

# Linking Authoritative (Government) data with Community data

*kadaster*



Dr.ir. Erwin Folmer  
[Labs.kadaster.nl](http://Labs.kadaster.nl)



1. Stukje context: Hoe vanuit silo's altijd hebben gewerkt....met als resultaat dat data over een gebouw in vele datasets te vinden is...
  - Wat verzamelt Google over een gebouw? (winkel, openingstijden), community datasets, specifieke sector datasets, overheids datasets (kadaster, kvk)....
  - Een complex rijk speelveld, maar ook redundantie, kwaliteitsissues, lastig te gebruiken, etc.. Kunnen we niet slimmer zijn? Om te beginnen met overheid en community data... In deze presentatie twee cases die binnen Kadaster lopen.

# One Building – Many Data Sources

- Authorative (Government) data
  - (ownership, parcel, building year, energy label, etc..)
- Google, Open Corporates, etc.
- Community Data

# It makes so much sense...

- Value for End User.
- Quality: 4 eyes principles
- Efficiency.

# Next step

- We kind of solved the silos within government (Kadaster Knowledge Graph)
- Next step is to connect with other data (knowledge graphs).

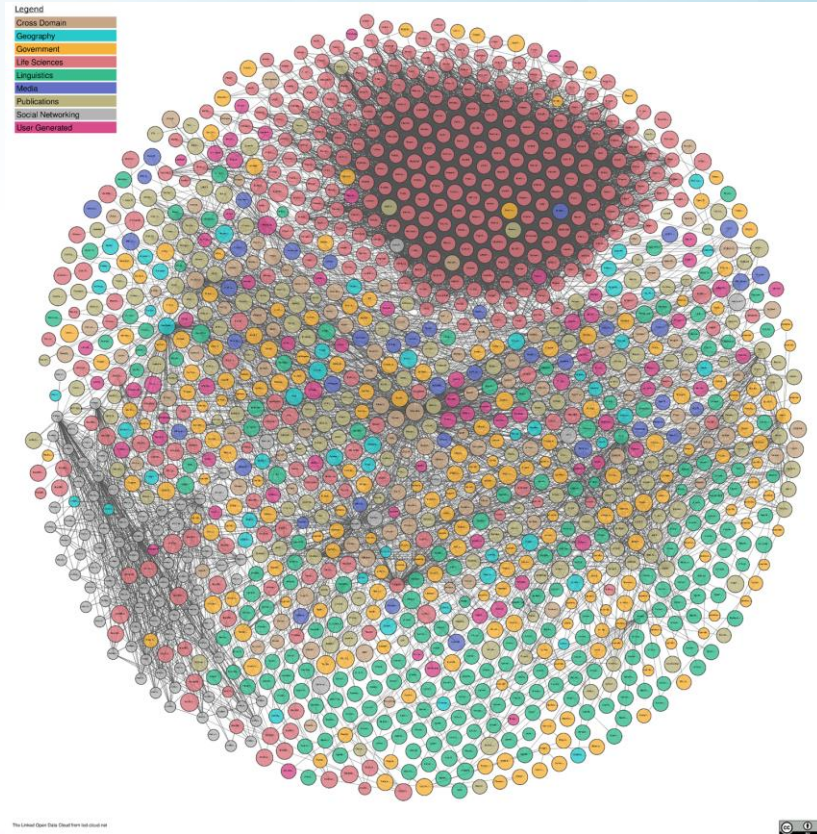
*kadaster*



# Project 1 – Wikidata and BAG

# Linked Open Data Cloud

- Includes Base Registry of Addresses and Buildings (Dutch Cadastre)
- Includes Wikidata (crowd-sourced data)
- We created 50 links in 2020





# Over 20,000 community links!

- We created 50 links in 2020
- Now 20,449 (!) links created by the community.
- Rich links, e.g. 19,013 images.



