Beginning study about : Taking into account the dependency between the thematic data and the reference data throughout the process of automatic generalisation

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Outline

1. Definitions
2. Problem statement
3. Referencing thematic data on topographic data
4. Case study of reference system
5. Conclusion and perspective

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1. Definitions

Mashup :

In Computer science, a mashup is a web page or an application that combines data or functionality from two or more external sources to create a new service (Wikipedia).

Youtube video

1. Definitions

Mapping mashup, map mashup, geomashups :

Combining data (personal or public) with a locating data through API like Google maps (McConchie 2008)

(http://www.theatreinchicago.com)

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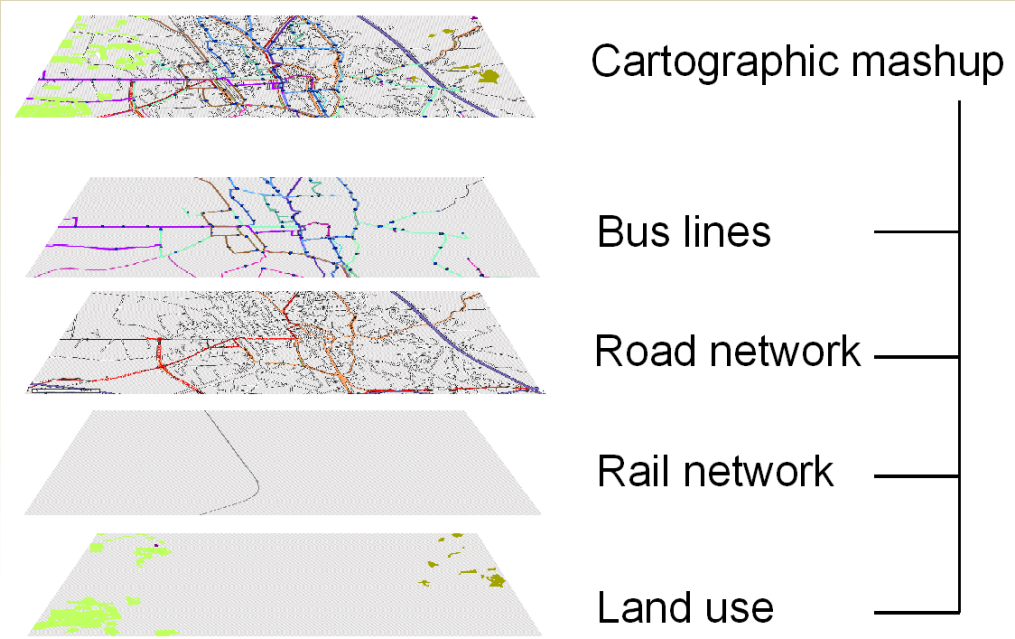
1. Definitions

Cartographic mashups for us :

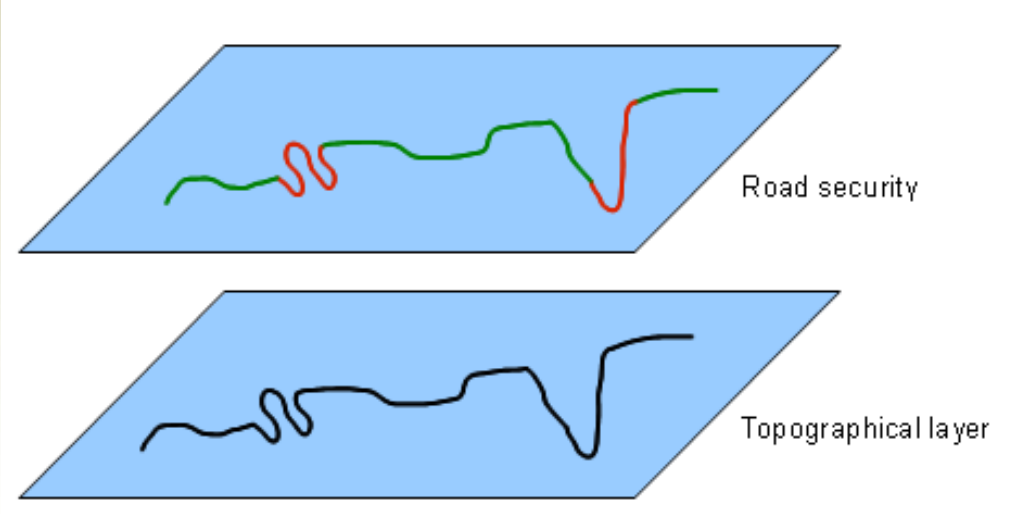
Group of geographic data layers which may come from more than one source, these layers are superimposed



1. Definitions

Thematic data: Features of one type that are generally placed together in a single layer(wiki.gis.com).

Topographic data: the reference data, serve at locating the thematic data.



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2.Problem statement

More and more data available through the web.

- Different Lod and *specifications*.
- Thematic or topographic
- More and more VGI.

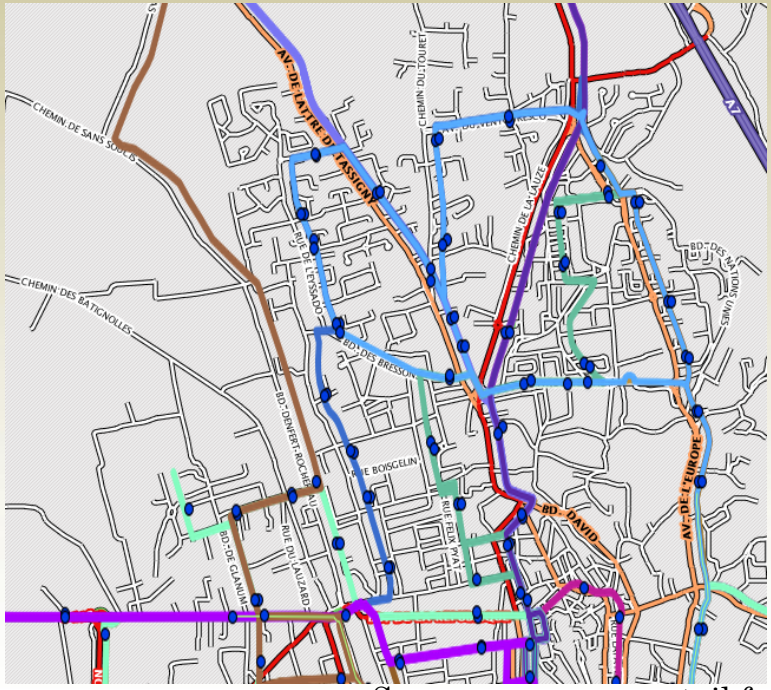
=> more and more mashups

=>Intgration and generalisation become more complex

2.Problem statement

Problems of integration:

- Shifts, it may break semantic relations (Bus lines are along roads)



