

Asset Information Management for a Communications Network in Ireland



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Project Overview

enhancing Motorway Operation Services

Asset Information Management Implementation

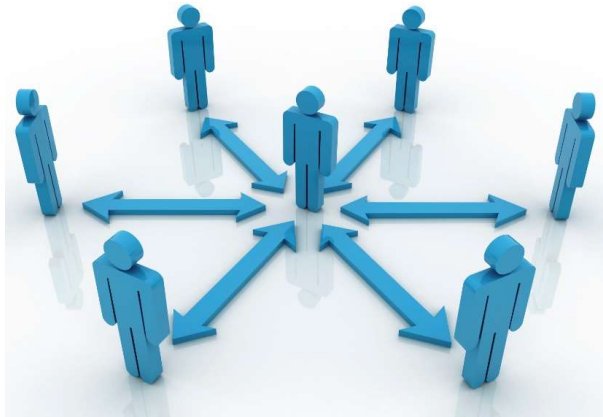


ROD
ROUGHAN & O'DONOVAN

- Task Order within eMOS (enhancing Motorway Operation Services) programme for **Intelligent Transportation System (ITS)** on the M50 motorway.
- The **asset information** needs to be **collated, configured, handed over to TII**, and then managed by TII.

TII
Bonneagar Iompair Éireann
Transport Infrastructure Ireland

Current Client Challenges



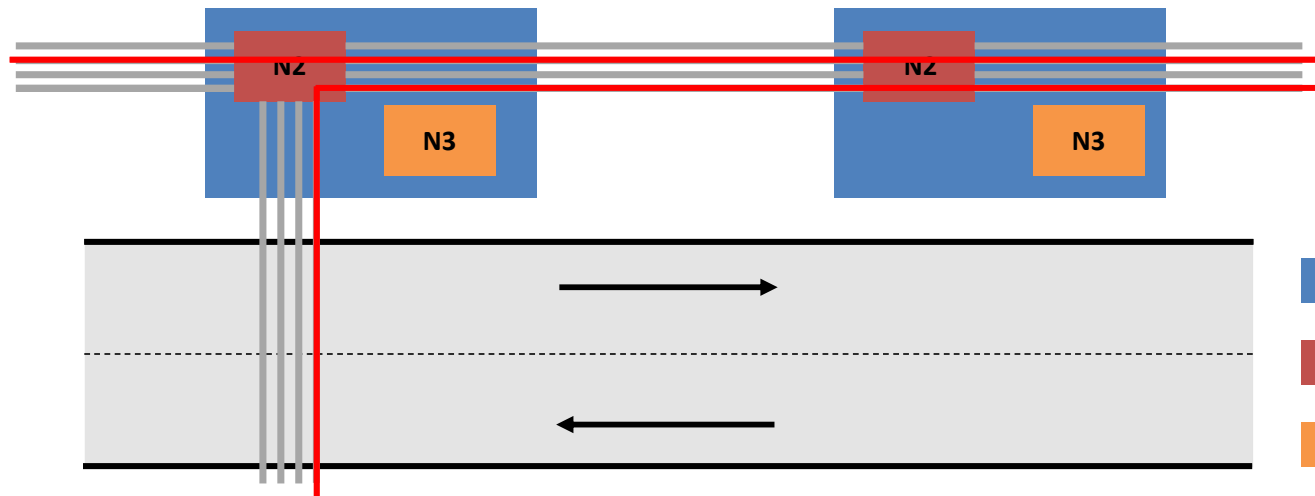
- **Over 6 million** data items received per year
- **220** data sources and **7** silo data repositories
- Multiple data formats and coordinate systems
- Duplication, gaps and superseded information
- Access to data (e.g.: inability to access data of 400km of PPP Network)
- Extensive paper based data dictionaries.

