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Sustainable Remote Working Neighborhood

Retrofitting the urban fringe neighbourhood to cater for remote workers, the case of Seoul

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MAJOR RESEARCH PROJECT

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Being a Major Project in Urban Design & City Planning submitted to the faculty of The Built Environment as part of the requirements for the award of the MSc Urban Design & City Planning at University College London, I declare that this project is entirely my own work and that ideas, data and images, as well as direct quotations, drawn from elsewhere are identified and referenced

Signature



Date 29/09/2020

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ABSTRACT

The modern city has placed offices and businesses at its core promising economic opportunities as the centralising force of urbanisation. This has resulted in expanded residential settlements surrounding centres of offices and contributes to the increase of carbon emissions from commute. Meanwhile, the remote working phenomenon accelerated by the recent global pandemic signals a sustainable urban development pathway that challenges the notion of traditional offices as urban centres. Despite the tragic losses from the COVID-19 pandemic, the crisis presents an important lesson regarding climate change as decentralised work from home being the 'new normal' has led to a significant reduction in carbon emission. Seizing this as an opportunity, this research project intends to strengthen this environmental gain by consolidating a transition of our cities towards a decentralised urban structure.

Ever since teleconferencing and internet technologies have pervaded our lives, the benefits and risks of remote working have been actively discussed. However, the implications of remote working specifically to sustainable urban development as well as the measures to plan our cities more adaptable to the future for the rising community of remote workers have yet been thoroughly addressed. By investigating the desires of remote workers, the trend of workplaces, and the sustainability implications of remote working, this research presents a design framework that integrates urban compactness and a catalogue of workspace typologies to achieve a sustainable remote working neighbourhood.

Based on the author's place-based knowledge about the social and historical context of South Korea, Seoul and its urban fringe neighbourhood Pyeongchon are selected as the focus area for this research proposal. Interventions on four sites from Pyeongchon aims to demonstrate the design strategies culminating with persona scenarios illustrating the experience of sustainable living and remote working in the retrofitted neighbourhood.

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01

INTRODUCTION

CONCEPTUALIZATION OF THE PROBLEM

The Pathway of Urbanisation

The urbanisation stems from the centralisation and concentration of offices and businesses in cities. With economic opportunities as the driving force, the migration of people results in urban sprawl of residential neighbourhoods surrounding the urban centre. As cities grow larger, the economy thrives with more employment which drives further urbanisation, while the average commuting time increases resulting in a higher carbon footprint.

The COVID-19 and Climate Change

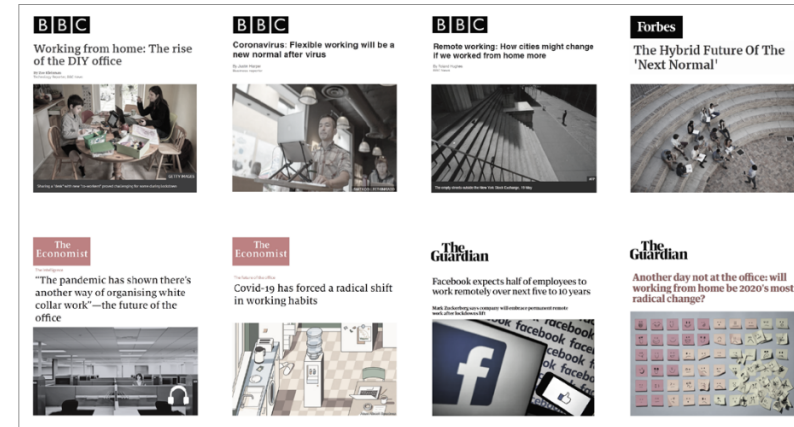
Despite the tragic impact of the COVID-19 pandemic, the 'new normal' lifestyle presents a hopeful future for sustainable urban development. The drastic fall of offices in Metropolitan areas during the pandemic questions the structure of urban centres with traditional offices at its core. Working from home has decreased commute and private vehicle use leading to a significant reduction in carbon emissions. Seizing this as an opportunity to reflect upon life in cities, this project intends to be more resilient in tackling climate change impact by consolidating a decentralised urban lifestyle in the post-pandemic era.

Rising Trend of Remote Working

Remote working has been an increasing worldwide phenomenon during the last few decades thanks to the advancement of Information and Communication Technology (ICT), with up to one-third of employees working remotely in some countries (Messenger et al., 2017) and has been further accelerated by the pandemic. Experiences of working from home has been reported positively by millions of employees around the world who are expected to refuse returning to commuting life. Global tech giants and many other companies have been preparing the transition to offer employees flexible work arrangements.

Cities must adapt to this future where work is done remotely away from traditional offices. A decentralised urban structure which is reimagined with the change in working culture in mind can bring about social and economic benefits for the future.

Remote Working, the New Normal



The Future of Office



Exodus from Cities



Fig.1 News Headlines

Speculating the Future Migration Trend of Remote Workers

The major drives of urbanisation have been better job opportunities and life quality that is dependent on social infrastructure. However, digitalization in the new era is transforming the lifestyle of people, especially the working culture, which will change the future drivers of migration. Apart from accessibility to the workplace, the people entering this new paradigm of working will prioritize different aspects for choosing where to live. City planners should identify this migration trend as a new opportunity to develop a sustainable model to mitigate the challenges of urbanisation while maximizing the benefits of remote working.

The future migration of remote workers has two scenarios – to leave or to stay. Those who leave the city might be location-independent and be able to move to smaller cities, rural area, or even a tourist destination. Alternatively, those who stay might have location-dependent jobs, are part-time remote working, or bound to client meetings or networking in the city. Another target group are those who are location-independent though choose to remain for the urban lifestyle or personal relationships. This will be more common in the metropolitan area, where diversity, culture, and agglomeration define the city. Hence, urban centres and rural neighbourhoods must be equipped towards this projected drive of migration and the new paradigm for remote working.

Sustainable Urban Development Pathways

The migration of people also significantly impacts the future pathways for sustainable urban development. Those leaving the city implies an opportunity to revitalize shrinking cities or rural towns. With digital infrastructure and fast internet connections, destinations with an affordable lifestyle with affluent nature is strongly attracting remote workers from cities.

For the group staying in the city, the workplace culture in the metropolis must transform to better cater the increasing need for flexible work arrangements. While the office centre will be redefined through shrinkage and adoption of new functions, the rest of the city and its urban fringe will transform to accommodate the dispersed ecosystem of the workplace. Through this binary transformation, the workplace of the metropolitan area and its urban fringe will be restructured into a decentralised model with stronger local centres.

Among these several pathways, this research project focuses on the transformation of the urban fringe neighbourhood of the city.

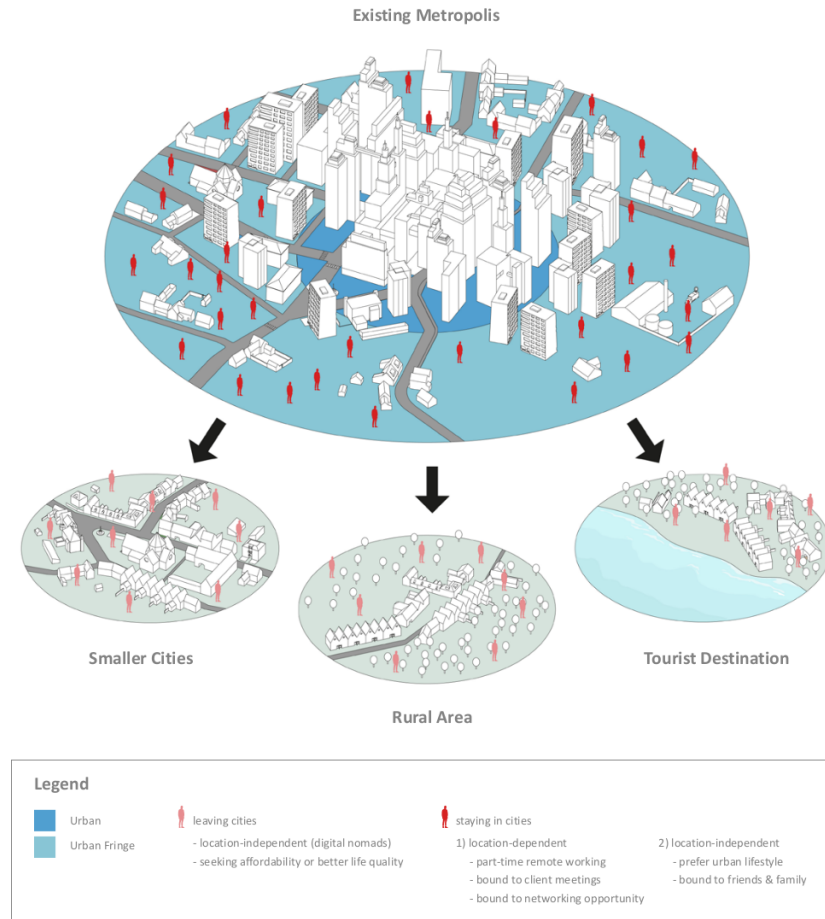


Fig.2 Remote Worker Migration Scenario

JUSTIFICATION OF THE RESEARCH TOPIC

Although the impact of remote working on environment, society, and economy has been addressed and discussed ever more recently due to the COVID-19 pandemic, the measures to plan and design our cities to adapt to this new paradigm are still obscure.

While the general discourse of sustainable neighbourhood does not specifically relate to the remote working phenomenon, this project will combine the two through a comprehensive design framework and design application on a neighbourhood scale.

JUSTIFICATION OF THE SITE

Terms such as suburbia, outer urban area, peri-urban area, outskirts, and urban fringe are synonyms used to describe the periphery of an urban area. In this research, urban fringe is selected to indicate the character of a residential neighbourhood surrounding the urban centre. Compared to the urban area, the urban fringe neighbourhood has a lower density with more open spaces and consists of residents who commute long distances for work in the urban centre. As the primary sustainable impact of remote working lies on the reduced commute, the research will focus on the urban fringe neighbourhood where the environmental gain from remote working could be maximal.

RESEARCH QUESTION

How can urban design for a remote working culture contribute to a more sustainable urban development in urban fringe neighbourhood?

OBJECTIVES

Following objectives were put forth to guide this project's research:

- Understand and explore the current challenges and demands of remote workers and future workplace trends
- Investigate the implications of remote working on sustainable urban development
- Explore the potential transition of an urban fringe neighbourhood into a decentralised workplace away from the urban centre
- Deliver design guidelines to retrofit an existing urban fringe neighbourhood to create a compact neighbourhood and a strong local centre where remote workers can thrive as part of a sustainable community
- Establish a flexible and adaptable design toolkit for workspace that promotes liveability and productivity of remote workers and supports the transition of an urban fringe neighbourhood into a decentralised workplace

METHODOLOGY

The methodology comprises three stages:
1) Research, 2) Design & Implementation, and 3) Evaluation.

The research starts by conceptualizing and justifying the research topic, defining the research questions, and setting aims and objectives for this project. The literature review is divided in three aspects: remote working, future of workplace, and sustainable neighbourhood. Additionally, interviews are performed to understand the specific needs of the target group and develop persona to highlight the design interventions proposed. The case study focuses on remote working workspace based on five features found in the previous research stage. The design & implementation stage begin with design framework where design principles are derived from findings of the research while some policy tools are introduced as design governance. The design toolkit 'workspace catalogue' is developed from design principles aided by case study of workspaces. The site analysis explores Seoul and its urban fringe neighbourhood Pyeongchon accompanied by few site visits. In design application stage, design strategies are applied in four specific sites from the focus area and four persona scenarios portray the sustainable remote working life in the retrofitted focus area. Lastly, the evaluation stage involves critical reflection and discusses the contribution to practice.

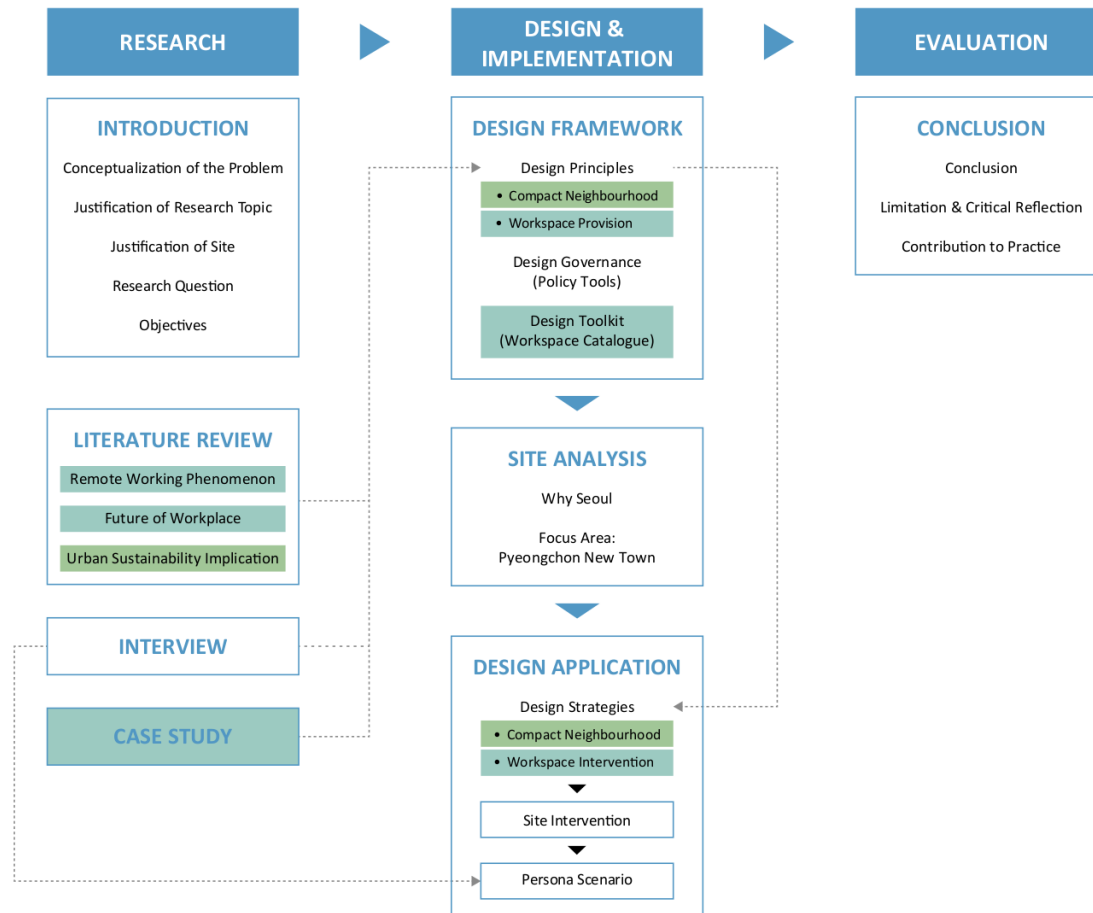


Fig.3 Methodology

02

LITERATURE REVIEW

REMOTE WORKING PHENOMENON

Defining Remote Working

Remote working, telecommuting, telework, mobile work, flexible working and working from home are amongst terms used synonymously in many literatures. While each definition differs slightly, this research will use 'remote working' defined by Gajendran and Harrison (2007, p.1525) as: "an alternative work arrangement in which employees perform tasks elsewhere that are normally done in a primary or central workplace, for at least some portion of their work schedule, using electronic media to interact with others inside and outside the organization". According to this definition, remote working encompasses various situations such as working remotely part- or full-time from home, abroad, a coworking space, or literally anywhere away from the office. The status of employees also varies from permanent employees, contractors, and freelancers. The most common way of remote working is working from home, which accounts for 80% of all remote workers according to a survey (Buffer, 2020).

The Increasing Global Trend

Research organizations and pundits have been affirming the fast-growing trend of remote working based on vast data regarding employees' positive preference for working from home (OWL Labs, 2019) and flexible work arrangements (Hickman and Robison, 2020). The rapid growth of the phenomenon stems from a confluence of societal, economic, demographic, and technological factors including the rise of the contingent workforce, technological advancement, and the recent global pandemic. The contingent workforce includes self-employed, independent contractors and part-time workers with a higher tendency for remote working which have been increasing (Bughin, et.al, 2016 & Partington, 2019) with the support of corporations (Intuit, 2010). Meanwhile, the advancement of ICT has expedited the transition to remote working for a substantial amount of knowledge-based economic sectors' workforce and is projected to continually increase.

Benefits and Challenges of Remote Working

There are many benefits to remote working with some of the most popular advantages being better work-life balance, location-independence, and a reduced commute (Buffer, 2020). Flexible schedules can be invaluable when attending to personal needs such as leisure, recharging, or caregiving. On the other hand, being location independent is another advantage by offering employees a lower cost of living and allowing broader job opportunities regardless of address. Lastly, the reduced commute can not only save budget but may also lower stress levels from traffic congestion.

On the contrary, several challenges such as difficulty of separation between job and private life, loneliness from working alone, obstacles in communication and collaboration, distractions from home, lack of motivation and exercise hinders the liveability and productivity of remote working. Since many of these challenges are associated with working from home, they can be resolved through a change of workplace. While working from a café is the most popular alternative, it is not ideal for long-term use and concentration. Instead, a coworking space that values community amongst the members can be a complementing option of the two. However, these advantages of coworking space are offset by its relatively high cost and central location. Hence, each workplace must serve an array of work needs and situation by balancing its benefits and challenges.

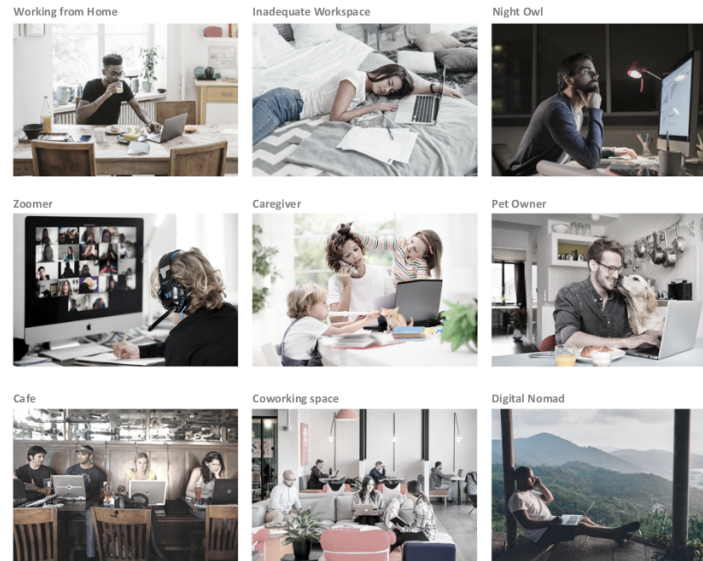


Fig.4 Characters of Remote Workers

FUTURE OF WORKPLACE

The Evolution of the Office

The correlation between the workplace and work type is also seen through the evolution of office design. Its history illustrates the change in cultural attitudes towards not only productivity and efficiency, but also wellbeing and creativity in the workplace. From Taylorism to open plan 2.0, the office design has evolved to accommodate the technological advances and reflect the working culture of the time.



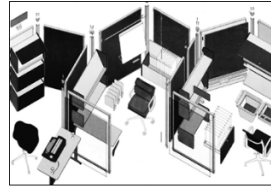
1900s Open Plan (Taylorism)
Maximizing industrial efficiency



~1939 Open Plan
Spacious open spaces in a modernist design



1960s Bürolandschaft
Open plan with plant landscaping



1960s The Action Office
Modular semi-enclosed office furniture for privacy, flexibility and versatility



1980s The Cubicle Farm
Low-cost modular walls for maximizing efficiency, profitability as the revive of Taylorism



2000+ Co-working Space
Open plan updated with 'third places' and nature

Fig.5 History of Office Design

Work Modes

With an emphasis on collaboration, open plan has once again become the norm to many offices in the 21st century. It is based on the belief that creativity comes from a gregarious place where we can foster the 'New Groupthink' in the sacrifice of solitude (Cain, 2012). However, criticism against the open plan arise from the lost opportunities of concentration in the workplace and its inadequateness for the introverted. Research from the architecture office Gensler (2008) highlights that knowledge work is composed of four work modes: focus (concentration), collaboration, learning and socializing and that companies that support all four modes have a higher performance. Additionally, studies in workplace designs are aiming to build a more inclusive work environment for the diversity of employees. A fifth mode 'rejuvenate' is further introduced by Gensler which corresponds to introverted workers who need to refresh and recharge. The studies show that the workplace design should accommodate the various work modes as it ensures flexibility for the individual that promotes productivity.

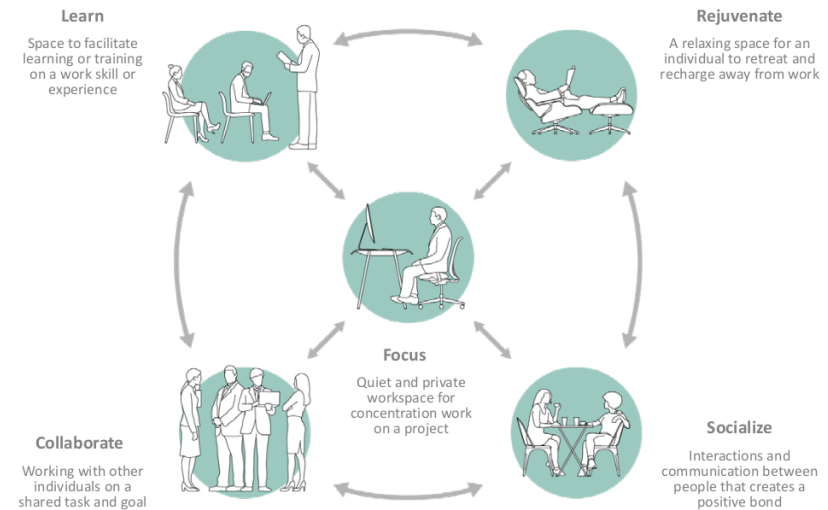


Fig.6 Work Mode

FUTURE OF WORKPLACE

The Rise of Coworking Space

The coworking phenomenon is a prominent contemporary workplace trend. The number of coworking spaces and its members are steadily growing globally (DeskMag, 2019) with various concepts evolving around the different demands for services and spaces. While the definition and classification of coworking differ in various sources (Jackonen et al., 2017), 'coworking space' is often used as a comprehensive term embracing other kinds of shared workspaces such as serviced offices, incubators and accelerators. Distinguishing the character of these spaces is important to understand the value and purpose of each space. According to the definition from HOK's coworking report (2016), a serviced office is often located in premium office buildings mainly targeting small and medium-sized enterprises (SMEs) whereas incubators and accelerators target startups with supporting programmes and amenities. However, a coworking space is targeted for the self-employed or people with different employers in a casual atmosphere that values community, which is the primary advantage considered by coworkers (Clifton et al., 2019).

This community value stems from the sharing economy in two aspects – physical and intangible assets (Bouncken & Reuschl, 2018). The shared facilities allow individuals not only to save on office rent but also to enjoy a variety of shared amenities. While shared amenities contribute to environmental and economic savings, the exchange of knowledge and information can expand networking and business opportunities which is valued especially by freelancers.

In conclusion, although there is more specific purpose in other shared workspaces, the community and networking aspect of coworking is what truly makes it valuable. Coworking can remedy the social isolation from working from home through its socializing aspect.

Biophilia

Biophilia, the idea that humans possess an innate tendency to interact with nature (Wilson, 1986), is another important feature of a modern workplace that is emphasized by many designers and architects. Biophilic design, referring to the embodiment of nature in the built environment to improve health and wellbeing, has been actively promoted in workplace to reduce stress levels, increase performance and creativity, and encourage community cohesiveness (Foster+Partners 2020). While there exist myriad ways of embedding nature in workplaces (Terrapin Bright Green, 2014), some commonly used strategies are indoor plants, views of nature, and natural lighting. From large corporations to coworking spaces and individual home offices, biophilic design is becoming a vital aspect to enhance liveability and productivity in the workplace.

While biophilic design in offices are focused on bringing outdoor nature to indoor environments, the reverse concept of bringing work outdoors is another rising trend. L.L.Bean, an American outdoor recreation equipment company, has been promoting this idea based on their survey and research about the benefits and desire of working outdoors (L.L.Bean, 2018).

The increase of remote working and mobile workforce surely supports this emerging expansion of biophilia in work environments. Moreover, thanks to the highlighted values for health and wellbeing during the pandemic, workplaces with biophilic and open-air outdoor environment are even more important in the post-pandemic workplace.



Fig.7 Types of Shared Workspace

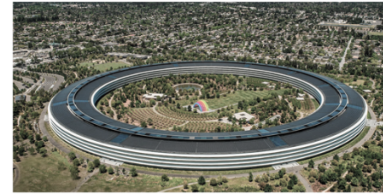


Fig.8 Apple Park Campus



Fig.9 Amazon Spheres



Fig.10 Second Home Lisbon



Fig.12 Second Home Hollywood



Fig.11 L.L.Bean 'Be an Outsider'

URBAN SUSTAINABILITY IMPLICATION

The sustainable impact of remote working from the reduced commute to social and economic aspects of working from home and in coworking spaces has been widely discussed. This part of literature review will investigate the extensive range of implications of remote working on cities based on three pillars of sustainability: environmental, economic, and social.

Environmental Impact

While the reduce in automobile use is widely acclaimed by reducing carbon emissions and congestion (Choo et al., 2005; Wood, 2003; Zhang et al., 2005), the rebound effect of remote working from residential relocation entails a risk to sustainable urban development. The liberation from commute motivates remote workers to move towards low density suburban environments (Moos et al., 2006). This assumes a dispersed and inefficient consumption of natural and energy resource compared to life in the city (Muhammad et al., 2007). Moreover, the relocation to the countryside may induce non-commute travels from oneself and other household members (Kim, 2017; Kitou & Horvath, 2003) since the low-density neighbourhood may fail to meet the needs for amenities in proximity. Eventually, this could result in offsetting the carbon emission savings from telecommuting.

