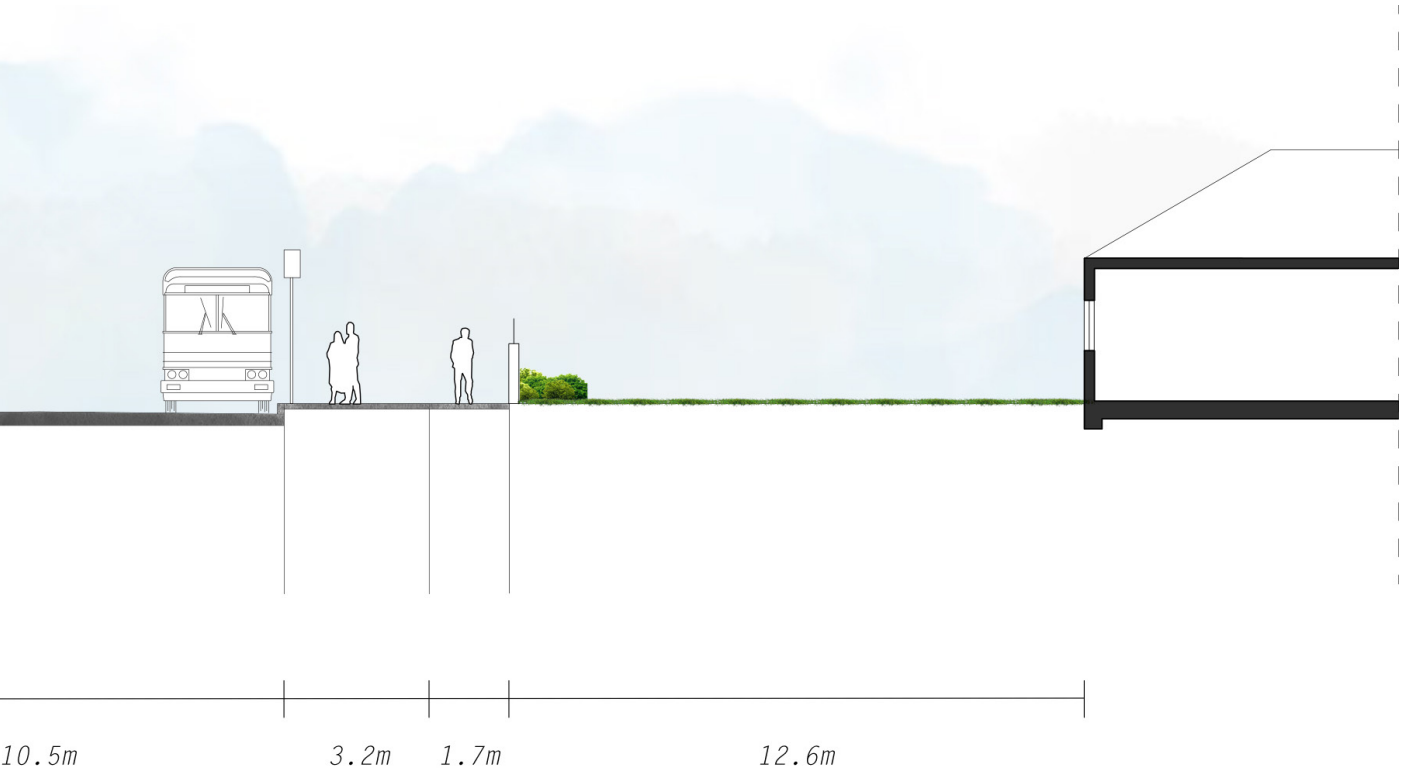
The sections below illustrate how the current situation could be improved by implementation of the proposals outlined in the preceding pages. With smaller front setbacks, balconies and front porches faces the street, lower front fences, more meaningful tree plantings in front gardens

Current typical street section

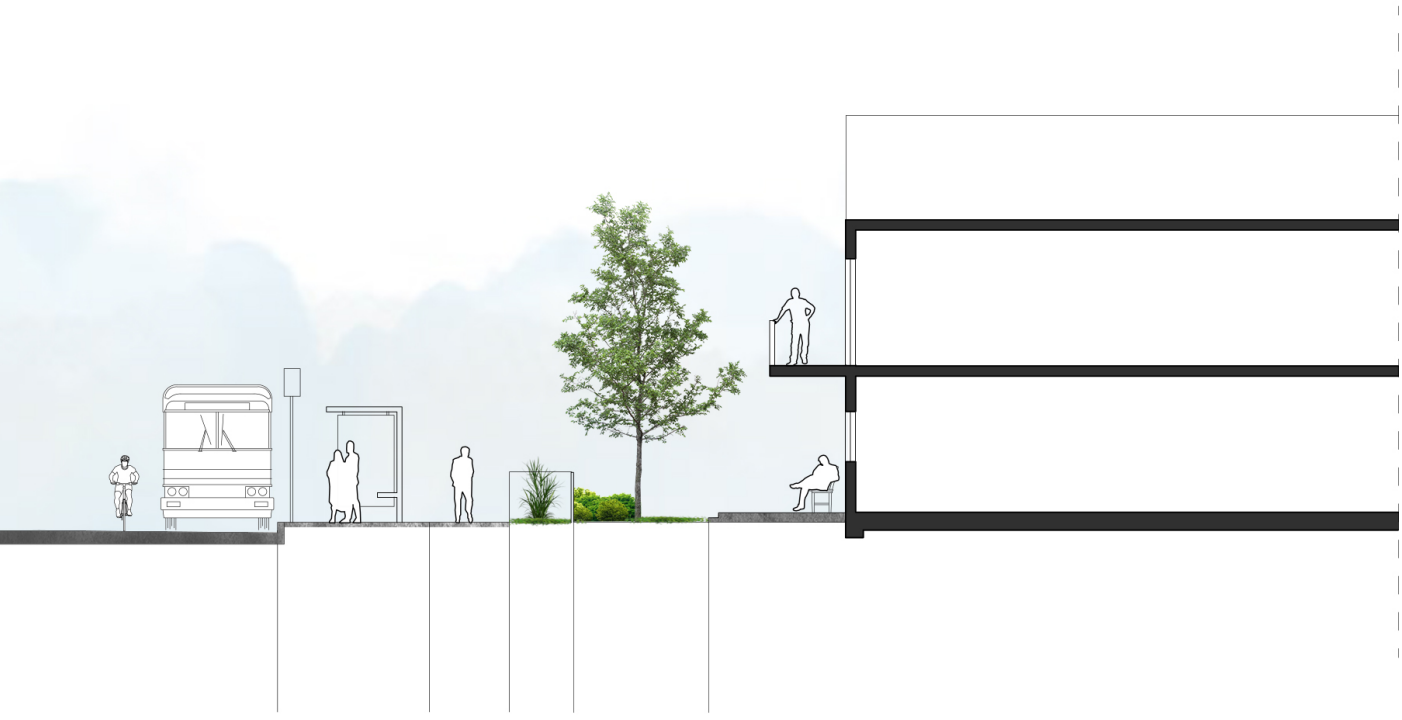
Proposed typical street section



and better utilised street dimensions the human qualities of the public realm would be greatly enhanced. The more intimate setting brings people closer together and offers more opportunity for interactions. This demonstrates how the physical environment can be adjusted within the existing parameters without wholesale transformation (with the exception of housing renewal).



10.5m 3.2m 1.7m 12.6m



10.4m 3.3m 3.1m 5.9m

7.4 Parkland repair

The quantity of public open space in Deer Park is not an issue with a good supply of parkland ranging from creek environs to sporting ovals and small local parks. However, the quality of these green spaces could be greatly improved, thereby giving residents and visitors a more welcoming and enjoyable place to play and rest.

Creekside gathering places

The Kororoit Creek corridor is currently underutilised with poor interaction with the water edge and a lack of gathering spaces along the creekside.