<<http://bag.basisregistraties.overheid.nl/bag/id/pand...>  
 commons:Leeuwarden station in 2006.jpg



<<http://bag.basisregistraties.overheid.nl/bag/id/pand...>  
 commons:Amsterdam centraal side.jpg



<<http://bag.basisregistraties.overheid.nl/bag/id/pand/0363100...>  
 commons:Estación Central, Ámsterdam, Países Bajos, 20...



<<http://bag.basisregistraties.overheid.nl/bag/id/pand/03631000...>  
 commons:00 8719 Amsterdam (NL).jpg



<<http://bag.basisregistraties.overheid.nl/b...>  
 commons:Overzicht stationshal - Amst...



<<http://bag.basisregistraties.overheid.nl/bag/id/pand/036310...>  
 commons:AmstelhotelAmsterdam.jpg

# Amsterdam Central Station in the Base Registry...

Pand 0363100012185598 «Primary topic»

Persistent URI: <<http://bag.basisregistraties.overheid.nl/bag/id/pand/0363100012185598>>

<a href="#">bag:documentdatum</a>	2013-03-05 (xsd:date)
<a href="#">bag:documentnummer</a>	MB00001504_NB01GM
<a href="#">bag:geconstateerd</a>	<a href="http://bag.basisregistraties.overheid.nl/bag/id/begrip/N">http://bag.basisregistraties.overheid.nl/bag/id/begrip/N</a>
<a href="#">bag:geometrie</a>	b0
<a href="#">bag:identificatie</a>	0363100012185598
<a href="#">bag:oorspronkelijkBouwjaar</a>	1889 (xsd:gYear)
<a href="#">bag:status</a>	<a href="http://bag.basisregistraties.overheid.nl/bag/id/begrip/PandInGebruik">http://bag.basisregistraties.overheid.nl/bag/id/begrip/PandInGebruik</a>

# The same building in Wikidata...

## Linked to the Base Registry

architect



Pierre Cuypers

▶ 1 reference

image



architectural style



Gothic Revival

▼ 0 references

image of interior



Renaissance Revival archi

▼ 0 references

*kadaster*



# Project 2: OSM and BRT

**CGI iAMLAB**  
Infra and Asset Management Lab

*kadaster*

My Blog    Events & Press

Rather than publishing online a database of railway station locations in the Netherlands and expecting a user to then query the database for “Amsterdam Centraal Station”, publish the database giving each record a URI so for example Amsterdam Centraal Station becomes;

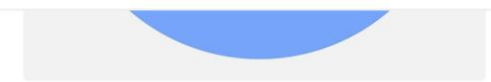
<https://brt.basisregistraties.overheid.nl/top10nl/id/gebouw/102625209>

Now this is something I can paste into an email, tweet or even share on Facebook !

Kudos to the Dutch Kadaster for taking this approach and providing this example, Ordnance Survey you could do the same ?

This approach also results in such data becoming part of the “mainstream” web indexable and searchable, but I argue the key benefit is the “linkability”

The [Spatial Data on the Web best practice document](#), something of course I recommend you taking a longer look at provides many



Heart icon, Share icon, Sep 12, 2017

Ed Parsons Retweeted

**Sam Zipper**  
@ZipperSam

Google Earth Engine + @NASA\_Landsat = annual 30 m resolution #irrigation maps!

Cool new study by @JillDeines:  
[onlinelibrary.wiley.com/doi/10.1002/20...](https://onlinelibrary.wiley.com/doi/10.1002/20...)