Concurrently, the workplace is another sector with significant impact on resource consumption. According to an Ecological Footprint (EF) analysis by Moos et al. (2006), the negative impacts of working from home such as increased household energy usage and consumption of additional home office equipment outweighed the decreased energy consumption and waste reduction from office centres. While the assessment did not consider the case of coworking spaces, it can be presumed that sharing resources and energy in a smaller scale than an office can alleviate the negative impacts of elevated individual consumption.

Economic Impact

Remote working improves work efficiency and can lead to considerable economic benefits to individuals and businesses. While the reduced commute and traffic congestion saves time and travel costs (Yu et al., 2019; Marinelli, 2010), the immense expenditure of office rental and energy consumption can be greatly curtailed when companies decide to adopt the sharing economy ethos of coworking spaces (Voordt, 2003). Furthermore, the enhanced social interaction from coworking spaces (Spinuzzi, 2012) and the flexible work arrangements will promote creativity, boost business collaborations, and drive innovation (Jackonen et al., 2017).

On the other hand, as proved by the lockdown during the COVID-19 pandemic, the working-from-home paradigm possess a threat of economic recession. Workers remaining at home have an overall lower consumption pattern due to inactive socializing (Moos et al., 2006). However, shared workspaces in communities can restart the local economy by attracting footfall and facilitating local consumption (Jama, 2018).

Social Impact

While remote working promotes wellbeing through a better work-life balance and lower stress levels, the social isolation and difficulty of work-life separation associated with home-based teleworking remains a challenge (Yu et al., 2019). These issues can be mitigated through working in a coworking space that facilitates socializing and networking (Johnson, 1999, 2003).

In terms of social equality, remote working has a positive impact on inclusive employment opportunities to talents in rural areas and specific demographic groups such as the disabled and caregivers (Dima et al., 2019). However, concerns for the aggravation of social divide from the transition that favours the digital adept knowledge-based economic sector workforce (Elder, 2019) are raised. Socio-demographic groups with lower accessibility to digital technology and the labour-intensive workforce are at risk of being marginalized from the advantage of remote working.

Conclusion

In conclusion, remote working has significant positive and negative impacts on sustainable urban development. By identifying the positive impacts as opportunities and challenging the negative impacts and mitigating the risks, the following urban design and planning guidelines can be derived to achieve a sustainable remote working neighbourhood:

- 1. Sustainable coworking space:** Coworking spaces can offset the negative impacts of working from home. To maximize the positive impacts, coworking spaces should be provided in the vicinity of remote working neighbourhoods. They will function as a decentralised workplace hub and promote an affordable shared workplace with efficient use of resources, but also a social community hub that contributes to the local economy.
- 2. Compact neighborhood:** To mitigate the rebound effect from non-commute travels due to low-density urban sprawl, the residential neighbourhood should have the spatial conditions of a compact city that discourages trips over long distances and stimulates the use of sustainable transport modes and public transport (Boussau et al., 2010). Conditions such as spatial proximity to diverse activities and amenities, high density (Neuman, 2005) and a mix of functions can lead to a self-sufficient neighbourhood (Cervero and Kockelman, 1997). In short, the precondition for sustainable remote working is a compact neighbourhood that leads to a modal shift towards low impact mobility modes such as walking and cycling.
- 3. Inclusive planning and community building:** Lastly, to avoid the risk of social inequality caused by a digital divide, the remote working neighbourhood must be designed to be more inclusive. Training programmes can help empower the digitally marginalized population while coworking spaces in the neighbourhood with communal facilities can support community building for all. Moreover, the compactness strategies that transforms the neighbourhood to be more sustainable can benefit the whole society.

RESEARCH FINDINGS



Fig.13 Findings

REMOTE WORKING PHENOMENON

Benefits

- work-life balance
- location-independence
- reduced commute

Challenges

- unplugging
- loneliness
- distractions
- communication & collaboration

CAFE
alternative

FUTURE OF WORKPLACE

5 Work Modes → Flexibility

- focus
- collaboration
- learning
- socializing
- rejuvenation

Coworking Space

Sharing Economy → Community Networking

Types of shared workspace

- Coworking Space
- Incubator
- Serviced Office
- Accelerator

Biophilia

- indoor
 - indoor plants
 - nature view
- outdoor
 - natural lighting

1 Sustainable Coworking Space

Prerequisite: →

- in vicinity
- affordable
- sharing economy
- community hub
- contribute to local economy

2 Compact Neighbourhood

- proximity & diversity
- high density
- mix of functions
- walkable neighbourhood
- sustainable transport mode

3 Inclusive Planning & Community Building

- Training Programmes

03

INTERVIEW

INTERVIEW

The purpose of the interview is to validate the findings from the literature review and to further investigate the needs of contemporary remote workers. Seventeen face-to-face and virtual qualitative interviews with remote workers of various profiles differing in age group, nationality, profession, and remote working status (duration, full-time/part-time, digital nomad) were performed to represent the diverse range of remote workers. The results of the interviews are later utilized for developing personas to demonstrate the design proposal.

Interview Questions

The questionnaire is composed of four sections - basic profile, work life, current state and preference of residential location, workplace, and commuting mode of travel – which are tailored to the interviewee to induce answers that relates to the design aspects for a sustainable remote working neighbourhood (Appendix A).

Interview Results

The challenges of working from home and the demand for affordable shared workspace, networking and socializing, and biophilic environments have verified the findings from the literature review while demand for ergonomic settings and digital devices add a new aspect to the research. Furthermore, the need for ubiquitous access to workspace was commonly mentioned among freelancers and especially web developers. Meanwhile, the questions about residential location and mode of travel also supported the correlation between remote working with the migration pattern that induces more car use as well as preference of walkable distance to a workplace. Only by truly understanding the demands and challenges of remote workers can a sustainable remote working neighbourhood be successful.



Fig.14 Interview Quotes

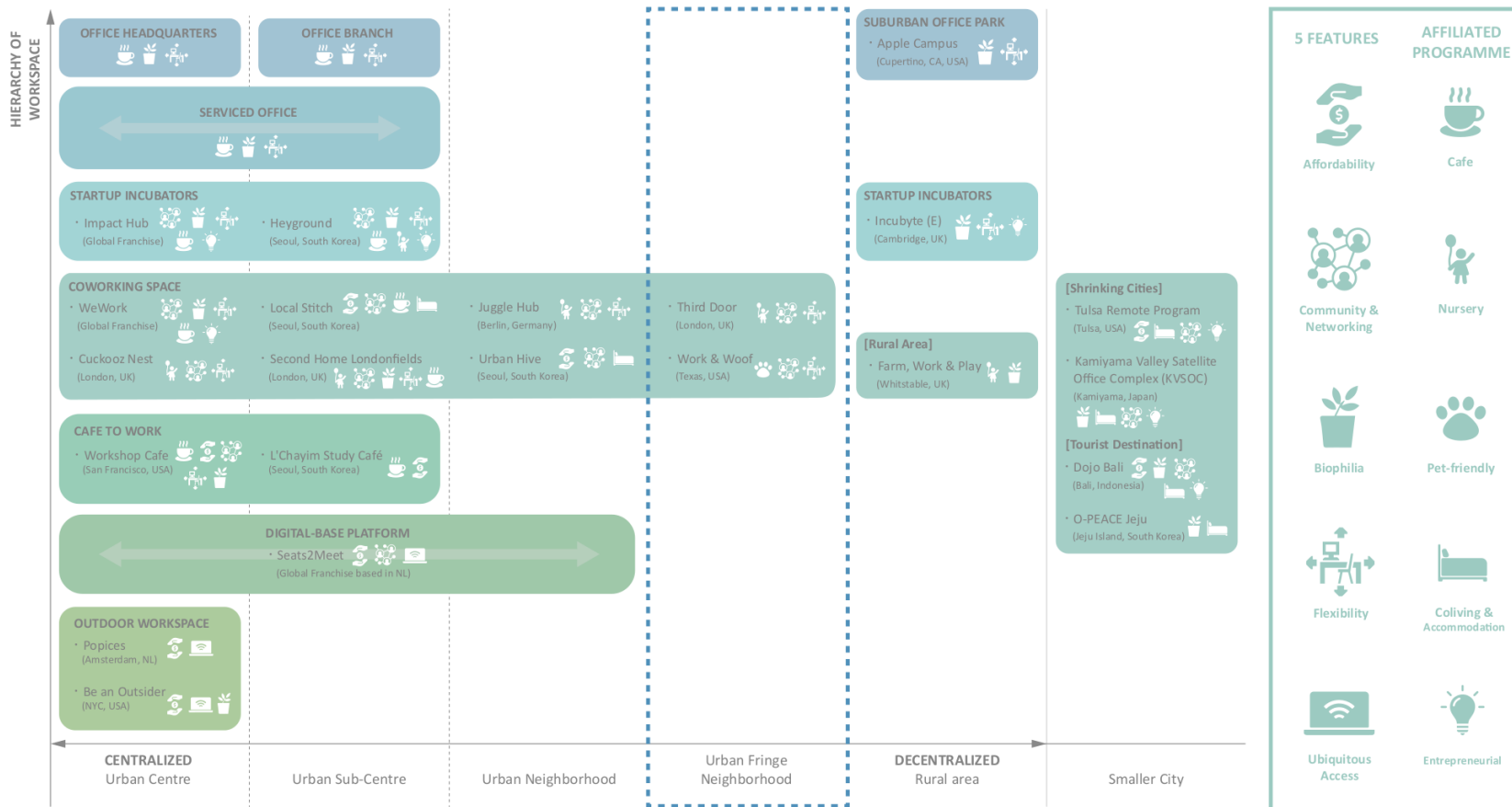
04

CASE STUDY

CASE STUDY OVERVIEW

The case study aims to explore ideal qualities of workspace that promote liveability and productivity for mobile workforce. The overview of case study is a summary of various cases (Appendix B) of workspace covering a range of scale, operation models, and affiliated programmes. Classified by its functional character, the overview shows the hierarchy of workspace and its proximity to urban centre. The distribution pattern reveals the concentration of workspace towards urban centre as well as the trend of workspace emerging in favour of the natural environment or affordable lifestyle. Five features for liveable and productive workspaces and common affiliated programmes are highlighted from the analysis, which will be further explained through six cases.

Fig.15 Case Study Overview



CASE STUDY

WeWork (global chain)



emphasizing community and networking among members through events and affiliated programs

biophilic design as main feature of lounge design

flexible work mode from socializing lounge, individual hot desking to private and team office



Second Home Londonfields (London, UK)



flexible workspace including open-plan fluid design to concentrating and rejuvenating zone

fostering family-friendly community of coworkers with affiliated nursery and events

indoor environment rich with plants, outside courtyards



Seats2Meet (Netherlands based global chain)



coworking space operated by free membership and added to various programs

online platform managing network of myriad workspace enables ubiquitous working

online platform facilitates active networking



Dojo Bali (Bali, Indonesia)



location is a tourist destination with affordable lifestyle attracting digital nomads

fostering community value through affiliated coliving function and networking events

an open view and proximity to nature as the greatest asset



Workshop Cafe (San Francisco, USA)



a hybrid coffee shop with coworking space paid by hour allowing affordable price for flexible time

indoor plants and outdoor patio

various work modes served with phone booths, meeting room, concentration and socializing spots



Be an Outsider (NYC, USA)

public pop-up workspace with individual work areas, cycling desks and conference rooms

outdoor workspace located in a park with Wi-Fi and charging stations

mobile workspace can be placed anywhere accommodating transient work



Fig.16 Case Study

05

DESIGN FRAMEWORK

DESIGN PRINCIPLES

Following the research, design principles are derived to achieve a sustainable remote working neighbourhood. While compact neighbourhood is the precondition for the remote working culture to be environmentally sustainable, the second principle addresses measures to cater for remote workers with ideal workspaces.



Fig.17 Design Principles

DESIGN GOVERNANCE - POLICY TOOLS

A list of policy tools consisted of design guidance, incentives, and control aids the transformation. Such institutional support is imperative to realize and foster the design principles. Although these policies are not specifically expanded at the design application, they are a general guideline to accomplish the goal within and beyond the design level.

Fig.18 Policy Tools

01 Encouraging business to increase flexible work arrangements

- Apply tax reduction for employers with remote working employees
- Provide employer and employee training for remote working applications
- Grant a legal right for employees to claim for flexible work arrangements

02 Supporting remote workers with public and social infrastructure

- Encourage the establishments of coworking space with tax reduction incentives
- Establish council-owned affordable workspaces in residential neighbourhood
- Promote mixed-use zoning that incorporates coworking space with other uses
- Support events facilitating networking of remote workers
- Subsidize individual remote workers with equipment supporting remote working

03 Restricting private car use and promoting alternative transport modes

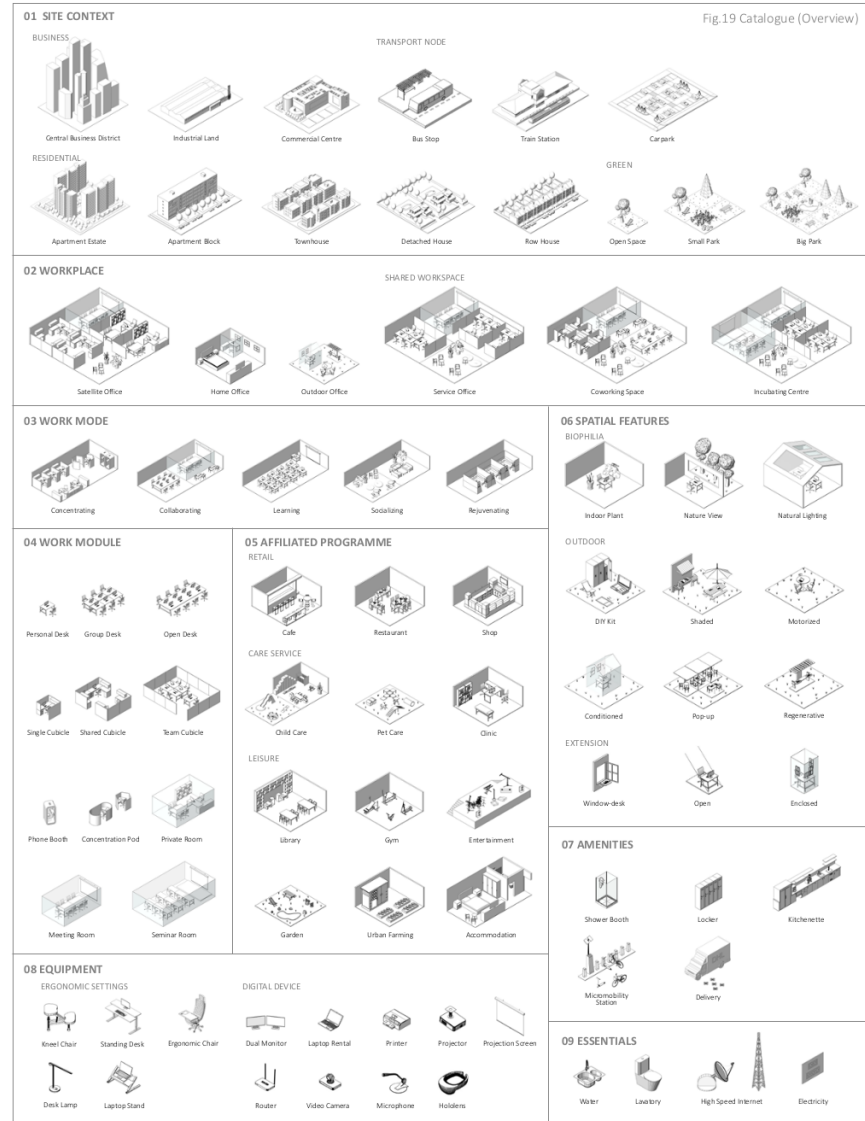
- Increase the tax of private car ownership
- Encourage the development of repurposing car parks into communal facilities
- Subsidize car-sharing and shared-mobility service suppliers
- Improve local public transport infrastructure
- Provide micromobility station in transport node, office, coworking space, commercial district, and residential district

04 Relieving social inequality

- Provide training for those with poor access to technology
- Support upskilling and reskilling the workforce for remote-compatible jobs

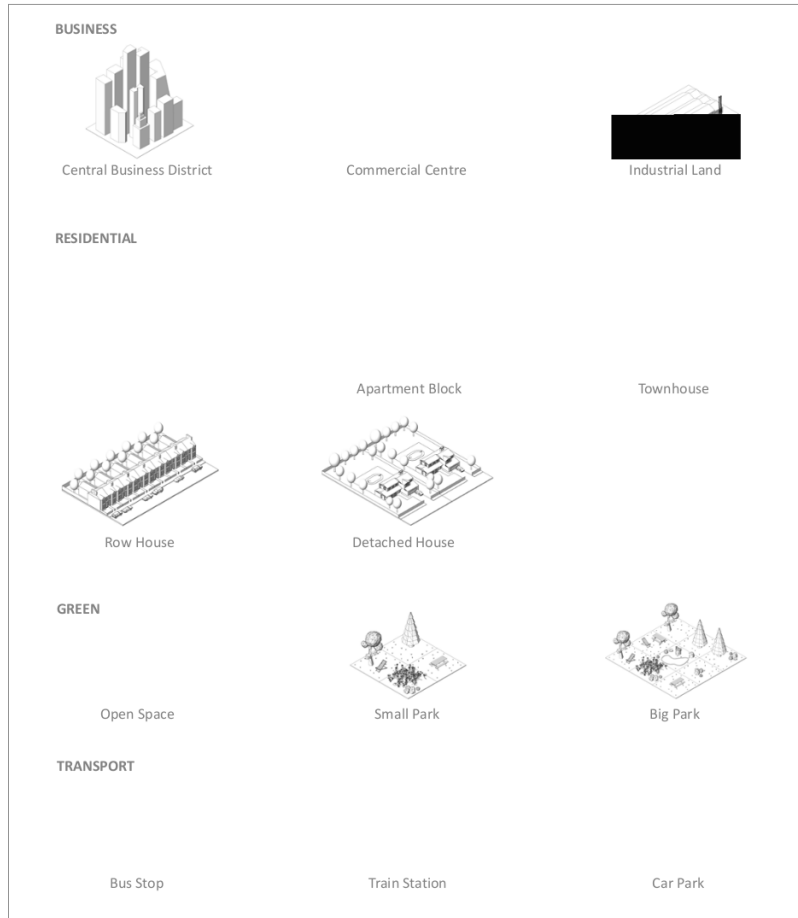
DESIGN TOOLKIT - WORKSPACE CATALOGUE

Instead of a 'one size fits all' approach, the toolkit represents an open-ended solution for the future of workplace that is tailored to the different needs and nature of work for the individual. As a response to the diverse and contrasting needs of remote workers, the catalogue is developed based on the design principles of liveable and productive workspace. The fundamental elements of work acts as a comprehensive and adaptable toolkit for the wider implications of remote working in a multitude of scales from the urban, to urban fringe and the rural. The nine layers composing the catalogue will be employed to design different workspace typologies for specific site contexts. Starting from defining the site context, the catalogue guides the reader through a process of workspace customization from the type of workplace, work mode, and comprising modules. After that, complementary elements can be customized to the specific needs of the workers to further improve the productivity and wellbeing in the workplace.



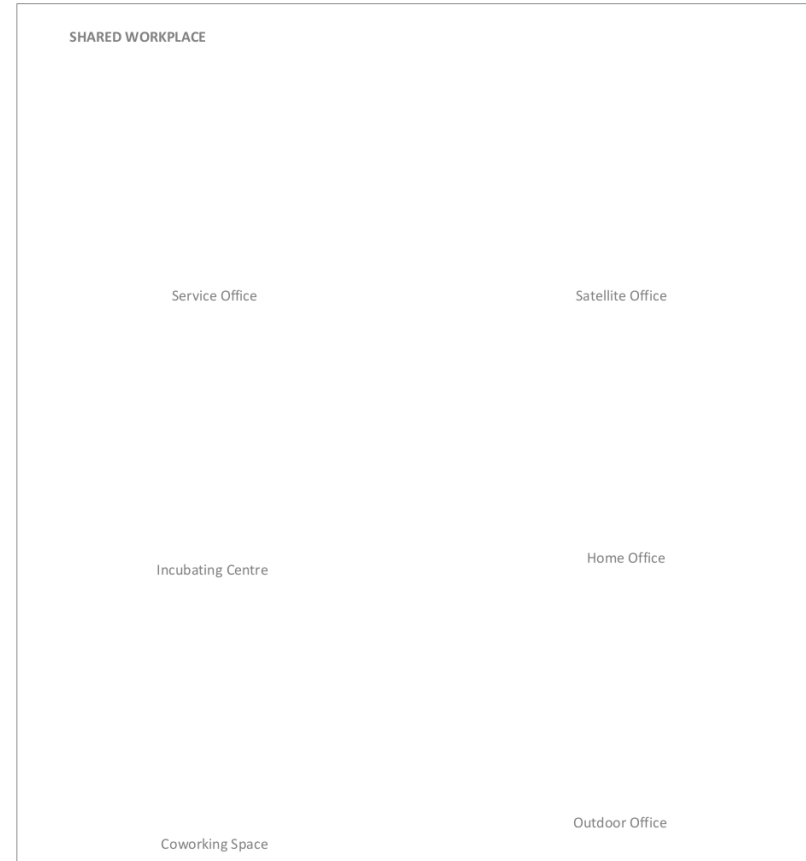
01 Site Context

The workspace options can differ with the site's land use but also aspects such as the typology of residential building, scale of the park, connectivity and accessibility, as well as distance from the centre. The breadth of the site context layer ensures the extensive transferability of the catalogue across locations globally.



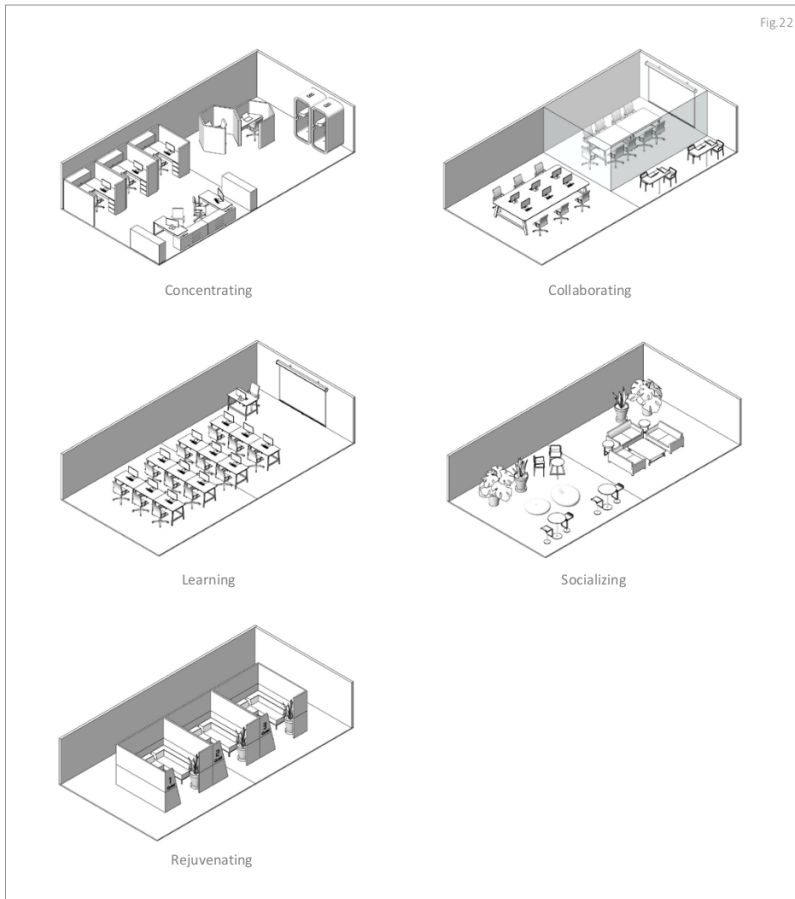
02 Workplace

Based on the literature review and case studies, the shared remote working workplace can be categorized into three types with different customer profiles and management system: the serviced office, incubating centre, and coworking space. The satellite office is a decentralised node of a corporation, usually headquartered in the CBD to serve the employees away from the centre. At the same time, the home office is a private or small-sized workspace located in an individual's home while outdoor workplace refers to the emerging concept of working in nature.



