



Case Study

Sao Paulo City (Brazil)

1. SVMA

Sao Paulo City first began staging substantial activities to cope with environmental problems in October 1993 by incorporating them into the municipal administration through the establishment of the Agency for Tree-Planting and Other Environmental Activities, or SVMA. In cooperation with various government-related commercial and industrial organizations, non-governmental organizations, colleges and universities, and vocational organizations across all industrial fields, the city has staged activities that stress environmental education, land use, public transportation and traffic systems, the effect on the human body, control and protection of the environment, tree-planting campaigns. These activities are provided for under Municipal Ordinance 11.426/93. At the same time, in 1993, when the ordinance was issued, the Environment/Development Council, or CADES, was set up as a consultative organ.

In order to train sufficient human resources to tackle environmental issues, the SVMA has established a postgraduate course with the cooperation of Sao Paulo University. Over the last two years this course has produced 300 specialists who have immediately been able to exercise their enthusiasm and newfound knowledge in the field.

Current SVMA projects were decided upon and launched between 1995 and 1997, and, as of October 1998, are in their extension phases.

Meanwhile, in September 1996, a publication entitled "AGENDA 21 (Memorandum on Programs for the 21st Century)" was issued by Sao Paulo City. It dealt with the direction in which the environmental development programs in each region were headed and the problems which should be given priority, presenting a set of action indices. The proposals have been referred to the municipal assembly to be legislated.

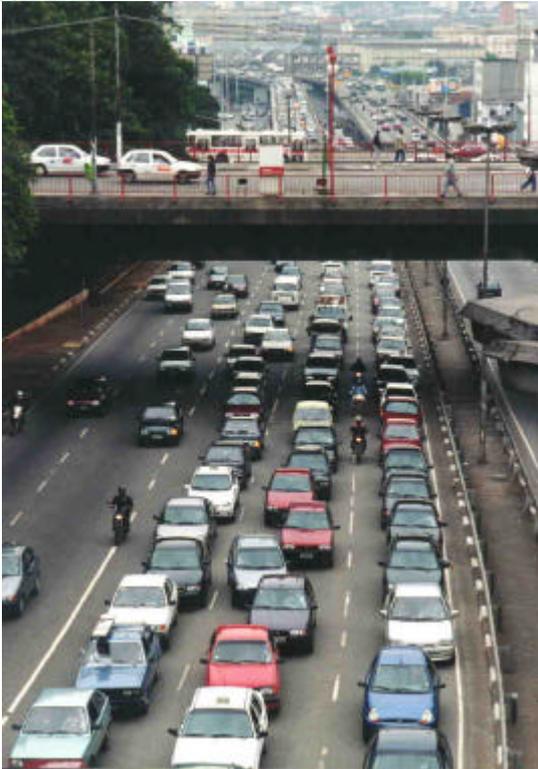
2. Environmental Projects

The SVMA is now carrying out projects under the following five broad categories:

- 1) Research into the control of exhaust gases, smoke and noise from automobiles.
- 2) Complete conversion of fuel for buses and taxis from diesel to methane.
Fuel for privately owned cars will also be converted during the later stages of the project.
- 3) Macro-scale garbage recycling project
- 4) Project to plant a million trees
- 5) Cycle path extension project

Before a description of each of the above projects, here are some statistics for population density and vehicle numbers to determine Sao Paulo's position in Brazil.

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| <i>Population density (people/km²)</i> | |
| Whole of Brazil: | 20 people |
| Whole of Sao Paulo State: | 131 people |
| Urban areas of Greater Sao Paulo: | 2,110 people |
| Sao Paulo City: | 6,627 people |
| <i>Number of vehicles</i> | |
| Within the State of Sao Paulo: | 9.8 million vehicles |
| Within urban areas of Greater Sao Paulo: | 5.6 million vehicles |
| Within Sao Paulo City: | 4.8 million vehicles |



It is clear how very congested Sao Paulo City and its surrounding areas are. Regarding automobiles, the ownership ratio in Sao Paulo City is the highest in Brazil, at one vehicle for every two persons. This clearly shows that Sao Paulo City is responsible for a large portion of the problems and that the city is, therefore, obliged to solve them.