**Annual irrigation dynamics in t...**  
Sustainable management of agricultural water resources  
onlinelibrary.wiley.com

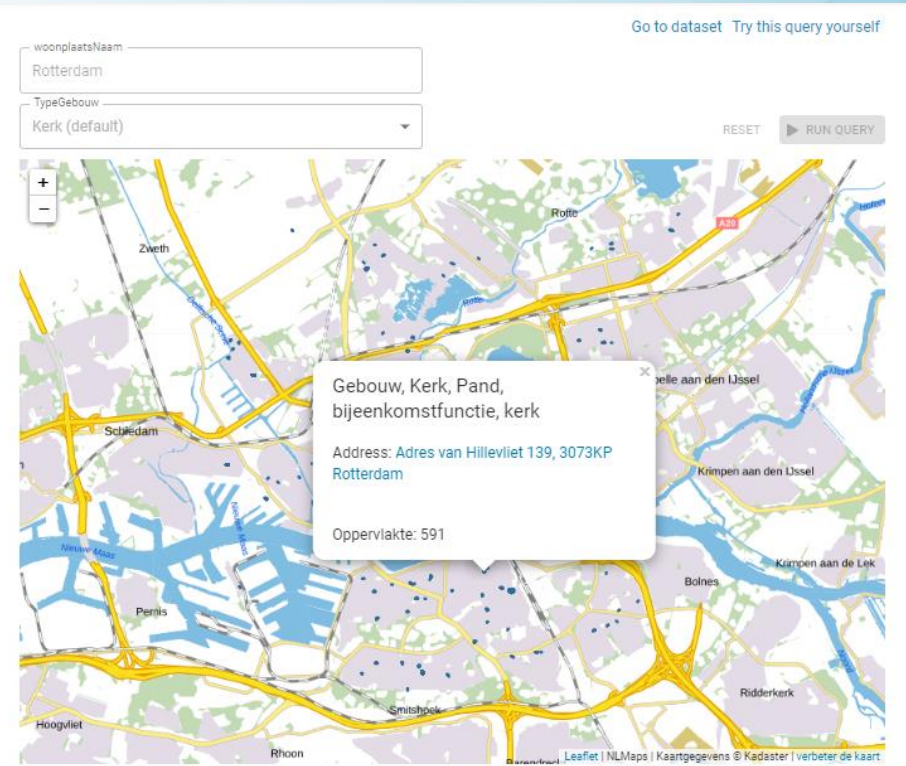
Heart icon, Share icon, Sep 11, 2017

Embed

View on Twitter

# BRT & Kadaster Knowledge Graph

- Kadaster recently published several ways to access the integrated data of the Dutch government through Linked Data technology
- See also:  
<https://labs.kadaster.nl/cases/integralegebruik/soplossing>



# Background BRT.Next

- Kadaster is owner of the BRT (Base registry for Topography)
  - The BRT consists of two major parts:
    - A map of the Netherlands
    - The underlying data product
  - The BRT is “expensive” to create and maintain; there is a continuous goal of more efficiency (with good results).
  - But there is more...