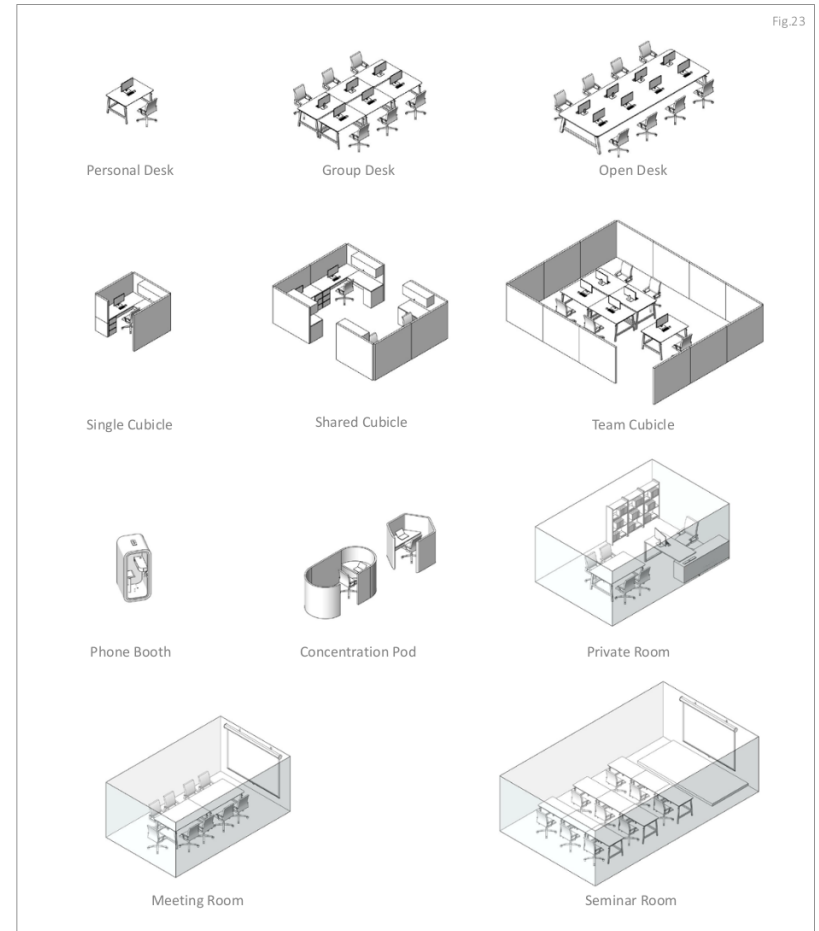
03 Work Mode

Based on the five modes identified by Gensler (2012) and Lewis (2016), they can be classified into concentrating, collaborating, learning, socialising and rejuvenating. Concentrating takes place in an individual or private workspace with visual or acoustical blockage while collaborating, learning, and socializing are known to be facilitated in an open plan layout. Rejuvenating on the other hand is targeted for introverts who desire solitary environment for refreshment.



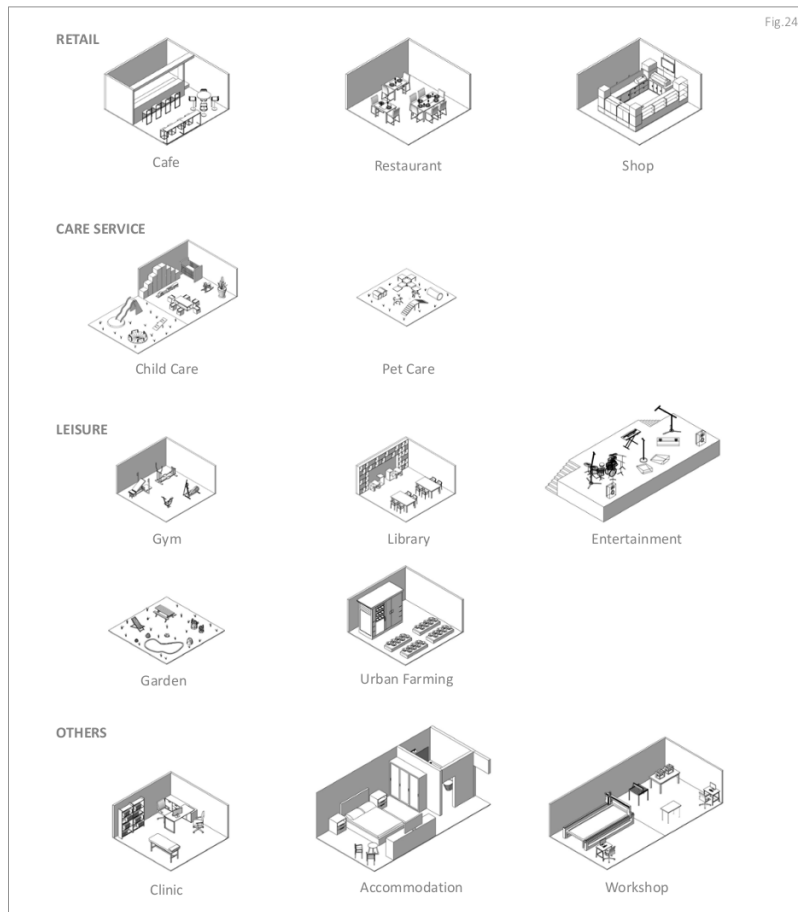
04 Work Module

The basic elements that comprise the workspace can be customized as a myriad of combinations of work modules with different scales, function, and layout.



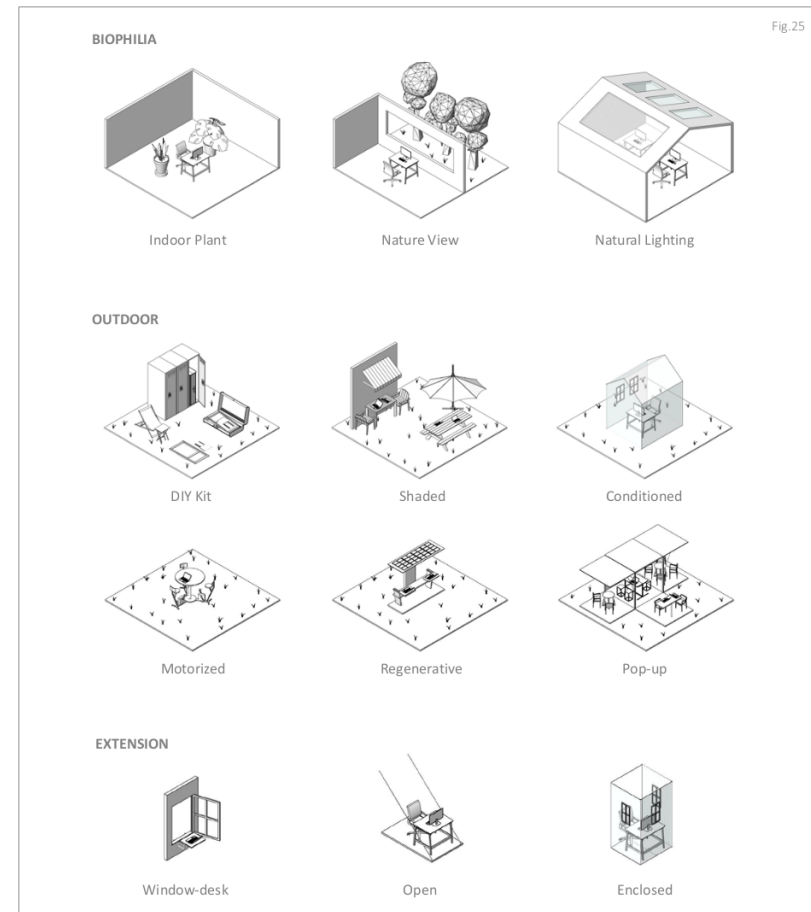
05 Affiliated Programme

The case study shows the possible affiliated programmes which usually accompanies the workspace. Here, the affiliation can take place not only as a programme that is contained in a workplace but one that is also adjacent and complements it. This multifunctional mix-use aspect enhances the wellbeing of a remote workers with different backgrounds by encouraging efficient use of time and reduced need for travels.



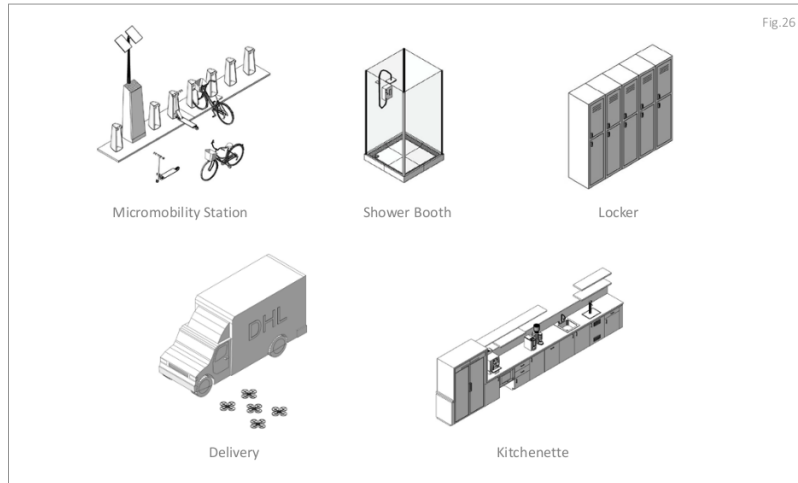
06 Spatial Features

Various design options such as biophilia components in indoor environment improves wellbeing for the workers while outdoor environments in nature inspires creative ideas. Furthermore, building extensions can be deployed to optimize and create additional workspaces in one's home where necessary.



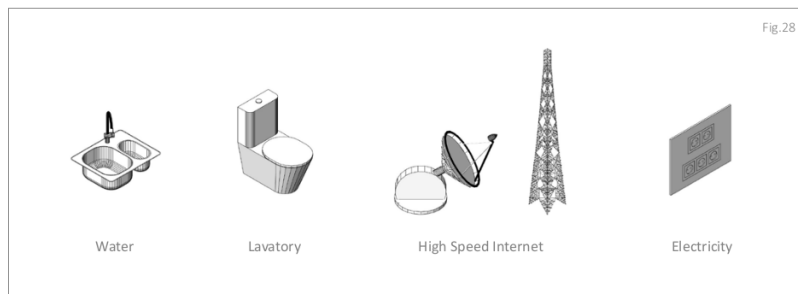
07 Amenities

Modern offices and shared workplaces feature amenities that supports the working life of its employees.



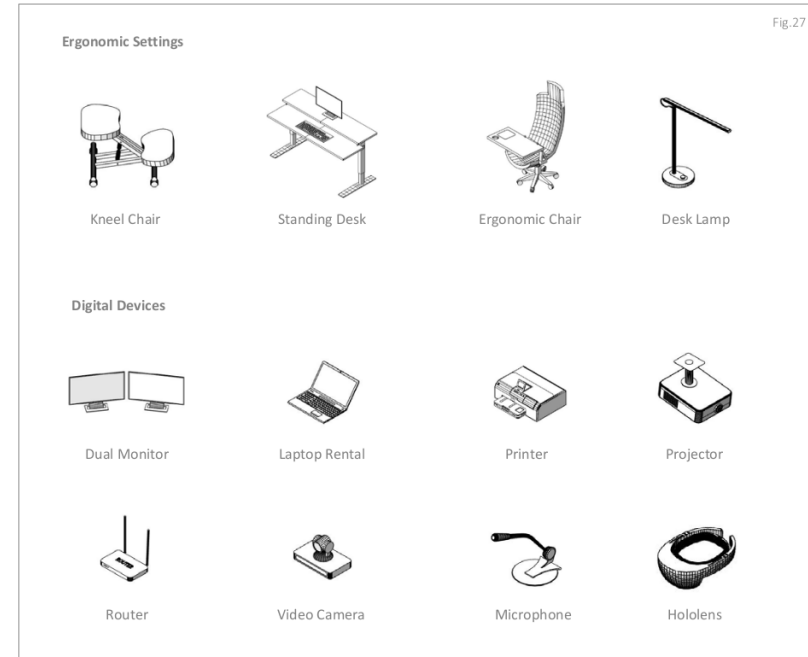
09 Essentials

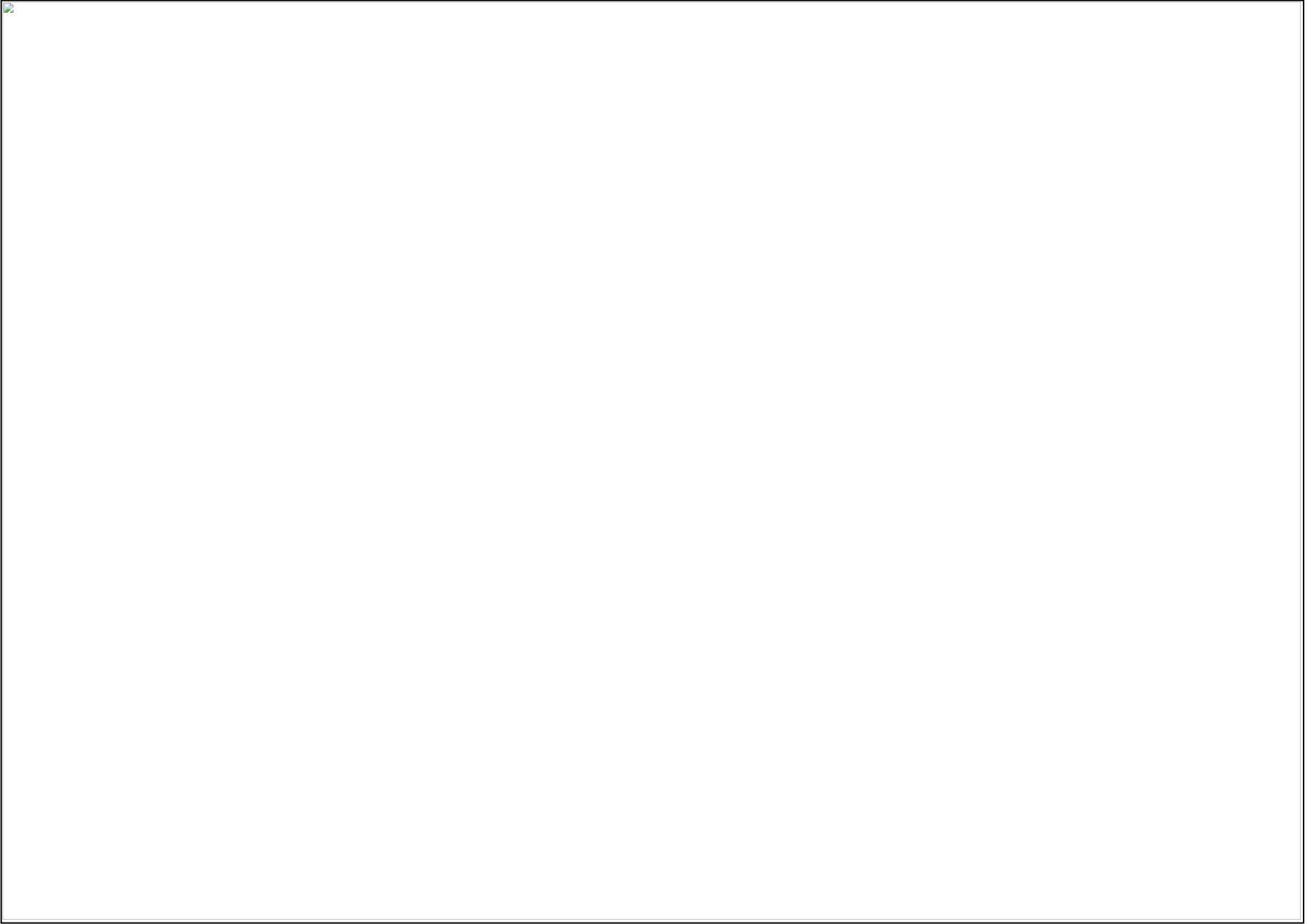
The fundamental requirements that must be included for a remote working workspace are high speed internet and basic infrastructures such as electricity, water supply and lavatory, especially in outdoor workplaces.



08 Equipment

Equipment such as ergonomic settings and digital devices are a critical aspect which benefits its users and increase productivity.





WHY SEOUL?

Internet Speed and Digital Infrastructure

South Korea is heralded for having one of the fastest average internet connections and the highest broadband adoption rate in the world (Fastmetrics, 2017). Moreover, South Koreans are among the most active users of Internet activities with strong adaptability towards new technologies (Rhee & Kim 2017). Thus, there is no doubt that the high-tech capital city of the country and its citizens are prepared for technological innovation and the new normal digital lifestyle.

Remote Working and Office Culture

Despite that, the remote working culture is yet noticeably unpopular in South Korea due to the traditional top-down corporate culture where employers prefer on-site work environment in the centralised offices. However, the COVID-19 outbreak led the nation's largest companies and IT firms to start accepting the work-from-home model out of concerns over the virus spread (Joo, 2020). Although comparatively less than European and North American countries, the ongoing experiment of remote work will prompt the nation's corporate culture to shift towards a more flexible working environment. To expedite such transition, institutional support for building remote working infrastructure is imperative. Regarding the current Korean government's pledge to promote 'untact economy', a newly coined term indicating non-face-to-face social and economic activities (Kim, 2020), in their recently announced 'New Deal' economic plan, the public support towards remote working has a bright prospect.

Urban Character

The research project aims to demonstrate a decentralised urban structure through the future of the workplace. To manifest this transition, the ideal city would be a metropolis with a high dependence on the central economy. Seoul has strong economic urban centres at Gwanghwamun, the Yeouido Business District, and the Gangnam Business District.

Responding to the migration trend of remote workers, a sustainable urban development must possess a pull factor beyond just employment opportunities. Cities must provide attractions such as diversity, culture and amenities that improve the life quality without which location-independent workers will shift away from. Seoul is well-placed since it is not only the economic centre of the country but also of social and cultural activities across industries as well as a tourism.

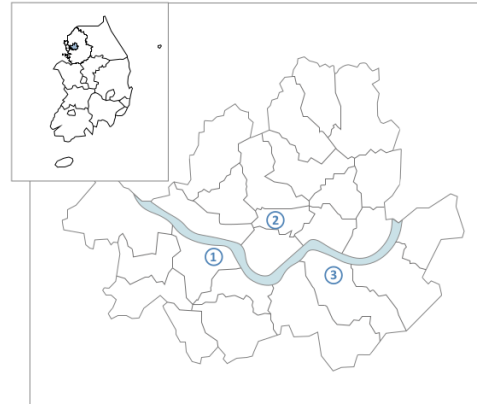


Fig.29 Seoul, South Korea



Fig.30 Seoul Apartment



Fig.31 Yeouido Business District



Fig.32 Gwanghwamun Central Business District



Fig.33 Gangnam Business District

WHY SEOUL?

Urban Fringe of Seoul

For this research, the urban fringe of Seoul is defined as the periphery of Seoul's administrative boundary which includes the area of Gyeonggi Province and Incheon city. The three jurisdictions are collectively referred to as the Seoul Metropolitan Area (SMA) covering 11,730 km² with a combined population of 25.5 million, amounting to over half of the country's population. With the rapid population growth in the SMA due to the concentration of job and economy in Seoul, the urban fringe area has started to accommodate the increased demand for housing.

Since compactness is a precondition for a sustainable remote working neighbourhood, the compactness of the urban fringe neighbourhood is another critical factor for site decision. Having been developed as a high-density residential neighbourhood with good public transportation connections, Seoul's relatively compact urban fringe is ideal for this project.

New Town Development

During the late 1980s, a national housing supply plan called the "Two Million Home Construction Plan" was directed by the South Korean government to tackle housing shortages and soaring housing prices in the capital. The scheme included several planned residential neighbourhoods, called 'New Towns', in the urban fringe of Seoul. The first phase includes five large new towns with a plan of supplying 500,000 units. It was acclaimed for exceeding its objective and attracting a substantial number of new residents within five years. With the success of the first phase new towns, there has been series of governmental new town development plans now leading towards the fourth generation. However, with insufficient jobs and commercial amenities in the new towns, they remain as a commuter town with high dependency upon the city of Seoul. The rise of new towns has contributed to longer average commuting distances (Go & Park, 1993) and non-working trips into Seoul which causes an increase in carbon emissions from travel and severe traffic congestion.

Terms such as 'Republic of Apartments', 'matchbox' and 'identikit' have been coined to criticize the urban identity of these new towns which are particularly repetitive. The strict single-use zoning system, dominant superblock apartment estates which fosters a vehicle-oriented culture, high density with proximity to amenities, and lack of open spaces are common denominators of a typical urban fringe residential neighbourhood of Seoul.

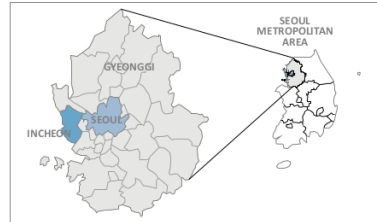


Fig.34 SMA

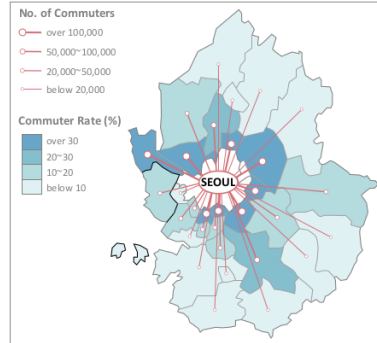


Fig.35 SMA Commuters to Seoul (Seoul Institute 2008)

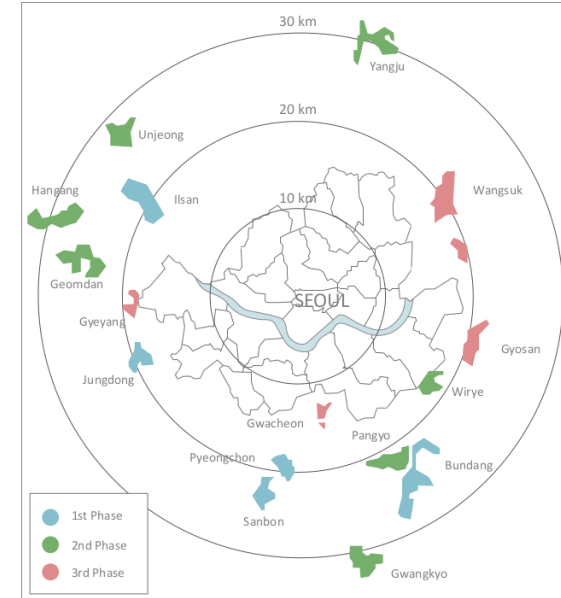


Fig.36 SMA New Town Development

	Bundang	Ilsan	Pyeongchon	Sanbon	Jungdong
Location	Seongnam-si	Goyang-si	Anyang-si	Gunpo-si	Bucheon-si
Area (m²)	19,640,000	15,740,000	5,110,000	4,200,000	5,460,000
Population	390,000	280,000	170,000	170,000	170,000
Units	97,600	69,000	42,000	42,000	41,400
Built Year	1991	1992	1992	1992	1993
Zoning Masterplan					

Fig.37 First Phase New Town Development

FOCUS AREA: Pyeongchon New Town

Overview

Pyeongchon is one of the five first generation new towns and the boundary of the focus area follows its original masterplan. Located in Anyang-si of Gyeonggi province, the masterplan covers 494.7 hectares with a population projection of 170,000 provided with 42,500 units with a very high density of 344 persons/ha. It is arranged in a grid pattern of road networks and a strict single-use zoning system with a commercial and business district at its centre and residential blocks towards the outer edges. Like many other first-generation new towns, Pyeongchon functions as a commuter town towards the urban centre of Seoul without self-sufficient economic activities. However, the recent development of a high-tech industrial complex on the east and the establishment of serviced offices in the business district indicates a prospective workplace for remote working.



Fig.38 Overview Map

Commute

Being located within a 20 km radius from Seoul's urban centre, the average distance to the three CBD districts in Seoul – City Centre, Yeouido, and Gangnam - is 22 km, with an average commuting time of 80 minutes by public transport and 45 minutes by car. Due to the significant time difference, most people still rely on private vehicles instead of public transport.

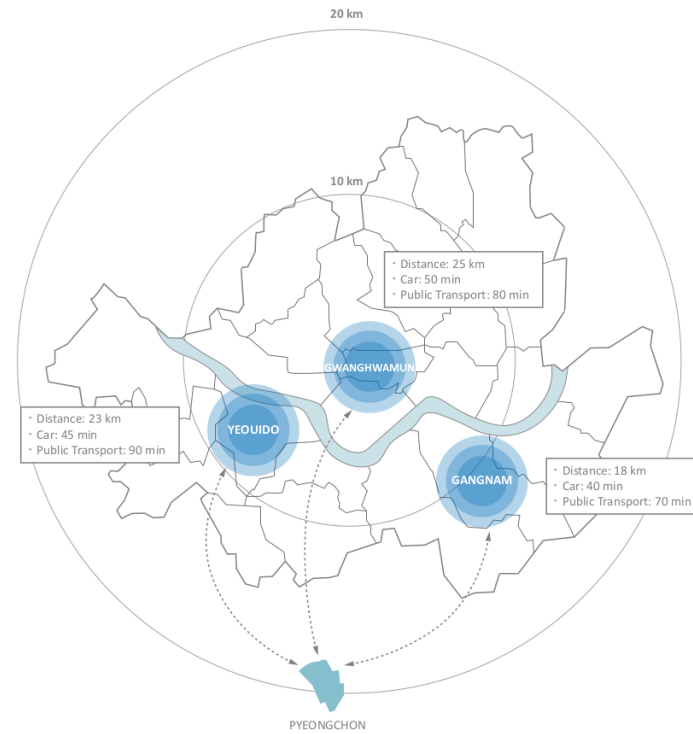
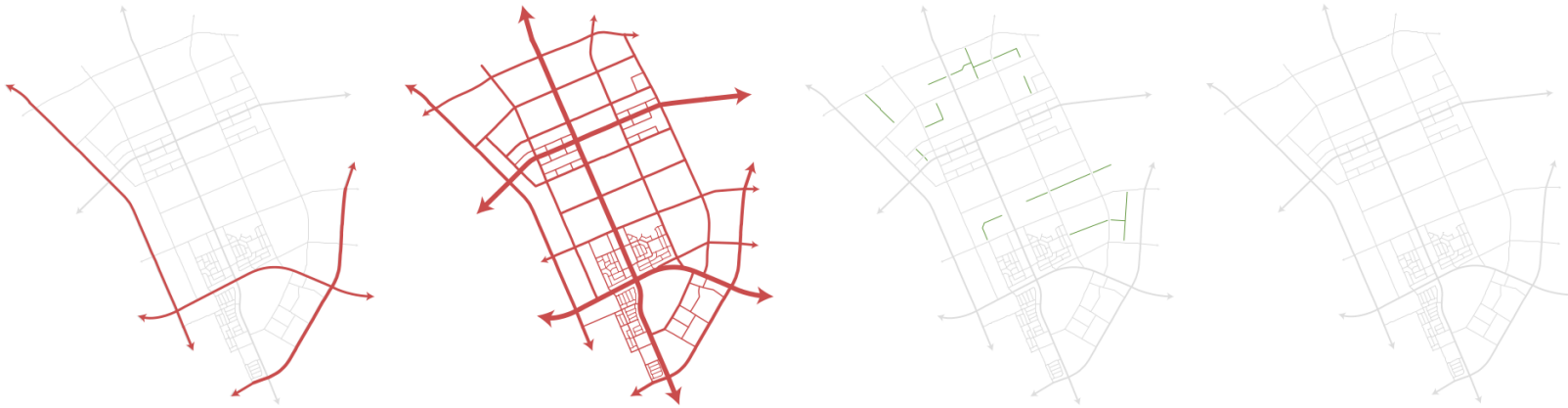


Fig.39 Commuting time and distance

FOCUS AREA: Pyeongchon New Town

Pyeongchon is well connected by several highways for vehicular public transport and subway lines for commuters to and from Seoul and its neighbouring towns. Despite having a good regional connectivity, improvements to the bus network can strengthen the transport node of Pyeongchon Station to promote public transport usage. High traffic main roads and expressways with eight to ten lanes form a grid defined by the superblock apartment estates. Regardless of generous tree coverage, the 100-300m long sidewalks have poor walkability due to the lack of destinations and monotonous scenery, and contribute to the car-oriented culture of the neighbourhood. At the same time, the townhouse district is divided by smaller roads that lack pedestrian pavements, thus diminishing the walkability of the area. Overall, despite the vast amount of overground carparking spaces and vehicle-oriented streets, Pyeongchon has a good network of green pedestrian streets that breaks down the superblocks and connect green spaces within the focus area. However, the pedestrian bridges and underground pathways are less ideal for pedestrian movement. Efforts should be intensified to improve the design and connectivity of the existing cycling infrastructure of Pyeongchon. Micromobility and shared mobility systems not limited to cycling must be promoted as an alternative sustainable primary mode of transport in this focus area.



