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Ar. Parul Nayar holds a Bachelor of Architecture from the School of Planning and Architecture, New Delhi. Her current interest in the field of inclusivity in architecture and designing experience 'for all' has focused her research on exploring mixed-use facilities as the future of senior living developments. Her other area of interest lies in understanding the design of temporal landscapes in cities and their consequent spatial transformations. She loves to explore, experiment, evolve and always aims to design a balance of experience, functionality and aesthetics.

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Prof. (Dr.) Mandeep Singh is presently Head Industrial Design Department and has been Head Architecture (2014-15 & 18-19), Dean of Studies (2015-17), Head Urban Design (2011-14) Head Industrial Design (2005-10), apart from being a full-time faculty at the School of Planning and Architecture, New Delhi since 1986. In addition to teaching, guiding design and research projects for 35 years, Prof. Singh is currently serving in several committees set up by the Government of India. He is a Member of Delhi Urban Arts Commission, Advisor to Association of Indian Universities (AIU), Advisor to Competition Commission of India (CCI), Member of Project Steering Committee (PSC) for 'Developing Energy Efficient Building Material Directory', Bureau of Energy Efficiency, Professional Advisor for National War Memorial, Ministry of Defence, Advisor and Member, Governing Council, NID Haryana, Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Jury Member in the Committee for National War Museum, Ministry of Defence, and Member of Expert Committee for selection of tableaux for Republic Day Parade, Ministry of Defence.

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Re-Imagining Ageing: The Role Of Mixed-Use Spaces In Fostering Healthy Ageing

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Abstract

Mixed-use development in senior living facilities is gaining acceptance to accommodate the transforming needs of older people, and to foster healthy ageing. This research explores the role of integrating senior living communities to various public functions as the key to address social, economic, and psychological challenges faced by the elderly. Specifically, the study evaluates five parameters including - (i) the role of creative placemaking, (ii) public-private interface, (iii) safety through functional intermixing, (iv) sensory experience of nature and explores the possibilities of a (v) barrier-free design, to provide unique architectural design solutions required for the successful functioning of a mixed-use facility for senior living. The above-mentioned parameters, derived from review of literature have been used to study and analyze the Parkside Retirement Homes in Bangalore and House of Generations in Denmark. The two case studies have been selected based on their location, code compliance and functional intermix. Findings of the analysis have been integrated in the design of a potential senior living facility, as a part of an undergraduate thesis project. The paper concludes by providing recommendations on spatial organization and design features that may be incorporated in the development of this nature. In doing so, this study informs the design decisions of various architects and authorities like DDA who are planning for such facilities in near future.

Keywords: **Built environment, Community, Active ageing, Inclusive**

Introduction

Population ageing is a complex phenomenon that is highly influenced by the built environment (Black and Jester, 2020)The built environment includes various objective and perceived characteristics of the physical context in which people spend their time("(PDF) The effect of the physical environment on mental wellbeing | Rachel Cooper - Academia.edu," n.d.)Older adults interact the most with the built environment based on their lifestyles and physical capabilities. This environment plays a crucial role in their ageing process as it not only enables them to carry out their daily activities but also enhances their long-term health and well-being by nurturing an inclusive habitat that caters to their changing needs("CDC - Healthy Places - Healthy Aging and the Built Environment," 2017).

India is witnessing a generational change ("Enabling a new senior care ecosystem," 2021) The increase in life expectancy due to advancements in technology and healthcare infrastructure is leading to considerable population ageing. The Longitudinal Ageing Study in India (LASI) India Report points out that people aged 60 and above account for 8.6% of the total Indian population and are projected to further rise to 19.5% by 2050. This considerable increase in the ageing population is leading to a rise in demand for senior living facilities in India ("Enabling a new senior care ecosystem," 2021)Earlier these facilities were designed as isolated spaces located at the outskirts of the cities, but now within the socio-cultural context of the 21st century, a new spatial category has emerged which breaks away from the traditional

notions of these facilities being imagined as isolated gated communities. Now, the design of these facilities is being envisaged as mixed-use spaces encompassing a diversity of functions and features to foster healthy ageing. The seniors of today are seeking these innovative design models because they allow them to stay connected with society, aid intergenerational interaction and yet ensure safety (News, n.d.).

