Reinventing Highrise Housing in Singapore

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Abstract

Singapore is a city-state with limited land and a growing population. Within its land area of 700 square kilometers, it has to meet the needs of the city, nation, and population. From an initial population of about 150 at the time of its British founding in 1819, Singapore grew through immigration and net natural change to 4 million inhabitants by 2000. The population of Singapore is projected to grow by 1.5 million or more in the next 40 to 50 years. The challenge is how to plan for the growing population while supporting economic growth and quality of life as Singapore strengthens its development as a dynamic and distinctive global city-state. This article addresses the principles, directions, and outcomes in a "planning for more with less" scenario. In particular, it focuses on the housing strategy and how Singapore has housed 84 percent of its resident population in highrise public housing and improved residents' living conditions in the process. Using empirical data from residents' perception research, the article explores the realities of highrise living and the factors that ground the celebration of highrise housing in Singapore. The manner in which Singapore turns its highrise housing concept into action offers lessons for other cities, especially because the housing literature is peppered with negative discourses on highrises and an emerging revival of highrise housing is occurring in many cities throughout the world. With more than one-half of the world's population living in urban areas, the unambiguous trend is toward a more urban-style development with taller buildings included as an inevitable housing solution.

Introduction

Singapore is a city-state of 700 square kilometers. Most (90 percent) of its 4.8 million residents (as of 2008) live in highrise apartment buildings. Although a highrise building is not the traditional form of housing, in recent decades it has become the common norm. Highrise housing is a key strategy for providing high-quality living to Singapore's growing population, which is anticipated to grow by 1.5 million or more over the next 40 to 50 years. The construction of highrise struc-

tures deliberately limits the footprint of residential development to free up land for developing facilities that support a high-quality living environment. The aim of this article is to address the principles, directions, and outcomes in this "planning for more with less" scenario.

Housing provision is one of the most critical activities in the global urbanization process. The pace and scale of urban population growth have, in many instances, outstripped the ability of city administrations to provide adequate housing, leading to enormous problems, particularly poverty, housing shortages, and unemployment (Devas and Rakodi, 1993; UNCHS, 1996). The United Nations Centre for Human Settlements (UNCHS) noted the following statistics regarding homelessness:

> Worldwide, the number of homeless people can be estimated at anywhere from 100 million to 1 billion or more, depending on how homelessness is defined. (UNCHS, 1996: 229)

The problem is almost universal, as Forrest and Williams (2001) recount, prevailing not just in Europe and North America but also across developing countries, where the rate of urbanization is most dramatic. With few exceptions, the scale of the global housing problem presents a serious challenge to those in the housing delivery sector and creates pressure on local and national governments to devise solutions to meet the housing shortages. As the Millennial Housing Commission wrote, "…housing matters…there is simply not enough affordable housing…" (Millennial Housing Commission, 2002: v). It is no surprise that adequate shelter with the promise of providing a decent life of dignity, good health, safety, happiness, and hope is one theme that has been repeated at international meetings and in successive United Nations declarations (see, for example, World Bank, 1993; UNCHS, 1998). The theme begs the question: How can we turn words into action and good intentions into practical possibilities? Since the 1960s, various governments have initiated ambitious public housing programs to build housing for lower income groups (World Bank, 1993).

Asian cities are no exception to the need for affordable housing. They are the sites of rapid urbanization and great housing pressure. Many of the world's largest cities are in Asia (Jacquemin, 1999; UNCHS, 1996). Amid the unsatisfactory housing conditions, several cities (for example, Hong Kong and Singapore) have perpetually provided housing for the masses and, in the process, generated much economic growth (Castells, Goh, and Kwok, 1990; Doling, 1999; Forrest, Lee, and Chan, 2000). The strong housing performance in these cities has been a source of inspiration for other policymakers. Yeung wrote the following assessment of the city-states:

> Many urban planners and policymakers from developing countries visit the city-states and come away with the conviction that they have seen the future and it works. (Yeung, 1987: 257)