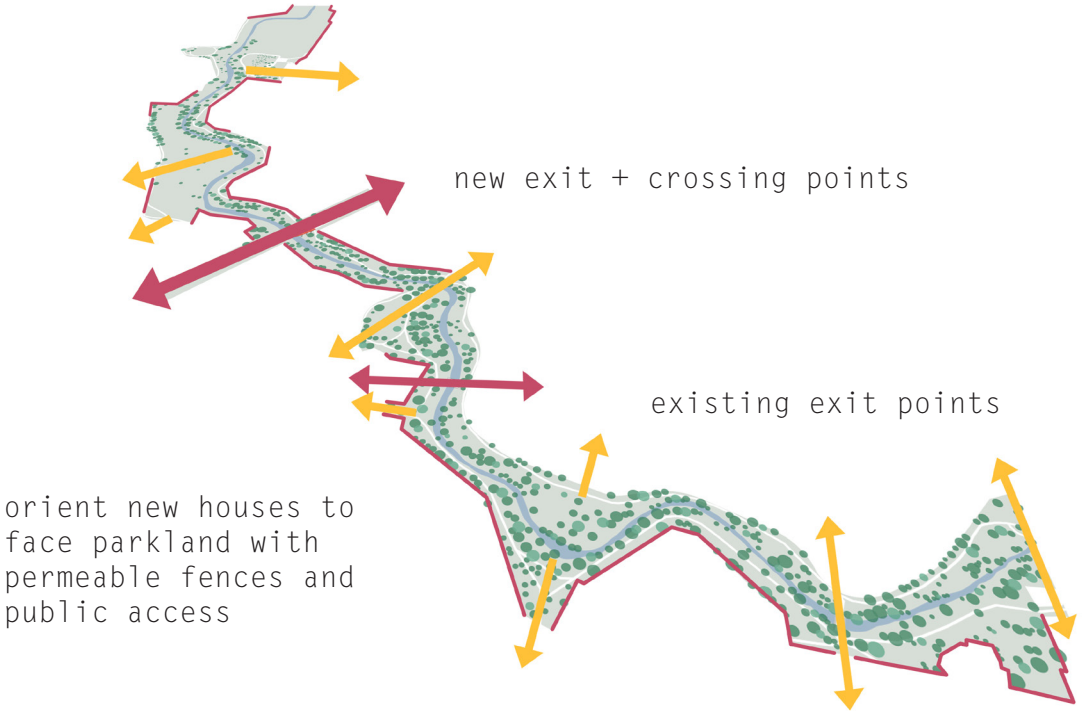
Proposal

- Lower promenade adjacent to creek edge at key places
- Platform raised over water with seating

Safety + Access

Parks in the area have poor public surveillance from adjacent properties where often tall fences restrict any views from houses and gardens. There are also limited entry and exit points along the Kororoit Creek, so that it feels unsafe to pedestrians due to being far from help and escape in the event of an incident. With more pedestrian activity the sense of isolation would be minimised.

Proposal



7.5 Housing renewal

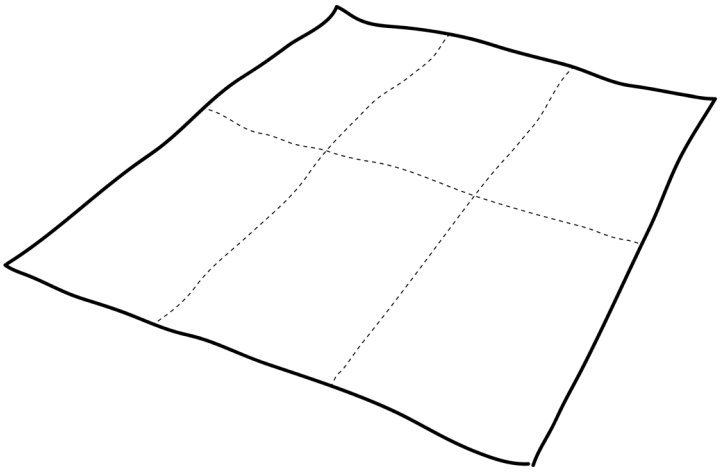
The most transformative aspect of this research project is housing renewal, which aims to reinvent and change the way that Australians buy and rent property.

Collective housing

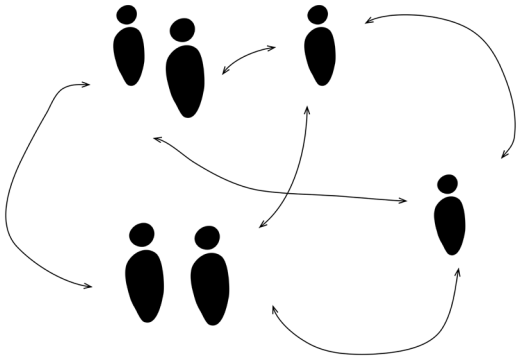
The collective (or co-housing) housing model is a form of community led housing where people, not developers, play a leading role in addressing their own needs. This contrasts to the usual redevelopment model where a developer buys land, builds housing and sells with a profit margin and other costs such as marketing. In contrast to this, the collective housing model allows a group of people to pool their resources, in particular financial capital, in order to take on the cost of development. It requires assistance from professionals, such as the local municipality, with clear principles and guidelines to follow.

The key features of the collective housing model in the suburban context are:

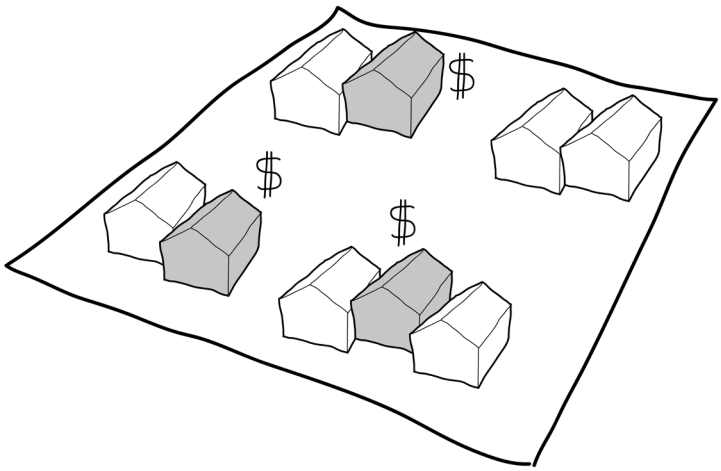
Consolidation of properties into larger development area



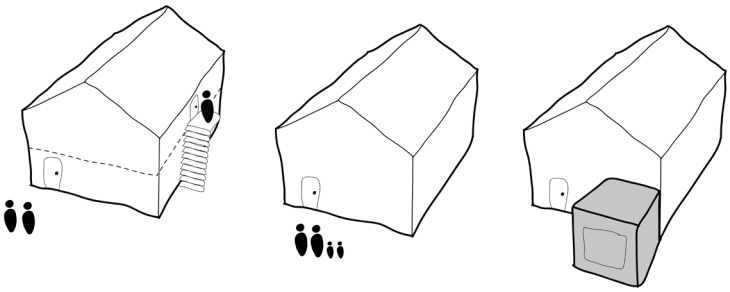
Pooling of resources and capital



Remain in place +
gain profit from
additional units sold



Mix of housing
typologies + home
business units



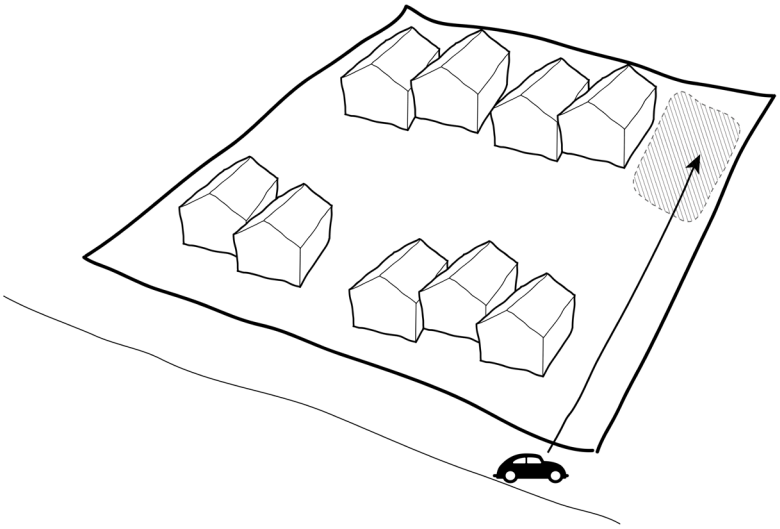
The collective housing model relies on participation and sharing of resources. For instance, there is often a shared laundry rather than having to provide individual washing and drying facilities in each unit, which lowers costs and saves on space. People are brought together by common outdoor spaces that can be used by any residents and their visitors. The shared garden space is an ideal location for urban farming planter boxes that can contribute fresh and cheap fruit and vegetables and is also an activity that requires co-operation between residents.

