THE PORT AUTHORITY OF NY & NJ

PROCUREMENT DEPARTMENT
4 WORLD TRADE CENTER
150 GREENWICH STREET, 21ST FLOOR
NEW YORK, NY 10007

REQUEST FOR INFORMATION

TITLE: **ROBOTS AND ARTIFICIAL INTELLIGENCE FOR THE PORT AUTHORITY OF NY & NJ**

NUMBER: 52870

QUESTIONS DUE BY: **Open and Ongoing Until Further Notice**
RESPONSE DUE DATE: **Open and Ongoing Until Further Notice**

*SUBMISSIONS TO REQUEST FOR INFORMATION # 52558
DO NOT NEED TO RESPOND TO THIS REQUEST FOR INFORMATION. THESE SUBMITTALS ARE STILL UNDER REVIEW.

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1. GENERAL INFORMATION: THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY, THE PORT AUTHORITY BUS TERMINAL AND THE LINCOLN TUNNEL

The Port Authority Bus Terminal (PABT) in Manhattan is the busiest bus terminal in the world, with an estimated 260,000 passenger trips and 7,900 bus movements each weekday. In addition, the PABT has over thirty retail tenants visited by thousands of people daily. The PABT serves both commuter bus carriers and mid- and long-distance bus carriers, which means that there are a number of commuters who use the PABT daily, as well as many infrequent travelers who come from all over the world and are often unfamiliar with the PABT as well as New York City itself. In addition to being a major transportation hub, the building hosts a number of tenants and must maintain numerous building systems.

Inextricably linked with the PABT is the Lincoln Tunnel (LT), the Port Authority's second largest vehicular crossing. Comprised of three (3) tubes, the LT actively manages traffic patterns leading to and from the tunnel in both New Jersey and New York City every day as it moves over 19 million buses, trucks and automobiles annually. The LT feeds buses to and from the PABT, and actively manages the Exclusive Bus Lane (XBL) operation, a 2.5-mile contra-flow bus lane traveling along New Jersey Route 495 operating 6:00am – 10:00am on weekdays. The XBL alone averages nearly 1,900 buses each day and supports over 100 different carriers.

For background on The Port Authority of New York and New Jersey (the "Port Authority"), which owns and operates the PABT and the LT, see www.panynj.gov. Additionally, the most recent electronic version of the Port Authority's Annual Report is available at http://www.panynj.gov/corporate-information/annual-reports.html

2. OVERVIEW

Together, the LT and PABT have a number of needs related to maintenance, inspections, customer service, safety, and traffic management. While recognizing that robotics and artificial intelligence technology subsume a bevy of applications that at different developmental stages, and that some may be in the early phases of development, the LT and PABT are exploring the possibility for different types of robotics and artificial intelligence (AI) technology to meet some of these needs.

To that end, the Port Authority is seeking information from firms (Respondents) that design and develop robots and/or AI in one or more of these areas. The Port Authority anticipates, but does not guarantee, that a procurement related to robots and/or AI at the PABT will be undertaken as a result of the information received pursuant to this Request for Information (RFI).

The Port Authority will not preclude firms or organizations who do not respond to this RFI, nor will it preclude firms or organizations who do respond to this RFI, from participating in any possible future procurements related to robot technologies at the PABT. Further, the Port Authority encourages companies that have designed and developed robots and/or AI applications for other industries beyond transportation (e.g., hospitals, educational institutions, travel/tourism, security, etc.) to respond to this RFI.

3. PROJECT SUMMARY

The LT and PABT are seeking ideas to better understand how robots and artificial intelligence (AI) may be employed to help the following needs:

A. Customer Service/Wayfinding. This area relates primarily to the PABT. The PABT is composed of two wings – the original South Wing, which spans an entire city block between 8th and 9th Avenues and 40th and 41st Street, and the North Wing, which was added later and runs from 41st Street to 42nd Street and half the block between 8th and 9th Avenues. Together, the two wings accommodate 130 gates and platforms comprising 195 different loading positions (some gates can accommodate multiple loading positions). Departures are situated on the Lower Level, and 3rd and 4th floors of the South Wing, and the Lower Level, and the 3rd floor of the North Wing. (Departure gates are accessible via vertical circulation from the Lower Levels in both wings, 2nd and 4th floors of the South Wing, and 3rd floor of the North Wing). There is a Main Ticket Plaza, but several carriers have other ticket window locations as well as vending machines throughout the building. And finally, there are three floors above the South Wing bus operations for regular daily parking.

Customers regularly need help finding their way in the Terminal. However, the physical characteristics/geography of the PABT makes wayfinding very difficult. In particular, the limitations of fixed signs hamper their usefulness in directing customers in a multistory building that spans 41st Street. As a result, staff often need to walk customers to their destinations, which takes time away from other needed tasks. Therefore, the PABT is looking for ways in which robots can help provide information and lead customers to their destinations.