[TII Asset Inventory \(Roads\) – Summary Report July 2021](#)
[AM-GEN-00001 \(tiipublications.ie\)](#)



Project Overview

ITS Communication Network



- Plinth
- Network 2 chamber
- Network 3 chamber
- Duct
- Cable



Definition of Information Requirements



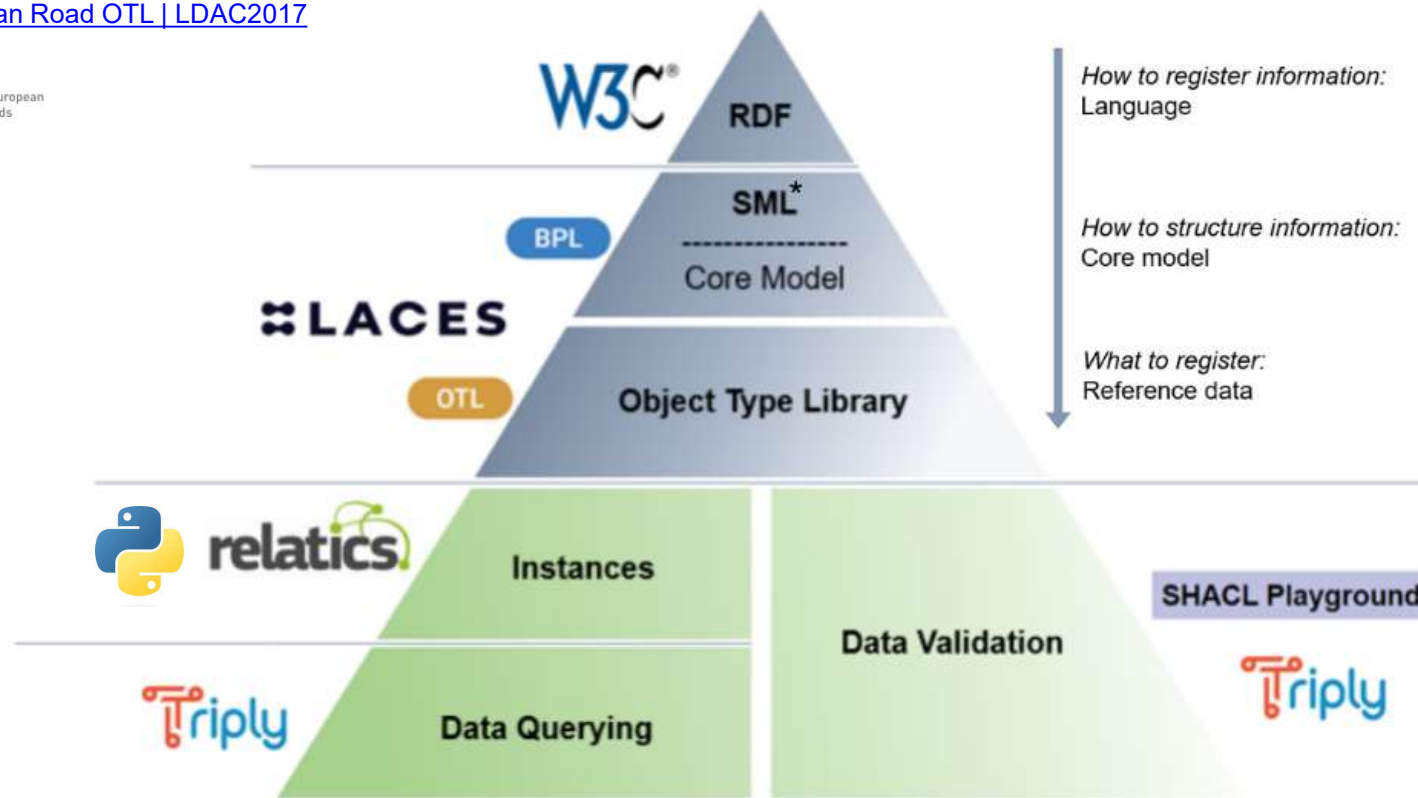
Data gathering is a costly process and information needs to provide value

A **network operator** requires to identify available ducts on a specific section of the network for cable installation

'start small, test, verify and scale'

OTL Development & Application Stack

[INTERLINK - European Road OTL | LDAC2017](#)



*EN 17632-1

Object Type Library

The screenshot displays the LACES Object Type Library interface. At the top left is the LACES logo. Below it are tabs for 'KINDS', 'PARTS', and 'GROUPS', along with a lock icon. A 'Status filters' dropdown is located at the top right. The main area is divided into two panels: 'Kinds' and 'Parts'. Both panels have a search bar and a 'by name' dropdown. The 'Kinds' panel shows a tree structure starting with 'Physical object', which branches into 'Cable', 'Chamber', 'Communication System', 'Duct', and 'Plinth'. 'Chamber' further branches into 'COMMS I Chamber', 'COMMS II Chamber', and 'COMMS III Chamber'. The 'Parts' panel shows a tree structure starting with 'Communication System', which branches into 'Cable', 'Chamber', 'Duct', and 'Plinth'. 'Plinth' further branches into 'Chamber'. A grey box at the bottom of the screenshot contains the text: 'Physical objects (assets) and Partonomy relationships definition'. The ROD logo is visible in the bottom left corner of the interface.