Institutions like the World Health Organization prescribe a framework to promote age-friendly environments, with a particular focus on the concept of "active-ageing", highlighting the importance of inclusive, accessible environments for the elderly and the possibilities of creation of opportunities for them by mixing functions (Aneshensel et al., 2007) However, there is a lack of data addressing the details of designing these mixed-use environments. Hence, it is imperative to research and understand the specific design features that may be incorporated to design a facility of this nature.

Mixed-use senior living in india- the growing trend

Senior living facilities are residential hubs designed on a "campus-style", having independent units, various other recreational and medical facilities. There has been a major emphasis in the past few years on the needs of the senior population with a focus on their wellness, which includes active community involvement, companionship, independence and better healthcare infrastructure ("Mixed-Use Developments in Senior Living | Senior Living Development," 2019)In short, the changing desires and lifestyle are fuelling the transformation in the development of such facilities and hence, the concept of mixed-use spaces have stepped in. These communities are situated within the city centers

and offer facilities that are open to both the residents and the surrounding community. Their ability to offer a variety of options to the elderly, combined with their flexibility, make them a growing market in the current scenario (Schiavone, 2019)As a result, this new trend encourages active living and also contributes to enhancing social connectivity, interaction, and safety due to its spatial proximity.

Social Engagement

The presence of various amenities that are essentially shared by all forms the foundation for the creation of a "community within a community". Functions like foodcourts, working zones, retail spaces allow for intergenerational interaction to occur ("Neighbourhood Supports for Active Ageing in Urban India - Deepti Adlakha, Murali Krishna, Ryan Woolrych, Geraint Ellis, 2020," n.d.)The key idea lies in designing an active sense of place which is harnessed by making use of the spaces in-between the various functions. These spaces or voids form the binding medium that invites people ("Placemaking and the art of Mixed Use | Dialogue 32," n.d.) By allowing for multiple activities and functions to co-exist at one place, mixed-use housing developments also create opportunities to work. Some seniors prefer to volunteer during their free time at local facilities or others provide free consultancy, their presence also leads to providing off-hours business for retailers and restaurants (Shaw, 2017) Therefore, these facilities create local job opportunities, stimulate the economy and also have a positive impact on overall senior lifestyle by providing higher levels of socialization and diversity in terms of the experiences they offer.

In such a situation, the interface determines the levels of interaction. The distinction between private (residential) and

public (commercial) spaces is defined by the arrangement of various functions (Narvaez and Penn, 2016)which can enable a transition to public street life through private buildings by addressing the interface(Narvaez and Penn, 2016) Moreover, processes by which the mixing of uses takes place is important, such as diversity, conservation and regeneration(Aldous,1992; Törmä, 2011) Common interface typologies are- Accessible/inaccessible, direct/setback, Opaque/transparent, car/pedestrian (Dovey and Wood, n.d.)

Enabling Environment

Another important feature of mixed-use senior living developments is their ability to enable an environment that allows for these functions to occur. Safety is one of the most crucial aspects that impact the elderly. All spaces for the baby boomer generation must provide a sense of security, as well as psychological and physical comfort (Chen, n.d.)Jacobs argued that urban spaces, should be designed with broader aspects of urban form, mixed land uses; and that there must be "eyes on the street", those belonging to "natural owners" of the street(Rosenberg, 1994). Jacob asserts that the seniors tend to feel confident to be within urban areas when they are not isolated from contact with the larger urban realm. The design of the physical environment can promote nature or informal surveillance. If people perceive that they are being observed, even if they are not being observed, it might arouse a sense of apprehension within them(Cozens et al., 2005). Different types of surveillance include natural (e.g. Looking through windows to outdoor spaces) formal or organized (e.g. patrols by police) and mechanical surveillance strategies(Larimian et al., 2013). Other ways of ensuring security include access control. It focuses on ensuring

safety and reducing crimes by denying access to potential spaces of threat. Informal/natural (e.g. spatial definition), formal/organized (e.g. manned security) and mechanical (e.g. locks)strategies (Cozens et al., 2005)might be adopted for the same.

