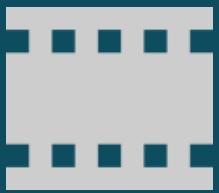


Thank you for joining us!
We will start shortly.



**The presentation
will be recorded**



**Mute your
microphone**



**Turn off your
camera**



**Use the chatbox to
ask or comment**

ELISE action
Webinar Series

Using synonyms to improve discovery of geospatial data

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03/12/2020



European Location Interoperability
Solutions for e-Government

*Enabling Digital Government through
Geospatial and Location Intelligence*



ISA² Programme & ELISE action

European Interoperability Programme

cross-border and cross-sector Interoperability solutions

for public administrations, businesses and citizens

54 different actions tackling **interoperability** from different angles

ELISE action is the **only** action focusing on the **location dimension**



















European Location Interoperability Solutions for e-Government

Enabling Digital Government through Geospatial and Location Intelligence



Welcome to the ELISE webinar series



 <p>ELISE action Webinar Series</p> <p>Using synonyms to improve discovery of geospatial data</p> <p>03/12/2020 at 14:00 CEST (UTC+2)</p>	 <p>ELISE action Webinar Series</p> <p>Workshop: SensorThings API brings Dynamic Data to INSPIRE</p> <p>19/11/2020 at 14:00 CEST (UTC+2)</p>	 <p>ELISE action Webinar Series</p> <p>Workshop: Data Ecosystems for Geospatial Data</p> <p>12/11/2020 at 14:00 CEST (UTC+2)</p>	 <p>ELISE action Webinar Series</p> <p>ELISE Guidance on Location Data Privacy</p> <p>22/10/2020 at 14:00 CEST (UTC+2)</p>
<p>ELISE Webinar: Using synonyms to improve discovery of geospatial</p> <p>03/12/2020 event </p>	<p>ELISE Workshop: SensorThings API brings Dynamic Data to</p> <p>19/11/2020 event </p>	<p>ELISE Workshop: Data Ecosystems for Geospatial Data</p> <p>12/11/2020 event </p>	<p>ELISE webinar: Guidance on Location Data Privacy</p> <p>22/10/2020 event </p>
 <p>ELISE action Webinar Series</p> <p>Monitoring and understanding emerging geospatial technologies and their impact on interoperability</p> <p>24/09/2020 at 14:00 CEST (UTC+2)</p>	 <p>ELISE action Webinar Series</p> <p>Location Intelligence Technology trends and case studies in digital government</p> <p>17/09/2020 at 14:00 CEST (UTC+2)</p>	 <p>ELISE action Webinar Series</p> <p>Location Intelligence for Cities and Regions: preparing the ground for smart places of the future</p> <p>03/09/2020 at 14:00 CEST (UTC+2)</p>	 <p>ELISE action Webinar Series</p> <p>Exploring Digital Government Transformation in the EU: Understanding public sector innovation in a data-driven society</p> <p>25/08/2020 at 13:00 CEST (UTC+2)</p>
<p>ELISE webinar: Monitoring and understanding emerging</p> <p>24/09/2020 event </p>	<p>ELISE webinar: Location Intelligence Technology trends and case studies</p> <p>17/09/2020 event </p>	<p>ELISE webinar: Location Intelligence for Cities and Regions: preparing</p> <p>03/09/2020 event </p>	<p>ELISE webinar: Exploring Digital Government Transformation in the</p> <p>25/08/2020 event </p>

ELISE Knowledge Transfer activities

- Purpose:**
- engage in an agile way
 - with topics of relevance to the Digital Transformation
 - by harnessing the use of spatial data and technology.

<https://europa.eu/!nP74ph>



Our speaker

**Marc
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Senior
researcher
KU Leuven

KU LEUVEN

The views expressed are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.



“Synonyms” activity under ELISE Knowledge Transfer

Goal: Improving the user experience when searching and retrieving results in catalogues, portal

This activity continues the work on

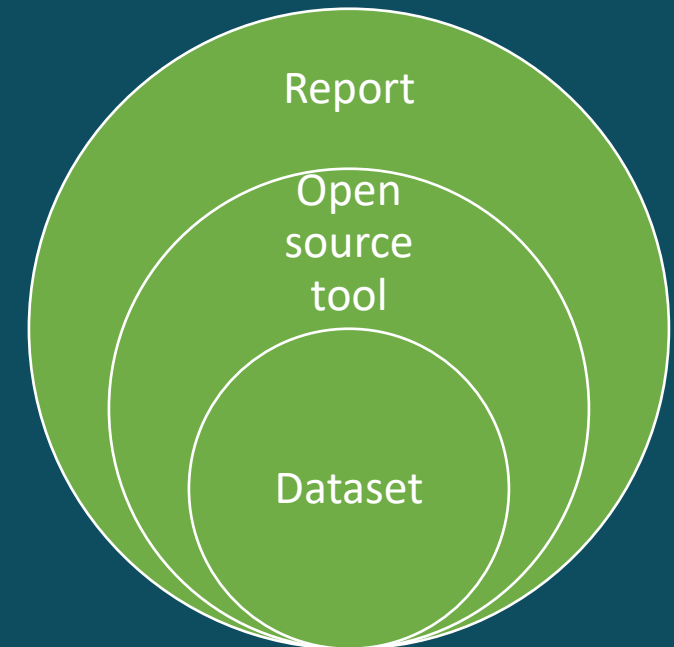
- “Semantic interoperability”

Aims to

- Increase the digital/interoperability skills
- Build new glossaries relying existing maintained vocabulary
- Allow its reusability and reproducibility of outcomes

Previous related work

[“Semantic Text Analysis tool: SeTA”](#)