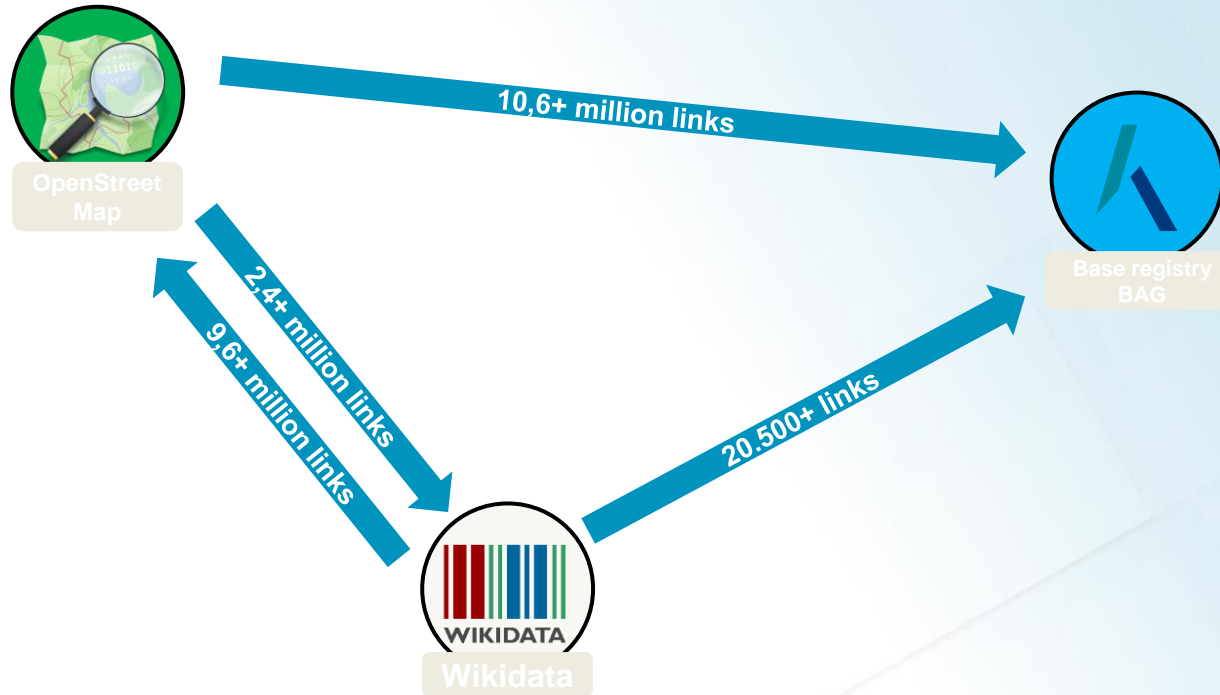
*Can we enrich our data about buildings with an external open data source (e.g. OpenStreetMap) and make automated linksets to the existing BRT such that the value of the integrated data improves?*



# Approach

- We explore which building types / OSM data will attribute to the highest value creation
- We automate the data ingress process for OSM
- We create a geometric match
- We transform OSM to Linked Data (including geometric links) and link to the existing BRT Linked Data set

# OSM & Open data ecosystem



# Semantics in crowdsourcing

- Semantics are vital in exploring OpenStreetMap data

Weg: 296698819

Versie #3

*Parkeerplaatsen bij de Lidl veranderd in parking lanes. Enkele andere correcties in de omgeving van de Lidl.*

bijna 2 jaar geleden bewerkt door Friendly\_Ghost · Wijzigingset #86200475

Labels

building	supermarket
ref:bag	0356100000081409
source	BAG
source:date	2019-10-28
start_date	1980

Weg: Albert Heijn  
(268856304)

Versie #6

#maproulette  
#Phone\_or\_fax\_number\_is\_not\_in\_international\_forr:  
T\_E.164)

2 maanden geleden bewerkt door  
lovelyfurball88 · Wijzigingset #116841824

Labels

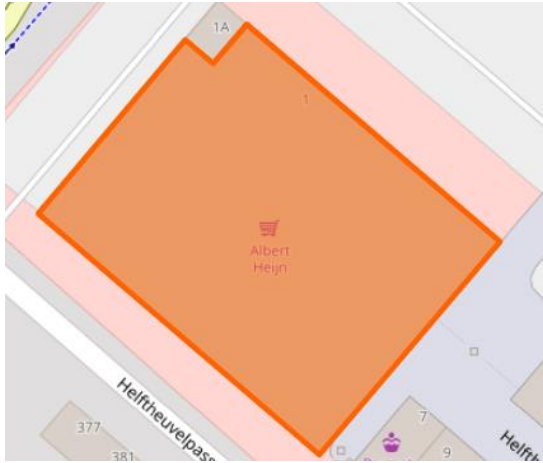
addr:city	's-Hertogenbosch
addr:housenumber	1
addr:postcode	5224AA
addr:street	Helthoeuvelpassage
brand	Albert Heijn
brand:wikidata	Q1653985
brand:wikipedia	nl:Albert Heijn (supermarkt)
building	retail
name	Albert Heijn
opening_hours	Mo-We 08:00-20:00; Th,Fr 08:00-21:00; Sa 08:00-20:00
operator	Albert Heijn
phone	+31 073-6217456
ref:bag	796100000258784

Use building=supermarket to tag a building built as a supermarket. Typical for the architecture of this kind of building are special entrances for costumers, a delivery area with ramp for heavy goods vehicles (HGV), and often only one level comprising a large room.

