

Master of Science in  
Urban Science, Policy and  
Planning Graduating Class of 2025  
Master Research Project  
A Compilation of Students' Posters



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Centre for  
Innovative Cities

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# **Topic: Resilience at the Margins**

# CAT-ALOGING

## ATTITUDES TO STREET CATS IN SINGAPORE, MEDIATED BY BELIEF SYSTEMS

This study explores how attitudes to street cats and animals in general are shaped by the lens of belief systems in the complex multi-faith, highly urbanised context of Singapore. Street cats in Singapore exemplify the complex entanglements of Anthropocene urbanism, subjects of biopolitical management and indices of shifting moral orders around species, space and care. How does Buddhism, Non-Religious thought, Christianity and Islam—shape and mediate the behaviours of Singaporeans towards this ubiquitous urban animal? What are the convergences and divergences of work here?

By  
**Koodal Theethaveerthi Sandip**

Under the supervision of:  
**Dr. Sarah Chan**

**SUTD-IRRHUSPP-23-01**

A Master's Research Project  
Submitted for the Degree of Master of Science  
in Urban Science, Policy and Planning  
Singapore University of Technology and Design

### Research Questions

How do principal belief systems in Singapore shape attitudes and perceptions towards street cats?

Secondary Questions:

1. In what ways do individuals interpret their experiences with street cats through cultural or religious lenses?
2. What common and divergent themes emerge within specific belief communities regarding street cats?
3. Are there broader anxieties or social issues tied to street cats in Singapore that intersect with belief systems?
4. To what extent are attitudes a product of religious values versus other social factors?

### CONCEPTUAL FRAMEWORK

**Doctrinal-Clarity Hypothesis**  
Singapore Urban Context Moderation Theory  
**Belief-Sensitive Policy Framework**

**THEORETICAL FRAMEWORK**  
Human-Animal Interaction Theory  
**Social Identity Theory**,  
Cultural Values and Animal Welfare Theory

### METHODOLOGY



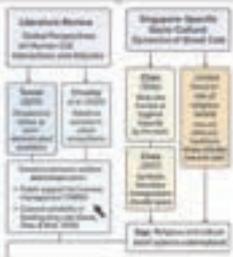
**Semi-Structured Interviews**  
- Primary Method

**16 Interviews** - 4 per belief group (n=4)

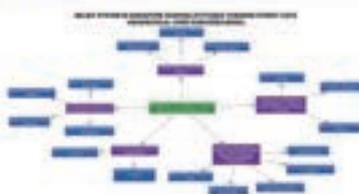
**Desk research, literature review (and expert interview)**

**Observation Studies**

### LITERATURE REVIEW

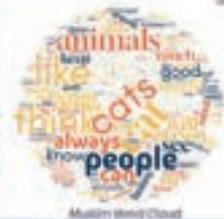
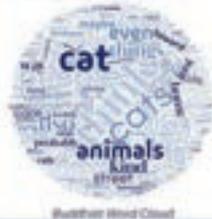
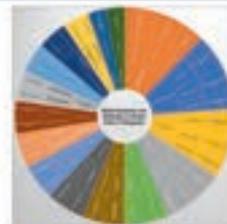
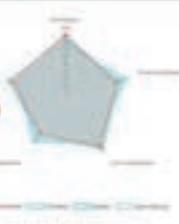


### Themes and Sub Themes



### Analysis

Religions like Buddhism and Islam with clear and specific doctrinal teachings about animal welfare exhibited High alignment, multi-denominational systems like Christianity and Non-Religious participants had more diversity. The Singapore environment had a moderating effect on attitudes, there was strong convergence over both Government intervention (89%) as well as the Trap, Neuter, Release, Manage (TNRM) program (95%), although for a variety of reasons, mediated by the individual belief perspectives.



### Conclusion

#### ONE UNIVERSAL AND INESCAPABLE CONCLUSION THE ANTHROPOCENE IS ANTHROCENTRIC ACROSS BELIEF SYSTEMS

##### Anthropocene's Anthropocentrism

Religious diversity doesn't challenge it but provides multiple justifications. "Multicultural tolerance can strengthen rather than weaken human-animal hierarchies." Urban sophistication creates more comprehensive animal control. "Policy progress often represents more sophisticated domination rather than genuine liberation."

#### Theoretical Frame of Anthropocentrism

1. **Colson's Binary Challenge**
  - Delineates how "binary human-animal ontology" coupled with hierarchical value system centered on human privilege" systems across Buddhist, Christian, Muslim, and secular frameworks.
2. **Colson's Moral Frontier**
  - Shows how Singapore's strict cat rescue-sterilize-relocate while retaining biopolitically excluded from genuine moral consideration.
3. **Berke's Critique**
  - Shows how even sophisticated ethical systems reproduce anthropocentric exclusion through traditional exemptions.

#### The Violence of Care

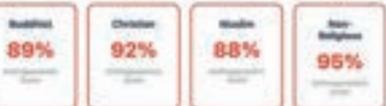
Feeding creates dependency rather than sustaining. TNM represents comprehensive, invasive bodily control. Rescue market maintains human authority over life/death decisions depriving agency. Emotional bonds serve human psychological needs while transforming animal freedom. Designated feeding areas = spatial and territorial control. Community volunteer networks = unpaid labor maintaining anthropocentric systems. Legal recognition = human administrative control. Policy as Anthropocentric Governance. HDB cat policy = management not rights recognition. TNM consensus = multicultural agreement on human authority over animal reproduction. Microchipping = digital surveillance and tracking.

### Universal Value Hierarchy

All religious groups demonstrated identical prioritization patterns, placing human concerns...



**Universal Anthropocentrism:**  
"Buddhist 'compassion' = instrumental harm-reducing using animals  
"Islamic 'halal' = pragmatic hierarchy, maintaining human authority  
"Christian 'stewardship' = explicit dominion with care obligations  
"Secular 'utilitas' = rational management maintaining human privilege"



### THE ANTHROPOCENTRIC LENS

#### PRESENTATION

- Belief system differences and multicultural coexistence
- Successful animal-welfare policies
- Comprehensive care and rescue
- Progressive TNM programs

#### REALITY

- Universal anthropocentric convergence across all belief systems
- Sophisticated systems of anthropocentric control
- Violence masked as care, dependency creation, management complexity
- Comprehensive bodily control and reproductive management

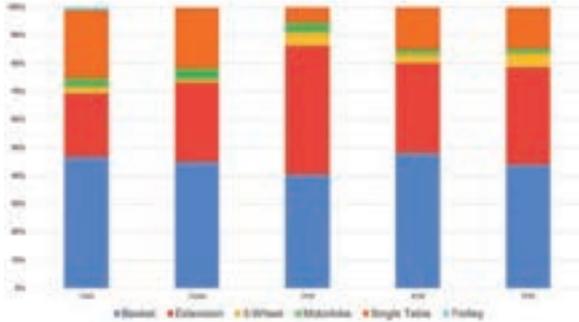
# HOW SPATIO-TEMPORAL DYNAMISM OF STREET VENDORS SHAPES COMMUNITY FOOD DIVERSITY: A CASE STUDY IN PHNOM PENH, CAMBODIA

## STUDY AREA

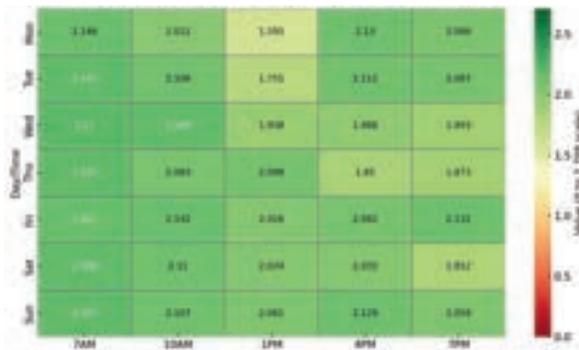
The study area is the Chrang Chamreh Pir Commune, Russei Keo District, Phnom Penh, Cambodia. The commune has a relatively high population density (6,173 people per square kilometer), according to the latest population census in 2019. Street vendors operate under canopies forms a daily market along the road which spans 350 meters (top right photo).

## OBJECTIVE

Food choices are constrained by their availability and accessibility to consumers. This study attempts to understand how spatio-temporal dynamism of street vendors shapes daily availability of food diversity.



The bar chart represents average proportion of street vendors across different times over a period of 7 days of the week. The study area is dominated by street vendors. Street vendors can be classified into 6 physical settings such as basket, 3-wheel, motorbike, trolley, extension, and single table. The first 4 settings are mobile whereas the last 2 settings are either permanent or semi-permanent. Mobile vendors dominate the area from 7-10AM and 4-7PM. Their fluctuation coincides with the level of food diversity indicated by Shannon Diversity Index.



The Heatmap represents Shannon Diversity Index, computed using data from vendor/food audit, ranging from 0 to a maximum of 2.708. It measures level of diversity of 15 food subgroups available at street vendors market. Smaller value means lower diversity, otherwise indicates higher diversity. Higher diversity in the morning between 7 - 10AM and lower diversity at 1PM are observed. The level of diversity picks up again at 4PM before it subdues at 7PM. This suggests temporal fluctuation of food diversity in the study area.



From field observation, there is a wet market (3) in the study area that consists of a few sellers in the morning before turning into quiet place in the afternoon. Most vendors operate on the road that have high pedestrian and vehicular traffics.

"Everyday I sell here from 6AM until 12PM and I resume at 3PM until 8PM. So I rest for 2 hours...I can rest whenever I want to but I sell almost everyday" — A single table-based vendor [0510\_01]

"We are on the road and block the traffic...if they chase or tell us, we need to move. Those are okay except those who sell down here" — A motorbike-based vendor [0408\_01]

"In the morning there is no space...they sell dried fishes here. I rent this space so there is a space for me to sell here in the evening" — A basket vendor [0511\_02]

"Normally I sell vegetables too but today I do not have...I am only here until all of my product is sold. Once they are all sold, I leave" — A basket vendor [0102\_01]



## TYPOLOGIES OF STREET VENDORS

Operating time: 6AM - 8PM

Road Sidewalk Building

## Recommendations:

- Recognize the importance of street vendors, especially those considered mobile and removable, in shaping community food diversity.
- Revitalize the wet market in order to reuse the space for street vendors.
- Explore possibility of using rotational model to assign spaces to street vendors.

