CSDINGENIEURS

ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

Section Sciences et Ingénierie de l'environnement
Design Project 2017 (semestre de printemps)

Proposition n°31

Use of GIS to plan waste management in Albania

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Condition

Avoir suivi le cours SIG (Systèmes d'information géographique)

Descriptif du projet

Albania has recently succeed territorial reform, reducing the number of municipalities from more than 350 to 62. This reorganization required from the new, bigger, municipalities to reorganize all the waste management services. This new organization is also an opportunity to extend and improve the service in all the areas of the municipalities, where no or very bad service was provided before.

Planning and financing waste management requires basic data on clients (families, business, waste production typology), geography (roads, transport time) and waste management facilities (landfills, dumpsites, transfer stations, etc.).

On another hand, new GIS data are now available for Albania too, in particular property register (buildings), business register and road network which are not used for the moment for waste management.

Developing a tool that would help the municipalities coping with these issues would facilitate a lot the improvement of waste collection services in the country. We propose to work on these solution through this design project, applied on a municipality where a register of users of waste collection services exists, but is very partial.

In the new, dynamic, municipality of Shkodra (north Albania) started in September 2016 a global census, in order to collect detailed data on the population through systematic questionnaires and survey. This action appears to be too much complicated and had not enough success: after 4 months, the Municipality could only cover 4 administrative units, among 11. But the idea is to use these results on these 4 areas to test other approaches and extrapolations.

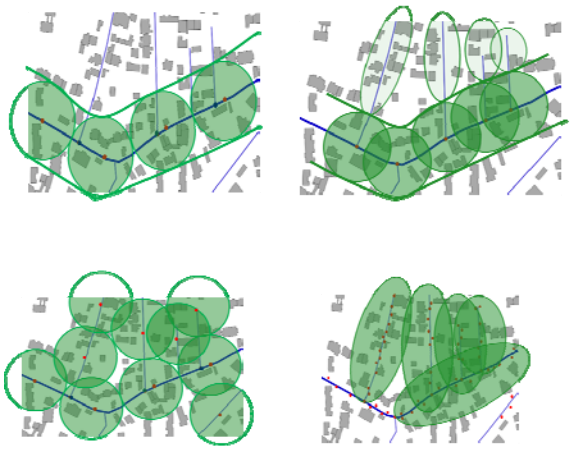
Municipality has a good team of experts, who knows very well the existing situation and available data.

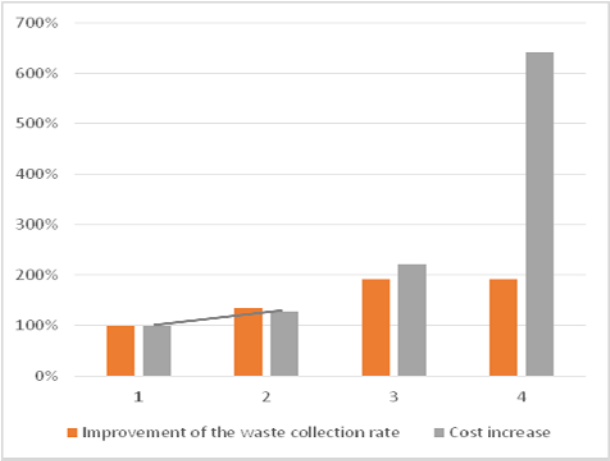
Objectives

The Objectives of the project are the following:

Test the potential of using different existing databases of population (property register, civil register, municipal register,…) and roads in order to plan the routes and activities of waste collection and transport

1. Propose collection service and logistic scenarii (routes, waste collection points, number and positions of containers, time, km, ton etc)
    a. Estimate the possible improvement on service coverage
    b. Adapt the existing cost calculation model to integer the GIS calculated data to calculate the elements of costs of each secenario
2. Test the model on well-known parts of the city (pilot urban and rural zones), estimate key parameters (like persons/family, proportion of uninhabited houses)
3. Test the sensitivity of the model to the uncertainty of the data.





Descriptif tâches

The Municipality has access to the property register (GIS data), which is not accurate. It seems that the Municipality has access to a list of citizens, distributed per area. It is not known how accurate this list is. The GIS layers on existing buildings and roads exist, based on recent satellite images, and seems to be much more complete and accurate.

First phase is to

- Identify, collect and analyze the different existing databases and other information, in collaboration with local and CSD experts
- Define 2-3 pilot zones for testing the tools
- Specify, in collaboration with CSD GIS and waste experts and Albanian experts, the objectives and low cost tools to be elaborated to establish the most complete and accurate database possible, for the purpose of implementing a billing system and better planning the service, which will help implementing a sustainable public service

Second phase :

- Elaborate different tools (GIS routing and adaptation of cost calculation model – Excel)

- Test it
- Propose a process in order to develop scenarios and a full cost calculation

The project will be based on a real present data and situation of a city in Albania. Data will be provided by the municipality, with the support of the dldp Project, an SDC Project managed by Helvetas- Swiss Intercooperation developed with the technical support of CSD.

Divers

Students should develop they knowledge and experience in the fields of :

- Waste management, collection and logistic,
- Using GIS for public services in low income countries,
- collaborate with nice partners of different culture

French and **English** are needed. Report will be delivered in **English**.

If the results are promising, we will try to organize a local workshop in Albania in order to present the results and discuss the next steps.

F. Schmidt / 17.01.2017