Singapore, for example, has a preeminent model of mass public housing as a way of moving need and provision closer into balance. In Singapore, state-built housing has provided not just decent homes and appropriate residential infrastructure to low-income families but also homeownership to a widening majority (95 percent) of the public housing residents. Because Singapore's public housing program and broad achievements have been documented elsewhere (see Wong and Yeh, 1985; Yuen, Teo, and Ooi, 1999), the emphasis of this article is to explicate the strategy of building highrises and how it has been employed to provide better housing in Singapore and address the challenges. The manner in which Singapore turns its highrise housing concept into action

yields lessons for other cities, especially because the housing literature is peppered with negative discourses on highrises. More significantly, during the past decade, under the narrative of urban sustainability, highrise housing is quickly reemerging on many cities' inner-city regeneration agendas. From London to Shanghai and Melbourne, local authorities are once again building residential highrises for their populations.

The Urban Highrise

The notion of building highrise structures for residential use is not new. Ford (1994) observed that highrise housing has existed in large American cities since the early 1900s. Several reasons underscore the rising height of buildings. Primarily, as Lacayo wrote, it is "the best means of getting more people and businesses into a smaller footprint on the ground" (Lacayo, 2004: 104). Earlier, Moser succinctly summarized the following trends in highrise housing:

> High-rise housing tends to be more prevalent in those countries where government is the major builder…. There are, of course, other forces shaping the aspect of tall buildings: technology enables us to build as high as we wish; the esthetics of urban design may call for a distinctive vertical mass or focal point in the cityscape; the political exigencies of a city or state may demand that "progress and development" be exemplified in a tall building. Not the least important factor in the proliferation of tall buildings around the world is the tendency to imitate. (Moser, 1981: 5)

The effect is the dynamic oscillation toward taller buildings or the 'supertalls' (Ali and Armstrong, 1995), the current genre of highrise buildings, and the global proliferation of such structures (Lacayo, 2004).

Worldwide, in the 1960s, governments began to build highrises as a way to house the underprivileged masses. The highrise was exhorted as the housing solution for postwar housing shortages: "a panacea for social problems" (Helleman and Wassenberg, 2004: 4), a "new architecture for new people" in a rising modern society (Tibbits, 1988: 150). Despite the proliferation of highrises in the previous decade, beginning in the 1970s, this housing form was increasingly characterized with livability problems (in particular, it was considered antifamily and antichildren), putting pressure on many governments to abandon and demolish highrise housing (Costello, 2005; Helleman and Wassenberg, 2004). Although negative perceptions about the highrise and renewed predictions of its demise may still exist, especially after September 11, 2001, interest in highrise housing has not been extinguished. Lacayo reflected on the popularity of the modern skyscraper following September 11th:

> In the months right after Sept. 11….The only clients still interested in building them were in nations that wanted a symbol of their arrival as a contender in the global market, mostly in Asia's Pacific Rim…there is the endlessly ambitious city of Dubai, in the United Arab Emirates, which architecturally is the mouse that roared: in the past five years, three of the world's 25 tallest buildings have been topped off there, and two more are in the works….The skyscraper seems to have even more power now as a symbol of modernization…. (Lacayo, 2004: 104)

The unfolding trend seems to indicate that more, not fewer, people will be living in highrises. An increasing number of cities are revisiting highrise housing as a viable residential alternative in inner-city regeneration (Abel, 2003; Yuen et al., 2006). Costello, in observing highrise living in Melbourne, said the latest highrises "are discursively constructed as new and exciting places to live" (Costello, 2005: 54–55)—a "lifestyle" choice in the global era. The scenario is also certainly true for Singapore. Its long-term development plan has pronounced a development strategy of constructing more highrises as Singapore aims to become a dynamic, distinctive, and delightful global city-state.

> More people will get to live on higher floors and enjoy the views. In areas with less stringent height constraints, housing can rise to 30 stories and higher. Currently, only about 35,000 people live above the 20th storey. (Urban Redevelopment Authority, 2001: 16)

In recent years, Singapore's private and public sectors have built 40-story housing and set in motion plans to build 50- and 70-story housing structures in the city area (Yuen, 2005a).