# ROLE OF SOCIAL CAPITAL ON HOUSEHOLD RECOVERY FROM FLOODING

## A QUALITATIVE CASE STUDY IN RURAL AREA, CAMBODIA

### BACKGROUND AND OBJECTIVE

- Over 80% of the land is exposed to seasonal flooding.
- Disaster recovery largely depends on informal networks rather than formal aid.
- This study aims to identify the types of social capital (bonding, bridging, and linking) mobilized by households during the post-flood recovery process.
- To analyze and examine how the presence or absence of social capital affects recovery outcomes.

### RESEARCH QUESTION

How does social capital influence household recovery from flooding in Kampong Leang District, Kampong Chhnang Province?

- What types of social capital are mobilized by households during the post-flood recovery process?
- In what ways does social capital enable or limit household access to resources and support during post-flood recovery?

### STUDY SITE



Toul Rolous Village



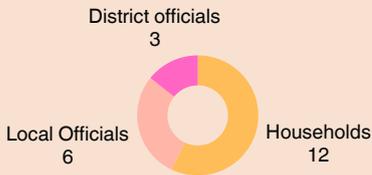
Koh ka'ek Village

### RESEARCH METHOD

#### PURPOSIVE + SNOWBALL SAMPLING

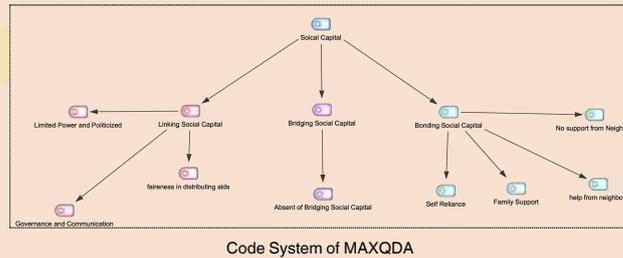
- ≥5 years of continuous
- Directly affected by flood event
- Above 18 and consented to participate

#### 21 SEMI-STRUCTURED INTERVIEWS

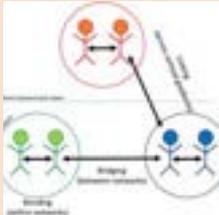


#### THEMATIC ANALYSIS

- Thematic analysis was conducted using Braun and Clarke's (2006) six-phase framework.



### FRAMEWORK



Aldrich's (2012) social capital framework

### INTERVIEW PROTOCOL

- Conducted in Khmer
- Duration: 30–45 minutes
- Audio-recorded, transcribed, translated
- Location: Commune Hall and Participant Houses, and designated meeting spaces

### RESEARCH FINDING

Bonding Social Capital Most Common, But Limited	Bridging Social Capital Structurally Absent	Linking Social Capital Limited Power and Politicized	Socioeconomic Status Patterns of Recovery Across Different SES Levels
All households relied on close family for support. Neighbor help was minimal due to shared poverty. Bonding ties offered emotional support and small repair assistance, but not enough for full recovery	Bridging social capital is Largely absent across the community. Lack of horizontal ties hindered collective recovery efforts.	Some accessed aid through village chiefs or local authorities. Chiefs were active but had limited control over distribution. Aid access was influenced by favoritism and personal relationships.	All households that achieved full recovery were from the middle socioeconomic group, while those from low socioeconomic backgrounds only achieved partial or no recovery

### KEY INSIGHTS

<p><b>Bonding capital = Emotional &amp; short-term support</b></p> <p>Bonding capital provided emotional and immediate support, but lacked the material capacity for sustainable recovery.</p> <p>Bonding social capital can reinforce cycles of deprivation rather than break them. (Tierney, 2006; Hossain &amp; Martin, 2018)</p>	<p><b>The Missing Layer of Community Resilience</b></p> <p>Communities remained fragmented post-flood, with reduced information flow, minimal mutual aid, and no coordinated recovery mechanisms.</p> <p>Bridging SC is the "connective tissue" that enables communities to scale resilience beyond the household (Woolcock &amp; Narayan, 2000).</p>	<p><b>Unequal Access and Institutional Bias</b></p> <p>Linking SC existed, failed to deliver equitable outcomes. Supporting the idea that SC alone isn't enough without accountable governance.</p> <p>Bridging SC is the "connective tissue" that enables communities to scale resilience beyond the household (Woolcock &amp; Narayan, 2000).</p>	<p><b>SES shapes access to effective social capital</b></p> <p>Households with higher SES had stronger links to institutions, while lower-SES households struggled to convert social ties into meaningful support.</p> <p>"Socioeconomic status explains the greatest variance in social vulnerability." (Cutter et al., 2003)</p>
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### CONCLUSION

- Primarily bonding capital (family, neighbors); bridging was minimal; linking was selectively accessed.
- Bonding enabled emotional and immediate support but lacked scale. Linking enabled access to aid only when mediated by powerful actors. Lack of bridging capital left households isolated.
- SES shaped both the type and effectiveness of social capital. Low-SES households relied on bonding but struggled to access linking networks. Middle-SES households accessed multiple layers and recovered better.

### PUSH FACTORS

- Rebuilding Bridging Social Capital: From Symbolism to Structure
  - Adopt the principles of effective implemented policies such as: Ward-Level Reconstruction Committees, and Community-Driven Recovery Forums (CDRFs).
- Promote Inclusive Representation to Reduce Elite Bias
- Inter-Village Networks for Collective Resilience

## **Topic: Growing Old in the city**

## Why & Who

Elderly pedestrians and motorcyclists remain the most vulnerable road user groups (Singapore Police Force, 2019; 2020; 2021; 2022; 2023; 2024).

In 2024, elderly pedestrians **12.5%** (of the population) accounted for **42.3%** (Fatal pedestrian accidents)



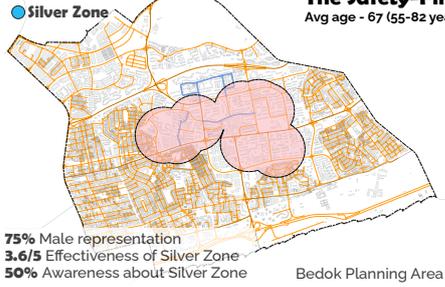
## What is Silver zone?

Singapore's Silver Zone programme, launched in 2014, improves safety for seniors with slower speeds, safer crossings and extended crossing times, reducing accidents by up to 80% and promotes active ageing.

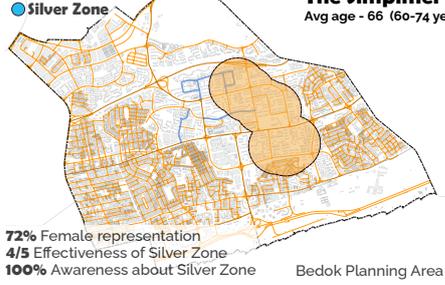
(Amin Akhounk et al. 2021; Belinda Yuen et al. 2020; Foo et al. 2024; He et al. 2025; Hou et al. 2021; Koh, 2025; Lee & Palliyani, 2017; Magkafas et al. 2025; Maletich, 2024; Melissa Liow Li Sa, 2023; Močnik et al. 2022; NGU et al. 2023; Numera Nazneen, 2021; Rojas López & Wong, 2017; Tan, 2022; Tao et al. 2021; Wang et al. 2019; Yongcheng, 2020)



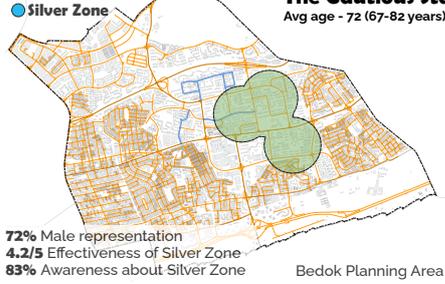
## Where would Factor 1 live



## Where would Factor 2 live



## Where would Factor 3 live



## Conclusion

All groups want safer, more predictable walking environments and value physical design features over abstract processes like budgets or participation.

Visible, built-in safety measures (bollards, crossings, anti-slip surfaces) are prioritized over awareness campaigns or procedural engagement.

- Factor 1 (Trust-in-Design Realists): External authority - safety confidence
- Factor 2 (Simplifiers): Low cognitive load = willingness to walk.
- Factor 3 (Cautious Stability Seekers): Physical stability = independence security.

# Perception to Planning: What Elderly Pedestrians Tell Us About Safety & Accessibility in Singapore. A Case Study in Bedok Planning Area

MUSSP Final Research Project (MRP)  
Thesis By - Utkarsh Chaudhary - 1009465  
Supervisor - Dr. Suhaila Binte Zainal Shah

## The Research

Research explores how elderly pedestrians in Singapore perceive road safety and traffic calming features, focusing on their psychological responses, mobility behaviors, and design preferences to inform safer, age-friendly urban planning.

## Research Question

"Which pedestrian-friendly design features, including those from the Silver Zones programme, do older pedestrians perceive as most enhancing or challenging to their sense of safety when walking or crossing roads in their neighbourhood, and why?"

## Objectives

Identify which design elements and community engagement strategies best enhance safe, age-friendly neighborhoods.

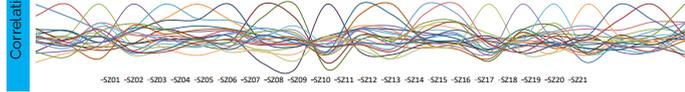
Examine how specific Silver Zone design features affect elderly pedestrians' daily mobility and sense of safety.

## Gap

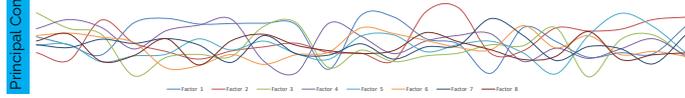
Current studies on Silver Zones focus on policy-level outcomes like accident reduction, leaving limited understanding of how specific design features and community engagement influence seniors' mobility and perceived safety in their neighborhoods.

