> Litter-dropping costs money

Component-specific cleaning costs produced by litter-dropping in Switzerland

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> Summary

Initial position, problems and motivation

By litter is meant the pollution of roads, squares, car-parks or public transport with carelessly or deliberately dropped or ignored waste. Even if in absolute terms relatively small amounts of waste are left lying on the ground the majority of the population sees this as unpleasant. Litter impairs the quality of life and the feeling of security in the public domain, leads to increased costs for the cleaning services and damages the reputation of a town.

There are various reasons for the increasing flood of litter. For instance, more and more people spend their lunch break at their place of work or education and take their meals outside the home. This altered consumer behaviour – in connection with an increased use of public spaces – leads to a situation where more waste is left in open spaces. Another increasing trend in recent years is the boom in free newspapers that are often thrown away after a short time or are left lying around in the tram or the park. Thirdly, the thoughtless throwing away of cigarette ends is a phenomenon that has been around for a long time but which has increased even more in recent months as a result of the smoking ban in bars and restaurants.

Questions and aims

Litter-dropping creates additional costs. They are largely unknown and up to now only rough estimates have been available. This study aims to clarify the actual cost of litter in Switzerland and the way this is distributed among the different litter components (take-away food packaging, drinks containers, newspapers and flyers as well as cigarettes).

Procedure and methodology

Since the greatest amount of litter is produced in residential areas, the emphasis will be on litter produced by pedestrians in towns and villages. A further point of emphasis is litter on public transport.

Litter causes additional direct and indirect costs that are mostly borne by the public authorities. This study covered the additional, litter-related cleaning costs. Other extra expenses, such as paying for additional, preventive measures, have not been taken into account.

The costs for litter and its division into litter components were determined on the basis of representative samples in 40 communes and in 9 public transport authorities. The selected communes and transport authorities vary in size and are distributed across the whole of Switzerland (cf. following table). For the public domain, cleaning costs were surveyed for 3 different categories of commune (Category I: towns and peri-urban

centres in metropolitan areas, Category II: touristic, industrial and/or agricultural types of medium-size communes, Category III: rural, industrial and/or agricultural tertiary communes) and within these categories for each of three uniform surfaces that are differently affected by litter-dropping (large, medium, slight amounts of litter). They were then extrapolated to the full extent of these local authority categories. The characteristics of the ground surface on which the litter has to be collected or swept up was also taken into account (whether a sealed or natural surface). The transport authorities were surveyed on three different types of public transport (long-distance, regional and local transport including railway stations). The required data were collected between June and September 2010.

Tab. A > Sample size and estimated accuracy of cost assessment

Survey	Sample size	Estimated accuracy
Litter costs in residential areas	40 communes	±20 % of the assessed costs
Litter costs for public transport	9 transport authorities	No error range defined
Composition of the litter components	20 communes and 13 surveys in the selected transport authorities	No error range defined

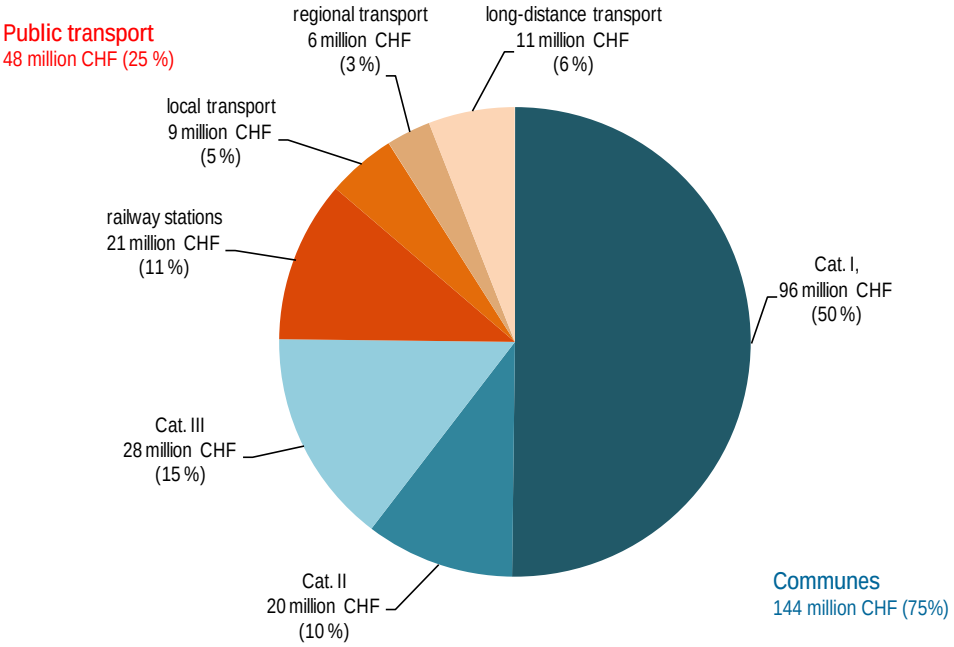
The cleaning costs resulting from litter-dropping have to be distinguished from the other costs for ordinary cleaning (caused by naturally-occurring dirt). This is achieved by a parallel analysis of the cleaning costs per m² of reference spaces that are not affected by litter-dropping (baseline). The cost difference is attributed to litter.