It is hoped that the collective housing model will be welcomed by communities with a large overseas born population, such as Deer Park, where extended families and friends often live in close proximity. With options to convert the upper floor of a house into a small unit, this creates possiblities for new living arrangements for the elderly or youth looking for an affordable place to live.

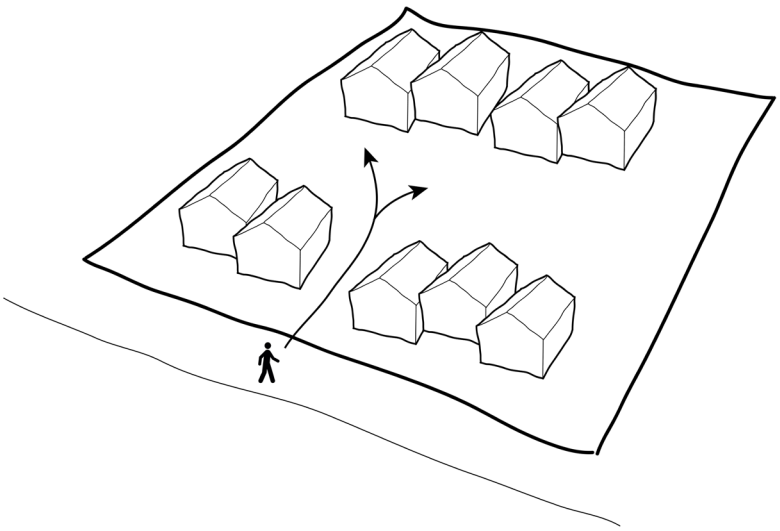
Site development guidelines

An architectural design must always consider the specific characteristics and context of the site and therefore is almost never exactly the same - small details such as the dimensions of the land, distance to adjacent buildings and orientation to the sun all have an effect on how the proposed buildings can be arranged and designed. Thus, it is important to establish general site development guidelines to ensure that principles of development will remain consistent, but with some flexibility to enable a site specific solution. Therefore, the following four objectives are considered to be the most important features of collective housing that must be incorporated into every development opportunity.

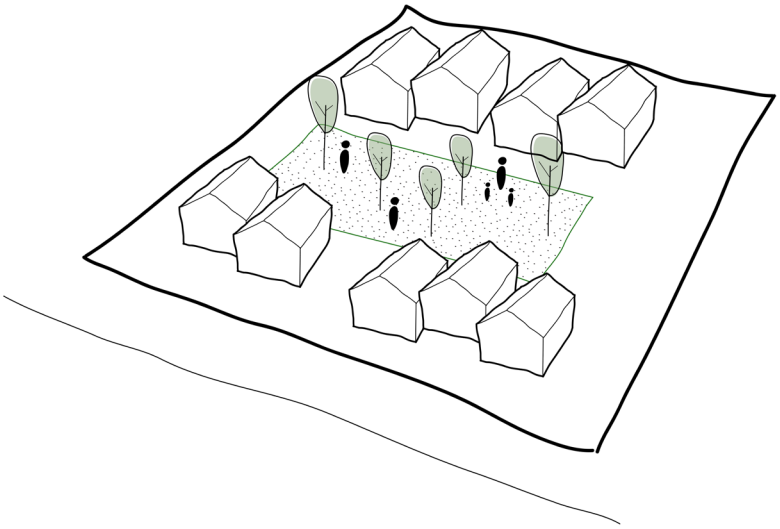
1. Consolidate parking to single driveway entry and parking area



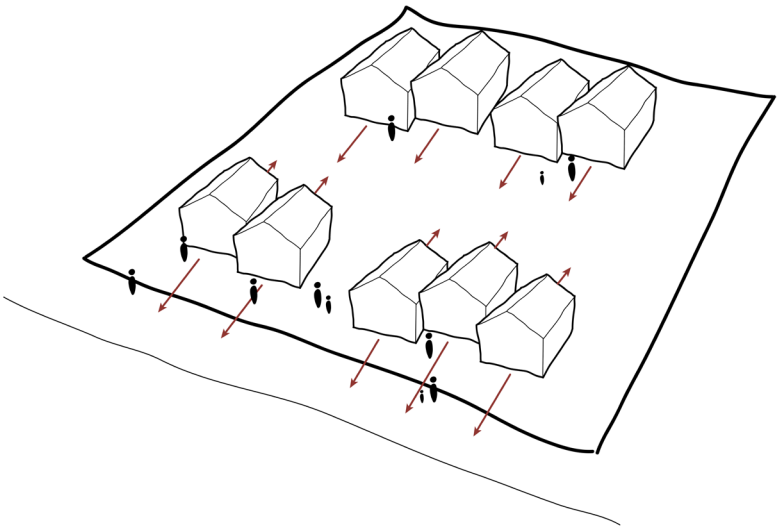
2. Central pedestrian access point leading to communal space



3. Communal green space in interior with access from all units



4. Active interface with the street and communal green space



Site development controls

In the context of suburban sprawl, which predominantly consists of single and double storey detached dwellings, the proposed development controls are quite modest. However, with the more efficient site layouts proposed and a shift to smaller housing units the urban density in persons/m^2 can still be significantly increased.

Maximum building height: 3 storeys
Maximum floor area ratio: 1
Maximum building footprint: 50% of site area
Minimum communal garden size: 10% of site area

The above requirements become discretionary for strategic neighbourhood sites (such as local shops) where there are possibilities for non-residential development.

Sustainable design features

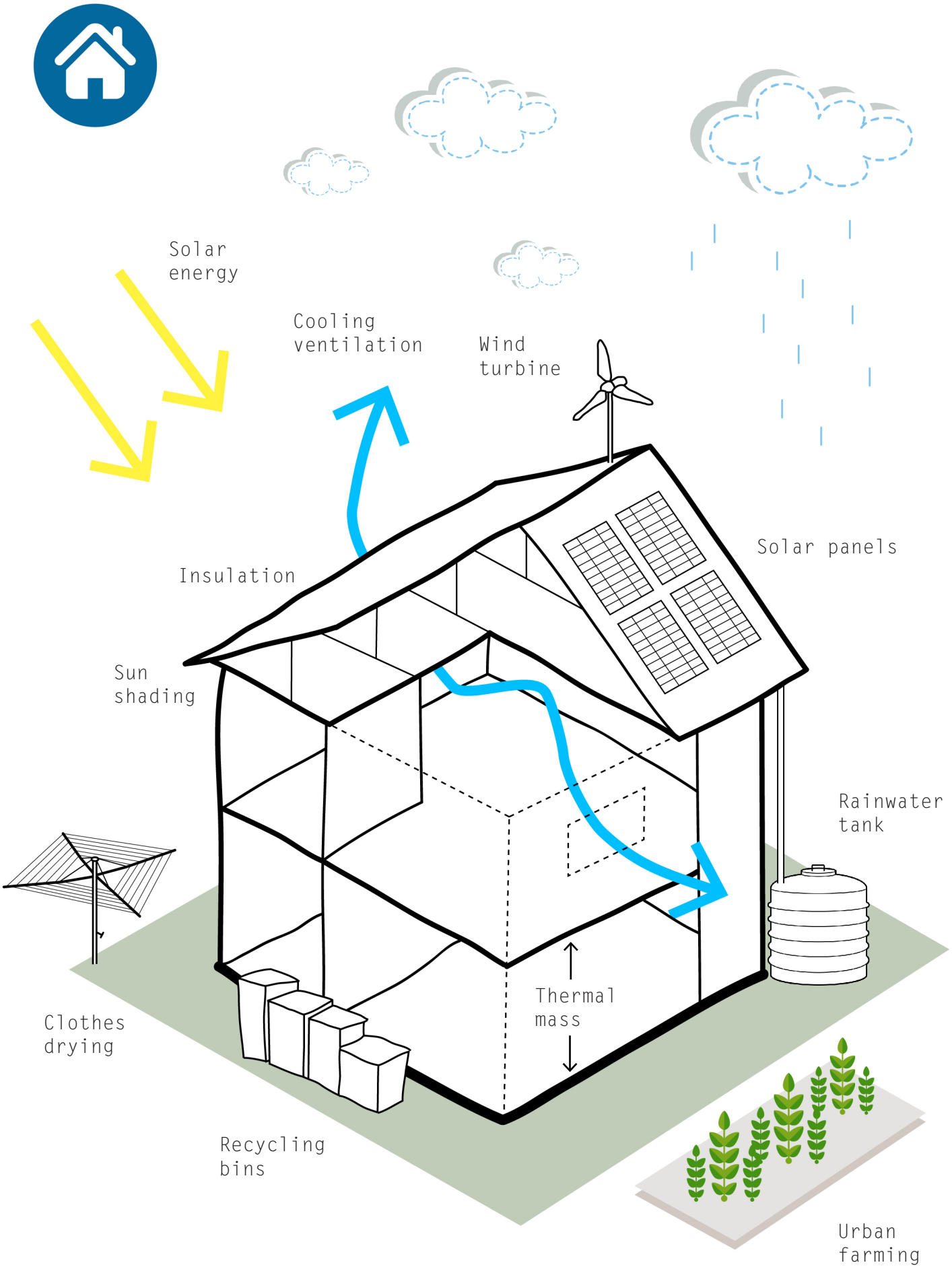
Much of the current housing stock in middle to outer suburban areas such as Deer Park dates from the post-war era up to the end of the 20th Century. The poorer quality of building construction generally from this period has led some to term Australian homes as "glorified tents in winter"[1] while in the hot summer months the need for airconditioning consumes vast amount of electricity, much of which comes from coal powered plants. Along with this, Melbourne has a temperate oceanic climate with a relative high number of sunshine hours and moderate to low rainfall with a propensity for drought conditions. This occured most recently during the 2000's when a period of lower than average rainfall led to a severe water shortage and fall in city storage levels to below 25%.

