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The Irish National Map Skin-of-the-Earth Data Model: Opportunities and Challenges for Geospatial Data Quality

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What is Skin of the Earth?

- The skin-of-the-earth concept is fundamental to Ireland's large scale National Map data model.
- The idea is that a seamless, topologically consistent blanket of polygons covers the entire surface of Ireland.
- There are no holes or gaps.
- There are five SOE Feature Classes:

Artificial, Exposed, Vegetation, Water, Way

Irish National Map Data Model

Skin of the Features

(Artificial, Exposed, Vegetation, Water, Way)

+

Superimposed Features

(These include Buildings, Structures, Divisions)

+

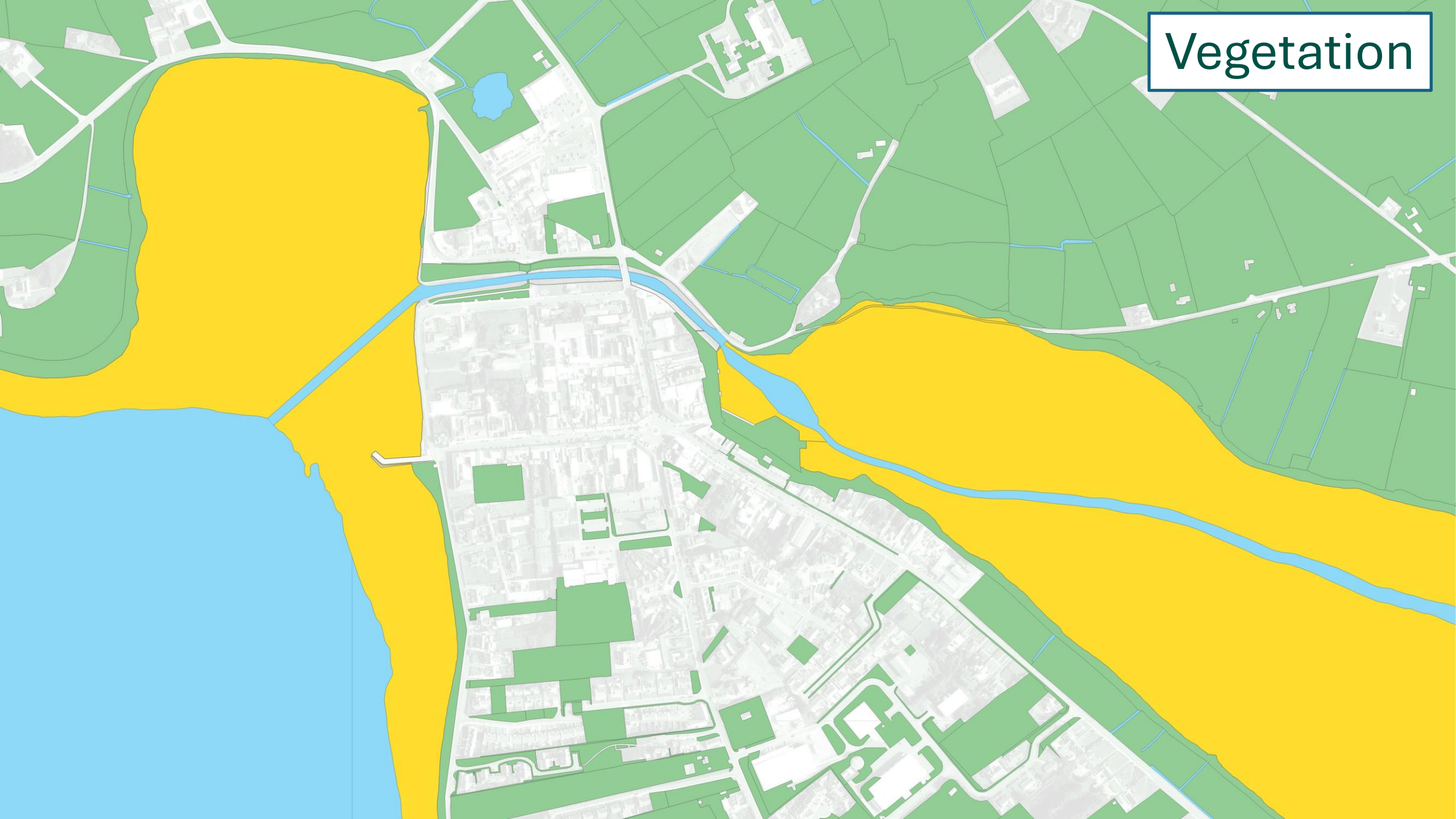
Network Features

(Road, Rail, Water)

