

### **V** AGENDA

Welcome Note
 Ms Daphne Boey
 Assistant Director, Built Environment, Sectoral Transformation Group, IMDA

Sharing by Frasers Property Singapore

Mr Alvin Low

Vice President, Head of Operations, Retail & Commercial, Frasers Property Singapore

 Sharing by Housing Development Board

Mr Heru Santoso Soerdarsono

Deputy Director (Building Design & Precast System), BRI, Housing Development Board

 Overview of Call for Innovative Solutions for Smart Estates

Mr Ronald Choh

Manager, Built Environment, Sectoral Transformation Group, IMDA

Q&A

### **GROWTH OPPORTUNITIES FOR SMART ESTATES**

FOR BOTH REGIONAL AND LOCAL MARKETS

### **Smart Cities Development in Asia**

- 1. US\$45.3 billion investment by 2021 in smart cities tech @ Asia-Pac (excl. Japan)
- 2. Increase in demand for tech solutions for cities to add new services & scale up faster at lower costs

### Focus on Smart Estates Development

1. Articulate clear problem statements & desired outcomes 2. Estates function as test-sites & innovative solutions can be adopted & scaled up once successfully tested & deployed

Source: Worldwide Semi-annual Smart City Spending Guide, International Data Corporation (IDC), 2018

### **SMART ESTATES FOCUS AREAS**

**CAPTURE OPPORTUNITIES** 

Inter-connected smart estates of the future will enrich community's experiences through greater accessibility to technology & enable innovative digital services with greater connectivity



- a. Predictive maintenance to reduce down-times
- b. Detection of anomalies for immediate response
- c. Integrated utilities management

### **Smart Living**

- a. Integrated platform for data aggregation & exchange
- b. Facilitate greater community collaboration & interaction
- c. Smart mobility solutions for commuting

**Enhance Estate's Environment** 

**Enrich Community's Experience** 

### WHAT IT MEANS TO DIFFERENT STAKEHOLDERS



#### **ESTATE OWNERS**

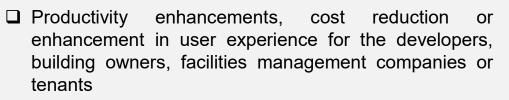






#### **ENTERPRISES**





- ☐ Integrated data and enhanced estate connectivity
- □ Differentiation through technology









- □ Enhanced unique experiences
- ☐ Seamless & personal







- ☐ Develop deep tech & smart estates related capabilities
- ☐ Cross-pollination & coinnovation through consortiums or partnerships
- ☐ Scalable business models for internationalisation





### **DRIVING THE SMART ESTATES INITIATIVE**

THREE STRATEGIES & DESIRED OUTCOMES

# Strengthen business partnerships & ecosystem

Support Smart Urban Co-Innovation Lab & forge strategic partnerships

## Build technology & innovation capabilities Vork with industry partners via Cal

Work with industry partners via Calls for Innovative Solutions (CFIS)

# Develop talent in smart estates & drive thought leadership

Establish talent development programmes to build competencies



Smart Estates
Call for Innovative Solutions
[SE-CFIS]

Launched Nov 2018, for next 3 years

- ✓ Develop Tech Capabilities
- ✓ Create new & skilled job opportunities
  - ✓ Position SG as Thought-leader

### STRONG PARTNERSHIPS AND VIABLE SOLUTIONS



Test-bedding of smart urban solutions at various trial sites

### **OUR AIM:**

Commercially viable solutions with strong market & user acceptance





## **AGENDA**

Q&A

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## Call for Innovative Solutions (CFIS) for Smart Estates

IMDA-Frasers Property Singapore

### **Cleaning Services**

#### **Challenges**

- 1. high dependency on manpower resources
- 2. Declining supply of resources
- 3. Increasing high expectations on cleanliness for public-spaces.
- 4. With dynamic deployment of limited resources (i.e. one cleaner is tasked to manage a zone or a pool of washrooms instead one one designated washroom), there would be a lag in service (e.g. toilet paper not refilled on time).

