Managing the Flemish Functional Cycle Network: A FOSS4G solution

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FOSS4G-Europe
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Introduction

- Karel Dieussaert
  - GIS consultant
  - **GEO Solutions NV (Belgium):**
    Geo-ICT integrator

- Customer:
  Department Mobility and Public Works
  (Flemish Government)

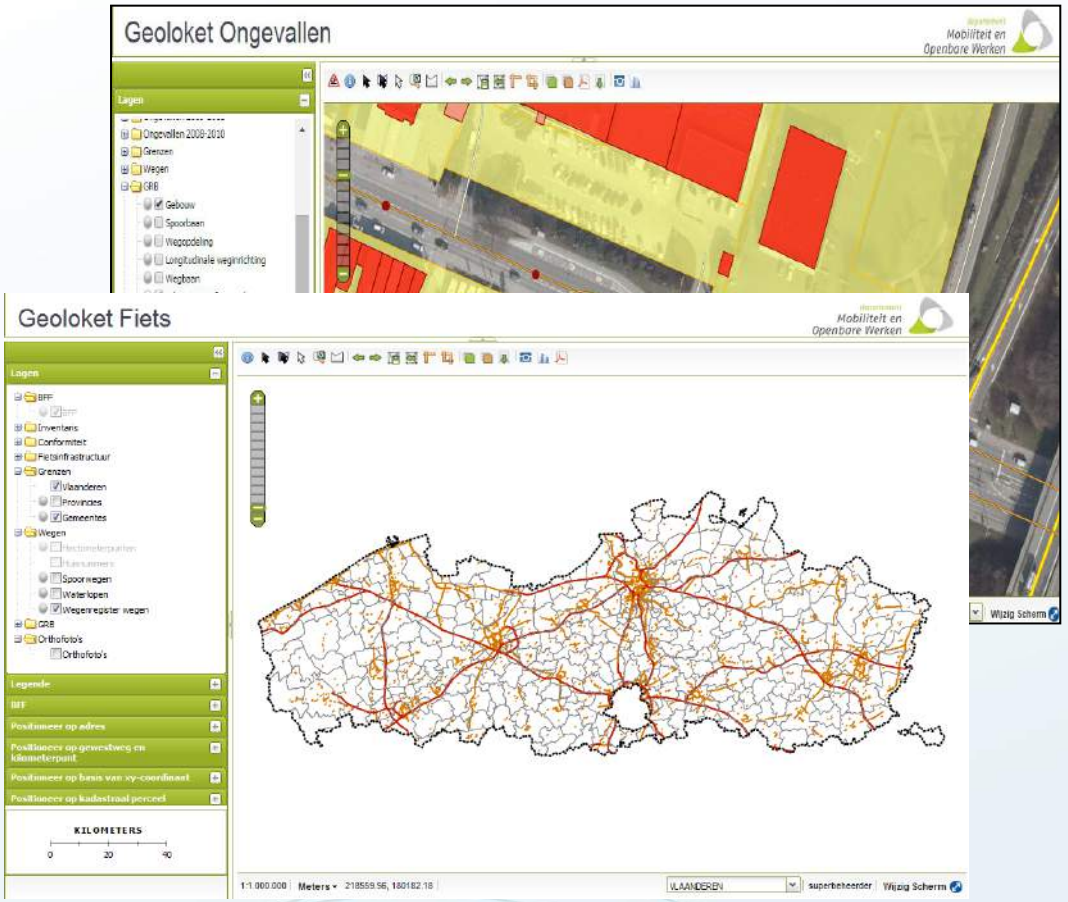
- Project:
  GeoMOB

Agenda

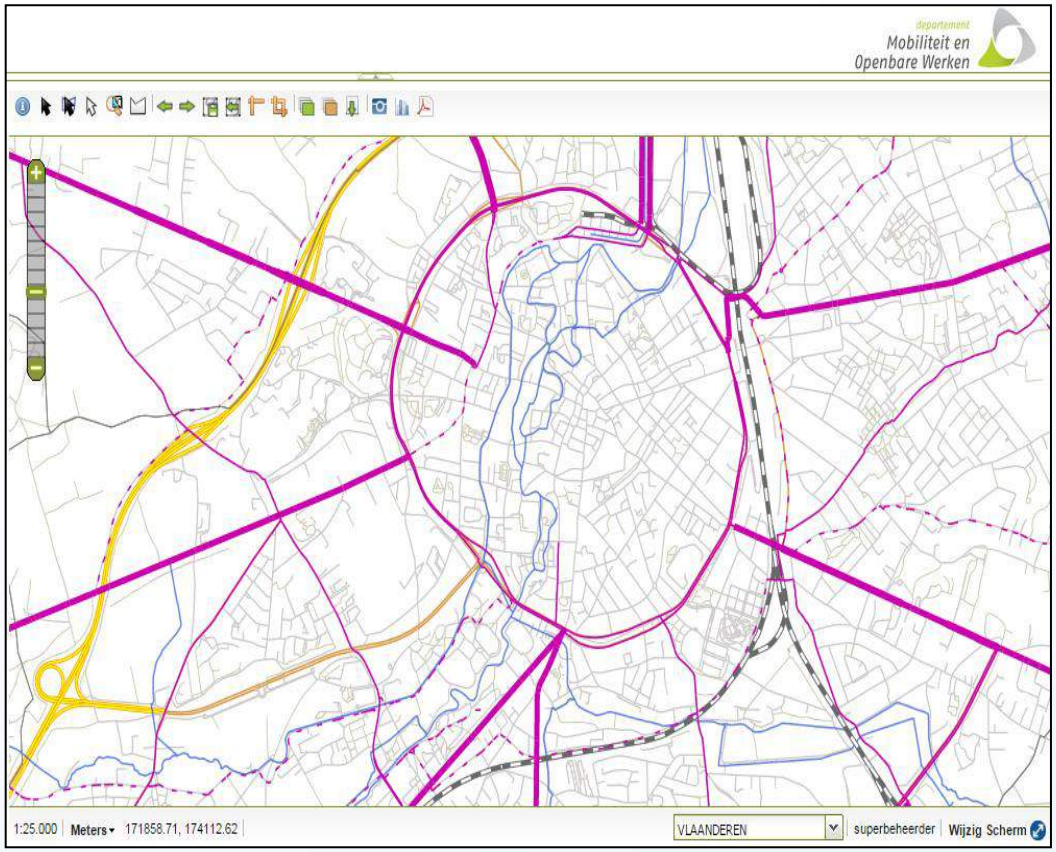
- Introduction
  - Project “GeoMOB”
  - Functional Cycle Network
- Functional demands
- Technical demands
  - Architecture
  - Data model (Lineair referencing)
- Integration: functional & technical demands
- Current state of the project
- Data migration – OpenLR

GeoMOB

- **Geo**portal for **MOB**ility
- Thematic geo-applications:
  - Accidents
  - Functional Cycle Network
- Goals:
  - Manage (geo)data
  - Visualisation
  - Analysis
  - Reporting & monitoring



Functional Cycle Network (FCN)

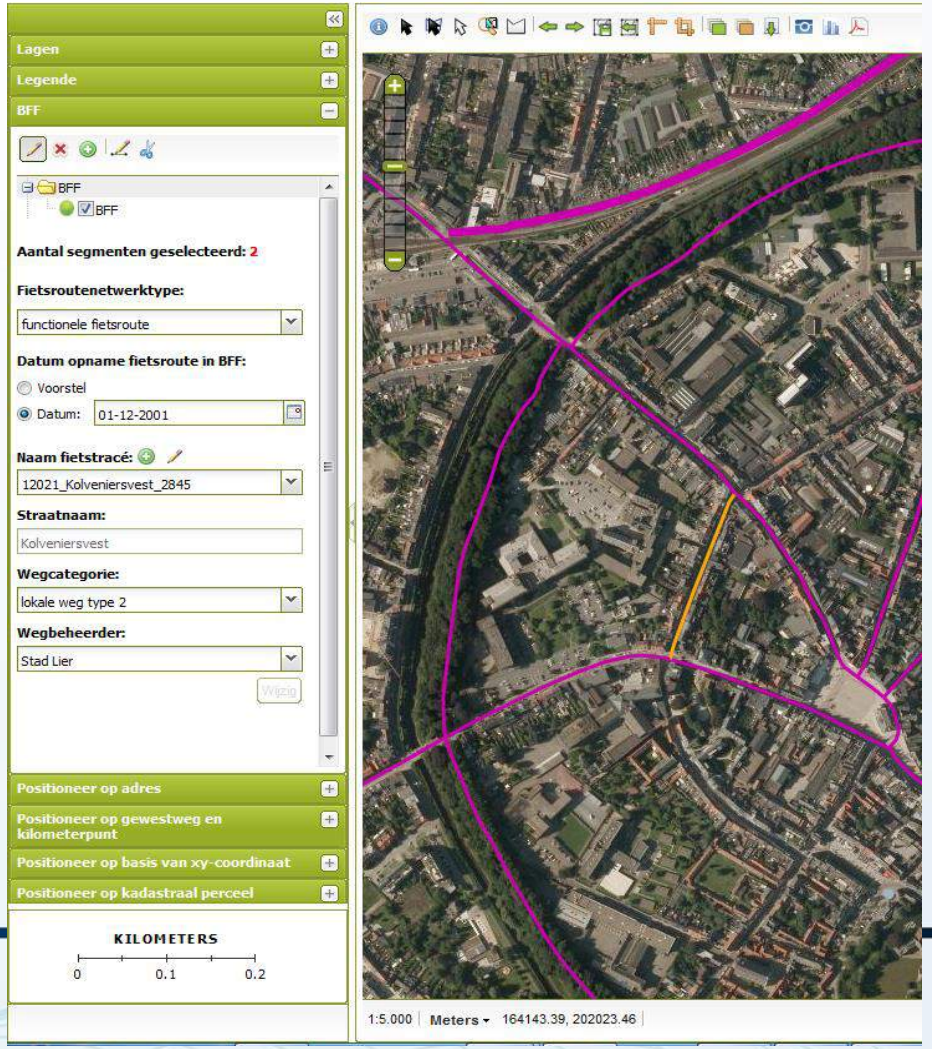


- Connects
  - residential area
  - attraction poles
    - Home - School
    - Home - Work
    - Home - Stores
    - …
- Comfort & safety
- Instrument for policy making
  - A functional network, not a touristic network

