



# **The Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE)**

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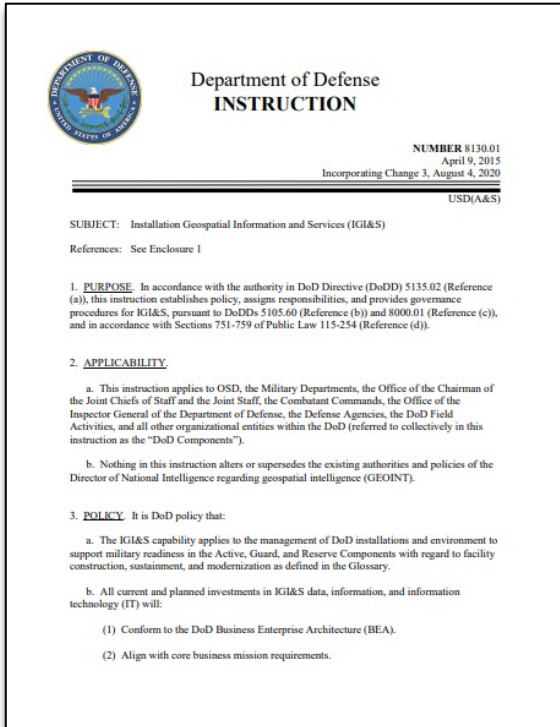
Office of the Assistant Secretary of Defense (Energy, Installations, & Environment)

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# What is SDSFIE?

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- A family of geospatial data standards
  - Models
  - Specifications
  - Procedures/Workflows
  - Online tools
- Purpose & Scope: To structure commonly used data and products for GIS mapping of DoD Installations and USACE Civil Works infrastructure - make geospatial data and services visible, accessible, understandable, trusted, and interoperable across the DoD

\* SDSFIE is mandated per DoD Instruction 8130.01, Installation Geospatial Information and Services, Change 3 issued 4 August, 2020

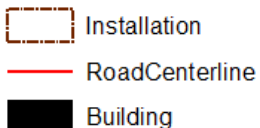


# SDSFIE Family of Standards

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## SDSFIE-Portrayal (P)

States how each layer should be displayed on the map



## SDSFIE-Vector (V)

Uniquely defines and names sets of geospatial features, e.g.,

Building Footprints    Installation Boundary    Road Centerlines

## SDSFIE-Metadata (M)

Metadata describes what is in the dataset; how it was produced; who did the work; when, & why

## SDSFIE-Quality (Q)

Specifies how the dataset should be produced, maintained, and assessed and checked for quality

## SDSFIE-Raster (R)

Provides guidance and best practices for acquiring and using raster data, e.g., satellite and *aerial imagery* and elevation



Fort Buchanan



# The SDSFIE Vector Standard: “Points, Lines, Polygons”

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- SDSFIE Vector (SDSFIE-V)
  - A “dictionary” of 287 geospatial feature types (aka map layers) commonly used by DoD for performing installation management, energy management, environmental restoration, natural and cultural resource management, test and training range operations, and civil works construction/maintenance/operations
- Functional Themes of SDSFIE-V data:

Airfields	Common & Cross-Functional	ENV Common & Cross-Functional	Planning
Cemetery Operations	Environmental Compliance	Military Ranges and Training	Real Property (Buildings, Structures, Land)
Civil Works	Cultural Resources	Natural Resources	Recreation
Environmental Clean Up	Emergency Services	Public Works (Communications, Electrical, Gas, Other, POL, Stormwater, Wastewater, Water)	Transportation



# SDSFIE-V Model “Elements”

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- Logical Data Model (LDM) elements:
  - **Folder** – a set of entities
  - **Entity** (two types)
    - **Feature Type** – set of thematically equivalent geographic features with table of attributes
    - **Object Table** – A non-spatial data table
  - **Attribute** – a characteristic of an entity
  - **Enumeration** – constraint on an attribute
  - **Enumerant** – permissible value in an enumeration
  - **Association** – establishes a relationship between two entities based on a primary key and a foreign key