What we will cover today

1. Challenges finding (geo)data- the INSPIRE case

2. Are *synonyms* allies? Methods and sources to identify them

3. Finding synonyms in practice

4. How using synonyms helps us finding (geo)data

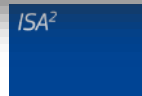
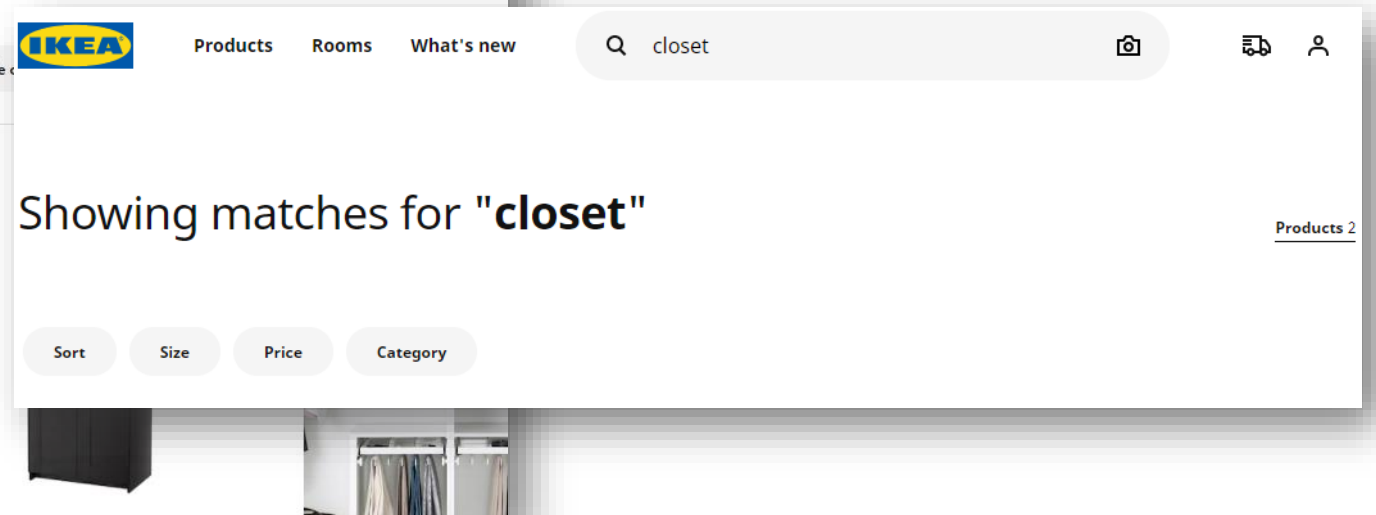
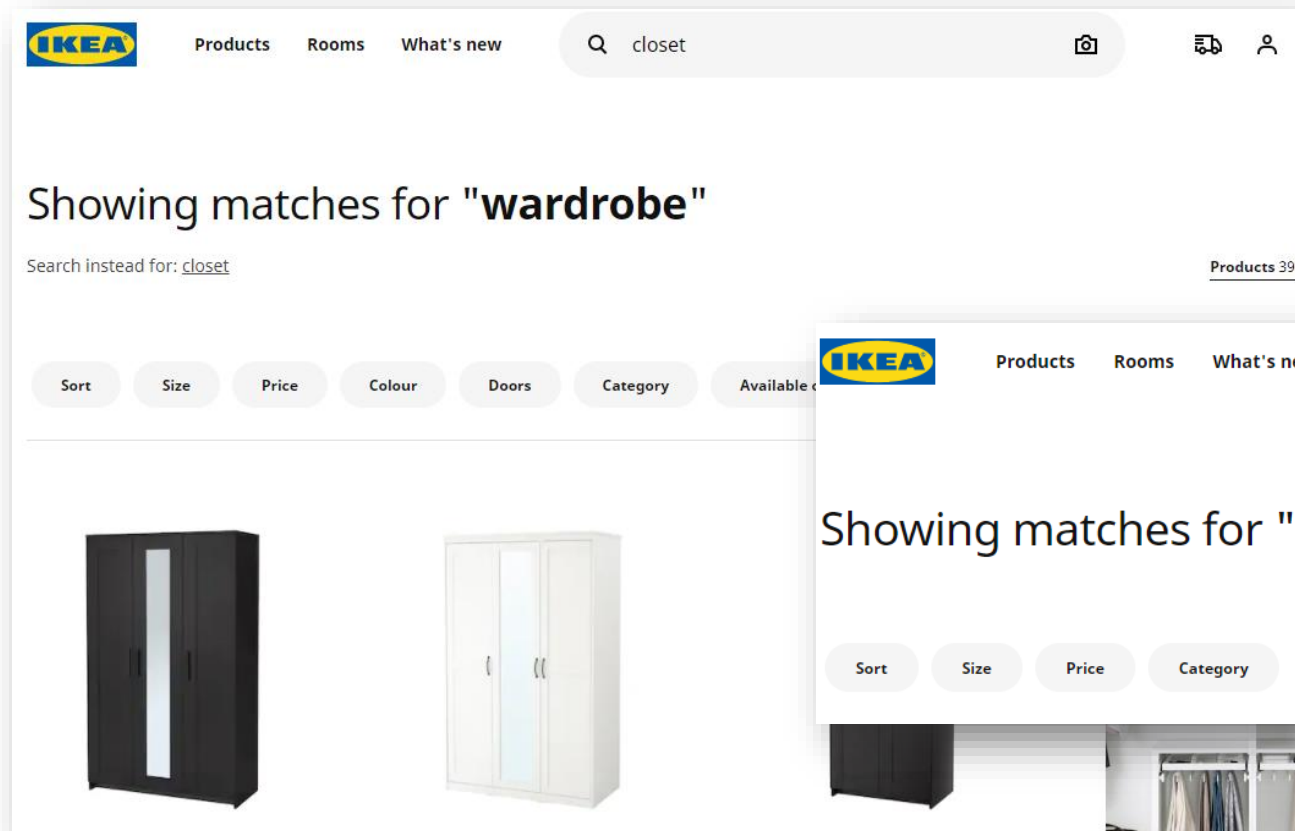
5. Q&A

1

*Challenges finding
(geo)data- the INSPIRE
case*



Welcome, how can I help you? What are you looking for?



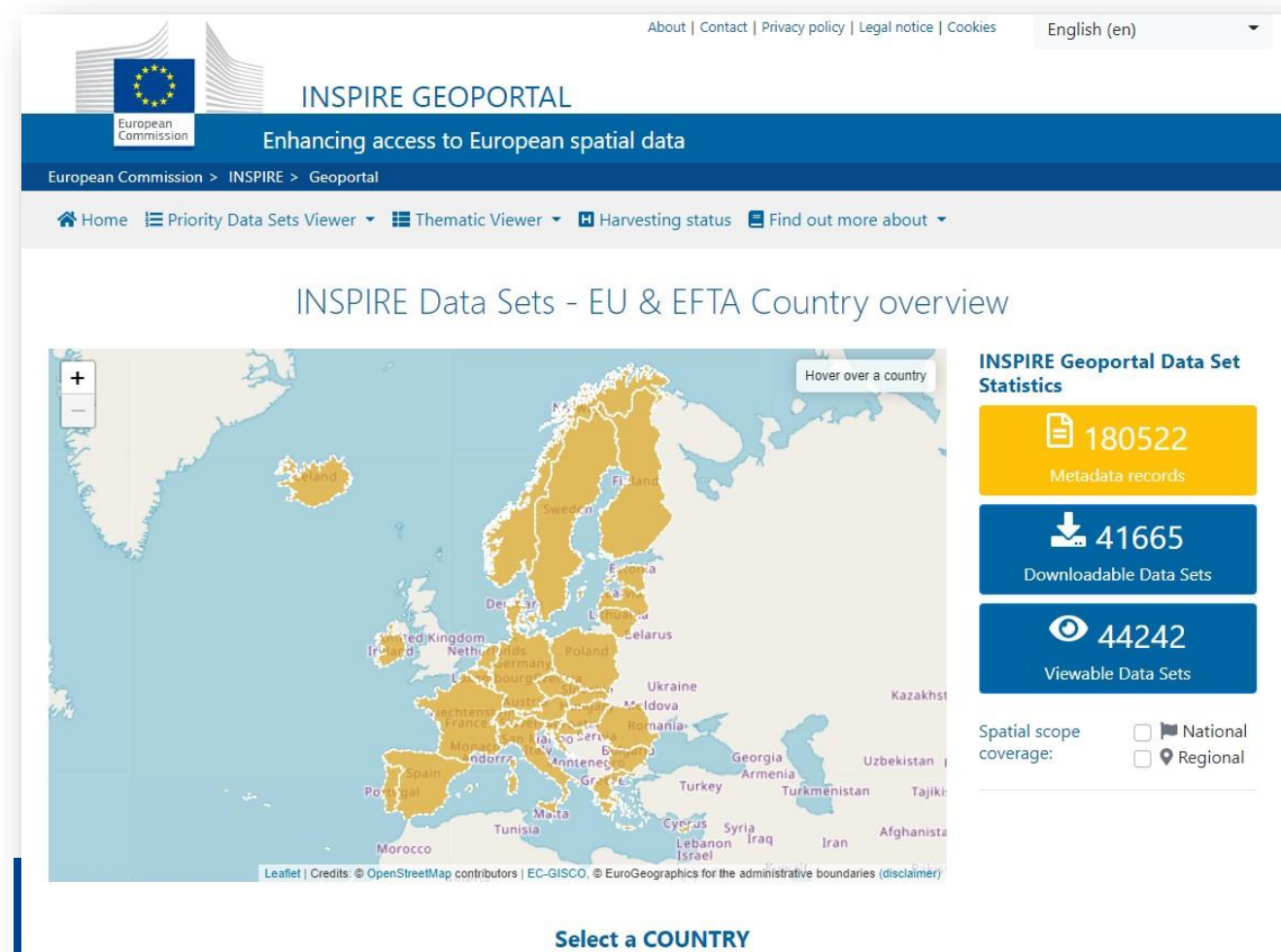
The challenge of finding what you need ...

*The **INSPIRE Directive**: Spatial data for EU environmental policies and environment related activities*

*The data is discoverable through the **INSPIRE Geoportal**: more than 180.000 datasets and services, in different ways: **per theme**, per country, according to a series of criteria, etc.*

***Find Your Scope** tool to look for specific data objects.*

However, it is not always obvious to find what you are looking for.



The screenshot displays the INSPIRE Geoportal interface. At the top, there is a navigation bar with the European Commission logo, the text "INSPIRE GEOPORTAL", and the tagline "Enhancing access to European spatial data". Below this, a breadcrumb trail reads "European Commission > INSPIRE > Geoportal". A secondary navigation bar includes links for "Home", "Priority Data Sets Viewer", "Thematic Viewer", "Harvesting status", and "Find out more about".

The main content area features a map titled "INSPIRE Data Sets - EU & EFTA Country overview". The map shows Europe with various countries highlighted in orange. A "Hover over a country" tooltip is visible. To the right of the map, a "Statistics" panel displays three key metrics:

- 180522 Metadata records
- 41665 Downloadable Data Sets
- 44242 Viewable Data Sets

Below the statistics, there is a "Spatial scope coverage" section with two radio buttons: "National" (selected) and "Regional". At the bottom of the page, a "Select a COUNTRY" button is visible.

Find Your Scope ...

