

Jockey Club Design Institute for Social Innovation



Construction Industry Council

Procurement Workshop for MiC Transitional Social Housing

29 April 2021

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Jockey Club Design Institute for Social Innovation



PolyU Design



DEPARTMENT OF
LAND SURVEYING AND GEO-INFORMATICS
土地測量及地理資訊學系



DEPARTMENT OF
BUILDING & REAL ESTATE
建築及房地產學系
INTERNATIONAL • COLLABORATIVE • CONSTRUCTION



DEPARTMENT OF
CIVIL AND ENVIRONMENTAL ENGINEERING
土木及環境工程學系



國家鋼結構工程技術研究中心香港分中心
Chinese National Engineering Research Centre
For Steel Construction (Hong Kong Branch)



應用社會科學系
Department of Applied Social Sciences



School of
Nursing
護理學院



康復治療科學系
Department of Rehabilitation Sciences



DEPARTMENT OF
BIOMEDICAL ENGINEERING
生物醫學工程學系

Vision

To become a leading institute to **trigger social innovation** in all dimensions of the society to improve the **well-being** of the community and people

Function in PolyU

1. University Social Responsibility - providing a **platform** to nurture and empower community members to become social innovators to tackle society's 'wicked problems'
2. Create opportunities to extend PolyU's **academic, social and knowledge impact** by making use of the departments' **applied researches**

2018-2021 Strategic focus - “Double Ageing”

Research & Practice areas - Social Design, Urban Planning, **Environmental Design, Design for Elderly, Universal Design, Accessible / Inclusive Design**, Design Thinking Education, Good Seed (Social Innovators Incubation).....

1. DISI Transitional Housing Experience (5/2018- 2020 present):

2 Symposia
(Oct 2018, Jun 2020)

20 Site Visits and **15** Participatory
Design Workshops
(2018 - 2020)

3 Action projects
(2019)



Sham Shui Po



Former SKH Stanley
Village Primary School



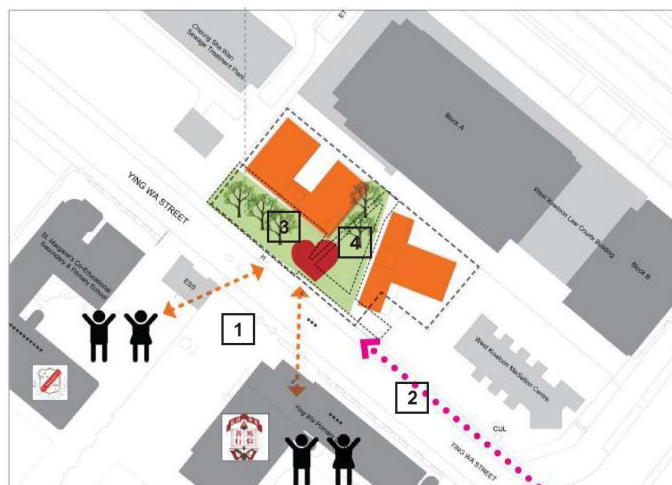
Ma Wan Old Village

1. DISI Transitional Housing Experience (2018- 2020 present):

3 NGO Project
Planning Workshops
(May 2020)

1 NGO Technical
Advisory Panel formed

4 NGO Project
Execution enabled



Ying Wah Street—SOCO (2019)



Former SKH Stanley Village
Primary School—AKA (2020)



1. DISI Transitional Housing Experience (2018- 2020 present):

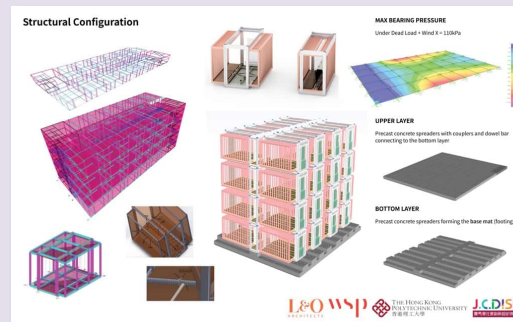
2 Publications
(May 2020)

Season 1 TSH Summary and Action Project Report



1 Applied Research

Expandable MiC prototype design
(2019-2020, CNERC)

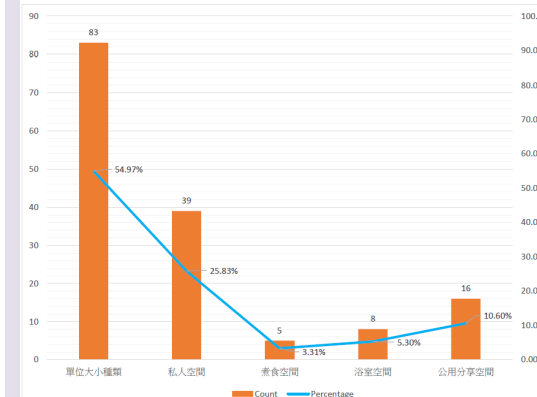


4 Key Stakeholders Opinion Survey

(12/2019, 6/2020, 7/2020, 9/2020 – building designers, contractors, social services sectors)

Q3 你認為在設計過渡性社會房屋的過程中，最重要的居住空間設計考慮是？	Count	Percentage
單位大小種類	83	54.97%
私人空間	39	25.83%
煮食空間	5	3.31%
浴室空間	8	5.30%
公用分享空間	16	10.60%
	151	100.00%

Q3 你認為在設計過渡性社會房屋的過程中，最重要的居住空間設計考慮是？



2 Executives Focus Group Discussion

(7/2020 - social sector; building sector)



Agenda

1. Introduction to Procurement of Transitional Housing Projects
2. Challenges - Clients Requirements & Design Responsibilities
3. Policy Research Study on Effective Delivery

1. Introduction

“Procurement” = process of purchasing goods or services.