SDSFIE LDM Element Terms	Physical Elements Terms, in ArcGIS Geodatabase
<i>Folder</i>	<i>Feature Dataset</i>
<i>Entity</i> <ul style="list-style-type: none"><li>• <i>FeatureType</i> (spatial)</li><li>• <i>ObjectTable</i> (non-spatial)</li></ul>	<i>Feature class</i>  <i>Object class</i>
<i>attribute</i>	<i>Field</i>
<i>Enumeration</i>	<i>Domain</i>
<i>enumerant</i>	(Domain) <i>Value</i>
<i>Association</i>	<i>Relationship</i>



# Example Feature Type In SDSFIE-V – Gas Utility Segment

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**GasUtilitySegment (Gas Utility Segment)**

Definition: The subdivision of a gas distribution network, particularly a pipeline for the transmission of some heat or installation gas product.

Description:

Note:

Justification:

Approval Status: Approved      Default Geometry: L      Permissible Geometry: A/L/P

Attributes	Model Name	Definition
featureDescription	featureDescription	The narrative describing the feature.
featureName	featureName	The common name of the feature.
gasUtilitySegmentIdpk	gasUtilitySegmentIdpk	Primary Key. A unique, user defined identifier for each record or instance of an entity.
installationId	installationId	The official code assigned by the Military Service (includes Washington Headquarters Services) to identify the site.
isMainLine	isMainLine	The yes or no indicator of whether the gas utility segment is a main line.
mediaId	mediaId	Used to link the record to associated multimedia records that reference data.
metadataId	metadataId	Used to represent or link to feature level metadata.
operationalStatus	operationalStatus	The state of usability of the feature.
legalInterest	legalInterest	The designator used to identify the type of legal interest that DoD holds in a real property asset.
rpnid	rpnid	The designator that distinguishes one real property network (RPN) from another within a RPI database.
rpsuid	rpsuid	The non-intelligent code used to permanently and uniquely identify a DoD real property site.
rpuid	rpuid	The non-intelligent code used to permanently and uniquely identify a DoD real property asset.
sdsid	sdsid	The unique identifier for all entities in the SDSFIE.

**List: OperationalStatus (OperationalStatus)**

Definition: The state of usability of the feature.

Enumeration Value	Alias Name	Definition
abandoned	Abandoned	The feature is abandoned but remains in place ...
closed	Closed	The feature is officially closed, but not yet tran...
inService	In Service	The feature is able to function or be used; it is ...
notInService	Not In Service	The feature is operational, but not currently bei...
other	Other	Has been determined to be a specific value tha...
programmed	Programmed	The feature is programmed to become operatio...
proposed	Proposed	The feature has been proposed to be program...
removed	Removed	The feature previously existed at the location, ...
temporary	Temporary	The feature is intended to be used for a limited...
tbd	To Be Determined	Has not been determined at date of record pop...
underConstruction	Under Construction	The feature is in the process of being built.
unknown	Unknown	Has been found to be not knowable at the date...

Definition & Description of Feature Type

List of Attributes (for this Feature Type)

Example enumeration for one attribute





# “What Does SDSFIE-V Data Look Like?”

## Utilities Management Feature Types (example)

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Select Identify Layer: Select a Layer Viewfinder Compass Pan

Zoom Level

Legend

- Fuel Pipe
- ABANDONED
- DEFUELING
- MAIN
- SERVICE
- UNKNOWN
- VENT
- Transmission Pipeline
- Water Line
- Storm Sewer Line
- Wastewater Line
- Gas Valve
- Gas Line
- Electrical Junction
- Electrical Transformer Bank
- Electrical Cable Line
- Air Accident Zone
- Athletic Area
- Athletic Court
- Golf Course
- Pool Area

