# Reducing excavation damage to subsoil infrastructure with INSPIRE

INSPIRE 2016 Conference, Barcelona, 30 September 2016

Stijn Goedertier (GIM), Ken Bragg (Safe Software)

# Flanders has 600.000 km of underground cables and pipelines

... 600.000 km of underground cables and pipelines

... hundreds of utility operators and thousands of contractors

... Excavation damage is a daily nuisance

# When disaster strikes…

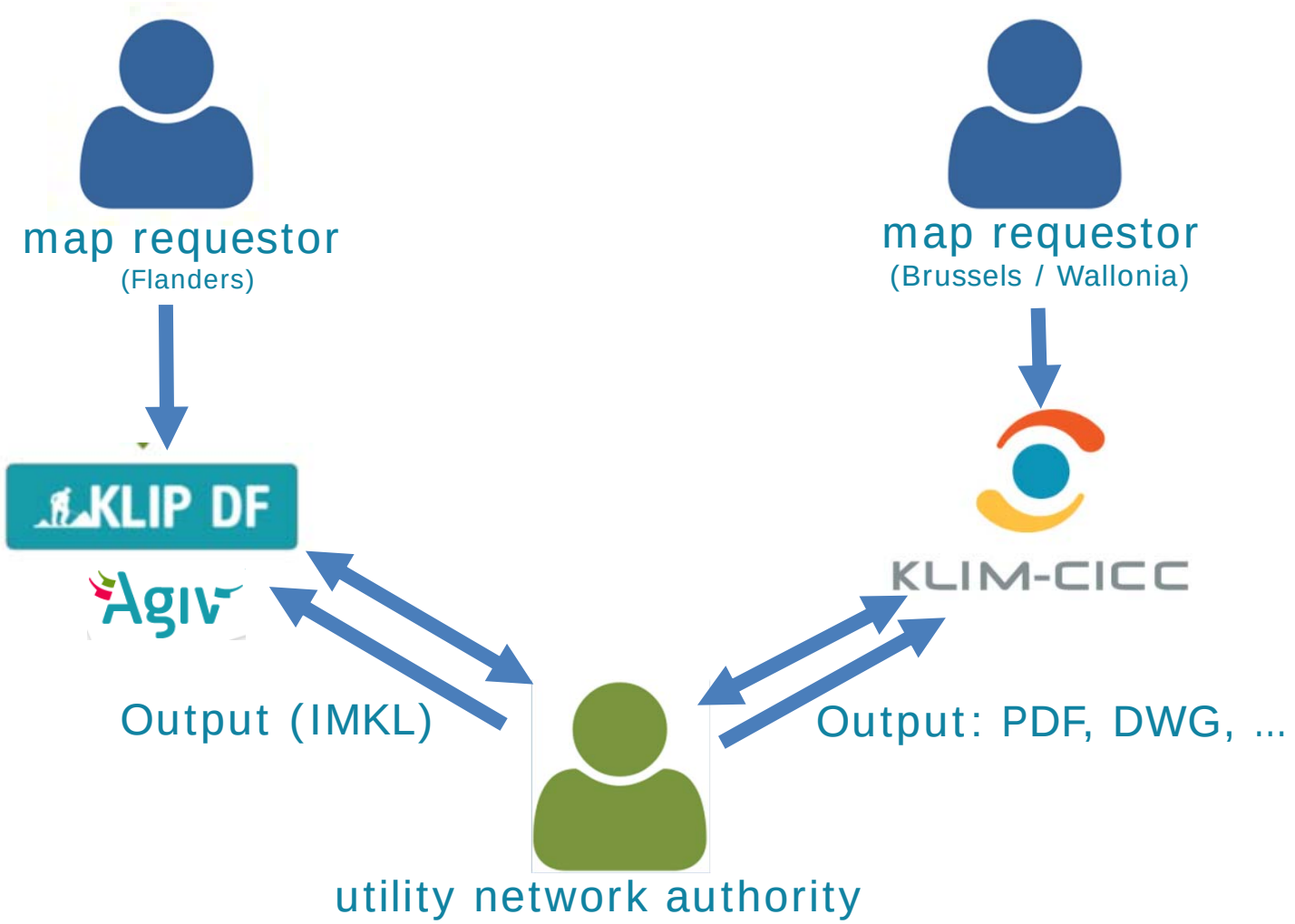
The Ghislenghien explosion of 30 July 2004 caused by excavation works took 24 lives and wounded 132.


