

SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS <small>OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24, & 30</small>				1. REQUISITION NUMBER RCS-Q-2018-00049		PAGE OF 1 45	
2. CONTRACT NO. GS00Q17GWD2110		3. AWARD/ EFFECTIVE DATE 09/30/2019		4. ORDER NUMBER 86615319F00010		5. SOLICITATION NUMBER 86543D18R00012	
						6. SOLICITATION ISSUE DATE 07/16/2018	
7. FOR SOLICITATION INFORMATION CALL:		a. NAME MARIA MARTINEZ		b. TELEPHONE NUMBER (202) 402-2589		8. OFFER DUE DATE/LOCAL TIME	
9. ISSUED BY US DEPARTMENT OF HUD OFFICE OF THE CHIEF PROCUREMENT OFFICER 451 SEVENTH STREET SW ROOM 5256 WASHINGTON DC 20410-1000		CODE HUD-NOI		10. THIS ACQUISITION IS <input type="checkbox"/> UNRESTRICTED OR <input type="checkbox"/> SET ASIDE: % FOR: <input type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> WOMEN-OWNED SMALL BUSINESS <input type="checkbox"/> (WOSB) ELIGIBLE UNDER THE WOMEN-OWNED <input type="checkbox"/> HUBZONE SMALL BUSINESS <input type="checkbox"/> SMALL BUSINESS PROGRAM <input type="checkbox"/> EDWOSB <input type="checkbox"/> SERVICE-DISABLED <input checked="" type="checkbox"/> 8(A) VETERAN-OWNED SMALL BUSINESS NAICS 541511 SIZE STANDARD: \$30.0			
11. DELIVERY FOR FOB DESTINA- TION UNLESS BLOCK IS MARKED <input checked="" type="checkbox"/> SEE SCHEDULE		12. DISCOUNT TERMS NET 30 PROMPT PAY		13a. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700)		13b. RATING	
15. DELIVER TO HUD-Q 451 7TH STREET SW WASHINGTON DC 20410		CODE HUD-Q		16. ADMINISTERED BY US DEPARTMENT OF HUD OFFICE OF THE CHIEF PROCUREMENT OFFICER 451 7TH STREET SW ROOM 5256 WASHINGTON DC 20410-1000		CODE HUD-NOI	
17a. CONTRACTOR/ OFFEROR CLOUD NINE TECHNOLOGIES INC 12606 CAMBERLEY FOREST DR HERNDON VA 20171-1721		CODE 145207101		FACILITY CODE		18a. PAYMENT WILL BE MADE BY ARCASDAPB ARCASDAPB AVERY 3G PO BOX 1328 ACCOUNTSPAYABLEFISCALTREASURYGOV PARKERSBURG WV 26106-1328	
TELEPHONE NO.				18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a UNLESS BLOCK BELOW IS CHECKED <input type="checkbox"/> SEE ADDENDUM			
<input type="checkbox"/> 17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER							
19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES			21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	Tax ID Number: 20-0497260 DUNS Number: Not Available The contractor shall provide development, modernization, enhancement (DME), steady-state operation, and maintenance of HUD's Enterprise Geographical Information System (eGIS) Invoice Approver/COR: HORTON, JERRY Inv Approver/COR Backup1: HARRIS, TERESA Period of Performance: 09/30/2019 to 09/29/2024 Continued ... (Use Reverse and/or Attach Additional Sheets as Necessary)						
25. ACCOUNTING AND APPROPRIATION DATA See schedule						26. TOTAL AWARD AMOUNT (For Govt. Use Only) \$9,998,539.29	
<input type="checkbox"/> 27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4. FAR 52.212-3 AND 52.212-5 ARE ATTACHED. ADDENDA <input checked="" type="checkbox"/> 27b. CONTRACT/PURCHASE ORDER INCORPORATES BY REFERENCE FAR 52.212-4. FAR 52.212-5 IS ATTACHED. ADDENDA						<input type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED. <input checked="" type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED.	
<input checked="" type="checkbox"/> 28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN <u>1</u> COPIES TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED.				<input type="checkbox"/> 29. AWARD OF CONTRACT: _____ OFFER DATED _____ YOUR OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS:			
30a. SIGNATURE OF OFFEROR/CONTRACTOR 				31a. UNITED STATES OF AMERICA (SIGNATURE OF CONTRACTING OFFICER) 			
30b. NAME AND TITLE OF SIGNER (Type or print) Ranjeev Pamnani, President		30c. DATE SIGNED 09/30/2019		31b. NAME OF CONTRACTING OFFICER (Type or print) TERESA A. HARRIS		31c. DATE SIGNED 9/30/19	

Performance Work Statement (PWS) eGIS Support Performance Work Statement

March 16, 2018
Version 4.0

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eGIS Support Performance Work Statement (PWS)

VISION STATEMENT

The Department of Housing and Urban Development, Office of Policy Development and Research (PD&R) and Office of the Chief Information Officer (CIO) require services from a contractor with extensive knowledge of geospatial system development and support to assist with the development, modernization, enhancement, steady-state operation, and maintenance of enterprise class geospatial solutions.

1 GENERAL INFORMATION

1.1 REQUIREMENT

The Department of Housing and Urban Development (HUD), Office of Policy Development and Research (PD&R) and Office of the Chief Information Officer (CIO) require services from a contractor with extensive knowledge of geospatial system development and support to assist with the development, modernization, enhancement, steady-state operation, and maintenance of enterprise class geospatial solutions.

1.1.1 Contract History

The work to be performed under this PWS is a continuation of work performed under two earlier 8(a) set aside contracts directly awarded to VSolvit, Inc., DU100F-13-C-04 and DU100-F-15-C-14. The period of performance on contract DU100F-13-C-04 was 09/30/2013 to 09/29/2015 and the total value of the contract was \$3.73 million. The follow-on contract, DU100F-15-C-14, has a period of performance from 9/30/2015 to 3/29/2018 and original total contract value of \$3.99 million. DU100F-15-C-14 was then modified adding \$390,000 of additional DME funds.

1.2 CURRENT STATE DESCRIPTION OF HUD ENTERPRISE GEOGRAPHICAL INFORMATION SYSTEM (EGIS) ENVIRONMENT

HUD's Enterprise Geographical Information System (eGIS) was created to support the mission and strategic objectives of the Department. It supports several HUD program areas and serves as the primary source for geospatial data, services, and applications for the Department's major offices, including but not limited to the:

- Office of Community Planning and Development (CPD)
- Office of Fair Housing and Equal Opportunity (FHEO)
- Office of Field Policy and Management (FPM)

- Office of Housing
- Office of Public and Indian Housing (PIH)

Since its inception, the number of eGIS business applications has doubled but the annual budget for eGIS Operations and Maintenance (O&M) support declined by approximately 25%. PD&R proposed the reduction because they correctly estimated that improvements in data automation would reduce the O&M data costs. However, they failed to provide any growth factor in O&M to support the out-year costs associated with new development, modernization, and enhancements (DME). Thus, applications, data, and infrastructure are vying for the same pool of resources and thus there are backlogs in all O&M areas

HUD eGIS, known as D77 in HUD's Inventory of Automated Systems (IAS), is comprised of multiple custom applications that leverage a shared physical infrastructure. As of October 1, 2017, there are seven custom applications. The database and services that form the backbone of the eGIS shared infrastructure are known as D77X – Integrated Geodatabase and Map Services (IGDBMS). The infrastructure includes an on-premise implementation of Esri ArcGIS Server 10.2.1 and an enterprise geodatabase hosted in Oracle 12c. The web and application tier of the on-premise solution are hosted on a virtualized Windows 2008 Server platform with Microsoft IIS. The database tier is hosted on a virtualized Linux RedHat 7 platform. In addition to the on-premise server platform, eGIS also maintains a concurrent use license manager supporting 10 Advanced and 13 Basic ArcGIS Desktop licenses including the Spatial Analyst extension. Finally, eGIS includes a subscription to Esri's ArcGIS Online for Organizations. It was anticipated that by the time of award the infrastructure would have been migrated to Esri Managed Cloud Services (EMCS) and the version of ArcGIS Server and Desktop would have been updated to 10.5.1, and the database would be in SQL Server. That migration did not occur as planned. HUD is currently reevaluating Cloud options for eGIS.

eGIS applications are built using a common code base to support modular, reusable application code that follows a common design and user experience for all future applications. The common codebase allows for configurable JavaScript applications wrapped in a .NET multi-tenant architecture and makes extensive use of the ArcGIS JavaScript API.

1.2.1 Custom Applications

The O&M support for these applications includes fixing application breaks, recompiling mobile application code to keep current with mobile operating system (OS) updates, and making other minor updates application code when problems are identified by users or as required to accommodate changes in data.

The custom applications of eGIS are listed here and described in detail below:

- D77D – CPD Maps
- D77E – Tribal Directory Assessment Tool (TDAT)
- D77F – Affirmatively Furthering Fair Housing Data and Mapping Tool (AFFHT)
- D77G – HUD Resource Locator (HRL)
- D77H – Preservation Mapping Tool (PMT)
- D77J – Community Assessment Reporting Tool (CART)
- In Development – Batch Geocoder Pilot

1.2.1.1 D77D – CPD Maps

Available as an external application to the public, CPD Maps supports a regulatory requirement. Under 24 CFR Part 91, jurisdictions are required to undertake a comprehensive planning process known as the Consolidated Plan to identify its community's needs over the next 3 to 5-year period. Annually, jurisdictions then track and report on their progress to address identified needs. The process is meant to be data-driven and place-based. CPD Maps is one of the tools provided to jurisdictions to assist with this planning process. Through mapping current grant activities, local housing market and economic data, Census data, and other data sources, CPD Maps offers a large amount of data in a way that is easy to access. The website allows grantees and the general public to easily search, query, and display information to identify trends and analyze the needs of their community. In addition to updated U.S. Census data, CPD Maps also includes data sets that highlight the accomplishments and results of HUD programs by displaying Community Development Block Grant (CDBG), HOME Investment Partnerships Program (HOME), and other HUD-funded community assets. As grantees gain a deeper understanding of their affordable housing and community development needs, they will be better able to set priorities, target resources, and track outcomes.

CPD Maps is tightly integrated with the CPD's grant management system, the Integrated Disbursement & Information System (IDIS). When HUD grantees initiate a Consolidated Plan in IDIS, required data elements are automatically populated from the GIS database. When a grantee wants to include a map from CPD Maps in their Consolidated Plan, an automated interface stores the map created in CPD Maps in the IDIS database. Finally, an automated nightly process extracts, transforms and loads data from IDIS on completed grantee activities into geospatial data for display in CPD Maps and other downstream eGIS applications. These workflows are subject to modification based on upgrades to either system.

Currently, CPD Maps is the oldest application in eGIS, does not use the eGIS common code base, and is not Section 508 compliant.

1.2.1.2 D77E – Tribal Directory Assessment Tool (TDAT)

Available as an external application to the public, TDAT supports a regulatory requirement. Under Section 106 of the National Historic Preservation Act of 1966, HUD provides a tool that identifies tribes, appropriate tribal contract information, and appropriate geographic areas of current and ancestral interest. TDAT links tribes' areas of interest down to the county level. It lists names and contact information for tribal leaders and Tribal Historic Preservation Officers (THPOs). Users can query the database by street address, county, state, and tribe. Information generated from TDAT can be exported in spreadsheet format for use in other programs. TDAT was designed to help users quickly identify tribes and provide appropriate tribal contact information to assist with initiating Section 106 consultation.

The TDAT application uses the eGIS common code base, is Section 508 compliant and is documented per CIO policy.

1.2.1.3 D77F – Affirmatively Furthering Fair Housing Data and Mapping Tool (AFFHT)

Available as an external application to the public, AFFHT supports a regulatory requirement. AFFHT plays a critical role in helping HUD and its program participants achieve the goals of the updated Affirmatively Furthering Fair Housing (AFFH) Rule. Under AFFH Rule, all formula grant recipients—state and local governments and public housing authorities (PHAs)—have an obligation to complete an

assessment of fair housing (AFH) using a HUD-provided template, data and guidance. The AFFHT allows HUD program participants, HUD staff and members of the public to generate maps and reports that have been designed to support each component of the assessment template. Program participants have the additional option to access the same maps and reports through the AFFHT User Interface (AFFHUI or D77U) which is the system that program participant's use to complete and submit their AFH. Data and maps flows seamlessly between these two systems via an API built specifically for this purpose.

The AFFHT application uses the eGIS common code base, is Section 508 compliant and is documented per CIO policy.

1.2.1.4 D77G – HUD Resource Locator (HRL)

Available as an external or a mobile application from the Apple iTunes and Google Play Marketplace, HUD Resource Locator puts the user in touch with HUD field offices, affordable housing property management companies, and public housing authority representatives to answer housing availability inquiries and general housing questions. The HUD Resource Locator is a mobile app and mobile website that includes information about commonly requested housing-related resources from HUD field and regional offices throughout the country; Location data and contact information for HUD Field and Regional Offices, Public Housing Authorities, Multifamily Housing, Low Income Housing Tax Credit apartments, USDA Rural Housing, Homeless client referral contacts; Maps seamlessly linked via Facebook, Twitter, Google+, email, and text messages; Uses GIS and Browser Location Detection to show local resources; Export search results to Excel; and generate a custom portable document format (PDF) resource guide. The HUD Resource Locator helps further expand and enhance traditional HUD customer service by offering HUD housing information at the fingertips of people looking to quickly connect with building managers, public housing authority representatives, and property management companies to inquire about housing availability and other housing-related questions.

Currently, the HRL application uses the eGIS common code base, is Section 508 compliant and is documented per CIO policy.

