CALL FOR INNOVATIVE SOLUTIONS (CFIS) FOR SMART ESTATES

INDUSTRY BRIEFING

16 NOVEMBER 2018

AGENDA

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

- Trial Sites

- Evaluation Parameters & Scope of Support

- Key Milestones & Timeline

WHAT IS A SMART ESTATE?

❑ A hyper-connected smart estate of the future will enrich the lives of the community through greater accessibility to technology

❑ Connectivity will enable innovative digital services

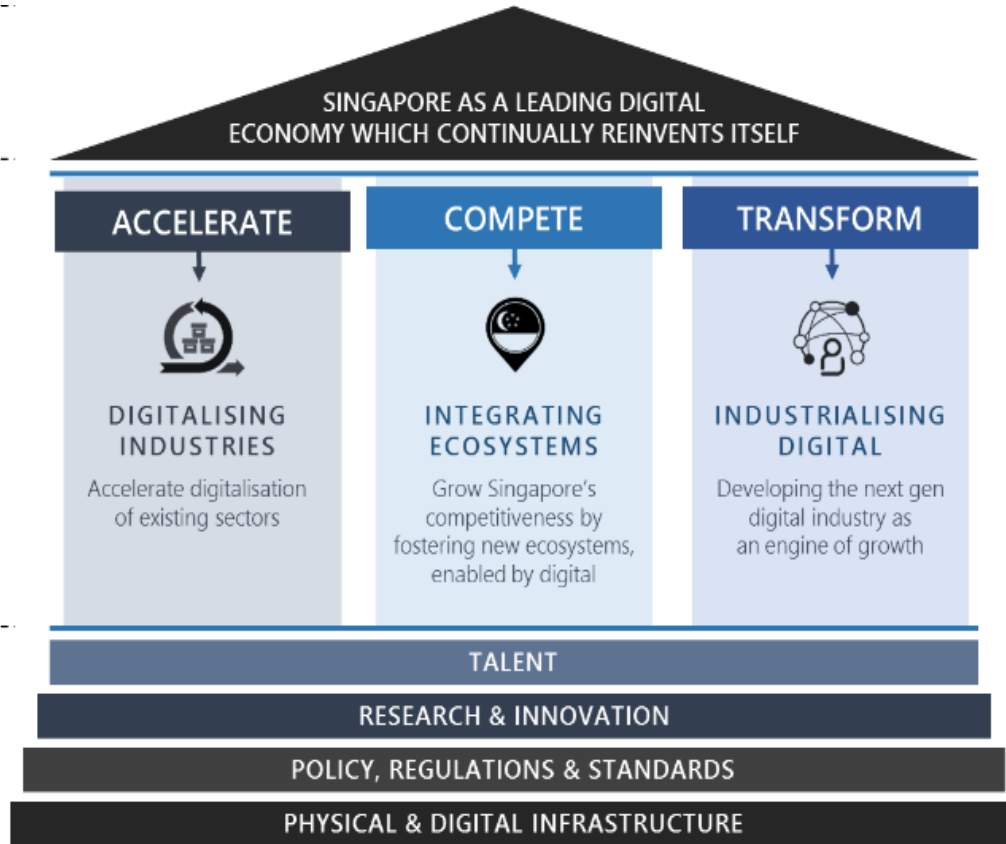| Smart Environment	Smart Enterprises	Smart Living

Key Building Blocks of IMDA's vision of Smart Estates

WHY SMART ESTATES?

GOAL

SINGAPORE AS A LEADING DIGITAL ECONOMY WHICH CONTINUALLY REINVENTS ITSELF

STRATEGIC PRIORITIES

ACCELERATE	COMPETE	TRANSFORM
DIGITALISING INDUSTRIES	INTEGRATING ECOSYSTEMS	INDUSTRIALISING DIGITAL
Accelerate digitalisation of existing sectors	Grow Singapore's competitiveness by fostering new ecosystems, enabled by digital	Developing the next gen digital industry as an engine of growth

ENABLERS

TALENT

RESEARCH & INNOVATION

POLICY, REGULATIONS & STANDARDS

PHYSICAL & DIGITAL INFRASTRUCTURE

1

Singapore to be among the top digital economies in the world. One where our sectors will embrace innovation and digital disruption, identify new growth areas and technologies that are continuously reviewed and stay ahead

2

Increasing Opportunities in Region & New Growth Area for SG

❑ Increase interests from developers in Asia for our Built Environment Companies & Tech/Solution Providers to collaborate, design & build Smart Estates.