FOCUS AREA: Pyeongchon New Town

Residential

The 42,500 units in Pyeongchon consists of two housing typologies - apartment estates and townhouses. With 98% of total units and 90% of the residential area being apartment estates, they are the dominant housing typology in the area. These apartment estates are characterized by high-rise apartments without balconies, ground-level and underground carparks occupying the central open space, and communal facilities placed at the edge of the estate. A playground, sports facility, kindergarten, management office, and a retail point are statutory requirements of communal facilities for a single apartment estate. Compared to newer apartment estates, these facilities in Pyeongchon apartments are generally less attractive as it was built in the 1990s.

Meanwhile the townhouse blocks have a smaller urban fabric with lower population density. Three-to-four storey detached buildings housing multiple units are surrounded by narrow roads without pavements. With cars parked beside the road, it makes for a poor walkable neighbourhood. These small parcels of space are opportunities to promote greater integration between work and living.



Fig.45 Pyeongchon Apartment



Fig.46 Pyeongchon Townhouse

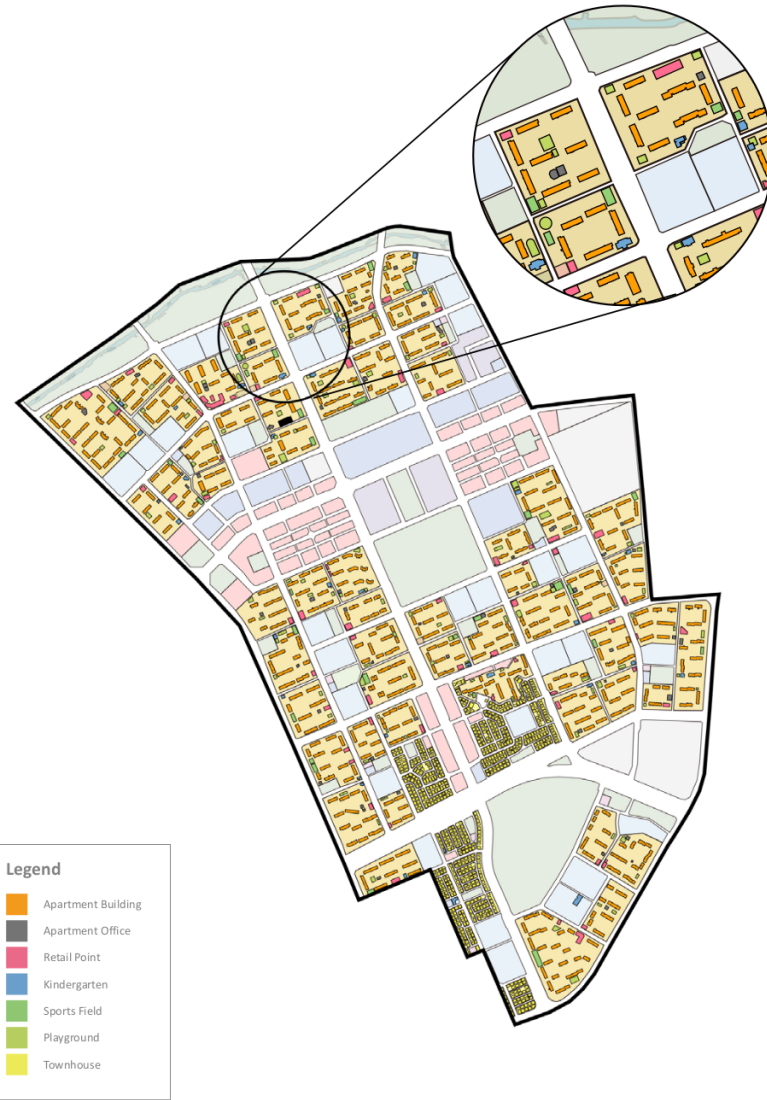


Fig.47 Residential Map

FOCUS AREA: Pyeongchon New Town

Commercial and Business

The commercial district is separated from the residential district while the provision of retail amenities is planned with a hierarchy of size and service. Based on Christaller's central place theory (Kim, 2005), the retail amenities diminish with variety and scale the further it is from the town centre.

The central commercial district contains retail services such as a departmental store, shops, restaurants, and clinics. These centralised retail services make it a popular destination among the residents resulting in high traffic congestions in the area. The business area in the central district includes few office buildings with public companies and SMEs. However, the overall percentage of office area is very low for the population of Pyeongchon. Furthermore, workspace facilities such as coworking spaces that supports remote working are not available. Despite having complementary small retail points in every apartment estate and some townhouse blocks, it is insufficient to meet the residents' daily demands resulting in a high dependence on the commercial district.

To sum up, the centralised hierarchy of the commercial and business destination induces a higher frequency of non-working trips that are often beyond walking distance. Adding to the commuter induced congestion, the centralisation of commercial districts aggravates the situation around the new town.



Fig.48 Central Commercial District



Fig.49 Department Store



Fig.50 Business Area



Fig.51 Retail Point

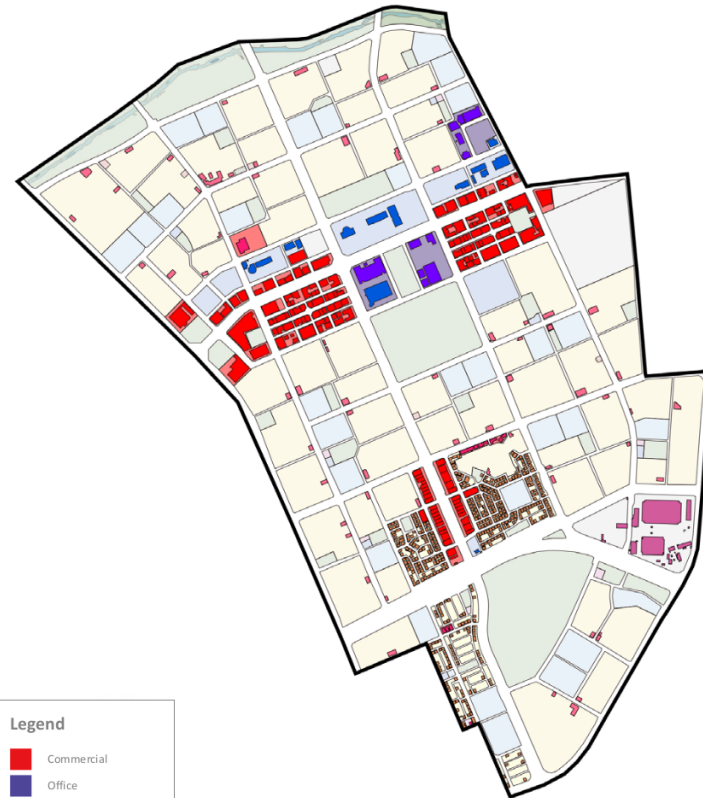


Fig.52 Commercial and Business District Map

FOCUS AREA: Pyeongchon New Town

Green and Open Spaces

Different levels of hierarchical green and open spaces are distributed around the focus area with Pyeongchon Central Park at the town centre serving as a landmark and providing diverse activities. Meanwhile, smaller neighbourhood parks within the residential districts are connected by pedestrian streets which are planned to form a green network. Additionally, a sports facility and a children's playground are provided in each of the apartment estates. Although the location and size of the park is well allocated, the design quality is lost only to fulfil the statutory requirements. Huge portions of these green areas are covered up with hardscapes while the monotonous design fails to interest the residents and visitors. While both the apartment and townhouse typology lack open space within the units, the green spaces in the vicinity are great amenities for the residents. Hence, the green open spaces must be redesigned with programmes benefitting the needs and interest of the residents in mind.



Fig.53 Pyeongchon Central Park



Fig.54 Neighbourhood Park



Fig.55 playground



Fig.56 sports field

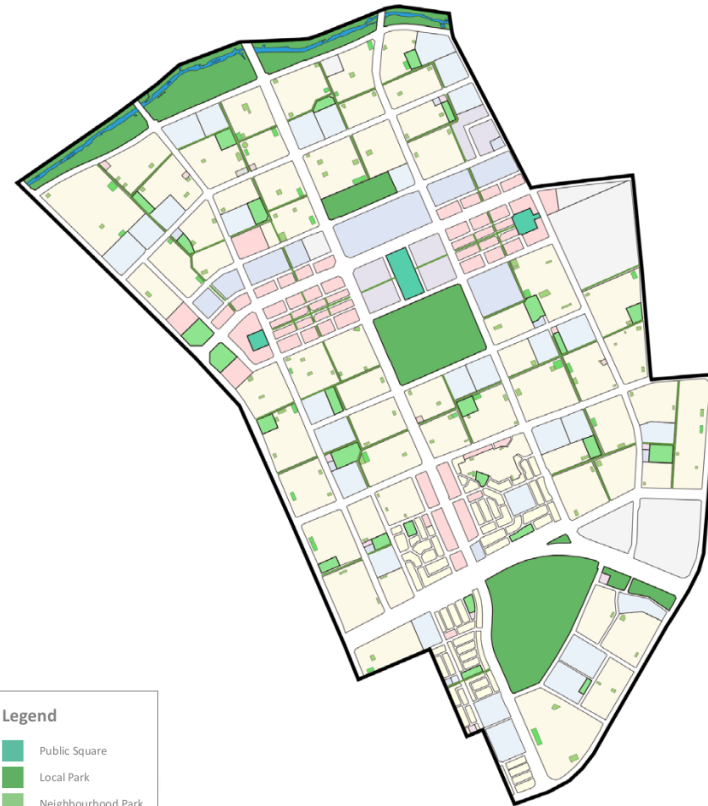


Fig.57 Green and Open Spaces Map

07

DESIGN APPLICATION

The following four steps are proposed to address the identified problems and transform the focus area into a compact neighbourhood.

Based on the premise that remote working can weaken the demand for private car use, a radical intervention such as reclaiming streets is imperative to change the car-oriented culture of the neighbourhood. Improvement of the public transport and street infrastructure will enhance connectivity and accessibility while prioritizing pedestrians over cars. With the reduction of car usage, the carparks can be transformed to host communal facilities and workspaces. Additionally, amenities can be intensified in the open and reclaimed areas to reduce the trips to commercial centres that are beyond walking distance.



DESIGN STRATEGIES

DS2. Workspace Intervention

For this project, the site contexts from the catalogue that applies to Pyeongchon new town are the apartment estate, townhouse, park, commercial centre and transport node. Various work modes are introduced to correspond to the needs of its residents in these separate locations.

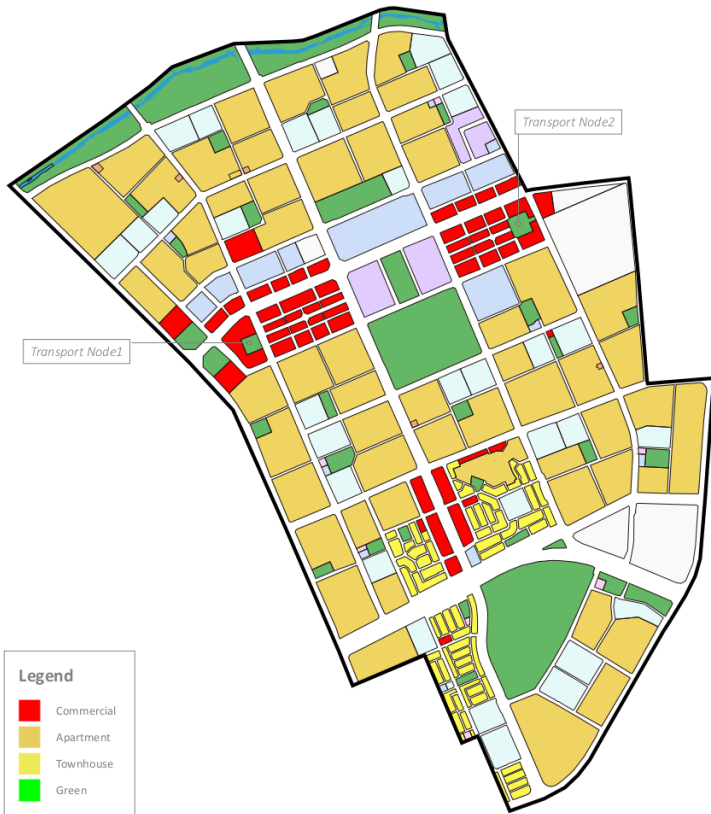
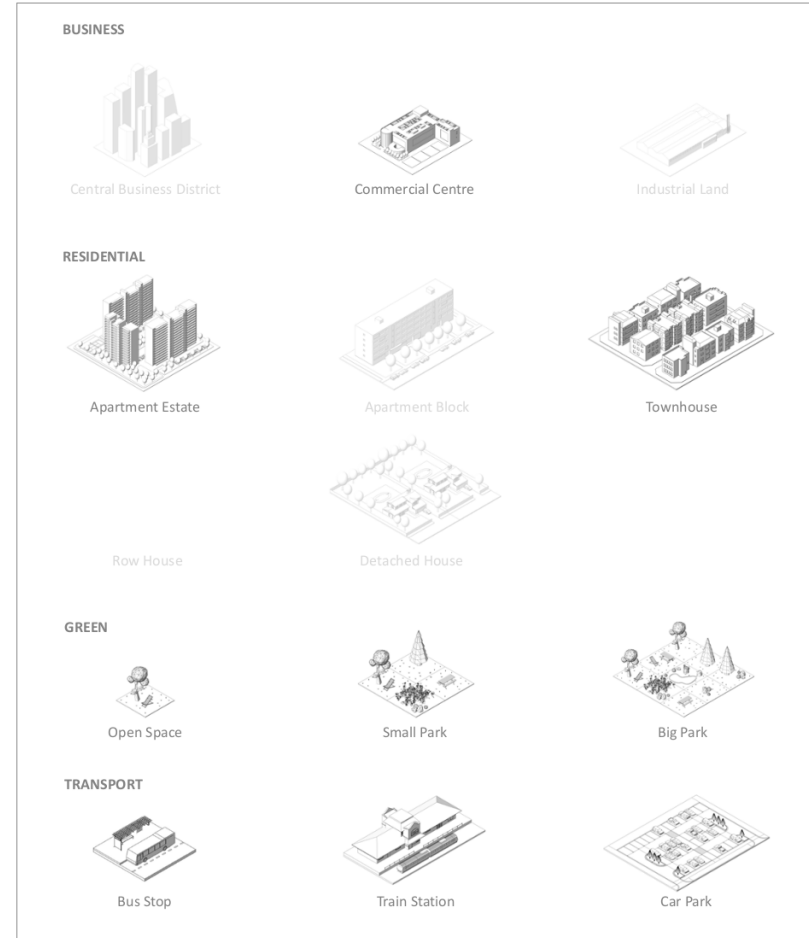


Fig.59

CATALOGUE 01 SITE CONTEXT

Fig.60



SITE INTERVENTION

Four sites of different land use character representing the new town are selected from the focus area to demonstrate the intervention of two design strategies: compact neighbourhood and workspace intervention.

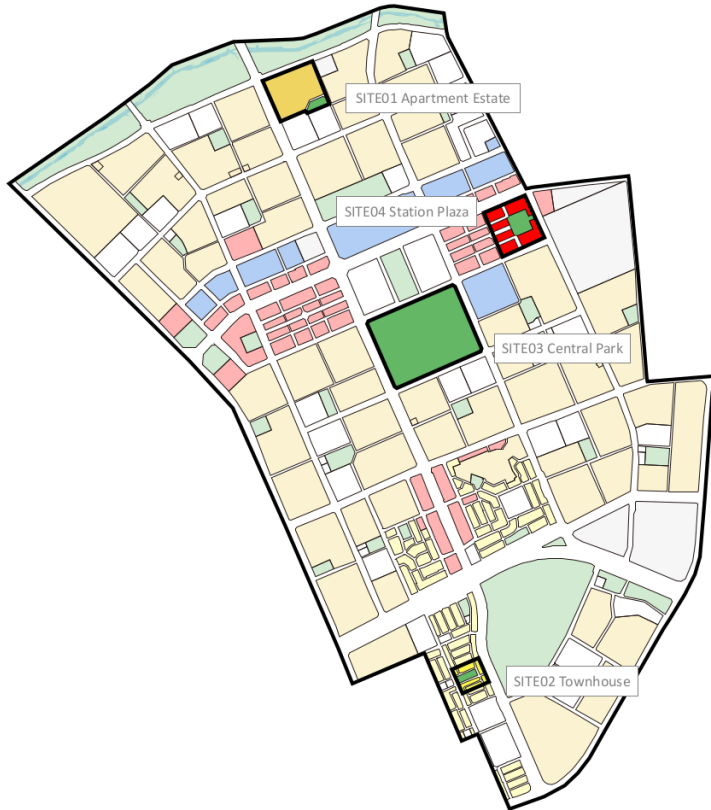
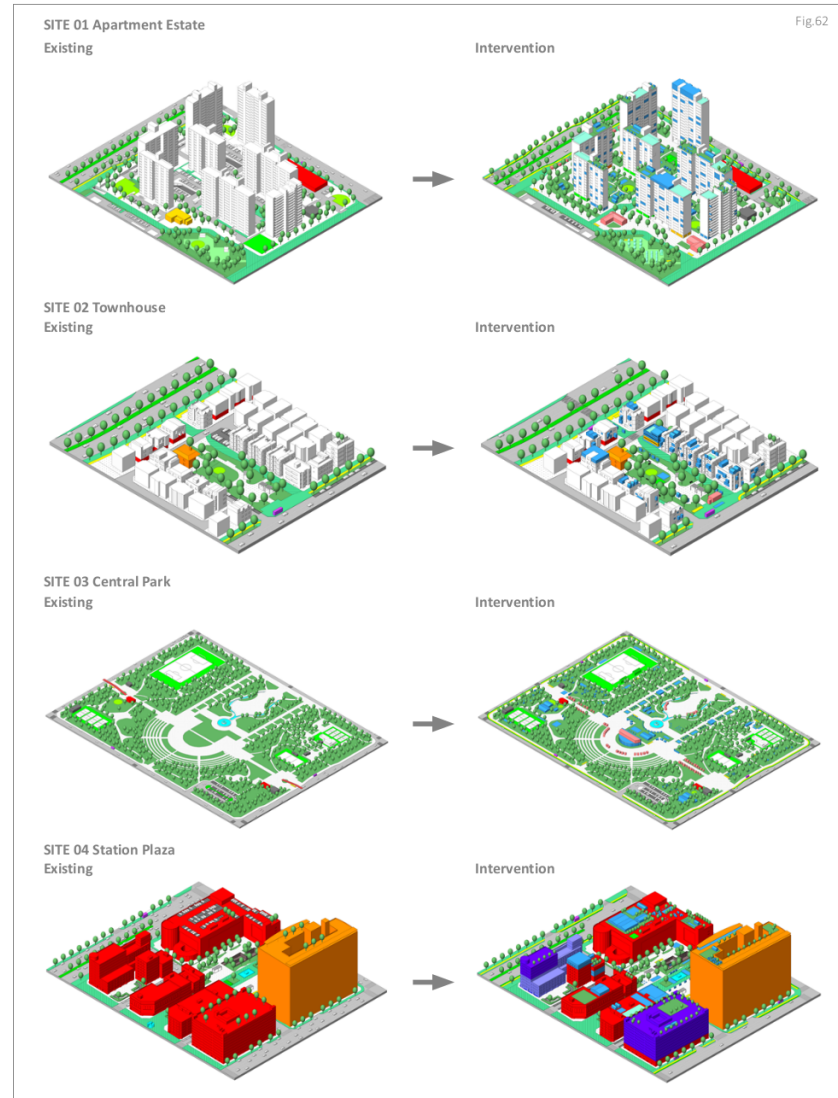
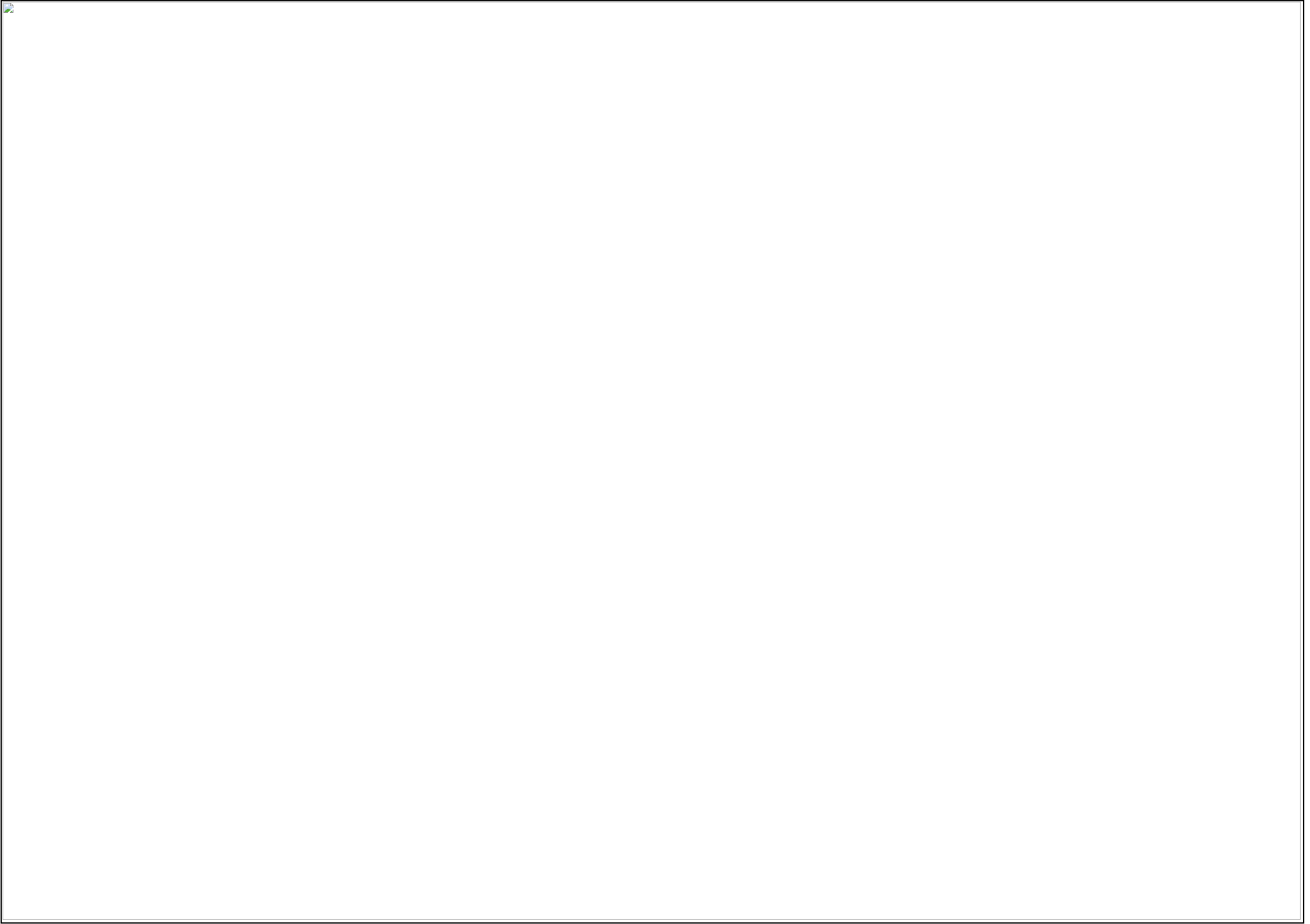


Fig.61





SITE 01 Apartment Estate

SITE INTERVENTION

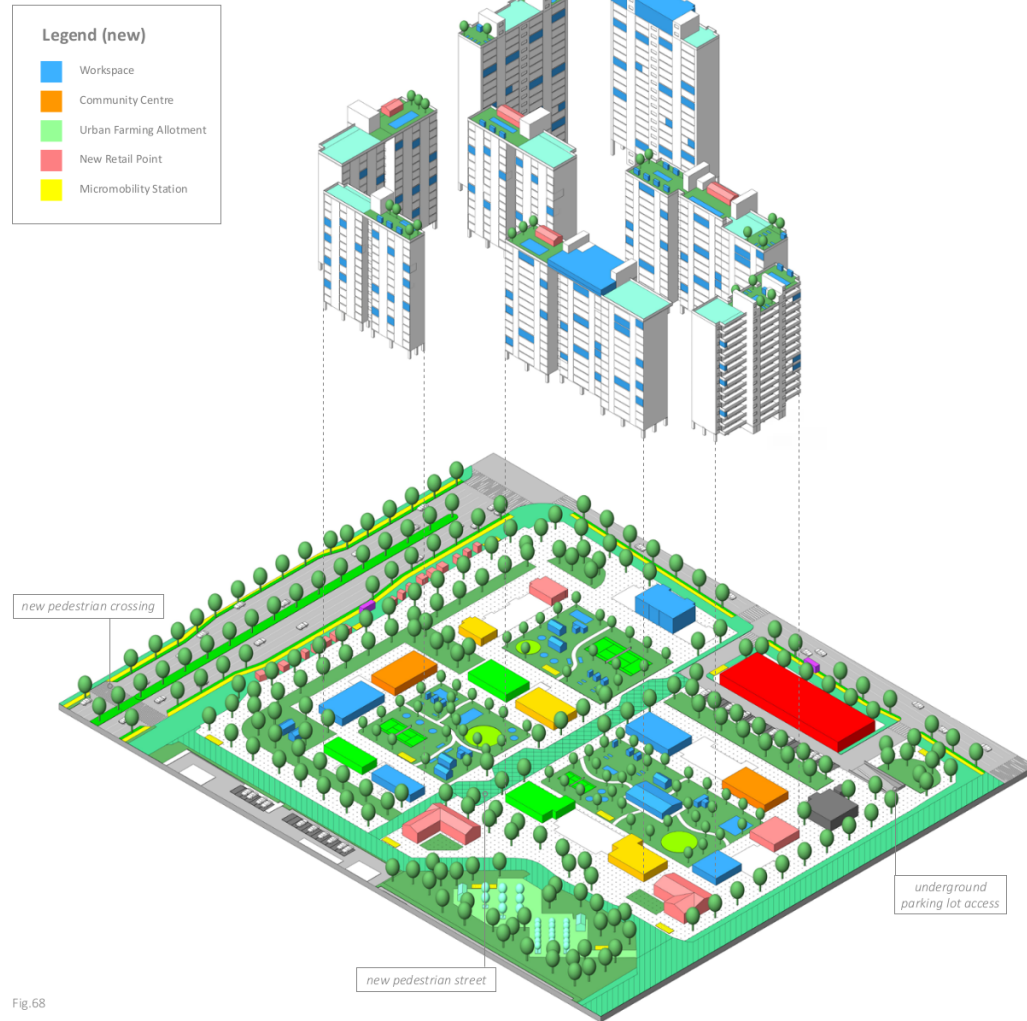


Fig.68

DS1. Compact Neighborhood

The roads are narrowed by one lane allowing wider pavements and a cycle lane with the support of increased transport nodes such as bus stops and micromobility stations. The transformation of the underground pathways to ground-level pedestrian crossings prioritizes pedestrians over vehicles and whilst being more pleasant encourages the use of the pedestrian street. Following the tradition of weekly markets in the overground car parks of the estates, the extended pavements in the main road is intensified with kiosks and stalls to promote it as a vibrant destination. Meanwhile, the existing underused neighbourhood park is converted into urban farming allotments to promote a communal activity for sustainable food production.