GEO solutions

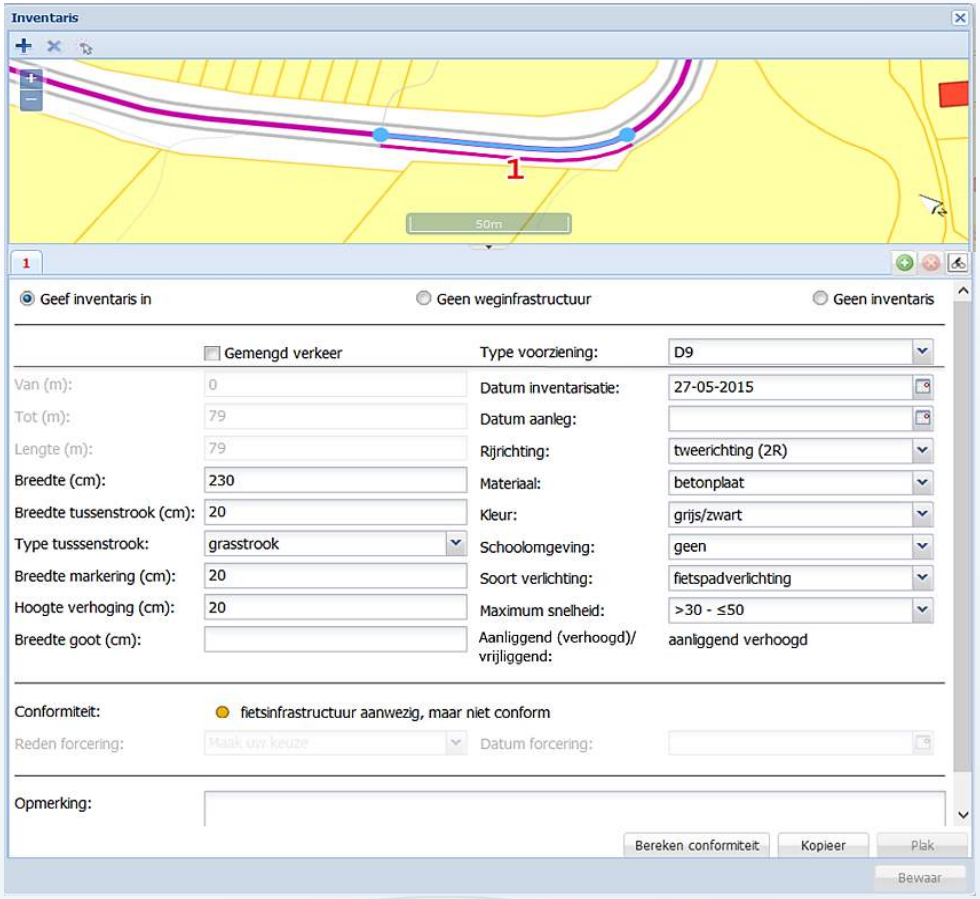
FCN – functional demands

- Editing the FCN:
  - add, split, delete, update attributes



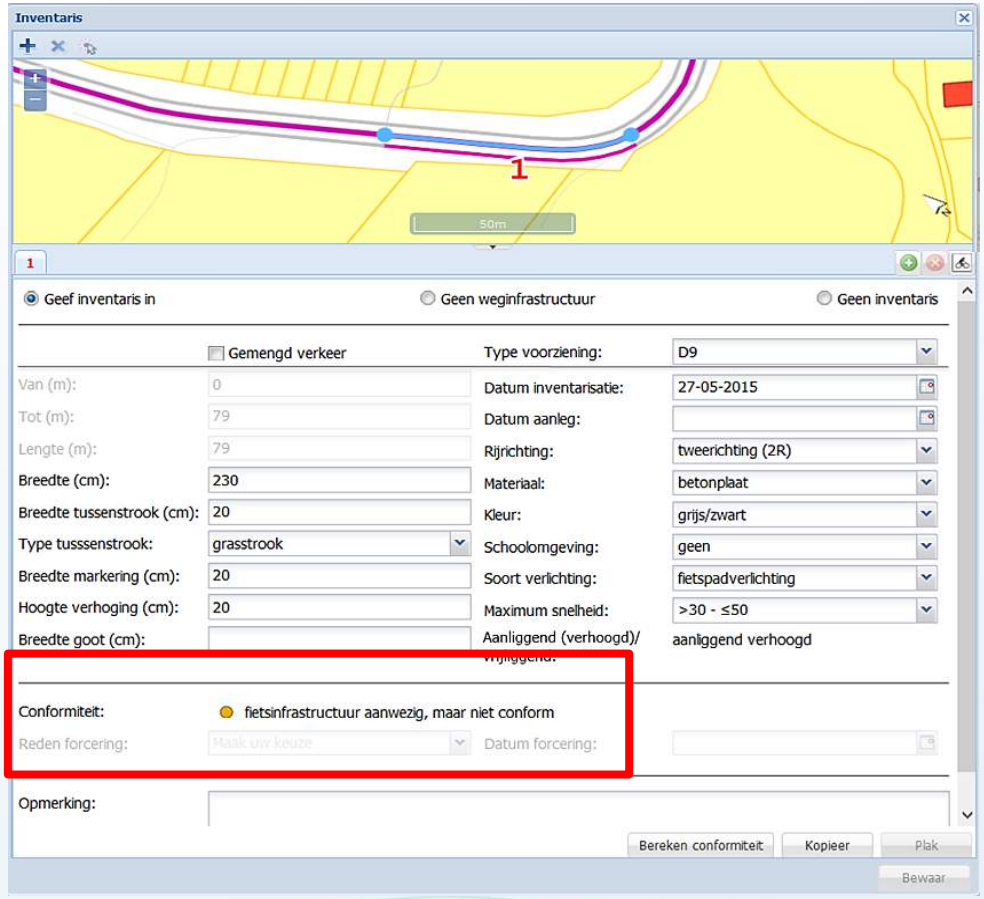
FCN – functional demands

- Inventory of the cycle road infrastructure:
  - Type, width, material, border, … of bicycle path



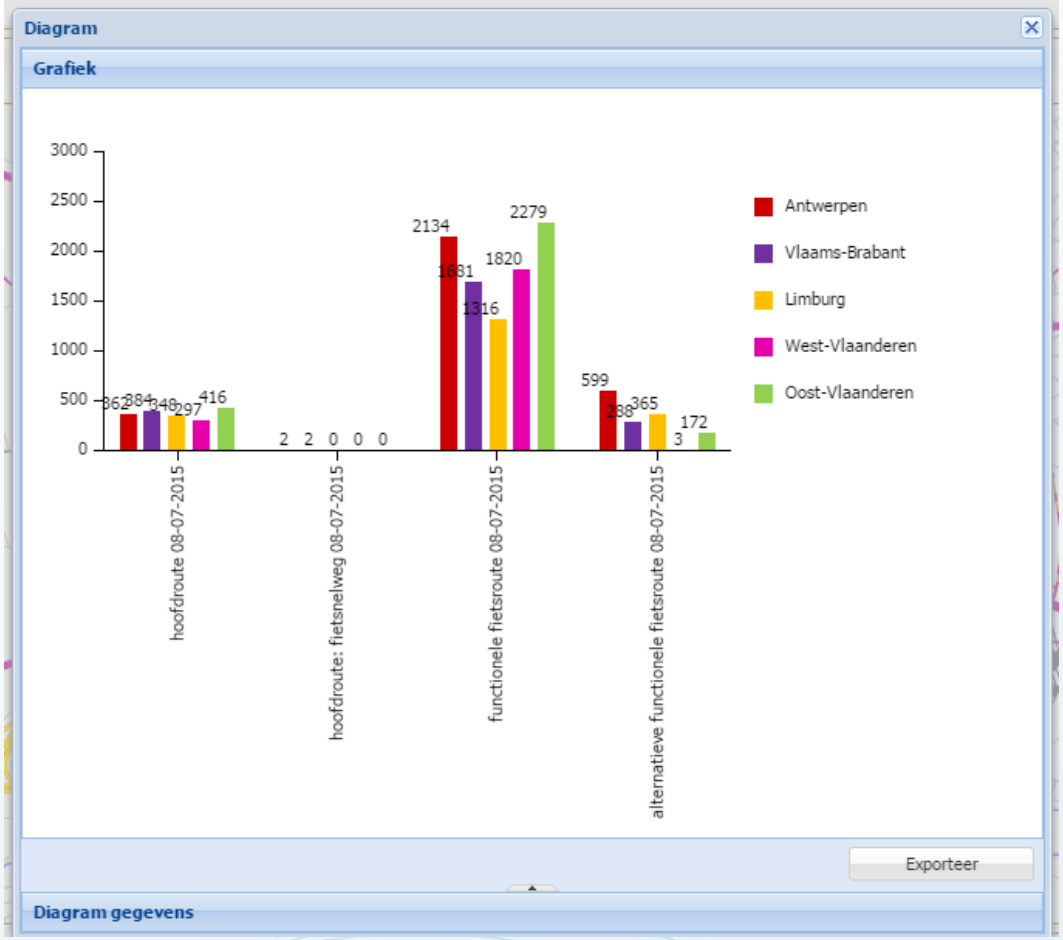
FCN – functional demands

- Data - analysis:
  - Checking compliancy of cycle infrastructure vs. policy rules