## Data Analysis

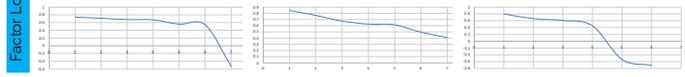
Q methodology uses participants' ranked Q-sorts as input and computes Pearson correlations to show similarity. The correlation matrix captures participant relationships, enabling detection of shared viewpoints.



PCA decomposes the correlation matrix into eigenvalues and eigenvectors to find shared viewpoint patterns, chosen for its objective, data-driven factor extraction. Eigenvalues: Measure variance each factor explains. >1 is usually kept. % Variance Explained: Shows variance share per factor, aim 40-60% cumulative.



Varimax Factor Rotation orthogonally rotates PCA factors, maximizing loading variance for clearer and interpretable viewpoints. Factor Loadings show participant-factor correlation, identifying defining or confounded sorts, based on rotated factor solutions.



**Highest**

- Silver zone bollard**  
Q-sort Value +3  
Z Score +1.82
- Two stage crossing**  
Q-sort Value +2  
Z Score +0.81

*On Silver Zone Bollard "Yes, it tells the drivers that there is a crossing ahead. That helps with the safety of the pedestrians."*

**Moderate**

- Shading of pathway**  
Q-sort Value +1  
Z Score +0.72
- Anti slip drain cover**  
Q-sort Value +1  
Z Score +0.31
- Public knowledge**  
Q-sort Value +0  
Z Score +0.31
- Resting areas**  
Q-sort Value +0  
Z Score +0.31

**Least**

- Speed Humps**  
Q-sort Value -2  
Z Score -1.00
- Cut back curb ramp**  
Q-sort Value -2  
Z Score -1.06
- Money Spent**  
Q-sort Value -3  
Z Score -2.54
- Senior Involvement**  
Q-sort Value -3  
Z Score -1.76

**Highest**

- Single Lane Regular Monitoring**  
Q-sort Value +3  
Z Score +1.70

*On Single lane "Single-lane roads are safer for users because they only need to check traffic from one direction, unlike multi-lane roads where monitoring multiple directions increases risk."*

**Moderate**

- Cut Back Curb**  
Q-sort Value +0  
Z Score -0.16

*On Anti Slip Drain Covers "Anti-slip covers reduce slipperiness temporarily, but the core issue lies with the drain cover design itself, so people still avoid walking directly on it."*

**Least**

- Green Man +**  
Q-sort Value -2  
Z Score -0.88
- Crossing distance**  
Q-sort Value -3  
Z Score -1.05
- Anti slip drain cover**  
Q-sort Value +1  
Z Score +0.31

**Highest**

- Anti slip drain cover**  
Q-sort Value +3  
Z Score +2.42
- Cut back Kerb**  
Q-sort Value +2  
Z Score +1.01

*On Anti Slip Drain Covers "When it rains, I just avoid those drains... now they have anti slip, so it is safer. Otherwise, I will walk further just to go around."*

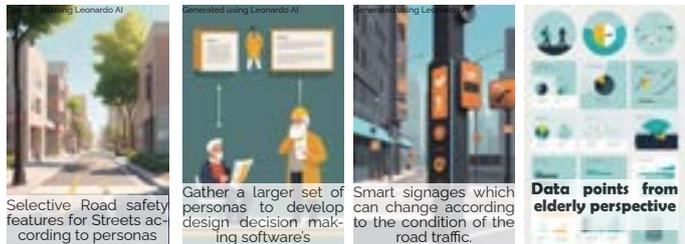
**Moderate**

- Senior Involvement**  
Q-sort Value +0  
Z Score -0.42
- Regular Monitoring**  
Q-sort Value -1  
Z Score -0.76

**Least**

- Road Markings**  
Q-sort Value -2  
Z Score -1.15
- Crossing Signage**  
Q-sort Value -3  
Z Score -1.62
- Wider foot paths**  
Q-sort Value -3  
Z Score -1.29

## Toolkit For Urban Planning Implication for Senior



**Q-Methodology**  
It is a research technique specifically designed to explore subjective viewpoints (Doygun, 2020; Leung & Topa, 2018; Tsigidinos et al. 2022).

**F2F Q-Sorts**  
Guiding Question- To what extent do each of these features, including those from the Silver Zones programme—affect your sense of safety while walking or crossing the roads in the neighborhood?

**Quantitative GIS**  
Identify site for case study.

**Semi-Structured Interview**  
Confidence rating & Knowledge for Silver zone  
Why did the participant rank each feature at that position?

**Recruitment Strategy**  
55 years old and above  
Public Venues  
English Speaker  
18-35 Participant

**Q-sort Grid**

	-3	-2	-1	0	1	2	3

**Concourse development**  
21 Government Documents  
66 NEWS-Paper Articles

## What Seniors have to say



## Attention Areas

The recruitment of the participant is by snowballing, though this method usually led to similar views. The Participants can only be recruited in public areas, where else most of the elderly likes to talk in the comfort of their homes.

## Next Steps

Q methodology enables quick interviews suited to seniors with short attention spans. Future research could compare multiple planning areas to reveal shared and unique safety perceptions for targeted interventions.

# Building Futures Uniting Generations

Spatial Upgrades for Ageing-In-Place Through Intergenerational Design in HDB Public Spaces

## INTRODUCTION

By 2030, 24.1% of Singaporeans will be aged 65 and above, making ageing-in-place a national priority. Study shows that the built environment plays a vital role in the mental and physical well-being of seniors. 80% of the population live in HDBs yet the precincts remain spatially compartmentalised, with co-located amenities that lack intentional design elements supporting meaningful intergenerational interactions. Existing initiatives are often short-term pilots that struggle to sustain due to limited funding. This research aims to address this critical gap.

**1 in 4** Singaporeans will be 65 years and over

**80%** live in public flats

**Breaking age divides** enhancing social networks within the community

## RESEARCH QUESTIONS

- R0** How can shared public spaces in HDB precincts be spatially upgraded to effectively support ageing-in-place while facilitating meaningful, naturally occurring intergenerational interaction?
- 01** What specific spatial and temporal usage patterns exist among seniors, adults and children within selected upgraded public spaces, and how do these observed patterns facilitate or limit intergenerational encounters?
- 02** How do residents perceive the current upgraded public spaces regarding inclusivity, comfort, support for ageing-in-place and suitability for intergenerational interactions, and what spatial improvements do they propose?

## SITES IDENTIFIED FOR STUDY

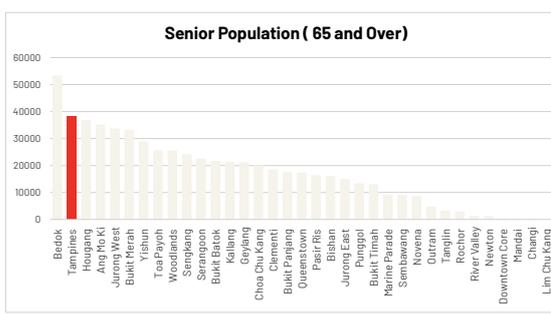
### Overview of Study Sites



Tampines is selected for its growing senior population and its status as one of the highest planning areas with the most seniors in Singapore. Its diverse public space typologies also align with HDB's communal space upgrading efforts.

- 609D Living Room**  
Community Living Room Typology, designed for multi-generational use
- 839 Community Link**  
Amenity Integration, clustered communal for cross-generational use
- 842 Neighbour's Hub**  
Social Linkway Typology, co-designed by residents with activity nodes & garden

### 2020 Senior Population by Planning Area



Age Range	2000	2010	2020
60 - 64	5793	12,103	21,360
65 & Over	12,789	17,976	38,260

**2nd** highest number of seniors in SG

**DIVERSE** housing typologies catering to evolving demographics

**53%** increase between 2010 & 2020

**Improving spatial design** for intergenerational cohesion

## CONTEXTUAL ANALYSIS OF IDENTIFIED SITES

Accessibility - Palmwalk to OTH (L), OTH to Palmwalk (R)

Accessibility - GreenWeave to OTH (L), OTH to Greenweave (R)

### Amenities, Anchor Point, Social (Corridors), Transport & Green Connections, Intersections

### Dyanmic Activity Patterns

#### Palmwalk to Tampines West & Central

1) Tampines West Commercial Cluster, 2) Tampines Central Park, 3) Tampines Central and Tampines Malls

#### GreenWeave to Tampines North

1) Greenridge Commercial Cluster, 2) Polyclinic + Ageing Centre, 3) Foodcourt

### Amenities, Anchor Point, Social (Corridors), Transport & Green Connections, Intersections

**KEY**

- Nodes
- Transport
- Schools
- Amenities
- Green Connections
- Social Linkway
- Mobility Corridor
- Recreational Corridor
- Anchor Point
- Site Location
- Courts
- Green Space

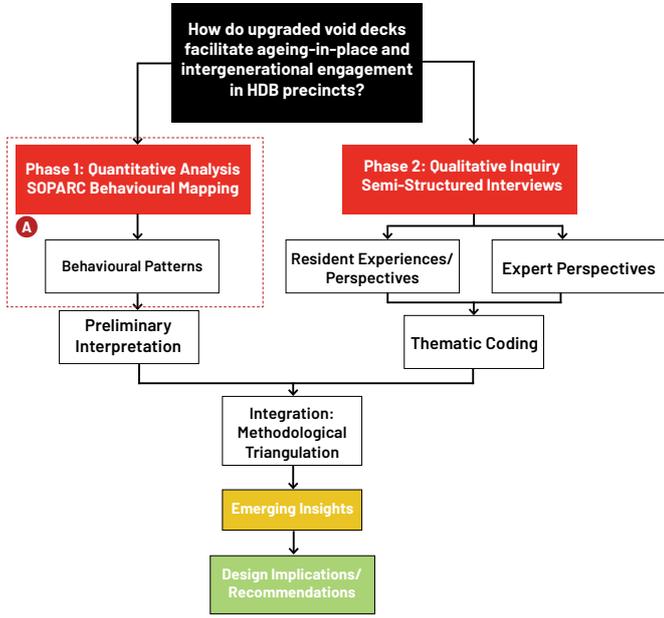


# Building Futures Uniting Generations

Spatial Upgrades for Ageing-In-Place Through Intergenerational Design in HDB Public Spaces

## RESEARCH DESIGN / METHODOLOGIES

An explanatory sequential mixed-methods design is implemented to investigate how upgraded void decks in HDB precincts facilitate ageing-in-place and sustain intergenerational engagement.

