

Ageing and the Built Environment in Singapore

Belinda Yuen
Editor

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Cover illustration: A public housing neighbourhood in Singapore

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Foreword

The Lee Kuan Yew Centre for Innovative Cities (LKYCIC) in the Singapore University of Technology and Design was established in September 2012. Shortly after, Mrs. Lee Liming, a Singapore philanthropist, agreed to gift a research grant to the Centre on the condition we work on ageing as a topic. Thus, the *Lee Liming Programme on Ageing Urbanism* became the first research programme set up in LKYCIC. The second research flagship programme, the *Future of Cities* was launched in 2014, followed by the *Chen Tianqiao Programme on Cities and Innovation*.

Taking up the topic of ageing was timely and the right thing to do. In 1997, then Prime Minister Goh Chok Tong, speaking at a Triennial Conference for grassroots leaders, raised the issue of the rapid ageing of the population. In 1998, the Inter-Ministerial Committee on the Ageing Population was formed to look into the needs and consequences of the ageing demographics. Academic interest followed. But, ageing as a research topic has gained wider attention more recently, prompted by the fact that 2030, the year when Singapore's population of those aged 65 and older would reach the projected figure of 900,000, is not far away.

Dr. Belinda Yuen working with her team completed a major survey of the ageing population to understand their needs. They verify and enrich their findings with other methodologies to get a full and rounded understanding of the requirements and aspirations of the senior population. We hope this treasure trove of data will be useful to those who have to make decisions affecting the ageing population, and for other researchers who are interested in working in the same area.

Singapore

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Ambassador-at-large and Chairman
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Preface

In 2013, when I joined the Lee Kuan Yew Centre for Innovative Cities, Singapore University of Technology and Design, I was asked to develop a research programme on population ageing. Thus was born the Lee Li Ming Programme in Ageing Urbanism and the project: Understanding the Changing Needs of Singapore's Older Population. Being the first project under the programme, it reflected my continuing interest and research on housing and public spaces with an analytical lens focused on a population that I have not closely studied before: older people, their lived experiences and perceptions of growing older in these spaces.

The World Health Organization has highlighted the rapid growth of older population worldwide and the importance of the built environment including housing and outdoor spaces in the older person's health, well-being and quality of life. Yet, relatively little research has addressed the older person's experiences of these spaces. We are inspired to share our research, the methods we have used and some of the findings.

I would be remiss if I did not mention that many people (listed in the individual chapters) have contributed to the completion of the research project and this book. I duly acknowledge their contributions. In addition, I thank Mrs. Lee Li Ming for supporting our research through her generous gift.

I hope the chapter contributions in this Volume, whether you read one or all of them, will go some way towards promoting better understanding of the older person's relationship with the built environment, and will further research and consideration while planning housing and outdoor environments for an ageing society.

Singapore

Belinda Yuen

Contents

1	Surveying Older Adults' Perceptions and Aspirations	1
	Belinda Yuen, Chathura Withanage and Parvathi Nair	
1.1	Introduction	1
1.2	Methodology	2
1.3	Findings	4
1.3.1	Economic and Living Arrangements	4
1.3.2	Perceptions of Old Age and Growing Older	6
1.3.3	Housing Satisfaction and Aspirations	12
1.3.4	Public Spaces and Outdoor Activities	23
1.4	Conclusion	40
	References	42
2	Focusing on Older Residents Views	45
	Belinda Yuen and Sue Wei Cheong	
2.1	Introduction	45
2.2	Methodology	46
2.3	Findings	46
2.3.1	Housing and Neighbourhood	47
2.3.2	Amenities and Transportation	53
2.3.3	Recreational and Social Spaces	56
2.3.4	The Individual and Community	60
2.3.5	Possible Differentiation Between Focus Groups	63
2.4	Conclusion	65
	References	69
3	Sharing Key Informant Views	71
	Belinda Yuen and Sue Wei Cheong	
3.1	Introduction	71
3.2	Methodology	72