❑ Opportunities for our companies to build capabilities, implement innovative solutions, enhance efficiencies of estates, and deliver unique & varied customers' experiences

SG:D EMPOWERING POSSIBILITIES

INFOCOMM MEDIA DEVELOPMENT AUTHORITY

WHAT IT MEANS TO DIFFERENT STAKEHOLDERS

ESTATE OWNERS

DEVELPOERS

FACILITY OWNERS

- Operational efficiencies and lower costs
- Integrated data and enhanced estate connectivity
- Anticipatory and proactive in estate management

ENTERPRISES

RETAIL

F&B

- New formats & concepts
- Resource-lite & sustainable
- Differentiated through technology

LIVING

ENTREPRENEURS/ IT EMPLOYEES

FAMILIES

STUDENTS

ELDERS

- Enhanced unique experiences
- Seamless & personal

TECH COMPANIES

IT BUSINESS

Built Env

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

SG:D
EMPOWERING POSSIBILITIES

INFOCOMM MEDIA DEVELOPMENT AUTHORITY

5

OVERALL DESIRED OUTCOMES OF IMDA'S EFFORTS

Clear capability development & growth for developers, BE & technology/solution providers in the BE space

Productivity enhancements, cost reduction or enhancement in user experience for the developers, building owners, facilities management companies or tenants

Adoption of the innovative technologies and internationalisation of the solutions
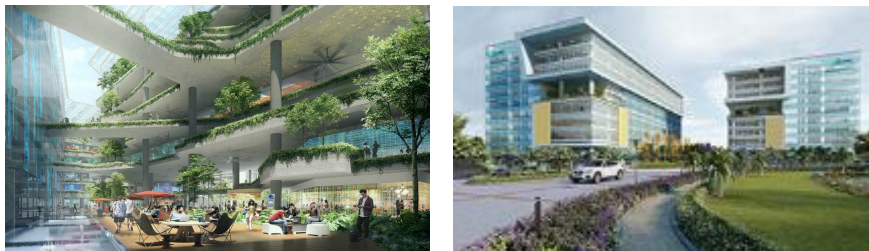
PARTNERING YOU ON THIS JOURNEY
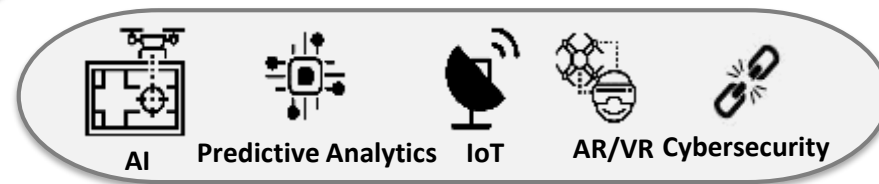
Built Environment Companies

Tech/Solution Providers

> **IMDA will facilitate & support partnerships to co-create innovative & integrated services that will value add to developments locally and regionally**

AI   Predictive Analytics   IoT   AR/VR Cybersecurity

Developers & Asset Owners

Test-bedding & Deployment of smart urban solutions

What does it mean for individuals, enterprises & estate owners

(1) 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

(2) Businesses: Smart Enterprises

Innovative and scalable

Resource-Lite

- On demand stocking through real-time tracking and footfall analytics

Labour-Lite

- Network of UAVs/AGVS for food/goods delivery
- Unmanned stores

Differentiated business

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

(3) People: Smart Living

Seamless & Personalised

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

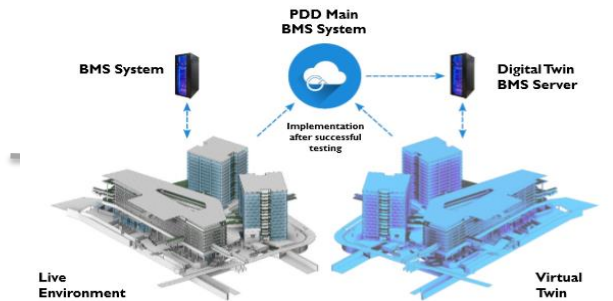## Unmanned security & surveillance

For anomaly detection

Predictive analytics

For proactive maintenance

Integrated Facility Management - Central command and control

Smart Environment

How can the technologies be augmented for hyper-connectivity?

Digital Twin

For modelling and simulation

Smart Parking

For resource allocation & use convenience

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 innovative applications?

ORDER
Consumer makes orders online.

DELIVER
Fulfilment made through unmanned droids within the day.

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 seamless experiences?

POINT
Consumer point camera at surrounding.

GO
Instant recommendations and directions.

