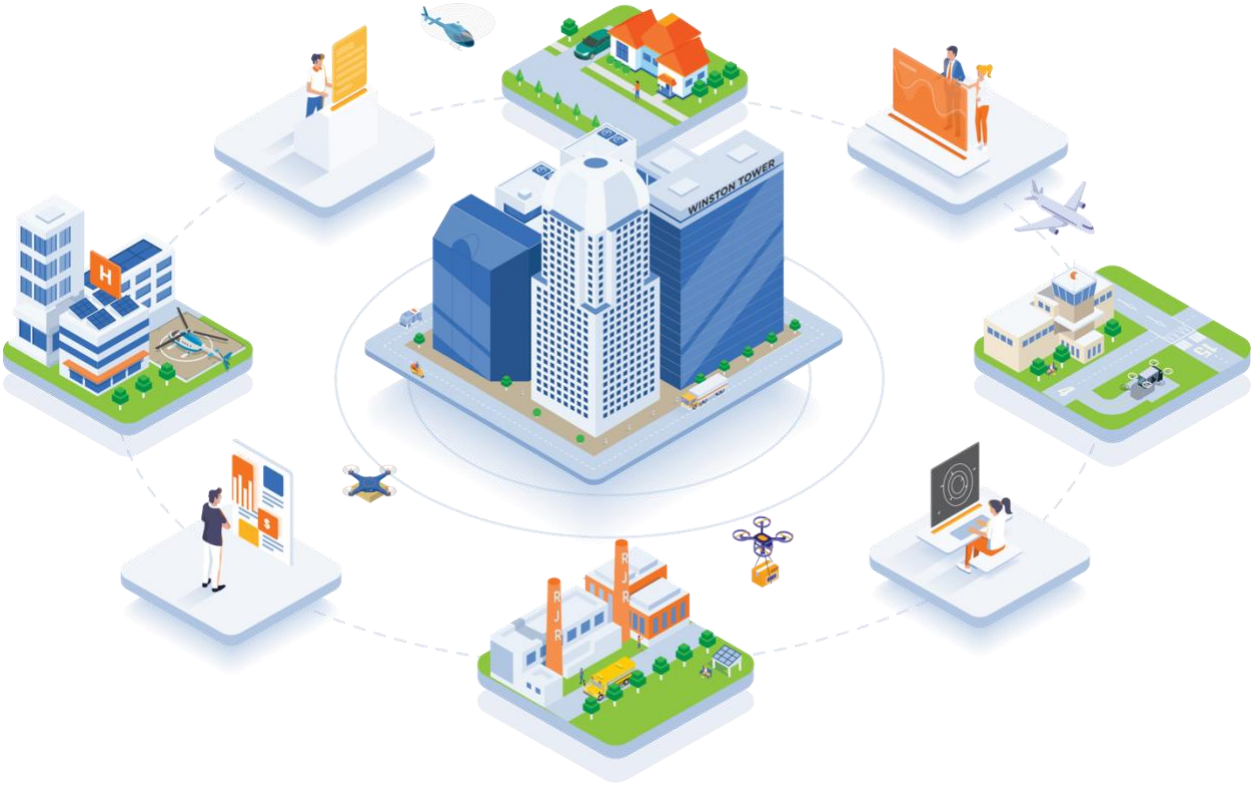
AEROX

NEXT IN FLIGHT



Market Survey/Request for Information For Air Traffic Low-Altitude Surveillance (ATLAS)

May 11, 2022

Table of Contents

Table of Contents 2

1 Announcement/Posting 3

2 Purpose 4

3 Background 4

North Carolina General Assembly Direction 4

Air Traffic Low Altitude Surveillance (ATLAS) 4

Timeline 5

4 Concept of Operations 5

5 Area of Operations 7

Operational Volume 7

6 Specifications 9

Overall System 9

Surveillance System Requirements 9

7 Responses from Vendors 10

Submission Requirements 10

Projected Schedule of Events 11

Industry Day 11

AeroX Point of Contact 11

Company Points of Contact 11

Submission 11

Closing Date 12

Additional Information 12

1 Announcement/Posting

Market Survey/ Request for Information (RFI) for Air Traffic Low-Altitude Surveillance (ATLAS)

This is a public announcement from AeroX, a North Carolina non-profit corporation, to inform industry that AeroX is seeking the commercial availability of a Ground Based Surveillance System(s) (GBSS) for low-altitude aircraft surveillance to enable Unmanned Aircraft System (UAS) Beyond Visual Line of Sight (BVLOS) operations in North Carolina. AeroX may consider awarding multiple contracts in the case that more than one candidate is determined to be qualified.

