

https://dspace.org/

PROMOTING URBAN SOCIAL INTEGRATION THROUGH URBAN DESIGN INTERVENTION IN CYRILDENE

Lu Ke, Ke Lu

2019

https://hdl.handle.net/10539/28787

Lu, ke (2019) Promoting urban social integration through urban design intervention in cyrildene, University of the Witwatersrand, Johannesburg, <http://hdl.handle.net/10539/28787>

Downloaded from a DSpace repository. https://dspace.org/

UNIVERSITY OF THE WITWATERSRAND

PROMOTING URBAN SOCIAL INTEGRATION THROUGH URBAN DESIGN INTERVENTION IN CYRILDENE

This research report is submitted to the faculty of Engineering and the Built Environment, University of the Witwatersrand,In Partial fulfilment of the requirements for the degree of Master of Urban Design

By Ke Lu (Lu Ke)

Johannesburg 2019

University of the Witwatersrand, Johannesburg

School of Architecture and planning

SENATE PLAGIARISM POLICY

Declaration by Students

I _____Ke Lu_____ (Student number: _1520577_____) am a student registered for _Master of Urban Design_____ in the year 2019___. I hereby declare the following:

- **I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.**
- **I confirm that ALL the work submitted for assessment for the above course is my own unaided work except where I have explicitly indicated otherwise.**
- **I have followed the required conventions in referencing the thoughts and ideas of others.**
- **I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this in not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.**

Signature: _____ **Date:** 2019 04 04

Contents

1.0 Introduction 9

Abstract 9

Methodology 10

Thesis topic 11

Background 12

Position Statement 13

Vision 13

Theories 14

Research questions 14

Limitation 15

2.0 Theoretical investigation 16

Making a multicultural place 19

Convivial space 21

The relationship between urban landscape space, safety and health 22

Urban planning and design movement in China 24

Crime Prevention 28

3.0 Site investigation and problem statement 29

History and background 29

The study area 36

4.0 Precedent study 38

Precedent study: Old Chinese cities 39

Precedent: City of Eguisheim and background 44

Comparison: Urban grain, urban morphology 45

Precedent study: Green infrastructure 47

TOD (A transit-oriented development) 50

Superblock Barcelona – the way of thinking through urban design intervention to promote urban community and sustainability 52

Layer cake system and Urban design horizontal and vertical system 54

5.0 Design development 56

Urban design principles 57

Concept Development 68

Design development 75

Block Typologies 87

Housing typology 102

Development guidelines: 107

Implementation process 114

6.0 CONCLUSION: 115

7.0 Final Design Documentation 117

8.0 References: 126

Acknowledgements

Thanks to my family who continue to support me.

Thanks to my supervisor Professor Diaan Van Der Westhuizen for his Knowledge and patience.

List of Figures

Figure 1.1: Qualitative method

Figure 2.1: The fresh market

Figure 2.3.1: Undeveloped space in the urban environment

Figure 2.3.2: Water sensitive design concept diagram

Figure 2.4.1: Traditional Chinese street junctions

Figure 2.4.2: Street view in Beijing during the 1900s

Figure 2.4.3: The gateway area in the old Beijing city

Figure 2.4.4: New urban form in 1970s.

Figure 2.4.5: The highway run-through city in China

Figure 2.4.6: Street sketch diagrams

Figure 2.4.7: Street activities in Qing dynasty

Figure 2.4.8: The Citygate in Qing dynasty

Figure 2.5.1: Hierarchy of defensible space

Figure 3.1.1: Aerial view of the site surrounding

Figure 3.1.2: Gauteng Metropolitan economic nodes

Figure 3.1.3 Gauteng polycentric concept diagram

Figure 3.1.4: Regional economic corridor

Figure 3.1.5: Critical biodiversity area around Cyrildene and city of Johannesburg

Figure 3.1.6: Critical Biodiversity Area around Cyrildene and City of Johannesburg

Figure 3.2.1: Cyrildene area map

Figure 4.1.1: Image shows landmarks building at intersection

Figure 4.1.2: Overleap with old Beijing Map

Figure 4.1.3: Street view

Figure 4.1.4: Image shows the Citygate in qing dynasty

Figure 4.1.5: Image shows the gate way area in old Beijing city

Figure 4.1.6: This image shows the traditional Chinese street junctions.

Figure 4.1.7: Summarized sketch diagram for the gateway concept

Figure 4.1.8: Sketch diagram shows the Barcelona super block sketch layout

Figure 4.1.9: Sketch diagram for the old Chinese street

Figure 4.1.10: Sketch diagram shows the typical western orientated urban open space diagram

Figure 4.1.11: Asian city Jaipur diagram

Figure 4.1.12: Typical Traditional Chinese City diagram

Figure 4.1.13: Sketch diagram shows the undulating street edge

Figure 4.1.14: Siheyuan Sketch diagram layout

Figure 4.2.1: City of Eguisheim

Figure 4.2.2: Movement network at city of Eguisheim

Figure 4.2.3: Open space at city of Eguisheim

Figure 4.2.4: Building Footprint at city of Eguisheim

Figure 4.2.5: CBD Johannesburg

Figure 4.2.6: Cyrildene district

Figure 4.2.7: Building footprints CBD Johannesburg

Figure 4.2.8: Road network at CBD Johannesburg

Figure 4.2.9 Building footprints at Cyrildene district

Figure 4.2.10: Road Network at Cyrildene district

Figure 4.2.11: Aachen Germany

Figure 4.2.12: Road Network diagram at Aachen

Figure 4.2.13: Building Edges diagram at Aachen

Figure 4.2.14: Amsterdam Holland

Figure 4.2.15: Road Network diagram at Amsterdam

Figure 4.2.16: Building footprints diagram at Amsterdam

Figure 4.2.17: Open space diagram at Amsterdam

Figure 4.3.1: Sponge Cities diagram

Figure 4.3.2: Sponge cities detail design diagram

Figure 4.3.3: Sponge cities detail design diagram

Figure 4.4.1: TOD concept diagram

Figure 4.4.2: Transit oriented concept diagram

Figure 4.4.3: TOD diagram

Figure 4.5.1: Superblock concept model

Figure 4.5.2: Comparison between current situation and the Superblock concept model

Figure 4.5.3: Comparison different aspects between Current situation and the Superblock concept model

Figure 4.5.4: Landscape site analysis maps

Figure 4.5.5: GIS layers

Figure 4.5.6: Urban design horizontal layers

Figure 5.1.1: Chinese city gate diagram

Figure 5.1.2: Xian city gate

Figure 5.1.3: Proposed threshold diagram

Figure 5.1.4: Proposed threshold 3D view

Figure 5.2.1: Typical Chinese wall diagram

Figure 5.2.2: Xian City wall

Figure 5.2.3: Proposed urban “Wall” diagram

Figure 5.2.4: Proposed Urban “wall” 3D view

Figure 5.3.1: Layout adjusted to achieve legibility

Figure 5.3.2: Landmarks buildings in Beijing

Figure 5.3.3: Street view with landmarks building in Beijing

Figure 5.3.4: Sense of place visual connectivity 3D view

Figure 5.3.5: Landmark buildings 3D view

Figure 5.3.6: Gateway building 3D view

Figure 5.3.7: landmark buildings 3D view

Figure 5.4.1: Civic space

Figure 5.5.1: Multi-centres diagram

Figure 5.5.2: Connected Multi-centres diagram

Figure 5.5.3: Connected open spaces diagram

Figure 5.5.4: Open spaces diagram

Figure 5.6.1: Personalization of the building typologies

Figure 5.6.2: Public open space plan

Figure 5.6.3: Public open space diagrams

Figure 5.6.4: Semi-public open space plan

Figure 5.6.5: Semi-public open space diagrams

Figure 5.6.6: Private open space plan

Figure 5.6.7: Private open space diagrams

Figure 5.7.1: Undulated urban edges

Figure 5.8.1: Permeability diagram

Figure. 5.9.1: Existing site information and Concept development diagrams

Figure. 5.9.2: Concept development process diagrams

Figure. 5.9.3: Concept development process diagrams

Figure: 5.9.4. Edges and corridors

Figure.5.10.1: Chinese urban design principles and 3D plan

Figure.5.11.1: Single node model

Figure.5.11.2: Multi-nodes model

Figure.5.12.1: Major traffic movement diagram

Figure.5.12.2: Existing site with property boundaries and major movement system

Figure.5.12.3: This diagram overleaps with the existing movement structure, existing corridor, potential corridors.

Figure.5.12.4: The colour in blue is the existing economic corridor. It links between M33 and Marcia St.

Figure.5.12.5: the existing movement system and the urban blocks.

Figure.5.12.6: The light-yellow colour highlights the proposed movement system.

Figure.5.12.7: The proposed building footprints.

Figure.5.12.8: Accessibility and connectivity between public open space to the semi-public space and private space.

Figure.5.12.9: Existing urban structure and proposed building footprints

Figure.5.12.10: proposed building footprints and existing property boundaries

Figure.5.12.11: The implication between the new proposed urban design movement structure with the existing context.

Figure.5.12.12: Overleaped proposed urban blocks, proposed economic corridors.

Figure.5.12.13: Put all proposed layer and existing layer all together.

Figure.5.13.1: Cross section through M33

Figure.5.13.2: Cross section through the general residential area.

Figure.5.13.3: Cross section through the Derrick Ave.

Figure.5.13.4: Cross section through the existing residential area and proposed new residential area.

Figure.5.13.5: Cross section through the Marcia St. On both side of Marcia St.

Figure.5.14.1: Block typologies diagrams

Figure.5.14.2: Typical cross section for mix-used area 1

Figure.5.14.3: Typical cross section for mix-used area 2

Figure.5.14.4: Typologies: Type 1

Figure.5.14.5: Typologies: Type 1 diagram

Figure.5.14.6: Typologies: Type 2

Figure.5.14.7: Typologies: Type 2 diagram

Figure.5.14.8: Typologies: Type 3

Figure.5.14.9: Typologies: Type 3 diagram

Figure.5.14.10: Typologies: Type 4

Figure.5.14.11: Typologies: Type 4 diagram

Figure.5.14.12: Typologies: Type 5

Figure.5.14.13: Typologies: Type 5 diagram

Figure.5.14.14: Typologies: Type 6

Figure.5.14.15: Typologies: Type 6 diagram

Figure.5.14.16: Typologies: Type 7

Figure.5.14.17: Typologies: Type 7 diagram

Figure.5.14.18: Typologies: Type 8

Figure.5.14.19: Typologies: Type 8 diagram

Figure.5.14.20: Typical mix-used block

Figure.5.14.21: Typical blocks footprints

Figure.5.14.22: 3D sketch, Mix-used block

Figure.5.15.1: Mix-used block footprints

Figure.5.15.2: Vertical land use layer diagram

Figure.5.16.1: Gateway Bird’s-eye View 3D Sketch

Figure.5.16.2: Gateway area Plan

Figure.5.16.3: Gateway 3D Sketch, Provide a horizontal and vertical mix of uses.

Figure.5.16.4: Gateway 3D Sketch, An environmental friendly mix-used environment.

Figure.5.17.1: Siheyuan layout type 1

Figure.5.17.2: Siheyuan 3D building plan

Figure.5.17.3: Siheyuan layout type 2

Figure.5.17.4: Siheyuan 3D building plan

Figure.5.17.5: Wall mediator and undulating edge incorporate Siheyuan concept

Figure.5.17.6: General cross section shows the Marcia St.

Figure.5.17.7: 3D view shows the integrated Siheyuan layout

Figure.5.17.8: General 3D Street view

Figure.5.18.1: Locality map

Figure.5.18.2: Major movement and proposed building footprints

Figure.5.18.3: Mixed-use map

Figure.5.18.4: General section for setbacks

Figure.5.18.5: Street general section

Figure.5.18.6: BRT station and bus station plan

Figure.5.18.7: Fig.5.15.7. Not recommended fence styles

Figure.5.18.8: Boundary wall styles

Figure.5.18.9: Signage plan

Figure.5.18.10: Way-finding signage elevation

Figure.5.18.11: Recommended window signages

Figure.5.18.12: Advertising board elevation

Figure.5.18.13: Street market diagram

Figure.5.18.14: building frontage diagram

Figure.5.18.15: Building setbacks

Figure.5.18.16: Building heights

Figure.5.19.1: Phasing plan

Figure.5.20.1: Poster 1-9

Figure.5.20.2: Poster 2-9

Figure.5.20.3: Poster 3-9

Figure.5.20.4: Poster 4-9

Figure.5.20.5: Poster 5-9

Figure.5.20.6: Poster 6-9

Figure.5.20.7: Poster 7-9

Figure.5.20.8: Poster 8-9

Figure.5.20.9: Poster 9-9

1.0 Introduction

Abstract

This research proposal discusses urban structure, ethnic group segregation, space-making, crime prevention and, the use of urban design intervention to solve social and spatial issues and promote sustainable and integrated urban communities in the Cyrildene area of Johannesburg. From the review I hope to understand the characteristics of homogeneous communities and the reasons that homogeneous communities isolate themselves, which, from the preservation of Ethnic Minorities' Culture's angle, is to encourage the identification of the ethnicity's unique characteristics. This research proposal also explores the relationship between space and neighbourhoods, and the value of the convivial space, as well as arguing that economic gain should not be used to determine social policies. The urban landscape space has multiple benefits, it can help to reduce particular types of crime, improve public health, as well as reconnect the urban environment with the eco-system. From reviewing the traditional Chinese urban planning and design history, there are some traditional Chinese urban planning and design principles that could be utilised in today's cities, and these principles could help to build up urban communities and emphasise the unique culture of the Chinese community. This research proposal analyses, through urban design, the current issues in the Cyrildene area. Urban design could be used as an instrumental tool to solve these urban design-related problems, and at the same time promote the urban communities. Properly designed urban open spaces can help to improve local social relations and job opportunities for the surrounding neighbourhoods. This research proposal develops an example for the ethnic group to show their unique identity through urban design in the environment and at the same time increase tolerance between ethnic groups to promote social integration. From reviewing the literature, restructuring the existing urban structure can improve social and spatial issues as well as build up the neighbourhoods. Furthermore, a high level of local community engagement can lead to the progression of social integration. Social integration, while at the same time strengthening an internal sense of community, is the goal for these urban communities. This research proposal attempts to discover the constraints and opportunities based on the urban design analysis result to generate an urban design concept framework and urban development code.

Methodology

This research programme included following stages: Site visit, research questions, literature review, case study, site analysis, design proposal and design guideline. The site analysis stage will influence the literature review, problem statement, and design proposal.

This research proposal will also incorporate qualitative research. Qualitative research is a type of scientific research method that focuses on an understanding of the rationale behind phenomena, observation, and motivations. Qualitative research includes five aspects: case studies, contextual inquiry, ethnography, grounded theory, and action research. See chart below. (Green,2007)

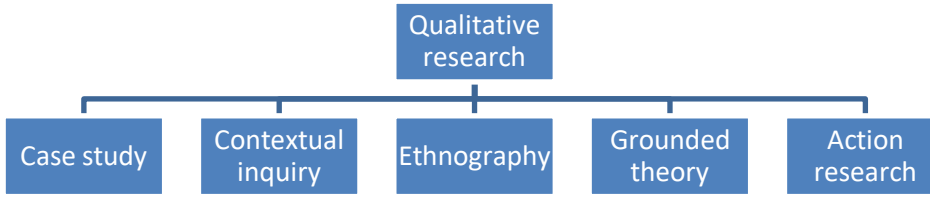


Fig.1.1 Qualitative method. Author 2018

Thesis topic

Promoting urban social integration through urban design intervention in Cyrildene.

Background

The Chinese have a long history in South Africa; the research shows that Chinese people arrived in Cape Town around the late 16th century (Yap and Leong Man, 1996).

Since the 20th century, South Africa has become one of the favoured destination countries for Chinese immigration (Park, 2009).

South Africa has the most extensive Chinese population in the African continent, with most of the community gathered in the Johannesburg-Pretoria region, and coming from 57 different areas of China (Park, 2009). Cyrildene is the most popular destination for the Chinese ethnic group. This area continues to attract new immigrants and existing members of the South African Chinese community (Ho, 2013).

Position Statement

It is possible to, through urban design intervention, improve the urban living environment. “The urban design profession can open up the boundary between different communities, as well as help to improve the urban living environment, creating a better connection between social life and the structure of the built environment.”

Vision

Revitalisation of urban spaces in the Cyrildene district so that spaces can continue to attract people from all over the world to enjoy work, live and play in the urban environment, as well as integrating into the community.

Theories

Changing the relationship between urban public spaces and buildings to decrease crime.

Promoting social sustainability through urban design principles, improving the urban public space and, as a result, public health, to attract people back to the urban environment.

Research questions

Based on the integration and densification concept, how can the Chinese community naturally integrate into the surrounding community?

How can urban design interventions address how the Cyrildene district the interfaces with its surrounding areas and the rest of the city?

How can the local cultural identity of the space be enhanced towards greater sense of place while building multiculturalism?

Limitation

This design project will focus on the Chinese community in Cyrildene only;
the results should not apply to other ethnic communities.

2.0 Theoretical investigation

The purpose of this chapter is to find answers to the research questions through theoretical investigation.

The topic of this research proposal is "Promoting urban social integration through urban design intervention in Cyrildene". Therefore, exploring the term 'social integration' became essential. In order to promote social integration, we need to understand in today's context what could cause urban segregation.

The social integration section attempts to understand a few fundamental social issues that could lead to segregation. This section explores different causal factors that could lead to social issues, and ways to improve these issues to achieve social integration. The study area also looked at social issues from the surrounding communities, to fundamentally understand reasons could that help to form better urban design decisions and to improve the current situation. The following section discusses multiculturalism, and Professor Robert Putnam points out that social diversity and multiculturalism should be seen as goals, due to the substantial social benefits for communities (Putnam, 2007).

Professor Robert Putnam emphasised that the roles of public space are essential, due to the fact that public spaces can improve social issues, and well-designed public spaces can increase the social capital for the surrounding communities. The same chapter also mentions that new immigration could lead to urban segregation from the nearby communities, the reasons for segregation are varied and could be related to communication issues, language barriers or new immigrants being unfamiliar with local laws or regulations. Many new Chinese immigrants stay in Cyrildene district and how to provide spaces for them and help them integrate into the surrounding is vital component of this research proposal. The following chapter tries to explain the concept of convivial space. Shaftoe argues that well-designed urban open spaces could increase social opportunities (Shaftoe, 2008); therefore only when people start to get to know each other, can tolerance increase between people from different ethnic groups with different cultures and educational backgrounds.

Spector (2016) discusses the relationship between the urban landscape space, safety, and health. Spector points out that multipurpose green spaces in the urban environment could help to increase safety in the area. The multipurpose green space can also play an essential function from a stormwater management point view. Spector also highlights that well-maintained urban green spaces could decrease particular types of crime. This research proposal is about promoting urban social integration through urban design interventions; adequately-designed landscaped urban spaces that can encourage people to do more outdoor activities and increase social opportunities.

Understanding Chinese urban planning and design history can help to inform better decisions for the Cyrildene district, due to Cyrildene district being mainly occupied by Chinese immigrants. In order to help Chinese people feel comfortable to live, work and play in this district, it is necessary to design spaces that they are comfortable with, thus it makes sense to review Chinese urban planning and design movements in order to find design principles that inform the structure of older Chinese cities. These Chinese Principles are fundamentally important, and need to be incorporated into the design.

Lastly, Newman (1996) speaks about defensible space to prevent crimes. Newman believes that adjusting physical layout can improve social issues as well as built up communities. Therefore people can get to know each other and better understand each other, and the communities in the area could become more harmonious, friendly and supportive of eachother.

Social integration

Cruz-Saco (2008) highlights that social integration aims to decrease the urban poor issue and reduce imbalanced economic development as well as promote social equity. To support social integration, social exclusion needs to be reduced through policymaking, job creation, economic growth, and bolstering community safety. Cruz-Saco summarised five aspects that can support the concept of social integration:

Renewing of concept and system reform to avoid discrimination

- Increase opportunities for lower income people to participate politically
- Create channels to listen to the voices of marginalised people
- Reserve or create decent and representable job opportunities for marginalised people or communities
- Develop a program to improve capabilities for marginalised communities for them to improve their living standards and reduce poverty

Cruz-Saco points out that people who are unable to live in a multicultural environment are, in most cases, people new to the environment, unfamiliar with local policies or law, with poor educational background, as well as being subject to language barriers, bias, discrimination, racism and xenophobia etc. New immigrants often have few local connections and little support. One of the social integration approaches is to remove prejudices and improve tolerance.

Cruz-Saco (2008) makes the point that social integration goals should consider economic, social, political and cultural aspects. Understanding the causes of urban segregation can better help to promote urban socio-spatial integration. However, it is important to note that merely providing space for diverse social groups and encouraging them to meet each other will have little effect (Karp, 1991) in isolation. Local people might be concerned about housing opportunities and the occupation of social resources such as education, hospitals, jobs, transportation etc. (Joseph, 2006). Bolt (2010) argues that social integration could result in weakening the indigenous culture or even wholly replacing it with the exotic culture in the area. Cashin (2004) queries the need to build unnecessary relationships; since people even from the same cultural background do not necessarily become friendly, why is it necessary to force people to accept an integrated neighbourhood? The integration concept in most cases still does not work, even after an adjustment of policy and improved conditions to encourage people to remain in the same neighbourhood.

Internationally, social integration policies applied in some Western countries and South Africa have achieved negative results. These social integration policies failed to improve the socioeconomic integration and reduce ethnic segregation. Furthermore, some of the social integration policies have caused fragmentation issues and led to an increase of housing stocks in the area (Phillips & Harrison, 2010).

Lemanski (2006a) emphasises that social integration is not directly linked to physical desegregation. Currently, class segregation is more significant than race-based segregation in South Africa. Lemanski points out that, in America, social integration policies have not really brought a positive impact to the excluded population. However, social integration policies have had a positive impact in South Africa, especially between different races following the apartheid period. Lemanski emphasises that in the current age, class-based segregation continues growing more widely than race-based segregation. Moreover, physical segregation is not the prime actor leading to social integration (Lemanski, 2006). It is important to recognize that it is essential to provide alternative images for social relations. Space can help to bring different experiences to different

people, and positive urban spaces could inspire people or help people to re-build confidence, and creative spaces could encourage people to innovate and stimulate people's imaginations. These scenarios could help to drive social change and provide opportunities for different communities and promote the social integration (Yong, 1995).

The ideal community should be able to provide a safe space and a sense of community. Furthermore, this kind of urban space should be able to conducive to personalisation and characterisation. This space should be permeable, able to help to build up the social network and easy to access to a sense of place. This kind of space could help to generate job opportunities. The space could have multiple functions; the space can provide an educational function, recreational function as well as stimulate small business development. Therefore, the local communities can better engage with the environment (Young, 1995).

Reflection

Different circumstances and factors can lead to different social issues. In some aspects, social integration could have a negative impact on the indigenous culture. However, to promote social integration in the urban environment is the goal for future urban communities. There is no simple solution to improve social integration in cities but, to appropriately provide designed urban spaces is one of the solutions to the challenge of bringing people together and increasing tolerance between different ethnic groups. An attractive policy can also instantly bring people together but not necessarily in a durable and sustainable way. However, from an urban design point of view, adequately designed public spaces could increase job opportunities, improve the urban living environment, and help to build a better connection between people of different backgrounds.

Making a multicultural place

Professor Robert Putnam from Harvard University concluded that social diversity and multiculturalism should be seen as goals, due to the substantial social benefits for communities. (Putnam, 2007)

Putnam emphasises that the way to improve homogeneous communities is to provide attractive, harmonious, and vibrant public destinations. Reinvesting in public spaces could help bring people together. Knapp (2008) argues that public spaces are essential factors in the success of communities and high-quality public spaces could increase the social capital of those communities.



Fig. 2.1 The fresh market. Knapp, 2008

Knapp also points out that vibrant public spaces could also help to break down social barriers. Quality public spaces could bring people of different cultural backgrounds together and provide opportunities for them to share and exchange experiences.

Knapp states that different groups of people have a propensity to isolate themselves from other groups. Public facilities can create a natural gathering together of different groups. Such successful multicultural spaces include public markets, playgrounds, pedestrianised streets and street furniture (Knapp, 2008).

Vranken (2011) states that lower income groups often have a better connection to their neighbourhoods compared to wealthier and more educated people. Due to the survival benefit of community cohesion among lower-income groups, neighbourhoods are a fundamental need.

Vranken also points out that new immigrants who come from the same ethnic groups could be a cause of spatial segregation from the surrounding communities, one of the factors being how the language barrier results in new immigrants from a low educational background being unable to communicate adequately with locals. New immigrants often need support from the local community who share their ethnic background and language to find accommodation and employment. These less educated new immigrants need support from their compatriot communities from an emotional, economic and social perspective. Occasionally, ethnic groups could develop their own culturally orientated environments such as restaurants, places of worship, nursery schools, or markets (Vranken, 2011). This phenomenon eventually grows into an ethnic community and, potentially, new economic seedbeds. I would argue that, in fact, in Cyrildene Johannesburg, most of the second or third generation of immigrants diverge a great deal from the first generation due to the second or third generation having a better education than the first, and the second and third generation absorbing culture and knowledge from local students. In most cases, the second and third generations will be integrated better than the pre-existing local communities.

Reflection

To sum up, only when we fundamentally understand the homogeneous communities' relationship with the surrounding communities can the urban designer find solutions to design attractive public spaces for bringing people together. Psychologists and sociologists suggest that the way to make people trust each other is to reduce social distance (Putnam, 2007). Inappropriately-designed public spaces do not help with issues of social tolerance. Good quality public open spaces can help improve social issues, break social barriers and increase the social capital. Adequately-designed public spaces can also help to increase the microeconomy in the surrounding environment. Nevertheless, new immigrants could cause spatial segregation issues due to language barriers, low educational background and unfamiliarity with local policy or laws. However, new immigrants usually have better neighbourhood relations, and in many cases, these new immigrants could develop their own culture-related businesses and eventually become a new economic node.

Convivial space

The word “convivial” is defined by dictionaries as ‘of an atmosphere or event; friendly, lively, and enjoyable’. In the urban environment, open spaces should be convivial and sustainably-built spaces that people can enjoy visiting, thus promoting sociability. Without consideration being provided to convivial spaces, the city could miss opportunities for people to interact with each other (Shaftoe, 2008).

Shaftoe (2008) points out that convivial spaces can bring opportunities for people to get to know each other. Moreover, they can also foster tolerance and understanding between communities. Convivial spaces should be rich, vibrant and mixed-use environments, and should continue to attract people day and night. Not only can such spaces attract residents but also could bring visitors to enjoy and make use of the environment.

John and Richard (2002) raised following questions (Shaftoe, 2008):

Is the place enjoyable – is it safe, human in scale, with a variety of uses?

It is environmentally friendly – sunlit, wind and pollution–free?

Is it memorable and identifiable – distinctive?

Is it appropriate – does it relate to its context?

Is access freely available?’

Shaftoe asserts the importance of public spaces in all ethnic groups and civilisations. From West to East, and throughout history, evidence is found of the need for public spaces (Shaftoe, 2008).

Shaftoe (2008) highlights that, to approach the concept of convivial spaces, three essential aspects must be integrated: design, policy and management. Only when straddling these multiple disciplines can the best results be achieved for convivial spaces. Government should not use economic gains to examine the success of the good social policy. The quality urban open spaces could help to improve the microeconomics of the area. A good urban environment can also help to improve people’s health conditions (Layard, 2005). Therefore the government should integrate these considerations.

The biopsychosocial model is a healthcare concept that has relevance to the current pain theory. There is a growing view that poor health and disease are results of the interrelation between biological, psychological and social aspects, which are affected by the environment. Psychological and social aspects, as well as suitable living environments could help people to relax, be calm, and feel refreshed (Labonte, 2005).

Reflection

To summarise, convivial spaces can naturally bring people together, both local and immigrant, and the surrounding space should be a mixed-use development with a healthy environment.

When urban designers create spaces, they should integrate thinking from multiple points of view: design, management and policy-making.

The relationship between urban landscape space, safety and health

Spector (2016) highlights that adding multipurpose green spaces in the urban environment can not only decrease criminal activity but also decrease stormwater runoff and improve public health. Research has found that exposure to green spaces in the urban environment can reduce mortality, morbidity, stress, and mental fatigue (Kondo, 2015).

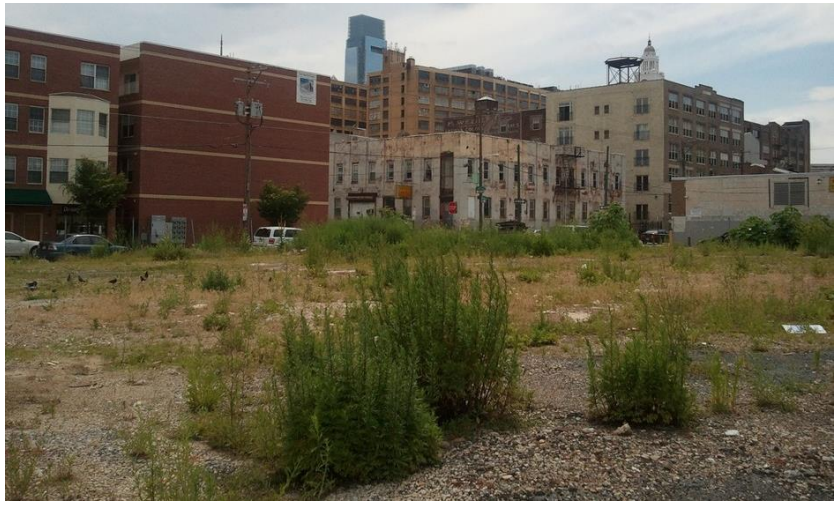


Fig.2.3.1. This Image shows the undeveloped space in the urban environment. (2016 Mike)

Spector points out the importance of the relationship between the maintenance of the urban landscape and certain types of crime. Dense foliage could provide cover for criminal activity. However, a tree with large canopy cover could reduce incidents of theft, robbery and violent crime. Furthermore, reinventing unattended vacant urban space could reduce gun crime and vandalism (Kondo, 2015).

A well-maintained urban area could entice communities to spend more time outdoors, therefore providing informal surveillance of the area. My argument is that a well-designed urban public space could attract people, however, if the urban structure is not planned properly, then the public space could also create problems. However, the location of urban public space and urban landscapes are equally important, and both landscape design and urban design need systematic and integrated design (Spector, 2016). This suggests that multi-level thinking regarding the urban space could create a safer environment for the local community.



Fig.2.3.2. This Image shows the water sensitive design concept diagram. (2016 Mike)

Spector (2016) points out the relationship between green space and certain types of crime. Research shows that improving vacant land could decrease property crime such as robbery, home invasion, and violent crime for those who live nearby. Spector (2006) suggests that cities should not only take into consideration economic value and aesthetics, but cities should set up policies prior to construction to temporarily improve the empty plot in order to decrease the crime rate. Research shows that different types of crime are linked to different environments such as robbery and violent crime. Improvements in public safety can be achieved by providing appropriately-designed spaces.

Conclusion

In conclusion, adequately-designed and well-maintained landscape spaces in the urban environment have several functions: first, the landscape space can be part of a green infrastructure system to reduce stormwater runoff, and improve the urban eco-system. Second, the well-maintained landscape space can help to reduce crime for the surrounding neighbourhoods. Third, the carefully-designed urban landscape open space can incorporate selected supporting physical activities that could help improve people's health conditions and decrease morbidities such as stress and mental fatigue, as well as mortality. (Nadja et al., 2016) Also, the well-designed urban landscape space could encourage people to spend time outdoors and increase opportunities for people to get to know each other.

Urban planning and design movement in China

Lu (2006) points out that China has a long urban planning history since 256BC. Cities in an ancient China were always surrounded by city walls, streets were orientated in a North-South and East-West direction. Streets also formed the urban grand system. The market district and residential areas were always enclosed and located in separated regions before the Sui dynasty (Yang, 1993). The enclosed market model continued until 581BC, when it was replaced by the open street system. The open street system lasted until 1127BC when it was replaced by the mixed-use living system. The mix-use system included commercial and residential functions; the system intensified the urban market economy at the same time strengthening the development of urbanisation (Skinner, 1997).



Fig.2.4.1. This image shows the traditional Chinese street junctions. (Youzhi, 2004)

Esherick (2009) reminds us that the urban form in China was influenced by the West since the Opium war, during which time many Western urban planning philosophies started to be implemented into traditional Chinese cities, such as the concept of railway cities, and treaty ports.

During that time the urban form became disorganised in China.



Fig.2.4.2. This image shows the street view in BeiJing during the 1900s. (Yuelang,2017)

After the overthrow of the Qing regime, many reformers promoted the integration of Western-orientated modern infrastructure, new regulations, planning theory and modern urban patterns into some of the cities in China. However, many cities in China remain the traditional Chinese urban forms from before 1949 (Lee, 2001).



Fig.2.4.3. Image shows the gate way area in old Beijing city.(Ni,2017)

Peng (2006) highlights that due to ideology influenced by the Soviet Union, China has copied the urban planning system from the Soviet Union and widely applied this to cities in China. Sun (2016) emphasised that the

Soviet Union urban planning system was based on the Western urban planning system, and is focused on industrialisation, so that all other aspects need to adjust to suit this industrial-orientated planning system, such as population, public utilities, and infrastructure development.



Fig.2.4.4. Image shows the new urban form in 1970s. (Kan, 2017)

Since the reform and opening up in China from the 1980s, the USA's urban master plan, regulatory plan, comprehensive plan and site plan system are starting to influence the urban planning system in China. However, the UK planning system was also gradually gaining influence into the Chinese urban planning system, especially the development plan and master-planning aspect. I argue that since the 1900's the Chinese planning system has been influenced by Western urban planning systems and during the past 100 years continued to be influence by the Soviet Union, UK, and US urban planning systems. To a certain degree, there are very limited traditional urban planning and design theories that are retained into the current age.



Fig.2.4.5. Image shows the highway run-through city in China (RenZen& Wuming, 2017)

China has a long planning history, and some of the urban planning theories are unique. Fengshui geomancy and astronomy-based planning theory are all ignored in the current planning system (Bai, 2003).

It is not necessarily a bad idea to borrow advanced urban planning and design knowledge from other countries; however, it is necessary to critique the foreign urban planning theory before implementing it into today's Chinese urban planning system. Miao (1990) highlights that many urban designers in China are trying to re-introduce the traditional Chinese urban planning heritage back to today's building environment from the time of reform and opening. However, there is no precise definition of "traditional Chinese urban planning form" in the Chinese urban designer's mind. Miao analysed the traditional cities in the South of China and discovered four fundamental urban design principles. Firstly, most of the cities are North to South orientated and most of the housings are also North to South orientated. Secondly, the primary movement routes always lay symmetrical in the cities, and it forms the major urban structure. The street orientation runs North to South. Thirdly, the municipality building is often located in the middle of the interstation of the major movement route. Finally, all buildings keep the rectangular

form and North to South orientation. The entire cities without irregular urban space due to the rectangular building form are the only element to fulfil the urban grids. Even if cities might have some random shaped urban spaces, eventually the space will be occupied by rectangular buildings and form part of the regular urban structure. Because city walls often follow the landform, eventually the city's morphology may become asymmetrical (Miao, 1990).

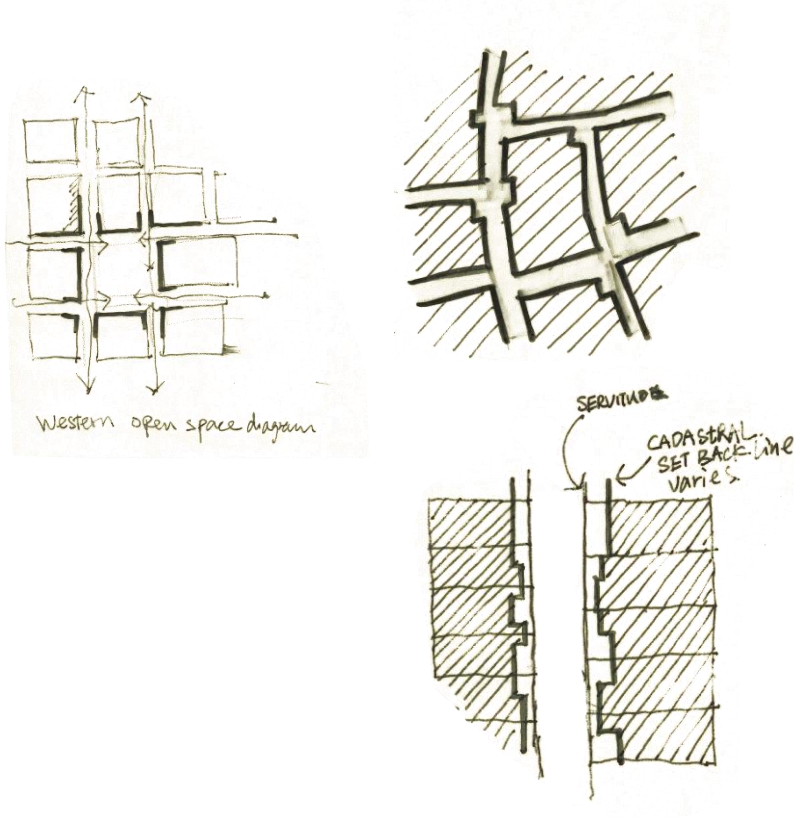
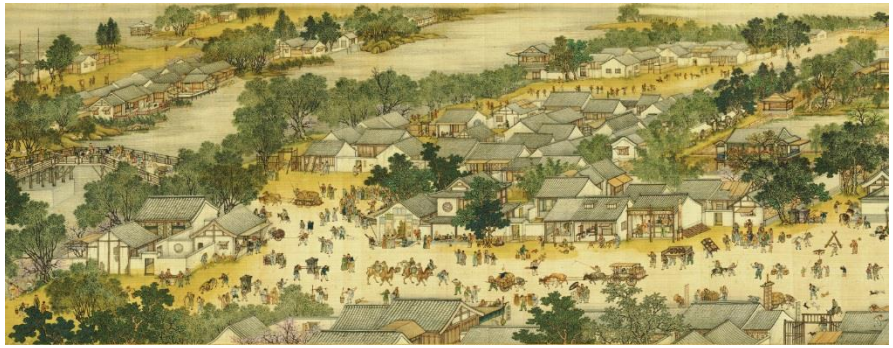


Fig.2.4.6Source: Author's own

It must be emphasised that the open space form in ancient China is different from European cities. From a functional point view, European cities use open spaces for public gathering for the entire city; generally, in western cities, an open space is an essential urban structural element as well as a social-political and worship place.

Open spaces in ancient China were in a linear form and the commercial street was often next to the waterway. There were not many large scale public squares in ancient China compared with the quantities of public squares in European cities. In China, most of the squares were relatively small and located in front of government buildings, bridges or a Confucius temple. Due to the non-official uses, these public spaces were usually in-between the front of buildings and boundaries of the streets; people often used the street space in front of their façade as their activity space or social space.



Fig,2.4.7. Image shows the street activities in Qing dynasty. (Zeduan, 1145)

In the ancient Chinese cities one could usually find a few well-structured large open spaces. However, these open spaces often had limited pavements and a lack of identity elements, and many activities were not allowed in these public spaces. Due to the political centralisation of

systems to prevent the civilians participating with local powers and official planned open spaces (Miao, 1990).



Fig.2.4.8. Image shows the citygate in qing dynasty. (Zeduan,1145)

Reflection

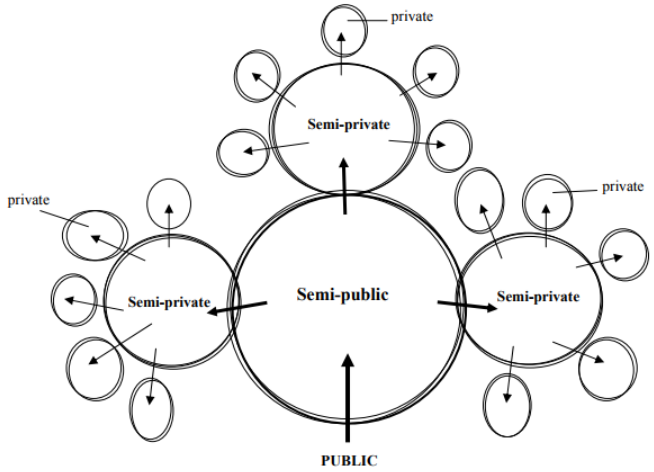
China has a long history of urban planning and design theory. Unfortunately, since the Opium war, Western-based urban planning theory starts influencing the Chinese cities and, up until today there is little traditional Chinese urban planning and theory that is implemented into the existing and new urban development. To investigate the traditional Chinese urban design theory and design characteristics central to the Chinese communities, and form a cultural heritage conservation point view, developing and extending the traditional Chinese urban planning and design theory is essential. To critically select the urban planning and design principles from Western into the contemporary Chinese cities is vital and, to emphasise and implement the traditional Chinese urban planning theory and design character into today's Chinese cities is equally important.

