Title: **A GIS Enterprise Road Map for the Defense Logistics Agency (DLA): Implementation/refinements**

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Abstract

As a phase 2 to "The Defense Logistics Agency (DLA) Enterprise GIS" by Kaley in 2018, this project will focus on the components involved with the initial implementation an Enterprise GIS solution for DLA. System architecture design, software approvals and user access were investigated and developed as a foundational requirements in developing a GIS capable of addressing identified requirements within Installation Management and across other DLA organizational stakeholders. It was also important that the solution be agile and a scalable to facilitate future expansion and capabilities. Prototyping and Testing was completed on the ESRI platform selected as the DLA IT solution for GIS to ensure long term stability of the program and maximize initial offerings success. Examples such as standard workflows, Installation Management interfaces and business process mockups were developed as both proof of concept iterations and stakeholder test cases to further socialize and support the continued expansion to the DLA Geospatial Portal. With these factors providing the system infrastructure, the project transitioned to identify a need to focus on education and training to familiarize stakeholders and potential users with the current capabilities and to encourage the brainstorming of potential future iterations of the system. An extensive list of challenges and limitations encountered throughout the standing up of this system are also included to function as a reminder of how impacts were mitigated and also provide reference for other Department of Defense Agencies possibly exploring a similar solution. Lastly, a review of the overall project and potential future work closes the discussion on the extensive project that has ultimately resulted in the successful implementation of the DLA Geospatial Gateway on the ESRI Portal platform.

Introduction

During World War II, the military leaders and President of the United States recognized the importance of America's ability to receive, store and distribute vital resources to the Warfighter. This realization was the genesis of the joint Army-Navy-Air Force Support Center in 1952, where each branch of the Armed Forces was tasked with overseeing individual commodities [1]. This activity was formalized by the creation of the Defense Supply Agency (DSA) in 1961 [1]. Throughout the 1960's and 70's, DSA responsibilities expanded to include the administration of procurement contracts for the materiel it was receiving and the expansion of its operations to a global presence. In 1977, DSA was changed to the Defense Logistics Agency and further integration of various Department of Defense activities consolidated redundant responsibilities across the Department. DLA has supported every major effort on the global stage since that time, while continuing to increase the effectiveness and efficiency of the United States' abilities to support it various missions domestically and internationally [1].

> "As America's combat logistics support agency, the Defense Logistics Agency (DLA) provides the Army, Marine Corps, Navy, Air Force, other federal agencies, and combined and allied forces with the full spectrum of logistics, acquisition, and technical services. DLA sources and provides nearly 100 percent of the consumable items America's military forces need to operate, from food, fuel, and energy, to uniforms, medical supplies, and construction and barrier equipment. DLA also supplies more than 85 percent of the military's spare parts. In addition, DLA manages the reutilization of military equipment, provides catalogs and other logistics information products, and offers document automation and production services. Headquartered at Fort Belvoir, Va., DLA is a global enterprise. Wherever the United States has a significant military presence, DLA is there as well." [2]

Internally, DLA is led by a General Officer (GO) level military Director, a civilian Senior Executive Service (SES) Deputy Director and a civilian SES Chief of Staff. It is divided into six Major Subordinate Commands (MSC); Land & Maritime, Troop Support, Aviation, Energy, Disposition Services and Distribution. These six MSCs contain six operationalized directorates; Human Resources (J1), Logistics Operation (J3), Information Operations (J6), Acquisition (J7), Finance (J8) and Joint Reserve Force (J9). Finally, eleven support organizations function under the command staff to provide enterprise wide functionality; Office of the Inspector General (OIG), Intelligence, Public Affairs Office (PAO), General Counsel, Legislative Affairs, Equal Employment Opportunity (EEO) & Diversity, Small Business, Office of the Chaplain, Transformation, Installation Management and Installation Operations (the last two now combined into Installation Management Operations). Figure 1 below provides a graphical representation of the organizational structure of DLA [1].
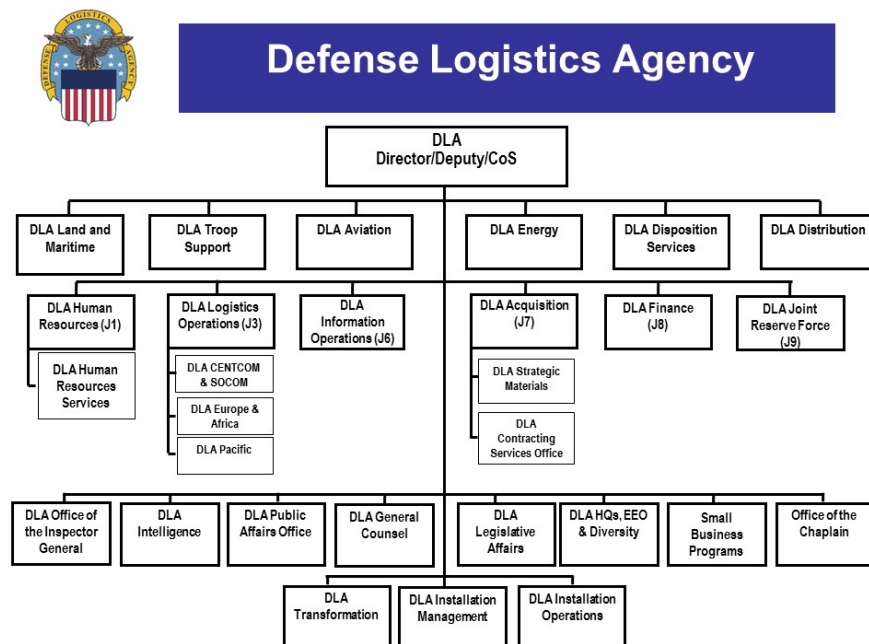

