

## **11.6 Financing Future SWM Expenditures**

### **11.6.1 Financing and Cost Recovery Objectives**

The principle of cost recovery of SWM expenditures has been already established by MB. Currently RASUB's opex is recovered from its waste tariffs. RGR also finances both its recurrent and capital investment expenditures from its tariffs.

In future contracts for collection and haulage and street sweeping will be let which will enable efficient providers to recover both their opex and capex costs. It is recommended that these contracts, including those for street sweeping, are financed from the waste tax.

Although, in principal, street sweeping is usually paid from general taxation, it is recommended that it is financed from the waste tax because MB's is very financially constrained and the waste tax gives MB a single opportunity to broaden its tax base. When MB is financially autonomous, the financing of street sweeping from general tax should be reconsidered.

It is also recommended that the recurrent costs of disposal are recovered from the waste tax. However, as demonstrated in section 11.5 above, it will be difficult to finance the proposed investment from the waste tax.

The proposed investment in landfill sites for both the project and post project investments, is relatively large and there are a number of possible financing sources. These are:

1. MB's own fiscal and non fiscal revenues;
2. GoR capex subventions;
3. a loan from an international lending agency;
4. a loan from a Romanian bank;
5. an issue of a Municipal bond.

Each of these sources is separately considered.

Table 11.6-1, below shows MB 's current revenues for 1992, 1993, 1994 and projections for 1995.

The revenue sources include MB's own fiscal and non fiscal revenues, the share of salary tax it receives from GoR, GoR price subsidies that it passes through to RADET

and RATB, and GoR capex subventions, most of which are spent by the Regie Autonomes. Amounts are stated in US\$ and price base 1992.

**Table 11.6-1 MB's Current Revenues 1992 to 1995**

	1992	1993	1994	1995
	US \$'000	US \$'000	US \$'000	US \$'00
<b>Fiscal Revenues</b>	18,450	13,768	13,897	
<b>Non Fiscal Revenues</b>				
<b>Transfers: Regies/public organisations</b>	362	2,895	672	
<b>Asset sales</b>	123	10,075	5,881	
<b>Other Income</b>	692	1,155	2,186	
<b>Total Fiscal and Non Fiscal Revenues</b>	19,627	27,894	22,637	15,240
<b>Share of Salary Tax</b>		16,719	24,429	19,917
<b>State Budget Transfers</b>				
<b>Price Subsidies</b>		45,642	35,417	22,312
<b>Capex Subventions</b>		48,815	47,213	29,973
<b>Total State Budget Transfers</b>	101,136	94,456	82,630	52,285
<b>TOTAL REVENUES</b>	120,763	139,069	129,697	87,443

All these revenue sources are formally included in MB's annual budget even though GoR price subsidies and most of the GoR capex subventions are transferred to and spent by the Regies Autonomes.

### 11.6.2 Financing Options

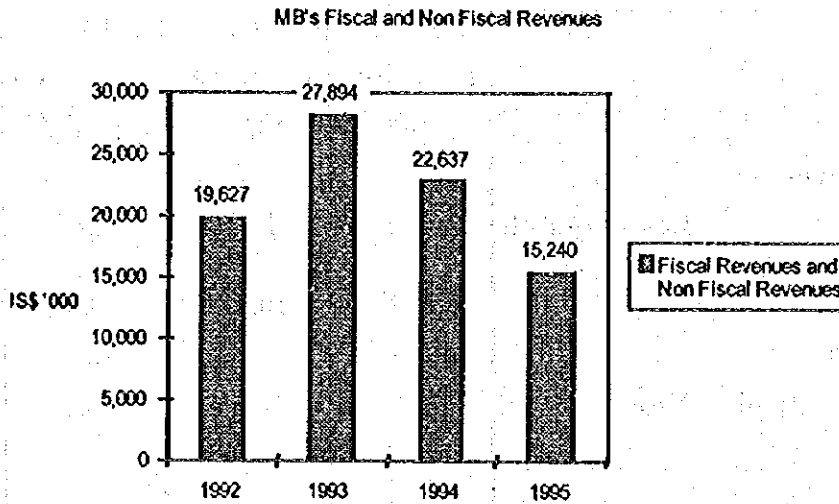
#### 1) General Taxation and Other Non Fiscal Revenues

Can MB finance new investment in land fill sites from its general taxation or non fiscal revenues? It seems that it will be very unlikely to do so in the medium term and the long term situation remains uncertain.

MB's own revenues have been falling in real terms. Figure 11.6-1, based on Table 11.6-1 above, illustrates this. Total revenues dropped by 19% in 1994 to \$22.6m, and are projected to fall by another 32% in 1995 to \$15.2. These are very large

decreases. The primary cause is hyper inflation coupled with MB's inability to increase its revenues.