3.3	Findings	73
3.3.1	Housing	73
3.3.2	Neighbourhood and City	86
3.3.3	Society and Individual	95
3.3.4	Different Groups, Similar Concerns	98
3.4	Conclusion	100
	References	102
4	Housing Audit	103
	Belinda Yuen and Parvathi Nair	
4.1	Introduction	103
4.2	Methodology	104
4.3	Findings	106
4.3.1	HAC Age-Friendliness Matrix	107
4.3.2	Component-Wise Analysis	108
4.4	Conclusion	121
	References	124
5	Walking with Older Adults	127
	Belinda Yuen and Penny Kong	
5.1	Introduction	127
5.2	Methodology	128
5.3	Findings	133
5.3.1	Respondent Usage of Space	133
5.3.2	Site A: 256 Bangkit Road	135
5.3.3	Site B: 434 Fajar Road	139
5.3.4	Site C: 415 Fajar Road	140
5.3.5	Site D: 201 Petir Road, Bukit Panjang N2 Park	143
5.4	Conclusion	146
	References	148
6	Seeing Through the Eyes of Older Adults	149
	Belinda Yuen and Emily Soh	
6.1	Introduction	149
6.2	Methodology	150
6.3	Findings	152
6.3.1	Amenities and Facilities	152
6.3.2	Structured Social Spaces	155
6.3.3	Incidental Social Spaces	158
6.3.4	Outdoor Green Spaces	160
6.3.5	Quality of Neighbourhood Infrastructure and Outdoor Street Furniture	162

6.3.6	Favourite or Frequented Activity Nodes Outside of One’s Neighbourhood	165
6.3.7	Transportation and Travel Journeys	167
6.4	Conclusion	170
	References	173
7	Investigating Space, Activities and Social Dynamics	175
	Belinda Yuen and Parvathi Nair	
7.1	Introduction	175
7.2	Methodology	176
7.3	Findings	180
7.3.1	Site A—256 Bangkit Road	181
7.3.2	Site B—434 Fajar Road, Void Deck	188
7.3.3	Site B—Fajar Road, Hard Court	192
7.3.4	Site C—415 Fajar Road, Void Deck	198
7.3.5	Site D—201 Petir Road, Bukit Panjang N2 Park	203
7.3.6	Site Comparison	209
7.4	Conclusion	216
	References	218
8	Real-Time Data Analysis Using a Smartphone Mobile Application	221
	Sumudu Hasala Marakkalage, Billy Pik Lik Lau, Sanjana Kadaba Viswanath, Chau Yuen and Belinda Yuen	
8.1	Introduction	221
8.2	Methodology	222
8.2.1	Mobile App Development	223
8.2.2	Older User Data Collection	225
8.2.3	Big Data Analysis	226
8.3	Findings	228
8.3.1	Home Stay Duration	228
8.3.2	Across Neighbourhoods	229
8.3.3	Across Singapore	231
8.3.4	Points of Interest (POI)	233
8.4	Conclusion	238
	References	239
9	Exploring Perceived Neighbourhood Social Capital	241
	Anna Lane	
9.1	Introduction	241
9.2	Methodology	242
9.3	Findings	243
9.3.1	Socio-demographics	244
9.3.2	Social Capital	244

9.4 Conclusion 255

References 258

10 Designing with Older Residents 259

Belinda Yuen and Sue Wei Cheong

10.1 Introduction 259

10.2 Methodology 260

10.3 Findings 261

 10.3.1 Vision 263

 10.3.2 Favourite Spaces 264

 10.3.3 Accessibility and Connectivity 264

 10.3.4 Maintenance and Management 266

 10.3.5 Safety and Security 268

 10.3.6 Activities and Amenities 271

 10.3.7 Community Spirit and Ownership 275

10.4 Conclusion 277

References 280

Index 283

Introduction: Framing the Issue

The United Nations (2010) estimates that by 2050, 70% of the global population will be living in urban environments. Crucially, a big proportion of that population will be older than 60 years. This population segment is growing faster than any other age group as a result of both longer life expectancy as well as declining fertility rates (World Health Organization 2015). Projections are predicting an unprecedented global crossing event before the end of the decade—older people aged 65 and over will outnumber children under the age of 5 by 2020 (He et al. 2016). The dynamics of these two trends—rapid urbanisation and rapid population ageing—will undoubtedly shape the future development of cities. It is imperative that cities recognise and respond to these changing realities, now rather than later.