Figure 1 DLA Enterprise Organizational Alignment Headquarters Organization Chart [3]

By its mission statement, Installation Management and Operations "…provides safety, security, installation, and facilities management support services to all DLA organizations," [4] and this is the element within DLA that has taken the forefront in obtaining, managing and utilizing GIS data. It is recognized throughout the Agency that other Department of Defense Services and Agencies possess more mature GIS programs and those products have been a benchmark for the development of the DLA GIS.

Phasing of the Capstone

This capstone project was broken down into two phases. Phase 1 of the project identified current user needs and developed the system requirements (see Kaley, 2018 for details), while Phase 2, this project, utilized the needs information captured by Kaley (2018) to develop an enterprise system for DLA that was implemented.

The framework upon which the effort was undertaken and developed linking Phase 1 to Phase 2 is highlighted in Figure 3.

Figure 2 Basic system design and evaluation process [5]

Summary of Phase I

Kaley (2018) modified this to suit the needs for Phase 1, that included performing a user needs assessments, concept development and these fit within the DoD environment, analyzing the findings and providing recommendation for products (Figure 4). Specific efforts were taken within each of these process steps that progressively build upon the prior.
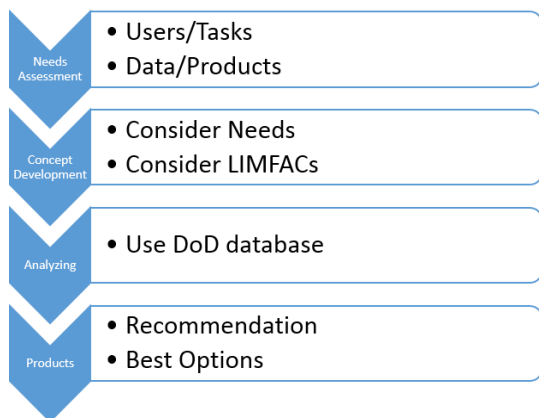

Figure 3 GIS design process [5]

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In essence Kaley (2018) investigated the needs across the enterprise while inventorying the known geospatial data repositories. A summary of the different types of users; functions necessary for each user to perform and the data sources required to complete the function user needs are provided in Table 1 and data sources in Table 2.

Table 1 Potential DLA users, skill-levels and access requirements [5]