Source : www.geoportail.fr

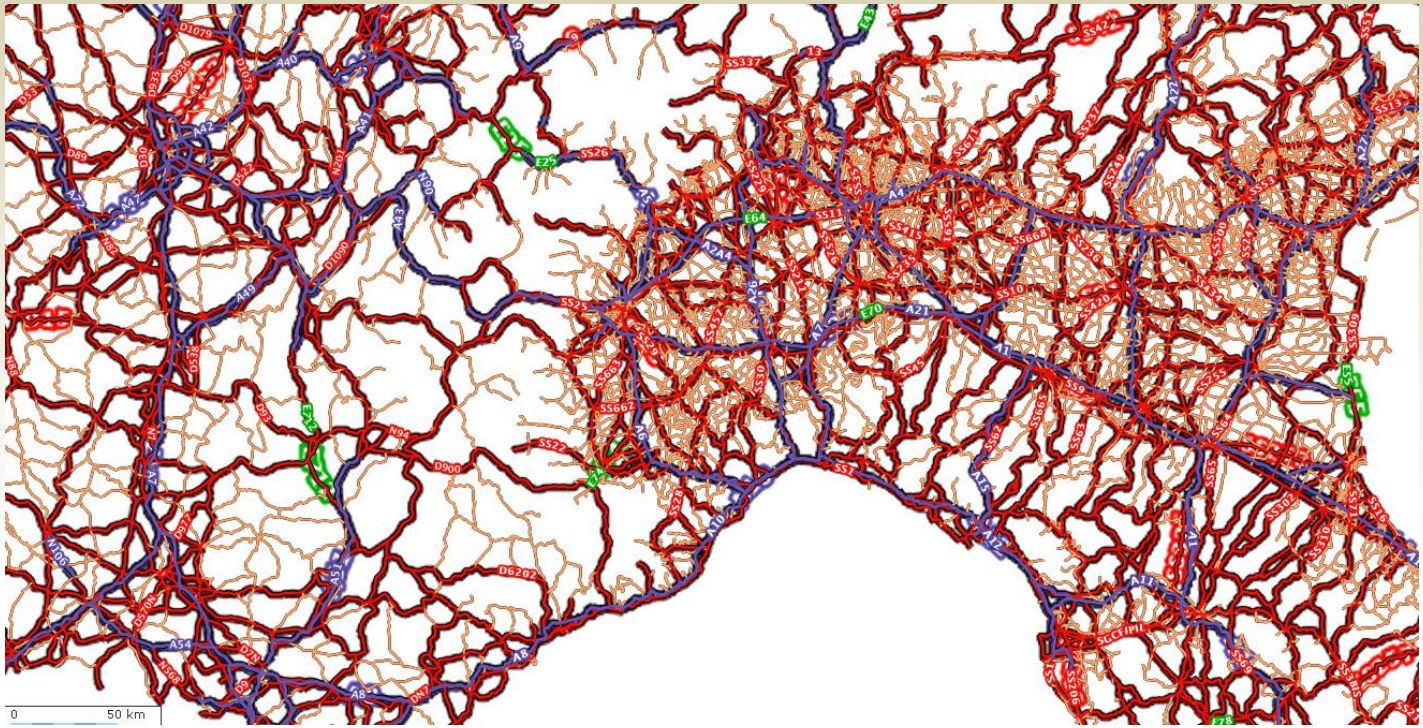
Bus lines (thematic layer)

Road network (topographic layer)

2.Problem statement

Problems related to generalisation:

- Different Lod, between layers or in the same layer



Source : geoportail(http://www.geoportail.fr)

2.Problem statement

Problems related to generalisation:

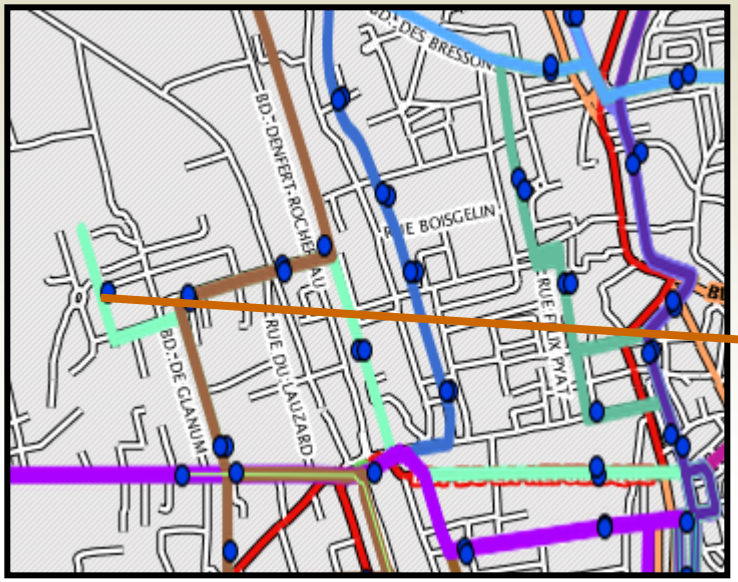
- Different Lod, between layers or in the same layer
- Visualisation at a smaller scale.

Source : www.geoportail.fr

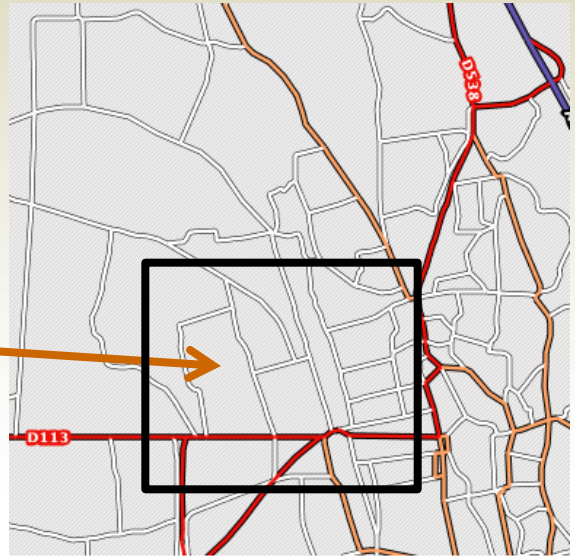
2.Problem statement

Problems related to generalisation:

- Different Lod, between layers or in the same layer
- Visualisation at a smaller scale.
- No respect of the thematic data