Crime Prevention

It is important to note that the defensible space programs focus on engaging with communities and allowing neighbourhoods to be part of the plans, therefore local communities can benefit from the improvement process through urban design intervention (Newman, 1996).

Newman (1996) points out that to reconfigure the physical layout for communities can help to improve social issues as well as build up the neighbourhoods. Physical re-configuration includes access to the area, road, street, outside of the buildings, entrance hall and corridors. Newman emphasis that to let local communities recognise the universal value to the way of life for the area are essential (Newman, 1996).

Figure 3. Hierarchy of Defensible Space



Source: Newman (1973, p9): arrows indicate entrance and exit points at different levels of the hierarchy.

Fig.2.5.1 Hierarchy of Defensible space.(Newman,1996)

Newman emphasis that a high level of local community engagement can progress social integration, that people from different incomes and races can all benefit from the improved living environment. The lower income group can benefit and experience the value of the defensible space; therefore, it can lead to the lower income group becoming positive and eager to become part of it (Newman, 1996).

It must be emphasised that the principle of defensible space is to reduce crime, encourage people to take ownership to manage their living environment, also to make sure the property value does not decrease due to a negative living environment, while attracting new investment (Newman, 1996).

Reflection

It is important to analyse the reasons leading to the social issues and engage with the communities and work together to improve the issues.

Systemically re-structuring the existing urban environment could improve the neighbourhood relations and reduce crime in the area. Primarily to reduce any unnecessary traffic movement is one of the solutions to increase the safety of the neighbourhood environment.

The local communities need to engage in the improvement process for better social integration - at the same time this can help to reduce income-based segregation and promote sustainable and integrated communities.

Property value links to the environmental improvement process. The local communities need to set up codes for the environment; thus people can become better at managing their living environment.

3.0 Site investigation and problem statement

History and background

Cyrildene is under the City of Johannesburg region and located close to the boundary between the City of Johannesburg and the city of Ekurhuleni. Cyrildene is located on the East side of Johannesburg CBD, 6 kilometers (km) from the CBD, and 3.5 km from the Eastgate economic node. From the OR Tambo International Airport to the Cyeildene is 14.5 km.

The population density in the Cyrildene area is 5126 people per km. The average density is approximately 7 units per hectare and, the average stand size is 1500 square meter (City of Johannesburg,2016).

Since the 1990s Cyrildene has become the most popular destination for new and existing Chinese immigrants. Tracing back the history, the first China Town was located at Commissioner Street in the CBD. Since the middle 1990s, due to disruption of the social order, and worsening public security in the CBD area, Chinese businessmen started relocating their businesses from the CBD to the Cyrildene area. Initially, most of the houses in the Cyrildene area were single dwelling units and occupied by Jewish communities. Jewish communities used to be the most populous in the area. Through time the Jewish culture has been influenced by the Chinese.

The most popular street in Cyrildene is Derrick Ave; there are all kinds of activities, including a Chinese Restaurant, office, a supermarket, fresh farm market, clinic, IT shops, antique shop, Chinese kindergarten, Chinese bookshop and institutions. There is a high demand for parking space, accommodation, schools and the well-maintained public open space due to the continued increasing business activities in Derrick Ave. Obviously the building density is low and it is necessary to adjust the town and urban planning scheme to meet the demand from social economic activities and population increase aspects.

Other than that, the new urban planning and design scheme needs to be able to control inappropriate development and, encourage mixed-use middle to high-density development in the Cyrildene area. At the same time providing well designed open space system will be beneficial in increasing business and job opportunities, and providing chances for social integration for the surrounding communities.

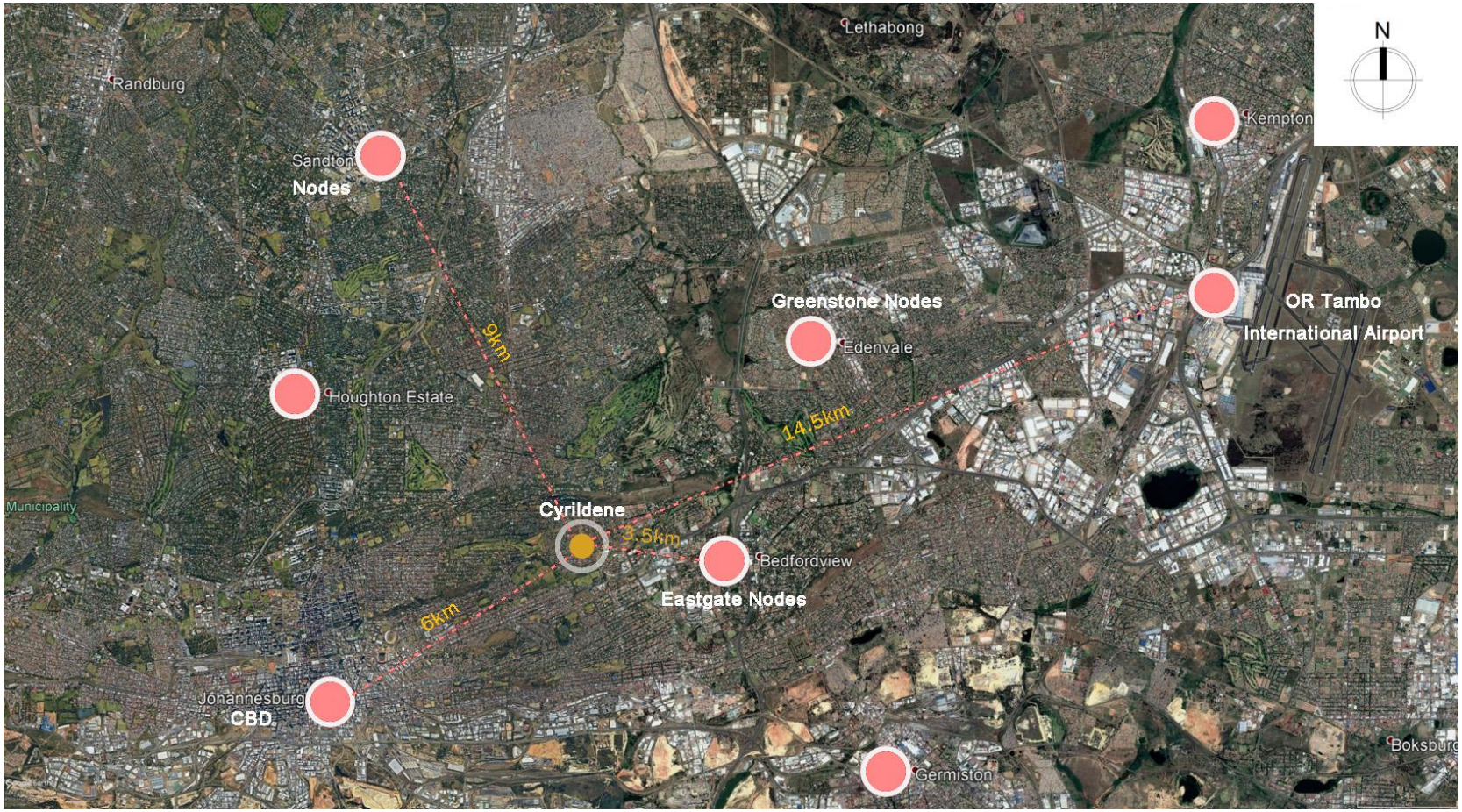


Fig.3.1.1. Aerial view of the site surrounding, Imagery sourced from Google maps 2018.

Metropolitan scale Economic nodes

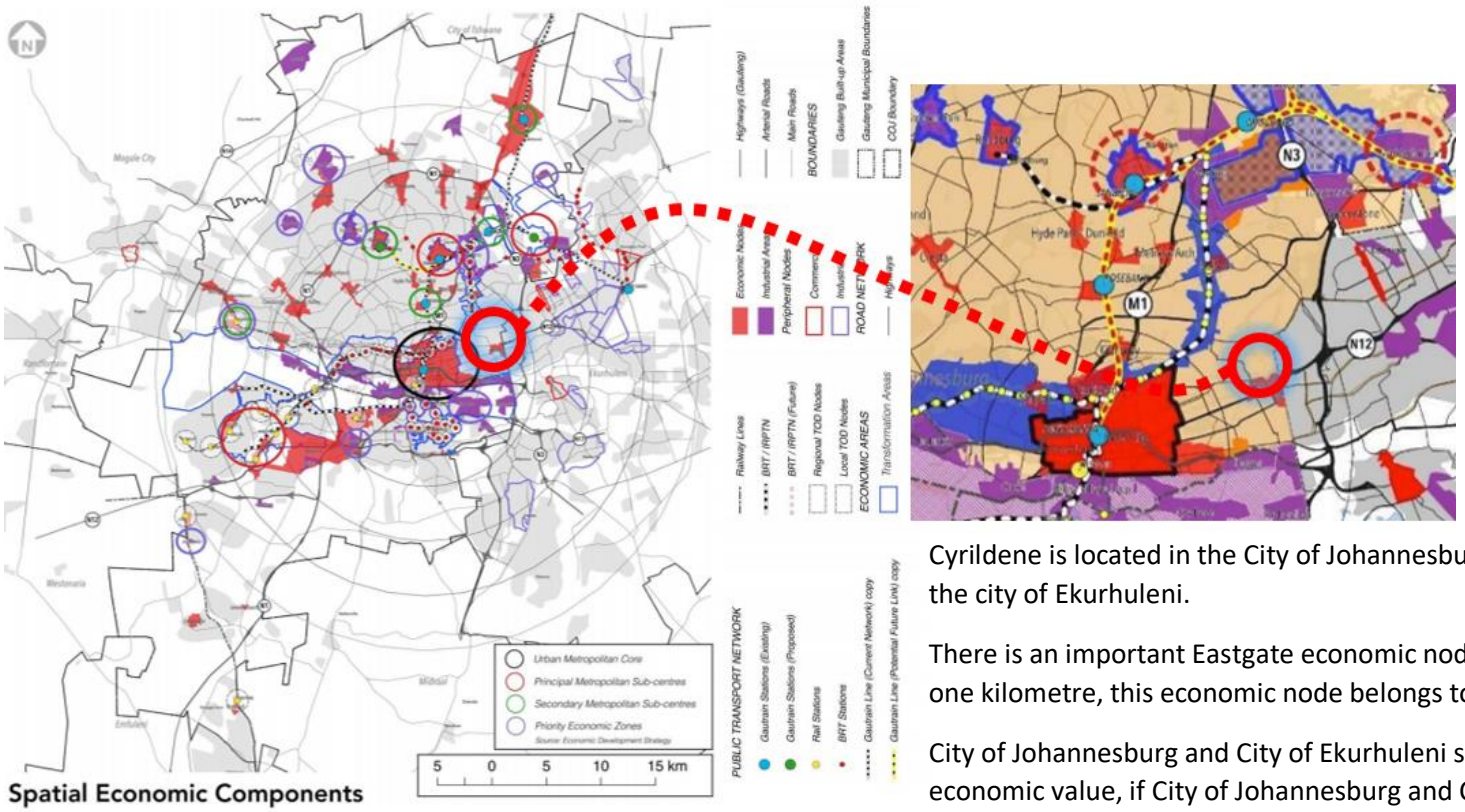


Fig.3.1.2. Gauteng Metropolitan economic nodes (City of Johannesburg, 2016)

To better understanding the economic context and review the possibly of the target site value. It is always better to tie back into the big scale of the economic nodes system.

Cyrildene is located in the City of Johannesburg close to the boundary of the city of Ekurhuleni.

There is an important Eastgate economic node closed to Cyrildene within one kilometre, this economic node belongs to the city of Ekurhuleni.

City of Johannesburg and City of Ekurhuleni should be seen as the social economic value, if City of Johannesburg and City of Ekurhuleni can integrate the thinking of these economic nodes in the area.

From the urban economic and urban planning point of view, Cyrildene, after a period of the time, became the most popular destination in the both the City of Johannesburg and City of Ekurhuleni. The Cyrildene economic node continues generate job opportunities for the surrounding communities. Therefore, rethinking to redevelopment Cyrildene became necessary.

Polycentric concept diagram _ Spatial development framework City of Johannesburg

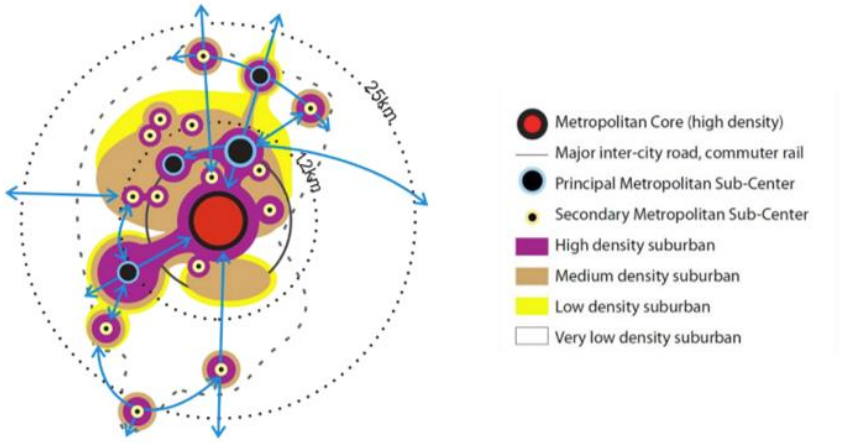


Figure 3: Johannesburg Future City Model: Compact Polycentric Urban Form

The future polycentric Johannesburg will bring jobs to residential areas and housing opportunities to job centres rather than merely transporting people between the two. It will create complete nodes where people can live work and play that are efficiently connected by public transport. It will bridge spatial and social barriers and build a framework for a spatially just city.

Fig.3.1.3. Gauteng Polycentric concept diagram (City of Johannesburg,2016)

A multi-nodal model could help to bring more job opportunities and reduction of traffic jams. This model should encourage people to live and work locally.

Cyrildene district is not listed as a current or future urban node in the Spatial Development Framework 2040, as per Statistics South Africa's report. Cyrildene district's unemployment rate is far lower than the City of Johannesburg's - 5% compared to the City of Johannesburg unemployment rate of 25%. Furthermore, 93% employees work in the formal sector, with only 4% in informal work (City of Johannesburg, 2016).

Therefore, it is necessary to reconsider Cyrildene district as a potential urban node. Through development, Cyrildene district could contribute to more socio-economic opportunities for the City of Johannesburg.

Regional Economic nodes

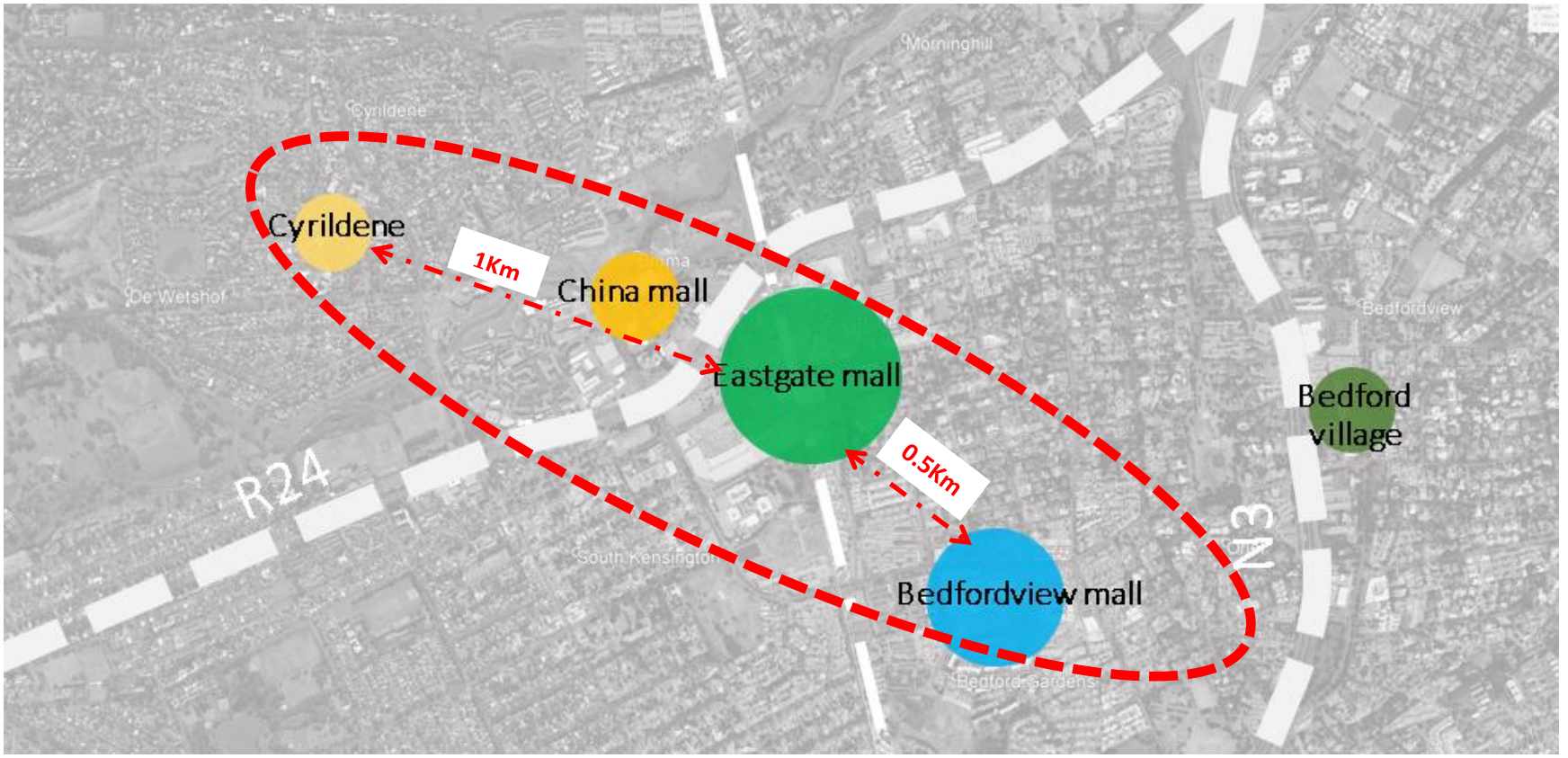


Fig.3.1.4. Regional economic corridor. Base map: Google maps 2018.

At the regional scale, Cyrildene district, Bruma Centre, China Mall, Eastgate Mall and Bedfordview Mall naturally become an economic corridor, which is why it is vital to enhance the environment and adjust the urban planning policy to support this potential economic corridor. However, comparing Cyrildene district and Bedfordview mall area, the Bedfordview mall area is far more advanced and developed than Cyrildene district.

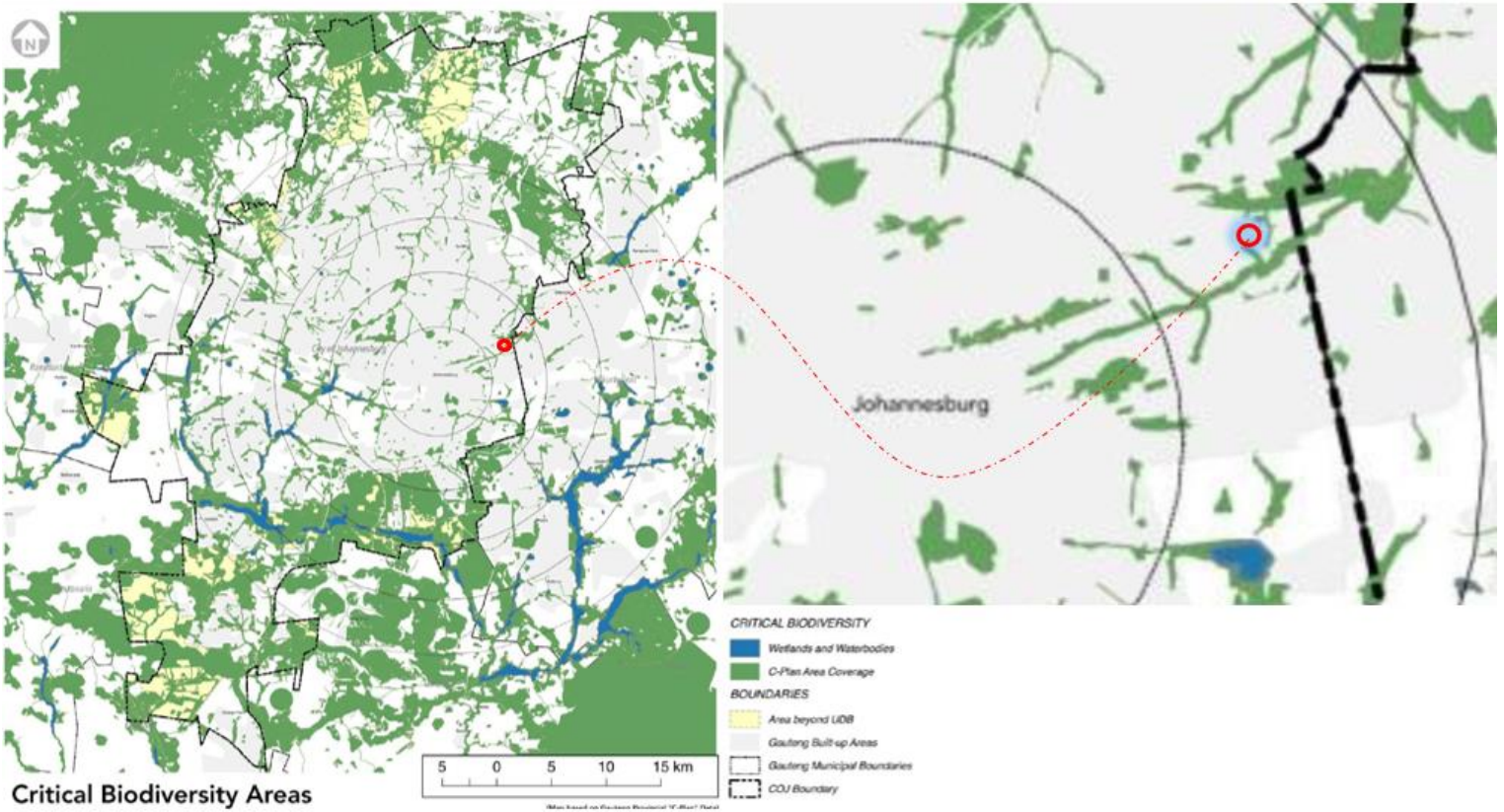


Fig.3.1.5. Critical Biodiversity Area around Cyrildene and City of Johannesburg (City of Johannesburg, 2016)

Environment is a fundamental aspect that needs to be seriously taken into consideration. Studying the biodiversity map from the large scale to the local scale that can facilitate a better understanding of the ecological value in the area, so that when drafting the urban design framework, an urban designer can always take into consideration and incorporate the environmental requirements of the design. From an urban planning and urban design point of view, maximising the green belt and open space in the area can improve both the social and ecological functions for the surrounding communities. To incorporate water-sensitive design concepts into the Cyrildene district could help to reduce urban stormwater runoff and improve climate change tolerance and adaptation.

Environment: Biodiversity map

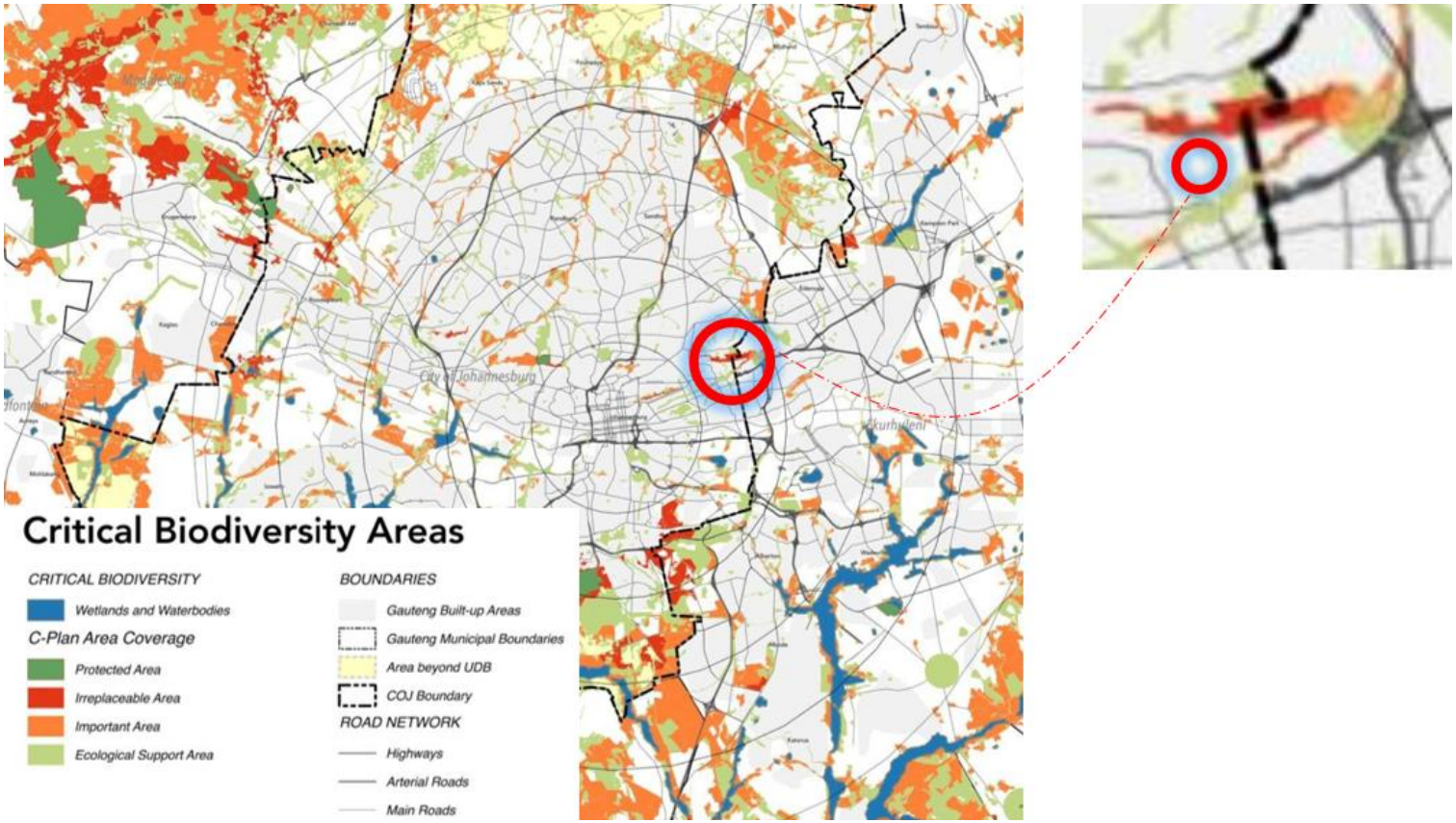


Fig.3.1.6. Critical Biodiversity Area around Cyrildene and City of Johannesburg (City of Johannesburg,2016)

Due to urbanization, with more and more of the urban area being interrupted, urban design must not only take into consideration human activities, but also need try to find ways to improve the urban ecological environment in order to make the city more sustainable.

The study area

As per the map in below, the study area's boundary on the East side is defined by the M33, and the Westside boundary is Aida St, and the South boundary defined by Marcia St.

Derrick Ave as an important economic corridor connecting the M33 and Marcia St. Most of the buildings on each side of Derrick Ave are middle to high-density mixed-use buildings. However, some of the buildings remain as single-story commercially-used buildings, and a few of the buildings remain as a single-dwelling residential units. Most of the single-dwelling units are north/south facing. The middle to high-density buildings on each side of Derrick Ave. are southwest and northeast facing.

The majority of residences in Cyrildene district are Chinese and Jewish. Other than that, there are some small groups from India, Thailand, as well as people from Southern African countries.

Derrick Ave includes two intersections and three 'T' junctions. The average city block size is 320 meters by 110 meters, most of the city blocks are parallelogram in shape and a few of the blocks are irregularly shaped.

The study area is approximately 30.44 ha, includes 255 stands, and the average stand size is 1500 sqm. The average altitude in the Cyrildene area is 1674 meters.

Most of the trees in Derrick Ave are the Liquidambar Styraciflua tree, most being approximately 15 meters tall. The Liquidambar Styraciflua tree is an exotic species from North America. This type of tree has a shallow root system and should not be planted too close to sidewalks.

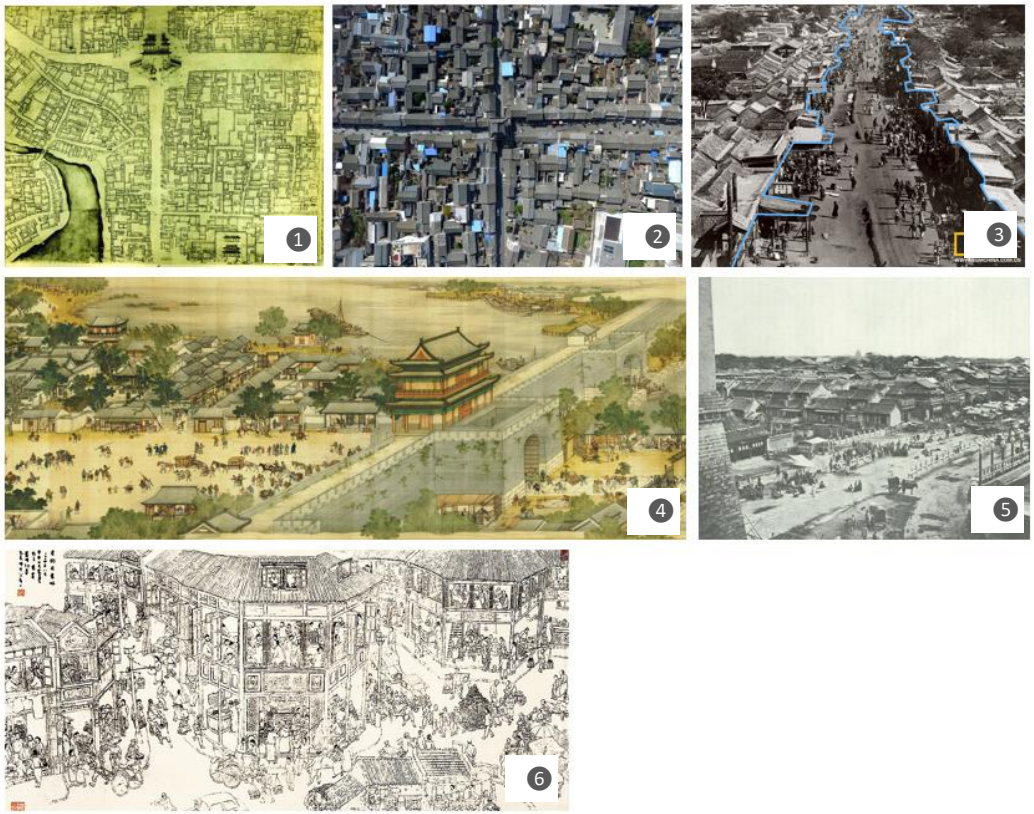
From a zoning point of view, the study area includes mixed-use, commercial, retail, utility, parks and residential.



Fig.3.2.1.Cyrildene area map, Base map: Google maps 2018

4.0 Precedent study

Precedent study: Old Chinese cities



Due to the Cyrildene precinct being predominantly Chinese, it is necessary to review the Chinese urban planning and design history and try to bring possible Chinese urban planning and design principles into the area.

These images can highlight some of the essential Chinese urban design principles, such as landmark buildings in the intersection area. The blue line shows the undulating urban edges which can accommodate different social activities.

The city wall and gateway are important thresholds for old Chinese cities. It can better govern the inside of the city wall, and people can use the gateway as an important identifier to find their way.

In terms of the street intersections, the building facades always extend from the ground floor to the first floor in order to open as much as possible and, when the distance between buildings is small, it can help to bring opportunities for people to communicate and interact.

1 Fig.4.1.1. Image shows landmarks building at intersection. (Digital silk road project, 2013)

2 Fig.4.1.2. Overleaf with old Beijing Map, Google maps 2018

3 Fig.4.1.3. Street view, (Old Peking Cityscape, 1920)

4 Fig.4.1.4. Image shows the citygate in Qing dynasty. (Zeduan, 1145)

5 Fig.4.1.5. Image shows the gate way area in old Beijing city (Ni, 2017)

6 Fig.4.1.6. This image shows the traditional Chinese street junctions. (Youzhi, 2004)

Precedent: Old Chinese cities

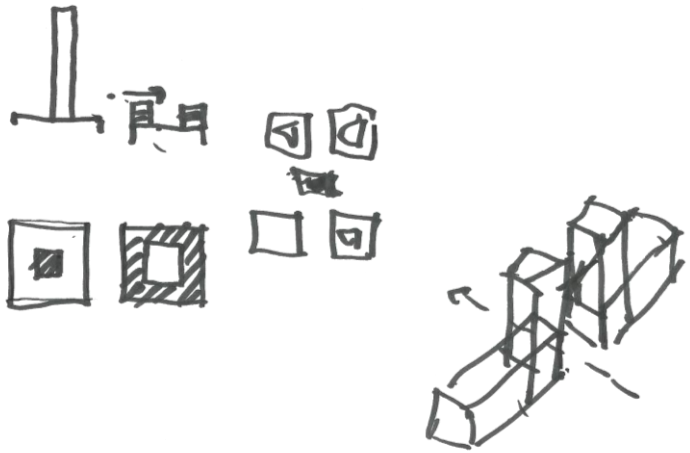


Fig.4.1.7. Summarized sketch diagram for the gateway concept.

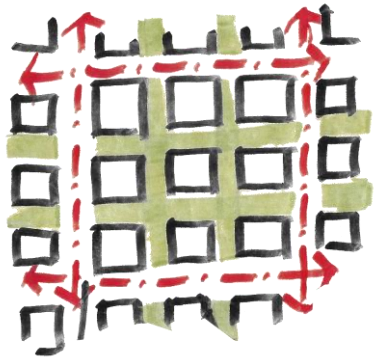


Fig.4.1.8. The sketch diagram shows the Barcelona super block project that encouraged people to walk in the city space and only allows motor vehicles to drive around the outside of the block. This concept can help improve the air quality and create better micro-economics for the area.

Precedent: Old Chinese cities

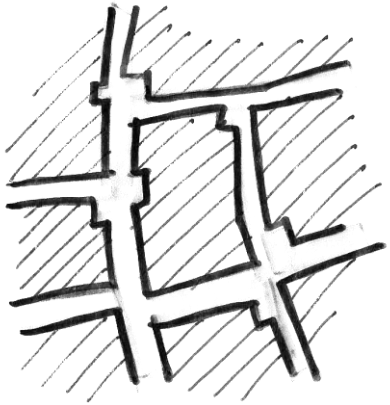


Fig.4.1.9. Sketch diagram for the old Chinese street.

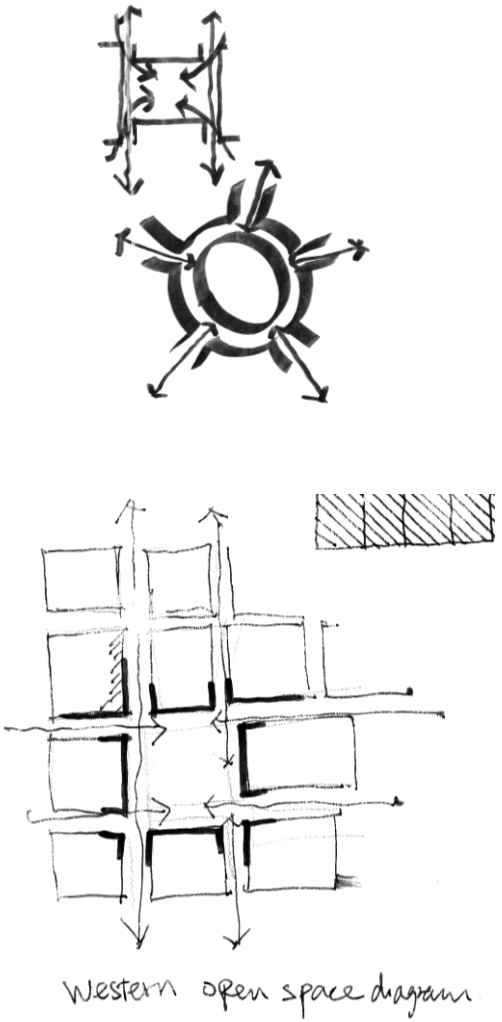


Fig.4.1.10. Sketch diagram shows the typical western orientated urban open space.

Precedent: Old Chinese cities

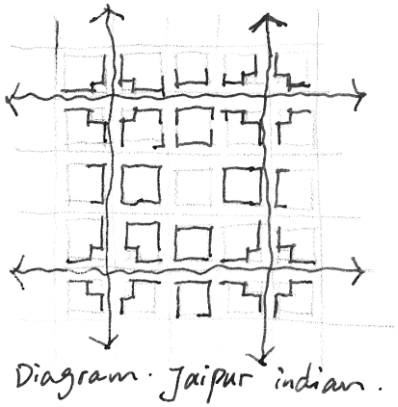


Fig.4.1.11. Asian City Jaipur diagram

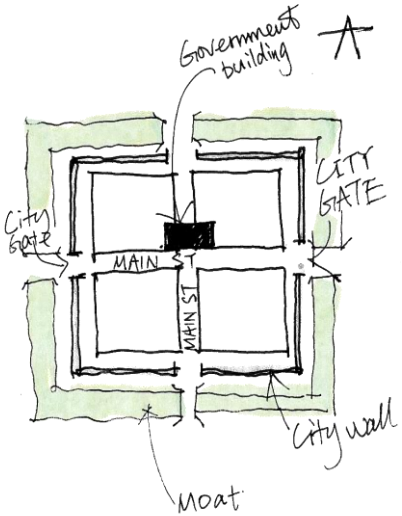


Fig.4.1.12. Typical Traditional Chinese city diagram

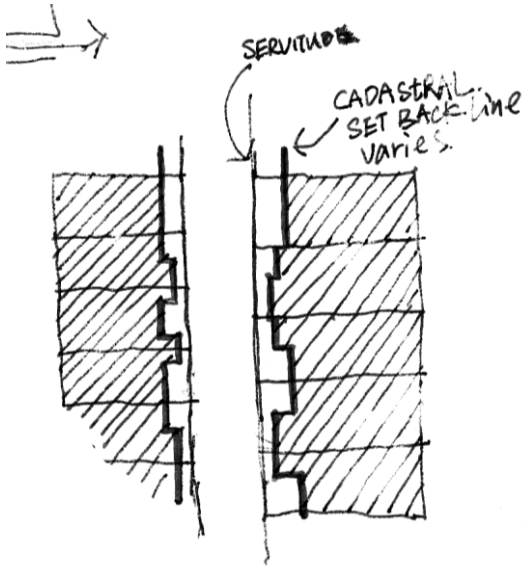


Fig.4.1.13. Sketch diagram shows the undulating street edge .