At the Lee Kuan Yew Centre for Innovative Cities (LKYCIC), Singapore University of Technology and Design (SUTD), we have responded to the changing reality by convening a flagship research programme, the Lee Li Ming Programme in Ageing Urbanism. The aim of the programme is to study the twin challenges of rapid urbanisation and rapid population ageing with special focus on ageing population and the urban built environment.

A key challenge facing cities is the question of how we (re)shape the built environment to accommodate the evolving needs of a fast-greying population. Specifically, how we plan and design the built environment, from housing to neighbourhoods, can determine levels of independence, dignity and self-respect in later life (Australian Local Government Association 2006; Garin et al. 2014). More than any other age groups, older people tend to spend more time at home, and if they go out, it is most frequently to the immediate neighbourhood. Getting these spaces right is a crucial factor to achieving successful, healthy ageing. At the global level, the World Health Organization has posited that an age-friendly city offers a supportive built and social environment that enables the older person to actively participate in the community (World Health Organization 2007a).

The first project under the Lee Li Ming Programme in Ageing Urbanism: Understanding the Changing Needs of Singapore's Older Population (2014–2017) seeks to investigate the lived experiences of Singapore's older population (55 years old and older) in two key spaces—housing (live) and recreation (play). Its main aim

is to understand both subjective and objective older person–space relationships. The novel scope is to bring together the ‘what’ of knowledge with the ‘how’ of formulating and implementing design solution, explicitly considering the older person–space relationships using a multi-dimensional methodological approach. This approach involves quantitative and qualitative methods, traditional instrumentation as well as recent developments in mobile crowdsourcing. The project combines research with planning, with the focus to include the older person into conversation. The methods and findings are presented in this book. To our knowledge, this is the most comprehensive study using mixed methods of the two mentioned aspects in Singapore to date.¹

Singapore is a natural laboratory for this study. With its land area of 720 sq km and population of 5.6 million, Singapore is a city-state. It is 100% urbanised and its citizen population is ageing at a rapid rate. Older Singaporeans (aged 65 and older) are expected to double to one in four by 2030. This demographic change has come about quickly. France has taken 117 years to increase its older population from 7% to 14%, Japan 24 years and Singapore is expected to take 17 years to achieve this growth (United Nations 2015). What is the impact of this demographic shift on Singapore’s built environment and urban living? How can we adapt and design its housing and neighbourhoods to become more supportive of older residents’ changing needs? Recognising and understanding this demographic shift is crucial. This book presents a collection of the methods and tools that may be used to help us better understand this demographic shift.

Singapore Ageing Research

Population ageing has been a topic of policy discussion in Singapore since the 1980s. Several high-level ministerial committees have been established to study ageing trends and their policy implications (see, for example the Committee on the Problems of the Aged 1984; Committee on Ageing Issues 2006; Ministerial Committee on Ageing 2016). The Ministerial Committee on Ageing released an Action Plan for Successful Ageing in August 2015, covering over 70 initiatives in 12 areas including research to help individuals to age well, foster an inclusive community and create a city for all ages (Ministry of Health 2016). This has spurred research on ageing. For example, since 2015, the National Innovation Challenge on Active and Confident Ageing has allocated S\$200 million to support research and innovation on work and learning, and the study of ageing well to find ways to delay the onset of disease and disability.

¹See other studies on Singapore’s ageing society and housing such as Addae-Dapaah and Wong (2001); Bozovic Stamenovic (2012); Wu and Chan (2012); on Singapore’s ageing society and outdoor spaces such as Teo (1997).