Potential vendors are advised that:

- This is not a Request for Proposals (RFP);
- AeroX is not seeking or accepting unsolicited proposals;
- AeroX will not pay for any information received or costs incurred in preparing the response to the Market Survey/ RFI;
- Any costs associated with responding to this Market Survey/ RFI are incurred solely at the Potential party's expense;
- AeroX, at its sole discretion, may contact one, some, all, or none of the respondents to the Market Survey/ RFI and ask for additional information; no formal evaluation of the vendor responses will occur and vendor participation in any informational session is not a promise for future business with AeroX;
- This is a developmental project; therefore, should AeroX elect to conduct business with a vendor, the requirements will be finalized based on the Operational Concept and desired system capabilities identified in the Specifications section of this document, as well as the requirements of AeroX;
- AeroX will host an industry day in Winston-Salem to respond to industry questions and provide a demonstration of a UAS medical package delivery operation; and
- Any proprietary information submitted must be adequately marked as proprietary and will be protected accordingly.

2 Purpose

This announcement is to conduct a Market Survey/ RFI for the purpose of soliciting statements of interest and capabilities from interested vendors, for AeroX to identify companies that meet the minimum requirements stated herein, in order to determine the method and type of procurement competition – full and open; limited; or sole source. This is not a Request for Proposals (RFP) of any kind. This Market Survey/ RFI does not commit AeroX to any future acquisition activity.

The GBSS for low-altitude aircraft surveillance proposed in response to this announcement must be capable of providing targeted surveillance coverage at low altitudes within the stated area of operation, for non-cooperative aircraft. Additionally, scalability and adaptability to accommodate varying UAS mission profiles are essential attributes required of these proposed solutions.

The purpose of this Market Survey/ RFI is to:

1. Inform industry of AeroX's intent to implement and evaluate a GBSS for low-altitude aircraft surveillance that could result in future acquisition of one or more systems;
2. Survey the marketplace to assess the level of interest and capabilities among qualified providers of the required services; and
3. Responses to this Market Survey/ RFI may result in a release of an RFP, or other contractual agreement with the vendor within 60 days of this announcement.

3 Background

AeroX is a nonprofit organization of business, government, and community partners focused on facilitating the safe and efficient commercialization of Advanced Air Mobility (AAM) technologies in North Carolina. It aims to capitalize on North Carolina's prominence as a UAS innovation leader by creating a national model ecosystem for AAM, a testbed for pioneering companies seeking to leverage these emerging technologies to grow their organizations. AeroX is headquartered in Winston-Salem, found within Forsyth County, North Carolina.

North Carolina General Assembly Direction

The 2021 North Carolina General Assembly (NCGA) awarded AeroX a $5 million grant to design and develop an urban advanced air mobility system in North Carolina. This award was directed to AeroX with the understanding that the lessons learned from the implementation of this system in Winston-Salem and Forsyth County would be shared and replicated in other cities and regions throughout the state, strengthening North Carolina's position as a leader in UAS.

Air Traffic Low Altitude Surveillance (ATLAS)

In 2022, AeroX initiated Project ATLAS to establish a GBSS in the Winston-Salem region with the intention of providing critical low-altitude surveillance of non-cooperative aircraft to UAS operators who are seeking BVLOS operational approval from the FAA. AeroX will build on the foundational work from NASA, FAA, and standards bodies including ASTM and RTCA.

AeroX is aligned with both industry and FAA with an end goal to enable repeatable, scalable, and economically viable BVLOS operations with an emphasis on package delivery, infrastructure inspection, and public safety.