*“Construction Project Procurement” = the framework in which development projects are **designed, financed, constructed, used, transferred and residual disputes** resolved.*

- Fox S. (2015) A GUIDE TO CONSTRUCTION PROCUREMENT STRATEGIES

“Criteria” of Procurement for transitional housing

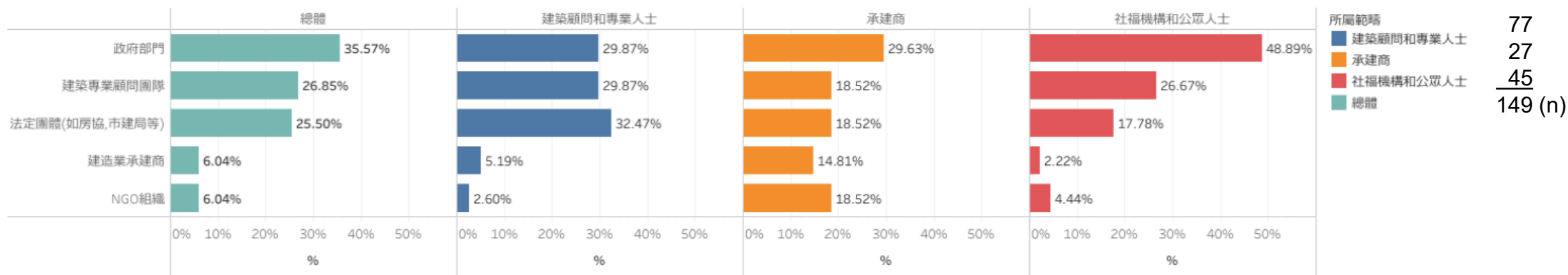
- Quality : Funding source(s), society expectations
- Cost : Financial efficiency, cash flow; application of technology (i.e. MiC)
- Time : Transitional /relocatable;

Typical **“components”** in **pre-construction stage**:

- Land acquisition, land use/zoning and infrastructure
- Consultants engagement – Technical Design, Cost Planning, Operation & Maintenance
- Tendering
- Building Contracts

1. Introduction

1.1 “Roles” of stakeholders – overall lead



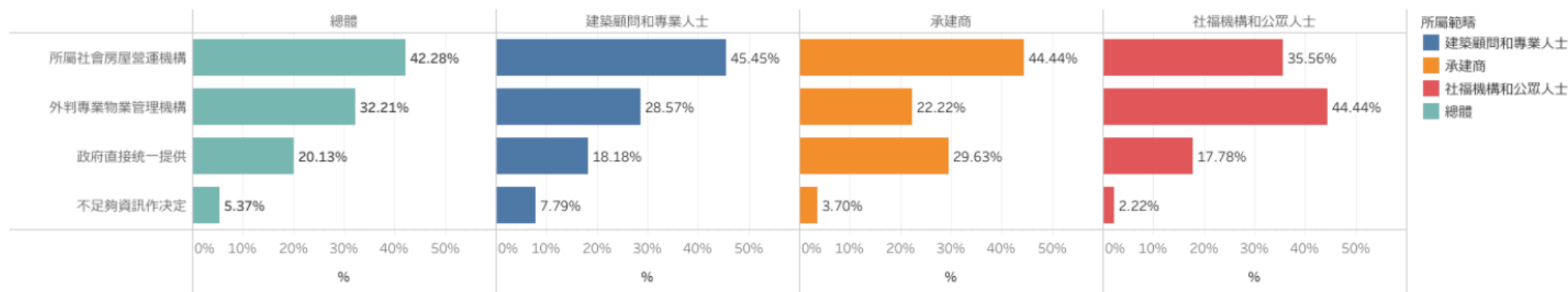
問題 4：你認為過渡性社會房屋的建造或建築工程，最佳由那方主導提供？

問題結果因受訪者的背景而異。一般而言，較多受訪者認為政府部門應在過程中擔當主導角色，尤其是來自非社福機構和公眾人士的受訪者（49%）。約半數受訪者認為建築專業顧問團隊（27%）以及香港房屋協會和市區重建局等法定機構（26%）可以主導興建過渡性社會房屋的建造或建築工程。此外，較多來自承建商的受訪者認同建造業和非政府機構在建造天水圍房屋的過程中扮演著關鍵角色。

Note: 149 participants symposium (77 nos. design consultants and professionals; 27 nos. from contractors; 45 nos. social service organisations and general public.)

