CHICAGO TRANSIT AUTHORITY GEOGRAPHIC INFORMATION SYSTEM SCOPE OF WORK

Overview

Chicago Transit Authority (CTA) requires a robust and high-functioning Geographic Information System (GIS). CTA utilizes GIS for analyzing and planning new services, market research, managing asset locations, understanding economic and social demographics, as well as cartographic presentations. GIS mapping technology is critical to core CTA applications and functions including Automatic Voice Annunciation System (AVAS), General Transit Feed Specification (GTFS), Ridership, Real Estate, Business Development, Engineering, and for conducting spatial analysis for many CTA departments.

CTA upgraded to the ArcGIS 10.7 version and implemented Enterprise GIS in 2019. Since then, CTA has created workflows that integrate with other enterprise systems and mobile collection tools using extract/transfer/load process. Customized web applications for targeted business needs have been developed that have received hundreds of views throughout the agency, where different departments are being exposed to GIS tools for the first time.

CTA anticipates that increased knowledge of and reliance on web applications will expand GIS usage beyond the current capacity and additional licenses and targeted support and training will be needed.

CTA is seeking a consultant to meet the CTA GIS needs over the next five years, which will include maintenance and support for existing licenses, as well as planning and support for future growth. The consultant scope of work is broken down into the following items:

I.   License Maintenance and Support
II.   Additional License Purchase
III.   Consulting Support and Strategic Plan

Item I includes annual license maintenance and support. Procurement of additional licenses is covered in Item II, and the Consultant will only procure licenses if directed to do so by the CTA in a Task Order. Task Orders will be issued as funding becomes available and based on need.

Item III includes consulting support for new development. This effort will begin with the creation of a Strategic Plan for GIS adoption/expansion throughout the agency that will guide new development. The Strategic Plan will identify business use cases throughout the agency that would benefit from GIS applications tools. It will incorporate or maintain existing workflows and approaches, as well as datasets, databases, and enterprise systems (such as Infor EAM, e-Builder, ProjectWise, and Power BI) with which to integrate. The Consultant must assist CTA in identifying the necessary licenses, tools, and products needed to fulfill a GIS Strategic Plan reflecting CTA's business processes and the emerging structure of integrated enterprise systems, which will inform Item II. Development of the GIS applications and tools recommended in the Strategic Plan will then be implemented with Consultant support, as directed by CTA in Task Orders based on available funding. All work will be coordinated

through CTA's GIS Coordinator, who will serve as the Project Manager, and appropriate department subject matter experts.

I.   License Maintenance and Support

a. Base Year Licenses

CTA has had single and multi-year maintenance and support agreements for desktop and other ArcGIS products since 1996 and currently maintains the following licensed software components:

Product	Licenses
ArcGIS Desktop Concurrent Licenses	26
ArcGIS Pro Licenses	26
Spatial Analyst Extension	2
Network Analyst Extension	2
Editor Named Web User	7
Field Worker Named Web User	11
Creator Named Web User	35
Business Analyst Web tool	7
Power BI web tool	5
Server Enterprise	1

The Consultant will provide annual maintenance for products of similar functionality to the above products for the duration of the contract. The functionality includes but is not limited to:

- Concurrent Desktop licenses with complete geoprocessing tools, python script library, and publishing capabilities to online and enterprise portal
- Spatial analysis tools to create heat maps with specific criteria using python based tools
- Network analysis tools to create multi-modal bus and rail network and provide detailed analysis
- Web based GIS including both online and enterprise portal
  - Security using Active Directory or other means agreed upon by CTA project manager
  - Sharing and access capabilities of data, maps and apps at different levels including public, specific outside entity, all internal agency, groups or individual
  - Integrated with Power BI web tools
  - Census, and business analysis data available through web
- Sustainable, flexible GIS server architecture to support mapping and visualization, analytics, data management and custom applications. Provide advanced capabilities such as tracking real-time data, performing bid data analysis, raster analytics, hosting image services, and data science workflows

Subsequently, the following benefits will be included with the annual maintenance fee:

- Access to data, maps and apps on a GIS platform via geodatabase and available to desktop, online and enterprise portalusers
- Access to imagery, basemaps, and demographics from census and business data
- New releases & software updates
- Unlimited access to e-Learning
- Unlimited technical support anytime via telephone, email, or chat

b. Future year licenses (based on section II)

The Consultant will provide annual maintenance and support for all the additional licenses that would be purchased under Section II for remaining years of the contract.