Layers Preferences Locate My Maps Help

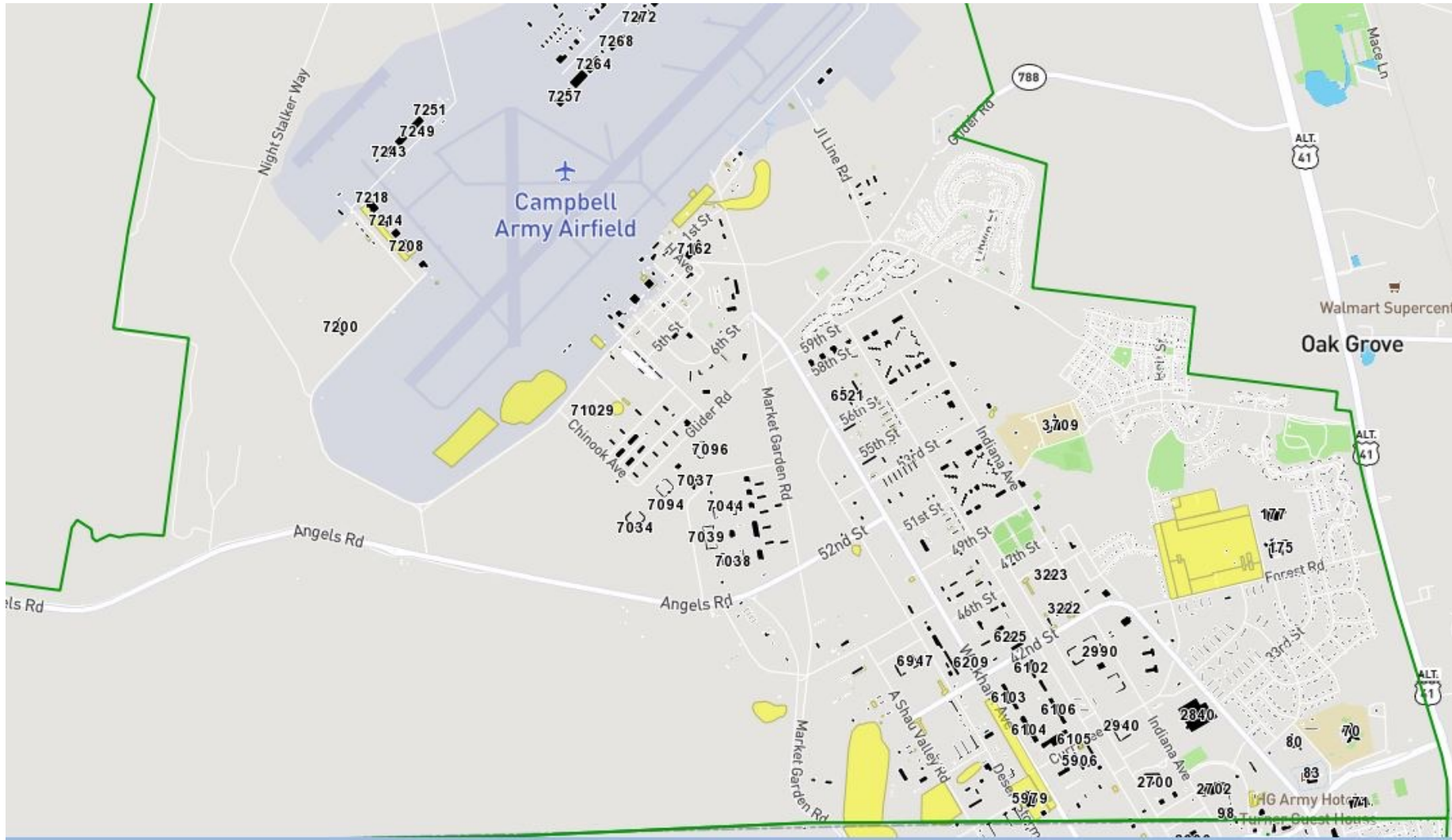
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# Example: Fort Campbell (1 of 3)