Timeline

The following is a tentative timeline for Project ATLAS:

- RFI – May 11, 2022
- Industry Day – May 24-25, 2022
- RFP – July 1, 2022
- Acquisition – September 2022
- Installation – Q4 2022
- Validation and Testing – Q4 2022
- Operational – Q1 2023

4 Concept of Operations

Under Project ATLAS, AeroX is looking to acquire a GBSS for low-altitude aircraft surveillance to enable UAS BVLOS operations that could be implemented using industry-developed Commercial-Off-the-Shelf (COTS) products without the need for substantial modification or engineering.

This system will provide non-cooperative aircraft surveillance data to accomplish three goals:

1. Supply UAS operators with critical surveillance data to obtain FAA approval to operate BVLOS under Part 107, Part 135, and other authorizations;
2. Allow UAS manufacturers, sensors manufacturers, and UAS operators to validate on-ship Detect and Avoid (DAA) systems by using the surveillance data provided by AeroX as a truth source; and
3. Capture and archive non-cooperative aircraft tracks for regional AAM forecasting and planning.

The solutions proposed in response to this Market Survey/ RFI must be capable of providing targeted surveillance capabilities for all aircraft operating within the specified area of operations. Scalability and adaptability to accommodate varying UAS mission profiles are essential attributes required of these proposed solutions. Additionally, in response to this solicitation, the respondent must provide evidence that the system(s) proposed, meet the requirements specified in Section 6.

Project ATLAS will focus on beginning and expanding the following use cases that will benefit from BVLOS operations:

- **Medical and Retail Package Delivery** – Forsyth County is home to two large healthcare institutions that pioneered the use of UAS to enhance medical logistics within their healthcare systems. It is also home to multiple retail stores that have partnered with UAS operators for package delivery operations. All have partnered with UAS operators who currently operate under Part 135 or pursuing Part 135 certification.

- **Infrastructure Inspection** – “Drone-in-a-box” used for infrastructure and site monitoring has gained market traction. Several organizations with a presence in Forsyth County are interested in starting these operations, including operating the UAS from a remote location and with no one on-site.

- **Public Safety** - Public safety agencies have benefited from using UAS to augment their missions. Public safety agencies within Forsyth County are interested in a Drone as First Responder (DFR) program.

AeroX intends to acquire and install a suite of weather sensors to provide current and predicted weather conditions to UAS operators. Although it is not a requirement of the surveillance solution that this RFI focuses on, any weather sensing capability provided by the surveillance sensors should be used to integrate with and enhance the overall quality of the weather data that AeroX intends to provide.

AeroX intends to use the suite of technologies and systems to serve as a Supplemental Data Service Provider (SDSP), as described in FAA’s UTM CONOPs, and provide low-altitude surveillance data to both UAS operators and UAS Service Suppliers (USS).

5 Area of Operations

The solutions proposed in response to this Market Survey/ RFI must provide targeted surveillance capabilities for all aircraft operating within the specified area of operations. RTCA DO-381 defines GBSS airspace volumes, including operation volume, declaration volume, and surveillance volume.

Operational Volume

The following Operational Volume (OV) captures many active and proposed UAS operations addressing different markets. The OV is defined as a 6 SM radius of a point at 36° 5'18.54"N / 80°16'5.21"W, extending from 200’ AGL to 2,000’ AGL.

