National Transportation Safety Board
Limited Sources Justification (LSJ)

"Vehicle Recorder Laboratory Software Maintenance & Enhancements"

1. **Contracting Activity**
   Office of the Chief Financial Officer (CFO), Acquisition Division (CFO-30)

2. **Program Office/Procurement Request**
   Office of Research and Engineering (RE), Vehicle Recorder Division (RE-40)

3. **Period of Performance**
   Total period of performance is approximately August 25, 2025 through August 24, 2030 including options (one 12-month base year and four 12-month option years). (See description in section 6)

4. **Nature of Action**
   The purpose of this Limited Source Justification (LSJ) is to provide documentation that explains why this specific requirement is to be awarded without competition to General Dynamics Information Technology, Inc. (GDIT) and thereby be considered "only one source is capable of providing the supplies or services required at the level of quality required because the supplies or services are unique or highly specialized" for maintenance and enhancements to the National Transportation Safety Board (NTSB)'s Vehicle Recorder Division's laboratory software in accordance with FAR 8.405-6(a)(1)(i)(B).

5. **Description of Requirement**
   The NTSB's Vehicle Recorder Division extracts, formats, and analyzes data from a wide variety of recording devices, both undamaged and damaged, including: aircraft flight data and cockpit voice recorders; recorders installed in locomotives, large ships, highway vehicles; as well as other electronic devices with non-volatile memory. The Division also examines recorded electronic audio and video information from aircraft, ship, train, support communication systems, and personal electronic devices.

   The Division has been using various custom developed software applications for its multimodal data recovery and analysis tasks. Those applications include Crash Investigation Data Extraction and Readout (CIDER) for Flight Data Recorders (FDRs) and other modal recorders and data; Reveal for binary chip-level data discovery, recovery and analysis; and other data read-out, discovery, recovery, and analysis toolkits; as well as other libraries and tools to support daily investigative work and help manage recorder workflow.

   In 2004, the NTSB initiated the development of the first generation of CIDER software and a competitively awarded contract was later established with GDIT. Since the complete delivery of CIDER in 2007, the NTSB has been using the CIDER software exclusively for the past eighteen years to read and analyze various pieces of information from all types of FDRs. As the Vehicle Recorder Division receives other types of recorder devices from other modes such as rail, CIDER has been expanded as a generic data recovery and analysis tool beyond data recovery for just the FDRs.

In 2011, the NTSB obtained external funding through the Technical Support Working Group (TSWG) of Combatting Terrorism Technology Support Office (CTTSO) for the development efforts of another software tool, Reveal, to aid the discovery and recovery of data recuperated directly from the memory chip of a damaged electronic device. The initial fund was from the TSWG, and the contract was competitively awarded to GDIT. Follow-on effort was funded by the NTSB and awarded to GDIT to continue the work. Since its delivery in 2013, the NTSB has been using the Reveal application to aid in chip-level recovery efforts in the laboratory.

The software needs of the Vehicle Recorder Division continue and change, as the recorder industry, electronic devices and related technologies evolve. The Division must constantly monitor and ensure it has software tools up to date for its investigative work. As with most software applications, these software tools require continuing software maintenance and enhancement efforts, to ensure their capabilities to always meet the Division's needs. This LSJ maintains Crash Investigation Data Extraction and Readout (CIDER) and Reveal software requirements previously awarded on sole source bases under one (1) Blanket Purchase Agreement (BPA) for all of the NTSB Vehicle Recorder Division (RE-40) software maintenance and enhancements support for flight data recorders and other modal recorders data, binary chip-level data discovery, recovery and analysis.

The NTSB has identified the following four (4) Task Areas for software development and support:

1. Task Area 1 – System Maintenance
2. Task Area 2 – New Features and Functionality
3. Task Area 3 – System Enhancements
4. Task Area 4 – Software Quality Assurance

This LSJ is a justification for services in the Task Areas listed above. NTSB intends to issue one (1) BPA issued under GDIT General Services Administration (GSA) schedule contract GS-35F-393CA for one (1) base period of 12 months and four (4) 12-month option years. Individually funded time and materials BPA Orders may be issued under the BPA for services in one (1) or more of the task areas listed above in a given year.

