



# Call-For-Proposals For Deployment of Outdoor AMRs With Road Crossing

17 Oct 2023



# Objective

To pilot **commercial** deployment of outdoor Autonomous Mobile Robots (AMRs) **without safety operator** and **with road crossing**

# We want to partner YOU to

- Co-create and scope innovative & scalable commercial projects
- Facilitate and support partnerships
- De-risk your development efforts and investments

# Calling for projects that are

## Collaborative

Tech providers, use case owners &/or site owners coming together to co-develop solutions and new business models that can meet unmet demands of the industry

## Innovative

Private sector use cases that require road crossing, with or without traffic light

## Commercially Viable

Clear business model & ROI for each partner

## Scalable

Able to scale to the rest of the industry and/or across sectors

## Desired Outcomes

### Tangible Benefits

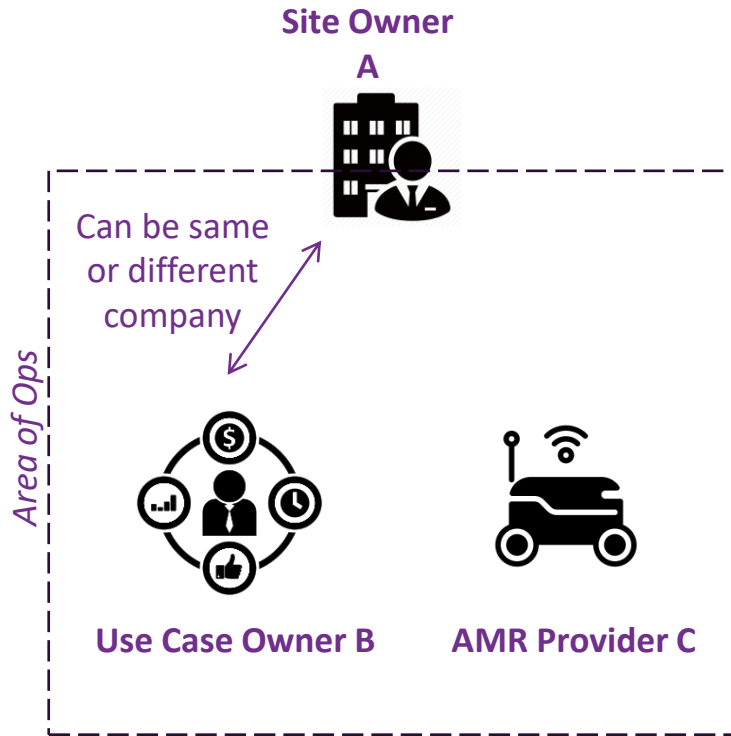
Cost saving  
Improved productivity  
New revenue stream

