

# FOODIE



FARM-ORIENTED OPEN DATA IN EUROPE

## DATA MODEL FOR (PRECISION) AGRICULTURE BY EXTENDING THE INSPIRE FOR BUSINESS APPLICATIONS

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[www.foodie-project.eu](http://www.foodie-project.eu)



CIP-ICT-PSP-2013-7 Pilot Type B  
Grant agreement no: 621074

- Foodie means:
  - A) A person who seeks new food experiences as a hobby rather than simply eating out of convenience or hunger.
  - B) A project targeted to support Farm-Oriented Open Data In Europe.
  - C) Cloud-based infrastructure that is being developed to support farmers in the EU.

**A), B) and C) are correct!**

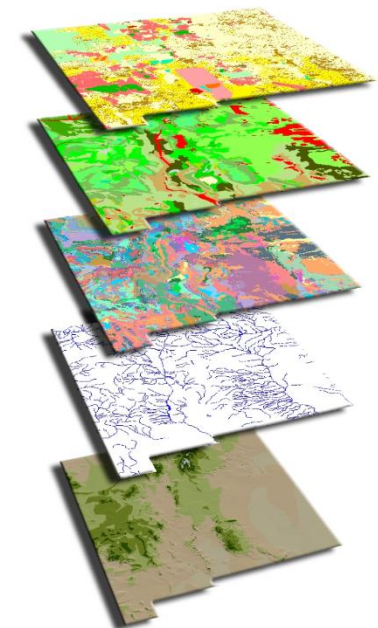




## Contents

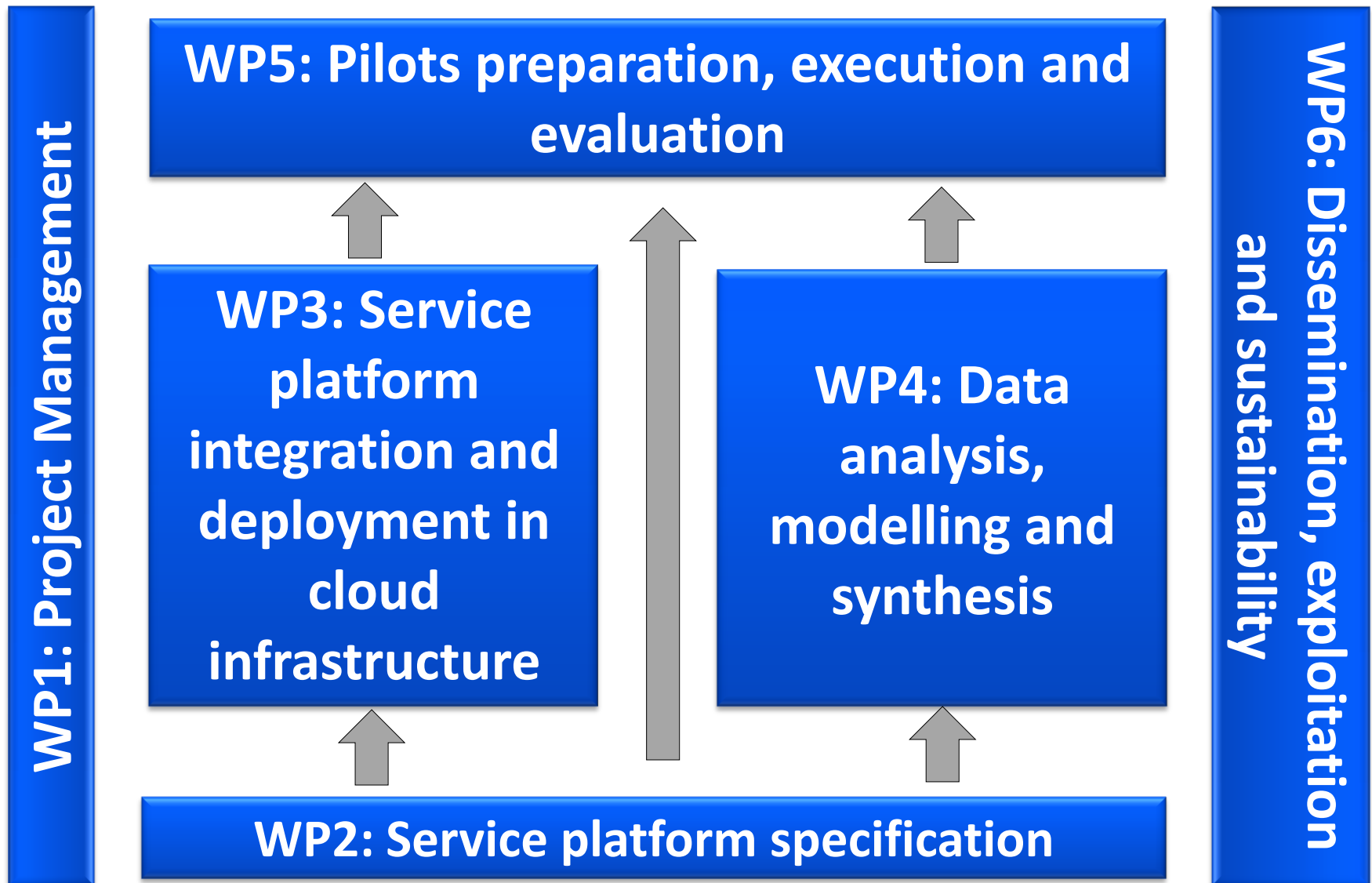
1. Motivations
2. Project background
3. Foodie data models in a nutshell
4. Implementation and further development
5. Conclusions

- The agriculture sector is a unique sector due to its strategic importance around the world
  
- Different groups of stakeholders managing heterogeneous sources of information
  - Base maps (topographic maps, cadaster, ortophoto, ...)
  - Aerial/satellite images
  - LPIS data: direct subsidies to the farmer
  - Field measurements
  - ...