6. Authority Cited

Check applicable FAR Citation:

X	8.401	The acquisition is conducted under the authority of the Multiple-Award Schedule Program.
	8.405-6(a)(1)(i)(A)	An urgent and compelling need exists and following the procedures would result in unacceptable delays.

X	8.405-6(a)(1)(i)(B)	Only one source is capable of providing the supplies or services required at the level of quality required because the supplies or services are unique or highly specialized.
	8.405-6(a)(1)(i)(C)	In the interest of economy and efficiency, the new work is a logical follow-on to an original Federal Supply Schedule order provided that the original order was placed in accordance with the applicable Federal Supply Schedule ordering procedures. The original order or BPA must not have been previously issued under sole-source or limited-sources procedures.
	8.405-6(b)(1)	Items peculiar to one manufacturer. An item peculiar to one manufacturer can be a particular brand name, product, or a feature of a product, peculiar to one manufacturer. A brand name item, whether available on one or more schedule contracts, is an item peculiar to one manufacturer. (1) Brand name specifications shall not be used unless the particular brand name, product, or feature is essential to the Government's requirements, and market research indicates other companies' similar products, or products lacking the particular feature, do not meet, or cannot be modified to meet, the agency's needs.

7. Unique Qualifications/Circumstances of Requirement

System development, enhancements, maintenance as well as new features and functionality were performed for CIDER and Reveal software tools through previous software contracts and BPAs with GDIT in the past twenty years. CIDER alone includes twelve (12) main sections. They are: FDR Software Application, the Incident Database Module and the Project File Management Module, Data Mining Module, the accommodation of a new flight recorder format ARINC-767, Tape Recovery Module, Animation Module, Image Processing Module, Chip Level Recovery Module, Railplus Module, Plotting Module using JFreechart, CSV (comma separated values) File Import Module, and Data Frame Definition (DFD) Module. Reveal is another software tool that has unique binary and custom view capabilities as well as other advanced features for binary data recovery and analysis.

Specific and intimate knowledge of these specialized laboratory software applications, written in Java programming language, is required to ensure the NTSB they are working at an acceptable efficiency and capacity. Furthermore, this extensive familiarity is required to maintain the software, repair programming 'bugs' as they are identified, and to make enhancements. Finally, the NTSB requires a Contractor with an extensive understanding of flight data recorders, chip-level data recovery, and the analysis the NTSB performs of various data, as well as a detailed understanding of the workflow of the recorder specialists.

GDIT is the only known company with the qualifications, skills, and capabilities to perform this requirement. As stated above, GDIT was the Contractor who developed the lab software. As the original developer who has been working with the NTSB for almost twenty years on the application, GDIT has this unique and specific knowledge that is not otherwise offered in the commercial market.

GDIT's role developing, maintaining, and enhancing laboratory software – efforts that the entire agency is dependent on – combined with both the complexity and redundancy of the expected tasks, make them uniquely qualified to continue to provide this support. Selection of a Contractor without such qualifications would, with near certainty, incur additional costs to the Government through added research and development time. GDIT is the only known source capable of providing this unique and highly specialized support at the level of quality required.

GDIT has a unique understanding of the programming language, structure, and nuances of the lab software. In addition, CIDER was developed with Java, Microsoft SQL, RESTful APIs and JFreechart software products. Reveal was also developed with Java. GDIT is Java certified, and their programmers have unique experience in developing the lab software in Java while having an excellent understanding of FDR and binary data recovery and analysis.

GDIT is the only known company with extensive knowledge and understanding of flight recorder data generated from various flight data recorders, and the Division's chip-level data recovery process, an ultimate understanding of the current lab software, and experience/knowledge in Java, Microsoft SQL, RESTful API and JFreechart software products that these software are developed with. The required combination of flight recorder and chip-level recovery understanding, and specific programming/software knowledge is only available from GDIT.