The road is deleted ☹

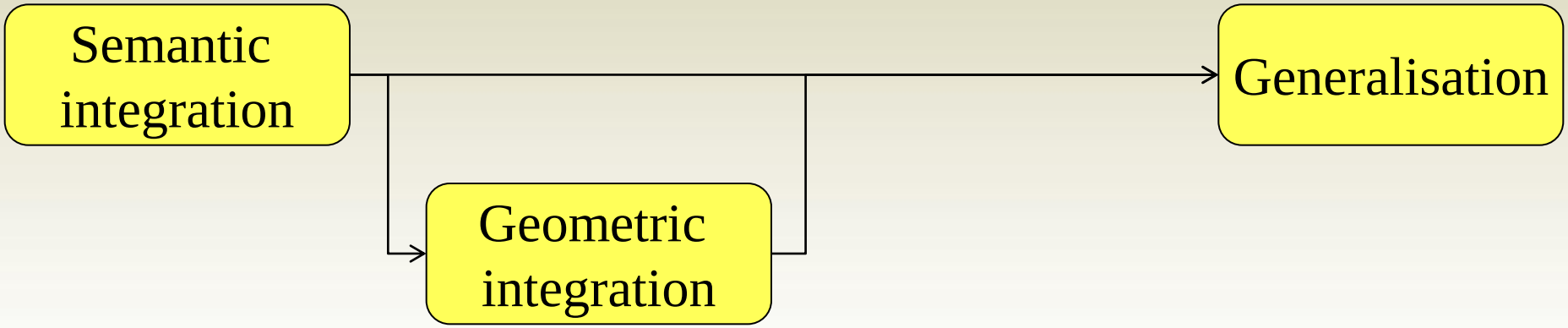


Scale of topographic layer 1:18000

Scale of topographic layer 1:32000

2.Problem statement

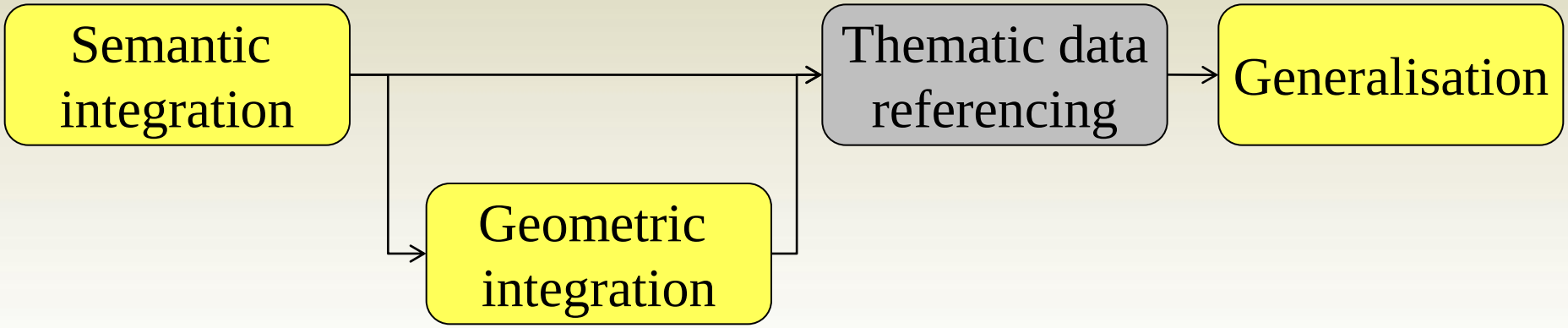
Sequence of integration and generalisation process :



2.Problem statement

Sequence of integration and generalisation process :

Our proposed changement :



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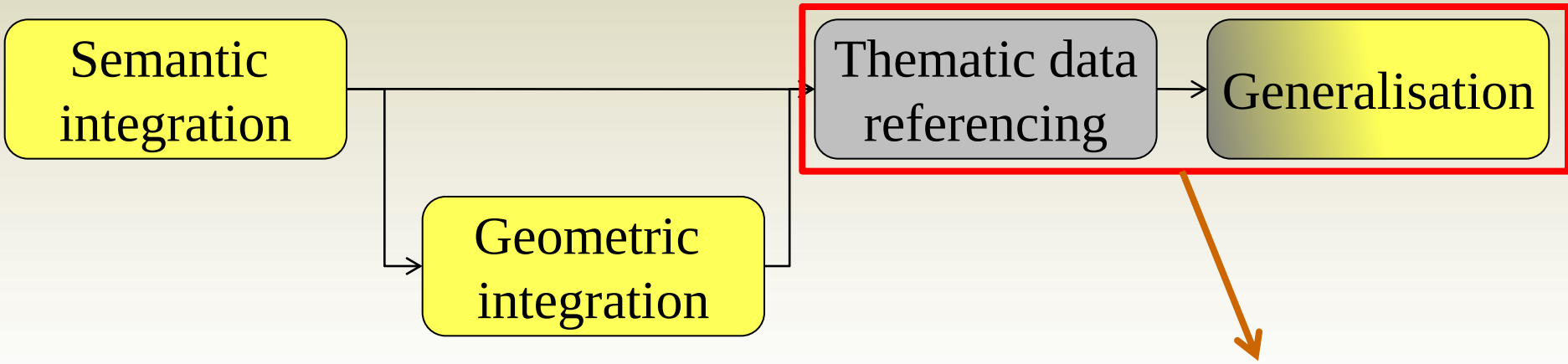

We work on this part

2.Problem statement

General objective

Be able to take into account dependencies between layers during the generalisation of cartographic mashups

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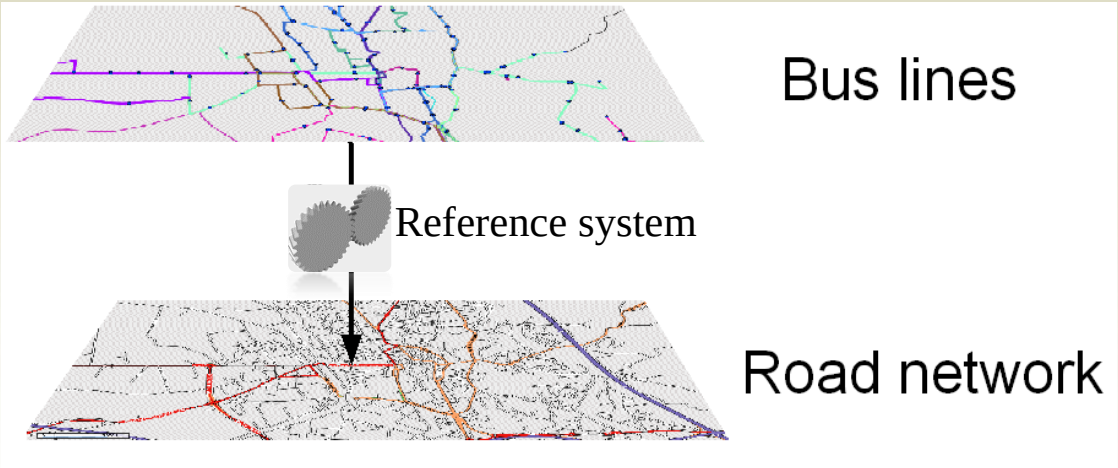
3. Referencing thematic data

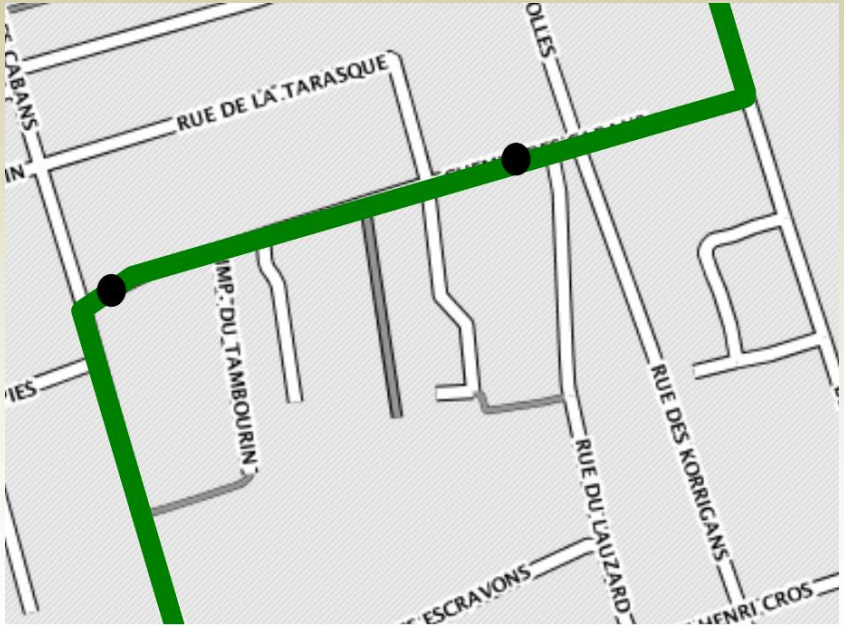
To preserve the relation between thematic and topographic data, we have to reference the thematic data