# Initiatives in Flanders…

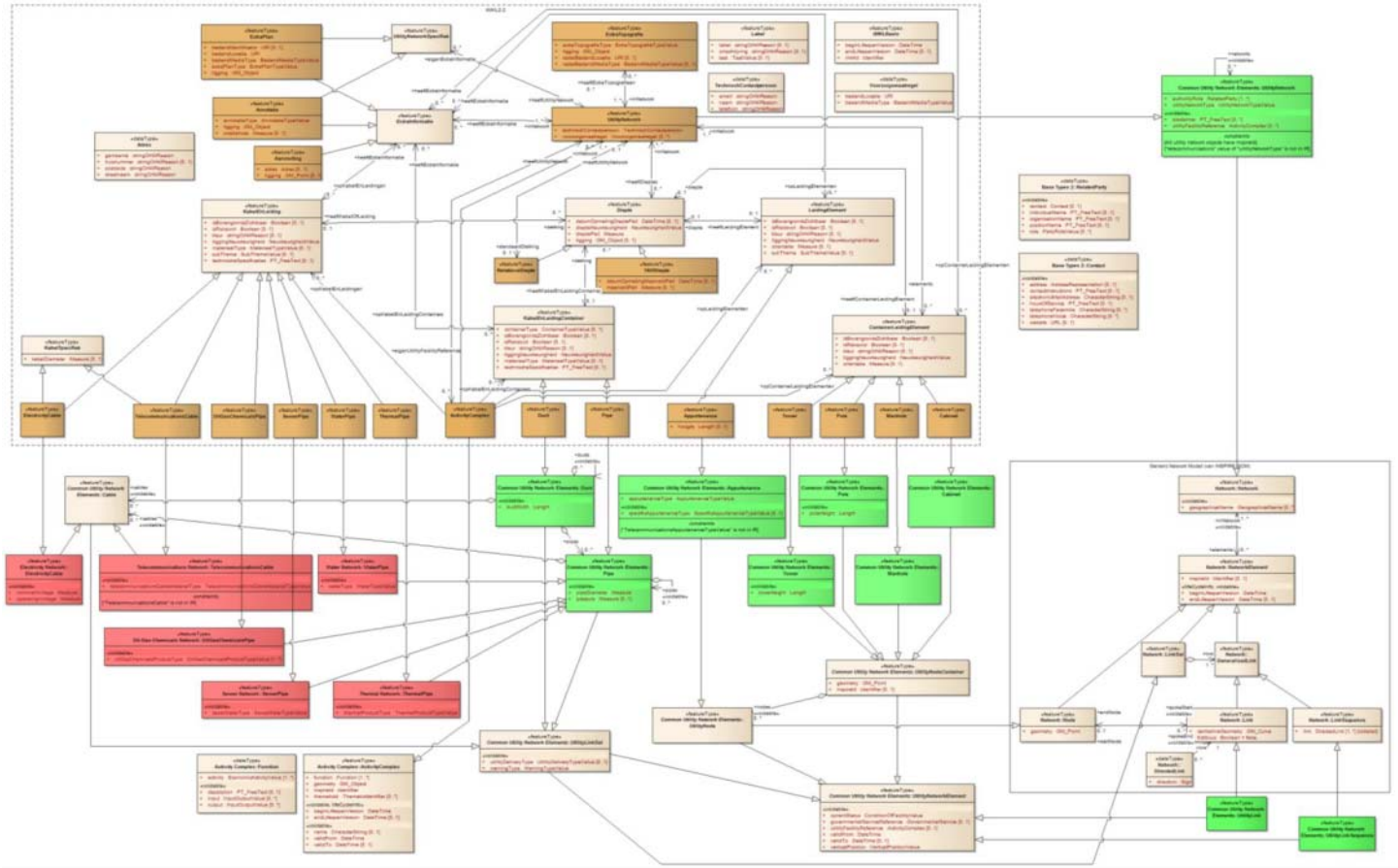
**Flanders: KLIP Decree of 14 March 2008**: obligation to request (and provide) cable and pipeline information via a portal **(KLIP portal)**

