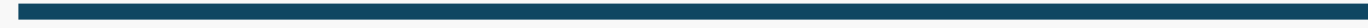# Automatically Correcting Spatial Validations

POI925: Points of Interests Inside of Multi-Dig Road

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A POI (Point of Interest) is located in the middle of 2 Multiply Digitised Roads, now this POI could have 4 possible outcomes depending on various validations to take into consideration

Posible Outcome Scenarios

01 NO POI EXISTS

02 WRONG POI LOCATION

03 WRONG MULTIPLY DIGITISED ATTRIBUTION
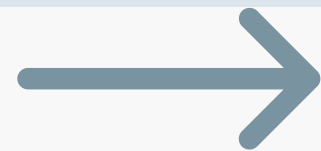
04 LEGITIMATE EXCEPTION
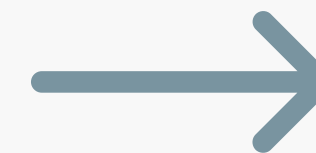
Explorative Data Analysis

Datasets

We worked with three main datasets: street information, street names, and POI (Point of Interest) data.

Data cleaning

To gather the most complete information for each POI, we merged the three datasets. This allowed us to consolidate relevant details and identify inconsistencies

Data preparation

We focused on the descriptive variables of each street and applied the following step: **standardization, multidigit filtering, desirability selection, merging**

Our Approach

Our approach is based on all the attributes and structure that we got in the Streets Nav file, it requires to do an analysis at first of all. Every case has his each geometric logic and sense.

Case 1: No POI exist

We defined a set of conditions under which a POI is likely to be non-existent, based on inconsistencies in the infrastructure or street type, or that it was moved or outdated. These conditions are:

1. **Infrastructure Issue**
The street is marked as multidigit (MULTIDIGIT == "Y") and is also associated with infrastructure elements like a tunnel, ramp, or bridge.

2. **Street Type Inconsistency**
The street type before and after the POI location do not match (ST_TYP_BEF ≠ ST_TYP_AFT), which may indicate a misalignment or misplacement of the POI.

Here we can see the amount of Non existence POIs for each section
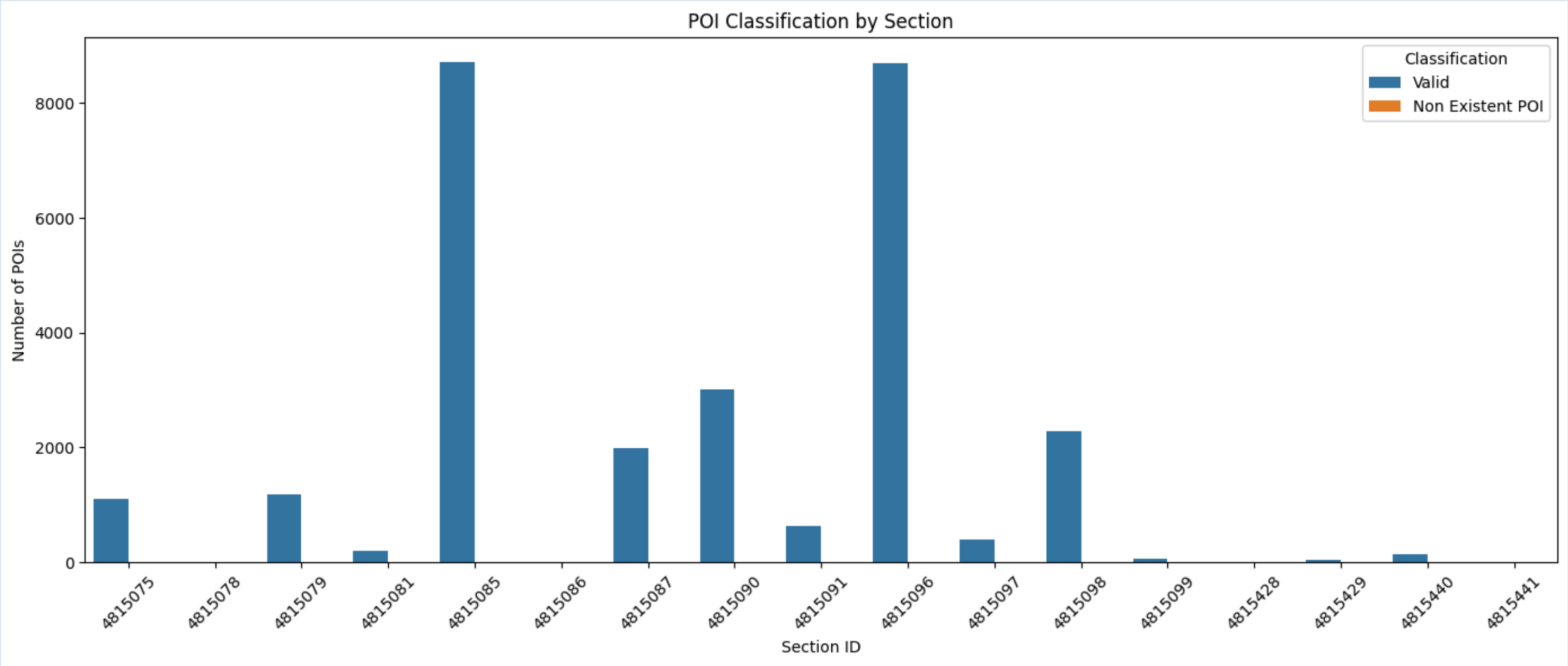
Only the seccions 4815079, 4815085, 4815096 have Non existence POIs and it represente their 0.0842, 0.022 and 0.011 porcentage of all their data

Case 2: Wrong POI Location

A set of conditions and parameters were stablished so that we would be able to determine if a POI was found between Multiply Digitised Roads, and to determine wether this was its actual location or it was wrongly assigned there

1. Scenic Route

The link_id has this attribute marked as positive, based on that we are able to review the POI, if its located in between 2 Multiply Digitised Roads, its is wrongly misplaced!

2. Surrounding Attributes

To determine if a POI was wrongly misplaced in the map we can use "Enhanced Geometry" which tells us how precise the location of the POI is based on its coordinates, as well as references to its location

Case 3: Wrong Multiply Digitised Assesment

To determine what would be categorized as a Multiply Digitised Assesment we need to understand the definition specified in the documentation (Page 468)

1. **Opposing Direction Lanes**

A MultiDigit needs to have lanes of opposed direction to one another and we can determine this by finding 3 parallel link_ids and to determine the direction of each link.

2. **Divider and its restrictions**

Another characteristic to classify a MultiDigit is that it requires a divider (Legal/Physical) of at least 3 meters and maximum 40 meters, if the divider is outside this range this cannot be classified as a MultiDigit.

Case 4: Legitimate Exceptions

POI and LINK_ID Match
The link_id has a matching POI ID, meaning that there is a Point of Interest along that area, which helps us determine the correct data

These POI's are marked as the exceptions for all the other cases, meaning that during all the past scenarios it wasn't flagged as non-existant, wrongly located, etc

Thank you!

If you have any doubts, comments or suggestions to improve our solution, let us know! We are open to better ourselves