These localised issues highlights the importance of green building technologies, in particular solar panels and rainwater collection to both harness and combat the harsh nature of the Australian climate. The orientation and layout of homes should optimise passive design that takes advantage of ventilation and shading for warmer months and captures winter sun for heating[2]. The need for cooling is arguably more important, given that improvements in wall and roof insulation and good thermal mass and glazing systems will help reduce the need for heating during the milder winter months, when compared to the harsher winters in northern parts of Europe and the United States.

The choice of building materials is also important, particularly materials that have properties that reduce energy consumption and minimise waste and can be adapted into modular construction systems. Other sustainable design features that should be incorporated into new housing include wind turbines, energy and water efficient appliances, solar thermal systems and energy storage (batteries). The garden also presents an opportunity for environmentally friendly solutions such as waste recycling, outdoor laundry drying and urban farming for local food production that could utilise food scraps for compost and recycled water for irrigation.

The graphic on the opposite page shows how some of the sustainable design principles discussed above can be incorporated into the proposed housing solutions. Along with the potential for widespread redevelopment of the suburban area with smaller housing units, these changes can make a big difference to lowering the high energy consumption associated with suburban sprawl.

1 Roberts, N. (2015)
2 Department of the Environment and Energy (2019)


Solar energy
Cooling ventilation
Wind turbine
Solar panels
Insulation
Sun shading
Rainwater tank
Clothes drying
Thermal mass
Recycling bins
Urban farming


RNER SHOP
PHOTOS
QFL PROCESSING
PHOTOS
QFL PROCESSING
Sunday
1P
9AM-6PM
MON-FRI
9AM-12 NOON
SAT
vodafone
Lebara
2GB

8 Pilot Developments

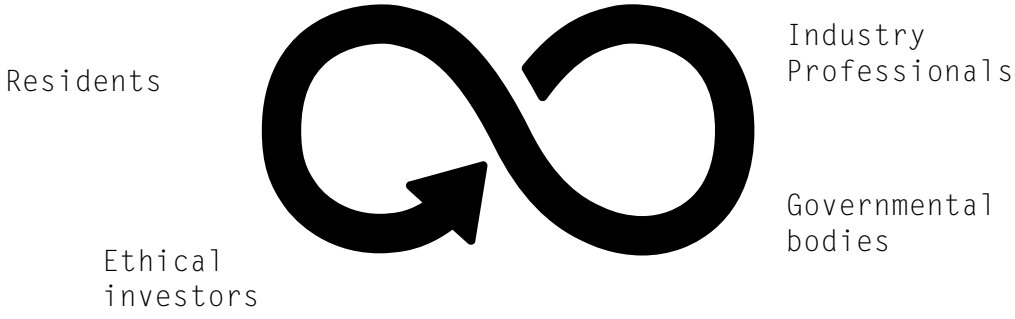
8.1 Overview and process

The pilot developments are intended to demonstrate how the principles of housing renewal and site development guidelines could be represented in different scenarios that are commonly found in suburban areas. Three locations have been chosen (p62-63) within Deer Park: grid block, neighbourhood centre and cul-de-sac. Each location has particular characteristics that separate one from another. For instance, the road type and lot pattern contrasts significantly between the regular shaped grid block and the more rounded patterns in the cul-de-sac. The neighbourhood centre is different altogether due to the clustering of shops and mostly non-residential land use.

Left:
Dumfries Street neighbourhood centre

The process behind collective housing presented in this research project requires neighbouring property owners to consolidate land and pool together their financial resources. Although this has many merits, it is acknowledged that in reality property development requires significant funds and one must have an ability to manage accommodation during the process of demolition and construction. For instance, not all people or families will be able to find temporary housing due to the costs involved.

In anticipation of this, it is recommended that partnerships be established between the local municipality, other governmental bodies and any residents looking to pursue a collective development. There is also room for ethical investors to contribute towards the cost of development on the understanding that profit margins would be limited or being offered other incentives. In terms of the regulatory framework, there should be clarity and guidance in the process to ensure transparency and to reduce the administrative burden on municipalities. This can be achieved by planning controls using zoning and overlays, with the added incentives achieved through other mechanisms such as legal agreements and covenants.



8.2 Grid block

The grid block is broken up further into three development ‘typologies’, which vary in size depending on the number of lots that can be consolidated and their positioning relative to the streets on both sides of the ‘block’.

Typology 1 ‘end of block’

An example of suburban typology where three properties have been consolidated at the end row of a grid block with at least one corner lot. The presence of two street boundaries presents both a challenge but moreso an opportunity for making clever placement of site access and to make street frontage enhancements.

1

Right:
Mid-block brick dwelling with street tree to grass verge

2

Right:
Corner site with vacant brick dwelling

Proposal 'end of block'

The corner location presents an opportunity to establish a new group of local shops and a gathering place (such as outdoor cafe seating), which is connected to the adjacent park by a pedestrian crossing, thereby establishing this location as a small neighbourhood hub. By consolidating parking and relocating the vehicular entry to the south-east the northern boundary can be activated by detached dwellings, each with a small front extension up to the pavement edge. This extension can be used for commercial activity such as a home businesses selling goods or services. There is also the opportunity for a mix of housing with shop-top flats and upper level unit conversion for the larger detached dwellings. The communal space at the rear includes playground for children and urban farming, surrounding an open lawn space with possibility for planting of larger canopy trees.