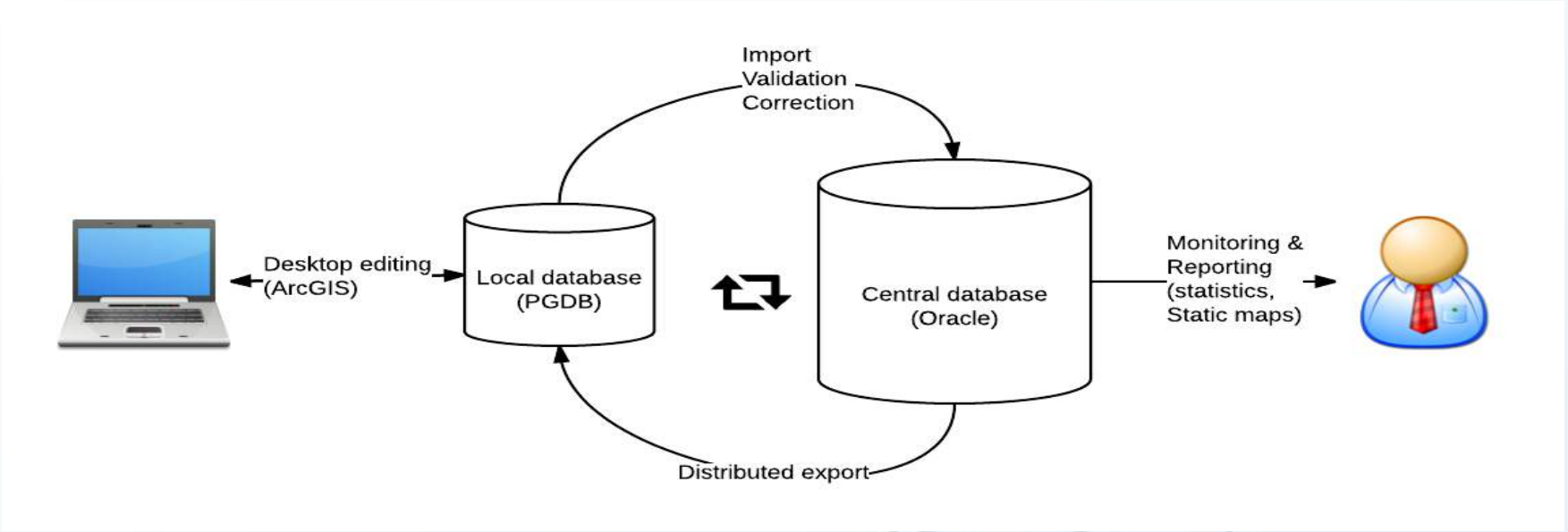
FCN – functional demands

- Monitoring & reporting:
  - Statistics
  - Graphs
  - Static maps

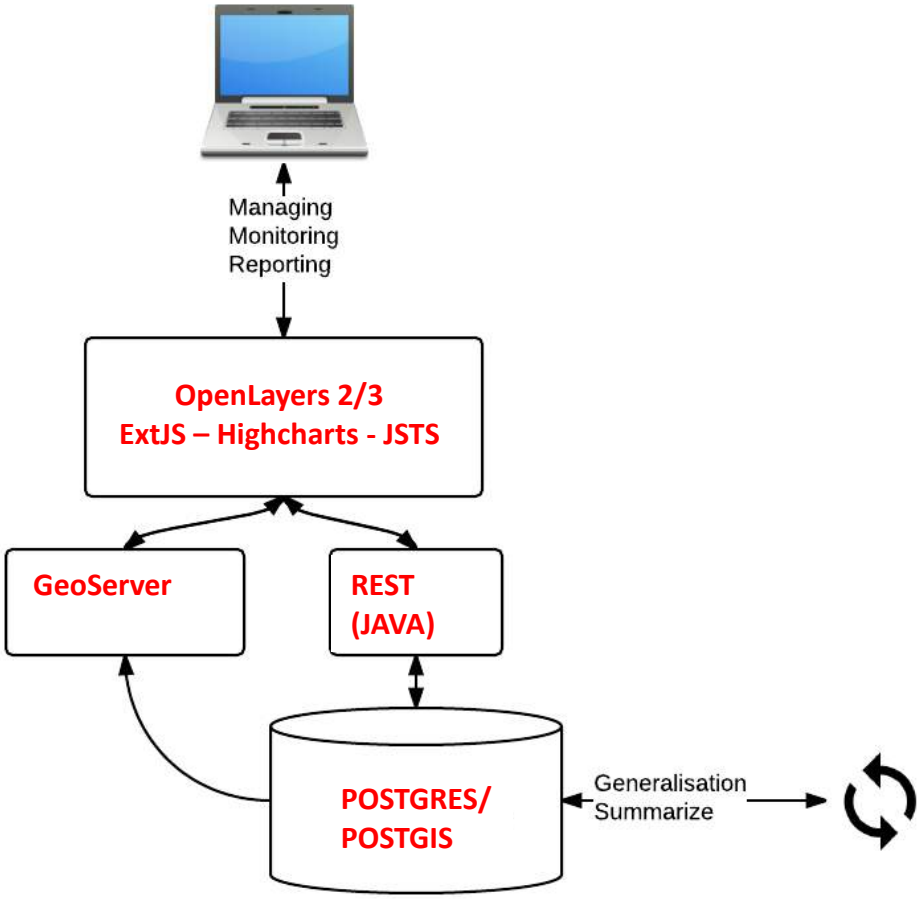


FCN – Technical demands

- Old architecture:
  - Distributed datasets
  - desktop editing
  - Commercial GIS components