Outdoor spaces and interaction with nature is also considered as an important quality of life aspect of senior living facilities(Rodiek, 2006)Various studies have demonstrated the healing effect of nature which can further aid in improving the cognitive functions of senior citizens.Designing outdoor spaces, and possibilities of interaction with nature often forms the core of the design of mixed-use space and hence becomes beneficial for the baby boomer generation ("Designing biophilia in senior living communites," 2018)According to Clare Cooper Marcus when being exposed to nature and outdoor spaces senior citizens experience a "relief from physical symptoms" or at least the relief from awareness of those symptoms. The is the key for long-term illnesses such as dementia as being constantly reminded of one's disability can have negative impacts such as depression or anger. The second type of healing is stress reduction. Dealing with any medical condition can be emotionally and physically draining for the patient as well as the family members and staff. Hence, nature and outdoor spaces aid in diverting the mind and providing a temporary relief from the same.

Access to all

Lastly, accessibility for all has been recognized as a basic necessity for mixed-use spaces, thus making them ideal to be clubbed with senior living facilities. The foundation lies in designing an environment that can be understood, physically accessed and used

by everyone irrespective of age, gender, situation, or ability (Pioneer, n.d.)For this various design features like wider corridors, grab bars, handrails, adjustable counters and ramps are provided to improve ease of use, comfort and ensure independence to all.

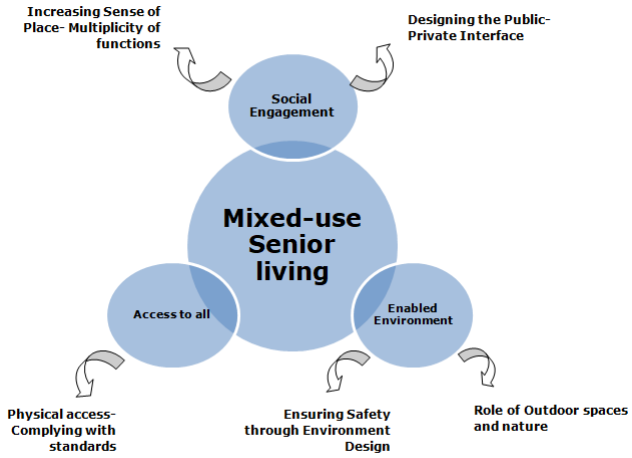


Figure 1- Factors enabling effective functioning of mixed-use senior facility
Source – Author

Based on the literature review, it can be inferred that Social engagement, Enabled environment and Access to all spaces form the pillars of effective functioning of mixed-use senior living spaces with the multiplicity of functions, the interface typology, safety levels, proximity to outdoor spaces and physical accessibility determining the spatial configurations and forming the backbone of the entire system.

The next stagefocuses on analyzing two case examples based on the parameters derived to understand the range ofdesign features that can be used to achieve the same.

Case examples

The following case examples have been selected to understand the exact design features that can enable effective functioning

1) Parkside Retirement Homes, Bangalore

2) House of Generations, Denmark

They have been selected based on their location, code compliance and functional intermix.

Parkside Retirement Homes, Bangalore

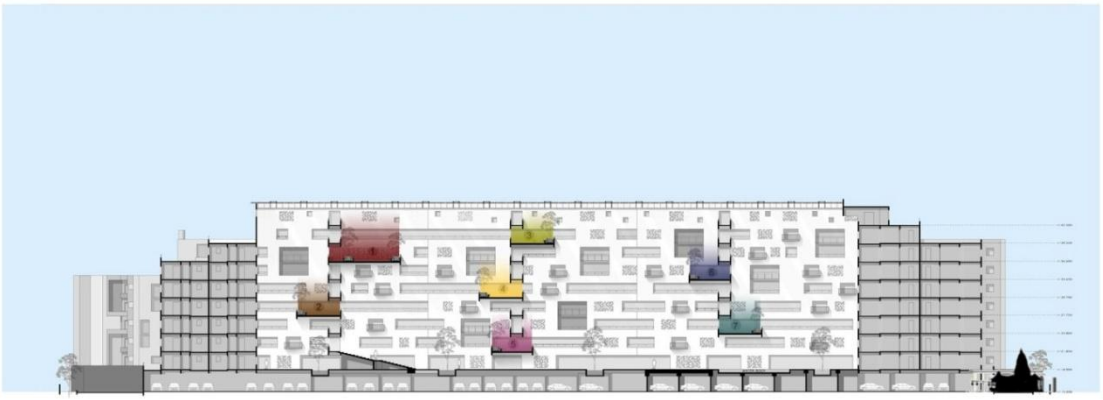
- **Architect: Mindspace**
- **Year of Completion: 2018**
- **Site area: 278709 sqm**
- **Occupancy:156 units**
- **Building height: G+8 floors**
- **User Group: 60+**

