

Smart Points of Interest



Otevřená data jako příležitost pro komerční sektor

18. ledna 2016, Praha

Smart Points of Interest (SPOI)

- POI: a specific point location that someone may find useful or interesting
- SPOI domain: tourism and related spheres (transport, logistics, advertising...)
- Smart: Links to other data and information
- Open and seamless data set of POIs as a “data fuel” for development tourism applications and services

Why SPOI?

- Save your money
- Show off your business
- Inform on your region or town
- Develop applications and services
- Combine SPOI with your data
- ...

Essential attributes of SPOI

- Many heterogeneous input data
- Complicated data harmonization process
- Based on standards, semantic description and Linked data
- Seamless data (no borders)
- Published on map portal and SPARQL endpoint
- Open Database License (ODbL)

LOD 5-star rating system



* On the web

- Accessible through SPARQL endpoint
- Open Database Licence (OdbL)
 - Copyleft license
 - Share, modify, and use a data
 - No restrictions (except keeping the freedom for other users)
 - <http://opendatacommons.org/licenses/odbl/>

**** Machine readable data**

***** Non-proprietary format**

- Original data are transformed to RDF
- SPARQL endpoint – RDF, JSON, XML, CSV...
- Via scripts we are able to prepare XML-based geo-formats (KML, GML...)

**** RDF standard

- Identifier = URI
- Combination
 - ISO 3166-1 alpha-2 country code (two letters)
 - Acronym of category of POI according Waze navigation data (three letters)
 - Coordinates (long_lat)

```
<rdf:Description rdf:about="http://www.sdi4apps.eu/poi/ML_NAT_0.8712_14.9746">
```


**** RDF standard

```
<rdf:Description rdf:about="http://www.sdi4apps.eu/poi/SZ_NAT NAT_31.15_-27.05">
  <rdfs:label>Vondo Kop</rdfs:label>
  <geos:asWKT>POINT(31.15 -27.05)</geos:asWKT>
  <poi:category>Waze
  rdf:resource="http://www.openvoc.eu/waze_classification#Natural_features"/>
  <owl:sameAs rdf:resource="http://www.geonames.org/934823/about.rdf"/>
  <skos:exactMatch rdf:resource="http://www.geonames.org/934823/about.rdf"/>
  <geos:sfWithin rdf:resource="http://dbpedia.org/resource/Swaziland"/>
  <geos:sfWithin rdf:resource="http://www.geonames.org/934841/" />
  <dc:identifier rdf:resource="http://www.sdi4apps.eu/poi/SZ_NAT NAT_31.15_-
27.05"/>
  <dc:publisher>SP0I (http://sdi4apps.eu/spoi)</dc:publisher>
  <dc:title>Vondo Kop</dc:title>
  <dc:rights rdf:resource="http://opendatacommons.org/licenses/odbl/1.0/" />
  <dc:source rdf:resource="https://www.geonames.org"/>
  <dcterms:created
  rdf:datatype="http://www.w3.org/2001/XMLSchema#date">2015-11-
12</dcterms:created>
</rdf:Description>
```

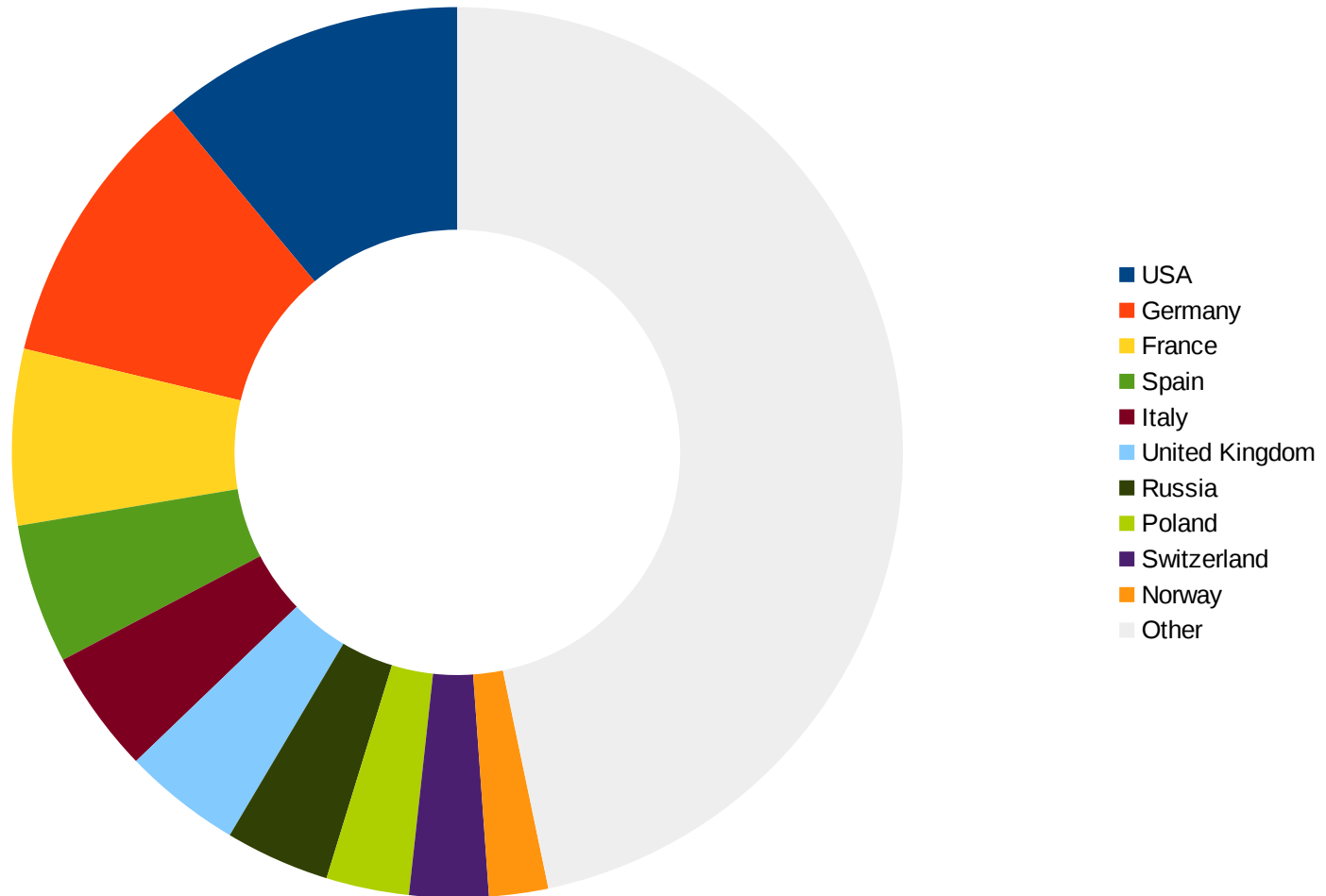
***** Linked RDF

- Classification – Waze RDF vocabulary
- Homepages (752 599), photos and pictures
- Same features
 - Web pages (Wikipedia, Wolfram|Alpha...; 2 384)
 - Wikidata (12 176)
 - Linked data resources (DBpedia, GeoNames.org; 3 333 254)
- Topological relation (GeoSPARQL) – to countries (DBpedia, GeoNames.org; 47 874 984)