3. Referencing thematic data

We propose two components reference system

- Semantic component: Semantic relations between objects (using Ontologies)



Semantically, bus lines related to a road

3. Referencing thematic data

We propose two components reference system

- Semantic component: Semantic relations between objects (using Ontologies)
- Spatial component : Relative topologic and metric position

Between « Tarasque » and « lauzard » roads

Before the crossroad

Topologic position

3. Referencing thematic data

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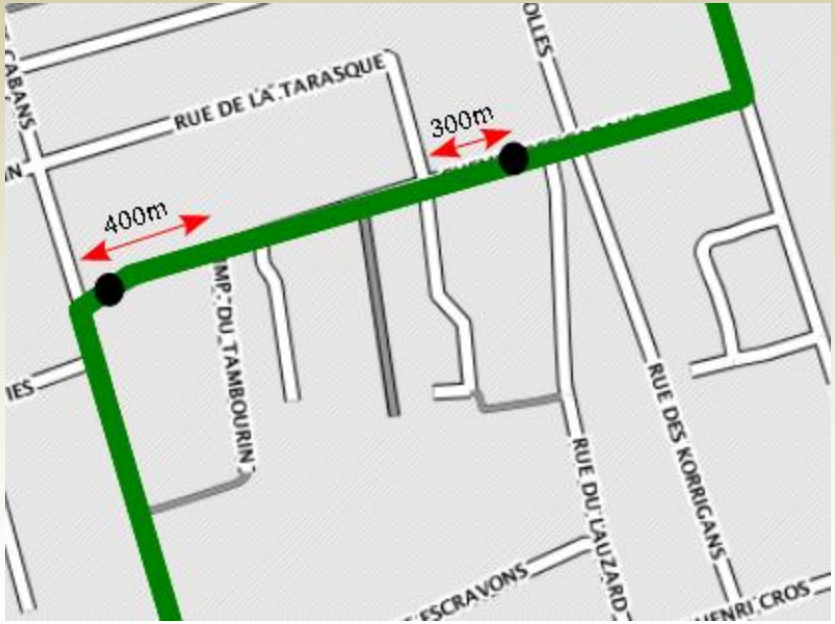

Metric position

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4.Case study of reference system

The case study is used to refine our propositions and to test our ideas

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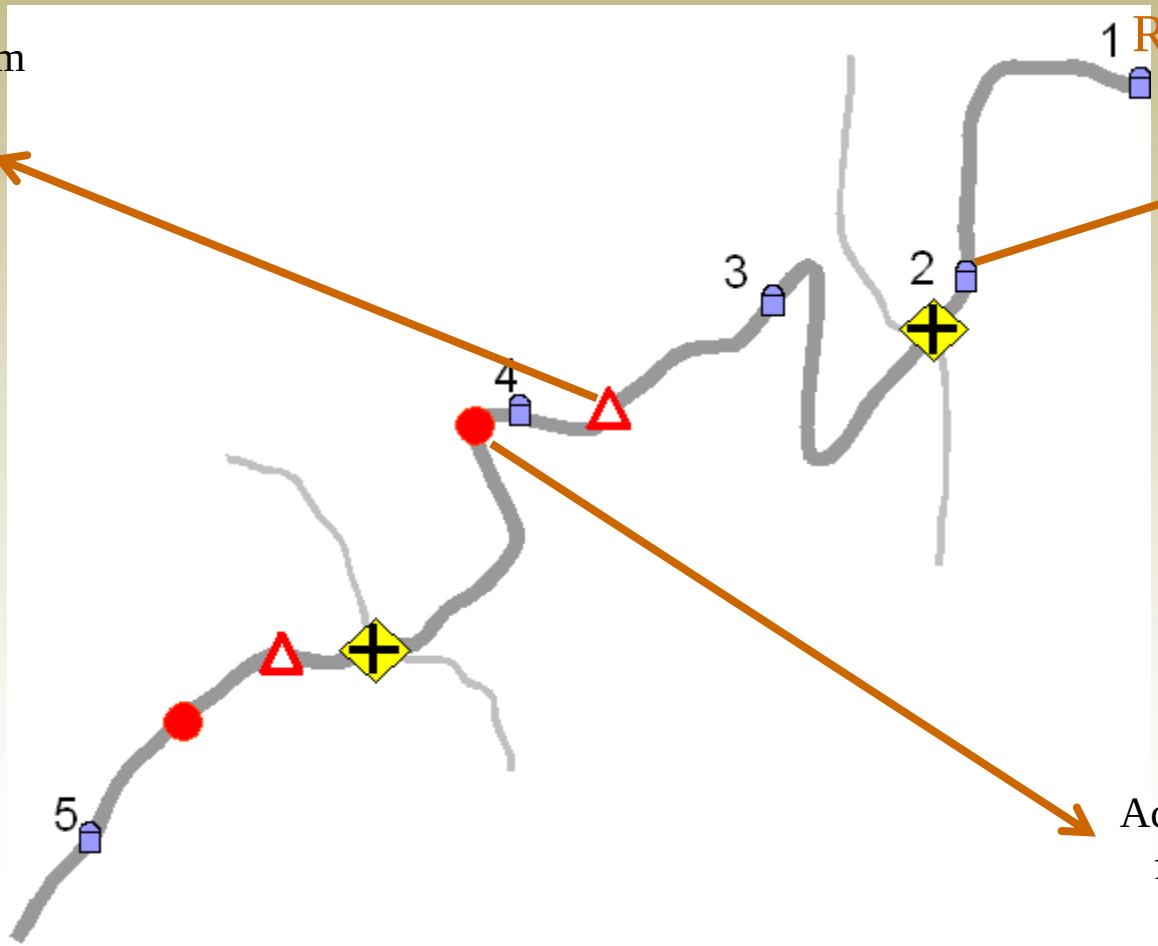
Cooperation with public road manager

- Thematic data = road information : security , accidents, traffic lights, signs…etc.
- The localization of their data is based on physical objects (milestones)