- **Phase 1**: 1 March 2007: requests only
- **Phase 2**: 1 April 2015: KLIP Digital: respond with digital map data in IMKL format, mandatory by 1 January 2016.

# How does the process work?



# IMKL2.2 extends the INSPIRE US specs



**Orange**: IMKL2.2
**Green**: INSPIRE US 3.0 Common
**Red**: INSPIRE US 3.0 Cables and Pipes (per theme)
White: Abstract & Code lists from INSPIRE US 3.0, INSPIRE GCM Network Mode

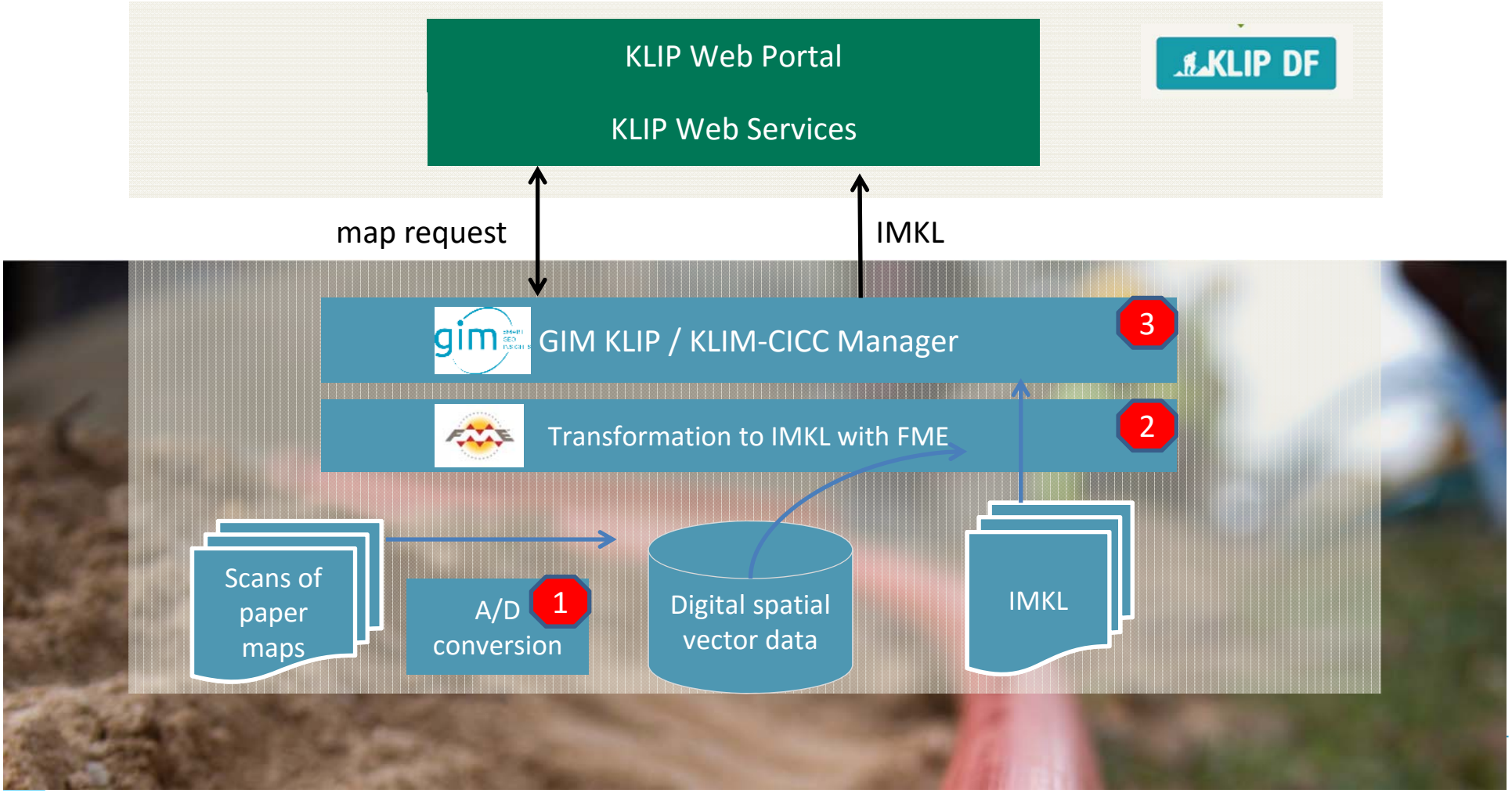
# Overall impact: reduction in claims

- KLIP Digital makes a fully automated processing possible for cable and pipeline operators.
