National Aeronautics and Space Administration
Ames Research Center
Moffett Field, California 94035-1000

Justification for Other than Full and Open Competition

[FAR 6.303-2(a)(1)]

Summary Information:

Initiating Office:	NASA Ames Research Center Aviation Systems Division (Code AFH)
Purchase Request No.:	4200306126
Procurement Title:	Research: *MEFISTO–Modeling Environmental Factors in Surface Traffic Optimization*
Total Estimated Value:	FOIA Exemption 5
Period of Performance:	October 1, 2009, through September 30, 2010
Statutory Authority: [FAR 6.303-2(a)(4)]	10 USC 2304(c)(1), *Only One Responsible Source and No Other Supplies or Services Will Satisfy Agency Requirements*

This Justification for Other than Full and Open Competition (JOFOC) has been prepared in accordance with the requirements of Federal Acquisition Regulation (FAR) 6.303 and NASA FAR Supplement (NFS) 1806.303.

Detailed Information:

A. Nature and/or description of the action being approved. [FAR 6.303-2(a)(2)]

NASA Ames Research Center (ARC) proposes to negotiate a sole-source contract modification with Metron Aviation, Inc., to extend the period of performance of contract NNA07BB40C for one year and increase its value to reflect current work requirements.

This contract modification is for the continuation of the effort to develop techniques to ensure that all relevant environmental constraints and mitigation options are considered in the surface traffic planning and optimization process through the work of the current contract for services for the Modeling Environmental Factors in Surface Traffic Optimization (MEFISTO) project, which is being completed under the Airspace Systems Program and the Next Generation Air Transportation Systems Program (NextGen) Airportal Project. This effort is unique and time critical and is needed by NASA to meet impending milestones of the Airportal Project related to integration requirements of a NASA simulation environment. The proposed work will also contribute to NASA Aeronautics Research Mission Directorate (ARMD)-mandated efforts toward environmentally responsible aviation.

This extension is for the continued provision of the highly specialized services currently provided for under contract NNA07BB40C, which was competitively awarded to Metron Aviation, Inc., under a NASA Research Announcement (NRA) for MEFISTO for the Airspace Systems NextGen Airportal Project. This effort has been underway for nearly two years, and includes the development of an environmental planner that is innovative and unique to NASA's needs.

The extension is needed to enhance the current contract tasks, including further development and improvement of the environmental planner algorithms, which will allow for more efficient airport operations, and completion of a more developed "clean-sheet" study of the environmental planner system. The work is also required to include algorithm and system integration efforts.

B. Description of the supplies or services required to meet the agency's needs (including estimated value). [FAR 6.303-2(a)(3)]

The current contract has a firm fixed price of $1,129,551.95 with the period of performance of September 25. 2007, through September 30, 2009. This acquisition is for an additional 12 months, extending the period of performance to the end of September 2010, with an estimated increase in value of FOIA Ex. 5. The total contract value with this increase will be FOIA Exemption 5. In accordance with FAR 6.303-2(a)(7), the NASA contracting officer has made a determination that the anticipated cost to the Government will be fair and reasonable and has provided certification on the signature page.

This extension will require continued algorithm development and interface requirements necessary for NASA's integrated simulation system. A test scenario for the integrated simulation system and the results of both a clean-sheet-paper study and benefit analysis will also be required.

The following are descriptions of the required services under the proposed contract modification:

1. Link the taxi route/schedule algorithm to the high-fidelity schedule algorithm.

In work under the current NRA contract, the development of two algorithms for taxi optimization was completed, and the current demonstration uses the algorithms independently. There is likely to be benefit in linking the algorithms so that the route/schedule algorithm develops routes with coarse-grained timing, and the high-fidelity schedule algorithm uses these as inputs to refine the timing. This two-stage planning would be addressed in this task as shown in the revised Statement of Work.

2. Enhance the treatment of environmental mitigation to include aspects of surface/terminal planning beyond taxi planning.

In work under the current NRA contract, demonstration is limited to taxi operations. With results emerging from other efforts regarding overall surface optimization, it will now be possible to expand the scope of the planning problems addressed from an environmental perspective. This should include one element upstream from the taxi process itself, as well as one element downstream from the taxi process. This will have the effect of broadening the environmental scope, particularly with regard to aircraft noise associated with the initial (or final) airborne segments. Noise remains a strong community concern, even in the face of increased concerns related to greenhouse gases and local air quality.

3. Estimate benefits of the above via experiments using ASDE-X data.

A benefits analysis continued from the current NRA contract will include the extensions discussed above, as well as the changed environment as efforts move toward use of NASA's simulation testbed. Also, an expansion of the number of scenarios will be included in the analysis by increasing the number of days sampled, considering additional traffic levels, and altering fleet composition to reflect possible changes in aircraft characteristics, particularly environmental performance.