The Rise of the Highrise in Singapore Public Housing

The development of public housing introduced Singapore's residents to living in highrise buildings. Although public housing development in Singapore first began in the 1920s, the city-state's current public housing program for the masses was largely a postindependence (1960s) phenomenon.[1] In the face of enormous housing shortages, the Singapore government, upon attaining internal self-rule in 1959, had funneled expenditures and the highest priority to housing. Premised on its election pledge to provide housing to the population, the Singapore government quickly organized the public housing production process to eradicate housing inadequacies in a planned, rational manner (see Wong and Yeh, 1985; Yuen, 2002).

By the end of its first 5-year building program (1961 through 1965), the state had constructed 70,000 flats in highrise apartment blocks (averaging 10 to 12 stories high) to house about 25 percent of its population. By 2005, some 900,000 dwelling units had been built, including 25-, 30-, and 40-story apartment blocks; the units provided housing for 84 percent of the resident population. These new apartment buildings were built within new towns. Initially located within an 8-kilometer radius of the city, the new towns have gradually spread to all parts of Singapore with the expansion of the public transportation network. The aim is to improve the existing residential space, especially in terms of occupancy, accessibility, and facilities. The development of highrise public housing for the masses is primarily rooted in the policy to provide good, affordable housing for everyone who lacks shelter. Many of the Singapore public flats are large and comfortable by international standards. The average size of a four-room flat[2] is about 90 square meters,

[1] Singapore is a newly industrializing country with a relatively short 40-year history as a self-governing city-state. It gained internal self-rule from the British colonial government in 1959 and full independence after seceding from Malaysia in 1965. Metropolitan growth during the colonial period brought many opportunities to the city, but also several serious problems, such as double-digit unemployment, labor strikes, acute housing shortages and overcrowding, a deteriorating urban infrastructure and environment, social and ethnic segregation, and exploding population growth. For further discussion of Singapore's postwar development challenges, see Motha and Yuen (1999) and Yuen (2004a).

[2] This flat generally includes three bedrooms, one living/dining room, one kitchen, and two bathrooms.

or approximately 24 square meters per person (the average household size is 3.7 persons). Most (95 percent) public flats are owner occupied. Housing access and affordability are not limited to some households; instead, various financial assistance schemes have been initiated to specifically help low-income families become homeowners (Field, 1989; Yuen, 2005b). Lee Kuan Yew, Prime Minister of Singapore from 1959 to 1990, summarized the argument for residents to own public housing units:

> My primary preoccupation was to give every citizen a stake in the country and its future. I wanted a home-owning society. I had seen the contrast between the blocks of low-cost rental flats, badly misused and poorly maintained, and those of house-proud owners, and was convinced that if every family owned its home, the country would be more stable. (Lee, 2000: 116)

The underlying principle is for public housing units to be "erected as part of comprehensively planned housing estates with schools, open space and other community facilities" (Singapore Planning Department, 1965: 35). With this principle, attention inevitably turns on highrise construction as the modus operandi to meet the twin objectives of high living standards and space affordability. Even though highrise housing lacks historical precedent, the concept of vertical stacking instead of the spread of lowrise housing has been constantly viewed as a pragmatic and responsive urban solution for housing a large and growing population that would yield a better usage of scarce land (Palen, 1990; Wong and Yeh, 1985). Wong and Yeh described how planners address issues of density:

> …the population density in Singapore is approximately 4,200 persons per sq km.…the planners in Singapore have to make sure that the Central Area facilities, new towns, water catchments, military training grounds and agricultural areas are all accommodated within the available land area.[3] Under these circumstances, the gross residential density for a new town as a whole has to be pegged at 64 dwelling units or 280 persons per hectare. Taking the residential area by itself, the net density is 200 dwelling units or 880 persons per hectare. At this density, and given the relatively large flat sizes, the plot ratio of the built up area is around 1.6 to 2.3. The building blocks have to be mostly 10- to 13-storey in height, with 5 to 10 per cent being 4-storey buildings and another 5 to 10 per cent 20- to 25-storey point blocks. (Wong and Yeh, 1985: 8)