Land data

Site area: 2,558m²
Building footprint: 806m²
Gross floor area: 1,294m²

Site coverage: 31.5%
Floor area ratio: 0.5

Residential floor area

Shops/workspace floor area

Private open space

4 x dwellings*
3 x shop-top units

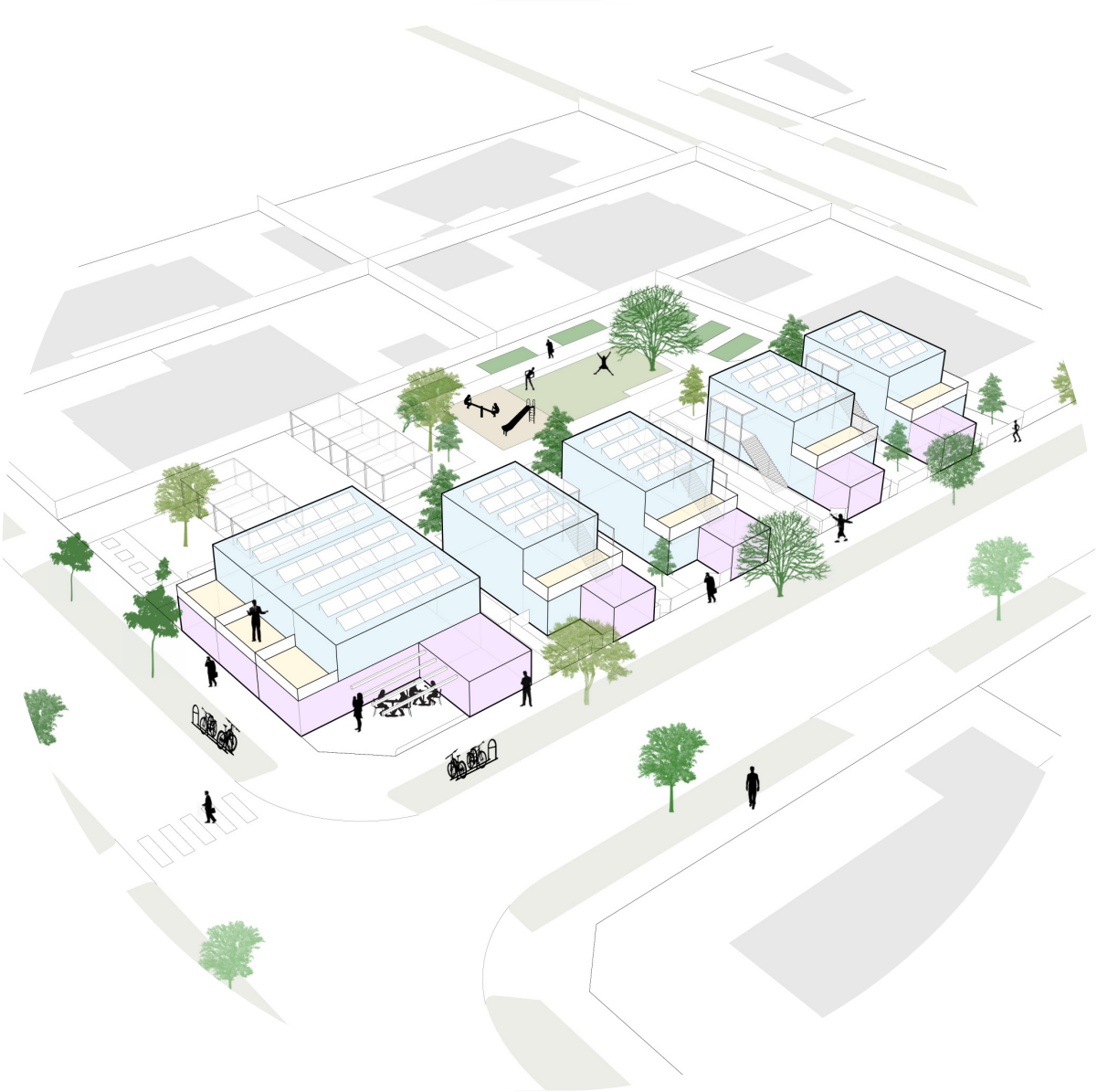
(mix of 1-2 bed units)

9 x parking spaces

3 x shops
4 x home workspaces

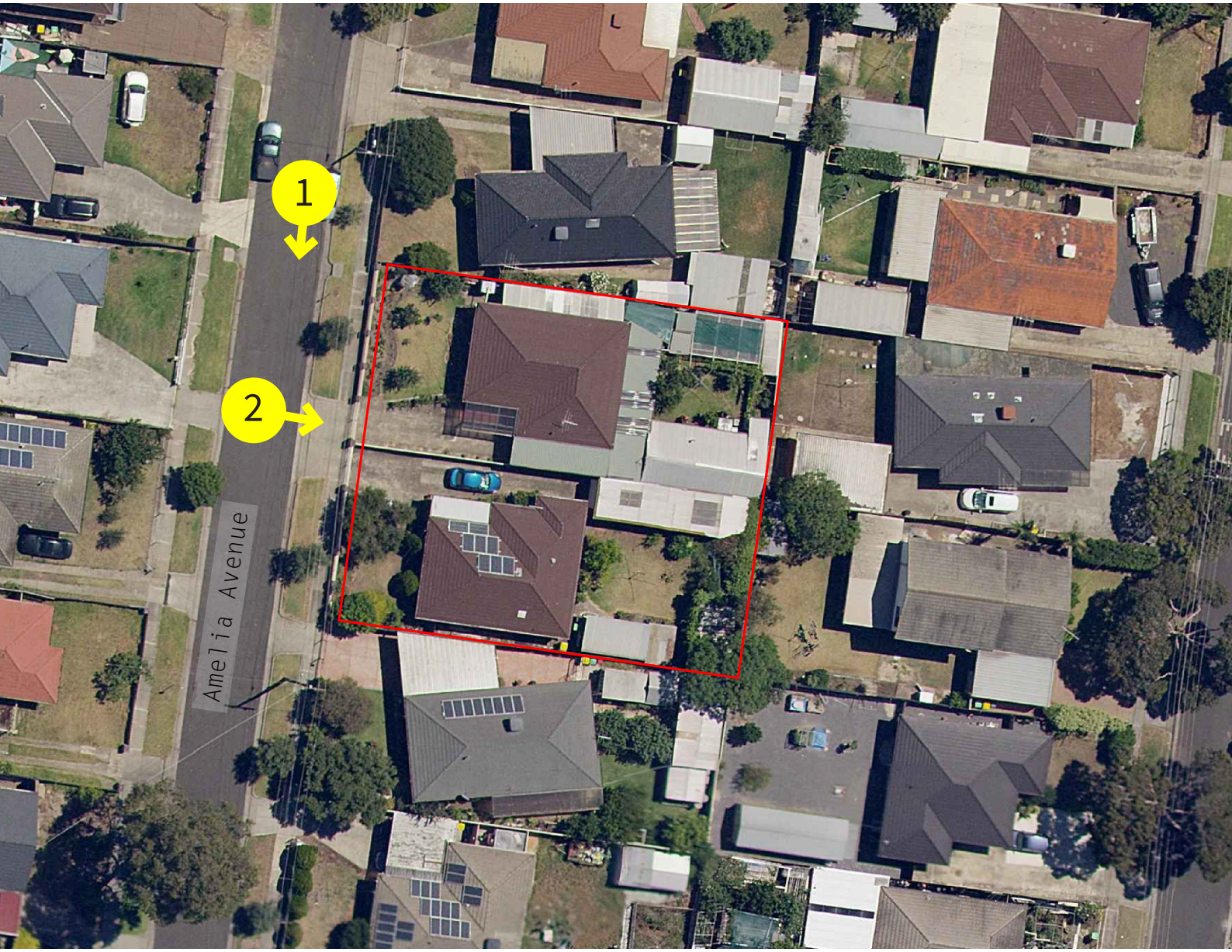
~18 residents
+ shop workers

* first floor can be converted into 1-bed units with separate side access via stairs



Typology 2 'mid block'

In this case two neighbouring properties have been consolidated, which are located mid-block on the east side of Amelia Avenue. This example represents the smallest development opportunity involving more than a single standard residential lot. The existing dwellings are both single storey with a double crossover for vehicle access in a central position. Both dwellings are setback a similar distance from the street and have outbuildings or house extensions in the back garden. There are sensitive interfaces with adjoining residential properties to the side and rear boundaries.



1

Right:
View of streetscape looking south

2

Right:
Site frontage with double crossover

Proposal 'mid block'

With a more efficient site plan and smaller dwelling footprints it is possible to significantly increase the density without making an 'overdevelopment' of the site. This can only be achieved through consolidation of vehicle access and placing the parking in an undercroft to the south side of the site, which allows for two groups of two-storey semi-detached terraces to present along the remaining frontage. A central pedestrian entry leads to the communal green at the rear, which also features two further dwellings that are positioned to the site corners. Each dwelling has its own small private garden with low fences, which face onto the common area and facilitate a more open, participatory setting. The location of proposed dwellings also takes into account the adjacent properties and minimising any impact on sensitive interfaces.