4.Case study

Trafic sign after 720m
from milestone 4

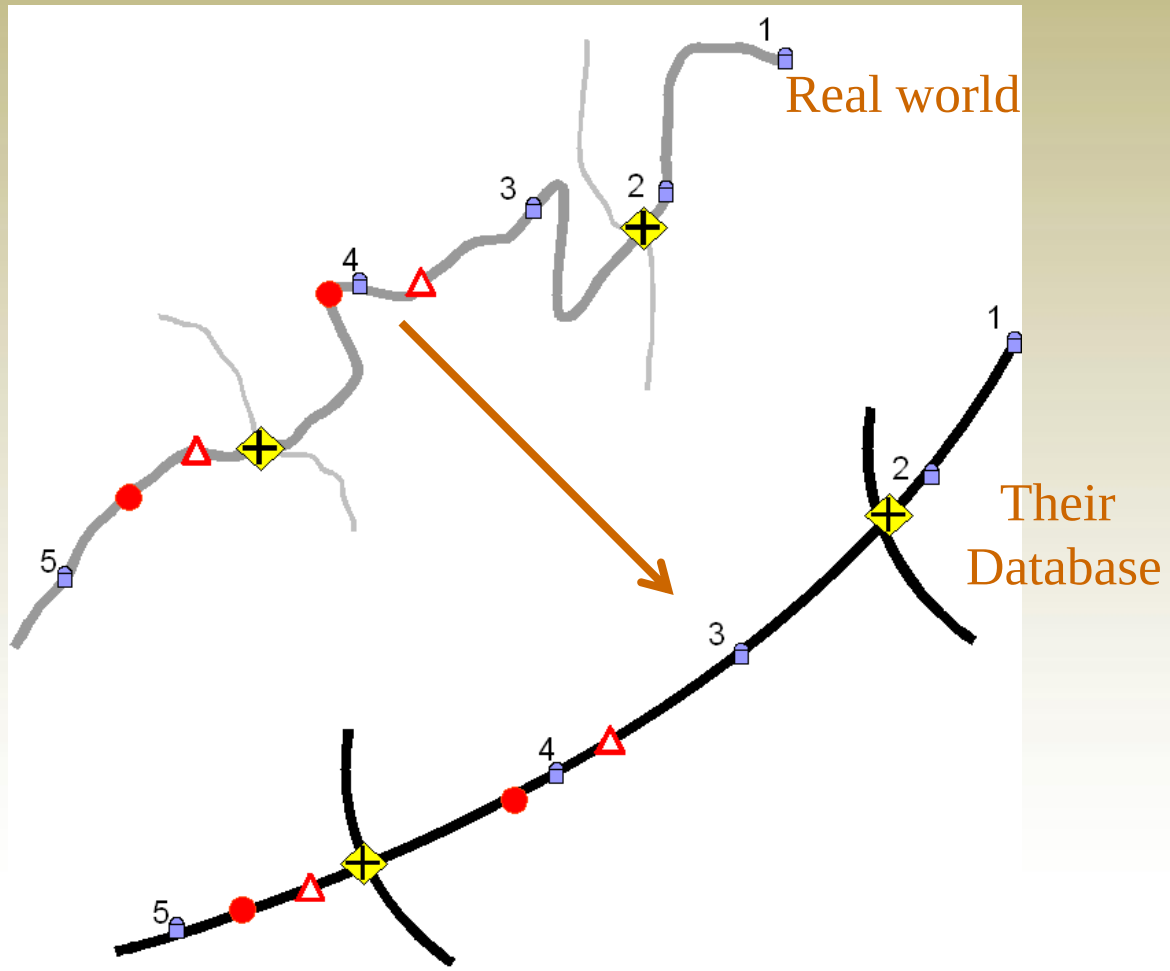


Real world

Milestone no.2

Accident after 155 m
from milestone 5
The 20/06/2011
(Over speed)

4.Case study



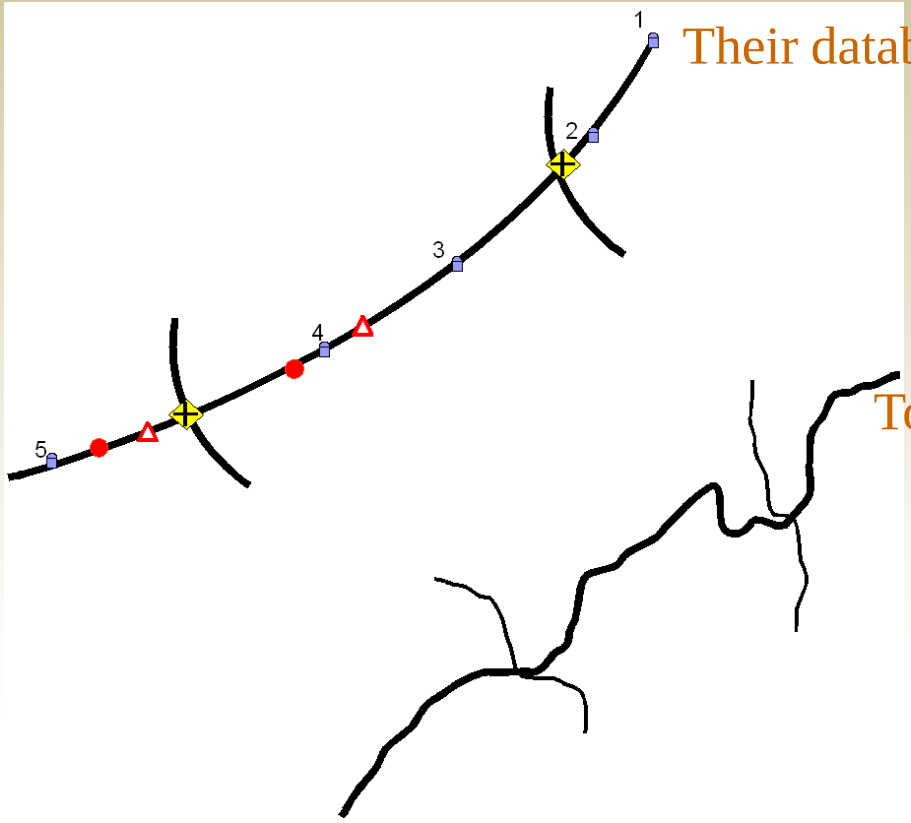
4.Case study

Table of milestones :

ROUTE	POS	RUB	AGE	MOIS	ANNEE	PRD	ABD	PRF	ABF	CUMULD	CUMULF	LG_INTER-PR	NUMERO_BORNE
976N0001		2	0	11	98	0	0	1	0	0	1004	1004	0
976N0001		2	0	11	98	1	0	2	0	1004	2000	996	1
976N0001		2	0	11	98	2	0	3	0	2000	2993	993	2
976N0001		2	0	11	98	3	0	4	0	2993	3984	991	3
976N0001		2	0	11	98	4	0	5	0	3984	4977	993	4
976N0001		2	0	11	98	5	0	6	0	4977	5967	990	5
976N0001		2	0	11	98	6	0	7	0	5967	6958	991	6
976N0001		2	0	11	98	7	0	8	0	6958	7953	995	7
976N0001		2	0	11	98	8	0	9	0	7953	8891	938	8
976N0001		2	0	11	98	9	0	10	0	8891	9882	991	9
976N0001		2	0	11	98	10	0	11	0	9882	10873	991	10
976N0001		2	0	11	98	11	0	12	0	10873	11863	990	11
976N0001		2	0	11	98	12	0	13	0	11863	12852	989	12
976N0001		2	0	11	98	13	0	14	0	12852	13842	990	13
976N0001		2	0	11	98	14	0	15	0	13842	14833	991	14
976N0001		2	0	11	98	39	0	999	0	14833	15052	219	15
976N0004		2	0	3	97	0	0	1	0	0	1000	1000	0
976N0004		2	0	3	97	1	0	2	0	1000	2000	1000	1
976N0004		2	0	3	97	2	0	3	0	2000	3000	1000	2
976N0004		2	0	3	97	3	0	999	0	3000	4045	1045	3

4.Case study

They located their thematic data by finding the corresponant of crossroads on the topographic database