23 937 492

POIs

Coverage – Top 10 countries



170 123 POIs = 0,71%

Classifications

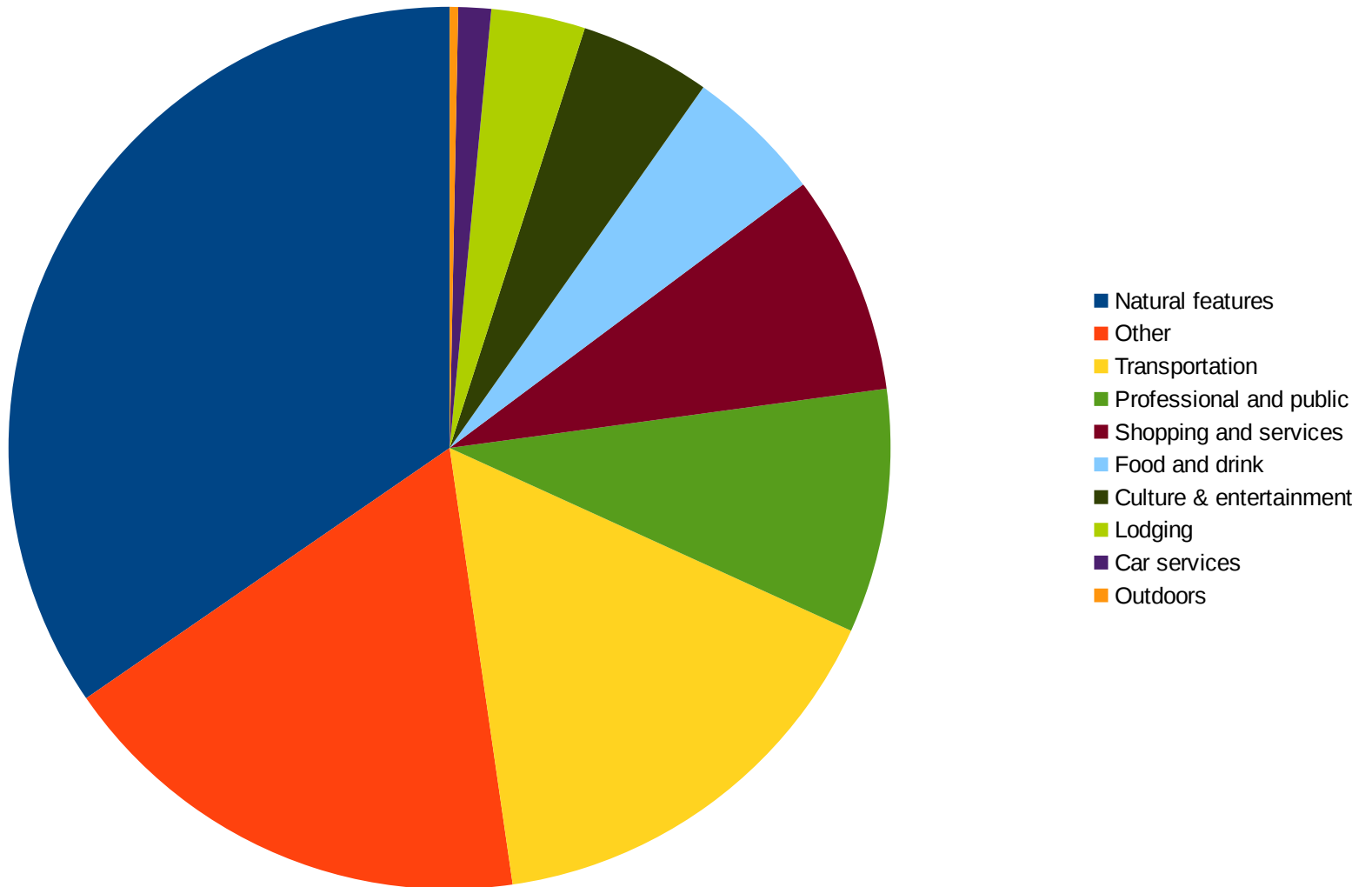
Waze

- Mandatory
- 10 categories
- RDF vocabulary

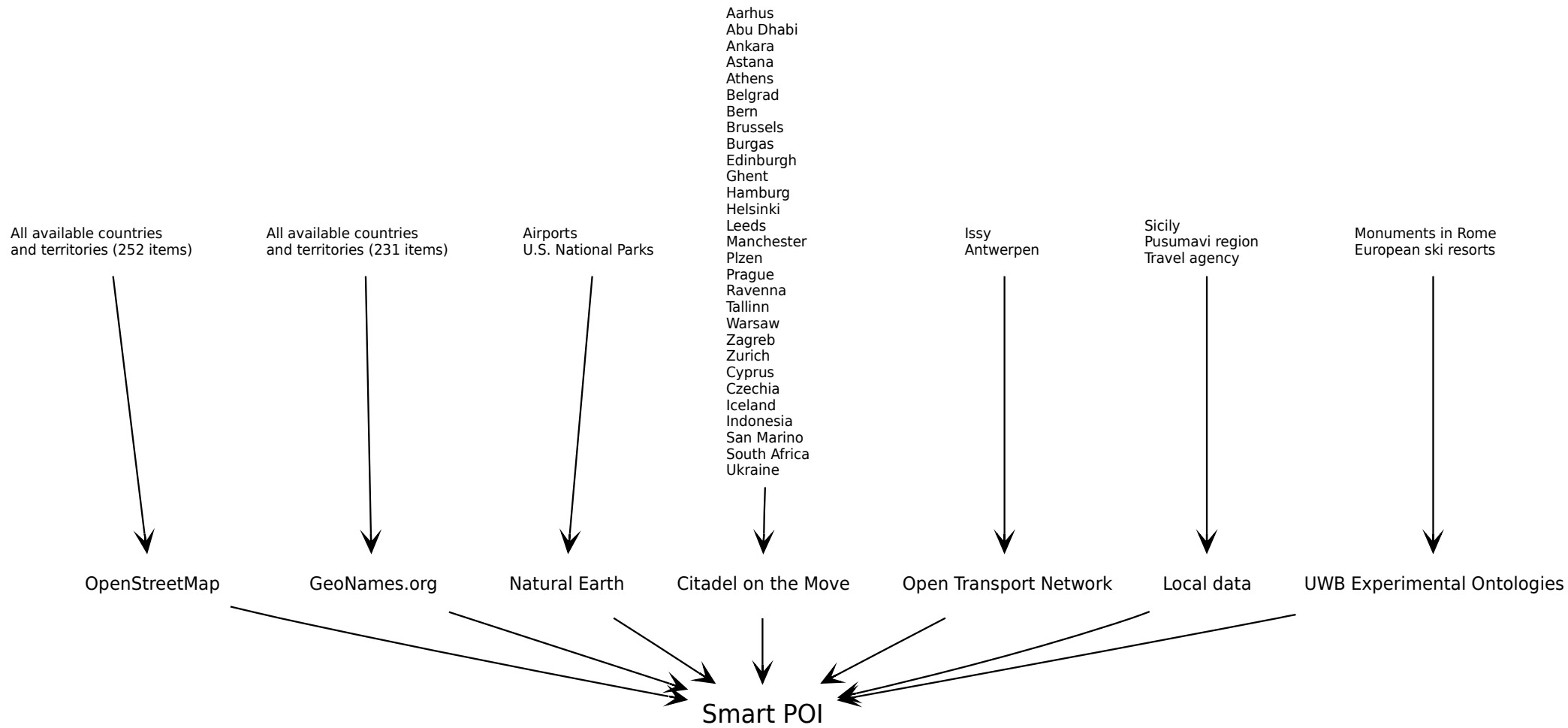
OpenStreetMap