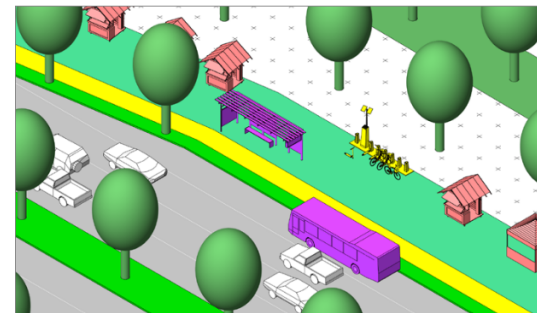


Fig.69 Main road



Fig.70 Pedestrian street

SITE 01 Apartment Estate

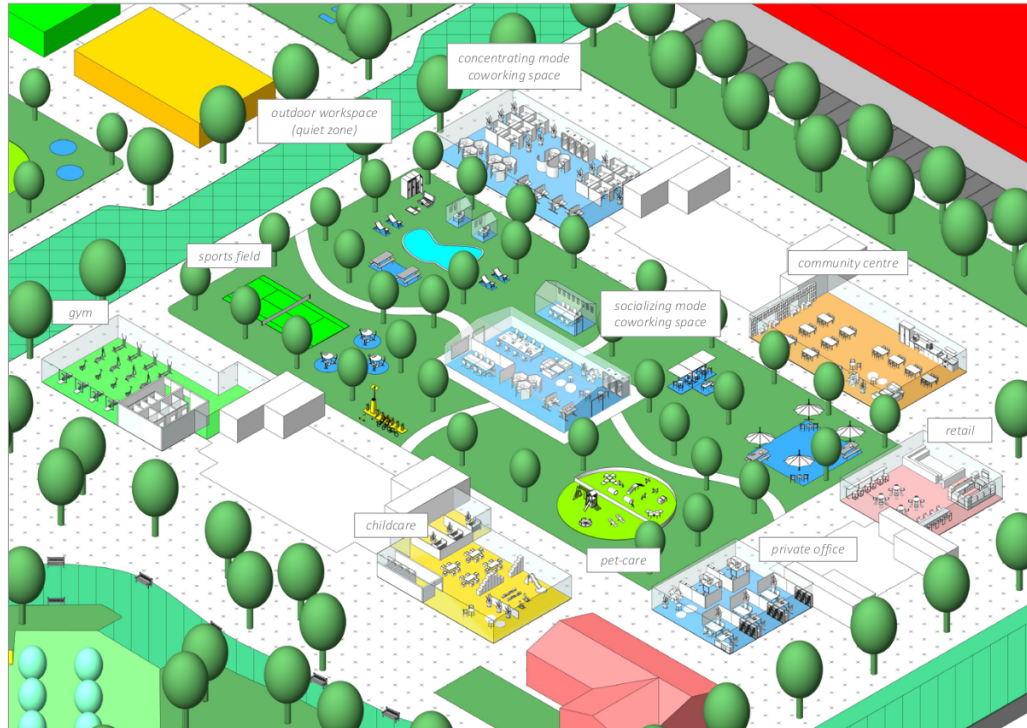


Fig.71 Apartment Estate Public Ground

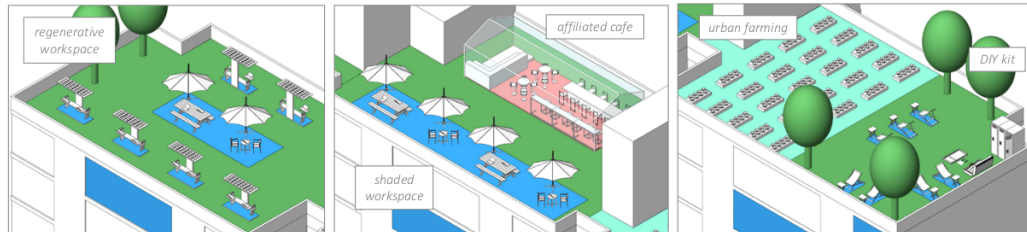


Fig.72 Rooftop Workspace

DS2. Workspace Intervention

The renovation of the apartment estate allows for a comprehensive design intervention that includes vertical extensions, rooftop designs, ground level rearrangements, and transformation of the carparks. Each household will have a chance to adopt and customize from a collection of home office solutions varying in size and work modules. For instance, a corner unit can extend towards the corridor while internal balconies can be implemented as semi-outdoor spaces on the other facade. With the reduction of vehicle usage due to remote working and compactness efforts, the existing overground carparks are repurposed as a public open space where communal facilities such as workspaces are centralised. Meanwhile, the rooftop now becomes an additional sanctuary of open space with a variety of workspaces and programmes catered to the residents of the blocks.

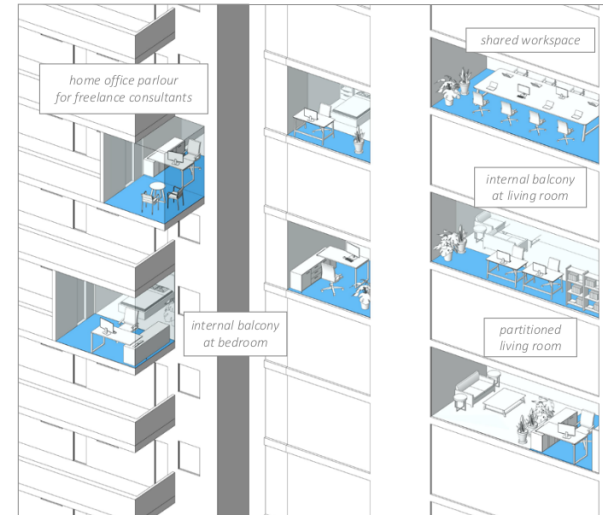


Fig.73 Types of home office

SITE 02 Townhouse

EXISTING CONDITION

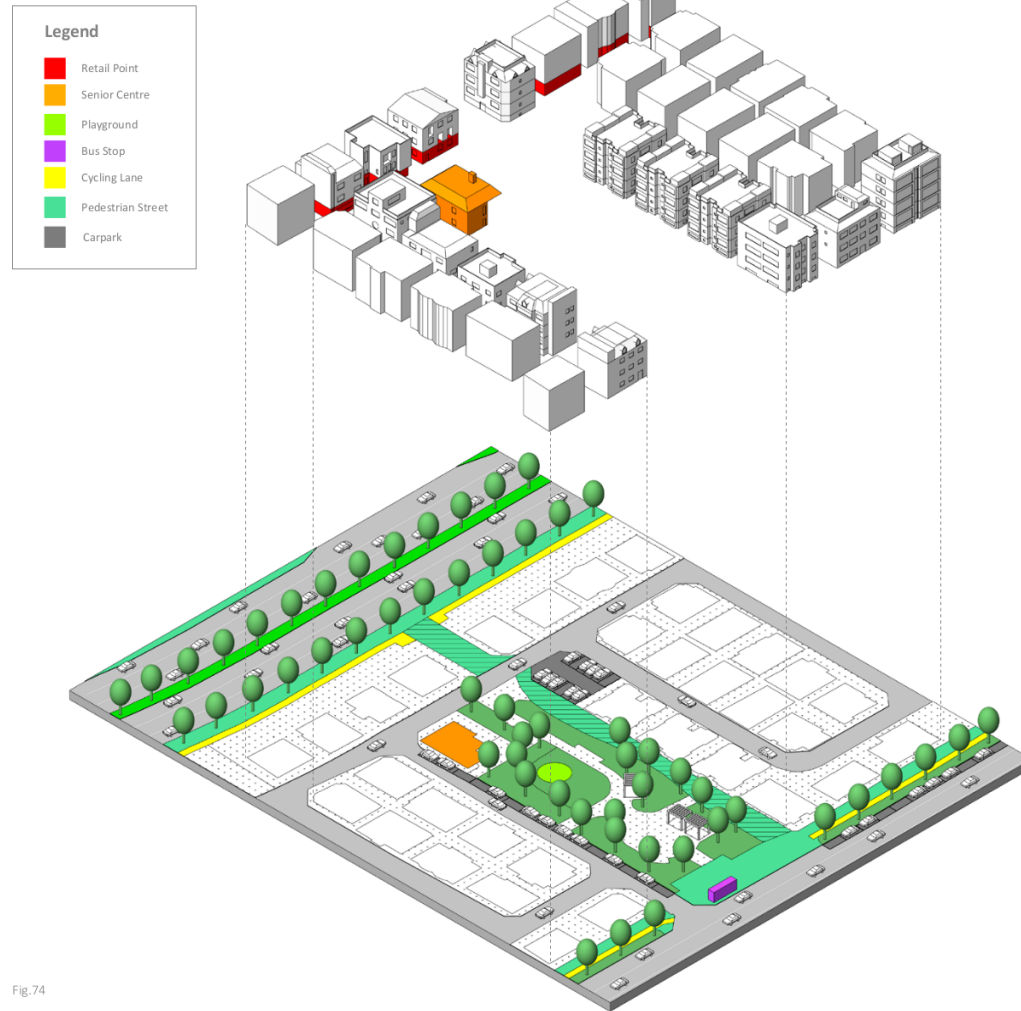


Fig.74

Site Analysis

The selected area is comprised of townhouse blocks surrounding the Galsan neighbourhood park located at the south of the site. Within this neighbourhood, communal facilities such as a small playground, a senior centre and a public shelter are all located inside the park making it the central space for the community. However, the park fails to attract all ages and is exclusively used by the elderly. The low utilization may attribute to poor public transport connectivity forcing the residents to become highly dependent on private vehicle use. This is not least also influenced by the lack of pavements in the inner streets around the blocks and a designated carpark next to the pedestrian street which deprives walkability.

Site Photos



Fig.75 Inner Street



Fig.77 Pedestrian street



Fig.76 Bus stop



Fig.78 Carpark



Fig.79 Playground



Fig.80 Senior Centre

SITE 02 Townhouse

SITE INTERVENTION

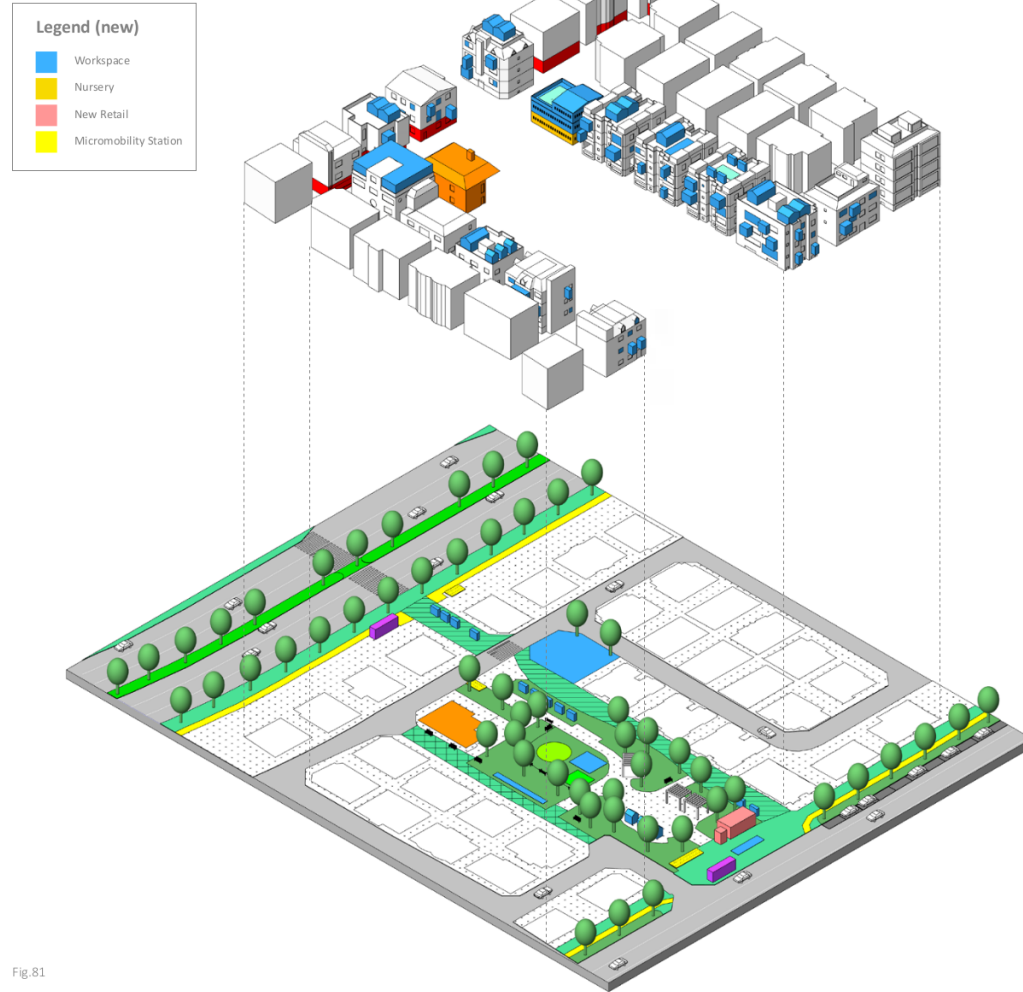


Fig. 81

DS1. Compact Neighborhood

The inner street adjacent to the senior centre is pedestrianized for better access to the park while cycle lanes and bus stops are added to support the connectivity of the neighbourhood. The once carpark is now repurposed into a coworking facility affiliated with a nursery and a rooftop urban farm. Acting as the community hub of the neighbourhood, it supports the park to promote a destination for the residents and visitors.

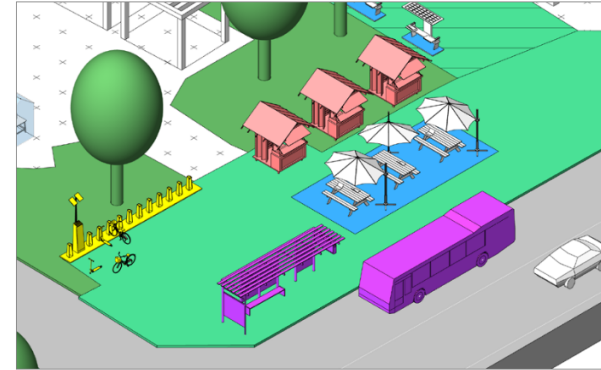


Fig. 82 Transport Node



Fig. 83 Reclaimed Street

SITE 02 Townhouse

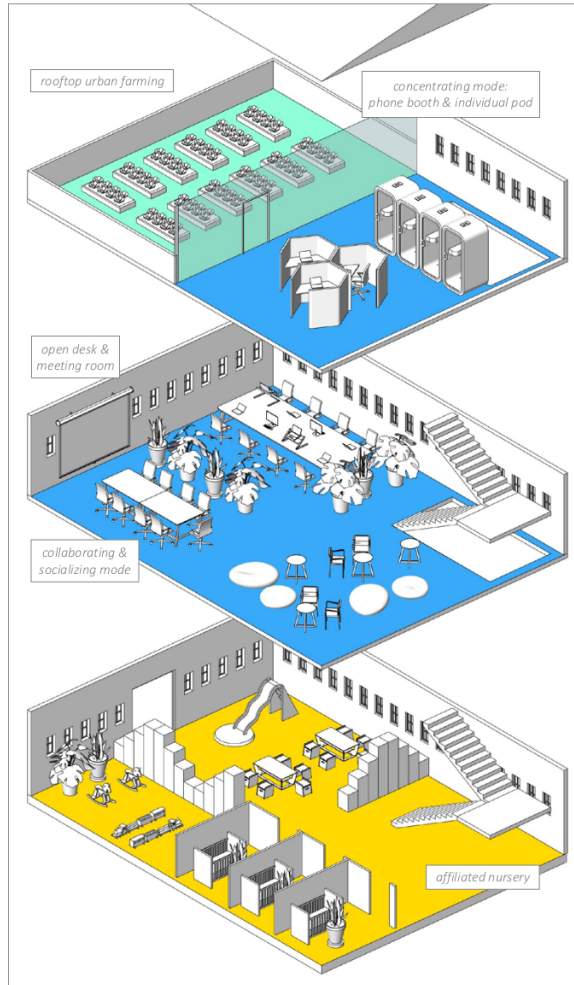


Fig.84 Coworking space affiliated with nursery and rooftop garden

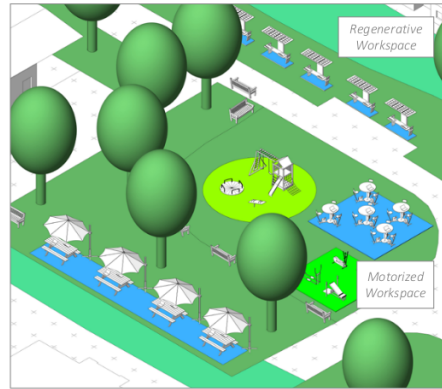


Fig.85 Neighbourhood Park Workspace

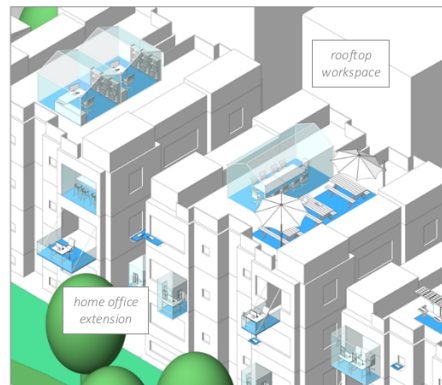
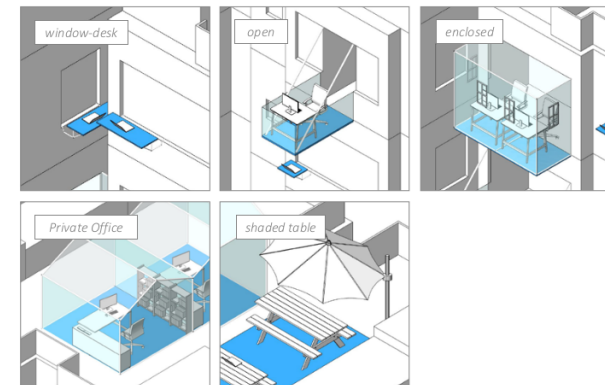


Fig.86 Townhouse Workspace

DS2. Workspace Intervention

A variety of interventions are introduced to cater to the different needs of the residents. Home offices for individuals are implemented as balcony extensions or internal renovations while rooftop spaces can be installed with private individual offices or workspaces which are shared amongst the residents of the block. At the same time, the park now also features a mixed work-leisure use with outdoor workspaces. Together with the mixed-use typology of the coworking community hub, the interventions promote the different work modes and community building amongst the residents of the neighbourhood.



SITE 03 Central Park

EXISTING CONDITION



Fig. 87

Site Analysis

The Pyeongchon Central Park is approximately 120,000 sqm, which accommodates various activities from static to dynamic. The park is accessible at multiple points around its perimeter with two pedestrian bridges at the east and west entrances. At its centre is a large circular open space with water features and is most popular amongst children. Besides that, the trees around the park provide for a quiet space for all while sports facilities are located at the edges of the site. Considering its massive size, the park is relatively underutilized apart from occasional events which may be attributed to it being surrounded by office buildings and less residential. On the contrary, its large green space and central location is ideal to promote an out-of-office working culture through design interventions.

Site Photos



Fig.88 Central Square



Fig.89 Waterways



Fig.90 Fountain



Fig.91 Pedestrian Bridge

SITE 03 Central Park

SITE INTERVENTION

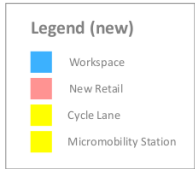


Fig.92

DS1. Compact Neighborhood

For better accessibility, bus stops and micromobility stations are placed more frequently while cycle lanes are introduced surrounding the park. With a car lane reduced east and west of the park, the pedestrian bridge is replaced with ground-level crossings to improve connectivity. Market kiosks and communal facilities are added as destinations throughout the park adding to better accessibility to amenities within the area.

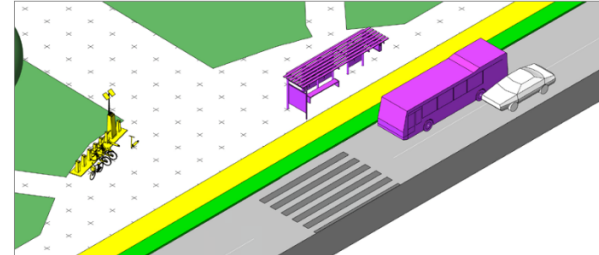


Fig.93 Main road

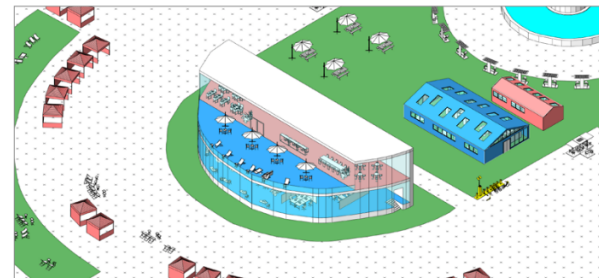


Fig.94 Amenities Intensification

SITE 03 Central Park

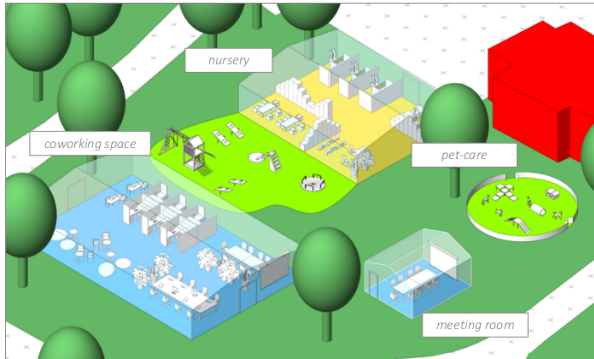


Fig.95 Coworking space affiliated with care service

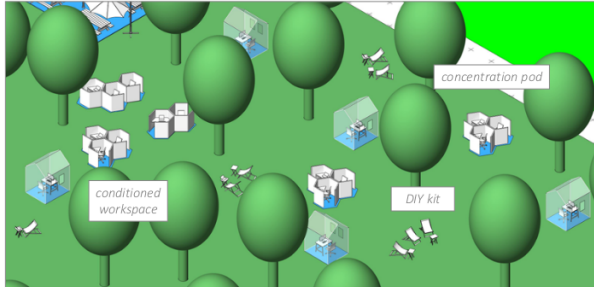


Fig.96 Static Work Zone

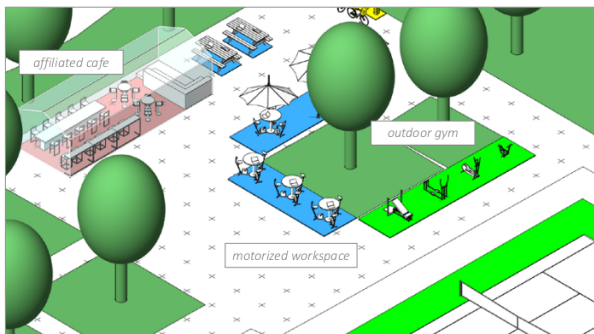


Fig.97 Dynamic zone near sports field

DS2. Workspace Intervention

A new multipurpose structure is introduced at the central open space functioning as a coworking space during the day and occasional event stage in the evening. Meanwhile, two coworking spaces affiliated with child and pet-care services are introduced at the side of the park. While dynamic workspaces are located next to the sports field, individual concentrating mode are placed around the static tree-covered green spaces. To add to that, DIY kit lockers are available at multiple locations to allow flexible work arrangements throughout the park.