Skin of The Earth Features


Water


Exposed


Vegetation


Way


Artificial

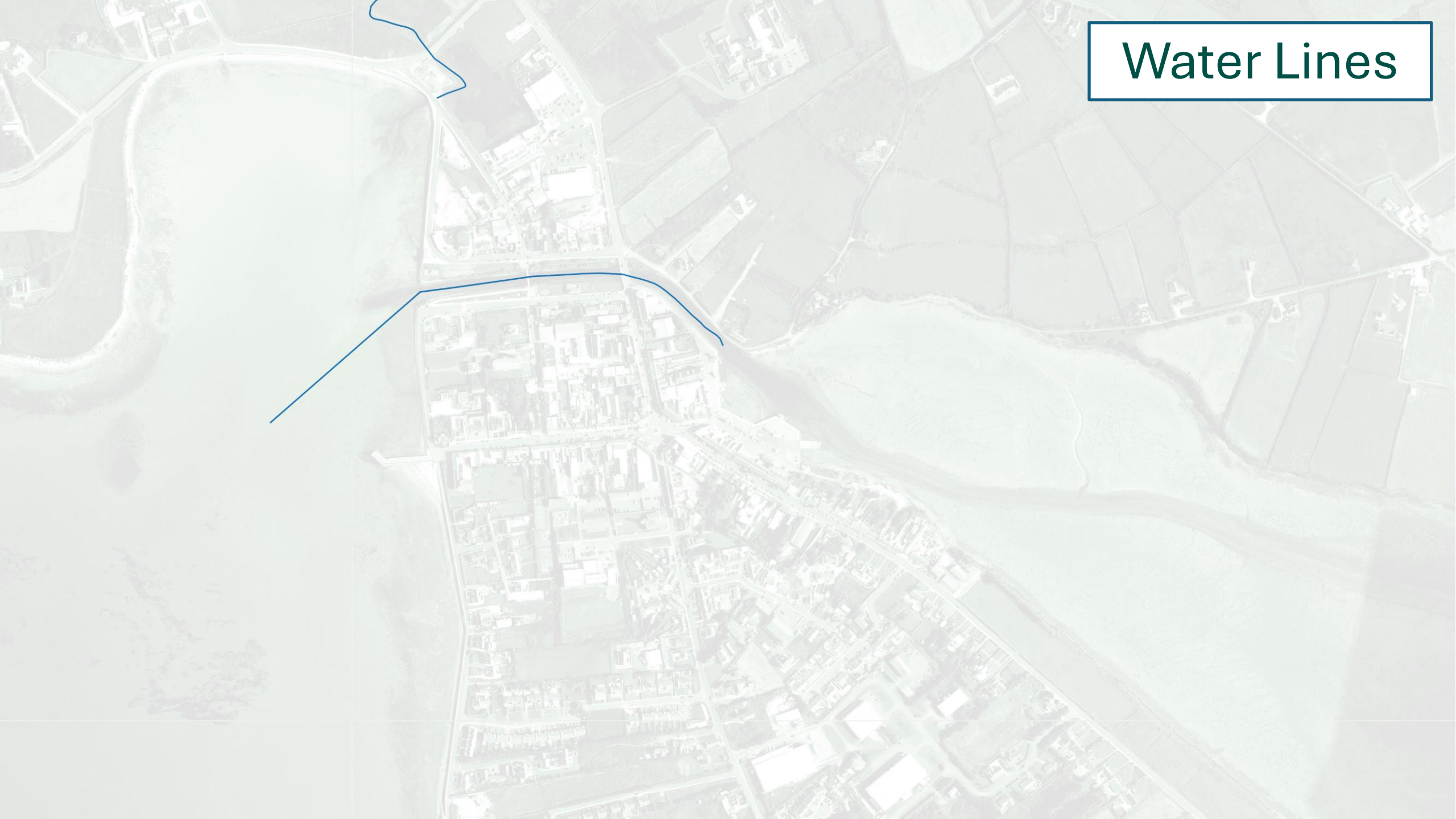
Super-imposed Features

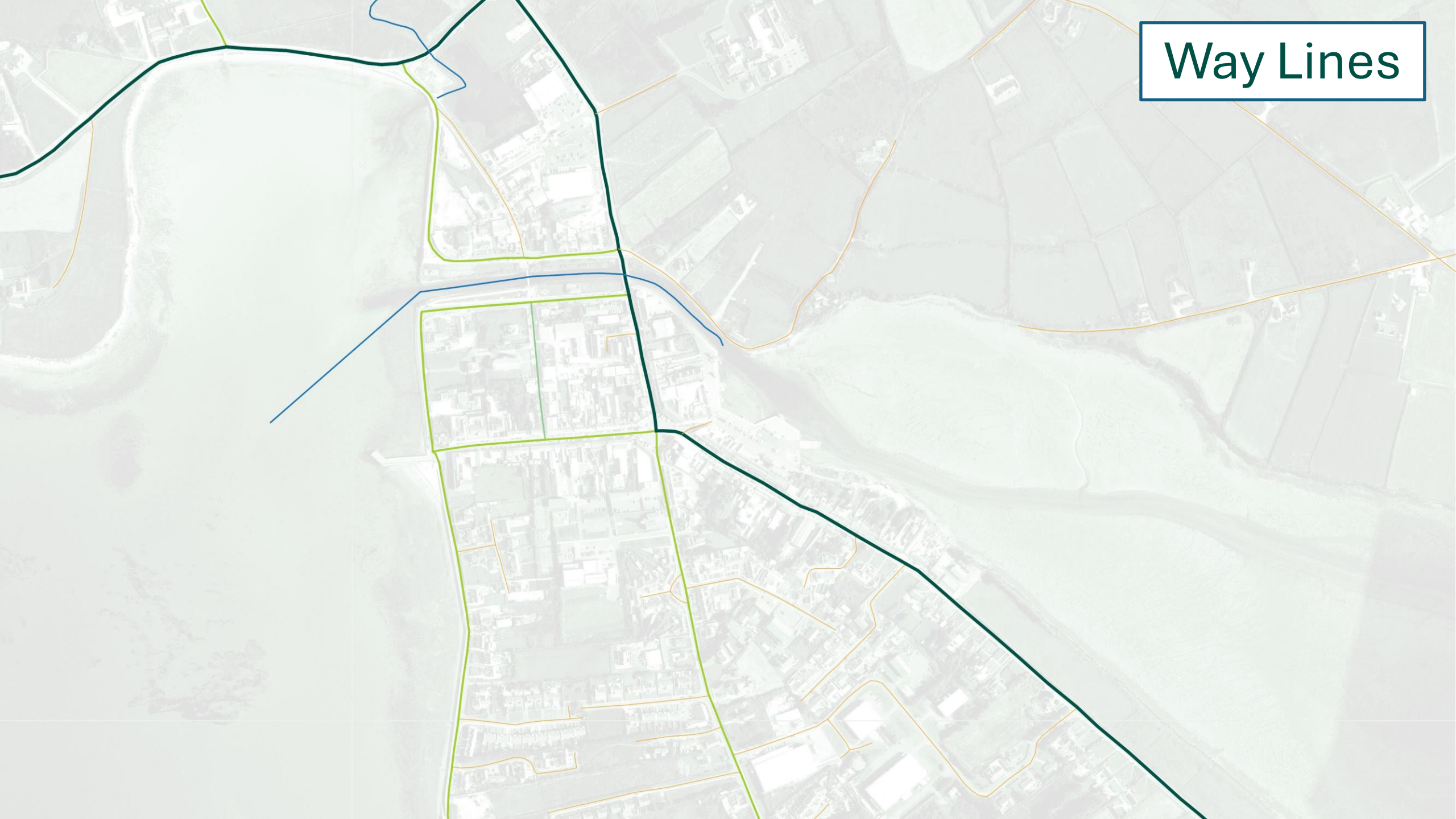

Buildings

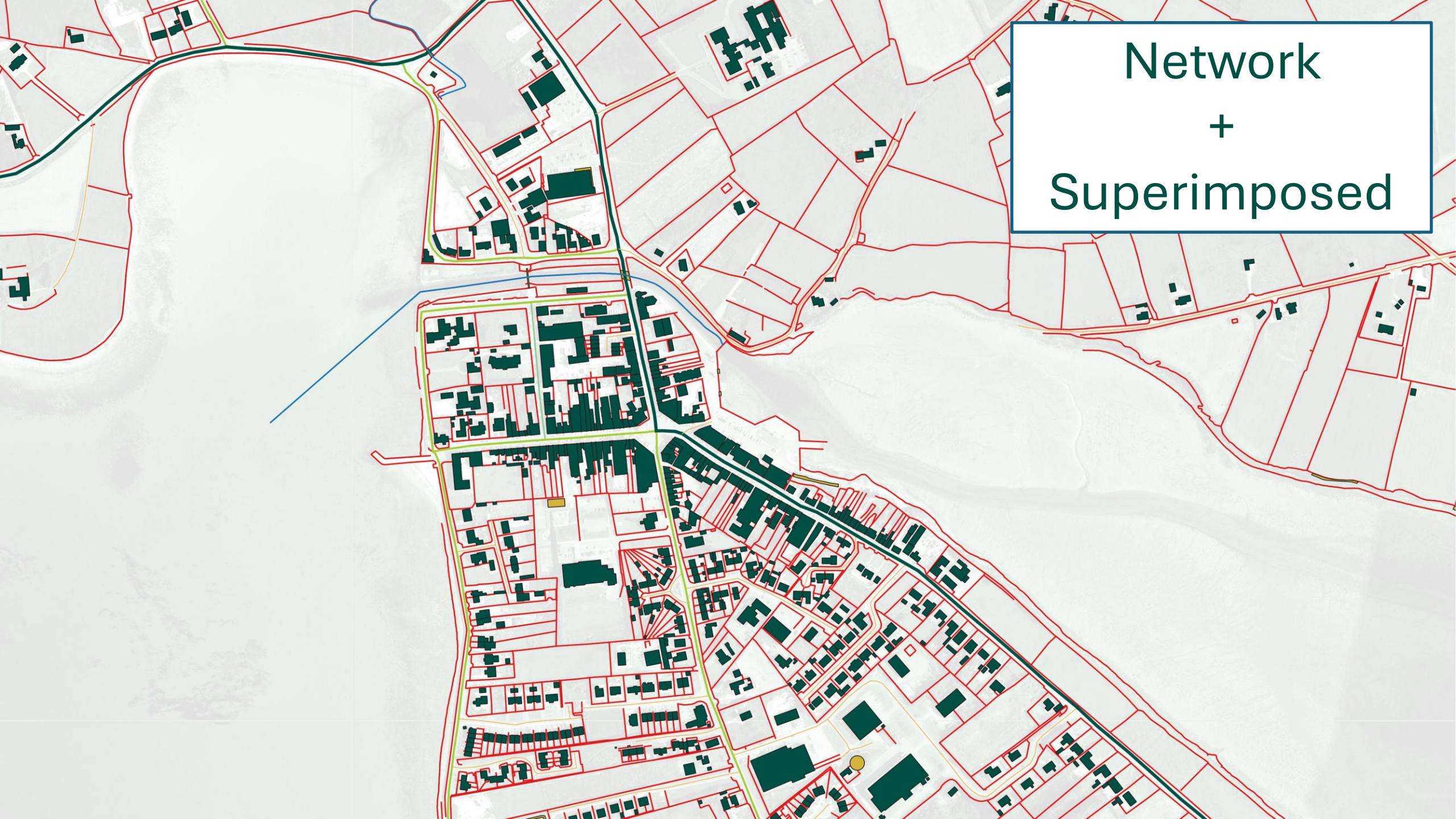

Divisions


Structures

Network Features


Water Lines

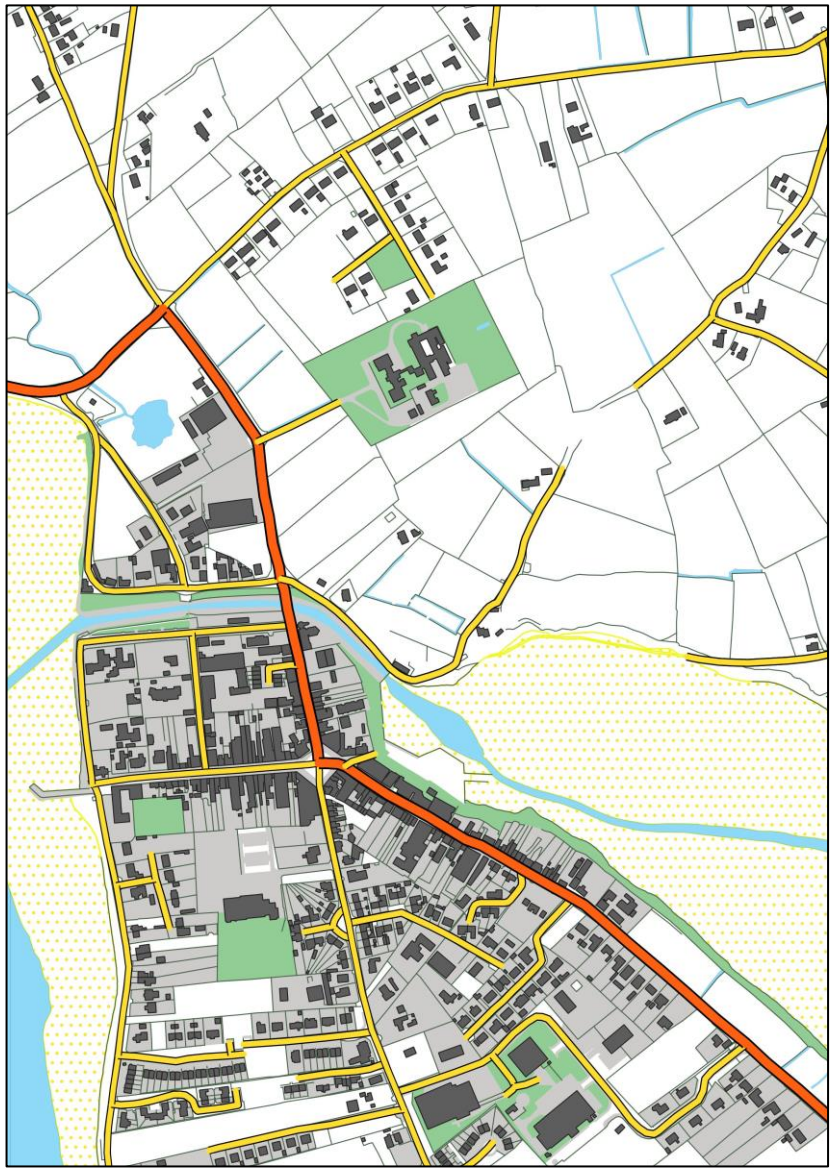

Way Lines


Network
+
Superimposed


Network