- Optional (86%)
- Open (OSM Map Features)
- 2 levels
- String

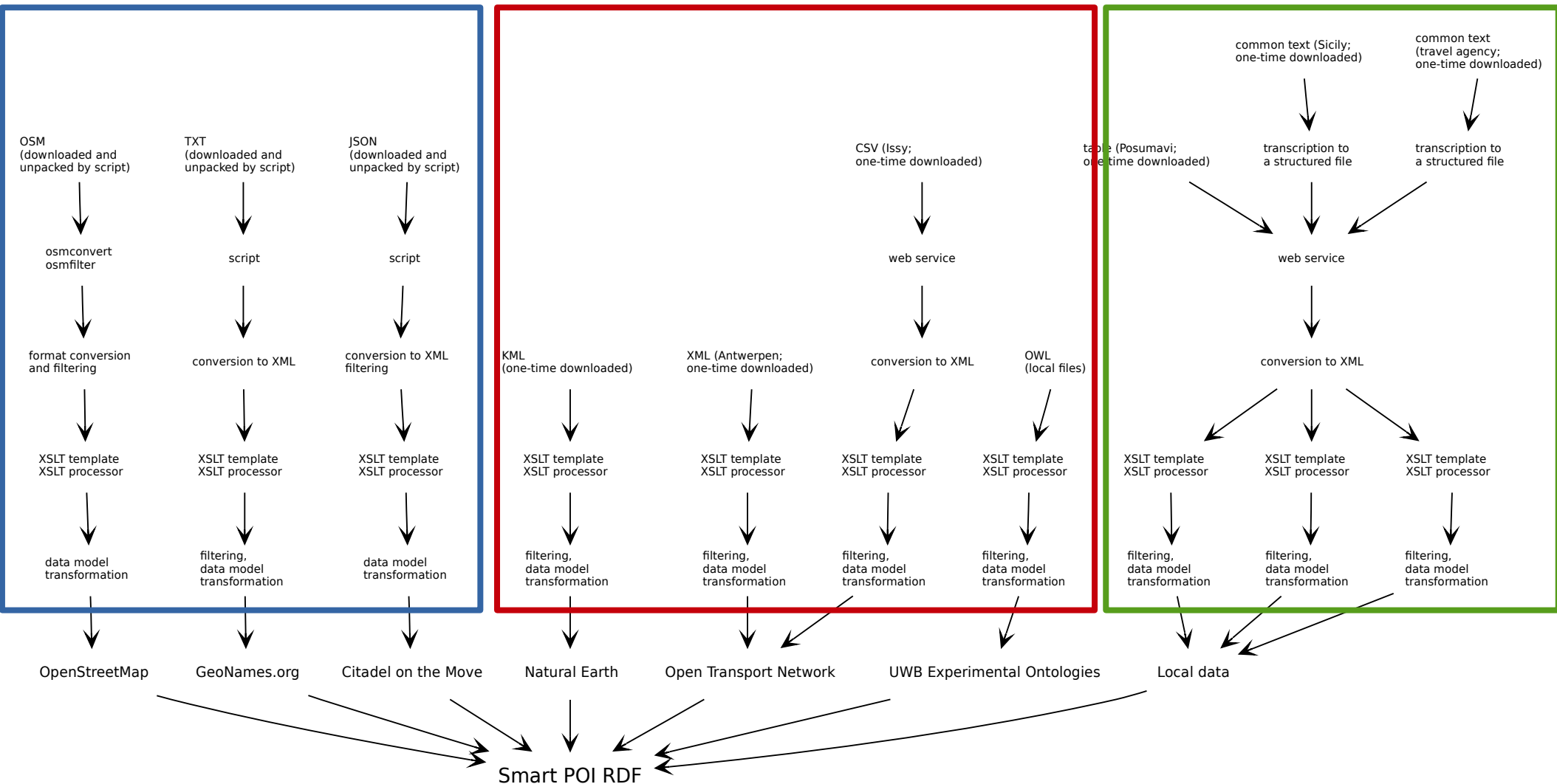
POI categories

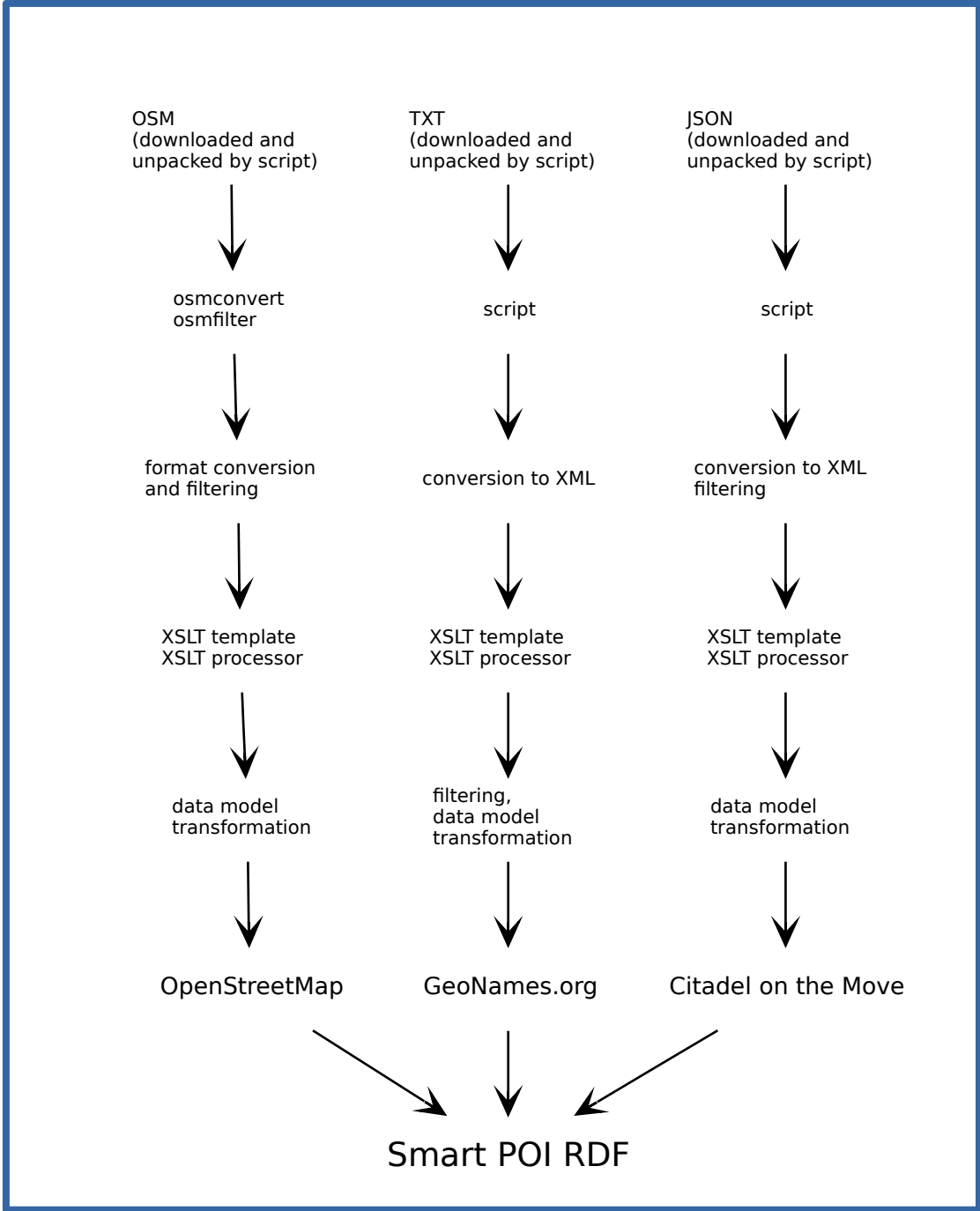


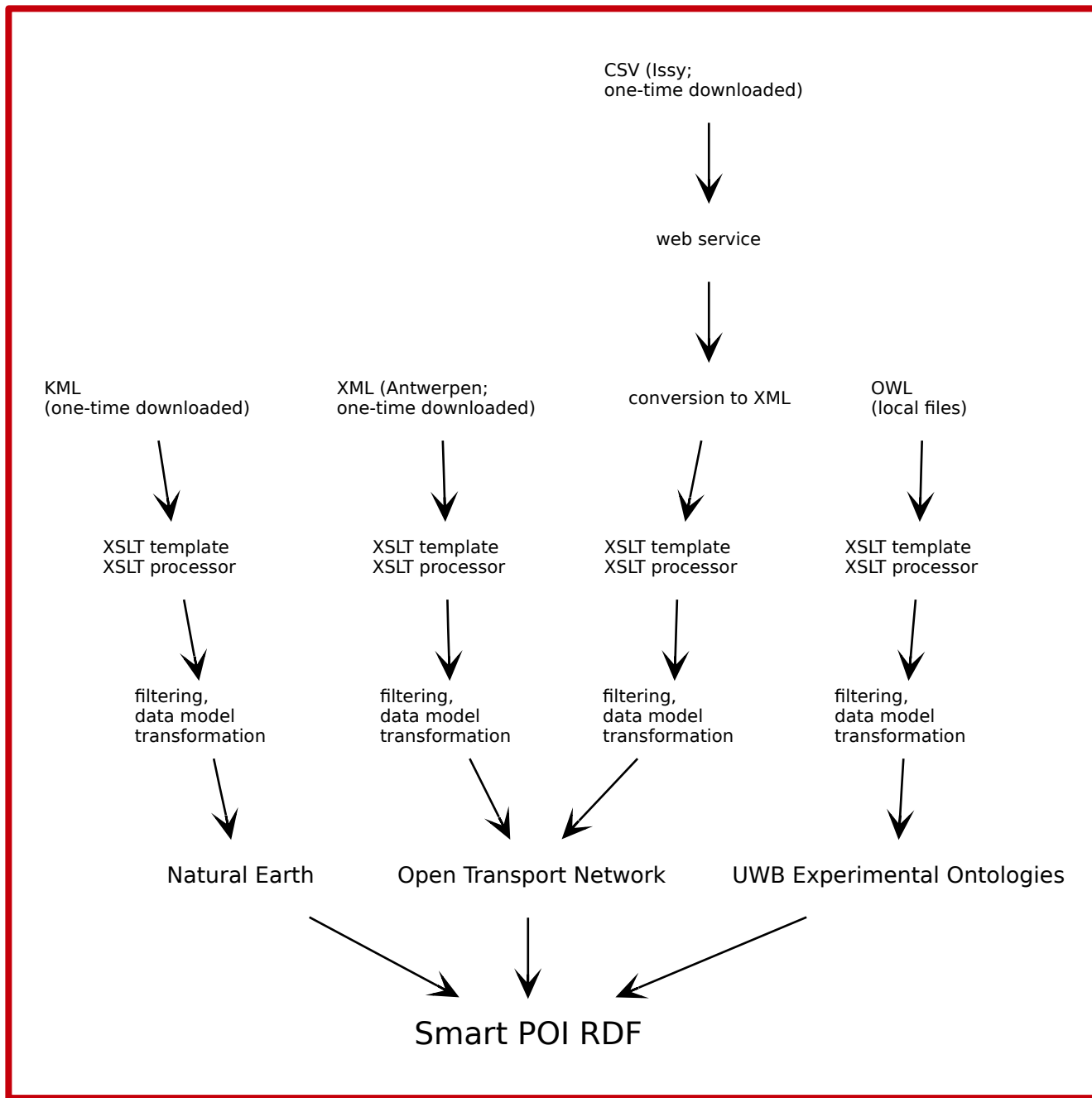
Data resources