- **80%** reduction in overall administrative costs from 10.594 K€ to 1.919 K€ according to Agentschap Informatie Vlaanderen (AIV)
- **50%** reduction in time from maximum 15 to 7 calendar days
- **20%** Reduction in damage claims, according to Datassur-Assuralia

# GIM helped 40+ cable and pipeline operators implement KLIP / KLIM-CICC

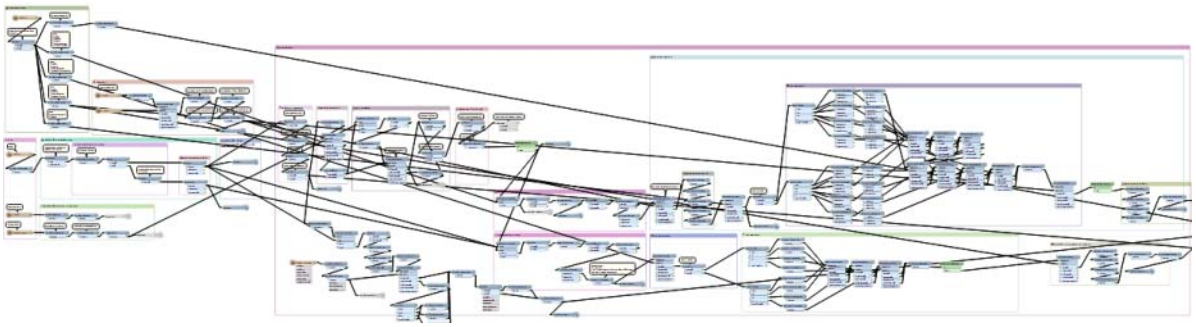

- GIM KLIP / KLIM-CICC SaaS: > 1000 map requests per day
- Client-side deployment: # requests not known