DATA USERS [3]	Description	Systems required	Additional information/data	GIS/mapping what level of access?	Mobile access
Master Planner (similar to Community Planners)	Facility siting, space management	Funding priorities, space requests	Protected areas, Mission of requestors	ArcGIS Desktop, ArcGIS Pro	Yes
Maintenance Personnel	Maintain facilities, roads, infrastructure, grounds maintenance	Work management system, database of warranties	Cartographic location of items to work on	Supervision would need access to ArcGIS Desktop	Yes
Construction Project Managers	Manage multi discipline construction projects	Infrastructure locations, as-builts		Read access only, perhaps a portal	
Military Construction (MILCON) Coordinators	Coordinate large-scale projects, Congress level	High-priority, mission-driven short-falls	Project priority list	Read access only, perhaps a portal	
Environmental Specialists	Fauna and flora numbers, protected species habitats	Database of environmental compliance items	LIDAR surveys	ArcGIS Desktop, ArcGIS Pro, author-level access	Yes
Emergency Responders	Hazardous material locations	Database of trained personnel	Meteorological charts (wind), topography (run-off/storm-water)	GIS product to plot events, Chief or Command Post level	Yes
Public Safety (Police and Fire)	E-911 system	GPS, Base Map		Geo-coded addresses in Desktop, linked GPS, read-only	Yes
Logistics Operations	Optimize storage with highest volume movers (closest to the exit)	GPS? SMART Installation?	Tracking system, track "hot" inventory and locations	GIS system linked to inventory; key personnel need author-level access to update database	Yes
Headquarters and Primary Field Units	Enterprise-wide planning, both logistics and facilities	Review available storage space, review infrastructure condition codes, determine funding priorities		Searchable database (GIS portal), entire enterprise	
Real Property Management	Track Real Property, update square footage and layout.	Database of property, including geographic location	New construction paperwork, as-built paperwork	Portal access, but will require assistance to perform attribution and vector changes.	
Other interested Federal Agencies, upon specified need and request	Coordination, high-level, inter-agency data sharing		Could be anything	Searchable, portal-level access, read only	

Table 2 Preliminary list of data types, formats, providers and locations [5]

DATA SOURCES	DATA PROVIDED	DATA FORMAT	DATA LOCATION	ADD'L INFORMATION
HDR, Inc. (Contracted Company)	Baseline Infrastructure	Shapefiles, SDE	Network Drive, Portal	
United States Army Corps of Engineers	Roofing, Paving, Facility Condition Index Survey	Digital Report (pdf?)	Network Drive	Not received yet
HDR, Inc (2nd Contracted Item)	Area Development Plan	Planning document	Network Drive	In-progress
CAD Files	CAD drawings	.dwg files	Network Drive	
As-built Deliverables	Depends on Statement of Work defined deliverables	Various (CAD, reports, Op Manuals, shape files, etc.	Network Drive, when submitted	Required for each project
In-house Surveys	Topo, boundaries, survey data	.csv files	Network Drive	As needed
Historical Data	Various	Various	Network Drive	
Project Deliverables	Reports, Plans, etc.	Various	Network Drive	As solicited
Building Information Modeling (BIM) data	Building life-cycle data	.dwg, .dxf, .ifc, .rvt, .nwd	Network Drive	Unknown if any currently available or on-hand
Civil 3D Data	Topo	.dwg files	Network Drive	As received
LIDAR Data	Elevation, vegetation, contours	.dem, .csv	Network Drive	
Historical, Multi-format Data	Various	All previously listed, plus .dgn (micro-station)	Network Drive	No Micro-station software available
TIFF & JPEG Files	Mostly old scanned as-builts	.tif, .jpg	Network Drive	
Historical, Hard-copy as-builts	Infrastructure As-builts	Hard-copy prints	File room	Will require scanning
Other Unknown Formats	TBD	TBD	Network Drive, physical location on-site	TBD while researching

After evaluating the Users and Data upon which the Enterprise GIS Solution should be built, Kaley (2018) progressed to researching the standards on which GIS systems are structured, investigating user requested capabilities, assessing the limiting factors for a system in general and specific to DLA and taking an inventory of IT capabilities and needs going forward.

Concept Development

- Literature Search – Design Standards
- User Recommendations
- LIMFAC Assessment
- IT Network, Software & Hardware Evaluation

The last element of Phase 1 was to analyze the "vocabulary" that the system would utilize and how the elements of geospatial data could be formatted to facilitate efficient internal usage for mission supporting activities and effective external data transfer to fulfill DLA obligations to the Department of Defense.

Analyzing

- ARMY Installation Geographic Information and Services (IGI&S) SDSFIE Adaptation
- Whole Building Design Guide (WBDG.com)
- Review of similar efforts and conversion of GeoDatabase to DoD SDSFIE
- Discussed subject at FedGIS 2018 & 2019 with ARMY IGI&S

OF NOTE: on April 11, 2018 it was decided that the Army Adaptation of SDSFIE v4.0 Gold will be adopted upon its acceptance by the Defense Installations Spatial Data Infrastructure (DISDI) Program. The scheduled timeframe for this action to complete was Dec 2018 and implementation of the program began in January2019. This decision will require all existing geodatabases and new data to conform to the standard. It is expected due to the relatively small repository of data maintained by DLA and its existing conformance to SDSFIE v3.1 that scripts will be developed to convert the existing data sources.

