September 2, 2014

REQUEST FOR INFORMATION

Land Surveying Equipment and Software
RFI #2014-42

ANNOUNCEMENT #3

The RFI #2014-42 Questions and Responses as well as Attachment 1 Description of the NYSDOT Operational Environment are attached to this Announcement #3.

The RFI #2014-42 response due date is September 12, 2014 COB.

Please direct any questions to:
Ms. Barbara Sonenberg, NYSDOT Contract Management Bureau
E-mail: barbara.sonenberg@dot.ny.gov

Sincerely,

Original Signed By Barbara Sonenberg for

WILLIAM A. HOWE
Director,
NYSDOT Contract Management Bureau
Question 1: RFI Page 2, under the section, "The software shall support..." please provide more information on the following bullet: "Processing of Batch files of Coordinate Geometry Commands".
Answer 1: NYSDOT would like to know vendor solutions that include coordinate geometry for making land surveying computations including the entering of record plan engineering data, and land surveying deed descriptions by batch file. For example, being able to type an alignment description or deed description into a text file that includes coordinate geometry commands for locating points by direction and distance, including curves; then storing that as an alignment/figure/or parcel; then being able to import that file into a coordinate geometry program for use in land surveying computations.

Question 2: The term “COTS” is new to us. Are you able to advise if this term indicates that the NYSDOT will acquire the equipment through an outright purchase or will the bid be for a lease of the equipment in the past?
Answer 2: NYSDOT assumes there are commercial off-the-shelf (COTS) solutions that can address its needs but can consider customized configurations to facilitate seamless functionality of survey data collection and processing. This RFI is requesting vendor information on how to possibly finance a solution over the term of any contract.

Question 3: RFI page 1, states: Publish price sheets are requested to be included. Is it mandatory to include published price lists if the supplier has a NYS Contract whereby price lists are part of the contract?
Answer 3: NYSDOT requests published price sheets for major items that are being included in any response. This will help NYSDOT consider costs/benefits in proposed solutions. Even if the supplier has a NYS Contract whereby price lists are part of the contract, it is necessary to include the price lists in this RFI.

Question 4: RFI Page 2, bullet 4, states: “Information provided shall include methods to maintain equipment and software.” Please clarify this item. Does this request include vendor’s responsibility to service, upgrade etc. the equipment and software? Does the NYSDOT require extended warranties for the 5-year period on all equipment and software?
Answer 4: NYSDOT is requesting information on possible solutions that could be provided to best maintain any equipment and software included in a contract. This would include warranty repairs during the contract term.

Question 5: Please provide the Attachment 1 referred to in the RFI (Responses, Bullet 2).
Answer 5: Attachment 1 Description of NYSDOT Operational Environment begins on page 4 of this document.
Question 6: Can you advise if funding has been secured for the RFI (#2006466) GPS Survey Equipment effort? If so, through was source and what amount? If not, what source(s) will be considered?

Answer 6: RFI’s simply seek information to help inform NYDOT’s pre-procurement planning. RFI’s do not have funding.

Question 7: Has it been determined if an RFP will be released for the procurement and when the procurement will take place?

Answer 7: The RFI seeks to garner information to help NYSDOT with its pre-procurement planning. Should NYSDOT make a decision to procure, a best value RFP shall be released some time in the future, and all firms expressing interest in and/or participating in this RFI shall be notified via e-mail regarding the RFP’s release.

Question 8: Who is the vendor for which the state already has a GPS Survey Equipment contract (that expires in 2015)? What is the value of the existing contract?

Answer 8: NYSDOT has a contract #030867 with Leica Geosystems Inc. with a total contract value of $1,758,667.

The contract may be accessed via:
Attachment 1

Operational Environment Description
for the
Highway Oversize / Overweight Credentialing System (HOOCS)
RFP C030786 (circa 11/2013)

Note: Versions may have been updated since publication.