Precedent: Siheyuan

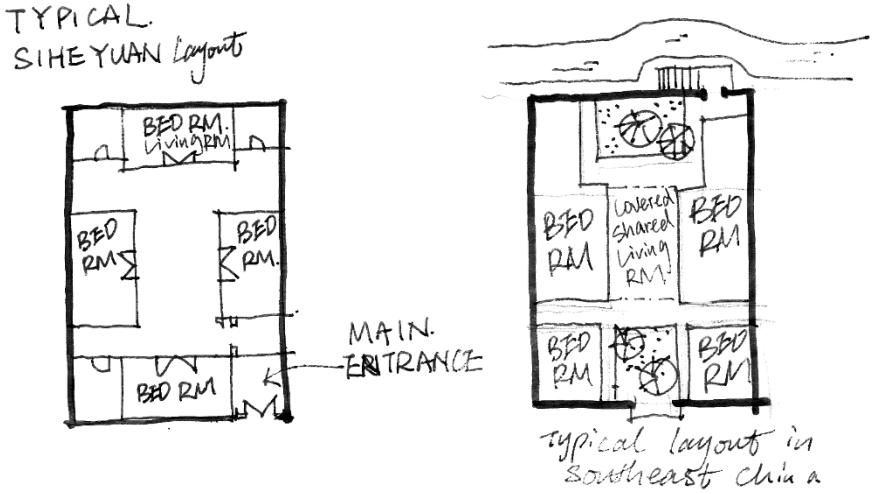


Fig.4.1.14. Siheyuan Sketch diagram layout

Siheyuan is the typical residential layout. Siheyuan uses the building to define the space instead of the wall. All building entrances face towards the shared garden, potentially generating social opportunities.

Most of Siheyuan only allows one entrance gate which can better control the internal space.

Precedent: City of Eguisheim and background



Fig.4.2.1.City of Eguisheim, Google maps 2018

The Eguisheim city is a French development dating back to the 1100s. Eguisheim city is an excellent example of the use of buildings to define the city edges and public open space. Inside, the city is predominantly a pedestrian-oriented movement system with good permeability. With four thresholds around the edge, the local authorities can better control the city. Various open spaces could encourage a variety of activities.



Movement network
Fig.4.2.2. Movement



Open space
Fig.4.2.3. Open space



Building footprint
Fig.4.2.4. Building footprint

Comparison: Urban grain, urban morphology

By comparing Johannesburg CBD area and Cyrildene, one can better understand the sense of scale and the density and road network hierarchies.

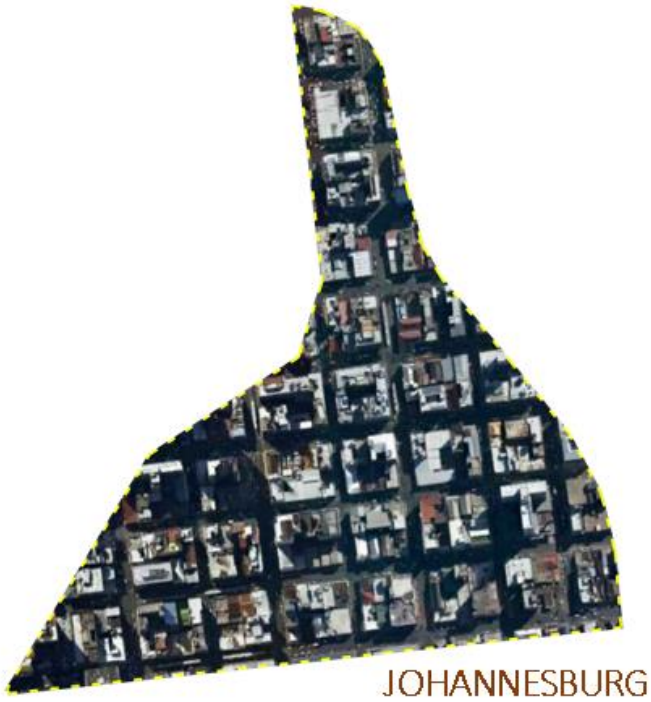


Fig.4.2.5. CBD Johannesburg, Google maps 2018



Fig.4.2.6. CBD Johannesburg, Google maps 2018



Fig.4.2.7. Building footprint



Fig.4.2.8. Road Network



Fig.4.2.9. Buildings footprints

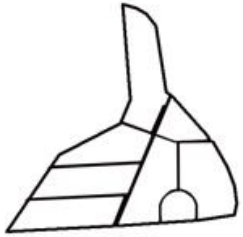


Fig.4.2.10. Road Network

Comparison: Urban grain, urban morphology

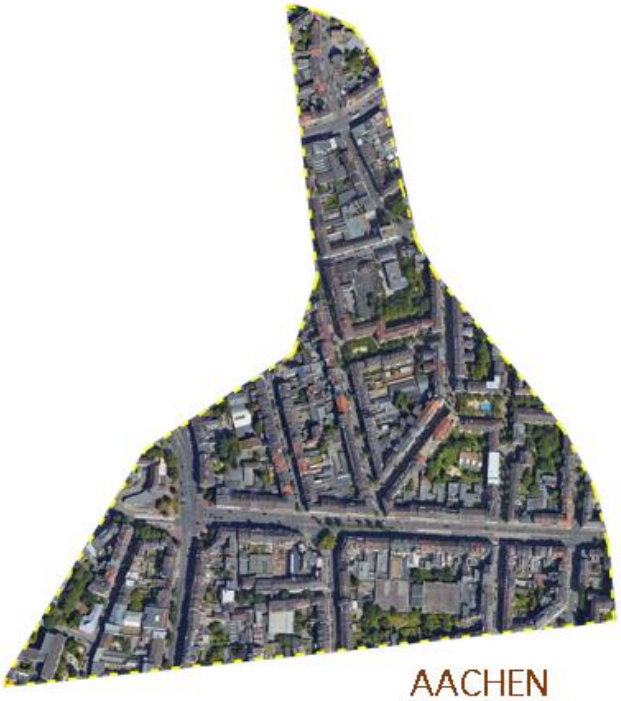


Fig.4.2.11. Aachen Germany. Google maps 2018



Road Network

Fig.4.2.12.



Building Edges

Fig.4.2.13.

Internationally, a comparison between Aachen, Germany, and Amsterdam, Netherlands, with Cyrildene can better illustrate the density, urban grains and spacial network.

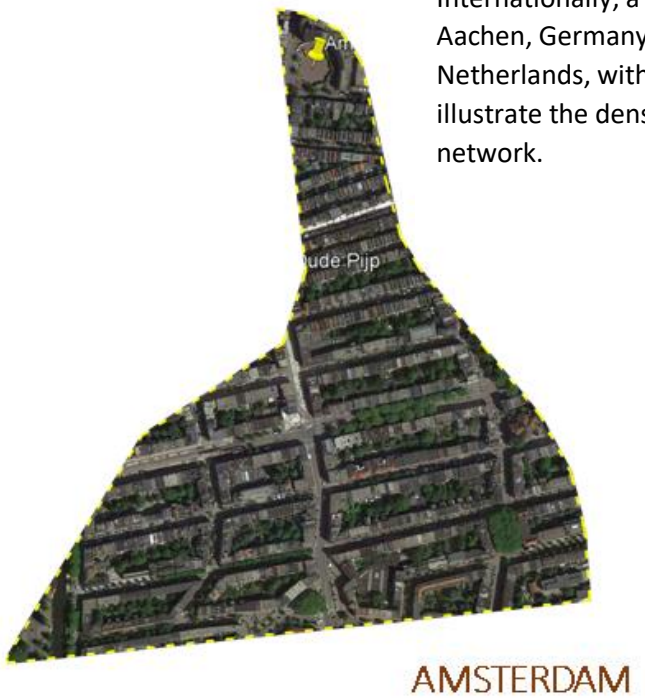
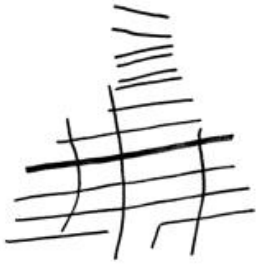


Fig.4.2.14. Amsterdam Holland. Google maps 2018



Road Network

Fig.4.2.15.



Building footprints

Fig.4.2.16.



Open space

Fig.4.2.17.

Precedent study: Green infrastructure

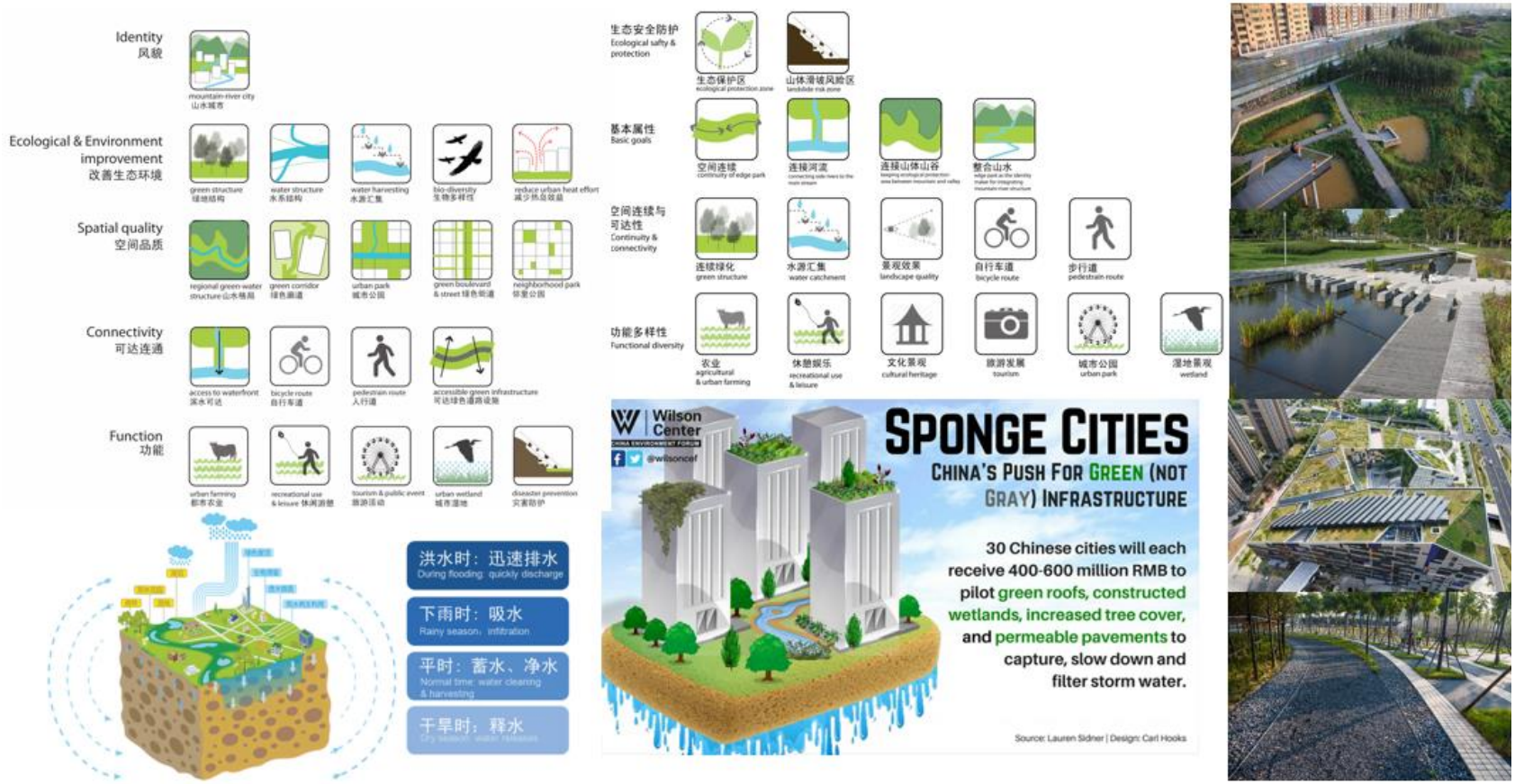


Fig.4.3.1. Sponge cities diagram (Lauren, 2017)

Urbanization has changed many natural surfaces to artificial surfaces such as tar, concrete, bricks etc. In consequence, the natural ground could not absorb a certain amount stormwater, resulting in cities facing urban stormwater issues. The 'Sponge City' is a strategy that could solve the urban flooding problems. It is necessary to systemically integrate the Sponge Cities concept into the urban design scheme in order to make the city more sustainable and attract more people to live in, work in, and enjoy the urban environment.

Precedent study: Green infrastructure

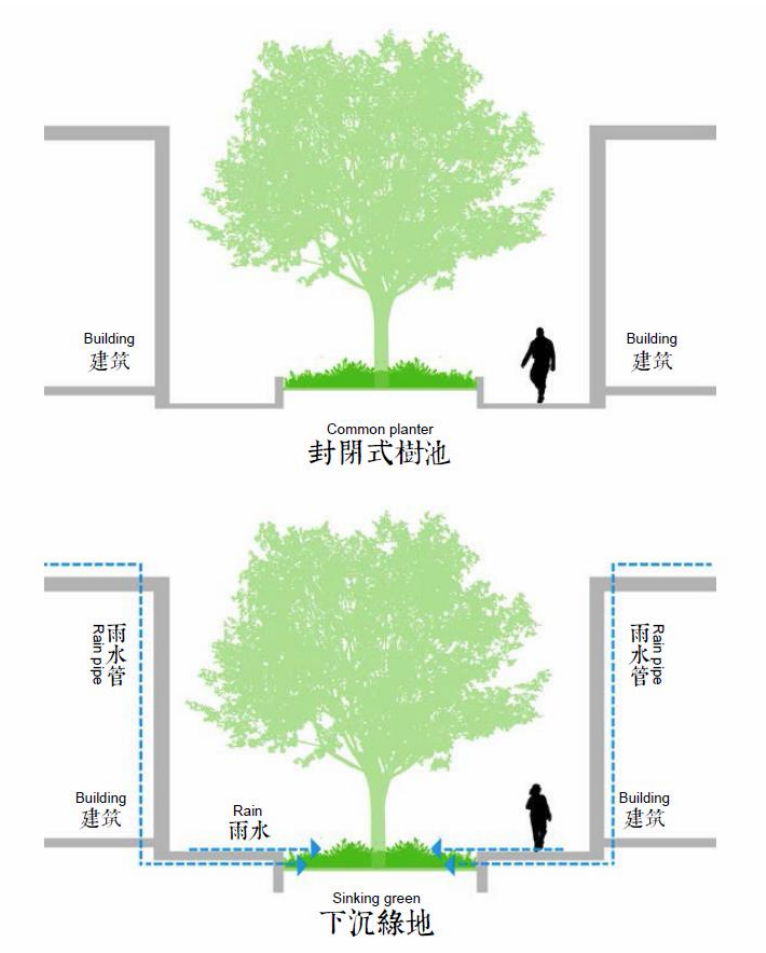


Fig.4.3.2. Sponge Cities detail design diagram (Pang, 2016)

LID STRATEGY

Sinking green area, the sinking green enhances the infiltration of rainfall.

This incorporates the Sponge Cities idea into the detailed design with few cost implications but still helping to reduce stormwater runoff.

Precedent study: Green infrastructure

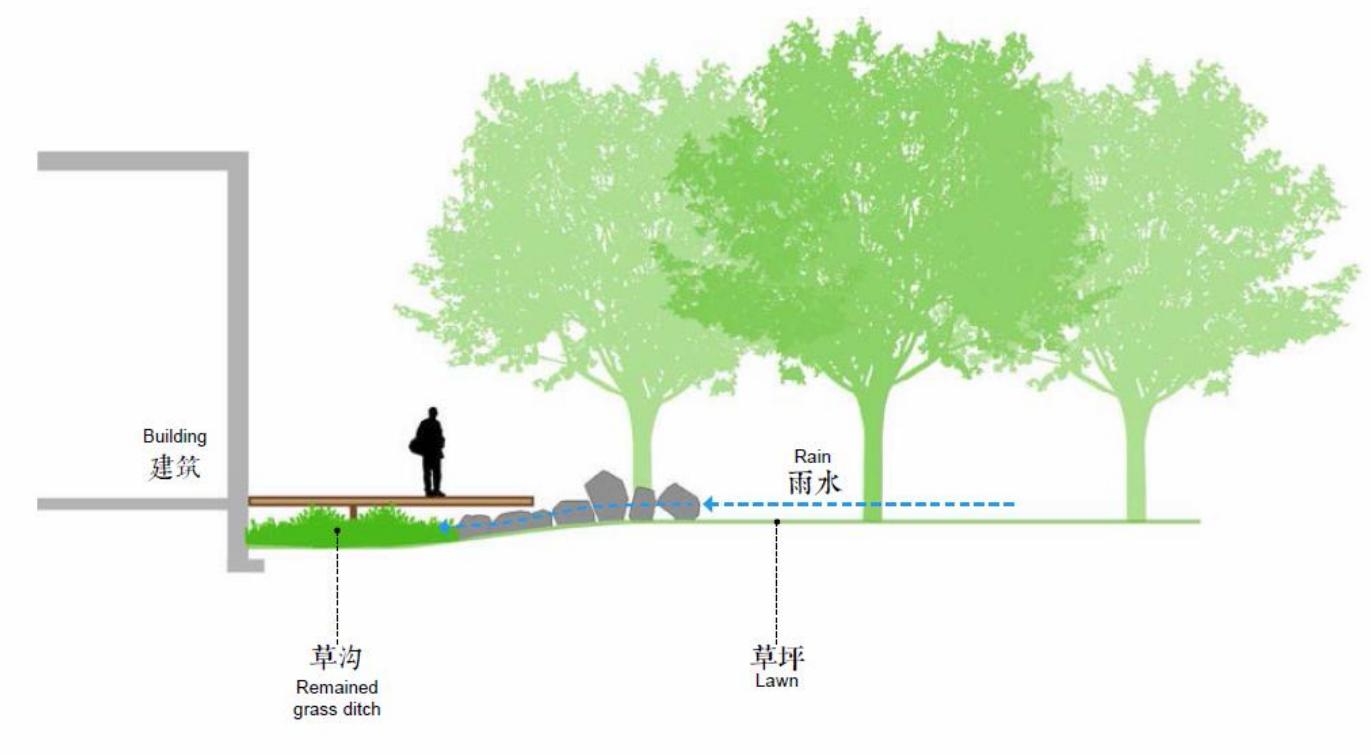


Fig.4.3.3. Sponge cities detail design diagram (Pang, 2016)

LID STRATEGY

Remained grass ditch.

Arrange the remained grass ditches around the buildings to manage the runoff.

TOD (A transit-oriented development)

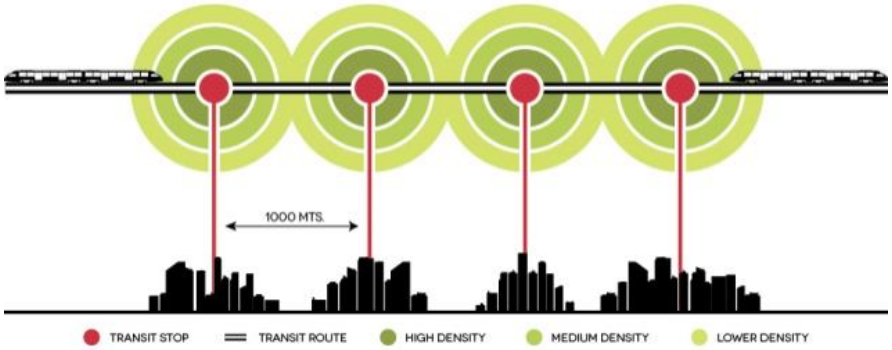


Fig.4.4.1. TOD concept diagram (Gregor, 2013)

"A well-designed city is walkable. It's a place where your destinations are close enough to walk to and where you feel safe enough to walk. And it's a place that is interesting enough socially to make you feel that walking is perhaps something more than just getting from point A to point B. I think that is the heart of it.

Democracies tend to be self-correcting, and I think we're in a self-correcting mode now. We see the problems. The first and most profound sign of it is the anti-growth movement. People are saying "I don't want any more development. "

If you look at the demographics, only 25 percent of the population is made up of married families — two people with one or more kids. The other 75 percent are "other." And one size doesn't fit all when it comes to housing. However, everybody invests in the same house because of resale and mortgage deduction and other externalities that are dampening the true diversity of our communities. What we need is a much broader spectrum of housing opportunities, from apartments that are conveniently located to townhouses for people without kids to duplexes to small-lot, single-family homes.

What is a street? It's not just a utility for the car. It's everybody's most immediate neighbourhood. At least that's what it used to be — a place to walk, a place to bike, a place for kids to play, a place to park cars, a place for trees, and therefore a place for birds. To think of the street as just a utility for cars is so absurd. And yet that is exactly what is happening because we have segmented design so that the traffic engineer designs the streets and the civil engineer designs the utilities and the architect designs the buildings. Nobody is thinking about the whole composition. Narrower streets win in every way. They make cars go slower, which means that the neighbourhood is safer for kids and more enjoyable for pedestrians."

---- ***Peter Calthorpe*** (Jared, 2017)

TOD (A transit-oriented development)

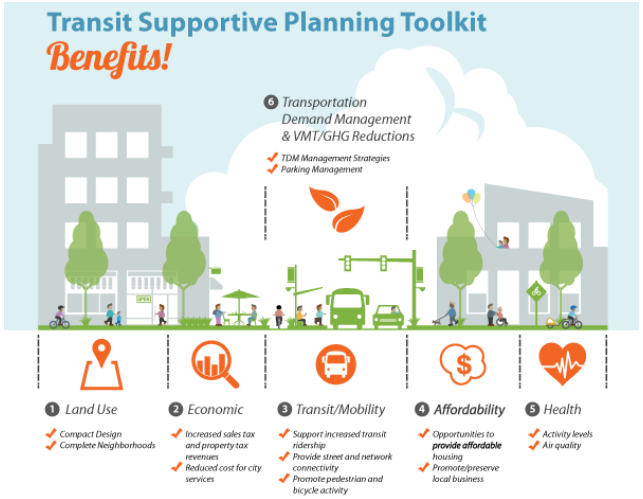


Fig.4.4.2. Transit oriented concept diagram (Elizabeth & Desiree, 2017)



Fig.4.4.3. TOD diagram (Steve & Chuck, 2013)

A transit-oriented development concept incorporates a mixed-use development, both residential and commercial. People can easily access the highly accessible transit station. Thus the transit-oriented development could reduce rates of private car use and private car parking. This would provide high quality outdoor open spaces for people to socialise, walk and cycle. The transit-oriented development also can maximise the outdoor walkability and safety. (Elizabeth & Desiree, 2017)

Superblock Barcelona – the way of thinking through urban design intervention to promote urban community and sustainability

It must be emphasised that the definition of streets requires some explanation; streets can used for sports spaces, community spaces, walking spaces, or social spaces. Reconsidering the functions of streets, through urban design intervention, streets can be used as instrumental tools for social integration. This can reduce negative experiences in community life for local people who live in the nearby urban environment. Streets need to fill life with as many positive activities as possible.

It is important to note that the superblock concept in Barcelona seeks to develop a new urban order. The primary purposes are to promote local social sustainability and, improve the relational network between people and streets, buildings and activities, and rethink the use of public spaces and urban movement systems as critical urban elements. Also to build up connections and foster improved local social relations (Commission for Ecology, Urban Planning and Mobility, Barcelona City Council 2016).

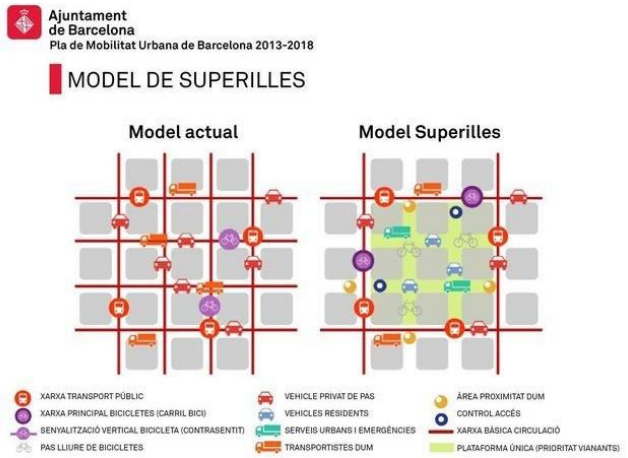


Fig.4.5.1. Superblock concept model (Commission for Ecology, Urban Planning and Mobility, Barcelona City Council 2016)

It is important to note that the superblock concept aims to reclaim the motorised movement system in the urban environment and convert the motor-vehicle movement space into an urban public social space to the extent of increasing the urban socio-ecological value and socio-economic value, as well as reconnect the urban system to the natural system as much as possible to improve the urban ecosystem (Grammenos, 2016). I argue that, if they were to merge the superblock concept into an urban environment, it could help to solve many urban social issues, such as crime, health, downgraded ecosystem, unemployment, and fragmented society. The aforementioned would make sense for social sustainability and the urban living environment (Vranken, 2011).

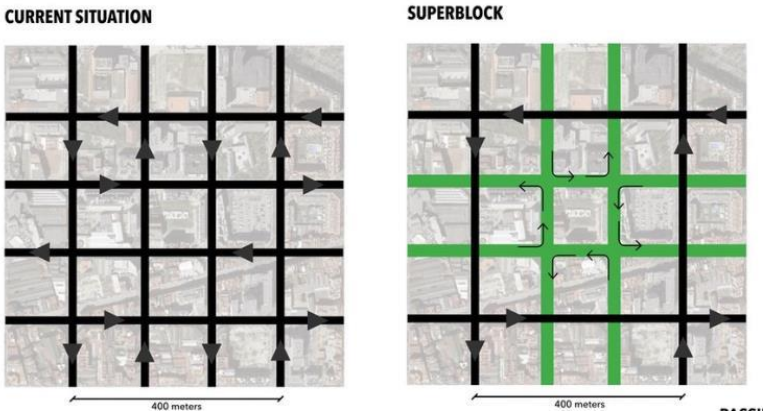


Fig.4.5.2. Comparison between Current situation and the Superblock concept model (Commission for Ecology, Urban Planning and Mobility, Barcelona City Council 2016)

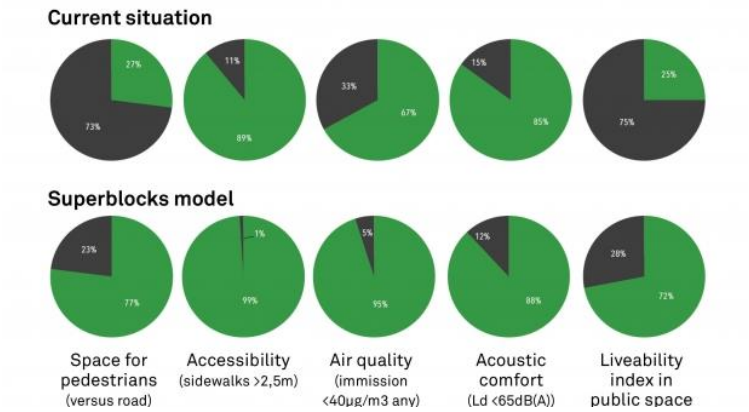


Fig.4.5.3. Comparison between Current situation and the Superblock concept model (Commission for Ecology, Urban Planning and Mobility, Barcelona City Council 2016)

By reducing 21% of traffic and minimizing cars in the urban environment, there was an increase of 45% to 75% in pedestrian space, traffic noise level dropped from 66.5dBA to 61dBA, nitrogen oxide emissions were reduced by 42%, and there was a 38% reduction in particle pollution in the area.

Reflection

Car-orientated cities continue generating urban issues. Cars take up too much urban space, decrease social opportunities, and at the same time emit pollutants that are harmful to human health and the urban eco-system. There is growing awareness that it is time to shift the mind-set from car traffic to human traffic and reconfigure city structures that can establish a better urban social network, decrease crime, bring more job opportunities as well as provide a healthy living environment. Urban design is helping to develop a new urban structure and encourage a neighbourhood-scale environment for communities. To achieve this, urban sustainability needs to provide attractive public spaces to encourage outdoor activities for people to use. In short, future cities should optimise the urban movement system and encourage the creation of a neighbourhood-scale living environment and promote social and economic sustainability.

Layer cake system and Urban design horizontal and vertical system

Design with Nature - Ian Macharg and Ecological approach

The “Layer cake” Method studies each aspect of design such as connectivity, accessibility, geology, hydrology etc. and attempts to find opportunities from each layer superimposed in order to come to systemic solutions.

Urban Design can use the same concept; analysis of each of aspect from permeability, space variety, legibility, and personalisation aspect and combining all aspects together to generate urban design solutions.

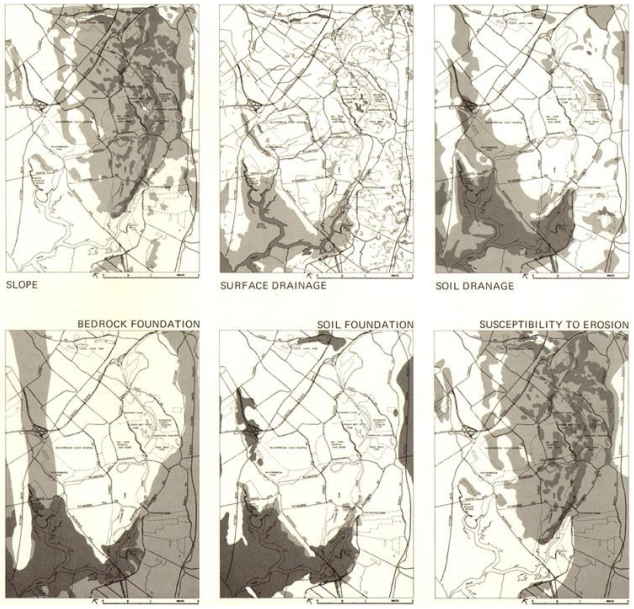


Fig.4.5.4.Landscape site analysis maps, (Mcharg,1969)

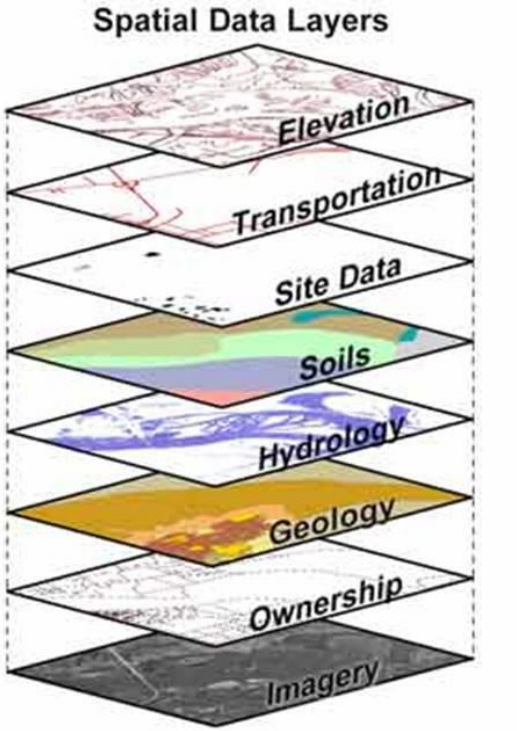


Fig.4.5.5. GIS layers (Rao,2017)

From an urban ecology point of view, this seeks to understand the relationship between humans living in the urban environment and the landscapes. It is essential to know the ecological processes that can inform when to design the urban system and make the designed urban system more sustainable.

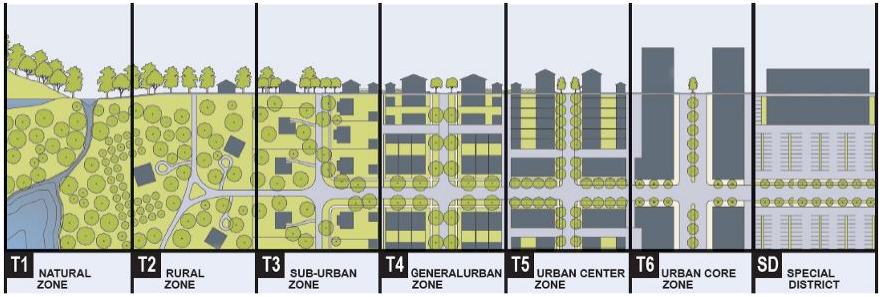


Fig.4.5.6.Urban design horizontal layers (Duany, 1999)

Urban design horizontal and vertical system Transect zones (Centre for applied transect studies (CATS), Undated).Transect Zones based on categorizations that highlight a rural to urban intensity transition(CATS, undated).

Vertical urban land use design is not a new concept. Integrate thinking around the vertical use of land in the urban environment can help to increase urban variety and social sustainability. Furthermore, three-dimensional land use also can help to facilitate future space reuse in the building (Yang, 2012).

The difference between the “layer cake” method and the urban design concept of horizontal layers is that urban design will need to have both vertical as well as horizontal thinking and make sure the current urban structures are in the right context. Urban design focuses more on the urban structure, structure hierarchy, space sequence and three-dimensional thinking to shaping the space and try to find best solutions for allowing interaction between peoples and their surrounding living environment (Ed& Tim, 2009). The layer cake focus on the analysis process and the natural system aspects such as hydrology, pedology, geology, climatology as well as if the target site. The layer cake system could also include road network, building footprints, and parks to find best possible solutions for urban ecology and urban sustainability.

5.0 Design development

This chapter aims to explain the proposed Cyrildene precinct area from the perspective of urban design principles. Through this explanation, the chapter provides the reader with an understanding of urban design principles and how these principles apply to the Cyrildene precinct.

Urban design principles

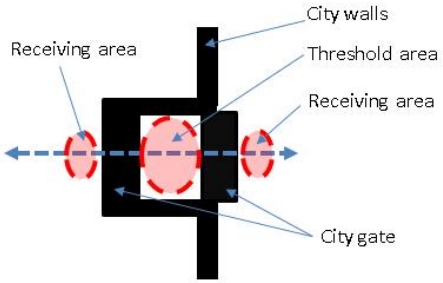


Fig.5.1.1. Chinese city gate diagram



Fig.5.1.2. Google maps 2018



Fig.5.1.3. Proposed threshold diagram

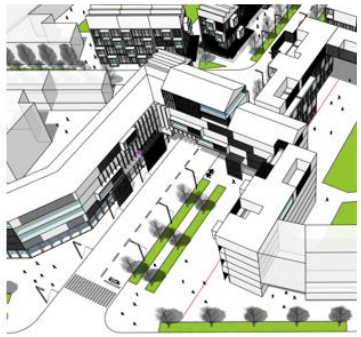


Fig.5.1.4. Proposed threshold 3D view

Principle 1 : Gateway

In old Chinese cities, people needed to pass the gateway to get into the city, and vice versa. People often used the gateway to identify the locations. Gateways became an important threshold to control the flow of people, manage security and served as important landmarks.

Gateways in old Chinese cities always came with defence buildings to prevent enemy forces from entering the cities.

Simplifying the gateway principles from old Chinese cities and keep some of the primary functions to integrate with the Cyrildene precinct can help to improve access control, legibility, and identity. It can also foster curiosity and interest among visitors. The gateway's defensive building can be employed as mixed-use building for retail and commercial purposes.

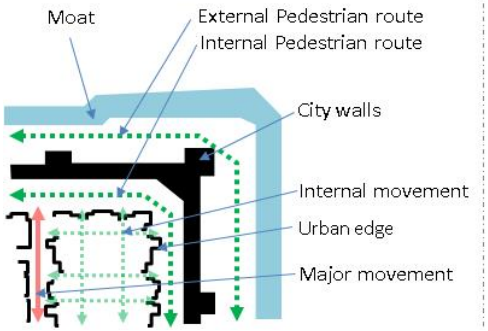


Fig.5.2.1. Typical Chinese wall diagram



Fig.5.1.2. Google maps 2018

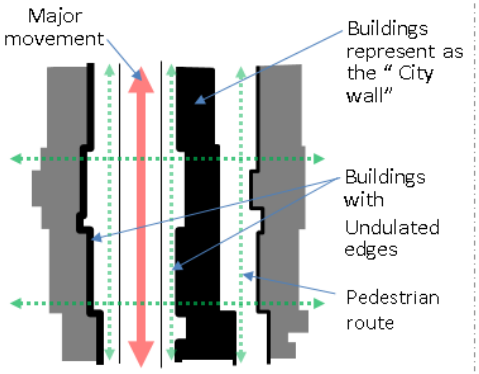


Fig.5.2.3. Proposed Urban "wall" diagram

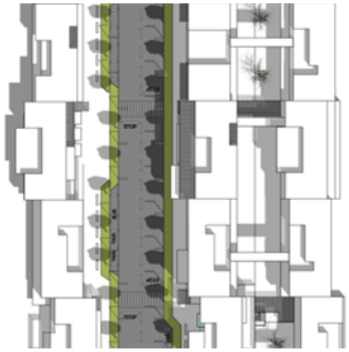


Fig.5.2.4. Proposed Urban "wall" 3D view

Principle 2: Urban "wall" fortification

City walls functioned mainly for defensive purposes in old Chinese cities. Enemies were deterred, due to the city walls height and thickness. The top of the city walls also always housed defensive facilities such as watchtowers or paths for soldiers.

However the wall concept in Johannesburg is prevalent, people use the wall to define the edge of properties and include anti-burglar measures. Walls can create unpleasant urban spaces and the non-social function of these walls do not make economic sense.

In the city of Eguisheim in France, people use buildings themselves instead of walls to define the city and use buildings as space-making tools to create public and private spaces.

In summary, the city wall can use buildings to replace walls. The "wall" can provide social function as well as economic functions. Also, these "walls" should be mixed-use developments serving a variety of different social functions.

Furthermore, the "wall" can increase of surveillance to the surrounding public and private open space.

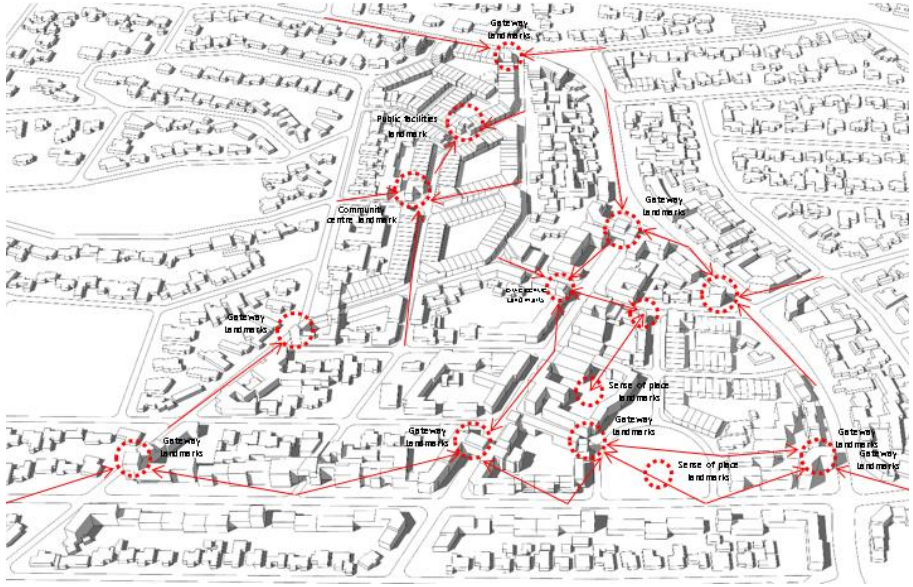


Fig.5.3.1. Layout adjusted to achieve legibility

Principle 3: Landmarks

Chinese cities always had significant buildings in the intersection area. These builds became landmarks, people used these landmarks to identify locations. Therefore these buildings not only can improve the legibility but also serve as a cultural symbol.

In Cyrildene precinct, landmark buildings can help to identify the location and space sequences; it can also emphasise the local character and stimulate visitor's imagination.

To locate the landmark buildings in the important intersection area can help visitor to find their way easily. The building at the civic space could be the tallest building.



Fig.5.3.2. Landmarks buildings in Beijing (Shuo, 2018)

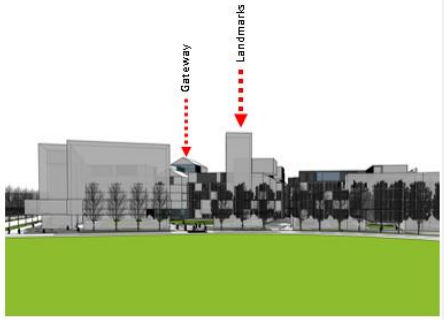


Fig.5.3.3. Street view with landmarks building in Beijing (Chacha, 2018)



General view shows the relationship between the sense of place and the proposed mixed-use development.

Fig.5.3.4. Sense of place visual connectivity



General view of the eastern side: Shows the proposed landmarks building and the proposed gateway building.

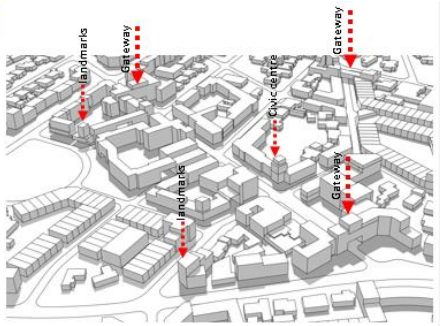
Fig.5.3.5. Landmark buildings

Layout adjusted to achieve legibility: Model



General view of the gateway area: Integrated with existing buildings. Mixed-use development, Office and retail.