Catalogue of INSPIRE objects

867 objects in total of which

338 spatial object type

294 code list /enumeration objects

121 data type objects

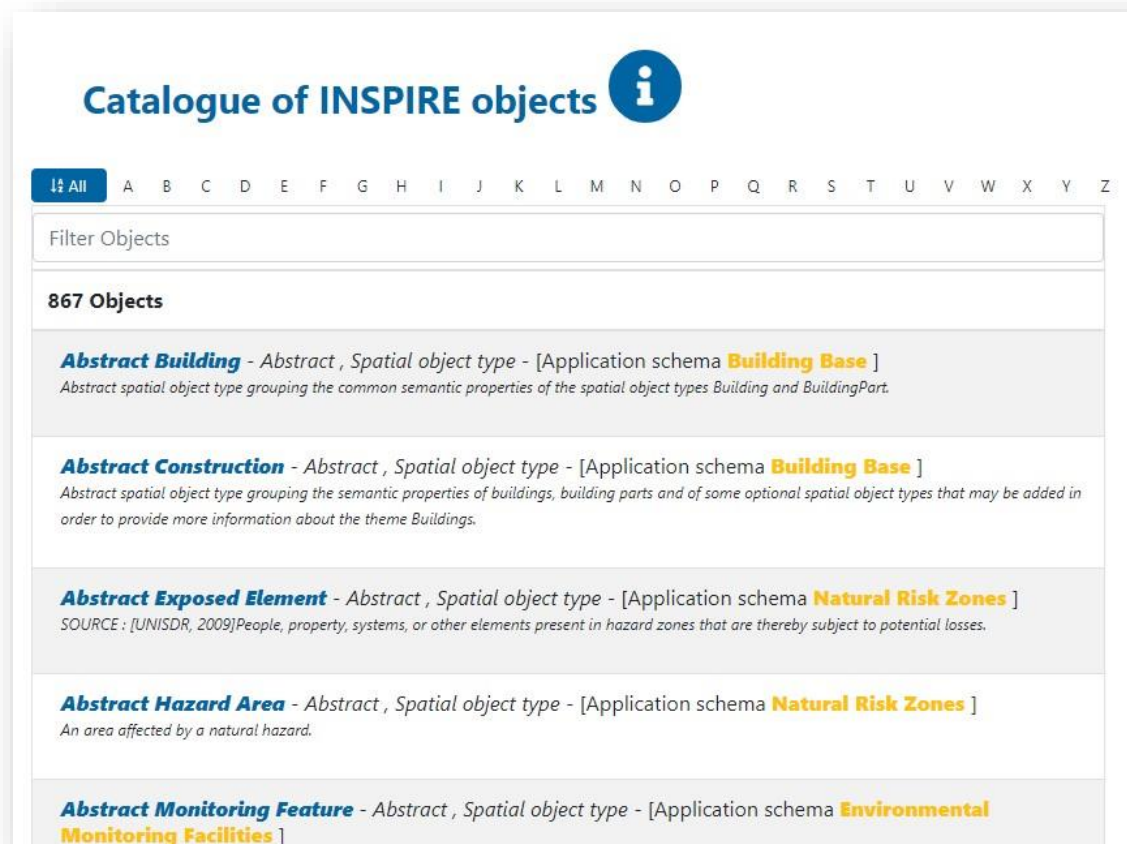


Abstract Hazard Area - Abstract - Spatial object type

Definition: An area affected by a natural hazard.

Address Locator - Data type

Definition: Human readable designator or name that allows a user or application to reference and distinguish the address from neighbor addresses, within the scope of a thoroughfare name, address area name, administrative unit name or postal designator, in which the address is situated.



The screenshot shows the 'Catalogue of INSPIRE objects' interface. It features a search bar with 'Filter Objects' and a list of 867 objects. The objects are listed with their names, application schemas, and brief descriptions.

- Abstract Building** - Abstract , Spatial object type - [Application schema **Building Base**]
Abstract spatial object type grouping the common semantic properties of the spatial object types Building and BuildingPart.
- Abstract Construction** - Abstract , Spatial object type - [Application schema **Building Base**]
Abstract spatial object type grouping the semantic properties of buildings, building parts and of some optional spatial object types that may be added in order to provide more information about the theme Buildings.
- Abstract Exposed Element** - Abstract , Spatial object type - [Application schema **Natural Risk Zones**]
SOURCE : [UNISDR, 2009]People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses.
- Abstract Hazard Area** - Abstract , Spatial object type - [Application schema **Natural Risk Zones**]
An area affected by a natural hazard.
- Abstract Monitoring Feature** - Abstract , Spatial object type - [Application schema **Environmental Monitoring Facilities**]

But are we talking the same language?

2

*Are synonyms allies?
Methods and sources to
identify them*

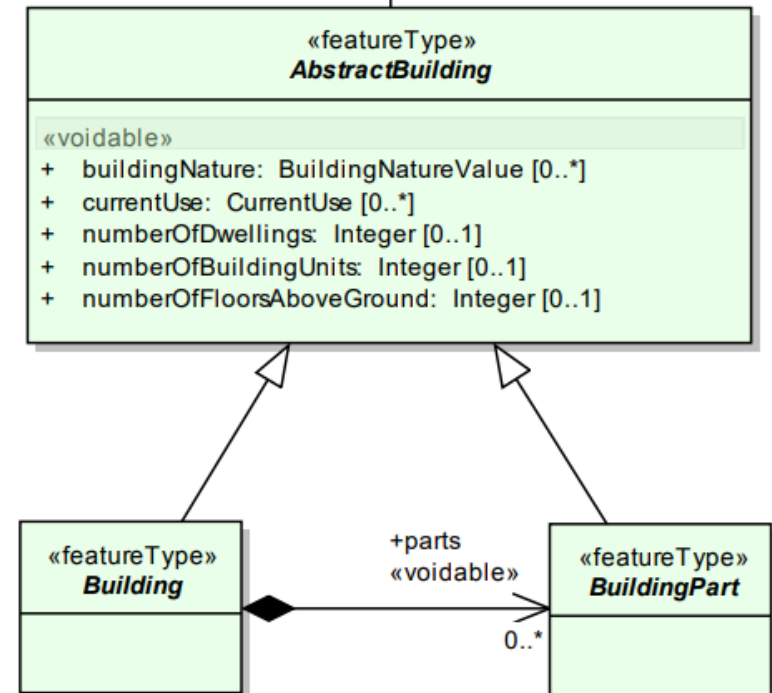
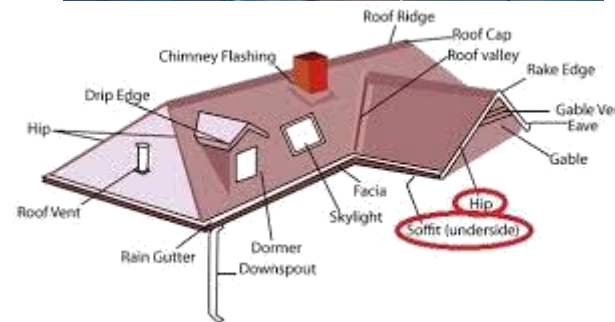
What are *synonyms*?

Synonyms, hypernyms, hyponyms

Synonyms: Two words that can be interchanged in a context are said to be synonymous relative to that context

Hypernym: a word that is more generic than a given word

Hyponym: a word that is more specific than a given word



Possible *synonym* sources

Sources that can provide alternative terms in a **semi-automatic way**



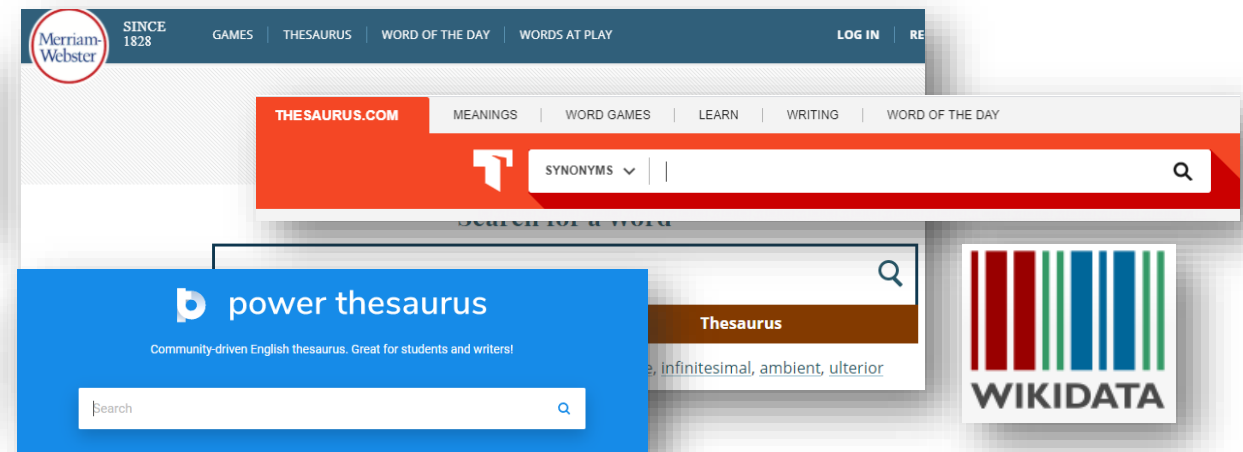
External resources

Technical vocabularies, thesauri, ontologies



- *Are alternative terms provided?*
 - Find synonyms in this source
- *Are alignments available?*
 - Find synonyms in aligned source