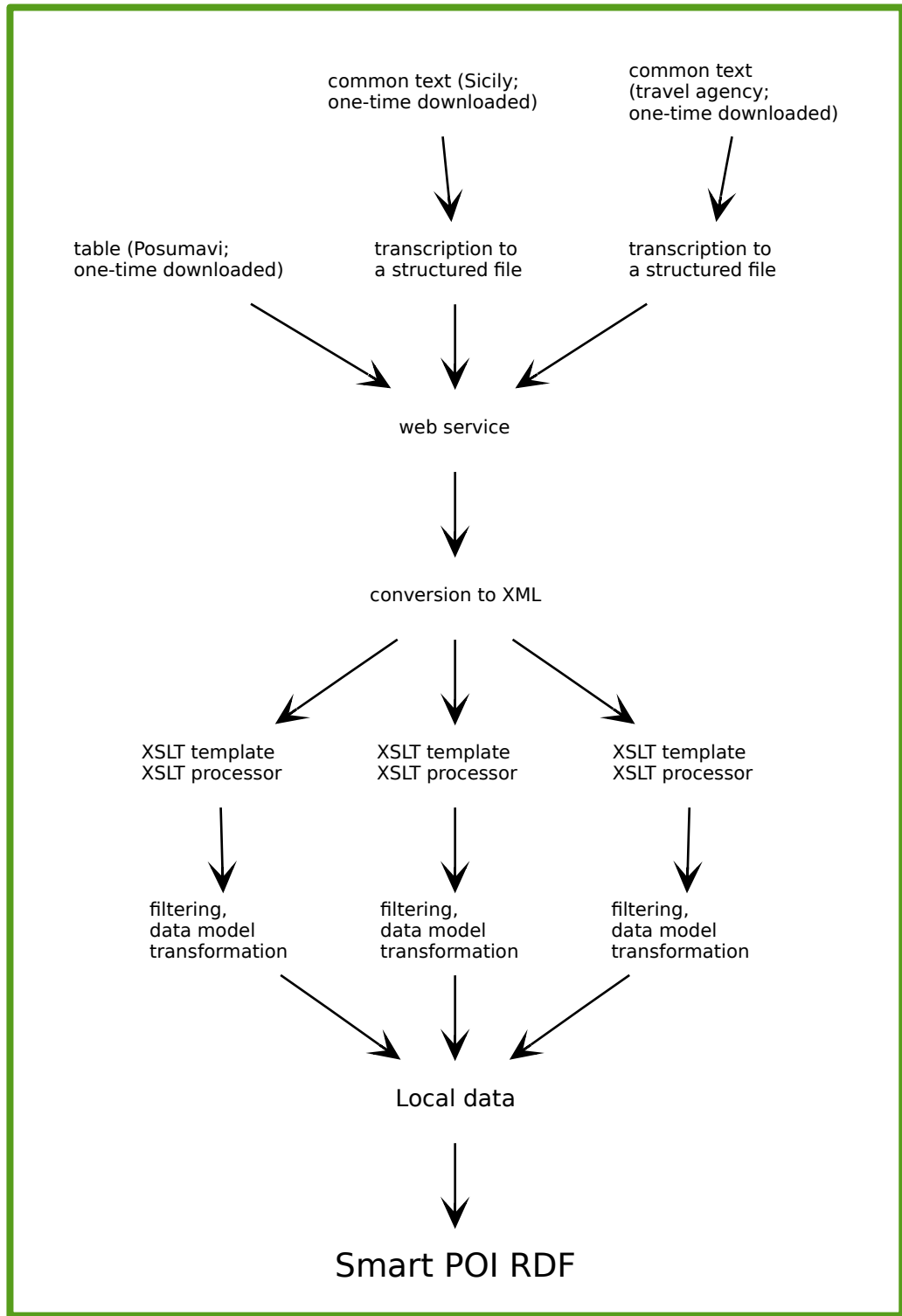


Data resources & harmonization

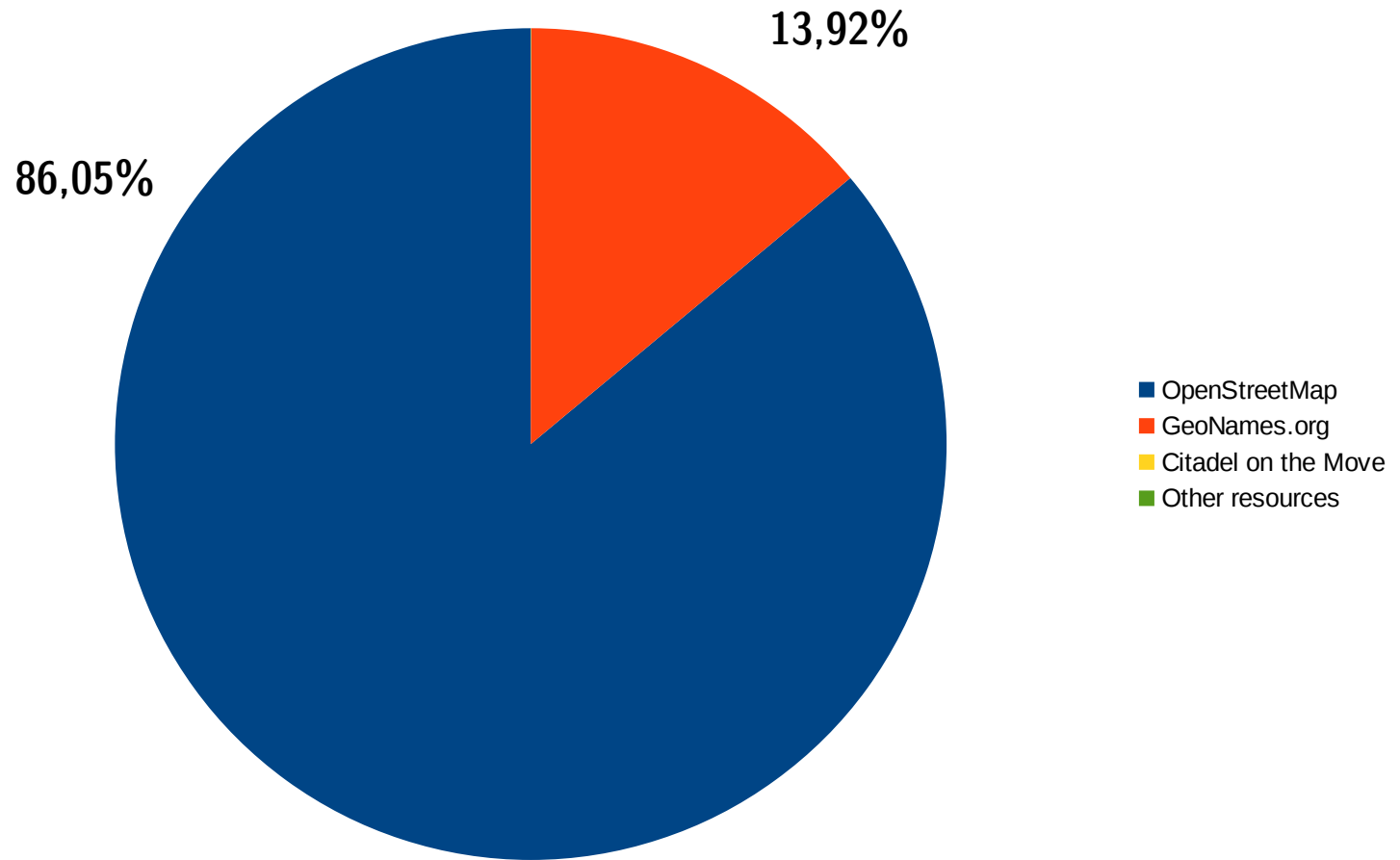




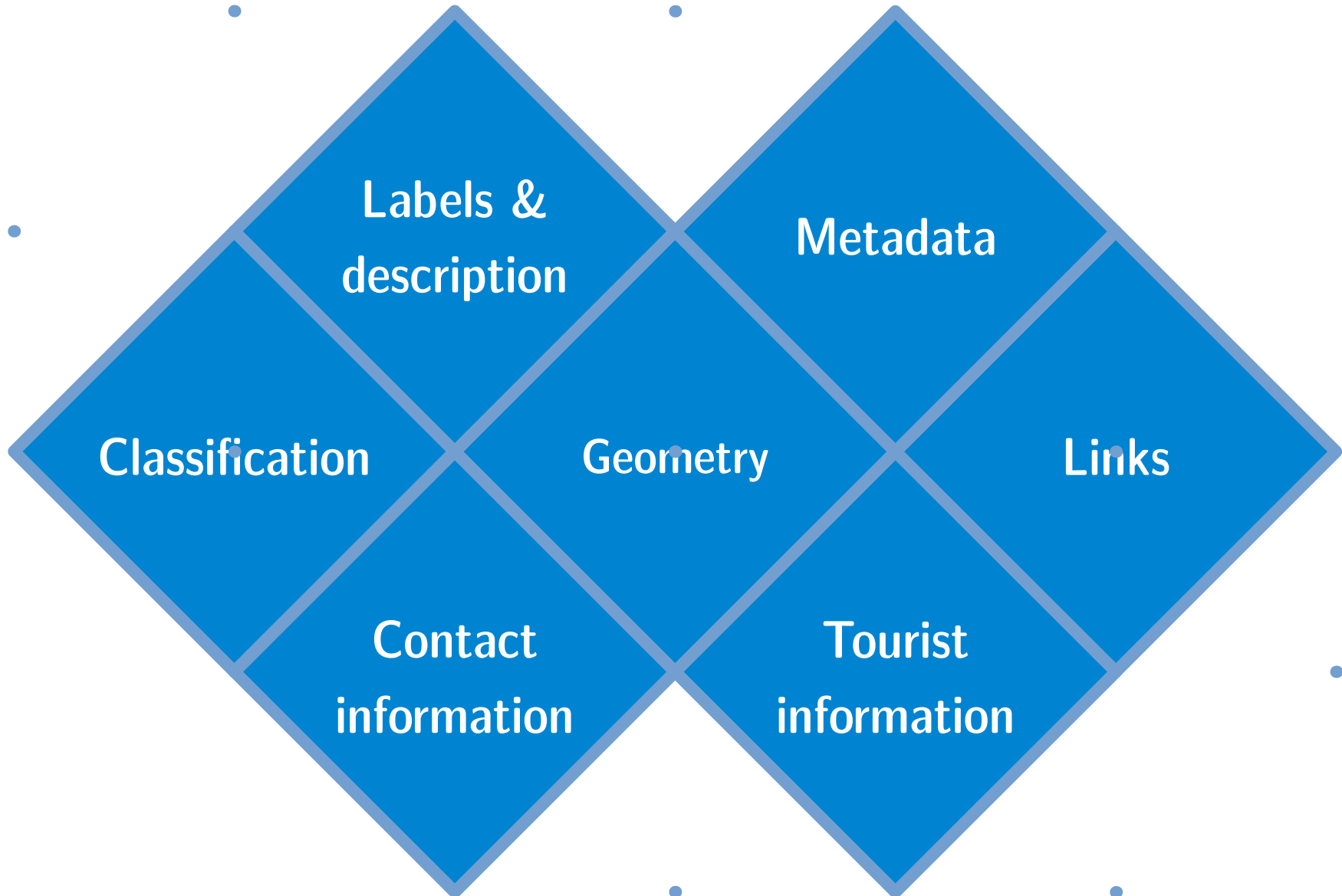


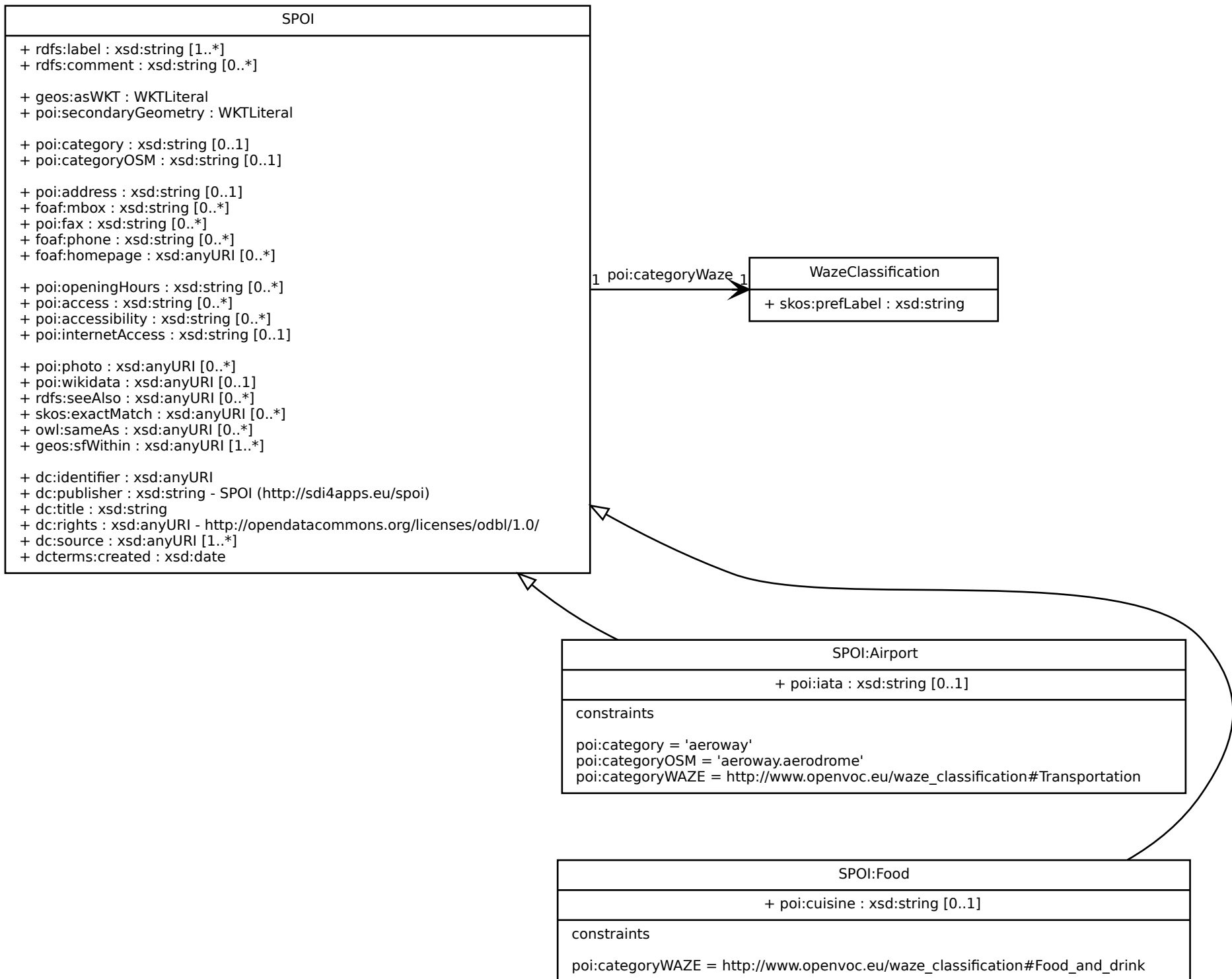


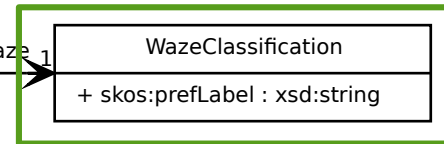