Fig.5.3.6. Gateway building



General view of the high street : Shows the proposed mixed-use development. Residential, Commercial and Office.

Fig.5.3.7. landmark buildings



Fig.5.4.1. Civic space

Principle 4: Civic space

The Civic space is the space for all the residences and people who stay around in the area. Civic spaces are important open spaces in the urban environment. Civic open spaces can provide a central focus for resident interaction in the area.

The civic space plays an essential function for public events, cultural exchange and provides a service for the communities. Therefore, the Civic space can have vital value for socio-economic and social integration.

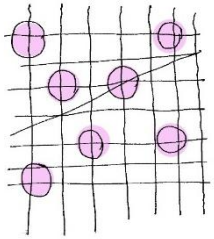


Fig.5.5.1. Multi centres

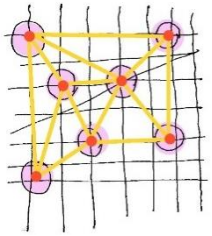


Fig.5.5.2. Connected multi centres

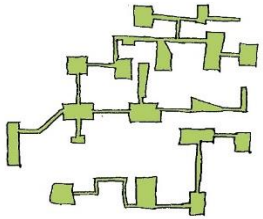


Fig.5.5.3. Connected open spaces

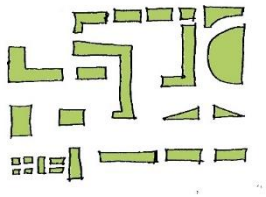


Fig.5.5.4. open spaces

Principle 5: Multi nodes and open spaces

The multiple nodes could improve convenience for the local community and deliver a variety of neighbourhood types.

Community nodes can be connected with the public transportation system, road, and the sidewalk and bicycles routes.

Landscaped space can be created between buildings and could improve the outdoor environment from an ecological and social point view.

Landscaped routes run parallel with the motor vehicle road, and the cycle lanes can create opportunities for large public open space systems.

In short, Green spaces can apply on different levels, scales and functions. The green roof can help clean rainwater and reduce rainwater runoff; urban agriculture could provide an education function and at the same could become the central medium for social and recreational value. The urban green street system could integrate into the urban stormwater management system, and it can treat stormwater from the developed, making improvements in stormwater runoff reduction, temperature mitigation, and urban air quality.

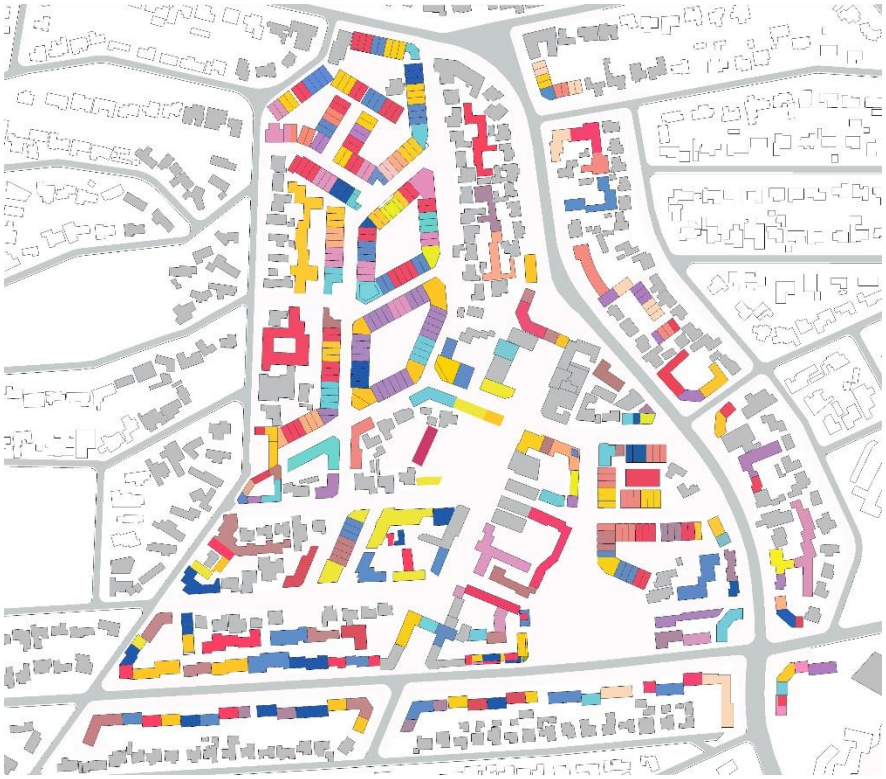


Fig.5.6.1. Personalization of building typologies

Principle 6: Personalization of the building typologies

Dividing the area achieves maximum personalisation of the building typologies, with varieties in size, height, depth and building façades. This creates a unique and memorable urban environment.

In the urban environment, the variety of building façades can attract people. Research shows that if the building's façade is attractive with lots of details, it can positively affect people and vice versa (Michael, 2017).

Personalized building typologies can create a unique and memorable urban environment.

Principle 6.1 : Space variety

Public open space

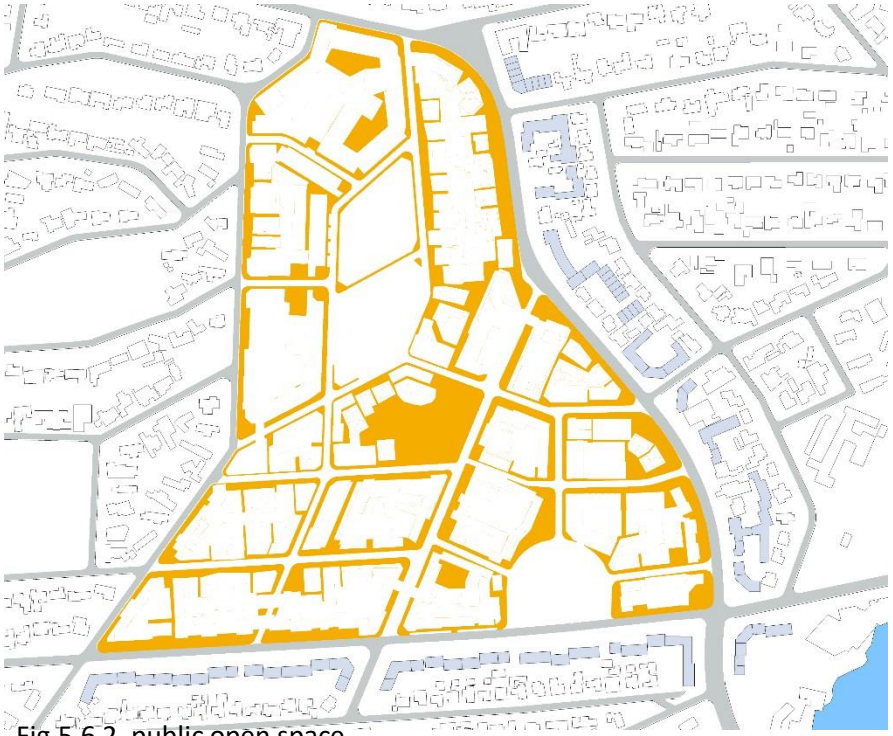


Fig.5.6.2. public open space

Varies open spaces attract varieties of people for various reasons and at different times. Spaces can accommodate various activities for various uses with different buildings and spaces.

Improvements in public safety can be achieved by providing appropriately designed open spaces (Spector,2016).

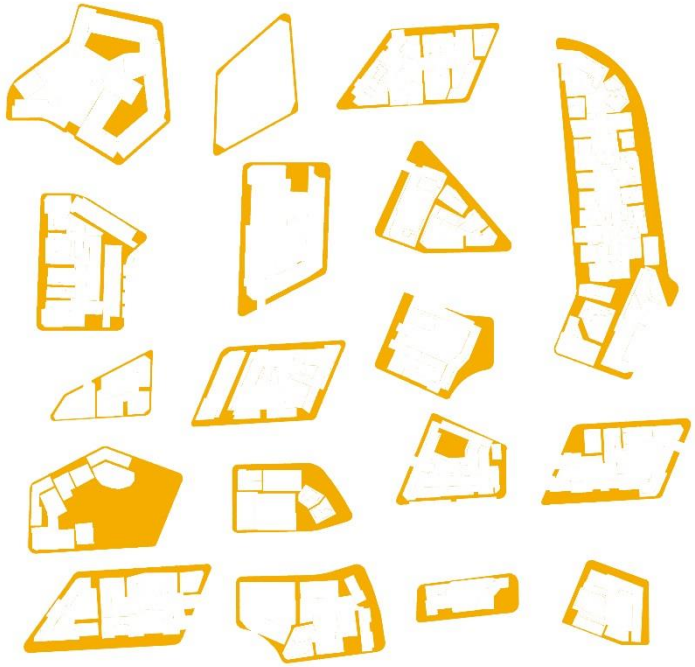


Fig.5.6.2. public open space diagrams

Public open space has a few essential functions: movement, recreation, ecological and aesthetic value. Public open space can provide an important social function, and people could linger, run or cycle on the public space.

Semi-Public open space

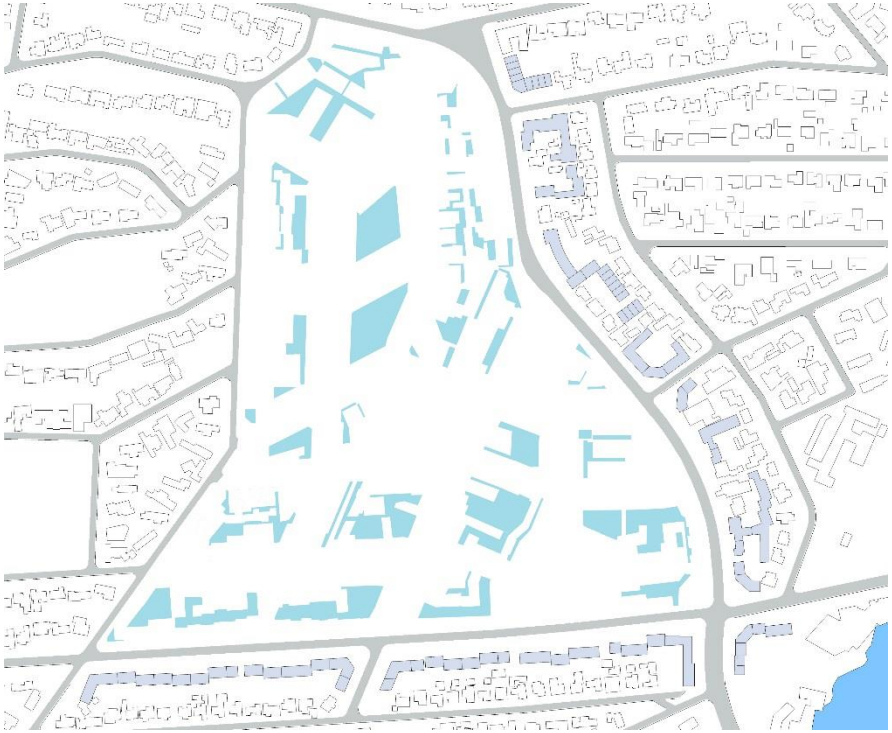


Fig.5.6.4. Semi-public open space

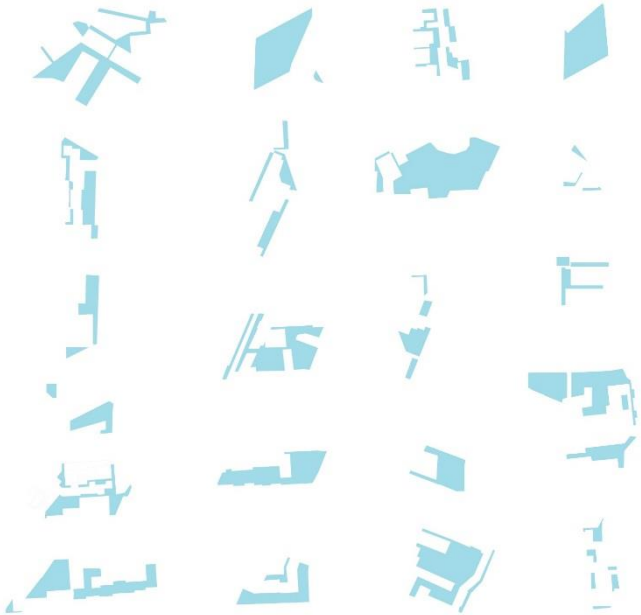


Fig.5.6.5. Semi-public open space diagrams

The semi-public open space is a crucial social integration tool, and people can share use of the space for different activities, such as outdoor gymnastics, urban agriculture, gardening or use as a public square. The semi-public open space linked to the public open space system, and it is part of the entire open space system in Cyrildene precinct.

Private open space

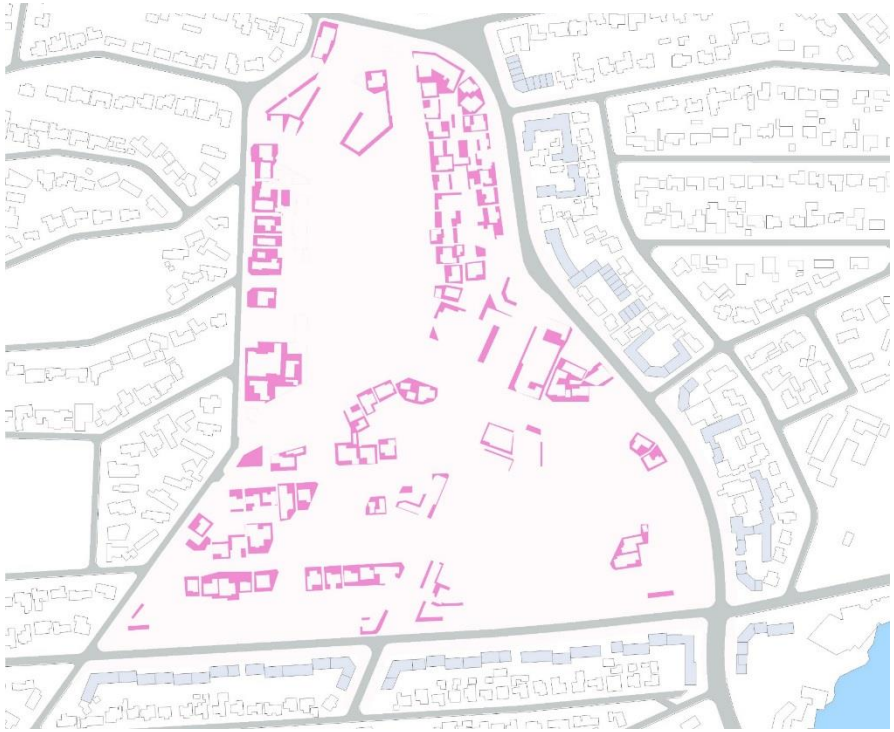


Fig.5.6.6.Private open space

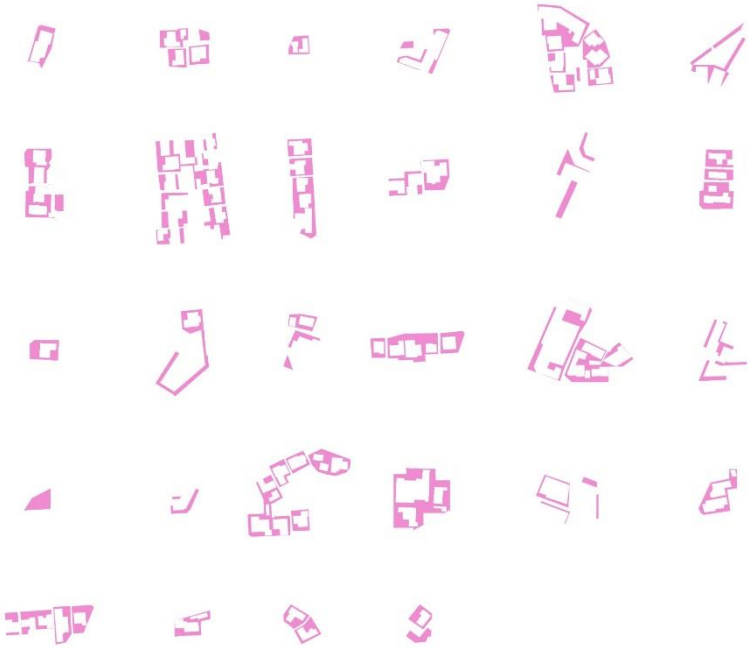


Fig.5.6.7.Private open space diagrams

The private open space system is part of an entirely open space system, and the private open space means private garden space or a small communal space. The traditional private garden space has limited social value, however, if the private space appropriately designed it can still bring social, ecological, and aesthetic value.

Principle 7 : Undulated urban edges



Fig.5.7.1.Undulated urban edges

Undulated urban edges could create various spaces for various social activities as well as business and job opportunities.

The form of the edges can vary: linear, angled, curvilinear, or recessed form. The undulated edges are defined by different buildings and varied building setbacks so that it can add variety to the edge conditions (Ron, 2011).

Principle 8: Permeability

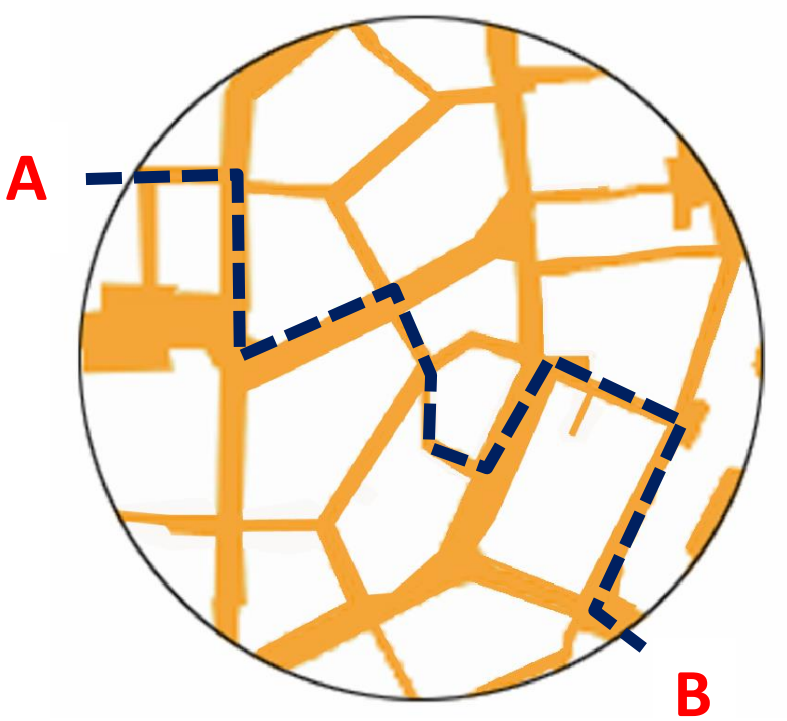
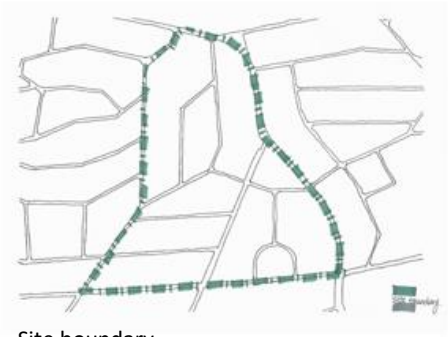


Fig.5.8.1.Permeability diagram

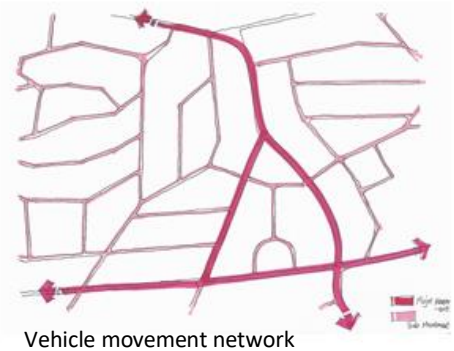
Five minutes' walk distance is always used as the standard distance for an urban design benchmark. The five minutes' walk is affected by a few factors such as climate, topography, safety, location and purpose of the trip. Recent research shows that people are willing to walk more if the walking environment is comfortable (Connectivity and Permeability, 2009).

Increasing the connectivity with mixed-use development can help to increase walkability. A highly connected path network incorporated with landscaped sidewalks and cycle lanes could encourage people to take part in various activities in the public open space and increase social opportunities.

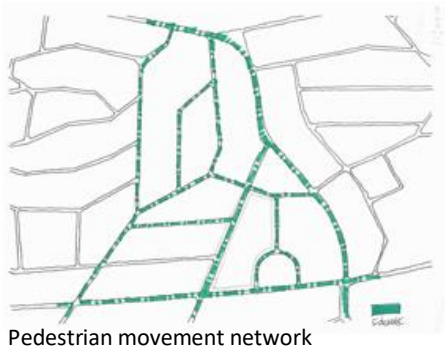
Concept development



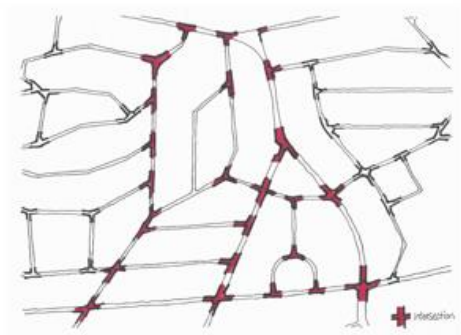
Site boundary



Vehicle movement network



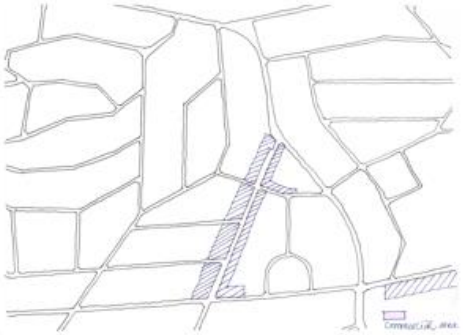
Pedestrian movement network



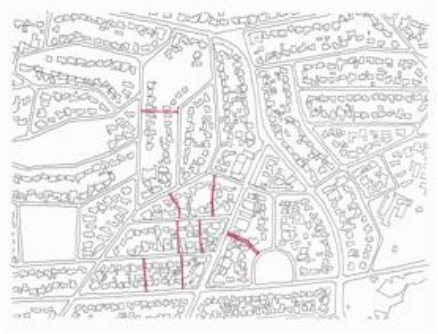
Intersections



Green open space



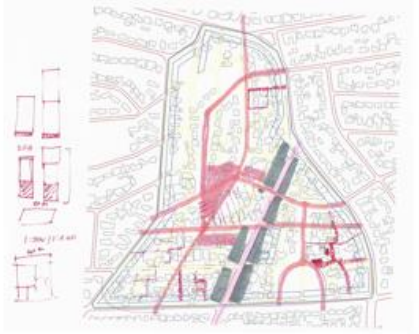
Existing corridor



Area need to improve permeability



Major existing movement and urban blocks



Permeability and potential civic space

Fig.5.9.2. Concept development process diagrams

The initial urban design process starts from: Unpacking the site and understanding the site boundary and main movement system both in motor-vehicle movement and the pedestrian system. and then highlighting intersections to understand energy flow. Thereafter highlighting green spaces to discern the relationship between the built environment and natural systems. And then Highlighting the existing building footprint and overlapping with movement system to understand current mobility for the area. From the accessibility perspective, highlighting the possible routes that can be added into to the current mobility structure to improve the permeability for the area.



Reconfigure existing layout



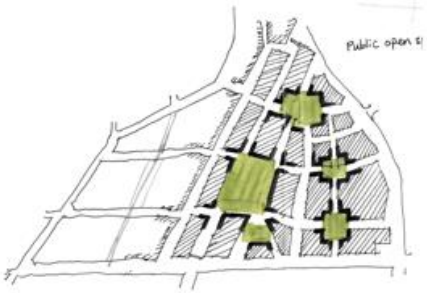
Reconfigure land parcels.



Highlight possible buildings that need to increase density



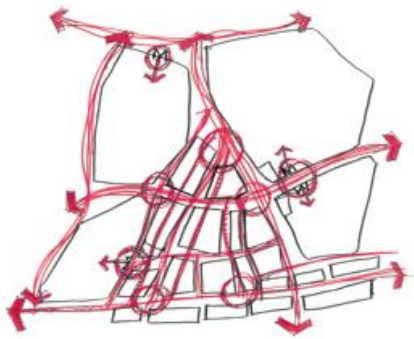
Public space: squares, road network



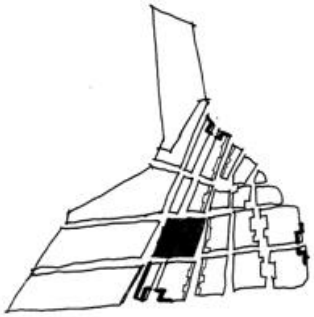
Proposed Important public square.



Accessibility test based on proposed model



Test connectivity and movement flow



Classify the squares and highlight the most important square as civic space



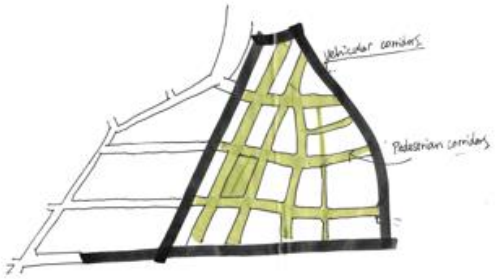
Focus on Civic space and analysis the edge conditions and landmark buildings

This initial design process tries to test ideas from the various theories to find ways to incorporate them.

However, during the initial design process, some of the ideas from theories might not wholly suite this specific site.

Moreover, in order to work for this specific existing site, a solution is needed to maximise the site value from liveability, sustainability and economic perspectives and at the same minimise the impact on the existing site.

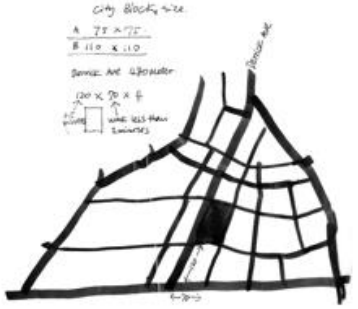
From a safety improvement point of view, Newman (1996) emphasises that reconfiguring the physical layout for communities can improve social issues as well as build up the neighbourhoods. Physical re-configuration includes access to the area, road, street, outside of the buildings, entrance hall and corridors. Newman emphasis that letting local communities recognise the universal value to their way of life for the area is essential (Newman, 1996).



Incorporating “Green” into the network



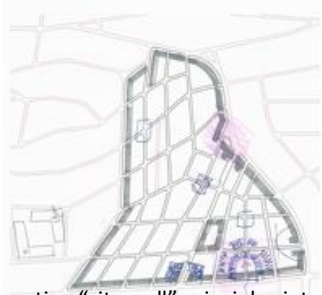
Pedestrian movement and green network



Proposed urban structure



Overlapping existing building footprints



Incorporating “city wall” principles into the design, use “city wall” represented as building to define the edges, and start incorporate “city gate into the design



Incorporating the green layer into the



Highlighting existing building edges and the proposed building blocks



Put together, including “City wall”, proposed building blocks, open spaces and existing building edges.

Urban ecology is an important aspect of urban design, integrating the green network with the pedestrian system can encourage outdoor activities for communities.

From a safety point view, trying to develop integrated solutions could improve safety in the area. Using mixed-use medium density buildings, represented as a city wall could increase surveillance of the public space. Integrating the city gate as threshold could better control access to the area. All of these measures could markedly improve safety in the area.

Fig.5.9.3. Concept development process diagrams

Concept development process

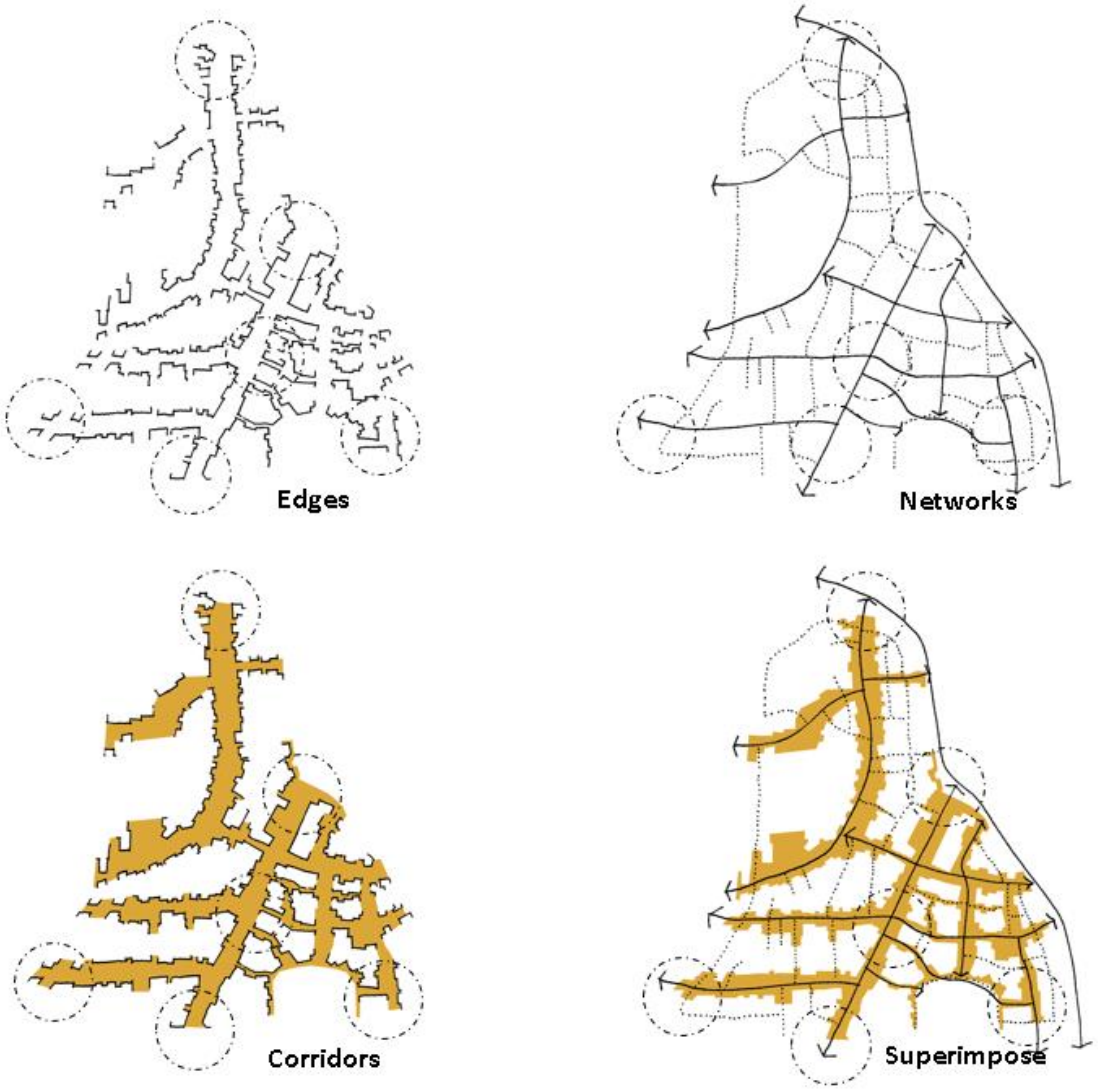


Fig.5.9.4. Edges and corridors

Highlighting existing and possible corridors in the area. From the activities map to demonstrate some of corridor used for business and some for movement or neighbourhood use only.

Chinese urban design principles

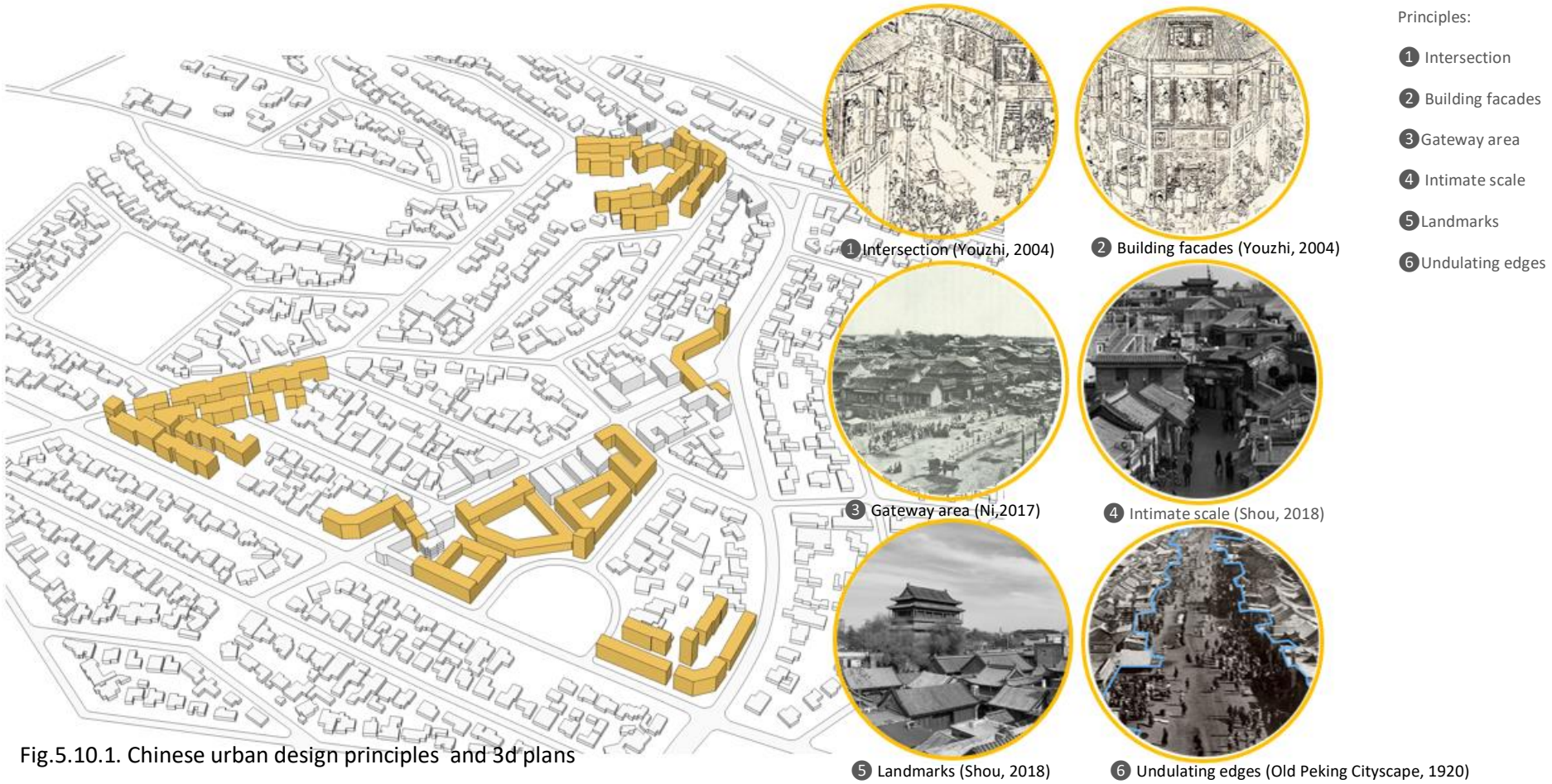


Fig.5.10.1. Chinese urban design principles and 3d plans

Incorporating Chinese urban planning and design principles into the site to improve social integration for the communities.

These Chinese urban design principles could help to improve space relations, increase social opportunities, improve safety and security, legibility and business opportunities.

Single node vs multi node

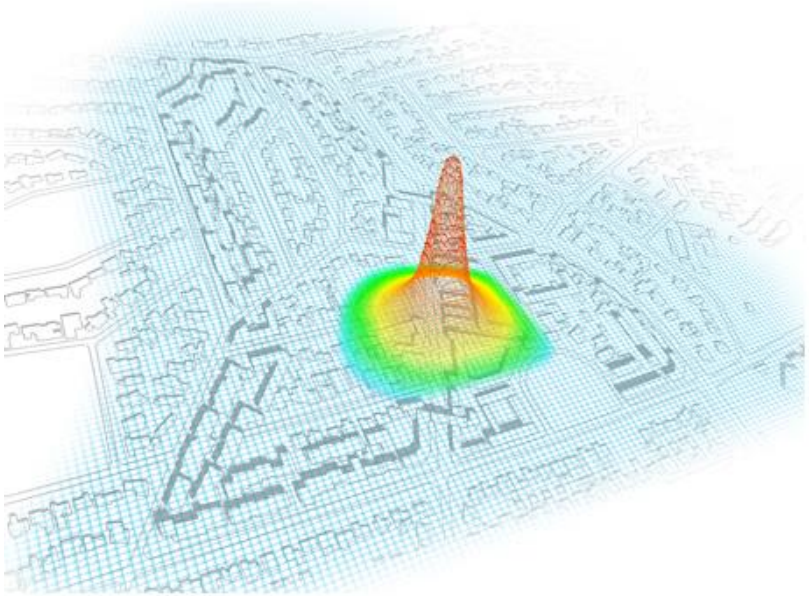


Fig.5.11.1. Single node model

In the past, the single-node model during the peak time has caused traffic issues, due to the high density of buildings located in the one district, the traffic movement system is ineffective.

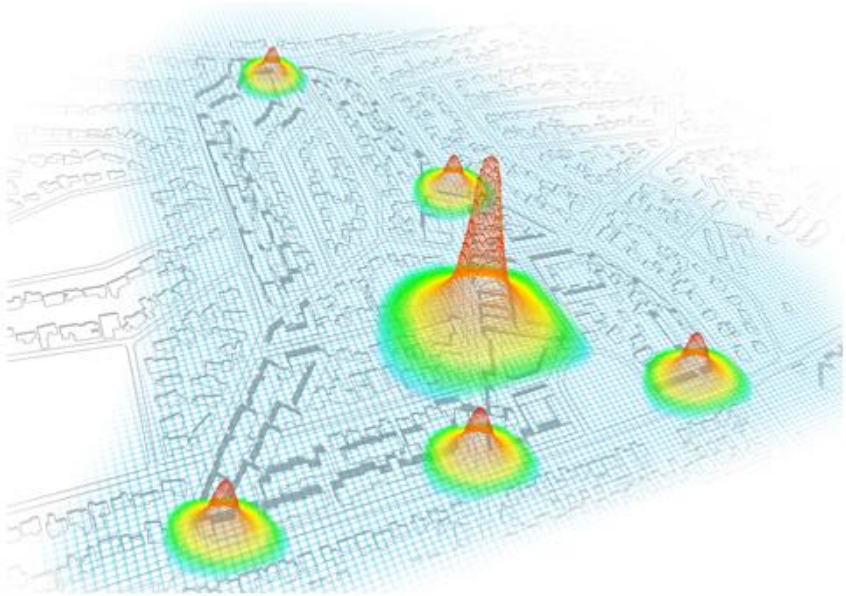


Fig.5.11.2. Multi-nodes model

The multi-node model is one of the solutions that could reduce the traffic jam issue compared with traditional central business district.

Design development

Existing movement diagram

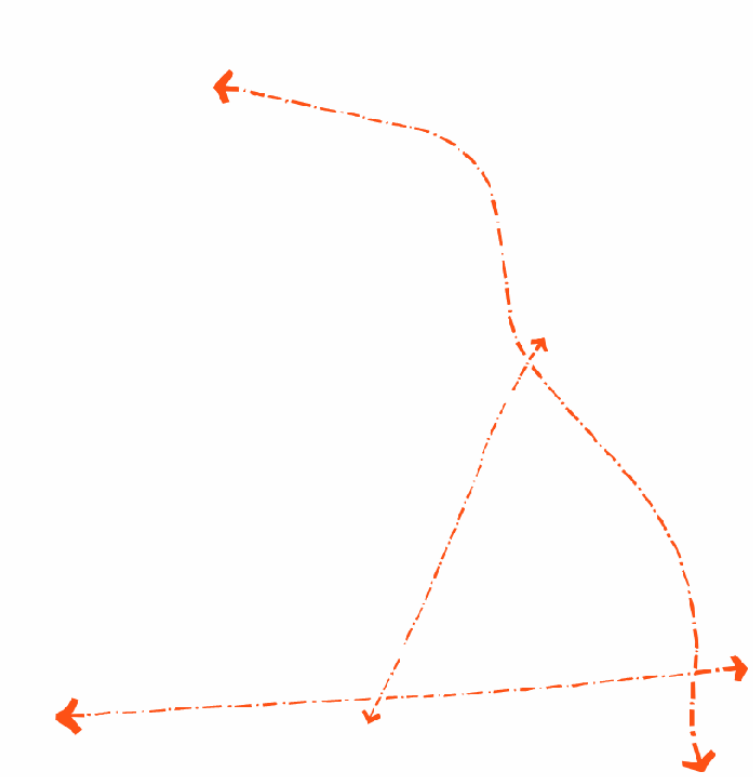


Fig.5.12.1. This diagram indicates the important movement structure.