Picture 1- Parkside Retirement Home
Source- Archdaily

a) Use of Creative Placemaking

The sense of place is achieved by the volumetric disposition and play of facade. It is the first point that engages the visitor and pushes them to move inside. Once the user enters, light and shadow play a vital role in establishing the connection along with presence of various functions like reading areas, small gathering spaces which provide opportunities for interaction with the residents.

b) The Public-Private Interface



Picture 2- Section through Parkside Retirement Home showing recreation spaces
Source-Archdaily

The podium level is entirely public housing all the amenities required. This is the only point till where the visitors are allowed. The recreation zone for the residents is split into various functions scattered at multiple levels maintaining visual connection with the public space below.

c) Safety

The entire circulation is around a courtyard, which ensures a constant 'eyes on the public areas'.A manned entry/exit gate has been designed to monitor security of the residents. Electronic surveillance is installed in all common areas with 'Call-Points' in all units.

d) Role of Nature & Outdoor Spaces

Picture 3- Open spaces within the facility
Source- Archdaily

The design is based around a courtyard with various waterbodies introduced to create a calming effect. The presence of skylight allows penetration of daylight at all times. The voids in facades have been strategically designed to create break out spaces that allow for interaction at a smaller scale. Furthermore, the terrace has been designed as an active outdoor social space with planters and seaters for comfort of the senior residents.

e) Universal accessibility features in design

Picture 4- Universal accessibility features in design
Source- Mindspace architects

Built in seaters have been designed in all circulation spaces at regular intervals for the residents. Also, the layouts of the units have been designed to reduce barriers like doors and ensure visibility and ease of access to all spaces. The design also adheres to the American Disability Act for design guidelines.

House of Generations, Denmark

- **Architect: ERIK Arkitekter**
- **Year of Completion: 2020**
- **Site area: 25,000 sqm**
- **Occupancy: 314 units**
- **Building height: G+7 floors**
- **User Group: All age group**

Picture 5- View of House of Generations
Source-https://www.rum.as/projekter/english-project-2

a) Use of Creative Place-making

Sense of place is established through the multiplicity of functions that the development offers ranging commercial, office and recreational opportunities thereby improving diversity and attracting a wider user base to the space. The space intentionally mixes the generations by making use of the gaps in between the buildings and activating them with functions. It houses spaces for

all ranging from units for the elderly, including units for individuals with physical disabilities and units for individuals with acquired brain injuries, along with units for youth/students, families and daycare spaces for smaller children("Meeting," 2018)

b) The Public-Private Interface

Picture 6- A typical floor plan depicts the relationship between dwelling units (white) to their semi-private circulation spaces within each "house" (dark green), which links to the semi-public common spaces adjacent to each "house" (light green). Outdoor public spaces are indicated in brown.
Source- Archdaily

Main public and common spaces are located at the ground level which are accessible to the neighborhood community. These include the café, outdoor spaces, daycare centre daycare centre, and a theatre("Meeting," 2018). At every floor, the individual houses spill out to semi-private spaces that foster interaction. These spaces are visually connected to the spaces below but are not physically accessible by the public.

c) Safety

Designed as a gated community for ensure security of spaces. Common spaces/ public functions are located at the ground level with residential spaces designed above to ensure "eyes on street"

d)Role of Nature and Outdoor spaces

Picture 7- Outdoor spaces in House of Generations
Source- https://www.rum.as/projekter/english-project-2

