**Market Sounding Exercise for Supply of**

**Autonomous Mobile Robots System for the Chinese Medicine Hospital**

**PROFORMA**

**(for completion by interested parties)**

**Preamble**

Interested parties are encouraged to respond to the market sounding exercise (“MSE”) listed below in relation to the supply of Autonomous Mobile Robots (“AMR”) System for the Chinese Medicine Hospital. Responses to the questions below shall be returned by 12 Oct 2021. Early responses in batches before the deadline are welcome.

Food and Health Bureau (“FHB”) will keep the information received confidential. Access to the information will be restricted to authorised personnel.

1. **Company Information**
   1. Name of company: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Origin of Company\*

☐ Local Company

☐ Non-local Company. Please specify country of origin if this box is chosen \_\_\_\_\_\_\_\_\_\_\_\_\_.

\*Please tick as appropriate:

* 1. Please provide the number of AMR System(s) provided by your company for hospital(s) and non-hospital both within and outside Hong Kong in the past 10 years immediately prior to the closing date of MSE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Please describe major implementations:

|  |  |
| --- | --- |
| Within Hong Kong | Outside Hong Kong |
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* 1. Please provide contact person’s information of the company in paragraph 1.1 above:

|  |  |
| --- | --- |
| Name: |  |
| Position: |  |
| Email: |  |
| Tel. no.: |  |

1. **Particulars of the Respondent and Level of Interest**
   1. Referring to the project overview, setup and operation of the AMR System stated in paragraphs 2, 3, 4 and 5 in the MSE document, please advise if your company provide AMR system(s) by completing the following table:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Parameter | Please tick if fully comply | Alternative proposal if not fully comply |
| 1 | AMR system interface with the Automatic Dispatch System (“ADS”) stipulated in paragraphs 3 and 4 in the MSE document | □ |  |
| 2 | AMR system interface with the lift installation stipulated in item a of paragraph 5.28 in the MSE document | □ |  |
| 3 | AMR system interface with automatic door installation stipulated in item b of paragraph 5.28 in the MSE document | □ |  |
| 4 | AMR system interface with fire alarm signal stipulated in item c of paragraph 5.28 in the MSE document | □ |  |
| 5 | AMR system in compliance with the building and building services provisions at AMR Home Station stipulated in item a of paragraph 5.29 in the MSE | □ |  |
| 6 | AMR system in compliance with the building and building services provisions at AMR Satellite Station (send/receive) stipulated in item b of paragraph 5.29 in the MSE | □ |  |
| 7 | AMR system in compliance with the building and building services provisions at AMR Satellite Station (waiting/temporary parking) stipulated in item c of paragraph 5.29 in the MSE | □ |  |
| 8 | AMR system in compliance with the building and building services provisions at AMR Control Room stipulated in item d of paragraph 5.29 in the MSE | □ |  |
| 9 | AMR system in compliance with the building and building services provisions at AMR service area stipulated in item e of paragraph 5.29 in the MSE | □ |  |
| 10 | AMR with built-in keypad or staff card access drawers for delivery of medicine or document | □ |  |
| 11 | AMR for delivery of trolleys of meal, linen, waste, bulk goods, etc. | □ |  |
| 12 | AMR system interfaced with lift(s) systems from the list of Specialist Contractor of Lift, Escalator and Passenger Conveyor Installation from DEVB’s ‘List of Approved Suppliers of Material and Specialist Contractors for Public Works | □ |  |
| 15 | AMR system with pre-scheduled delivery function | □ |  |
| 16 | AMR system with ad-hoc delivery function | □ |  |
| 17 | Minimum payload of AMR for cart or trolleys of meal, linen, waste and bulk good delivery (includes cart and actual material to be transport) is 450kg | □ |  |
| 18 | Maximum dimensions of the largest AMR are 1,200mm (L) x 600mm (W) | □ |  |
| 19 | AMR manoeuvring requirements comply with the transportation route stipulated in the table of paragraph 5.1 in the MSE | □ |  |
| 20 | Delivery of the garbage bin stipulated in paragraph 5.25 and **Appendix C** in the MSE. | □ |  |

* 1. Further to question 2.1, please indicate:
     1. Which component(s) can be provided by your existing system(s) and/or new system(s)? and
     2. Which component(s) that you would like to appoint sub-contractor to provide?
  2. Conforming to the project overview, setup and operation of the AMR System and the building provisions stated in paragraphs 2, 3, 4 and 5 in the MSE document, please advise:
     1. Architectural requirement