1. NYSDOT Technical Environment

The New York State Department of Transportation (NYSDOT) technical environment is managed by the Office of Information Technology Services (ITS) at the NYSDOT Main Office located on Wolf Road in Albany. The computer hardware and databases used in support of the Highway Oversize Overweight Credentialing System (HOOCS) will be configured to support multiple processing environments that are logically, and in some cases physically, separated. The separation of computing resources is necessary to prevent ongoing development and testing activities from conflicting with one another, or with the production system, and allows the controlled implementation of new functionality and software patches. The NYSDOT technical environment consists of four logical and physical tiers: Development, Test, Quality Assurance, and Production.

1.1 CODE MIGRATION AND TESTING TIERS

1.1.1 Development Tier

The Development Tier is the environment where integrators will develop, modify, and test software code. ITS utilizes the development environment to perform unit testing. Unit testing is the most ‘micro’ scale of testing and validates a particular function or specific section of code. These tests are written and performed by developers, require detailed knowledge of the internal program design, and cover things like statements, branches, conditions and paths. Unit tests should also include the preliminary testing of interfaces (exchanges of data or control) with other systems.

1.1.2 Test Tier

The Test Tier is the environment used for Functionality, User Interface, Security, and (optionally) System Interface testing. Functionality testing is a collaborative effort by developers, testers, and end users, which requires no knowledge of the internal design. It is software testing that evaluates the system's overall compliance with its specified functional requirements and behavior versus the expectations of the customer. Intra-system testing includes:

   **Functionality testing** - Verification that the individual components flow and function effectively as one integrated system.
**User Interface testing** - Verification that the Graphical User Interface (GUI) meets its written specifications, including look and feel ('user-friendliness'), handicap compliance, drop downs, lists of values, validity checking, etc.

**Security testing** - Verification that the system protects data while enabling functionality as intended. The six basic elements that should be addressed, regardless of the method used to implement security are: confidentiality, integrity, authentication, authorization, availability, and non-repudiation.

**Static testing** – The Intra-system test phase is where activities such as desk checks, code reviews, and peer reviews intended to find and fix mistakes should be conducted. Code reviews allow the transfer of knowledge and best practices from the more experienced staff to the less experienced.

**System Interface testing** - System Interface testing seeks to validate the quality of the interfaces between independent systems. This includes all exchanges of data or control and file extracts and/or reports into the system being tested, as well as to all other internal and external systems. System Interface testing may also be performed utilizing the Quality Assurance Tier.

1.1.3 **Quality Assurance Tier**

The Quality Assurance (QA) tier is the environment used for system interface (optionally) and enterprise integration testing comprising Performance, Recovery, and Operational testing.

Enterprise Integration testing validates that all necessary interfaced enterprise services and components will function as designed in the production tier. Enterprise Integration testing includes:

- **Performance testing** - a set of tests (stress, load, etc.) used to determine the stability of the system under a variety of operational conditions, from normal to extreme, often to a breaking point. Performance tests seek to reveal the system’s robustness, availability, and error handling under heavy loads to ensure that the software doesn't crash due to insufficient resources (memory, disk space, number of connections, network capacity, etc.), high concurrency, denial of service attacks and the like. Performance tests are also used to determine the speed or effectiveness of a computer, network, software program, or device.

- **Recovery testing** - the activity of testing how well an application is able to recover from crashes, hardware failures, and other similar problems.

- **Operational testing** - verifies that all enterprise components that were insufficiently tested, or were not tested at all, during prior phases are functioning as intended, including: Citrix, GIS, LDAP or OID, mobile devices, Portal, Tidal, Business Objects, etc.

- **User Acceptance testing** - User acceptance is the point in time when the customer, using as a basis the collective results of prior testing and exposure to the system, acknowledges that the system meets the predefined criteria for that phase and may move to the next phase of an implementation.

- **Regression testing** - Regression testing focuses on finding defects (previously working functionality that has stopped working) after changes to the code or the operating environment have taken place. The extent of testing will depend on the magnitude of the changes.
changes and/or the level of risk to the organization should the software fail. NYSDOT strives to fashion easily repeatable, preferably automated, tests to help streamline regression testing efforts. A sanity test, or sanity check, is a basic type of regression test used to quickly assure that the application or system works as expected.

1.1.4 Production Tier

The Production Tier is the operational environment operational application utilization.