1. Introduction

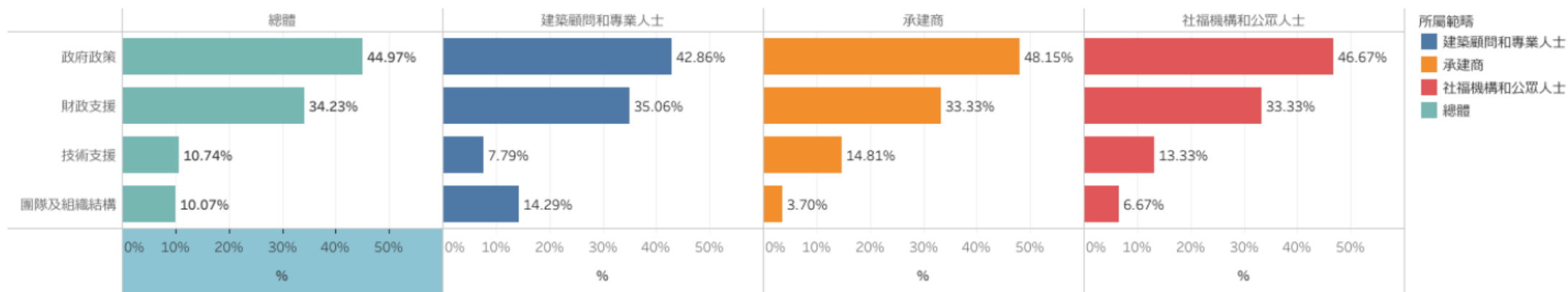
1.2 “Roles” of stakeholders – property management



問題 10：你認為過渡性社會房屋在物業管理方面，最佳由那些機構去負責？

大多數受訪者認為，過渡性社會房屋的物業管理應交由所屬營運機構負責(42%)、外判專業物業管理機構 (32%)或政府直接統一提供 (20%)。結果顯示，較多非政府組織代表認為由物業管理公司管理過渡性社會房屋比由營運機構管理更好，顯示他們可能缺乏提供專業物業管理服務的能力。

1.3 “Roles” of stakeholders – relocation

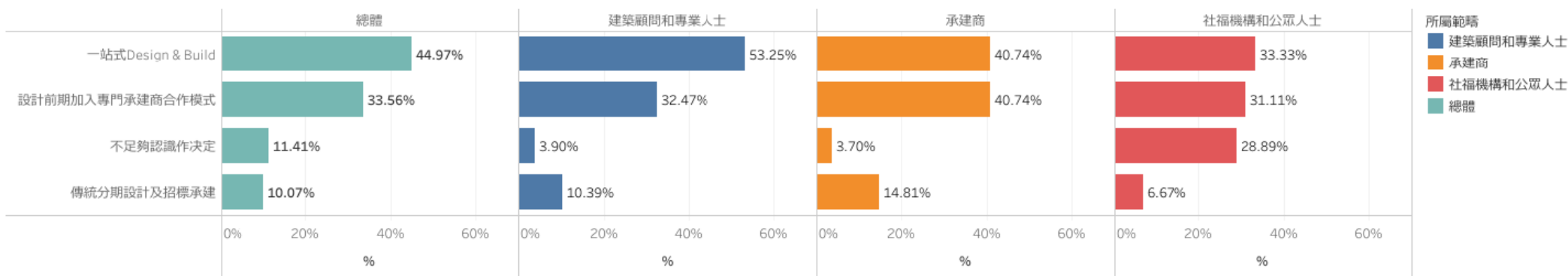


問題 12：你認為對過渡性社會房屋將來所需的遷徙安排，最需要那些方面的支援？

大多數受訪者認為，政府政策(45%)和財政支援(34%)是促進過渡性社會房屋遷徙的最重要因素。技術支援(11%)、團隊及組織結構(10%)等其他方面的援助也是遷徙過渡性社會房屋所需的安排。

1.4 “Strategies of Construction Procurement” for transitional housing

- Traditional (design, document, tender, construct by general contractor, JSSC etc.)
- Design & Build (contractor led design or novation of design consultants)
- Management Contracting (construction manager lead)

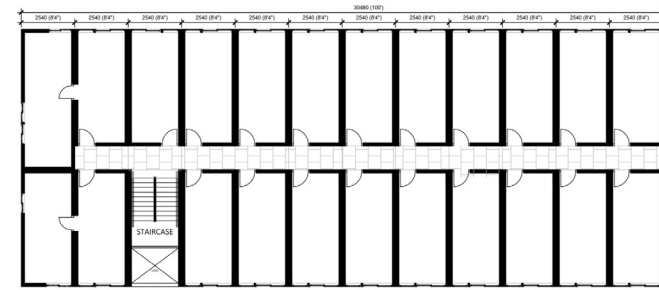


問題 9：你認為過渡性社會房屋在設計及工程方面，最佳的承建模式是？

大多數受訪者選擇一站式設計和建造服務(45%)或在設計前期加入專門承建商合作模式(34%)。傳統分期設計及招標承建不被視為過渡性社會房屋的最佳承建模式（10%）。同時，有超過四分之一的社福機構受訪者(29%)對不同的承建模式沒有足夠的認識。這凸顯了為非政府組織提供有關過渡性社會房屋的發展和建造過程的基本知識的重要性，以便他們能根據自己的需要和能力作出適當的決策。