+
Superimposed
+
SOE

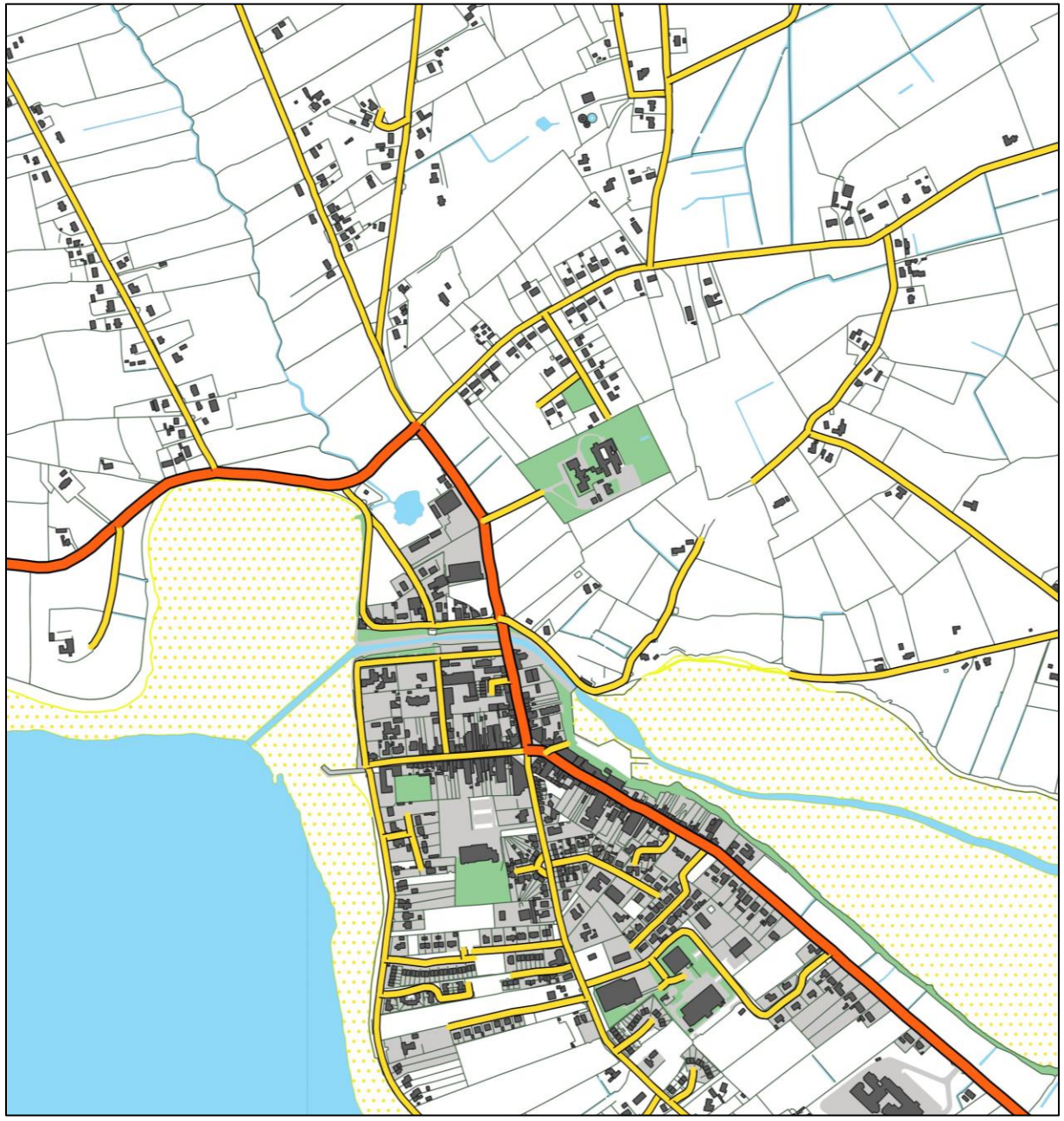

Bràid na Cèithe
Bràid an Mhurthaid
Bràid an Mhurthaid

Alternative to SOE



Non-SOE vs SOE

- Only certain vegetation captured: e.g. Parks and Forests
- No way polygons. Lines instead
- Lots of empty space. Works well cartographically especially scales >= 1:5000
- From a data model point of view easier to maintain but less comprehensive.



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Advantages of SOE

Aadvantages

Topological validation: No overlaps, no gaps

Topological editing. Edges can be edited where SOE features meet.

Completeness. Every ‘inch’ (cm) of the country covered and described by the national map

Positional Accuracy. At capture positional accuracy issues are less likely because of the ripple effect will cause validation errors.

Topology

Completeness

Position Accuracy

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Challenges Of SOE

Challenges

Topological validation: Maintaining topological rules after generalisation for smaller scale products

Completeness. More features, harder to maintain. More thematic accuracy issues.

