

SAKO REPORT: SATISFACTION WITH WASTE SERVICE IN BRNO

The research held by SAKO company in 2003 states that 55% of respondents know what the separation of parts from communal waste is and only 49% of respondents uses this services. Research also highlights other relevant results:

- More than a half of the citizens uses separation services.
- Citizens are satisfied with communal waste service.
- Waste separation tends to grow.

PROCESS ANALYSIS OF WASTE PRODUCTION IN BRNO

We analyzed the process of waste production and its liquidation in Brno to find out which steps of a process can be improved. Firstly we identified the inputs and the outputs of the process. Afterwards we determined the roles and participants of the process so we could identify which tasks or flows in the process could be changed to reach cost reduction or citizens' satisfaction.

INPUTS/OUTPUTS OF PROCESS

Input is the 800 tons of waste produced by citizens and then placed into the waste collection center (WCC).

Output is the waste liquidated in two ways, in the city incinerator or firms collecting the kind of waste which cannot be incinerated.

ROLES OF THE PROCESS

The roles in the process are as follows:

1. Producer of waste – Is citizen of Brno
2. Waste collection centers - operated by company SAKO a.s.
3. Transporter of waste – in this role is company SAKO a.s.
4. Waste liquidators – in these roles are the city incinerator and firms which liquidate other waste

OUR FINDINGS AND CONCLUSIONS

Brno city is the major supplier of the waste for the city incinerator. Despite of this fact the Brno city has to pay fees for the incineration as high as other – smaller suppliers. We suggest to implement the system of price monitoring for the incineration fees over Czech Republic and to establish a platform for information exchange between the city departments of environment in the cities in Czech Republic. Secondly we suggest negotiating lower fees. The Brno city should be careful about transfer pricing and tax evasion when lowering the fees because the city incinerator is company owned by city.

EFFICIENCY OF WASTE DISPOSAL YARDS

Waste disposal yards are according purpose and size distinguished in four categories.

1. level – yard is equipped with containers for paper, glass, plastic, scrap iron, bio waste etc.
2. level – yard besides functions of 1. level yard accepts dangerous waste and therefore is sheltered
3. level – yard is equipped with storage room and necessary machinery (fork-lift truck, press, etc.)
4. level – place that accepts all kinds of materials, is equipped with many kinds of special machinery (brushwood crusher, presses and other disintegration tools)

The level of waste disposal yard depends of variety of factors. We have chosen three attributes for following analysis of efficiency of these yards. Each waste disposal yard shall be given point score for every attribute where 5 points are the best and 1 point is the least. Yards with the worst scores will be marked and suggested for closing.

Attribute no.1 – Operational efficiency and volume of recieved waste

Points	Comment
5	Highly efficient yard: big volume, all kinds of accepted waste, technical facilities
4	Efficient yard – medium volume, accepted all kinds of wastes
3	Efficient yard: medium volume, limited variety of accepted waste
2	Inefficient yard: low volume, limited variety of accepted waste, technical facilities
1	Inefficient yard: low volume, limited variety, without technical facilities

Attribute no.2 – Suitability of location of waste disposal yard

Points	Comment
5	The yard is not in proximity of residential area. Enlargement of the yard is possible.
4	The yard is not in proximity of residential area and the enlargement is not possible.
3	The yard is situated on the edge of residential. Enlargement is possible.
2	The yard is located in residential area or on its edge and enlargement is not possible.
1	Parcel under the yard or driveway to it is not in possession of city of Brno.

Attribute no.3 – Concentration of waste disposal yards

Points	Comment
5	Very long distance to next yard
4	Long distance to nex yard.
3	Medium distance to next yard.
2	Short distance to next yard.
1	Short distance to next yard. The yard does not accepts all kinds of waste