In that same year, two key national research centres were established. The first is the Centre for Ageing Research and Education at Duke-NUS Graduate Medical School Singapore to conduct research and education on ageing and health, in particular, taking a comprehensive gerontological perspective and combining the biological, social and clinical aspects of ageing to contribute to successful ageing. The second is the Geriatric Education and Research Institute to lead the development of research and education on age-related health issues to promote healthy ageing. Notwithstanding the many and growing number of research centres on population ageing in Singapore, local research has tended to largely centre on the domains of inquiry emphasised by the inter-ministerial committees of ageing like older adults' employment, health and caregiving. Analysis of the older population's experience of urban living, in particular, their attitudes, expectations and lived experiences remain an area to be further investigated (see, for example Chan 2001; Chan et al. 2010; Mathews and Leong 2014).

There is an urgent need both to identify and understand the diverse and changing ways in which the older population (and their subsets) perceive and experience the city, especially in light of the policy to promote ageing in place as the key principle of an age-inclusive built environment in Singapore (Inter-Ministerial Committee on the Ageing Population 1999; Committee on Ageing Issues 2006). The usage of methods in the present project is largely premised on this particular reasoning—if we want to improve the older residents' quality of life, we must include them in the study and ask for their wishes, suggestions, ideas and hopes. The discussion concentrates on two aspects of urban living—housing and outdoor recreational spaces.

Housing for Older People

Housing is a key focus of the present study. Housing is one of the most important aspects of age-friendly neighbourhoods, since it is a place where older people spend most of their time. According to the World Health Organization (2007b), housing is essential to the safety and well-being of older residents in the city. Housing provides the basic infrastructure for an older individual's everyday activities, communal connections and access to important services (Menec 2017). As Frochen and Pynoos (2017) observed, '[t]he condition and location of one's residence determines a great many quality-of-life outcomes resulting from structural and neighbourhood features' (p. 160).

Most, 1 in 7, older adults in Singapore live in the community within inter-generational households; less than 0.3% lived in institutional care in 2008 (Ministry of Social and Family Development 2009). Although there is a range of housing types available, the common abode is public housing; 82% of Singapore's resident population currently live in public housing, many are homeowners. About 11% (113,294) of households in public housing are headed by persons aged 65 and above while 13% (144,792) of households have head-of-household who are 55 and above (Housing and Development Board 2014). About 32% of public housing residents aged 55 and older live in 1–3-room flats and 54% in 4-room and larger flats.

There is an emerging trend of decreasing household size and increasing number of one-person households. The 2011 National Survey of Senior Citizens in Singapore reported that the average household size has been declining from 4.4 persons in 1995 to 3.3 in 2011 and more people are living in one-person households. Among the people aged 55 and above, 15% lived in one-person households in 2011 as compared to 6% in 2005. Among those aged 75 and older, the corresponding figures were 16.6% in 2011 and 4.4–7.5% in 2005 (Kang et al. 2013). The change towards smaller households is most prominent among Chinese households; one-person Chinese households increased from 8.8% in 2000 to 13% in 2010 as compared to the corresponding proportions of 4.3% and 6.5% for Malay households and 7.9% and 10.3% for Indian households (Department of Statistics 2011). Many of these one-person households are single (57%), divorced or separated (14%) or widowed (14%).

By 2030, the total number of older persons living alone could increase to 83,000 as compared to 35,000 in 2012 (*The Straits Times*, 12 April 2012). The rapidly growing number of older persons living on their own suggests that community- and home-based eldercare services as well as infrastructure and social support services will be needed even more in the future (Yuen and Soh 2017). Even while the majority of older adults are expected to remain healthy and functional, by 2030, 13% (117,000) of those aged 65 and above (more than double the current number) may be semi-/non-ambulant. The policy towards enabling the older person to age in place is necessary and urgent, especially in the context of Singapore where 5 of 6 public hospitals have over 85% bed occupancy. Rapid population ageing will put even more pressure on public hospitals.

Outdoor Recreational Spaces

Outdoor spaces are ubiquitous features of Singapore's public housing environment. On average, about 50% of public housing town are used for residential development. The remaining area is for the provision of supporting amenities and infrastructure including about 12% for open space to nurture vibrant communities. Parks are evenly distributed and allocated on a hierarchical town, neighbourhood and precinct basis. Providing open spaces in the residential neighbourhoods is equally significant for an older individual's well-being. They serve a range of functions, from visual relief and green buffer between apartment buildings to outdoor recreational spaces to support physical activities and social interaction, factors fundamental to the older resident's social, psychological and physiological health.