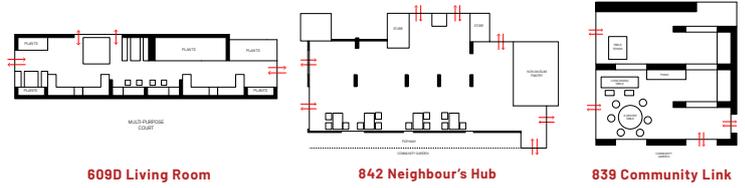


Integrated Analytical Framework

### A SOPARC Behavioural Mapping

System for Observing Play and Recreation in Communities

Documenting spatial usage patterns by age/gender/activity intensity/ social groups. Each site: 1 weekday + 1 weekend

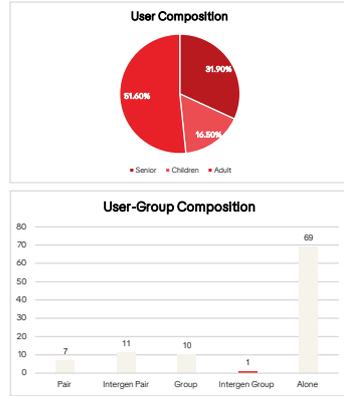
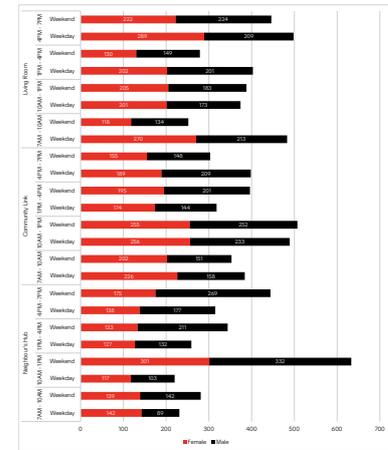


### Layering of Methodologies

Who uses public spaces and with whom?	When do they appear and how do time windows overlap?	Where do they appear & where do overlaps occur?	Why no interaction in comfortable spaces? How is inclusivity defined?	What features can encourage intergenerational interactions?
<ul style="list-style-type: none"> <li>Site Observations (SOPARC)</li> <li>Semi-structured resident interviews</li> </ul>	<ul style="list-style-type: none"> <li>Site Observations (SOPARC)</li> <li>Semi-structured resident interviews</li> </ul>	<ul style="list-style-type: none"> <li>Site Observations (SOPARC)</li> <li>Activity Mapping</li> <li>Space Syntax Visibility Graph Analysis (VGA)</li> <li>Thematic Analysis</li> </ul>	<ul style="list-style-type: none"> <li>Space Syntax Segment Analysis</li> <li>Semi-structured resident interviews</li> <li>Key informant interviews</li> <li>Thematic Analysis</li> </ul>	<ul style="list-style-type: none"> <li>Site Observations (SOPARC)</li> <li>Activity Mapping</li> <li>Semi-structured resident interviews</li> <li>Key informant interviews</li> <li>Space Syntax</li> </ul>

## WHO USES THESE SPACES AND WITH WHOM?

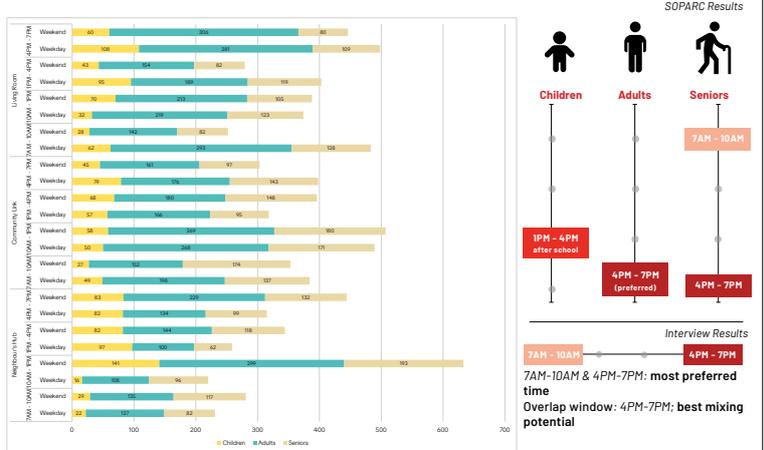
SOPARC + Interview Findings



Adults dominated public spaces across all 3 sites. These spaces were mostly used within same-age clusters, not across generations.

## WHEN DO THEY APPEAR & THERE AN OVERLAP?

SOPARC + Interview Findings



Results obtained from SOPARC forms

**56%** use spaces alone

**60%** use with family

**66%** rarely / never interacted with other generations

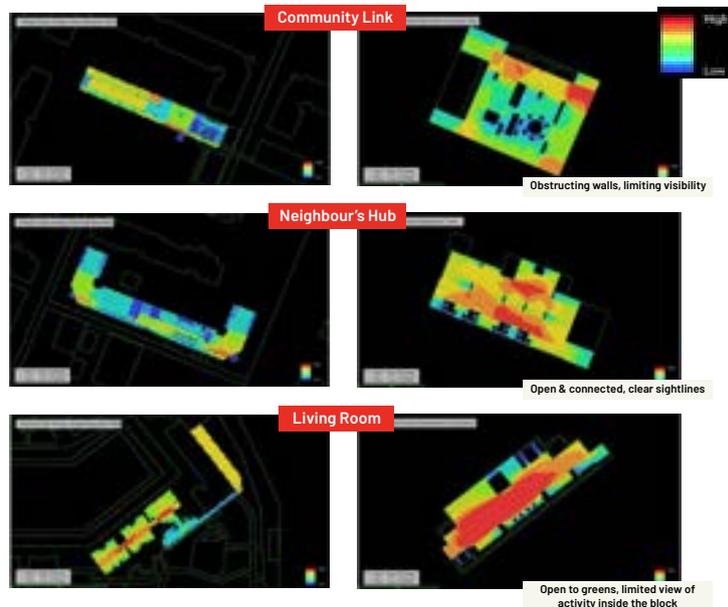


Higher proportion of women on weekdays (7AM-10AM) is likely due to caretaking duties & grocery shopping given the proximity to Tampines Hub & Tampines West Market

**8998** people observed (all 3)  
**54** residents interviewed

## WHERE DO THEY APPEAR?

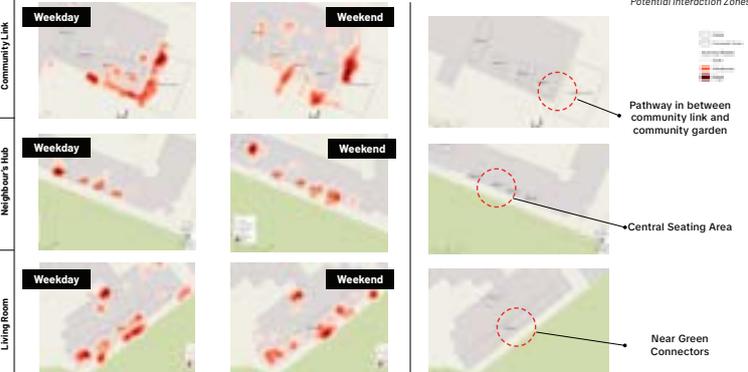
Space Syntax Visibility Graph Analysis



## WHERE DO THEY APPEAR?

SOPARC Usage Patterns Heatmaps

Potential Interaction Zones



# Building Futures Uniting Generations

Spatial Upgrades for Ageing-In-Place Through Intergenerational Design in HDB Public Spaces

## WHICH SPACES ATTRACT PEOPLE?

Thematic Analysis

### Motivators for Increased Use of Public Space



- Parents:** "Shaded areas, pavilions for parents to take breaks from pushing strollers."
- Adults:** "Regular maintenance of facilities, sanitisation zones, cleaner public toilets, increased garden spaces."
- Seniors:** "More convenient access and better connectivity...As a PWD user, it's quite inconvenient."

No. of Residents Interviewed

**17** people aged 21 and above

**13** parents with children

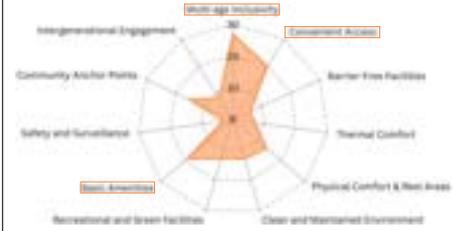
**20** seniors aged 65 and above

Residents are keen to use public spaces if they are **well-maintained, thermally comfortable, accessible with inclusive features and light programming**

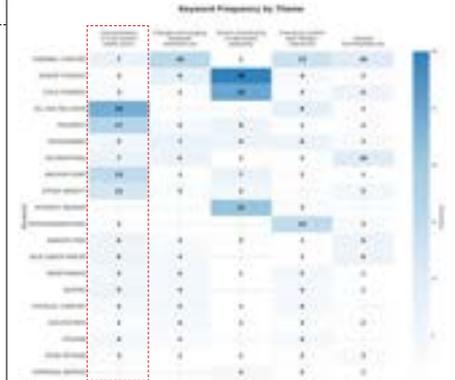
## HOW IS INCLUSIVITY DEFINED IN PUBLIC SPACES?