**Figure 11.6-1 MB's Own Revenues 1992 to 1995**



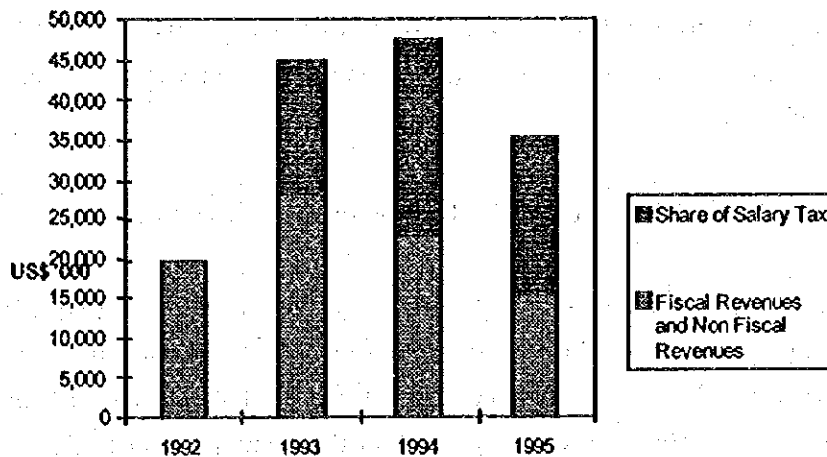
MB lacks financial autonomy and has little flexibility to increase tax rates and non fiscal revenues or to expand its revenue base. As a result increases in taxes and non fiscal revenues are running behind inflation.

In practice the MoF has almost complete control over MB's fiscal and non fiscal revenues and does not wish to increase public spending at the municipal level during the current economic transition. We do, however, understand that a new agricultural tax will be levied during 1995 and this may have some financial impact.

Because of MB's financial situation, GoR has been subsidising MB's operating expenditures since 1993 by allocating a share of salary taxes arising in Bucharest to MB. The extent of this financial support is shown in Table 11.6-2 below.

Subsidisation increased by 46% to \$24.4m in 1994. Projections for 1995 are lower at \$19.9m but subsidisation is likely to continue in the medium term

**Figure 11.6-2 MB Own Revenues and Share of Salary Tax 1992 to 1995**



It is therefore not possible for MB to finance capital investment in disposal landfill sites in the medium term given MB's inability to finance operations.

## 2) GoR Financing

What are the possibilities?

Currently GoR finances almost all capital investment in public services in Bucharest through capex subventions from the State Budget. Although the total subvention is at MB's discretion to spend, in practice it is spent on prioritised investments which are included in MB's investment list.

The list is in reality "approved" by MoF because it is used by the MoF to determine the total capex subvention in the annual determination. MoF policy has been to contain municipal government spend through the current economic transition.

At the moment it appears that the majority of investment projects are prioritised "work in progress" projects. This leaves little room for new projects. Given this and GoR's policy of containment of municipal spend, it seems unlikely that of GoR capex subventions will be a likely source of financing 100% of the the project. However, partial financing should be considered as a possibility.

**3) A loan from an international donor agency**

Can MB finance new investment in landfill sites from a loan from an international donor agency repaid from the proposed waste tax? To answer this question forecast SWM expenditures and citizens affordability are evaluated and a forecast waste tax estimated from 1996 to 2010.

**a Forecast SWM Expenditures Including the Landfill Project**

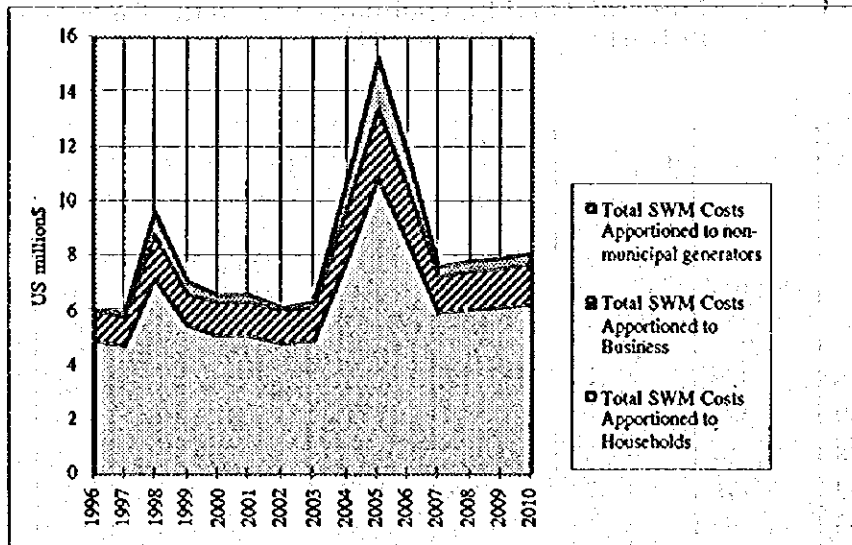
Table 11.6-2 below gives forecasts of total solid waste management expenditures assuming that the project is financed from a soft loan from an international donor agency. Forecast disposal expenditures are obtained from Table 12.1-2, Chapter 12 of the Feasibility Report. These forecasts were prepared on the assumption that 75% of the project investment costs are financed by the loan.

