

The banner features a blue background with a white line graph and data points. The title 'Linear Audit Readiness Application (LAuRA)' is prominently displayed in white. Below the title, it states 'In Partnership with AFCEC/COAU'. A dark blue horizontal band contains a paragraph of text. Below this, the text 'ULS Data Deliverable | Installation Database' is centered. At the bottom, four white boxes represent the application's workflow: 'Compare', 'Review', 'Determine', and 'Reconcile', each with a brief description of the step.

Linear Audit Readiness Application (LAuRA)

In Partnership with AFCEC/COAU

LAuRA was developed to assist installation GIOs in performing data analysis and review in an effort to improve quality and accuracy of utilities datasets. Deployed by AFCEC GIO across the AFGIMS Enterprise for reconciliation of Utilities Linear Segmentation (ULS) data deliverable attribution values against an installation's most up-to-date database.

ULS Data Deliverable | Installation Database

- Compare**
Joins the ULS Deliverable with the Installation Database.
- Review**
Analyze the Differences Between Attribution Values at the Feature Level.
- Determine**
Find Highest Accuracy of Values Between Databases.
- Reconcile**
Make Updates to the Authoritative Data Source Without Overwriting Geometry.

Linear Audit Readiness Application (LAuRA) improves real property data quality

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The Air Force requires good data to support good asset management capital investment decisions. Trust in recommendations supporting Infrastructure Investment Strategy (I2S) objectives and actions is heavily influenced by data completeness and accuracy. Speed, although desired, is not always the best course of action for improving data quality, especially when it comes to the volume and variety of Air Force installation built and natural infrastructure, including the installation's utility system linear assets.

Utility distribution networks provide a unique challenge for collection of new data because of its size and a large portion of assets are often obscured by man-made structures or are buried underground. AFCEC's Operations Directorate, Asset Visibility Division, Utilities Branch, has focused its efforts to improve linear asset data through a deliberate, standardized, and steady-paced collection and assessment process. The results have been positive for installations and the civil engineer enterprise.

Between 2015 and 2019, AFCEC's Operations Directorate centrally executed a base support contract to collect 12 key data attributes for linear segmenting utility

distribution systems and populating the respective fields in the geospatial database at 94 installations. This was in direct response to support an OUSD Directive on Feb. 4, 2013

"Revised Implementation Goals for the Linear Segmentation Capability of the Real Property Inventory Requirements (RPIR)" to complete real property accountability by Sept. 30, 2017.

ATTRIBUTE	DESCRIPTION
[sdsFeatureName]	Asset Type
[realPropertyUniqueIdentifier]	Real Property Unique Identification (RPUID)
[segmentID]	Segment Identification Number
[functionalArea]	Geographical/Functional Area
[operationalStatus]	Operational Status
[measuredLength]	Total Length
[utilityNetworkType]	Use
[latitudeFrom] [latitude to] - longitudeFrom] [longitude to] [latitude], [longitude]	Location Coordinates (linear and non-linear)
[installedDate]	Installation Year
[generalMaterialType]	Material Type
[diameter] [diameterUOM]	Size (diameter to include Unit of Measure)
[condRatingValue]	Condition Rating

The 12 attributes are defined by *"DoD's Guide for Segmenting Types of Linear Structures for Collection"* drive Real Property Accountable Property Systems of Record (APSR) integration and asset geospatial information accountability enabling Asset Management System age degradation formulas for asset replacement or maintenance, Utility Design to Construct (D2C), reliability engineering via outage analysis and other calculations for Air Force Comprehensive Asset Management Plan (AFCAMP), Integrated Priority List (IPL) development, Comprehensive Planning Platform (CPP), Utility Sustainment Management System (SMS) and Facilities Sustainment, Renovation and Maintenance (FSRM) activities.

"The installation's linear segmented GIS data will serve as the authoritative data source for the new DoD Enterprise SMS Utilities Domain, and it is very important the data accurately reflects the installation's real property records" said Joe Worrell, program manager for the Enterprise SMS Utilities domain.

No operation of this size is free of complications.

"After receiving concerns from several installations that the final government provided Linear Segmentation deliverable to the bases had errors with missing data, we performed troubleshooting of the government provided data and confirmed there were errors that caused concerns over the usability of the information," said York Thorpe, AFCEC Operations Directorate utilities branch chief, Tyndall AFB, Florida.

These gaps and errors, in addition to the intrinsic value of utility location attributes, led to the Operations Directorate collaborating with the AFCEC Geospatial Integration Office (GIO). Together, they worked on creation of an application using existing capabilities to ingest, process and assess select attributes, identify gaps and prepare installation utilities data for the next phase of the ULS activities.

The result of the collaboration is the Linear Information and Audit Readiness Application (LAuRA), an agile geospatial information processing tool and a python-based user interface that compares collected attribute data at the feature level designed to provide end users an easy way to compare and accept, take no action, defer or flag for future review a change detected between collected geospatial data and the same utility linear segmented object, such as primary overhead conductor data, within an installation's geospatial database.

More specifically, after comparing all the objects for each of the Primary Utility Datasets – such as electrical, water, wastewater and gas – and installation data owner decisions are made, selected object level decisions are recorded and updated within *LAuRA*. This comparison process can be run until accepted by the installation user. At that point, the application saves updates into the installation's geospatial database. The updated values are then ready for use reporting, integration and reconciliation with other enterprise systems, project planning and funding justification.

An additional *LAuRA* function includes automatic logging of user activity and recording ingestion metrics from each installation. This information is used to report results of the application to select Operations Directorate personnel, including that utilities data is comparatively up to date for many installations. It has also provided others the opportunity to save important values from the 12 key attribute fields for use on other initiatives.

"It is wonderful to have such an invaluable tool that the bases can use to quickly correct errors in their linear segmentation data and incorporate it into the bases' geospatial data file. It helps provide a measure of comfort to the Civil Engineer Enterprise that we now have accurate utility linear segmentation information that we can rely on to be used in the soon to be fielded Enterprises Utilities Sustainment Management System," Thorpe said. "Creating and fielding such a user-friendly tool to the field in the matter of a few months is a phenomenal accomplishment by the AFCEC GIO staff. It has and continues to be a lifesaver for us and empowers the base engineers in ensuring the quality of their GIS data."

Proven to be an invaluable cross-functional Civil Engineering tool, we will continue to employ LAuRA to improve data quality of future data collection, with a focus on the FY 20 awarded utility linear segmentation contract titled "Geospatial Information System (GIS) Services to Support Utilities Linear Segmentation" for the remaining 99 utility systems at 43 installations during the next two fiscal years.

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