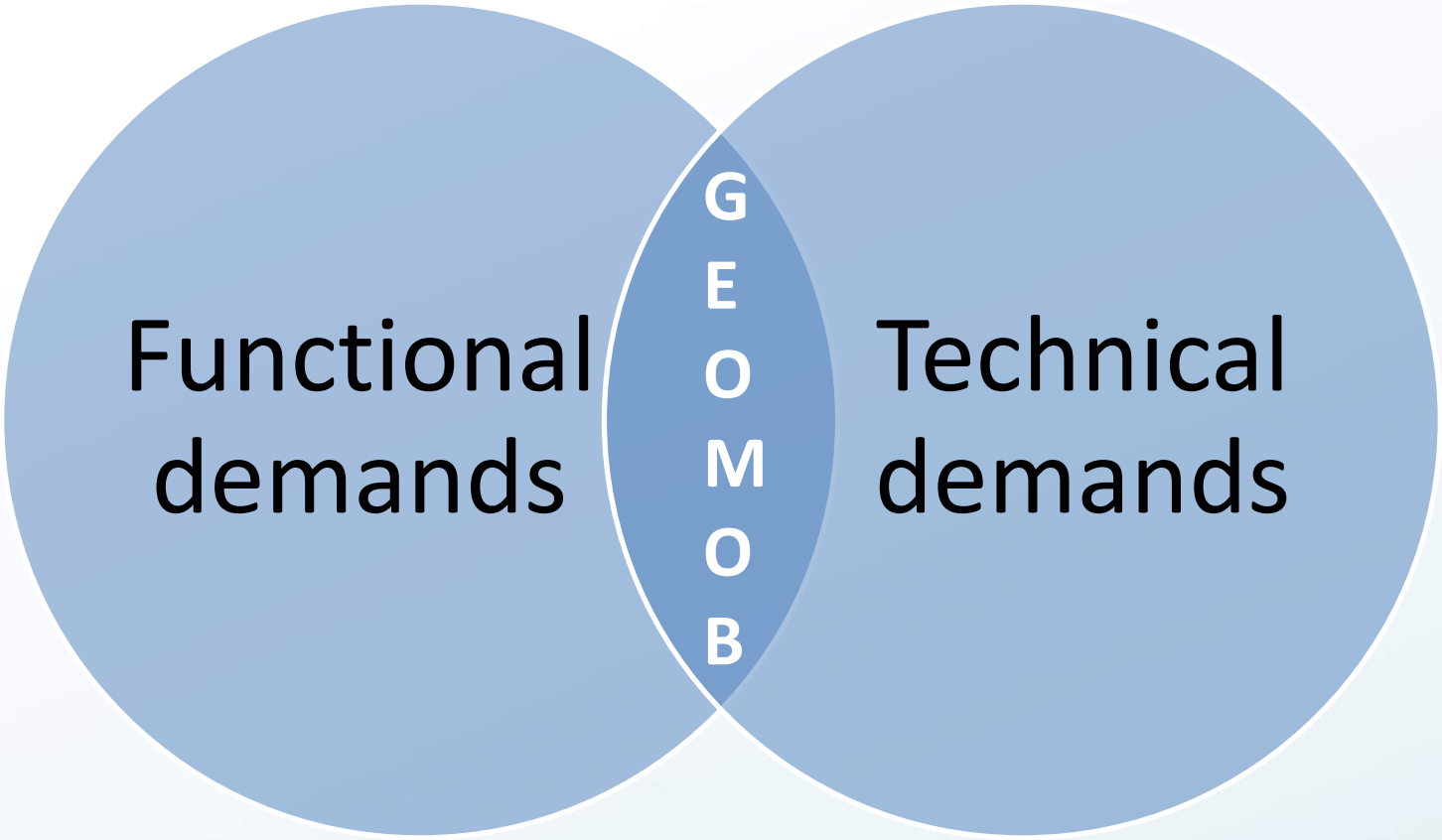


FCN – Technical demands



- Old architecture:
  - Distributed datasets
  - desktop editing
  - Commercial GIS components

- New architecture :
  - Service Oriented Architecture
    - » Central database
    - » Rest
    - » OGC standards
    - » Webapplication
  - Integrated validation
  - FOSS4G & OS components



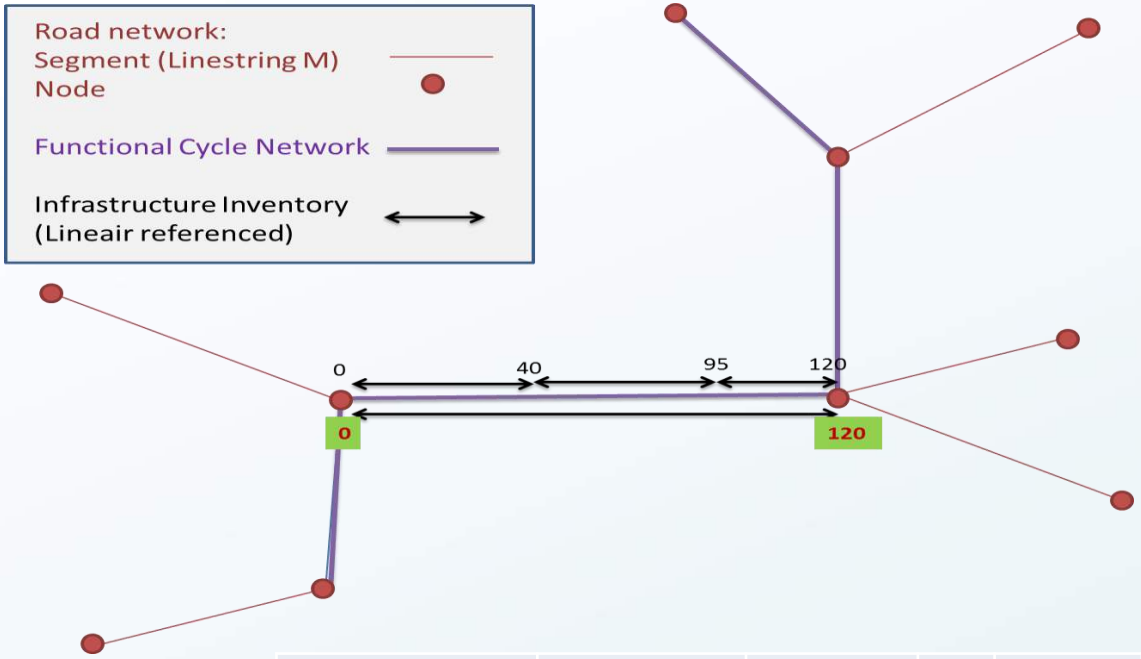
GEO solutions

FCN – Event based datamodel

- PostGIS

  Lineair referencing capabilities:

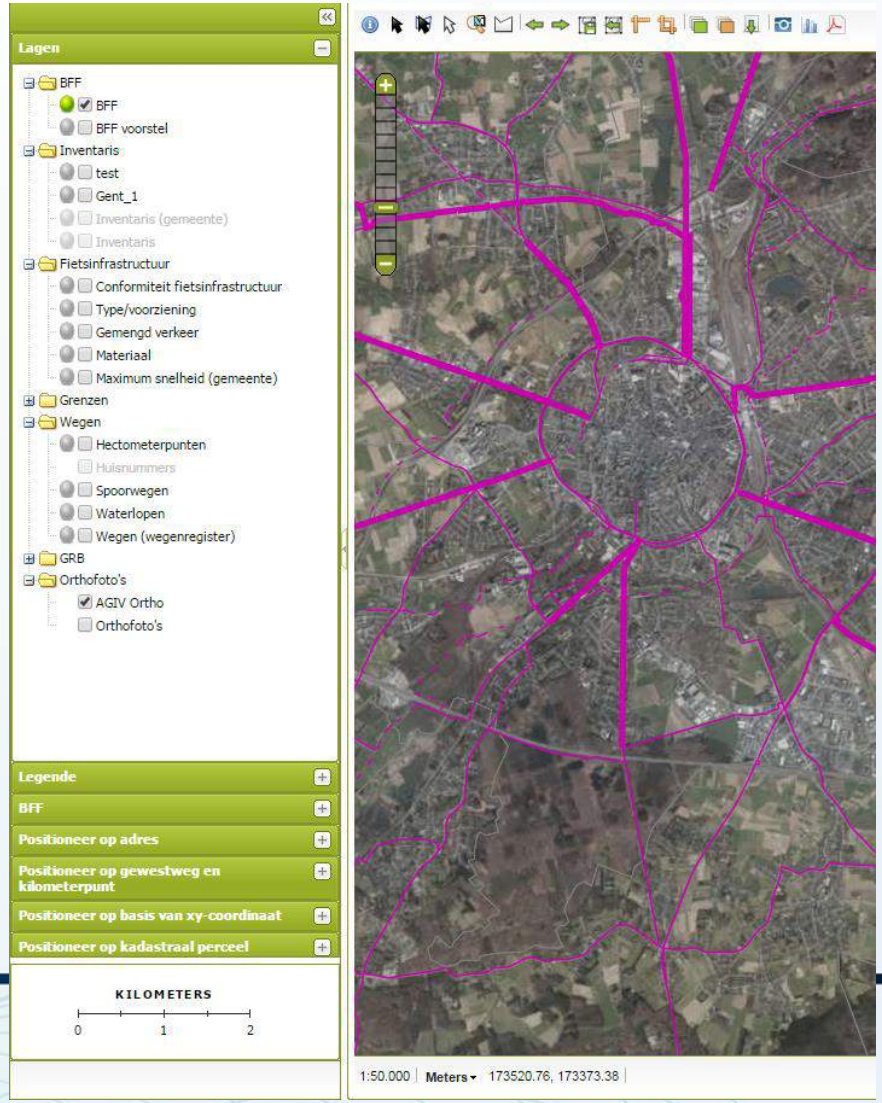
  - ST_LineInterpolatePoint
  - ST_LineLocatePoint
  - ST_LineSubstring
  - ST_LocateAlong
  - ST_LocateBetween
  - ST_interpolatePoint
  - ST_AddMeasure



id_road_segment	FromMeasure	ToMeasure	Side	Material
192584	0	40	Left	soil
192584	40	95	Left	concrete
192584	95	120	Left	soil
192584	0	120	Right	Unknown

FCN - OGC services

- Web Map Service (WMS)
  - Background layers
  - Business layers (zoomed out)
    ~performance



