

The MUDDI Model and NUAR

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Model for Underground Data Definition and Integration

One approach to
making sub-surface
data more

Findable

Accessible

Interoperable

Re-usable

MUDDI

“The **MUDDI Conceptual Model** is designed as a common basis to create **Logical Models** that make different types of sub-surface data interoperable in support of a variety of **use cases** and in different **jurisdictions and user communities**”



The MUDDI SWG: an international collaboration



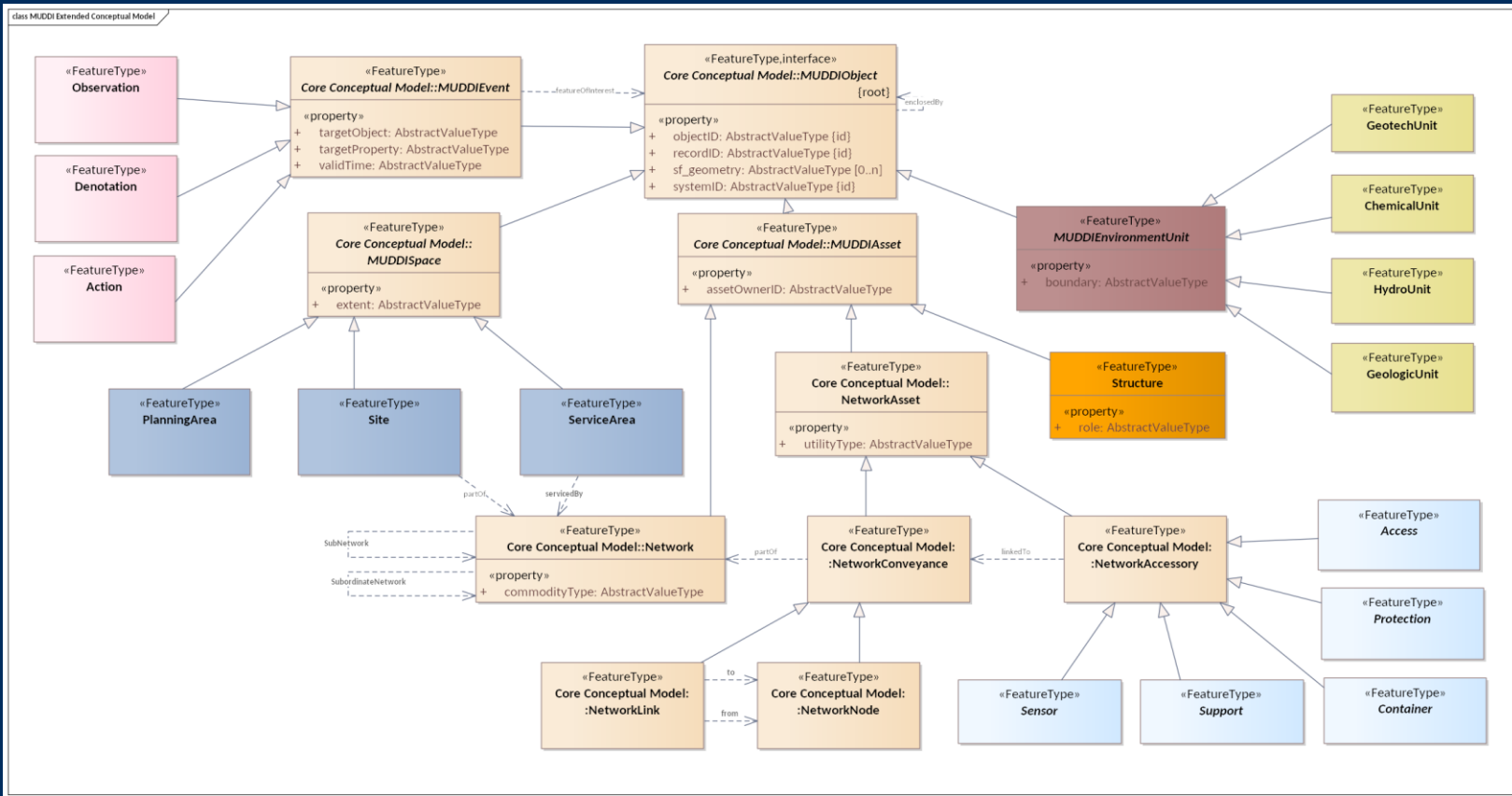
The diagram illustrates the Core Conceptual Model with the following classes and relationships:

- MUDDISpace** (FeatureType):
 - property: extent: AbstractValueType
- MUDDIEvent** (FeatureType):
 - property: targetObject: AbstractValueType, targetProperty: AbstractValueType, validTime: AbstractValueType
- MUDDIAsset** (FeatureType):
 - property: assetOwnerID: AbstractValueType
- NetworkAsset** (FeatureType):
 - property: utilityType: AbstractValueType
- Network** (FeatureType):
 - property: commodityType: AbstractValueType
- NetworkConveyance** (FeatureType):
 - property: objectID: AbstractValueType {id}, recordID: AbstractValueType {id}, sf_geometry: AbstractValueType {0..n}, systemID: AbstractValueType {id}
- NetworkAccessory** (FeatureType):
 - property: utilityType: AbstractValueType
- NetworkLink** (FeatureType):
 - property: to: NetworkNode, from: NetworkNode
- NetworkNode** (FeatureType):
 - property: utilityType: AbstractValueType


Relationships:

- MUDDISpace** is **enclosedBy** **MUDDIAsset**.
- MUDDIEvent** is **featureOfInterest** **MUDDIAsset**.
- MUDDIAsset** is a **specialization** of **MUDDIEvent**.
- NetworkAsset** is a **specialization** of **MUDDIAsset**.
- Network** is a **specialization** of **MUDDIAsset**.
- NetworkConveyance** is a **specialization** of **NetworkAsset**.
- NetworkAccessory** is a **specialization** of **NetworkAsset**.
- NetworkLink** is a **specialization** of **NetworkConveyance**.
- NetworkNode** is a **specialization** of **NetworkConveyance**.
- Network** is **partOf** **NetworkConveyance**.
- NetworkConveyance** is **linkedTo** **NetworkAccessory**.
- NetworkLink** is **to** **NetworkNode** and **from** **NetworkNode**.

The MUDDI Conceptual Model: Extended



What is NUAR?

 **GOV.UK** NUAR

Home [Map](#) [My saved bookmarks](#) [My enquiries](#) [Coverage](#) | [CY](#) | [Sign Out](#)

PRIVATE BETA This is an evolving service and currently should be used to complement your existing processes, plan for future adoption, and provide valuable [feedback](#) to enhance the service further. Safe excavation practices as outlined in HSG47 should ALWAYS be followed.

[Search](#) [Edit Area](#) [Clear](#) [Recentre map](#) [Bookmarks and sharing](#)

Notifications

Layers

Expand All [Reset](#)