1. Maximum horizontal AMR travel distance between goods lifts and L/UL zones serving different departments on each floor to achieve the tentative delivery schedule.
2. Maximum horizontal AMR travel distance between goods lifts and the two collection points per floor for AMR for dirty items to achieve the tentative delivery schedule.
3. Specification of AMR door opener (provided by AMR vendor) automatically controlling the doors along AMR circulation and the compatibility with electromagnetic door lock in the market.
4. Other requirement and observation on the tentative layout plans.
   * 1. Building services requirement
5. Power charging requirements for AMR, e.g. quantity of power socket including its power rating suiting local application at each location, and associated accessories such as trunking and cable containments for AMR’s own internal communication.
6. Required signal(s) from lift cars for AMR’s operation and necessary interface requirements for lift control.
7. Required signal(s) from fire service for AMR’s emergency operation.
8. Required provision for AMR internal communication inside lift car.
   * 1. Performance specification
9. Speed and turning radius of AMR.
10. Optimum speed of AMR to meet tentative delivery schedule while considering the sharing of corridor with staff and escorted patients.
11. the maximum net weight can be carried by a single AMR including the trolley.
12. Parking and manoeuvring swept path of AMR.
13. Specifications (including but not limited to the weight and size) of trolley/cart base.
14. Other relevant specification of the AMR.
    * 1. Operational protocols
15. Complete AMR control logic procedure and flow chart on accessing to lift including how AMR handing the case of lift fully occupied by passengers, lift fully occupied by another AMR(s), and lift fully occupied with passenger and another AMR(s) as well as any priority control.
16. Communication between nurse station / reception / office and the AMR system to notify staff for sending and receiving at the AMR satellite station (send/receive).
17. Contingency proposal in case lift at 1 major lift service core is out of order.
18. Protocol on the AMR reaction to sharing circulation with staff, escorted patients (including in gurney and wheelchair) and manual trolley.
19. Fire handling protocol to not obstruct the escape route of occupants, manoeuvring of beds to evacuation lifts (which may share with clean goods lifts) and rescue pathway.
20. Self-arranged electricity consumption payment for the whole testing & commissioning (T&C) period before system handover to the hospital.
21. To provide own active harmonic filter(s) on AMR’s equipment to avoid disturbing the power quality from power distributing system in building.
22. Other foreseeable scenarios and corresponding AMR protocol.
    * 1. IT system
      2. What are the features or functions of the AMR control system?
      3. Is the AMR control system run on local server or on Cloud Platform?

If on local server, please help to state the physical dimension, power consumption and network requirement of the server as it will be installed in Hospital Data Centre.

If on Cloud Platform, what is the network connectivity requirement?

* + 1. Is there any interfacing requirement with other IT systems in the hospital? For example, interface with ADS that centralises all despatching orders from hospital users, communicates to AMR system on scheduled and ad-hoc delivery, and receive acknowledgement from AMR system.
    2. Is there any contingency plan when the AMR control system is down? How the control system manages system reliability and resilience?
    3. Is there any requirement on Wi-Fi network inside the lift?

If yes, please state in details how the Wi-Fi network can facilitate the workflow.

* + 1. How the testing performed when there is a new version of AMR system software?  Is there any testing facility before the new version is applied to production environment?
    2. The IT security measure of the AMR system on different security areas,

1. System security: server hardening policy, installation of latest anti-virus program and security patches, regular security scanning;
2. Data security: relevant data protection in accordance with Government security regulations (e.g., data encryption);
3. Application security: proper access control and audit logs;
4. Network security: unauthorised network connection, such as connection to external parties, is prohibited.
   * 1. Breakdown on detailed assignment of tasks among the 25 nos. of AMR
     2. proposed numbers of AMR for serving clean items
     3. proposed numbers of AMR for serving clean items with built-in drawers
     4. proposed numbers of AMR for serving dirty items
     5. proposed numbers of AMR for ad-hoc item delivery
     6. proposed numbers of AMR for ad-hoc item delivery with built-in drawers
     7. proposed numbers of AMR for stand-by / spare capacity (if required)
     8. specification for each type of trolley or cart base involved
     9. specification of the AMR for delivery of garbage bin as stipulated in paragraph 5.25 and **Appendix C** if the AMR is different from others
     10. Maintenance
     11. maintenance schedule of various component(s)
     12. normal life spans of major components in the AMR system
     13. charging time required for each type of robot
     14. normal operation duration, in terms of hours, of the AMR after full charge
     15. proposal for user training
     16. terms and conditions of warranty
     17. estimated maintenance cost for one AMR (including spare parts with breakdown e.g. accessories, warranty and labour) and any other necessary maintenance
5. **Estimated initial cost**

Referring to the project overview, setup and operation of the AMR System stated in paragraphs 2, 3, 4 and 5 in the MSE document, please complete the following table by filling in the quantity and cost.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Description | Quantity | Unit Price (HKD) | Amount (HKD) |
| 1 | Server and software |  |  |  |
| 2 | Touchscreen control panel |  |  |  |
| 3 | Robots with built-in keypad or staff card access drawers (for delivery of patient specimens, medical record/document, sterile supplies, stationaries and WM drugs) |  |  |  |
| 4 | Robots (for delivery of meal, CMs, linen, consumables, waste and bulk goods trolley) |  |  |  |
| 5 | Home station charging dock |  |  |  |
| 6 | Satellite charging dock |  |  |  |
| 7 | Lift controller box (including installation per lift car) |  |  |  |
| 8 | Automatic door controller box (including installation per door) |  |  |  |
| 9 | Arrival signal device (wireless annunciator) if applicable |  |  |  |
| 10 | PC station |  |  |  |
| 11 | Equipment racks |  |  |  |
| 12 | Uninterruptible Power Supply |  |  |  |
| Others (to be suggested by interested parties) | | | | |
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| Grand Total: | | | |  |

1. **Submission of Information**
   1. Referring to the purposes and functions of the planned AMR system listed in paragraphs 2, 3, 4 and 5 in the MSE document and the questions in **Proforma – Annex.**
   2. Any other information (e.g. photos, catalogues or illustrations, etc.) in support of the response is welcome.
   3. Respondents are advised to indicate which parts of their responses are “commercial in confidence” that they do not want to be disclosed in subsequent tender(s).