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Trial Sites

LaunchPad @ one-north

Key Development Details

Address: 67, 71, 73, 77, 79 & 81 Ayer Rajah Crescent
Industry: Start –up
Estimated Land Area: 4.0 ha
Estimated Footfall: 50,000/mth
Tenant units: 260

Amenities

**Food & Beverages:** Timber+, Vending Machines (Drinks), Quickpick mini mart (weekday)
Shared Meeting Room: 3 Rms (Manual booking at FMC office)
Shared Event Hall: 1 hall (Manual booking at FMC office)
Shared Sports Court: Outdoor Futsal Court, Outdoor Basketball Court (Manual booking at FMC office)
Carpark Lots: 180 lots

Core Maintenance Team

Property Executive: 3
Cleaners: 15
Security Guards: 0

Trial Sites

LaunchPad @ JID
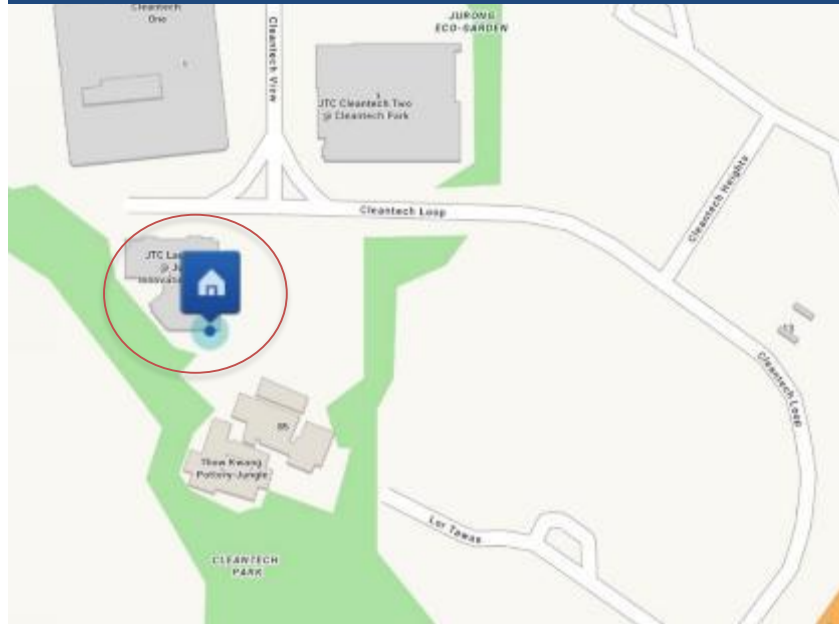
Core Maintenance Team

Property Executive: 1
Cleaners: 3
Security Guards: 0

Key Development Details

Address: 2 Cleantech Loop, Singapore 637144
Industry: Start –up
Estimated Land Area: 0.33 ha
Estimated Footfall for LP: 800/mth
Estimated Footfall including CTP and JEG: 4,200/mth
Tenant units: 27

Amenities

Food & Beverages: Café (Not opened yet)
Shared Meeting Room/ Event: CleanTech Park

SG:D EMPOWERING POSSIBILITIES

IIM INFOCOMM MEDIA DEVELOPMENT AUTHORITY

Trial Sites

Fusionopolis One

Core Maintenance Team

Property Executive: 5
Cleaners: 17
Security Guards: 10

Key Development Details

Address: 1 & 3 Fusionopolis Way, Singapore 138632
Industry: Infocomm & Media
Estimated Land Area: 1.2 ha
Estimated Footfall : 10,000/mth

Amenities

Food & Beverages: Retail podium comprising of a food court, F&B outlets and supermarket
Shared Meeting Room/ Event: L5 Symbiosis Meeting and Seminar Rooms, one-north Gallery, Genexis Theatre

Trial Sites

Science Park 1

Key Development Details

Address: 1 Science Park Drive, Singapore 118221
Industry: varied
Estimated Land Area: 30 ha
No. of buildings: 17
Average Park Population: 7,500 / mth
Tenant units: 40 (office), 33 (retail)

Amenities

Food & Beverages: 6
Shared Meeting Room/Event: thebridge
Parking lots: 2,500

Trial Sites

Science Park 2

Key Development Details

Address: Science Park Road, Singapore 117674
Industry: varied
Estimated Land Area: 25 ha
No. of buildings: 12
Average Park Population: 5,000 / mth

Amenities

Food & Beverages: 4
Shared Meeting Room/ Event: -
Parking lots: 1,800

Trial Sites

Galaxis

Key Development Details

Address: 1 Fusionopolis Place, Singapore 138522
Industry: ICT, Media, Physical Science, Engineering
Gross Floor Area: 69,000 sqm
Net Lettable Area: 56,000 sqm
Estimated Footfall: 5,000 / mth

Amenities

Food & Beverages: 20
Shared Meeting Room/Event: -
Parking lots: 300

SG:D EMPOWERING POSSIBILITIES

IMDA INFOCOMM MEDIA DEVELOPMENT AUTHORITY

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Scope of Funding Support & Eligibility

Components of Funding support	
1	Manpower
2	Software
3	Hardware
4	Consultancy
5	IP/ licences
6	Facilities
7	Prototyping Materials
8	Others[1]

