



**FIRES Center of Excellence and Fort Sill
Geographic Information Systems (GIS) Team
Army “Best Business Practice” Award Winner
17 December 2010**

This Award is Presented on Behalf of the Office of the Assistant Chief of Staff for Installation Management (OACSIM) IGI&S to Acknowledge Excellence in Business Problem Solving through Geospatially Enabling and Reconciling Real Property Records at Fort Sill



1.1 Problem Statement

In 2008, Fort Sill funded a low altitude aerial imagery capture and update the majority of the Installation Geographic Information Systems (GIS) database features via photogrammetric mapping.

Once the newly acquired GIS data was received and reviewed, the Fort Sill GIS Team started the tedious process of integrating information from the Real Property Inventory (RPI) into the GIS database attribute data. Fort Sill immediately identified that a potentially serious problem existed. Numerous quantitative discrepancies between the GIS features calculated values and the Real Property Inventory (RPI) reported values existed. For example: A line feature that was captured, digitized and calculated to be 1,000 ft. according to our GIS branch was being reported by Real Property as 600 ft.

If these discrepancies and/or miscalculations were to remain unresolved it could potentially be costing Fort Sill millions of dollars annually in Sustainment, Revitalization, and Modernization (SRM) funding used to maintain the installation infrastructure.

Fort Sill had to determine several factors in order to define and solve the problem. Are these discrepancies simply miscalculations or a flaw in the method(s) used to calculate and/or validate the quantitative value of the asset? Which business system is more accurate in determining the correct value? What are the required technical specifications for calculating these values?

The root cause of the problem was two part; the multitude of specialized reporting systems and databases used by the Real Property to determine the assets physical quantity. Personnel shortages and a lack of training in each specialized system made a repeatable research and validation method virtually intangible. An example of this is trying to locate & gather all the existing information about your building – the spatial data, floor plans, maintenance schedule, environmental hazards, existing and past work orders, design documents and ISR data are all kept in separate databases.



1.2 Business Case Analysis & 1.3 Implementation Plan

Fort Sill determined a need to create an accurate repeatable process to access, measure, correct, validate and reconcile the discrepancies between the Real Property Inventory (RPI) and the Geographic Information System (GIS) databases. It was determined that the best method was to perform a field collection study to collect, validate and reconcile of a pilot feature.

The GIS Team decided to perform the initial field collection effort on the Electrical System. Why did Fort Sill choose the Electrical System to start? It was determined that the electrically system was the most outdated asset (over 20 years) and that it was to the point of being virtually useless for design, modeling and analysis. So even if the intended validation & reconciliation study failed the collected data could still be utilized for short circuit analysis and calculations, developing & testing electrical load balancing strategies, electrical feeder optimization and electrical consumption modeling. We also felt that the complexity of the SDSFIE defined electrical dataset would easily translate well to other potential future studies.

*Fort Sill contracted with KAYA Corporation through Office of the Assistant Chief of Staff for Installation Management (OACSIM) to perform this survey, collect the features utilizing GPS technology and other sources, archive and create an SDSFIE 2.610 compliant multi-versioned geospatial database and finally validate/reconcile the collected information by coordinating with the Fort Sill Real Property office and comparing to the IFS Real Property database. Also under the scope of work KAYA was to replicate Fort Sill geospatial data to HQDA Army Mapper and Load/Configure the geospatial vector and raster datasets. Total cost of awarded contract **(W9132V-08-D-003 DO No. 0005)** was **\$701,763.43**.*

The initial collection process began by manually field collecting the electrical features (approximately 200 days) in an SDSFIE compliant database by utilizing Trimble GPS equipment. Fort Sill mandated that conventional surveying and other like methods, such as "Total Station GPS" for field data collection at an accuracy level in accordance with: "Geospatial Positioning Accuracy Standards, Part 4: Architecture, Engineering Construction, and Facilities Management" Published by the FGDC be stringently observed. The minimal acceptable positional accuracy for the GPS collection was initially defined as +/- 2cm with the hopes of the final deliverable being within 1-2 inch accuracy well below the OACSIM mandated 1 foot accuracy.

*After field collection efforts were completed, the resulting calculations were verified by on-site personnel and dollar figures were calculated based on the Department of Defense (DoD) Facilities Pricing Guide FY09. DD1354s were completed to update the Real Property Inventory (RPI) in IFS. Facility sustainment funding is determined by the (RPI) quantitative value as of 30 September each year. The result of the initial survey reconciliation for only the electrical features (listed in attached spreadsheet) was a net increase in potential Sustainment, Revitalization, and Modernization (SRM) funding in the amount of **\$2,333,809 annually**.*

Imagine the (SRM) funding that could result from future surveying, validation, correction and reconciling the numerous GIS/Real Property Inventory features that could potentially be miscalculated or unverified in the Real Property Inventory. This solution would allow IMCOM and the Army to properly calculate needed funding for installations via properly validated and reported data.