Phase 2: Implementation

With the information collected and outlined in the framework set by Kaley's (2018) effort, I began to prototype a system around those findings which resulted in the development and implementation of an enterprise system requiring minimal revisions throughout the process.

One of the initial efforts of the 2nd phase of this project was to gain approval from the DLA IT Front Desk for the foundational software The following list of products have been processed through the DLA Front Door for Enterprise implementation and acceptance as a component of the IT Solutions Document:

1. ArcGIS for Desktop
2. ArcGIS Pro
3. ArcGIS Portal
4. ArcGIS Server
5. ArcGIS Maps for Office
6. ArcGIS Maps for Adobe Creative Cloud
7. ArcGIS Maps for Power BI
8. ArcGIS Maps for SharePoint
9. Survey123 for ArcGIS
10. Collector for ArcGIS
11. Workforce for ArcGIS
12. Insights for ArcGIS
13. Operations Dashboard for ArcGIS
14. GeoEvent Server
15. GeoAnalytics Server
16. ESRI CityEngine
17. ArcGIS Earth
18. Python
19. All the Extensions as applicable for Pro, Desktop and Enterprise

These approvals allowed the project to proceed towards creating a working beta for the purpose of educating organizations about the capabilities of a GIS and gaining additional stakeholder support. This prototype was referred to as the DLA Portal and was built upon the ESRI Portal for ArcGIS platform.

Also, the IT Solution Document will have to be consistently updated with versioning and software releases to maintain the capabilities of the Geospatial Gateway into the future.

System Architecture and user access

With an influx of funds during 2018, a number of software suites were approved for use on the DLA network enabling for the development of the system architecture. Considerations of the architecture system included user access, data access (through a central server) and security. User access is provided by way of supplied login credentials with DoD Common Access Card (CAC) being the ultimate goal of combining access and security. As of November 2018, the DLA Installation Management Portal for ArcGIS license has been transferred from operating within a corporate server to the Microsoft Azure Cloud gaining common access for all users, increasing performance, packaging the instance for future export onto the GovCloud Azure and providing increased security benefits. The resulting system architecture is summarized in Figure 4.
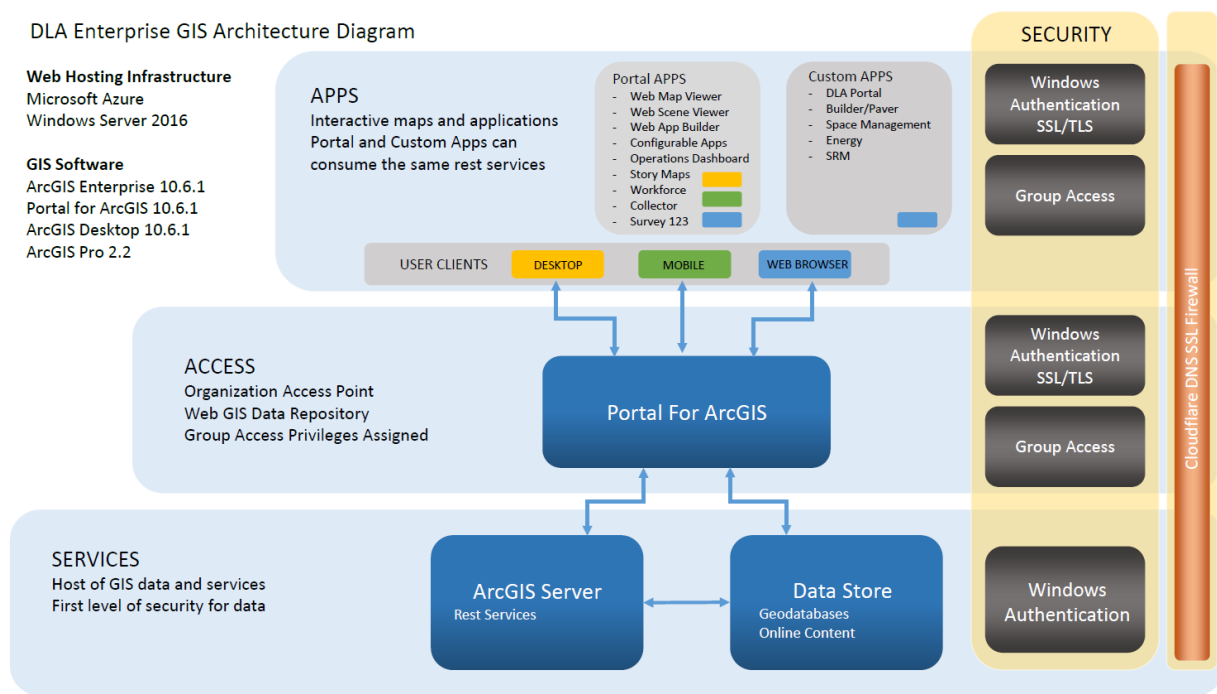