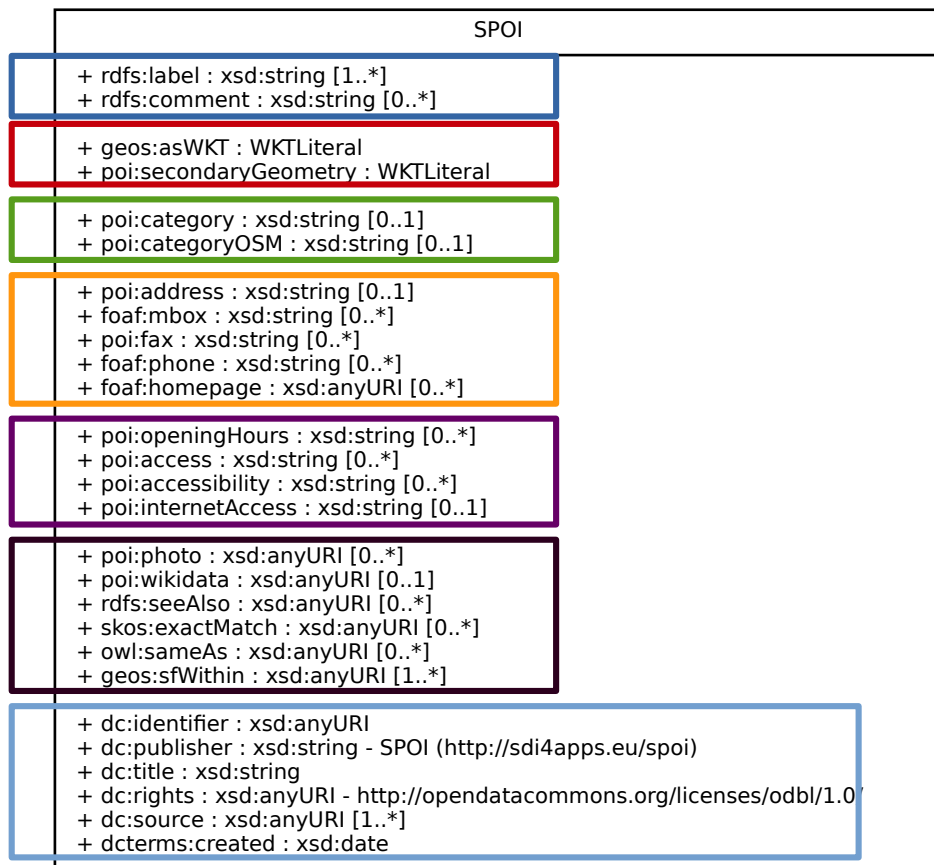
Data resources



Data model







1 poi:categoryWaze 1

Labels & descriptions

Geometry

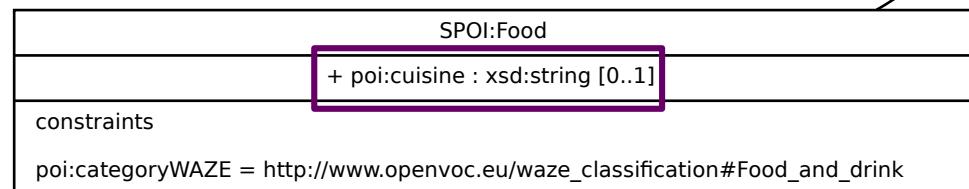
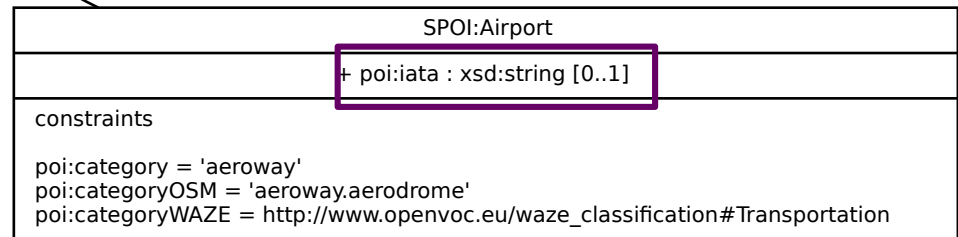
Classification