#### **Desired Tools & Applications**

- On-demand alert notifications: Web based
- Predictive sensor-based tools
- Data collection capability to provide analysis: people count vs dispensers empty alert sensors.
- Additional systems to enhance user experience

#### **Undesirable Applications**

• Standalone systems like Robotic machines, Odour sensors

### **Security Services**

### **Challenges**

- a) More efficient deployment of security personnel.
- b) Longer than desired response time
- c) raise the service level of officers to support building operations?

#### **Desired Tools & Applications**

- Robotics-patrolling equipped with reliable sensors
- Identifying security threats thru AI e.g. illegal parking, smokers etc
- Using AI to perform analytics in a post-mortem (e.g. during examination of video surveillance)
- Use predictive tools to mitigate crisis/emergency
- Reporting systems to assist security officers value add in building operations

#### **Undesirable Applications**

Standalone systems like robotic machines

### **Fire Command Centres (FCC)**

#### **Challenges**

- a. Some properties have multiple Fire Command Centres and/or Retail Command Centres (RCC) – can we centralise the operations and replicate the monitoring functions of all the services to a remote station in one of Frasers' designated properties?
- b. Have the added ability to optimize building performance, predictive tools for maintenance and other service/equipment?

#### **Desired Tools & Applications**

- Optimization of building performance
- Predictive/preventive maintenance
- Energy saving initiatives
- M&E multi system integration
- Dashboard enabled solutions
- Managing the various vending machines around the premises, to ensure they are working and stocked up
- Identifying water leaks / plumbing chokes
- Mosquito / rodent management
- · Car park gantry management

### **Vector Control Services**

#### **Challenges**

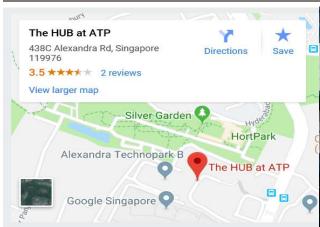
Reactive mode: building management team needs tools to improve on identifying where the pests are and to eradicate them before infestation escalates; or before it becomes a health issues, especially for F&B areas.

### **Desired Tools & Applications**

- Deployment of sensors?
- Use of predictive tools to identify hot spots?

## Trial Sites

### **Alexandra Technopark**





### **Key Development Details**

Address:438A/B/C Alexandra Rd,

Singapore 119967

**Industry:** Commercial Building

**Estimated Land Area: 1.35** 

million sqft

Estimated population: 4,000

**Tenant units: 50** 

### **Amenities**

Food & Beverages: Vending Machines (Food & Drinks), Mini

Mart, Food Court, GP clinic, F&B restaurants

**Shared Meeting Room:** Function Room

**Shared Sports Court:** 2 Outdoor Futsal Courts

Nursing Rooms: 2

**Urban Farming**: 5 small plots

**Electric Vehicle charging stations: 4** 

End-of-Trip Facility: 127 parking lots with shower and lockers

facilities

Carpark Lots: 908

### Core Maintenance Team

**Property Executive: 5** 

**Cleaners:** 21 in morning shift.

10 in evening shift

(outsourced)

**Security Guards:** 15 in a typical weekday/night cycle

(in-house & outsourced)





**Experience** matters.









## **AGENDA**

 Overview of Call for Innovative Solutions for Smart Estates

#### Mr Ronald Choh

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## Call for Innovative Solutions for Smart Estates

### **Background:**

Video cameras are currently installed in HDB's lifts and are only used for post-incident analysis. HDB is looking for solutions that make use of video analytics to identify non-civic behaviours in the lift (e.g. vandalism, urination), faults within lift car which cannot be detected through existing monitoring system (e.g. lights/lift button spoilt) and able to provide real-time alerts to town council and / or cleaning contractor.

### **Desired outcome:**

To be able to identify the following use cases and send real time alerts to Town council or relevant parties:

- Lift misuse by renovation contractors, newspaper vendors and residents
- Vandalism
- Overloaded lift
- Lift moving without door fully closed
- Crime (Robbery, Fights, Molestation etc.)
- People screaming/falling
- Urination/Liquid Spillage
- Levelling problems
- Light/Lift button spoilt
- Smoking
- Children jumping or playing in the lift
- Unattended objects
- Abnormal activities

### Requirements:

The targeted accuracy ratio is at least 70-90% (depending on specific use case). Edge Analytics is also preferred to save on communication costs.