Figure 4 DLA enterprise GIS architecture system incorporating DLA approved software

To ensure easy access to the enterprise system, access was provided through a central location, the DLA Geospatial Gateway, as shown below (Figure 5). As more tools become available users will be able to search and access the tools they need base on location, organization and group membership permissions.

Figure 5 DLA geospatial Gateway where DLA users can access different applications.

The DLA Portal was hosted on remote servers and was accessed through a web browser interface. Baseline geospatial layers were consolidated to one data repository and collected for installations with no geospatial data solely in support of this effort. Dedicated tabs within the web browser supplied targeted data that included topics such as Logistics & Tracking Inventory, Master Planning, Utility Pathways, Environmental Mapping and FEMA Floodplain Web Services.

The DLA Portal provided an environment to begin a dialog across the Enterprise and explore the possible future solution and the inevitable challenges.

The following are functional or practices in place at this time to provide auxiliary support to the ongoing GIS effort:

<u>ArcGIS for Desktop/ArcGIS Pro:</u> GIS data/policy creators/editors. Permitted rights through server group policies to perform duties associated with creation, editing and maintenance of geospatial dat.

<u>ArcCatalog:</u> GIS Standards (SDSFIE) enforcement. Permitted rights through server group policies to perform duties associated with this activity.

<u>ArcGIS Online:</u> DLA Geospatial Gateway data is accessible directly through this interface allowing for additional manipulation of the data sources.

Prototype and Testing

Additional needs assessments were developed from information gathered during a prototyping meeting with several organizational stakeholders. The purpose of this was to identify essential tools and prioritize development of specific tools that will have the most impact. The output of this will allow for the design of a framework that will be flexible enough to serve the wide variety of needs of DLA and enable for the system to evolve over time as needs change.

Several examples were identified that highlight different use needs and will be expanded on:

1- Development of workflows for data editing, updating and conversion
2- Facilities Management
3- Inventory Tracking

1. Development of workflows for editing, updating and converting data.

It is expected that a substantial amount of data will enter, exit and be modified within the geospatial environment that is being created and that as a matter of ensuring standardization across the Enterprise outlines of Standard Operating Procedures should be provided for personnel to facilitate repetition and consistency. The workflows below in Table 3 describe just 3 levels of taskings that will be associated with the long term maintenance of the DLA Enterprise GIS solution.

Modifications to the physical environment of a DLA site do not occur often, so the workflow for Site Changes will provide guidance to DLA personnel to ensure this action is completed following the same path. Georeferencing CAD files is a necessity to bring historical documentation into the environment as well as correct deficiencies from modern projects that are not adhering to DoD specifications. A related workflow that would need to be created is how to induct CAD files received from third parties and standardizing layer naming conventions. Editing is a high volume, daily occurrence that needs to be consistently applied to avoid a large number of uniquely attributed data points.

Table 3 Summary of workflows used for standardizing data editing, updating and conversion

Workflow for Data Updates Following Site Changes [6]	Un-Georeferenced CAD Data Transfer Workflow *[6]*	Editing Workflow [6]
A site change (new building, building addition, road reconfiguration, new sidewalk, etc.) is completed through an in-house or execution agent project. Installation Management receives completed as-built drawings and inducts them into the Enterprise GIS. Workflow provides diagram of native file import, creation through digitizing and in-field surveying. Quality Control step with project point of contact occurs prior to broad release.	Bi-directional workflow for working between two primary Installation Management engineering environments. As a substantial amount of CAD formatted files do not contain a spatial reference, the assumption is that for facility interiors the left side of this workflow will be used frequently early in the system data population.	Extensive editing workflow attempts to capture three anticipated instances were editing may occur online, offline or by multiple users at the same time. Routine steps mirror each other with a step down closing from disconnect single user through connected multi user to single gatekeeper for finalized database data of record.