- The “Foodie” project addresses the previously mentioned issues
  - Farm-Oriented Open Data in Europe
  - 2014 – 2017, funded under the Competitiveness and innovation framework programme (CIP)
  - 6 million €, 3 million € EU contribution
  - 13 project partners
  - 7 countries
    - Austria
    - Czech Republic
    - Italy
    - Latvia
    - Poland
    - Spain
    - Turkey





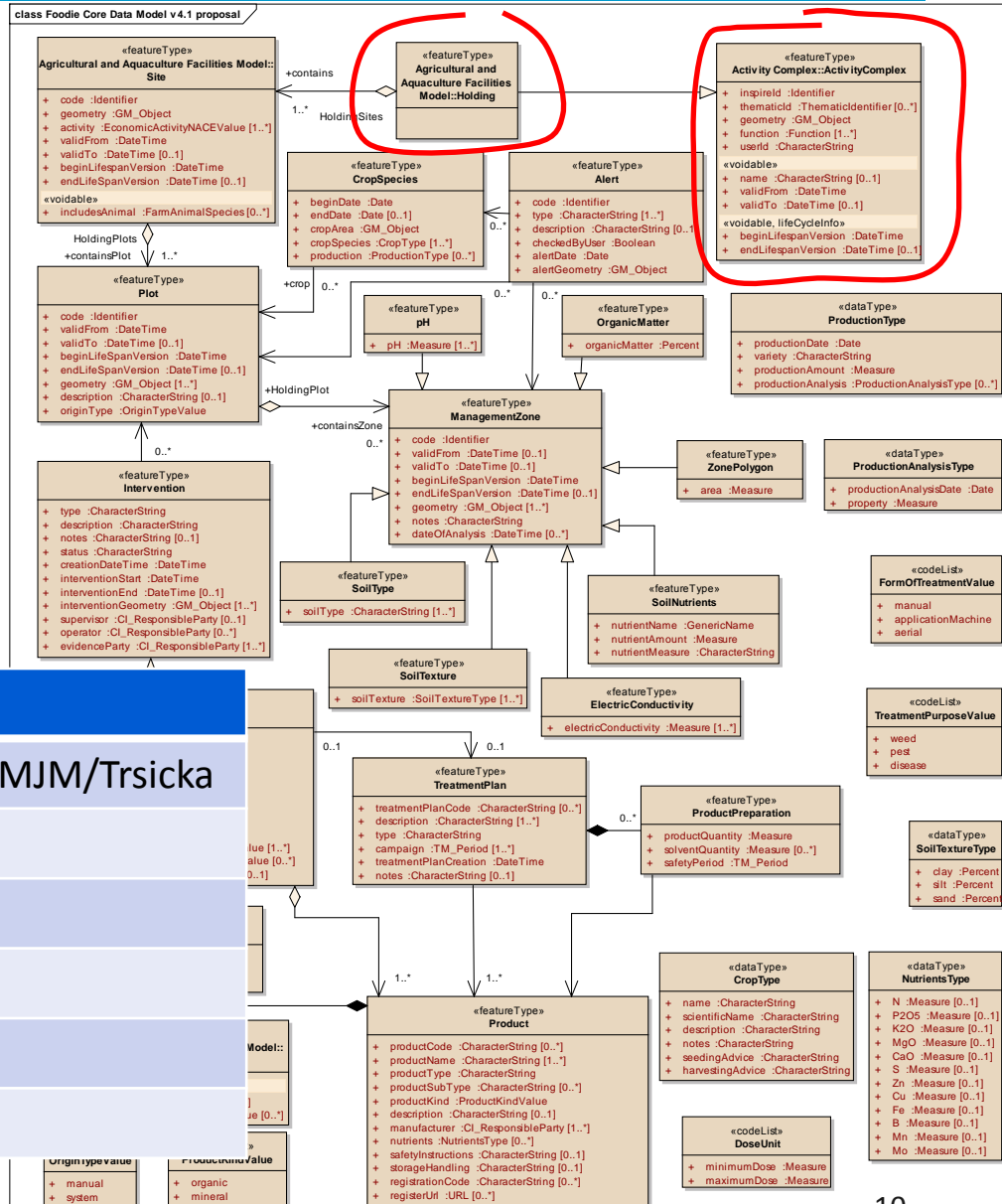
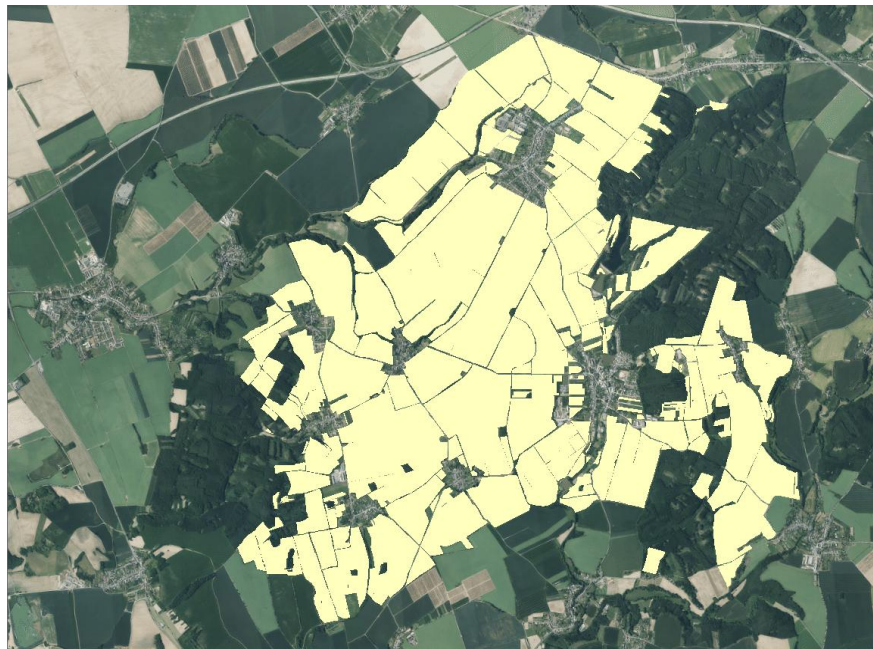
- **Pilot 1: Precision Viticulture (Spain)**
  - Appropriate management of the inherent variability of crops
    - to increase in economic benefits and a reduction of environmental impact
  
- **Pilot 2: Open Data for Strategic and Tactical Planning (Czech Republic)**
  - Improving future management of agricultural companies (farms), introducing new tools and management methods
    - the cost optimization path, reduction of environmental burden, improving the energy balance while maintaining the production level
  
- **Pilot 3: Technology allows integration of logistics via service providers and farm management including traceability (Germany)**
  - Integrating the German machinery cooperatives systems with existing farm management and logistic systems as well as to develop and enlarge existing cooperation and business models with the different chain partners
    - to create win-win situations for all of them with the help of IT solutions.