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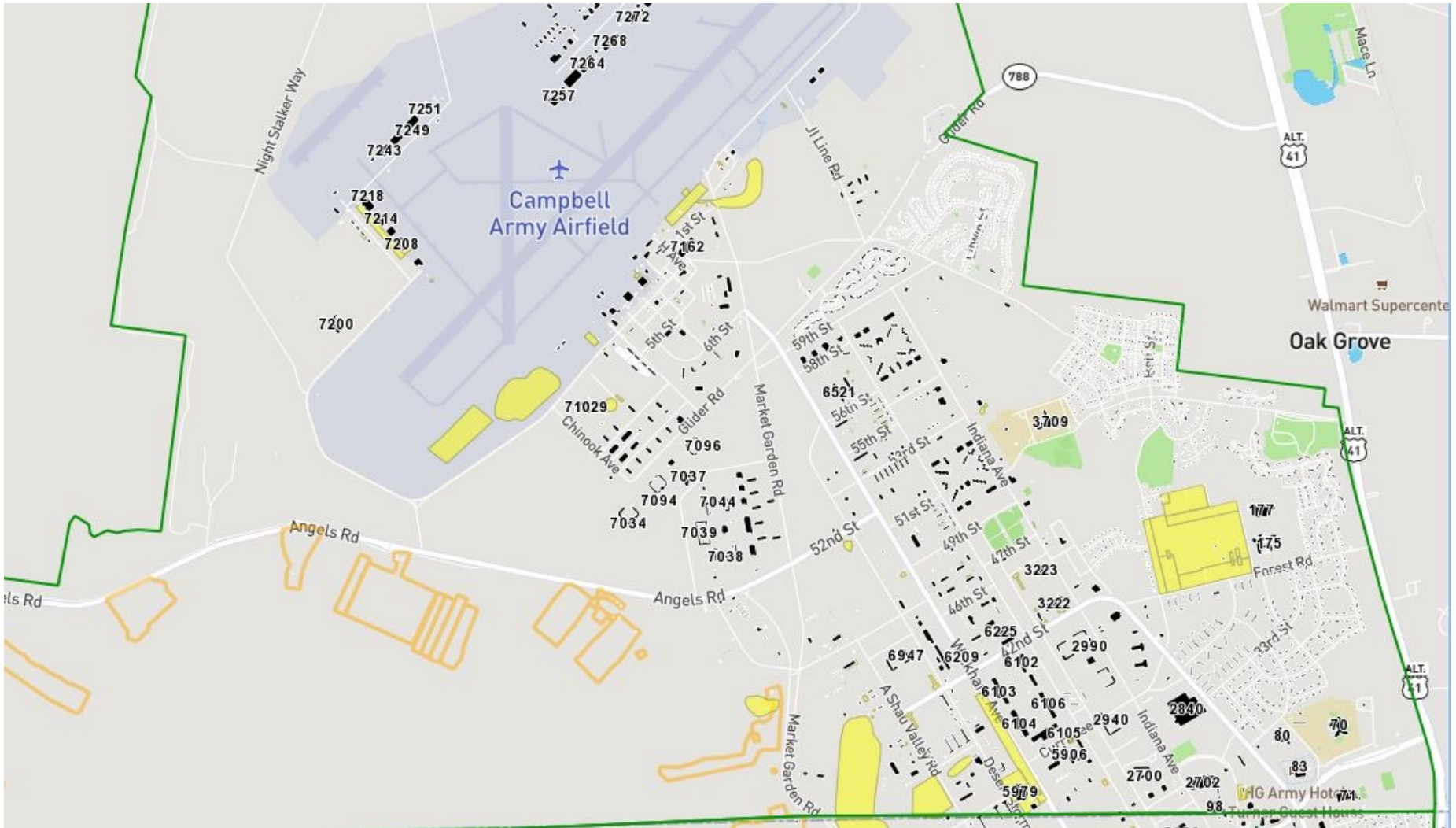