Furthermore, many customers have luggage. While staff do help with this, customers must sometimes wait during busy times. Customer's baggage can be very heavy for our employees to handle, potentially leading to injuries. There are also few elevators, which makes movement with luggage difficult. Because of this, the PABT is exploring options for using robots to improve the customer experience and reduce injuries despite these fixed conditions.

B. Inspection and/or Maintenance. Both the LT and the PABT perform routine inspections, preventative maintenance, and corrective and emergency repairs. These inspections, maintenance, and repairs involve many types of systems including, but not limited to, roadways, pipes, fire and life safety systems, electrical systems, and pumps. The PABT and LT are exploring options for using robots as the transportation platform to perform ultrasonic wall thickness testing for standpipes installed in walls of an approximately eight-thousand-foot-long tunnel. There is further interest in exploring how to utilizing robots and AI to be more predictive with maintenance inspections or a means for performing inspections or maintenance in tight and/or dangerous spaces.

C. Safety/Emergency. The LT has a particular need in this area as responding to and addressing incidents inside a congested tunnel is time and labor sensitive, especially when the type and/or severity of the incident is not readily known until staff can assess the situation. For example, a vehicle stopped inside the tunnel could be something minor, such as a customer who ran out of gas, or major, if a medical emergency exists. Robots may aid in quickly accessing the scene, initiating communication with the drivers, facilitating the response of staff and equipment,

and/or providing supplemental carrying capacity. Robots that could safely aid in stopping traffic and/or responding to an incident are also of interest as are robots that enhance the capabilities of staff during a response (e.g., robot carriers for medical supplies or AEDs).

The Port Authority is also interested in exploring the use of robotics or autonomous vehicle technologies to develop a personnel transportation system on the catwalk inside the LT to expedite the response of Tunnel & Bridge Agents to the site of an emergency within the tunnel.

D. Traffic and People Management. Both the LT and PABT have needs in this area, though they are different. The PABT regularly manages bus traffic on two levels within the Terminal. This traffic is especially heavy during the morning and evening rushes, and there is a particularly difficult chokepoint in one section that functions as an intersection. The PABT is interested in AI applications and/or robots to aid in managing this traffic. Further, PABT is interested in applications and/or technologies that could aid bus drivers with backing out of gates or parking spaces.

In addition to the vehicle movements, during the evening rush, overcrowding and movement of people can become problematic. The PABT is interested in robots that could help in providing traffic information while moving throughout the PABT and LT locations.

Finally, the LT actively manages traffic on a daily basis, putting out and moving cone lines regularly throughout the day, depending upon traffic conditions. The LT is interested in robots and/or AI that could aid in these efforts.

4. GOALS AND OBJECTIVES OF THIS RFI

The goal of this RFI is to better understand how robots and/or AI could be used to address key needs in a variety of operations at the PABT and LT. Specifically, the Port Authority is looking for information related to the following questions in the different categories below. Recognizing that different robots and/or AI applications may address different needs and groups of questions, respondents may provide information on how their robots and/or AI address one or more than one of the following areas.

A. Customer Service (Carrying and/or Directional Help)
   1. What kind of information does your system provide?
   2. Is your system capable of moving throughout the building or is it stationary? If it can move, is it able to move on only one level or can it move across multiple levels of the building?
   3. If a customer bumps into, or comes in physical contact with the system, are there safety mechanisms in place to prevent injury? Please describe.
   4. How does your system negotiate vehicular and/or pedestrian traffic?
   5. If there are multiple units, do they communicate (e.g., could one unit bring someone from one side of the building to the other, bring them to an escalator and have another unit waiting at the top of the escalator to continue the trip?)?
   6. What method of communication, if any, does your system employ (e.g., reading on a screen, voice, other?)

7. Can your system provide users audible directions, visually mapped directions, or both?
8. Can your system lift and/or carry objects? How? What is the maximum load?
9. What languages are available?
10. Does your system initiate conversations, and how?
11. Can your system interact with other types of systems (e.g., kiosks) for information?
12. What kind of maintenance is required?
13. What other features does your system have that you would like to let us know about?
14. Who performs the maintenance on the system?

B. Inspection and/or Maintenance
   1. Do you have systems that can inspect pipes? Do they do so from within or outside the pipes?
   2. What are the maintenance or inspection routines that your system provides?
   3. Are there remote health checks conducted?
   4. Do your systems offer the potential for predictive maintenance?
   5. Can your systems carry equipment to various locations as needed? If so, what types of equipment and what are the maximum loads?
   6. What kind of maintenance is required on the system?
   7. Who performs the maintenance on the system?
   8. What other features does your system have that you would like to let us know about?

C. Safety/Emergency
   1. How does your system interact with people?
   2. How does your system assess a situation?
   3. How does your system gain access to an incident?
   4. What kind of maintenance is required?
   5. What other features does your system have that you would like to let us know about?
   6. Who performs the maintenance on the system?