- Core Data Model
  - Management zones
  - Interventions
  - Treatments
  - ...



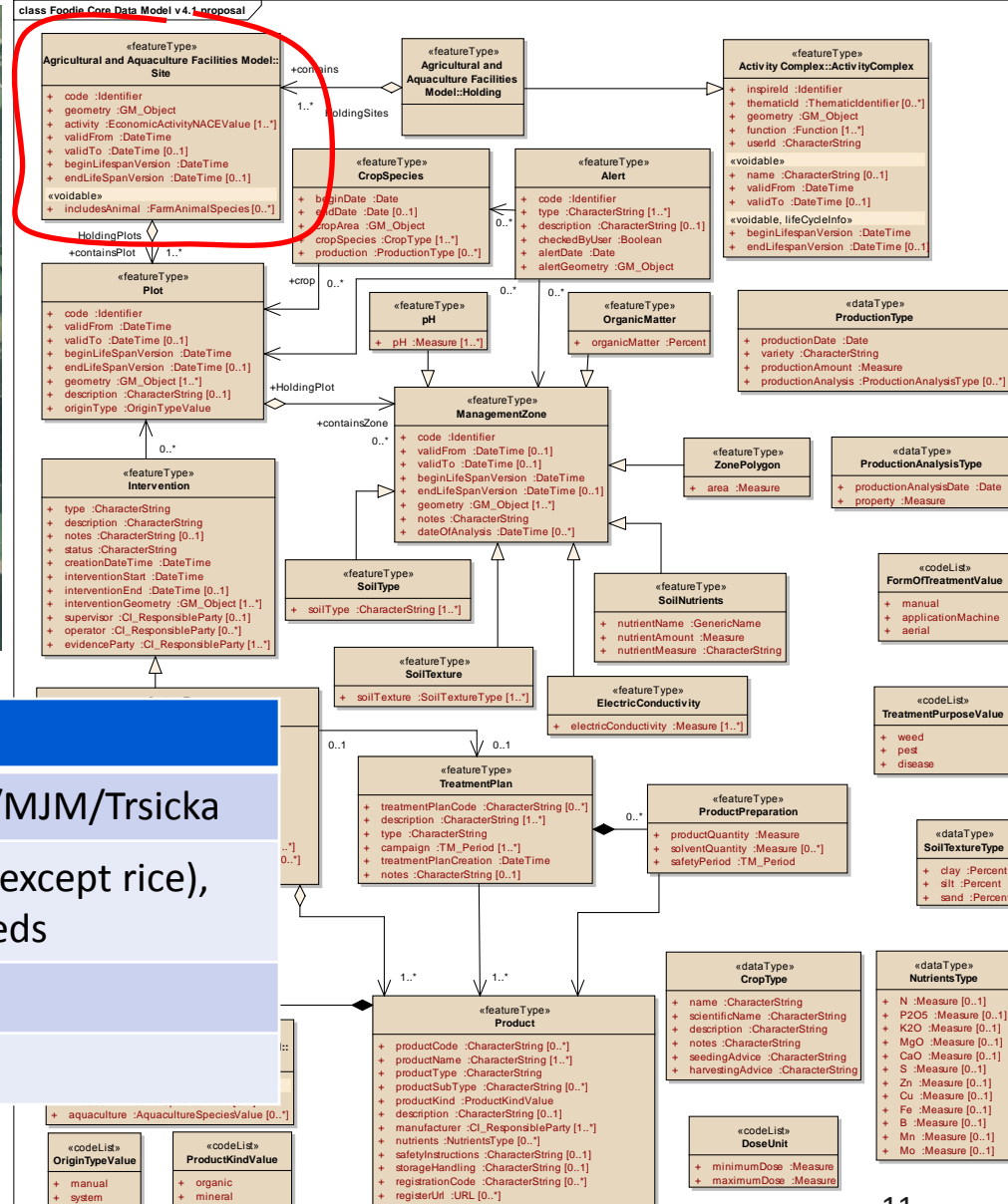
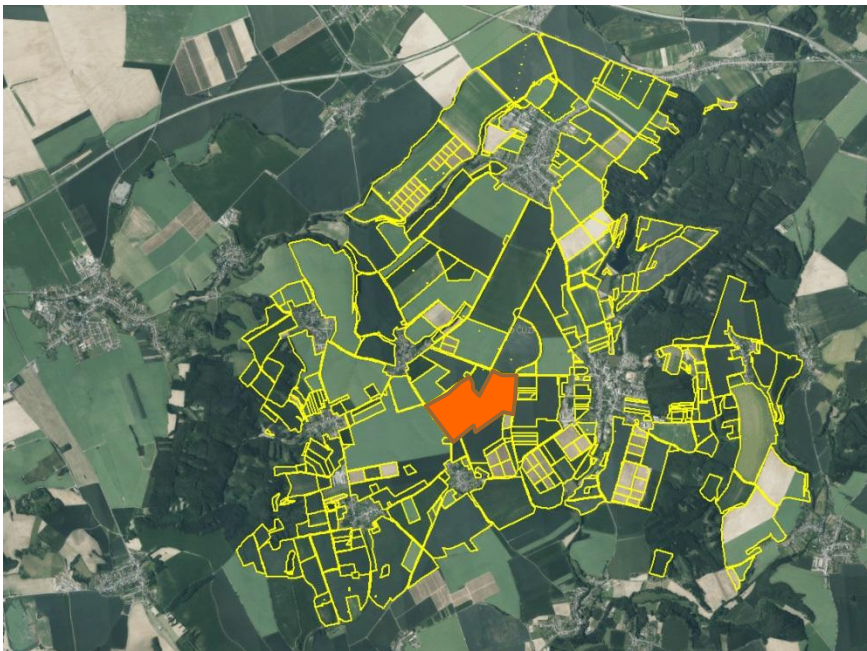