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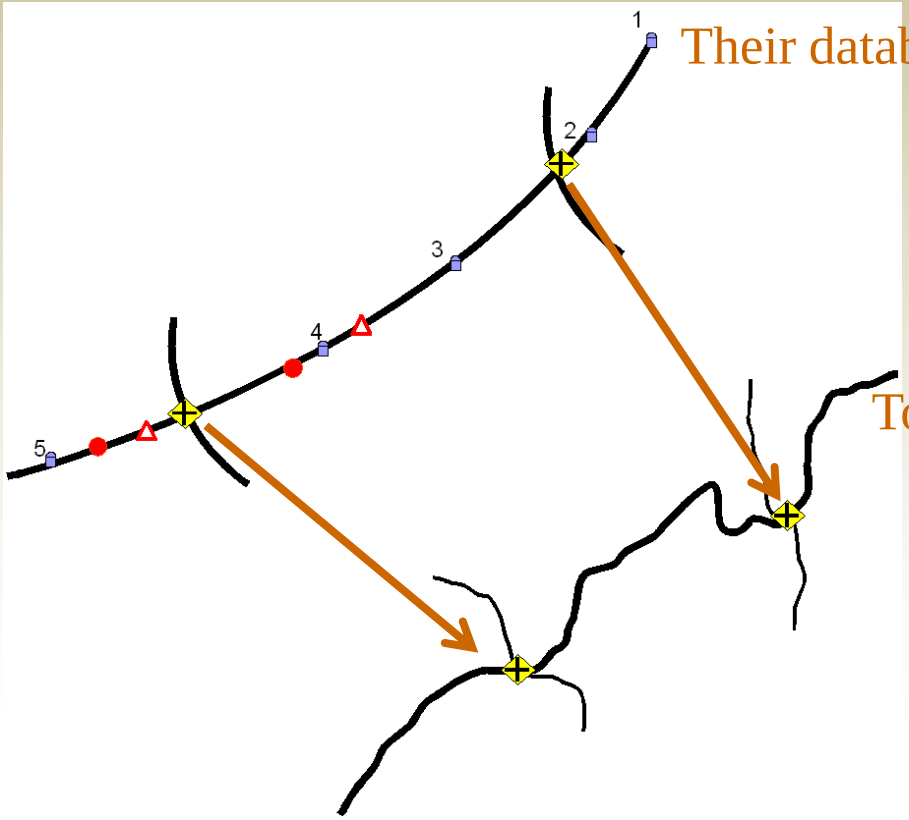
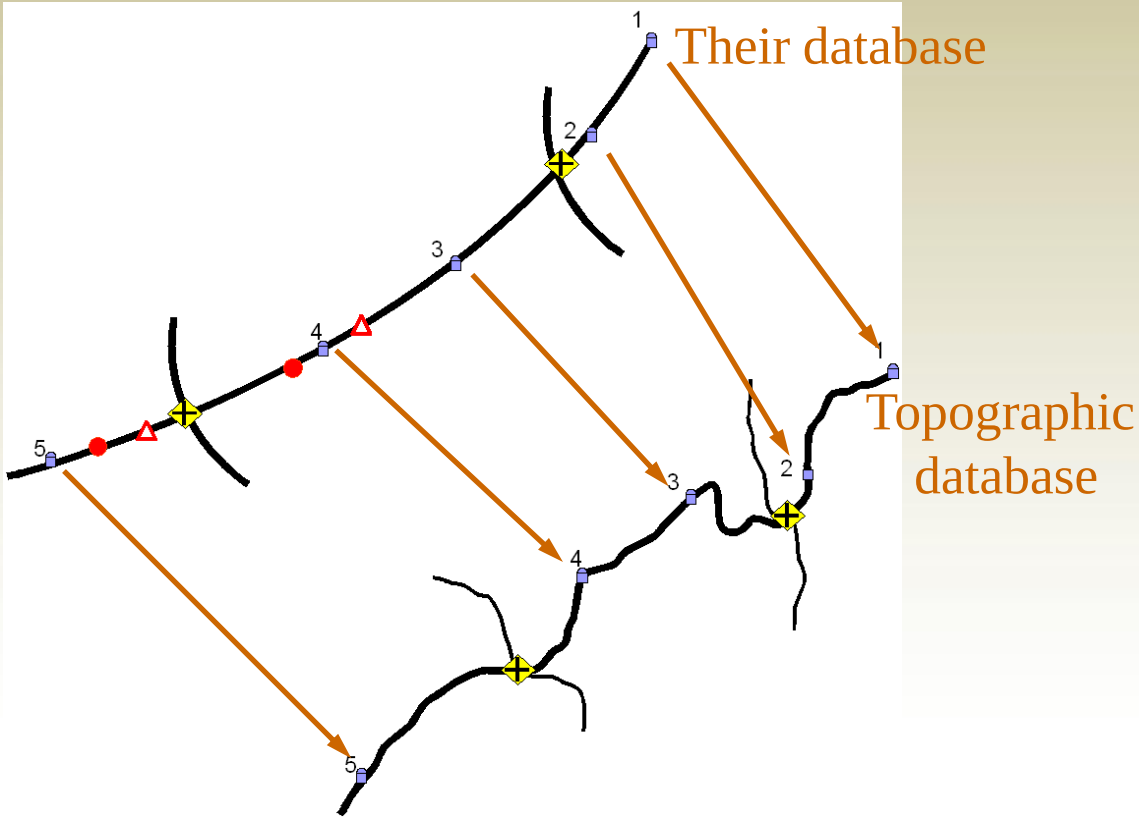


4.Case study

So

- they locate the milestones of crossroads
- then locate the other objects in a proportional way