Existing site



Fig.5.12.2. This diagram shows the relationship between existing contexts with the movement system.

New and existing corridor

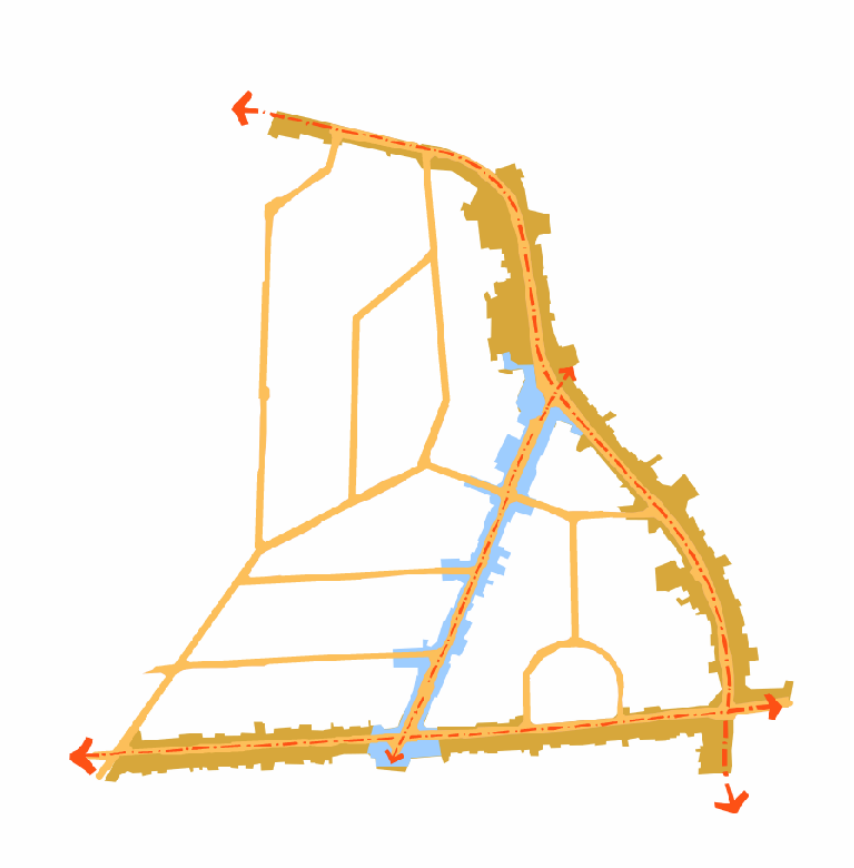


Fig.5.12.3. This diagram overlaps with the existing movement structure, existing corridor, and potential corridors.

Existing corridor



Fig.5.12.4. The colour in blue is the existing economic corridor. It links between M33 and Marcia St.

Existing movement

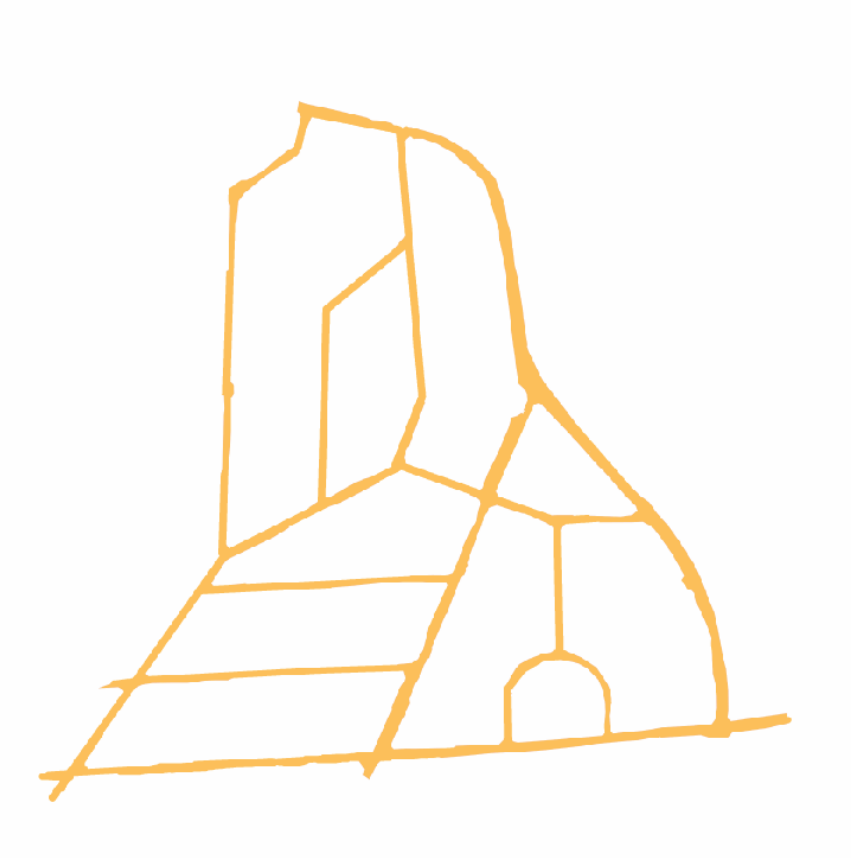


Fig.5.12.5. This diagram shows the existing movement system and the urban blocks.

New proposed movement map



Fig.5.12.6. The light-yellow colour highlights the proposed movement system.

New proposed building footprint



Fig.5.12.7. This diagram shows the proposed building footprints. One of the principles in this research proposal is to use buildings to define spaces.

Proposed buildings and accessibility

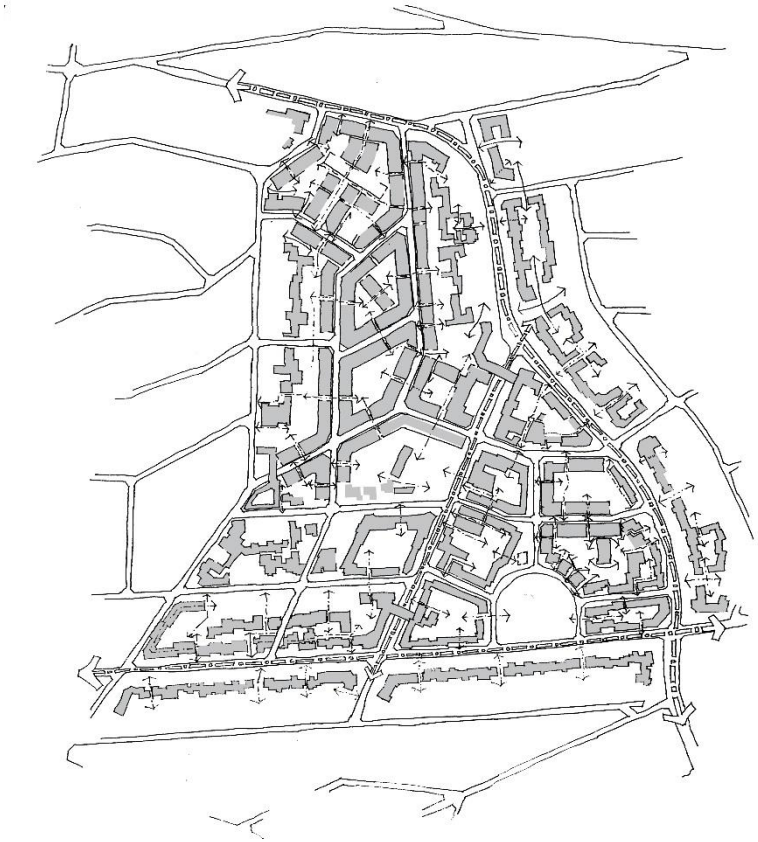


Fig.5.12.8. This diagram shows accessibility. It shows the connectivity between public open space, the semi-public space, and private space.



Fig.5.12.9 Corridors, existing movement system, and proposed building footprints



Fig.5.12.10. Overlap between the proposed building footprints and existing building footprints

Overlap

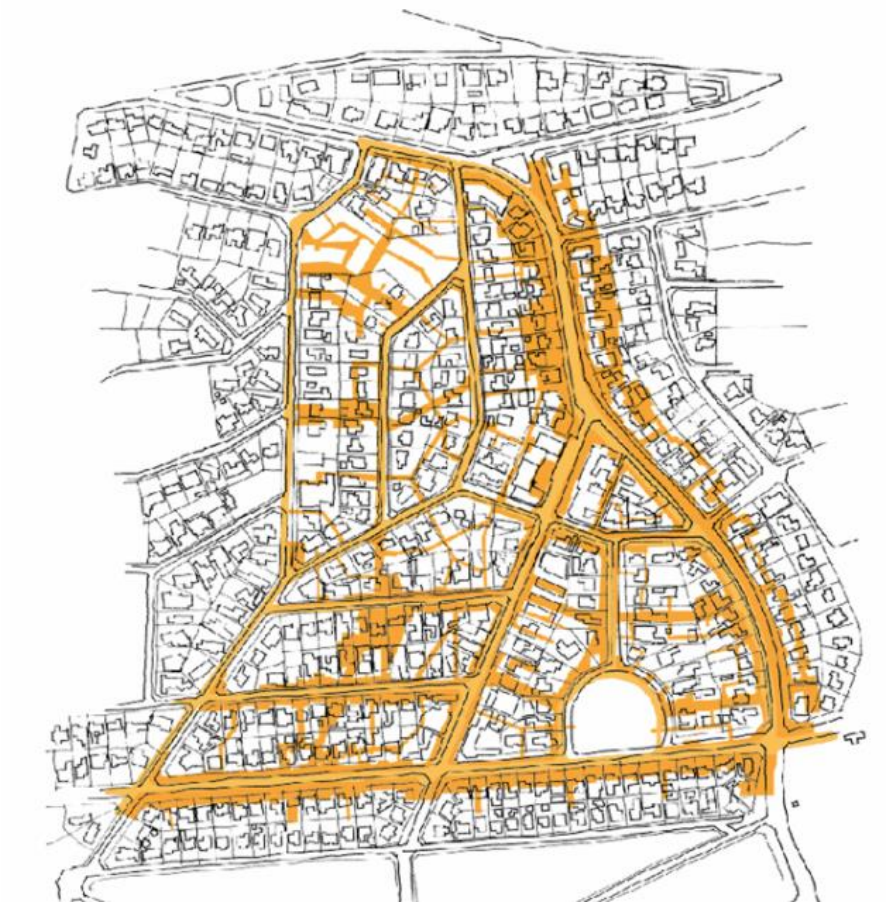


Fig.5.12.11. This diagram shows the implication of the new proposed urban design movement structure for the existing context.



Fig.5.12.12. This diagram overlaps proposed urban blocks and proposed economic corridors.

Superimposed map with existing context



Fig.5.12.13. This diagram puts all the proposed layers and existing layers together and shows the implications of the proposed design.

Redeveloping the Cyrildene precinct is a complex process. This research proposes promoting urban social integration through a space-making process. Improving the permeability to the Cyrildene area can help to improve the accessibility to the different spaces.

Urban corridor redevelopment can support the concept of urban integration, densification and activities varieties. From a regional scale, the urban corridor development could help to reduce the urban sprawl problem. The urban corridor is an essential development strategy to improve the urban environment.

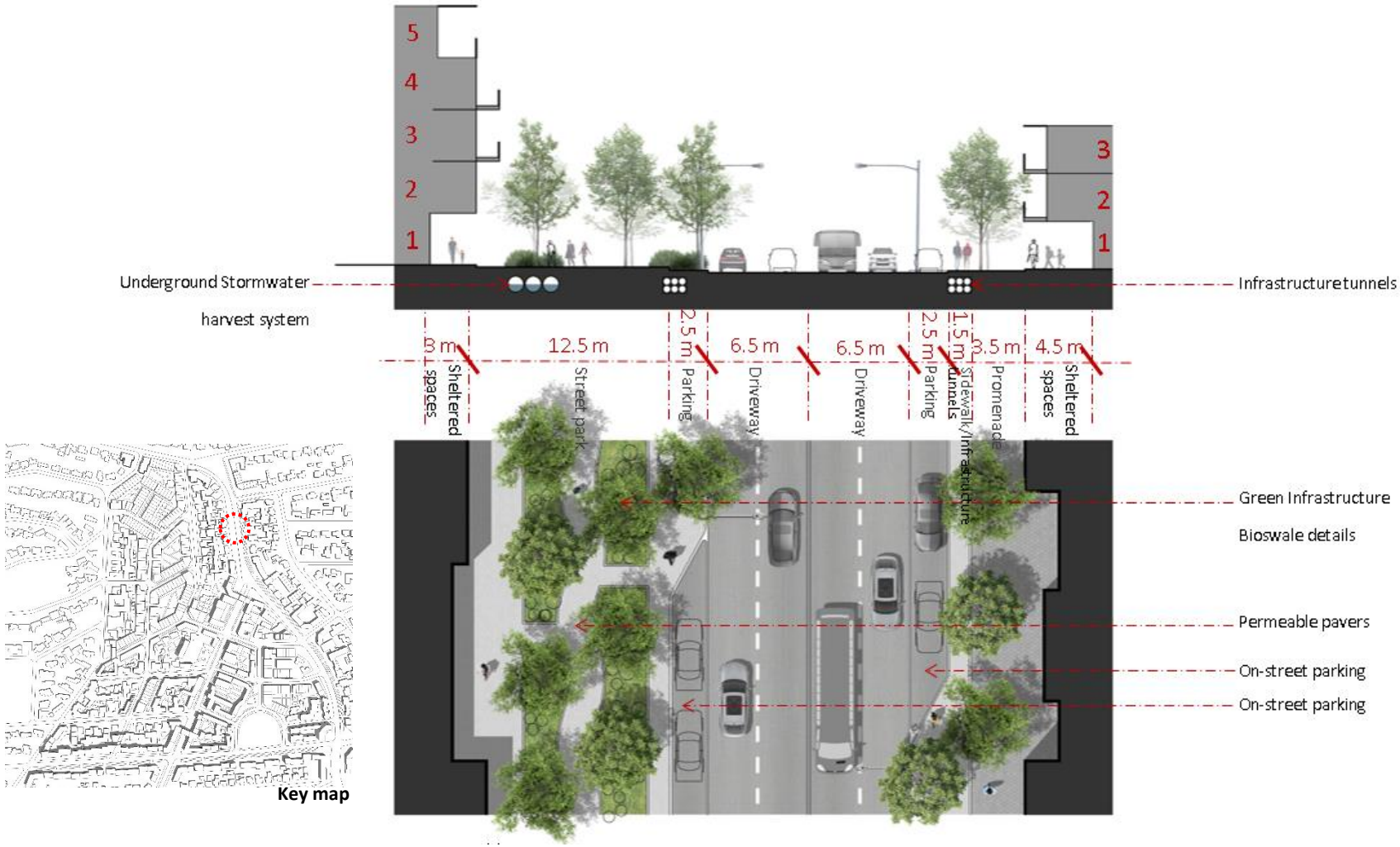


Fig.5.13.1. This Cross section through M33, shows the relationship between buildings, landscaped promenade space and motor vehicle roads.

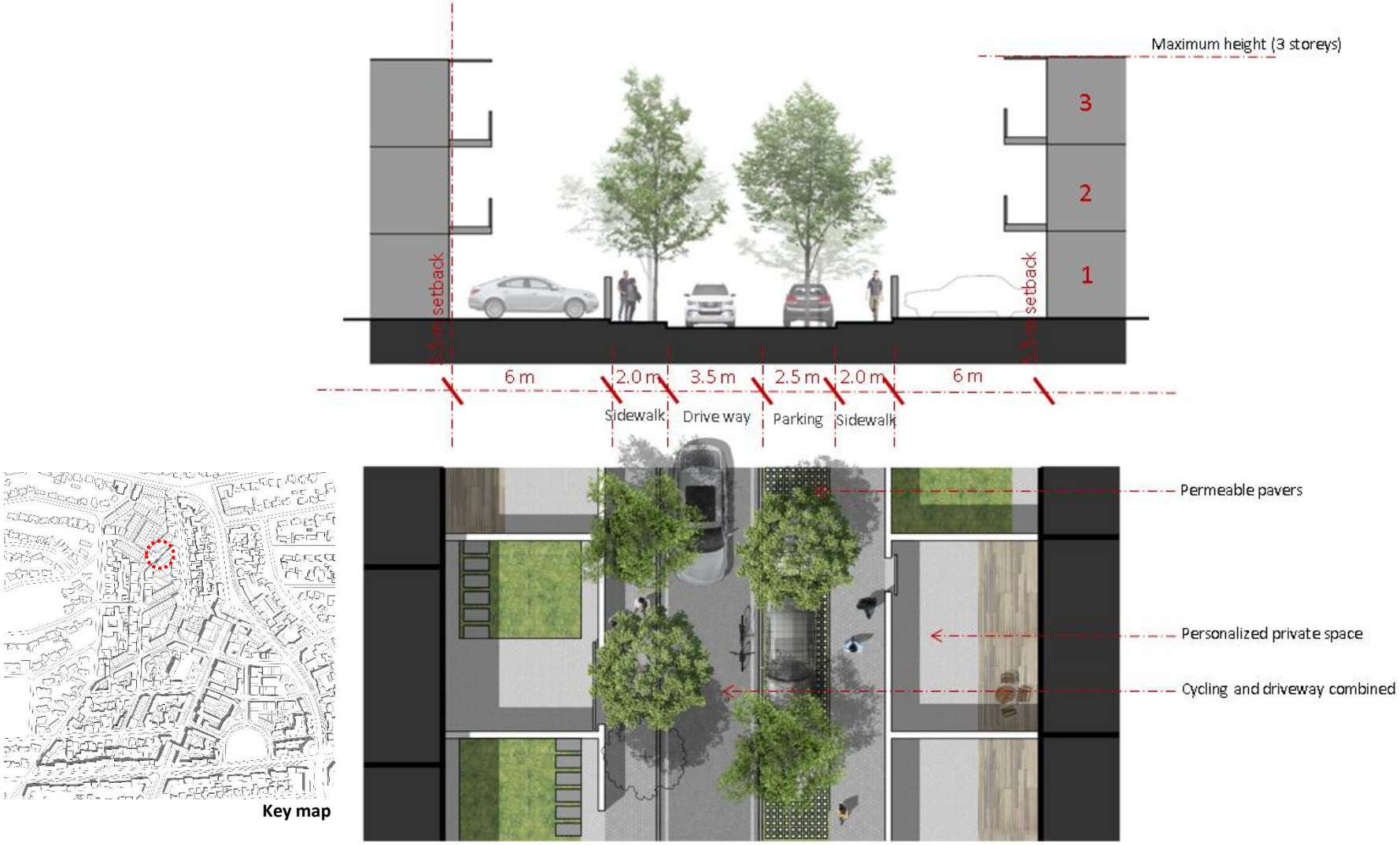


Fig.5.13.2. This shows a cross section through the general residential area. The road is one way and allows on street parking. The space also accommodates cyclists. Both sides include landscaped sidewalks. All road surface materials are permeable and the road surface material is cobbled. All materials should be locally made so that it could help to build up local businesses and the foster economic growth.

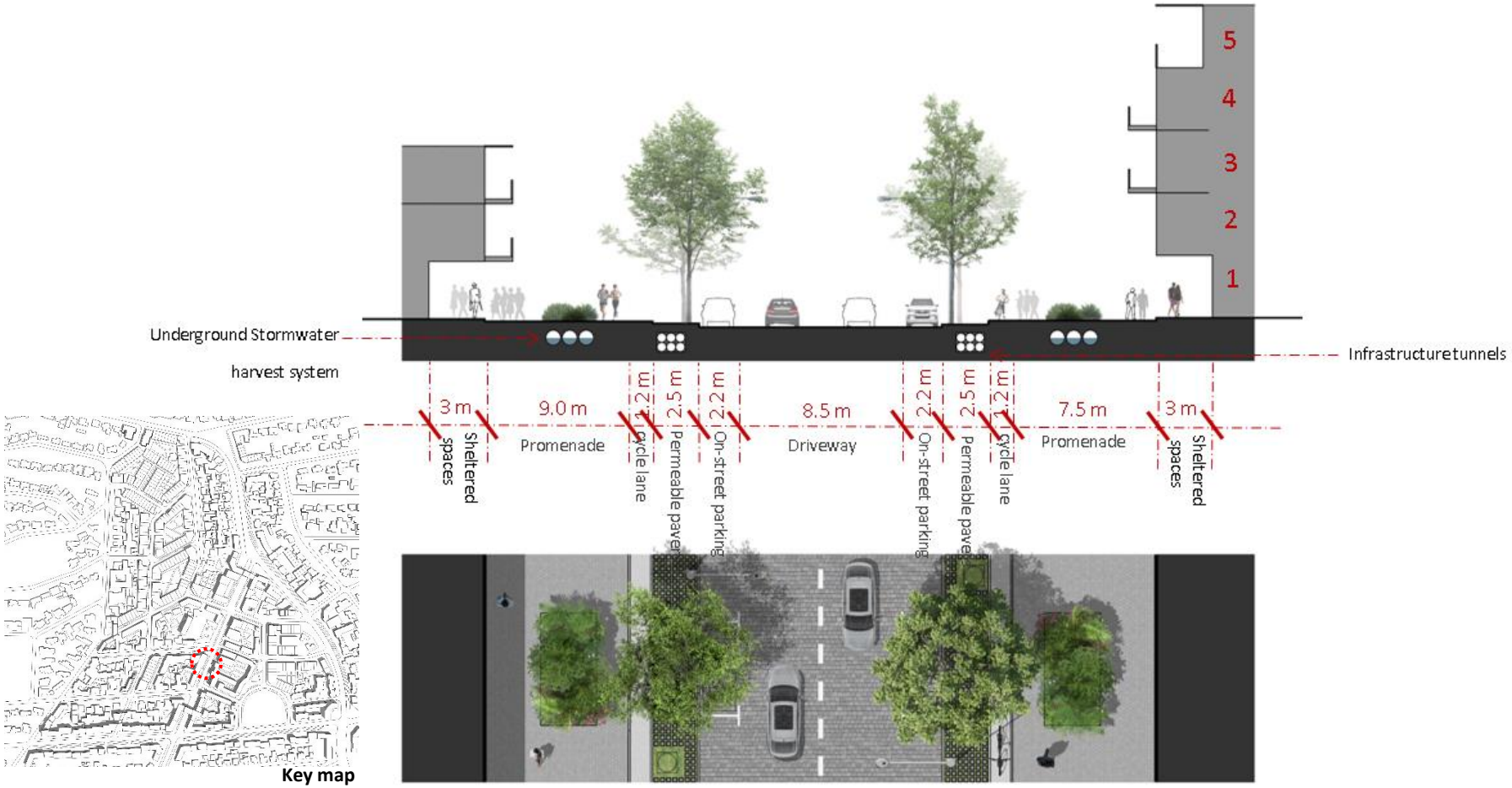


Fig.5.13.3. This is a cross section through Derrick Ave. The roads integrate with street parking space. Both sides include landscaped sidewalks. This allows a nine meter wide promenade in certain new development areas so the space could accommodate a temporary fresh market.

All road surface materials are permeable. The road surface material is cobbled, which can help to slow down vehicles.

All materials should locally made, so that it can help to build up local business.

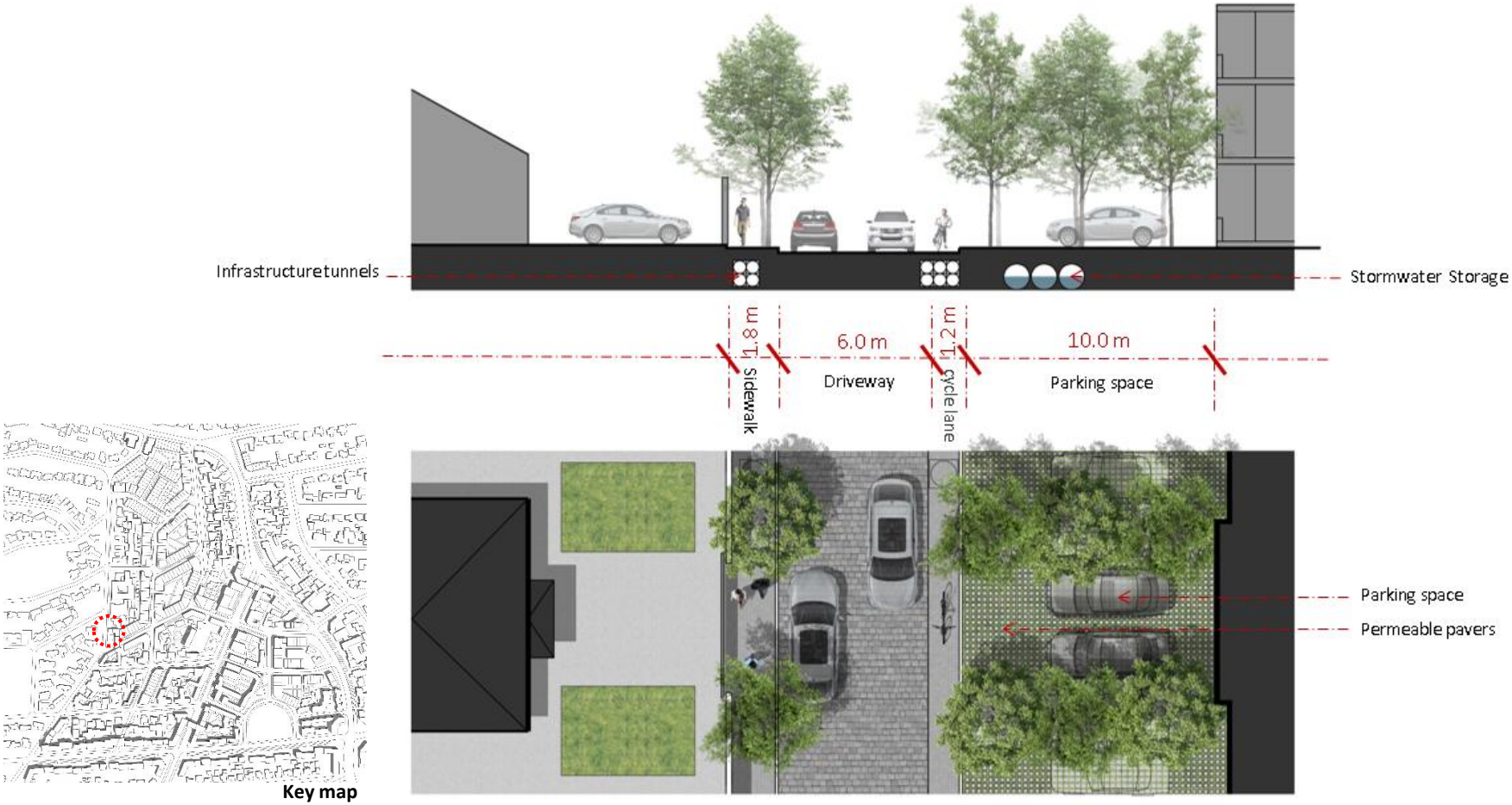


Fig.5.13.4. Cross section through the existing residential area and proposed new residential area. The road is two-way and does not allow on-street parking. On the new development, space is allowed for cyclists and parking. All road surface materials are permeable and cobbled, which can help slow vehicle speed.

All materials should locally made, so that it can help to build up local business.

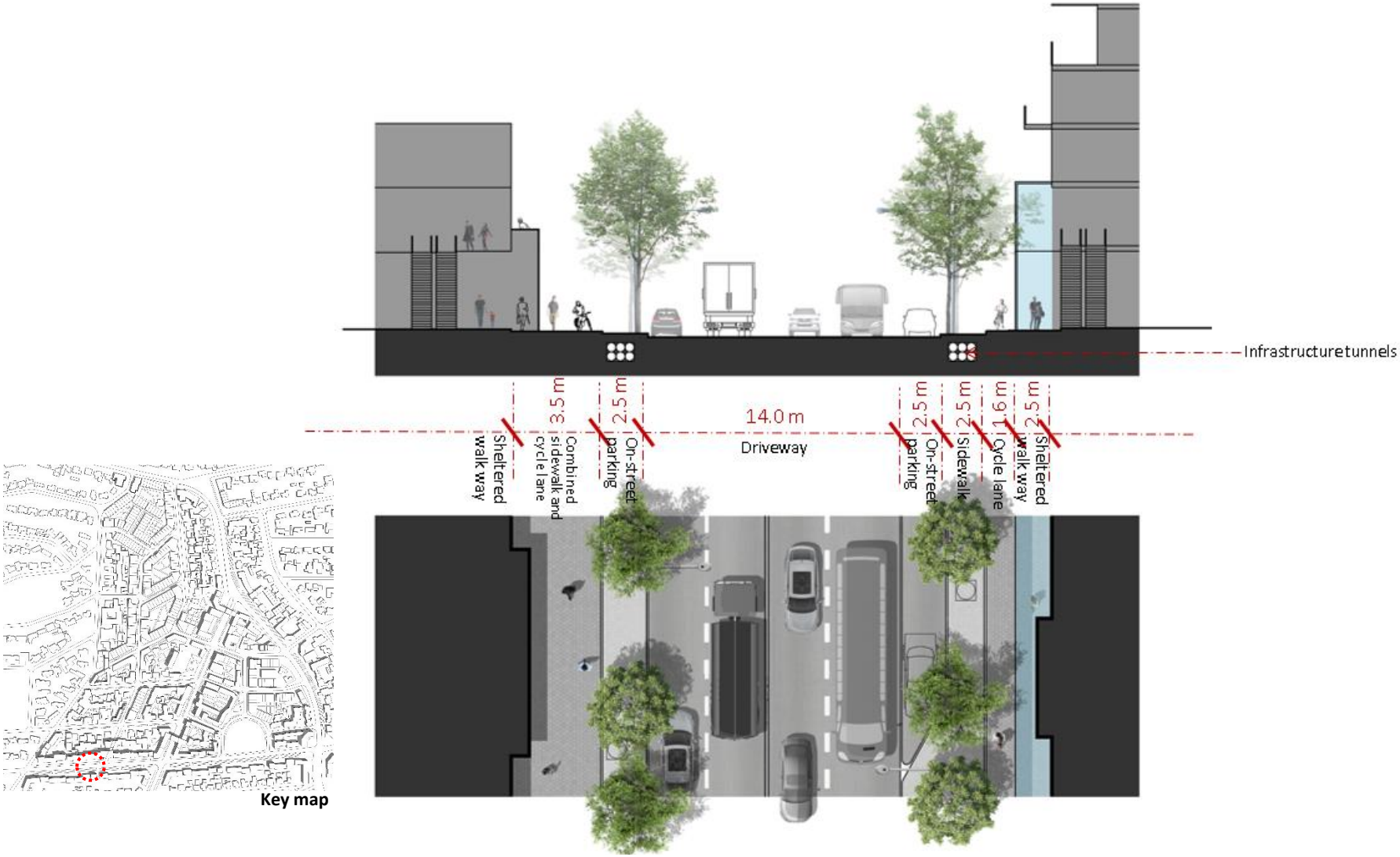


Fig.5.13.5. Cross section through Marcia St. On both sides of Marcia St. six meters are allocated for sidewalk, cycle lane and space for landscape. Each side of motor-vehicle road allows space for temporary parking. The underneath of the walkway is integrated with infrastructure tunnels to allow service providers to work on infrastructure without lifting the pavements.

All materials should locally made, so that it can help to build up local business.

Block Typologies

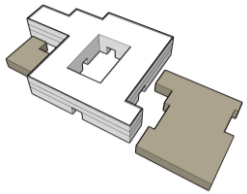
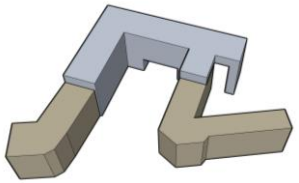
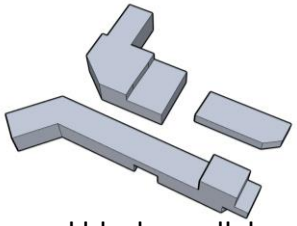
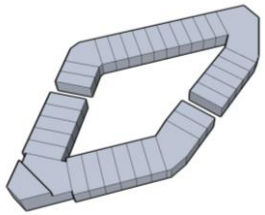
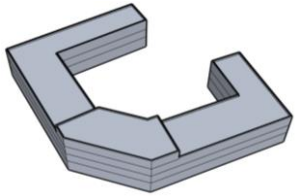
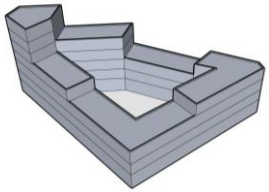
 Parallel blocks	 Linea block in between existing houses	 Closed block	 U-shaped block
 L shaped block parallel with linear blocks	 U-shaped blocks with shared courtyard	 Folded blocks	 Stepped block

Fig.5.14.1. In order to provide various types of dense urban environments that could help to support different activities in the Cyrildene district, different block typologies could accommodate various densities, functions, and allow different activities.

From a land use perspective, the mixed-use development is an important key principle for Cyrildene district. Mixed use developments can help to reduce motor vehicle use and decrease air-pollution in the district. From a socio-economic point of view, mixed use developments can increase social opportunities and job opportunities for the local communities as well as surrounding communities. Other than that, the vertical land-use concept is also important to the Cyrildene district. The vertical land-use concept could help to stimulate street life - for example, the ground level can be used as coffee shop, restaurant, fresh produce market, or convenience store. The first floor can be used for commercial purposes, while the second and third floor can be used for offices or apartments, and the roof space could function as urban agriculture or a neighbourhood park. Therefore, the vertical planning method can help to increase social opportunities for the local people as well as improve the socio-economic value of the surrounding area.

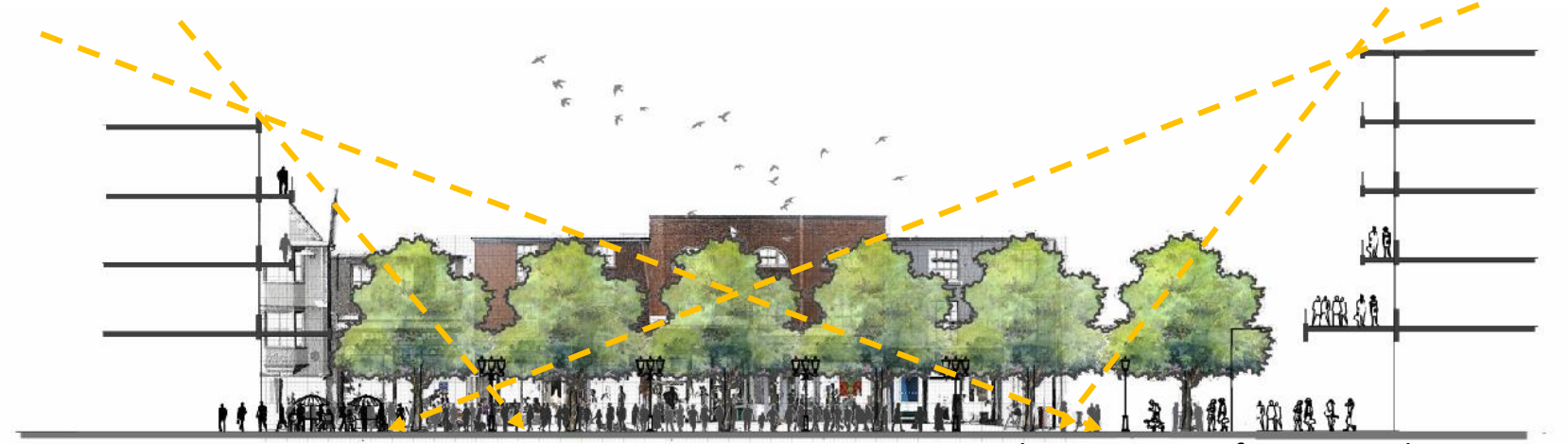


Fig.5.14.2. Typical Cross Section for mix-used area 1

The proposed block height in the Cyrildene district is moderate, generally ranging between three to five floors, with the landmark buildings normally located on each corner on the blocks. The landmark buildings would range between seven to ten floors, depending on the surrounding building height. Buildings of a height of three to five floors create a comfortable outdoor environment for people walking in the area.

Space in between buildings can be used for landscaping and as a buffer zone, which can help to provide privacy between buildings, and at the same time, encourage people to use the outdoor space, which can bring opportunities for people to get to know each other.

From an urban ecology point view, landscaping can provide better air-quality for the environment, as well as reduce stormwater runoff.

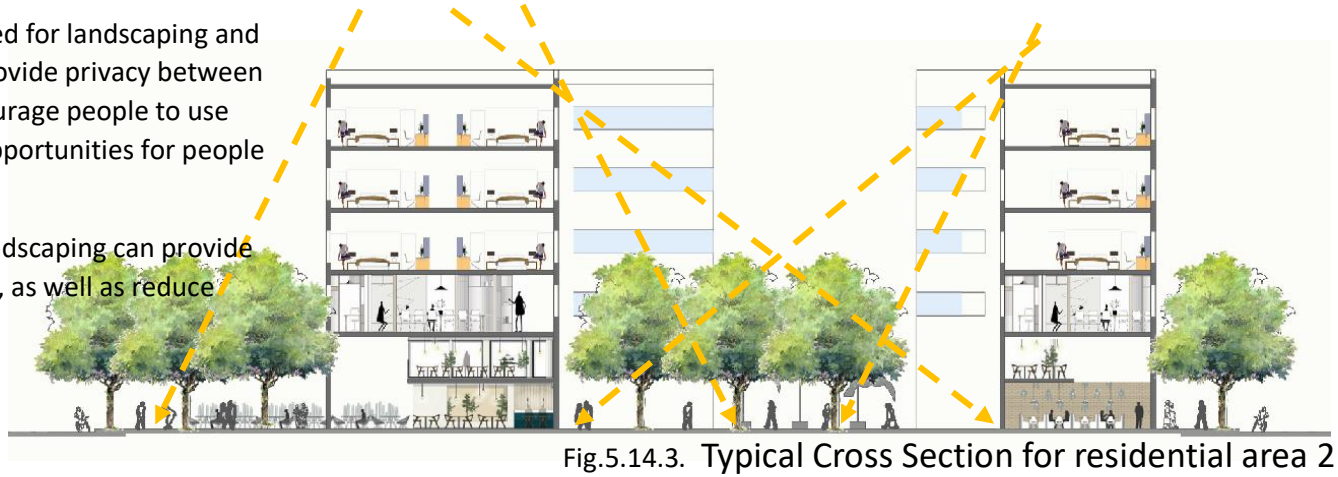


Fig.5.14.3. Typical Cross Section for residential area 2

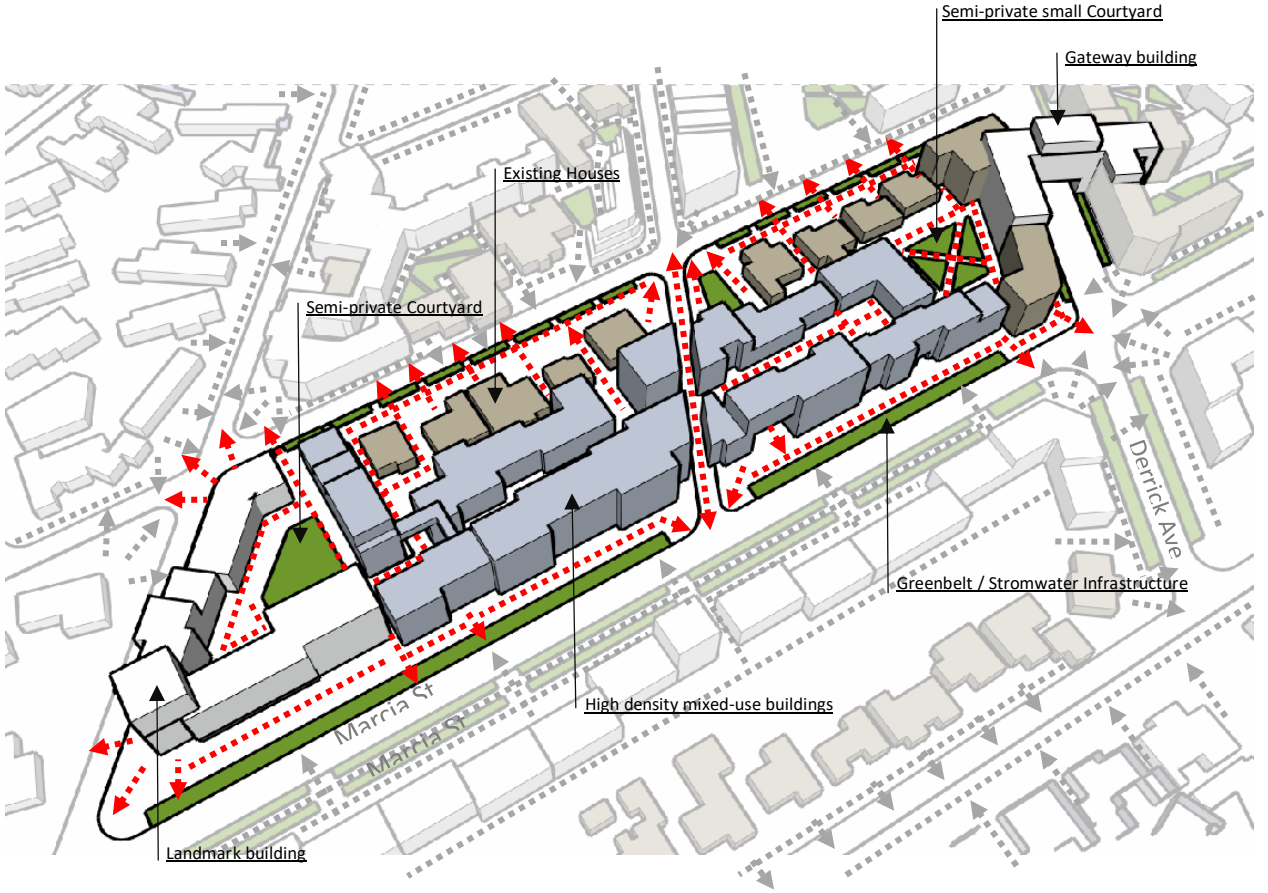


Fig.5.14.4.