1.2.1.5 D77H – Preservation Mapping Tool (PMT)

Available as internal application to HUD Staff, the Preservation Mapping Tool (PMT) provides program staff with information about all remaining mortgage maturities scheduled to occur over the next 25-year period. The tool provides visibility on the location of legacy HUD properties relative to each other: whether they are clustered in one or two regions of the country, or if they are scattered in various locations across all fifty states. Output generated by the tool's reporting functionality can be customized by the user allowing staff in the Office of Recapitalization to supplement plans for affordable housing preservation outreach and technical assistance on a year-to-year basis.

Currently, the PMT application is internal only, uses the eGIS common code base, is Section 508 compliant and is documented per CIO policy.

1.2.1.6 D77J – Community Assessment Reporting Tool (CART)

Available as an external application CART is a reference tool designed by the US Department of Housing and Urban Development to display HUD's major investments in communities across the United States. Using the search bar, a user can enter a name of a City, County, Metropolitan Statistical Area or State to see many of HUD's investments or use the Advanced Search for more options. CART can easily generate reports in PDF and Excel.

The information provided in this tool is based on HUD's administrative systems and Census data. The funding and expenditure data portrayed in this tool may be estimated due to the limitation of available data on place of performance in HUD Administrative Systems or to the fact that community boundaries do not necessarily align with HUD program jurisdictions. Additionally, the information provided in CART is not intended to be a comprehensive accounting of all HUD programs and/or grants administered within a community. Rather it is HUD's intent to focus on the programs that make up most of HUD's budget. For a more detailed list of programs, a user can contact their local HUD office.

Currently, the CART application uses the eGIS common code base, is minimally Section 508 compliant and is documented per CIO policy.

1.2.1.7 In Development – Batch Geocoder

Available as internal application to HUD Staff, the Batch Geocoder Tool allows staff to upload their input files with address information to HUD's enterprise Geocoding Service Center (GSC) and receive back (via email) an updated excel file containing the original input data and a robust set of census and postal attributes (e.g., census block census tract, county, Congressional District, metropolitan area, ZIP+6, address deliverability, postal vacancy status, latitude and longitude, address and geocoding data quality. Any data set that has address information can be geocoded to create new value-added information. This information can be combined with other data sets across HUD program areas or from other agencies.

Currently, the Batch Geocoder application is only available in the eGIS Development environment, uses the eGIS common code base, is not Section 508 compliant and is not documented per CIO policy.

1.2.2 eGIS Storefront on ArcGIS Online

HUD maintains a subscription to ESRI's ArcGIS Online (AGO) for Organizations, which is a Software as a Service (SaaS) solution. The ArcGIS Online service provides HUD staff with a platform for making and sharing online, interactive maps and applications. HUD also uses the Open Data component of ArcGIS Online to host data services and APIs in support of the agency's Open Data initiatives. HUD's implementation of the ArcGIS Online Open Data component is embedded in another website called the eGIS Storefront (<https://egis.hud.gov>) which serves as a one-stop shop for eGIS data and applications. Currently, HUD is using in-house program staff to manage content and access to the ArcGIS Online environment. HUD's ArcGIS Online subscription level allows for 250 named users. HUD's ArcGIS Online administrator performs set up and configuration of users and groups, provides technical support to the user base, monitors usage, curates public galleries to feature high-quality content, and maintains approximately 70 hosted feature services that are published from the on-premise eGIS geodatabase.

1.2.3 D77X – Integrated Geodatabase and Map Services (IGDBMS)

The IGDBMS (D77X) is the backbone of HUD's eGIS, providing the agency with a shared geospatial infrastructure beginning with an enterprise geospatial database, or geodatabase. The D77X enterprise geodatabase is the primary source for geospatial data across the agency. It stores HUD program data, as well as demographic, socioeconomic, and housing statistical data relevant to HUD's programs. These data are spatially-enabled and ready for geospatial analysis and mapping. The enterprise geodatabase also stores metadata associated with each data set, describing the content, date of publication, and other important information. The primary mechanism for the dissemination of these geospatial data is a service-oriented architecture that allows for the publication of these data through web-enabled map

services and geoprocessing services. In addition to providing data over the internet and intranet, these services also encapsulate business functions that can be reused across the agency. Finally, the IGDBMS also includes the physical and virtual server infrastructure that provides the capabilities to host all eGIS data, services, and applications. The enterprise geodatabase is implemented with Oracle 12c and ESRI's ArcSDE 10.2.1 software. The map services are delivered by ESRI's ArcGIS Server 10.2.1. The web and application tier of the on-premise solution are hosted on a virtualized Windows 2008 Server platform with Microsoft IIS. The database tier is hosted on a virtualized Linux RedHat 7 platform. In addition to the on-premise server platform, eGIS also maintains a concurrent use license manager supporting 10 Advanced and 13 Basic ArcGIS Desktop licenses including the Spatial Analyst extension. Finally, eGIS includes a subscription to Esri's ArcGIS Online for Organizations. .

1.2.4 eGIS Python Library

The eGIS Python Library is a collection of tools and scripts required to publish data, associated metadata, and services to the D77X – IGDBMS. All tools and scripts are written in Python (currently version 2.7) or ArcPy (version corresponding to the version of ArcGIS Server installed). In order to maintain continuity of operations, each tool and script includes comments and instructions for successful use. The comments and instructions provide sufficient information to allow HUD Staff to execute the scripts.

1.2.5 Application Shells in Apple iTunes and Google Play Marketplace

HUD provides app store applications to facilitate access to the HUD Resource Locator by allowing the responsive application to be accessed from within in the app store app. This supplement's the user's choice of accessing the application via a web browser and provides a short cut on the mobile device.

1.3 CONSTRAINTS

The services identified in this PWS will adhere to the rules, regulations, laws, standards, and conventions identified by HUD as well as within the Federal Government. Constraints include the following:

Document Number	Title & URL	Released	Mandatory/ Advisory
44 USC §3541 et seq.	Federal Information Security Management Act (FISMA, supersedes the Computer Security Act of 1987)	2002	M
	http://www.gpo.gov/fdsys/pkg/USCODE-2008-title44/pdf/USCODE-2008-title44-chap35-subchapIII.pdf		
44 USC §3601 et seq.	E-Government Act of 2002	2002	M
	http://www.gpo.gov/fdsys/pkg/USCODE-2010-title44/pdf/USCODE-2010-title44-chap36.pdf		
Pub. L. 104-106, 40 USC §1401 et seq.	Information Technology Management Reform Act of 1996 (Clinger-Cohen Act)	1996	M
	http://www.gpo.gov/fdsys/pkg/USCODE-1998-title40/pdf/USCODE-1998-title40-chap25.pdf		
Pub. L. 105-277 (112 STAT. 2681-749-751), 44 USC §3504	Government Paperwork Elimination Act	1998	M
	http://www.gpo.gov/fdsys/pkg/PLAW-105publ277/pdf/PLAW-105publ277.pdf http://www.gpo.gov/fdsys/pkg/USCODE-2008-title44/pdf/USCODE-2008-title44-chap35-subchapI-sec3504.pdf		

Document Number	Title & URL	Released	Mandatory/ Advisory
OMB Circular A-16 Revised	Coordination of Geographic Information and Related Spatial Data Activities	Latest version	M
	https://www.whitehouse.gov/omb/circulars_a016_rev		
OMB Circular A-130	Security of Federal Automated Information Resources (Appendix III)	Latest version	M
	https://www.whitehouse.gov/omb/circulars_default#numerical		
OMB Circular A-130	Management of Federal Information Resources	Latest version	M
	https://www.whitehouse.gov/omb/circulars_default#numerical		
OMB Circular A-130	Security of Federal Automated Information Resources (Appendix III) (see also 34 FR 6428)	Latest version	M
	https://www.whitehouse.gov/omb/circulars_default#numerical		
OMB Memorandum 99-20	Security of Federal Automated Information Resources	1999	M
	https://www.whitehouse.gov/omb/circulars_default#numerical		
OMB Memorandum 06-16	Protection of Sensitive Agency Information	2006	M
	https://www.whitehouse.gov/omb/circulars_default#numerical		
OMB Memorandum 06-20	Reporting Instructions for the Federal Information Security Act and Agency Privacy Management	2006	M
	https://www.whitehouse.gov/omb/circulars_default#numerical		
NIST Special Publication 500-267	A Profile for IPv6 in the U.S. Government – Version 1.0	2008	M
NIST Special Publication 800-14, Series	Generally Accepted Principles and Practices for Securing Information Technology Systems	Latest Version	M
	http://csrc.nist.gov/publications/PubsSPs.html		
NIST Special Publication 800-18, Series	Guide for Developing Security Plans for Federal Information Systems	Latest Version	A
	http://csrc.nist.gov/publications/PubsSPs.html		
NIST Special Publication 800-30, Series	Guide for Conducting Risk Assessments	Latest Version	M
	http://csrc.nist.gov/publications/PubsSPs.html		
NIST Special Publication 800-34, Series	Contingency Planning Guide for Information Technology Systems	Latest Version	M
	http://csrc.nist.gov/publications/PubsSPs.html		
NIST Special Publication 800-35, Series	Guide to Information Technology Security Services	Latest Version	M
	http://csrc.nist.gov/publications/PubsSPs.html		
NIST Special Publication 800-37, Series	Guide for the Security Certification and Accreditation of Federal Information Systems	Latest Version	M
	http://csrc.nist.gov/publications/PubsSPs.html		
NIST Special Publication 800-47, Series	Security Guide for Interconnecting Information Technology Systems	Latest Version	A
	http://csrc.nist.gov/publications/PubsSPs.html		
	Security and Privacy Controls for Federal Information Systems and Organizations	Latest Version	A

Document Number	Title & URL	Released	Mandatory/ Advisory
NIST Special Publication 800-53, Series	http://csrc.nist.gov/publications/PubsSPs.html		
NIST Special Publication 800-53A, Series	Guide for Assessing the Security Controls in Federal Information Systems and Organizations http://csrc.nist.gov/publications/PubsSPs.html	Latest Version	A
NIST Special Publication 800-55, Series	Performance Measurement Guide for Information Security http://csrc.nist.gov/publications/PubsSPs.html	Latest Version	A
NIST Special Publication 800-60, Series	Guide for Mapping Types of Information and Information Systems to Security Categories (Appendices) http://csrc.nist.gov/publications/PubsSPs.html	Latest Version	A
NIST Special Publication 800-64, Series	Security Considerations in the Information System Development Life Cycle http://csrc.nist.gov/publications/PubsSPs.html	Latest Version	A
NIST Special Publication 800-84, Series	Guide to Test, Training and Exercise Programs for IT Plans and Capabilities http://csrc.nist.gov/publications/PubsSPs.html	Latest Version	M
NIST Special Publication 800-119	Guidelines for the Secure Deployment of IPv6	2010	M
HUD Handbook 2400.25	Information Technology Security Policy http://portal.hud.gov/hudportal/documents/huddoc?id=240025CIOH.pdf	Latest Version	M
HUD Handbook 3255.1	Enterprise Architecture Policy http://portal.hud.gov/hudportal/documents/huddoc?id=32551CIOH.pdf	Latest Version	M
Pub. L. 105-220, 29 USC 701 et seq.	Section 508 of the Rehabilitation Act of 1998	1998	M
OMB Circular A-16	Office of Management and Budget (OMB) Circular A-16, "Coordination of Geographic Information and Related Spatial Data Activities," and supplemental guidance https://www.whitehouse.gov/omb/circulars_a016_rev	2010	M

1.4 DESCRIPTION OF SERVICES

The Contractor shall provide all personnel, equipment, supplies, facilities, transportation, tools, materials, supervision and other items and non-personal services necessary to the services as defined in section 5 except for those items specified as Government furnished property and services described in section 3. The Contractor shall perform services in support of eGIS including Operations and Maintenance (O&M), Program Management, and Development, Modernization, and Enhancement (DME).

1.5 NON-PERSONAL SERVICES

The Government will neither supervise Contractor employees nor control the method by which the Contractor performs the required tasks. Under no circumstances shall the Government assign tasks to, or prepare work schedules for, individual Contractor employees. It shall be the responsibility of the Contractor to manage its employees and to guard against any actions that are of the nature of personal services, or give the perception of personal services.

If the Contractor believes that any actions constitute, or are perceived to constitute personal services, it shall be the Contractor's responsibility to notify the Contracting Officer (CO) immediately. These services shall not be used to perform work of a policy, decision making, or management nature, i.e. inherently Government functions. All decisions relative to programs supported by the Contractor shall be the sole responsibility of the Government.

1.6 PERIOD OF PERFORMANCE

The Period of Performance shall be for one base period of 12 months and four 12-month option years.

1.7 PLACE OF PERFORMANCE

The services to be performed under this contract shall be performed at the Contractor's facility.

1.8 HOURS OF OPERATION

The Contractor is responsible for providing services between the hours of between the hours of 8 am and 8 pm ET, Monday thru Friday except for Federal holidays or when the Government facility is closed due to local or national emergencies, administrative closing, or similar Government directed facility closings. Weekly hours shall not exceed a forty (40) hour work week and a typical work day will be 8 hours each day Monday through Friday. The Government reserves the right to change hours of operation or restrict contractor access. Work outside of these daily hours is prohibited without Contracting Officer approval. Government agencies will not be available during scheduled holidays, inclement weather, weekends, and after duty hours.

The Contractor shall at all times maintain an adequate workforce for the uninterrupted performance of all tasks defined within the contract when the Government facility is not closed for the above reasons. When hiring personnel, the Contractor shall keep in mind that the stability and continuity of the workforce is essential.

1.9 SPECIAL QUALIFICATIONS

The Contractor shall maintain Capability Maturity Model Integration (CMMI) certification Level III or equivalent and maintain a business partnership with Esri during the execution of this contract.

The Contractor shall have a history of supporting an enterprise GIS program of similar size and scope. A similarly sized program would have an annual budget of \$1-5million. A similarly scoped program would program support: more than one application or program area utilizing the JavaScript API for ArcGIS Server; provides GIS data, services, and capabilities in a shared service or platform; provides automated data and geoprocessing with Python (ArcPy); and the entire Esri software suite. The history shall

demonstrate mature web based GIS service support using the entire Esri ArcGIS software suit to translate production data into geospatial capabilities for operations and decision support.