- Design & develop solutions
- Prototyping
- Test-trials / User-acceptance tests
- Pilot trials
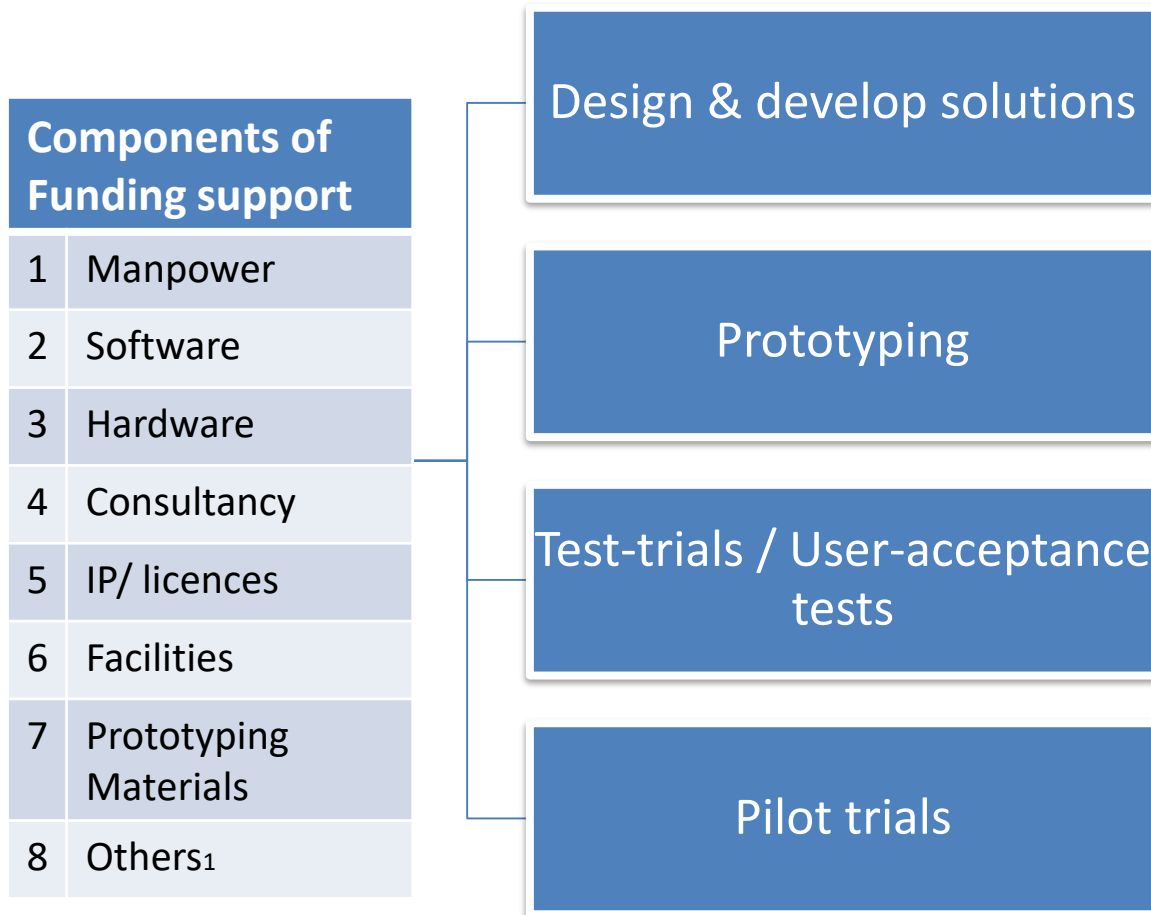
50% project cost support, capped at $300K grant support per project[2]

Consortiums / Strategic Partnerships (led by a local company[3])