The decision to build highrise housing is, in the official narrative, not intended to show off economic or technological capabilities. Instead, as Wong and Yeh stated, "there is simply no other choice" (Wong and Yeh, 1985: 8). The lack of choice is undergirded by the urban characteristics of Singapore, the demographics, and the housing delivery process that focuses on providing decent shelter in a landscaped, residential environment. As Huxtable (1984) argued in the wider case for highrises, building highrise housing can yield a physical, holistic reality. Although they can greatly affect the scale and context of the urban environment due to their height, highrise structures would yield land for other buildings and retain open spaces to serve societal needs and aspirations.

[3] At the time of the Wong and Yeh (1985) writing, the population of Singapore was 2.6 million and the land area was 620 square kilometers. Through land reclamation, the land area has since been increased to 699 square kilometers; however, land reclamation is limited.

In this regard, while following western new town prescriptions, Singapore has set aside as much as 50 percent of the land in its public housing new towns for facilities provision (exhibit 1).

Each new town is planned with an ascending distribution of public facilities and spaces, from the block, precinct, and neighborhood to the town center. For example, as the largest of the town's retail nodes, the town center would have the largest number and greatest variety of shops. After several initial ad hoc developments, planning standards such as those outlined in exhibit 2 have been developed for each facility to create a high-quality service environment that would readily fulfill the day-to-day living needs of the residents (Housing & Development Board, 1995; Wong and Yeh, 1985). This use of standards has produced a new pattern of facility provision in which amenities such as open spaces, car parks, schools, and shops are being developed within easy access (a 5-minute walk) of the residents. The premise for this pattern of development is, as Delamonica and Mehrotra (2006) observed, one's standard of living is very much determined by access to basic social services, which provides the means to expand capabilities and functionalities.

Like its western counterparts, Singapore's public housing town is established on the spatial organization of major land uses, including residential, employment, and leisure. Structured around the notion of self-contained, cohesive communities living in landscaped residential areas of neighborhoods and precincts, the primary direction is to plan each new town with an anticipated population of 200,000 to 300,000 as a "total living environment" that will support high-quality living, recreation, and accessibility to facilities so that people will want to stay (Urban Redevelopment Authority, 2002). In its basic conception, a new town of 200,000 people is composed of five to six neighborhoods. The town includes about 4,000 to 6,000 dwelling units (80 to 100 hectares) with differing amounts of floor space to accommodate between 20,000 and 30,000 people in each neighborhood. After findings showed that neighborhoods were too large to foster a sense

Exhibit 1

Land Use Distribution and Gross Density of New Town

Land Use	Prototype New Town (60,000 Dwelling Units)	
	Land Area (hectares)	Percentage of Land Designated for Given Land Use
Residential*	347	53.4
Major roads	89	13.7
Schools	62	9.5
Industry**	44	6.8
Commercial (town center and neighborhood center)***	30	4.6
Open space	26	4.0
Institutions	15	2.3
Sports complex	7	1.1
Utilities and others	30	4.6
Total	650	100.0
Gross new town density	92 dwelling units per hectare	

** Includes private housing within the town boundary.*

*** Includes nonpollutive industries only.*

**** Includes civic, cultural, and recreational uses and incidental developments in the town and neighborhood centers.*

Source: Housing & Development Board (2000a)

Exhibit 2

Planning Standards for Commercial Facility Provision in New Towns

Commercial Facility and Size	Planning Standards
Shops (30 to 400 square meters)	1 per 70 flats
	20% in town center, 50% in neighborhood centers, 30% in precincts
Kiosks (3 to 15 square meters)	1 per 600 flats
	30% in town center, 70% in neighborhood centers
Emporiums (4,500 to 6,500 square meters)	1 to 2 per new town, in town center
Supermarkets (1,200 square meters)	1 to 2 per new town, in town center
Eating houses (450 square meters)	1 per 750 flats
	7% in town center, 23% in neighborhood centers, 70% in precincts
Restaurants (90 to 2,000 square meters)	1 per 1,000 flats
	30% in town center, 70% in neighborhood centers. In addition, 2 or 3 fast food restaurants and 1 or 2 bigger restaurants in town center
Office space	60 square meters per 450 flats
	70% in town center, 30% in neighborhood centers
Cinemas (1,800 square meters)	2 per new town, in town center
Minimarkets (450 square meters)	1 per 6,000 flats
Market produce shops (130 square meters)	1 per 3,000 flats
Market produce lockup shops (40 square meters)	1 per 500 flats