2. Facilities Management

The Facilities Management component of the Enterprise GIS will facilitate a broad range of real property, site management and emergency/safety function in addition to many others into the future of the program. A Master Planning tab provides for future Military Construction planning and communication by way of the Common Installation Picture of transportation networks and facility layouts alongside basic utility infrastructure information. A Environmental and Safety tab relays monitoring well, pollutant plume, confined space and storm water management facility locations and related information. A detail Utilities tab provides a single point of information for One Call activities and emergency response situations where utilities may be impacted or deactivation is required. Lastly, a FEMA Floodplain service is streamed into the interface to coordinate broad notification to Installation personnel in the event of high water events to ensure a safe and efficient travel plan from the location.
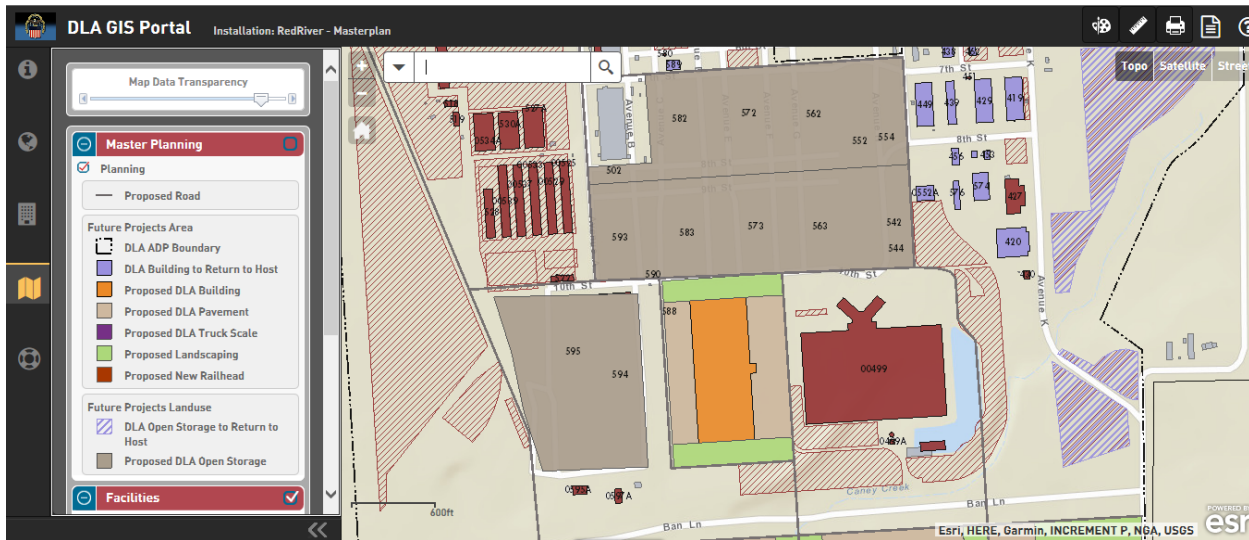

Figure 6 Installation Management Beta GIS Portal developed to test interface and garner stakeholder support.

3. Inventory Tracking

The purpose of this initial example was to demonstrate the timeline of items and evaluate where processes could be improved. A prototype was developed and made available to DLA users for about 6 months. For the purpose of this study, a logistic tool was developed and tested since this is an important workflow at DLA.

The logistics business relates to 4 key DLA Distribution organizations: Distribution Operations (J3), Strategic Operations (J5), Deployment Operations (J9) & Distribution Emergency Operations (DLOC) (Report, March 2018). Uniform mission needs and area of concern was developed and centered on the following:

- No spatial tracking of inventory and assets in storage areas
- No spatial tracking of inventory and assets on site or between buildings
- No spatial tracking of inventory and assets between sites in the organization
- Minimal collection of metrics throughout
- No concerted efforts at optimization across the distribution network
- No spatial overview of ground conditions in areas of fulfillment or deployment [7]
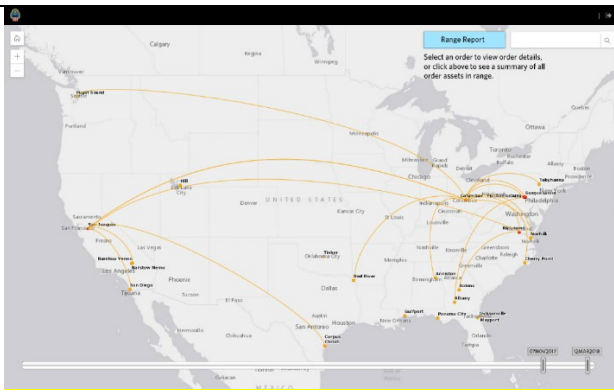
Inventory tracking and logistics can be broken down into five stages (Table 4) and are able to view real-time shipping routes, track as an item from the time is has been shipped until delivery (Table 5).