- 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	**Business Viability**	• Sustainable & scalable business model • Adoption viability
2	**Technical Feasibility & Innovation**	• Novelty and innovativeness • Sound technical specifications, concise plan in solution development and prototyping • Interoperability • Data collection and data security integrity • Modular design for ease of scaling • Comply to industry standards
3	**User Acceptance**	• Direct positive outcome to users' business or experience: quantifiable or qualifiable outcomes in productivity, enhanced user experience or cost savings • Ease of adoption for users
4	**Competency of Project team / Consortium**	• Technical expertise and capabilities • Sound financial standings (or investments) • Complimentary capabilities and sustainable collaboration model (for consortium)
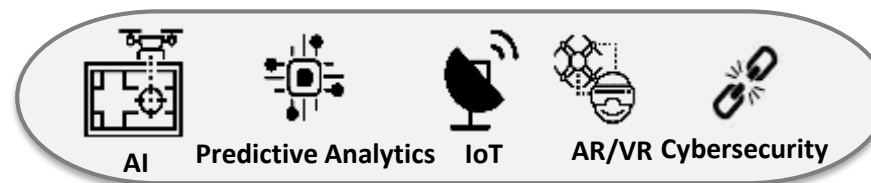
AI   Predictive Analytics   IoT   AR/VR Cybersecurity
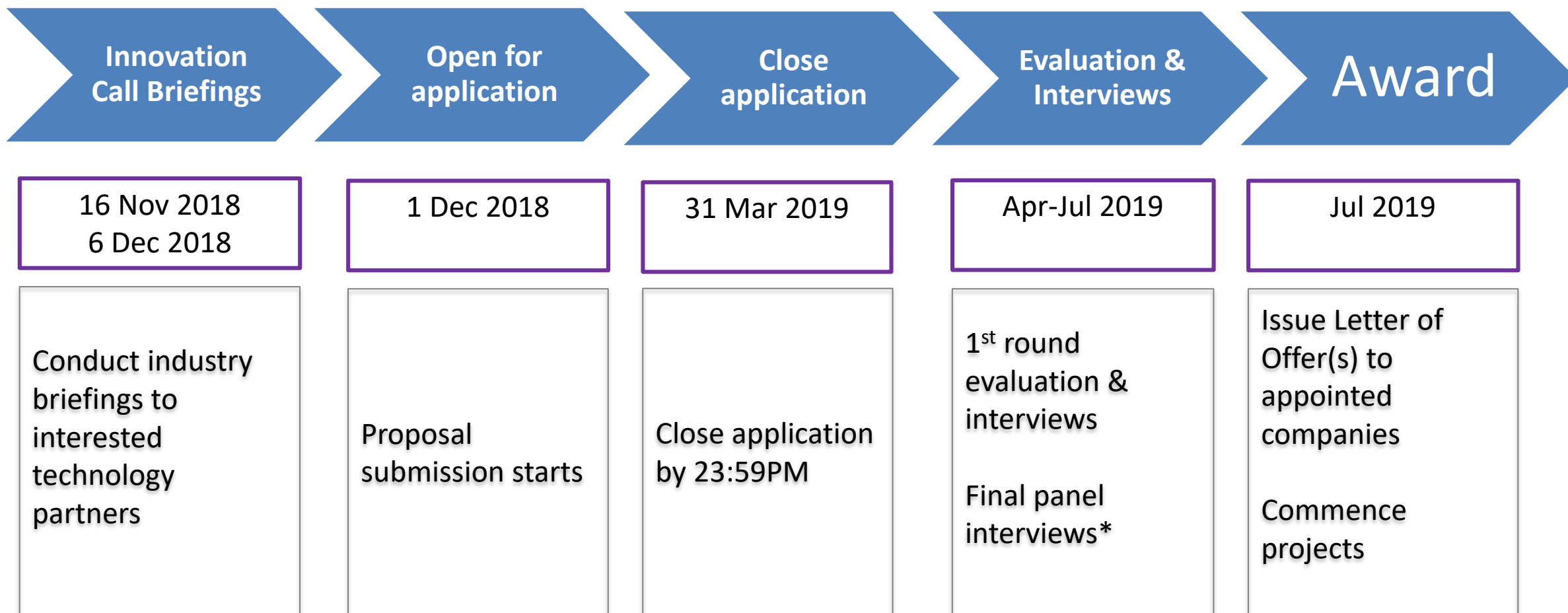
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Key Milestones & Timeline

Innovation Call Briefings	Open for application	Close application	Evaluation & Interviews	Award
16 Nov 2018 6 Dec 2018	1 Dec 2018	31 Mar 2019	Apr-Jul 2019	Jul 2019
Conduct industry briefings to interested technology partners	Proposal submission starts	Close application by 23:59PM	1st round evaluation & interviews Final panel interviews*	Issue Letter of Offer(s) to appointed companies Commence projects

*Panel consisted of IMDA, developers (JTC/ASB) and academic or industry experts.

Smart Estates of the Future

JTC's Future Smart Estates

- Mixed Use Developments (Work, Live, Play, Learn)
- Promote Industry-Academia Collaboration
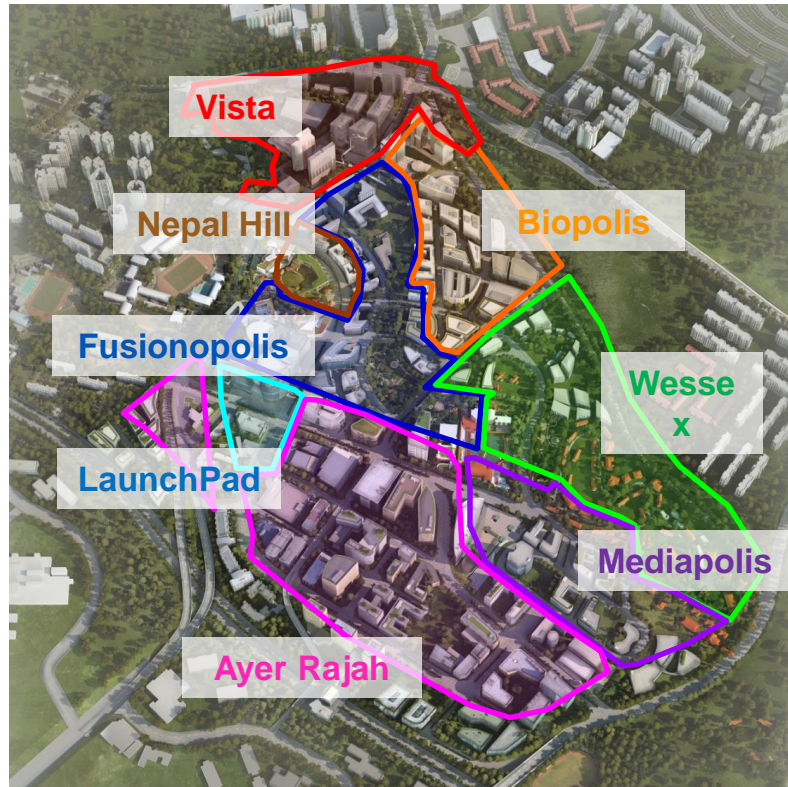- Smart, Sustainable, and Livable Estates