# Core Data Model

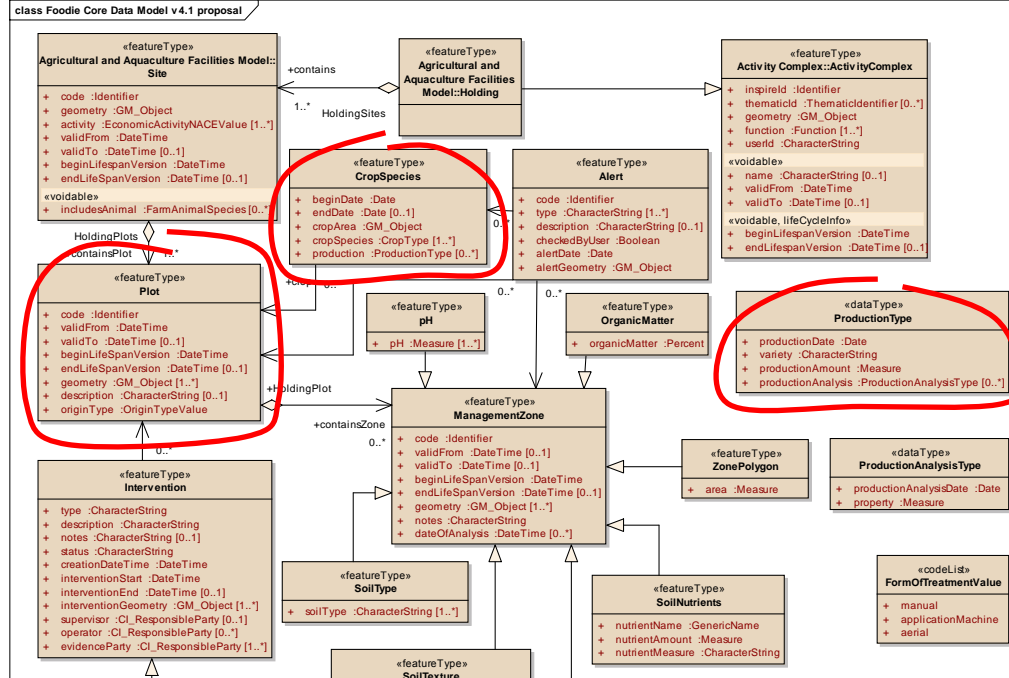
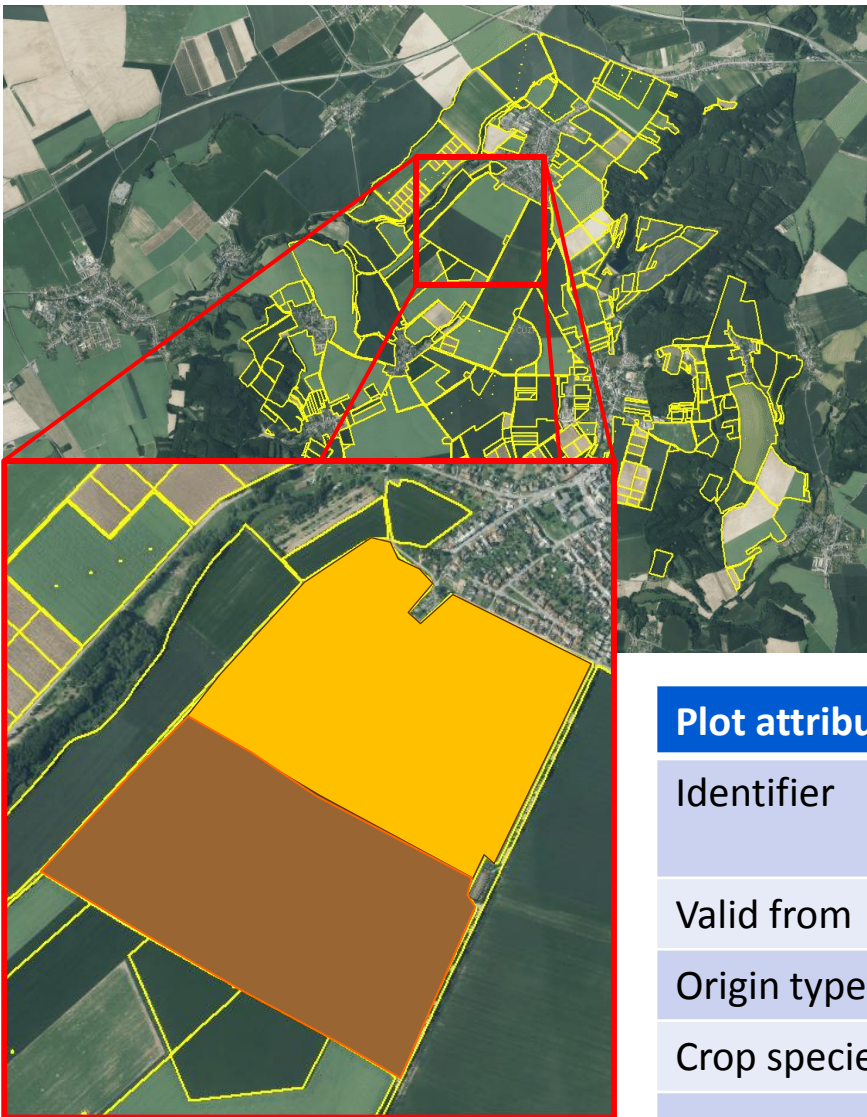