1.10 POST AWARD/KICKOFF CONFERENCE

The Contractor shall attend any post award conference convened by the contracting activity or contract administration office in accordance with FAR Subpart 42.5. The Government intends to convene a Post Award Conference with the Contractor within ten business days after contract award. The Contracting Officer will notify the Contractor of the specific date, location, and agenda within five business days after contract award.

1.11 STATUS MEETINGS

The Contracting Officer (CO), Contracting Officer's Representative (COR) and other Government personnel, as appropriate may meet periodically with the Contractor to also review Contractor performance, requirement status, etc. At these meetings, the Contracting Officer will apprise the Contractor of how the Government views the Contractor's performance or progress of the requirement. The Contractor will apprise the Government of problems, if any, being experienced. Appropriate action shall be taken to resolve outstanding issues. These meetings shall be at no additional cost to the Government. Post Award Conference and subsequent meetings may be held via teleconference.

1.12 CONTRACTOR TRAVEL

No Contractor travel is anticipated during the performance period of this contract.

1.13 TRANSITION IN

The Contractor shall, upon the Contracting Officer's written notice, furnish Transition-In services as required. As a successor, the Contractor shall have sufficient personnel on board during the 30-day Transition-In period to ensure a smooth transition with the incumbent Contractor. The Contractor shall provide an orderly transition of work acceptance and accomplishment such that any impact to the program is minimized. During the Transition-In period, the Contractor shall become familiar with the requirements in order to commence full performance of services by the end of the contract Transition-In period. Transition-In is not required if the successor Contractor is the incumbent Contractor.

1.14 TRANSITION OUT

To minimize any decrease in productivity and to prevent possible negative impacts on additional services, the Contractor shall have sufficient personnel on board during the 30-day Transition-Out period. The incumbent Contractor shall ensure a smooth transition with the successor Contractor during the Transition-Out period, prior to completion of contractual performance. The incumbent Contractor shall aid the successor in the development of plans, procedures, and methods for the assumption of all on going work. The Contractor shall provide an orderly transition of work acceptance and accomplishment, such that full control by the successor Contractor is achieved by the end of the new contract Transition-In period.

2 DEFINITIONS AND ACRONYMS

2.1 DEFINITIONS

Business/Work Days – Every official work day of the week which are days between and including Monday to Friday. This does not include public holidays and weekends.

Calendar Day – Any day of the week.

Contractor – A supplier or vendor awarded a contract to provide specific supplies or service to the Government. The term used in this contract refers to the prime.

Contracting Officer (CO) – A person with authority to enter into, administer, and/or terminate contracts and make related determinations and findings on behalf of the Government. Note: the only individual who can legally bind the Government.

Contracting Officers Representative (COR) – An employee of the U.S. Government appointed by the Contracting Officer to perform contract administration activities in regard to technical issues. This individual has authority to provide technical direction to the Contractor as long as direction is within the scope of the contract, does not constitute a change and has no funding implications. This individual does NOT have authority to change the terms and conditions of the contract.

Defective Service – A service output that does not meet the standard of performance associated with the Performance Work Statement.

Deliverable – Anything that can be physically delivered, but may include non-manufactured things such as meeting minutes or reports.

Government Furnished Property (GFP) -- Government-furnished property means property in the possession of, or directly acquired by, the Government and subsequently furnished to the Contractor for performance of a contract. Government-furnished property includes, but is not limited to, spares and property furnished for repair, maintenance, overhaul, or modification. Government-furnished property also includes contractor-acquired property if the contractor-acquired property is a deliverable under a cost contract when accepted by the Government for continued use under the contract.

Performance Requirements Summary (PRS) – A listing of the performance requirements under the contract that are to be evaluated by the Government on a regular basis, performance indicators for these requirements, performance standards for these requirement and surveillance methods to be used to determine if performance standards are met.

Performance Standard – The Contractor's performance level required by the Government.

Performance Work Statement (PWS) – A statement of work for performance based acquisitions that describe the required results in clear, specific and objective terms with measurable outcomes.

Physical Security – Actions that prevent the loss or damage of Government property.

Quality Assurance (QA) – Policies and procedures adopted by the Government to ensure that supplies and services acquired under Government contracts conform to the contracts quality requirements.

Quality Assurance Surveillance Plan (QASP) – A plan describing how the agency will survey, observe, test, sample, evaluate and document the Contractor's performance in meeting critical performance standards identified in the contract.

Quality Control (QC) – All necessary measures taken by the Contractor to assure that the quality of an end product of service shall meet contract requirements.

Service Contract – A contract that directly engages the time and effort of a Contractor whose primary purpose is to perform an identifiable task rather than to furnish an end item of supply.

Subcontractor – Any person, other than the prime Contractor, who offers to furnish or furnishes any supplies, material, equipment, or services of any kind under a prime contract or a subcontract entered into in connection with such prime contract, and any person who offers to furnish or furnishes general supplies to the prime contractor or a higher tier subcontractor. The Government does not have privity of contract with a subcontractor.

Technical Point of Contact (TPOC) – An individual designated by the Contracting Officer to assist in providing technical direction and monitoring performance under the contract.

Work Week – Monday through Friday, unless specified otherwise.

2.2 ACRONYMS

ACS – Census Bureau's American Community Survey

AFFH – Affirmatively Furthering Fair Housing Rule

AFFHT or D77F – Affirmatively Furthering Fair Housing Data and Mapping Tool

AFH – Assessment of Fair Housing

AGO or AGOL – ArcGIS Online

AQL – Acceptable Quality Level

BAS – Census Bureau's Boundary and Annexation Survey

CART or D77J – Community Assessment Reporting Tool

CCMB – Configuration Change Management Board

CDBG Community Development Block Grant

CMMI – Capability Maturity Model Integration

CFO or OCFO – Office of the Chief Financial Officer of HUD

CFR – Code of Federal Regulations

CIO or OCIO – Office of the Chief Information Officer of HUD

CO – Contracting Officer

COR – Contracting Officer Representative

COTS – Commercial Off-the-Shelf

CPD – Office of Community Planning and Development

CPD Maps or D77D – CPD Maps

CPO or OCPO – Office of the Chief Procurement Officer of HUD

CSV – Comma Separated Values
DME – Development, Modernization, and Enhancements
eGIS – HUDs Enterprise Geographical Information System
eGIS CCB – eGIS Change Control Board
EMCS – Esri Managed Cloud Services
EPPM – Enterprise Project and Portfolio Management
ERD – Entity Relation Diagram
ET – Eastern Time (U.S.)
FAI – Federal Acquisition Institute
FAQs – Frequently Asked Question and Answers
FGDC – Federal Geospatial Data Committee
FHEO – Office of Fair Housing and Equal Opportunity
FIPS – Federal Information Processing Standard
FPM or **OFPM** – Office of Field Policy and Management
FTP – File Transfer Protocol
GAO – U.S. General Accounting Office
GIS – Geographic Information System
GSC or **A15** – Geocoding Service Center
GSS – General Support System
HARTS – HUD Application Release Tracking System
HOME – HOME Investment Partnerships Program
HUD – U.S. Department of Housing and Urban Development
HUD@Work – HUDs Intranet Web Site and related WEB pages
HRL or **D77G** – HUD Resource Locator
HUDAR – HUD Acquisition Regulation
HUDPLUS – HUD’s Enterprise Project and Portfolio Management System
IAS – HUDs Inventory of Automated Systems
IDIS – Integrated Disbursement & Information System
IG or **OIG** – Office of Inspector General
IGDBMS -- Integrated Geodatabase and Map Services [for eGIS]
ISO – International Organizations for Standards
ISSO – Information System Security Officer
IT – Information Technology
IT PM – Information Technology Project Manager
IV&V – Independent Validation and Verification
KML – Keyhole Markup Language
MAF/TIGER – Census Bureau's Master Address File / Topologically Integrated Geographic Encoding and Referencing Database
MSA – Metropolitan Statistical Area
MSL – Map Services and Layers
O&M – Operations and Maintenance
OMB – Office of Management and Budget
OS – Operating System
PD&R or **PDR** – Office of Policy Development and Research

PDF – Portable Document Format
PHA – Public Housing Authority
PIH – Office of Public and Indian Housing
PL – Public Law
PMP – Context Specific – Project Management Plan or Project Management Professional (Certification)
PMT or **D77H** – Preservation Mapping Tool
POC – Point of Contact
PMI – Project Management Institute
PPM – Project Planning and Management
PRS – Performance Requirements Summary
PWS – Performance Work Statement
QA – Quality Assurance
QASP – Quality Assurance Surveillance Plan
QC – Quality Control
QCP – Quality Control Plan
SaaS – Software as a Service
SF – Context Specific – Single Family or Standard Form
SME – Subject Matter Expert
SPUFI – SQL Processing Using File Input
TDAT or **D77E** – Tribal Directory Assessment Tool
THPO – Tribal Historic Preservation Officer
TPOC – Technical Point of Contact
TRC – Technical Review Committee
U.S.C. – United States Code
WBS – Work Breakdown Structure

3 GOVERNMENT-FURNISHED PROPERTY AND SERVICES

The Contractor shall ensure accurate control and accountability of all Government-Furnished Property (GFP) in accordance with the terms and conditions of this contract. The Government will furnish, at no cost to the Contractor, the GFP shown below.

3.1 GOVERNMENT SERVICES

No Government services will be provided.

3.2 FACILITIES

No facilities will be provided by the Government.

3.3 EQUIPMENT

PIV Cards will be provided to those Contractor Staff as deemed necessary by the Government.

3.4 MATERIALS

The Government will provide eGIS System and Program Document as well as other documentation necessary to perform the tasks in this contract.

Copies of required materials may be provided to the Contractor in hard copy or soft copy. All materials will remain the property of the Government and will be returned to the COR or Technical Point of Contact (TPOC) upon request or at the end of the contract period.

3.5 QUALITY ASSURANCE (QA)

The Government shall evaluate the Contractor's performance under this contract in accordance with the Quality Assurance Surveillance Plan (QASP). This plan is primarily focused on what the Government must do to ensure that the Contractor has performed in accordance with the performance standards. It defines how the performance standards will be applied, the frequency of surveillance, and the minimum acceptable quality level

4 CONTRACTOR-FURNISHED ITEMS AND SERVICES

The Contractor shall furnish, all facilities, equipment, and supplies required to perform the work under this contract that are not listed under Government-Furnished Property and Services.

4.1 FACILITIES

The Contractor shall furnish, all facilities, equipment, and supplies required to perform the work under this contract that are not listed under Government-Furnished Property and Services.

4.2 EQUIPMENT

The contractor shall furnish all equipment necessary to meet the requirements under this PWS including tools to test the custom software for Section 508 compliance.

4.3 MATERIAL

The Contractor shall furnish, all facilities, equipment, and supplies required to perform the work under this contract that are not listed under Government-Furnished Property and Services.

4.4 CONTRACTOR RESPONSIBILITIES

The Contractor shall only conduct business with designated Government personnel listed as points of contact (POCs). Names of authorized personnel shall be provided to the Contractor by the Government, in writing, and updated as necessary throughout the contract period.

U.S. Government records, copies of original results and reports, verified original data, corrected data and corrected supporting final reports which are maintained by the Contractor remain the property of the U.S. Government. These files/results must be surrendered to the COR.

4.5 CONTRACTOR PERSONNEL

The Contractor shall provide a **Senior Project Manager** who shall be responsible for all aspects of the development and implementation of assigned projects and provides a single point of contact for those projects. The Project Manager shall ensure adherence to quality standards; review project deliverables; provide technical and analytical guidance to project team; recommend actions to direct the analysis and solutions of problems. An alternate shall be designated to act in the absence of the Contract/Project Manager. The Project Manager shall have the following competencies in the resume:

- Demonstrated experience reflecting increasing responsibilities in information systems design or project management with the ability to motivate and lead diverse teams.
- Demonstrated experience taking projects from original concept through final implementation.
- Demonstrated experience developing detailed work plans, schedules, project estimates, and resource plans using MS Project and then using for project tracking and analysis.
- Demonstrated experience conducting project meetings.
- Demonstrated experience in development, modernization, and enhancements for a portfolio of projects for system of similar size and complexity as eGIS
- Demonstrated experience in the use of agile methodologies to produce and deliver fit for-use deliverables.
- Demonstrated experience in operating and maintaining a portfolio of systems applying the necessary steps to transition from development, testing, and handoff to operations and apply continuous improvement strategies to the delivered IT program or project
- Demonstrated experience in Requirements Generation, Analysis and Management as evidenced by the application of requirements management process and activities to an IT project throughout its life-cycle.
- Demonstrated experience in the understanding of information systems and the value of alternative analysis as evidenced by the application of alternative analysis to reduce risk and increase performance while meeting current and future organizational mission, vision, and objectives.
- Demonstrated experience in identifying, managing, and mitigating risks and issues that could prevent the agency from achieving business objectives.
- Current Project Management Professional (PMP) certification from Project Management Institute (PMI), FAC P/PM III from the Federal Acquisition Institute (FAI) or equivalent from the Defense Acquisition Institute.

The Contractor shall provide a **Senior Software Systems Engineer** who shall provide expert guidance on the evaluation of new and existing applications including feasibility analysis on potential future projects and their overall impact on eGIS and may serve as Scrum Master. The Senior Software Systems Engineer shall have the following competencies in the resume:

- Demonstrated experience architecting, managing and optimizing an enterprise GIS of a similar size and complexity as eGIS
- Demonstrated experience providing feasibility analysis on potential future projects.
- Demonstrated experience providing analysis and level of effort necessary to implement change requests.