Jurong Innovation District
Ready from 2022

Punggol Digital District
Ready from 2023

one-north

- 200-hectare mixed-use estate that hosts research facilities and business park space
- Supports the industries of Biomedical Sciences, Infocomm Technology (ICT), Media, Start-ups, Physical Sciences and Engineering
- Work-live-play-learn environment

A Living Lab for Innovations

Autonomous & Electric Vehicles

one-north is the first estate in Singapore where autonomous vehicles are tested on public roads; electric car-sharing services are also test-bedded here

Autonomous Vehicles

Electric Vehicles

Drone Testing

Singapore's first drone estate where companies and research institutions can test-bed innovative unmanned aircraft systems (UAS) in an urban environment

Top of the News
Buzz over S'pore's first drone estate
A4

One-north to be designated as S'pore's first drone estate

A Living Lab for Innovations

Fully Self-Checkout Supermarket

Testing a new retail concept with a dining area, ready-to-eat meals and meeting rooms within a supermarket. Utilising technology like self-checkout, camera weighing scale with recognition capabilities.

SMART SCANNER WEIGHING SCALE

Augmented Reality at Hair Salons

Hair salon, KCut has a photo booth that lets customers try out and pick different hairstyles before going through with a cut.
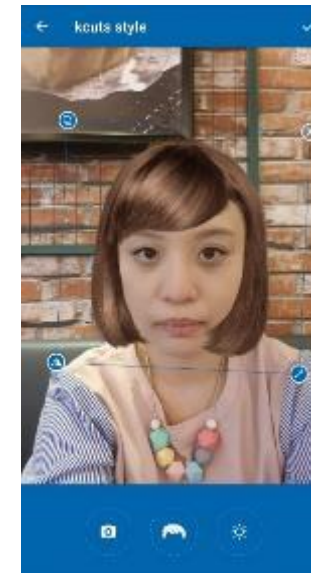
JTC Trial Sites for this Call

Fusionopolis One @ one-north

LaunchPad @ one-north

LaunchPad @ Jurong Innovation District

The Vision

- **Punggol Digital District**

PUNGGOL DIGITAL DISTRICT

A vibrant enterprise district that fosters collaboration and synergy between academia, businesses and the larger Punggol community

50 ha
LAND
(Includes BP & EI)