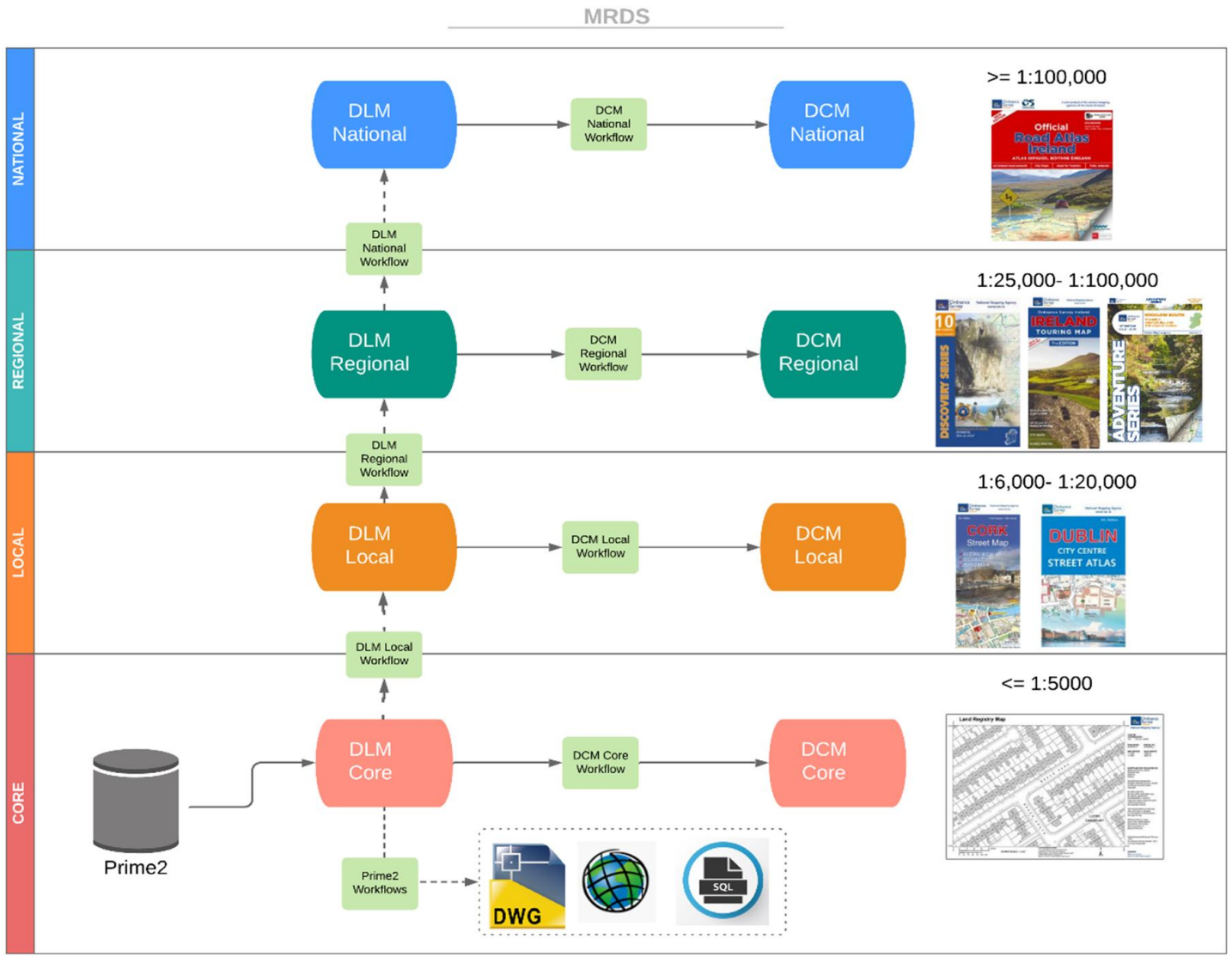
Positional Accuracy Higher level of accuracy required. Local fits not possible.