**Table 11.6-2 Forecast Total Expenditures for Solid Waste Management in Bucharest 1996 to 2010**

Year	Total Disposal Cost (2)	Payment to Contractors for Collection & Haulage (3)	Payment to Contractors for Street Sweeping (4)	Total Solid Waste management Cost = (2)+(3)+(4)= (5)	Total SWM Costs Appor-tioned to House-holds (6)	Total SWM Costs Appor-tioned to Business (7)	Total SWM Costs Appor-tioned to non-municipal generators (8)
1996	305	4,485	1,314	6,104	4,895	1,148	61
1997	441	4,251	1,216	5,908	4,714	1,106	88
1998	4,362	4,067	1,223	9,652	7,112	1,668	872
1999	2,170	3,877	1,058	7,105	5,403	1,267	434
2000	1,593	4,113	962	6,668	5,143	1,206	319
2001	1,490	4,224	955	6,669	5,160	1,210	298
2002	888	4,342	947	6,177	4,859	1,140	178
2003	893	4,464	938	6,295	4,955	1,162	179
2004	5,322	4,589	929	10,840	7,918	1,857	1,064
2005	9,659	4,717	921	15,297	10,826	2,539	1,932
2006	5,935	4,849	926	11,710	8,524	1,999	1,187
2007	1,773	4,985	901	7,659	5,916	1,388	355
2008	1,762	5,125	893	7,780	6,017	1,411	352
2009	1,752	5,268	883	7,903	6,118	1,435	350
2010	1,743	5,416	887	8,046	6,235	1,462	349
Total	40,087	68,772	14,953	123,812	93,794	22,001	8,017
Average	2,672	4,585	997	8,254	6,253	1,467	534

Table 11.6-2 shows that the costs of SWM total \$123.8m over the 15 year period, averaging \$8.8m per annum. In real terms total costs in 2010, \$8m, are 21% higher than total costs in 1996 of \$6.1m. Between these years costs rise to high of \$15.3m in 2005 and are lowest in 1997 at \$5.9m.

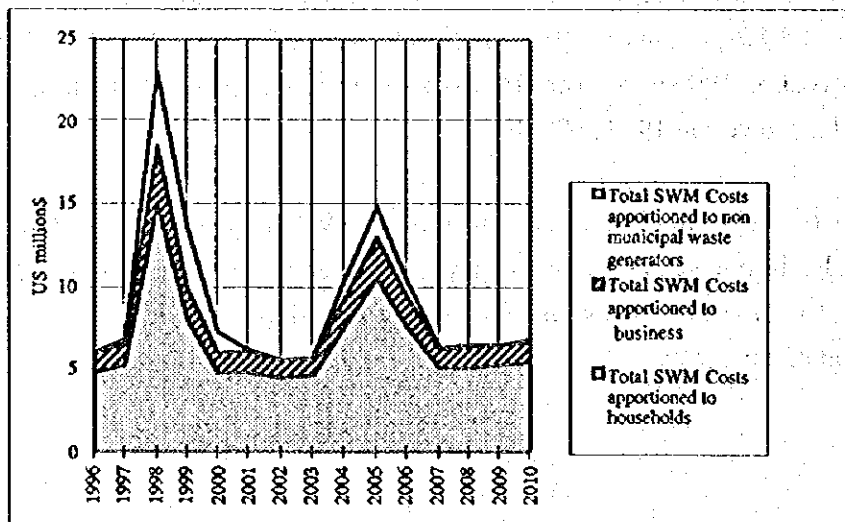
Figure 11.6-3 below illustrates how total forecast SWM expenditures, analysed between households, businesses and non municipal waste generators, move over the 15 year period. The first peak between 1997 and 1999 shows the impact of the project investment on total costs.



**Figure 11.6-3 Forecast Total Expenditures for Solid Waste Management in Bucharest with a Soft Loan**

The second peak between 2004 and 2006 shows the large post project investment costs of constructing additional embankments for Balaceanca and Cretuleasca sites and three new disposal sites at Berceni, Afumati and Jilava.