II.   Additional License Purchase

The Consultant will provide additional licenses and support for existing products and future new products/tools on a Task Order basis.

a. Existing Products

The following additional licenses for existing products are anticipated at this time over the duration of the contract, however this need may change based on the Strategic Plan developed by the Consultant in Item III, which will help identify additional licenses required to fulfill the plan recommendations (by year needed):

Potential Additional License Needs For Existing Products

Product	Current Licenses	Additional Licenses	Year One	Year Two	Year Three	Year Four	Year Five	Total
Editor level web user	7	30	4	0	13	12	1	37
Field worker level web user	11	1116	11	4	81	1,010	10	1127
Creator / Publisher level web user	35	6	3	1	2	0	0	41

b. Future Products

As GIS expands at CTA throughout the multi-year contract, additional tools and products may be needed as identified in the Strategic Plan and as funding becomes available in future. The Consultant will provide installation, and support, as needed. Additional future tools and products may include, but are not limited to:

1. An extension tool that allows access to data in different files, databases, services, and feeds to leverages data such as vector, raster, text, tabular, markup, notation, and binary. This functionality is critical for CTA business needs as we rely on data in many forms and from many external and internal sources.
2. A module that provides a complete indoor mapping system for smart building management and provides mobile wayfinding for internal staff or customers navigating the transit system.
3. A GeoEvent Server, which enables real-time event-based data streams to be integrated as data sources in enterprise GIS. It will allow CTA to respond faster with increased awareness of current events both routine and emergency situations.

Additional products and tools may be identified through the Strategic Plan in Section III below.

III.   Consulting Support and Strategic Plan

The Consultant will provide consulting support for enhancement of GIS at CTA, which will include user training of GIS products and applications, technical support on current and future projects, and application development and implementation of new GIS products. First Task Order is anticipated to be an agency-wide GIS Strategic Plan, which will identify GIS needs at CTA, recommended solutions, and a roadmap for implementation.

Specific requirements and tasks will be established within each task order, which will be issued based on need and funding availability. In general, it is expected that each task order will require the following:

General Requirements
The Consultant shall be responsible for all planned project management processes including, but not limited to, project requirements, schedule, cost, risk management, communication management, quality management, contract management, and administration. The Consultant will assign a project manager for each Task Order who will be knowledgeable of CTA GIS capabilities, platform implementation, applications, and geospatial initiatives.

Project Plan
The Consultant must provide a project plan and schedule for each Task Order and shall be responsible for ensuring all project milestones and dates are met. The Consultant must develop a realistic schedule, a comprehensive work plan, and a project management approach. The Project Plan must account for time needed to collect input and data from CTA staff members, based on the selected and/or desired enhancement.

Schedule
The Consultant must draft and maintain a detailed project schedule. Proposers should list specific risks (and mitigation tactics) that arise from the schedule constraints. Final approval of the project schedule will be at the sole discretion of the CTA. The consultant and CTA must agree to a milestone deliverables schedule for each Task Order. Upon acceptance of each milestone, the Contractor will be authorized to submit invoices for payment.

Communication Approach

The Consultant must develop a communications approach for each task order. The Consultant must work with the CTA's project manager at regular project meetings and must document project status reports, risk mitigation plans, open and closed issues, accomplishments, milestones, quality control, and meeting notes. The Consultant shall also coordinate and work with a change management team for approvals in baseline changes of scope, cost, schedule, and quality.

Functional Specifications

The Consultant must support the CTA with development of functional specifications for desired enhancements, if applicable to the specific Task Order. The collaborative functional specification must describe how a product will work entirely from the CTA's perspective. The documentation must focus on features required without defining how it is to be implemented. CTA must understand the general concept for necessary screens, menus, processes, dialogs, etc.

Technical Specifications

The Consultant must develop necessary technical specification to describe implementation of the enhancements, if applicable to the specific Task Order. This includes providing a technical overview and approach; and references data structures, relational database models, choice of programming languages and tools, algorithms, resources, reports, etc.