Typologies: Type 1

Parallel blocks

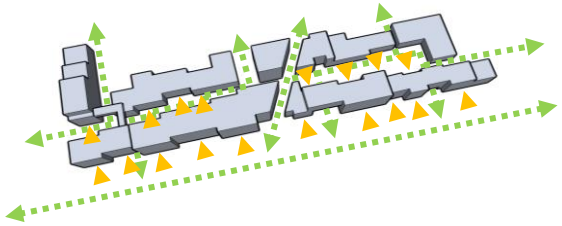


Fig.5.14.5.

This type of block can help to define the edges, however, the ground level provides many paths that can maximize permeability for the surrounding communities. Furthermore, the undulating the blocks edges can provide privacy for different activities. the path is pedestrianised only in between blocks, which can help to reduce traffic and provide opportunities for social interaction.

Legends

New proposed Parallel blocks, with Mixed-use Residential, Commercial and Retail

Existing houses

Landscaping

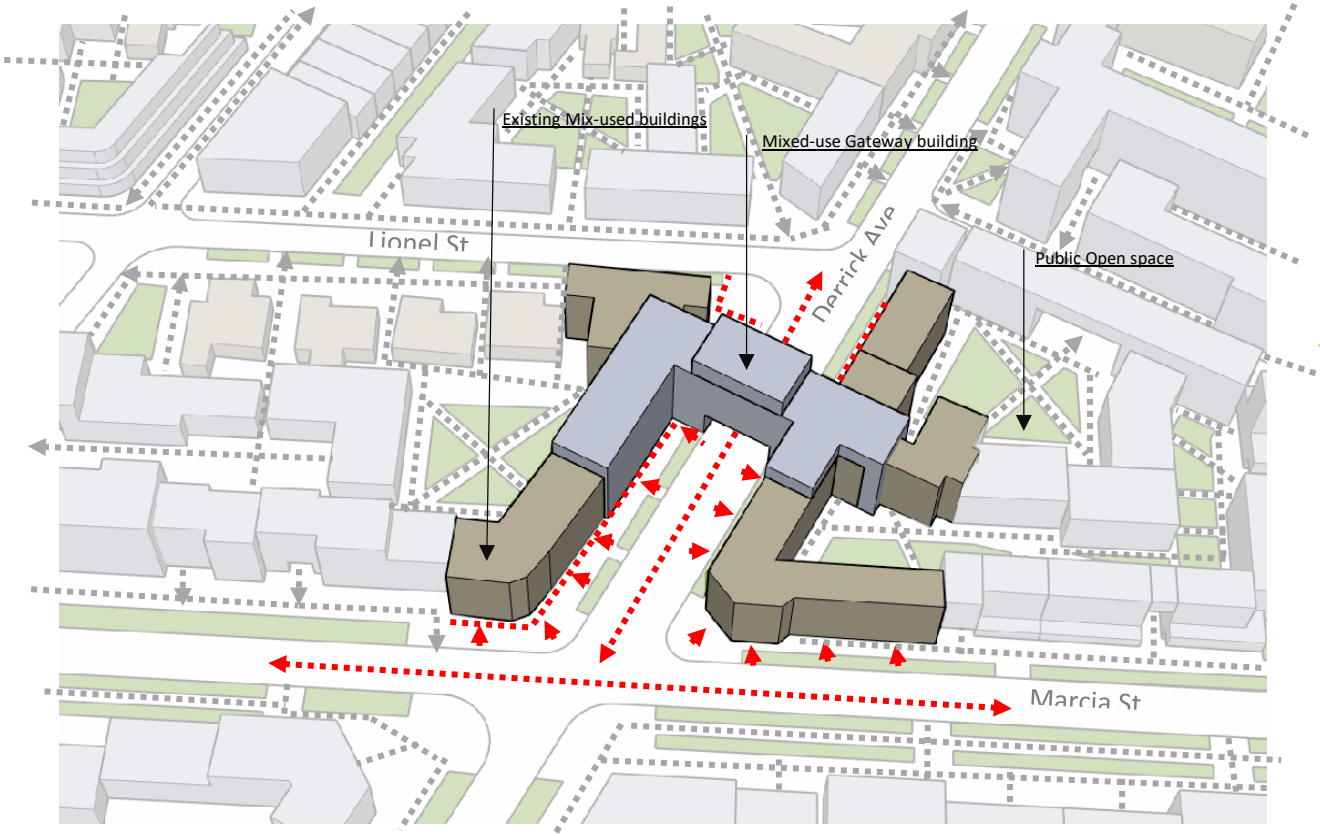


Fig.5.14.6.

Typologies: Type 2

U-shaped block

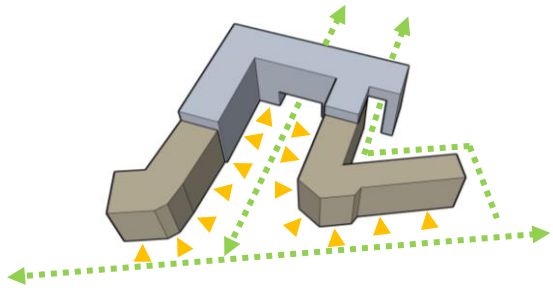


Fig.5.14.7.

A U-shaped block for this specific project provides a threshold function; mixed-used buildings can accommodate a variety of different functions.

Legends

New proposed Gateway buildings, Mixed-use Commercial, Retail and office.

Existing buildings, Mixed-use Commercial, Retail and Residential

Landscaping

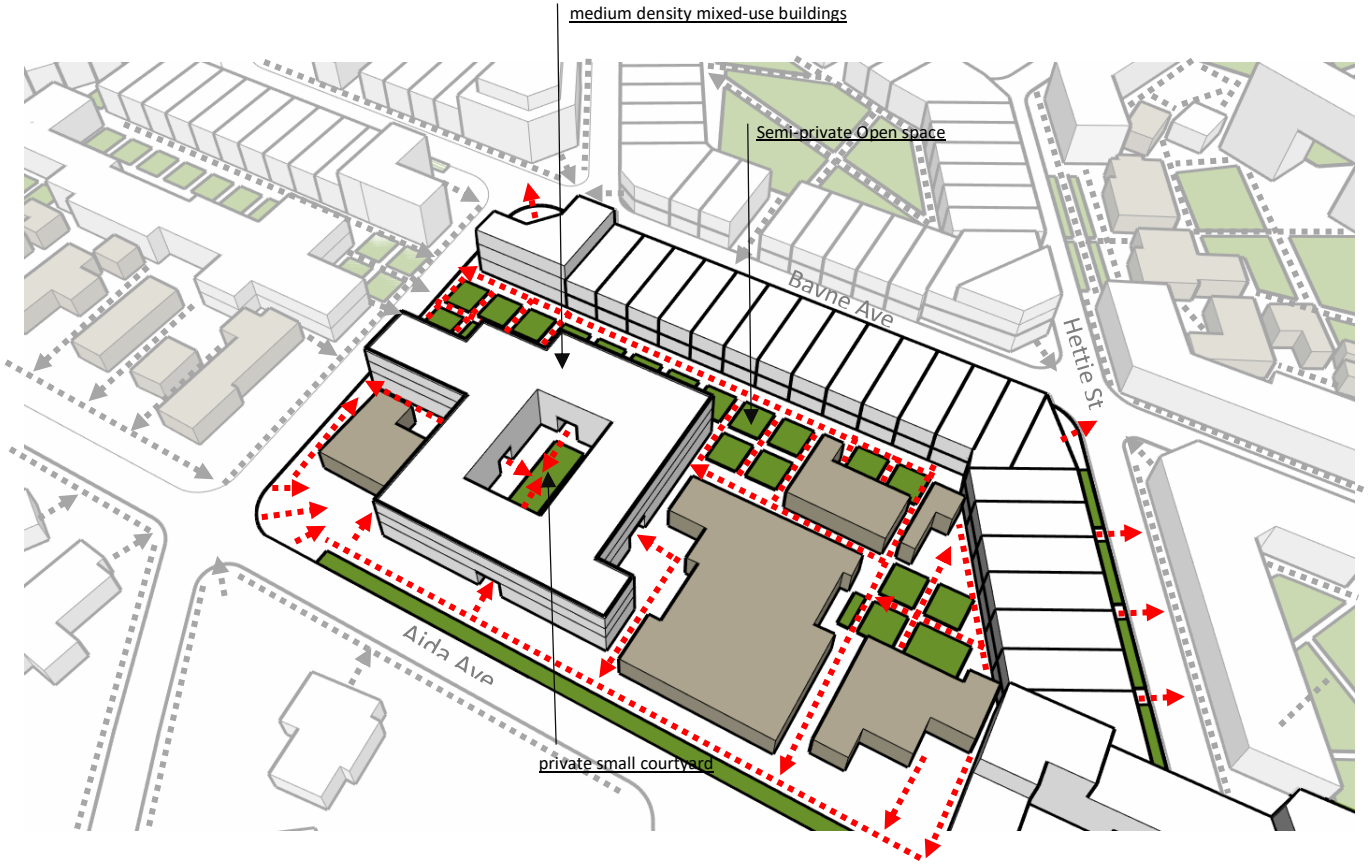


Fig.5.14.8.

Typologies: Type 3

Closed block

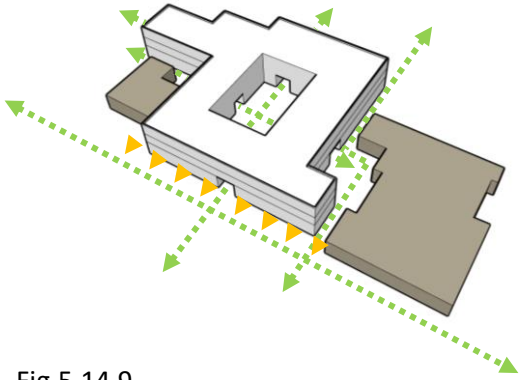


Fig.5.14.9.

Closed blocks can help divide public spaces, semi-public spaces and private spaces. Different spaces could attract different people for different reasons to visit this area.

Legends

New proposed buildings, Mixed-use Residential, Public facilities and Retail

Existing houses

Landscaping

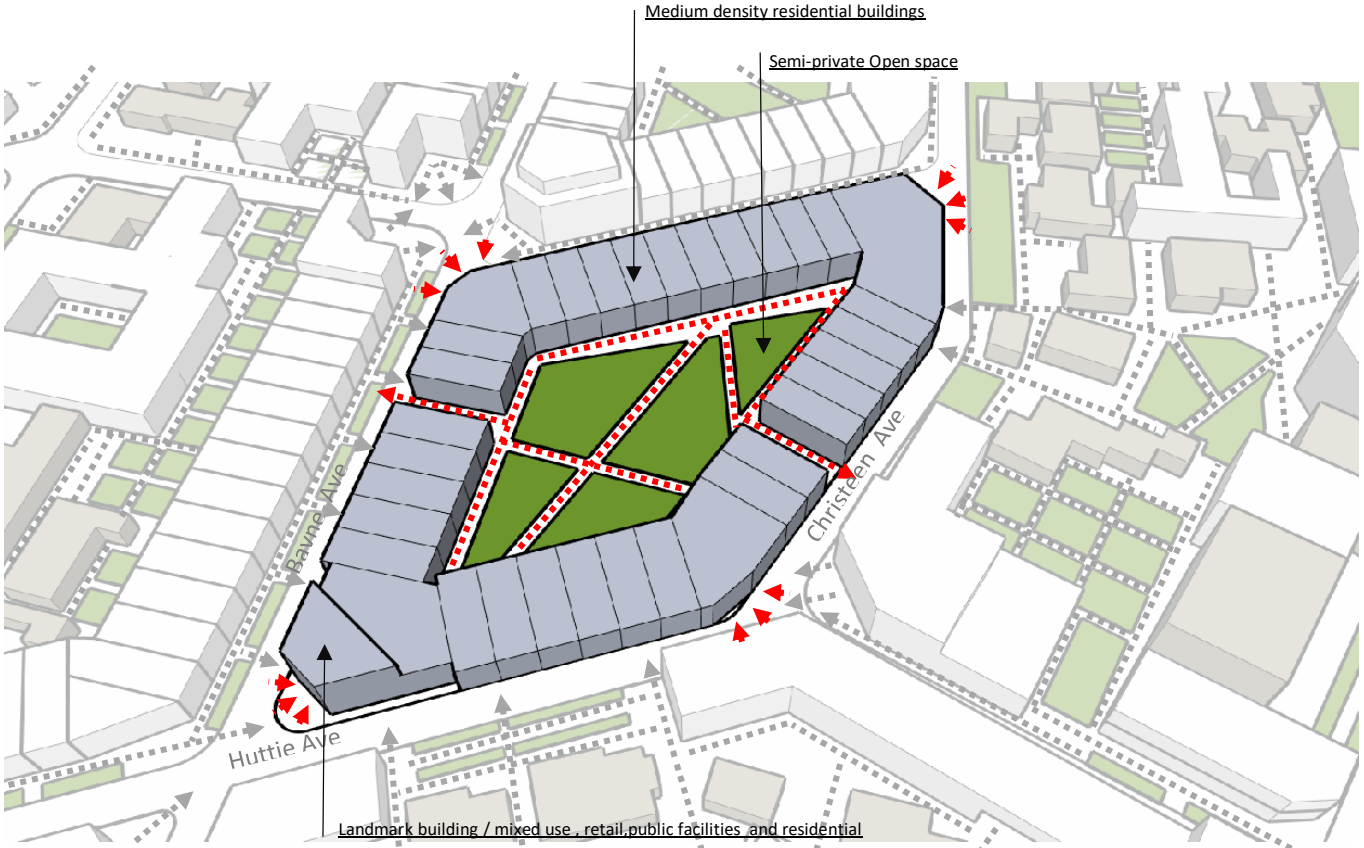


Fig.5.14.10.

Typologies: Type 4

U-shaped blocks with shared courtyard

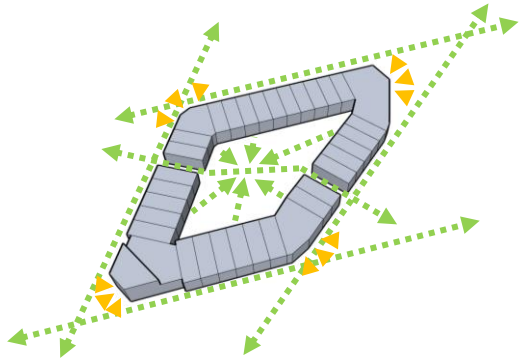


Fig.5.14.11.

This type of block could be utilized for residential areas. Local residents can share use of the courtyard space, thus maximising opportunities for social bonding.

Legends

New proposed buildings, U-shaped blocks with shared courtyard

Mixed-use Residential and Public

Existing houses

Landscaping

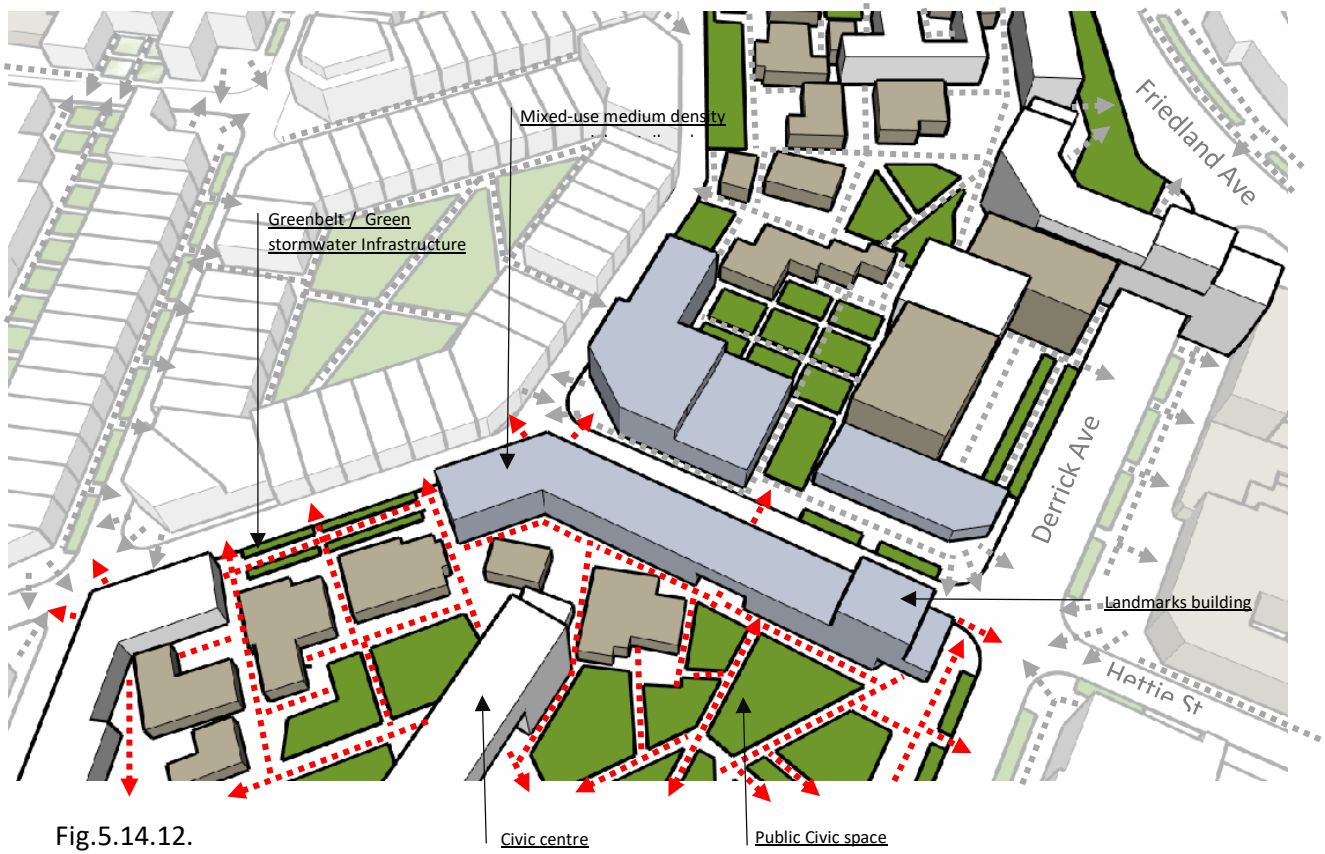


Fig.5.14.12.

Typologies: Type 5

L shaped block parallel with linear blocks

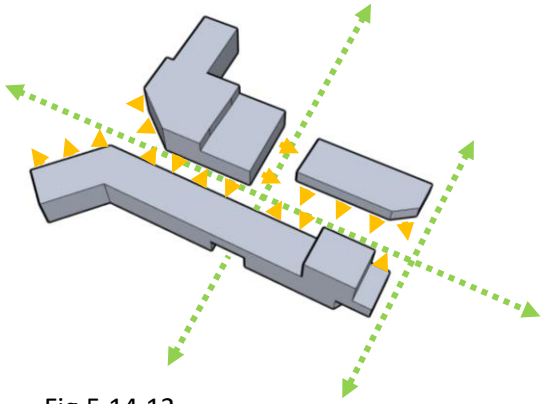


Fig.5.14.13.

This type of block model is designed for commercial mix-used areas, and can provide more facades on street level, so that it could increase business opportunities. Additionally, it could serve to improve the socio-economic and social value for the area as well as surrounding communities.

Legends

New proposed L shaped block parallel with linear blocks, Mixed-use Residential, Commercial and Retail

Existing houses

Landscaping

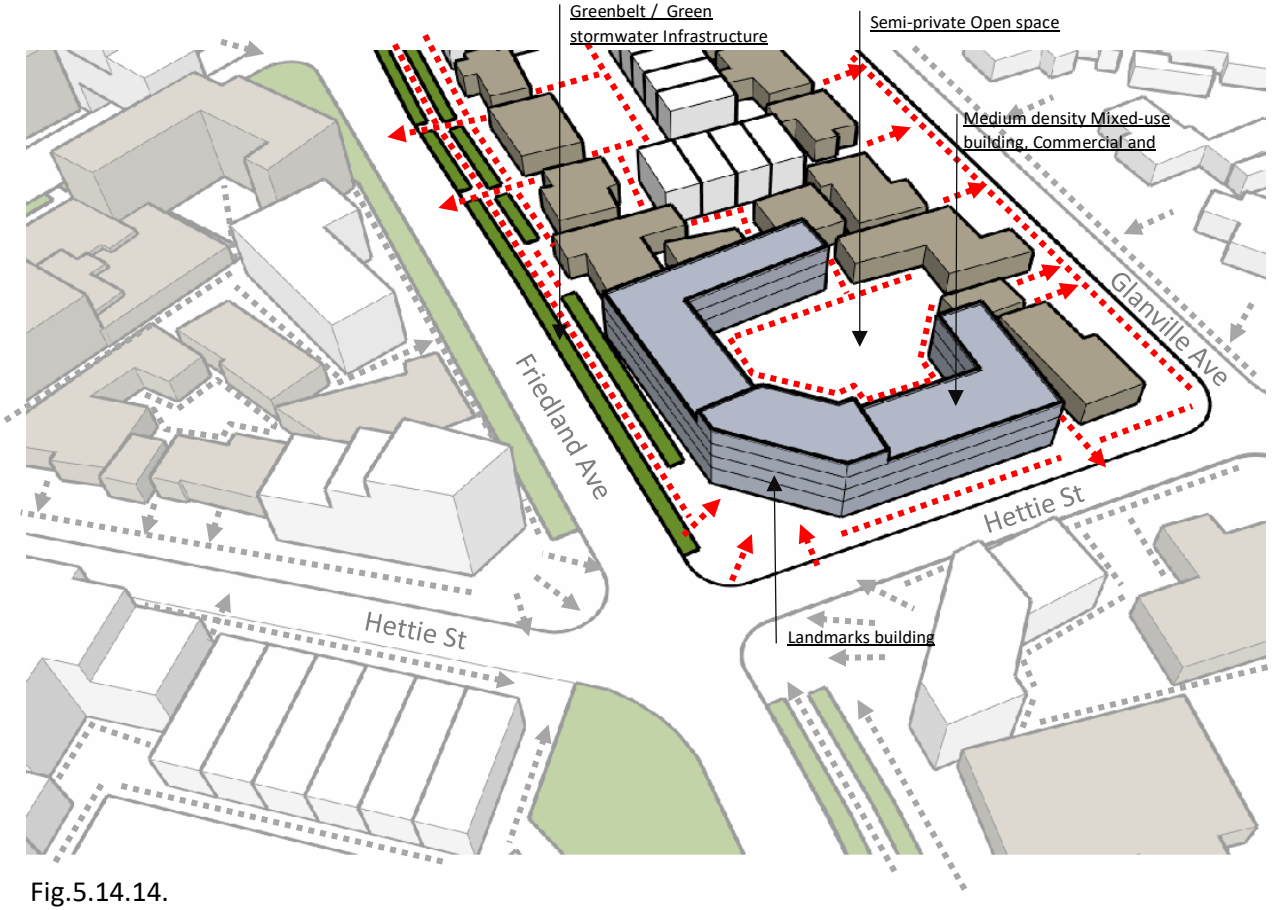


Fig.5.14.14.

Typologies: Type 6

Folded blocks

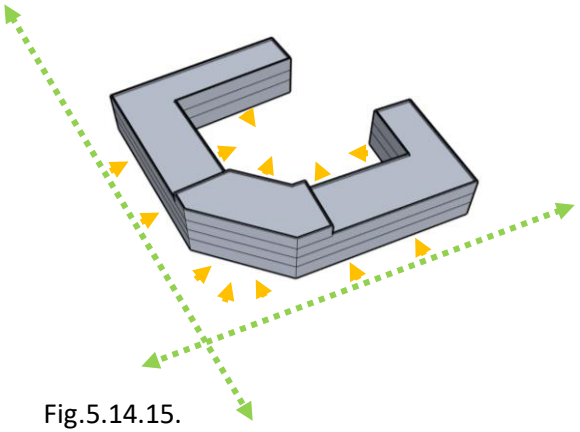


Fig.5.14.15.

Folded blocks, normally located on street corners, can serve as landmarks for people to easily find their way around. This form of block also divides public space and semi-public space.

Legends

New proposed buildings, Mixed-use Residential, Commercial and Retail

Existing houses

Landscaping

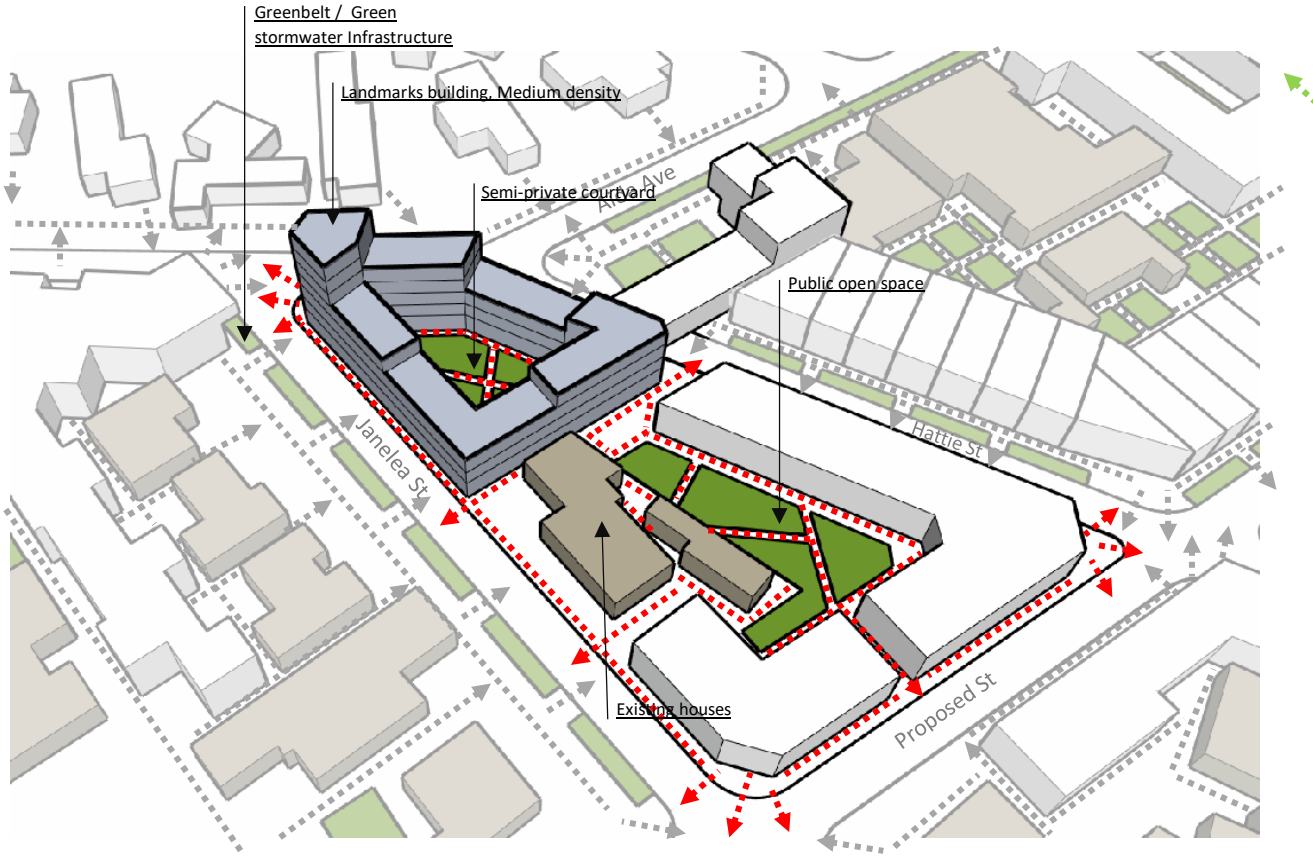


Fig.5.14.16.

Typologies: Type 7

Stepped block

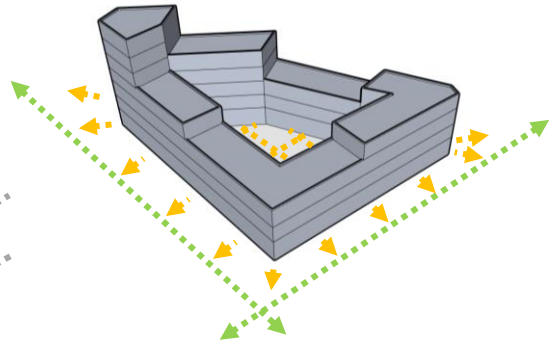


Fig.5.14.17.

The stepped block is mix-used development which can provide an interesting building shape and aesthetic, which further allows people to easily identify locations.

Stepped blocks could also divide public space and semi private space for different users, as well as providing an interesting street view.

Legends

New proposed Stepped block,Mixed-use Residential, Public facilities and Retail

Existing houses

Landscaping



Fig.5.14.18.

Typologies: Type 8
Linea block in between existing houses.

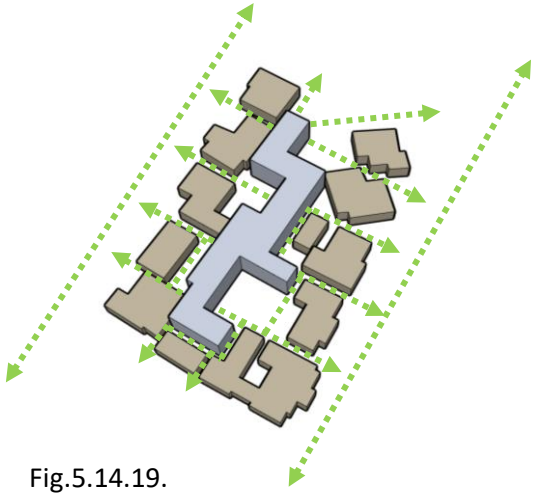


Fig.5.14.19.

In the developed area, there isn't much space left for new development. However, it would be conducive to a rethink of the backyard space and consolidation of these spaces for medium density development. This type of block could help to create many different-sized building, varied structure and a variety of open spaces for people to socialise.

Legends

New proposed , Residential Linea block in between existing houses

Existing houses

Landscaping

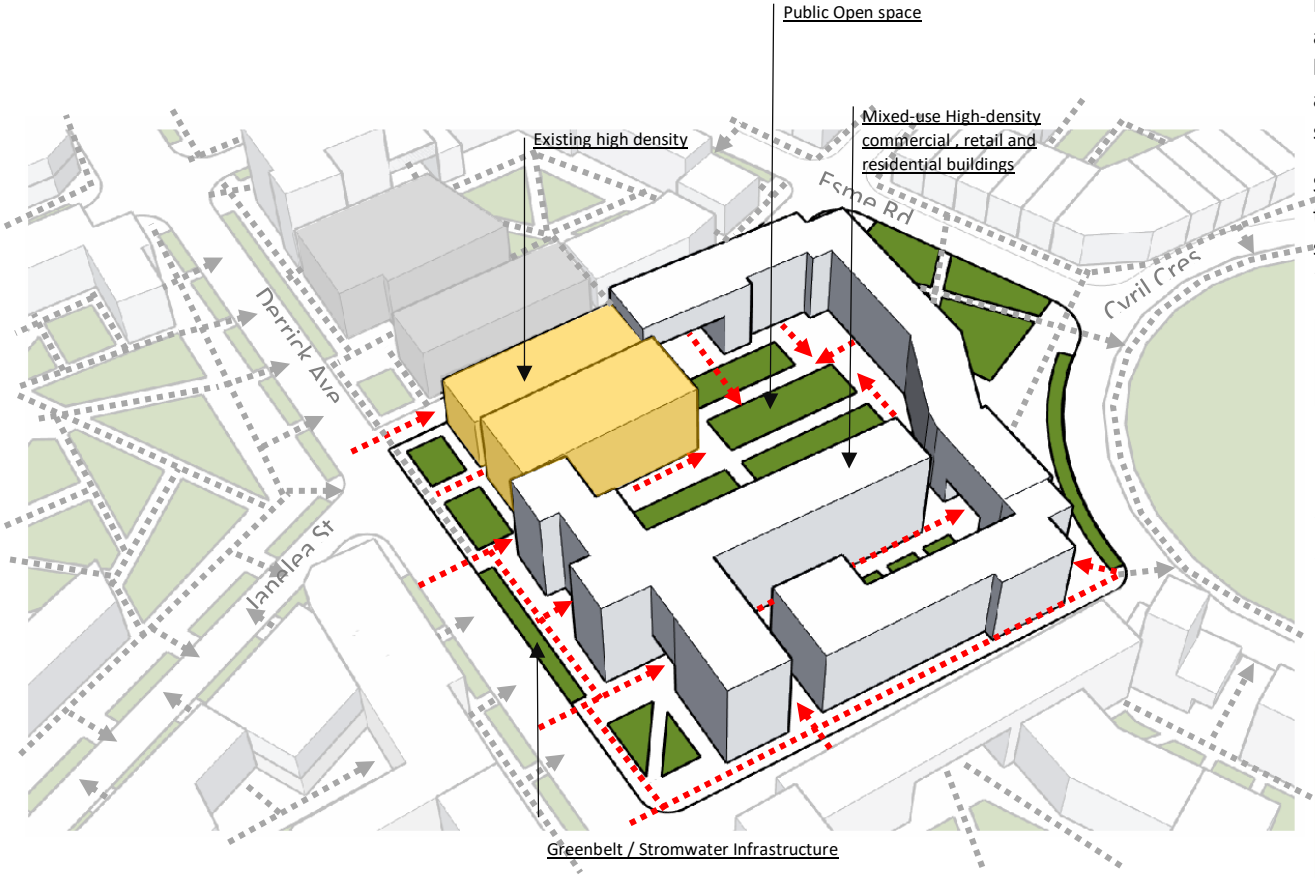


Fig.5.14.20. Typical mix-used block

Legends

New proposed buildings, Mixed-use development, Commercial and Residential

Existing buildings, Mixed-use buildings, Retail ,commercial and Residential

Providing alternative routes for people to walk past the area or access the public space, these alternatives could bring different experiences to various groups of people, as well as increasing opportunities for social bonding and social interaction.

Surrounding neighbourhoods could share the use of these semi-private / public spaces in thus enriching the social experience while improving social integration for



Fig.5.14.21.

Buildings are important space making tools; a variety of building types could form diverse spaces and, at the same time, attract people from different cultural backgrounds. At the detailed level, various building façades could also bring unique experiences to visitors. People would be afforded the opportunity to linger in the environment, one which itself increases the socio-economic opportunities.

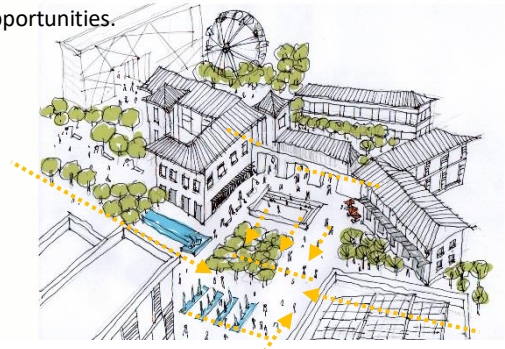


Fig.5.14.22.

From property development point of view, to encourage different scale of developers to participates the development process could increase job opportunities for communities, and it is an opportunities to decrease the social barrier when people work, live and play together.

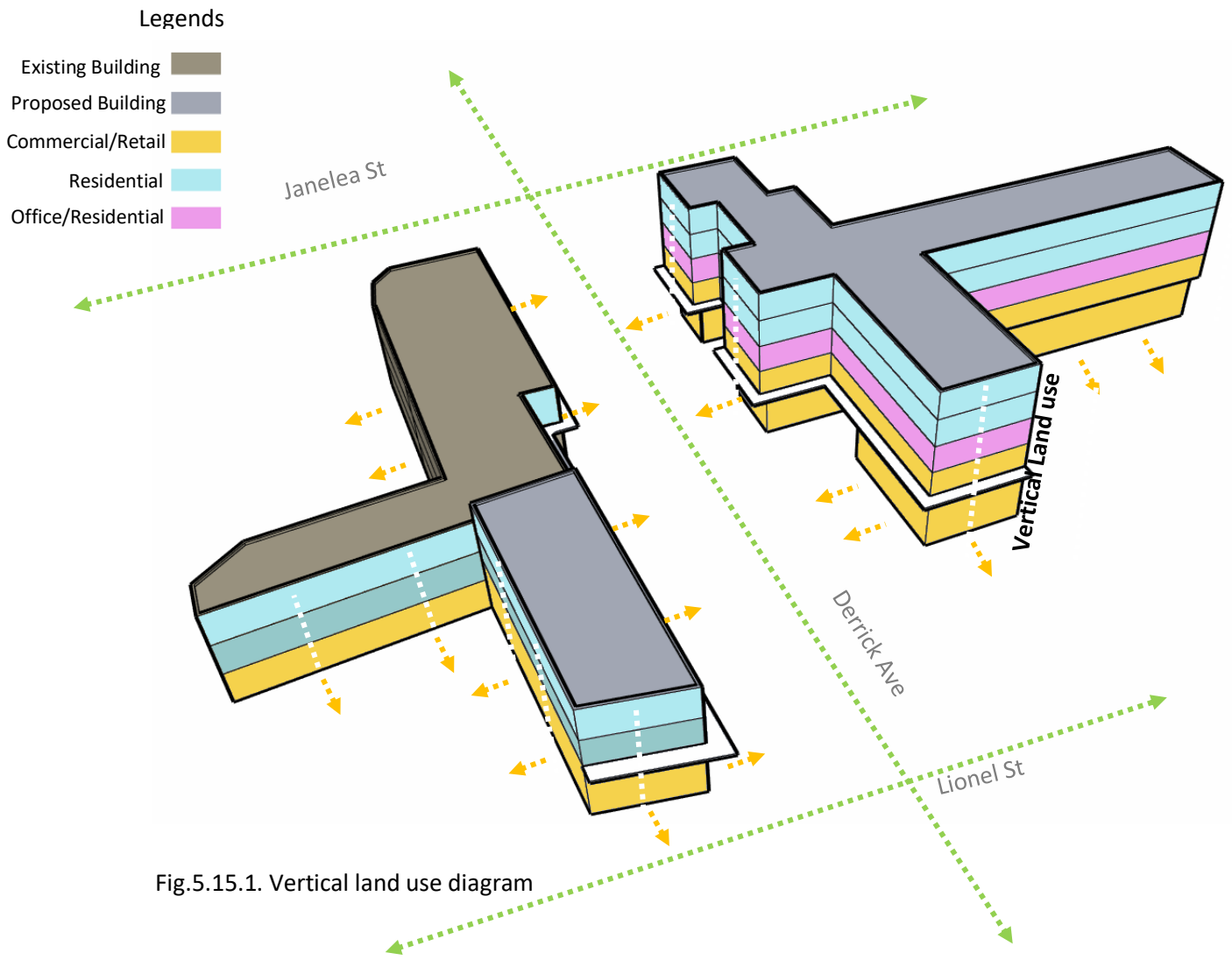


Fig.5.15.1. Vertical land use diagram

Vertical Land use

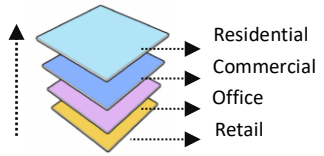


Fig.5.15.2. Vertical land use layers diagram

This diagram Provides a horizontal and vertical combination of uses.