Contact information

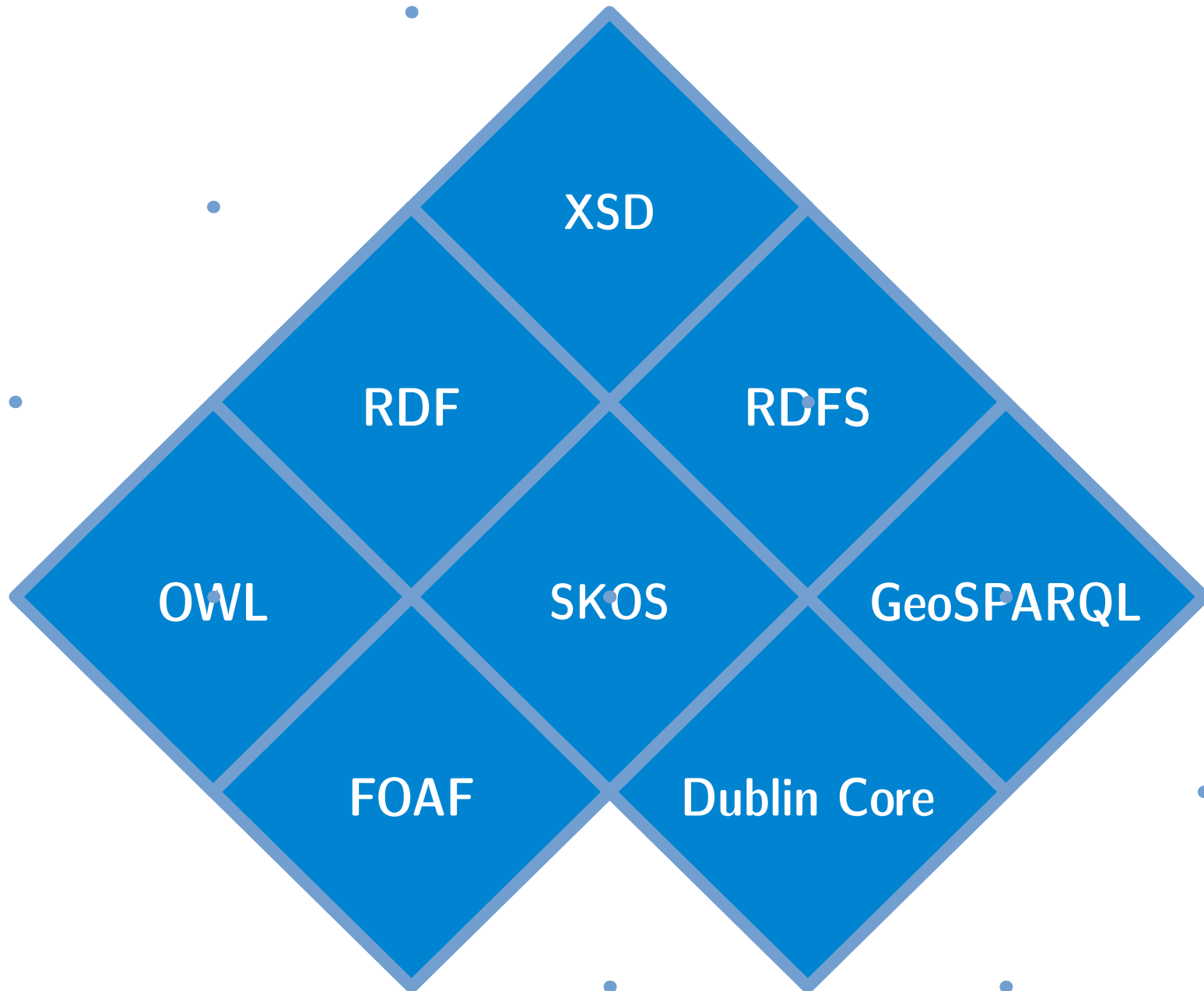
Tourist information

Links

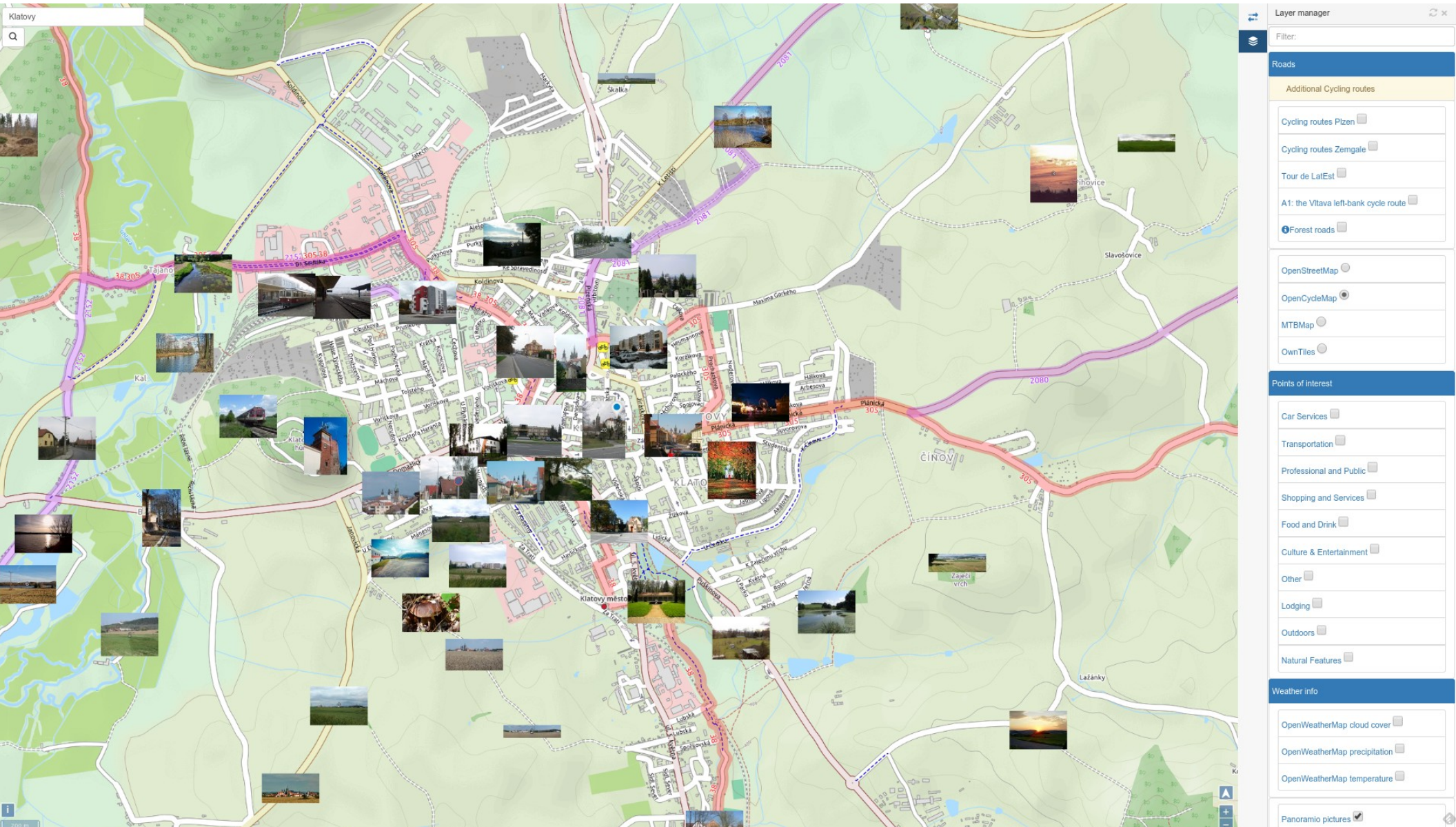
Metadata



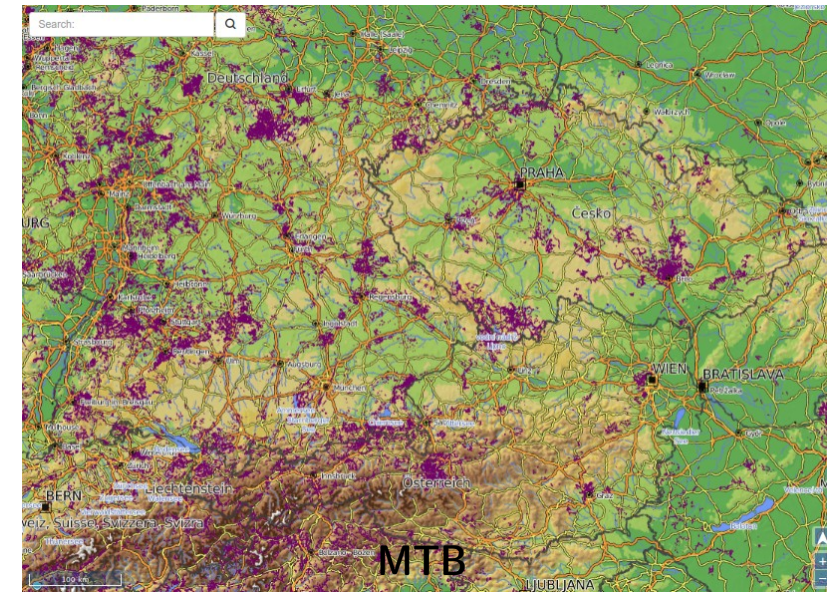
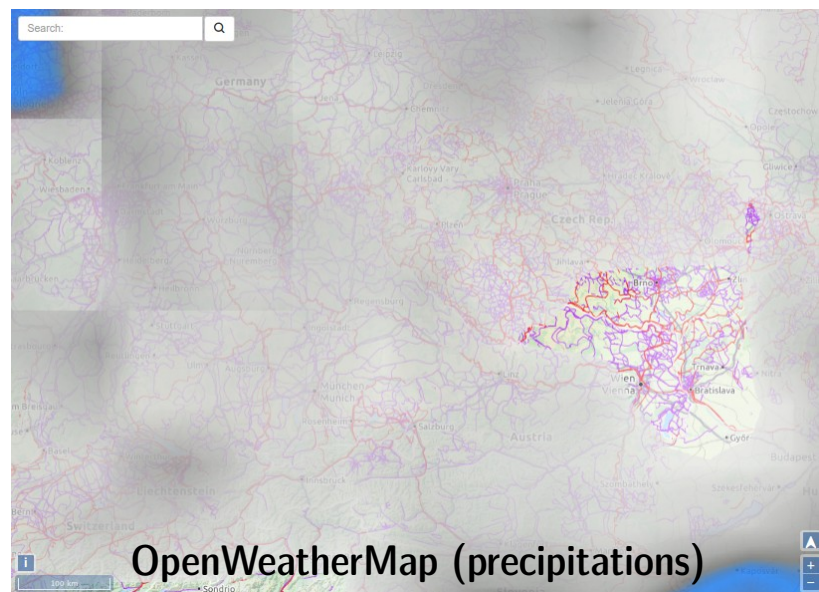
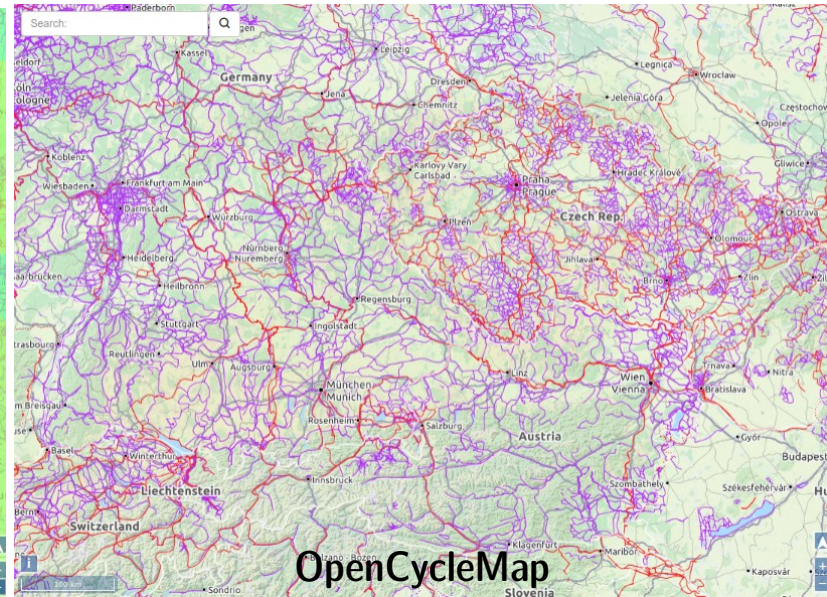
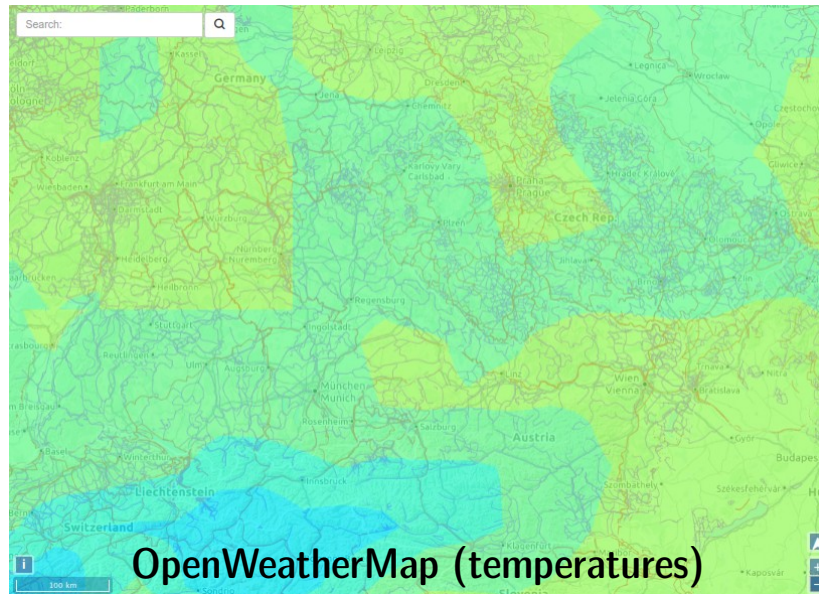
Re-used vocabularies / formats