Generic vocabularies, thesauri

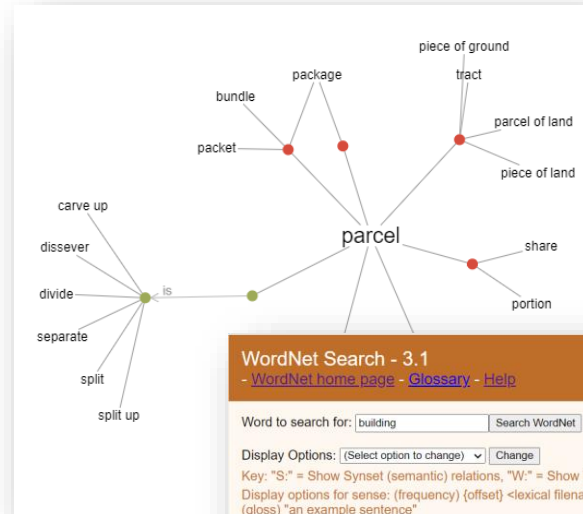


- *Is context provided?*
 - Synonyms grouped by definition
- *Accessible?*
 - API to search the vocabulary

Selected generic external resources



- Synonyms in context
- Hypo/hypernyms
- Open access
- Machine accessible
 - REST API
 - SPARQL
- **WordNet®**: synsets
- **DBpedia**: redirects
- **Wikidata**: structured



WordNet Search - 3.1
- [WordNet home page](#) - [Glossary](#) - [Help](#)

Word to search for: Search WordNet

Display Options: (Select option to change)

Key: "S:" = Show Synset (semantic) relations, "W:" = Show Word (lexical) relations
 Display options for sense: (frequency) {offset} <lexical filename > [lexical (gloss) "an example sentence"]
 Display options for word: word#sense number (sense key)

Noun

- (48)[02916498] <noun.artifact>[06] S: (n) **building#1 (building%1:edifice#1 (edifice%1:06:00:))** (a structure that has a roof and walls, or less permanently in one place) *"there was a three-story building was an imposing edifice"*
- (3)[00912746] <noun.act>[04] S: (n) **construction#1 (construction%1:building#2 (building%1:04:00:))** (the act of constructing something) *"construction we had to take a detour"; "his hobby was the building"*
- (1)[01106542] <noun.act>[04] S: (n) **construction#7 (construction%1:building#3 (building%1:04:01:))** (the commercial activity involved in repairing old structures or constructing new ones) *"their main business is home construction"; "workers in the building trades"*
- (07999688) <noun.group>[14] S: (n) **building#4 (building%1:14:00:)** (the occupants of a building) *"the entire building complained about the noise"*

Verb

- (123)[01658171] <verb.creation>[36] S: (v) **construct#1 (construct%2:36:00:)**



WIKIDATA

Item: **cableway** (Q1424016)

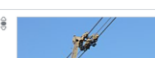
any of a variety of transportation systems relying on cables to pull vehicles along or lower them at a steady rate, or a vehicle on these cable transport

Language	Label	Description	Also known as
English	cableway	any of a variety of transportation systems relying on cables to pull vehicles along or lower them at a steady rate, or a vehicle on these systems	cable transport
Dutch	kabelvoer	No description defined	
French	système de transport par câble	système de transport par cable	transport par câble
German	Seilbahn	selbstgestütztes Verkehrsmittel für Personen- oder Gütertransport	Seilbahnanlage Drahtseilbahn

Statements

subclass of: rail guided transport

0 references

image: 

label
"Contour Plot"@en
"Contour plot"@en
"Contour maps"@en
"Contour lines"@en
"Isopleths"@en
"Halleyan line"@en
"Halleyan lines"@en
"Isogon"@en
"Isogonic line"@en
"Isobar (meteorology)"@en
"Isoclinic Lines"@en
"Isodynamic Lines"@en
"Height Contours"@en
"Mathematical Contours"@en
"Aclinic line"@en
"Isohel"@en
"Agonic line"@en
"Agonic lines"@en
"Isarithm"@en
"Contour map"@en
"Isotherm (contour line)"@en
"Isotherms"@en
"Isohyat"@en
"Isohyet"@en

3

*Finding synonyms in
practice*



Synonyms tool

- Combine sources
- Traverse results
 - Result from one step is input for the next
- Python with *nltk*, *sparqlwrapper*, *requests*

The screenshot shows the Synonyms tool interface. At the top, there are input fields for a word and a file path (s/INSPIRE/InspireFCD_eurovoc_aligned.csv). Below these are buttons for 'Add word', 'Test', and 'Only select'. There are also checkboxes for 'WordNet', 'DbPedi', 'wn synonyms', 'WIKI synonyms', 'wn hyponyms', and 'oogle synonym'. On the right, there are checkboxes for 'Synonyms', 'Hyponyms', 'Hypernym', and 'All relative', along with buttons for 'Lustre sugg', 'Lustre syn from sug', and 'Lustre relatives'. A 'Delete activity' button is also present. Below the controls is a table with columns: original, stat, lvl, descr, subj, pred, obj, comment, and task. The table contains 21 rows of data, starting with 'Oil, Gas and Chemicals Pipe' and ending with 'Duct'. A scrollable list on the left shows a detailed view of the first row (2665), including URLs and labels for 'commodity price', 'Commodity markets', and 'Product markets'. At the bottom right, there is a 'Save' button.

	original	stat	lvl	descr	subj	pred	obj	comment	task
434	Oil, Gas and Chemicals Pipe	V	1	manual_input	Oil, Gas and Chemicals Pipe	manual_label	Gas Pipe	Utility and ...	2
435	Oil, Gas and Chemicals Pipe	V	1	manual_input	Oil, Gas and Chemicals Pipe	manual_label	Chemicals Pipe	Utility and ...	2
436	Coastline	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Coastline	Sea regions	
437	Intertidal Area	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Intertidal Area	Sea regions	
438	Marine Circulation Zone	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Marine Circulation Zone	Sea regions	
439	Marine Contour	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Marine Contour	Sea regions	
440	Sea	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Sea	Sea regions	
441	Sea Area	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Sea Area	Sea regions	
442	Sea Bed Area	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Sea Bed Area	Sea regions	
443	Sea Surface Area	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Sea Surface Area	Sea regions	
444	Shoreline	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Shoreline	Sea regions	
445	Shore Segment	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Shore Segment	Sea regions	
446	Statistical Grid	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Statistical Grid	Statistical units	
447	Statistical Grid Cell	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Statistical Grid Cell	Statistical units	
448	Area Statistical Unit	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Area Statistical Unit	Statistical units	
449	Statistical Tessellation	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Statistical Tessellation	Statistical units	
450	Vector Statistical Unit	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Vector Statistical Unit	Statistical units	
451	Governmental Service	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Governmental Service	Utility and ...	
452	Environmental Management Facility	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Environmental Management Facility	Utility and ...	
453	Appurtenance	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Appurtenance	Utility and ...	
454	Cabinet	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Cabinet	Utility and ...	
455	Duct	V	0	inspire_fcd	http://inspire.ec.europa.eu/...	inspire_label	Duct	Utility and ...	