# Example: Fort Campbell (2 of 3)

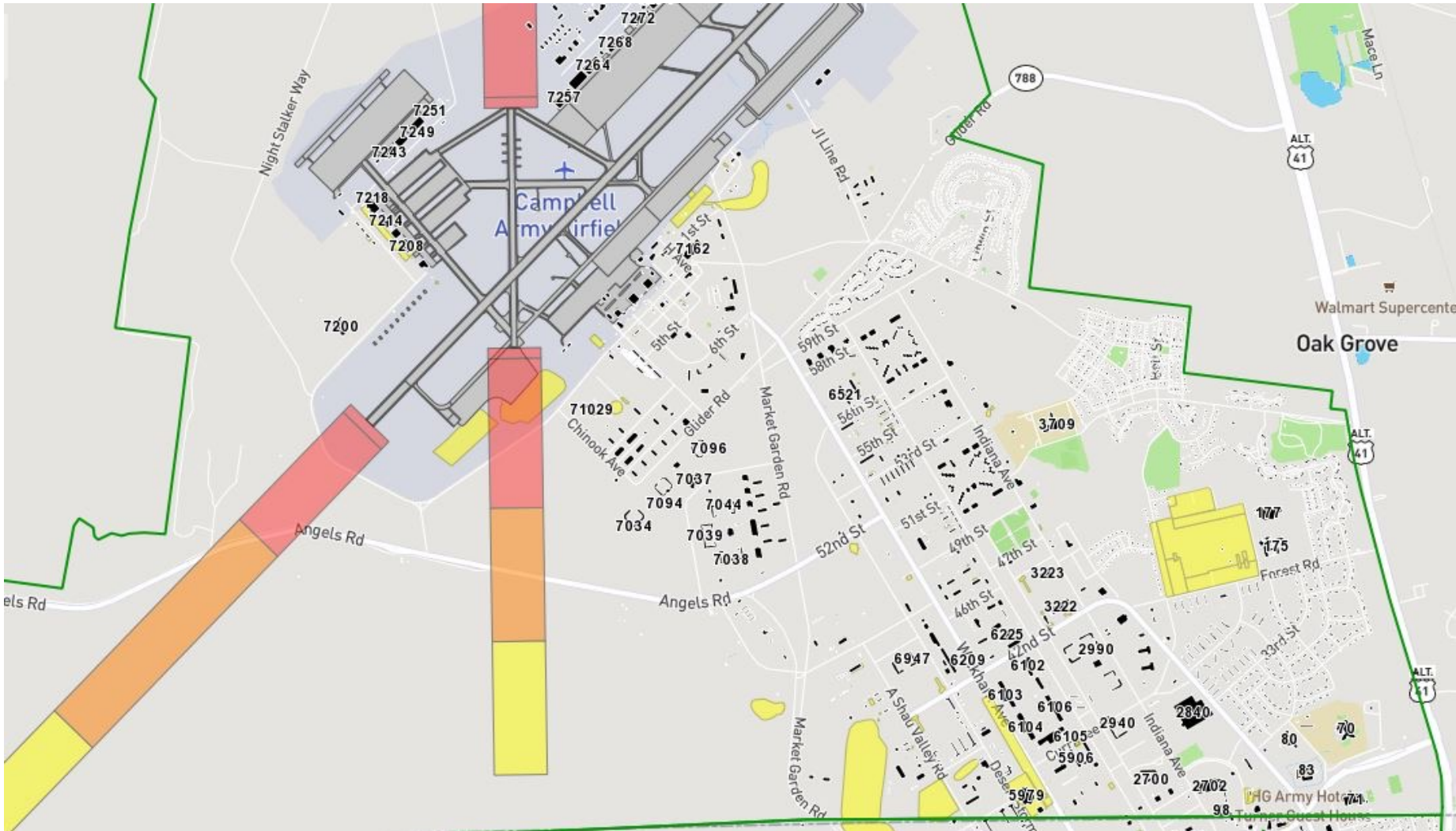
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# Example: Fort Campbell (3 of 3)