Figure 11.6-4 below gives total forecast SWM expenditures where the project is not financed by the loan. A comparison of the two charts shows how financing the project with the loan significantly smoothes the cost profile over the project period 1996 to 1999.



**Figure 11.6-4 Forecast Total Expenditures for Solid Waste Management in Bucharest without a Soft Loan**

In Figure 11.6-4 the second peak between 2004 and 2006, is slightly larger than in figure 11.6-3 because of the additional loan repayments.

**b Citizens' Affordability: Comparison of Total SWM Costs to per Capita GDP**

To assess whether the proposed project is affordable by citizens, the per capita SWM costs over the project period are calculated as a percentage of per capita GDP. Table 11.6-3 below shows the calculated percentages. The average percentage for Bucharest over the project period is 0.23%; peaking at 0.50% in 2005.

**Table 11.6-3 Comparison of Total SWM Costs to per Capita GDP**

Year	Total Solid Waste Management Costs US\$'000	Population '000	Total Solid Waste Management Costs Per Capita Per Annum US\$	Per Capita GDP US\$	Per Capita SWM Costs as a % of Per Capita GDP
1996	6,104	2,065	2.97	1,060	0.28%
1997	5,908	2,080	2.84	1,079	0.26%
1998	9,652	2,095	4.61	1,114	0.41%
1999	7,105	2,110	3.37	1,150	0.29%
2000	6,668	2,125	3.14	1,187	0.26%
2001	6,669	2,141	3.11	1,226	0.25%
2002	6,177	2,156	2.86	1,266	0.23%
2003	6,295	2,172	2.89	1,307	0.22%
2004	10,840	2,188	4.95	1,350	0.37%
2005	15,297	2,203	6.94	1,394	0.50%
2006	11,710	2,219	5.28	1,439	0.37%
2007	7,659	2,235	3.43	1,486	0.23%
2008	7,780	2,251	3.46	1,534	0.23%
2009	7,903	2,268	3.48	1,584	0.22%
2010	8,046	2,284	3.52	1,636	0.21%
<b>Total</b>	<b>123,813</b>		<b>3.79</b>	<b>1,321</b>	<b>0.23%</b>

**Note**

Per Capita GDP based on 1993 per capita GDP inflated by World Bank estimates of growth in GDP.

These percentages compare very favourably with international comparators and the results indicate that the project is affordable by citizens. To assess the impact on citizens forecast s of the waste tax are presented in section c below.



c Forecast Waste Tax

Table 11.6-4 gives the forecast monthly waste tax in both US\$ and Lei over the Master Planning period. The tax is estimated by dividing total monthly SWM expenditures apportioned to households by Bucharest's population. This assumes that the same per capita tax is levied on all citizens regardless of age or household income.

The waste tax does not include the cost of administering the collection of the tax and revenue losses from bad debts. At the moment MB will have no administration costs to bear since the MoF will be responsible for tax notification and collection.

Table 11.6-4 Estimated Monthly Solid Waste Tax 1996 to 2010

Year (1)	Total SWM Costs Apportioned to Households US\$ '000 (2)	Total Population '000 (3)	Estimated Tariff US\$/month (4)	Estimated Monthly Waste Tax Lei (5)
1996	4,895	2,065	0.20	395
1997	4,714	2,080	0.19	380
1998	7,112	2,095	0.28	560
1999	5,403	2,110	0.21	420
2000	5,143	2,125	0.20	400
2001	5,160	2,141	0.20	400
2002	4,859	2,156	0.19	380
2003	4,955	2,172	0.19	380
2004	7,918	2,188	0.30	600
2005	10,826	2,203	0.41	820
2006	8,524	2,219	0.32	640
2007	5,916	2,235	0.22	440
2008	6,017	2,251	0.22	440
2009	6,118	2,268	0.22	440
2010	6,235	2,284	0.23	460
<b>Total</b>	<b>93,794</b>	<b>32,592</b>		
<b>Average</b>	<b>6,253</b>	<b>2,173</b>	<b>0.24</b>	<b>480</b>

