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# TME
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Linear segmentation data of utilities distribution systems at military installations is relied on for accurate modeling and financial decisions, and so assuring its accuracy is paramount. U.S. AIR FORCE PHOTO

# Resolving Differences in GEOSPATIAL DATASETS

**Faced with discrepancies in linear segmented utility data, the U.S. Air Force applied a new tool to compare existing data and integrate information in a safe and protected manner.**

*By Scott Ensign, M.SAME*

When discrepancies arise among asset information in a U.S. Air Force installation enterprise system of record, such as the GeoBase geospatial database, those differences must be resolved. While such discrepancies are not uncommon, they have significant impacts.

The Air Force Civil Engineer Center recently acquired linear segmented utility data to update asset information in the GeoBase Program's geodatabase. The data had been collected over a four-year period at 94 Air Force installations and was stored in readily ingestible geospatial databases organized by each installation. However, to integrate the new data with installation geodatabases, a tool to compare the two datasets before ingesting was needed.

To reconcile the newly collected linear segmented utility data, the Linear Audit Readiness Application (LAuRA) was used to quickly compare existing data to incoming data line by line. Incorporating safeguards to ensure the existing data is protected and usable, the tool provided a way for geospatial analysts to select and compare attributes, identify differences in the data, and integrate the new data values to build more accurate and reliable geodatabases on utility assets.

## DATA FIDELITY

Geospatial data for linear segmentation of a utilities distribution system provides a record of the physical attributes of the utility system. These attributes improve the modeling of fuses, valves, switches, and other features. The geodatabase contains layers of information to track and maintain the utility systems and their multitude of subcomponents. No matter what the system is used for, maintaining these assets is critical to sustaining mission and operational capabilities. Consequently, the linear segmentation data is essential to keeping an installation running and facilitates critical financial decisions for installation leadership.


The LAuRA tool tracks a number of metrics to provide insight on its use, as well as safeguards to protect the datasets. PHOTO COURTESY WOOLPERT

When gaps and errors were discovered between the new and existing datasets, LAuRA proved to be invaluable in salvaging data and restoring confidence in the accuracy of the utility linear segmentation information. With it, the Air Force was able to compare the final linear segmentation data with the final product the government had provided to bases and quickly see the errors between the two datasets.

The LAuRA tool was configured to review 12 key attributes for each geospatial object within the linear segmentation data. Attributes such as install dates, functional areas, and real property unique identifiers were in the existing databases and also collected by the contractor over the four-year period. To compare the two datasets, users first created a separate database with the new values, then made a copy of the default or master database with the original values. LAuRA was used to select and compare the new and existing values line-by-line for each attribute. Users were able to save and accept changes made, take no action, defer, or flag a change detected for review.

To protect the integrity of the data, fail-safes are built in. LAuRA can only be accessed using an administrative account. Updates can be made without overriding values. A series of prompts alerts users to changes being made for each database.

## TRACKING METRICS

Without the LAuRA application, data collected by installations over the span of a couple of years was at risk of being shelved because there was not a way to integrate the new values into the existing databases. LAuRA's logging function aids in tracking various metrics to provide insights into how the tool is being used and its effectiveness. It can be used as a reporting mechanism to capture the information needed to determine the next major focus for data collection and analysis. Though the tool was originally developed to track basic inputs, such as the frequency and length of time it was being used and how many datapoints were reviewed, it has been enhanced to provide a wealth of information and applications. Users can now look at every individual feature class and every individual dataset, as well as every individual field, and it will report how many discrepancies it found per field, per layer, and then how many of those values were reviewed, modified, or flagged.

Additionally, the logging function provides qualitative metrics rather than quantitative—showing aspects such as percentages of modified values in a particular field, or how long a particular attribute was reviewed.

## VITAL MISSION SUPPORT

For the civil engineers at military installations, LAuRA can provide a way to remove errors and gaps in geodatabases when newly collected data is provided. The Air Force plans to use the tool again for its next phase of data collection and has noted that it can also assist in reconciling the real property records and geospatial data to support the Financial Improvement and Audit Remediation Report. The approach of having a granular comparison of values within two datasets representing the same assets and attributes can theoretically be applied to support other surveying objectives where databases need to be updated with newly acquired data.

Utilities infrastructure is vital to supporting the mission of the Air Force and its operational requirements. Having confidence in the geospatial data that provides a digital representation of those assets is critical. Keeping accurate data on those assets is key to ensuring day-to-day operations are maintained, and to sustaining those same operations over the long term.

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Scott Ensign, M.SAME, is Air Force GeoBase Program Manager and Geospatial Integration Officer, Air Force Civil Engineer Center; scott.ensign.1@us.af.mil.