- Demonstrated experience providing general direction; formulating and defining specifications for complex applications; and modifying and maintaining complex existing applications.
- Demonstrated experience validating requirements, designing, coding, testing, debugging, and documenting custom GIS applications and the underlying databases.
- Competent to work at the highest technical level on all phases of software systems.
- Demonstrated experience evaluating new capabilities of Esri Software and recommending improvements to custom GIS applications to leverage the new Esri capabilities.
- Demonstrated experience using the Agile methodology for software development
- Certification of PMI-ACP, Certified Scrum Master from Scrum Alliance, or equivalent
- Demonstrated experience as a Scrum Master for a portfolio of projects for system of similar size and complexity as eGIS.

The Contractor shall provide an **Application Lead (Senior Software Developer)** who shall be responsible for the application development leading the development team in the design of highly complex software systems and may serve as Scrum Master. The Application Lead shall have the following competencies in the resume:

- Demonstrated experience under general direction, formulating and defining specifications for complex operating software programming applications or modifying and maintaining complex existing GIS applications using engineering releases and utilities from the manufacturer.
- Demonstrated experience validating requirements, designing, coding, testing, debugging, and documenting custom GIS applications.
- Competent to work at this highest technical level on all phases of software systems programming applications.
- Demonstrated experience using the Agile methodology for software development
- Certification of PMI-ACP, Certified Scrum Master from Scrum Alliance, or equivalent
- Demonstrated experience as a Scrum Master for a portfolio of projects for system of similar size and complexity as eGIS.

The Contractor shall provide a **Data Lead (Data Architect)** who shall be responsible for the data solutions. The Data Lead shall translate business needs into long-term architecture solutions and develop strategies for data acquisitions that minimize the level of effort to maintain the data as well as ensuring maximum data quality and reusability of current data for analyses. The Data Lead shall have the following competencies in the resume:

- Demonstrated experience designing, building, updating, and maintaining relational databases.
- Demonstrated experience designing, building, updating, and maintaining geodatabases.
- Demonstrated experience developing strategies for data acquisitions, archive recovery, and implementation of a database.
- Demonstrated experience working in a data warehouse environment, which includes data design, database architecture, metadata and repository creation.
- Demonstrated experience reviewing object and data models as well as metadata repositories to structure data for better management and quicker access.
- Demonstrated expert proficiency with data management, including: extracting data, cleaning, and merging multiple data sets; organizing, sorting and filtering data in order to distinguish

patterns and recognize trends; conducting descriptive analyses based on needs of the project; summarizing complex data to easy to read formats.

- Demonstrated experience working with extraction, transformation and loading of large volumes of data, including automation of batch processes to reduce manual processing needs.
- Demonstrated experience using the American Community Survey and Decennial Census products including the hierarchy of geographic summary levels used by the Census Bureau

These Contractor personnel are considered Key Personnel by the Government and shall be listed as such in accordance with HUDAR 2452.237-70, "Key Personnel. The Contract/Project Manager and alternate shall have full authority to act on all contact matters relating to daily operations of this contract. Accordingly, at a minimum, the points of contact shall have the technical knowledge of the requirement and be in the position to actually receive assignment, guidance, and direction from the COR, TPOC, and CO per HUDAR 2452.237-73, "Conduct of Work and Technical Guidance" and shall be allocated enough hours to the requirement to ensure successful performance. These points of points of contact shall each be an employee of the Contractor. An employee of a subcontractor is not acceptable for any of these positions. The Contract/Project Manager or alternate shall be available between the hours of 8:00am to 8:00pm Monday through Friday ET, except Federal Holidays or when the Government facility is closed for administrative reasons.

4.6 IDENTIFICATION OF CONTRACTOR EMPLOYEES

All Contractor/subcontractor personnel shall wear company picture identification badges as to distinguish themselves from Government employees. When conversing with Government personnel during business meetings, over the telephone, or via electronic mail, Contractor/subcontractor personnel shall identify themselves as such to avoid situations arising where sensitive topics might be better discussed solely between Government employees. Contractors/subcontractors shall identify themselves on any attendance sheet or any coordination documents they may review. Electronic mail signature blocks shall identify their company affiliation. Where practicable, Contractor/subcontractors occupying collocated space with their Government program customer shall identify their work space area with their name and company affiliation, or at a minimum, "Contractor" after name.

4.7 QUALITY CONTROL

The Contractor shall establish and maintain a complete quality control program that shall ensure services are performed in accordance with this contract. The Contractor shall develop and implement procedures to identify, prevent, and ensure non reoccurrence of defective services. The Contractor's quality control program is the means by which he assures himself that his work complies with the requirements of the contract. The Contractor shall provide the associated Quality Control Plan to the Government as directed.

4.7.1 Quality Control Plan (QCP)

The Contractor shall develop, maintain, enforce, and document a Quality Control Plan (QCP). The QCP shall ensure the Government receives the level of quality that is consistent with the requirements specified in this contract. The QCP shall be sufficiently detailed to provide the Contractor's methodology for identifying and recruiting qualified personnel. The QCP shall also provide the Contractor's methodology for resolving problems identified by the Government during reviews conducted in

accordance with its Quality Assurance Surveillance Plan (QASP). The QCP shall also provide the Contractor's methodology for establishing an internal feedback system for support personnel, and for resolving problems identified by that feedback system. The QCP shall demonstrate and validate that the services or deliverables to be provided under the contract are completed with a level of quality that meets the minimum performance threshold established in the Government's QASP. The QCP shall address Quality Management Approach, Quality Assurance, Quality Control and Quality Standards.

5 SPECIFIC TASKS

5.1 GENERAL OPERATIONS AND MAINTENANCE SUPPORT (O&M)

The Contractor shall work close with the appropriate HUD IT and Business Specialists in maintaining the HUD eGIS system components to provide on-going O&M support of the system described above.

Maintenance of hardware is strictly out of scope but that does not mean the contractor will not provide suggestions for maintenance in line with the support provided for the applications being designed and supported for the eGIS team.

If DME projects are approved and completed, the government will enter into a bilateral negotiation to adjust the O&M value for the performance period left and all future options.

5.1.1 O&M Releases of Custom Applications

The Contractor shall perform ten (10) O&M releases for custom applications each year. Each of these releases shall be categorized as “minor” or a “dot release” and is a collection of change requests approved by the eGIS Change Control Board (eGIS CCB). The releases will be selected by the COR or TPOC to meet stakeholder needs.

Most releases typically address slight modifications to existing functionality and resolve bug fixes collected through user feedback covering 10-30 story points capable of being performed in one 2-week development sprint. HUD anticipates that each custom application shall have one O&M release as necessary to maintain the application to current standards and ensure operability as the base Esri software and operating systems of desktops, mobile devices, and servers change.

Other releases could be required due to government-wide (e.g., OMB M-15-13 for HTTPS only) or HUD-wide decisions all systems are required to perform mandatory updates. The Contractor shall plan and execute these upgrades as directed by the COR or TPOC to ensure eGIS continues to meet HUD standards. Due to the shared infrastructure of eGIS, these upgrades may require coordination with the custom application system owners and/or support teams of other systems. All deadlines and the specific requirements required will be provided at the time of request.

The Contractor shall manage all work as well as define, develop, test, and document all releases in accordance with the HUD Agile Project Planning and Management (PPM) processes and templates (currently in development) including the use of configuration management system, i.e., YouTrack or JIRA. As PPM artifacts are modified, the Contractor shall use the modified artifacts in all subsequent development activities. Monthly, the contractor shall update the Documentation Inventory to reflect the current version and date of documents updated as part of an O&M Release. All releases shall be

developed in an Agile manner in accordance with HUD's Agile best practices (currently in development). All releases delivered shall be fully tested (including 508 testing), optimized for performance and resource utilization for HUD's production environment. All releases shall maintain existing system integrity, 508 compliance, error handling, provide for graceful termination of execution for unexpected problems, and not adversely impact other applications running on the HUD production environment.

For each release, the Contractor shall update system PPM documentation. For each release, the Contractor shall migrate software files into HUD's code repository, currently Serena Dimensions under configuration management. For each release, the Contractor shall create a validated release package. Currently, a validated release package containing the following: a HUD Application Release Tracking System (HARTS) Release Form, a HUD Service Desk Ticket, software installation instructions, and software test packages including test scripts and test data for test center personnel.

The Contractor shall coordinate with the HUD testing and infrastructure support contractors to ensure successful release to production. Before the next business day, the Contractor shall verify if the release was successful or not. If not, the Contractor shall also ensure that the application was rolled back to the previous state. The Contractor shall notify the COR, TPOC, and Investment Manager of the results of the installation. The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Performance Standards

- a) Standard: 100% of O&M releases are successfully deployed to production, requiring no roll back.
- AQL: 90% of O&M releases are successfully deployed to production, requiring no roll back.

Deliverables

A001 Updated Software
A002 Updated PPM Documentation
A004 HARTS Release Documentation
A005 HUD Service Desk Ticket
A006 Software Installation Instructions
A007 Software Test Package
A008 Monthly Status Report
A028 Documentation Inventory

5.1.2 Data Management

The Contractor shall provide database and map service administration services for the eGIS system. Table 1 – eGIS Data Sets, contains basic information on the types, quantities, historical level of effort, and the update frequency for key eGIS data and services.

Table 1 – eGIS Data Sets

Data	Abbreviation	Description	Estimated Quantity	Historical Hours per Release	Update Frequency
American Community Survey	ACS	5-Year estimates on various demographic, housing and socioeconomic variables at several geographies	35 feature classes; 32 tables; 9 services	100	Annually
Affirmatively Furthering Fair Housing	AFFHT	Communities will use the AFFHT, in addition to local data and local knowledge, to determine the best strategies for integrating fair housing goals into their existing community development and housing planning processes to expand access to opportunity.	35 feature classes; 12 tables; 11 services	100	Annually
Census TIGER	CEN	Census Bureau TIGER data geographies	23 feature classes; 4 services	80	Annually
Comprehensive Housing Affordability Strategy	CHAS	HUD receives custom tabulations of ACS data from the U.S. Census Bureau.	7 feature classes; 8 tables	80	Annually
HUD Community Assessment Reporting Tool	CART	Allows users to search for HUD investment information at five levels of geography: congressional district, unit of general local government (e.g. city, township), county, Metropolitan Statistical Area (MSA) or state.	33 feature classes; 34 relationship classes; 36 tables; 3 services	160	Annually
HUD Consolidated Planning Grantees	CPD	HUD's Office of Community Planning and Development (CPD) developed the Consolidated Plan to help states and local jurisdictions to assess their affordable housing and community development needs and market conditions, and to make data-driven, place-based investment decisions.	42 feature classes; 64 tables; 13 services	240	Annually
HUD Environmental	ENV	FEMA disaster declarations; Q3 and DFIRM flood zones	5 feature classes; 1 table; 4 services	48	As Needed

Data	Abbreviation	Description	Estimated Quantity	Historical Hours per Release	Update Frequency
HUD Facilities	OFPM	Various HUD facilities, i.e., field offices, field jurisdictions.	4 feature classes; 1 table; 2 services	24	Annually
HUD Multifamily	MF	HUD's Multifamily properties including rental assistance and mortgage insurance programs.	1 feature class; 3 services	8	Quarterly
HUD Preservation Mapping	PMT	Preservation Mapping Tool (PMT) provides program staff with information about all remaining mortgage maturities scheduled to occur over the next 25-year period. The tool provides visibility on the location of legacy HUD properties relative to each other: whether they are clustered in one or two regions of the country, or if they are scattered in various locations across all fifty states.	9 feature classes; 2 tables; 3 services	40	Annually
HUD Public and Indian Housing	PIH	HUD's Multifamily properties and Public and Indian Housing public housing buildings, projects and public housing authorities. Also includes housing choice vouchers. Data includes only rental assistance programs.	6 feature classes, 1 tables, 4 services	40	Quarterly

Data	Abbreviation	Description	Estimated Quantity	Historical Hours per Release	Update Frequency
HUD Resource Locator	HRL	The HUD Resource Locator is a mobile app and mobile website that includes information about commonly requested housing-related resources from HUD field and regional offices throughout the country; Location data and contact information for HUD Field and Regional Offices, Public Housing Authorities, Multifamily Housing, Low Income Housing Tax Credit apartments, USDA Rural Housing, Homeless client referral contacts	9 feature classes; 3 services	24	Quarterly
HUD Single Family	SF	Office of Single FHA Insured in Force, bank owned properties, housing counseling agencies, etc.	9 feature classes, 5 tables; 5 services	40	Quarterly
HUD Signature Programs	SIP	Data representing Presidential Initiatives, i.e, Choice Neighborhoods, Promise Zones, Rental Assistance Demonstration, Community Challenge Grantees	12 feature classes; 10 tables; 3 services	40	Annually
HUD Policy Development and Research	PDR	Includes data not categorized above, i.e. Fair Market Rents, IRS Low Income Housing Tax Credits, USDA Rural Housing programs, etc.	14 feature classes; 7 tables; 3 services	40	Annually
HUD Section 106	TDAT	Tribal Directory Assessment tool data used for Section 106 compliance	9 tables	30	As Needed

5.1.2.1 Update and Maintain eGIS Python Library

The contractor shall update and maintain tools and scripts required to publish data, associated metadata, and RESTful services to IGDBMS (D77X), and the eGIS Storefront on ArcGIS Online. Collectively these tools and scripts shall be known as the eGIS Python Library. Historically, at least one tool (often an ETL script) has required modification during each D77X deployment, using SPUFI or HARTS. To maintain continuity of operations, the Contractor shall write all tools and scripts in the EGIS Python library as stand-alone tools and scripts in Python (currently version 2.7) or ArcPy (version corresponding to the version of ArcGIS Server installed). Each tool and script shall include comments and instructions for successful use. The comments and instructions shall provide sufficient information

to allow HUD Staff to execute the scripts from within the HUD network or other network location without assistance from the contractor. The eGIS Python Library shall be maintained in a mutually agreed upon location that is accessible to both Contractor and HUD Staff. Additionally, the Contractor shall ensure that the most recent version of the eGIS Python Library is checked into a code repository within 5 days of update. The code repository to be used will be identified at time of award. The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Performance Standards

- a) Standard: HUD Staff can successfully run 100% of eGIS Python Library as expected. v
AQL: HUD Staff can successfully run 90% of eGIS Python Library with the remaining 10% needing assistance.