Source: Wong and Yeh (1985)

of community, since 1978, each neighborhood has been structured into six or seven precincts to better promote community interaction among residents. Each precinct is made up of seven or eight residential blocks with 400 to 800 dwelling units to house 1,500 to 3,000 people.

In addition to the land-saving argument, another key factor supporting highrise construction is that it can readily support modern building methods, including precasting, and promote speedy, large-volume construction (Lam, Chung, and Sham, 2005; Wong and Yeh, 1985). Helleman and Wassenberg observed the following in their review of European highrises:

> …repetitions, regularity, symmetry…the production process—quicker, cheaper and more efficient. High-rise with prefabricated components, standardization and rationalization of the building process did fulfil all these aspects…. Applying industrial methods significantly reduced the average time taken to produce a dwelling, in France, for example, by two-thirds. (Helleman and Wassenberg, 2004: 4)

Considering the long life of these buildings, the intent to provide quick and good housing has meant not just new construction but also proper maintenance, as pointed out earlier in Prime Minister Lee's citation and as other housing observers have long argued (Conway and Adams, 1977; Young, 1976). More than three decades have passed since Young wrote about her findings:

> Surprisingly, satisfaction with the estate was not determined by such factors as density, building form, being on or off the ground and problems with children's play, but was closely related to the appearance of the estate and the way it was looked after. (Young, 1976: 27)

Aging neighborhoods and new towns are accordingly upgraded and redeveloped, where appropriate, to maintain attractiveness and define a greater sense of place identity to help build social stability (Lau, 1998; Yuen, 2004b, 2002). The Minister for National Development announced that the upgrading program "will improve the interior and exterior of flats in existing HDB [public housing] estates, and progressively convert them into precincts and communities of middle class housing comparable to or even better than the latest HDB projects at Pasir Ris or Bishan."[4] British and American experiences have demonstrated that a defined neighborhood image can heighten local distinctiveness and satisfaction among the residents, reducing the dangers of design uniformity and repetition that are often associated with highrise public housing (Lang, 1994; Moughtin, 1996). The continuing effort to strengthen the bonds between residents and between residents and their environment is integral to reducing degradation and transforming highrise communities into good places to live. The basis for implementing this plan is the basic desire that highrise public housing does not deteriorate into "vertical slums" or "soulless monstrosities." Teh expanded on the rationale of this goal as follows:

> …residents of the HDB [public housing] estates belong to various ethnic groups[5] and they come from all walks of life. This conglomeration of different social groups must be quickly welded into a cohesive community if we were to avoid soulless monstrosities. (Teh, 1983)

The Outcome and Realities of Highrise Living

Over the decades, public housing has brought not just a new landscape of highrise buildings but also a new lifestyle. Singapore is clearly distinguished by highrises. The "Manhattanized" Singapore has stirred urbanists such as Koolhaas and Mau to observe that "Singapore is incredibly 'Western' for an Asian city" (Koolhaas and Mau, 1995: 1013) and others to argue and finally take action to conserve its remaining old buildings (Keys, 1981; Urban Redevelopment Authority, 2001; Wong et al., 1984). One major achievement of building highrise housing is restructuring the city to facilitate what Field described as "a more efficient locational arrangement for urban activities, with a massive relocation of population into public housing estates and new towns to reflect the preferred spatial pattern" (Field, 1989: 344). Such housing is planned, built, and provided for the people. Organized and equipped to serve the daily needs of the residents, highrise public housing offers improved housing and living conditions. In the process, residents have identified with the environment, become increasingly adapted to highrise living conditions, and become more prepared to live in taller blocks of apartments. The Housing & Development Board reported on the sentiments of highrise living:

[4] Parliamentary Debates, 1989, Vol 54, Col 332-3.