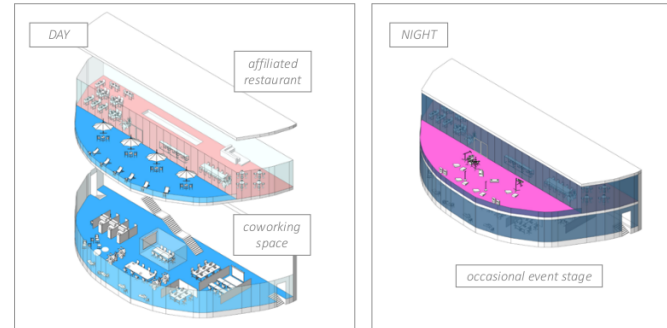


Fig.98 Multipurpose Structure

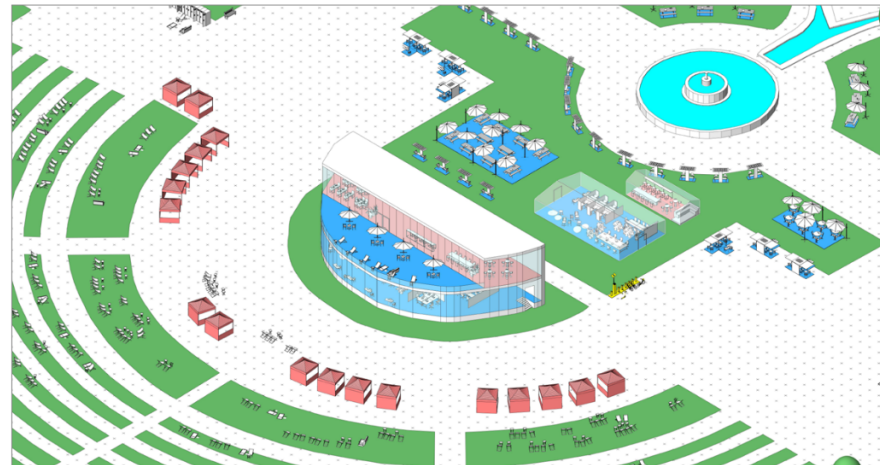


Fig.99 Central Zone with various workspace types

SITE 04 Station Plaza

EXISTING CONDITION

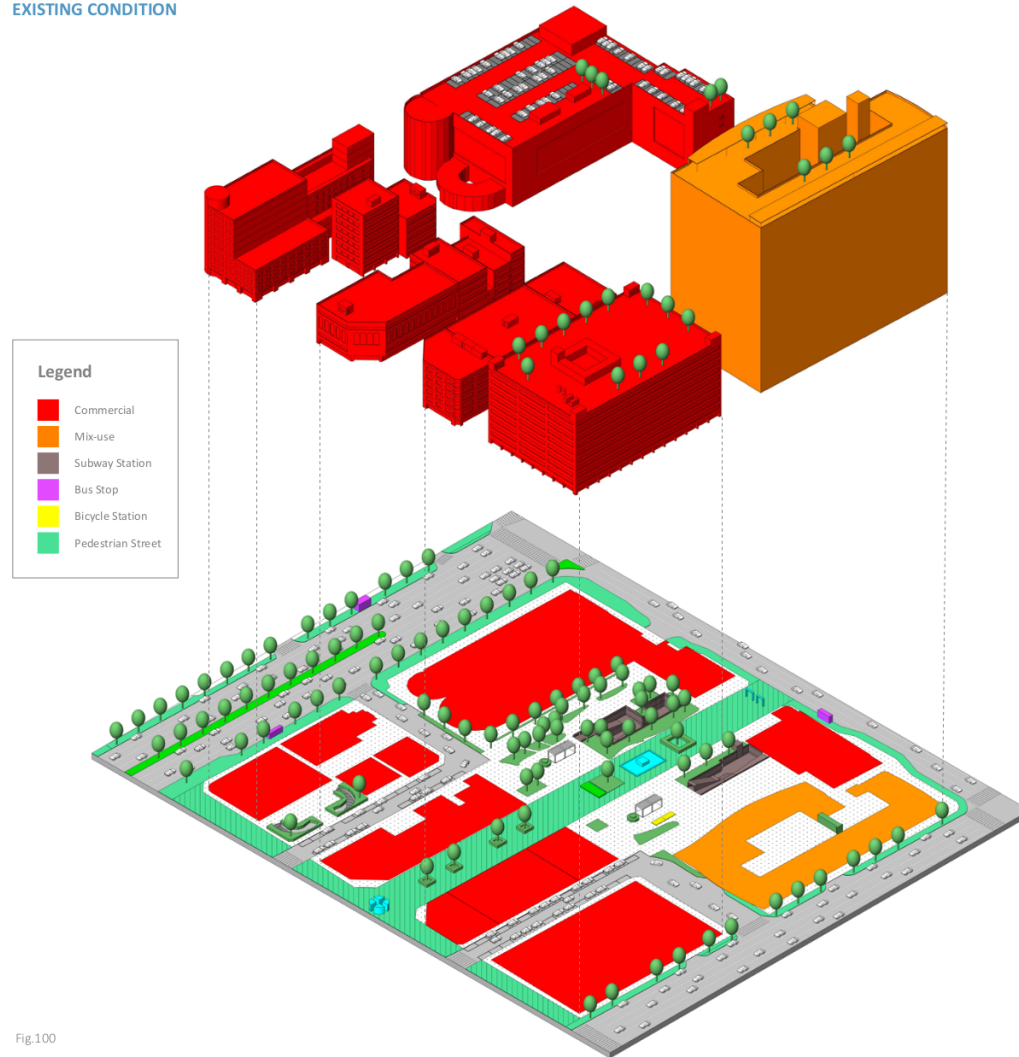


Fig.100

Site Analysis

The Pyeongchon station plaza in the central commercial district is one of the main transport nodes of the town serving the residents and visitors. The plaza is connected by a pedestrian street through the middle and is flanked by commercial buildings on either side. Despite being surrounded by commercial buildings and a mixed-use residential building as well as having shelters, bike stations, and water features, the large open plaza remains underutilized. At the north end, a large retail departmental store which is among the busiest shopping destinations in Pyeongchon, contains a large floor area of carparking space within and on its rooftop. Responding to a high population footfall, it is only logical that the site should also accommodate the changing working culture.

Site Photos



Fig.101 Station



Fig.102 Discount Shop



Fig.103 Shelter



Fig.104 Pedestrian Street

SITE 04 Station Plaza

SITE INTERVENTION

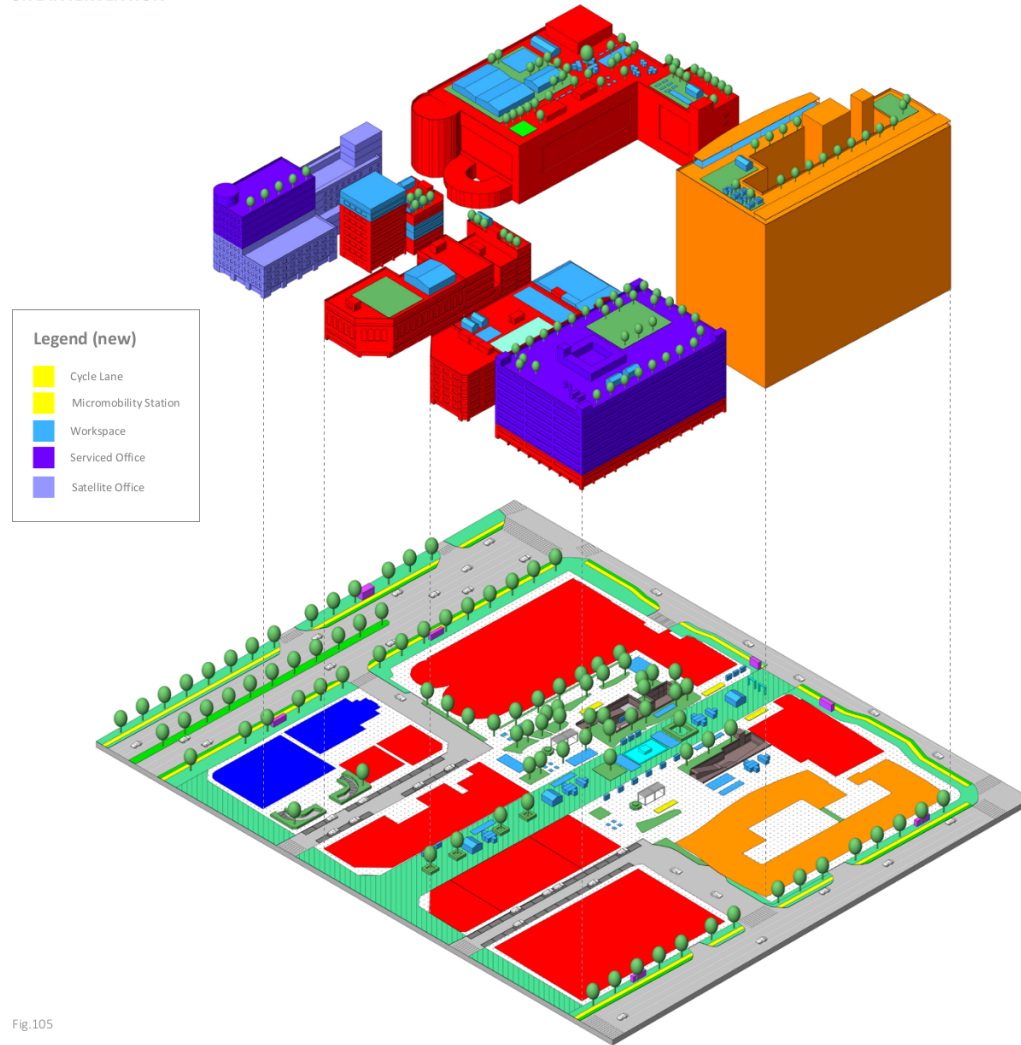


Fig.105

DS1. Compact Neighborhood

With reclaimed pavements, added cycle lanes and bus stops, the district will become more accessible from the residential district. Meanwhile, existing commercial buildings and its rooftop can accommodate business functions such as satellite offices and startup incubating centres which enhances the compactness of the overall neighbourhood with a shorter commute distance to amenities. As a result of the remote working phenomenon, the transport node must adapt by not only serving as the gateway to the CBD of Seoul but become a work destination in its own right.

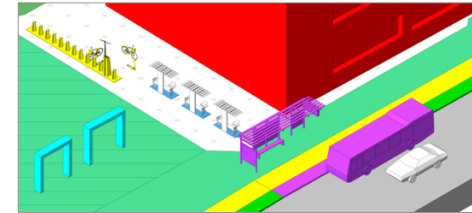


Fig.106 Bus Stop

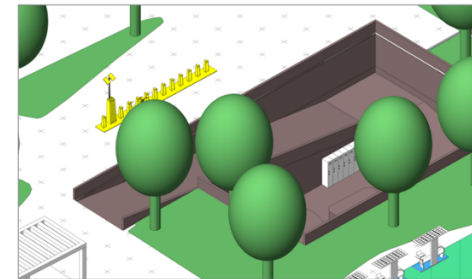
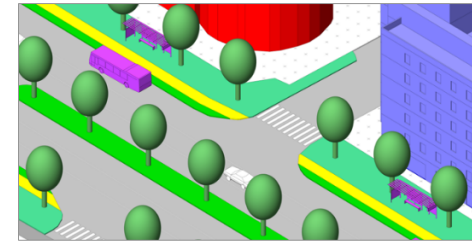


Fig.107 Station

SITE 04 Station Plaza

DS2. Workspace Intervention

The existing open plaza will accommodate various outdoor workspace types that caters towards a socializing work mode. At the same time, commercial buildings will transform its use into a serviced office, or a satellite office of a company headquartered in the CBD. The rooftop carpark will be repurposed into a startup incubating centre alongside some outdoor workspaces. These offices will function as a decentralised workplace away from the urban centre but a centralised node within the neighbourhood.

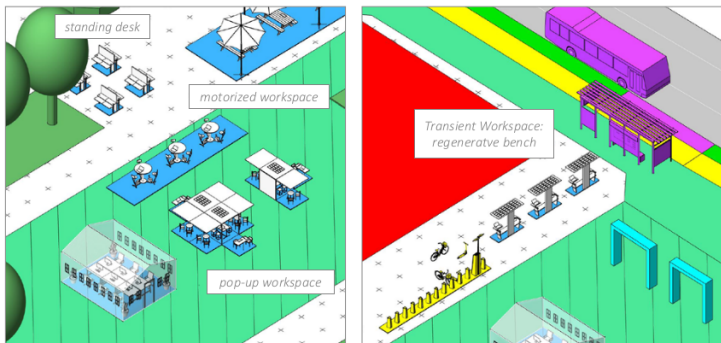


Fig.108 Plaza workspace

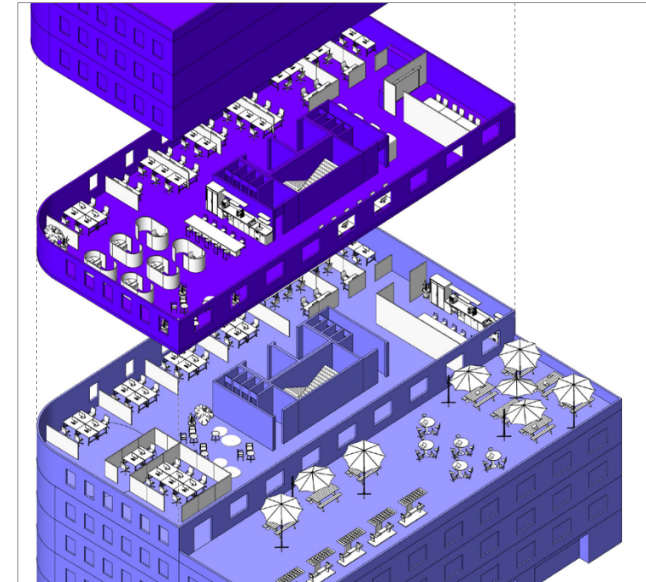


Fig.109 Satellite Office and Serviced Office

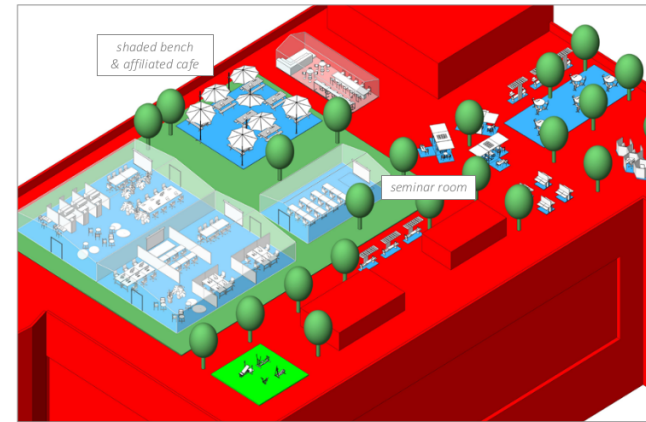


Fig.110 Startup Incubating Centre

PERSONA SCENARIO

Based on interviews from the research stage, four personas are derived to demonstrate the experience of remote workers in the areas of intervention. The quotes from the interviewees are combined to form a narrative of the occupation, work life, and challenges of remote working of each character.

The persona scenarios which represents a small segment of the remote working society illustrates how the residents of Pyeongchon benefit from the design application. The advantage of living in the neighbourhood is the availability of various work facilities that supports flexible working. On the other hand, the compactness allows them to access activities and essential services in the vicinity while travelling around the site sustainably.



Part-time Remote Worker



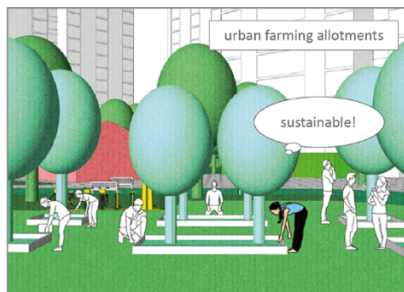
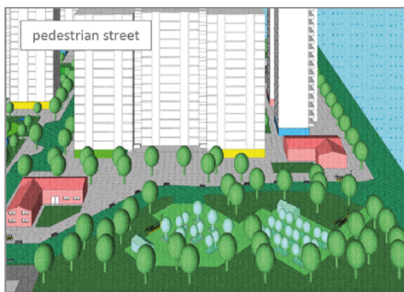
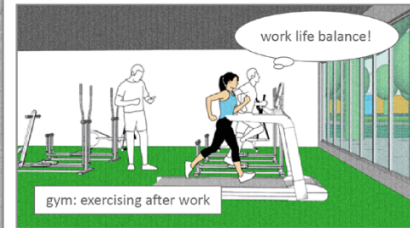
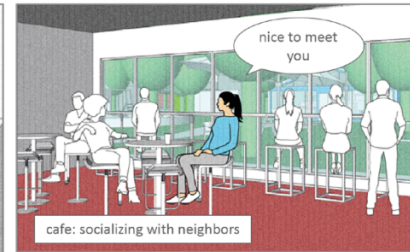
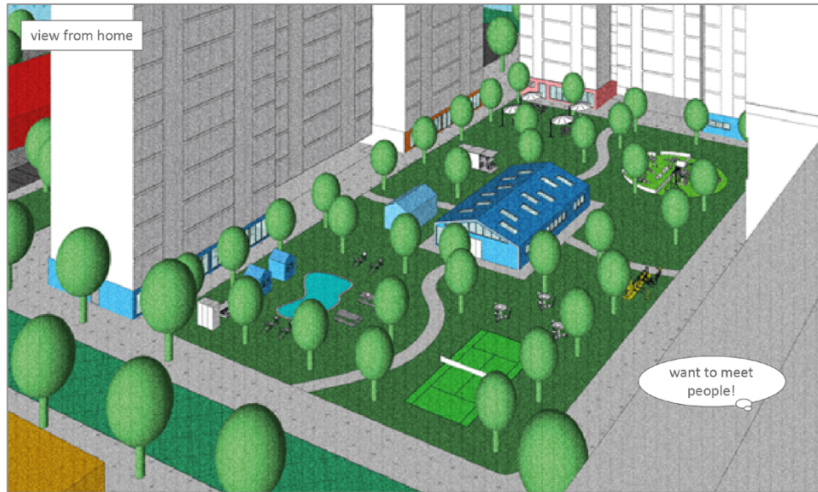
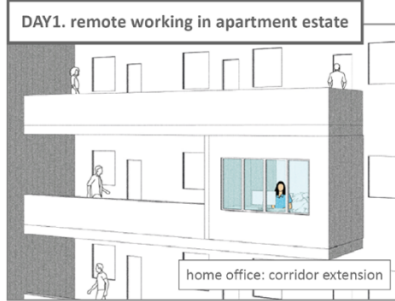
DEMOGRAPHICS
20s, single woman,
living in apartment

OCCUPATION
employee of a corporation in CBD

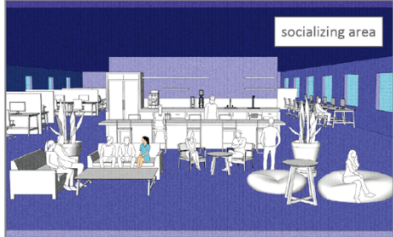
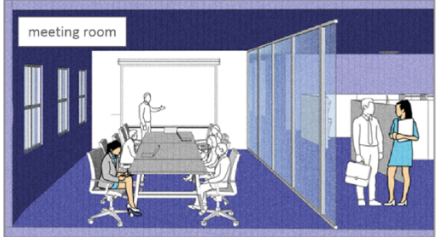
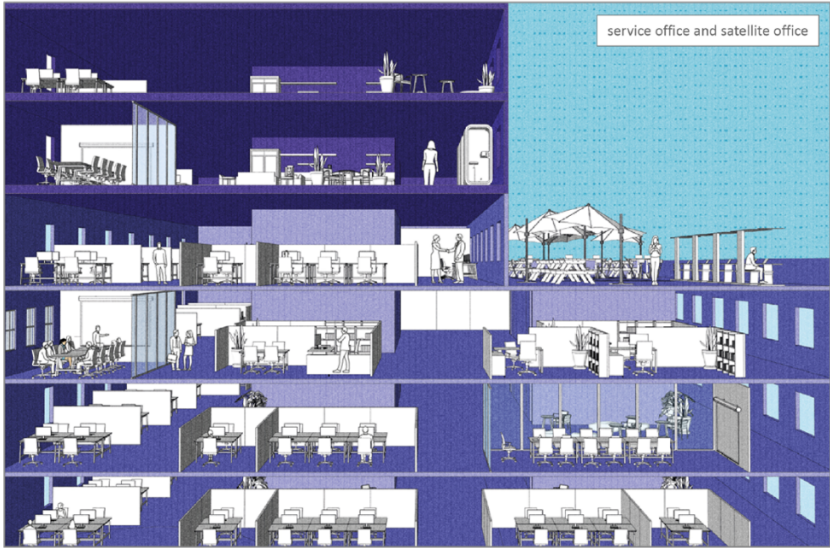
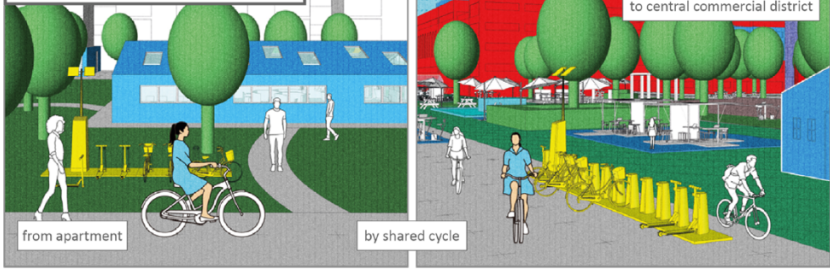
WORK LIFE
remote working 3 days/week,
commuting to satellite office at central
commercial district 2 days/week,
visiting headquarter few times a month

NEEDS
coworking space with video call facility,
ubiquitous workspace, socializing opportunities

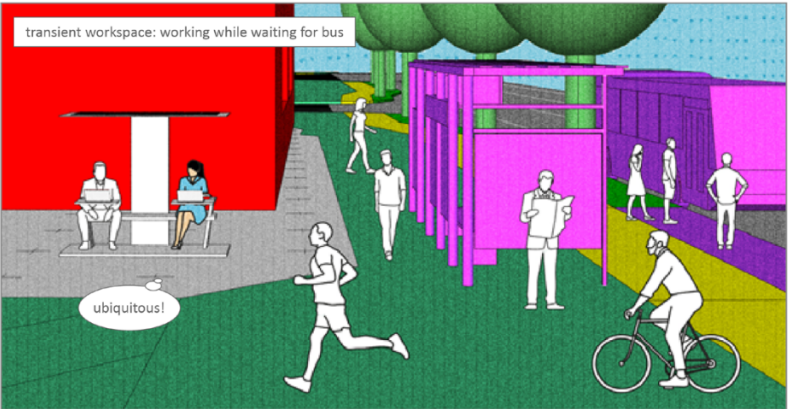
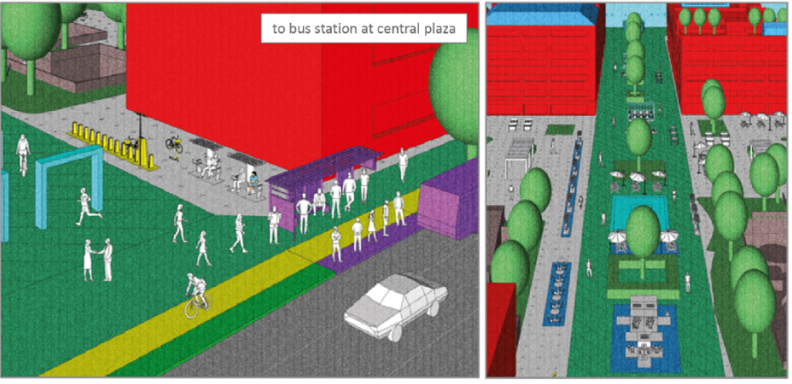
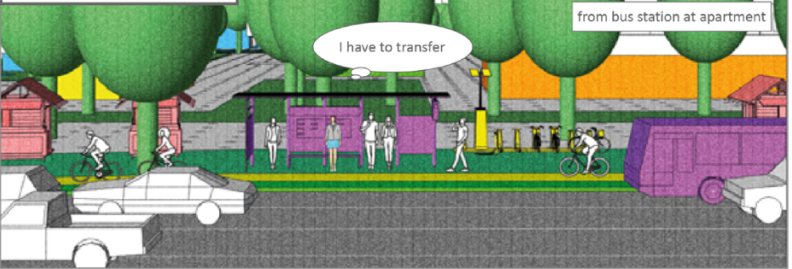
Fig.112 Persona Scenario 1