Topology

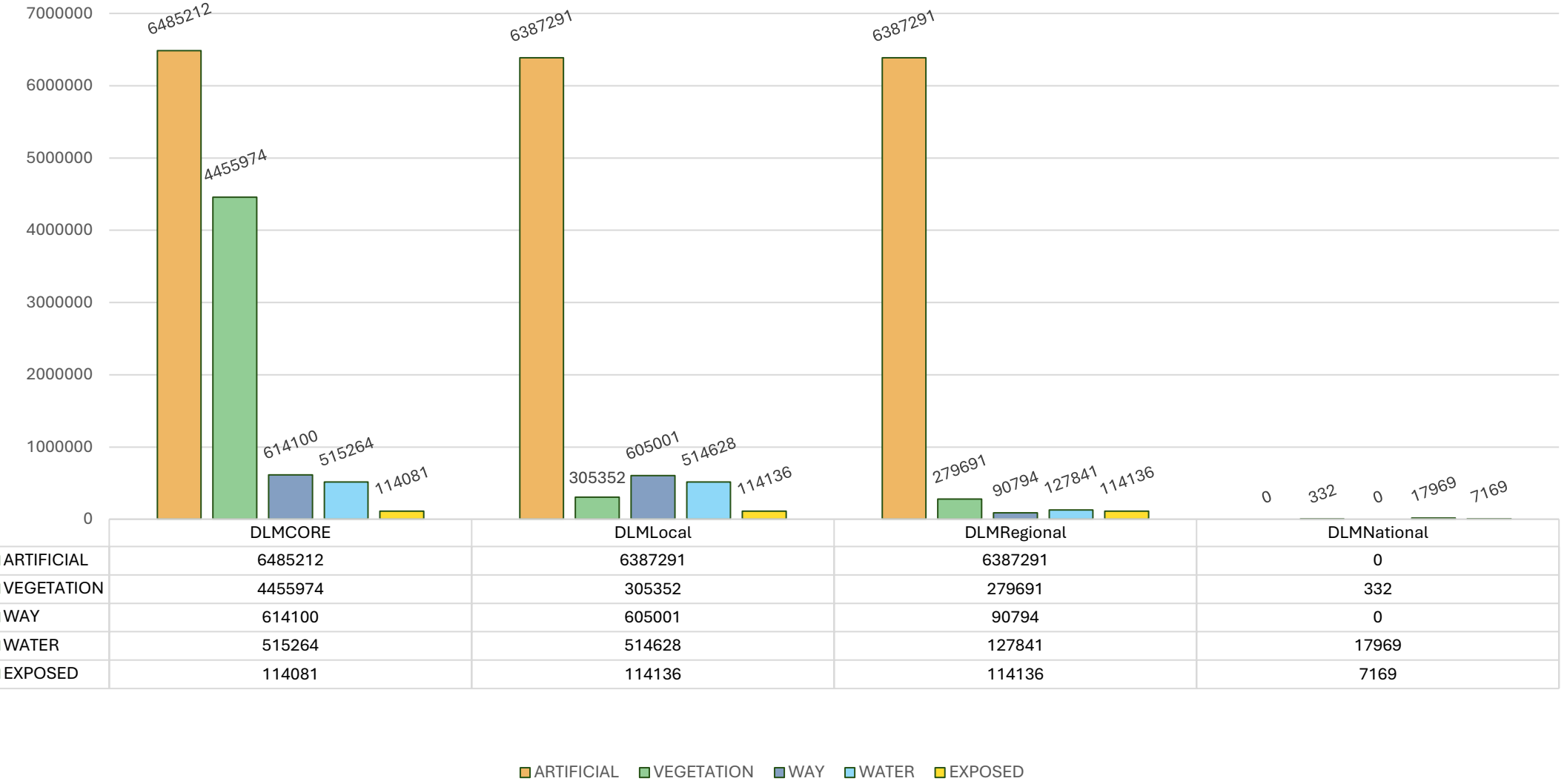
Completeness

Position Accuracy

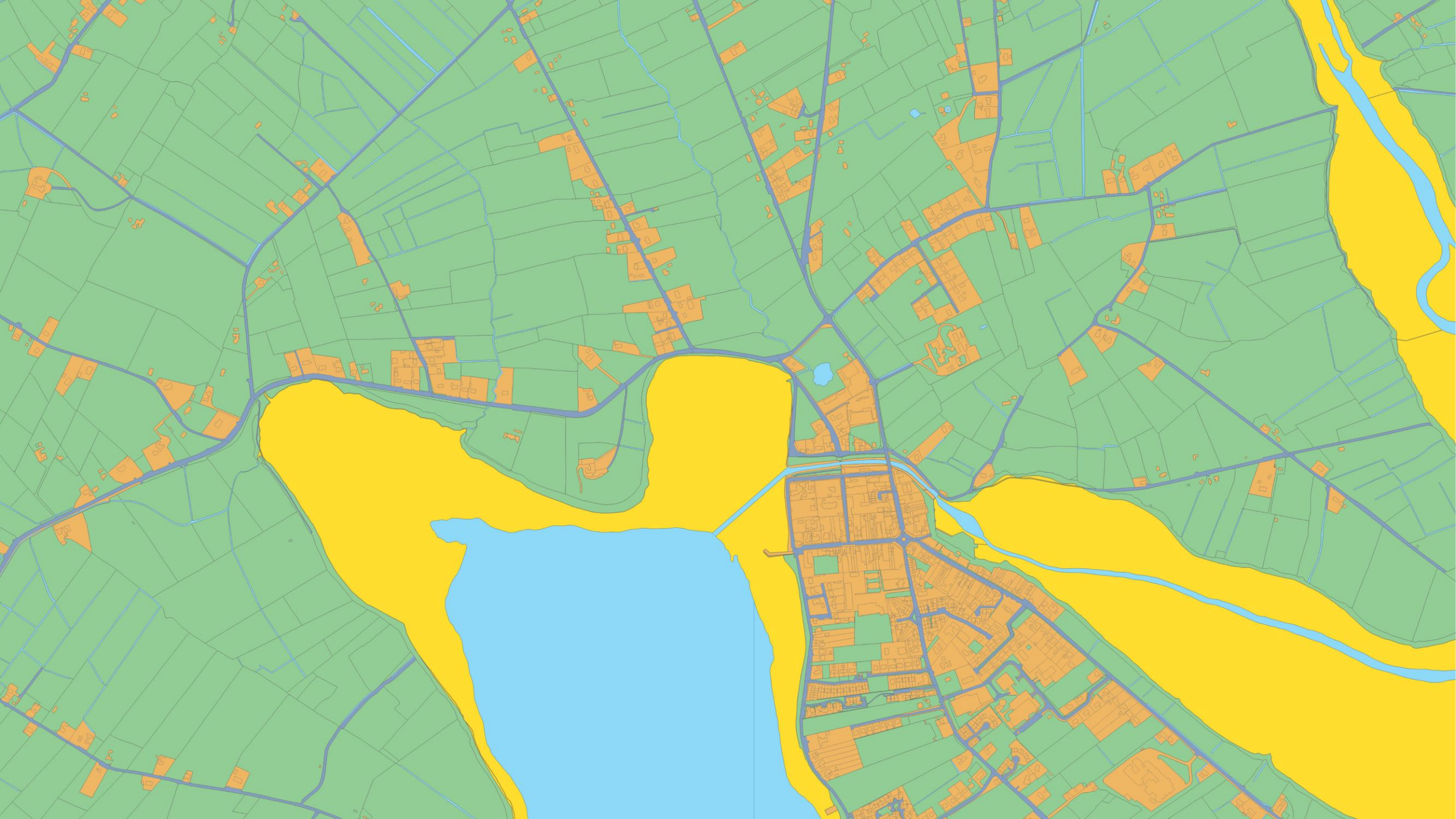
Multi Resolution Data Store

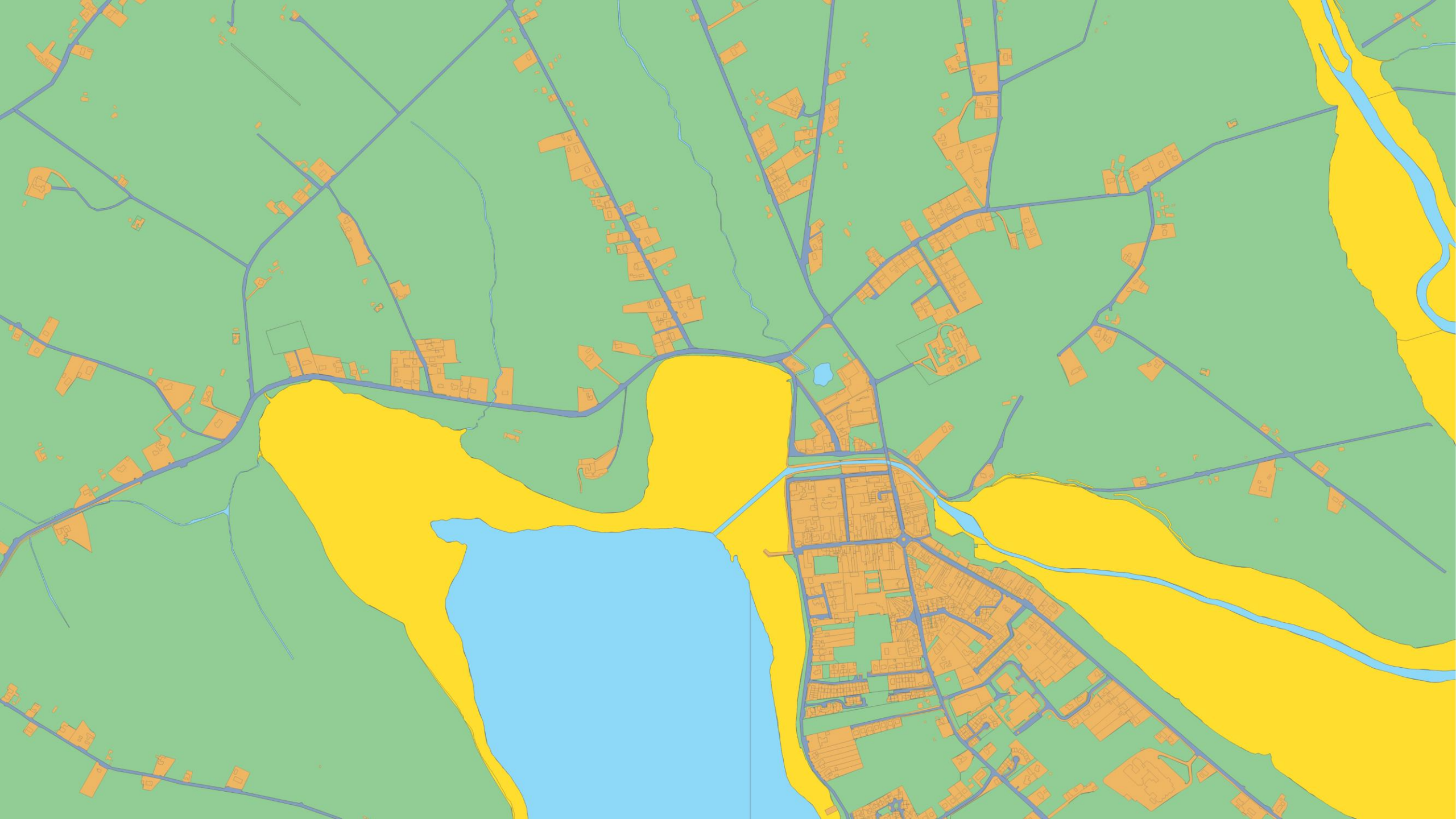


Number of SOE Features At Different Resolutions



	DLMCORE	DLMLocal	DLMRegional	DLMNational
ARTIFICIAL	6485212	6387291	6387291	0
VEGETATION	4455974	305352	279691	332
WAY	614100	605001	90794	0
WATER	515264	514628	127841	17969
EXPOSED	114081	114136	114136	7169





Conclusions

- Skin of the Earth enables topological rules and validation.
- Enables completeness
- Higher Maintenance
- Challenges when generalising

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Discussion

- Does your NMA have a Skin of the Earth Data Model?
- Has implementing one been considered?
- Can you see advantages/disadvantages?
- What do you think the biggest challenges would be?