[5] After the colonial immigration policy ended, Singapore evolved into a multiethnic, multireligion, multiculture society. About 79 percent of the population is Chinese, 14 percent is Malay, 6 percent is Indian, and 1 percent is Eurasian.

> Despite external shocks arising from the 11 September 2001 terrorist attack on the World Trade Centre in New York…ground sentiments towards living in high-rise, high-density environment remain strong. (Housing & Development Board, 2005: 84)

Residents have expressed a keen sense of belonging to their public housing towns; in 2000, 82 percent of residents expressed a sense of belonging to their new town (Housing & Development Board, 2000b). Their main reasons for this perception included length of stay in the town (an average of 12 years), good neighbors, pleasant surroundings and environment, and regarding the flat as home. The inclusive nature of dwelling has been demonstrated in the work of Norberg-Schulz (1985) and Moser (1981). Dwelling is an activity that develops out of residents' lives, habits, and practices. It enhances familiarity and engagement with the particular environment. In the case of Singapore, the dwelling impulse is reinforced by several factors.

Contrary to the living conditions in multiple occupancy, overcrowded, traditional two- to three-story shop houses and temporary, squalid squatter huts, highrise public housing offers more living space and amenity convenience to the residents. Comparative statistics reveal that public housing residents enjoy more floor area and open space per person after moving to highrise public housing: living space per person doubled from just under 3 square meters to 6 square meters per person (Yeh and Lee, 1968); open space increased from 2 square meters to 20 square meters per person (Liu, 1975). Research has continued to show high levels of public satisfaction with highrise living (Wong and Yeh, 1985; Yuen et al., 2006). Most (more than 85 percent) public housing residents perceived the elevator to be reliable, the noise level to be tolerable, and the level of privacy from neighbors and passers-by to be sufficient (Housing & Development Board, 2005). Our interview with sampled residents in two new towns[6] indicated general satisfaction on several dimensions, as summarized in exhibit 3.

Exhibit 3

Respondent Satisfaction With Present Living Arrangement

Aspect	Very Unsatisfied (%)	Unsatisfied (%)	Fairly Satisfied (%)	Satisfied (%)	Very Satisfied (%)
Floor level (n=348)	3.2	5.5	36.2	34.8	20.4
Location (n=348)	0.3	2.6	26.7	45.4	25
View (n=348)	3.2	15.8	33	31.6	16.4
Breeze (n=348)	0.6	12.1	20.1	40.8	26.4
Privacy (n=348)	1.4	6.6	25.3	41.7	25
Noise from traffic (n=347)	3.7	17.6	28.5	30	20.2
Noise from neighbors (n=346)	0.9	3.5	27.5	36.1	32.1
Space between buildings (n=348)	3.2	19	34.5	29.3	14.1
Convenience to facilities (n=348)	2.0	9.8	23	40.2	25

[6] We interviewed a total of 348 households in two new public towns: Toa Payoh and Bukit Panjang. Using a structured questionnaire, we interviewed the household head or the spouse. The sample selected, using stratified random sampling, comprised residents living in apartment buildings of different heights (30 stories and the adjoining lower block), floor levels (low: 10 stories or fewer; medium: 11 to 20 stories; high: more than 20 stories), and flat types (four- and five-room apartments built within the past 5 years).

We also collected time-use diaries, which provided a view of how residents spent their time on a typical day (excluding working or school hours). Our aim in collecting the diaries was to examine how living in highrise buildings affects daily behavior. A total of 3,272 diary entries were collected over a 24-hour period from 211 members[7] of 82 households living in focus neighborhoods in the two towns. Some 4,350 activities, or an average of 20.62 activities per person per day, were reported. As far as we know, ours was the first time-use study conducted in Singapore. Time-use data collection is widely recognized as an effective, albeit difficult, method for measuring behavior (Gershuny, 2000; Robinson and Godbey, 1997).