Table 4 Logistics business process used to demonstrate GIS usefulness

Stage	Details	Benefits
Storage & Inventory Management	Inventory Order Received	• More effective use of storage space resulting in reduced overall storage costs • More efficient storage can result in reduced time from Order Receipt to Packaging • Fine-tuned storage can also lead to automation resulting in further reductions in time from Order Receipt to Packaging • Automation in this area would result in more efficient use of staff resources, especially in later areas of the logistical spectrum
Fulfillment & Packing	Order Fulfillment Packaging	• Refined order tracking metrics and business logic could provide better metrics for J5 models • More efficient organization of inventory resulting in reduced time from Order Receipt to Packaging • Updated Order tracking tools and software may provide more efficient processing • Potential inventory automation resulting in reduced time from Order Receipt to Packaging • Potential Order Receipt and Order Fulfillment automation resulting in reduced time from Order Receipt to Packaging
Shipping & Lading	Shipping Transit	• Enhanced delivery metrics would provide carrier performance indicators • Refined commercial shipping criteria would ensure data availability for further metrics • Advanced real-time tracking of items in transit could provide additional insight
Recipient Review	Arrival Receipt	• More efficient organization of site-level inventories could result in reduced time from Order Receipt to Arrival for individual sites.
Ground Conditions	Destination	• Critical decision information would be available to deployment and emergency planners.

Table 5 Logistics business process and mockups used to develop GIS Application

Stage	View Mockup of Prototype	Capabilities
Operations Dashboard addressing Inventory, Order Received, Order Fulfillment and Packaging		Provides real time heat mapping of facility activities, transportation loading and unloading time frames, on site personnel, active order queueing and historical charting of facility efficiency by personnel loading to orders fulfilled. Additional tabs would provide detailed Pick/Pack/Stow & Throughput metrics, inventory turnover and order details.
Transit Logging addressing Shipping, Transit and Arrival		Provides interactive tracking of customer orders utilizing package number provided by DLA Distribution visualizing real time location and individual order performance within historical norms.

Distribution Logistical Performance addressing Arrival, Receipt and Destination		Provides historical analytic capability to evaluate long-term, short-term and event perfomance of the DLA Distribution network as a platform for improving effectiveness and reducing resource mismanagement.

Testing has been an integral part of the prototyping process and the continued improvement of the system, particularly the interface. Methods of testing/grading that were utilized are as follows:

- Cost Benefit Analysis (CBA)
  - Evaluation of the cost of development specifically with the mission activities above versus the return on that investment. The goal was to have a payback of 5 years or less and what has been calculated in most cases in under 2.
- Surveys
  - Early adopters/testers were invited to provide active feedback when closing their instances of the portal.
  - Current gateway users have been provided a survey link at the bottom of the interface to provide at-the-moment comments and suggestions.
- DoD Partner Evaluation (NGA, NAVFAC, ESRI etc.)
  - By introducing the developed products to other organizations, it has provided a host of constructive criticism, lessons learned and mutual growth as the differing perspectives and diverse goals create a wealth of comments to educate the future development and capabilities of the system.
- Living Workflows
  - Several initial workflows were created to act as graphical representations of different level of effort in maintaining, utilizing and manipulating the system and its data through various Installation Management Operations activities and new work flow needs to be developed as the system matures for additional stakeholders.

Enduring System Education & Training
Training has not been emphasized at this time beyond introductory courses for the primary interfaces. Self-exploration and trial & error has been the primary methods for personnel enrichment as the system does not currently allow user inducted changes to the data. With future capability roll outs and elevated privileges additional training will be required as data impacts materialize.

Additional opportunities that have been discussed are:

- Lunch & Learns - Lunch and Learns with different levels of users to promote networking and lesson learned.

- Demos - Demos to show specialized and perhaps regulated processes with their proper steps to facilitate a greater auditability of an authoritative source.