Object Type Library

LACES Chamber 🇬🇧 Concept

Add synonym

Information

<input type="checkbox"/>	Name	Value
<input type="checkbox"/>	Description	Simple container object which ...

Aspects

<input type="checkbox"/>	Name	Value	Unit
<input type="checkbox"/>	Direction	Click here to edit from Route Direction	
<input type="checkbox"/>	ID	Click here to edit	
<input type="checkbox"/>	RouteChainage	Click here to edit	

Is described by

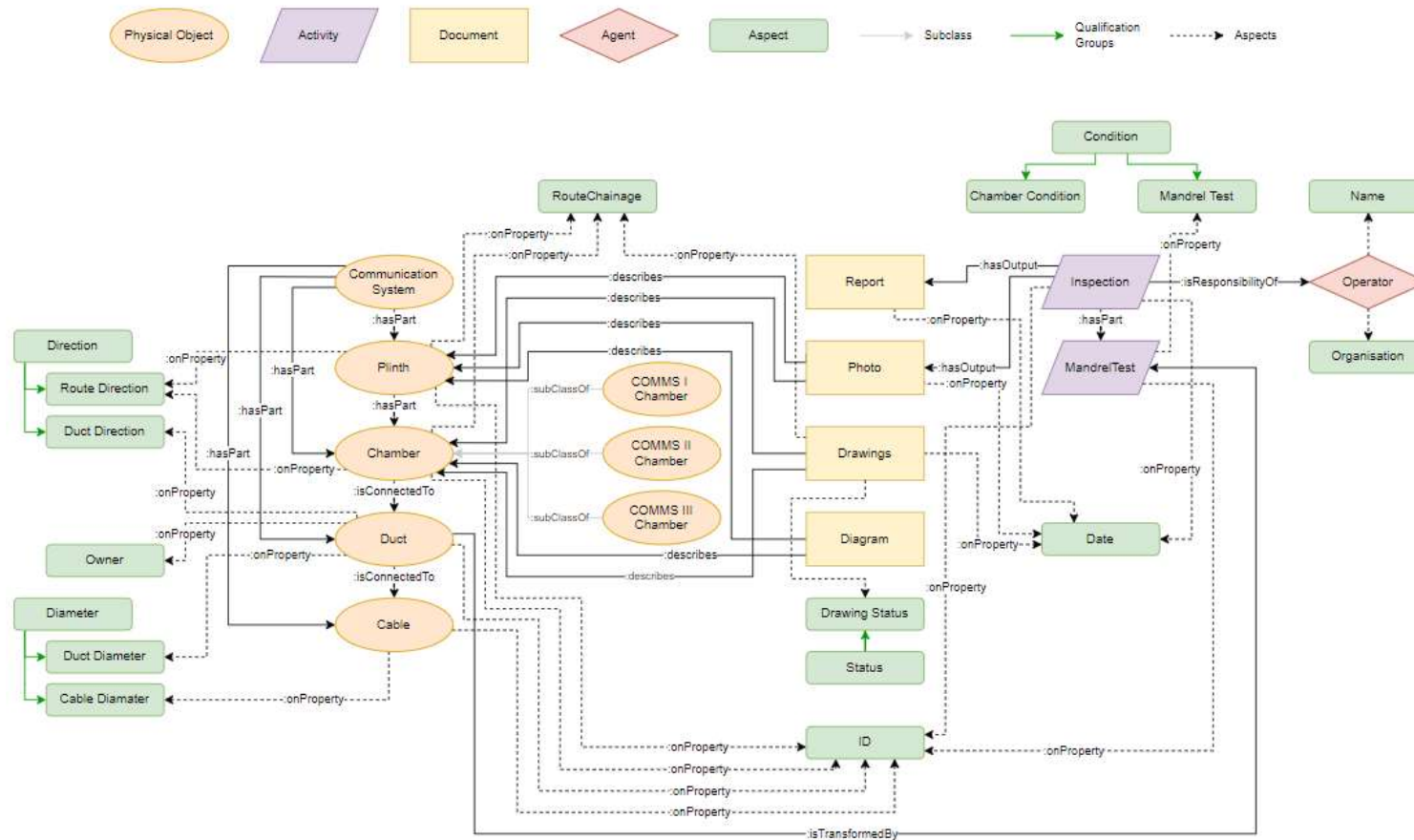
Diagram Drawing Photo

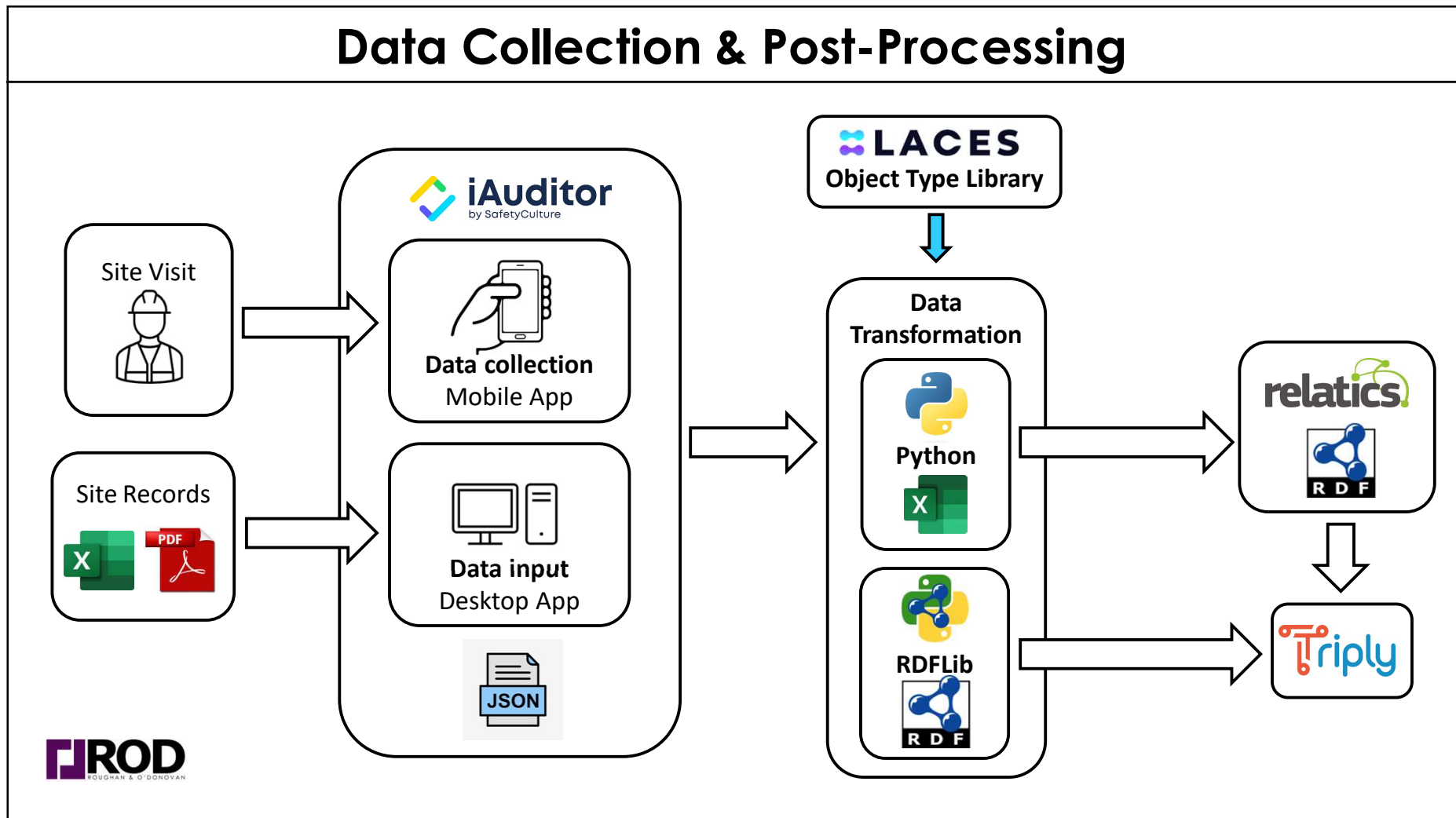
RELATE TO DOCUMENT

Attributes, relationships and SHACL cardinality constraints definition



Configuration of Data Rules

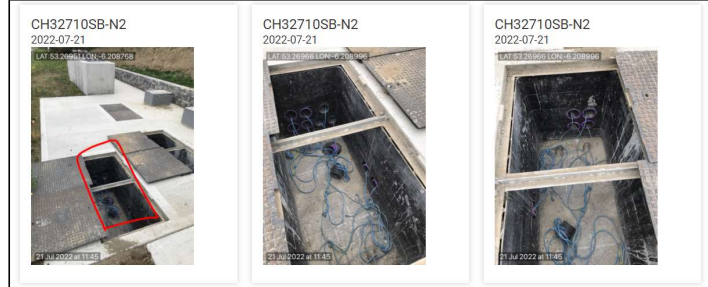
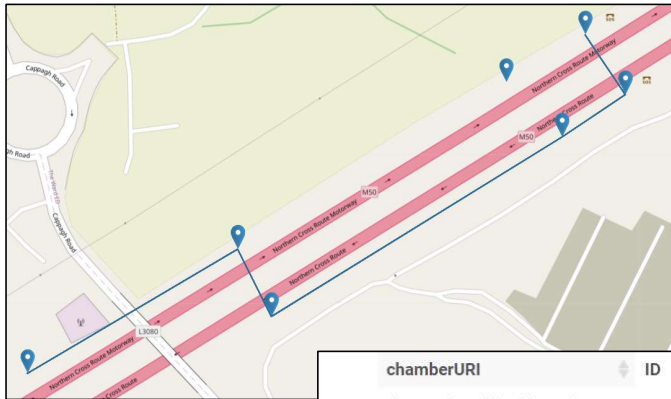




Data Storage & Query

Triply Triple store + SPARQL editor + Unstructured data + GeoSPARQL

- Table
- Response
- Gallery
- Chart
- Geo
- Geo-3D
- Geo events
- Markup
- Network