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Identifier	http://foodie-project.eu/CZ/MJM/Trsicka
Function	agriculture
User identifier	47674814
Name	Tršická zemědělská, a.s.
Valid From	1993-12-13
Begin Lifespan	2015-03-11

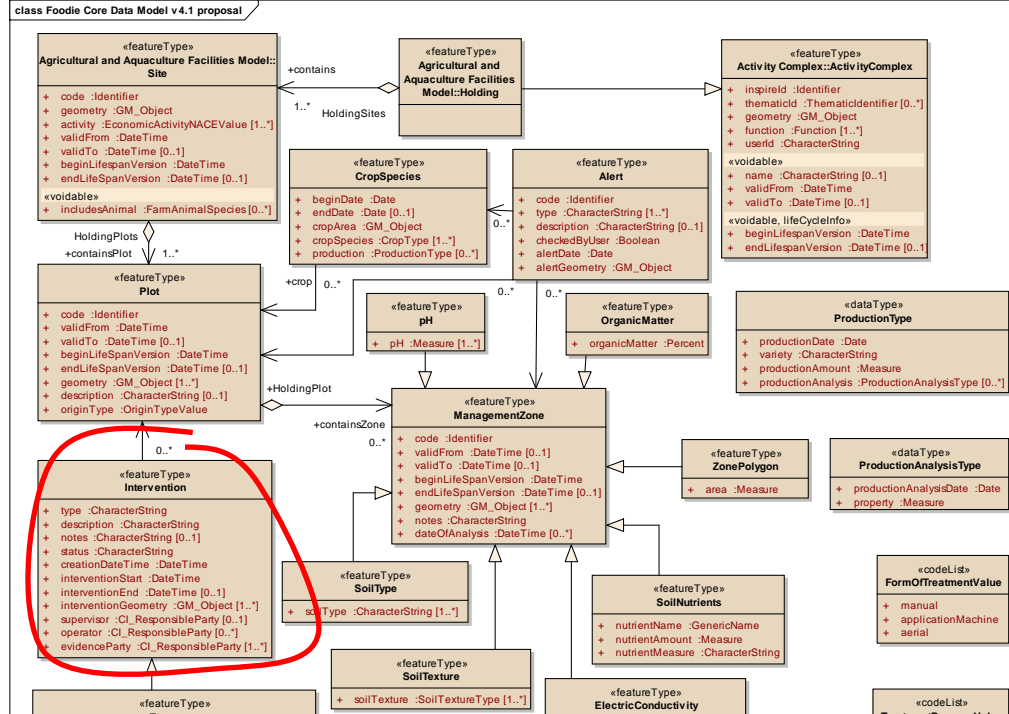
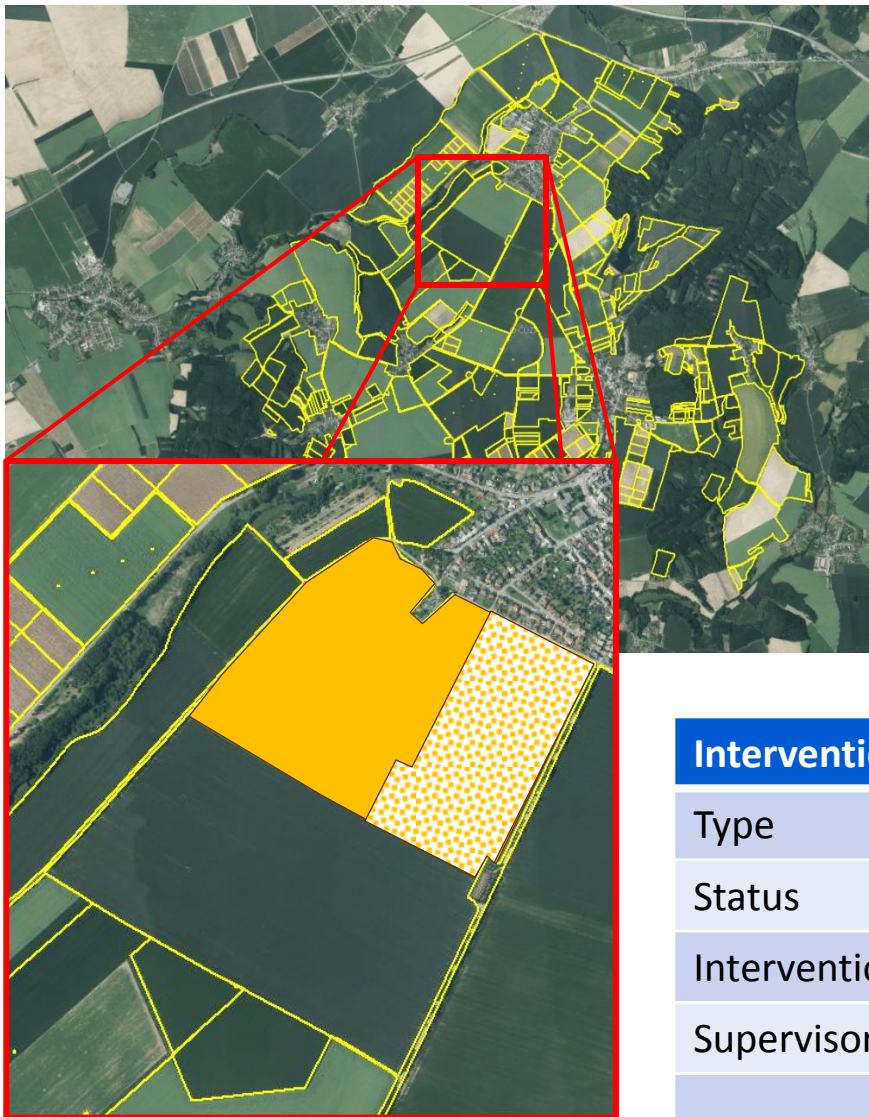
# Core Data Model



Site attribute	Value
Identifier	<a href="http://foodie-project.eu/CZ/MJM/Trsicka">http://foodie-project.eu/CZ/MJM/Trsicka</a>
Activity (NACE code)	A1.1.1 - Growing of cereals (except rice), leguminous crops and oil seeds
Valid From	2014-03-15
Begin Lifespan	2015-04-07