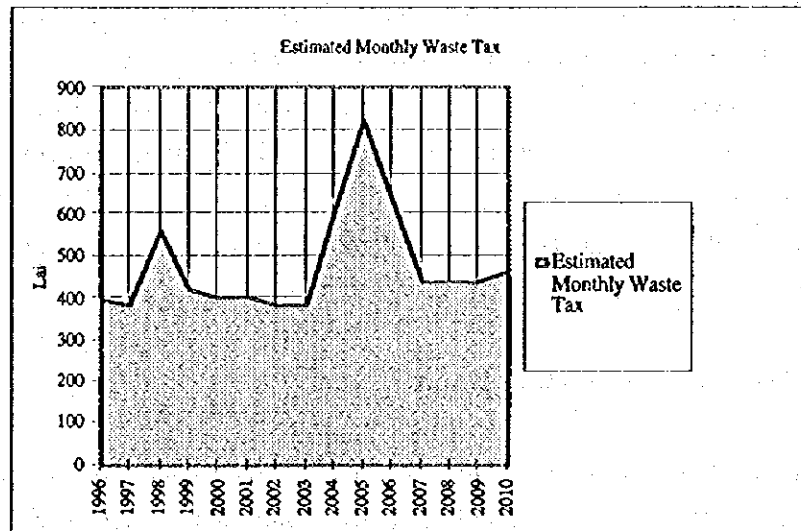
Notes

1. a Lei/US\$ rate of 2000 was used for conversion
2. population data was based on the 1994 population of 2,035,660 - was obtained from the Statistical General Division of Bucharest Municipality. The base year population was assumed to grow at an annual rate of 0.722% until 2010.

The table gives a waste tax of Lei 560 in 1998 and an average monthly waste tax of Lei 480 over the period. The range of the tax is Lei 380 to Lei 820. The current monthly waste tariffs of Lei 450 (RASUB) and Lei 550 (RGR) are about 80% and 98%

of the forecast 1998 waste tax of Lei 560, and 94% and 115% of the average waste tariff of Lei 480 respectively.

Figure 11.6-5 below illustrates how the monthly household tax moves over the 15 year period



**Figure 11.6-5 Estimated Monthly Solid Waste Tax (Households) 1996 to 2010**

The results suggest that raising the tax to Lei 560 from RASUB's current levels, a 24% increase over two years, is very feasible and would be acceptable to both citizens and government.

The analysis of SWM costs demonstrates that the costs of financing the project with a soft loan from an international lending agency are affordable by both the Municipality and citizens, and that the Municipality would be able to finance the repayment of the loan this through the proposed waste tax.

#### **4) A Loan from a Romanian Bank**

An alternative source could be a loan from a Romanian bank. However, this option is not considered viable because:

1. the banking sector in Romania is not well developed and, therefore, this type of loan might be difficult to obtain under favourable terms and conditions;
2. MB would undoubtedly be perceived as risky by the banks, given its poor financial strength and lack of financial autonomy. This would make it more difficult and costly to obtain a loan;
3. At the moment bank loans are costly. Interest charges are high as a result of high inflation.

#### **5) An Issue of a Municipal Bond**

Issuing municipal bonds is a common method used by municipalities, eg in Japan and the United States, to finance their capital investment programs. However, it is not considered to be a viable option in Romania at the present time because:

1. municipal bonds require specialised capital markets which issue them. The banking sector in Romania is just beginning to develop and clearly capital markets of this type are unlikely to be developed for a long time;
2. external bond markets will view municipal financing in Romania as high risk for a considerable time; and
3. municipal government in Romania needs to be substantially reformed so that it is financially autonomous and financially robust before banks seriously consider it as a possible market for bonds issues.

It is recommended that MB seriously consider this type of financing in the long term when conditions are appropriate. This may be very well be beyond the period of the Master Plan.

#### **11.6.3 Conclusion**

The preferred financing option is a soft loan from an international donor agency. Loan financing costs will be repaid from the waste tax. Partial financing from GoR State Budget subventions should also be considered.

## **11.7 Summary of SWM Financial Strategy and Policy**

### **11.7.1 The Waste Tax**

It is proposed that MB finance SWM services through a waste tax which MB is empowered to levy under Law 27, 1994. There will be separate household and business waste taxes. The deciding reasons are:

1. MB is too financially constrained to finance SWM from its general tax revenues;
2. the waste tax is the only option to expand MB's revenue base; and
3. tariffs will cease to be collected because contracts for collection and haulage and street sweeping will be issued under which contractors will be directly remunerated by MB.

### **11.7.2 Financial Policy**

It is recommended that MB adopt the following financial policy for SWM, based on the introduction of the waste tax:

1. the objective of implementing the waste tax is to make SWM financially viable rather than changing consumer behaviour;
2. the principle of cost recovery from the waste tax is established. As a minimum, all operating costs of collection and haulage, disposal and street sweeping are recovered. This includes amortisation costs of contractors equipment;
3. contractors are remunerated so that they can finance both their operating and equipment expenditures;
4. where it is feasible, capital costs, primarily those of building landfill sites, should also be recovered. If it is not feasible, investment should be financed from loans or other means. Financing costs of loans should be fully recovered from the waste tax;
5. household and business waste taxes are structured which optimise revenues and are socially equitable;
6. waste taxes are set with due consideration to the affordability of citizens and businesses, as well as, to their willingness to pay; and
7. procedures for collecting the tax must ensure a good rate of collection.