☒ Drainage

☒ Telecommunications

☒ Electricity

☒ Gas

☒ Thermal

☒ Water


☒ Sewer


☒ Fuel & Chemicals


☒ Transport


☒ Non-Utility Objects


☒ Reference and Planning


 Layers


 Legend


 Sensitive Sites

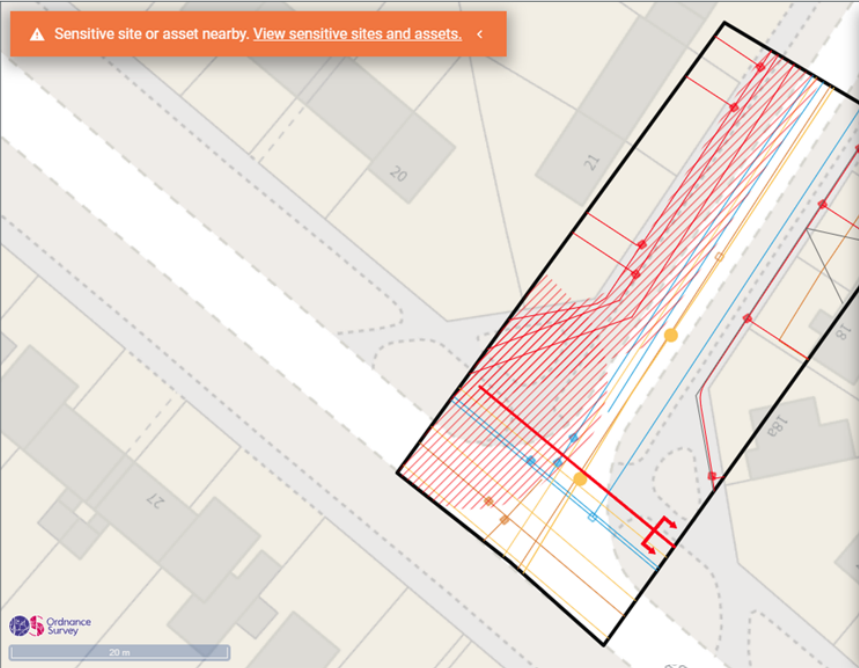
 Isolated Views


 Asset Owners

 Settings


 Help

 Sensitive site or asset nearby. [View sensitive sites and assets.](#)



 Ordnance Survey
20 m

[Previous](#) 1 of 3 [Next](#)