The design involves a variety of small breakout spaces few of which are accessible to public and the rest are private. The idea is to ensure design of both inward and outward looking spaces. The presence of water adjacent to the development adds calm and tranquility to the busy environment. Furthermore, residential units have been designed to harness the waterfrontview.

e)Universal accessibility features in design

A sensitive approach to materiality, color, and differentiation of each threshold aids inway finding. The concept of 'borrowed space' has been adopted while designing individual units. This is preferred for residents dealing with dementia as the main focus is to avoidsegregation through the use of doors/walls("Meeting," 2018)

Design

The design features observed in the case examples were further used in design of an undergraduate thesis project aimed at designing a "Mixed-use senior living facility in Delhi, India"

a) Use of Creative Place-making

Illustration 1- 3D View showing the multiplicity of functions and there inter-relationship
Source- Author

The design incorporates multiple functions ranging from commercial, residential, recreational and community, that foster 'a sense of place' and invite more people to stay. The strategic location of connector functions like the community hall and eateries invite more people to visit the development and interact with the senior residents.

Illustration 2- Public spaces in the design
Source- Author

b) The Public-Private Interface

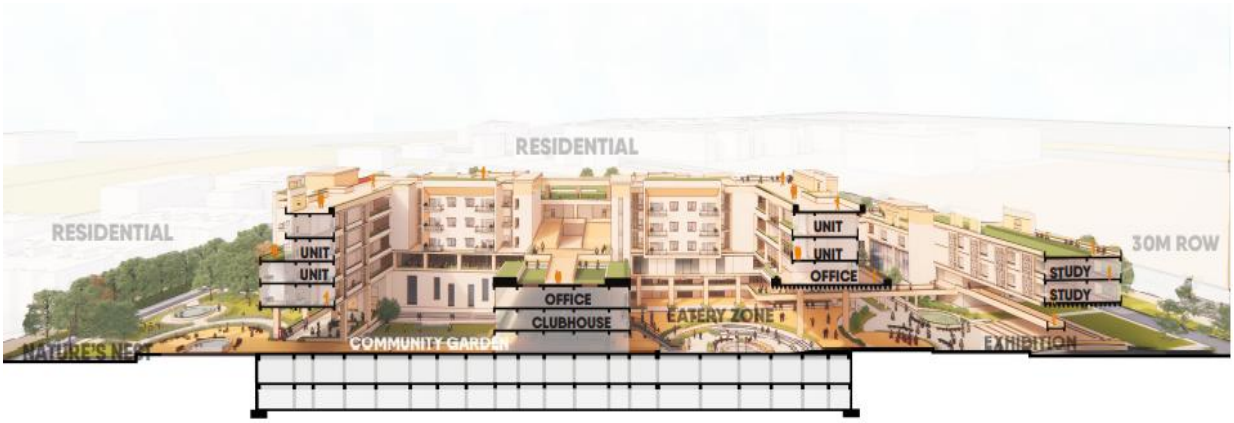


Illustration 3- Sectional Perspective depicting the interface and co-relation between functions

Source- Author

The residential spaces have been located above the public zone thereby promoting natural surveillance in public spaces at all times. The private zones are inaccessible to the public due to access control technology installed in vertical circulation areas. Recreation spaces have been broken into individual functions and scattered throughout the development to promote chance encounters. These spaces therefore function as the binding medium between the public and the private.

c) Safety

The design deploys strategies of natural surveillance followed by rfid technology for access control. Security points have been designed at multiple entrances with security stations at upper levels.

d) Role of Nature and Outdoor spaces

Illustration 4- Landscape strategy and design
Source- Author

The activity levels on site were understood and in order to promote interactions, the public realm has been proposed at two levels. Thus, the nature of experience transitions an active hub to a calm and serene zone called the nature's nest, providing options for multiple interactions. Various water features have been designed in the open spaces to add calmness and promote healing. Built in planters have been designed in all circulation spaces to aid in navigation.