### Trial Site – HDB Centre of Building Research / Punggol

Depending on readiness of the solutions. Exact trial sites to be determined at a later stage



10 Woodlands Ave 8



Punggol

### Smart Home Infrastructure Solutions



### **Background:**

### Promote smart living in HDB estates

 HDB is driving the development of Smart-Enabled Homes via provision of smart infrastructure within HDB flats

 Smart infrastructure deployment like high-tech distribution boards allow for home energy management via a mobile

application



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### Smart Home Infrastructure Solutions

To source for solutions in the areas of:

- Innovative Smart home infrastructure for new and existing HDB developments
- Development of smart home app/devices ecosystem of Apps and interoperable devices to enhance daily living of residents

### Smart Home Infrastructure Solutions



### **Trial Site**

### **HDB Centre of Building Research**





Mock Up Flats at HDB CBR\*

\*Note: There is currently no WiFi on-site, advised for applicants to bring their own network connection

### **Background:**

Current method of common areas cleaning is very labour intensive and time consuming.

There is a need to automate the process so that cleaning work can be more efficient and productive

### **Desired Outcomes:**

Development of new automated solutions that are

- Able to optimise the cleaning frequency and/or manpower resources (e.g. creating an on-demand cleaning process)

Possible areas for automation includes:

- Cleaning of common toilets
- Removing refuse from common area bins
- Cleaning of high ceiling (more than 3m high), building internal area
- Picking refuse from common corridors or landscape area
- Cleaning of Façade (including protrusions e.g. with fins), building external area
- Cleaning of staircase

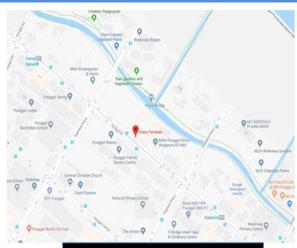
### Requirements:

The automation for the cleaning of common area shall result in

30% reduction in work delivery time and manpower required

The costing of proposed solution should be equivalent or lower than \$2 sq metre per month

### **Trial Site – Oasis Terraces**



### Key Development Details

Address: Blk 681 Punggol Drive No. of dwelling units: N.A.

No. of residents: N.A.

No. of lifts: 15

No. of escalators: 10

Estimated Land Area: 1.3 ha

Estimated Footfall: 1million/mth

**Tenant units: 107** 



#### **Amenities**

1 Polyclinic

72 Retail & Services outlets

34 Food & Beverages outlets

Roof Garden, Terrace Garden, Fitness Corner, Dry Playground, Water play ground, Water features

276 Carpark Lots, 50 Motorcycle lots, 10 Loading/unloading lots, 64 Bicycle lots

6 sets of toilets

42 common area bins

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### **Thank You**

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Board Deputy Director (Building Design & Precast System), BRI, Housing Development

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## **AGENDA**

- Enabling the Smart Estate Technologies
  - Call for Innovation Solutions
  - Possible Tech Areas

- Evaluation Parameters & Scope of Support
- Key Milestones & Timeline





### What does it mean for individuals, enterprises & estate owners

Estate Owners: Smart Environment

### **Efficient & proactive**

#### **Energy efficiency**

 On demand lighting, cooling, cleaning

#### **Integrated FM**

- Central command, control & surveillance
- Digital Twin for modelling and simulation

#### **Anticipatory**

- Predictive maintenance



#### -----**-**

#### **Resource-Lite**

 On demand stocking through real-time tracking and footfall analytics

#### **Differentiated business**

Innovative and scalable

Labour-Lite

Network of UAVs/AGVS

for food/goods delivery

**Unmanned stores** 

 Innovative retail/F&B concept by leveraging on technology, e.g.
 AR/VR

### People: Smart Living

### **Seamless & Personal**

### Your Face, Your ID

- Biometric payment, access, reservations

#### On demand service

- Autonomous transport
- Last mile delivery

#### **Personalisation**

 Seamless personal experience

Open API & data exchange to be connected to Estate Level Digital Platform



### **Illustrations of Solutions to Test**

### **Unmanned security &** surveillance



For anomaly detection



**Smart Environment** 



How can the technologies be augmented for hyperconnectivity?