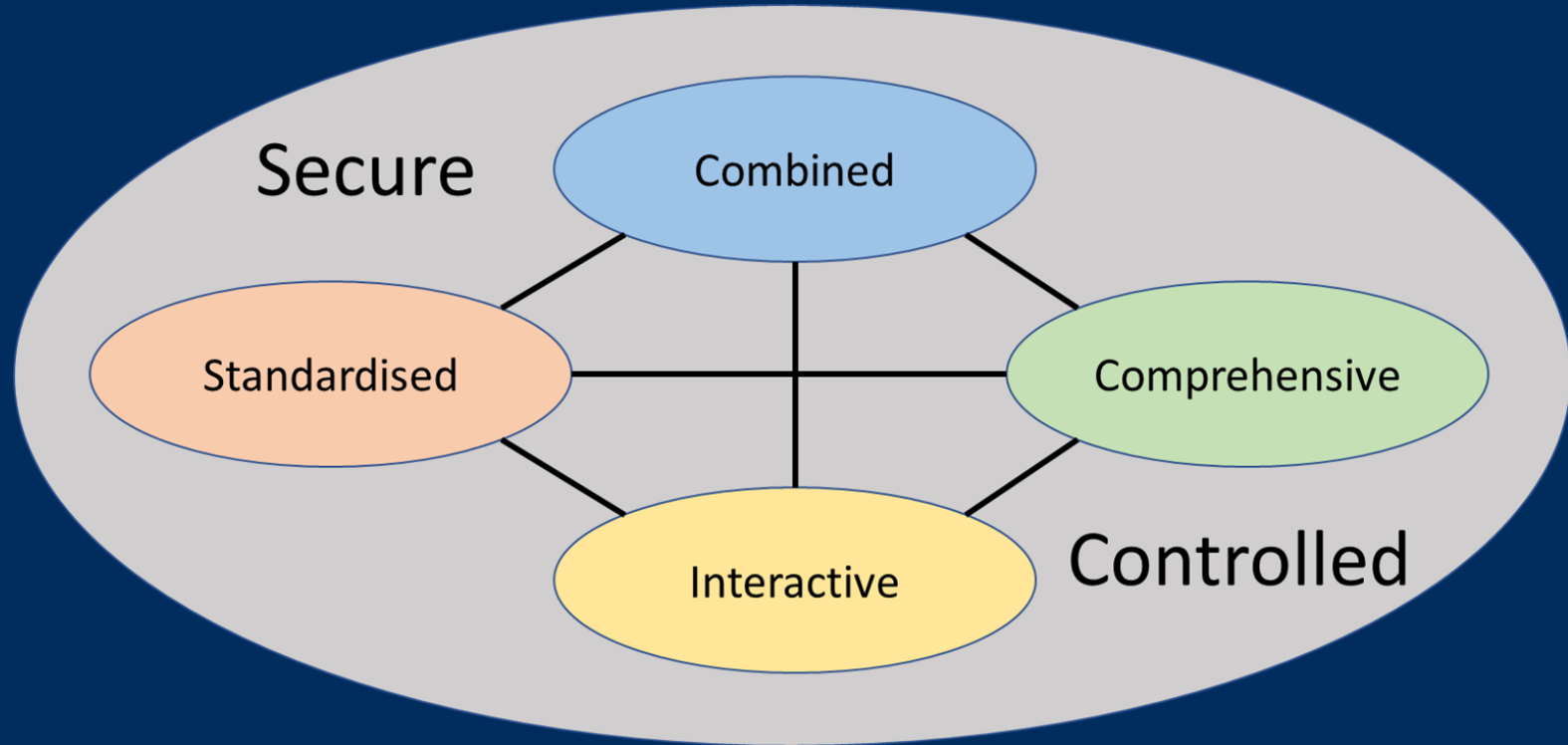


General Information

Property	Value
Data Provider	Let There Be Light
Emergency Number	123456789
Emergency Email	emergency@let-there-be-light
Business Number	123456789
Business Email	enquiries@let-there-be-light
Last Refreshed in NUAR	06/12/2022, 13:24:20
Expected Data Refresh Period	Unknown

[Asset](#) [Supplementary Data](#)

Key Characteristics



The Model Hierarchy

- Reference Models (e.g. ISO19100)
- OGC MUDDI Conceptual Model
- Profile: UK Excavation
- NUAR Platform Model



UK Excavation: Room for Specialisation



Why bother with a Data Model?

- **A Common Language:** standard, consistent representation of buried assets and their characteristics across geographies and sectors
- **Scalable:** standardised “joining instructions” for new organisations
- **Sustainable:** data load and transformation needs to be repeatable and frequent – data model provides an enduring, consistent target

Why bother with a Data Model?

- **Data Quality Improvement:** opportunity for data quality improvement – conformance to a standard is one way of communicating data quality
- **Roadmap.** Represent what's there now, but also headroom to grow as an industry – in particular metadata about data quality
- **Open:** helps to avoid lock-in and contributes to an open eco-system



NUAR Meets the Real World

“Everyone has a plan
until they get
punched in the mouth”



NUAR Meets the Real World

“Everyone has a Data Model
until they get
Real Data”



What's Next for NUAR?

- Implementation of the “Observations” feedback loop
- Data Model publication:
 - GML encoding
 - OGC Code Sprint
 - Publication as reference model for MUDDI conceptual model
- Consideration of independent Validation service:
 - Engine for feedback on compliance and conformance
 - Currency; Completeness; Domain Consistency; Metadata
 - Maturity Model



What's Next for MUDDI at OGC?

- MUDDI 1.0 Conceptual Model out for public comment and subsequent TC adoption vote
- Work on EN and DR use cases
- Decision on publishing the Generic Logical Model as an OGC standards (or other document type) + encoding
- More outreach



This codesprint

- Objectives:
 - Test MUDDI with real data
 - Promote software support / tools that work with MUDDI data
- Work with the Generic Conceptual Model / the NUAR model + test data
- Tasks include
 - Creating a GML/JSON encoding for the GCM
 - Transforming test data into the GCM/NUAR model
 - Showcasing the transformed data in an online demonstrator
 - Comparing input (non-MUDDI) and output (MUDDI) data





Geospatial Commission

You can find out more about NUAR at:



gov.uk/guidance/national-underground-asset-register-nuar



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company/geospatial-commission