### **11.7.3 Financing Investment In Landfill Sites**

It is recommended that the proposed disposal project is financed by a soft loan from an international donor agency. The loan financing costs are recovered from the wastetax. It is preferable that any portion of the project not financed from the loan is

recovered from the waste tax where possible. Alternatively, the unfinanced portion could be financed from a GoR subvention from the State Budget.

**It is recommended that the post project investment costs (2004 to 2006) which are considerable and cannot be wholly funded from the waste tax, are financed from a similar soft loan or possibly from a concession.**

#### **11.7.4 Setting and Implementing the Waste Tax**

The waste tax should be set over the master planning period to recover:

1. operating costs of collection and haulage, disposal and street sweeping;
2. project loan financing costs;
3. any project costs not financed by the loan; and
4. to provide savings for post project investment costs (2004 to 2006).

Under the proposed technical assistance (TA) to be provided by an international consultant, the waste tax will be modelled, taking each of the above into account, to ascertain the tax rates which will assure full cost recovery taking households' and businesses' affordability and willingness to pay into consideration. As far as possible the tax should be smoothed over the period but without compromising cost recovery.

Under the TA, the international consultant will assist MB to formulate appropriate tax structures for both businesses and citizens, to advise on the best method of tax collection and . MB needs to finalise the tax structures, rates and collection method.

Savings for post project investment costs should be established to contribute in some way to future loan financing costs (and any unfinanced portions of the investment) or the costs of a concession(s). The level of savings and their absorption in the tax will be modelled under the TA and will take into account the likely cash flow over the investment period.

An investment fund or reserve will need to be set up with appropriate fiscal controls to accrue the savings.

**Chapter 12**  
**Staged Implementation Plan**



## **CHAPTER 12 STAGED IMPLEMENTATION PLAN**

This chapter shows key targets and goals to be achieved and actions to be carried out to implement the master plan. The master plan period is 15 years from 1996 to 2010, which is divided into 2 phases, i.e., Phase 1: 1996 - 2000, and Phase 2: 2001 - 2010. Table 12.1-1 summarize the key targets and actions in each phase.

### **A. Collection and Haulage**

Most of the collection targets should be achieved by the end of the 1st phase. Main targets and actions include the following:

1. 100 % collection coverage by 2000
2. Minimum frequency by 2000 should be once a week. By 2005, twice a week collection should be provided for all the households, and at least twice a week collection for business waste.
3. Replace all RASUB's existing collection trucks by recommended types, i.e., Compactor (16 m<sup>3</sup>) with two mechanical lifts and Container compactor with mechanical arm-roll by 1999.
4. Replace 110 liter bins with 240 liter plastic bins, with casters, which are compatible with compactor (16 m<sup>3</sup>) with two mechanical lifts. 120 liter bins should be used for individual houses.
5. Eliminate shortage of bins by 1998. Use of imported plastic bins is the most economical and recommendable.
6. Become the cleanest city in eastern Europe by 2010.

### **B. Street Sweeping**

Main improvement point is to introduce patrol cars for monitoring and identification of streets which need sweeping. By 2000, patrol cars will be provided for rough stone roads in the central areas within the inner beltway, and by 2010 patrol cars will be introduced for suburban trunk roads.



### **C. Disposal**

It is planned that the Bucharest Municipality will execute the project "Development of 3 landfill sites" by acquiring soft loan from an international lending agency. The project has the following components:

- 1) Improvement of the existing Glina site.
- 2) Construction of a new landfill site in Balaceanca.
- 3) Construction of a new landfill site in Cretuleasca.
- 4) Construction of a water supply and sewage system for Popesti-Leordeni village in connection with the above 1st component.

Construction of another 3 landfill sites in Berceni, Afumati and Jilava will be required so that they can be used in 2006 and thereafter.

### **D. Waste Utilization**

The target recycling rate (10 -15 % of household waste generation) should be achieved by 2000.

A major recommendation is that recycling boxes should be provided on streets in which people deposit recyclable materials. 1,000 boxes may be necessary. By 1996, MB should establish a system to issue licenses to collectors who collect materials from those boxes. An option is that collectors should provide collection bins, and in return obtain the licenses to collect recyclable materials from them.

### **E. Institutional Arrangements**

#### Collection & Haulage

MB will use RASUB and RGR and other collection service providers as contractors. MB will use at least 3 contractors in Phase 1. All sectors will be contracted out within 1 to 2 years. During Phase 1, RASUB should be considered for a program of institutional strengthening. Privatization of RASUB should also be considered in Phase 1.

#### Street Sweeping

In Phase 1 street sweeping will be initially provided by RASUB but will be separately contracted out from collection and haulage to the private sector when conditions are appropriate. Participation of many sweeping contractors is expected.