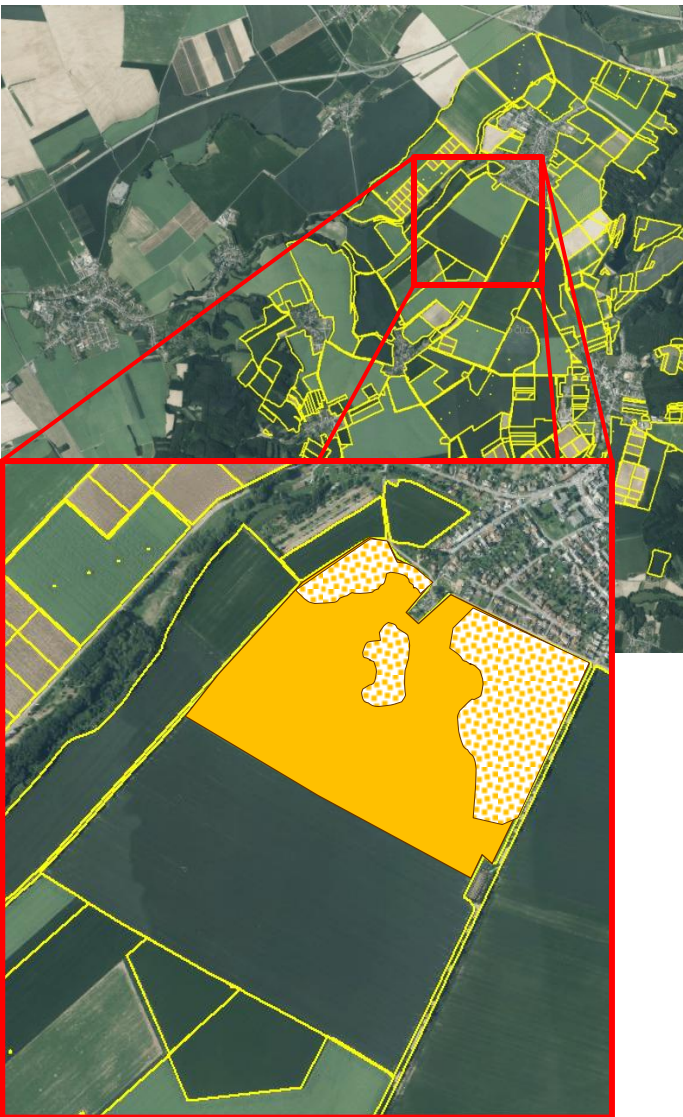


Plot attribute	Value
Identifier	<a href="http://foodie-project.eu/CZ/MJM/Trsicka/Plot/001">http://foodie-project.eu/CZ/MJM/Trsicka/Plot/001</a>
Valid from	2015-04-09
Origin type	manual
Crop species	wheat
...	...

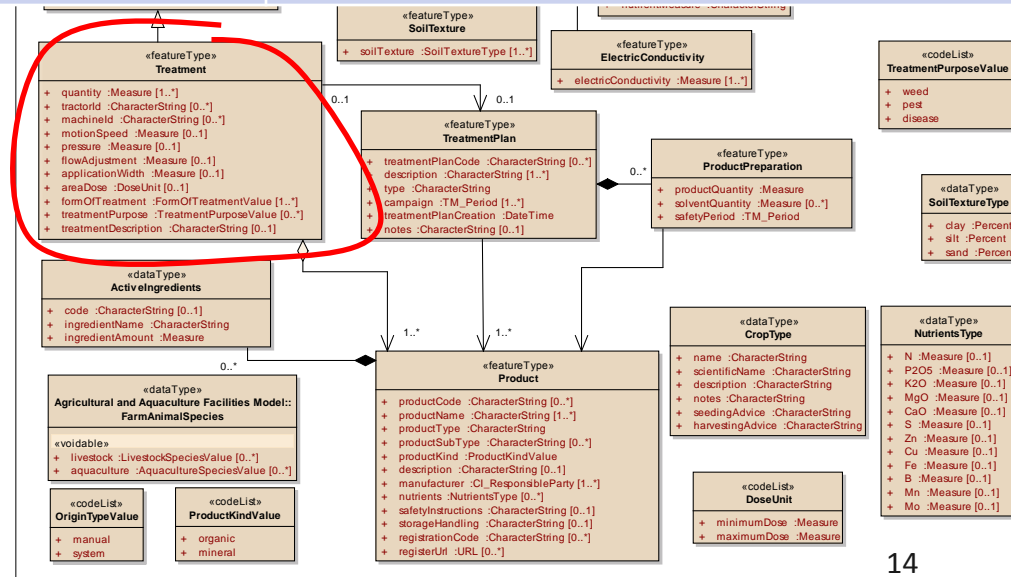


Intervention attribute	Value
Type	tillage
Status	ongoing
Intervention start	2015-04-22
Supervisor	John First, senior manager, phone 7435
...	...

# Core Data Model



Treatment attribute	Value
Intervention type	herbicide application
Status	ongoing
Intervention start	2015-04-22
Supervisor	John First, senior manager, phone 7435
Treatment quantity	70 litres
Application width	25 meters
Form of treatment	Application machine
Product	<u>Roundup®</u>
...	...