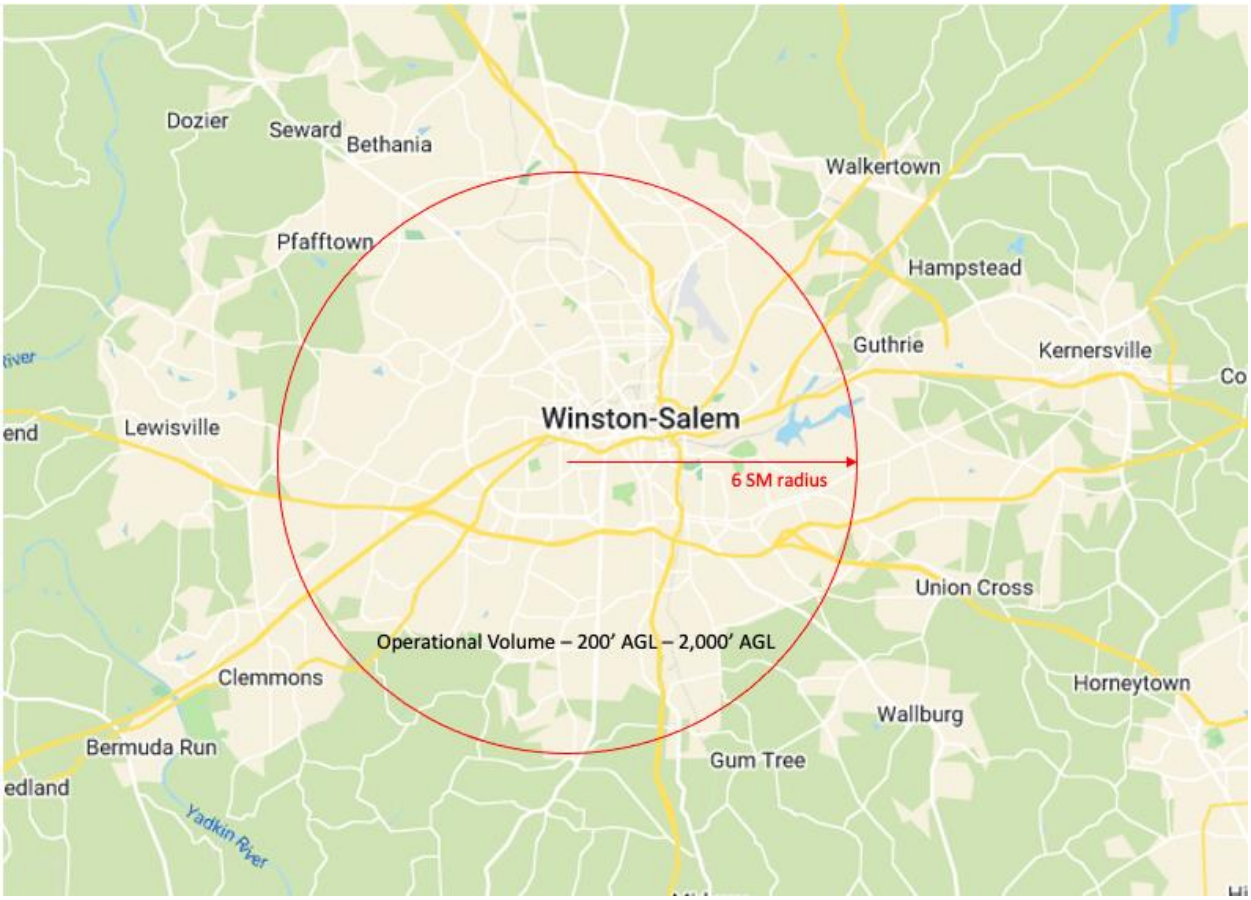


Figure 1. Operational Volume

This OV is defined as an urban environment and includes the city of Winston-Salem and part of the surrounding metropolitan area. The city has a population of close to 250,000, making it the fifth most populous city in North Carolina. The Winston-Salem metro area is home to close to 680,000 and is the fourth largest metropolitan area in North Carolina.