2. Challenges - 2.1 Clients' requirements (unique for MiC Transitional Social Housing):

- **Relocatable** and **reusable** (due to short term land tenure)
- **Facility planning** as manifestation of the social services operation model, vision and mission.
- Impact of **funding/financial model** for NGO on space planning (unit SOA and communal facility).
- **Building life cycle / operation cost** - optimum sustainability (building material & system – energy, water, etc.)
- Cost effectiveness - **module width & modular efficiency** (impact on scale of economy for small sites)



30m façade



module width = no. of units

2.5m = 12 single / **6 family**



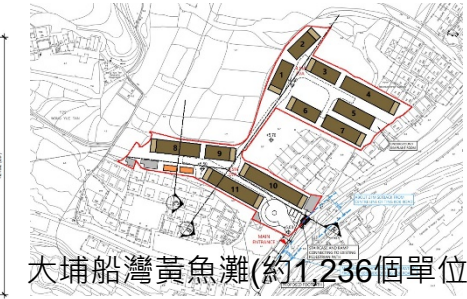
2.8m = 10 single / **5 family**



3.1m = 9 single / -
3.3m = - / **9 family**



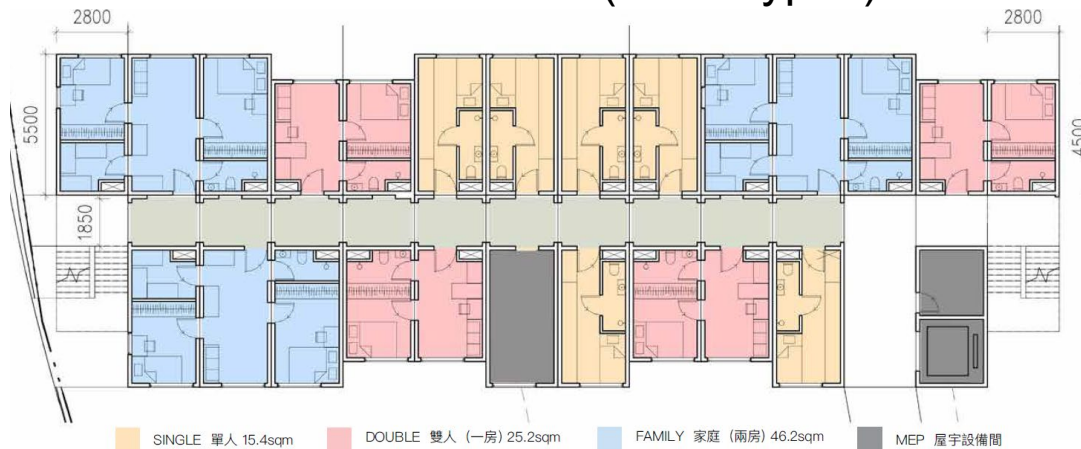
4.5m = - / **6.6 family**
4.9m = - / **6 family**
(Expandable prototype)



大埔船灣黃魚灘(約1,236個單位)

Modular Efficiency = **Units types to Module types ratio**
– representing the efficiency of MiC units repetition (vs Modularization Rate – Pan W. 2020)

Site A - 213 units (4 unit types)

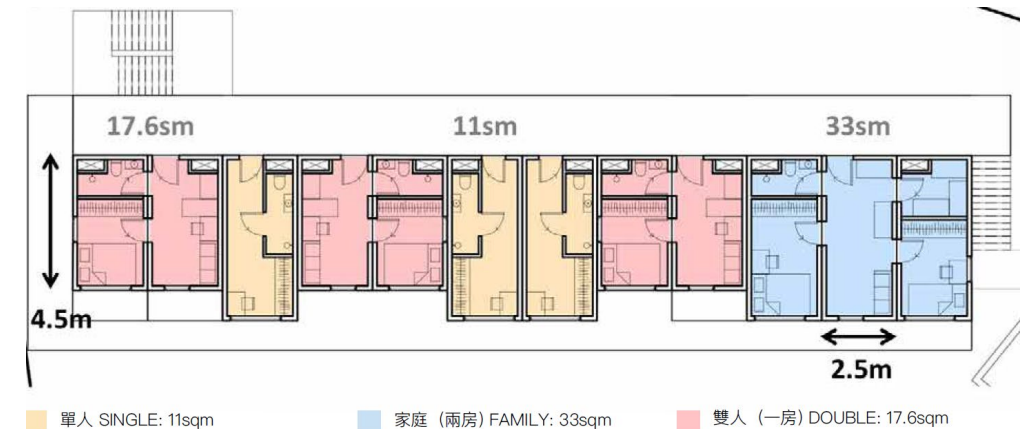


Total Number of MiC Modules	210-355*
Number of MiC Module Types	12
Number of MiC Modules per Unit Type	50-60*

* Depending on scheme

(Efficient)

Site B - 21 units (3 unit types)



Total Number of MiC Modules	36
Number of MiC Module Types	9
Number of MiC Modules per Unit Type	3-6