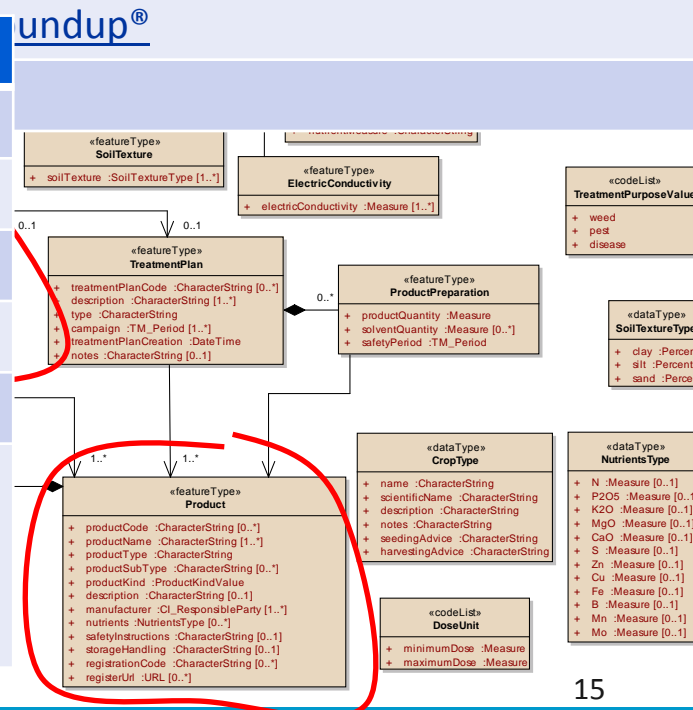


# Core Data Model



Treatment attribute	Value
Intervention type	herbicide application
Status	ongoing
Intervention start	2015-04-22
Supervisor	John First, senior manager, phone 7435
Treatment quantity	70 litres
Application width	25 meters
Form of treatment	Application machine

Product attribute	Value
Product code	01475200
Product name	Roundup®
Product type	herbicide
Manufacturer	MONSANTO®
Register URL	<a href="http://agro-register.cz/?1475">http://agro-register.cz/?1475</a>
Safety instructions	Eye contact: may cause may cause pain, redness and tearing based on toxicity studies. ...

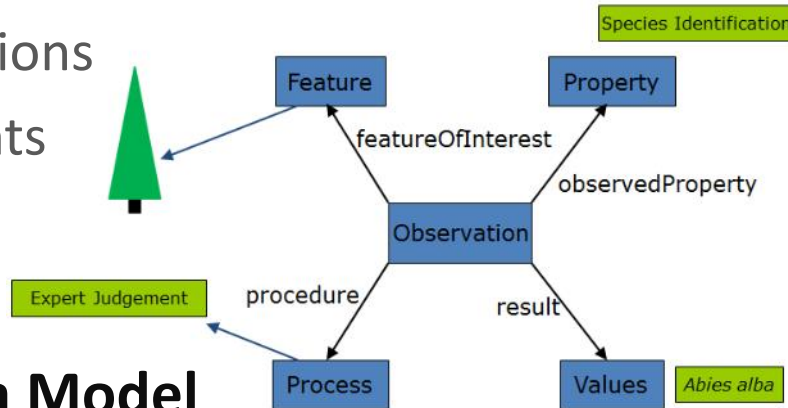






## ■ Core Data Model

- Management zones
- Interventions
- Treatments
- ...