FCN - OGC services

- Web Map Service (WMS)
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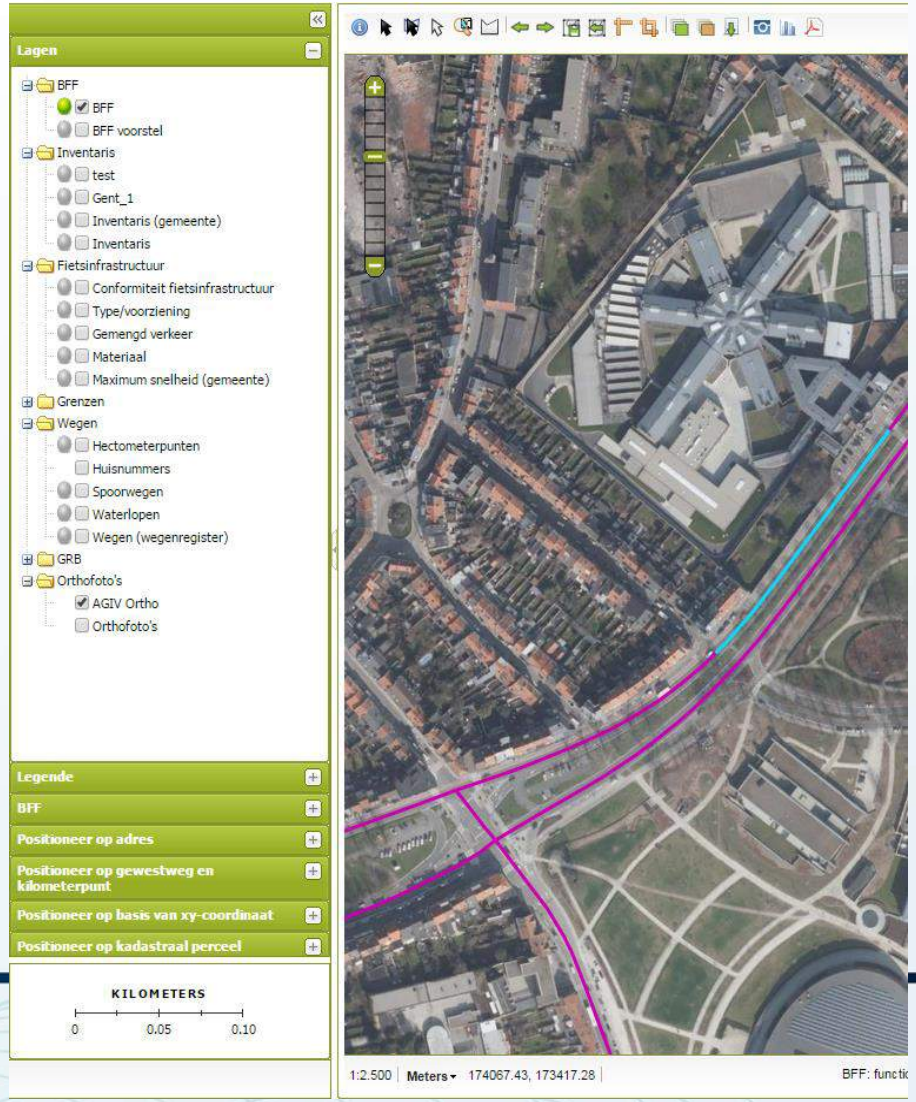
- Web Feature Service (WFS)
  - Business layers (zoomed in)

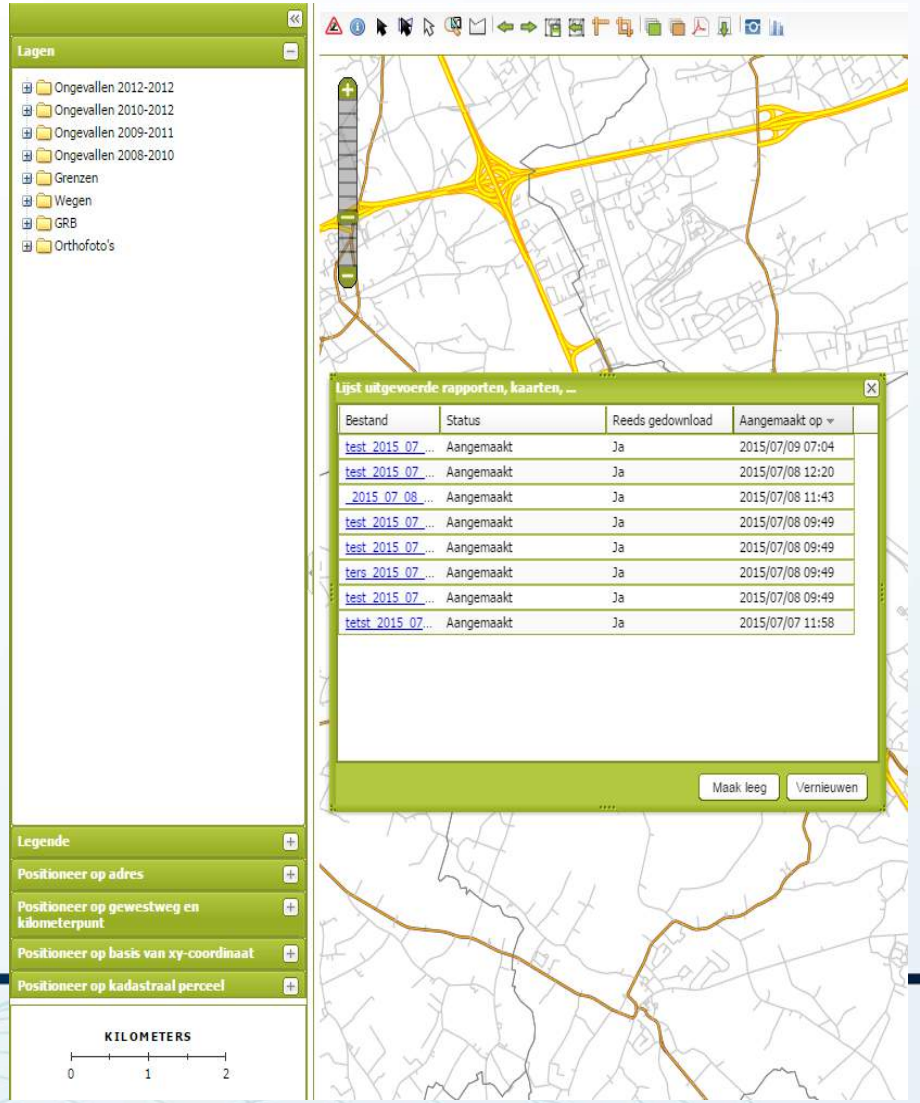


FCN - OGC services

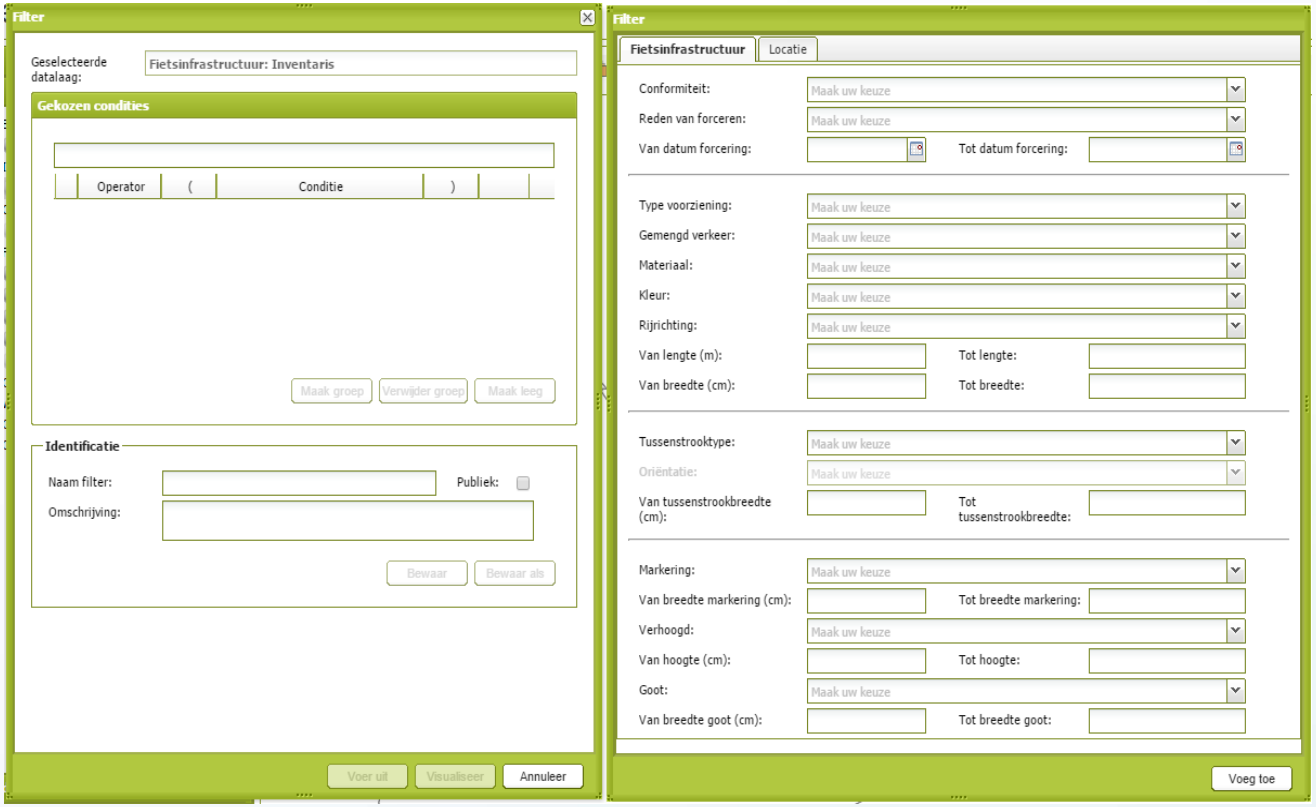
- Web Map Service (WMS)
  - Background layers
  - Business layers (zoomed out) *~performance*
- Web Feature Service (WFS)
  - Business layers (zoomed in)
- Web Processing Service (WPS)
  - Asynch processes
  - Calculations on big datasets

  (F.e. accidents around school areas in Flanders)

➔GEO Server & OpenLayers
  - covered our needs!
  - Good experiences in previous projects
  - WMS, WFS, WPS (extension), SLD styling
  - GeoWebCache integration *~performance*