Note that this tag is about the building itself. To indicate that the location has an active supermarket, use shop=supermarket.

A supermarket is a large shop for groceries and other goods, including meat and fresh produce. It's a full service grocery store that often sells a variety of non-food products as well. Almost always part of a chain, e.g. Tesco, Safeway. Stores that do not provide full service grocery departments, including meat and fresh produce, are generally not considered supermarkets for historical reasons.

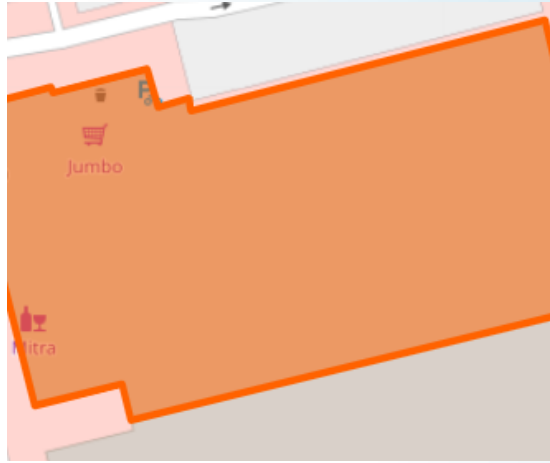
# Challenge: Completeness and consistency OSM



One building  
Building has tag building=yes  
Building has shop = supermarket  
No 'pointobject' available

**URI (nice):**

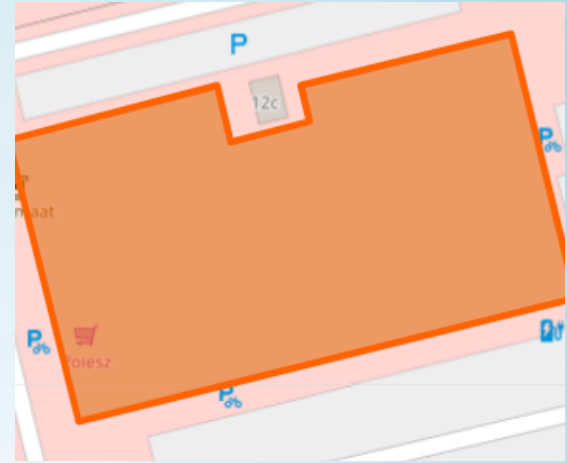
<https://www.openstreetmap.org/way/268856304>



One building  
Building has tag building=retail  
Building has multiple point objects, where one has tag shop=super\_market

**URI (nice):**

<https://www.openstreetmap.org/way/45351743>




One building  
Building has tag building=supermarket  
Building has a single point object with shop=supermarket

**URI (nice):**

<https://www.openstreetmap.org/way/45351750>

# Challenges: Geometric matching



Identificatieresultaten

Object	Waarde
▼ planet_osm_polygon_building_view	
bagid	0599100100005765
▶ (Afgeleid)	
▶ (Acties)	
osm_id	274087882
bagid	0599100100005765
wikidata	NULL
building	yes
amenity	NULL



# Challenges: Geometric matching



Identificatieresultaten

Object	Waarde
▼ <b>brt_buildings_vlak.geometrie_wgs84</b>	
uri	<a href="https://brt.basisregistraties.ov">https://brt.basisregistraties.ov</a>
(Afgeleid)	
(Acties)	
uri	<a href="https://brt.basisregistraties.ov">https://brt.basisregistraties.ov</a>
id	131077751
status	in gebruik
geometrie	Polygon ((195119.58449999999
geometrietype	Vlak

# Summary

On a higher abstraction level it makes so much sense and it seems so easy to connect all data sources...

When looking in the details...it is far more complex, and several challenges need to be solved.

There is a big win....but not a quick win.