4. Perform experiments at the simulation testbed, and support analysis and evaluation of these experiments.

In the current NRA contract effort, work is being conducted in a stand-alone fashion for the technology demonstration of the environmental planner. With the maturation of NASA's surface simulation testbed, interaction with NASA components (baseline plan generator, situation display, etc.), for more realistic and broader demonstrations, will be plausible.

5. Enhance the "cleansheet" airport design.

In the current NRA contract work, a "cleansheet" airport design was performed independently of developments in the environmental-planning and optimization domains. Requirements for the proposed award will consider the synergies that may be possible between the futuristic airport design and improved environmental planning/optimization.

C. An identification of the statutory authority permitting other than full and open competition. [FAR 6.303-2(a)(4)]

The statutory authority is 10 USC 2304(c)(1), *Only One Responsible Source and No Other Supplies or Services Will Satisfy Agency Requirements*.

D. Demonstration of the proposed contractor's unique qualification or the nature of the acquisition requires use of the authority cited. [FAR 6.303-2(a)(5)]

In accordance with FAR 6.302-1(a)(2)(iii), for DoD, NASA, and the Coast Guard, services may be deemed to be available only from the original source in the case of follow-on contracts for the continued provision of highly specialized services when it is likely that award to any other source would result in substantial duplication of cost to the Government that is not expected to be recovered through competition, or unacceptable delays in fulfilling the agency's requirements.

Metron Aviation, Inc., is currently under contract to provide NASA with an environmental planner that will be essential in future air traffic management research. Through this highly specialized work, the organization offers a concept not available to the Government in the mitigation strategies offered in its environmental planner. [See FAR 6.302-1(a)(2)(i).] The work to be provided in this extension is a continuation of the work performed by Metron Aviation, Inc., in its current NRA contract with NASA.

The following descriptions characterize the highly specialized work currently being performed:

Characterization of Environmental Constraints

* Survey of Emerging Practice – Reviewed emerging practice in the U.S. and Europe regarding environmental constraints on aviation. This provided essential background for understanding how these constraints may evolve throughout NextGen development and implementation.

* Next Generation Systems – Identified the principal environmentally relevant operational improvements in the U.S. NextGen and European SESAR programs. This fostered understanding of the system-level context within which the environmental aspects of surface and terminal optimization are likely to occur.

* Metrics and Goals - Described the principal metrics associated with fuel efficiency, local air-quality emissions, noise, and water. Discussed possible environmental-management goals in these areas, since the goals will influence the nature and magnitude of the environmental constraints for surface and terminal operations.

* Fairness Considerations – Described basic approaches to fairness in current resource-allocation procedures in the U.S. TFM system. This provided context for issues that will arise in allocation of limited surface/terminal resources as environmental constraints are applied.

* Valuation of Environmental Impacts – Described the valuation of environmental impacts in order to show how this factor may influence the nature of environmental constraints on surface/terminal operations. Major valuation techniques were summarized and the implications for surface/terminal environmental constraints were outlined.

* Possible Environmental Constraints – Provided an assessment of the nature and point of application of different environmental constraints in the realm of surface/terminal optimization. This constituted a major input to the underlying technical and architectural issues.

This work exemplifies Metron Aviation's unique qualifications in identifying environmental constraints in current air traffic operations, as well as its ability to characterize those constraints that may become binding in the efforts to complete the goals of the NextGen project.

Metron Aviation's long history of expertise in air traffic environmental needs, coupled with a detailed understanding of surface optimization research undertaken by NASA, provides a unique technical advantage to the Government and the related projects.

Environmental Planner Design

* Concepts and requirements for the environmental planner and interfaces with NASA surface simulation tools were described.

* Techniques to analyze noise/emissions output in near real-time based on data from recent flights were explored.

* Techniques to advise the surface path planner on individual or ensemble constraints to mitigate critical noise and emissions issues were developed.

* Software interface requirements between the environmental planner and the surface path planner were compiled.

The additional 12-month extension to the current contract is necessary to provide continuing coverage of unique—and highly specialized—technical requirements. Attempting to acquire these unique research services competitively, rather than via the sole source extension sought here, would result in a substantial duplication of costs to the Government that would not be recovered. This duplication of costs would include not only those costs associated with competing a separate procurement for the extension period, but also the costs associated with phase-in activities for that contract, which would be necessary to ensure that the new, possibly different, contractor has proper knowledge of work requirements necessary to support ARC's requirements. Hence a contract extension, rather than a new procurement, is the only cost-effective and reasonable approach for NASA to take.

Further, the contract extension is necessary to avoid unacceptable delays to NASA's requirements. If the extension is not approved, program and project milestones and schedules will be impacted. A separate competition and award to, potentially, a different vendor for the extension period would neither be feasible nor reasonable, and the result would necessarily be disruption and unacceptable delays and damage the research being performed in support of this area of the Center's and NASA's mission.

All of the above work is reported and detailed in monthly summary reports received from Metron Aviation, Inc., under the current NRA contract.