Finding synonyms in practice, there are still some hurdles

INPUT

- Starting point: INSPIRE Feature concept dictionary
- Container names
 - Governmental services
- INSPIRE labels > lemmas
 - Word base, capitalisation, plural
- Compound labels
 - Cadastral Parcel
- Stop words, units

OUTPUT

- Different senses
- Not always structured output
- Narrow or broaden search criteria



	original	stat	lvl	descr	subj	pred	obj	comment	task
110	Embankment	V	2	wn_synonym	embankment.n.01	wn_label	embankment		17
111	Embankment	#	2	wn_hyposet	embankment.n.01	hyposetcount	2		17
112	Embankment	V	2	wn_hyposet	embankment.n.01	wn_hyposet	levee.n.03		17
113	Embankment	V	3	wn_hyposet	levee.n.03	wn_definition	an embankment that is built in order to prevent a riv...		17
114	Embankment	V	3	wn_hyponym	levee.n.03	wn_label	levee		17
115	Embankment	V	2	wn_hyposet	embankment.n.01	wn_hyposet	rampart.n.01		17
116	Embankment	V	3	wn_hyposet	rampart.n.01	wn_definition	an embankment built around a space for defensive ...		17
117	Embankment	V	3	wn_hyponym	rampart.n.01	wn_label	rampart		17
118	Embankment	V	3	wn_hyponym	rampart.n.01	wn_label	bulwark		17
119	Embankment	V	3	wn_hyponym	rampart.n.01	wn_label	wall		17
120	Embankment	V	1	wikidata	Embankment	wikidata_concept	http://www.wikidata.org/entity/Q105190	levee	14
121	Embankment	V	2	wikidata	http://...	wikidata_label	levee		14
122	Embankment	V	2	wikidata	http://...	wikidata_label	dike		14
123	Embankment	V	2	wikidata	http://...	wikidata_label	dyke		14
124	Embankment	V	2	wikidata	http://...	wikidata_label	embankment		14
125	Embankment	V	2	wikidata	http://...	wikidata_label	floodbank		14
						wikidata_label	levée		14
						wikidata_label	stopbank		14
						wikidata_concept	http://www.wikidata.org/entity/Q10505824	embankment	14
						wikidata_label	embankment		14
130	Embankment	V	1	wikidata	Embankment	wikidata_concept	http://www.wikidata.org/entity/Q1244922	embankment dam	14
131	Embankment	V	2	wikidata	http://...	wikidata_label	filldam		14

To start with a good example:
Embankment returns different
synonyms

	original	stat	lvl	descr	subj	pred	obj	comment	task
23	Maritime Zone	V	0	inspire_fcd	http://...	inspire_label	Maritime Zone	Administrative units	
24	Basic Property Unit	V	0	inspire_fcd	http://...	inspire_label	Basic Property Unit	Cadastral parcels	
25	Cadastral Boundary	V	0	inspire_fcd	http://...	inspire_label	Cadastral Boundary	Cadastral parcels	
26	Cadastral Parcel	V	0	inspire_fcd	http://...	inspire_label	Cadastral Parcel	Cadastral parcels	
27	Cadastral Parcel	#	1	lustre_sug	Cadastral Parcel	suggest_count	2	length limit100	29
28	Cadastral Parcel	V	1	lustre_sug	Cadastral Parcel	lustre_sug_concept	http://linkeddata.ge.imati.cnr.it/resource/...	Cadastral Parcel	29
29	Cadastral Parcel	V	2	lustre_sug	http://...	lustre_sug_label	Cadastral Parcel		29
30	Cadastral Parcel	V	1	lustre_sug	Cadastral Parcel	lustre_sug_concept	http://linkeddata.ge.imati.cnr.it/resource/...	Cadastral Parcels	29
31	Cadastral Parcel	V	2	lustre_sug	http://...	lustre_sug_label	Cadastral Parcels		29
32	Cadastral Parcel	V	1	manual_input	Cadastral Parcel	manual_label	Parcel	Cadastral parcels	22
33	Cadastral Parcel	#	2	lustre_sug	Parcel	suggest_count	4	length limit100	23
34	Cadastral Parcel	V	2	lustre_sug	Parcel	lustre_sug_concept	http://linkeddata.ge.imati.cnr.it/resource/EARTH/83610	parcel of land	23
35	Cadastral Parcel	V	3	lustre_syn	http://...	lustre_label	parcel of land		23
36	Cadastral Parcel	V	2	lustre_sug	Parcel	lustre_sug_concept	http://aims.fao.org/aos/agrovoc/c_2893	Parcel size	23
37	Cadastral Parcel	V	3	lustre_syn	http://aims.fao.or...	lustre_label	Field size		23
					http://aims.fao.or...	lustre_label	Plot size		23
					http://aims.fao.or...	lustre_label	Parcel size		23
						lustre_sug_concept	http://eurovoc.europa.eu/2237	parcel of land	23
						relation_count	7	all:True; ...	24
						lustre_broader	http://eurovoc.europa.eu/4337	has broader	24
43	Cadastral Parcel	VB	4	lustre_rel	http://...	lustre_rel_label	area of holding		24
44	Cadastral Parcel	VB	3	lustre_rel	http://...	lustre_related	http://eurovoc.europa.eu/2355	has related	24

Compound words often cause problems: No results for cadastral parcels, but parcel works fine

	original	stat	lvl	descr	subj	pred	obj	comment	task
335	Railway ...	V	0	inspire_fcd	http://...	inspire_label	Railway Electrification	Transport networks	
336	Railway Line	V	0	inspire_fcd	http://...	inspire_label	Railway Line	Transport networks	
337	Railway Line	#	1	lustre_sug	Railway Line	suggest_count	3	length limit100	30
338	Railway Line	V	1	lustre_sug	Railway Line	lustre_sug_concept	http://linkeddata.ge.imati.cnr.it/resource/...	Railway Line	30
339	Railway Line	V	2	lustre_syn	http://...	lustre_label	Railway Line		30
340	Railway Line	V	2	lustre_syn	http://...	lustre_label	RailwayLine		30
341	Railway Line	V	1	lustre_sug	Railway Line	lustre_sug_concept	http://linkeddata.ge.imati.cnr.it/resource/EARTH/21080	railway line	30
342	Railway Line	V	2	lustre_syn	http://...	lustre_label	railway line		30
343	Railway Line	V	1	lustre_sug	Railway Line	lustre_sug_concept	http://eurovoc.europa.eu/3430	railway line	30
344	Railway Line	V	2	lustre_syn	http://...	lustre_label	rail network		30
345	Railway Line	V	2	lustre_syn	http://...	lustre_label	railway line		30
346	Railway Line	V	2	lustre_syn	http://...	lustre_label	railway track		30
347	Railway Link	V	0	inspire_fcd	http://...	inspire_label	Railway Link	Transport networks	
348	Railway Link	#	1	lustre_sug	Railway Link	suggest_count	2	length limit100	31
349	Railway Link	V	1	lustre_sug	Railway Link	lustre_sug_concept	http://linkeddata.ge.imati.cnr.it/resource/...	Railway Link	31
350	Railway Link	V	2	lustre_syn	http://...	lustre_label	Railway Link		31
						lustre_label	RailwayLink		31
						lustre_sug_concept	http://linkeddata.ge.imati.cnr.it/resource/...	Railway Link ...	31
						lustre_label	Railway Link Sequence		31
354	Railway Link	V	2	lustre_syn	http://...	lustre_label	RailwayLinkSequence		31
355	Railway Link ...	V	0	inspire_fcd	http://...	inspire_label	Railway Link Sequence	Transport networks	
356	Railway Node	V	0	inspire_fcd	http://...	inspire_label	Railway Node	Transport networks	

Railway Line does also return results in LustRE

	original	stat	lvl	descr	subj	pred	obj	comment	task
335	Railway ...	V	0	inspire_fcd	http://...	inspire_label	Railway Electrification	Transport networks	
336	Railway Line	V	0	inspire_fcd	http://...	inspire_label	Railway Line	Transport networks	
337	Railway Line	#	1	wn_synset	Railway Line	synsetcount	2		31
338	Railway Line	V	1	wn_synset	Railway Line	wn_synset	railway.n.01		31
339	Railway Line	V	2	wn_synset	railway.n.01	wn_definition	line that is the commercial organization responsible ...		31
340	Railway Line	V	2	wn_synonym	railway.n.01	wn_label	railway		31
341	Railway Line	V	2	wn_synonym	railway.n.01	wn_label	railroad		31
342	Railway Line	V	2	wn_synonym	railway.n.01	wn_label	railroad_line		31
343	Railway Line	V	2	wn_synonym	railway.n.01	wn_label	railway_line		31
344	Railway Line	V	2	wn_synonym	railway.n.01	wn_label	railway_system		31
345	Railway Line	#	2	wn_hyposet	railway.n.01	hyposetcount	7		31
346	Railway Line	V	2	wn_hyposet	railway.n.01	wn_hyposet	cable_railway.n.01		31
347	Railway Line	V	3	wn_hyposet	cable_railway.n.01	wn_definition	a railway up the side of a mountain pulled by a movi...		31
348	Railway Line	V	3	wn_hyponym	cable_railway.n.01	wn_label	cable_railway		31
349	Railway Line	V	3	wn_hyponym	cable_railway.n.01	wn_label	funicular		31
350	Railway Line	V	3	wn_hyponym	cable_railway.n.01	wn_label	funicular_railway		31
351	Railway Line	V	3	wn_hyponym	cog_railway.n.01	wn_hyposet	cog_railway.n.01		31
352	Railway Line	V	3	wn_hyponym	cog_railway.n.01	wn_definition	railway for steep mountains; a cogwheel on the ...		31
353	Railway Line	V	3	wn_hyponym	cog_railway.n.01	wn_label	cog_railway		31
354	Railway Line	V	3	wn_hyponym	cog_railway.n.01	wn_label	rack_railway		31
355	Railway Line	V	2	wn_hyposet	railway.n.01	wn_hyposet	elevated_railway.n.01		31
356	Railway Line	V	2	wn_hyposet	elevated_railway.n.01	wn_definition	a railway that is covered by electricity and that runs		31