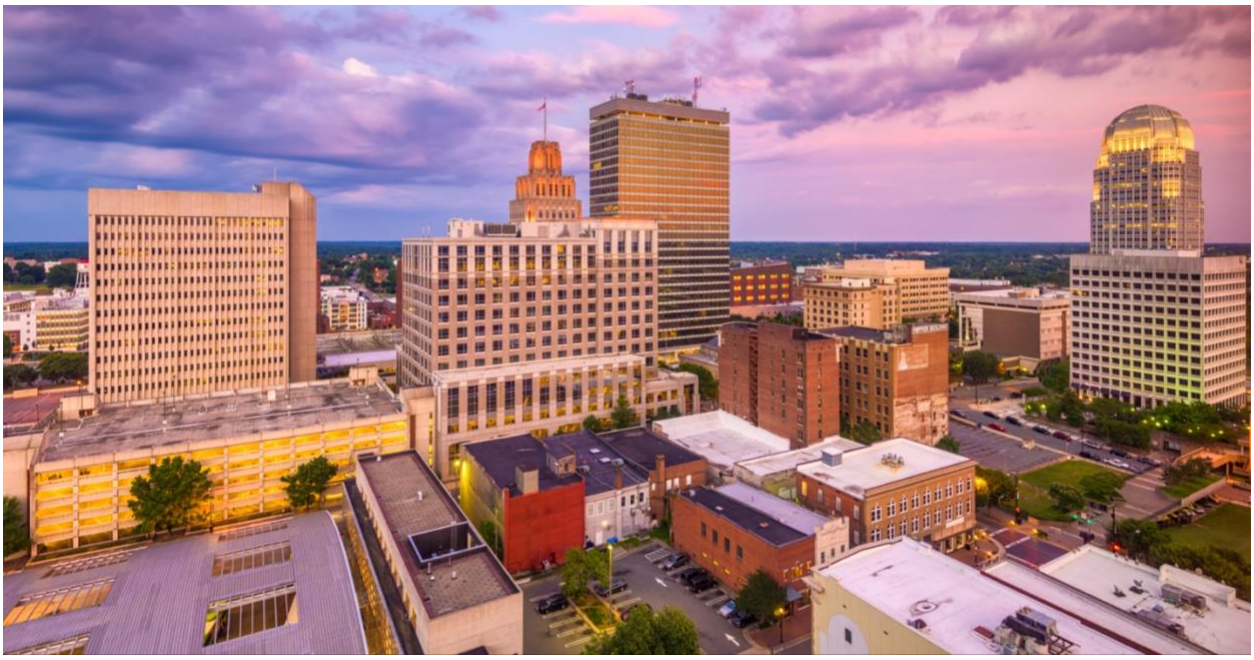


Figure 2. View of downtown Winston-Salem

The OV includes office buildings as high as 460’ AGL, two helipads located at hospitals (not depicted on a sectional chart), and Class D airspace surrounding Smith-Reynolds Airport (KINT).