E. Description of efforts made to ensure that offers are solicited from as many potential sources as is practicable, including whether a notice was or will be publicized as required by FAR Subpart 5.2 and, if not, which exception under 5.202 applies. [FAR 6.303-2(a)(6)]

This procurement was a selection under NRA NNH06ZEA001N-AP, Airspace Systems Program, NGATS ATM- Airportal Project, Subtopic 1: Modeling of Environmental Constraints in Surface Traffic Optimization. NSPIRES Proposal # 06-AP-06-0010, MEFISTO--Modeling Environmental Factors in Surface Traffic Optimization. The solicitation process was initiated with a notice of Research Opportunities in Aeronautics, which was posted to NSPIRES and Grants.gov on May 23, 2007. A total of 22 proposals from interested potential sources were received.

F. A determination by the contracting officer that the anticipated cost to the Government will be fair and reasonable. [FAR 6.303-2(a)(7)]

The contracting officer's signature on this document indicates that the contracting officer has determined that the anticipated cost to the Government will be fair and reasonable. Prior to execution of the contractual instrument, a proposal analysis will be performed in accordance with FAR 15.404. The proposal analysis will ensure that the final agreed-to price for the contract extension is fair and reasonable. Analysis will include cost and price evaluation techniques. Pre-negotiation objectives will be prepared prior to the initiation of negotiations and will be approved in accordance with FAR 15.406 prior to the conduct of negotiations.

G. Description of the market research conducted and the results or a statement of the reason market research was not conducted. [FAR 6.303-2(a)(8)]

A review of company websites and generally available product literature for industry competitors was conducted within the last three months and revealed that each of the potential contractors lacked sufficient knowledge in all of the required areas of research for this NRA contract, which is being completed under the Airspace Systems Program and the Next Generation Air Transportation Systems Program (NextGen) Airportal Project. These companies lacked either adequate experience in environmental modeling and analysis, applying it in the field of air traffic management, or in integrating environmental modeling systems.

The reviews established that Metron Aviation, Inc., possesses the qualifications and experience in all aspects of environmental impact covering all area of the air traffic realm, from surface operations to en-route operations. These capabilities show that Metron Aviation, Inc., is uniquely able to provide NASA with the needed research, design, and integration services under this contract. Therefore, the Government's needs cannot be sufficiently met by items or services customarily available in the marketplace without creating both significant duplication of costs and significant time delays.

H. Any other facts supporting the use of other than full and open competition. [FAR 6.303-2(a)(9)]

As described above, this performance extension is for the continued provision of highly specialized subject matter expertise and extensive knowledge and experience in the area of environmental analysis in aviation by Metron Aviation, Inc. This is evident in its development of numerous tools and software integration into other models, including the NAS-wide Environmental Impact Model (NASEIM), Noise Integrated Routing System (NIRS), Departure Noise Avoidance Planner (DNAP), Route Optimization for Mitigation Analysis (ROMA), Analysis and Mitigation of Increased Traffic Impacts on the Environment (AMITIE), Emissions and Noise Total Impact Reduction (ENTIRE), Airspace Design Tool (ADT), and the Tool for the Analysis of Separation and Throughput (TASAT).

I. Listing of the sources, if any, that expressed, in writing, an interest in the acquisition. [FAR 6.303-2(a)(10)]

A synopsis of the Government's intent to award this sole source extension was advertised from July 23, 2009, through August 3, 2009. No other source has expressed interest in providing the additional work required by this extension.

J. Statement of the actions, if any, the agency may take to remove or overcome any barriers to competition before any subsequent acquisition for the supplies or services required. [FAR 6.303-2(a)(11)]

The actions NASA may take to remove or overcome any barriers to competition in the future will be an updated definition and competitive procurement of the support required to address this effort. The resulting future acquisition(s) will be competed using full and open competition.

As set forth above, we have determined that only one responsible source and no other supplies or services will satisfy agency requirements. Award to any source other than Metron Aviation, Inc., for this contract extension to NNA07BB40C would result in (A) substantial duplication of cost to the Government that is not expected to be recovered through competition; and (B) unacceptable delays in fulfilling the agency's requirements. Therefore, as set forth above, the Government will issue a sole source contract modification to Metron Aviation, Inc., under the authority of 10 USC 2304(c)(1) and in accordance with FAR 6.303 and NFS 1806.303.

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JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION

PR Initiator:

I certify that the facts presented in this Justification are accurate and complete.

Signature 7/23/09 Date

Contracting Officer: (Approval)

I hereby determine that the anticipated cost to the Government will be fair and reasonable and that this Justification is accurate and complete to the best of my knowledge and belief. Based on the justification and certifications set forth above, I approve the use of other than full and open competition pursuant to the authority of 10 USC 2304(c)(1).

Signature 8/17/09 Date

cc: JAB:241-1 (after approval)