# Architecture

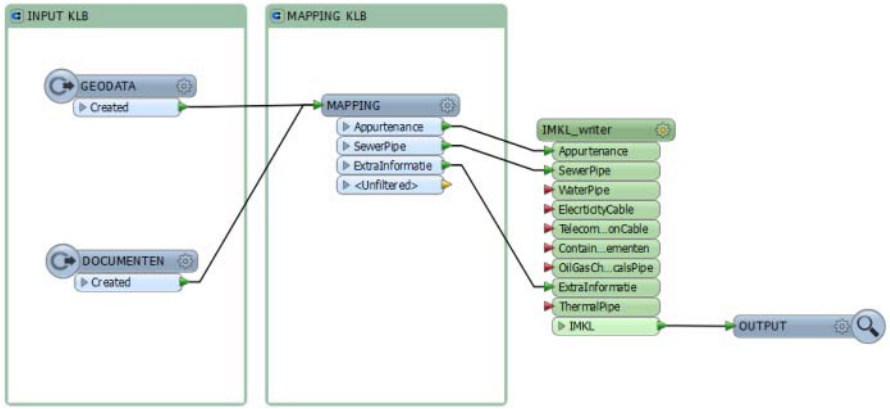


# For each map request, FME is used for data conversion to IMKL

- FME Workspace



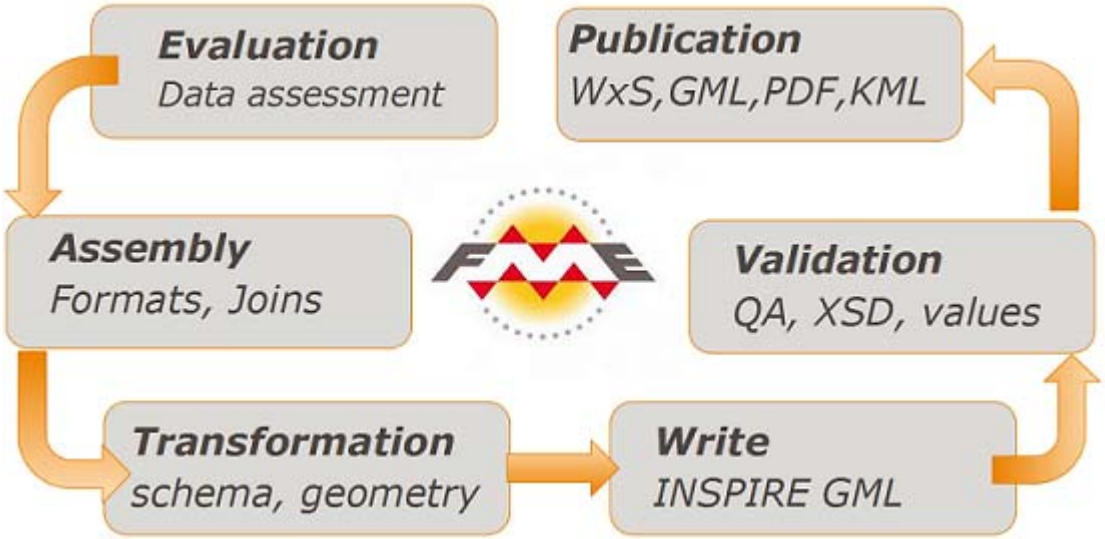
- Simplified: IMKL Writer (GIM custom transformer for FME)




# IMKL Writer (licensed custom FME transformer)

- **Attribute creation:** mandatory attributes, default values, …
- **UtilityNetwork:** drilldown parent-child relationship (sub-networks).
- **Generates UtilityLinks:** generates UtilityLink objects from which utility objects derive their geometry and connectivity information
- **Depths:** generate relative depth, TAW depth objects
- **Validation**: uniqueness IDs, mandatory attributes, attribute syntax (regex), geometries, …
- **GML**: uses the FME GML writer to write the XML result

# FME supports the entire lifecycle of INSPIRE data production



# Conclusion

- A use case of INSPIRE with tangible benefits… outside the environmental policy domain
- > 1000 map requests treated everyday with GIM & FME technology in INSPIRE conform data.

# Thank you!

**Stijn Goedertier**
GeoICT Project Manager
GIM
stijn.goedertier@gim.be
+32 496 105 390

**Steven Smolders**
Technology Director
GIM
steven.smolders@gim.be
+32 498 976 843

**Ken Bragg**
European Services Manager
Safe Software
ken.bragg@safe.com
+33 7 86 42 92 72