DAY2. commuting to Satellite Office



DAY3. visiting Headquarter



Freelance Web Developer



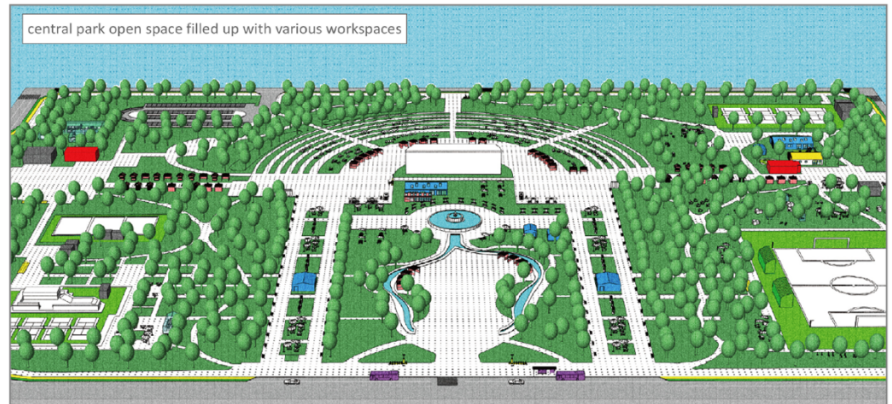
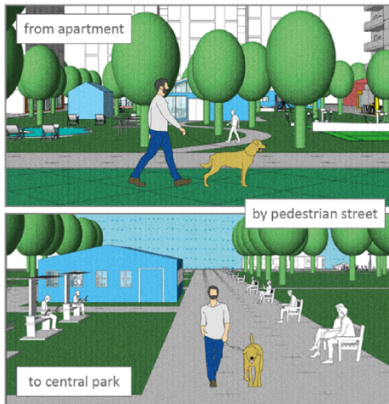
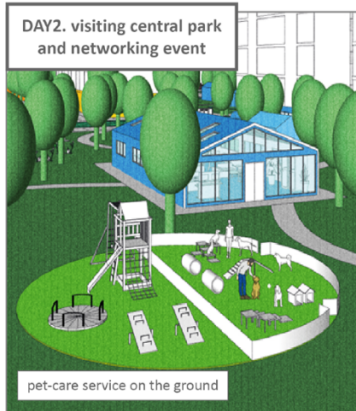
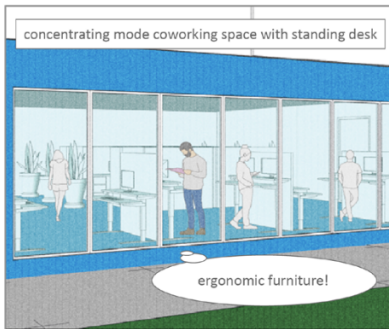
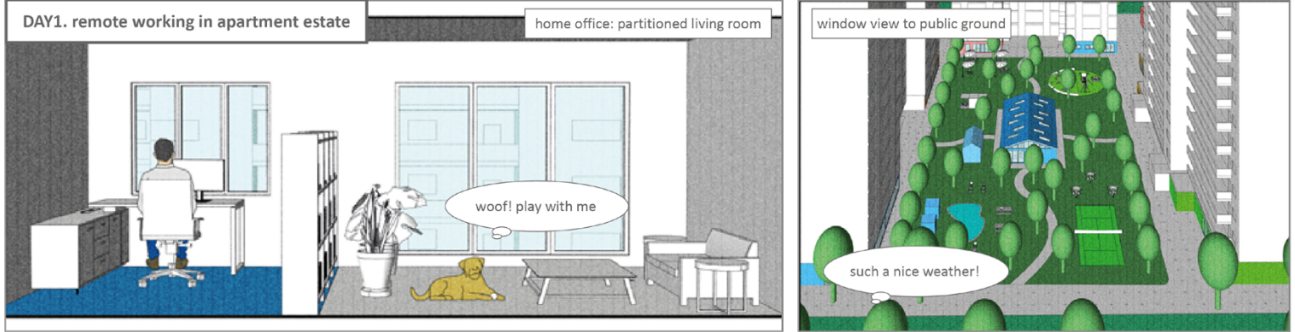
DEMOGRAPHICS
30s, single man with a dog,
living in apartment

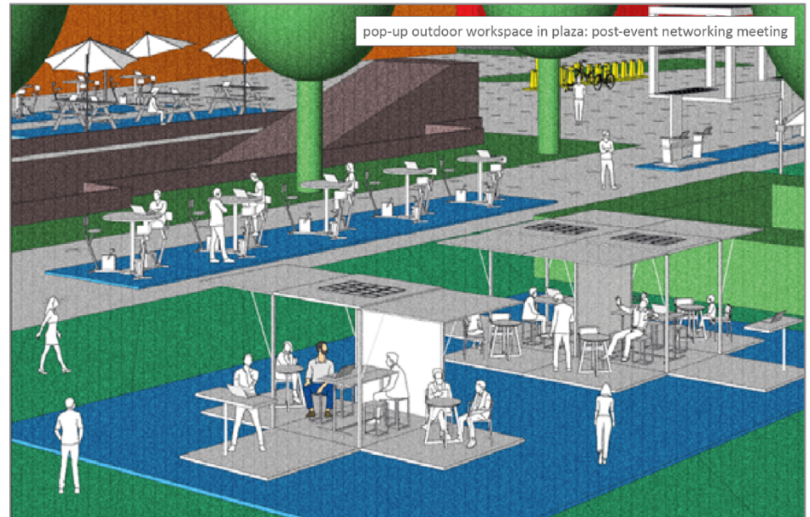
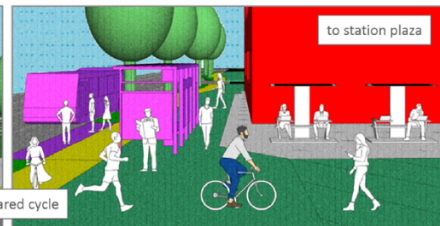
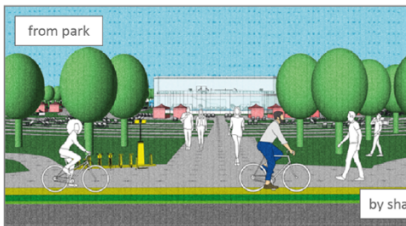
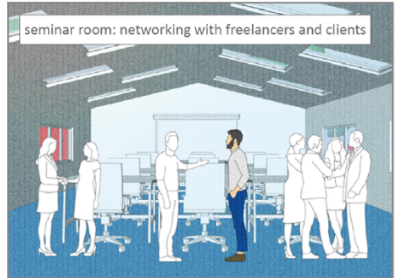
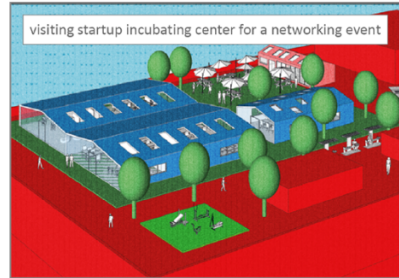
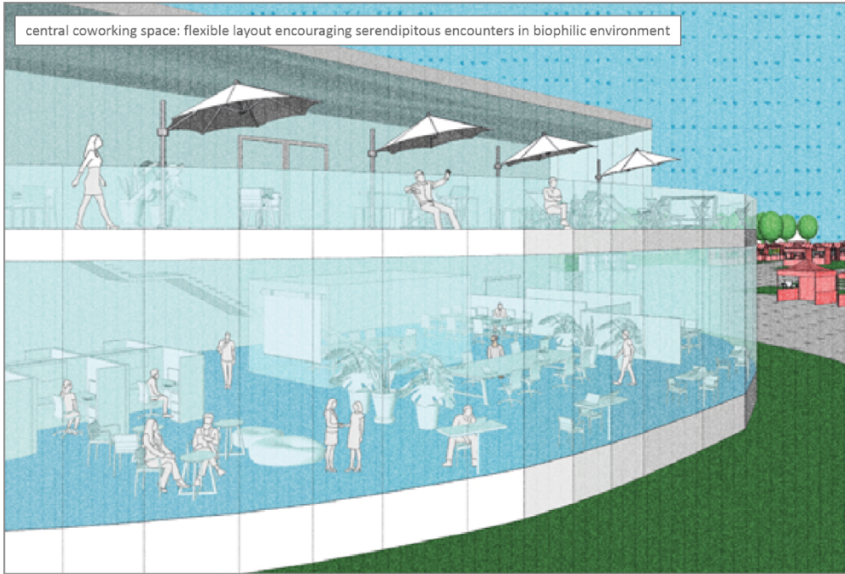
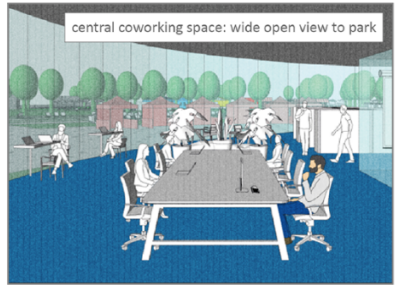
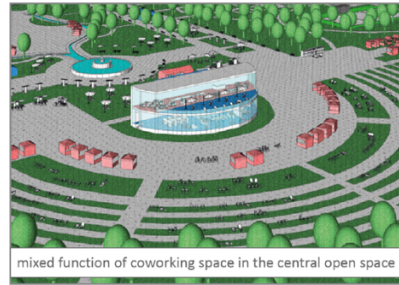
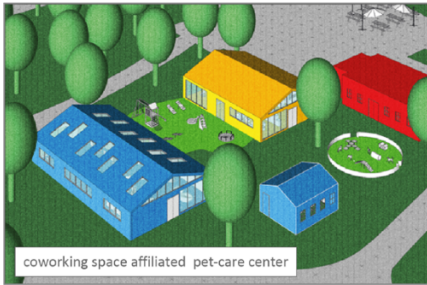
OCCUPATION
digital nomad working for
global clients in different time zone

WORK LIFE
location-independent,
flexible and irregular working hours

NEEDS
networking opportunities, 24/7 workspace,
workspace with pet-care service

Fig.113 Persona Scneario 2





Startup Youth



DEMOGRAPHICS
20s, single man enjoying sports,
living in apartment

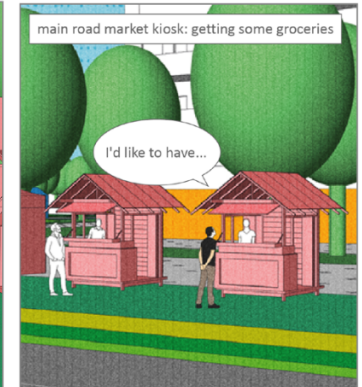
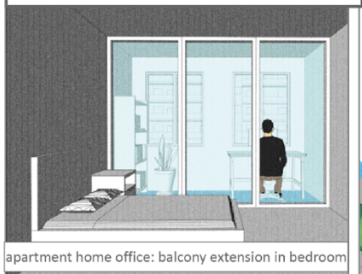
OCCUPATION
social venture startup employee

WORK LIFE
commuting to startup incubating center at
central commercial district, flexible work
arrangement allowing remote working

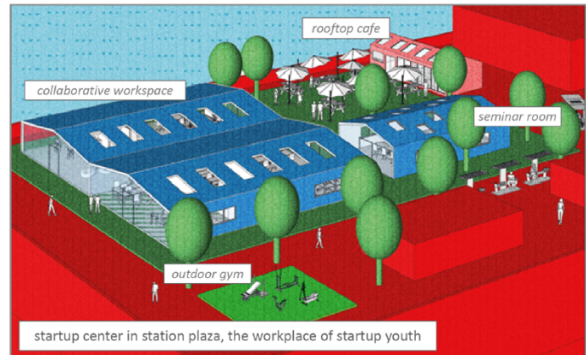
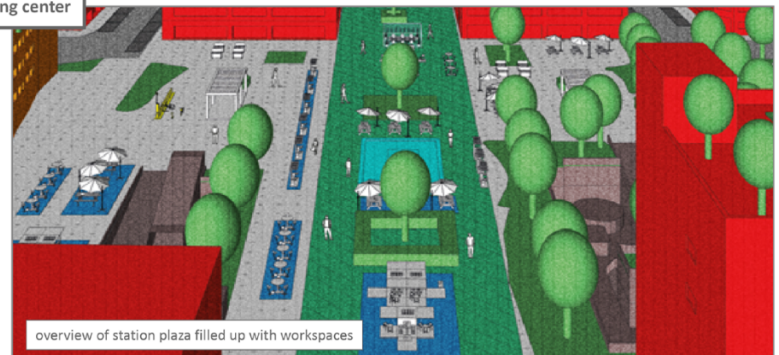
NEEDS
socializing opportunities, sports supporting
workspace, ubiquitous workspace

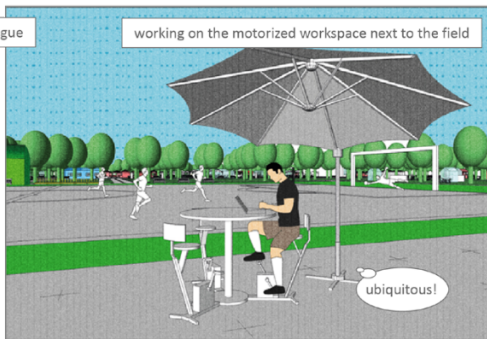
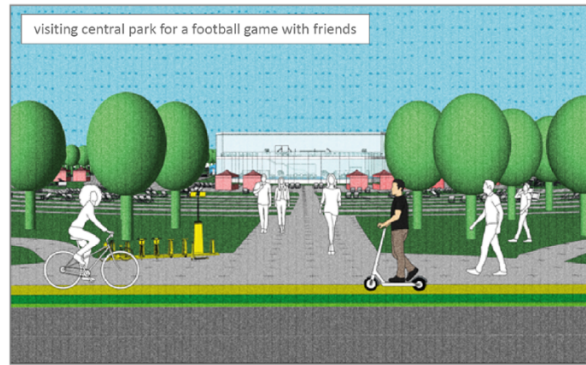
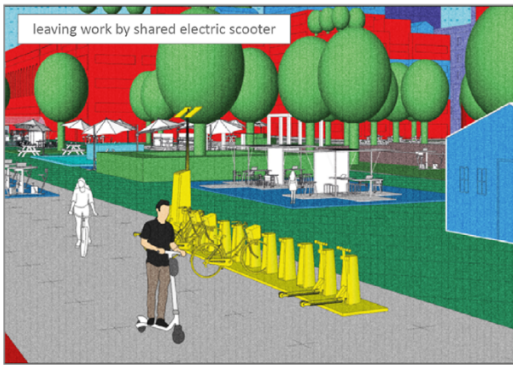
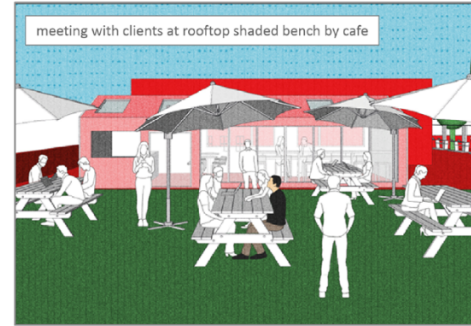
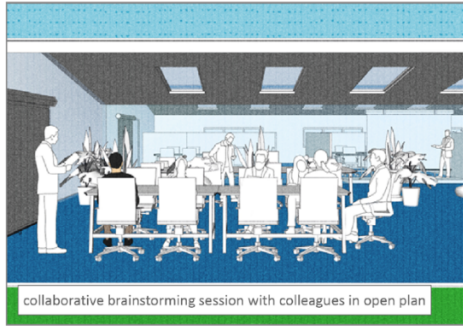
Fig.114 Persona Scenario 3

DAY1. remote working in apartment estate



DAY2. commuting to startup incubating center





Working Mom



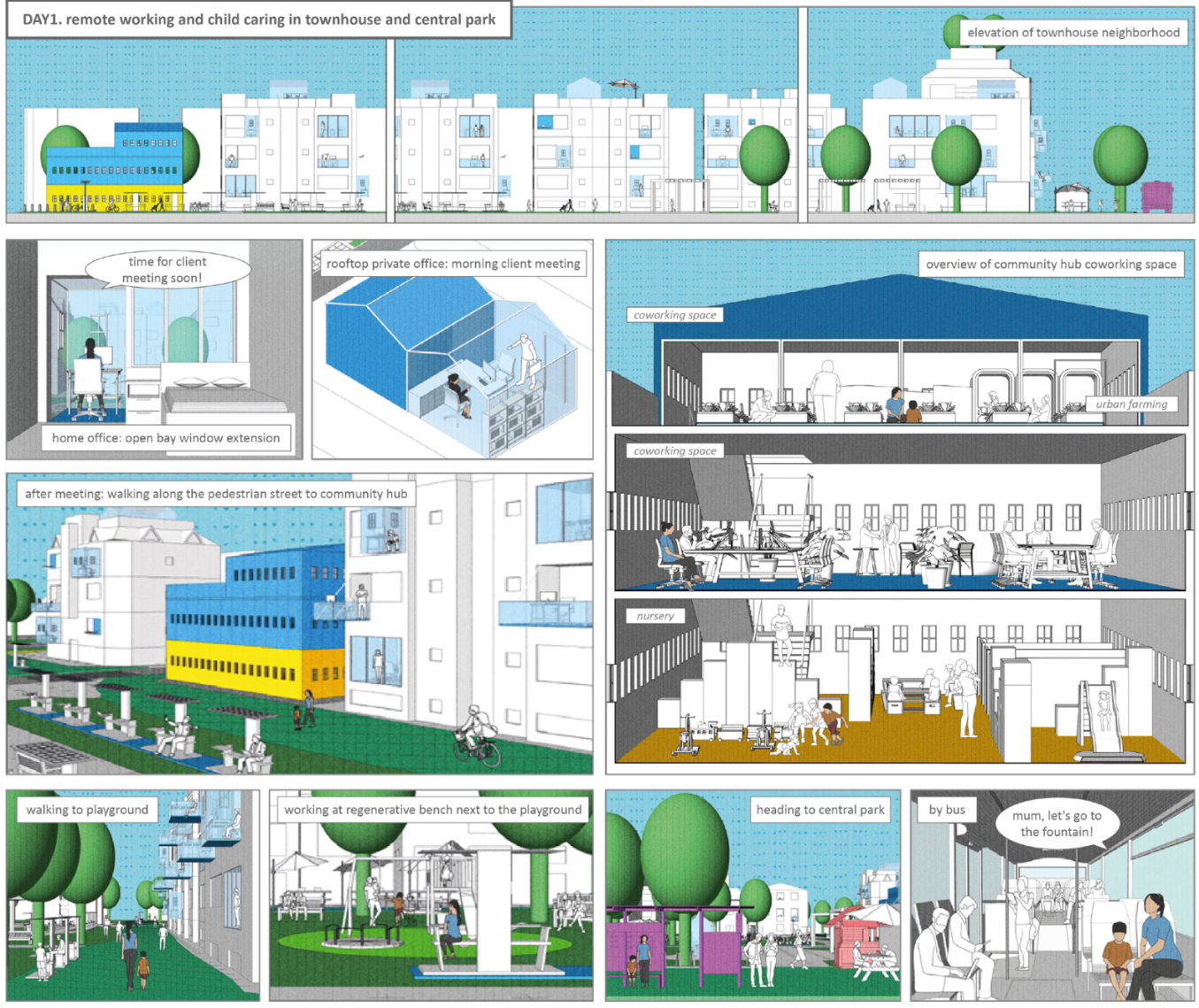
DEMOGRAPHICS
30s, wife and mother of a young kid,
living in townhouse

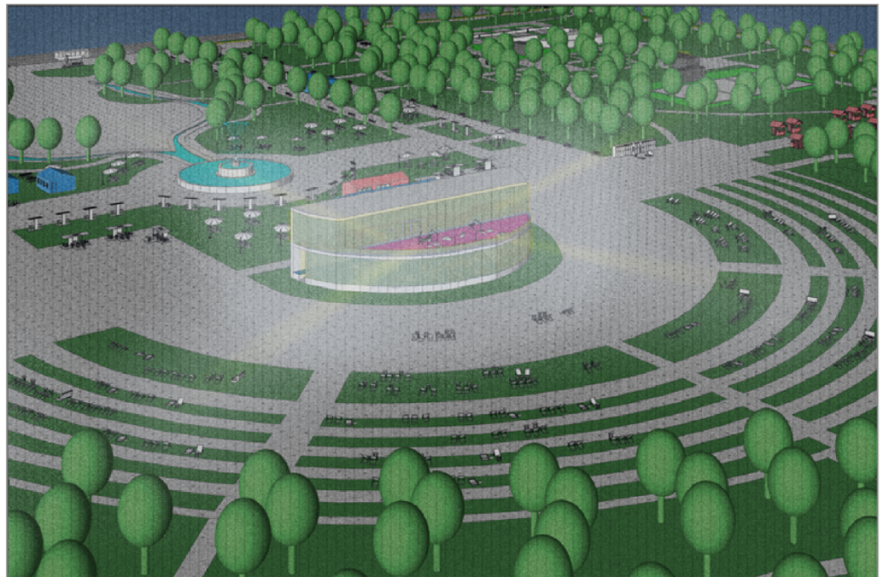
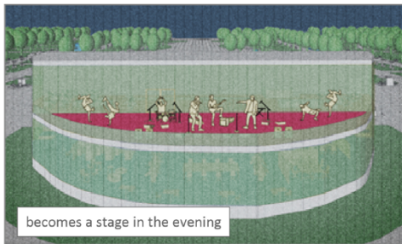
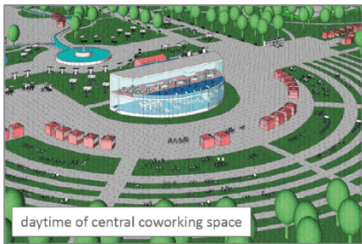
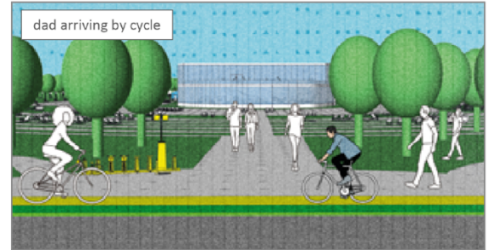
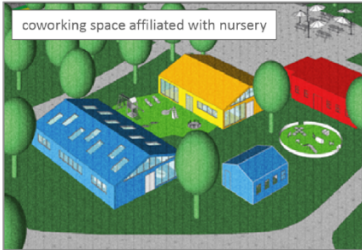
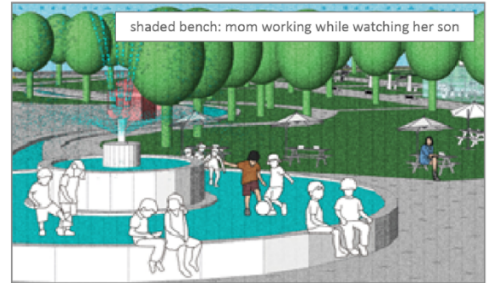
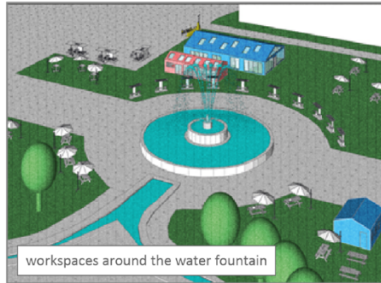
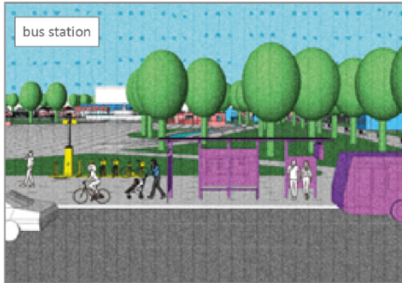
OCCUPATION
freelance consultant working with
personal clients

WORK LIFE
juggling between child care and work
load with frequent client meetings

NEEDS
private office separate from home
for visiting clients, coworking space
in vicinity with child-care service

Fig.115 Persona Scenario 4





08

CONCLUSION

CONCLUSION

The project started with a simple question, “Is the rising remote working phenomenon sustainable to urban development?”. Throughout the research, positive and negative implications of the new work trend are explored. The reduction in carbon emissions thanks to reduced commute and the enhanced wellbeing of individuals presents a great benefit. However, the rebound effect of non-commute travels and socioeconomic problems such as social isolation and decrease in local consumption poses a risk to our environment, society, and economy. Moreover, the research has indicated that the existing cities lack the social infrastructure and workspace facilities to sustainably cater for remote workers.

The proposed sustainable remote working neighbourhood is a response mitigating the risks and maximizing the opportunities of the double-edged future of work. By integrating compact neighbourhood and workspace options from the catalogue, this research project demonstrates how remote workers can thrive in the urban fringe neighbourhood of Seoul. As a decentralised workplace, Pyeongchon can become a more vibrant local centre that supports the wellbeing and productivity of remote workers and propel towards a more sustainable future.

CONTRIBUTION TO PRACTICE

- While the research topic has gained more relevance and attention due to the COVID-19 pandemic, the world is yet unprepared for a future where remote working becomes the new normal. The design proposal of a sustainable remote working neighbourhood will contribute to opening discussions of building resilience to the paradigm shift in work trend. As a guideline for neighbourhood regeneration, the design framework encourages developers and planners to design residential neighbourhoods with consideration for compactness and provision of sustainable workspace infrastructures.
- The research focuses on the sustainable transition to a digital future with a comprehensive design framework that involves the participation of various stakeholders. Institutional support from public and private sectors is imperative to encourage individual participation in remote working. Thus, this project calls for collective actions and collaborations from local and state authorities, businesses and employers, and the local residents.
- While the design strategy is applicable to cities with similar site contexts of a dense and vehicle-oriented urban fringe commuter towns, the design framework can be adapted to any metropolitan city through the comprehensive workspace catalogue from the needs of urban environments down to individual remote workers.