Railway Line does also return results in WordNet

	original	stat	lvl	descr	subj	pred	obj	comment	task
335	Railway ...	V	0	inspire_fcd	http://...	inspire_label	Railway Electrification	Transport networks	
336	Railway Line	V	0	inspire_fcd	http://...	inspire_label	Railway Line	Transport networks	
337	Railway Link	V	0	inspire_fcd	http://...	inspire_label	Railway Link	Transport networks	
338	Railway Link	#	1	lustre_sug	Railway Link	suggest_count	2	length limit100	33
339	Railway Link	V	1	lustre_sug	Railway Link	lustre_sug_concept	http://linkeddata.ge.imati.cnr.it/resource/...	Railway Link	33
340	Railway Link	V	2	lustre_syn	http://...	lustre_label	Railway Link		33
341	Railway Link	V	2	lustre_syn	http://...	lustre_label	RailwayLink		33
342	Railway Link	V	1	lustre_sug	Railway Link	lustre_sug_concept	http://linkeddata.ge.imati.cnr.it/resource/...	Railway Link ...	33
343	Railway Link	V	2	lustre_syn	http://...	lustre_label	Railway Link Sequence		33
344	Railway Link	V	2	lustre_syn	http://...	lustre_label	RailwayLinkSequence		33
345	Railway Link	#	1	dbpedia	Railway Link	DBPedia_count	0		32
346	Railway Link	#	1	wikidata	Railway Link	wikidata_count	0		31
347	Railway Link	#	1	wn_synset	Railway Link	synsetcount	0		30
348	Railway Link ...	V	0	inspire_fcd	http://...	inspire_label	Railway Link Sequence	Transport networks	
349	Railway Node	V	0	inspire_fcd	http://...	inspire_label	Railway Node	Transport networks	
350	Railway Station Area	V	0	inspire_fcd	http://...	inspire_label	Railway Station Area	Transport networks	
351	Railway Station Code	V	0	inspire_fcd	http://...	inspire_label	Railway Station Code	Transport networks	
352	Railway Station Node	V	0	inspire_fcd	http://...	inspire_label	Railway Station Node	Transport networks	
353	Railway Type	V	0	inspire_fcd	http://...	inspire_label	Railway Type	Transport networks	
354	Railway Use	V	0	inspire_fcd	http://...	inspire_label	Railway Use	Transport networks	
355	Railway Yard Area	V	0	inspire_fcd	http://...	inspire_label	Railway Yard Area	Transport networks	
356	Railway Yard Node	V	0	inspire_fcd	http://...	inspire_label	Railway Yard Node	Transport networks	

... added geospatial words like node, link, area,
must be removed to get results

	original	stat	lvl	descr	subj	pred	obj	comment	task
512	Sea Bed Area	V	0	inspire_fcd	http://...	inspire_label	Sea Bed Area	Sea regions	
513	Sea Surface Area	V	0	inspire_fcd	http://...	inspire_label	Sea Surface Area	Sea regions	
514	Shoreline	V	0	inspire_fcd	http://...	inspire_label	Shoreline	Sea regions	
515	Shore Segment	V	0	inspire_fcd	http://...	inspire_label	Shore Segment	Sea regions	
516	Statistical Grid	V	0	inspire_fcd	http://...	inspire_label	Statistical Grid	Statistical units	
517	Statistical Grid Cell	V	0	inspire_fcd	http://...	inspire_label	Statistical Grid Cell	Statistical units	
518	Area Statistical Unit	V	0	inspire_fcd	http://...	inspire_label	Area Statistical Unit	Statistical units	
519	Statistical ...	V	0	inspire_fcd	http://...	inspire_label	Statistical Tessellation	Statistical units	
520	Vector Statistical ...	V	0	inspire_fcd	http://...	inspire_label	Vector Statistical Unit	Statistical units	
521	Governmental ...	V	0	inspire_fcd	http://...	inspire_label	Governmental Service	Utility and ...	
522	Governmental ...	#	1	dbpedia	Governmental ...	DBPedia_count	0		37
523	Governmental ...	#	1	lustre_sug	Governmental ...	suggest_count	1	length limit100	36
524	Governmental ...	V	1	lustre_sug	Governmental ...	lustre_sug_concept	http://linkeddata.ge.imati.cnr.it/resource/...	Governmental ...	36
525	Governmental ...	V	2	lustre_sug	http://...	lustre_sug_label	Governmental Service		36
526	Governmental ...	#	1	wikidata	Governmental ...	wikidata_count	0		35
							0		34
							Environmental Management Facility	Utility and ...	
							Appurtenance	Utility and ...	
							Cabinet	Utility and ...	
531	Duct	V	0	inspire_fcd	http://...	inspire_label	Duct	Utility and ...	
532	Manhole	V	0	inspire_fcd	http://...	inspire_label	Manhole	Utility and ...	
533	Pipe	V	0	inspire_fcd	http://...	inspire_label	Pipe	Utility and ...	

Governmental service is a container term
 No results returned
 (the one returned is the INSPIRE object itself)

	original	stat	lvl	descr	subj	pred	obj	comment	task
518	Area Statistical Unit	V	0	inspire_fcd	http://...	inspire_label	Area Statistical Unit	Statistical units	
519	Statistical ...	V	0	inspire_fcd	http://...	inspire_label	Statistical Tessellation	Statistical units	
520	Vector Statistical ...	V	0	inspire_fcd	http://...	inspire_label	Vector Statistical Unit	Statistical units	
521	Governmental ...	V	0	inspire_fcd	http://...	inspire_label	Governmental Service	Utility and ...	
522	Governmental ...	V	1	service type codelist	Governmental ...	manual_label	child care service	Utility and ...	35
523	Governmental ...	V	1	service type codelist	Governmental ...	manual_label	fire station	Utility and ...	34
524	Governmental ...	V	2	wikidata	fire station	wikidata_concept	http://www.wikidata.org/entity/Q1195942	fire station	37
525	Governmental ...	V	3	wikidata	http://...	wikidata_label	fire station		37
526	Governmental ...	V	3	wikidata	http://...	wikidata_label	barracks of the firemen		37
527	Governmental ...	V	3	wikidata	http://...	wikidata_label	fire hall		37
528	Governmental ...	V	3	wikidata	http://...	wikidata_label	fire house		37
529	Governmental ...	V	3	wikidata	http://...	wikidata_label	firehouse		37
530	Governmental ...	V	3	wikidata	http://...	wikidata_label	firemen's hall		37
531	Governmental ...	V	2	wikidata	fire station	wikidata_concept	http://www.wikidata.org/entity/Q380627	fire station pole	37
532	Governmental ...	V	3	wikidata	http://...	wikidata_label	fire station pole		37
							tom		37
							fireman's pole		37
							firepole		37
536	Governmental ...	V	3	wikidata	http://...	wikidata_label	sliding pole		37
537	Governmental ...	V	3	wikidata	http://...	wikidata_label	firefighter's pole		37
538	Governmental ...	V	3	wikidata	http://...	wikidata_label	firewoman's pole		37
539	Governmental ...	V	3	lustra_cvs	fire station	suggest count	1	length limit 100	36