Land data

Site area: 1,721m²
Building footprint: 706m²
Gross floor area: 1,263m²

Site coverage: 41%
Floor area ratio: 0.73

Residential floor area

Private open space

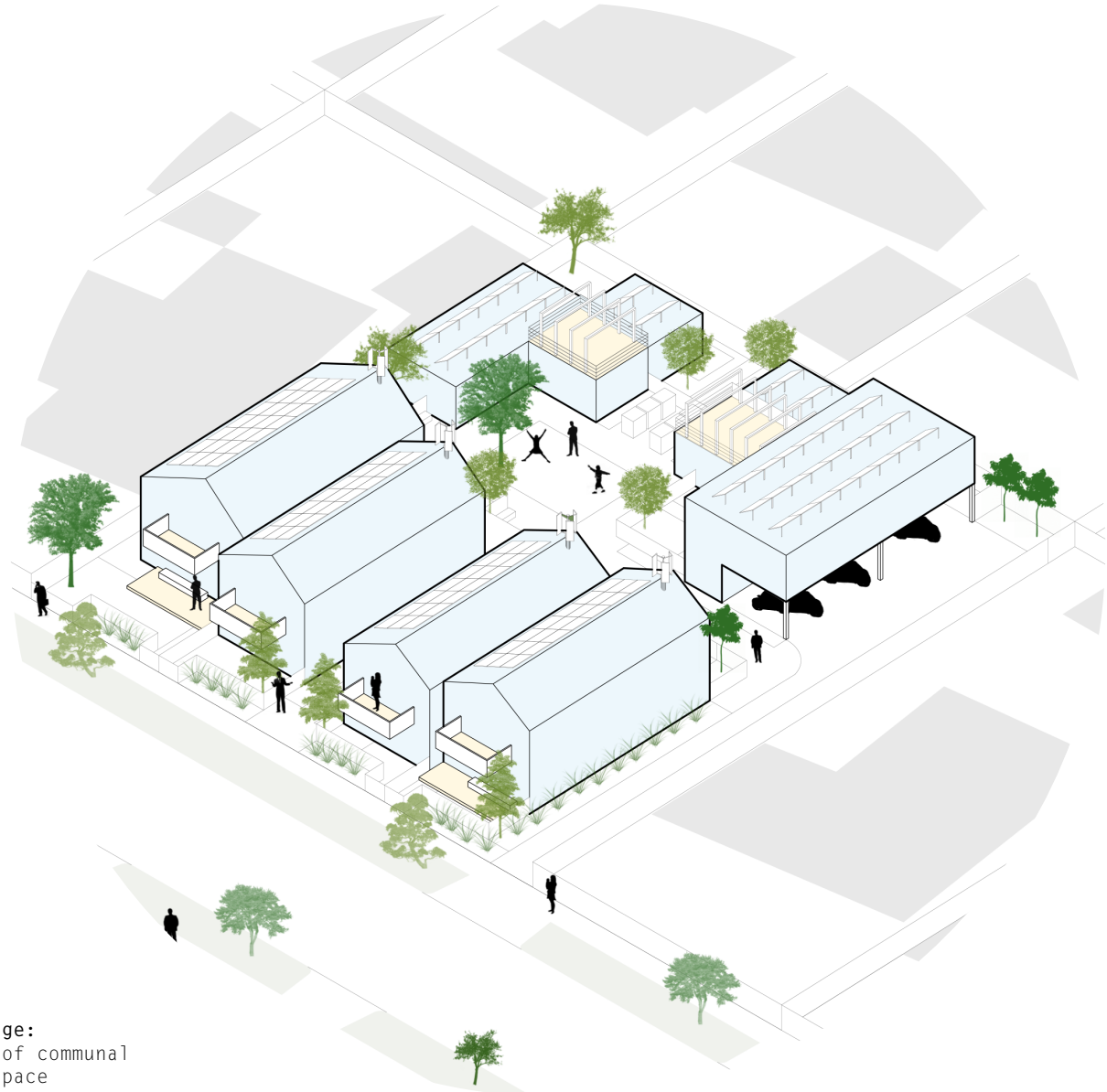
4 x semi-detached*
2 x detached at rear

(mix of 2-3 bed units)

6 x parking spaces

~18 residents

*front room can be converted into home workspace for active frontage with street



Next page:
Vision of communal green space

Typology 3 'full block width'

In this example a collection of 6 neighbouring properties have been able to consolidate the full width of the block between one street and another street. This creates a large site of 5,158m² and opens up more possibilities for site access and building layout. Most importantly, the additional width allows the central portion of the site to be developed which is normally occupied by the back gardens and boundary fences of properties to either side. There is a range of dwelling types from smaller single storey brick dwellings to a double storey brick dwelling with significant renovations and extensions.

1

Right:
View of site from
Amelia Avenue

2

Right:
Detached dwelling
on Gould Street
with street tree

Proposal 'full block width'

The two street frontages allows the provision of through site access along the southern boundary with the parking garages located in the interior. The dwellings are arranged in a cluster around a central communal space that features an open grass area, seating and urban farming planter boxes. The pair of dwellings fronting both streets are positioned closer to the pavement, while on the south side are two buildings positioned up to the street pavement edge. These buildings are intended to be used as co-working space for small businesses or other commercial activity. The proposed development provides a balance of common vs private space with small private courtyards to the sides of buildings, with low fences that are positioned next to pedestrian walkways. There are two buildings with access to the upper floor unit via external stairs from the central communal space.

Land data

Site area: 5,158m²
Building footprint: 1,616m²
Gross floor area: 2,148m²

Site coverage: 31.3%
Floor area ratio: 0.42

3 x dwellings*
3 x duplex units

(mix of 1-3 bed units)

11 x parking spaces

2 x co-working spaces

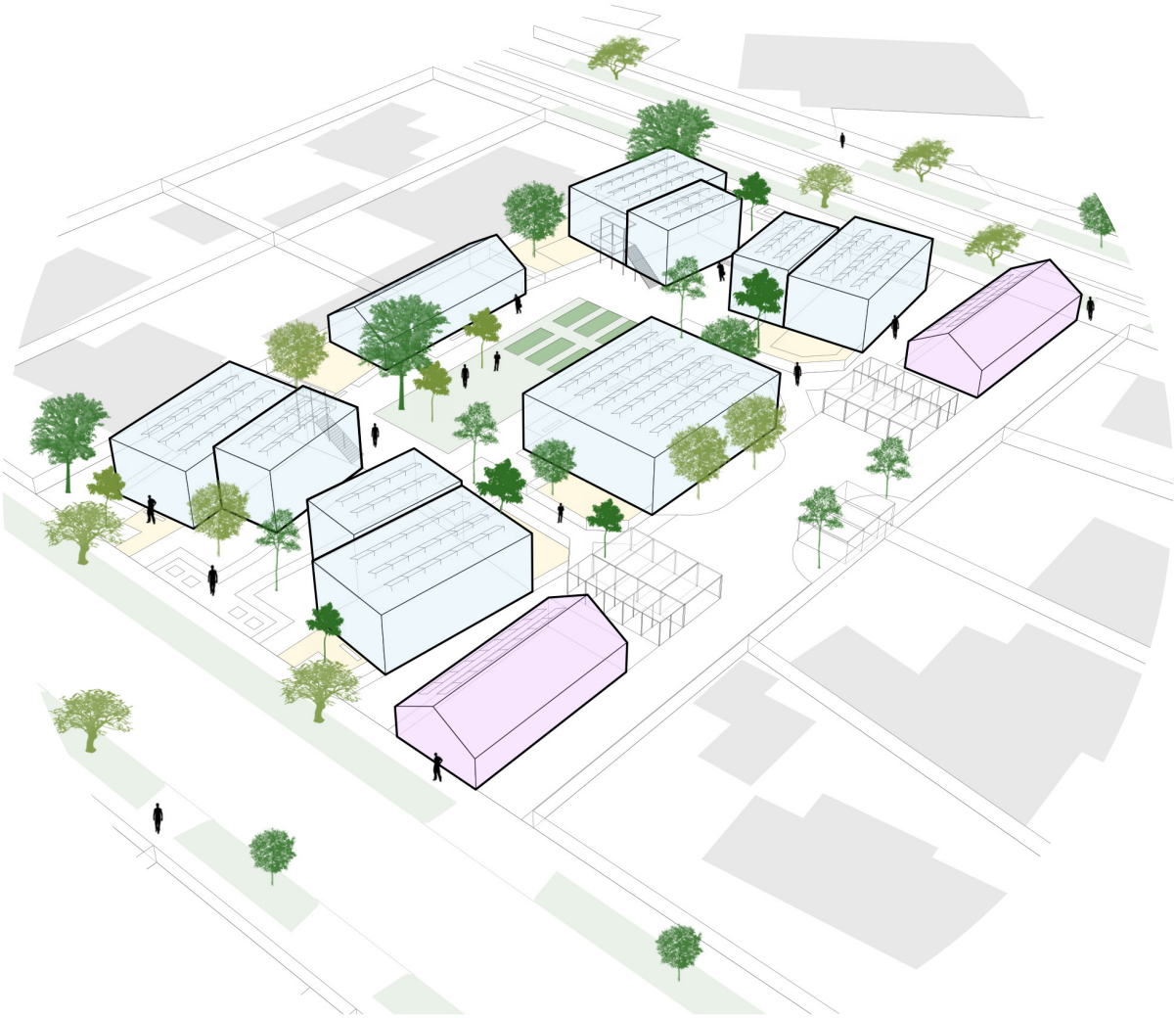
~25 residents

* first floor can be converted into 1-bed units

Residential floor area

Co-working floor area

Private open space



8.3 Neighbourhood centre

This row of shops is representative of a small neighbourhood centre that is a common feature of suburban areas in Melbourne i.e. the milk bar corner shop. The existing buildings are modest and single storey with the exception of the two storey milk bar on the corner plot. The pavement is lined by shopfronts with a canopy over and on-street parking along Dumfries Street. The lots are narrow but long with vehicle access via a rear laneway with neighbouring residential properties further east.