a) Universal accessibility features in design

SUMMARY MATRIX

Parameters	Parkside Retirement Homes, Bangalore	House of Generations, Denmark	Enliven: Mixed-use Senior living community, Delhi (Thesis project)
Use of Creative Place-making	• Play of facade • Multiple recreation spaces • Drama with light and shadow	• Multiple functions for all age groups • Activating gaps between buildings with public functions	• Multiple functions for all age groups • Use of connector functions- Community hall, Eateries
The Public-Private Interface	• Ground level entirely public. • Private units designed above • Visual connection between all spaces	• Ground level designed as entirely public • Private units designed above • Circulation zones designed as small interactive spaces • Visual	• Ground level entirely public. • Private units designed above • Use of RFID technology for access control • Recreation spaces as common functions between public &

		connection between all spaces	**private**
Safety	• **Circulation around the main courtyard.** • **Constant natural surveillance**	• **Gated community** • **Constant natural surveillance through "eyes on street"**	• **Gated community with access control in private areas** • **Natural surveillance through mix of functions)residentialabove public spaces)** • **Security stations at all levels**
Role of nature &outdoor spaces	• **Water features designed for calming effect** • **Skylight to allow daylight penetration** • **Terrace as a social**	• **Multiple outdoor breakout spaces** • **Residential units designed to harness views of the water**	• **Water features designed for calming effect** • **Public realm proposed at two levels** • **Differentiating between public & private through**

	space		**transition in user experience from one edge to the other (active to calm)** • **Built in planters in circulation spaces**
Universal accessibility features in design	• **Built in seaters in design** • **Reduction of physical barriers in unit planing**	• **Differences in materials, colours & textures**	• **Grab bars** • **Anti skid flooring** • **Built in seaters** • **Call buttons in living units** • **Ramps and railings** • **Differences in materials, colours & textures**

Grab bars in washrooms, anti-skid flooring, user friendly fittings for comfortable usage,periodically spaced built in seaters in corridors, emergency alarms and call buttons within each residence, ramps and railings for support in negotiating between levels, spacious elevators, ability to accommodate stretchers in case of an emergency, visual aid through change in colours and textures for easy navigation are few of the features that have been designed.

Conclusion

As India is experiencing a major generational change, the provision for healthy and active ageing is imperative. The term mixed use senior living facility suggests that the space should be inclusive and accessible to all and hence, should be perceived as a part of the urban design. Furthermore, the residential spaces for the senior living community are perceived safer when clubbed with public functions. Not only does this mix foster inter-generational interaction but also creates opportunities for working. This is ac SUMMARY MATRIX ıultiplicity of functions, designing the ınterface, ensurıng safety through built environment design, promoting use of outdoor spaces and adding features that ensure universal accessibility.

Some of the features as inferred from the case examples and design exercise are-

- **Including multiple functions like commercial, community, residential and integrating them both horizontally and vertically to promote chance encounters and ensure natural surveillance at all times.**
- **Using recreation facilities like play zones, cards room, common theatre areas as "connector functions" to establish community building.**

- **Defining zones that are completely public to the zones that are entirely private by using technologies like RFID, visual barriers like screens, landscape design to enable access control.**
- **Introducing water features, outdoor green interactive spaces in design to promote healing effect fostering healthy ageing.**
- **Terraces can be envisaged as an active social space overlooking the public realm.**
- **Design of seating spaces at regular intervals (fixed/flexible)**
- **Designing anchor features to invite people to stay. Eg. Eateries, restaurants, temporary food kiosks.**
- **Designing terraces and courts of interactions as breakout spaces of various activities scattered around levels to create interactive 'pockets' in design.**

Therefore, all of these features play acrucial role in shaping the character of the development, as they all work together to affect the manner in which a space is used and perceived. Based on the context of the development, some factors might have a considerable impact than the other, but the resulting experience and outcomes would be a combination of all of these.

