CASE STUDY TITLE: Solid waste pneumatic collection system in the historic centre of Leon.

SECTOR: Solid waste
COUNTRY: Spain

STATEMENT ON SUSTAINABILITY

One of the most usual problems in the historic centres of many old cities is the collection of solid waste. Examples exist of pneumatic garbage collection systems having been implemented in consolidated areas, but no so many in historic urban areas. No experience exists for medieval historic centres, so the application of such modern technique in the city of Leon is a good opportunity to study this case, evaluating the sustainability of this action using the methodology explain in Part I.

BACKGROUND

The city of Leon is one of the provincial capitals in Castilla y Leon, a region in the northwest of Spain. Leon is a medium-sized city with a population close to 150.000 inhabitants. It has an important historic core center, with a very rich cultural and built-up heritage of quite different periods and styles. The Gothic cathedral is the main monument in the city. The walled quarter or Old City corresponds to the roman and medieval area and features a great morphological, functional and social diversity. Notwithstanding a complex socio-urbanistic problematic, it still retains an essential role in the city life both for its central location and its historic and cultural relevance.

The building stock in the Old City shows severe shortage in infrastructure and other facilities The City Council of Leon has prepared an overall strategy in order to managed the rehabilitation of the historic core. This strategy contains different policy goals, and cover an extensive set of actions. One of them is the implementation of a system for pneumatic solid waste collection in the Old City.

Garbage was dumped in containers placed along public right-of-ways that, if collected daily by the municipal services, heavily deteriorated the city: garbage collection implied big trucks roaming old medieval roads and hence, badly damaging the local environment. With the introduction of pneumatic garbage collection, old fashioned street containers have given way to modern boxes, and lorries no longer have to enter the city center, largely improving health, sanitation and overall environmental conditions.

INDICATORS

The selected system collects and pneumatically conveys garbage through pipes from the generating points to final disposal facilities. Waste is transported by a current of compressed air to a central waste collection plant through the use of an underground network and waste drop off points. At the central collection plant the waste is sorted and automatically placed in large containers to be subsequently transported to a waste treatment or disposal centre.

The description and characteristics of the elements that make up the system are as follows:

- This is a selective system having two kinds of drop off points. Green collecting boxes are for organic waste and yellow boxes are for paper and cardboard. Glass cannot be collected by the system and is therefore thrown away in traditional containers to be collected later.
- The collecting boxes were also differentiated into residential (for families residing in the area) and commercial (mainly bars and restaurants) drop off points, according to their users.
- A central waste collection point
- 51 maintenance shafts
- 71 collecting boxes
- 2 suctioning valves
- 8 air inlet valves
- Maximum transport distance is less than 1,300 metres
- A suctioning plant including extraction tubes, waste separation centrifuge, waste compactor, internal container transport system and air purification equipment.

The area covered by the new waste collection system has 4,000 inhabitants as well as 150 bars and restaurants that produce a total of almost 10,000 kg/day of organic waste and rubbish in addition to 1,000 kg/day of glass.

The total cost of the project amounted to 5.2 million euros and was financed with European funds.

Annual maintenance costs are estimated to be somewhat less than 100,000 euros.

EVALUATION

The new system has the advantages outlined below over the traditional waste collection system by lorries:

- Reduces the visual impact of containers and having waste in public thoroughfares
- Reduces environmental impact of rubbish collection lorries
- Eliminates waste and smells
- Is less expensive to operate
- Allows for selective waste collection at source.

The main disadvantages are as follows:

- High investment costs.
- Inconveniences are caused to inhabitants and businesses during the execution of construction works
- Possibility of blockages occurring in tubes and drop off points. However, these risks are minimised in the installed system. So far no major incidents have occurred during the trial phase.

DRIVERS

The Municipality of Leon is the institution responsible for the action. The global strategy has been co-financed by the European Union through the Urban Pilot Projects scheme regulated in art. 10 of

the existing Council regulation (CEE) 2083/93.

LESSONS LEARNT

It is important that users are willing to use the system and know how to use it in order for it to work properly. This is why the Local Authorities have run several information campaigns using posters, adverts in the mass media and meetings with neighbourhood and business associations. It has even conducted an information campaign in schools.

An initial period lasting three months was put into effect to facilitate the system's implementation and ease users' familiarisation with the new system. During this time, the traditional rubbish collection system functioned alongside the new system. At the end of this period, waste collection by means of containers and lorries disappeared.

TRANSFERABILITY

The Leon´s experience has proved that the pneumatic system can be one of the solutions of garbage collection in historic cities. After this experience, other Spanish cities with historical centres have followed its step, namely Palma de Mallorca, Vitoria and Sevilla.

IMPACT ON SUSTAINABILITY

ECOLOGY		ECONOMY		SOCIAL ASPECTS	
Emissions?	↑	Cost effective?	↗	Participation?	→
Use of natural resources?	↗	Willing to pay?	→	Transparency?	↑
Bio-diversity?	↑	Effective organisation?	↑	Safety?	↗
Total	↑	Total	↗	Total	↗

PROJECT CONTACT

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REFERENCES.

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