Thematic Analysis + Heatmap

### Characteristics of Successful Public Spaces



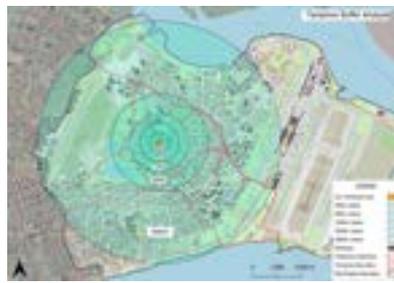
- Parents:** "Clean, safe, regular maintenance, space for parents to rest while kids play."
- Adults:** "Caters to all demographics, accessible to public transport and PWD, sufficient shade & shelter, no weird smell"
- Seniors:** "Supports daily activities, offers relaxing areas & attracts people based on interest, not just necessity"



Residents believe that public spaces are inclusive if they are **comfortable, accessible, safe environment near home, people of all ages can gather, rest and interact** across generations

## NO INTERACTION IN SPACES?

Space Syntax Segment + Thematic Analysis



Using Tampines Hub as the anchor point, 400m, 800m, 1200m and 2000m buffers were created. Given the focus on spatial design at the pedestrian level, the range of 400m - 1200m is most relevant.

**400m:** grocery, playground, void decks (short trips)

**800m:** school, clinic, bus stop (neighbourhood level)

**1200m:** public transport integration & MRT



### 839 Community Link

Strong integration with nearby civic amenities allows seniors to run daily errands independently. High Choice values around Tampines West Market reflect strong pedestrian flow, making the Community Link an ideal site for intergenerational infrastructure.

### 842 Neighbour's Hub

Moderate integration with internal streets within block cluster being more fragmented. While there is reasonable accessibility to nearby amenities, spatial interventions within the precinct are needed to enhance senior mobility. Near to Community Link, but has lower through-movement due to its enclosed layout.

### 609D Living Room

Lowest integration compared to the other two sites. While accessibility to Tampines East MRT and green connectors is possible but direct walkability to district functions is limited, and visibility for seniors is restricted.

Below: Responses from Interview

**100%** feel comfortable

"Meets all our needs, facilities are sufficient"

**90%** feel spaces are inclusive

"Well designed. More spaces like this needed"

**82%** spaces cater to their age

"Everything is very nice"

Satisfied with facilities

- "Age clustering creates a sense of exclusion for non-dominant groups"
- "Physical / mobility issues hinder seniors' access to certain spaces"
- "Older HDB layouts often separate playgrounds from elderly seating areas, limiting daily interaction opportunities (times)"
- "Mobile phones. Many parents tend to leave their children to play while they use their mobile phones"

**BUT...**

**66%** residents indicated they rarely / never INTERACT across generations

## Physical Comfort

## Intergenerational Connection

due to **Mismatched Schedules** (lesser discretionary time), **Spatial Segregation** and **Subtle Social Barriers**.

## WHAT FEATURES FOSTER INTERGENERATIONAL INTERACTION?

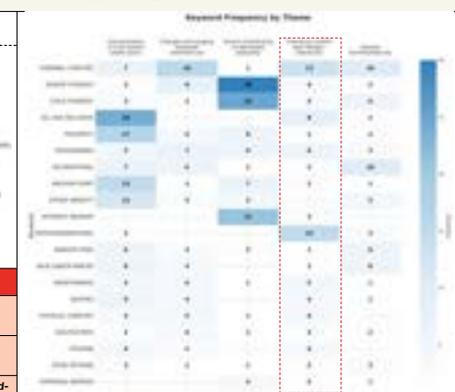
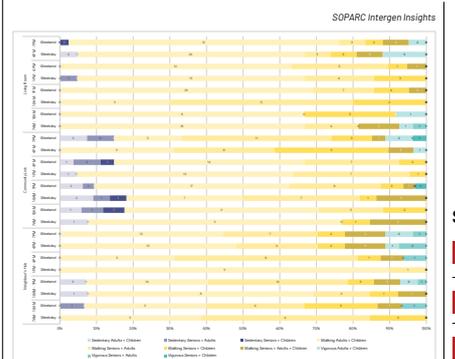
### Resident Perspectives



### Expert Perspectives - Intergenerational Frameworks

- "Spaces designed for elderly, something for them to do with youngsters helping"
- "Integration of children play areas & senior fitness corners and the new 3-Generational areas"
- "Similar universal design frameworks apply. Intergenerational interaction is dependent on daily lifestyle patterns...social networks more than just design features..."
- "Current designs do not encourage parent or adult participation"

### Methodological Triangulation



Residents and experts agree that **improved environmental comfort, greater accessibility and inclusive activities/programs** foster cross-age interaction

### Specific Features from Each Site:

- 839 Community Link:** Strong integration to nearby amenities. Ideal for serendipitous intergen encounter
- 842 Neighbour's Hub:** Greatest diversity of intergenerational groups. Open and Connected, Clear sightlines
- 609D Living Room:** Not as connected to amenities; greenspace. Highest satisfaction with comfort, shade, environmental comfort and spatial layout

## RECOMMENDATIONS

### Time and Routine

- Spaces for temporal flexibility, tapping on overlapping patterns (SOPARC): Spatial configurations that support transitions during overlap peak hours (e.g. modular seating, retractable shade)
- Overlap / Peak Periods: Seniors - Morning, Children - Afternoon, \*Intergen Walking Groups
- Regular / Weekly inclusive program to activate spaces: Program schedule must align with intergen windows derived from observed patterns

### Space and Accessibility

- Permeable boundaries: No harsh thresholds to prevent deterrence of informal engagement (e.g. plants instead of fence - GreenWeave)
- Increased visibility: Especially for areas where visibility is low, to encourage more seniors to leave their homes
- Barrier-free Networks: To promote inclusive use among seniors, PWD and increase willingness to use public spaces

### Comfort and "Active" Nodes

- Improved thermal comfort: Thematic analysis highlights thermal discomfort as a deterrent. Solution - continued shading, wind corridors, sheltered connectors to increase dwell time and intergen occupancy
- Embedding shared activity nodes in high visibility paths: To move past co-located amenities and encourage low-effort activities. "Active" Nodes (e.g. social benches, mini displays, interactive features) situated along paths where groups converge (Intergen always walking)

For highest intergen impact, strategies should be implemented at highest visibility & highest traffic points.

The main barriers to intergenerational interaction are age-specific rhythms and spatial separation; not the lack of shared space but the lack of shared use. To facilitate more meaningful engagement, participatory design processes, aligning spatial features with lived routines and intergenerational needs, should guide future upgrades

# Ageing-in-place in HDB Estates: An Ongoing Process of Negotiation



## Background & Research Motivation

Singapore is set to become a super-aged society by 2026 (Lau, 2024), with rising median ages and a shrinking younger population (Figure 1 & 2). Ageing-in-place initiatives to help one stay active and continue ageing in the community are crucial, such as a studio apartment (SA) that enables independent living for older adults with social support structures like active ageing centres (AACs).



FIGURE 1: ESTIMATED MEDIAN AGE OF RESIDENTS, SINGAPORE<sup>1,2,3</sup>

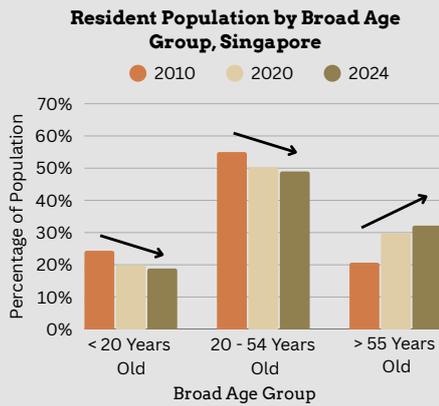


FIGURE 2: RESIDENT POPULATION BY BROAD AGE GROUP, SINGAPORE<sup>4,5,6</sup>

With shifting socio-demographics and lifestyle choices, younger generations of older adults have differing needs. More are choosing to stay alone (Thang & Hong, 2015). There are also changes in expectations of filial piety and family in providing care (Cheng & Chan, 2006). This could have implications on the meaning of family relationships to older adults. With changing family structures, there is a need to shift away from solely relying on family for care.

Family and friends can encourage social participation, which has a positive effect on health and well-being, by providing opportunities to form connections (Shiraz et al., 2020; Tiew et al., 2024). These resources, including AACs, facilitate ageing-in-place by mitigating limitations arising from obstacles like declining mobility & health.

Investigating lived experiences of older adults living in SAs could shed light on their **evolving needs** as they **negotiate with their environment**. It is crucial to understand their reactions as they experience the **relational and negotiated process of ageing**.

## Research Question

How do older adults meet their needs as they age within their community and HDB studio apartments in Singapore?

Sub-Research Questions:

### Perceptions of AACs and Formal Care

How do older adults perceive the role of formal social infrastructures such as Active Ageing Centres (AACs) in their ageing-in-place experiences?

### Relationships and Community Networks

What is the meaning of social relationships to older adults as they age in their communities?

### Perceptions of Social Interactions

How do social interactions affect older adults' experiences of ageing as they attempt to fulfil their needs?

## Study Area & Site Selection



FIGURE 3: STUDY AREA OF TAMPINES<sup>7,8,9</sup>

Tampines is located in the Eastern part of Singapore with a significant population of older adults aged 65 years & above and an ageing trend (Figure 3 & 4). It is also one of the four areas where the first development of SAs from 2002 are located.

Investigating ageing-in-place initiatives could yield insights into their effectiveness for future generations of older adults.