Consulting Support

The Consultant will provide implementation of the Strategic Plan, other development and implementation services as needed and identified by business units, ongoing technical support, and training as the GIS system expands to fulfill business needs on a task order basis. Potential scope items are listed below.

1. **Instructor Led Training**: CTA anticipates software and product training needs as Consultant builds out new applications.

2. **General Consulting**
   a) Support and consulting on current and future projects
   b) Assistance with annual upgrades
   c) Assistance with managed cloud services
   d) Technical advisory to maintain GIS readiness as an enterprise system
   e) Collaboratively developed technical work plan

3. **Application Development and Implementation:** Consultant will provide support for creation of application and dashboard projects as identified by the Strategic Plan or in consulation with business units. Scope could include, but is not limited to:
   a) Create GIS data, layers, geodatabases, 3D scenes and share data online or via enterprise portal
   b) Create maps, applications including but not limited to dashboards, templates, story maps, web application builder, crowdsource application, internal sites, and external hubs.

c) Extract/Transform/Load workflow with data from various internal sources (AWS, Access, excel, SDE oracle geodatabase, Infor EAM, e-Builder, ProjectWise, other enterprise databases) and outside sources (Open data portal, geojson, json, shapefile, OData)
d) Develop mobile collection applications including necessary domains, related tables, reports, and attachments.
e) Develop online applications that share data securely between CTA and other agencies.
f) Create complete workflow for collection of indoor assets including integrating with Infor EAM.Develop application to enhance accessibility wayfinding information in rail stations.
g) Ensure sensitive data is secured and protected using existing Active Directory (AD) security infrastructure or other security services as directed by CTA project manager

The first task order is anticipated to be an agency-wide Strategic Plan as described below.

Task Order 1: Strategic Plan
The Consultant will develop an agency-wide GIS Strategic Plan that will provide CTA with a roadmap for future uses of GIS within agency departments. The Consultant will conduct detailed interviews with business units to establish their GIS needs and identify data, maps and apps that are necessary to achieve their goals. The goal of the Strategic Plan is to provide a way for all business units to utilize GIS to improve processes, make more work more efficient, access authoritative data, create new data, effectively utilize applications, provide convenient access to relevant spatial data, and share contributions throughout the agency.

The Strategic Plan will meet the following criteria:

- Identifies user-focused and interconnected apps that meet business needs
- Builds upon existing technology and data investments
- Establishes a sustainable ecosystem for ongoing innovation AND strong data governance
- Generates quick wins at the start of the initiative to establish buy-in for GIS across departments
- All data is sharable and can be "unlocked" based on user credentials
- Data duplication is minimized
- Users access the data through single Portal
- Users are equipped to build their own apps
- The Plan is a "system of systems" that builds on existing relational database management system (RDBMS) infrastructure and IT assets for accessing, processing, and integrating business and geographic data.
- Maintenance of separate production and publication data, maps and applications
- Reusable data and web services resources are established

The Strategic Plan will start with a 12 to 14-week discovery activity that culminates in the development of a formal Implementation Plan. The Consultant will develop the Strategic Plan using following steps:

1. **Kick-Off Presentation**: A presentation to introduce the concept of a Strategic Plan to the business units and other stakeholders, as well as a review of the Strategic Plan discovery process will be conducted. This will be a two-hour event led onsite.

2. **Phone Interviews**: The Consultant will conduct interviews with CTA-selected stakeholders to prepare both the Consultant and agency teams for the one-week Onsite Discovery Workshop. The interviews will be conducted 2-3 weeks prior to the workshop.

3. **Onsite Discovery Workshop**: The Discovery Workshop will include two parallel tracks– a Business Track and a Technical Track. The Consultant will conduct the onsite Discovery Workshop to uncover needed business applications, known as "apps", as well as technical strategies to facilitate the deployment of these applications.

4. **Implementation Plan**: The Consultant will develop an Implementation Plan and provide for review to the CTA within four to six weeks of the onsite Discovery Workshop. The Consultant will adjust the Implementation Plan based on agency feedback and take into consideration funding availabile for implementation. The Implementation Plan will span a four to five year period and will include:
   a) List of applications prioritized by two factors– ease of implementation and benefit to the agency
   b) Architecture, data, and infrastructure technical strategy
   c) Organizational, training, and change management recommendations
   d) Business process recommendations
   e) Time line and budget
   f) Hardware and server space recommendations