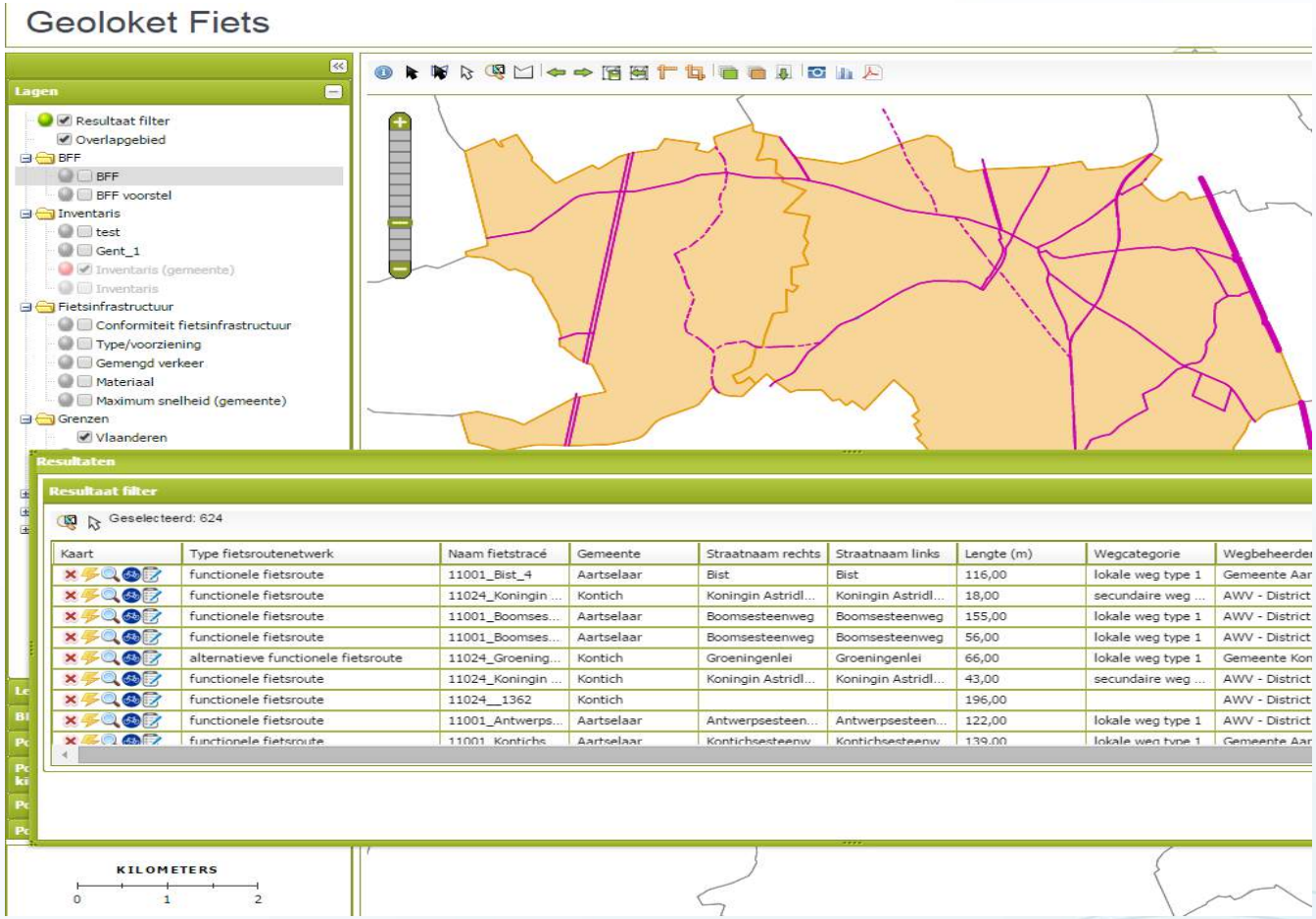


FCN – Analysis



- Filter data
  - Attribute
  - Spatial
- Resulting filter added to TOC
- REST & WPS service

FCN – Analysis



- Filter data
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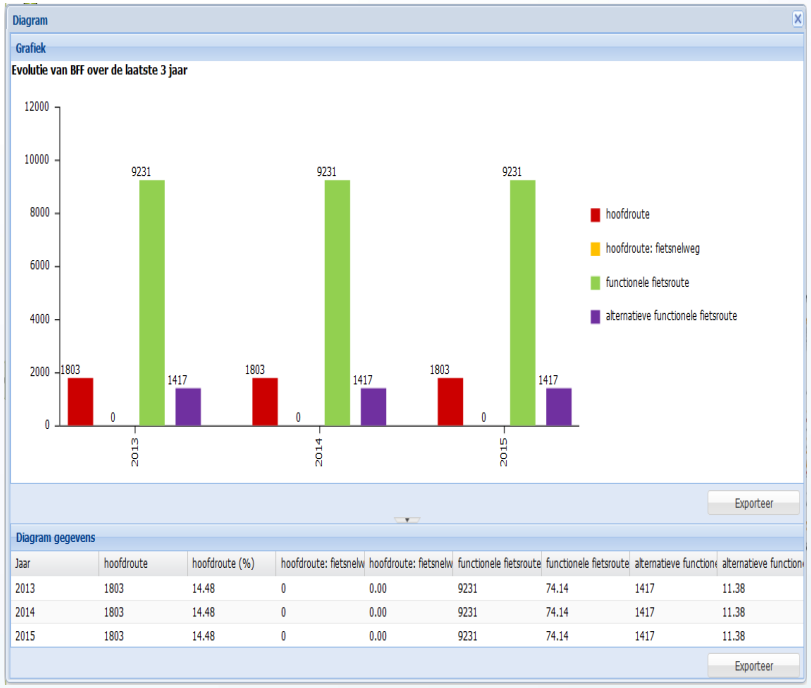
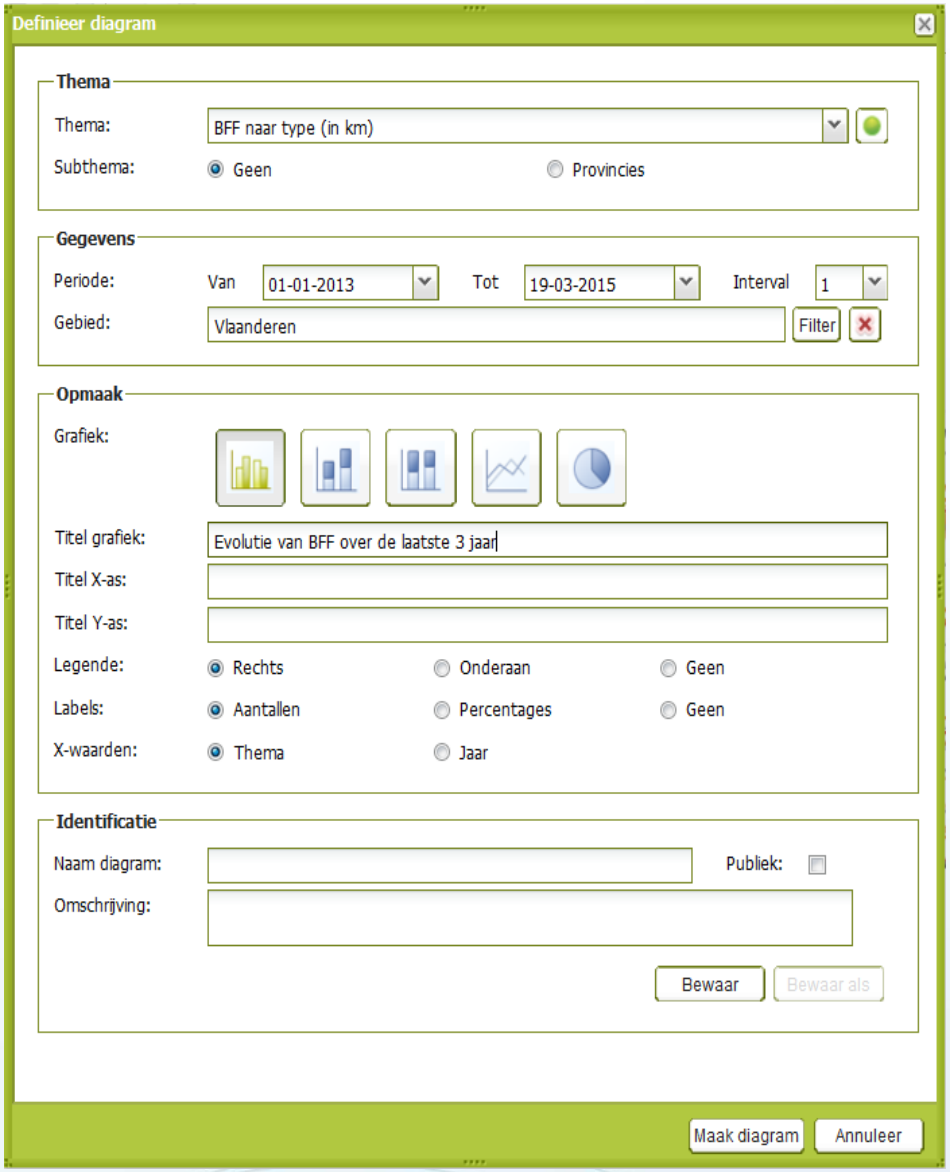
FCN - Reporting