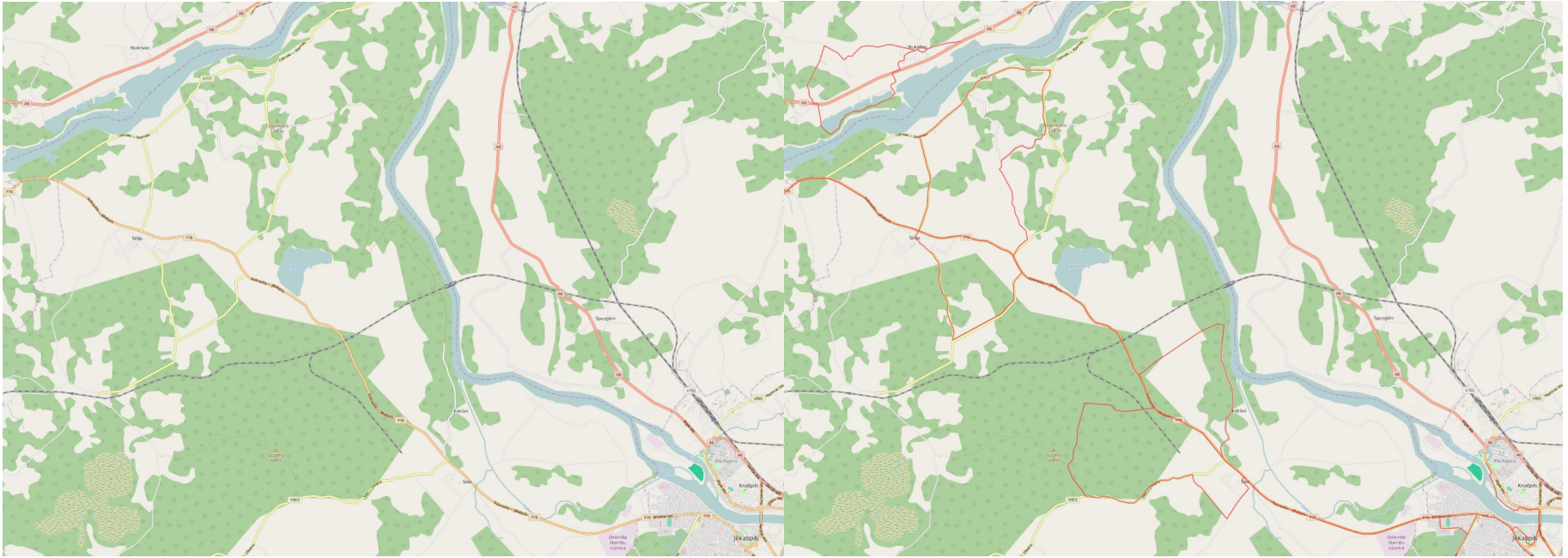
Map client



Map client – layers

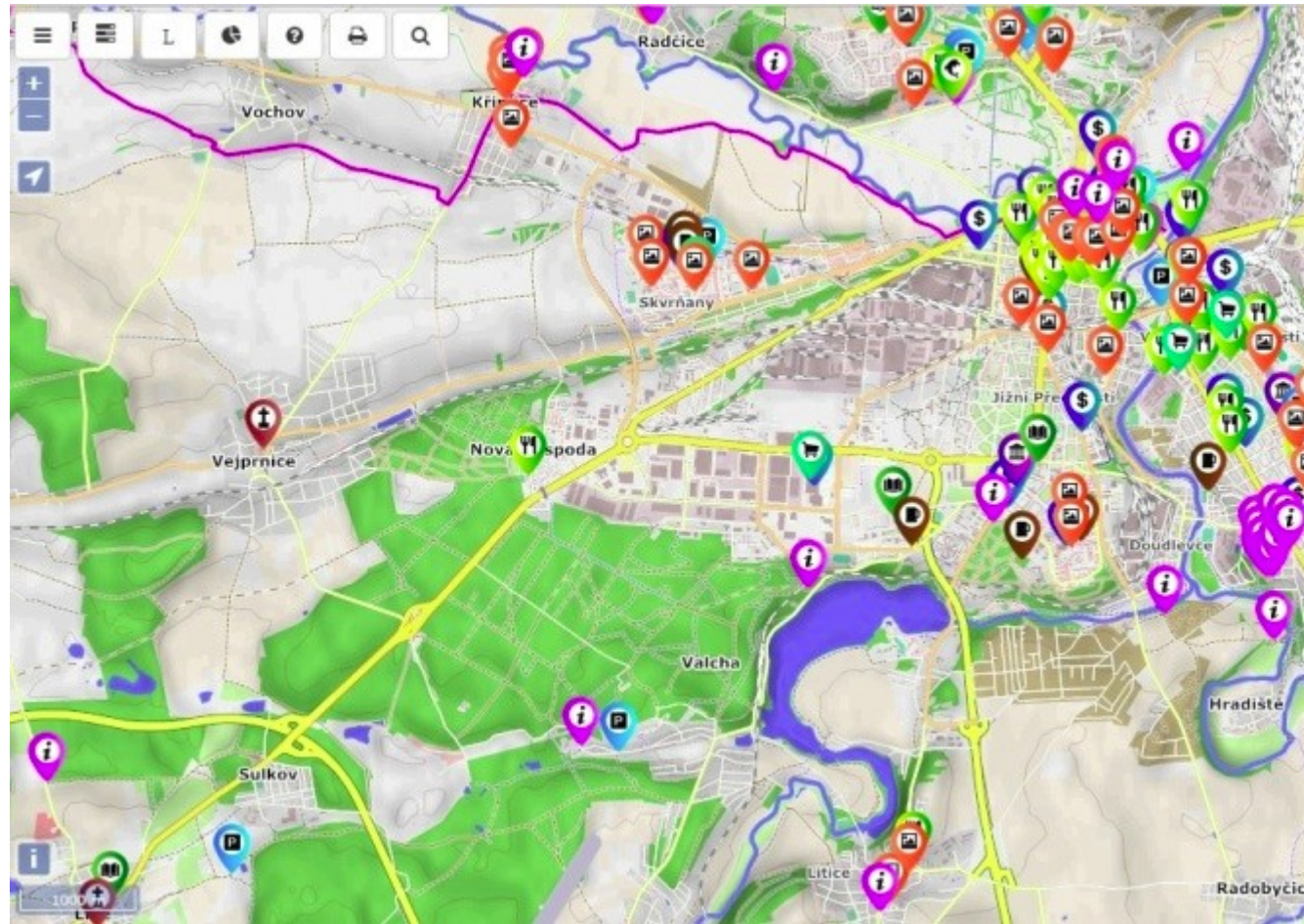


Map client – layers



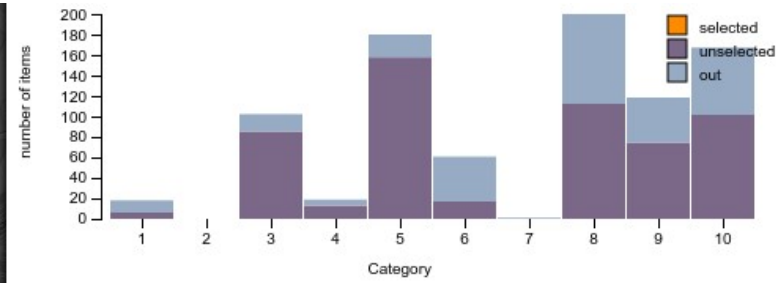
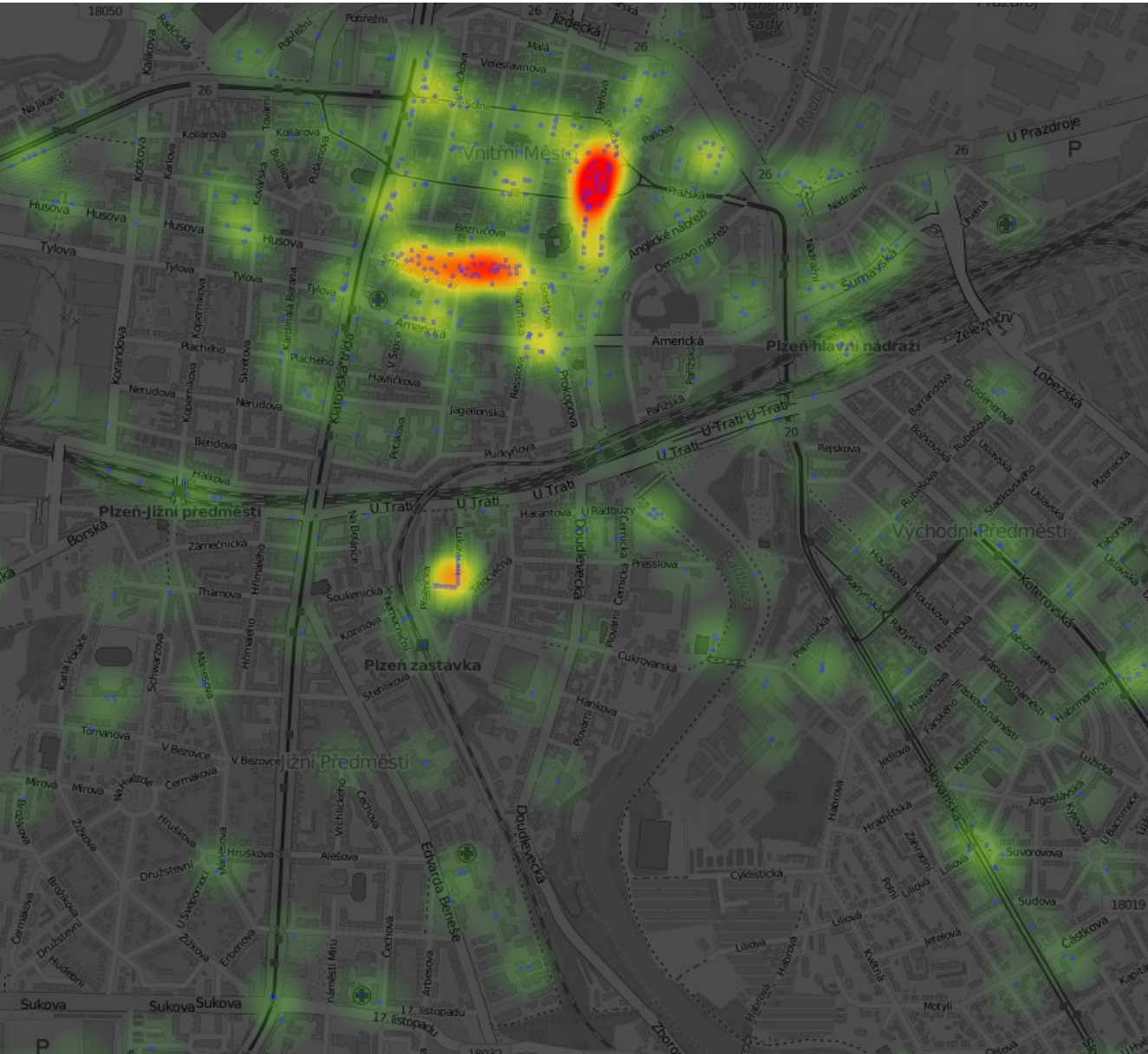
Map client – Technologies

- HS layers
- Specific tiles for cycling and biking
- OpenCycleMap, MTB map, OSM...
- Panoramio, OpenWeatherMap



<http://ng.hslayers.org/examples/geosparql/>

Advanced visualization



- 1 - Car Services
- 2 - Culture & Entertainment
- 3 - Food and Drink
- 4 - Lodging
- 5 - Natural Features
- 6 - Other
- 7 - Outdoors
- 8 - Professional and Public
- 9 - Shopping and Services
- 10 - Transportation

Radius:



SPARQL endpoint

Virtuoso SPARQL Query Editor

Default Data Set Name (Graph IRI)

Query Text

```
select distinct ?Concept where {[] a ?Concept} LIMIT 100
```

(Security restrictions of this server do not allow you to retrieve remote RDF data, see [details](#).)