Our findings, summarized in exhibit 4, show that respondents spent the bulk of their time on personal maintenance. Television watching at home was a favorite pastime. The main activity was sleeping. Respondents spent about 25 percent of all available time (the largest block of social time) with their immediate family and spent less than 10 percent of their time with friends (exhibit 5). When we compared our data with American findings, the emerging picture seems to indicate that the Singapore respondent spends more time on passive leisure, in particular on watching television, than the television-addicted American does. The Singapore respondent also appears to engage in fewer collective social activities in other people's homes, such as visiting, and in activities outside their own homes, such as visiting museums, than does the typical American. Determining to what extent these differences are influenced by culture, the living environment, or other considerations is a matter for further investigation.

Exhibit 4

Time Use of Respondents

Broad Categories*	All Respondents % (minutes)	Adult (16+) Respondents % (minutes)	Adult (16+) Respondents Activities With Immediate Family % (minutes)	Adult (16+) Respondents Activities With Friends % (minutes)
Productive time	25.32 (96,145)	26.93 (84,670)		
Contracted time (employment)	12.94 (49,140)	13.93 (43,800)		
Committed time (housework, childcare, shopping)	12.38 (47,005)	13.0 (40,870)	21.86 (9,790)	15.36 (2,370)
Transport	5.42 (20,595)	5.36 (16,860)	7.64 (3,420)	7.23 (1,115)
Personal maintenance time	42.74 (162,280)	42.73 (134,360)	25.30 (11,330)	23.05 (3,555)
Eating	7.54 (28,615)	7.55 (23,735)	19.08 (8,545)	18.57 (2,865)
Sleeping	28.41 (107,855)	28.02 (88,095)		
Expressive time (free time)	26.51 (100,671)	24.98 (78,561)	45.21 (20,250)	54.36 (8,385)
Television viewing	10.57 (40,145)	10.29 (32,345)	25.13 (11,255)	7.49 (1,155)
Total	100 (379,691)	100 (314,451)	100 (44,790)	100 (15,425)

**Categories according to Robinson and Godbey (1997).*

[7] The unit of analysis was the individual. Each member of the household aged 12 and older was asked to keep a time-use diary over a span of 24 hours. Our sample included a total of 173 adults.

Exhibit 5

Time Respondents Spent With Others

Adult (16+) Respondents	% (minutes)
Immediate family	25.04 (44,790)
Extended family	1.87 (3,345)
Friends	8.62 (15,425)
Colleagues from work	2.32 (4,150)
Nonrelated intimates	0.25 (450)
Others	1.89 (3,375)
Total social time	39.99 (71,535)
Total nonwork, nonsleep time	100 (178,876)

Of interest, according to the Singapore Census of Population 2000, is that all ethnic groups in Singapore have indicated an improvement in the proportion occupying better quality housing over the 10-year intercensus period. Among households living in public housing, the average number of rooms per person has increased from 0.99 in 1990 to 1.29 in 2000 (Leow, 2001). To put this achievement in perspective, it should be noted that, right at the outset, community feedback and participation are widely accepted as integral components of the public housing delivery system. This approach has put the residents at the center of the provision and has brought the city-state in constant contact with residents' housing needs and preferences, including monitoring their levels of satisfaction with the physical and social living environment. The rationale is as follows:

> …to gain a better understanding of the urban community living in high-rise, high-density environment so that efforts can be made to foster a sense of community spirit among our residents. (Housing & Development Board, 2000b: 3)

Increasingly drawn by residents' needs, expectations, and lifestyles, the consequential outcome is, as Teo and Phillips (1989) have argued, an evolving high-quality residential space that is fast becoming synonymous with comfortable, middle-class housing. After the initial housing shortages were mitigated, the housing production emphasis focused not just on volume but also on quality considerations (Teo and Kong, 1997). The people who live in highrise structures are not reluctant tenants; instead, an increasing number of Singapore residents are opting for highrise living. Most (82.5 percent) households in public housing have expressed contentment about the idea of always living in public housing apartment buildings (Housing & Development Board, 2000c). Attracted by unblocked city views and natural ventilation, many households have expressed a willingness to live on high floors, even in the proposed 50-story public housing buildings (Ong, 2005). Response to the initial launch of the first 50-story public housing development in May 2004 was so overwhelming that all 1,848 units (instead of the original planned batch of 528 units) in 7 blocks were released for public application (Housing & Development Board, 2004). As a recent survey confirmed, one in three public housing residents are willing to live on the 40th story or higher (Loo, 2005).