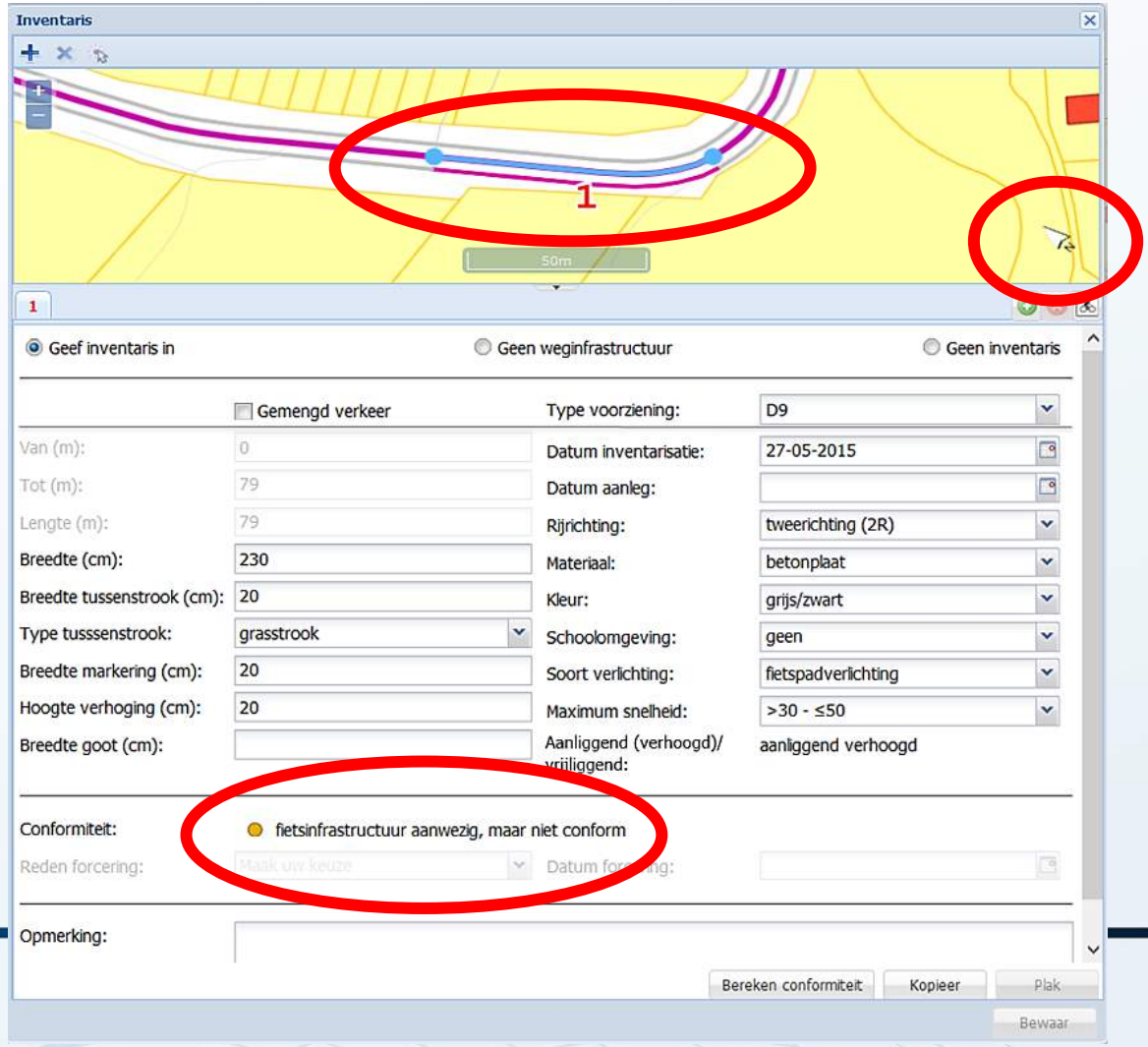
- Evolution in time
- ExtJS - HighCharts





FCN – Infrastructure inventory

- Map turned for best fit (OpenLayers 3)
- Edit inventory
  - Add, split, delete part of geometry
  - Edit attributes
- Copy inventory to other side
- Check compliancy

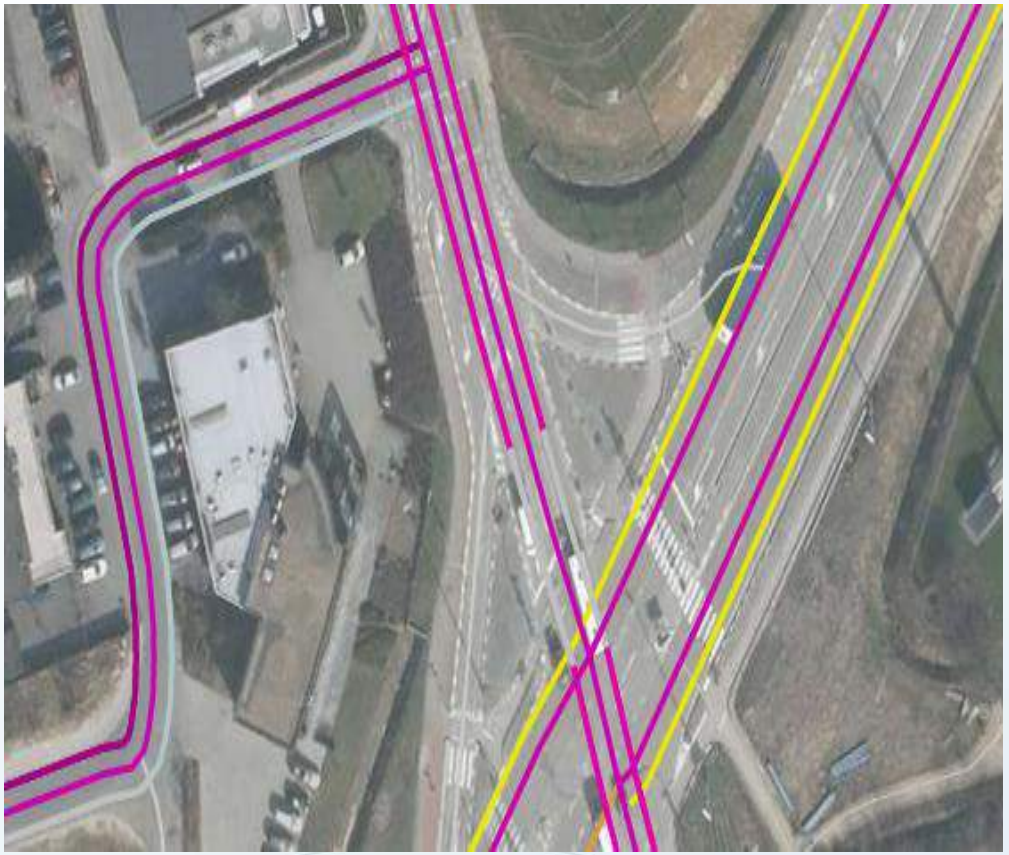


FCN – Offset rendering with JSTS

- Dynamic offset
- Left & Right
  - Based on measures (Linestring M)
  - Not on digitising direction
- SLD offset didn't solve problem

➔Client-side offset rendering with Javascript Topology Suite (JSTS)