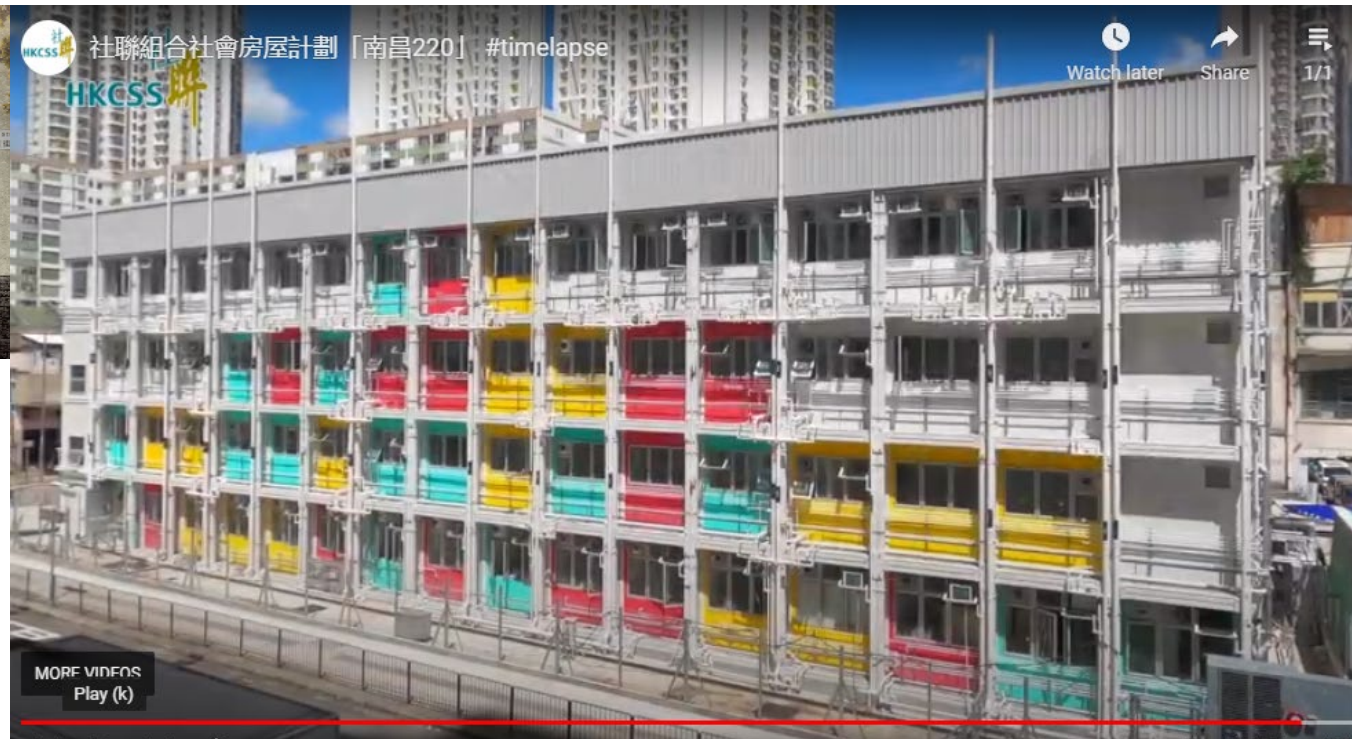
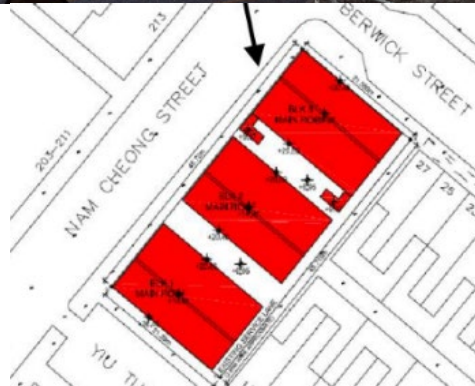
(Not efficient)

*Tips: To further improve ratio / cost efficiency, avoid mirror layout of same unit type
(note: pay-off in coordination of additional piping or deleting pipe ducts entirely)*