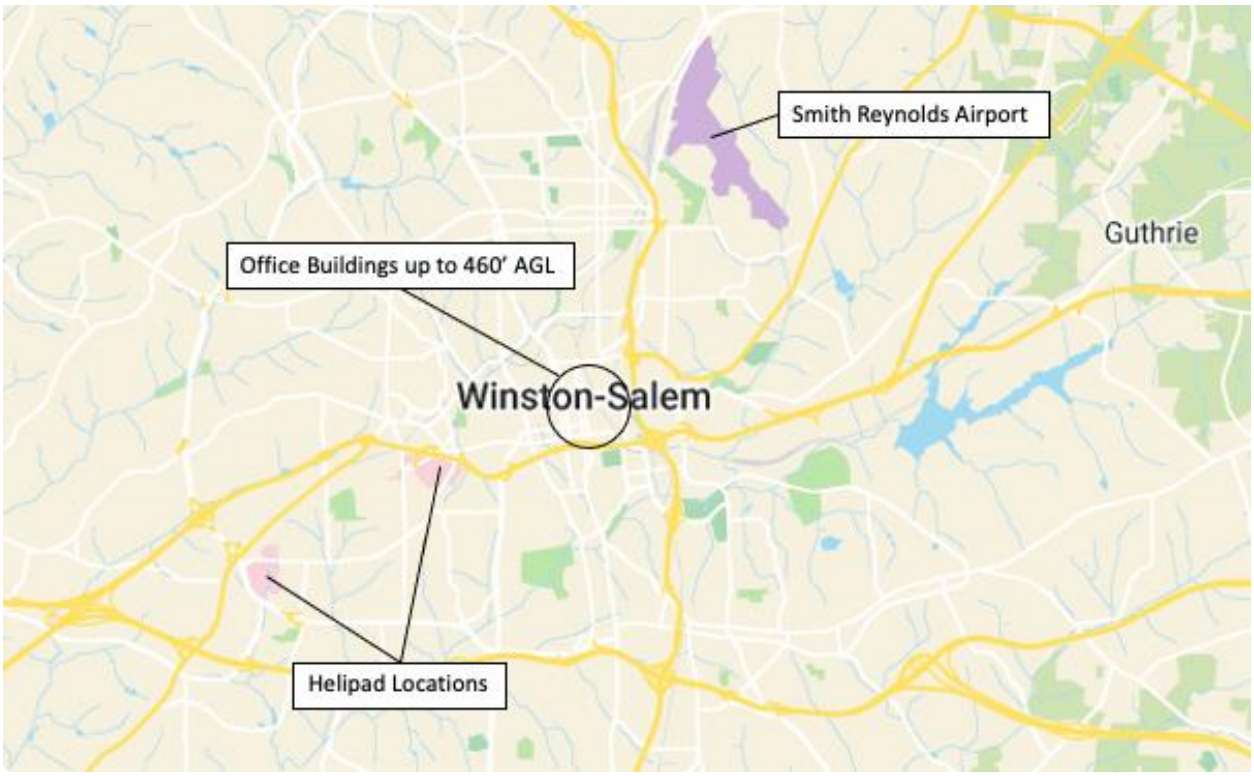


Figure 3. Areas of interest within the OV

Additional Reference Points

- Well Fargo Building 460’ AGL - 36° 5'42.98"N / 80°14'38.31"W
- Atrium Forest Baptist Hospital Helipad - 36° 5'25.46"N / 80°16'14.64"W
- NOVANT Hospital Helipad - 36° 4'39.67"N / 80°17'47.63"W
- Smith Reynolds Airport Reference Point (ARP) - 36° 8'1.20"N / 80°13'19.20"W

6 Specifications

The following are the minimum requirements for the desired Air Traffic Low Altitude Surveillance (ATLAS) concept. Final requirements for the system will be solidified prior to AeroX entering into an agreement with a vendor.

Overall System

1. The system must provide primary, non-cooperative surveillance. The system may also use cooperative surveillance technologies to augment the non-cooperative surveillance.
2. The system design must be independent and employ open architecture principles to support integration with other systems. Interfaces between system components/architectural elements must be specified and documented through an Interface Control Document (ICD).
3. The system must be scalable and adaptable in order to support future needs.
4. The system must use commercial, standardized protocols for any interfaces implemented for information exchange.
5. The system must work and provide usable surveillance in all environmental and low visibility conditions where operations continue to be conducted; including but not limited to rain, snow, fog, wind, hail, sleet, dusk, dawn, day, and night.
6. The system must provide an engineering/maintenance display that shows target and track data.
7. The system must not require the addition of avionics for any purpose.

Surveillance System Requirements

1. The Ground Based Surveillance System (GBSS) proposed must meet the Minimum Operational Performance Standards (MOPS) specified in RTCA DO-381 (ver. Dated March 26, 2020) for the operational volume specified in Section 5 of this document, titled “Area of Operations”
2. The system must be able to integrate available ADS-B surveillance data from equipped targets and provide a fused target that correlates surveillance from the non-cooperative surveillance with the ADS-B data.
3. The system must provide location of a target using Latitude, Longitude, Absolute Altitude (LLA) within the Area of Operation depicted in the Section 5 of this document in All Purpose Structured Eurocontrol Surveillance Information Exchange (ASTERIX) message format specifications.
4. The system must automatically initialize and begin operation within 15 minutes of startup.