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1) Control of Exhaust Gases, Smoke and Noise from Automobiles

In 1995, the city assembly adopted a resolution that would effectively introduce a system to control exhaust gases, smoke and noise from automobiles and, accordingly, the city government planned to bring a new system into operation from 1996. However, the city has yet to receive approval for it from the state government.

The city authorities tell us that, once the legal issues with the state are resolved, it will be possible for the city to operate the system immediately, as early as from the following day, because it has already selected companies to handle the practicalities and installed the necessary equipment.

The municipal law concerned only provides for inspection of vehicles produced after 1989 (as it was estimated that 60% of the cars running in the city were produced after 1994).

The inspection process uses an equipment which test exhaust and noise emission one car at a time. Those which pass inspection and are thus within the standard limits, are given a certification seal ("Green Seal"). Already, about 50,000 vehicles, including local buses making their rounds within the city, minibuses called "rotason" and taxis, which are under the city's control have been tested. They account for about 1% of all the vehicles, including privately owned cars that need to be inspected. Due to the testing of these 50,000 vehicles, the computer software for the inspection process has been significantly improved.

Once the inspections become law, car owners will be obliged to have their cars inspected once in a year. Each owner will have to pay 18 real (about \$15) per car for the annual inspection and all cars that pass will receive a certification seal.

As a result of holding these inspections, the city will have 100 million real (about \$75 million) of capital to invest. Part of these funds are to be used to pay the companies handling the practical work for the inspections, and the remainder, or the profit, will be transferred to the SVMA budget to be used to meet expenses for environmental measures.

This project as the first attempt of its kind in the country's history, and also assumes an educational role as a model for other states.

Laws concerning air pollution in Sao Paulo were introduced in 1975 and 1976. These provided for the following three states: Level 1: "Attention required", Level 2: "Action required" and Level 3: "State of



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Emergency" under which traffic levels may be forcibly reduced by 20%, 50% and 80%, respectively. However, the actual level of air pollution has not even fallen to Level 1 for the past few years.

Also, there are the so-called "rodigio" traffic regulations introduced by the Sao Paulo City Traffic Bureau primarily to minimize traffic jams. Under these regulations, vehicle use is slightly restricted in turn according to license plate numbers. Initially, about two years ago, the regulations were enforced on a trial basis for one month in the limited period of the dry season beginning in August and ending in October, when the school year and vacations usually end. Later, the enforcement period was extended to two months, and eventually the regulations came to be implemented throughout the year. Under these regulations, cars cannot be driven once a week between seven and ten in the morning, and five and eight in the evening. In 1998, in conjunction with Sao Paulo State Law, these license plate-based traffic regulations came to be enforced not only in the morning and evening, but also throughout the day from June through September. These state regulations are principally aimed at reducing air pollution.

The level of air quality is reported daily in the newspapers. Thus far, it has neither been deemed very good nor particularly bad. It has been concluded that this state-imposed "rodigio" has had no particular effect by now.

*The system of regulatory values for pollution-causing exhaust gases was established in 1986 by the Environmental Protection Organization and Automobile Manufacturers' Association, who determined a value for each model to be produced each year by pre-supposing the minimum value to be attained by 2000, thus making the system extremely complicated.

2) Converting to Methane as a Vehicle Fuel

This is a 10-year project concerning a total conversion in fuel sources for public transportation, including the 11,000 local buses (currently diesel powered) and 35,000 taxis controlled by the city, to non-polluting methane.

Regarding the buses, when the project was begun, the conversion was scheduled to effect 1,000 units annually. Currently, the first 100 buses that have been converted are going around the city.