Results: What does litter-dropping cost Switzerland?

Cleaning expenses resulting from litter-dropping in the communes and on public transport were around 192 million francs (CHF) in the year 2010. Of this total, 144 million CHF fell to the communes (75 %) and about 48 million CHF to the public transport authorities (25 %) (see Illustration below).

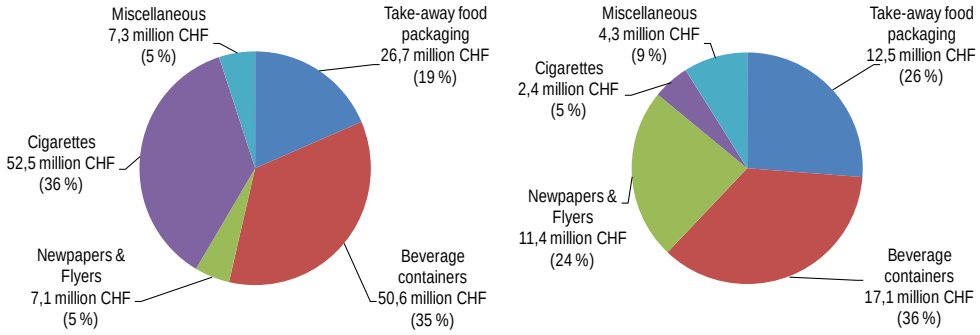
The choice of survey method makes it possible to give an accuracy of –46 %/+ 56 % for litter costs in the cantons. The effective litter costs in all the Swiss cantons therefore lie between 77 million and 225 million CHF. It is not possible to estimate the accuracy for litter costs on public transport within this study.

Fig. A > Cleaning costs caused by litter in communes (blue areas) and on public transport (red areas)



Total: 192 million CHF/a

Fig. B > Litter-related cleaning costs sub-divided by litter component. Distribution in the communes (left) and distribution on public transport (right)



Communes total: 144 million CHF/a

Public transport total: 48 million CHF/a

In the communes more than 50 % of the litter-costs (77 million CHF) are caused by food and drink packaging and other objects associated with fast food (serviettes, plastic cutlery etc.). A further large proportion of the costs can be attributed to cigarettes left as litter i.e. 36 % (53 million CHF). The high cost share of the cigarettes can be explained by the fact that a disproportionately high level of effort is required to pick up small items on natural surfaces (grass, gravel, the area around the base of trees, hedges).

On public transport the litter-related cleaning costs are dominated by drinks, food and newspapers. The litter-related cleaning costs at public tram, bus and post-car stops are not included here but have been collected by the communes, which is why the cigarettes are relatively speaking less significant on public transport.

For the uniform spaces that were investigated, various average litter-related cleaning costs could be calculated by level of litter pollution and type of surface. Six types were identified: sealed surfaces where pollution is strong, medium or slight (types A, B, C) and natural surfaces where pollution is strong, medium or slight (types D, E, F). The average costs per square metre (medians) of these uniform space types are listed in the following table.

Tab. B > Annual litter-related cleaning costs in CHF per square metre for the three commune categories for the litter surfaces A to F (medians)

A to C: strong, medium and slight pollution on sealed surfaces;
D to F: strong, medium and slight pollution on natural surfaces.

Commune category	A	B	C	D	E	F
Category I	11.5	3.7	1.7	2.1	1.4	0.8
Category II	4.3	3.0	0.8	2.0	2.7	0.3
Category III	6.7 [1]	2.8	0.5	0.9	1.4	0.2

[1] Only one sample taken

Classification and critical appraisal of the results

The direct litter costs to the communes of 144 million CHF which have been assessed in this study are in the same range as the most current estimates produced up to now by the Swiss Cities Association and the FOEN. The 144 million CHF per year can be converted into an annual per head cost of litter removal in communes of 18.50 CHF per year. When litter-related cleaning costs are taken into account, the cost of waste disposal in the communes is raised to a total of around 111 francs per inhabitant per year or around 20 %.

The accuracy of the results was assessed only for the survey of litter costs in the local authority areas. The analysis of the uncertainty level showed that for the significance level of 10 % it is considerably larger than the estimated ± 20 %, that is, –46 %/+ 56 %. This is a consequence of the greater deviations from the mean in the sample values than were assumed in the preliminary study (Sommerhalder & Berger 2010).

Up to now there have been no comprehensive figures available for litter costs on public transport. Since the sum of 48 million CHF is based on estimates of selected transport authorities these costs reflect the qualified view of experts.

The total litter costs are higher since indirect costs such as, for example, costs for the disposal of litter in municipal waste incineration plants, the costs for anti-litter campaigns and the costs for security patrols are not taken into account.