Mixed residential and commercial land use can help to reduce travel distance, create microeconomics and increase opportunities for social interaction in the public spaces.

Vertical Land use

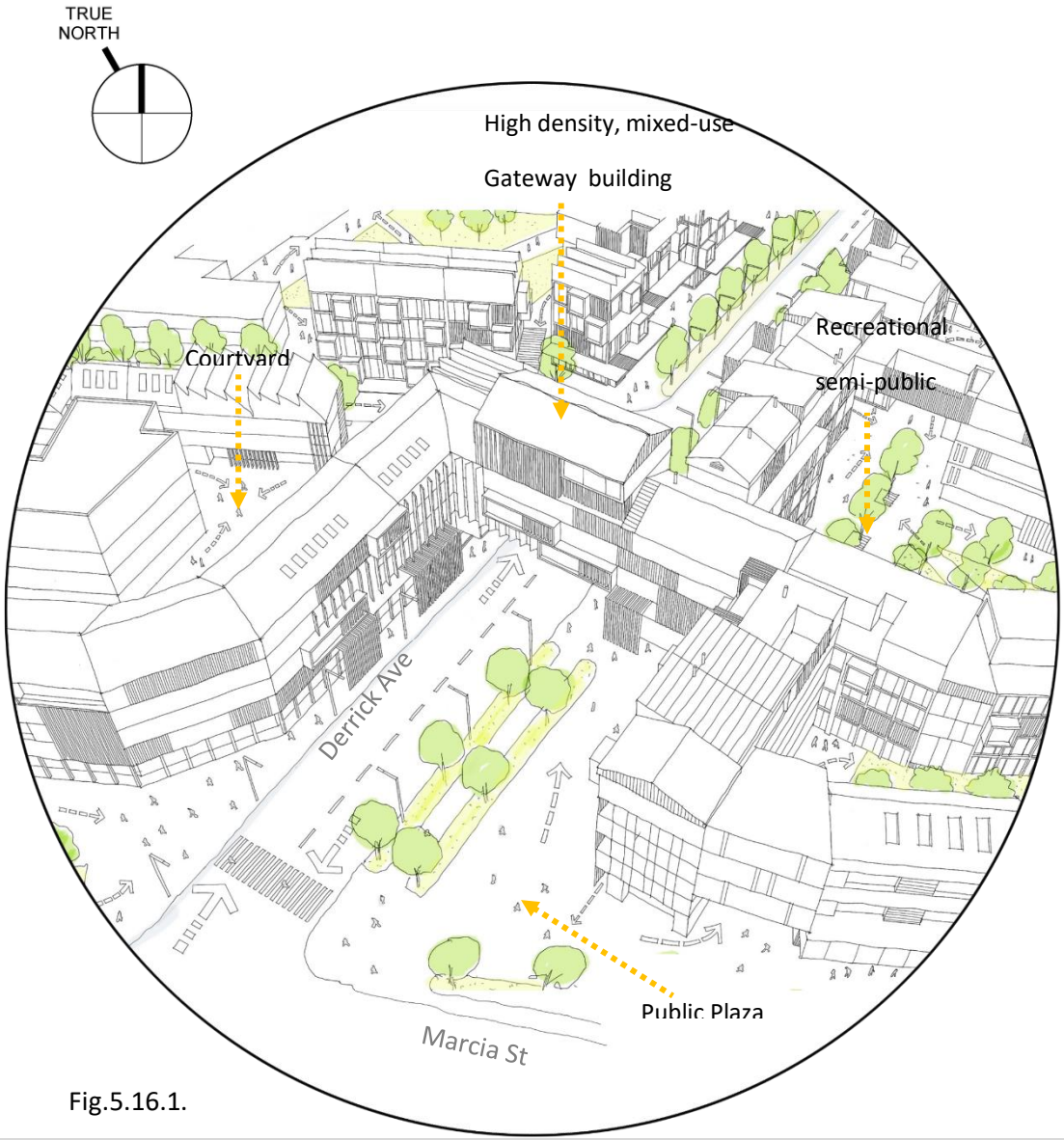


Fig.5.16.1.

Gateway Bird's-eye view

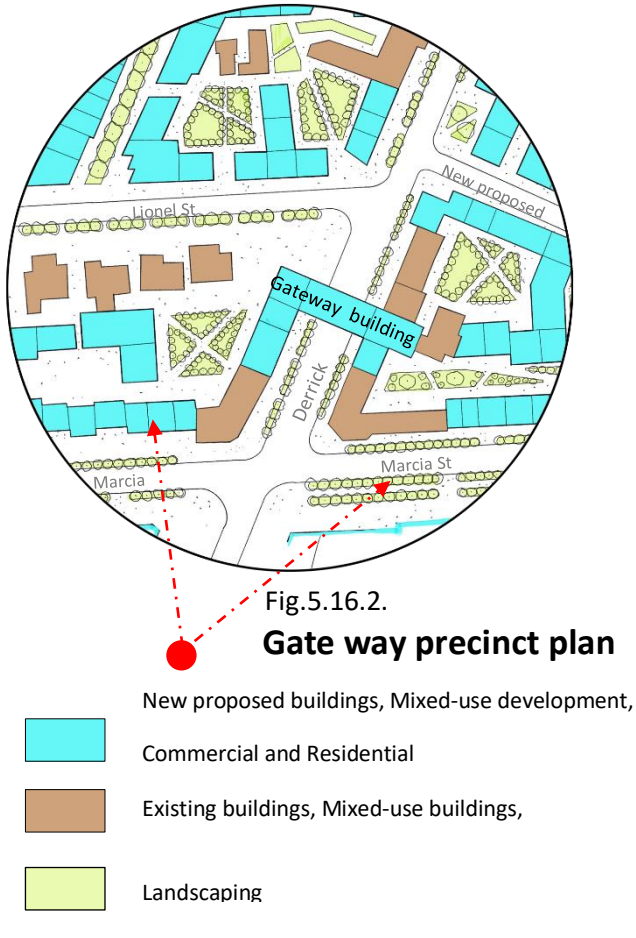


Fig.5.16.2.

Gate way precinct plan



Fig.5.16.3.

Gateway Sketch

Provide a horizontal and vertical mix of uses

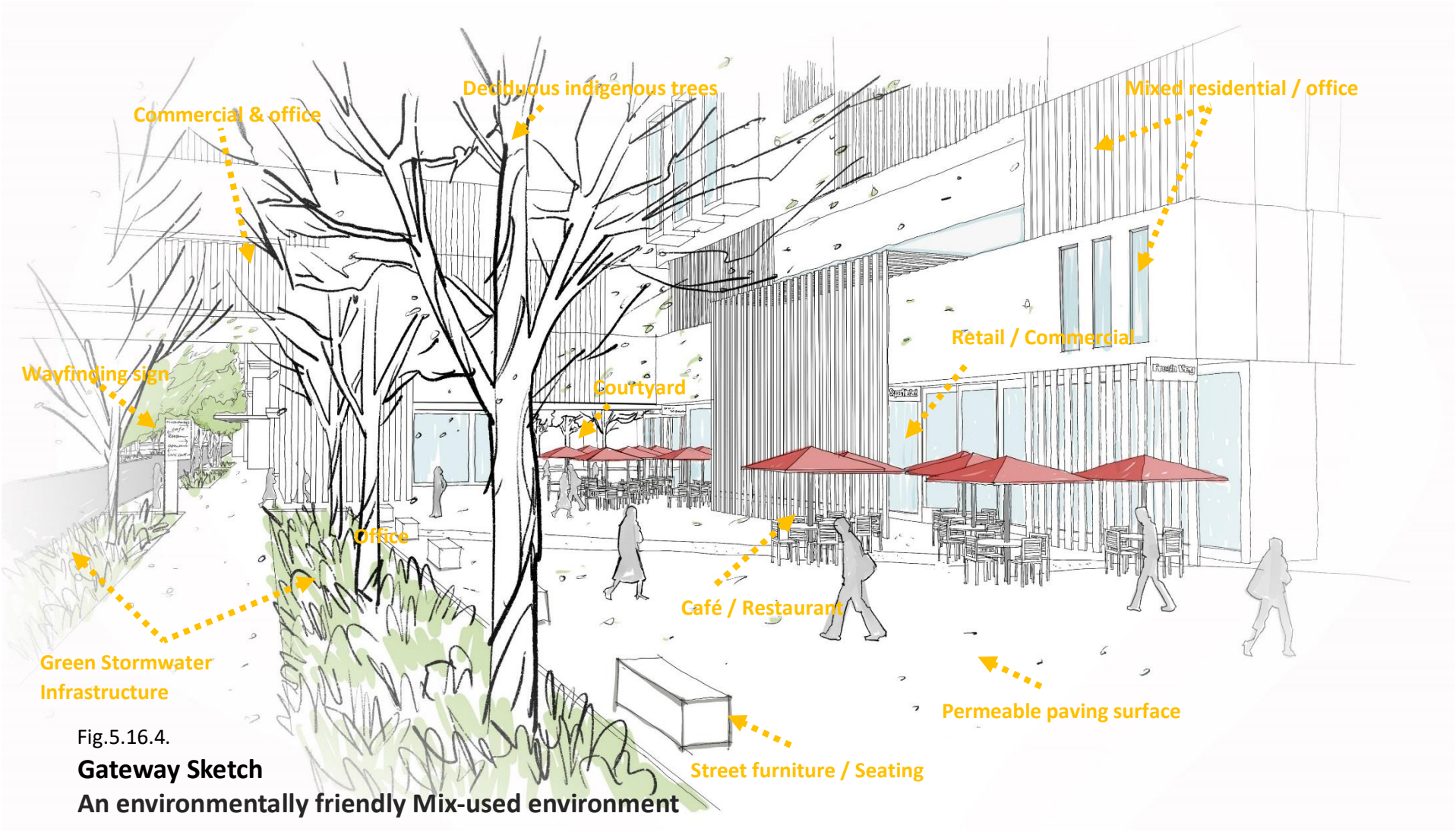


Fig.5.16.4.

Gateway Sketch

An environmentally friendly Mix-used environment

In today's cities, people are increasingly concerned about the liveability of the city environment. Hence, improving the urban environment and making cities became liveable is the goal. This research proposal discusses how social integration, from the large to the granular scale needs to consider the human social habitat carefully. Housing is the smallest urban element in the urban environment, one of the ways to increase social opportunities from the top down is to study the relationship between urban movement flow, urban structure and open space. From the bottom up, consideration must be given to the relationship between houses and public space.

This chapter is attempts to borrow the typical Chinese Siheyuan layout concept, as the Siheyuan layout has some positive aspects such as use of buildings to define edges and courtyards as a shared communal spaces for neighbours. Additionally, small communities are able to tie into the bigger scale communities.

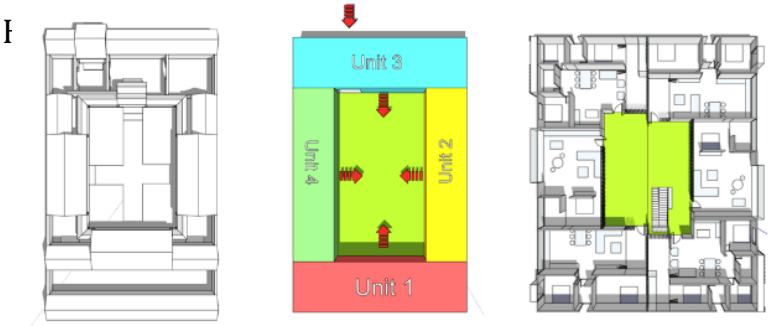


Fig.5.17.1. Siheyuan Layout type 1

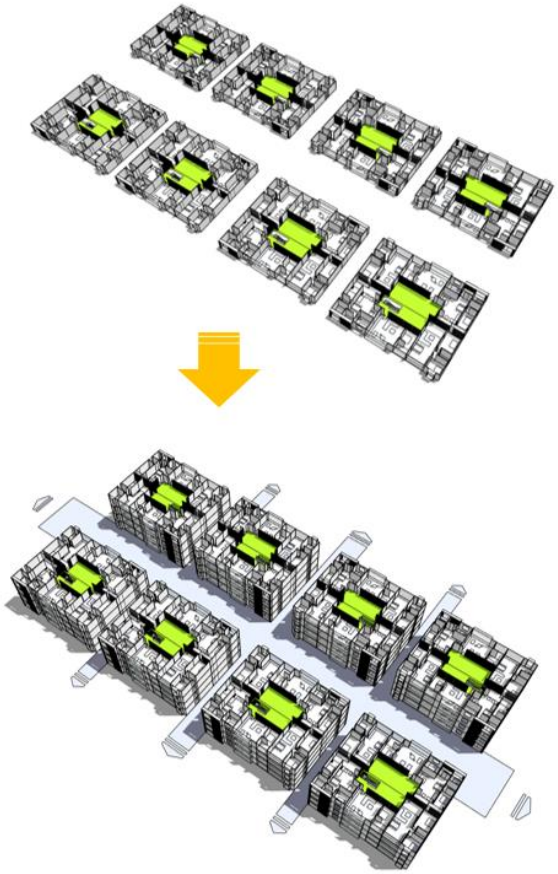


Fig.5.17.2. Siheyuan 3D building plan

This layout develops from the traditional Chinese Siheyuan concept. Siheyuan uses buildings to define space and allows the communal space in the middle, so that the when people use the communal space, it can increase of social opportunities. Moreover, this typical layout accommodates people with different lifestyles and different economic brackets. For example, this layout can accommodate four units or consolidate them into one unit and increase urban variabilitv.



Fig.5.17.3. Siheyuan Layout type 2

Type 2

Continuing the development of the layout from the type one, removing one building and making the individual communal space open to the public. This new Siheyuan layout is more open than the traditional Siheyuan concept - this new layout brings more social opportunities for the local communities. This layout also improves surveillance in the more public spaces, potentially increasing safety for the surrounding urban environment.

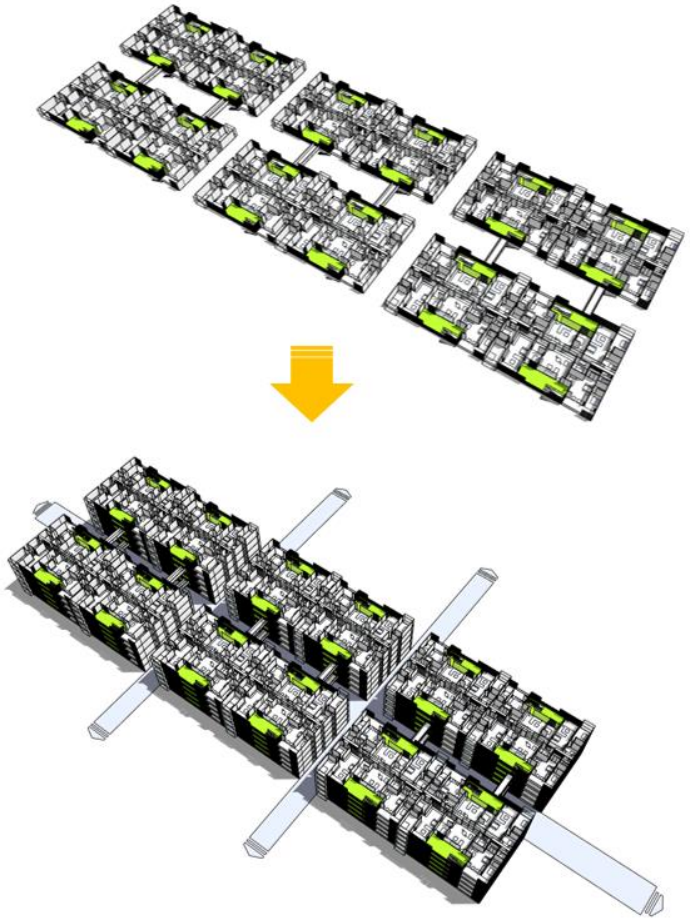
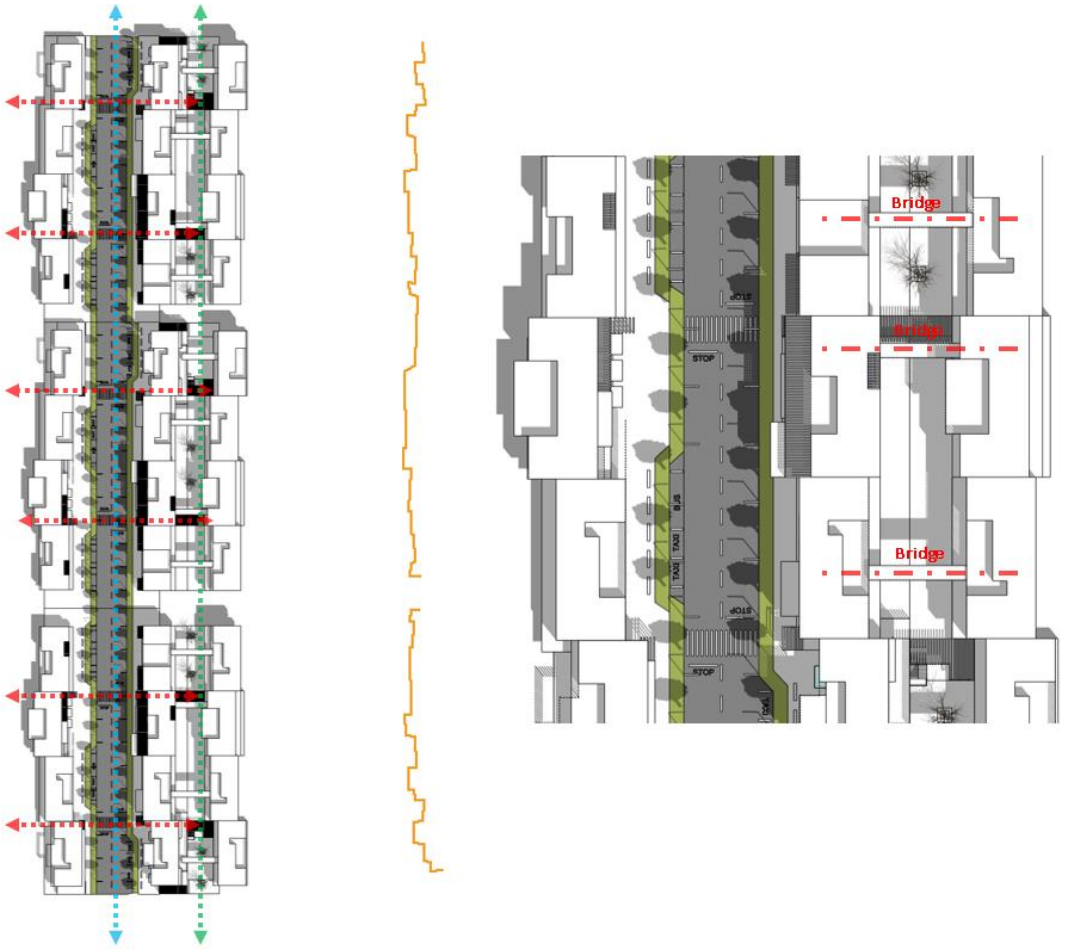


Fig.5.17.4. Siheyuan 3D building plan



Use of building to represent city wall and define the Cyrildene district edges. This integrates with undulating building edges that can allow space for a variety of activities.

Fig.5.17.5. Wall mediator and undulating edge incorporate Siheyuan concept

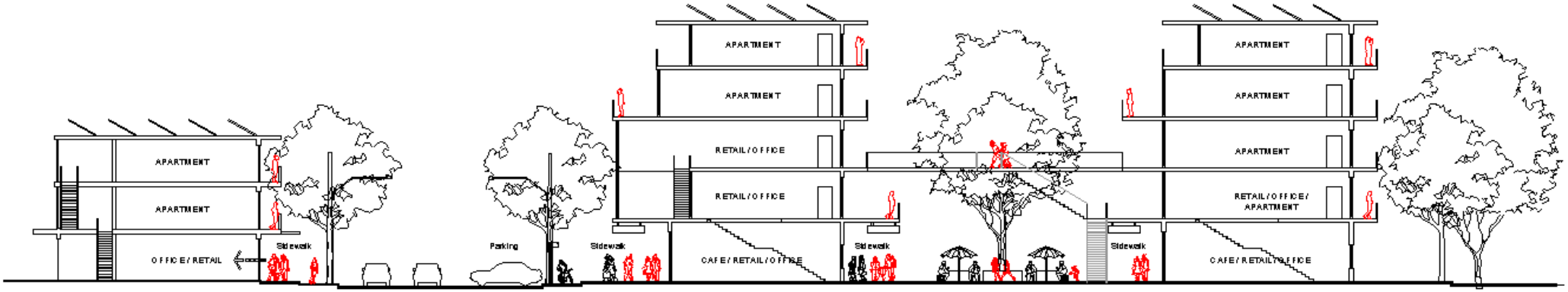


Fig.5.17.6. General cross section shows the Marcia st.

This general cross section shows Marcia St. as well as “the urban wall” area. Buildings in between allow different spaces for activities.

Multilevel connection within “the urban wall” area can improve connectivity for the area and bring multilevel social spaces for people to use.

The ground floor façade setback for people to walk can provide a better walking experience, especially during the wet season.

The building façade faces towards the public space which could increase social opportunities and increase surveillance for the public area.

Trees can always increase urban ecological value; trees can provide shade and a gathering space beneath for social activities.

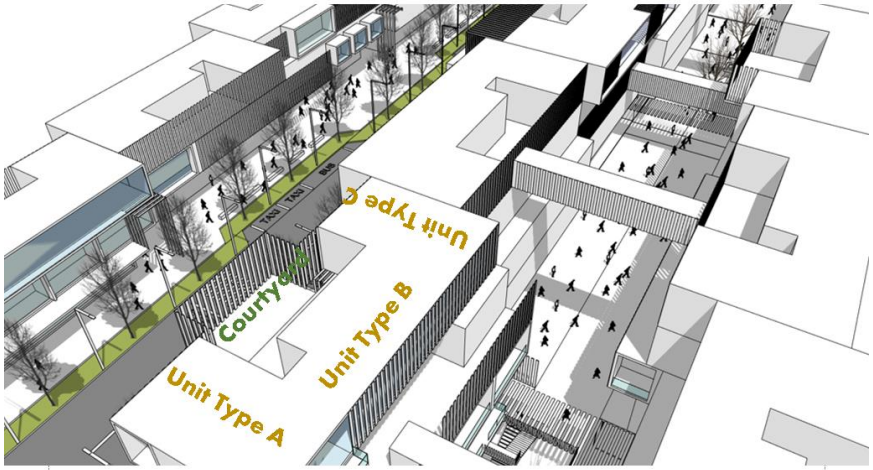


Fig.5.17.7. 3D view shows the integrated Siheyuna layout



Fig.5.17.8. General 3D Street view

These 3d sketches show the mixed-use building concept. The ground floor and first-floor are used for retail and commercial purposes and from the second floor up to fifth-floor are used as residential apartments. The apartment layout incorporates with the Siheyuan unit type 2 and also uses bridges to connect these apartments; thus these bridges are not only used to connect apartments but also for social activities.

The building façade should remain transparent to allow window shopping. People inside the building can also observe the outdoors.

In terms of the tree selection, deciduous trees should be encouraged which create less shade during the winter and generate more shade during the summer to maximise comfort.

Development guidelines:

BACKGROUND

Cyrildene precinct is approximately 30.44 ha and the average altitude in the Cyrildene area is 1674 meters. Cyrildene precinct's boundary on the East side is defined by the M33, on the West side by Aida St, and the South boundary by Marcia St. There are two new proposed economic corridors: the M33 and Mercia St. Derrick Ave as a redeveloped existing economic corridor as per the chart in below.

The proposed Cyrildene precinct includes mixed-use, commercial, retail, utility, parks and residential.



Fig.5.18.1. Locality map

The M33 in the Cyrildene precinct is one of the most important transportation routes in the Johannesburg region. As per the chart below.



Fig.5.18.2. Major movement and proposed building footprints

Land use: the new proposed land use on both sides of the M33 and Mercia St. is a mixed-use development.

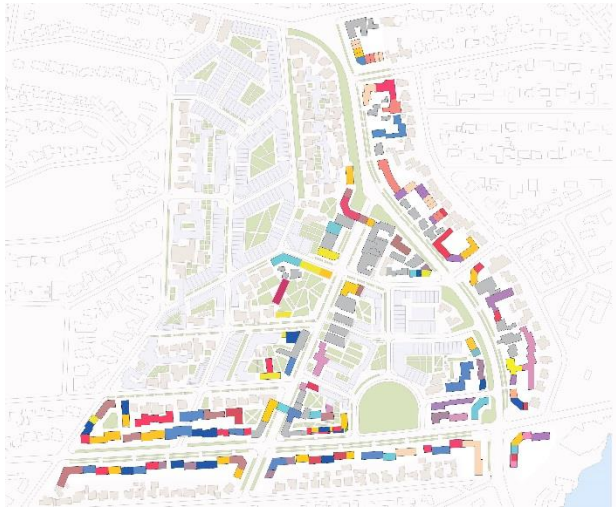


Fig.5.18.3. Mixed-use map

The southern side of the M33 permits five stories of mixed-use development and the northern side permits three stories of mixed-use development.



Fig.5.18.4. General section for setbacks

Setbacks: The M33 requires a building line of 9 meters along the M33 and Marcia St. to create a green belt and parkway environment along this side of these roads. The 9 meter setback includes: parking space, sidewalks, greenbelts, cycle lines and space for infrastructure installations. As per the chart below.

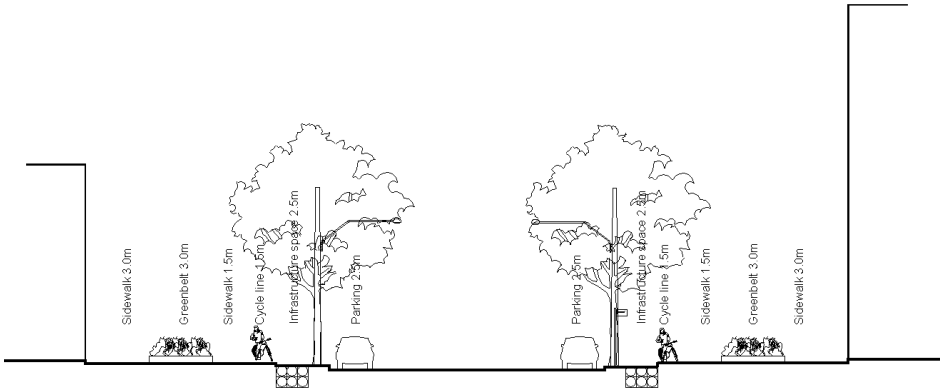


Fig.5.18.5. Street general section

Bus-stations on each side of Marcia St. require 3.0 meters by 20 meters for future BRT and bus stations as per the chart below.

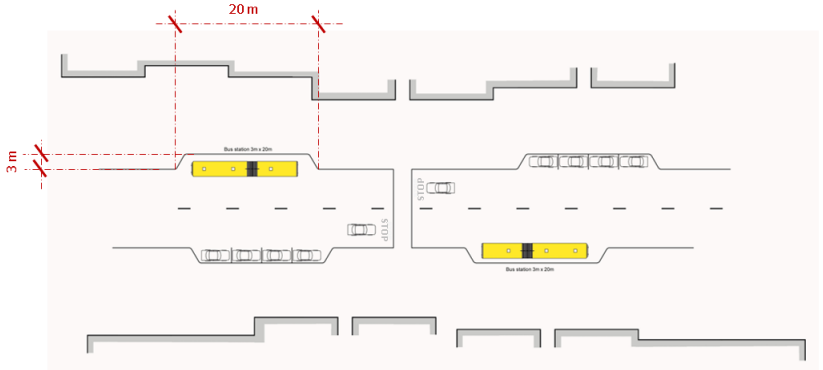


Fig.5.18.6. BRT station and bus station plan

Visible fence, electrical fence, security gate and burglar bars are not encouraged in Cyrildene precinct.



Fig.5.18.7. Not recommended fence styles

A boundary wall is not encouraged. However, the boundary wall is required to be 80% see-through and no hedge or creeper is permitted to occlude this area.



Fig.5.18.8. Boundary wall styles

Wayfinding signage should be strategically located on the intersections and in public spaces. The wayfinding signage should be user-friendly and direct visitors to toward the desired destinations. This signage should be uniform and located as per the signage map below.



Fig.5.18.9. Signage plan

General signage for businesses should considers visitor's experience and activities, signage orientation, visibility and legibility for drivers and pedestrians. Illustrated below is an example of potential wayfinding signage.

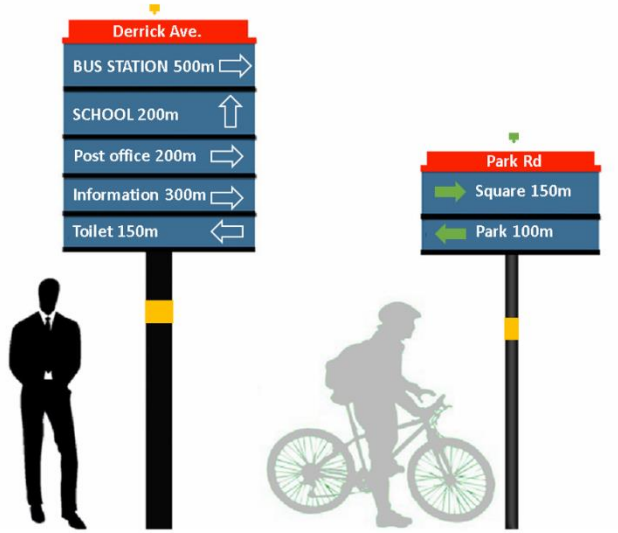


Fig.5.18.10. Way-finding signage elevation

The primary signage for buildings should be located above the entrance and the side of the building if applicable.

The signage material should be inflammable and durable. The premier signage should be fixed and non-animated. Third party signage should not be permitted.

The size of signage on the ground floor window should be less than 20% of the window size and should not block the display windows.

No hand-written signage should be permitted in the Cyrildene precinct.

No business signage on the building facade above the second floor or roof signage should be permitted.



Fig.5.18.11. Recommended Window Signages

ADVERTISING

General advertising and temporary advertising should be required to fit on the pre-designed signage space as per the diagram below.

The advertising board or menu board should be placed on the side of the entrance and ensure they do not block the sidewalk. The illustration below provides an example of an advertising board.



Fig.5.18.12. Advertising board elevation

LANDSCAPE

Only ingenious plants should be permitted for all the future developments in the Cyrildene precinct. All alien vegetation needs to be removed completely. Water-sensitive design should be encouraged and implement in new and existing developments. All pavements must be constructed from permeable material. All new and existing buildings need to install a rainwater-harvest system which needs to be integrated into the irrigation system or used for general purposes.

Street market

Street markets are popular in Chinese culture. In Cyrindene most of the fresh produce markets are located on each side of Derrick Ave. The street markets provide social opportunities for Chinese communities as well as visitors. To encourage this, a designated area should be provided with as little traffic impact as possible. All temporary street markets are encouraged in the designated area. Street markets should not be allowed to block sidewalks and roads.

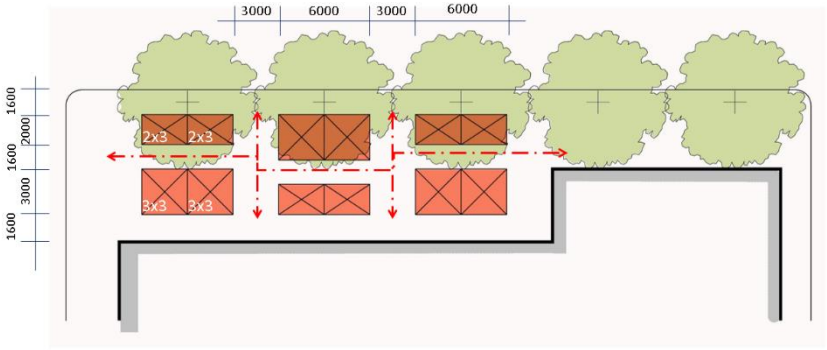


Fig.5.18.13. Street market diagram

BUILDING FRONTAGE

The M33 and Marcia St. is a high visibility vehicular and pedestrian movement corridor; it therefore should have primary frontage condition on all sides. Additionally, the retail, office and commercial components of the developments should be located along this edge, and should have active frontage i.e. be visually permeable to the M33 and Marcia St.

Derrick Ave is an important economic corridor, therefore frontage along this portion should take account of the high visual impact that this exposure will have. Moreover, the building façade should encourage the building of shelter, so that during the wet season people can still walk along the building frontage area.



Fig.5.18.14. Building frontage diagram

SETBACK LINES

The new Cyrildene precinct plan requires a building line of minimum 10 meters along the M33 and Marcia St. to create green belts and parkway environments along this stretch. All new developments in Derrick Ave. will require a setback of 10 meters to extend the multi-functional parkway environment along this route, except if the building has integrated the walkways, in which case the setback can be relaxed from 10m to 2.4m. The integrated walkway plan needs to be reviewed individually and get approval from the local authority. The integrated pathway should extend from the permanent structure and the width of the walkway should not be less than 3.0m.

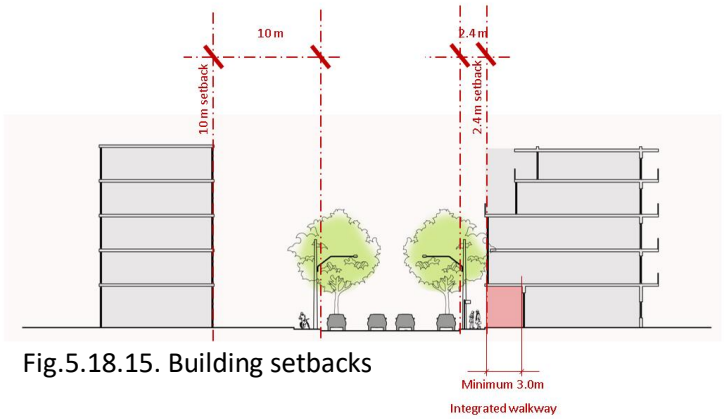


Fig.5.18.15. Building setbacks

PEDESTRIAN ACCESS

It is imperative that pedestrian access is provided to all new and existing development areas. This structuring principle is to cater for, and encourage, people living or working in the neighbourhood making use of public transport as an alternative to private transport.

GREEN

Indigenous plants are encouraged and no invasive plant listed in the Department of Environmental Affairs of South Africa should be permitted.

Existing storm-water infrastructure runs off to the south due to the geography of the site. Higher density development in the precinct could help to reduce storm water runoff, if water-sensitive design gets integrated into the new and existing development areas.

The streets within the precinct can be viewed as an ‘ecosystem’ whereby natural drainage can take place. Permeable paving could decrease the storm-water runoff, creating an enjoyable environment.

BUILDING HEIGHTS

Buildings on the west side and along the M33 permit 5 storeys. Buildings on the North side and along with Marcia St. permit five storeys and both sides of Derrick Ave permit five storeys, with the height roof ridge not exceeding 20m.

Buildings on the east side and along the M33 permit 3 storeys, buildings on the South side and along with Marcia St. permit 3 storeys, with the height roof ridge not exceeding 12m.

In the general the residential area permits 3 storeys, with the height roof ridge not exceeding 12m.

The landmark buildings need to be assessed individually, however the height of the roof ridge should not exceed 40m.

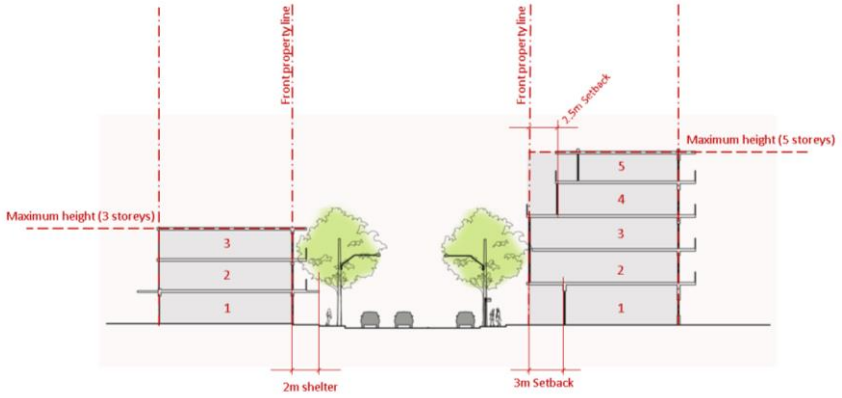


Fig.5.18.16. Building heights

MATERIAL

Material should consider the following principles: durability, sustainability and aesthetic.

All building materials should be durable and easy to maintain.

The side of building finish should be similar to the finish of that used in building façade.

The building material colour should match the surrounding existing colour.

The choice of colour should take consideration the local cultural.

Implementation process

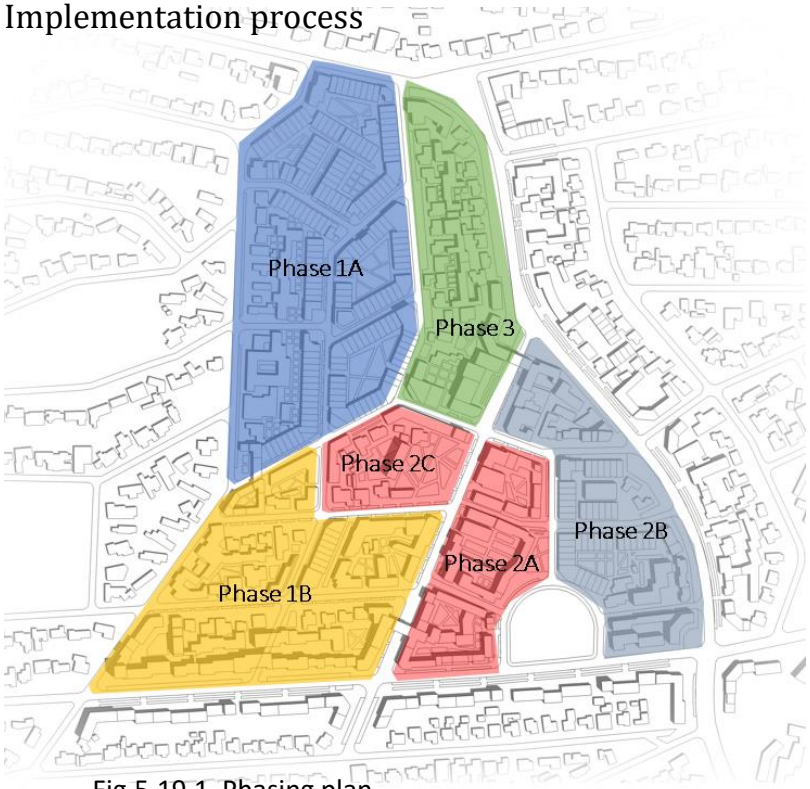


Fig.5.19.1. Phasing plan

Implementation principles

- The implementation process should be followed to achieve urban design principles.
- The essential elements such as gateway, landmarks and open space should follow the urban strategies.
- The entire implementation process needs to comply with the sustainability concept.