## ■ Sensor Data Model

- ISO 19156 O&M
- also VGI

```

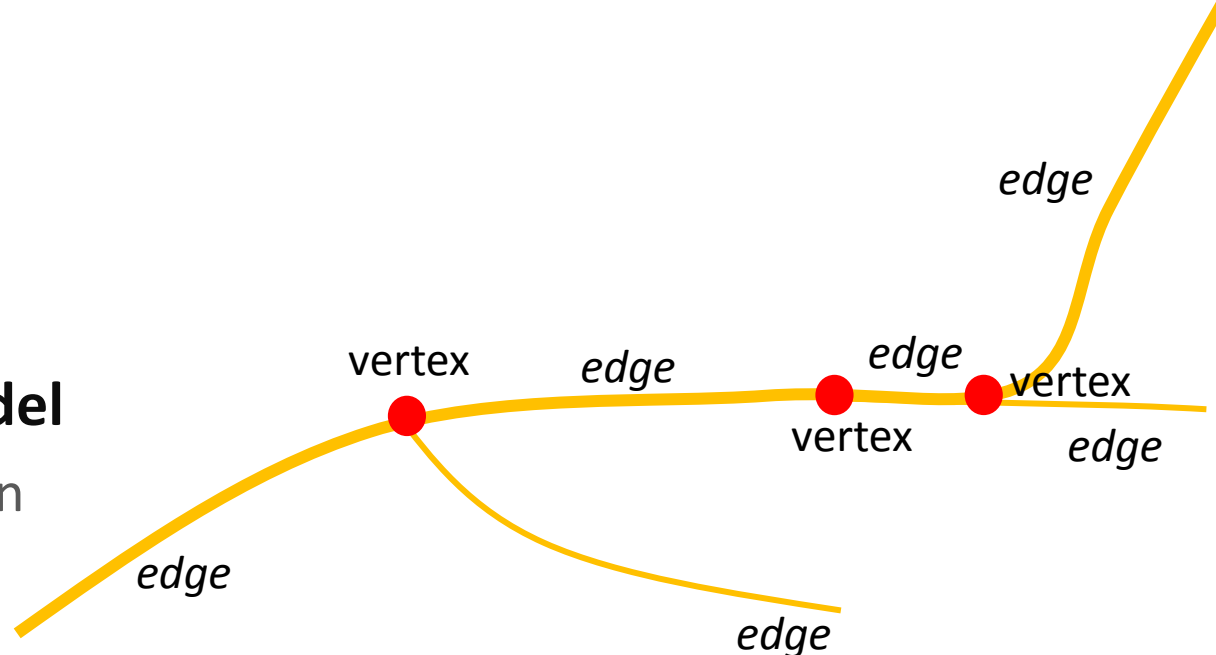
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```

- Core Data Model
  - Management zones
  - Interventions
  - Treatments
  - ...

Road segment attributes
Identifier, e.g. <a href="http://foodie-project.eu/dat/tn/654787">http://foodie-project.eu/dat/tn/654787</a>
National code, e.g. 43
Road width, e.g. 5 meters
Maximum height, e.g. 2.1 meters
Maximum weight, e.g. 2 tons
Speed limit, e.g. 20 km·h <sup>-1</sup>
Surface category, e.g. asphalt, unpaved,...
HAZMAT limitation, i.e. flammable/explosive/corrosive/toxic/oxidizing

- Sensor Data Model
  - ISO 19156 O&M
  - also VGI

- Transport Data Model
  - OSM for navigation



## ■ Core Data Model

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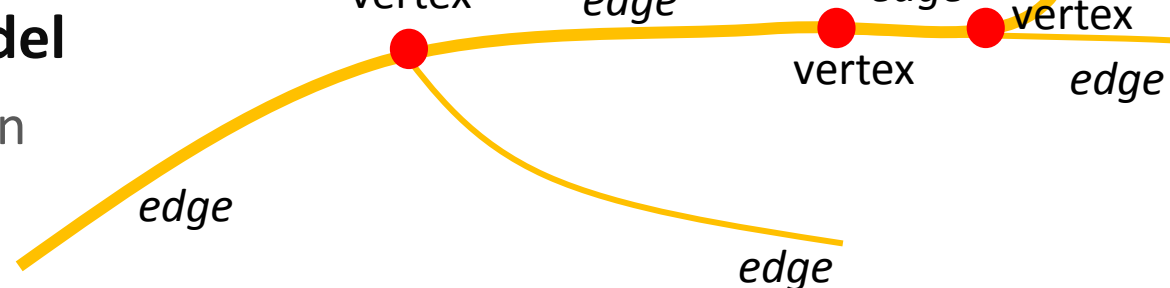
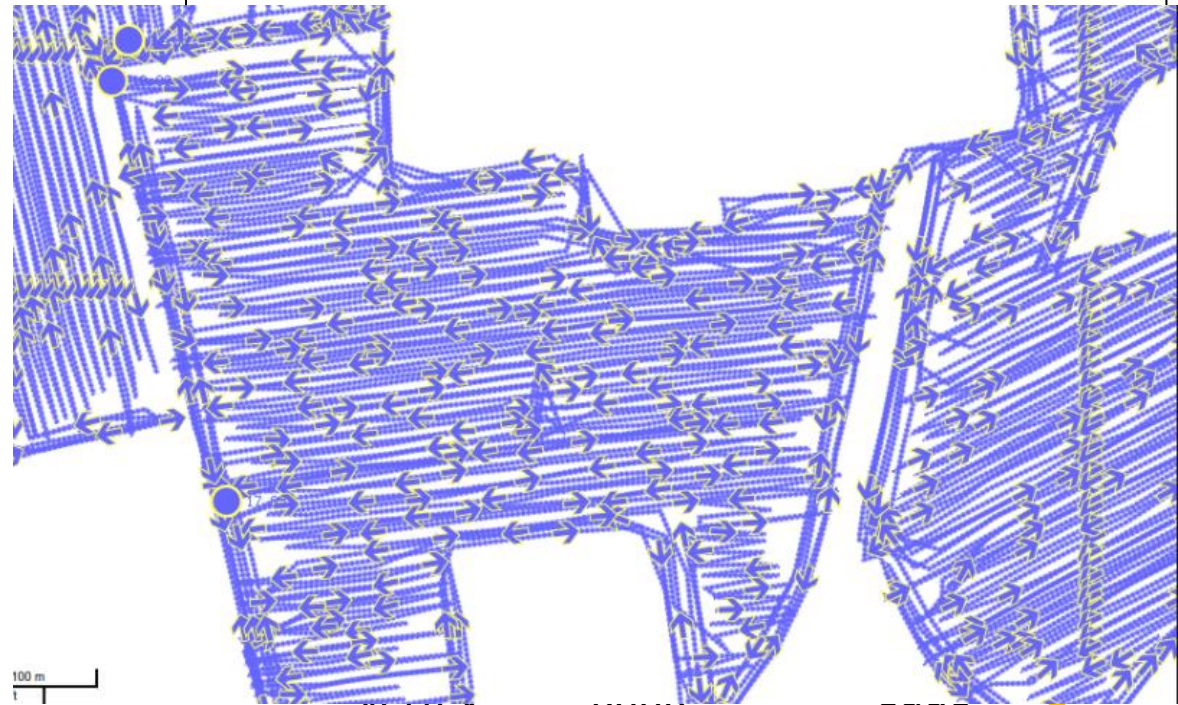
## ■ Sensor Data Model

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- OSM for navigation

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National code, e.g. 43



- Development based on open source
  - PostgreSQL 9.3.6 with PostGIS 2.1.0
  - PostgreSQL XL with OpenStack as a cloud solution
  - Freely available SQL script for setting up the database schema at the end of the project
  
- FOODIE platform is a part of the GEOSS Architecture Implementation Pilot – Phase 8
  - Agriculture and water pollution monitoring
  
- Developed open and lightweight APIs
  - Connection to cadaster, LPIS etc.
  - More on Friday's workshop

- Difference between other systems?
  - Foodie platform offers a complex set of tasks
    - Telematics to/from the field
    - Fleet management
    - Reduction of environmental impacts
    - Improving the energy balance
  - Openness and cloud computing
    - INSPIRE, COPERNICUS and/or GODAN may be integrated as a part of the Foodie hub
    - Respecting standards for geographic information
      - Open Geospatial Consortium's (OGC) Web Map Service (WMS), Web Feature Service (WFS), Catalogue Service for Web (CSW),...
      - RESTful APIs
      - ...
    - Customizable and scalable

- Data model achievements
  - Extended data models of three INSPIRE spatial data themes
    - Agriculture and aquaculture facilities (AF)
    - Transport Networks (TN)
    - Environmental Monitoring Facilities (EF)
  - Negotiations with the standardization bodies
    - Open Geospatial Consortium (Agriculture Domain Working Group)
    - Joint Research Centre of the European Commission
  
- Similarity to other systems?
  - Farmers usually distrust the companies aggregating (big) data

# FOODIE



FARM-ORIENTED OPEN DATA IN EUROPE

THANK YOU FOR YOUR INTEREST...

...AND LOOKING FORWARD TO SEE YOU AT THE  
FRIDAY'S WORKSHOP (1330 – 1500 hrs)