1.2 NYSDOT TECHNICAL ENVIRONMENT ACCESS RULES

Applications that require customization will be installed, customized, and tested in the Development Tier. Fully tested installation and data-migration scripts will need to be provided in order to move applications and data to the Test, Quality Assurance, and Production Tiers.

Commercial applications that do not require customization can be installed in the Test Tier by Consultants. Fully tested installation and data migration scripts will be provided in order to move applications and data to the Quality Assurance and Production Tiers.

1.3 INSTALLATION PACKAGES

NYSDOT requires generic, repeatable installation packages or scripts which contain all necessary application, data-migration scripts that can be run with little or no modification on any application server or database tier. Neither developers nor vendors are granted permission or access to tiers other than development.

Converted data, stored in ASCII text files, must follow standard data-loading procedures. Supported options for Oracle are:

- **Oracle SQL*Loader** - Create an SQL*Loader control file and UNIX shell script to utilize the Oracle SQL*Loader utility for loading the conversion data.

- **Oracle Bulk Load using ‘External Tables’ feature** - Using the ‘External Tables’ feature of Oracle, the conversion data file is treated as though it is a table. Bulk SQL statements, such as “insert into … select * from …” can then be used against these files.

- **Oracle PL/SQL package** - Create custom stored procedures that read converted data and then process and populate the target tables. Advantages of this approach are ease of development, customized yet structured data loading, and excellent error handling capabilities.

And supported options for SQL Server are:

- **SQL Server BCP Import/Export Utility** – A DOS/Powershell/UNIX script that will execute the utility and move large amounts of data into/out of SQL Server.

- **SQL Server Bulk Insert** – Use a TSQL script to load data directly into a SQL table.

- **SQL Server Integration Services (SSIS) package** - Create packages that read the data into the requested tables. This is a pure SQL Server solution that is easily administered, and works seamlessly with the database with regard to creation of the packages, scheduling of runs, as well as error handling and reporting.
The selected process developed must be repeatable in Development, Test, QA, and finally run against Production. Data will not be “migrated” from development or test environments into the production environment.

### 1.4 REQUIREMENTS TRACEABILITY MANAGEMENT/SOFTWARE CONFIGURATION MANAGEMENT

NYSDOT uses Rational V.7 tools to manage the software development lifecycle. The following modules are currently licensed and preferred by NYSDOT:

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<tr>
<th>Tool</th>
<th>Purpose</th>
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<tr>
<td>Team Concert</td>
<td>Change management, defect tracking and software management</td>
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<tr>
<td>Requisition Composer</td>
<td>Requirements management</td>
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<td>Rational Software Architect</td>
<td>Systems modeling</td>
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<td>Quality Manager</td>
<td>Quality Management</td>
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<td>HP LoadRunner</td>
<td>Automated testing</td>
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### 1.5 HARDWARE CONFIGURATION MANAGEMENT/DATA ARCHIVING

The client-side hardware is Intel Pentium 3 or 4 based microprocessors with 2 GB of memory, using a Microsoft Windows XP operating system and Internet Explorer 8 web browser.

The UNIX Application Server environment is a three-tiered architecture of client, mid-tier, and database consisting of:

- **Operating System** – AIX 6.1.3.5, AIX 7.1.0.3, SUSE Linux 11 PL2, Oracle Linux Release 6 Update 3 (6.3) and Oracle VM Release 3.2.1
- **Application Server** – Oracle Application Server 10g (10.1.2/10.1.3.5), Oracle Weblogic Server 11g (10.3.5/6), IBM WebSphere Application Server (latest version available 8.5)
- **Forms and Reports Services** – Oracle 10g Application Server 10.1.2.2

The Windows Application Server environment consists of the following:

- Microsoft Server 2008 R2
- VMWare Vshpere / ESXi : 4.1
- Internet Information Server IIS 6/7/7.5

Note: Support for applications running in a virtual environment is preferred.

The current NYSDOT file-sharing environment is a Microsoft clustered environment using DFS with SAN attached storage.
Client software distribution is accomplished on the NYSDOT network using LANDesk.

1.6 NETWORKS

All network communication is done using the TCP/IP protocol.

For all remote access, web applications run in the DMZ using SSL encryption and application-based authentication, or run through Citrix.