5. The system must operate in accordance with all requirements without the need for manual adjustments once optimized.
6. The system must maintain the target and track update rate under wind loading conditions of up to 85 knots.
7. The system must monitor operational status and key system performance parameters, and provide a "System Health" dashboard for viewing these parameters.
8. The system must log and timestamp operational status changes of the overall system.
9. The system must log and timestamp operational status changes of the system sensors.
10. The system must log and timestamp changes to key system performance parameters.
11. The system must preserve logs for a minimum of 26 weeks to a maximum of 52 weeks.
12. The system must meet all requirements in any fog conditions.
13. The system Mean Time Between Failures (MTBF) must be greater than or equal to 2,376 hours (99 days).
14. The system Intrinsic Mean Time to Repair (MTTR) must be less than or equal to 24 hours.
15. The system operational availability must be greater than or equal to 0.99.
16. The system must provide a Maintenance and Engineering (M&E) display for viewing system logs and troubleshooting system anomalies.

7 Responses from Vendors

Responses to this Market Survey/ RFI will be used for informational purposes only and must not be construed as a commitment or a promise to contract with AeroX. The response should not exceed 15 pages in length, which excludes any attachments. Submissions should be in Times New Roman, Font 12, with one inch margins on the top and bottom of each page. Each page of the submission is to be numbered. The electronic submission must be in PDF format. Facsimile submissions or oral submission will not be acceptable.

Responses must be received by the President, Basil Yap, by email at byap@ncaerox.com, with "Project ATLAS RFI Submission" in the subject line, no later than 5:00 PM Eastern Time on June 10, 2022. Late submissions will not be accepted.

All communications with the President must be in writing.

Submission Requirements

- The respondent must provide clear evidence to support all the technical performance requirements specified in section 6, titled "System Capabilities".
- Responses must articulate the surveillance concept, and must address and describe the science, technology, or engineering behind their proposed system.
- Respondents must provide a detailed description of the system including, but not limited to current product specifications. The system must be installation-ready within a period of nine months from the publication of this announcement.

- Respondents must provide a past performance write-up that demonstrates capability and results in programs that involved substantially similar size, scope, and complexity that will be required to provide the services described in the Scope of Work and are currently ongoing or were recently completed. For these purposes, the following definitions apply:
    - Recently Completed or Ongoing Programs – ongoing programs must have completed a minimum of 12 months of performance and completed programs must have ended not later than three years prior to the date of proposal submission
- Scope – each Program must have performed (or be performing) a substantially similar nature of work to that described in the Scope of Work, Respondents must demonstrate knowledge and past performance of systems in support of the FAA's Safety Risk Management process, which would allow for certification of BVLOS UAS operations.
- Respondents must provide a cost estimate of the proposed system.

Projected Schedule of Events

The following are important dates specific to this RFI:

- Release of Market Survey/ RFI 05/11/22
- AeroX Industry Day in Winston-Salem 05/24-05/25/22
- Respondent's response to Market Survey/ RFI 06/10/22

Industry Day

AeroX will host an industry day in Winston-Salem to respond to industry questions, allow respondents to view the coverage area, and view a routine UAS medical package delivery operation. Please RSVP for Industry Day at the link below.

- Project ATLAS Industry Day RSVP Link

AeroX Point of Contact

All inquiries regarding this Market Survey/RFI must be in writing to AeroX at byap@ncaerox.com with "Project ATLAS RFI" in the subject line.

Company Points of Contact

For informational purposes, respondents must include a Point of Contact(s) with phone number(s), email address, and mailing address.

Submission

Respondents must provide clear evidence of how their solution would satisfy AeroX's need as expressed in the Concept of Operations and System Capabilities sections. Responses containing only company brochures, catalogs or other types of generic information will not be considered as a response to this Market Survey/ RFI.

Submission Format	**Email Address**	**Subject Line**
Electronic submission	byap@ncaerox.com	Project ATLAS RFI Submission

Closing Date

All responses to this Market Survey/ RFI must be submitted to the above points of contact no later than 5:00 p.m. (EDT) on 06/10/22.

Additional Information

This announcement is not intended to guarantee procurement of the services, and shall not be construed as a commitment by AeroX to enter into a contract. Companies are advised that subcontracting/consulting/teaming arrangements are acceptable.

AeroX is not liable for costs associated with the preparation, submittal of inquiries, or responses for this announcement and will not reimburse any firm for costs incurred in responding to this announcement.

END OF ANNOUNCEMENT