1

Right:
View to shops from the north with bus stop in foreground

2

Right:
View to shops from the south

Proposal 'neighbourhood centre'

The proposal involves full redevelopment of the shops, which allows a single building to occupy the full depth of the site, but retaining the narrow width of tenancies. The additional depth provides better layout potential for storage and service vehicle access via the rear laneway. The adjacent property to the north has been acquired to create a new local park and public square at the corner. With a park shelter, play area and seating there are more places for people to stay and interact. There are apartments positioned above the ground floor shops with a communal terrace and overlooking balconies. It is hoped this proposal will make the centre more attractive to visit.

Land data

Site area: 3,298m²
Public space gained: 1,285m²
Building footprint: 1,847m²
Gross floor area: 2,997m²

Site coverage: 56%
Floor area ratio: 0.91

8 x shop-top units

(2 bed units)

8 x private parking spaces
3 x disabled/taxi spaces

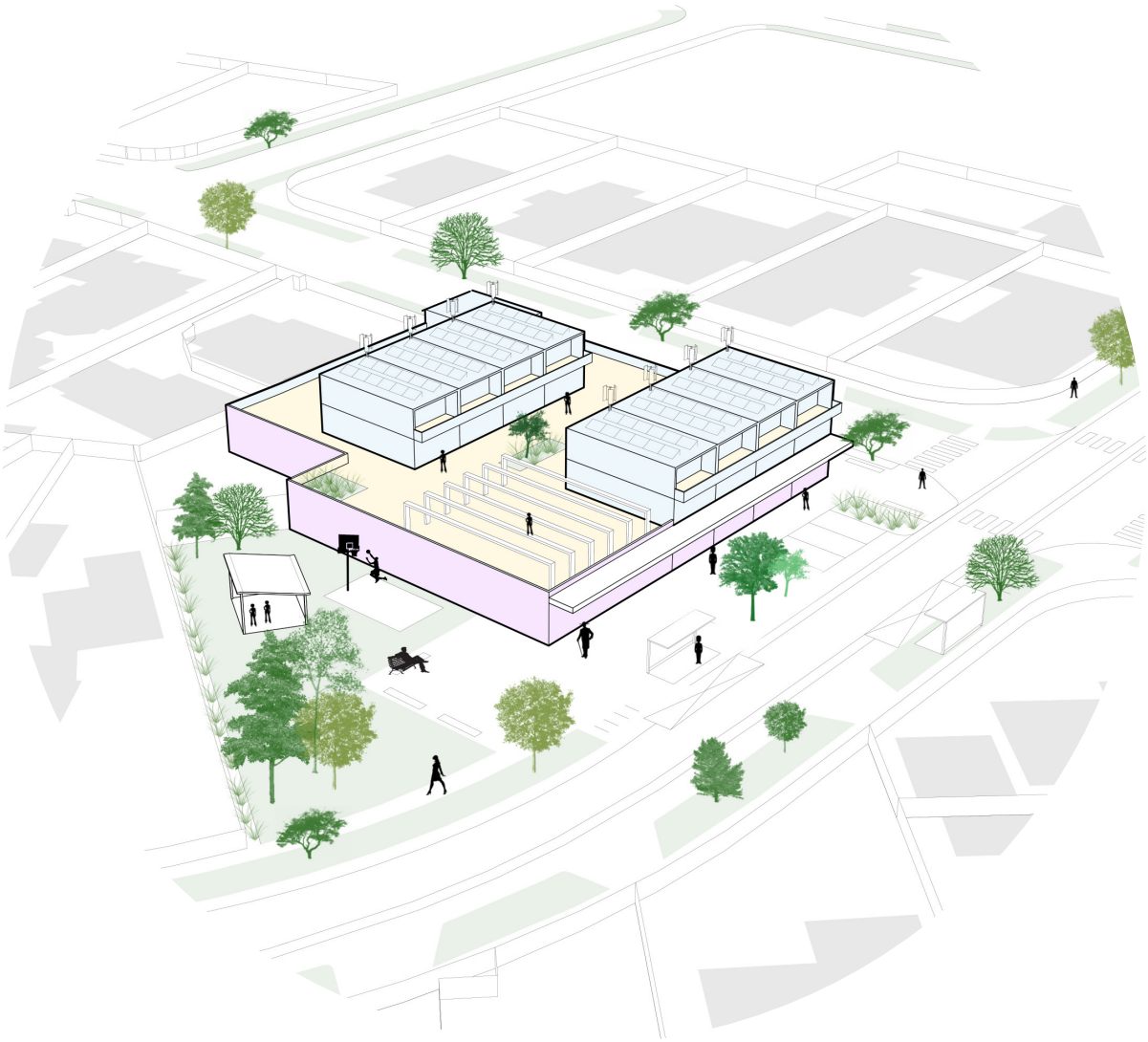
6 x shops

~24 residents
+ shop workers

Residential floor area

Commercial floor area

Private open space



8.4 Cul-de-sac

This pilot development aims to reinvent the quitessiential feature of post-war suburban sprawl - the cul-de-sac, in this case a short no-through road giving 'private' access to a group of 8 properties that turn their back on the adjacent creekland area. Cul-de-sacs have a huge impact on the permeability of suburbs and are often placed 'back to back', which lengthens the distance required to navigate through the neighbourhood.

The site abuts the Kororoit Creek but the interface is lined by tall fences along the property boundaries. These houses face inwards towards the street and do not provide any passive surveillance over the creek envrions. While the creek is quite narrow, at this point a small rock formation has produced a larger body of water that presents an opportunity to ‘activate’ the edge of the creek with a new meeting and recreational place. There is also an opportunity to establish another crossing point over the creek and to link with the bicycle/foot path on the eastern side adjacent to Millbank Drive.

Davitt Drive

Kororoit Creek

Millbank Drive

Land data

Site area: 7,726m²
Parkland gained: 1,205m²
Building footprint: 2,549m²
Gross floor area: 3,285m²

Site coverage: 33%
Floor area ratio: 0.43

12 x dwellings*

(mix of 2-3 bed units)

16 x parking spaces

~48 residents

* first floor can be converted into 1-bed units with separate side access via stairs

Residential floor area

Private open space

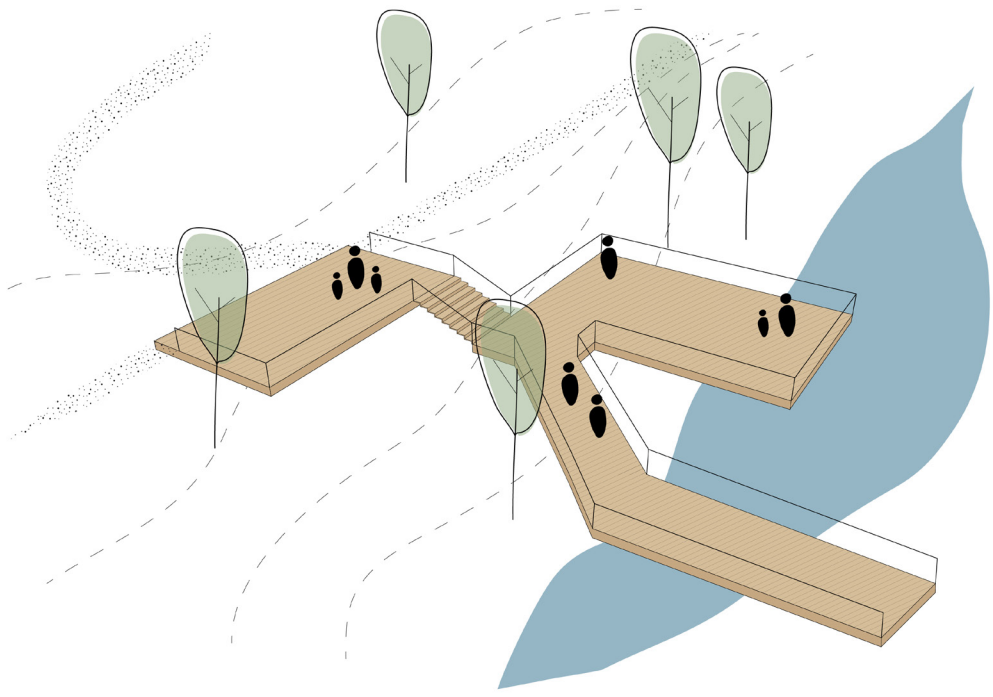
Proposal 'cul-de-sac'

The most transformative aspect of this pilot development is the acquisition of the roadway to form a new publically accessible park link 1,205m^2 in size through to the Kororoit Creek. This requires partnership with the local municipality and raises issues with land ownership and other practicalities, but may be possible in principle.