Added elements from the Service type codelist
These do return results

	original	stat	lvl	descr	subj	pred	obj	comment	task
518	Area Statistical Unit	V	0	inspire_fcd	http://...	inspire_label	Area Statistical Unit	Statistical units	
519	Statistical ...	V	0	inspire_fcd	http://...	inspire_label	Statistical Tessellation	Statistical units	
520	Vector Statistical ...	V	0	inspire_fcd	http://...	inspire_label	Vector Statistical Unit	Statistical units	
521	Governmental ...	V	0	inspire_fcd	http://...	inspire_label	Governmental Service	Utility and ...	
522	Governmental ...	V	1	service type codelist	Governmental ...	manual_label	child care service	Utility and ...	35
523	Governmental ...	#	2	lustre_sug	child care service	suggest_count	0	length limit100	40
524	Governmental ...	V	2	manual_input	child care service	manual_label	child care	Utility and ...	38
525	Governmental ...	#	3	lustre_sug	child care	suggest_count	2	length limit100	39
526	Governmental ...	V	3	lustre_sug	child care	lustre_sug_concept	http://aims.fao.org/aos/agrovoc/c_1544	child care	39
527	Governmental ...	V	4	lustre_syn	http://aims.fao.or...	lustre_label	child care		39
528	Governmental ...	V	3	lustre_sug	child care	lustre_sug_concept	http://eurovoc.europa.eu/1133	child care	39
529	Governmental ...	V	4	lustre_syn	http://...	lustre_label	child care		39
530	Governmental ...	V	4	lustre_syn	http://...	lustre_label	kindergarten		39
531	Governmental ...	V	4	lustre_syn	http://...	lustre_label	baby-sitting		39
532	Governmental ...	V	4	lustre_syn	http://...	lustre_label	children's home		39
533	Governmental ...	V	4	lustre_syn	http://...	lustre_label	child minding		39
						lustre_label	day nursery		39
						lustre_label	crèche		39
						lustre_label	nursery		39
537	Governmental ...	V	1	service type codelist	Governmental ...	manual_label	fire station	Utility and ...	34
538	Governmental ...	V	2	wikidata	fire station	wikidata_concept	http://www.wikidata.org/entity/Q1195942	fire station	37
539	Governmental ...	V	2	wikidata	http://...	wikidata_label	fire station		37

Some interaction is still needed:
Child care service <> child care

	original	stat	lvl	descr	subj	pred	obj	comment	task
542	Governmental ...	V	4	wn_hyponym	hobo_camp.n.01	wn_label	jungle		42
543	Governmental ...	V	2	wn_synset	camp	wn_synset	camp.n.03		42
544	Governmental ...	V	3	wn_synset	camp.n.03	wn_definition	temporary lodgings in the country for travelers or ...		42
545	Governmental ...	V	3	wn_synonym	camp.n.03	wn_label	camp		42
546	Governmental ...	#	3	wn_hyposet	camp.n.03	hyposetcount	2		42
547	Governmental ...	V	3	wn_hyposet	camp.n.03	wn_hyposet	tennis_camp.n.01		42
548	Governmental ...	V	4	wn_hyposet	tennis_camp.n.01	wn_definition	a camp where tennis is taught		42
549	Governmental ...	V	4	wn_hyponym	tennis_camp.n.01	wn_label	tennis_camp		42
550	Governmental ...	V	3	wn_hyposet	camp.n.03	wn_hyposet	trailer_camp.n.01		42
551	Governmental ...	V	4	wn_hyposet	trailer_camp.n.01	wn_definition	a camp where space for house trailers can be rented...		42
552	Governmental ...	V	4	wn_hyponym	trailer_camp.n.01	wn_label	trailer_camp		42
553	Governmental ...	V	4	wn_hyponym	trailer_camp.n.01	wn_label	trailer_park		42
554	Governmental ...	V	2	wn_synset	camp	wn_synset	clique.n.01		42
555	Governmental ...	V	3	wn_synset	clique.n.01	wn_definition	an exclusive circle of people with a common purpose		42
556	Governmental ...	V	3	wn_synonym	clique.n.01	wn_label	clique		42
557	Governmental ...	V	3	wn_synonym	clique.n.01	wn_label	coterie		42
							ingroup		42
							inner_circle		42
							pack		42
561	Governmental ...	V	3	wn_synonym	clique.n.01	wn_label	camp		42
562	Governmental ...	#	3	wn_hyposet	clique.n.01	hyposetcount	10		42
563	Governmental ...	V	3	wn_hyposet	clique.n.01	wn_hyposet	bloomsbury_group.n.01		42

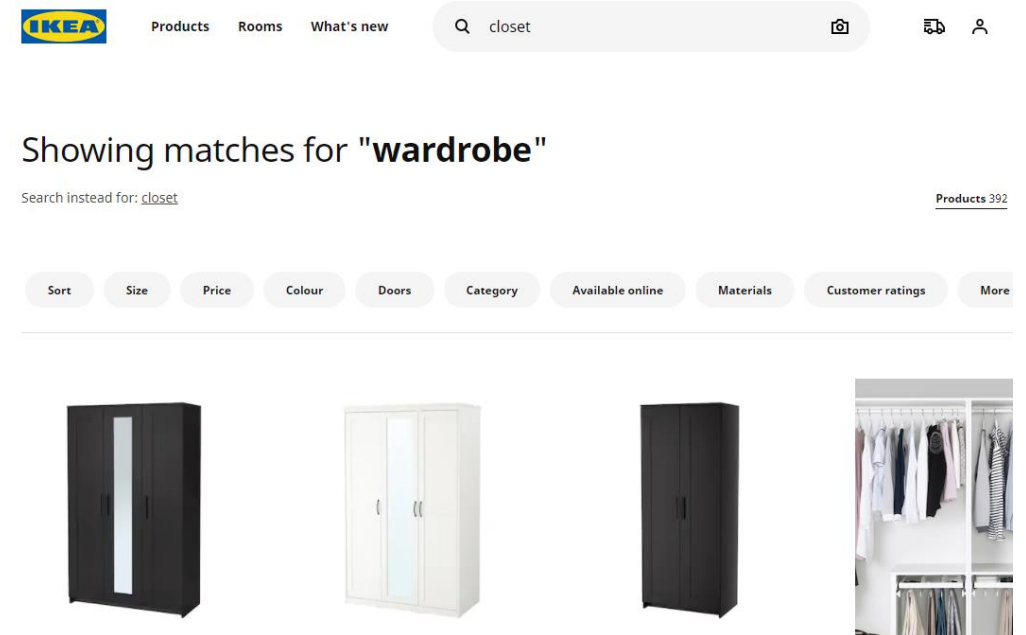
Intervention on the output side needed:
Different context for camp

4

*How using synonyms
helps us finding (geo)data*

What do we do with the words we found?

river
rampart
wall
bank
stopbank
embankment
dyke
floodbank
bulwark
levee
dike
fill
dam



The screenshot shows the IKEA website interface. At the top, there is the IKEA logo, navigation links for 'Products', 'Rooms', and 'What's new', a search bar containing the text 'closet', and icons for a camera, a list, and a user profile. Below the search bar, the text reads 'Showing matches for "wardrobe"'. Underneath, it says 'Search instead for: [closet](#)' and 'Products 392'. A row of filter buttons includes 'Sort', 'Size', 'Price', 'Colour', 'Doors', 'Category', 'Available online', 'Materials', 'Customer ratings', and 'More'. The main content area displays four product images: a tall black wardrobe with a white vertical panel, a white wardrobe with two doors and a glass panel, a tall black wardrobe with two doors, and a photograph of a modern wardrobe interior with hanging clothes and shelves.

How to use the results?

- Add as keywords

Cadastral Parcel

Plot, piece of land, real estate

How to use the results?

- Add as keywords
- Different properties
 - Synonyms (maybe hidden)
 - Broader concepts (Hypernyms)
 - Narrower concepts (Hyponyms)
 - Related words