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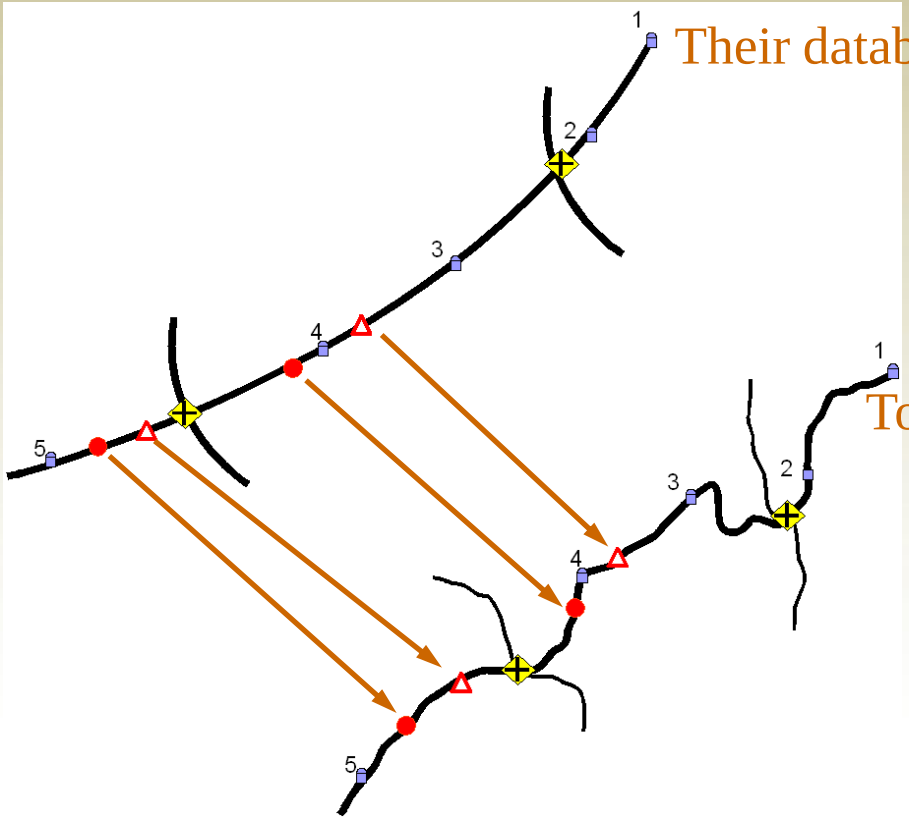
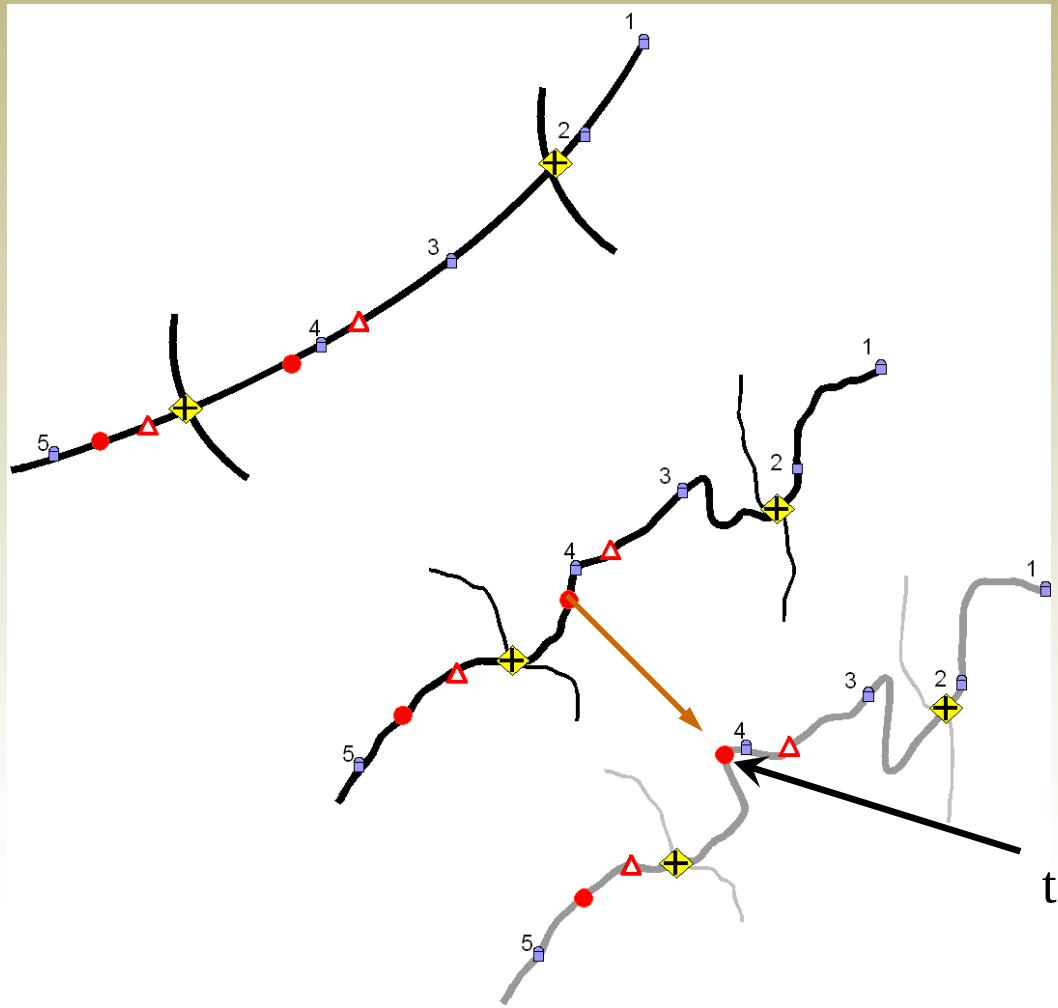


Their database

Topographic database

4.Case study

BUT :

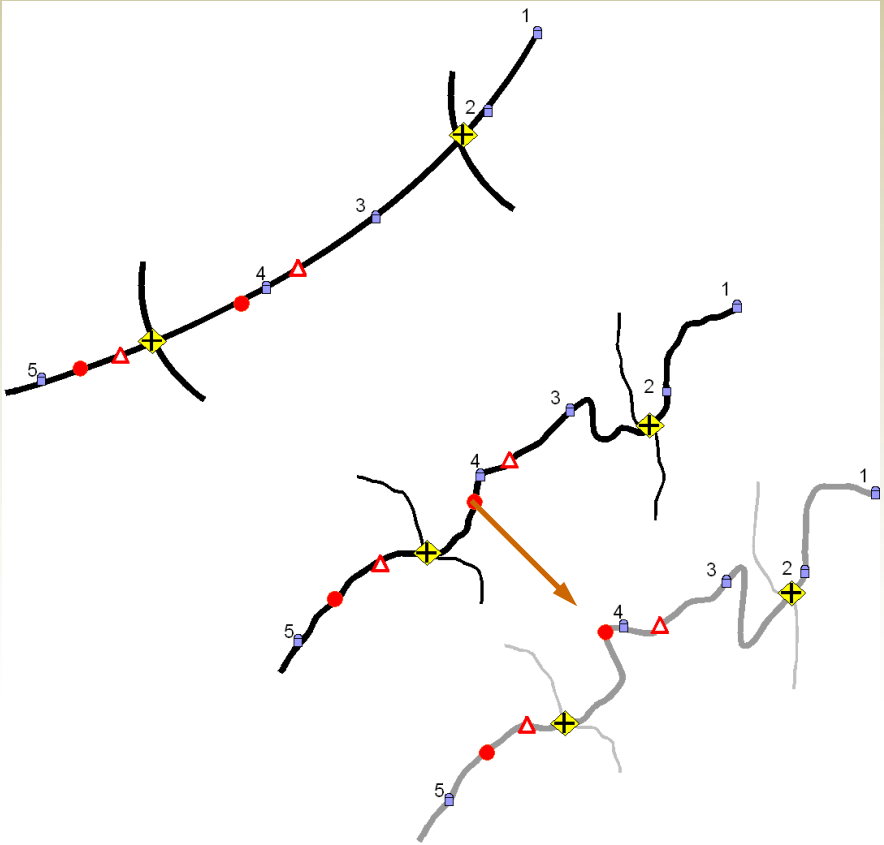


Not the same topologic position !!

4.Case study

Problem :

We need to conserve the semantic and spatial relations when we locate the thematic data.