Deliverables

A008 Monthly Status Report

A009 Updated eGIS Python Library

5.1.2.2 Receive and Process Source Data and Metadata

As shown in the table above, the HUD eGIS System consists of data from many Program Offices within the agency and from other agencies and external sources. Currently, HUD data stewards deliver data to the eGIS Program through email, database to database connections and file transfer protocol (FTP) connections. The HUD eGIS Program utilizes file format standards for the email delivery of source data, comma separated values (CSV) and excel, and metadata files, a Word document template.

During the first three months, the Contractor shall implement and then maintain a web-based, automated solution for source data and metadata collection for HUD data stewards to deliver data and metadata to the eGIS Program. The automated solution for source data and metadata shall be data driven, Commercial Off the Shelf (COTS)-based (if possible), visually interactive, and minimize the manual effort needed to maintain the documentation.

Data Stewards shall also be able to edit previously submitted metadata (but not data) using the automated solution. The automated solution shall place the source data in the eGIS folder that will be used by eGIS Python Library script to prepare the data for deployment to production. The automated solution shall store the source metadata in the eGIS system and update the geospatial metadata in the enterprise geodatabase. The contractor shall maintain only the two most recent submissions of source data and metadata in eGIS.

The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Performance Standards

- a) Standard: 100% of HUD Data Stewards, within a calendar year, can use the automated process to successfully submit data and metadata.
AQL: 90% of HUD Data Stewards, within a calendar year, can use the automated process to successfully submit data and metadata.

Deliverables

A008 Monthly Status Report

A010 Source Data and Metadata Captured
A011 Geospatial Metadata Populated
A014 Automated Solution for Source Data and Metadata

5.1.2.3 Prepare Data and Map Services for Deployment to Production

The contractor shall use the eGIS Python Library to update and maintain tools and scripts required to publish data, associated metadata, and RESTful services to the D77X IGDBMS to ArcGIS Online (AGO) where they is shared via the eGIS Storefront. In addition to data sets listed in Table 1 above, HUD publishes data in support of its Open Data effort that may not be related to any custom application. The Contractor shall prepare no more than 10 open data sets per year for deployment to production and eGIS Storefront.

The Contractor shall run all new versions of the source data against the Python tools and load them into their respective target feature classes and tables in a development environment. The Contractor shall perform validation and verification on all data loaded and all map services in a development environment. HUD will provide an inventory list of all data items no later than one (1) month in advance for regularly scheduled updates and releases. The Contractor shall manage all data items, map services and data-related tasks in a web-based, agile-driven configuration management system, i.e., YouTrack or JIRA.

The data and map services shall be fully tested, optimized for performance and resource utilization for the eGIS system to maintain existing system integrity and error handling, and not adversely impact other applications running on the eGIS production environment; maintain feature classes, tables, and relationship classes among the data; maintain indexes on feature classes and tables; provide for graceful termination of execution and roll back to previous state if unexpected problems are found; maintain map services; and map services and data are tested by the validation and verification of eGIS applications to provide data to the map interface and the interaction of the map using the application tools provided.

As mentioned above, it is expected that the workflow for data for IDIS will be slightly different from current practices. The tasks needed to provide data to IDIS will be provided at time of award.

The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Performance Standards

- a) Standard: 100% of eGIS data and map services are ready for deployment per schedule.
AQL: 90% of eGIS data and map services are ready for deployment per schedule.

Deliverables

A008 Monthly Status Report
A012 Data and Services for Production

5.1.2.3.1 Update Operational Metadata

Before data and map services are deployed to production, the Contractor shall update the operational metadata for all data and services being deployed. Currently, updating the operational metadata is an extremely manual process because the information is maintained in two excel spreadsheets. The

Contractor shall utilize the automated solution for source data and metadata and eGIS Python Library scripts to transform the operational metadata from stand-alone excel files into metadata tables for datasets and map services. Using the automated solution for source data and metadata the Contractor shall update all operational metadata prior to deployment into production.

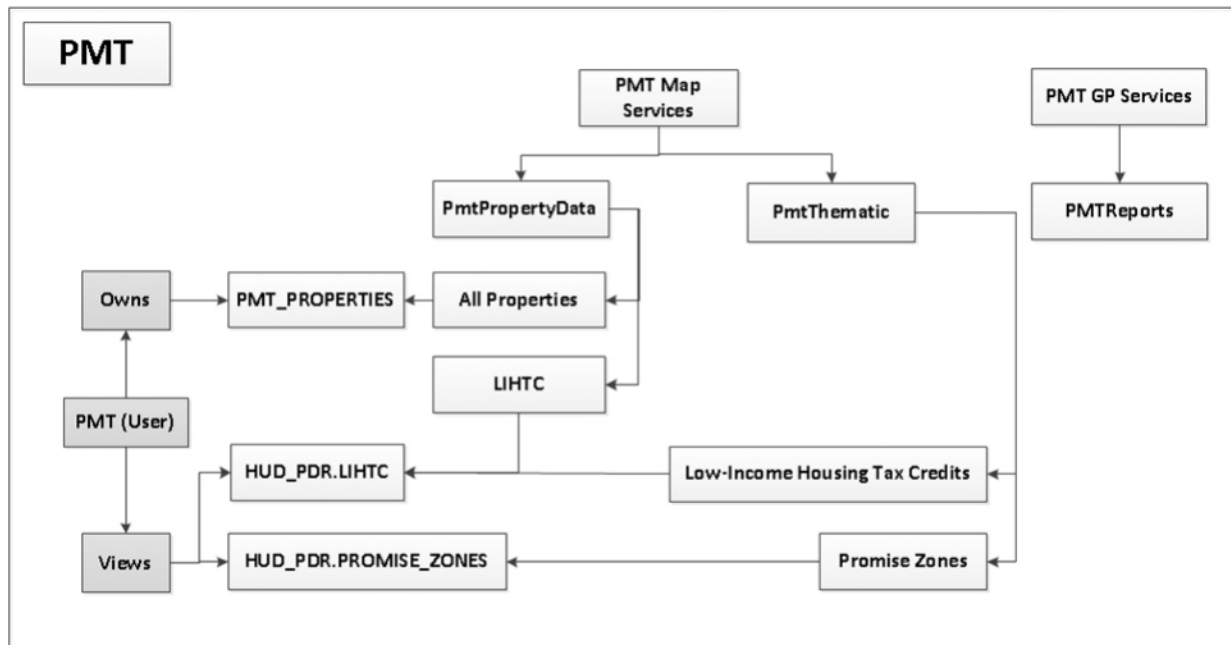
Table 2 – Operational Metadata Elements (Map Services and Layers), contains the information necessary to maintain feature classes, tables and map services currently maintained manually in the first of two spreadsheets, called Map Services and Layers (MSL). The automated process shall contain these data.

Table 2 – Operational Metadata Elements (Map Services and Layers)

Field	Description
Target Schema	Target Schema of Dataset
Source Schema	Source Schema of Dataset
Dataset	Dataset Name
Schema.Dataset	Concatenation of Target Database Schema and Dataset Name
Type	Type of Dataset; FC for feature class, T for Table
PROD?	Is dataset in eGIS Production? TRUE or FALSE
Key Field	Indexed Field Name
Map Service	Map Service Name that Contains Dataset
Layer ID	Layer ID of Dataset in Map Service
LAYER	Name of Dataset in Map Document
Definition Query	Definition Query applied to dataset in Map Document
Symbology Field	Symbology Field used in Map Document
Update Frequency	Update Frequency of Dataset; Annual, As Needed, Nightly, Quarterly
As Of Date	As Of Date of Dataset
Last Update Date	Last Update Date of Dataset in eGIS System
Release/ SPUFI #	Release or SPUFI version number
Data Steward	Data Steward
Primary Contact	Primary Contact, usually data steward or eGIS team member
D77D: CPD Maps	Dataset or map service used in D77D: CPD Maps application
D77E: TDAT	Dataset or map service used in D77E: TDAT application
D77F: AFFHT	Dataset or map service used in D77F: AFFHT application
D77G: HRL	Dataset or map service used in D77G: HRL application
D77H: PMT	Dataset or map service used in D77H: PMT application
D77J: CART	Dataset or map service used in D77J: CART application
D77X: eGIS IGDBMS	Dataset or map service used in D77X: eGIS IGDBMS
GOT IT!	Dataset or map service used in GOT IT! application

The Contractor shall provide a visually interactive Entity Relation Diagram (ERD), similar to Diagram 1 – PMT Application Diagram, to support data management; targeted testing of data, services and applications; and to understand the relationships between the users, data, and services for each eGIS application. The PMT application diagram depicts the services, data, database schema and their relationships to each other. The visually interactive interface shall display information, on hover or click, pertaining to all its related information in the Operational metadata and in the eGIS metadata tables.

Diagram 1 – PMT Application Diagram



The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Performance Standards

- a) Standard: 100% of operational metadata is updated successfully for all data and services, prior to their deployment to production per schedule.
AQL: 90% of operational metadata is updated successfully for all data and services, prior to their deployment to production per schedule.

Deliverables

A008 Monthly Status Report

A013 Updated Operational Metadata

A015 Updated Entity Relationship Diagrams

5.1.2.3.2 Update Geospatial Metadata

Before data is deployed to eGIS production, the Contractor shall update the geospatial metadata on all geospatial data being deployed. The geospatial metadata shall be Federal Geospatial Data Committee (FGDC) and International Organizations for Standards (ISO) 19139 compliant and shall be stored with feature class in the eGIS production system. The Desktop ArcGIS Users shall be able view the geospatial metadata.

The Contractor shall also leverage the automated process or solution for source data and metadata (see **Receive Source Data and Metadata** section) for collecting and managing field aliases. The solution allows users to view metadata in a web browser. The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Table 3-- Geospatial Metadata (Sample), contains geospatial metadata for a production feature class currently maintained manually in the second of two spreadsheets. The automated process shall contain these data.

Table 3-- Geospatial Metadata (Sample)

Geospatial Metadata (sample)			
BLOCKGROUP	ACS_5YR_2013.BLOCKGROUP		
Originator	United States Census Bureau		
Abstract	<p>The TIGER/Line Files are shapefiles and related database files (.dbf) that are an extract of selected geographic and cartographic information from the U.S. Census Bureau's Master Address File / Topologically Integrated Geographic Encoding and Referencing (MAF/TIGER) Database (MTDB). The MTDB represents a seamless national file with no overlaps or gaps between parts, however, each TIGER/Line File is designed to stand alone as an independent data set, or they can be combined to cover the entire nation. The primary legal divisions of most States are termed counties. In Louisiana, these divisions are known as parishes. In Alaska, which has no counties, the equivalent entities are the organized boroughs, city and boroughs, and municipalities, and for the unorganized area, census areas. The latter are delineated cooperatively for statistical purposes by the State of Alaska and the Census Bureau. In four States (Maryland, Missouri, Nevada, and Virginia), there are one or more incorporated places that are independent of any county organization and thus constitute primary divisions of their States. These incorporated places are known as independent cities and are treated as equivalent entities for purposes of data presentation. The District of Columbia and Guam have no primary divisions, and each area is considered an equivalent entity for purposes of data presentation. The Census Bureau treats the following entities as equivalents of counties for purposes of data presentation: Municipios in Puerto Rico, Districts and Islands in American Samoa, Municipalities in the Commonwealth of the Northern Mariana Islands, and Islands in the U.S. Virgin Islands. The entire area of the United States, Puerto Rico, and the Island Areas is covered by counties or equivalent entities. The 2010 Census boundaries for counties and equivalent entities are as of January 1, 2010, primarily as reported through the Census Bureau's Boundary and Annexation Survey (BAS). The American Community Survey (ACS) 5 Year 2009-2013 demographic information is a subset of information available for download. Downloaded tables include: B01001 – Sex By Age, B03002 – Hispanic Or Latino Origin By Race, B11001 – Household Type (Including Living Alone), B11005 – Households By Presence Of People Under 18 Years By</p>		

	Household Type, B11006 – Households By Presence Of People 60 Years And Over By Household Type, B16005 – Nativity By Language Spoken At Home By Ability To Speak English For The Population 5 Years And Over, B25010 – Average Household Size Of Occupied Housing Units By Tenure and B15001 – Sex by Educational Attainment for the Population 18 Years and Over. To download additional demographic information, visit: http://www.census.gov/acs/www/		
Purpose	In order for others to use the information in the Census MAF/TIGER database in a geographic information system (GIS) or for other geographic applications, the Census Bureau releases to the public extracts of the database in the form of TIGER/Line Shapefiles. U.S. Census Counties with American Community Survey (ACS) 5 Year 2009-2013 provides boundaries and some demographic information for the U.S. Census counties within the United States		
As of Date	2009-2013		
Access Constraints	None		
Use Constraints	None		
Coordinate System	WGS 1984 Web Mercator Auxiliary Sphere WKID: 3857		
Maintenance	None		
Status	None		
Tags	polygon, census, boundaries, society, county, county equivalent, demographics, American Community Survey, ACS		
Keywords	polygon, census, boundaries, society, county, county equivalent, demographics, American Community Survey, ACS		
Column Name	Column Description	Type	Width
OBJECTID	In ArcGIS, a system-managed value that uniquely identifies a record or feature.	NUMBER	
GEOID	Geographic Identifier – fully concatenated geographic code (State FIPS and district number)	VARCHAR2	12
STATE	Census 2-digit FIPS State Code	VARCHAR2	2
STUSAB	State Abbreviation	VARCHAR2	2
COUNTY	Census 5-digit FIPS County Code	VARCHAR2	3
TRACT	Census 11-digit FIPS Tract Code	VARCHAR2	6
BLOCKGROUP	Census 1-digit Block group ID	VARCHAR2	1
SHAPE	The characteristic appearance or visible form of a geographic object as represented on a map	ST_GEOMETRY	256

The Contractor shall maintain the alias information for all datasets, where applicable. The alias information is used for the simplification and readability of database field names of feature classes that are published from the D77X IGDBMS to the eGIS Storefront on ArcGIS Online. A script within the eGIS Python Library is used to replace the field names with the corresponding alias names, which cannot be more than 255 characters in length. The feature class is published to the eGIS Storefront on ArcGIS Online.