### Resident Population, Tampines, Singapore, 2024

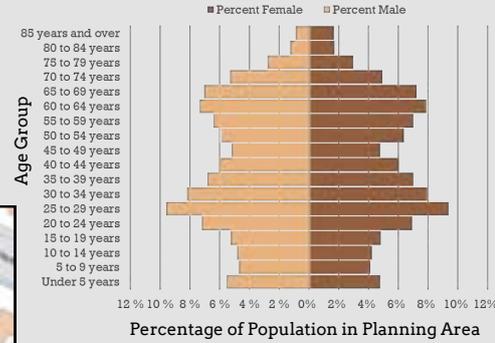


FIGURE 4: POPULATION DEMOGRAPHICS OF TAMPINES<sup>10</sup>

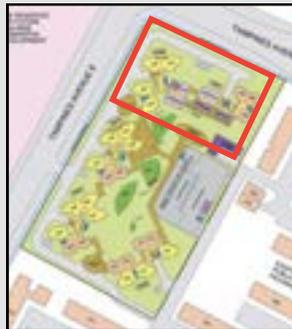


FIGURE 5: LAYOUT OF TAMPINES GREENWOOD ESTATE<sup>11</sup>

Blocks 868B/C of Tampines Greenwood Estate are part of a newer development of SAs. Amenities in close proximity include an AAC, a community garden, a pavilion and a fitness corner (Figure 5).

## Data Collection Methods



Semi-structured Interviews



Non-Intrusive Observations



Fieldnotes & Transcripts

Fieldwork was conducted to investigate and understand the **lived experiences of older adults**, focusing on their **daily lives, relationships** with family members and fellow residents as well as their **perceptions** of their environment.

## Participants' Profile

### Interview Participant Statistics

Group	N	Gender (M/F)	Age (70s/80s)
Older Adults	11	3, 8	9, 2
Staff/Volunteers	3	2, 1	-

Older Adults' Responses arranged in a 2x2 matrix, mapping their **Orientation of Engagement** (Group - Individual) against **Mode of Engagement** (Formal - Informal) (Figure 6).

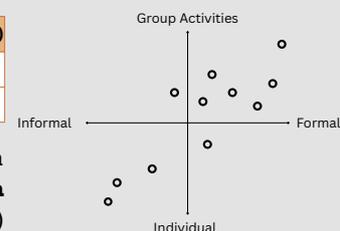
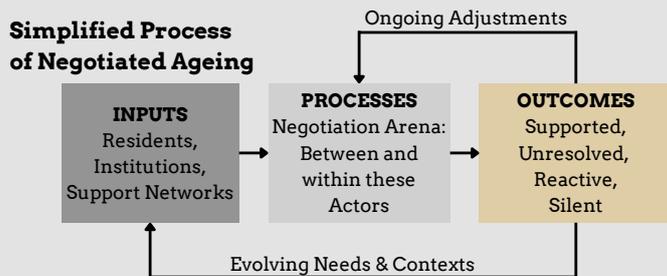


FIGURE 6: OLDER ADULTS' ENGAGEMENT MATRIX

# Conceptual Framework: Negotiated Ageing

A grounded, ethnographic concept that captures the ongoing, relational and uneven negotiations older adults engage in to maintain autonomy, identity and care in public housing contexts.

## Simplified Process of Negotiated Ageing



CONCEPTUAL TOOLS	CONTRIBUTIONS TO THE FRAMEWORK
IRP (Interests-Rights-Power)	How decisions are shaped through negotiation based on personal needs, entitlements or authority.
Capability/Coping	How older adults adapt internally or endure challenges when structural support is limited
Resilience/Reactive	How ageing is sustained through shared adaptation with family, friends or community.
Person-Environment Fit (Contextual)	How an older adult's interests, abilities and identities align with the demands of their physical and social environment.

A multi-framework approach is used to analyse ageing-in-place as a dynamic process shaped by individual adaptation, social negotiation and social contexts. These concepts explain how older adults navigate ageing across four thematic outcomes:

**Supported, Unresolved, Reactive and Silent Negotiation.**

## Negotiated Ageing Framework: How Older Adults Navigate Support, Constraints and Identity

INPUTS	NEGOTIATION ARENA		OUTCOMES & [Frameworks]	
<b>Residents' Needs &amp; Preferences</b> [Coping / Capability] <b>Housing Environment</b> [Capability] <b>Support Networks</b> [Resilience / Reactive] <b>Institutional Supports</b> [IRP]	<b>Supported Negotiation</b> [IRP + Capability]	<b>Unresolved Negotiation</b> [IRP + Capability]	<b>Reactive Negotiation</b> [Resilience]	<b>Silent Negotiation</b> [Coping + Capability]
<b>Conversations &amp; Feedback</b> [IRP] <b>Shared problem solving &amp; adaptation</b> [Resilience / Reactive] <b>Personal Coping &amp; Self directed adjustments</b> [Coping]				

## Supported Negotiation When Needs Are Aligned

With alignment comes engagement and participation. Success of formal programs and social infrastructures are the result of:

- High levels of engagement with formalised programs within the centre reflect a **good fit between needs and capabilities of institutions and older adults.**

*"A highly involved older adult, Mdm V frequently goes above and beyond participation, co-organises meetups, gatherings and art workshops to encourage socialisation among her neighbours."*

- **Agency and choice** at the forefront, with residents being given **freedom of choice** to engage in activities that suit their **preferences, identities and needs**

*"Everyday after lunch, the regular crew of residents gather for their daily board games session, lasting up till closing time. These residents seem very familiar with each others' company"*

## Unresolved Negotiation: Institutional & Circumstantial Barriers

Absence as an **expression of choice and agency. Willingly** disengage from formal programming as a **response.**

This friction may be due to;

- **Identity**, where programs, social norms and expectations **do not align** with the perceived identities, capabilities and preferences of older adults.

*"[The men] rarely come here, they rather meet at the kopitiam across here to sit and just talk" (Mr Z, staff)*

- **Institutional** capabilities may cause a self-perpetuating cycle of underrepresentation, skewing to cater to the residents who are present in the centre, further widening the mismatch.
- **Circumstantial**, these can be reinterpreted as capabilities that affect their ability to participate in such activities, due to obligations or personal challenges.

## Silent Negotiation: Alone but not (Completely) Unsupported

Home visits by AAC staff/volunteers illustrate the **hidden realities on ground** - the silent battles being fought by the unseen and unheard, the socially isolated.

- AAC staff/volunteers and older residents have echoed the **difficulties** they face when **encouraging** older residents to participate in the AAC

*"There are still residents 'hiding behind their doors...not willing to come out' and the staff 'cannot force them'". (Ms A, ex-staff, current volunteer)*

- **Lack of manpower and time, and fixed AAC opening hours** could lead to individuals falling through the cracks

*"Seniors 'need someone to talk to them, to listen to them'", but 'the centre cannot provide the time'... 'On weekends, the centre is not open. When there is an emergency, who is going to help them?'". (Ms A)*

However, these individuals are not alone, as there are available resources such as family, neighbours and the AAC

- Finding ways to access these resources, and **helping older adults overcome barriers** in participating could support their ability to **establish agency**

## Reactive Negotiation: Resilience & Adaptation

As residents and AAC staff/volunteers **react to their circumstances**, **adaptation** results from **negotiations** with their environment, needs and preferences.

- Older adults have found **alternative ways to adapt & remain active on their own terms** (Aw et al., 2017, Guell et al., 2016)

*"Mdm F, who usually keeps to herself and prefers to be alone, frequents the centre to read newspapers, which has become part of her daily routine."*

*"An ex-participant at the AAC, Mr H has a daily routine that involves getting out of the house as he will 'never stay at home in the daytime'".*

- This enables older adults to thrive by staying active and achieving P-E fit, even if just perceived (Lien et al., 2015).

- AAC staff/volunteers **support older adults agency and autonomy** by **engaging them in ways they are receptive to.** This enables them to **see themselves as fit, active** (Øye et al., 2023), **empowered & respected** (Weintraub & Killian, 2007).

*"Though initially resistant, after encouragement from the staff, the elderly lady nodded her head and began walking towards the room to participate in the activity, seemingly more excited now." (Observations, AAC, 13<sup>th</sup> June 2025)*

# IMPLICATIONS: What Negotiated Ageing Tells Us

## ACCOUNT FOR INFORMAL PARTICIPATION & AGENCY

Residents who choose to exclude themselves from formal programs may not be fully captured, resulting in a misreporting of true activity and engagement levels of older adults.

## BEYOND SUCCESS METRICS

Attendance sheets and surveys do not fully encapsulate what it means to be meaningfully engaged

## SENSITIVITY TO IDENTITY

Identity, culture and gender greatly affect engagement of residents with their social environments

## RECOMMENDATIONS:

### Designing with Negotiation in Mind

## MORE INCLUSIVE METRICS

Indicators that account for informal visits, peripheral participation, and keeping in touch by passive presence

## VALUING STAFF & VOLUNTEERS

Providing more resources to support AAC staff and volunteers, while recognizing the value of their work and efforts

## SNAPSHOTS



## PROGRAM INNOVATION

Flexible, low risk planning that does not displace current activities - enables a greater variety of programs to be piloted and implemented

## CO-DESIGNING WITH RESIDENTS

Ensure voices of older residents are heard by including them in discussions. This could empower them and make them feel acknowledged.

## REFLECTIONS & FUTURES



## CONCEPTUAL CONTRIBUTIONS

Negotiated Ageing frames ageing-in-place as an active process shaped by:  
Interests (Personal desires)  
Rights Entitlements  
Power (Ability to act or participate)

## FUTURE RESEARCH

Longitudinal ethnographic study  
Research into the roles of AAC staff & volunteers and the value of their work



## REFLECTIONS & TAKEAWAYS

Value of ethnography  
Reflexivity & Positionality  
Flexibility & Adaptability



## Sources & Acknowledgements

We would like to thank the Lee Kuan Yew Centre for Innovative Cities (LKYCIC) and the Housing and Development Board (HDB) for the support in this study. Also special acknowledgement to Precious AAC for their support towards this study, particularly in facilitating site access and participant recruitment.

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# **Topic: Journeying and Place Experiences in the 'hood**

# Walking Between Place & Identity

## A Comparative Case Study of Katong & Siglap Neighbourhoods

Master of Science in Urban Science, Policy and Planning (MUSPP) Master Research Project Presentation  
MUSPP SOIREE 6 August, 2025  
Prepared by: Jose Paolo T Boquiren Supervisors: Dr Felicity Chan & Dr Cathy Huang

### INTRODUCTION & RESEARCH QUESTION

This research looks at how walking shapes the way people perceive the identity of their neighbourhood. In cities, walking is often seen as something good for health or getting around, but it is also a personal and emotional activity. The study asks:

#### How does walking shape residents' perceptions of neighbourhood identity?

The following sub-research questions support the main research question:

- How do residents **experience walking** in their neighbourhood?
- How do residents perceive **the identity** of their neighbourhood?