Evaluation of attributes

	Yard	Operational Efficiency	Location	Concentration	Total core
1	SSO Ukrajinská	4	5	5	14
2	SMO Pražská	2	2	2	6
3	SMO Bratří Žurků	1	3	5	9
4	SSO Košuličova	2	5	5	12
5	SMO Dusíkova	3	3	4	10
6	SMO Bieblova	2	2	1	5
7	SSO Okružní	3	1	4	8
8	SMO Útěchovská	1	1	2	4
9	SSO Jana Svobody	3	4	2	9
10	SMO Plynářská	2	5	2	9
11	SMO Jílová-Vídeňská	2	3	1	6
12	SMO Veverří	3	3	5	11
13	SMO Vaňkovo nám.	3	3	5	11
14	SMO U ZOO	2	3	2	7
15	SSO Páteřní	5	4	2	11
16	SMO Húskova	2	5	1	8
17	SMO Mírová	2	1	1	4
18	SSO Zámecká	4	5	5	14
19	SMO Atriová	2	1	1	4
20	SSO Plástky	4	3	5	12
21	SMO Žebětínská	3	5	3	11
22	SMO Pastviny	3	1	1	5
23	SSO J.Faimonové	5	5	5	15
24	SMO Líšeňská	2	1	1	4
25	SSO Oblá	4	2	5	11
26	SMO Drozdí	2	3	1	6
27	SMO Hapalova	5	1	3	9
28	SMO Rysova	3	2	5	10
29	SSO Mikulčická	3	2	2	7
30	SMO Zemanova- Černozemní	3	1	2	6
31	SMO Vltavská	3	2	1	6
32	SMO Točná	1	2	1	4
33	SMO Malínská	3	3	2	8
34	SSO Sladovnická	2	3	2	7
35	SMO Adamovská	1	1	5	7
36	SMO Sochorova	3	1	1	5
37	SMO Korejská	2	2	1	5
38	SSO Pod Kopcem	4	2	5	11
39	SMO Nezamyslova	3	1	5	9

Key to the table

	Efficient yards (score > 10)
	Mild scenario - suggested for closing (score < 6)
	Strict scenario- suggested for closing (score < 9)

ONLINE APPLICATIONS

We introduce two online applications to improve efficiency of the waste disposal yards. First application introduces a waste map – an overview map of container occupation at Brno waste yards. Second application enables citizens to inform waste service about occupation of containers at their residence.

WASTE MAP APPLICATION

Waste map application presents interactive map of waste disposal yards in Brno. On a given map citizens can find information about occupation of containers in nearby waste yards. By clicking on the given waste yard, citizens can see fullness of containers. Besides interactive map application also involves summary table of all waste yards in Brno.

TECHNICAL SOLUTION

It is necessary to fill application with current data about container occupation. This can be guaranteed by the waste gathering service but the data can be even more accurate if the waste yard employees would also participate on data collection. There are two ways how to collect necessary data for the application:

1. Data insertion through short messages from mobile phone. Employees would send text message on a given number (e.g. “container 19, full”).
2. Data insertion through online application on the mobile phone. This would need internet connection on given phones.

Both solutions are cheap and easy to implement (i.e. it would take about 30 hours for programmer to create online application).

OCCUPATION OF WASTE CONTAINERS AT CITIZENS’ RESIDENCES

Second application allows citizens to inform waste service about container occupation at their residences. Each container would carry the text “when container is full, send text message ‘Cont36 full’ on the number XXX”. When message is sent, a detailed map updates information about fullness of containers. Afterwards, waste service would be able to coordinate its service to attend residences with fullest containers first.

TECHNICAL SOLUTION

When text message is sent it is automatically processed and presented to waste the service through online overview table. Besides table, data are also presented on an interactive map with marked urgent regions. Technical solution is similar to the first example with the text messages and it is easy to implement.

CONCLUSION

We conclude that general awareness about SSO is among citizens below average. On the other hand citizens who uses SSO services are relatively satisfied. Therefore this paper focused mostly on the costs reduction.

To improve citizens' satisfaction we propose development of online tools for interactive overview of waste yards occupation. This solution saves time for citizens and enables better information to waste service.

To lower costs we propose:

1. Inspired by the Liberec city: due to the fact that SSO services are used by many citizens who do not contribute to Brno's treasury, we propose to control citizens id cards. Undesirable effect for the city is small. Predicted savings are from 3.8 to 5 million crowns per year.
2. Mechanical processing of the waste: the goal is to lower costs for a waste transportation which are nowadays a most expensive item from budget. By compressing waste in container, waste service can save more than 4.3 million crowns per year.
3. We propose to close chosen SSO since many of them have another SSO in their neighborhood. By this step, Brno can save up to 8.6 million crowns.

Total saving which are reachable ranges from 10.2 million to 17.9 million.