2. Challenges - Project Delivery Mechanism

2.2 Design Responsibilities

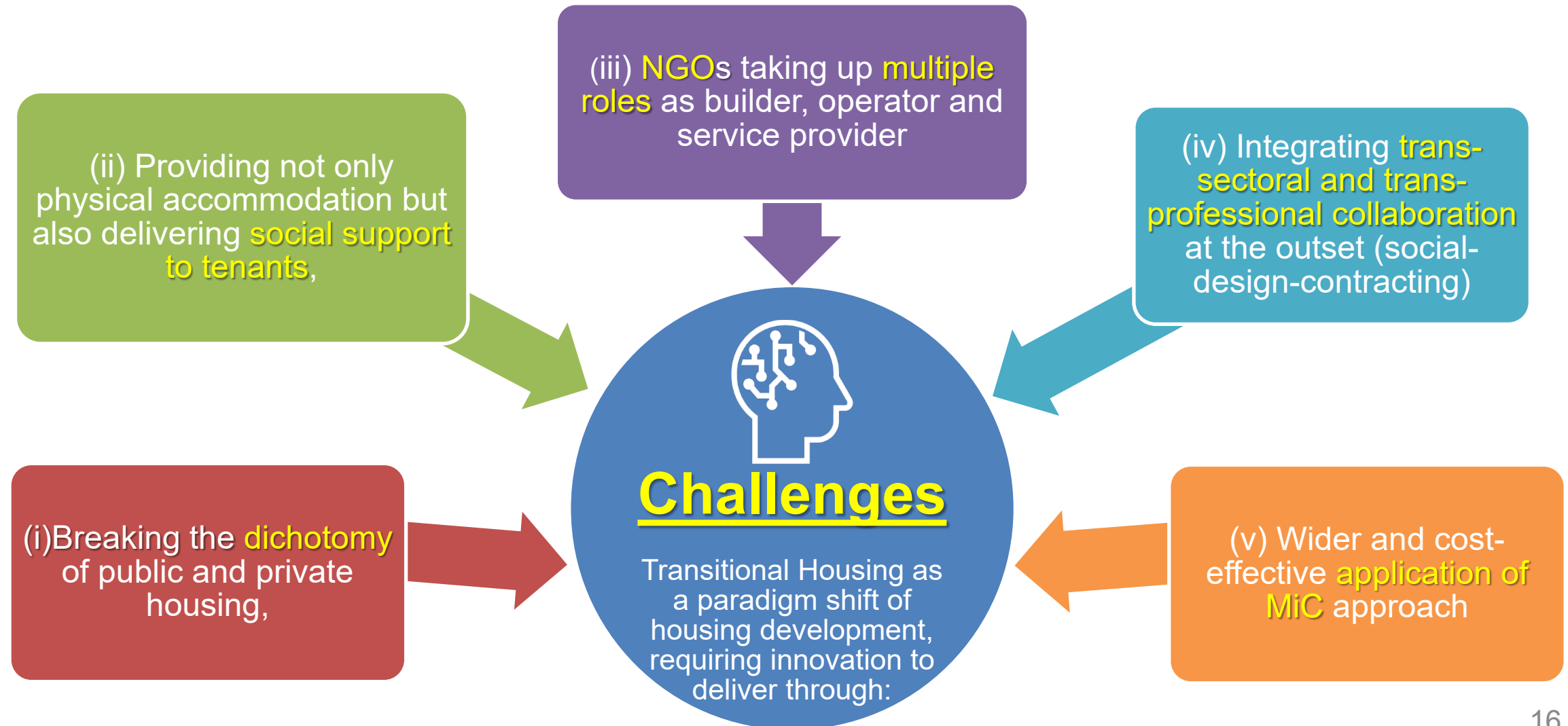
- Architect-engineers as “Building Designers” vs MiC manufacturer as “Product Designer”
- Dual process of IPA and GBP submissions



3. Policy Research Study on Effective Delivery

Title	Study on Effective Transitional Housing Delivery in Hong Kong 有效推進香港過渡性房屋供應研究 https://www.pico.gov.hk/en/PRFS/sppr-granted.html
Funding Scheme	Policy Innovation Coordination Office (Strategic Public Policy Research)
Strategic Theme	Code SE09 Transitional Housing
Project Duration	36 months (16 May 2021 to 15 May 2024)
Approved Funding	HK\$ 3,151,920 (New Application)
Keywords	Transitional Housing, Social Housing Policy, Modular Integrated Construction, Development & Design Manual, NGO Capacity Building.

3.1 Research Questions



3.2 Pain Points Analysis

Critical issues:

a) Lack of comparable precedents

- Uniqueness of the relocatable multi-storeys housing structure
- Only one completed locally in Hong Kong (Nam Cheong Street 8/2020)
- Limited overseas examples (usually permanent buildings or singular mobile houses)

b) Additional technical issues for MiC

- On relocatable & reusable requirements (building life-cycle costing benefits not yet ascertained)
- Subject to stringent local building regulations same as permanent buildings (structural, fire safety, health, etc.)

c) New collaborative roles among key stakeholders

- Mindset changes required in design, contracting and building approval processes for the new housing type and new MiC technology (i.e. a new construction procurement strategy).
- New mode of working relationship for NGOs, professional consultants, construction contractors, MiC manufacturers and government authorities to achieve delivery efficiency and expected quality-cost benefit.

d) Local NGOs capacity

- Technical know-how as project owners to “plan, design, construct, operate, maintain and relocate” the new housing option
- Limitation in government funding for social services provisions and MiC innovation (e.g. capital cost on community spaces to enable social services programs are not separately allocated; low rise structures not eligible for MiC consultancy subsidy)

3.3 Research Components

Investigate and compare overseas and local experiences on:

- Various **forms** of housing provision, design & construction, operation and management;
- Housing policies - **government** & financial support, **tenancy** & rental control;
- Housing **operators'** roles and social services; and
- Benefits and experience of **tenants**.

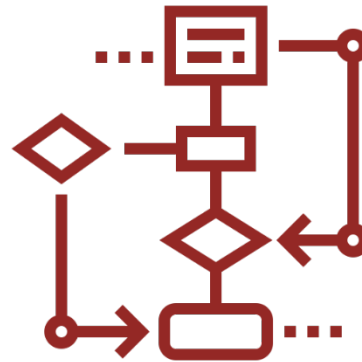
Examine interplay, contribution, pain points, conflicts and issues of **multiple key stakeholders** including **NGOs, government, angel landlords, related development professionals and contractors**.



3.4 Objectives



With reference to overseas experience, provide pragmatic **policy recommendations** to the **government and non-government sectors** to enhance Hong Kong's overall capacity on the delivery of transitional housing.