The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Performance Standards

- a) Standard: 100% of geospatial metadata is updated successfully for all feature classes, prior to their deployment to production per schedule.
AQL: 90% of geospatial metadata is updated successfully for all data and services, prior to their deployment to production per schedule.

Deliverables

A008 Monthly Status Report

A016 Updated Geospatial Metadata

5.1.2.4 Deploy Data to IGDBMS (D77X) Production using SPUFI

If the updated data to deploy to production did not require a change to a data schema, the Contractor shall deploy data utilizing a SQL Processing Using File Input (SPUFI) process documented under the eGIS Master Change and Configuration Management Plan. The data contained in a SPUFI can be either a routine monthly update or a “bug fix” which occurs on average every other month for a total average of 18 SPUFI’s per year. Unless instructed by the COR or TPOC, the Contractor shall ensure the updates to D77X are not reflected in D77F unless the data update is specifically requested for AFFHT. Unless instructed by the COR or TPOC, the Contractor shall ensure the updates to D77X are not reflected in D77J unless the data update is specifically requested for CART.

The Contractor shall thoroughly test the SPUFI through log review and application testing in lower environments before moving to production. HUD will review and approve each change management data item and map service task entered in the configuration management system and all operational metadata during development and test phases prior to deployment. The Contractor shall coordinate with the HUD testing and infrastructure support contractors to ensure successful updates to production. For each SPUFI, the Contractor shall create a validated SPUFI package. Currently a validated SPUFI package contains a valid HUD Service Desk ticket, the SPUFI installation instructions including scripts and configuration files.

Before the next business day, the Contractor shall verify if the SPUFI was successful or not. If not, the Contractor shall also ensure that the data was rolled back to the previous state. The Contractor shall notify the COR, TPOC, and Investment Manager of the results of the SPUFI. The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Performance Standards

- a) Standard: 100% of SPUFI updates are successfully deployed to production per schedule, requiring no roll back.

AQL: 90% of SPUFI updates are successfully deployed to production per schedule, requiring no roll back.

Deliverables

A005 HUD Service Desk Ticket

A008 Monthly Status Report

A012 Data and Services for Production

A021 SPUFI Installation Instructions

5.1.2.5 Deploy Data to IGDBMS (D77X) Production using HARTS Release

If the updated data to deploy to production requires a change to a data schema the Contractor shall deploy data to Production using the HUD Application Release Tracking System (HARTS) process under the eGIS Master Change and Configuration Management Plan.

The data contained in a HARTS release is generally related to an Application release and performed concurrently to the related Application release. However, it is possible that a release is required to fix data that isn't related to an application release (e.g., an Open Data Set). For planning purposes, we expect 10 HARTS releases. When possible, O&M HARTS releases and DME HARTS releases may be combined to reduce the total number of HARTS data releases.

Unless instructed by the COR or TPOC, the Contractor shall ensure the updates to D77X are not reflected in D77F unless the data update is specifically requested for AFFHT. Unless instructed by the COR or TPOC, the Contractor shall ensure the updates to D77X are not reflected in D77J unless the data update is specifically requested for CART.

The Contractor shall manage all work as well as define, develop, test, and document all releases in accordance with the HUD Agile Project Planning and Management (PPM) processes and templates (under development). As PPM artifacts are modified, the Contractor shall use the modified artifacts in all subsequent development activities. Monthly, the contractor shall update the Documentation Inventory to reflect the current version and date of documents updated as part of a Data Release. All releases shall be developed in an Agile manner in accordance with Agile best practices. All releases delivered shall be fully tested, optimized for performance and resource utilization for HUD's production environment. All releases shall maintain existing system integrity, error handling, and graceful termination of execution for unexpected problems and not adversely impact other applications running on the HUD production environment.

For each release, the Contractor shall update system PPM documentation. At this time, the only two PPM documents that are updated are the Solution Architecture Document and the O&M Manual. For each release, the Contractor shall migrate software files into HUD's code repository, currently Serena Dimensions under configuration management. For each release, the Contractor shall create a validated release package. Currently, a validated release package contains the following: a HARTS Release Form, a Change Request Form, software installation instructions, and software test packages including test scripts and test data for test center personnel.

The Contractor shall coordinate with the HUD testing and infrastructure support contractors to ensure successful release to production. Before the next business day, the Contractor shall verify if the release was successful or not. If not, the Contractor shall also ensure that the database was rolled back to the

previous state. The Contractor shall notify the COR, TPOC, and Investment Manager of the results of the installation. The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Performance Standards

- a) Standard: 100% of D77X releases are successfully deployed to production per schedule, requiring no roll back.
AQL: 90% of D77X releases are successfully deployed to production per schedule, requiring no roll back.

Deliverables

A002 Updated PPM Documentation
A004 HARTS Release Documentation
A005 HUD Service Desk Ticket
A006 Software Installation Instructions
A007 Software Test Package
A008 Monthly Status Report
A012 Data and Services for Production
A028 Documentation Inventory

5.1.2.6 Manage AFFHT Data Versions

Due to regulatory requirements on providing data to program participants submitting Assessments of Fair Housing, data in AFFHT (D77F) is updated per specific business rules provided by FHEO. The AFFHT Data Versions are numbered sequentially starting with AFFHT0001. Every AFFHT data version corresponds to a D77X version and is deployed with a D77X SPUFI or release as described in the previous two tasks above. Historically, the update frequency of AFFHT data is twice per year. Unless instructed by the COR or TPOC, the Contractor shall ensure the updates to D77X are not reflected in D77F unless the data update is specifically requested for AFFHT. Upon request of COR or TPOC, the Contractor shall create and deploy an AFFHT data version. The Contractor shall update the AFFHT Data Version Crosswalk that provide information to the program participants about the changes to the data. The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Deliverables

A008 Monthly Status Report
A022 AFFHT Data Version
A023 Updated AFFHT Data Version Crosswalk

5.1.2.7 Manage CART Data Versions

Due to the nature of the funding amounts for the HUD Rental Assistance and Mortgage Insurance programs, data in CART (D77J) is updated per specific business rules provided by FPM. Every CART data update corresponds to a D77X version and is deployed with a D77X SPUFI or release as described in the previous two tasks above. Historically, the update frequency of CART data for Rental Assistance and Mortgage Insurance is once per year. Unless instructed by the COR or TPOC, the Contractor shall ensure the updates to D77X are not reflected in D77J unless the data update is specifically requested for CART. HUD will provide an inventory list of all CART data items no later than one (1) month in advance for

scheduled updates and releases. The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Deliverables

A008 Monthly Status Report

5.1.2.8 Publish Data and Metadata from the Enterprise Geodatabase to ArcGIS Online, eGIS Storefront, and the Data.gov Catalog

HUD's process of publishing of data from the enterprise geodatabase to the eGIS Open Data Storefront and ArcGIS Online is a manual one. Table 4 below shows the number and frequency of updates for each data set currently maintained in ArcGIS Online and the eGIS Storefront. The Contractor shall continue to maintain these data sets in ArcGIS Online and the eGIS Storefront using the current manual process and frequency of updates. Once HUD's on-premise ArcGIS Enterprise and Desktop products have been upgraded to 10.5.1 (or higher), the Contractor shall automate the process of maintaining eGIS data sets in ArcGIS Online and the eGIS Storefront. The automation should allow for more frequent updates of the 5 data sets listed that are being updated on a nightly basis in the enterprise geodatabase but only monthly in ArcGIS Online and eGIS Storefront due to the manual nature of the update process.

Table 4 –eGIS Data to be Published as Services

Data Update Frequency in AGOL/Storefront	Approximate Number of Services per Update Type
Annually	53
Quarterly	12
Monthly (source data in D77X IGDBMS is updated nightly)	5

Per the requirement stated in 5.1.2.3, the Contractor shall prepare no more than 10 open data sets per year for deployment to production and eGIS Storefront in addition to the current baseline referenced in Table 4 above.

For each new or updated RESTful service published from the Enterprise Geodatabase (D77X) to the ArcGIS Online environment the contractor shall include: a custom thumbnail graphic; a summary description of the data; a detailed description of the data; the currency of the data reflecting the latest release date of the data used to create the service; the source of the data; the relevant search tags; user limitations of the service data; source credit; a data dictionary listing field names and corresponding aliases of all attributes; and the option to download service data as file geodatabase.

The process that HUD currently uses to publish metadata for its open geospatial data sets to the data.gov catalog is also a manual one. It entails editing a json file by hand whenever there are changes to metadata. The eGIS team provides the updated json file to HUD IT contractor support staff to post on a publicly accessible server where a the data.gov harvester collects it. The contractor shall enable FGDC compliant metadata for HUD's open geospatial data sets in ArcGIS Online and coordinate with data.gov support staff to configure the harvesting of metadata for these data sets from the Esri RESTful services published in ArcGIS Online and the eGIS Storefront.

The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Performance Standards

- a) Standard: 100% of data and services slated for publication from the Enterprise Geodatabase (D77X) to ArcGIS Online, eGIS Storefront, and the Data.gov catalog published per schedule.
AQL: 90% of all data and services published from the Enterprise Geodatabase (D77X) to ArcGIS Online, eGIS Storefront, and the Data.gov catalog published per schedule.

Deliverables

A008 Monthly Status Report

A024 Published Data and Services

5.1.3 Development of Story Maps

Upon request of COR or TPOC, the Contractor shall create an average of one Story Map a quarter that supports the eGIS Program. The COR or TPOC will provide the Story Map objective, content, and deadline at time of request. The COR or TPOC will also identify a Subject Matter Expert (SME) who can provide additional information about the Story Map objective, content, and deadline at the time of the request. A summary of requests and the work completed for the requests will be provided in the Monthly Status Report.

Deliverables

A008 Monthly Status Report

A025 Story Map

5.1.4 Application Shells in Apple iTunes and Google Play Marketplace

The application shells effectively provide a shortcut to eGIS applications. Currently, Shells exist for the HUD Resource Locator Application (HRL). From time to time, both Google upgrades their Android and Apple upgrades their iOS operating systems (OS). Such upgrades have caused an application shell to fail, but only rarely. Monthly, the Contractor shall determine if an OS has upgrade has occurred. If an upgrade has occurred, the Contract shall validate that application shells allow the applications to function as expected in the upgraded OS. If the applications do not work, the contractor shall update the shell as necessary and prepare it for submission to the appropriate App Store. A summary of the work completed for this section shall be provided in the Monthly Status Report.

Deliverables

A008 Monthly Status Reports

A026 Updated Application Shells

5.1.5 Infrastructure Software Version Upgrades

The Contractor shall support all Esri ArcGIS, Oracle database, and other software version upgrades as directed by the COR or TPOC to ensure eGIS continues to meet current HUD Enterprise Architecture and Operations version standards. Currently, the Esri software stack is version 10.2.1 and therefore is out of date. Within the first 6 months of the contract, the Contractor shall update the Esri software stack to a current version to be determined at time of award. Due to the shared infrastructure of eGIS, these upgrades generally require coordination with other teams. Historically, Esri upgrades software every year and Oracle every other year. Further it is anticipated that during this contract, HUD will require the

database to be migrated to SQL Server rather than receive an Oracle update. A summary of the work completed for this section shall be provided in the Monthly Status Report.

Performance Standards

- a) Standard: 100% complete by HUD OCIO deadline
AQL: Zero Deviation

Deliverables

A001 Updated Software

A008 Monthly Status Reports

5.2 PROGRAM MANAGEMENT

The Contractor shall work within established HUD guidelines and standards as provided in the Constraints table. The Contractor will be provided with other documented standards, policy, and other documents referenced in this PWS that the contractor is expected to comply with upon award.

The Contractor shall perform program management tasks and activities necessary to support the overall management of the system to ensure eGIS compliance with HUD's current program/ project life cycle management methodology and maintain program management documentation.

5.2.1 Provide Program Management Plan / WBS / Schedule

The Contractor shall create and maintain a Program Management Plan (PMP), by Period of Performance, for accomplishing the tasks of this PWS. The PMP shall include a detailed description of all tasks, itemized deliverables, schedule, resource estimates, and identification of any risks, issues, risk mitigation, and issue resolution strategies for the completion of all tasks. The Initial PMP shall be submitted to the COR and TPOC within ten business days after contract award. Each PMP shall include a Work Breakdown Structure (WBS) and Project Schedule in MS Project format. The Contractor shall update the narrative and WBS Project schedules as tasks are assigned by the COR or TPOC, with updates occurring monthly with submission to the COR or TPOC within 5 business days after the end of the reporting month.

Performance Standards

- a) Standard: Initial PMP is submitted within 10 business days after award.
AQL: Initial PMP is submitted within 15 business days after award.

Deliverables

A017 Program Management Plan

5.2.2 Provide Monthly Status Reports

The Contractor shall submit by the 5th of the month to the COR and TPOC a Monthly Status Report providing the activities performed and actual progress of each task supported under the PWS. The Monthly Status Reports shall be current as of the last business day of the month. These reports shall:

- Provide a brief, factual summary description of technical progress made for each PWS task during the reporting period.

- Provide a brief, factual summary description of key planned activities/accomplishments for next reporting period.
- Identify significant risks and issues and their impacts, causes, proposed corrective actions. The effect that such corrective actions will have on the accomplishments of the contract objectives shall also be included.
- Provide an updated schedule showing status and/or completion of tasks/activities by time intervals.
- Provide all other items identified in the PWS as being provided in the Monthly Status Report.