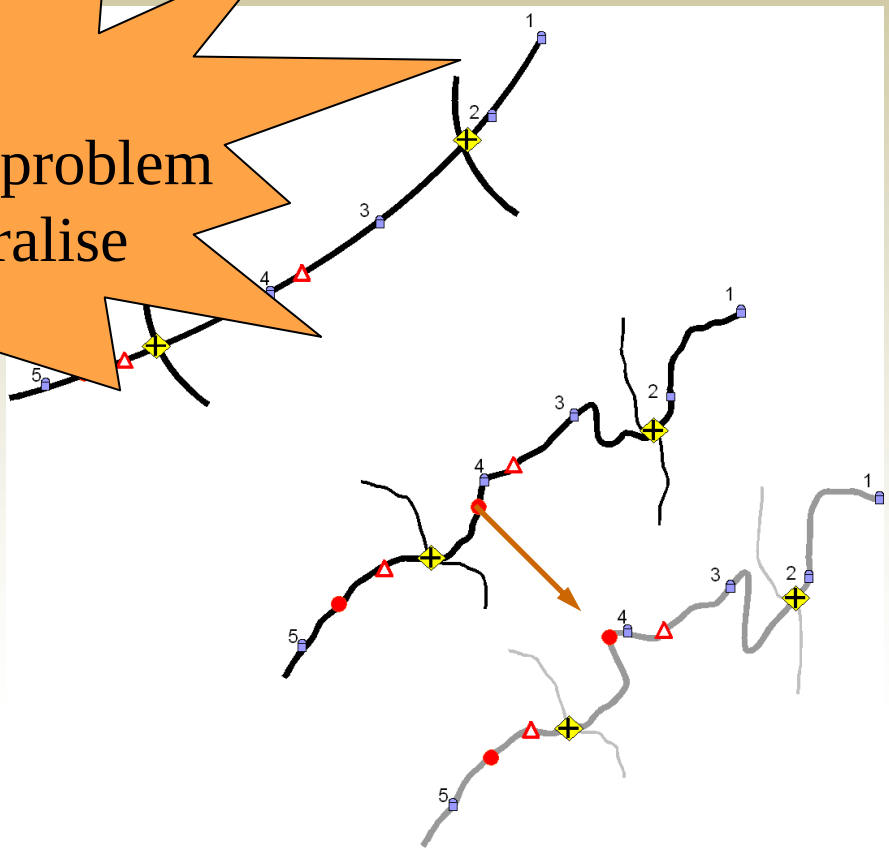


4.Case study

Problem :

We need to conserve the semantic and spatial relations when we locate the thematic data.

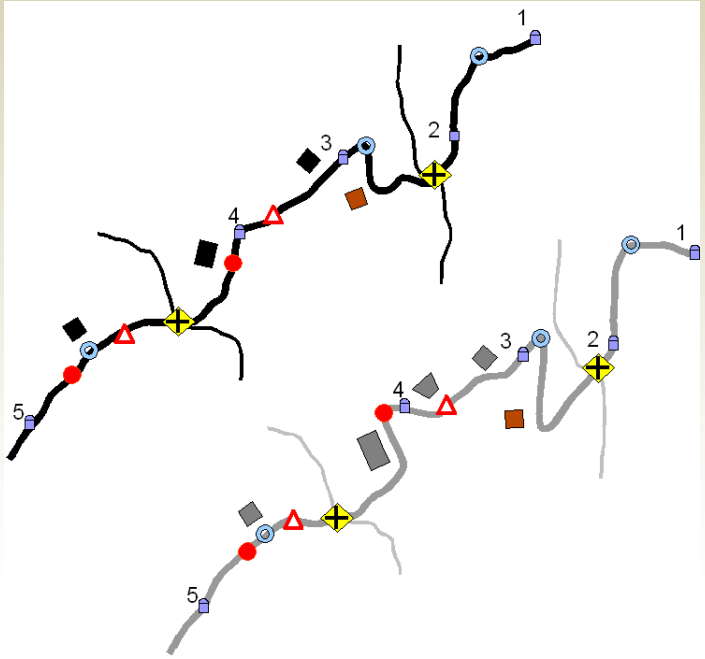
We have the same problem when we generalise



4.Case study, possible solution

What we propose to do :

- insert characteristic points be recognized between geographical databases and extract the relations topologic and metric of thematic data with them.



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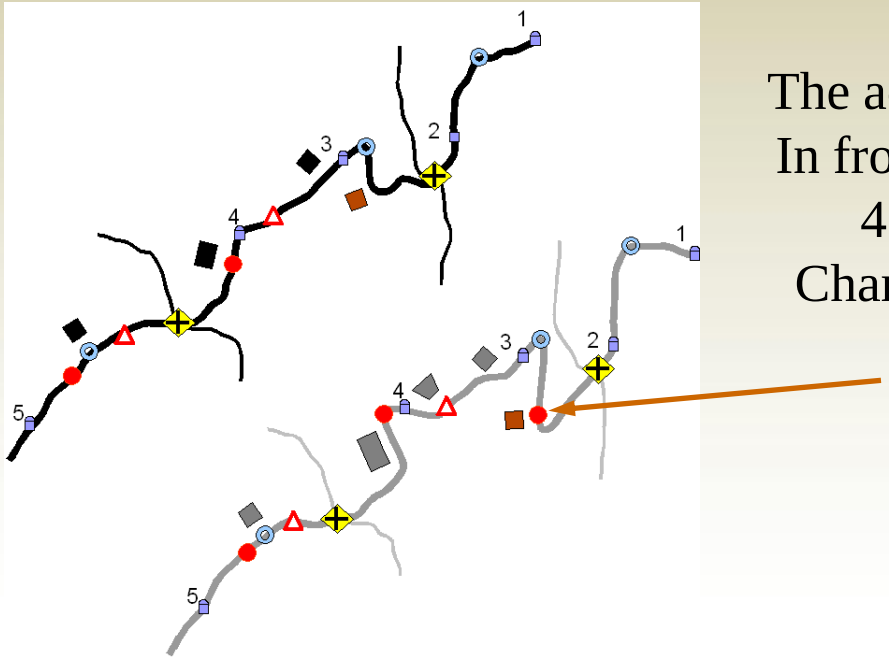


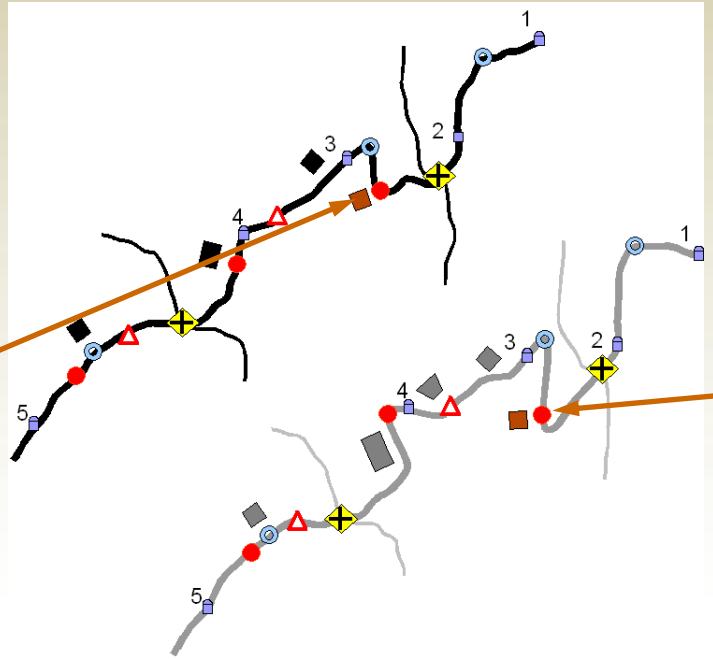
The accident took place
In front of the museum
400m south of
Characteristic points

4.Case study, possible solution

What we propose to do :

- insert characteristic points be recognized between geographical databases and extract the relations topologic and metric of thematic data with them.

We can use that
To put the decide
the accident place
In any topographical
database



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5.Conclusion and perspective

- The beginning of a study regarding the integration and the generalisation of mashups even when having the two types of data “topographic” and “thematic”

- We presented our first thoughts about a referencing system

- We want to be able to generalise with respect to relationships between thematic and topographic components.

5.Conclusion and perspective

- Study an automatic way to choose the characteristic points
- Test the deformation of generalisation result during and after the processing (on real road data)
- Study the generalisation of thematic data

Thanks