### **Digital Twin**

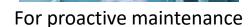


For modelling and simulation

### **Smart Parking**



For resource allocation & use convenience



**Predictive analytics** 



### **Illustrations of Solutions to Test**

**Unmanned Store** 



Unmanned drone/ ground vehicle fleet for delivery



**Smart Enterprises** 



### **SHOP**

Consumer enters shop and browse products.

#### **PAY**

Self-checkout.

How can the technologies be augmented for <u>innovative</u> <u>applications?</u>

### **ORDER**

Consumer makes orders online.

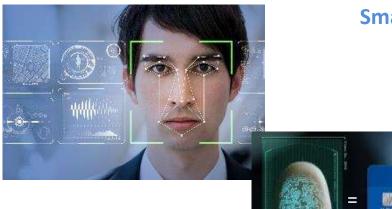
### **DELIVER**

Fulfilment made through unmanned droids within the day.

6

## Illustrations of Solutions to Test

### **Biometric ID**



**Smart Living** 





**AR Way Finding** 



### **ACCESS**

Destination-based access using biometric technology.

#### **PAY**

Payment using face or fingerprint.

How can the technologies be augmented for <u>seamless</u> <u>experiences?</u>

### **POINT**

Consumer point camera at surrounding.

#### GO

Instant recommendations and directions.

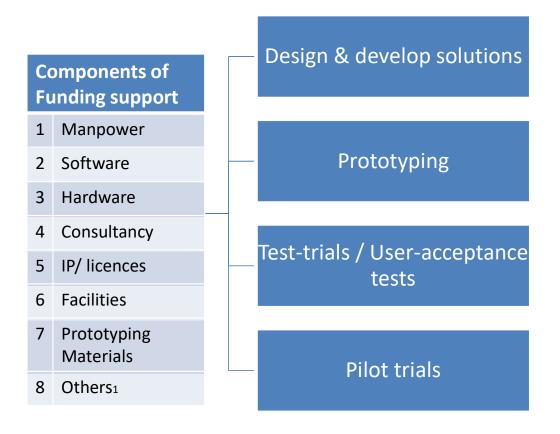
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### **Scope of Funding Support & Eligibility**



50% project cost support, capped at \$300K grant support per project<sub>2</sub>

per projecta

- Consortiums / Strategic Partnerships (led by a local company<sub>3</sub>)
  - Consortium of technology companies, facility management companies, telco etc., or
  - Strategic partnership of technology companies with complimentary capabilities

- 1. Cost components must contribute directly to the product development.
- 2. Projects should not exceed 18 months.
- 3. Local companies are defined as companies with 30% local shareholdings and core activities in Singapore





### **Evaluation Parameters**

	Assessment Area	Considerations
1	<b>Business Viability</b>	<ul> <li>Sustainable &amp; scalable business model</li> <li>Adoption viability</li> </ul>
2	Technical Feasibility & Innovation	<ul> <li>Novelty and innovativeness</li> <li>Sound technical specifications, concise plan in solution development and prototyping</li> <li>Interoperability</li> <li>Data collection and data security integrity</li> <li>Modular design for ease of scaling</li> <li>Comply to industry standards</li> </ul>
3	User Acceptance	<ul> <li>Direct positive outcome to users' business or experience: quantifiable or qualifiable outcomes in productivity, enhanced user experience or cost savings</li> <li>Ease of adoption for users</li> </ul>
4	Competency of Project team / Consortium	<ul> <li>Technical expertise and capabilities</li> <li>Sound financial standings (or investments)</li> <li>Complimentary capabilities and sustainable collaboration model (for consortium)</li> </ul>







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### **Key Milestones & Timeline**