Network Standards:

- Redundant Checkpoint (on Nokia) firewalls
- Redundant Juniper ISG 2000, provide VPN/ firewall, at the Main Office
- Redundant F5 Load Balancing (for External Servers/ Application load balancing)
- Redundant F5 Load Balancing (for Internal Servers/ Application load balancing)
- Cisco switches/routers support the Main Office WAN and LAN
- Juniper Firewall/VPN utilized at remote locations for connectivity and security
- Cisco switch environments support the Regional Office LANs
- Redundant Internet connectivity consists of: 1-100 Mb circuit for Primary use and 1-30Mb circuit for Secondary (Failover).
- Internal client internet access is configured utilizing ISA proxy servers
- Enterprise data center in Albany; network architecture via hub and spoke environment
- 10 Regional offices with 100 Mb WAN connectivity via NYeNET (New York State private network)
- Approximately 300 remote sites throughout the state connected via T1, Broadband, or DSL
- Wireless Air-cards for mobile connectivity

1.7 DATABASE

NYSDOT maintains several commercial relational database management systems (RDBMS), preferred databases are: Oracle 11.2 and SQL Server 2008. NYSDOT supports both online transaction processing (OLTP) and warehouse databases at an enterprise level.

1.8 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

NYSDOT’s GIS software environment is standardized on the Esri suite and currently includes the following components:

- Desktop: Esri ArcGIS Desktop 10.1 running on Windows XP SP2 & Windows 7 operating systems.
- Database: Esri ArcGIS Server (ArcSDE) 9.3.1, Oracle 11g R2 database running on AIX 7.1.
Esri software for NYSDOT is covered by Enterprise License Agreement with Esri and bidders should not include the procurement of Esri software in their cost proposals.

1.9 CUSTOM CODE

NYSDOT supports a variety of programming languages. Those preferred for custom coding include Java, PL/SQL, and Visual Basic

1.10 BACKUP & RECOVERY/DISASTER RECOVERY/BUSINESS CONTINUITY

Oracle - Backup and Recovery of Oracle environments is handled by Oracle's Recovery Manager in conjunction with IBM Tivoli Storage Manager. A combination of full and incremental backups is taken to ensure point-in-time recovery.

SQL Server – ITS has two distinct backup strategies for the SQL Server, simple or full-recovery mode. The backup strategy is dictated by the needs of the application as well as the environment that the application resides in (Development, Test, QA and Production).

- 'Simple' recovery mode - one full backup per day
- 'Full' recovery mode - one full backup per day plus transaction log and differential backups to ensure point-in-time recovery

SQL databases are backed up using the SQL backup utility within Microsoft SQL, which creates a backup file that is then picked up by the Backup Exec runs. Production SQL Server backups are done using the SnapManager for SQL Server tool from NetApp.

- NYSDOT currently utilizes two methods of backups; IBM Tivoli Storage Manager (TSM) and SnapManager for SQL Server (NetApp).

1.11 JOB SCHEDULING

Automated job scheduling at NYSDOT is performed by Tidal Enterprise Scheduler by Cisco. Tidal Enterprise Scheduler v5.3.1 provides the ability to launch and monitor job automation across a wide variety of operating system platforms. NYSDOT currently has Tidal Agents performing automated tasks across NYSDOT's Unix, Window, iSeries, Mainframe, Oracle and Email environments, as well as processing job output from external sources.

1.12 BUSINESS INTELLIGENCE (FOR INFORMATIONAL PURPOSES ONLY)

Core Business Intelligent Tools

- Business Objects Enterprise (Web Intelligence, Universes, and Crystal Reports included)
- OBIEE (ad hoc reporting and dashboards)
- ER Studio (data modeling)
- Oracle Warehouse Builder
- Oracle Portal
- Kimball, Inomon, and Hybrid methodologies of data warehouse design

1.13 SERVICE ORIENTED ARCHITECTURE

NYSDOT is in the process of implementing and extending a Service Oriented Architecture (SOA) solution. This new methodology will allow NYSDOT to improve major business processes, have interoperable services, well-defined business functionalities, and reusable components, while using predefined standards and state-of-the-art tools.