### Intangible Benefits

First mover  
New way to engage consumers  
New/increase market share

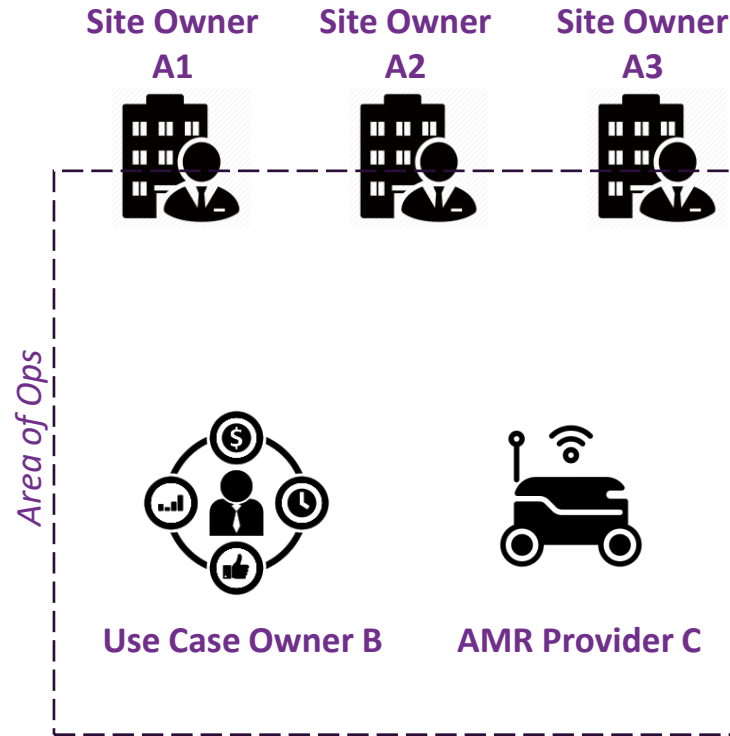
# Possible consortium approaches

## One to One



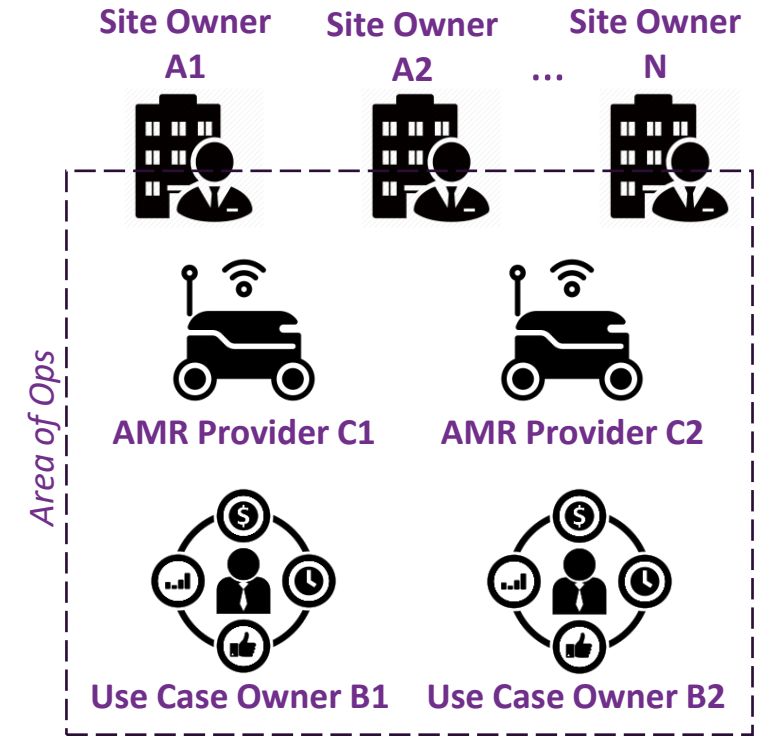
E.g. Site owner **A** engages a security vendor **B**'s service, who in turn uses AMRs from AMR provider **C** to patrol an area that requires the AMRs to cross road

## One to Many



E.g. Logistics company **B** uses AMRs from AMR provider **C** to deliver parcels to buildings, **A1 to A3**

## Many to Many



E.g. Food ordering apps **B1** and **B2** use AMRs from AMR providers **C1** and **C2** to collect food from F&B tenants in buildings, **A1** and **A2** and deliver to consumers in buildings, **A1 to N**

# Potential use cases with road crossing

Last Mile Delivery



Disinfection/Fumigation



Cleaning/Waste Collection



Security/Inspection

# Regulatory requirements

## Deployment in Public areas

- **With supervision** – AMR to be deployed needs to pass T1 test @ CETRAN for deployment on **public path only** and obtain Exemption Orders (EOs) from LTA
- **Without supervision; with and without road crossing** – AMR to be deployed needs to pass T1 + T2\* test @ CETRAN (modules to take subjects to CONOPS of deployment) and obtain EOs from LTA

### 4 modules^ in T2

- **Module 1 = Paths only, daytime only**
- **Module 2 = Paths only, nighttime**
- **Module 3 = Road crossings, daytime only**
- **Module 4 = Road crossings, nighttime**

*\*T2 targeted to be launched in 1H 2024*

*^AMR must pass Module 1 as a baseline before attempting Modules 2, 3 or 4. (e.g. AMR will need to take modules 1 and 3 to travel on public path and with road crossing during daytime)*

# Funding support for tech devt.

- Up to 50% funding support for AMR providers (for project period not more than 12 months) to
  - **Develop road crossing capabilities**, not limited to the following:
    - i. **Dynamic obstacles detection**
      - i. To detect and classify dynamic obstacles and their speed
    - ii. **Robot logic for road crossing**
      - To enable robot to decide whether to cross the road or not
    - iii. **Video analytics (traffic light)**
      - To determine traffic light status (red man, solid green, blinking green, error) as well as time left for crossing
    - iv. **Teleoperation**
      - To remotely assist the robot to cross the road/handle exceptions
  - **(Optional) Develop and install traffic light common node** to enable AMR to request for “green man” for road crossing purpose

- Eligible cost components include
  - Manpower
  - Software
  - Hardware
  - IP/licences
  - Professional services
  - Materials and consumables
  - Other cost components that contribute directly to the product development



# Reach out to us with your ideas

Reach out to us by submitting a simple deck to kickstart discussions

Selected consortia to submit detailed proposal\* by January

Process and award project by June 2024

By mid November

November - December

January

February - April

May - June

IMDA to meet up with selected consortia to ideate and refine use cases to strengthen proposal

IMDA to assess detailed proposal, LTA to assess and approve CONOPS and traffic light common node design

PowerPoint  
(up to 10 slides)



Key  
Partners



Use Case &  
Impact



Scope,  
Estimated Cost,  
Timeline



Growth  
Potential

Note: Project beneficiaries must be Singapore registered companies

Indicate your interest by Friday, 17 November

Email: [patrick\\_low@imda.gov.sg](mailto:patrick_low@imda.gov.sg)



THANK YOU



INFOCOMM  
MEDIA  
DEVELOPMENT  
AUTHORITY