The research compared two neighbourhoods in Singapore—Katong and Siglap. Katong is more walkable and richer in culture, while Siglap is more spread out and suburban.

### METHODOLOGY

#### Semi-Structured Interviews

- 20 Participants
- 10 from each neighbourhood
- At least 1 year living in the neighbourhood
- 30-45 minute interview
- Snowball sampling through personal networks

#### Thematic Analysis & Spatial Analysis

- Audio recordings were transcribed
- QDA Miner and WordStat for coding
- QGIS for spatial analysis and visualisation

### PARTICIPANTS

#### DEMOGRAPHIC MIX

- 11 Males, 9 Females
- 11 Chinese, 2 Malay, 2 Indian, 5 Other Ethnicities
- Average Age: ~41 years
- Age Range: 22 to 84 years
- Average Residential Tenure: ~21 years
- Range of Residential Tenure: 1 year to 56 years
- 18 SG Citizens, 1 Perm Resident, 1 Non-Resident
- 15 Local-born, 5 Foreign-Born
- Degree of Connection: 7 first, 11 second, 2 third
- 11 Industries Represented

### KEY FINDINGS

#### Key Factors in the Conceptualisation of One's Neighbourhood

Walkability, Familiarity, Social Sphere, Proximity to Amenities

#### Perceptions of Neighbourhood Identity

Katong	Siglap
Convenient	Safe, Quiet, Peaceful
Vibrant, Diverse	Rich, Atas
Peranakan, Cultural, Heritage	Chill, Relaxed, Laid-back
Changing	Residential
	Friendly

### NEIGHBOURHOOD IDENTITY

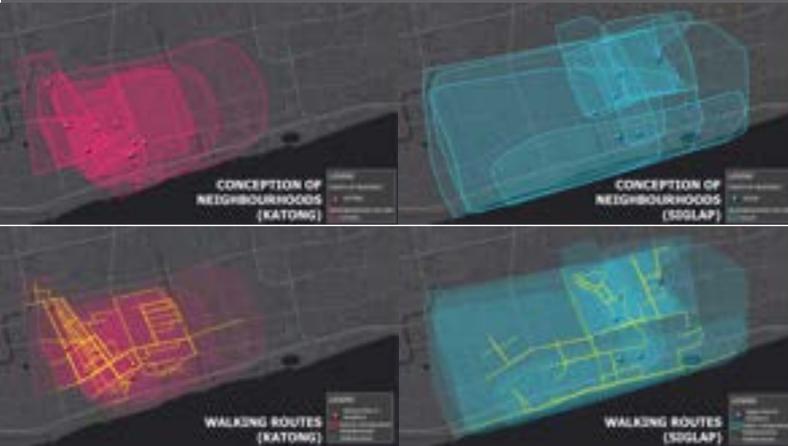
#### Examples of Place Identity Anchors

Colourful Shophouses at Koon Seng Road

Bars & Food Establishments Along Joo Chiat Road

F&B Establishments in Siglap & East Coast Road

Siglap Linear Park



### WALKING EXPERIENCES

#### Purpose of Walking

Food & Drinks, Shopping & Services, Health & Leisure

#### Walking Experiences

Katong	Siglap
Very walkable (+)	(-) Uneven walkability
Access to many and varied amenities (+)	(-) Weather an issue when walking
Enjoyable, interesting, engaging (+)	(+) Calming and relaxing

### WALKING EXPERIENCES & PLACE IDENTITY

#### How Walking Mediates the Perception of Place Identity

##### Familiarisation & Knowing

"Walking brings familiarity to the one that walks around, right? Whether it be a new resident that moves into that area and just trying to familiarize themselves, or someone who has stayed there for a long time... sometimes just like walks in the evening as a form of like after dinner digestion activities... those kind of things... become part of your daily life. It's not something spectacular or memorable that... gives you the identity. It's just the sense of familiarity that builds the identity over time."



##### Noticing & Observing

"...it's a pleasant walk, especially at night... you see people so happy... singing at this coffee shop with red lanterns... I go slower and I'll look at the people and it gives me happy vibes... every time I walk past those places... I wonder how their lives are like."

##### Social Encounter & Connection

"Actually, walking my dogs has allowed me to make a lot of friends within the neighbourhood... you do tend to make friends because regularly you see the same people walking the dog or seeing people walking, pushing the grandkids or things like that. So you really get to know people, in that sense, even though it is maybe casually."

##### Discovery & Exploration

"The few times when I walk with my kid and then we walked past some people's garden, I'll stop and show my kids the garden, tell them about the flowers or the insects. Itself is an activity, it's engaging, but the beautiful part, the owner will come out, and then 'ehh, this one, I just plant' and talk to my kids about it. Wow."

### RECOMMENDATIONS

- **More walkable social spaces that facilitate 'encounters'** (aligned with URA's Draft Master Plan 2025 for Katong and Siglap precincts).
- **Building in places to discover and explore**, e.g., pop-ups, allowing more self-expression in the neighbourhood.
- **Aligning place identity anchors with walkable routes** making place identity anchors more accessible and walkable.
- **Limit gentrification by supporting and preserving traditional businesses** with strong place identity (new Heritage Business Scheme introduced in 2025 but limited to Central Area).



### CONCLUSION

The participants in this study could have not said it better about the spirit, essence and invaluable learning of this research journey:

"The more you know... the more you can identify with it. There's a Malay saying... 'Tak kenal maka tak cinta'... if you do not know, you will never love... walking is an excellent way of doing that."

"Every walk is in itself a journey. And how many places can you find where that's the case, right? And the destination becomes a minor part of the process. So, the journey itself become a joy."



# Investigating Children's School Journeys in Singapore: A Child-Centred Approach

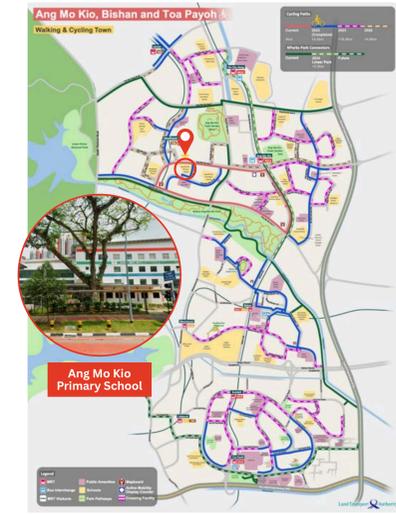


Figure 1. Location of this study's collaborating school, Ang Mo Kio Primary School, within the Ang Mo Kio (Walking & Cycling Town), Bishan and Toa Payoh region. [Source: Land Transport Authority]

Motorised travel has increased globally. This not only has implications on the environment, but also decreases children's independent and active travel to school. Walking, cycling, and outdoor activities in general have well-studied benefits to children's physical health.

Less-studied benefits of independent and active travel include psychological, cognitive, and social well-being, such as improved mood, opportunities to socialise with friends and the community, spatial knowledge, agency, and confidence (Eisenlohr et al., 2023).

## The Context in Singapore

Island-wide promotion of walking, cycling and public transport

Walk Cycle Ride SG and Walking & Cycling Towns (Land Transport Authority, n.d.)

Primary schools prioritise admission of students residing nearby

in the following order: within 1km, between 1-2km, and beyond 2km (Ministry of Education, 2024)

There is however a dearth of research on children's active travel to school in tropical environments (Rojas Lopez & Wong, 2017). Most studies found on children's travel to school in Singapore are quantitative studies on:

- physical health (Wang et al., 2014; Chong et al., 2017; Tan et al., 2018)
- mode choice (Benita et al., 2023; Leong et al., 2024).

## Given Singapore's active travel-conducive policies and infrastructure in its tropical urban environment, how do children experience their journey home after school?

Specifically, recognising children as co-producers of their school journeys:

- RQ1** What are their lived experiences? Where do these take place?
- RQ2** How do the physical and social aspects of these places shape—and become shaped by—children's experiences?
- RQ3** How do the physical and social aspects of these places shape—and become shaped by—children's experiences?
- RQ4** Finally, how might these inform urban policy and planning in Singapore?

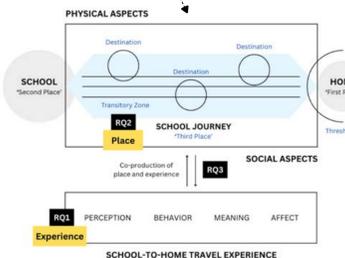
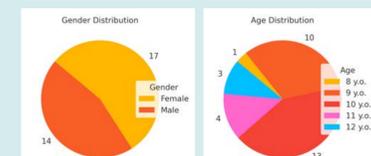


Figure 2. Conceptual framework integrating the 'third place' framework (Carroll & Witten, 2023; Gardner, 2011) into Eisenlohr et al.'s (2023) socio-ecological framework.

## Participant recruitment & data collection through Ang Mo Kio Primary School



**Sample group:** 31 students from school-based Student Care Centre (SCC)  
**Age group:** 8–12 years old (Primary 3–6)

Figure 4. Left to right: Participant filling in worksheet; the standard materials provided: a pencil, an eraser and a set of coloured pencils; simple stretching exercises for a health break.

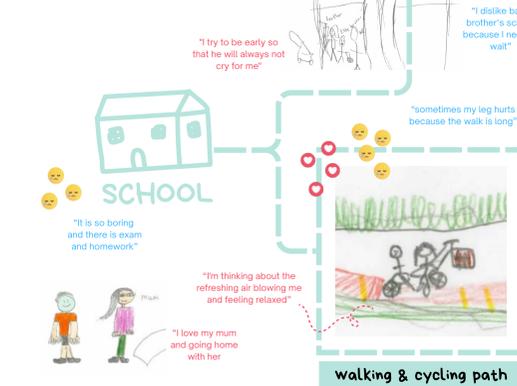
RQ1 RQ2

## Children's places & lived experiences in their journey home after school

### 1 Independence & responsibility

10 out of 31 (32%) indicated they can travel home by themselves—either for some days, every day, for a portion, or all the way.