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# Key Points About SDSFIE-V

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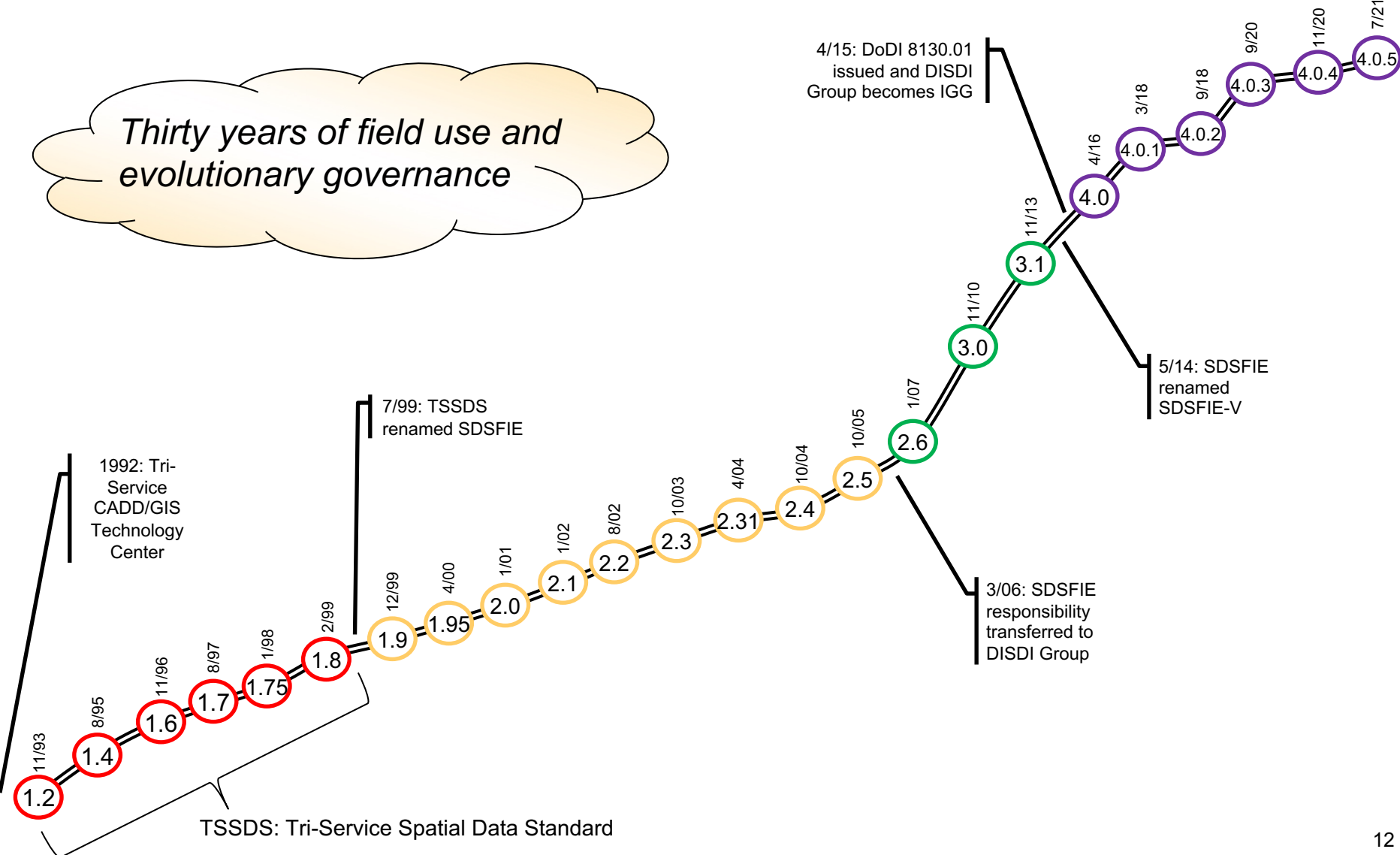
- Structure of SDSFIE-V
  - ISO standards-based; A logical data model for geospatial data (machine readable)
  - SDSFIE-V can be used in all commercial or open-source GIS software today (e.g., ArcGIS, Bentley, AutoDesk, QGIS, MapServer)
  - SDSFIE-V 4.0 Gold is enterprise-level core data model
    - o DoD Components each build their own version of the Gold model, tailored to Component-specific business requirements and systems
    - o Component versions of the Gold model are standardized and registered by DoD
  - The logical data model is based on consensus input from all DoD Components (Army, Marine Corps, Navy, Air Force, Washington Headquarters Service (WHS), and US Army Corps of Engineers, as well as subject matter experts
  - Incorporates some content from Federal Geographic Data Committee standards
- SDSFIE-V is fundamentally structured in alignment with the DoD real property information model, and real property accountability requirements
  - A core goal of IGI&S is to provide a geospatial feature for each DoD real property asset



# SDSFIE-V Releases and Major Milestones

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*Thirty years of field use and evolutionary governance*