- DLA Training Learning Management System (LMS) - LMS is DLA internal training library that facilitates training whether it be onsite, offsite, online or self paced. We have initial discussions with ESRI to upload some their various training video within the DLA network.

- Regional and National Conferences (i.e. ESRI's FedGIS)

Additionally, this phase of the future system operation is where we hope to harvest new ideas and gain suggestions on where a functional production model of a DLA Enterprise GIS can go into the future.

Challenges and Limitations

DLA, as with all Federal Government organizations, is governed by regulations, policies and codes. Often with new processes, these documents conflict or provide divergent directions. Steps such as project initiation, assignment of responsible parties, allocation of funds and perpetual maintenance all required review against policy.

Information Operations, known as J6, controls all aspects of the DLA network and systems that operate within and through it. Requests for software, hardware, network access & security measures all have to be routed through J6 and have indefinite timeframes for processing. The resultant approvals are mandatory before embarking on following stages of this project due to the downstream impacts of misdirected efforts. Also, J6 support of this effort has been slow. J6 possesses no Subject Matter Experts relying on their customers to provide this knowledge, but provide guidance without knowing the end result and with a discipline that is risk adverse, this has been a cultural learning experience for all parties. J6 will maintain this system, provide access to its resources and be called upon to fix outages and protect this system from unauthorized use. Additionally, J6 has had to invest in a large Windows 10 hardware rollout that has demanded a substantial portion of their annual budget, Cloud and server resources were slowed to almost a crawl, but a contracted solution has been put in place to facilitate this project through other funding streams.

In regards to data procurement, we have pursued a two headed solution. Currently, we have a task order contract in place that is providing data assurance and quality control on existing DLA provided datasets and also is supplying survey teams to collect identified deficiencies in what DoD refers to as the Common Installation Picture or CIP. This includes, but is not limited to, datasets including buildings, roadways, utilities, topography and security measures. The second pursuit is procuring J6 approval for a GPS Base Station and Rover units to collect data with Government personnel through routine work processes and site surveys. The desire is to package a solution that is deployable throughout the Enterprise.

An organizational issue we have encountered is educating various levels of DLA leadership that possess little to no operational experience with a GIS. This has resulted in slow processing and the requirement to educate personnel, as well as addressing concerns that alternate solutions may be available and/or should be pursued. The project team, along with our contracted partners, recently had in detail meetings with ESRI personnel to strategize on a targeted plan to educate various decision making pathways on the applications of the technology across the government and the regulatory obligations of the Agency.

Operational and Information Security (respectively OPSEC and INFOSEC) continues to be a main concern associated with the aggregation Geospatial and Mission-oriented data. We have taken steps up to this point to provide access through credentials and user permission segregation.

This leads to a significant responsibility of a Government Agency and current new topic. Public visibility has been pushed as a significant goal within DoD and open platforms have been built (NGA). This has furthered by the recent passing of the Geospatial Data Act, OPEN (Open, Public, Electronic and Necessary) Government Data Act and Evidence-Based Policymaking Act signed into law in late 2018 and early 2019. As the system is continuing to be developed, this will be a challenge for the foreseeable future.

Future work

The project described here is a robust framework from which additional solutions will be provided over time. An additional interface is being developed to act as a repository for map services for public viewing and will be in addition to the non-secure and secure instance used within the DLA network.

Tables 3 & 5 demonstrate some of the on-going efforts that are occurring as the Enterprise GIS gains audience and influence within the individual DLA organizations to enable it to be an effective, efficient and responsive tool to

stakeholder needs. Emergency Operations Center (EOC), Emergency Dispatch and Security Camera solutions are the latest request that have been received for support which require additional needs assessments and prototyping thus maintain a cycle of revitalization within the Geospatial Portal and expansion of capabilities.

Discussion and Conclusion

The Enterprise GIS Road Map for DLA is very active and continues to develop, hopefully for years to come. The breadth of the stakeholders involved continues to expand with the developing interest in consolidated network solutions, automation and big data repositories within the Agency. As of the writing of this paper, an additional Task Order contract has been awarded to support this effort with new data service and a dedicated GIS Professional for the next two years. Additionally, ESRI has taken a keen interest in partnering with DLA and has begun to supply business case analyses for presentation to Agency executive management. In total this project was extremely challenging from the perspective of navigating the various decision making pathways within DLA, but also extremely rewarding in the experience gained and production grade enterprise solution that has resulted from the efforts of this project.

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