Adequate preparations have been made concerning the quality and quantity of gas. However, some difficulties are now being experienced concerning the means to store and supply it to buses. It is estimated that an investment of \$1 million will be needed to construct special service stations and, whereas the construction was to have been carried out in parallel with the conversion of the buses, the work has seen delay. At present, there are only 12 methane service stations within the city.

Meanwhile, efforts are also underway to develop a new more efficient engine fueled with this gas. At present, however, they cannot be considered sufficient.

In the case of the taxis, 3,000 have already been converted. As an incidental issue, following the introduction of the methane system, it has become easier to maintain these vehicles (because the engines are not stained) and the fuel used is cheaper than gasoline. Furthermore, taxis have the advantage of being able to be refueled at ordinary service stations. Therefore, prospects are that the taxis may be converted earlier.

Until last year, methane was solely handled by public oil corporations. However, it has now become possible for private companies to handle it.

*Neither of these two projects, which have only just been implemented, have yet shown any real effect in reducing air pollution.

3) Macro-Scale Garbage Recycling Project

In Sao Paulo, 15,000 tons of garbage, of which 12,000 tons are estimated to be household waste, are collected every day. Waste disposal sites have been prepared on vast pieces of land. However, five of them have already been filled, and it is expected that the three others now in use will be used up within five years if garbage continues to be dumped there at the present rate. Therefore, the SVMA has adopted a new policy by initiating this macro-scale garbage recycling project.

Under the project, households are to be required to put garbage into collection sites after dividing it into two classes: organic matter containing water (raw garbage, vegetation, etc.) and other dry materials

(plastic products, glass, paper etc.). The garbage is to be collected by trucks that can carry each of the classes of garbage separately. At eight waste disposal sites, the garbage is to be separated by class, and from the organic matter, bio gas and fertilizer are to be generated in the form of organic compounds. At present, only two processing plants are in operation and two more plants are scheduled to be constructed within two years. Once they are complete, it will be possible to process 5,000 tons of garbage per day to output 625,000 cubic meters of gas and 2,000 tons of fertilizer. Of the dry garbage, that which can be sold is to be recycled. The remnant that cannot be sold is to be incinerated so as to be used as thermal energy. It is estimated that the thermal energy generated will be enough to provide electricity to heat city hall at least.

\$600 million has been appropriated for this project in the budget. However, it was not begun by an outlay from the city but by private corporate investment. For the next 20 years, therefore, the city is to pay those companies concerned for each ton of household garbage collected.

Incidentally, the companies that are to provide incinerators have already been chosen and have received the approval of the SVMA and CADES for the machinery. The approval standards applied were amongst the toughest in the world.



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4) Project to Plant a Million Trees

Under this project, which was started between 1993 and 1994, more than one million trees have already been planted within the city. Unfortunately, however, three quarters of the trees planted have not



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survived. Therefore, an additional task to be tackled now is to set up a fence round every sapling planted. The current view is that if 25% of those planted now survive, it could be deemed a success. The SVMA believes that an important future issue will be to 'educate' people to take good care of the trees planted and look after the fences set up around them. A new project is scheduled to be initiated in the very near future under a different name.

5) Cycle Path Extension Project

The project drawn up in April 1994 by CADES was to construct a total length of 300 km of cycle paths in the city. As of the present, however, there are only about 50 km of cycle paths, mostly in parks. Cycle paths have been neither popular with roadworks engineers, nor have they seen general acceptance or enthusiasm from the public. Consequently, they have come to hold an increasingly strong view that bicycles cannot replace cars.

3. Budget

In 1997, of the \$6.96 billion¹ in the city budget, \$69 million², or about 1%, was appropriated as the budget for the SVMA. The SVMA has 1,165 staff members, all public servants of the city, of whom 673 are engaged in the tree-planting campaign; 115, in environmental control; and 122, in environmental education/protection; and 225 work in the bureau's offices.

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¹ \$6,955,475,100

² \$69,046,153