  - Small artefacts at end of line



GEO solutions

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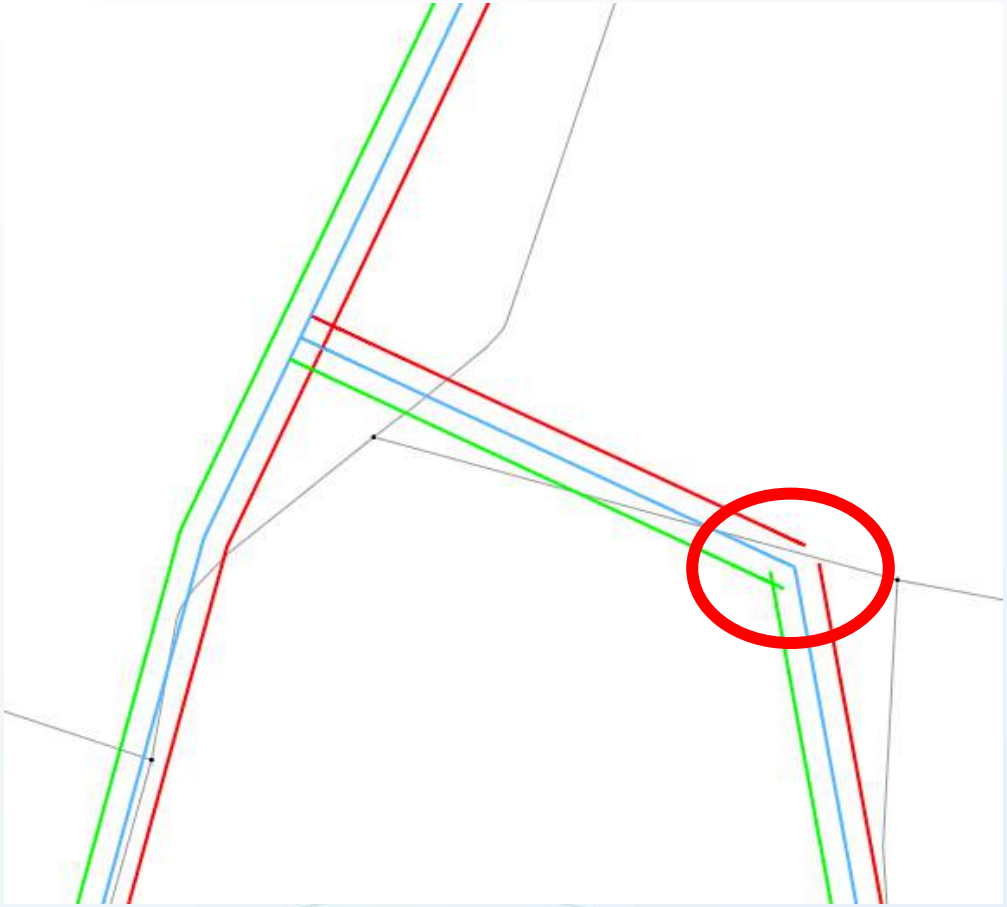
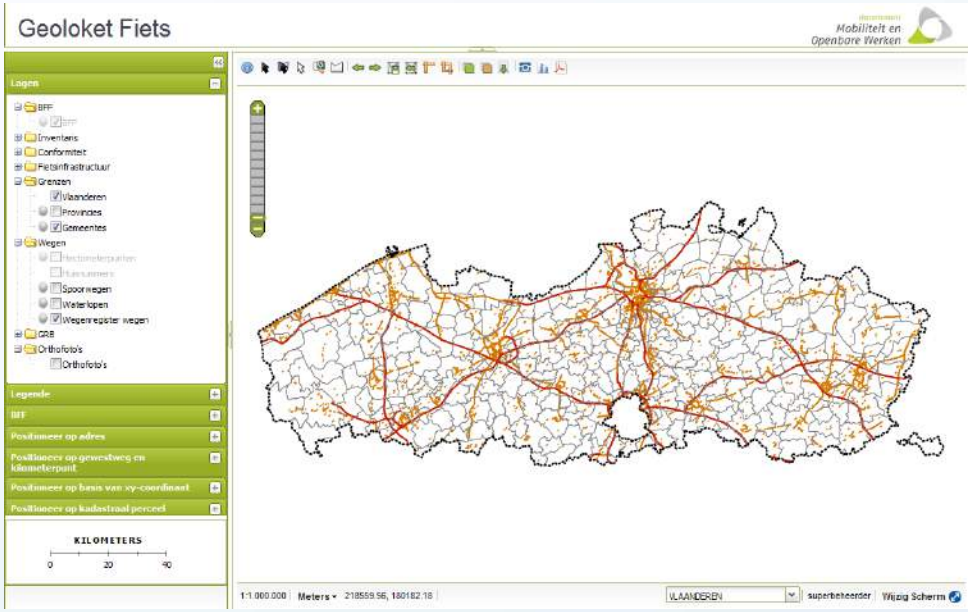


FCN – Project status

- Version 1.0: In production



FCN – Project status

- Ideas for future versions:
  - Follow-up investments on cycle path infrastructure
  - Mobile app for inventory on the field
  - Integration dataset MeasureBike:
    - measurement of vibrations (=comfort of a cycling path)

FCN - Data migration

FCN on old road network

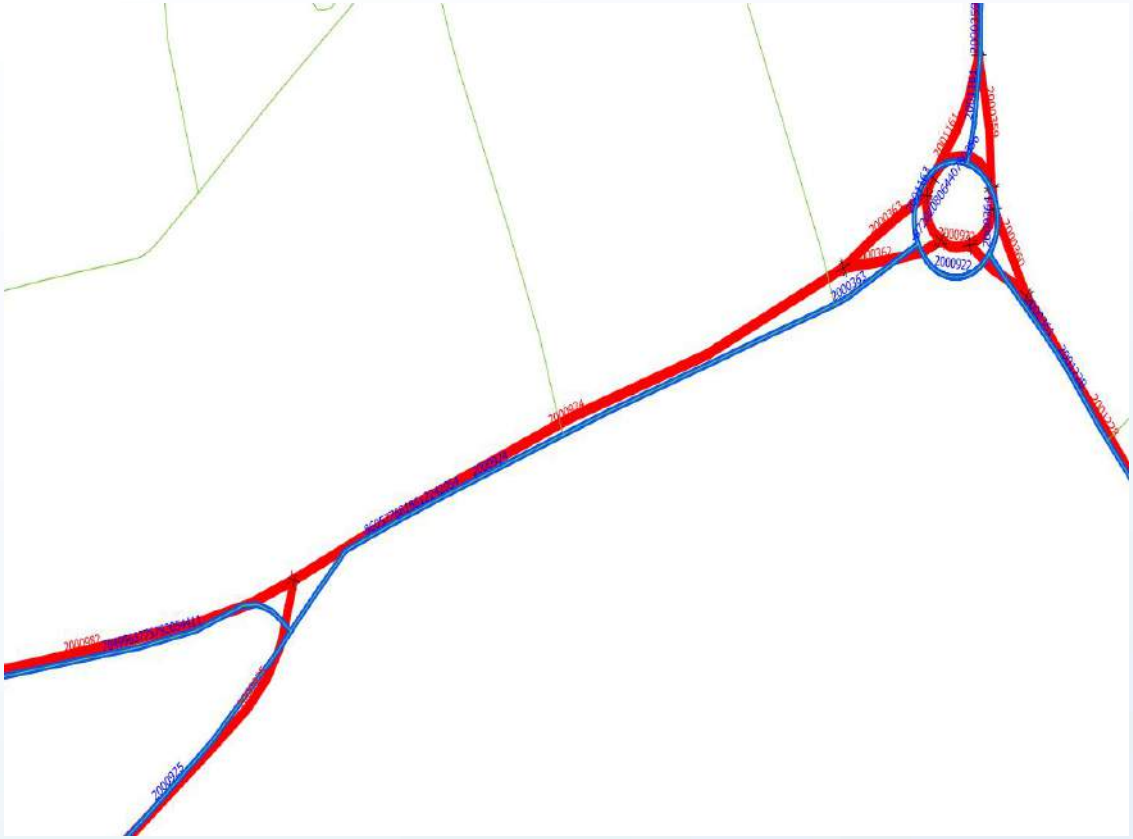
FCN on new road network:

Geometrically different!

FCN - Data migration

FCN on old road network

FCN on new road network:
Geometrically different!



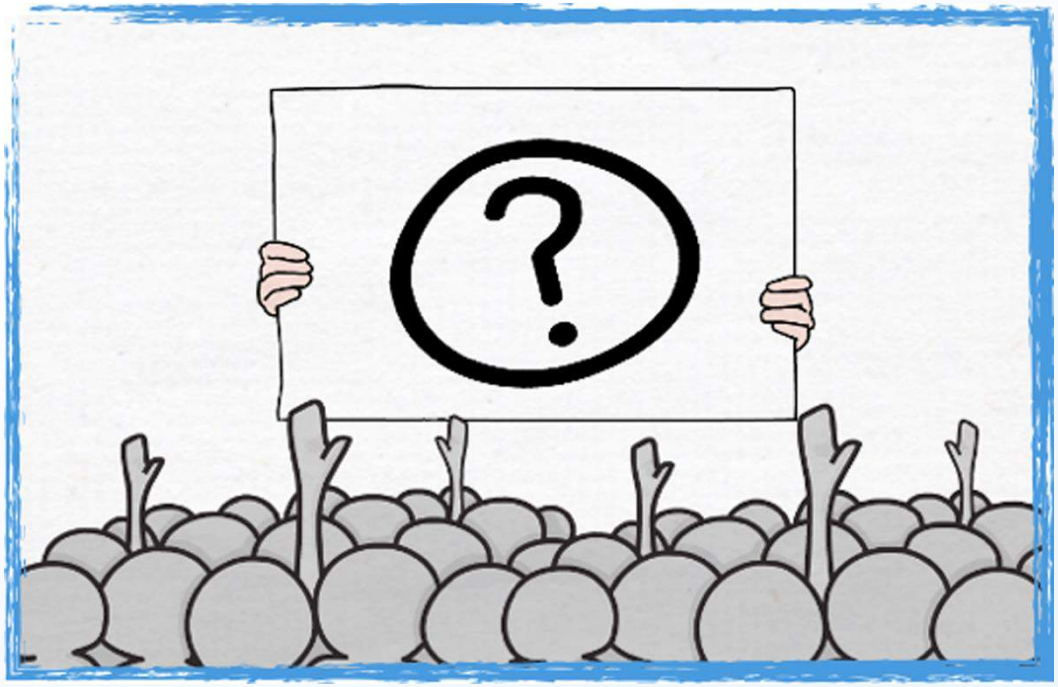
FCN – Data Migration (OpenLR)

- **OpenLR:**
  - OS project from TomTom
  - Methodology based on Location Reference Points (LRP)
  - **Encode** FCN in a network-independent format
  - **Decoding** network-independent format on new network

➔Manual validation and correction!

Thanks!

Any questions?



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