Some in upper primary levels travel home with younger siblings, pass by or fetch a younger sibling from the kindergarten, exercising embodied responsibility over others.



### 2 Adult accompaniment

19 out of 31 (61%) travel home with a parent, grandparent or helper at least some of the time. In these journeys, children expressed they buy or share food together, or talk about their day.

Accompanied travel serve as periods and spaces for children to interact with family, with some indicating this as the special part of their journey.

## RQ3 Co-production of place & experience in children's journeys

Diverse perspectives of children illuminate the bi-directional relationship between physical and social aspects of third places and children's experiences. The role of affective, perceptible, behavioural and meaning-making experiences are emphasised in shaping place, recognising children as co-producers of place and experience.

### Travel mode and agency

Children's travel is shaped by the availability, accessibility, and navigability of different travel modes (walking, cycling, riding the bus/MRT) to them. These are enabled by the transport infrastructure and proximity of children's homes to their school.

- making shortcuts,
- choosing a route depending on the weather, or
- stopping over destinations en route.

They also shape their travel companion's experiences, especially those responsible over siblings.

### Play and creativity

Children's narratives reveal how they reinterpret and reshape spaces not primarily designed for play, demonstrating children as imaginative actors and stakeholders.

- using an empty lot for sports or carnivals, and
- augmenting bus stops into playful waiting spaces.

Beyond imagination, actual play is narrated in non-play areas, such as racing a brother home on a cycling path, or, inversely, using a playground for rest—subverting these places' prescribed functions.

### Moral and sensory evaluations in public spaces

Children are seen to evaluate behaviours of adults and how these might put themselves and others at risk. An account of feeling guilty when accidentally stepping on snails suggest similar moral negotiations and understandings of risk expanding beyond human relations.

### Natural neighbourhood networks and comfort

In places near home, anticipation and comfort backdrop children's natural neighbourhood networks, evidenced by familiar faces in the neighbourhood and more porous shared corridors supporting the development of an identity within the space near home.

Further, these accounts begin to illuminate how proximity to the 'first place' can influence the experience within this 'threshold' of the third place.

### Social urban memories

Kindergartens serve as highly socialised spaces where children engage with younger siblings and former teachers. One child who returned to her kindergarten to see her former teachers and take photos with them shows intentional capturing and creation of new memories.

Further, returning to one's kindergarten informs the grounding of a physical marker of urban memory in past experiences. This is supported by one child's drawing of a playground as the special part of her journey on account of memories with her friend who has since moved abroad, attributing significance to a place based on reminiscing on the social memory of past experiences.

### 3 Sense of affordability

Children's sense of affordability featured strongly at neighbourhood shops when exercising independent purchasing decisions:

- using recess money to buy snacks at a mama shop
- buying ice cream 'if I have money' below a residential block
- liking the dollar store because it has 'so many candy' and 'is cheap'
- having bubble tea with friends for '\$2.50'

Interestingly, all four children above indicated walking as their mode of transport all the way home. This may imply the accessibility of neighbourhood shops when one's walking.

**DID YOU KNOW?** In Singapore, mama shops provide convenient and affordable goods, and serve as vibrant social nodes in public housing blocks. However, evolving consumer habits and preferences have posed a challenge to the survival of these shops (Housing & Development Board, 2022).

### 4 Delight in company, play & food

Food featured vividly in children's journeys. Nearly 1 in 3 expressed enjoying food, alone or with company. In one account, a girl buys snacks with her friend after they have 'played enough' basketball, indicating a routine where company, play, and food intersect.

Play was shown to be highly social—involving siblings, friends or classmates. Relational narratives include reminiscing a playmate who had emigrated, suggesting how play spaces could be embedded in children's emotional lives.

Children engaged in play across different places—from purpose-built playgrounds and sports courts about 70% drew or wrote about playgrounds alone), to more informal spaces such as empty lots and cycling paths, and even in digital space through mobile games.

One girl likes racing her brother home on public rental bicycles, showing how playful and competitive. Children also indicated this play, with 10 (32%) stating play-related suggestions to improve their journeys.

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## RQ4 Informing urban policy & planning through a qualitative and child-centred approach

This study demonstrates how children are perceptive, reflective and imaginative actors, who are not just shaped by, but also actively shape their neighbourhoods. Their perspectives can help urban policy and planning better attend to their unique needs, while offering fresh insights and challenging adult assumptions about how urban spaces should be used or valued. The following are some areas of opportunities made visible by this study:

### 1. Enhance active travel affordances

Reflections on walking, cycling or taking public transport revealed affordances for a diverse range of experiences which can support holistic child development.

### 2. Support neighbourhood shops as everyday anchors

As part of child-friendly neighbourhood ecosystems, these shops allow young children to negotiate independence, sociality, affordability and access at the child's scale.

### 3. Activate transitory and in-between spaces

Spaces like bus stops, crossings and void decks may hold untapped potential for playful, restful or reflective experiences, even in brief engagements.

### 4. Celebrate flexible and informal spaces

In the absence of formalised functions, spaces like public corridors or empty lots can foster joy and vibrancy by inviting everyday improvisations and connections.



## 40 Anticipation of home & rest

Home was consistently associated with rest, with accounts conveying delight even at the prospect of simply being home again. This affirms the school journey as a 'third place'—a transitional space through which a child gradually occupies their roles at their next destination. In this case, transitioning from a student in school to a child at home (Camponovo and Moody, 2021).

## 5 Neighbour interactions & observations

Children are found to interact with neighbours as they near home in threshold spaces such as the void deck and corridors. Children recognise neighbours on the way home, too, such as along walking paths and nearby playgrounds.

In these threshold spaces contextually unique to public housing in Singapore, children are found capable of initiating neighbourliness themselves.

I like ... walking past my neighbour's house because ... they have a really cute pomeranian dog they let me pet her.

"I like the two trees I see from home and I like their colours"

## 6 Human-nature interactions & observations

Children's accounts on nature include liking trees and their colours, admiring the fish, feeling the breeze while on a bicycle, and including greenery in their drawings of built-up spaces, such as green verges and rooftop trees.

Encounters with animals that are laced with emotions also take place in children's journeys. One feels 'guilty when accidentally stepping on snails on her walking path. One pets her neighbour's pomeranian dog, and another feels happiness and calm with cats.

These two accounts on petting animals are drawn as the special part of these children's journeys.

"Whenever I see the sight of cats, I feel happy and when I touch their fur, I feel calm and want to take them home with me."

"I am feeling very worried about the game the two people are playing. I think that they are running fast and can slip."

"I'm thinking about the refreshing air blowing me and feeling relaxed"

"I love my mum and going home with her"

"I like anybody who fetches the who is in my family"

"I thought about how good my friend was. I the friend that I played with moved to another country"

"It's so boring and there is exam and homework"

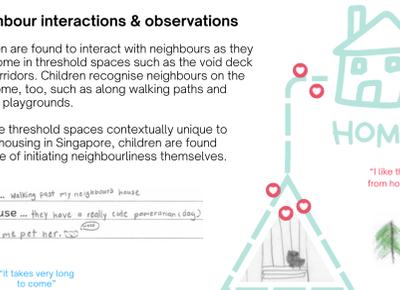
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"I dislike when I go to the coffee shop and there is a lot of uncles because they are too loud and cause noise pollution."

"There is a lot of people smoking which is not good for children to breathe in as it is a public place"

"Usually, buses take long to arrive and children may get bored. Maybe we can add an area for children to play with."

"The bus has air conditioner so it refreshes me after a long, bring day!"



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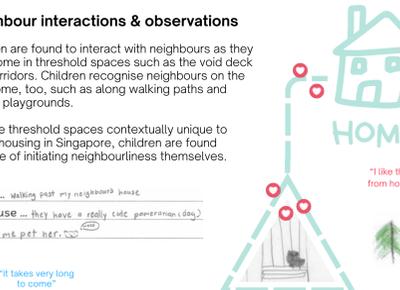
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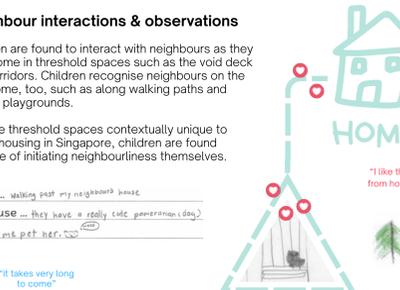
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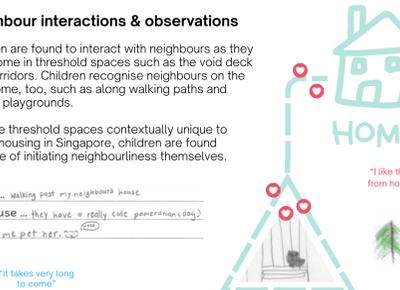
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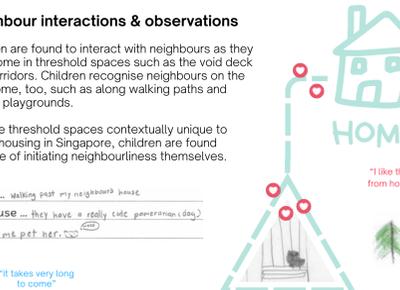
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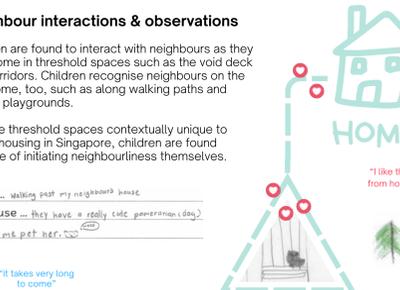
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