D. Traffic Management
   1. Is your system capable of moving (e.g., along a platform or in the roadway) or is it stationary?
   2. What method of communication, if any, does your system employ (e.g., lights, directional signals, other?)
   3. Has your system been tested in high volume vehicular and pedestrian traffic environments?
   4. Is the device capable of understanding traffic signs and pavement markings as to not confuse drivers of where they should be?
   5. Does any other hardware/software need to be installed for your system to function?
   6. What kind of maintenance is required?
   7. What other features does your system have that you would like to let us know about?
   8. Who performs the maintenance on the system?

5. SUBMISSION OF INFORMATION

The Port Authority intends to review responses on an ongoing, rolling basis, as submissions are received. The final date and time for submission ("Final Submission Date") will be posted as an Addendum one (1) week before the RFI is closed.

Each Respondent shall EMAIL a .PDF copy of its response to Alex Siegal at the email address located on the cover page of this RFI. The subject line should clearly indicate the transmission is in response to the RFI for the Robots and Artificial Intelligence for the Port Authority Bus Terminal and include the RFI number #52870 listed on the cover page.

The Response shall also include or identify:

A. Transmittal Letter / Executive Overview

1. The name, address, homepage URL and Federal Employer Identification Number of the Respondent;
2. Contact information (name, title, email, telephone number) of the individual who shall act as the Respondent's contact with the Port Authority for further information requests and future solicitations, if any. In addition, at any time after the opening of the responses to the RFI, the Port Authority may request additional information relating to the Respondent's qualifications and will use this individual as the point of contact for these queries.
3. A brief description of the Respondent, its lines of business, organization, mission, affiliates, objectives, location, years in business under its present business name, and a list of previous business names used, if any.

B. A signed copy of ***Attachment A*** (Agreement on Terms of Discussion) hereof.

C. Responses to questions identified in Section 4 – Goals and Objectives of this RFI.

D. A description of the Respondent's experience in providing robotics and/or AI technologies. Provide a client list identifying or describing the following:

1. Client
2. A description of the installed system
3. Contract timeframe (beginning/end)
4. Value of Contract

6. QUESTIONS AND COMMUNICATIONS REGARDING THIS RFI

All communications concerning this RFI should be directed to the Buyer listed on the cover page. All questions regarding this RFI should be submitted by email to the Buyer at the email address listed on the cover page.

The Buyer is authorized only to direct the attention of prospective Respondents to various portions of this RFI so that they may read and interpret such portions themselves.

Neither the Principal Buyer nor any other employee of the Port Authority is authorized to interpret the provisions of this RFI or give additional information as to its requirements. If interpretation or other information is required, it will be communicated to Respondent by written addenda and such writing shall form a part of this RFI.

7. CONFERENCE / MEETING

At any time after the receipt of responses, Respondents may be asked to attend an informal discussion with staff of the Port Authority regarding further clarification of the response and/or for additional information. Any such informal discussion will last for two (2) hours and consist of roughly one hour for a presentation by the vendor and demonstration of the app, and one hour for questions/answers. Selection of such firms, if any, will be at the sole discretion of the Port Authority based on review of submitted material and other information gathering. To facilitate the free flow and exchange of ideas and information, the Port Authority intends to meet with Respondents separately. The Port Authority will communicate the date, time, place and objectives of such conference in due course.

Note: The Port Authority may schedule and hold individual conferences with select Respondents on a 'rolling basis,' as responses are received by the Port Authority, which may be prior to the Final Submission Date.

8. GENERAL

A. The Port Authority reserves the right to conduct interviews, issue a solicitation for a proposal, or to perform none of the above.

B. The Port Authority reserves the unqualified right in its sole and absolute discretion to choose to accept or reject any and all firms responding to this RFI on the basis of an evaluation of the responses to the RFI. The Port Authority also reserves the unqualified right to request further information from any Respondent.

C. Neither the expression of your organization's interest, nor the submission of your response to the RFI and any documents or other information supplied by you, nor any correspondence, discussions, meetings or other communications between your organization and the Port Authority, shall impose any obligation on the Port Authority. The Port Authority shall have no obligation to any Respondent. Costs of participation or information preparation are not compensable or reimbursable by the Port Authority.

9. ADDITIONAL INFORMATION

The following additional information may help guide Respondents in the information submission process:

A. The Port Authority is undertaking this Request for Information to understand the marketplace and has not established a timeline or budget to move forward with implementation at this time.
B. The Port Authority is currently fulfilling the operational needs germane to this RFI with staff and skilled laborers, without the use of robots or artificial intelligence, as indicated in the "Project Summary" section of this document.
C. The Port Authority is open to ideas from Respondents regarding software needs/compatibilities for use in regards to this RFI and encourage Respondents to present complete solutions in their submissions, including software suggestions.
D. The Port Authority encourages prospective respondents from any geographic location, without restriction.
E. Respondents are free to provide images (diagrams, pictures, etc.) if such items assist in explaining or clarifying the solution(s) and is relevant to Section 4 entitled "Goals and Objectives of this RFI."