The World Health Organization (2010) report on physical activity for older adults suggests that compared to less active individuals, both men and women who are more active have lower rates of coronary heart disease, high blood pressure, stroke, type 2 diabetes, colon cancer, a higher level of cardiorespiratory and muscular fitness, healthier body mass and composition, a biomarker profile that is more favourable for the prevention of cardiovascular disease, among others. Marquet and Miralles-Guasch (2015) further showed in their study of Barcelona's population that living in vital urban environments contributes to building healthy

mobility habits, especially when there are facilities and enough opportunities for walking nearby.

Yet, the Singapore National Health Survey 2010 (Epidemiology and Disease Control Division 2010) has revealed that physical inactivity increases with age. The data shows that 67% of Singaporeans aged between 60 and 69 did not engage in leisure time physical activities. This is not only worrying in terms of their physical health but also social and mental health. To compound matters, as stated earlier, an increasing number of older people are living in one-person households, away from their children and help or companionship may not always be readily available. The challenge is to increase the opportunities for older people to stay socially, mentally and physically active. Evidence suggests that older persons who remain both physically and socially active are diagnosed with fewer diseases and have better social health than those who remain home-locked (World Health Organization 2002). The importance of proximate outdoor spaces cannot be underestimated.

Structure of the Book

Methodology used in this project was wide ranging and combined qualitative and quantitative methods. A total of nine instruments were developed to examine older adults' perceptions and views about Singapore's housing and neighbourhoods: housing audit checklist, mobile phone application, see and snap instrument, community design workshop, interview survey, walk and talk survey, on-site observation, focus group discussion and key informant interview. Depending on the nature of enquiry, we adopted the most suitable tool in order to obtain deeper insights. Together, they provided a more complete glimpse into the older persons' lived experiences of their built environment. The research was approved by the Singapore University of Technology and Design Institutional Review Board.

Each Chapter offers a detailed description of the method used. Each method has its advantages as well as limitations. The methods are not exhaustive, but offer a broad array of some of the tools available for research into older people's lived experiences. It is but a starting point and future considerations of these methods would have to be adapted according to the research problem and question.

The Chapter following the Introduction, Chap. 1, introduces the first instrument that was used for this project, the National Survey. The aim of using this method was to provide a snapshot of older adults' experiences, perceptions, needs and aspirations for the spaces around them through personal interview. The National Survey was designed in the form of a questionnaire that covered four broad areas: demographics, home, neighbourhood and outdoor recreation spaces and respondents' life. The demographics provided answers to general questions relating to participants' age, gender, ethnicity, type of housing and living arrangements. Questions about home arrangements provided an insight into respondents' (dis)satisfaction with their home spaces, residential mobility and living arrangement preferences as they grow older. Questions about neighbourhood and outdoor recreation spaces helped us understand

respondents' outdoor activities, level of satisfaction with public spaces in their neighbourhoods, and needs for facilities. Questions that inquired about respondents' life offered answers to respondents' perceptions on ageing as well as their experiences and satisfaction with growing old in Singapore.

Chapter 2 presents a qualitative research method—focus group—to offer an older user's perspective. Asked in an interactive small group setting, the broad discussion questions in the focus groups were aimed at generating opinions and discussion among the participants about their aspirations, lifestyle needs and experiences on housing and outdoor recreation spaces as they age, the innovations, barriers and opportunities in using current housing and outdoor recreation spaces, how these spaces contribute to enhancing their quality of life, and their suggestions for future development. These discussions were helpful for adding understanding—the 'why' and 'how' of issues and information collected with the survey.

Chapter 3 analyses the results from 33 Key Informant Interviews. These in-depth interviews were used to gather individual experts, community leaders and professionals' first-hand knowledge about older people's housing and outdoor recreation space design and provision. The participants came from four different sectors: government agencies and public sector, development industry, medical and healthcare sector, and caregivers, non/profit organisations, charities and service providers.