A total of approximately 96,000 hours of software system development, enhancements, maintenance as well as new features and functionality have been performed by GDIT to date. The NTSB requires support for systems that have been extensively customized over twenty years. It is cost prohibitive and inefficient for a different Contractor to learn over 96,000 hours of custom development and the NTSB information technology (IT) environment.

In addition to the cost consequences, there are potentially serious technical consequences to awarding to a Contractor that does not have intimate technical and functional knowledge of these specialized software applications. These proprietary tools are essential to the NTSB Vehicle Recorder Division's daily operation, which includes recorder data and chip-level data recovery and analysis. It is an unacceptable risk to rely on a Contractor that lacks the knowledge or experience necessary to maintain such critical systems for the NTSB.

The absence of obtaining support from a Contractor with the qualifications described above will compromise vital agency operations and have an inherently adverse impact on the NTSB's ability to fulfill its mission. It will also severely limit the ability of the NTSB to perform multimodal data recovery and analysis tasks, binary chip-level data discovery, recovery and analysis; and other data read-out, discovery, recovery, and analysis necessary to comply with its mandate.

8. Efforts to Determine Only One Source

The NTSB staff annually meets with representatives from more than ten (10) international government accident investigative agencies to discuss what tools other agencies use for accident data recovery. In addition, RE staff are active members of government and industry funded domestic and international flight recorder standards groups. Through conversations with this group, no Contractors or schedule holders could be identified as possessing both the unique flight recorder knowledge and the Java programming experience. Market research described in section 11 also confirmed that GDIT is the only responsible source.

9. Contracting Officer's Determination

I have reviewed the information contained in this LSJ, and determined that based on all the information provided, the anticipated cost of any subsequent sole source award would be fair and reasonable and represent the best value to the Government consistent with FAR 8.404(d).

10. Market Research

The NTSB closely monitors flight data recorder companies to ensure we have the capability to read all types of FDRs. The NTSB also stays up to date for its chip-level recovery for all other electronic devices. Through these efforts, the NTSB technical staff have contact with many representatives in a relatively small field of expertise, and through their attendance at conferences and meetings, the NTSB has not identified any other sources or schedule holders with the capabilities to fulfil this requirement.

In addition, the NTSB issued a Sources Sought Notice on the contracting opportunities section of the System for Award Management (www.sam.gov) website for 14 days. All responsible sources were invited to submit a capability statement which would be considered by the NTSB. The NTSB received no responses to this notice. Therefore, the NTSB intends to issue the BPA to GDIT in accordance with FAR 8.405-6(a)(1)(i)(B), only one source is capable of providing the supplies or services required at the level of quality required because the supplies or services are unique or highly specialized.

In accordance with FAR 8.405-6(a)(2)(i), within 14 days of establishing the BPA, a notice of this contract action and LSJ will be posted on the contracting opportunities section of the beta.sam.gov website and the NTSB website for 30 days.

11. Other Pertinent Information

The laboratory software has been developed and maintained over a twenty-year period with GDIT.

12. List of Interested Sources

No other companies/organizations have expressed an interest in this requirement.

13. Efforts to Remove Barriers to Competition

This is a very small niche in programming. For FDR data recovery and analysis, before the development of CIDER, the NTSB and similar safety organizations representing their countries, purchased software licenses for an application called RAPS (Recovery Analysis Presentation System), developed and maintained by FlightScape, a Canadian company. However, this application is not compatible with the CIDER data files and project structure nor do they have the same database backend functionality for shared workload as CIDER. Changing applications would be a major undertaking if there is not an application that is compatible with our existing database, library, and toolsets. For chip-level binary data recovery and analysis, before the development of Reveal, the only tools available to accomplish this type of data recovery and analysis were generic tools designed to perform non-specific hex editing functions which is not a valid alternative to Reveal software functionality. The NTSB will continue to conduct market research to acquire other sources to meet its requirements.

14. Contracting Officer Certification

I certify that the supporting data under my cognizance, which are included in the LSJ, are accurate and complete, to the best of my knowledge and belief.