- Pivot
- Timeline



http://data.tii.ie/def/

Chamber OTL

Chamber OTL

Ontology

http://data.tii.ie/def/

Type
Ontology

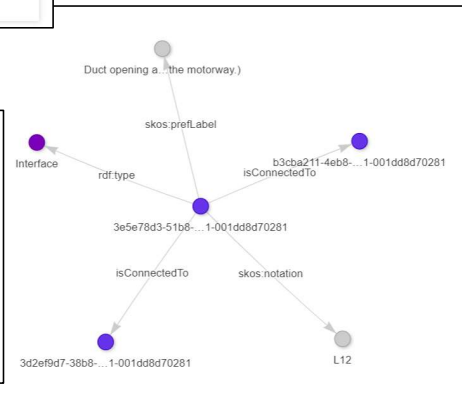
Comment

Imports
geosparql#
smls-owl#

VersionInfo
13 Jan 2022

PrefLabel
Chamber OTL

	chamberURI	ID	Chainage	Direction	shape
1	<http://data.tii.ie/id/35abe297...	CH32620SB-DCC	32620	SB	Point(-6.21018442 53.27004104)
2	<http://data.tii.ie/id/35abe297...	CH32620SB-DCC	32620	SB	Point(-6.21018442 53.27004104)
3	<http://data.tii.ie/id/de6404f2...	CH32710SB-N2	32710	SB	Point(-6.20895736 53.26967866)
4	<http://data.tii.ie/id/de6404f2...	CH32710SB-N2	32710	SB	Point(-6.20895736 53.26967866)
5	<http://data.tii.ie/id/de6404f2...	CH32710SB-N2	32710	SB	Point(-6.20895736 53.26967866)
6	<http://data.tii.ie/id/de6404f2...	CH32710SB-N2	32710	SB	Point(-6.20895736 53.26967866)



Challenges

Project specific:

- **Underground** assets and **network** modelling
- **Merging** data collected from different sources

LD/SW Approach:

- Market penetration of the technology
- Lack of stack of applications for data **collection**
- Data **transformation** (approx. 70% of the project hours)
- **Complexity** of data querying (SPARQL) and data validation (SHACL)



Conclusions

- Clear need from public asset owners to gather, validate and consume F.A.I.R. asset information – **must be valuable**
- LD/SW technologies have the potential to solve data specification **requirements**, data **validation** and **interoperability** issues
- **‘Start small, test, verify and scale’** approach is key
- Inherent **complexity** needs to be hidden from the end user
- GIS & RDB are well established technologies with a strong UI/UX
- These findings are consistent with international experience (e.g.: RWS-NL OTL)



Thank you



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