Performance Standards

- a) Standard: Monthly Project Status Reports are submitted with invoice by the 5th of the month.
AQL: Zero Deviation
- b) Standard: Monthly Project Status Reports address 100% of required elements.
AQL: Zero Deviation

Deliverables

A008 Monthly Status Report

5.2.3 Attend and Document Program Status Meetings

The Contractor's key personnel shall attend in person, weekly Program Status Meetings to review the status of the project, discuss schedule variances, discuss status of issues assigned for closure during previous meetings, and discuss new issues and assignment of resources to address newly opened issues. As the program matures, the COR or TPOC may reduce the meeting schedule to every other week. However, should problems that affect the critical path of the work plan, the COR or TPOC may increase the meeting schedule to weekly until the problem is resolved.

The Contractor shall prepare and submit to the TPOC (or COR) a meeting agenda within one (1) business day prior to each meeting. In addition, the Contractor shall submit draft meeting minutes to the COR and TPOC within two (2) business days after each meeting. The meeting minutes shall include a summary of issues discussed, decisions, assignments, and pending matters. Upon receipt of Government comments, the Contractor shall incorporate the comments into final meeting minutes which shall be submitted within three (3) business days.

Deliverables

A018 Meeting Agenda

A019 Draft Meeting Minutes

A020 Final Meeting Minutes

5.2.4 Monitor database size and performance

Monthly, the Contractor shall report on database size and performance. This report shall include space allocation, utilization, estimated growth rates, recommendations on space allocation to include the resizing/reorganizing of the databases.

If available space drops below that required for 6 months' growth, the Contractor shall notify the TPOC and COR via email and provide an estimate of the additional space required. In addition, upon request of TPOC and COR, the Contractor shall provide information necessary to complete a request for

additional space by the due date established at the time of request. The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Deliverables

A008 Monthly Report

5.2.5 Provide Help Desk Support

The Contractor will not be required to provide general Tier 1 and Tier 2 Help Desk Support to users. The Contractor shall respond to HUD's National Service Desk System Tier 3 service tickets assigned to the eGIS Team by being sent via email to identified contractor staff. The Contractor shall also respond to tickets submitted directly to the contractor or is incorrectly submitted to one of the other HUD Help Desks and rerouted to the eGIS Support Contract for resolution. The Contractor shall review tickets submitted directly and referred from other Help Desks. If they are Tier 3, the Contractor shall submit a Service Desk Ticket to document the issue. Historically an average of ten (10) tickets a month routed directly or indirectly to the eGIS Support Contractor. Of these, an average of five (5) are Tier 3 Service Desk Tickets.

The Contractor shall be responsible for closing all Tier 3 tickets within two (2) business days. It is assumed that if a ticket can't be closed within 2 days it is because a release is required to resolve the ticket, triggering another work flow. Such tickets shall include that information in the close out notes. Tier 3 Service Desk Tick Response shall include the following:

- Contact the affected user via emails or phone calls to fulfill the following service requirements:
 - Confirm receipt of ticket and understanding of problem.
 - Request further information from the affected user regarding screen shots of online views (if needed) and/or specific data in question.
- Diagnose the problem and identify the required actions to fix the problem.
- Report to the COR or TPOC via email and/or phone call and explain:
 - The reason for the reported problem,
 - The diagnosis and required actions to fix the problem, and
 - The problem resolution timeframe.
- Obtain concurrence form the COR or TPOC on plan of action
- Resolve the problem by performing the previously identified required actions.
- Documenting actions taken in the ticket and then close the ticket. If appropriate, documentation shall reference any planned emergency release is pending and the planned release date.
- Contact the affected user via email or phone call to indicate that the ticket has been closed and confirm that the documented and implemented resolution is acceptable to the affected user.

Non-Tier 3 tickets and Tier 3 tickets requiring a release to resolve, shall be treated as change requests and managed under the eGIS Change and Configuration Management Plan. A summary of tickets received, and the actions taken shall be included within the Monthly Status Report.

Performance Standards

- a) Standard: Tier 3 Service Tickets closed within two (2) business days.
AQL: Tier 3 Service Tickets closed within five (5) business days.

Deliverables

A008 Monthly Status Report

5.2.6 Support Ad Hoc Data Calls, Reports, and Other Requests

From time to time, the Office of Chief Information Officer (OCIO), the Office of Inspector General (IG), or others, may request information about eGIS in the form of data extracts, analysis reports, and custom documentation. Upon request of the COR or TPOC, the Contractor shall to complete these requests creating the output specified in the request. Historically, the eGIS program has received an average of one request per month. A summary of the request and the work completed for the request will be provided in the Monthly Status Report.

Deliverables

A008 Monthly Status Report

A027 Ad Hoc Request Output

5.2.7 Maintain Program Documentation

This section does not apply to release specific PPM or other documentation. The contractor shall ensure that all program documentation is up to date. Documentation is considered up to date if it is reviewed and updated annually at a minimum. To facilitate the tracking and status of documentation, contractor shall create and then maintain a Documentation Inventory for all documents, containing the name of the document, an indicator if this is draft, or approved final, location of document, the date of the document, the version number of the document, an indicator if an update is required, and the planned date of the update. The Contractor shall submit to the COR and TPOC a Documentation Inventory within 30 days of award. Then monthly, the contractor shall provide an updated, current Document Inventory as an Attachment to the Monthly Report.

PPM Program Documentation – eGIS is part of a pilot program created by the Technical Review Committee (TRC) to allow programs to create and maintain documents required under HUD’s Project Planning and Management Life Cycle V2.0 (PPM 2.0) at the program level. The TRC has determined that for this pilot program, the following PPM documents may be created and maintained at the program level:

- Program Charter
- Program Management Plan
- Change and Configuration Management Plan
- Test Plan
- System Architecture Documentation
- O&M Manual

This list is subject to change as this is both a pilot program and HUD is in the process of developing the HUD Agile Project Planning and Management process. Historically, the creation and updates to the PPM Program documentation has been made during DME projects under an optional DME CLIN. If a DME CLIN is not exercised, then the contractor shall review and update each PPM Program document once.

Provide HUDPLUS O&M Monthly Data – OCIO has implemented and continues to mature an Enterprise Project and Portfolio Management (EPPM) Framework that is reflected in the system called HUDPLUS. Currently, HUD collects planned and actual data as defined by the EPPM Framework on status (recent

accomplishments and planned activities); costs (contract dollars and FTE time); and up to 15 metrics. As HUD continues to mature the EPPM Framework, additional HUDPLUS functionally will be implemented to improve operational analysis and reporting. The Contractor shall collect, manage and report O&M Monthly Data required by HUD as part of the EPPM Framework. Specific information required and timing to submit the HUDPLUS O&M Monthly Data for this in this section will be provided at the time of award.

Security Documentation – Currently, eGIS and all its component systems are considered minor applications. The Contractor shall update the Minor Application Forms on an annual basis. It is possible, but unlikely, that HUD may determine that eGIS a Major Application. If so, the Contractor shall prepare a “Security Package” including a System Security Plan, Security Controls, Risk Assessment, Self-Assessment of Security Controls, Contingency Plan, Business Impact Analysis, e-Authentication Risk Analysis, FIPS 199 Worksheet, Privacy Impact Analysis, Systems of Records Notice, and Privacy Impact Assessment. All of HUD’s Major Applications must undergo an Annual Security Self-Assessments to confirm security controls are implemented and working as intended as well as an annual vulnerability scan. If eGIS becomes a Major Application , then the Contractor shall support HUD in performing the annual security Self-Assessment and/or completing new Authorization to Operate (ATO) and/or remediating identified vulnerabilities as required. All deadlines and the specific security documentation required will be provided at the time of request.

Performance Standards

- a) Standard: 100% of Security Documentation submitted COR, TPOC, and Information System Security Officer (ISSO) by the due date established at the time of request.
AQL: No Deviation

Deliverables

A008 Monthly Status Report
A028 Documentation Inventory
A029 Program PPM Documents
A030 HUDPLUS O&M Monthly Data
A031 Security Documentation

5.2.8 Create and Maintain Communications Materials

Upon request of COR or TPOC, the Contractor shall create communications materials that supports the eGIS Program. The communications materials may include presentations, Frequently Asked Question and Answers (FAQs), program announcements, job aids, newsletters, and other similar materials. There will be an average of 2 items created per month. The COR or TPOC will specify the type of output, content goal, and deadline at time of request. A summary of requests and the work completed for the requests will be provided in the Monthly Status Report.

Deliverables

A008 Monthly Status Report
A032 Communications Materials

5.2.9 Submit Configuration Change Management Board (CCMB) Requests

HUD has instituted a Configuration Change Management Board (CCMB) to track technologies implemented across the department. The introduction of a new technology or a different version of an already approved technology to the HUD network requires the submission and approval of a CCMB Product Submission Form. Historically, Product Submission Forms were required approximately annually to correspond with the near annual update of the Esri ArcGIS COTS software suite. The Contractor shall prepare and submit CCMB Product Submission Forms per policy for all new technologies and new versions of already approved technologies. The due date will be determined at the time of request. The process will be provided upon award. A summary of the status of all Product Submission forms pending approval by the CCMB and the work completed shall be provided in the Monthly Status Report.

Deliverables

A008 Monthly Status Report

A033 CCMB Product Submission Forms

5.2.10 Support the eGIS Change Control Board (eGIS CCB)

Per the eGIS Master Change and Configuration Management Plan, all requests for changes (Change Requests) to eGIS applications from application bug fixes to application minor usability enhancements to data fixes to major enhancements are entered into a tracking system (currently YouTrack) by the Change Manager. Now, approximately 15 change requests are received each month. The eGIS CCB may reject the change request without analysis. To allow the eGIS CCB to make an informed decision about a decision to implement as O&M, reject (either in its entirety or as beyond the scope of O&M and requiring a DME Business Need to be submitted), the Contractor shall perform an analysis of each change request. The analysis shall include the following information:

- If a bug, the diagnosis of the root cause of the problem and a strategy to fix or address the issue.
- If an enhancement, a list of assumptions and a strategy address the request including an analysis of alternatives if appropriate.
- Impacts to the eGIS as a whole including functionality, performance, and security.
- A Level of Effort to address (in story points).
- If O&M, a recommended release or timeframe.

The Contractor's key personnel and shall attend monthly eGIS CCB Meetings to review the status of submitted change requests. The Contractor shall prepare and submit to the eGIS CCB Members a meeting agenda within three (3) business day prior to each meeting. In addition, the Contractor shall submit draft meeting minutes to the eGIS CCB Members within three (3) business days after each meeting. The meeting minutes shall include a summary of change requests submitted, and change requests analyzed (including timeframe between submission and analysis), issues discussed, decisions, assignments, and pending matters. Upon receipt of Government comments, the Contractor shall incorporate the comments into final meeting minutes which shall be submitted within five (5) business days. A summary of requests and the work completed for the requests will be provided in the Monthly Status Report.

Deliverables

A008 Monthly Status Report

A018 Meeting Agenda
A019 Draft Meeting Minutes
A020 Final Meeting Minutes
A034 Analyzed eGIS Change Requests

5.3 DEVELOPMENT, MODERNIZATION, AND ENHANCEMENTS (DME)

DME is future work to be approved and performed during the period of performance of the contract based on the future needs of the Department. Historically, most eGIS DME has provided additional geospatial capabilities for a variety of stakeholders in the form of new custom applications or major upgrades to existing custom applications. DME tasks will be exercised via an optional CLIN not to exceed \$1.3M per year, as needed at the discretion of the Government. Contractor's DME Technical and Managerial approaches may differ from those used in O&M but shall still be acceptable to the government. A Work Request containing the project requirements, performance standards and deliverables will be issued and a determination to award this work as labor hour or fixed price will be decided by the Contracting Officer.

Potential DME Projects to meet management objectives, satisfy legislative mandates, or implement regulatory requirements could include:

- Modernize and update CPD Maps to address the significant backlog of change requests, some of which are too complex and costly to be considered as part of regular operations and maintenance including making it 508 compliant.
- Add functionality to AFFHT to provide custom sub-state areas to improve a program participant's ability to analyze the data.
- Add functionality to HRL to provide additional types of resources.
- Add functionality to CART to provide additional geographies and/or additional HUD programmatic investments.
- Finish the development of the Batch Geocoder and make it a production system.
- Implement user authentication to allow CPD grantees to add their data to the provided data to improve analysis.
- Implement additional COTS geospatial capabilities.
- Automate data updates to eliminate manual processes.

The Contractor shall provide the full range of software development services to complete the DME project. Typical software development activities include project management; user story development; requirements validation, analysis, and definition; design; coding; testing; implementation; documentation; and post implementation support. Contractor's Key Personnel shall attend all user story development, requirements, and sprint review meetings with stakeholders in person.

The Contractor shall manage all work as well as define, develop, test, and document all releases in accordance with the HUD Agile Project Planning and Management (PPM) processes and templates (currently in development) including the use of configuration management system, i.e., YouTrack or JIRA. As PPM artifacts templates are modified, the Contractor shall use the modified artifacts in all subsequent development activities. All releases shall be developed in an Agile manner in accordance with Agile best practices. All releases delivered shall be fully tested (including 508 testing), optimized for

performance and resource utilization for HUD's production environment. All releases shall maintain existing system integrity, 508 compliance, error handling, provide for graceful termination of execution for unexpected problems, and not adversely impact other applications running on the HUD production environment.

For each release, the Contractor shall update PPM Program Documentation and develop PPM Project Documentation per the Project Tailoring Agreement. For each release, the Contractor shall migrate software files into HUD's code repository, currently Serena Dimensions under configuration management. For each release, the Contractor shall create a validated release package. Currently a validated release package containing the following, a HARTS Release Form, a HUD Service Desk Ticket, software installation instructions, and software test packages including test scripts and test data for test center personnel.