Innovation Call Briefings

Open for application

Close application

Evaluation & Interviews

Award

1 July 2019 3 July 2019 5 July 2019

30 September 2019

October to December 2019

January 2020

Conduct industry briefings to interested technology partners

Proposal submission starts

Close application by 23:59PM

1<sup>st</sup> round evaluation & interviews

Final panel interviews\*

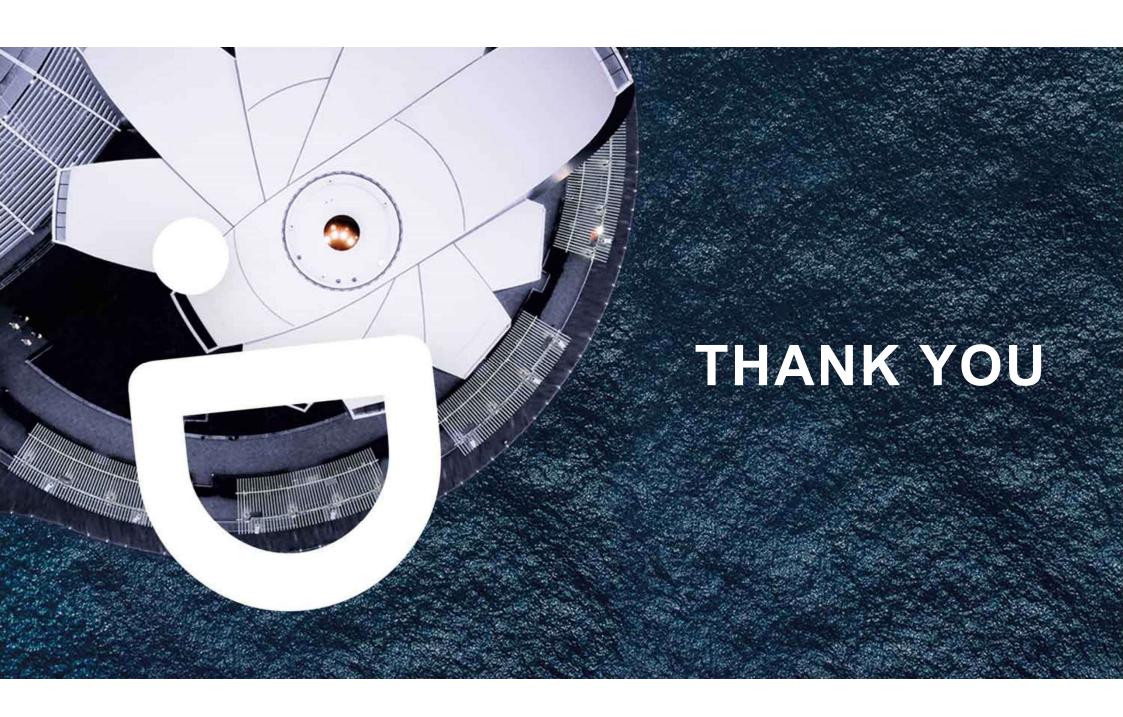
Issue Letter of Offer(s) to appointed companies

Commence projects





<sup>\*</sup>Panel will consist of IMDA, the Housing and Development Board, Frasers Property Singapore and academic or industry experts.



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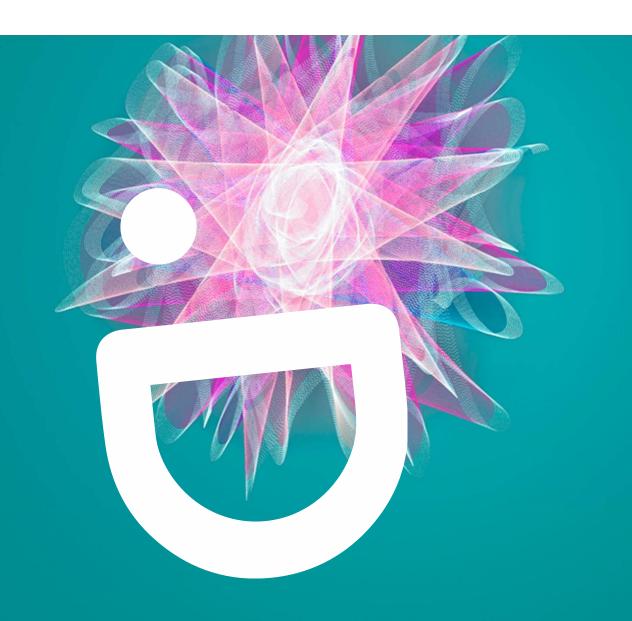
Q&A





### V

## Q&A PANEL



Thank You!