The creation of the park link is achieved by consolidation of parking into two locations to either side of the shortened road. The proposed dwellings are arranged in two clusters, each around a central common area, but also with two pairs fronting Davitt Drive in order to maintain a presence to this street. The dwellings are larger 2-3 bed units, but the upper level can easily be converted into a small studio if required. The front entries to all dwellings are carefully placed to activate the public spaces, while the new paths lead down to the creekbed and the proposed boardwalk against the water edge. This provides a place for people to relax and also cross the creek.

The new path links up with the path network along the creek corridor and extends down to the water edge to a new platform area, which also gives pedestrian access to the other side of the Kororoit Creek.

Right:
Concept of proposed creekside platform

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9 Conclusion

9.1 Key findings

Left:
Friendly neighbours in Amsterdam

(Source: Iam Marjon Bleeker)

The aim of this research project was to find answers to the disparity between territories in a sprawling metropolis. This takes the notion that urban sprawl has formed ever distant suburbs from the city core, which in turn has helped spread social and physical infrastructure. Consequently, there are clear divides between those living in desirable areas of the city and those confined to the places seen to be less desirable - which are generally defined by their access to and quality of services - be that public transport, parks, schools, shops, jobs and so on.

As a starting point I sought to first define the key symptoms of urban sprawl with the intention of making proposals that either combat the root cause or suggest changes to the status quo. These nine key symptoms are:

1. People living far from where they work
2. Limited public transport connections outside inner city
3. Reliance on car use and resulting traffic congestion
4. Monofunctional residential neighbourhoods
5. Limited housing choice and poor housing affordability
6. Failure to address evolving dwelling needs and falling household sizes
7. Excessive consumption and impact on ecology and climate
8. A failure to adapt to a changing, knowledge intensive economy and shifts in employment
9. Social isolation of suburban living

In the process of formulating a strategy to address these symptoms it became clear that making smaller interventions to the existing environment, rather than wholesale transformation, produces a more realistic outcome and requires less monetary investment. This approach is required to achieve meaningful change in places such as outer suburban neighbourhoods that are not located in areas targeted for significant redevelopment.

In order to make proposals to combat the symptoms of urban sprawl it was necessary to find the right places in the metropolitan area to investigate. This led to a process whereby areas termed ‘forgotten suburbs’ were identified through use of geographic and demographic data by applying filters through a step by step methodology. Gradually this revealed which places in the existing urban area were most affected by factors such as distance from the city core,

era of development, access to public transport and socio-economic status. Subsequently, the suburb of Deer Park in Melbourne, Australia was chosen as the site location for the design phase of the project. This neighbourhood has many of the typical characteristics of suburban sprawl such as low density, car dominated with limited public transport, monofunctional land use and an inwards (i.e. private) focused environment that places restrictions on the level of interaction between people.

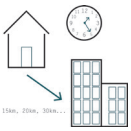
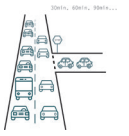
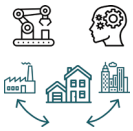
The intention was not for wholesale transformation of the area through proposals such as realignment of roads and large scale development. Rather, through smaller targeted interventions it should be possible to make more modest changes that can have nonetheless a big impact. But first it is important to consider how the neighbourhood sits within the wider metropolitan framework. The key issue in this case is to be able to better connect outer suburbs with the key places in the city such as the CBD where many of the jobs are available. With limited public transport outside the inner city the proposed suburban 'rail loop' aims to make these connections to the spaces between important places of the city. This strategy also translates to the district scale where bus services in particular present an opportunity to link with district centres that offer jobs, other needed services and public transport connections.

The vision for the future of Deer Park is to 'repair and renew' with the idea that repairing is to fix something from a poor to good condition whereas renewal is more progessive that suggests replacement. Hence, the proposals are made under the following four key strategies:

Connectivity Streetscape repair Parkland repair Housing renewal

There is a distinction between the proposals made within the public realm in both streetscapes and parkland compared to the housing renewal on private land. This allows for the most transformative aspect of the thesis to be controlled by the residents themselves with a high degree of flexibility and potential for innovation.

In order to summarise how the proposals directly address the symptoms of suburban sprawl the chart opposite shows which of the proposed strategies and specific proposals are relevant to each of the nine symptoms.

Symptoms	Strategies and proposals				
 Long commute distances	METRO RAIL LOOP	DISTRICT CONNECTION	NEW BUS + BIKE LINKS	HOME BUSINESS	
 No public transport	METRO RAIL LOOP	NEW BUS + BIKE LINKS	BUS STOP UPGRADES		
 Road congestion	NEW BUS + BIKE LINKS	BUS STOP UPGRADES	HOME BUSINESS		
 Mono-functional	LOCAL SHOPS	ACTIVE THRESHOLDS	URBAN FARMING	MIX OF USES	
 Housing affordability	LOCAL SHOPS	COLLECTIVE HOUSING			
 Changing household size	COLLECTIVE HOUSING				
 Unsustainable consumption	STORMWATER SYSTEM	NEW PLANTING	URBAN FARMING	WETLANDS	ECO FRIENDLY HOUSING
 Changing jobs + economy	SCHOOLS + ADULT EDUCATION	HOME BUSINESS			
 Social isolation	LOCAL SHOPS	URBAN FARMING	CREEKSIDE GATHERING PLACES	SAFETY + ACCESS	COLLECTIVE HOUSING

In some cases the strategies and proposals fall across several different symptoms. For instance, the proposed collective housing aims to address road congestion and long commutes by facilitating small businesses at home, but also tackles social isolation by bringing people closer and encouraging participation amongst residents.

When it comes to whose responsibility it will be to implement the changes proposed, of course the relevant bodies such as local municipalities and infrastructure providers will contribute much of what enhancements are made to the public realm. However, what is important to acknowledge is that public participation and involvement holds the key for true change to suburban areas as people look to new ways of finding affordable housing and improved quality of life by their own means. It is this level of activism and public will that drives the concept of collective housing and must form part of a cultural shift in the way that Australians look to buy and sell housing.

One only has to take lessons from the many places around the world, such as Baugruppen in Germany and Vrijburcht in the Netherlands, to see how community participation can only result in positive outcomes. This is already taking shape as a movement in Australia through fantastic initiatives like the Nightingale housing model first developed in Coburg, Melbourne by a group of architects and like minded people[1]. There is definitely the potential for collective housing to reach a wider group of people and make a big difference to the lives of the average Australian, not just those fortunate enough to benefit from it now.

9.2 Global application

Although this research project has investigated the issue of suburban sprawl in the context of Australian cities, specifically Melbourne, the global ramifications of continued suburban development are significant. Many cities today face a shortage of housing in the face of continued population growth, often leading to a rise in housing prices. Of course with continued growth many cities are expanding greatly in size by consuming the surrounding area, often consisting of valuable farmland.

The densification of the built-up area presents a viable strategy to limit the unsustainable expansion of the metropolitan limits. However, the answer does not lie solely in high density living such as residential skyscrapers. The existing suburban area has much to offer in this regard. The low density configuration of suburban areas with excessively large houses on big lots means that even modest redevelopment can make a significant contribution towards housing numbers.

Making changes to suburbia is also critically important to minimise their ecological footprint, being the epitome of modern consumption and excess. The idea that bigger is better is becoming less attractive as increasing numbers

1 http://nightingalehousing.org

of people now realise just how much human behaviour has contributed to problems such as climate change.

Finally, there is nothing that epitomises suburbia and the modern excess as the ‘McMansion’ - houses known for being overtly large with more space than any household ever needs and with garages for more cars than reasonably required. If just a handful of McMansions were to be redeveloped or converted into multiple dwellings in a single neighbourhood, imagine the sheer numbers that can be achieved if this could be replicated in every similar neighbourhood across the world.

Right:
Typical McMansions

(Source: NT News, 2014)

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