The Contractor shall coordinate with the HUD testing and infrastructure support contractors to ensure successful release to production. Before the next business day, the Contractor shall verify if the release was successful or not. If not, the Contractor shall also ensure that the application was rolled back to the previous state. The Contractor shall notify the COR, TPOC, and Investment Manager of the results of the installation. The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Performance Standards

- a) Standard: To be determined at the time of request.
AQL: To be determined at the time of request.

Deliverables

A008 Monthly Status Report

Others to be determined at the time of request

5.4 MIGRATE EGIS TO A CLOUD INFRASTRUCTURE

As stated above, HUD had anticipated it would have migrated eGIS to Esri Managed Cloud Services (EMCS). However, the project was not completed as planned. HUD is currently reevaluating Cloud Infrastructure options. If a cloud migration is approved, an optional CLIN not to exceed \$500,000 to support the migration will be exercised at the discretion of the Government. The Contractor's Technical and Managerial approaches may differ from those used in O&M but shall still be acceptable to the government. A Work Request containing the project requirements, performance standards and deliverables will be issued and a determination to award this work as labor hour or fixed price will be decided by the Contracting Officer.

As necessary, the Contractor shall provide the full range of services to complete the migration project. Typical software development activities include project management; user story development; requirements validation, analysis, and definition; design; coding; testing; implementation; documentation; and post implementation support. The Contractor's Key Personnel shall attend all user story development, requirements, and sprint review meetings with stakeholders in person.

The Contractor shall manage all work as well as define, develop, test, and document all releases in accordance with the HUD Agile Project Planning and Management (PPM) processes and templates

(currently in development) including the use of configuration management system, i.e., YouTrack or JIRA. As PPM artifacts templates are modified, the Contractor shall use the modified artifacts in all subsequent development activities. All releases shall be developed in an Agile manner in accordance with Agile best practices. All releases delivered shall be fully tested (including 508 testing), optimized for performance and resource utilization for HUD's production environment. All releases shall maintain existing system integrity, 508 compliance, error handling, provide for graceful termination of execution for unexpected problems, and not adversely impact other applications running on the HUD production environment.

For each release, the Contractor shall update PPM Program Documentation and develop PPM Project Documentation per the Project Tailoring Agreement. For each release, the Contractor shall migrate software files into HUD's code repository, currently Serena Dimensions under configuration management. For each release, the Contractor shall create a validated release package. Currently a validated release package containing the following, a HARTS Release Form, a HUD Service Desk Ticket, software installation instructions, and software test packages including test scripts and test data for test center personnel.

The Contractor shall coordinate with the HUD testing and infrastructure support contractors to ensure successful release to production. Before the next business day, the Contractor shall verify if the release was successful or not. If not, the Contractor shall also ensure that the application was rolled back to the previous state. The Contractor shall notify the COR, TPOC, and Investment Manager of the results of the installation. The Contractor shall provide a summary of all work performed under this task in the Monthly Status Report.

Performance Standards

- a) Standard: To be determined at the time of request.
- AQL: To be determined at the time of request.

Deliverables

A008 Monthly Status Report

Others to be determined at the time of request

6 DELIVERABLES

The Contractor shall complete all work and submit all deliverables as specified herein. The Government reserves the right to make changes to delivery dates.

Number	Name	Frequency	Quantity
A001	Updated Software	Apps – 0-1 per month COTS – 0-2 per year	10-12 updates
A002	Updated PPM Documentation	0-1 set per month	12 sets
A003	Reserved		
A004	HARTS Release Documentation	Apps – 0-1 per month Data – 0-1 per month	20 sets

Number	Name	Frequency	Quantity
A005	HUD Service Desk Ticket	Apps – 0-1 per month Data – 0-1 per month	20 tickets
A006	Software Installation Instructions	Apps – 0-1 per month Data – 0-1 per month	20 sets
A007	Software Test Package	Apps – 0-1 per month Data – 0-1 per month	20 packages
A008	Monthly Status Report	1 per month	12 reports
A009	Updated eGIS Python Library	SPUFI – 1-2 per month HARTS – 0-1 per month	28 updates
A010	Source Data and Metadata Captured	SPUFI – 1-2 per month HARTS – 0-1 per month	28 updates
A011	Geospatial Metadata Populated	SPUFI – 1-2 per month HARTS – 0-1 per month	28 updates
A012	Data and Services for Production	SPUFI – 1-2 per month HARTS – 0-1 per month	28 updates
A013	Updated Operational Metadata	SPUFI – 1-2 per month HARTS – 0-1 per month	28 updates
A014	Automated Solution for Source Data and Metadata	Once in first 3 months	1 solution
A015	Updated Entity Relation Diagrams	SPUFI – 1-2 per month HARTS – 0-1 per month	28 updates
A016	Updated Geospatial Metadata	SPUFI – 1-2 per month HARTS – 0-1 per month	28 updates
A017	Program Management Plan	1 Initial Plan 1 update per month	12 plans
A018	Meeting Agenda	Status Meeting – 1 per week CCB Meetings – 1 per month	64 agendas
A019	Draft Meeting Minutes	Status Meeting – 1 per week CCB Meetings – 1 per month	64 draft minutes
A020	Final Meeting Minutes	Status Meeting – 1 per week CCB Meetings – 1 per month	64 final minutes
A021	SPUFI Installation Instructions	1-2 per month	18 sets
A022	AFFHT Data Version	2 per year	2 versions
A023	Updated AFFHT Data Version Crosswalk	2 per year	2 docs
A024	Published Data and Services	Per section 5.1.2.8	
A025	Story Map	1 per quarter	4 maps
A026	Updated Application Shells	0-2 per year	0-2 updated shells
A027	Ad Hoc Request Output	1 per month	12 outputs

Number	Name	Frequency	Quantity
A028	Documentation Inventory	1 initial inventory 1 update per month	1 inventory 11 updates
A029	Program PPM Documents	Up to 6 per year	Up to 6 documents
A030	HUDPLUS O&M Monthly Data	1 per month	12 sets
A031	Security Documentation	1 set per year	1 set
A032	Communications Materials	2 items per month	24 items
A033	CCMB Product Submission Forms	1-2 sets per year	1-2 sets
A034	Analyzed eGIS Change Requests	10-20 per month	60 analyzed requests

6.1 QUALITY CONTROL PLAN (QCP)

The Contractor's QCP shall be delivered with the Contractor's proposal as part of the Management Plan evaluation factor. The QCP shall be submitted to the COR and TPOC within 30 days when changes are made thereafter. After acceptance of the QCP, the Contractor shall receive the Contracting Officer's acceptance in writing of any proposed change to its quality control system.

6.2 ACCEPTANCE CRITERIA

All documents (and other written material) shall be free of typographical errors, grammatically correct, and written in "Plain Language" to the maximum extent practicable. Further, all necessary definitions and acronyms used in the document shall be provided in an appendix. All PPM documents shall conform to PPM standards for content and format including the appropriate signature page.

Documents (and other written material) shall be submitted electronically in a draft format agreed upon by the Contractor and the Government. The Government will review and provide edits and comments to the Contractor. Within 5 business days, the Contractor shall address all Government comments and submit a final draft. Documents (and other written material) will be accepted when all issues identified by the Government have been corrected.

All software and data updates shall be free of defects and errors so that it works as expected in production (i.e., bug free). As appropriate, the contractor shall submit all work for review during a sprint review for testing and preliminary acceptance. When the release is complete, the contractor shall load the final product into the Test environment for final User Acceptance Testing (UAT). The contractor shall remediate any defects and errors found related to the changes made within 2 days. Software and data shall be accepted by the approval of the release to production.

7 PERFORMANCE REQUIREMENTS SUMMARY (PRS)

The summary chart below lists the contract's primary requirements, the associated performance standards, the expected target performance, and the methods of surveillance. While some contract requirements may not be listed in the chart below, requirements not appearing on the PRS chart do not negate the Contractor's obligation to perform all requirements as specified in the contract. Additionally,

HUD reserves all rights and remedies under the provisions and clauses of the contract when performance of any contract requirement, whether or not listed below, is unacceptable.

HUD will develop a Quality Assurance Surveillance Plan to be used to provide contract oversight. In conjunction with the Contractor's Quality Control Plan and various other methods of assessing performance, the COR and TPOC may perform on-site reviews and/or other types of verification to determine that the specified target performance requirements have been met.

Regular review of Contractor performance is critical to the overall success of the contract. Monthly, the COR will evaluate the quality of the product or services.

8 RELATED DOCUMENTS

The Contractor shall abide by all applicable regulations, publications, manuals, policies, and procedures in the performance of this contract.

Performance Requirement Summary (PRS)

Statements		Standards/AQLs	Disincentive/Remedy
5.1.1	O&M Releases for Custom Applications	a) 100% of O&M releases are successfully deployed to production, requiring no roll back. AQL: 90% of O&M releases are successfully deployed to production, requiring no roll back.	Disincentive: For every O&M application release that requires a rollback, payment of the monthly invoice will be reduced by \$2262. Remedy: If AQL for this task is not met or 3 or more rollbacks across tasks 5.1.1, 5.1.2.4 and 5.1.2.5 then the contractor shall address the deficiency through revisions to the Quality Control Plan.
5.1.2.1	Update and Maintain eGIS Python Library	a) HUD Staff can successfully run 100% of eGIS Python Library as expected. AQL: HUD Staff can successfully run 90% of eGIS Python Library with the remaining 10% needing assistance.	

Statements		Standards/AQLs	Disincentive/Remedy
5.1.2.2	Receive and Process Source Data and Metadata	a) 100% of HUD Data Stewards, within a calendar year, can use the automated process to successfully submit data and metadata. AQL: 90% of HUD Data Stewards, within a calendar year, can use the automated process to successfully submit data and metadata.	
5.1.2.3	Prepare Data and Map Services for Deployment to Production	a) 100% of eGIS data and map services are ready for deployment per schedule. AQL: 90% of eGIS data and map services are ready for deployment per schedule.	
5.1.2.3.1	Update Operational Metadata	a) 100% of operational metadata is updated successfully for all data and services, prior to their deployment to production per schedule. AQL: 90% of operational metadata is updated successfully for all data and services, prior to their deployment to production per schedule.	Disincentive: If eGIS technical SME finds that the operational metadata does not meet the AQL for any given O&M release or SPUFI, payment of the monthly invoice will be reduced by \$566. Remedy: If the AQL is not met twice, shall address the deficiency through revisions to the Quality Control Plan
5.1.2.3.2	Update Geospatial Metadata	a) 100% of geospatial metadata is updated successfully for all feature classes, prior to their deployment to production per schedule. AQL: 90% of geospatial metadata is updated successfully for all data and services, prior to their deployment to production per schedule.	Disincentive: If eGIS technical SME finds that the geospatial metadata does not meet the AQL for any given O&M release or SPUFI, payment of the monthly invoice will be reduced by \$566. Remedy: If the AQL is not met twice, shall address the deficiency through revisions to the Quality Control Plan

Statements		Standards/AQLs	Disincentive/Remedy
5.1.2.4	Deploy Data to IGDBMS (D77X) Production using SPUFI	a) 100% of SPUFI updates are successfully deployed to production per schedule, requiring no roll back. AQL: 90% of SPUFI updates are successfully deployed to production per schedule, requiring no roll back.	Disincentive: For every SPUFI that requires a rollback, payment of the monthly invoice will be reduced by \$2262. Remedy: If AQL for this task is not met or 3 or more rollbacks across tasks 5.1.1, 5.1.2.4 and 5.1.2.5 then the contractor shall address the deficiency through revisions to the Quality Control Plan.
5.1.2.5	Deploy Data to IGDBMS (D77X) Production using HARTS Release	a) 100% of D77X releases are successfully deployed to production per schedule, requiring no roll back. AQL: 90% of D77X releases are successfully deployed to production per schedule, requiring no roll back.	Disincentive: For every O&M data release that requires a rollback, payment of the monthly invoice will be reduced by \$2262. Remedy: If AQL for this task is not met or 3 or more rollbacks across tasks 5.1.1, 5.1.2.4 and 5.1.2.5 then the contractor shall address the deficiency through revisions to the Quality Control Plan.
5.1.2.8	Publish Data and Metadata from the Enterprise Geodatabase to ArcGIS Online, eGIS Storefront, and the Data.gov Catalog	a) Standard: 100% of data and services slated for publication from the Enterprise Geodatabase (D77X) to ArcGIS Online, eGIS Storefront, and the Data.gov catalog published per schedule. AQL: 90% of all data and services published from the Enterprise Geodatabase (D77X) to ArcGIS Online, eGIS Storefront, and the Data.gov catalog published per schedule.	

Statements		Standards/AQLs	Disincentive/Remedy
5.2.1	Provide Program Management Plan / WBS / Schedule	a) Initial PMP is submitted within 10 business days after award. AQL: Initial PMP is submitted within 15 business days after award.	Disincentive: The first Invoice will not be approved until Initial Work Plan and Schedule are submitted.
5.2.2	Provide Monthly Status Reports	a) Monthly Project Status Reports are submitted with invoice. AQL: Zero Deviation b) Monthly Project Status Reports address 100% of required elements. AQL: Zero Deviation	Disincentive: Invoice for the month will not be approved until the Monthly Status Report addressing 100% of the required elements is submitted.
5.2.5	Provide Help Desk Support	a) Tier 3 Service Tickets closed within two (2) business days. AQL: Tier 3 Service Tickets closed within five (5) business days.	
5.2.7	Maintain Program Documentation	a) 100% of Security Documentation submitted COR, TPOC, and Information System Security Officer (ISSO) by the due date established at the time of request. AQL: Zero Deviation	

Statements		Standards/AQLs	Disincentive/Remedy
5.3	Development, Modernization, and Enhancement (DME)	a) To be determined at the time of request. AQL: To be determined at the time of request.	To be determined at the time of request.

Statements		Standards/AQLs	Disincentive/Remedy
5.4	Migrate eGIS to a Cloud Infrastructure	a) To be determined at the time of request. AQL: To be determined at the time of request.	To be determined at the time of request.