Results Format:

HTML ▾

Execution timeout:

0 milliseconds *(values less than 1000 are ignored)*

Options:

Strict checking of void variables

(The result can only be sent back to browser, not saved on the server, see [details](#))

Run Query

Reset

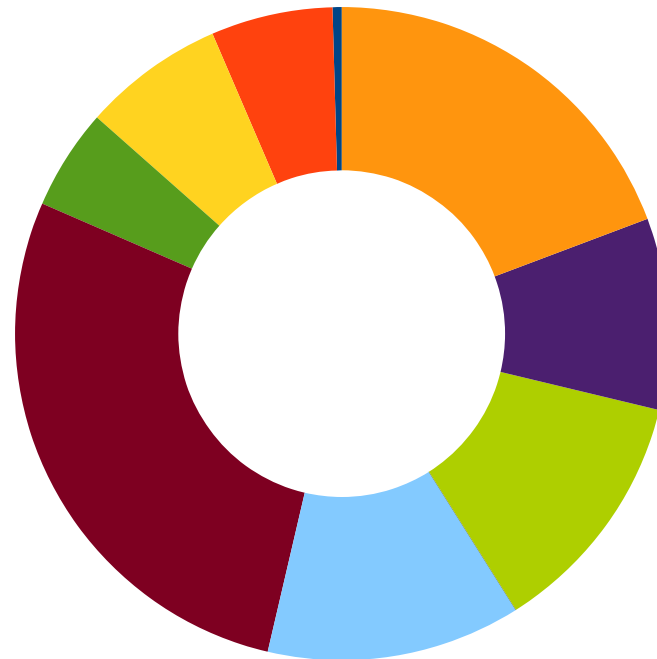
<http://ng.hslayers.org:8890/sparql>

SPARQL query

```
SELECT ?categ (COUNT(?o) as ?oCount)
WHERE {?o <http://www.openvoc.eu/poi#categoryWaze> ?categ.}
GROUP BY ?categ
ORDER BY ?categ
```



categ	oCount
http://www.openvoc.eu/waze_classification#Car_services	37289
http://www.openvoc.eu/waze_classification#Culture_&_entertainment	497791
http://www.openvoc.eu/waze_classification#Food_and_drink	578861
http://www.openvoc.eu/waze_classification#Lodging	411714
http://www.openvoc.eu/waze_classification#Natural_features	2302460
http://www.openvoc.eu/waze_classification#Other	1039602
http://www.openvoc.eu/waze_classification#Outdoors	1719
http://www.openvoc.eu/waze_classification#Professional_and_public	1014299
http://www.openvoc.eu/waze_classification#Shopping_and_services	782140
http://www.openvoc.eu/waze_classification#Transportation	1592835

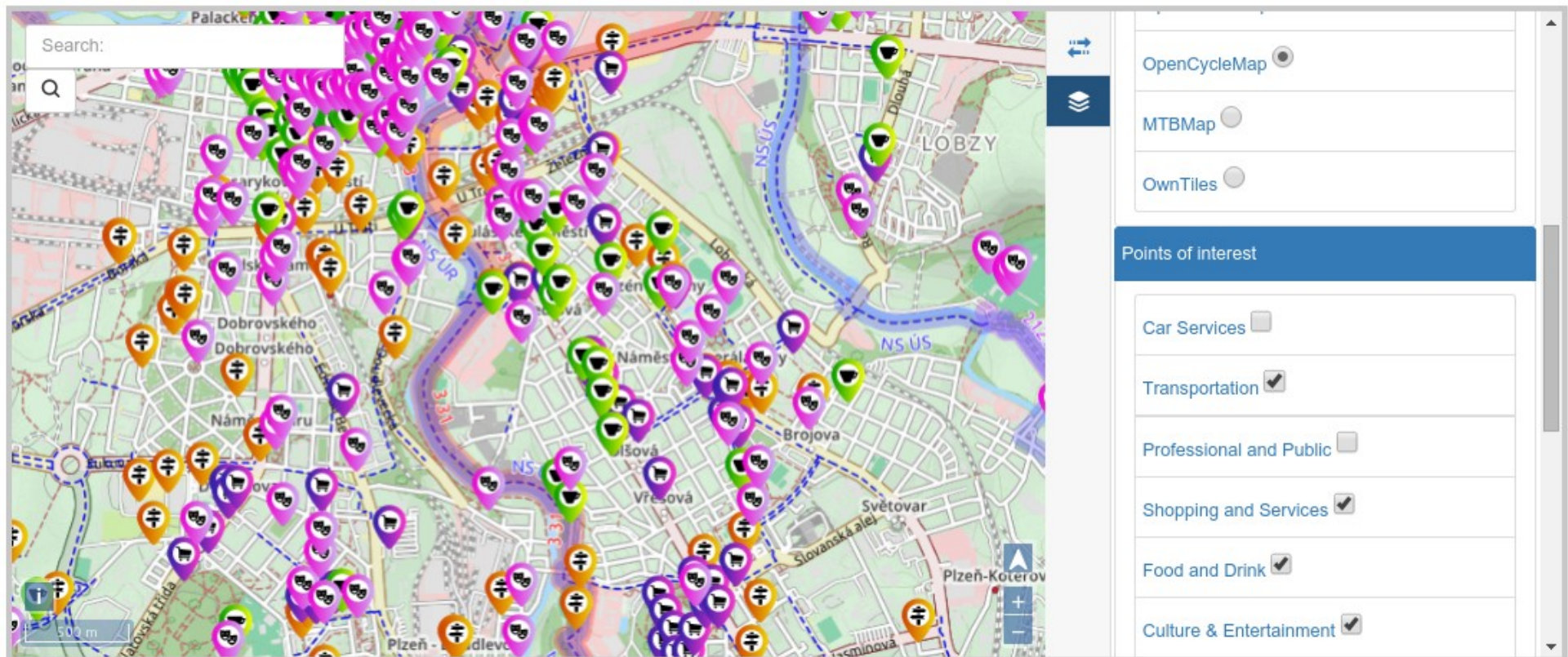


- Car services
- Culture and entertainment
- Food and drink
- Lodging
- Natural features
- Other
- Outdoors
- Professional and public
- Shopping and services
- Transportation

Over 23,000,000 Points of Interest in the data set

Open and seamless SPOI data set, which is based on Linked data principles, contains over 23 million Points of Interest important for tourism.

Visualization



Search:

OpenCycleMap

MTBMap

OwnTiles

Points of interest

Car Services

Transportation

Professional and Public

Shopping and Services

Food and Drink

Culture & Entertainment

Přes 23 000 000 turistických zájmových bodů

Otevřená a bezesová datová sada, založená na principech Linked Data. Obsahuje přes 23 000 000 zájmových bodů využitelných zejména pro turistiku.

sdi4apps.eu/spoi
gis.zcu.cz/spoi

Vizualizace

The screenshot displays a web application interface for visualizing POI data. The main area is a map of Pilsen, Czech Republic, densely populated with colorful markers (purple, orange, green, pink) representing various points of interest. A search bar is visible in the top left corner. On the right side, there is a sidebar with several filter options:

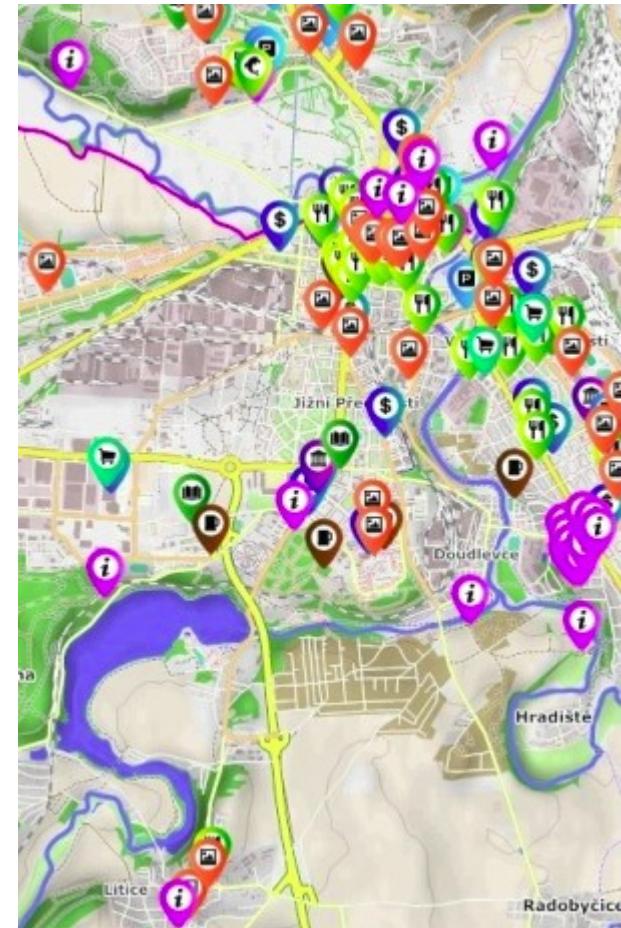
- Map style selection: OpenCycleMap (selected), MTBMap, OwnTiles.
- Points of interest filter:
 - Car Services
 - Transportation
 - Professional and Public
 - Shopping and Services
 - Food and Drink
 - Culture & Entertainment

Future

- Data model & metadata
- New data & new data resources
- Massive linking
- Optimization of download and harmonization
- Errors & duplicities
- Better map client (visual hierarchy, clustering...)
- Optimization of server solution
- Apps development (context-based, analysis, routing, itineraries...)
- Business solution (advertising)

Benefits

- Common data model
- Re-using existing standards
- Linked data
- SPARQL endpoint



SPOI Promotion

- July 2015: 27th International Cartographic Conference, Rio de Janeiro, Brazil
- September 2015: 19th International Conference on Information Systems for Agriculture and Forestry, Dresden, Germany
- October 2015: International Semantic Web Conference, Bethlehem PA, USA
- November 2015: 1st ICA European Symposium on Cartography, Vienna, Austria
- November 2015: Where Camp, Berlin, Germany

SPOI main contributors

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- Czech Centre for Science and Society: Karel Charvát
- Baltic Open Solutions Centre: Raitis Bērziņš, Přemysl Vohnout
- Help service – remote sensing: Štěpán Kafka

We are waiting for



Your data



Feedback



**Your ideas
& support**

SDI4Apps



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