### Disposal

MB will establish a Disposal organization by March 1996 responsible for waste disposal. The preferred option is a Foreign Joint Venture Company. MB receives technical assistance to set up new disposal organisation. MB agrees performance contract with FJVC.

### Maintenance of RASUB 's Waste Trucks

In Phase 1 RASUB will begin contracting out maintenance service for waste trucks.

### Monitoring of SWM Contractors

Monitoring responsibility will split between the Sectors and PSD. Each Sector will establish a section responsible for service monitoring before MB starts using contractors. Each Sector will carry out daily monitoring. PSD will be responsible for preparation of monitoring plan, analysis of monitoring data, monitoring compliance with contract terms and conditions, and application of sanctions to contractors when necessary.

## **F. Finance**

### Waste Tariff/Tax

The Waste Tax and the joint contracting out of collection/haulage & street sweeping are simultaneously implemented. Contractors cease to levy tariffs, and are remunerated through their contracts which are financed from the waste tax.

In principle 100 % of operation and investment costs of SWM should be recovered. However, if it is difficult in Phase 1, to recover 100 % of total SWM costs from the proposed waste tax, an option is to set the tax to cover SWM costs excluding or partly covering disposal investment costs. By Phase 2, all SWM costs should be recovered through the waste tax.

### Procurement of Waste Trucks

In Phase 1 RASUB and private sector contractors will be responsible for purchasing their own trucks and equipment. MB should set contract remuneration to enable contractors to finance their equipment purchases

Note: If RASUB is transformed into SALUB, SALUB will substitute for RASUB in the above.

## **G. Public Education & Information Program**

MB will prepare and implement a public education program for the citizens. The program will cover waste handling manner and recycling, etc. The program will also inform the citizens of new SWM developments.

## **H. Training of SWM Personnel**

Regular training should be provided for SWM personnel (both managers & engineers) in the public and private sectors.

## **I. Research & Development (R & D)**

MB should establish a R & D section responsible for improvement of solid waste management standards. R & D topics will include standardization of disposal methods according to area conditions, collection efficiency improvement and recycling technology, etc.

## **J. Cost Target**

It is estimated that the current average unit cost of waste collection, haulage and disposal is \$15.8/ton, of which \$15.3/ton is spent for collection and haulage and \$0.5/ton is for disposal.

This master plan strongly recommends that the Municipality of Bucharest should stop the current practice of open dumping, and apply sanitary landfill at a minimum level, which is estimated to have a unit cost of \$5.2/ton approximately.

This master plan also strongly recommends that the Municipality of Bucharest should ensure that the most efficient method of collection and haulage systems should be applied by using contractors through competitive tendering. Unit cost of collection and haulage can be reduced to \$10.5/ton with application of efficient and economical systems.

If the reduction of collection and haulage costs is achieved as shown above, a total cost of waste collection, haulage and disposal can be slightly reduced from the current level of \$15.8/ton to \$ 15.7/ton in spite of application of sanitary landfill and resulting disposal cost increases. See Fig. 3.2-1.

**Table 12.1-1 Staged Implementation Plan**

	Present 1995	Phase 1 1996 - 2000	Phase 2 2001 - 2010
<b>A. Collection &amp; Haulage</b>			
A1. Target coverage for household waste in terms of collection amount	85 %	1996: 86 % 1997: 89 % 1998: 92 % 1999: 96 % 2000: 100 %	100 %
A2. Target coverage for other waste	90 %	1996: 92 % 1997: 94 % 1998: 96 % 1999: 98 % 2000: 100 %	100 %
A3. Target collection frequency (1)	It is estimated 26 % of citizens receive collection once in 10 or more days	At least once a week for all the population by 2000.	<ul style="list-style-type: none"> <li>• Twice a week for households</li> <li>• At least twice a week for business waste.</li> <li>• Bucharest will become the cleanest city in eastern Europe.</li> </ul>
A4. Type of vehicles used	Multiple types are used including inefficient ones.	The existing trucks will be replaced by recommended efficient ones, i.e. 1) For bin system: Compactor (16 m <sup>3</sup> ) with 2 mechanical lifts. 2) For container system: Container compactor (12 m <sup>3</sup> ) with arm-roll	
A5. Replacement of existing trucks with recommended types	0 %	1996: 25 % 1997: 50 % 1998: 75 % 1999: 100 %	100 %
A6. Type of bins and replacement	110 liter bin & 4 m <sup>3</sup> container	All 110 liter bins will be replaced with 240 liter plastic bins, with casters, which are compatible with Compactor (16 m <sup>3</sup> ) with 2 mechanical lifts by 1999 in accordance with the phased introduction of the trucks. 120 liter bins will be used for individual houses.  4 m <sup>3</sup> containers will be used.	Replacement of the existing bin type (110 liter metal) with recommended types (240 liter and 120 liter plastic bins) will be completed in phase 1.