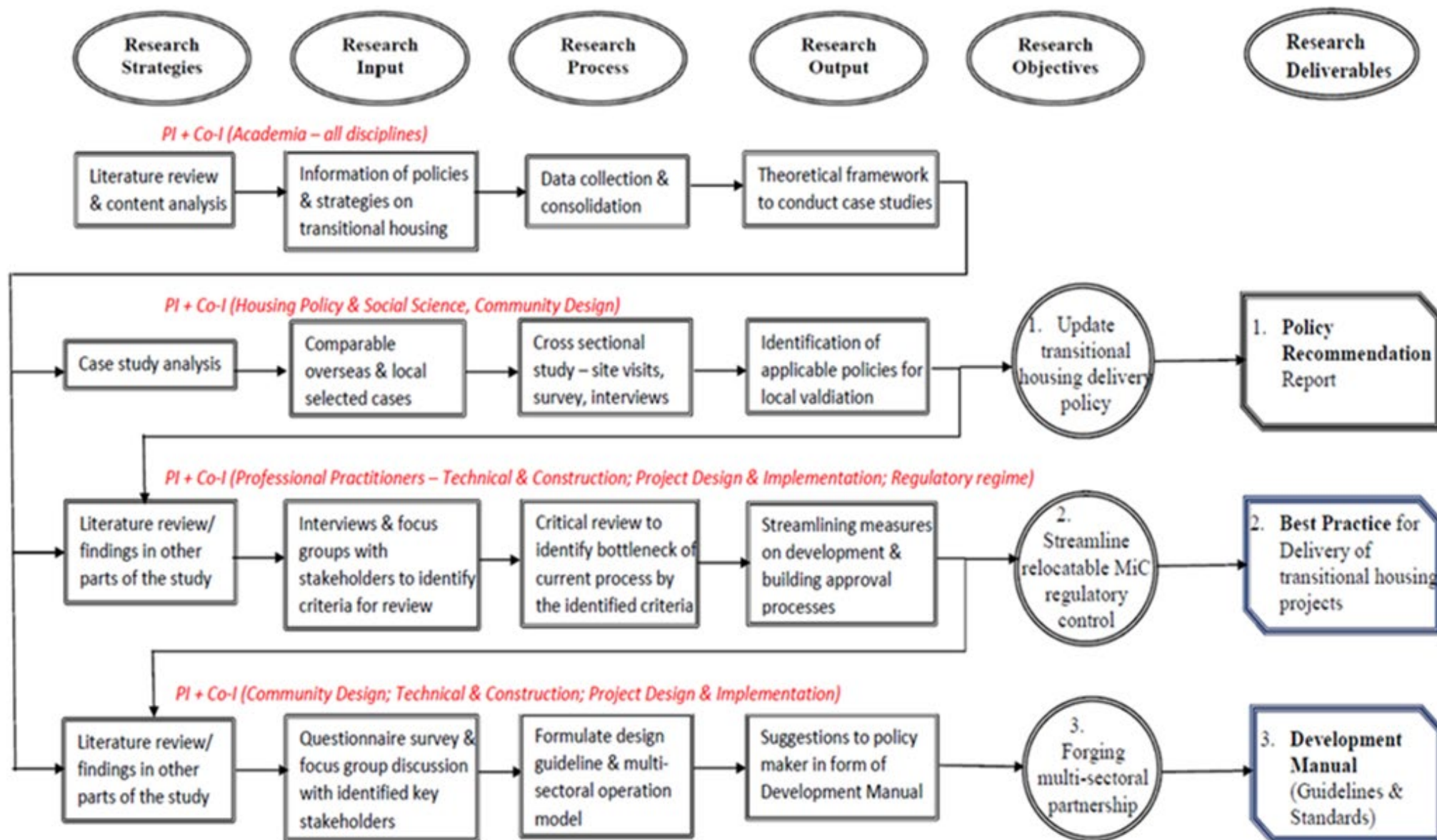


Streamline the **development control regulations and approval process** for the delivery of transitional housing, at the same time facilitating the incorporation of Modular Integrated Construction (MiC) technology.



Develop an **operation model for forging trans-sectoral and trans-professional collaboration** throughout the whole development process, for enhancing the overall delivery efficiency and quality of transitional housing projects.

3.5 Flow of Overall Research Framework



3.6 Research Methodology

Principle:

holistic approach with three interrelated components running in parallel (i.e. staggering of key activities and work load/resource levelling) to address to the urgency of issue.

Comparative study of overseas and local cases of transitional housing

- **Literature review** incl. policy papers;
- **Site visits** to selected overseas and local projects;
- Conduct **(1) questionnaire surveys, (2) in-depth interviews and (3) focus group** discussions of cross-sectoral and cross-professional stakeholders including tenants;
- **Qualitative analysis** of commonalities and differences (on socio-economical, policy & stakeholders' roles, spatial mode) to identify potential applications.
- Propose policy recommendations and test through peer review and **community-industry evaluation**;

Critical Review of regulatory regime on development process

- **Comprehensive review** of current administrative procedure and approval process;
- **Semi-structured interviews** and **focus group** of key stakeholders including government departments, urban planning and building professionals, construction contractors and MiC manufacturers;
- **Qualitative analysis** to identify pain points, bottle-neck issues and key barriers, with particular focus on the adoption of MiC;
- Propose and test preliminary streamlining framework through **industry review**.

