The Integrated Development Council (IDC) convened on 21 April 2022 to discuss the adaptive reuse of mixed-use asset and/or integrated development. Members from the Singapore Sustainability Product Council also joined in this meeting to weigh in on the topic.

The two-hour discourse covered 3 key aspects:

1. Technical Challenges
2. ESG Intentions
3. Financial Considerations

During discussion, the Council also highlighted the need to distinguish between ***repurposing*** vs ***rehabilitation*** of a development for the purpose of this framing, where the former refers to a change in use(s) of the development while rehabilitation /retains the original use(s) such as Golden Mile Complex. Rehabilitation and refurbishment are referred interchangeably for the purpose of discussion.

1. Technical Challenges

There is a perception that the technical challenges of readapting an existing mixed-use asset would be costly and therefore an unattraction option. However, a cost study was conducted on 4 existing Singapore developments: OUE Downtown Gallery, Triple One Somerset, Mandarin Gallery, Grand Park Orchard. It was found that the construction costs of repurposing an existing asset was significantly lower than redevelopment. Further, between the cost elements of mechanical, electrical and plumbing engineering (MEP) vs façade vs structure improvements, the structure improvement costs were the lowest. The cost of rehabilitating a building including a conservation building was around 30% of the cost of rebuilding a new asset.

The study suggests that rehabilitation and readaptive construction costs are lesser than rebuilding cost.

The cost study did not include other costs such as re-use of the materials, consultancy, holding costs (time) and investment costs.

Future Cost of Construction: Due to the costs of materials, supply chain challenges and government's

Procurement Challenges: Adaptive reuse of conserved buildings also presents practical issues where embedded technology/equipment is no longer safe or can no longer be maintained due to discontinued spare parts, equipment, and talents. In terms of placing new technologies in, the current PV Procurement process is not conducive for sourcing of clean energy and should be addressed to support more green buildings in Singapore.

2. ESG Intentions

Risk & Ambiguity: Lack of information / data on embodied carbon of existing building creates ambiguity for developers, so teardown is favoured.

> *There is no central authority that verifies carbon calculations with wide variations, and this is an issue when assessing the carbon tax.*
>
> *Net zero: Today's standards for Net Zero as regulated by BCA requires energy consumption to be reduced to 40% of existing before being able to buy renewable energy credits. Furthermore, Singapore has limited renewable energy options.*

Original Building Use: Older buildings (c 1970s) in Singapore were designed for natural ventilation as use of air-conditioning was not common at that time. Readapting or refurbishing such buildings to achieve Net Zero or Net Positive is possible. Buildings that were previously designed for education (schools, universities) vs office/corporate use are easier to repurpose.

Human Comfort and Response: Research has consistently shown that anywhere in the world 80% of occupiers in an airconditioned building would be satisfied, vs. 60% of occupiers in a naturally ventilated building. Building developers and owners should be aware of this human response so that they do not dismiss natural or hybrid cooling options because of the drop in occupier satisfaction levels.

> *Designing in the Adaptive Process: It generally takes about 40 mins to acclimatize from being outdoors in warm humid conditions to indoors. However, if a person was able to pause in a shaded area for 10 mins prior to entering indoors, they were able to quickly acclimatize quicker. This could vary depending on the purpose of visit – cooling down in corporate attire may take longer than casual wear.*
>
> *Air quality: There is a direct impact between the air quality and the human comfort in a space whether naturally ventilated or otherwise.*

3. Financial Considerations

Economic lifecycle vs Building lifecycle: The common financial consideration for developers is the cost of developing it + value of the exit 5 to 10 years as opposed to the value created and sustained or even enhanced over the building's lifecycle.

> *There is value that is created and sustained over a well-designed building as future owners would have options to retain and refurbish or repurpose over a poorly built/designed one.*
>
> *Is there a more viable evaluation model that the market would embrace where it includes it reflects the value of a durable, adaptive, green building over the remaining tenure of the building lifecycle? If there is no first-mover advantage in adopting this new model, there will be no traction for such a model. It is*

difficult for developers to calculate and rationalize to investors their future adaptive plans.

Ownership / Decision Makers: Many mixed-use/integrated developments are strata titled, this consideration may not even be possible unless it is included and accepted as part of the strata title ownership.

Rise of a Hybrid Model: There is a trend towards a hybrid model where there are parts of an integrated development that are retained/refurbished, while another part is rebuilt and intensified in use. Where there are sections that have a heritage value, the developer has access to government incentives for conservation (increase in GFA, discount in differential premium pricing) sustainably with adherence to super low energy requirements for an overall reduction in carbon footprint.

Value Creation: The incentive or value in conserving a building should not be one-off. In Australia, owners of conserved buildings are given air rights incentives every 25 years as an ongoing reward. The value creation also takes a different scale if the repurposing is conducted at a precinct level vis-à-vis one building within that precinct.

With land cost in Singapore being 60%-70% of total development cost, there are 2 key drivers for redevelopment: (i) increase in unused GFA and (ii) maximizing efficiency. Looking at the existing buildings in CBD, there is a limitation on adaptive reuse of these CBD office buildings. However, the socioeconomic value that comes for readapting the CBD to increase its 24/7 vibrancy by injecting non-office uses there can be created and driven by public policy and land sales conditions. E.g. there the 2-envelope system includes an assessment of the adaptive reuse on ESG and the long-term socioeconomic value. In other cities, without government intervention, there are cultural assets such as the Houston Astrodome that are left in dilapidation.

In attendance: ULI Singapore IDC Members, Invited ULI Singapore Sustainability Council members and guests

No.	Name	Organisation
1	Esther An	CDL
2	Jack Backen	Cistri
3	David Calkins	Gensler
4	Chan Hui Min	DP Architects
5	Joelle Chen	Lendlease
6	Cheng Hsing Yao	Guocoland
7	Chia Khong Shoong	Frasers Property Ltd
8	Anthony Chua	Keppel Urban Solutions
9	Scott Dunn	Aecom
10	Kwee Ker Wei	Pontiac Land Group
11	Dr Lam Khee Poh	NUS
12	Yvonne Lim	URA
13	Ng Chiang Wei	Allianz Real Estate
14	Ng Hsueh Ling	Lendlease
15	Ong Choon Fah	Edmund Tie
16	Matthew Pryor	MaceTpm
17	Chintan Raveshia	Arup
18	Ben Robinson	RQAM
19	Darren Sabom	8M Real Estate
20	Desmond Sim	Edmund Tie
21	Kabi Subramaniam	Arup
22	Terence Tang	Atelier Capital Partners
23	Wang Wei	Ramboll
24	Yam Yujian	URA
25	Gerald Yong	CDL