References

- ***Aneshensel, C.S., Wight, R.G., Miller-Martinez, D., Botticello, A.L., Karlamangla, A.S., Seeman, T.E., 2007. Urban Neighborhoods and Depressive Symptoms Among Older Adults. J. Gerontol. Ser. B 62, S52–S59. https://doi.org/10.1093/geronb/62.1.S52***
- ***Black, K., Jester, D.J., 2020. Examining Older Adults' Perspectives on the Built Environment and Correlates of Healthy Aging in an American Age-Friendly Community. Int. J. Environ. Res. Public. Health 17, 7056. https://doi.org/10.3390/ijerph17197056***
- ***CDC - Healthy Places - Healthy Aging and the Built Environment [WWW Document], 2017. URL https://www.cdc.gov/healthyplaces/healthtopics/healthyaging.htm (accessed 8.6.21).***
- ***Chen, K., n.d. SUSTAINABLE DESIGN FOR THE ELDERLY: SENIOR HOUSING DESIGN GUIDELINES 58.***
- ***Cozens, P., Saville, G., Hillier, D., 2005. Crime Prevention through Environmental Design (CPTED): A Review and Modern Bibliography. Prop. Manag. 23, 328–356. https://doi.org/10.1108/02637470510631483***
- ***Designing biophilia in senior living communites, 2018. . Colo. Real Estate J. URL https://crej.com/news/designing-biophilia-in-senior-living-communites/ (accessed 1.22.21).***
- ***Enabling a new senior care ecosystem: India needs holistic regulatory framework [WWW Document], 2021. . Times India Blog. URL https://timesofindia.indiatimes.com/blogs/voices/enabling-a-new-senior-care-ecosystem-india-needs-holistic-regulatory-framework/ (accessed 8.6.21).***
- ***Larimian, T., Zarabadi, Z.S.S., Sadeghi, A., 2013. Developing a fuzzy AHP model to evaluate environmental sustainability from the perspective of Secured by Design scheme—A case study. Sustain. Cities Soc. 7, 25–36. https://doi.org/10.1016/j.scs.2012.10.001***
- ***Meeting: Generations House, 2018. . H O M E. URL https://housingourmatureelders.wordpress.com/2018/08/31/meeting-generations-house/ (accessed 8.10.21).***
- ***Mixed-Use Developments in Senior Living | Senior Living Development [WWW Document], 2019. . LCS Dev. URL***

https://www.senior-living-development.com/senior-living-mixed-use-developments/ (accessed 8.6.21).

- ***Narvaez, L., Penn, A., 2016. The Architecture of Mixed Uses. J. Space Syntax 7, 107–136.***
- ***Neighbourhood Supports for Active Ageing in Urban India - Deepti Adlakha, Murali Krishna, Ryan Woolrych, Geraint Ellis, 2020 [WWW Document], n.d. URL https://journals.sagepub.com/doi/full/10.1177/0971333620937497 (accessed 8.8.21).***
- ***News, S.H., n.d. Strategies for Mixed-Use Development in Senior Living [WWW Document]. URL https://resources.seniorhousingnews.com/strategies-for-mixed-use-development-in-senior-living (accessed 8.8.21).***
- ***(PDF) The effect of the physical environment on mental wellbeing | Rachel Cooper - Academia.edu [WWW Document], n.d. URL https://www.academia.edu/471564/The_effect_of_the_physical_environment_on_mental_wellbeing (accessed 8.14.21).***
- ***Pioneer, T., n.d. Barrier-free design: Making environment accessible to the disabled [WWW Document]. The Pioneer. URL https://www.dailypioneer.com/2013/state-editions/barrier-free-design-making-environment-accessible-to-the-disabled.html (accessed 8.8.21).***
- ***Placemaking and the art of Mixed Use | Dialogue 32 [WWW Document], n.d. . Gensler. URL https://www.gensler.com/publications/dialogue/32/placemaking-and-the-art-of-mixed-use (accessed 8.7.21).***
- ***Rodiek, S., 2006. A Missing Link: Can Enhanced Outdoor Space Improve Seniors Housing? Sr. Hous. Care J. Volume 14, 3–19.***
- ***Rosenberg, E., 1994. Public and Private: Rereading Jane Jacobs. Landsc. J. 13, 139–144.***
- ***Schiavone, L., 2019. Exploring Senior Living Partnerships in Mixed-Use Development — Love & Company. URL https://loveandcompany.com/2019/08/exploring-senior-living-partnerships-in-mixed-use-development/ (accessed 8.6.21).***

- ***Shaw, J., 2017. Seniors Housing Draws Customers to Mixed-Use Centers. REBusinessOnline. URL https://rebusinessonline.com/seniors-housing-draws-customers-to-mixed-use-centers/ (accessed 8.7.21).***