LIMITATION & CRITICAL REFLECTIONS

- The development of the persona scenario which is based on limited interviews with remote workers may be insufficient to form a general overview of the target group. More interviews must be conducted to portray a clearer picture of its usage.
- Due to social distancing rules, the fieldwork in Pyeongchon was solely limited to observations. Performing interviews with local residents and users could have improved the understanding of the site. Acknowledging that design should be an iterative process based on community participation, this project should require co-designing with residents.
- In the literature review, social inequality due to digital divide was raised as a risk of the remote working phenomenon. Although policy tools in the design framework addresses the mitigation measures, the design intervention does not specifically focus upon this. However, the fundamental goal of the workspace catalogue is to offer various workspaces beyond the home office to trigger local consumption and engage remote workers in community building. The coworking space in the vicinity of the neighbourhood will not only cater remote workers but serve the whole community with intensified amenities such as retail or care services. Moreover, the positive sustainability impacts of the design proposal such as economic growth, improved health from better air quality and walkable environment, and reduction in traffic congestion and carbon emissions can be shared by the whole society.
- With technology being the enabler of remote working, workplace design will be constantly evolving to accustom the technological advance. The open-ended workspace catalogue is designed for flexibility and adaptability with endless variations in configuration. The toolkit needs to be constantly re-evaluated and adapted in accordance with the changing working habits and the culture.
- The author's personal experience as a digital nomad as well as working from home and a coworking space during the research provides an insight into the demand and challenges of remote working.

09

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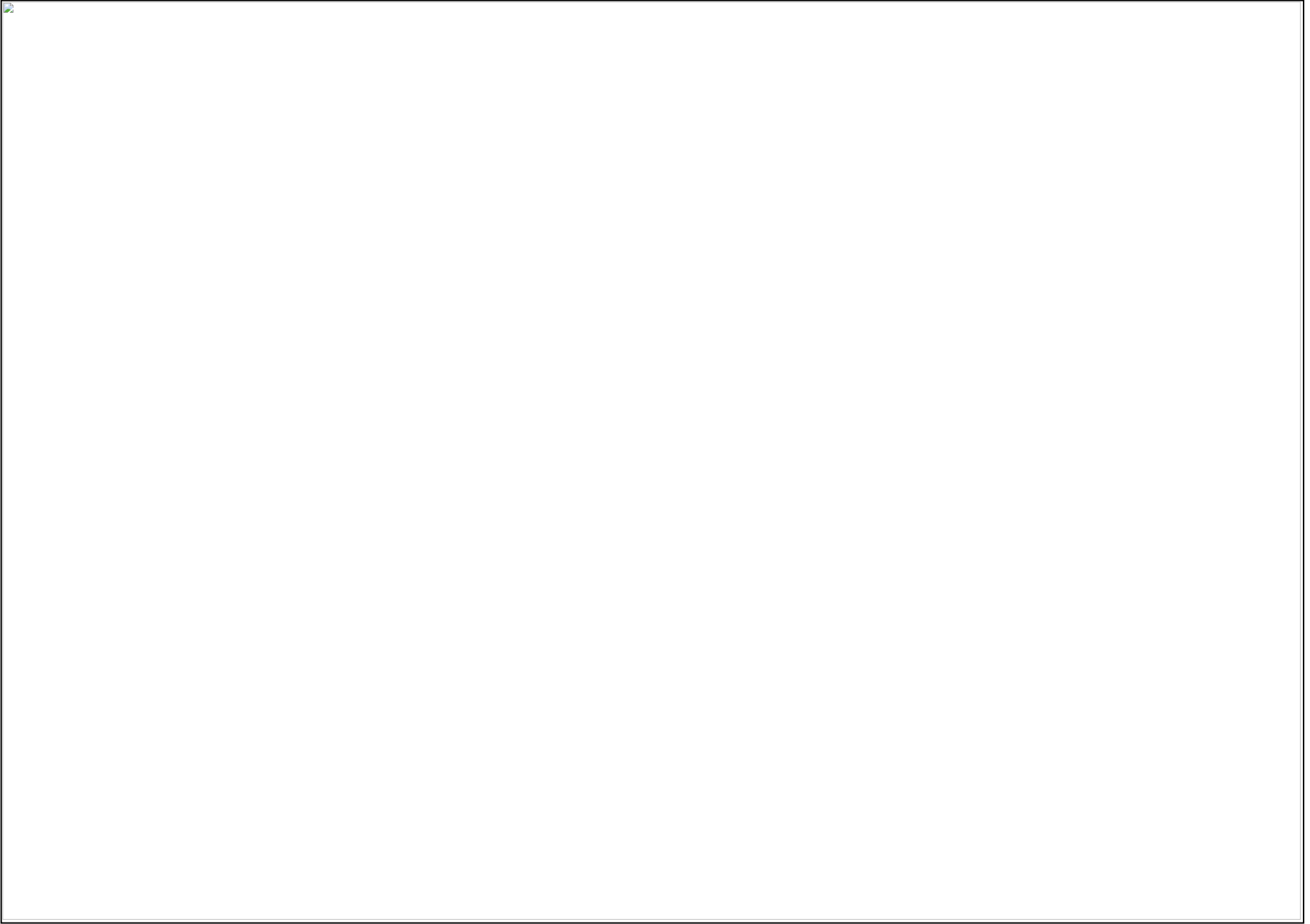
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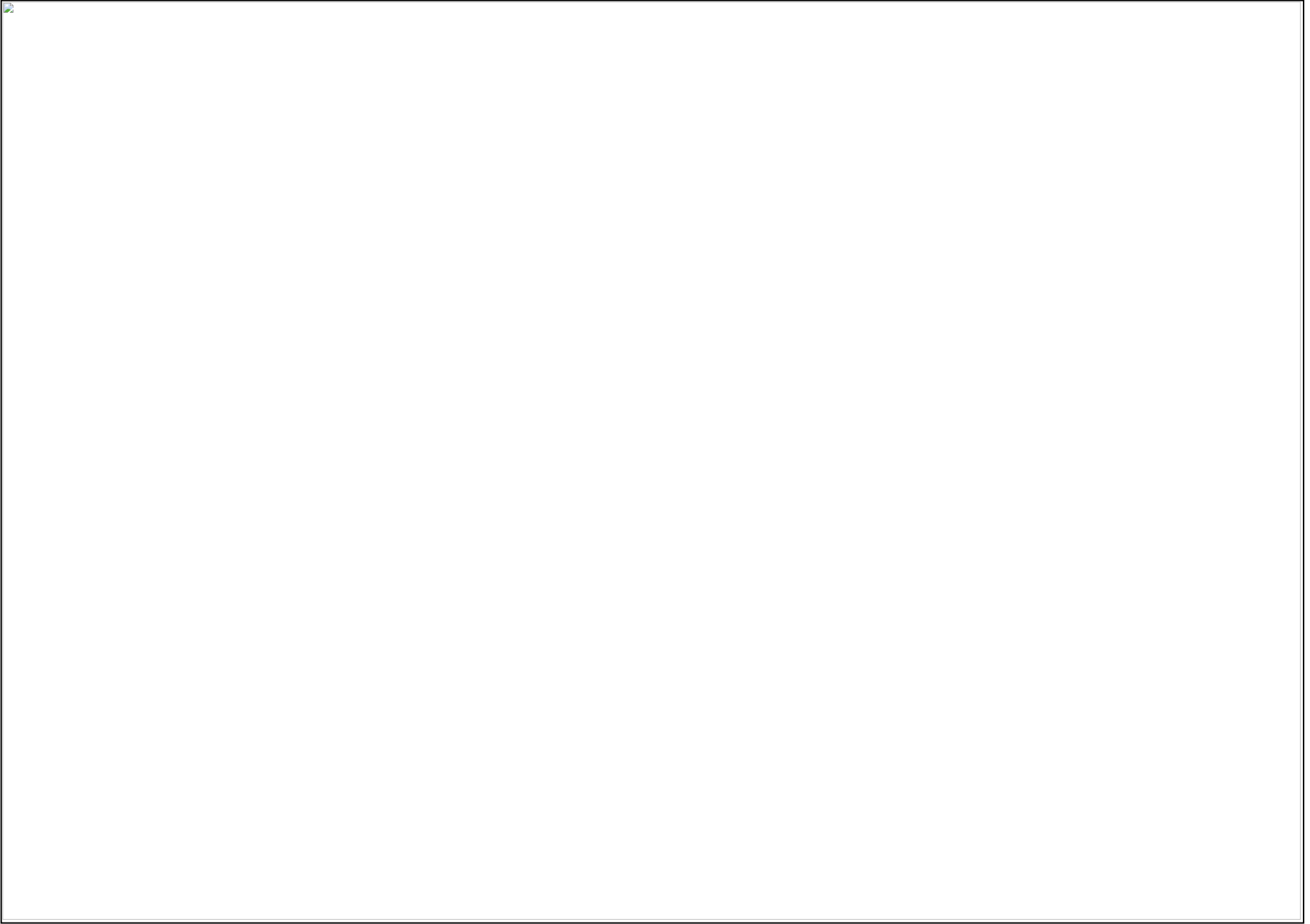
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Appendix A. INTERVIEW QUESTIONS

Welcome

You are being invited to participate in a research study titled 'Sustainable Remote Working Neighbourhood'. This study is being done by Jeong Hyun Cho from the Bartlett School of Planning at the University College London (UCL).

This interview will ask about your experiences of your remote working lifestyle. Your responses will be combined with those of others to help with a University College London (UCL) academic research assessing the impact of remote working culture in the built environment. The survey will be used to develop guidelines for sustainable remote working culture in future urban development.

Remote Workers

Remote Working Profile

1. How long have you worked remotely?
2. How often do you work remotely? (e.g. full-time, part-time)
3. How did you engage in remote working? e.g. personal choice, employment contract
4. Which of the following categories best describes the industry you primarily work in?
5. Which of the following best describes your role in industry? (e.g. Upper Management, Middle Management, Junior Management, Administrative Staff, Support Staff, Student, Trained Professional, Skilled Labor, Consultant, Temporary Employee, Researcher, Self-employed/Partner, Other)
6. Is your team or coworkers working remotely?
7. Describe your schedule of remote working (sketch if possible)

Residential Location

1. Where are you currently residing in?
2. What is the reason behind the decision of your residential location?
3. Did remote working influence you to change your residential location?
4. What are the ideal qualities for choosing a residential location? (e.g. green area, urbanity, affordability, convenience (amenities), accessibility(transportation), sustainability)

Workspace

1. Where is your primary workspace to remote work? (home, café, coworking space, etc)
2. What are the advantages and disadvantages of working from there?
3. What other environment would you be interested in working in? (e.g. park, cafe, public space)
4. If you have or are willing to use coworking space, what kind of affiliated programmes would you want in a coworking space? (e.g. nursery, green space, café, restaurant, kitchen, coliving space)

5. How important are the following criteria for choosing a workspace? (e.g. Space: Number of users, size of the space, affordability, facilities / Social: social gathering, networking opportunity / Location: distance from residence, accessibility, amenities around the neighbourhood, nature-friendly / Design: interior design, ergonomic settings, nice view, openness, social distancing, flexibility of space etc.)

Travel Behaviour

The most significant benefit of remote working is known as the reduce of commute. However, remote working can induce non-commute travel. The following questions will ask you about your commute and non-commute travel behaviour.

1. Approximately how far do you travel from where you live to your workplace? (e.g. Under 1 mile (1.6 km), 1-5 miles, 6-10 miles, 10 miles or more, Not applicable (if home))
2. How far would you commute from your home to your workplace? (e.g. walking distance, 30-minute public transportation)
3. What is your primary mode of commute to your workplace? (e.g. private cars, public transport, cycle, other micro mobility such as E-scooters, E-cycle, walk, Not applicable (if home))
4. What is the primary nature of your travel besides work? (e.g. socializing, groceries, dining out)
5. How often do you make these travels? And what is the average duration for the non-commute travels?
6. What is the primary mode of transportation for the non-commute travels?

Lifestyle

1. Do you think remote working allows you to maintain a more sustainable and healthier lifestyle? If yes,why? (e.g. less use of car and travel, healthier diet, ...)
2. Remote working can affect your daily consumption and resource uses. In your opinion, does remote working increase or decrease your resource consumption? Which particular category of consumption does this increase or decrease apply to?
3. Do you agree that remote working increases leisure time? If yes, how would you spend the increased leisure time?
4. Did the COVID-19 pandemic have any influence on your pattern of remote working lifestyle?

Future of the Office

1. Explain in your own opinion, what is the future of office?
2. Do you think more people will be working remotely in your company or industry in the post-pandemic era? What do you think is the ideal?

Appendix A. INTERVIEW QUESTIONS

Coworking Space Manager

Customers

1. Who are your major customers?
2. What are the demographics of your customers? (Age, nationality, profession, remote working status etc.)
3. What are the operating hours of the coworking space?
4. How many remote and non-remote workers are using the space daily?
5. When is the daily peak hours and season?
6. Where does your customer reside? How close do they reside from the coworking space?
7. What mode of travel do your customers use to commute to the coworking space?

Space/Programme/Amenity

1. What programmes (e.g. networking or socialising sessions) does your coworking space offer? And how popular are these programmes?
2. What kind of workspace (e.g. meeting room, office rooms, private cubicles, open lounge, hot desk) does your coworking space offer? And how popular are these workspaces?
3. What kind of amenities does your coworking space offer? (e.g. printing, drinks, delivery etc)
4. Does your coworking space have any other affiliated functions or programmes? (e.g. coliving space, startup incubating, accelerating, open café, nursery, etc.)
5. What plans does your coworking space offer to your customers and what are the most popular plans? (e.g. Hot desk, one month, three months, etc.)

Others

1. Which of the following best describes the location of your coworking space? (Metropolitan, Urban, Suburban, Rural)
2. How important is the following criteria for setting up a coworking space? (Ranking: Size, price, distance from residential, facilities, location, accessibility, etc.)
3. What do you think about the relationship of the coworking space and its surrounding community? (e.g. residential, shops, restaurants, bars, etc) Are there programmes to support the community?
4. Are there any support schemes towards your coworking space from the local municipality? (e.g. financial subsidy)
5. Do you think coworking space is environmentally, economically, or socially sustainable?

Appendix B. CASE STUDY

	Workspace Name	Main Character	Location	Site Context	Surrounding	User Group	Contract	Workspace & Design	Affiliated Program, Amenities & Events	Digital Service	Conclusion	
Startup Incubator + Coworking space	Impact Hub	coworking for changemakers		Urban Center		Social Change Agents (working for SDGs)	office and hotdesk membership	Workspace: private office, meeting room, private booth, event space Design: high floor-to-ceiling height, open plan	Program: coffee and tea Amenities: nursing rooms, showers, bike storage		community, entrepreneurial, biophilia, flexibility	
	Incubyte	coworking for tech	Cambridge, UK	Rural area	landscaped and green open spaces, nearby Cambridge Science Park	IT industry, startups		Workspace: coworking arena Private meeting rooms	Program: nursery, café and bar, gym facility Amenities: car parking and dedicated electric car charging points, showers, bike storage, locker, Open 24/7 with full-time security / networking events, mentoring, coaching and advice		community, entrepreneurial, biophilia, flexibility	
	Heyground	coworking for changemakers	Seoul, South Korea	Urban Center	Regenerated mixed-use neighborhood	changemakers		Workspace: office, coworking lounge, meeting room, podcast room	Program: kids lounge, library, café, plant shop Amenities: shared kitchen, pet-friendly, sky lounge, rooftop garden, store, yoga		community, biophilia, flexibility, entrepreneurial, affiliated	
Café + Coworking Space	Workshop Café	hybrid Coffee Shop	San Francisco	Urban Center	financial district	Digital Nomads (short-term)	Hotdesk only, pay by hour possible	Workspace: diverse and ergonomic seating, private rooms, printing and scanning, monitors, adapters, inspiring music Design: floor-to-ceiling windows, outdoor patio, indoor plants, new art, glass-walled meeting rooms	Program: Café and Restaurant	connection via app	café affiliated, flexibility, affordable, community, biophilia, ergonomics	
	L'Chayim Study Café	cafe operated like a library	Seoul, South Korea	Urban Subcenter	Near university or hagwons	students			Program: café		café affiliated, affordable	
Coworking Space	WeWork	global chain of coworking space, a serviced office	Metropolitan	Urban Center			Small and Big offices, hot desk Membership	Workspace: small to medium size office, phone booth, meeting room, lounge, kitchen Design: professional, welcoming	Program: (partly) cafe, bar, nursery, gym) Amenities: Global Networking	IT networks	community, biophilia, flexibility, affiliated (unaffordable)	
	Second Home Lisbon	coworking+market	Lisbon, Portugal	Urban Center	Repurposing the oldest market in Lisbon, Mercado da Ribeira			Workspace: Meeting rooms and breakout spaces Event spaces for 120 people Design: Filled with 1000's of plants and natural light	Program: On-site cafe with all-day dining and late night drinks Amenities: Reception and mail services, Fully serviced with on-site operations team, Open 24/7 with full-time security, cultural, educational, and wellness events		biophilia, community, flexibility, affiliated	
	Second Home Hollywood	coworking+forest	Los Angeles, USA	Urban Center	commercial renovating an old building	start-ups, social enterprise, innovation teams of blue-chip companies / design and marketing high portion	Day, Roaming, Resident, Studio, Flex membership	Workspace: Events auditorium for 200 people Meeting rooms, breakout spaces and phonebooths Design: Low-rise, open-air campus, Biophilia (50,000 sq ft garden filled with 6,500 trees and plants), visual and physical fluidity	Program: In-house restaurant and bar with central courtyard for all-day dining Amenities: Reception and mail services, Fully serviced with on-site operations team, Open 24/7 with full-time security, car park, cultural, educational, and wellness events	High-speed private internet / Unlimited free printing and scanning	biophilia, community, affiliated	
	Second Home Londonfields	coworking+nursery	London, UK	Urban Subcentre	mixed-use high street (Londonfields, Hackney)			Workspace: Event auditorium for 500 people Playback room – an alternative meeting room with lounge chairs and a high-quality sound system for listening back to new releases and records Design: retro-futuristic, open-plan workspace, biophilia, visual and physical fluidity, scaled-down version of the Google offices, chic, green energy	Program: priority access to on-site preschool N Family Club Nursery, In-house cafe with outside courtyard, library Amenities: Reception and mail services, Fully serviced with on-site operations team, Open 24/7 with full-time security, Bike Parking, Showers and towel service, Reception and mail services, cultural, educational, and wellness events		biophilia, community, nursery affiliated, flexibility	
coworking space + childcare	Third Door	coworking+nursery	London, UK	Urban fringe	newly built residential in Wandsworth	young family, remote worker,	coworking, coworking+nursery	Workspace: airy communal spaces, bookable meeting rooms	Program: nursery with well-staffed, toy-filled space modeled after the child-first principles of the Reggio Emilia method Amenities: business-building events		nursery affiliated, community, flexibility	
	Elemeno	nursery+coworking	Washington DC, USA	Urban Neighborhood	quiet local residential neighborhood	young family		Design: chic and airy working space	Amenities: play space, family-friendly social events		nursery affiliated, community, flexibility	
	The Village	nursery+coworking (small scale)	Lausanne, Switzerland	Urban fringe					Program: professional childcare programme l'écoline inspired by Reggio-Emilia		nursery affiliated, community	
	JuggleHub	coworking+nursery	Berlin, Germany	Urban Neighborhood	some shops, but residential neighborhood		flexible childcare package subscription, refund system affiliated to public childcare 'Kita'		Program: professional childcare, café Amenities: locker, mail-forwarding service / meetups & workshops	bring and store your own monitor	nursery affiliated, community, flexibility	
	Cuckooz Nest	coworking+nursery	London, UK	urban center	Farringdon - business district			Workspace: private phone booths, event space	Program: Childcare – ofsted registered staff, darkened sleeping area, breastfeeding area, snug reading corner, dress up area, arts&crafts area, climbing soft play, 3.1 staff Amenities: fully equipped kitchen, showers, bike storage, pet friendly, ethical coffee	24/7 hour access, A3 printer, supersonic Fibre Optic Wi-Fi, projector&screen	nursery affiliated, community, flexibility	
	Farm Work Play	coworking+nursery	Whitstable, UK	Rural Farmland	Farmland	young family, remote workers						nursery affiliated, community, biophilia
	Coworking space + Pet-care service	Work & Woof	coworking with dogs	Texas, USA	Urban fringe		dog owners	Workspace: permanent desks, open seating, private office space, private phone booths	Program: Indoor/Outdoor Playpark, pet sitting, daycare Amenities: Kitchen, virtual mailbox, locked filing cabinets	google fiber, printing services		pet-care affiliated, community, flexibility

	Workspace Name	Main Character	Location	Site Context	Surrounding	User Group	Contract	Workspace & Design	Affiliated Program, Amenities & Events	Digital Service	Conclusion
Shrinking city and rural town targeting digital migrants	36 Degrees North (Tulsa Remote Program)	Tulsa's basecamp for entrepreneurs	Tulsa, USA	Urban Center	Shrinking City sparking local growth / Arts District, Downtown	Migrated Digital Nomads through 'Tulsa Remote' program					community, entrepreneurial, affordability (lifestyle), flexibility
	Kamiyama Valley Satellite Office Complex (KVSOC)	factory renovated coworking space in rural town, majorly for IT, +makerspace, coliving	Kamiyama, Japan	Rural Town	Nature adjacent	IT Startups, Migrated Digital Nomads (long-term)			Amenities: Networking, Great surrounding environment (nature)		biophilia, community, entrepreneurial, affordability (lifestyle), flexibility
	WEEK Kamiyama Stay & Work	coworking+coliving+community	Kamiyama, Japan	Rural Town	Nature adjacent						biophilia, community, entrepreneurial, affordability (lifestyle), flexibility
coworking+co living in urban area	Local Stitch	urban coworking+coliving	Seoul, South Korea	Urban Neighborhood	Regenerated mixed-use neighborhood	young freelancers			Program: coliving(sharehouse/studio type only), co-retailing (pop-up stores), shops (discount), small library Amenities: rooftop, shared kitchen, pet-friendly / community networking events		
	Urban Hive	coworking+coliving	Seoul, South Korea	Urban Neighborhood	quiet local residential neighborhood	Digital Nomads (foreigners travelling)			Amenities: Networking, social dinner		community, affordability, affiliated (coliving)
coworking+co living in tourist destination	Hub 53	coworking+coliving	Chiangmai, Thailand	Urban Center	busy	Digital Nomads / Travellers			Program: accommodation, spa, café and restaurant, tourism, fitness, transport	Monitor Rentals	community, affordability, affiliated (coliving+tourism)
	Dojo Bali		Bali, Indonesia	Suburban	Nature adjacent	Digital Nomads / Travellers	Small Office and Hotdesk		Amenities: Networking, Great surrounding environment (nature)		biophilia, community, affordability, affiliated (coliving+tourism), entrepreneurial
	O-Peace Jeju	coworking+coliving	Jeju, South Korea	Rural Island	Nature adjacent	Digital Nomads (short, long-term)	Hotdesk only, pay by hour possible	Workspace: floor-to-ceiling windows, separate zoning for open plan and concentrating zone Design: prioritizing the view to the seaside, high ceiling	Amenities: Great View, F&Bs (not free)	Monitor Rent	biophilia, affiliated (coliving)
Digital-base Platform of Coworking Space	Seats2Meet	free coworking space / serendipity as value-added / dynamic network organization	Started in Utrecht, NL and now around 2,000 spaces worldwide		Applied to various locations: museum, library, university, public building, restaurant, hotel, office, (those that want more footfall through promoting their brands), stand-alone building		- for hosts: social/free), business, enterprise - users: only pay for software and meeting rooms, free coworking space but instead pay by social capital (knowledge) for coworking space		Program (partly): entrepreneurial incubating Amenities: beverages & lunch for free, free networking opportunities		ubiquitous, affordable workspace, affiliated with many programs, community, entrepreneurial
	Seats4Silence	Monastery turned into coworking space / 52M serviced	Utrecht, NL	Rural Farmland	Farmland with monastery	nature lovers	reservation	Workspace: 2 workspace for groups, 2 workspaces for all, free workspace in the garden Design: open view to the green, tranquility	Amenities: 'biological food, garden		biophilic, ubiquitous, affordable workspace
Outdoor Workspace	outbox	Outdoor workspace on high street	Silver Spring, Maryland, USA	urban center	downtown retail district						ubiquitous, biophilic, affordable
	Be an Outsider (Campaign)	Outdoor workspace (LLBean X Industrious)	NYC's Madison Square Park	urban center	park, public square			Workspace: mobile outdoor co-working spaces complete with individual work areas, conference spaces and even cycling desks Design: open-air, mobile		free Wi-Fi, power hookups, online reservation system	ubiquitous, biophilic, affordable
	Popices	pay-as-you-go pop-up coworking spaces	Amsterdam, NL	urban center	claiming spaces that are unused during their off hours		cheaper than regular coworking spaces				affordable ubiquitous
Hotel + Coworking Space	Moxy	Hotel+coworking space (the lounge as a living room of the city, inviting local entrepreneurs)	Paris, France	Urban center			lounging and working are available to both hotel guests and the public	Workspace: break down into zones - active bar space and quiet library space Design:			ubiquitous, affiliated, community
	Hobo hotel	hotel+coworking+pop-up exhibition	Stockholm, Sweden						Program: pop-up exhibition area SPACEby		ubiquitous, affiliated, community
	Hotel Schani Wien						free for hotel guests, affordable price for coworking customer				ubiquitous, affiliated
Office Headquarter	Apple Headquarter	suburban office park	Cupertino, CA, USA					Design: spaceship, biophilia (forestry)	Program: wellness center, R&D facility, care clinics, café, courtyard garden Amenities: campus bus		
	Amazon Spheres		Seattle, WA, USA					Design: biophilia (living wall, dome)			