Cadastral Parcel

Synonym: Plot, piece land, lot

Related to: real estate, ownership

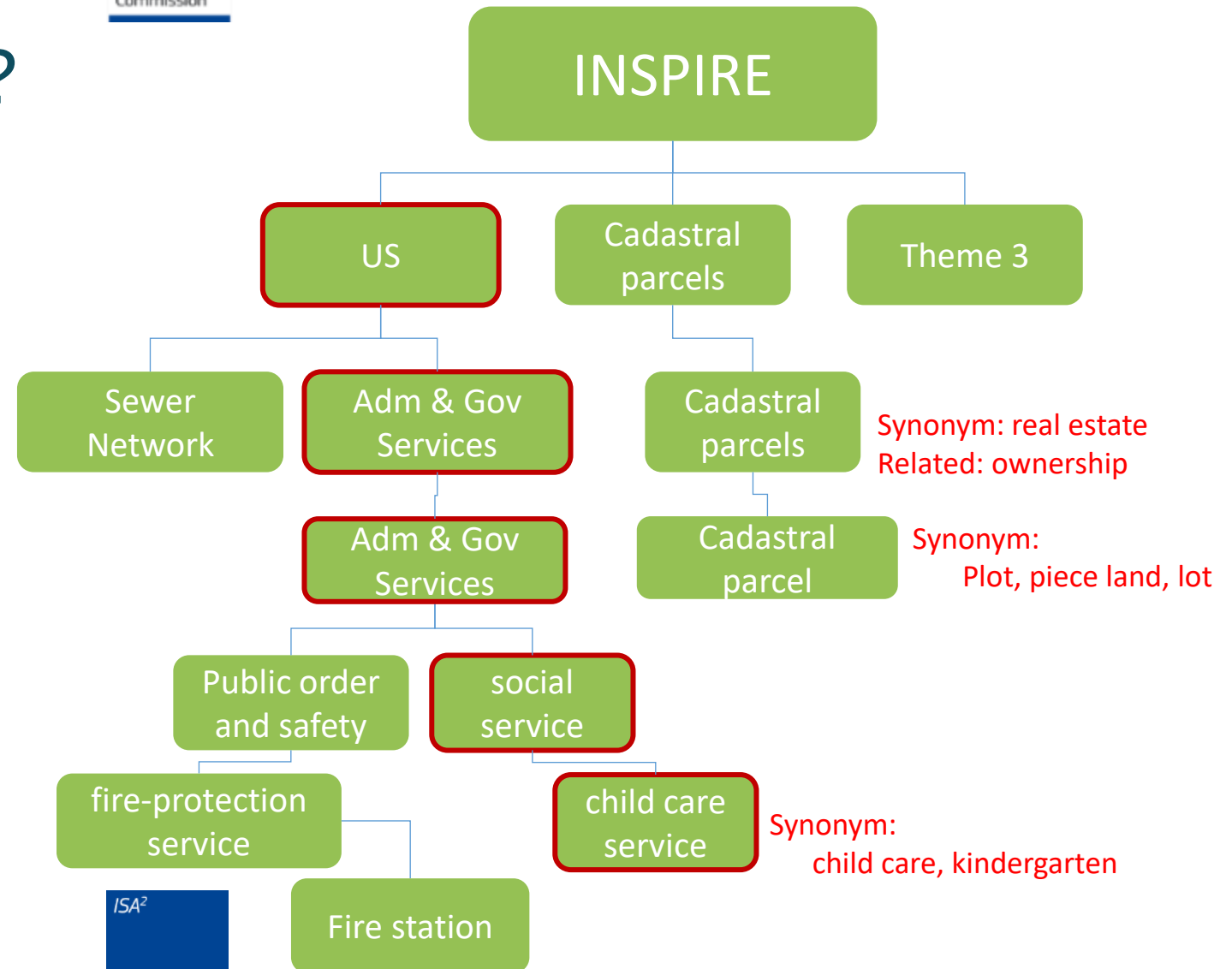
Hyponym: Police station, child care

How to use the results?

- Add as keywords
- Different properties

- **INSPIRE Ontology**

- Build from App Schemas: Themes, App Schema, Feature Concepts
- Add selected codelist values
- Synonyms, Hyponyms, hypernyms inserted on different levels



How to use the results?

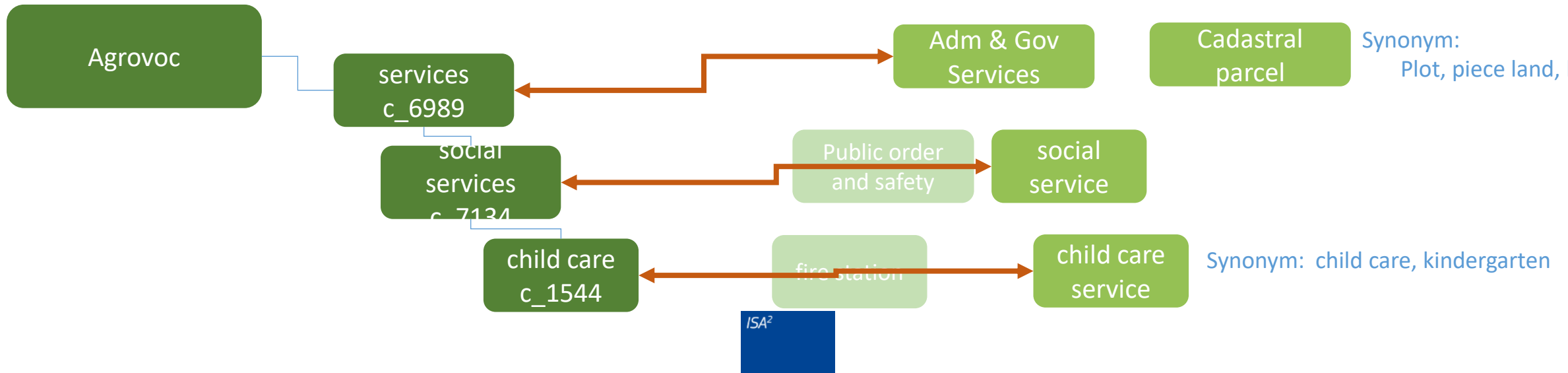
- Add as keywords
- Different properties
- INSPIRE Schema ontology
- **Align with other ontologies**

INSPIRE

US Cadastral parcels Theme 3

Adm & Gov Services Cadastral parcels
 Synonym: real estate
 Related: ownership

Cadastral parcel
 Synonym:
 Plot, piece land, lot



How to use the results?

- Add as keywords
- Different properties
- INSPIRE Schema ontology

Align with other ontologies And further

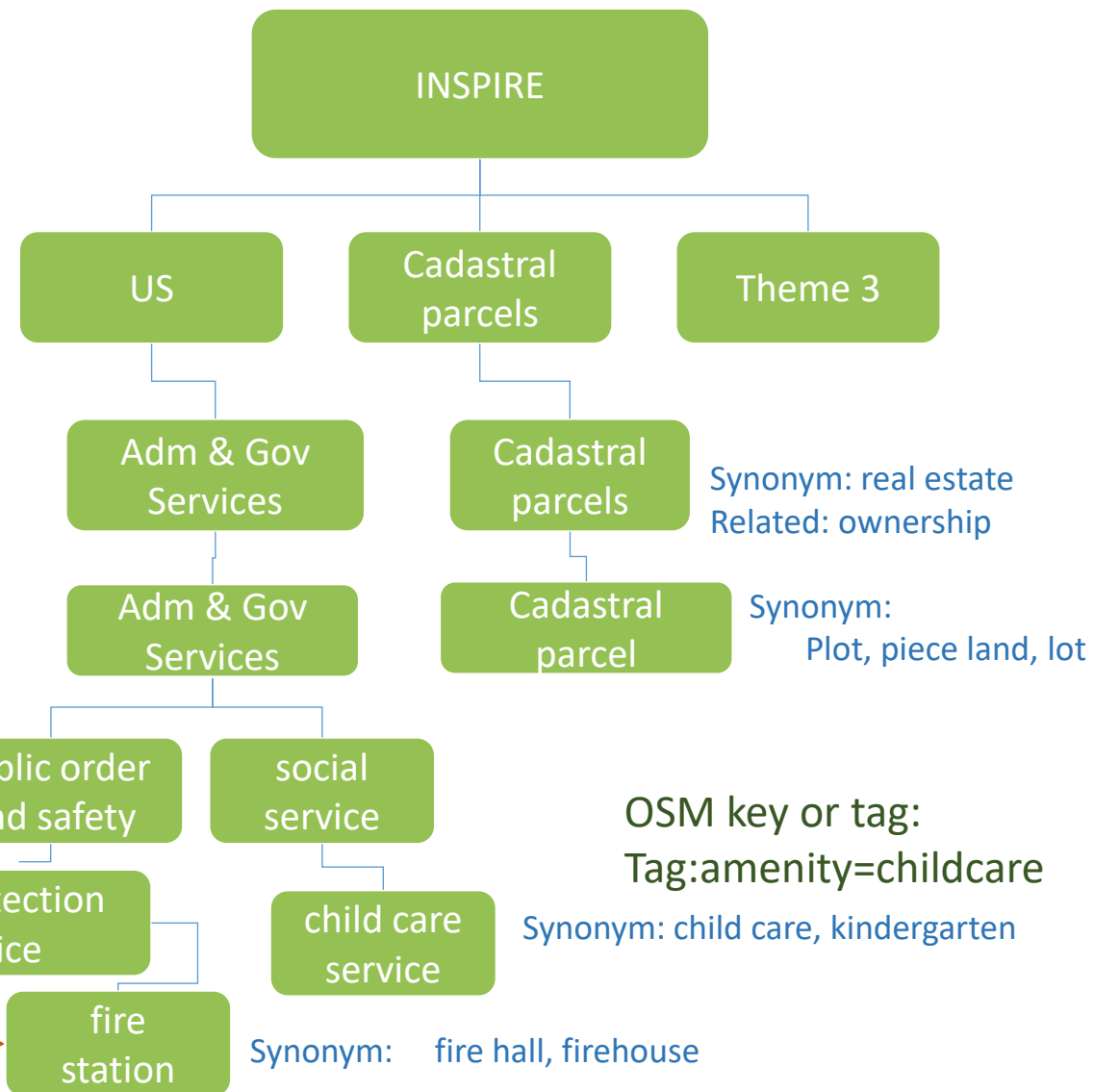
Wikidata

...

Emergency service

Fire station

OSM key or tag:
Tag:amenity=fire_station



Q&A

6

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