28,000
JOBS

12,000
STUDENTS

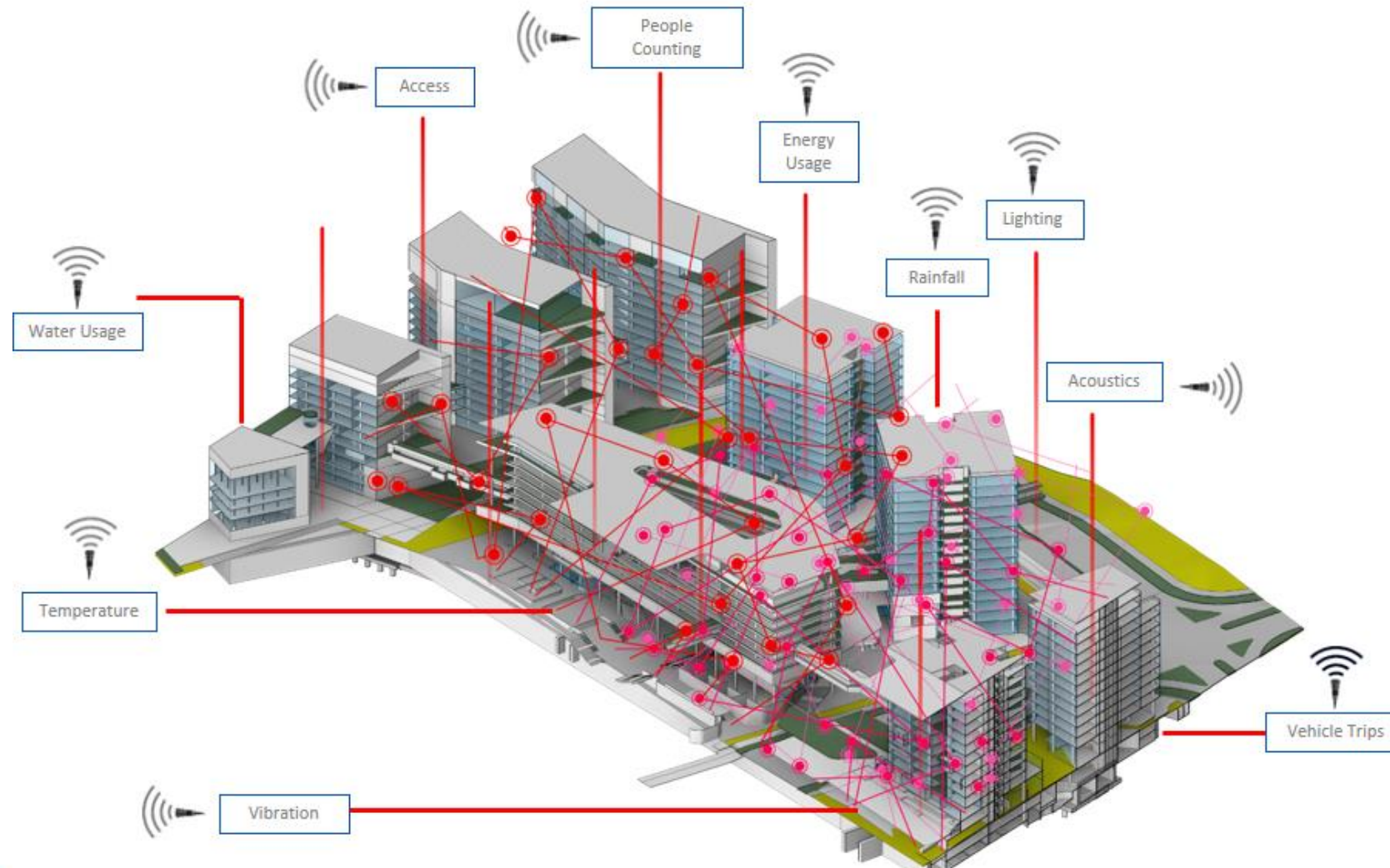**35,000**
RESIDENTS
(Punggol North)

*upon full completion

District-wide Sensor and IoT Network

- **Allows JTC to centrally monitor entire PDD**

Open Digital Platform

Use-case Verticals

| AGV Fleet Management System | AV Fleet Management System | Facilities & Estate Mgmt Apps | Estate Application | Smart Traffic Lighting Controller | District Cooling System Controller | Smart Grid Controller | EV Charging Infrastructure | Enterprise Data System | SNSP / SDX |

Open Digital Platform

| IoT | Video & VA | Data & DA | C2 | Security & Identity | Information Exchange | System Management |

Data Distribution Service ("DDS") Protocol – Data/Control, RTSP for Audio / Videos

Network Communications (DSRC, LORA, NB-IOT, 4G/5G, Fiber, Ethernet, WiFi)

Data Connectors and Monitoring Access Outlets ("MAO")

Building Management System

In-building Systems

| Mechanical Ventilation | Vertical Transportation | PA/BGM | Video Surveillance | Fire Protection |

Air-conditioning | Lighting | Electricity | Access Control | Plumbing & Sanitary | ...

In-building

Access Point

Smart Meters | AGVs

Smart Lamppost

AVs

External Environment Sensors | Video Surveillance

Digital Technology

- **Possible Deployments**

Smart Operations
- District Ops Center
- Sensor Network
- Video Analytics

Smart Utilities
- DCS
- PWCS
- Rooftop Solar PV
- Smart Grid

Smart Mobility
- AV Transport
- PMD Sharing
- Smart Parking
- Drones & Robots

Smart Experience
- Smart Wayfinding
- Building App
- Personalised Climate Control
- Smart Lighting

Smart Industry
- Makerspaces
- Urban Logistics & AGVs
- Digital Twin Test Bedding
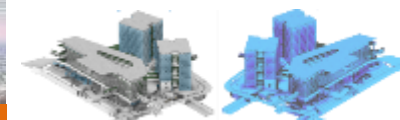
jtc

Intended Outcomes

Operational Efficiency	Resilient Infrastructure
Improved User Experience	Enabling Innovation

Sharing by Ascendas-Singbridge (ASB)

Key Trends in Real Estate

Digital Innovation
- Harnessing Data, analytics, and new technology in real estate

Low Carbon Economy
- Movement towards long term science based carbon reduction targets

Changing Demographics
- Asset flexibility – tenant mix, management & leasing strategies

Inventive Communications
- Using VR to communicate visuals, and social media to engage the community

Health and Wellness
- Benchmark and improve the work environment to drive productivity