Chapter 4 introduces a Housing Audit, which delves into the housing needs and preferences of older residents. Designed as an easy-to-use checklist that can be completed by the individual or with assistance from a helper, the housing audit builds on the World Health Organization age-friendly cities guide (2007b) to identify current and potential barriers and enablers in housing design for ageing, and understand the features that are important to older people in age-friendly housing.

Chapters 5–7 move the audit activity into the outdoor spaces. Urban audit of the neighbourhood public spaces is analysed with the help of three instruments: Walk and Talk survey (Chap. 5), See and Snap study (Chap. 6) and On-site Observation (Chap. 7). Four public spaces in Bukit Panjang Town² were studied. The Walk and Talk and See and Snap tools were developed and used to understand the experiences of older users as well as the barriers that they face in the outdoor urban environments. The Walk and Talk survey was conducted as a mobile survey while the See and Snap took the form of a photo-taking activity. Both offer examples of participatory methods to gain insights into participants' sentiments and experiences of public spaces, neighbourhoods and the city as they journey through them on a daily basis.

The on-site observation took place on a weekday and during one weekend day, offering the researcher an opportunity to visit the site and discover its functioning—

²Bukit Panjang Town is located in the western region of Singapore. Built since the 1980s, Bukit Panjang's resident population in 2015 was 139,030, almost 9% of whom were residents older than age 65 (Department of Statistics 2016).

its activities, actors and processes—at different times of the day. Although time consuming and not altogether revealing about people’s perceptions, motivations and feelings, this method gives a complimentary glimpse into how the public space is being used by people, not just older adults—how many, who, where and what they do while on site.

Chapter 8 presents the development and usage of an Android mobile phone application called ‘City’ on Google. The application was developed by the research team to capture the everyday journeys and outdoor activities of older participants in Bukit Panjang Town. The Chapter describes the methodology and development of the application as well as explains the process of data collection and analysis of big data from smart phone.

Chapter 9 investigates the social capital of older residents. Again, the Bukit Panjang Town is examined. It seeks to unveil older users’ experiences of and contributions to the neighbourhood life and social outcomes. Five areas are examined: demographics of the respondents; the respondents’ social connections, which are presented in terms of how many people they know in the neighbourhood, where they usually meet their friends, whom they ask for financial help and what sort of activities they are involved in; trust in respondents’ neighbourhood; neighbourhood environment and the respondents’ experiences of various facilities and services in their neighbourhood; and their quality of life.

The final chapter (Chap. 10), looks at the use of Community Design Workshop that was developed to work creatively together with the residents on one of the studied public spaces in Bukit Panjang Town—Bukit Panjang Neighbourhood 2 Park. The focus is on issues of identification of community concerns and opportunities for placemaking. The eight workshops explored the participants’ Needs, Experiences and Vision; Accessibility and Connectivity; Park Identity and Activity Part 1 and 2; Safety and Security; Walk and Talk Urban Audit Session; Park Spirit and Sense of Place; and Community and Ownership. The workshops gave the older users (and the community) of the park an additional opportunity to voice their concerns, hopes and suggestions on how their proximate community park should look, feel and function in support of their lifestyles and quality of life. Participants’ suggestions and recommendations are analysed in this Chapter.

International research suggests that there is great value in innovatively integrating research into a policy and planning agenda, especially when assessing age-friendly environment (Glicksman et al. 2014). Simply put, research on age-friendly environment is only valuable when it can contribute to the effort of creating age-friendlier neighbourhoods and public spaces, and when the agencies and organisations involved in planning the changes incorporate research’s findings into their actual plans (*ibid.*). The study took that into consideration and collaborated with both the older users as well as local authorities. The Community Design Workshops (Chap. 10) are a good example of that.

Working together with the residents of Bukit Panjang Town and with the support of the local member of parliament and town council, fresh community perspectives and maps were produced as a graphic guideline for streamlined application and redesign of the community park, Bukit Panjang Neighbourhood 2 Park. In this way,

research that was fuelled with direct feedback of the older users of the park got translated into planning the park's redesign and day-to-day maintenance. In the process, we gave voice to the users and enabled older adults to co-design the nearby public space.

Belinda Yuen
Špela Močnik

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