Repeatedly, the main attractions of highrise living appear to pivot around good views, breeziness, and air quality (Chew, 2005; Housing & Development Board, 2005; Yuen et al., 2006). Among younger residents and higher income households, living in taller buildings is perceived as a

desirable choice—a prestigious lifestyle. As Turner has long argued, housing is "an existentially significant activity" (Turner, 1972: 153), offering various opportunities for its residents, including identity and security, and "as a vehicle for personal fulfilment." Even so, as with most forms of housing, not everyone is equally enthusiastic about highrise living. Those not so keen on highrise living have expressed concerns that include personal fears (such as fear of height), potential difficulty of escaping in case of emergency, elevator breakdown, and high density that would result from more people living in taller blocks. Findings from our study of residents' living experiences indicate much ambivalence about highrise living concerns because experiences vary from individual to individual. As illustrated in exhibit 6, respondents seem to be most worried about a lack of neighborhood facilities, elevator breakdowns, and who their neighbors are. Presenting the realities of highrise living, these concerns ground the sensibility of attending closely to residents' living experiences. If not addressed, these concerns might detract from the highrise living experience.

Over the past four decades, Singapore has turned the modern highrise apartment building into the city-state's most prevalent form of housing. Highrises are built in large concentrations and at increasing heights throughout Singapore. More and more people choose to live in highrises. Unlike residents' experiences elsewhere, highrise public housing in Singapore offers many people a satisfying living environment. These structures have not, with the passage of time, become, as Forrest

Exhibit 6

Respondents' Concerns About Living Arrangement in Highrise Housing

Concern	Respondent is concerned…				
	Not at All (%)	A Little (%)	Fairly (%)	Much (%)	Very Much (%)
Traveling time in elevator (n=348)	42.2	9.2	24.1	14.9	9.5
Crime in elevator (n=348)	32.2	13.2	20.1	17.5	17
Elevator breakdown (n=348)	30.7	14.9	14.7	18.7	21
Who you have as your neighbors (n=347)	34.3	10.7	18.7	19.3	17
Accidental falling of family members from the highrise flat (n=346)	33.8	18.2	23.1	12.4	12.4
Height of the building (n=348)	40.5	17.5	26.4	12.1	3.4
Fire risk (n=348)	31	17.2	21.3	20.4	10.1
Power failure (n=348)	34.2	19	17.8	19.8	9.2
Collapse of the building (n=347)	40.3	21.3	14.4	11.5	12.4
Walking along common corridor to reach your flat (n=348)	45.7	20.4	21.8	8.6	3.4
Lack of neighborhood facilities (n=347)	25.6	8.4	19.6	27.1	19.3
Other worries (for example, killer litter*, dumping arrangement, problems with insects, electrical bills) (n=14)	35.7	14.3	7.1	21.4	21.4

**Highrise littering, from televisions to bicycles to coffee mugs, can pose a danger to life and property and can maim or kill people; thus, it has earned the name* killer litter.

and Williams described of other mass housing estates, "holding camps for the unemployed and a mechanism for destroying hope and personal esteem" (Forrest and Williams, 2001: 100). Without seeming to exaggerate, the Singapore highrise public housing system, if anything, converges toward providing affordable housing of high quality, the good life, and asset enhancement (Teo and Kong, 1997; Yuen, 2002). The analysis indicates that, at a broad level, the Singapore case strengthens the argument of positive discourse that celebrates highrise living. More specifically, highrise housing can also contribute to and uplift the standard of living for the masses. Several factors have been reasserted as critical to this outcome: a housing delivery system that seeks a high-quality total living environment, emphasizes a sense of belonging, and, most importantly, puts residents at its center. These factors are key pillars in producing sustainable housing.

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