Real Estate Value Chain

Design

BIM & 3D Mapping – Improving construction, development process, and operations

Construct

Material Efficiency – Sustainable material selection

Supervision of works using drones, AR/VR

Buy, Sell, Rent

Data Management Platform

Smart Asset Optimisation

Green Leases

Manage

M&E Performance Analytics

Predictive Maintenance & Digital Inspection

'Technology driven' outcome based contracts

Retrofit

Adaptation for Lifespan Extension

End of Life

End of Life & Zero Waste – Reduce demolition waste and reuse of material

Our Innovation Focus
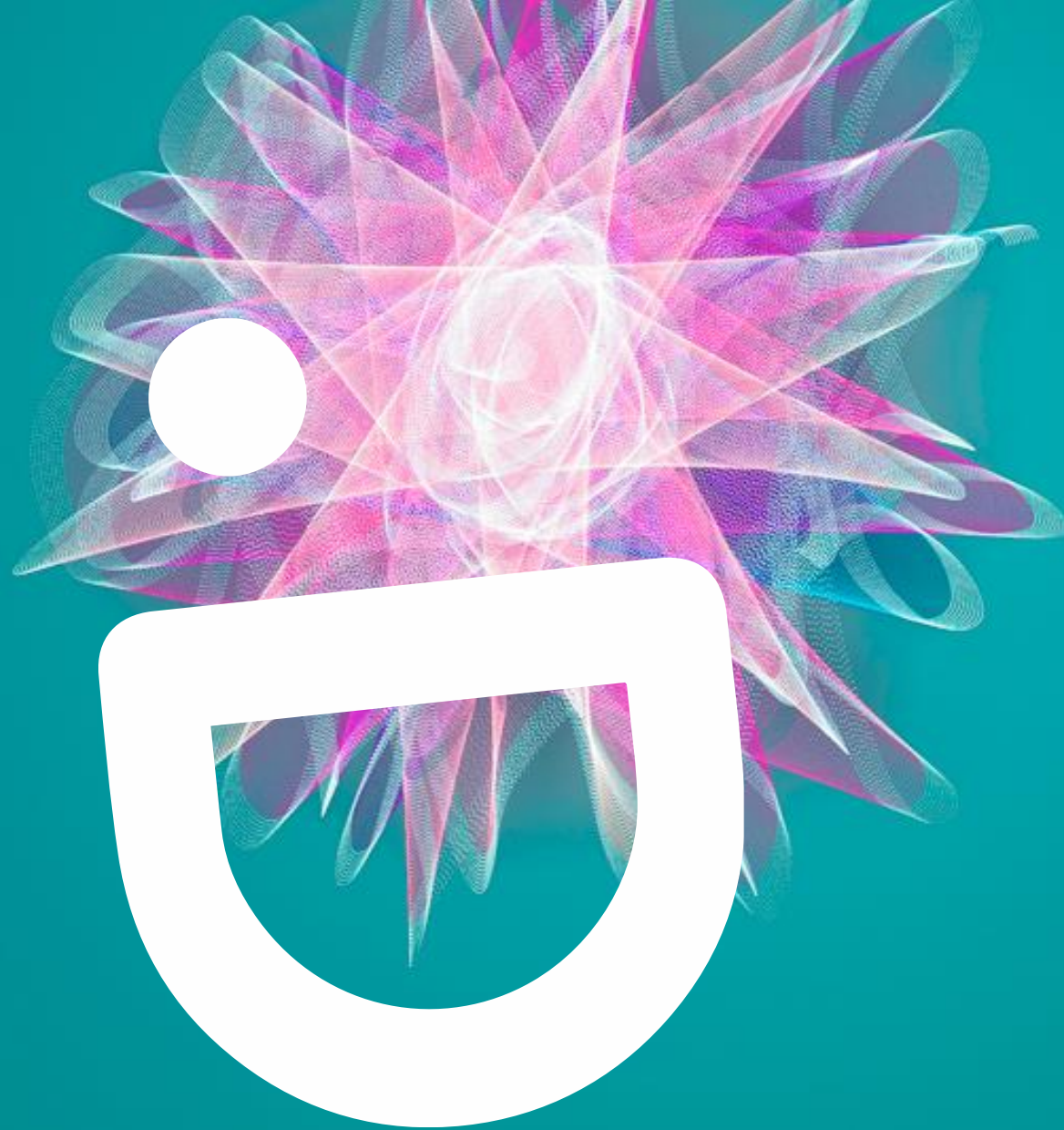

Smart Building
Exploit Technologies to enhance building management

Connected Experience
Create experiences that connect people-to-building & people-to-people in our park/buildings

Green & Sustainability
Environmentally responsible design, construction & operations

Occupant Wellness
Occupants feel good and live well in our space

Operational Excellence
Professional & operationally excellent on all customer fronts

Thank You!

SG:D
EMPOWERING POSSIBILITIES

INFOCOMM
MEDIA
DEVELOPMENT
AUTHORITY