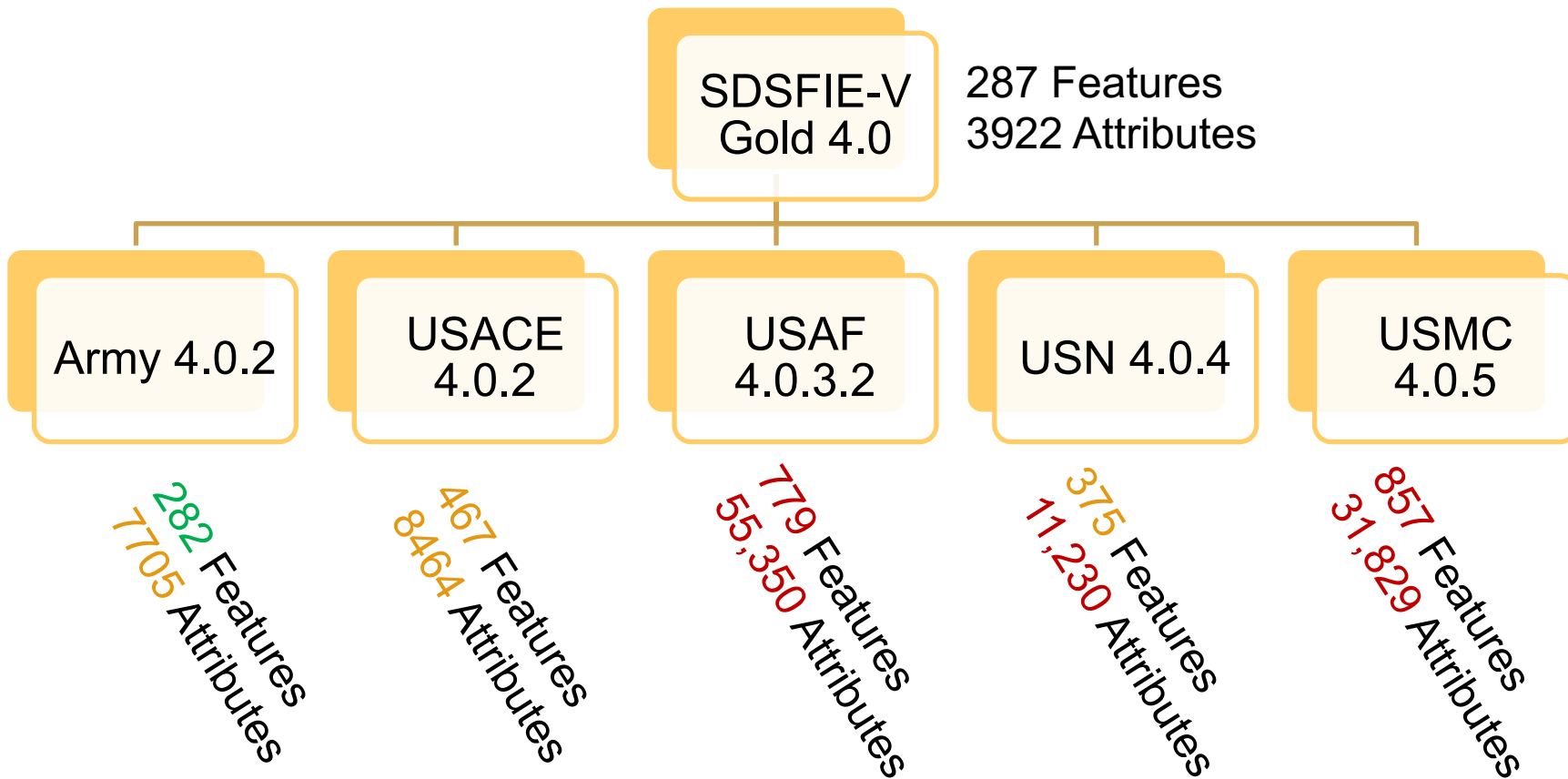






# DoD Components' Implementation of SDSFIE-V 4.0

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***Dept. of Energy and NASA have also implemented SDSFIE-V for their facilities management***



# Summary

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- Three most important parts of SDSFIE:
  - SDSFIE-V (vector)
  - SDSFIE-M (metadata)
  - SDSFIE-Q (quality)
- The IGI&S Governance Group (IGG) has a highly structured and repeatable change management process for SDSFIE
- SDSFIE-V defines data types for the full spectrum of EI&E functions/missions
- SDSFIE-V is primarily a 2-D model, but 3-D can be integrated using commercial off-the-shelf software
- SDSFIE continues to evolve, especially the vector standard