- Phase 1A / 1B
  - Purchase and consolidate lands
  - Mixed use residential development
  - Sell sectional title apartment to get funds and increase population density to the area
  - Purchase and consolidate lands for the phasing 1B area
  - Rezoning for Phase 1B
  - Mixed use commercial development
  - Use the profit to develop the public space and public facilities
- Phase 2A/2B
  - Purchase and consolidate lands.
  - Rezoning
  - Mixed use residential development
  - Sell sectional title apartment get funds and increase population density to the area
  - Purchase and consolidate lands for the phasing 2B area
  - Mixed use commercial development
  - Use the profit to develop the public space and public facilities
- Phase 2C
  - Purchase and consolidate lands.
  - Rezoning
  - Mixed use residential development
  - Green space development
  - Public

6.0 CONCLUSION:

This research proposed to understand the Chinese communities' historical background in South Africa and, more specifically, Cyrildene precinct, their cultural context and the site development movement.

The literature review analyses current theories, principles and traditional Chinese urban planning and design movements and how to use these theories to examine the current urban design scheme.

The precedent studies provide a better understanding of current urban design issues and the methods to improve them.

The design process develops appropriate design principles that can apply to Cyrildene precinct in response to the title of the research, "Promoting urban social integration through urban design intervention in Cyrildene".

The Urban design process targets different areas and aspects to investigate urban issues and potential opportunities for the area. This facilitates a better understanding of urban design as a selection of tools to marry various aspects of the urban environment such as socio-economic, urban ecology, cultural, heritage, spatial arrangement as well as urban sociology.

From past to present, many cities' planning and design are still driven by political ideas and people are beginning to realise that this is not necessarily conducive to environmental friendliness, and these cities are not sustainably scalable in social, economic, ecological, cultural, sociological terms (Ian etc 1985). Urban design as profession attempts to address urban spatial issues and provide solutions to improve the urban living environment.

Beyond the political aspects, Trancik (1986) emphasises that many designed spaces lack a consideration of how local communities use them and, ultimately, the space becomes non-functional and ill-shape. A critical contributing factor to ill-shaped spaces is an inappropriate urban development process. There are many urban spaces that have problems due to inappropriate urban planning and design processes, and this phenomenon is still ongoing. Urban design is emerging to improve this situation toward more sustainable urban environments.

"What makes a good city?" Might be a meaningless question. Cities are too complicated, too far beyond our control, and affect too many people, who are subject to too many cultural variations, to permit any rational answer (Kevin Lynch, 1981,pp.1-2).

Moreover, Urban design is a circular process, when superimposing the different aspects one may encounter conflicting aspects and considerations, such as permeability and variety, legibility and robustness and visual appropriateness, richness and personalisation.

Urban designers need to always review the each of aspect during the design process to get the best design result. Urban design can help to improve the urban living environment and create a better connection between social life and the structure of the built environment.

This research process resulted in a number of findings relating to the research questions:

Based on the integrating cities concept, how can the Chinese community naturally integrate into the surrounding community?

Structurally providing different types of space linked together that can help to create social opportunities. Furthermore, the landscape can always be used as an instrumental tool to bring people together. The

proposed civic space uses a public space for cultural exchange and public events that can also promote social integration.

How can urban design intervention deal with the Cyrildene district's interface with the rest of the urban area, and vice versa?

People are generally concerned about safety in Cyrildene district. Introducing mixed used development at the Cyrildene edging area and at the same time increase density and building height to increase surveillance of the public space. Undulating urban edges can generate many urban niches, which can be used for varies activities. The mixed use development allows the ground floor to be used for retail and commercial use, which can increase social opportunities for people with a various reasons for visiting the area.

How can people from different countries integrate into the multicultural urban environment in such a way that people can still enjoy the cultural atmosphere of these urban spaces?

From the urban design point of view, a comfortable environment can always entice people to visit and enjoy the area. In this sense, "comfortable" means the area is easily accessible, comfortable to walk, has easily identifiable orientations, can accommodate various spaces and activities and various cultures, and incorporate public and private spaces with landscaping. People can have a choice of when they want to get to a particular destination. Consequently, people who come from different countries can always find spaces in the Cyrildene district where they feel comfortable and enjoy staying. People can also find suitable activities in which the can participate or experience something different.

7.0 Final Design Documentation

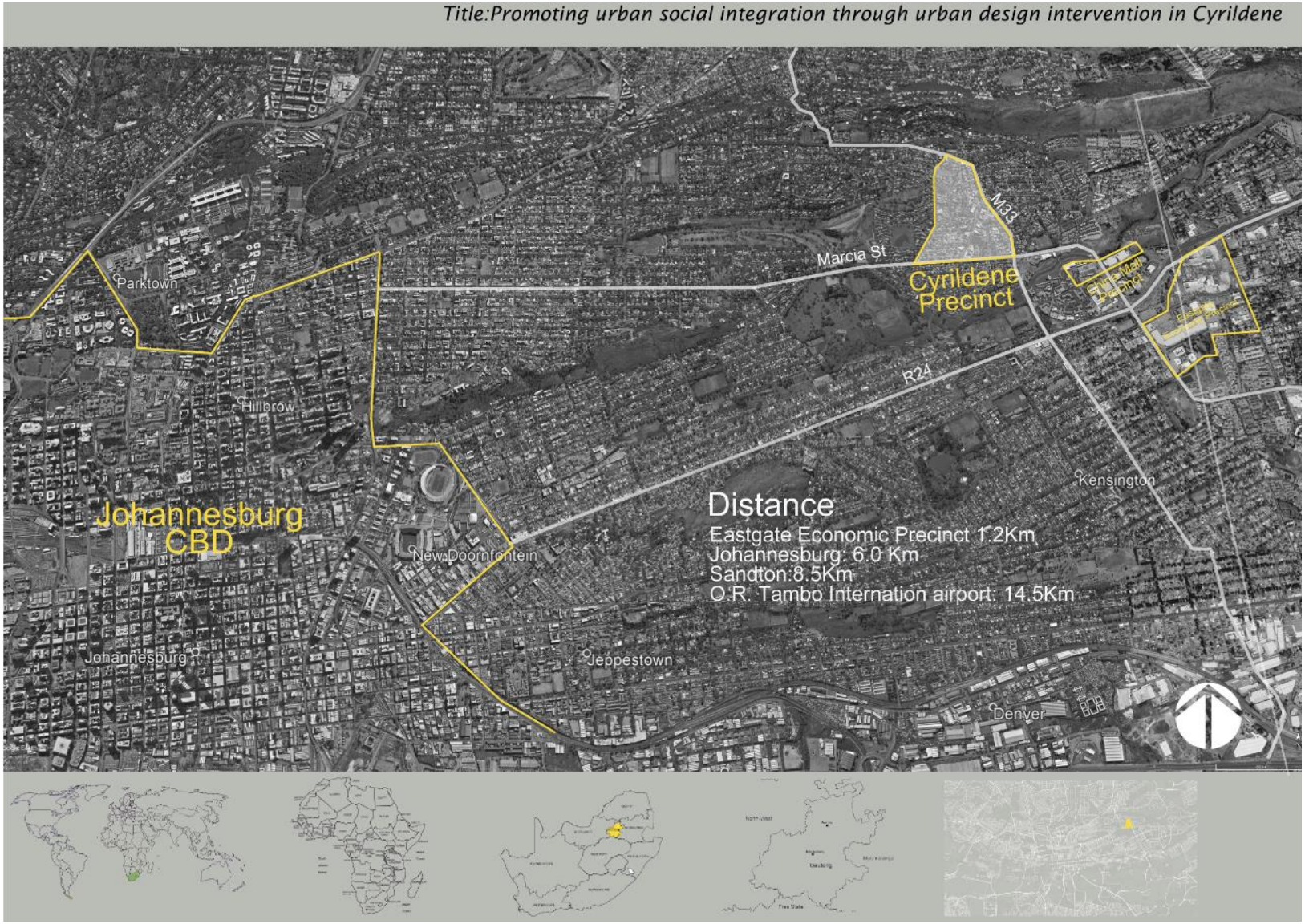


Fig.5.20.1 poster 1-9



Fig.5.20.2 poster 2-9

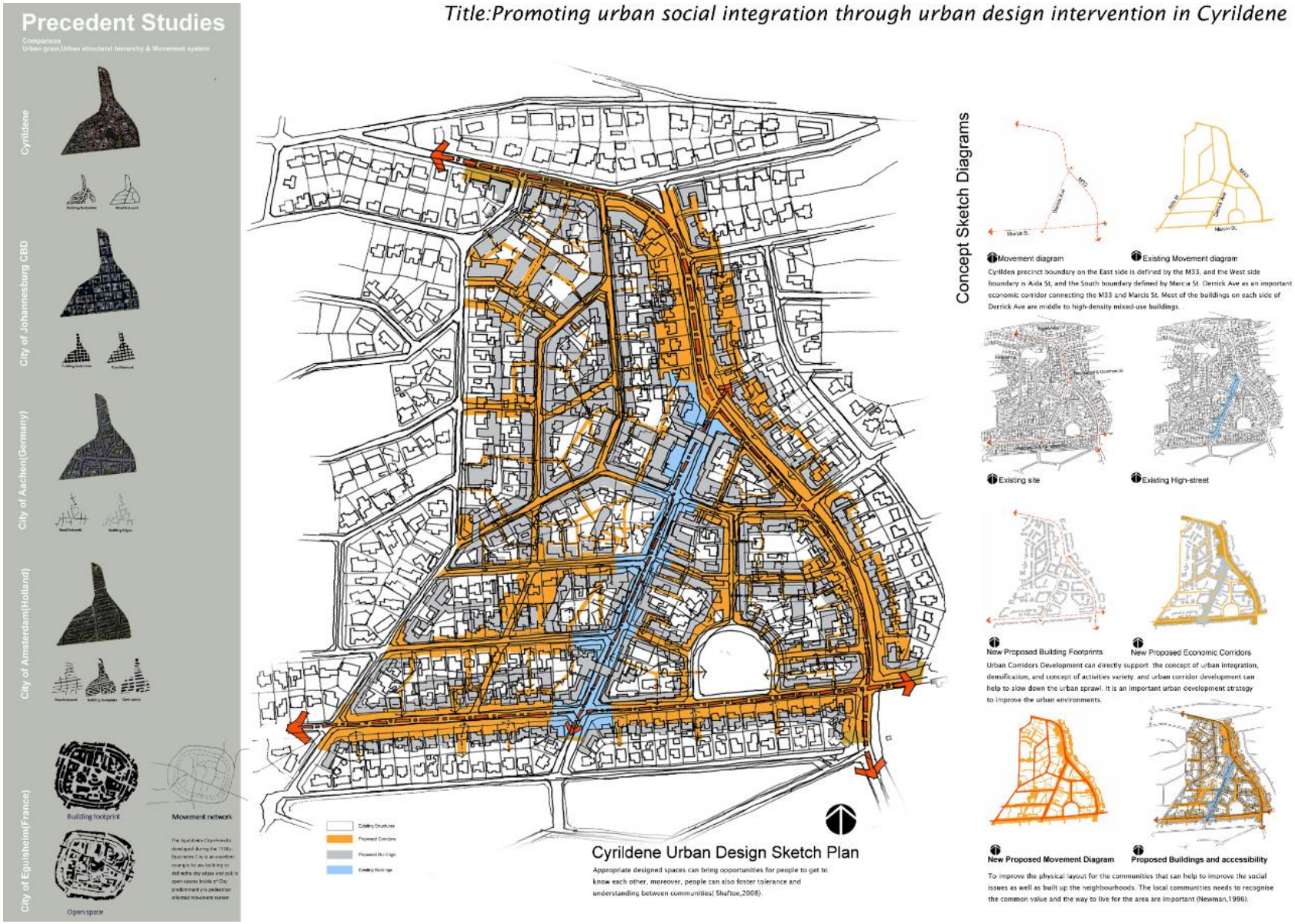


Fig.5.20.3 poster 3-9

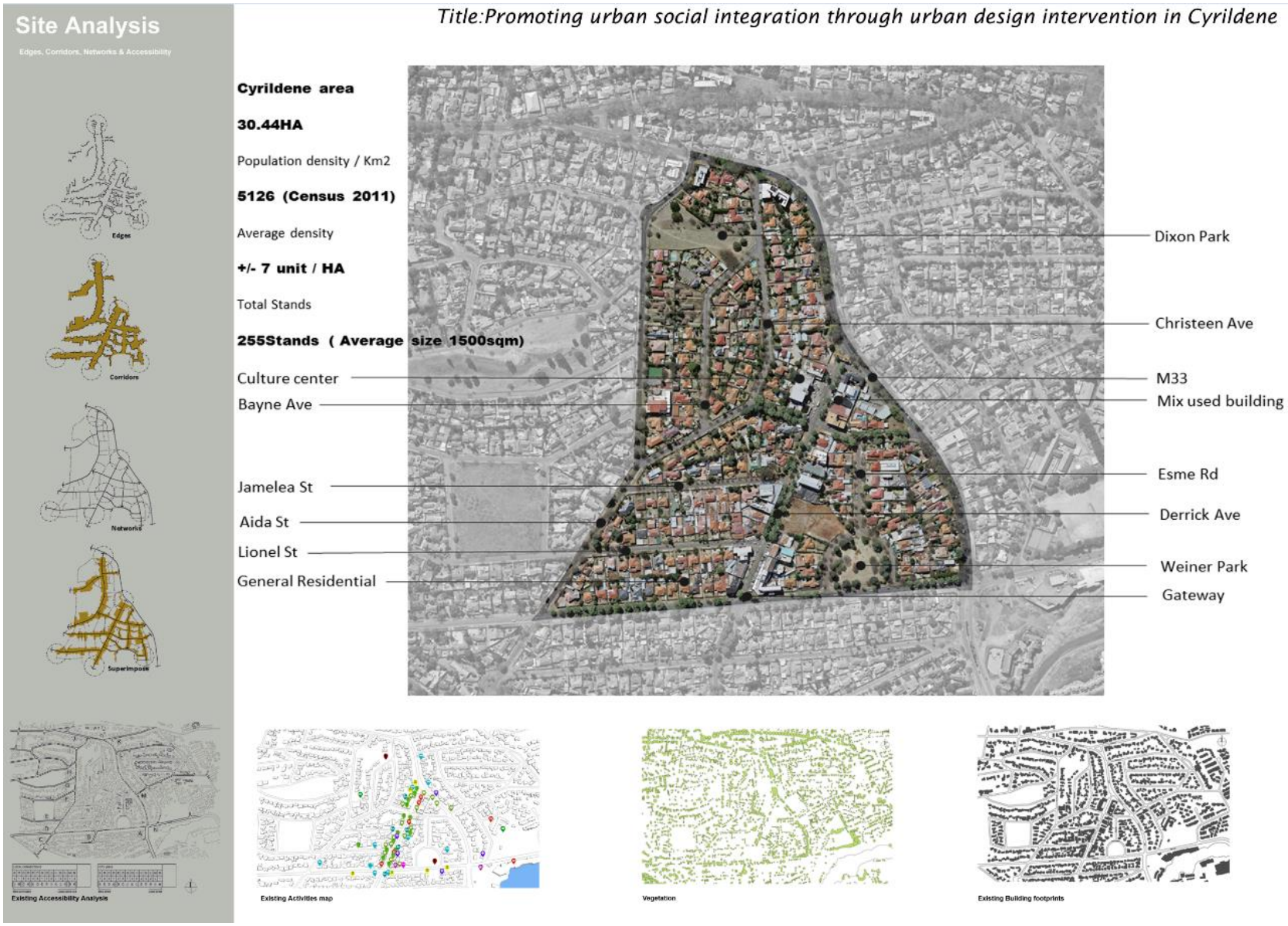
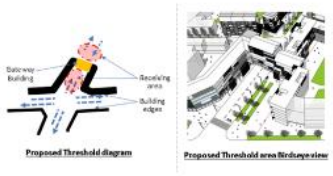


Fig.5.20.4 poster 4-9

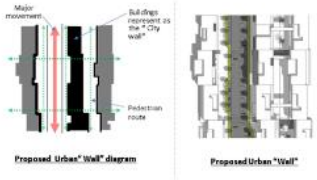
Title:Promoting urban social integration through urban design intervention in Cyrildene

1



Principle 1: Gateway
Better access control
Improve the legibility
improve the identity
Imgenability

2



Principle 2: Urban "wall" fortification
Use buildings to define the space
provided social opportunties
surveillance to the sourounding environment
Improve the legibility and identity to the area

3



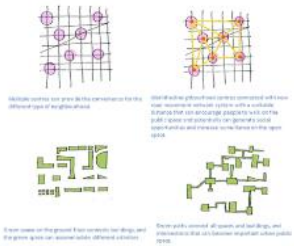
Principle 3: Landmarks
Improve the legibility
Emphasis local characters
identity the location and space sequences
Bring visitor's imagenability

4



Principle 4: Civic space
Sesen of space for sourounding communities
Space for celebrate the diverse cultures
Social economic value
Public activitis and social intergration opportunties

5



Principle 5: Multi nodes / Open space
Multi node model can help to reduce the traffic jam compare with the traditional central business district.
To ensure all people can safely access public spaces
To provide comfortable and enjoyable public spaces
To provide multi-functional use space
To encourage activities on the non-motor vehicle streets
To provide the sense of places with local characters

6



Principle 6: Personalization of the building typologies.
To divided the area to achieve maximum personalization of the building typologies, with varies in size, height, depth and building facades. To create a unique and memorable urban environment

7



Principle 7: Undulating urban edges
Provided space for social opportunities
Space variety and building variety
Avtivities variety
Business opportunites and job opportunities

8



Principle 8: Permeability
Better accessbilities
Alternative route through the environment.
Efficiency
Increase of walkability

Design Principles

Fig.5.20.5 poster 5-9



Fig.5.20.6 poster 6-9

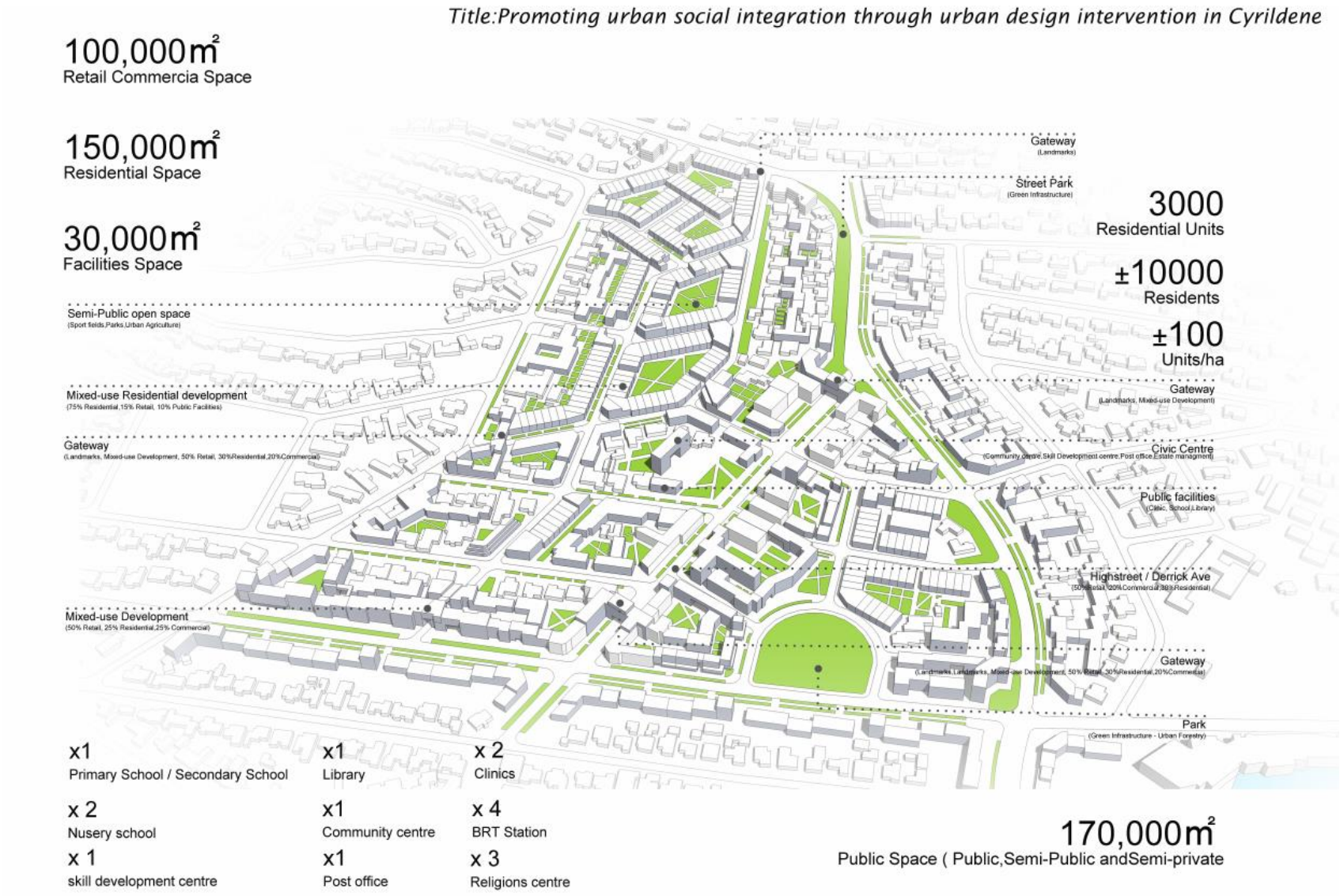


Fig.5.20.7 poster 7-9

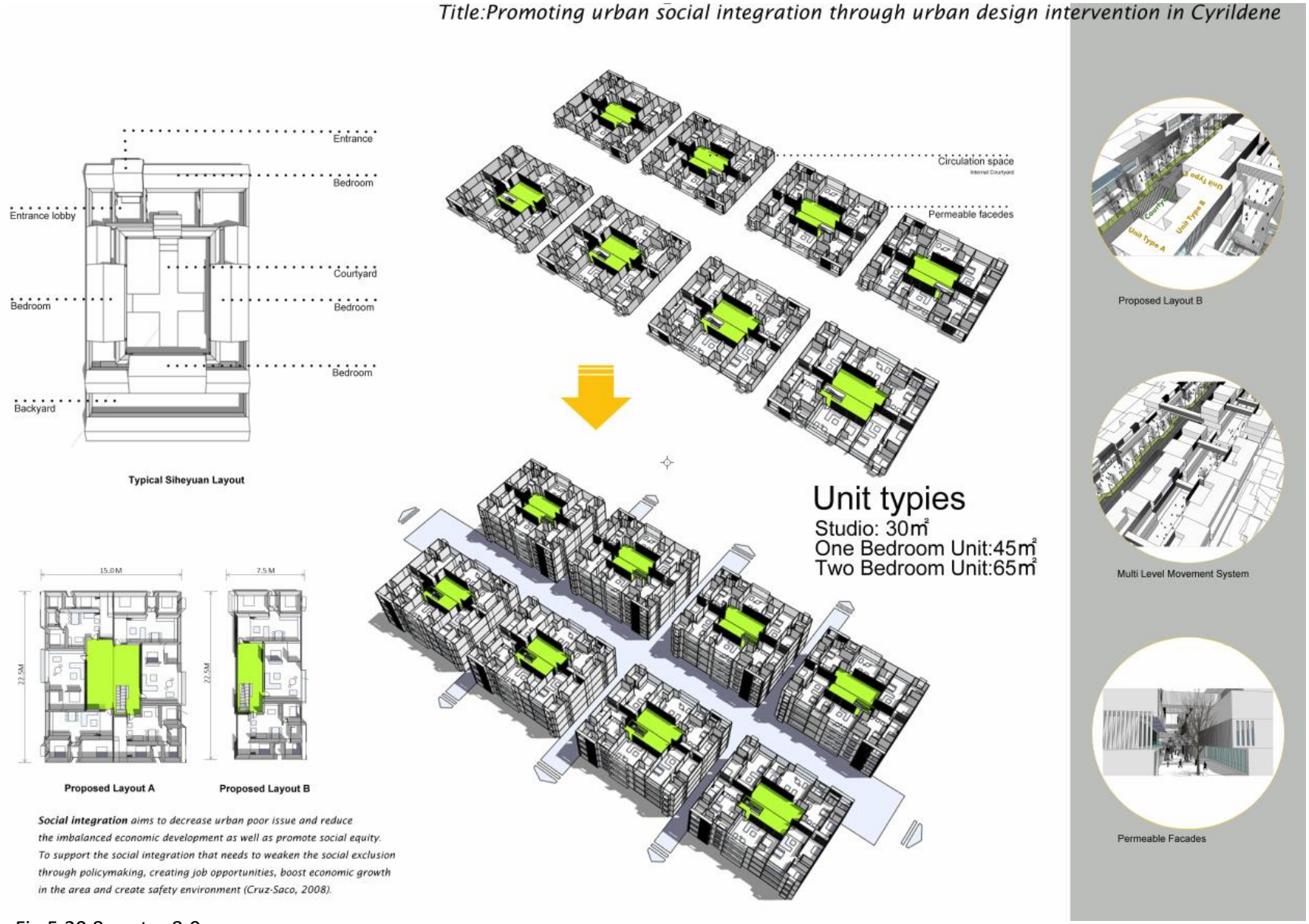


Fig.5.20.8 poster 8-9

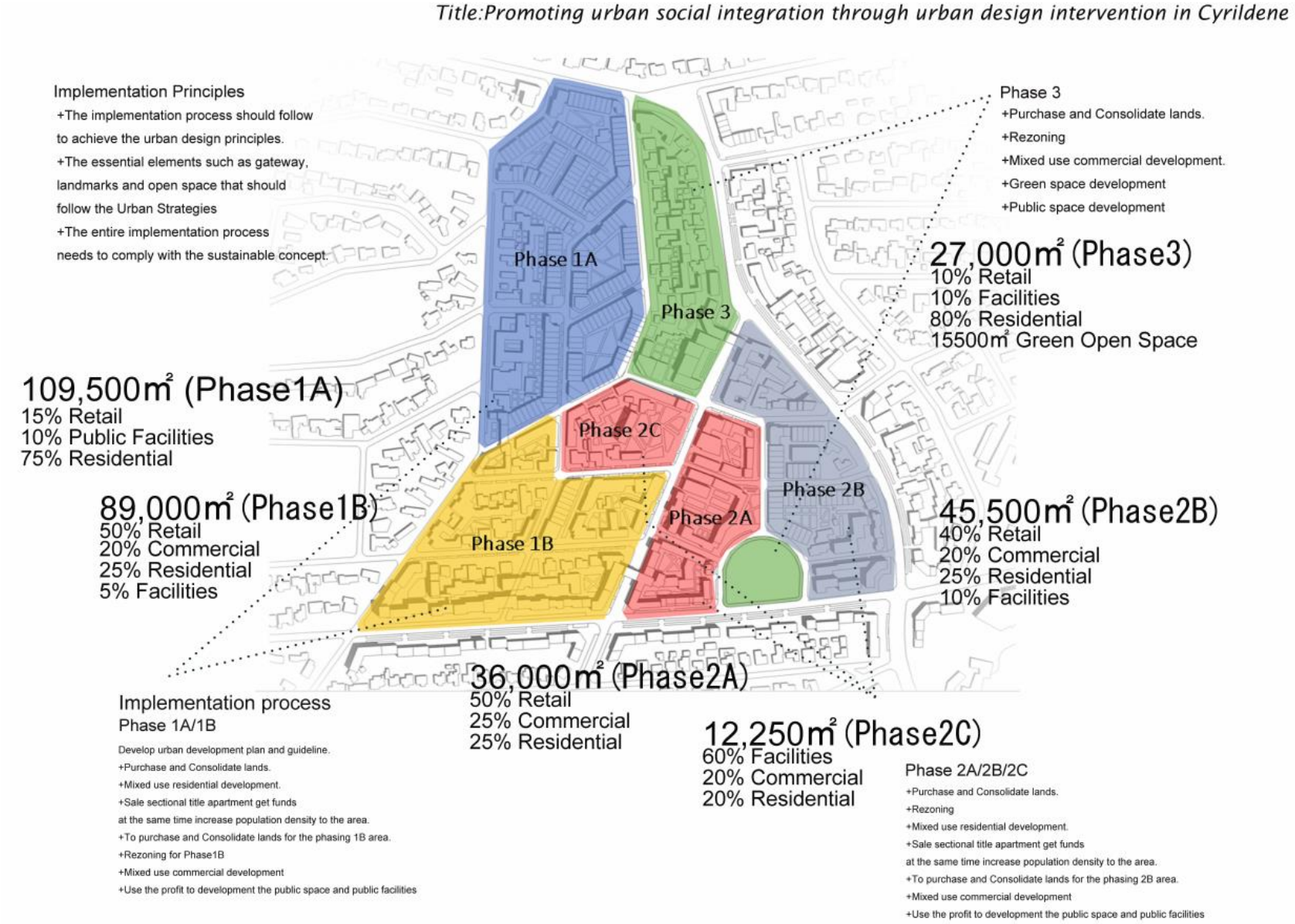


Fig.5.20.9 poster 9-9

8.0 References:

Biopsychosocial model of health. Online Available https://za.pinterest.com/pin/546694842253267742/?lp=true [2018 Mar 14]

Bai, YX. 2003. On the Early city and the Beginning of the State in Ancient China. Online Available: https://web.archive.org/web/20110724021503/http://bic.cass.cn/English/infoShow/Arcitle_Show_Forum2_Show.asp?ID=261&Title=The%20Humanities%20Study&strNavigation=Home-%3EForum-%3EArchaeology&BigClassID=4&SmallClassID=8. [2018, April 05]

Cashin, S. 2004. The failures of integration: how race and class are undermining the American dream. Public Affairs, New York.

Cruz-Saco, AM. 2008. Promoting Social Integration: Economic, Social and Political Dimensions with a focus on Latin America. Paper presented for the United Nations, Department of Economic and Social Affairs Division for Social policy and Development in Collaboration with the Government of Finland, Expert Group Meeting, Helsinki, Finland, 8-10 July, 2008.

Commission for Ecology, Urban Planning and Mobility, Barcelona City Council. 2016. Let's Fill Streets with Life Establishing Superblocks in Barcelona.

Ed,W.& Tim,W.2009. Landscape Architecture Urban design. AVA publishing SA: Switzerland.

Grammenos, F. 2016, How to use the Barcelona superblock concept for community and sustainability. Online Available: https://citiesofthefuture.eu/how-to-use-the-barcelona-superblock-concept-for-community-and-sustainability-b6653bd953b2. [2018, March 26]

Ho, U.2013. The arch angle on booming Chinatown. Online available: https://web.archive.org/web/20130714131834/http://mg.co.za/article/2013-07-12-the-arch-angle-on-booming-chinatown. [2018,April,20]

Joseph, M. 2006. Is mixed-income development an antidote to urban poverty? Housing Policy Debate 17.2:209-34.

Karp, D, Stone, G and Yoels, W. 1991. Being urban: a sociology of city life. Praeger, Westport, CT.

Knapp, C. 2008. Making Multicultural places. Online Available: https://www.pps.org/article/multicultural-places. [2018, March 06]

Kondo, MC, Low, SC, Henning, J, and Branas, CC. 2015. The Impact of Green Stormwater Infrastructure Installation on Surrounding Health and Safety. American Journal of Public Health; 105(3)

Lee, LO. 2001. Shanghai modern: reflections on urban culture in China in the 1930s, in Gaonkar, D.P. (ed.) Alternative Modern cities. Durham, NC: Duke University Press,

Lu, D. 2006. Remaking Chinese urban form; Routledge, UK.

Labonte, R & Schrechker, T. 2005, Globalization and Social Determinants of health analytic and strategic review paper; Institute of Population Health. Canada

Lemanski, C. 2006. Desegregation and integration as linked or distinct? Evidence from a previously 'white' suburb in post-apartheid Cape Town. International Journal of Urban and Regional Research; 30(3):564-86.

Miao, P. 1990. Seven Characteristics of Traditional Urban Form in Southeast China. Traditional Dwellings and Settlements Review; I: 35-47.

Newman, O. 1996. Creating Defensible Space, U.S. Department of Housing and Urban Development Office of Policy Development and Research, Washington, D.C.

Peng, Y, Lou, J. 2006, the Historical Track of the Institutional Development of Urban Planning In China after 1949: Institutional Evolution Analysis from Institutional Economics. Online Available: http://www.mur.cn/nsfiles/6e7354088837d319d1db740b704e8545.06-07-12.pdf [2018, April 05]

Park, YJ. 2009. Chinese Migration in Africa, South African Institute of International Affairs.

Phillips, D and Harrison, M. 2010. Constructing an integrated society: historical lessons for tracking black and minority ethnic housing segregation in Britain. Housing Studies; 25(2); 221-35.

Ruiz-Tagle, A. 2013. A Theory of Socio-spatial Integration: Problems, Policies and Concepts from a US Perspective. International Journal of Urban and Regional Research; 37(2).

Shaftoe, H. 2008, Convivial Urban Spaces: Creating Effective Public Places. London: Earthscan

Spector, J. 2016. Another Reason to love Urban Green space: It Fights Crime. Online Available: https://www.citylab.com/solutions/2016/04/vacant-lots-green-space-crime-research-statistics/476040/ [2018, March 26]

Skinner, GW. 1977. The City in Late Imperial China. Stanford, CA: Stanford University Press.

Sun, SW. 2016. Analysis of Urban planning in China. Online Available: http://www.szcaupd.com/research-city-i_12068.htm. [2018, April 05]

Vranken, J. 2011. Social Challenges of Cities of Tomorrow. Centre OASeS, University of Antwerp

Yang, K. 1993. Zhongguo gudai ducheng zhidu shi yanjiu [A study of the history of the Capital City System in Ancient China. Publisher: Guji, Shanghai China.

Young, IM. 1995. City life and Difference. In P. Kasinitz (Ed.). Center and symbol of our times (pp.250-272). New York: New York Press.

Yap, Melanie; Leong Man, Dainne. 1996. Colour, Confusion and Concessions: The History of the Chinese in South Africa. Hong Kong: Hong Kong University Press.

Trancik, R. (1986). Finding Lost Space; Theories of Urban Design. Van Nostrand Reinhold Company, New York.

kevin L (1981). Good city form; Massachusetts Institute of Technology, The US, pp1-2

Ian Bentley et.al (1985). Responsive environments a manual for designers; Architectural press, UK. Pp105-143

Connectivity and Permeability. 2009. Online Available https://www.healthyplaces.org.au/userfiles/file/Connectivity%20June09.pdf [2018 Sep 30]

Michael, B. 2017, The hidden ways that architecture affects how you feel. Online Available: http://www.bbc.com/future/story/20170605-the-psychology-behind-your-citys-design [2018,Sep 30]

Ron,K. 2011. Urban Design The Composition of Complexity.UK: Routledge press.

Putnam, R.2007, E Pluribus Unum: Diversity and Community in the Twenty-first Century The 2006 Johan Skytte Prize Lecture. Online available: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.515.6374&rep=rep1&type=pdf [2018 Sep 30]

Nadja,K., Jutta,S., Horse, K., & Aletta,B.2016. Nature-based solutions to climate change mitigation and adaptation in urban areas.Bonn,Germany: Springeropen

Yang, K., 2012, A vertical Theory of Urban Design, Online Available:

http://www.buildingfutures.org.uk/printarticle.php?articleid=18&themename=Tall%20Buildings, [2018 April 21]

Jared,G.2017. Interview with Peter Calthorpe, Online Availabe: https://www.asla.org/ContentDetail.aspx?id=30566 [2018, October 10]

City of Johannesburg.2016, Urban development framework for Cyrildene. Johannesburg: City of Johannesburg.

List of Figures references:

Mike,L .2016.Another reason to love urban green space: It fights Crime, [image] Available: https://www.citylab.com/solutions/2016/04/vacant-lots-green-space-crime-research-statistics/476040/ [2018,September 28]

Youzhi, H.2004. laoJieGuangJingHao. [image] Online Available: http://auction.artron.net/paimai-art5008700634/ [2018, March 29]

Yuelang,L.2017. PanDianlaobejingjiaotonggongju shuxidebushuxidebamenwuhuadejiyi.[Image] Online Available: https://kknews.cc/history/39egmja.html [2018, September 29]

Fangliu, Ni. 2017. Who is the old city of Beijing removed the instructions? And you don't know. [Image] Online Available: http://www.bestchinanews.com/History/13895.html [2018, October 4]

Kan,C. 2017.Baiwanzhuang:Xinzhonggguozhuzhaiqudehuohuashi.[Image] Online Available: https://www.wxwenku.com/d/102583978 [2018, October 4]

RenZen,L.& Wuming, Z.2017.Chendushifoushixiayigeshenzhen?[Image] Online Available: https://pit.ifeng.com/a/20171020/52720038_0.shtml[2018, October 4]

Zeduan, Z.1145. qingmingshanghetu [Image] Online Available: https://zh.wikipedia.org/wiki/%E6%B8%85%E6%98%8E%E4%B8%8A%E6%B2%B3%E5%9C%96 [2018, October 8]

Newman, O. 1996. Creating Defensible Space,[Image] U.S. Department of Housing and Urban Development Office of Policy Development and Research, Washington, D.C.

City of Johannesburg Department of Development Planning.2016.Spatial Development Framework 2040.[Image] Available: http://www.parkview.org.za/docs/townplanning/Johannesburg%20Spatial%20Development%20Framework%202040.pdf [2018,October 08]

McHarg, I.1969 Design with Nature. [Image] Cardell City, N.Y. Narum HistoryPress.

Scott,N. 2015.How Can Geospatial information systems be used to address urban green spaces?. [Image] Available: https://closedlooper.wordpress.com/2015/03/22/how-can-geospatial-information-systems-be-used-to-address-urban-green-spaces/ [2018,October 08]

Duany,A.1999. Urban to rural transect. [Image] Available: https://www.spur.org/publications/urbanist-article/2013-03-08/member-profile-andres-duany [2018,October 08]

Digital silk road project.2013, National Institute of Informatics.

[Image] Available: http://dsr.nii.ac.jp/beijing-maps/index.html.zh [2018,October 09]

Old Peking Cityscape 1920, [Image] Available: https://www.pinterest.com/pin/630081804086477785/ [2018,October 09]

Lauren,S.2017. Sponge City: Solutions for China's Thirsty and Flooded Cities. [Image] Available: http://waterbucket.ca/rm/files/2017/08/Sponge-City_-Solutions-for-China%E2%80%99s-Thirsty-and-Flooded-Cities_2017.pdf [2018.October 09]

Pan,W. 2016. Culture centre landscape concept design.[Image] Unpublished: GuangZhouTuRen Landscape planning Pty.,Ltd.

Gregor,W. 2013.Principles and Practices of TOD. [Image] Available: http://www.despacio.org/wp-content/uploads/2013/07/2013-07-Principles-and-practices-of-TOD.pdf [2018,October 09]

Elizabeth,C. &Desiree, P.R. 2017. Transit Oriented Development Planning Grant Program Round 5 Workshop.[Image] Available: http://media.metro.net/projects_studies/joint_development/images/tod_grant__round_5_presentation.pdf [2018,October 10]

Steve,W.& Chuck,K.2013. Colombia transit oriented development nama selected for funding. [Image] Available: http://ccap.org/colombia-transit-oriented-development-nama-selected-for-funding/ [2018,October 10]

Shuo,S.2018. Tayongxianyin,zhongjianlexiaoshedelaobeiping.[Image] Available: https://sobooks.tw/beijing-1/ [2018,October 10]

Chacha,T.2018.Zhecaishibeijingweidao,chengmendiaohuaqingxikejian[Image] http://happytify.cc/article/514024 [2018,October 10]

Ci ty of Johannesburg.2016,Urban development framework for Cyrildene.[Image]. Johannesburg: City of Johannesburg.

Rao,v,v.2017. GIS Application-Water Resources. [Image]. Available:

https://www.aphrdi.ap.gov.in/documents/Trainings@APHRDI/2017/11-nov/gis/GIS%20FOR%20WATER%20RESOURCES.pdf [2018.October 15]