Innovation of technical and design solutions to promote application of MiC for transitional housing

- **Literature review** of exemplary overseas guideline on MiC application;
- **Factory visits** to MiC production plants and conduct semi-structured interview of practicing professionals, contractors and MiC manufacturers on keys areas of concern and explore possible solutions;
- Conduct **participatory co-design workshops** for NGOs, tenants and professionals to innovate and design prototype MiC units for flexible combination;
- **Peer review and industry evaluation** of critical technical and design solutions.

3.7 Research Impact

The research findings will enable formulation of proposals to adjust and refine the regulatory regime and approval process, more effective facilitating policies and measures, allocation of financial and human resources, etc. with a view to expedite and increase supply of transitional housing in short and long term:

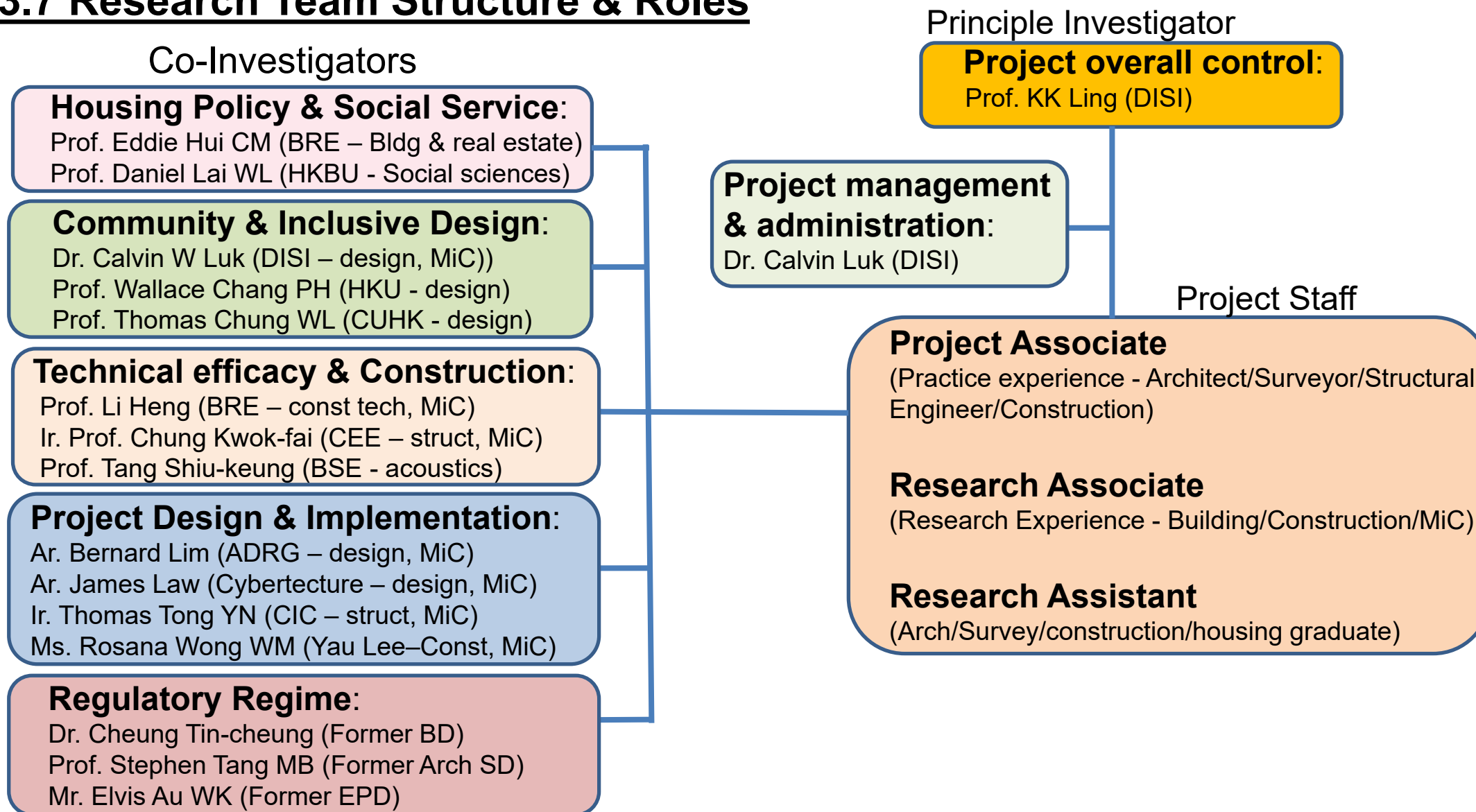
Short term (< 5 years)

- Develop a **viable mode of transitional housing** with both speed & quality;
- Alleviate authorities **administrative burden** to improve development efficiency;
- **Capacity building** of social organisations/NGOs to fulfill the new development role

Long term (> 5 years)

- Establish a **niche sector of affordable housing** (third sector housing) with strategic social mission and services;
- Drive industry **transformation of construction technology** to a new era, where manpower, quality and safety can be optimized through the approach of MiC.
- Enhance **community participation** in housing issues and allow more focused social services to be provided to target residents according to individual district needs and organization operation goals.

3.7 Research Team Structure & Roles



Thank you !

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