Modeling antique roads

In this analysis, we compare a modelisation of antique roads with their reconstitution by maps and archaeology.

A

Modeling itineraries

The basic hypothesis is the sharing through the roads network between antique civitates.

Two models were tested:
- the straight line between the towns
- the shortest path with cost weighted distance by slope.

Two models of shortest path to Beauvais

We used the SPOT - Digital Elevation Model with cell size is 90 m. DEM were reclassified and the shortest path generated in ArcGIS, Spatial Analyst.

Results: For the itinerary to Beauvais, paths are quasi identical with a cost by slope or not: Soissons, Evreux, Amiens for example. But for Rouen, Meaux and mainly Orleans, there is no correspondence between the two models. For Orleans, the model by slope goes by an intermediary point: Paris.

B

The reconstitution of the antique roads

In the Service départemental d'archéologie du Val-d'Oise (SDAVO), we realized a mosaic of 19th century cadastré, on all the department (185 municipalities). All the roads were vectorised and can be compared with archaeological datas. Road’s name and road’s orientation were selected systematically. This morphological analysis was compared with archeological datas.

Results: For each itinerary, there were many different roads. We observe two types of roads: classic monumental roads (datation : 1st AD. - 3rd AD), no monumental roads (datation : 1st AD. - 8th AD). But for Rouen, Meaux and mainly Orleans, there is no correspondence between the two models. For Orleans, the model by slope goes by an intermediary point: Paris.

C

Comparison between models and reconstitution

3 cases:
- the attested road is closer than the path forced by slope (Sens-Beauvais, Charles-Beauvais)
- the attested road is between the straight line and the path forced by slope (Paris-Beauvais)
- the attested road is closer than straight line (Orleans-Beauvais by Chaussée Brunehaut).

D

Redjustment of the model

The comparison of attested roads and models show the rule of intermediary points like Pontoise, Beaumont-sur-Oise, Saint-Denis (Pierrefitte) where topographical locations (ford then bridge on river or swamp) is exploited by shortest path.

Perspective:

Collective Research Program "DYNARP": Dynamic and resilience of Ile-de-France’s roads, coord. by S. Robert (Arscan - Nanterre) and N. Verdier (Géographie-Cités - Paris) propose a reflexion on resilience of roads in long time with different research workers (CNRS, Paris University, INRAP, IGN - ENSG Cogit) and institutions (DRAC, Conseil Général 95, 78, 93, IAURIF, ENAV) around 4 axes:
- database on ancient roads in Ile-de-France by GIS
- interaction between road, site, parcels and environment on local analysis (Paris, Senart)
- Modeling and simulation

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