Note (1): According to the survey conducted by the JICA Study Team in November 1994, 35 % of the interviewees answered that they received a twice weekly collection service, 39 % received a once weekly, and the remaining 26 % received once in 10 or more days.

	Present 1995	Phase 1 1996 - 2000	Phase 2 2001 - 2010
A7. Supply of bins relative to demand for bins	60 %	1996: 80 % 1997: 90 % 1998: 100 % Use of imported used plastic bins is the most economical and recommendable. The citizens may use plastic bags until 240 liter bins are supplied.	100 %
<b>B. Street Sweeping</b>			
B1. Introduction of patrol cars	Some patrol cars are used for checking some streets (2 lanes or less) of the central district.	Patrol cars will be introduced for rough stone roads in central area to monitor & identify streets that need sweeping. (Central area is that which is within the inner beltway.)	Patrol cars will be introduced for suburban trunk roads to monitor & identify streets that need sweeping.
B2. Type of mechanical sweepers	Both FAWN (Mercedes) & Ford are used.	Ford mechanical sweepers should be replaced with FAWN because the latter are more efficient.	
<b>C. Disposal</b>			
C1. Immediate improvement of Glina landfill site	Smoke and bad odor are generated.	In 1995 and 1996, MB should execute the plan to prevent the generation of smoke and odor.	
C2. Improvement of Glina landfill site		Design and improvement work in 1997 and 1997 respectively. Cost of improvement work: US \$ 4.5 million	Use of Glina site until 2005
C3. Acquisition of new landfill sites		2 sites in Balaceanca (40 ha) and Cretuleasca (28 ha) Total area to be acquired: 68 ha	3 sites in Bercent (20 ha), Afumati (36 ha), and Jilava (45 ha). Total area to be acquired: 99 ha including area used after 2010
C4. Construction of new landfill sites including design costs		2 sites in Balaceanca (1998) & Cretuleasca (1998) Total construction cost: US \$ 12.4 million	3 sites in Berceni Afumati, and Jilava during 2003 -2005 Total construction cost: \$ 27.3 million

	Present 1995	Phase 1 1996 - 2000	Phase 2 2001 - 2010
C5. Level of landfill	Open dumping or controlled tipping	Sanitary landfill with artificial lining	Sanitary landfill with artificial lining and leachate leakage monitoring facility, etc.
<b>D. Waste Utilization</b>			
D1. Collection points	Citizens' bring recyclable materials to REMAT's collection points.	Target recycling rate (10 - 15 % of the household waste generation) should be achieved by 2000.  Provide recycling boxes on streets. Approximately 1,000 boxes may be necessary. MB will issue license to collectors who collect recyclable materials from the boxes. An option is that collectors provide collection boxes.	
<b>E. Institution</b>			
E1. Collection & Haulage	RGR is franchised. RASUB has no contract with MB.	MB will contract out all sectors and use at least 3 contractors. RASUB will be considered for institutional strengthening. MB will not give special privileges to RASUB. Consider privatization of RASUB.	
E2. Disposal	RASUB carries out disposal.	MB will establish Disposal organization by March 1996. The organization will be responsible for financing both investment and operational costs.	Consider use of private enterprises for operation & maintenance of landfill facilities, and also capital investments in landfills.
E3. Street sweeping	Sector ADPs provide sweeping service until transferred to RASUB	RASUB will initially provide both collection and street sweeping service under one contract with MB. A phased and separate contracting out of the street sweeping will be implemented.	
E4. Maintenance of RASUB's collection vehicles	RASUB carries out own maintenance.	RASUB will implement a phased contracting out maintenance services.	
E5. Monitoring of SWM services and SWM contractors	MB's Public Service Department (PSD) carries out the monitoring.	Monitoring responsibility will split between Sectors and PSD. Each Sector will establish a service monitoring capacity before MB starts using contractors. The monitoring sections will carry out daily monitoring. PSD will be responsible for preparation of a monitoring plan, analysis of monitoring data, application of sanctions to contractors when necessary and actual compliance.	

	Present 1995	Phase 1 1996 - 2000	Phase 2 2001 - 2010
<b>F. Finance</b>			
F1. Waste tariff/tax	Citizens pay tariff to service providers based on service contracts	Citizens pay waste tax to MB through MoF's local offices.  Contractors will be remunerated through contracts.	Same as left
F2. Cost recovery	100 % of SWM operating costs	100 % of operating and investment costs of SWM should be recovered from waste tax. However, if this is difficult, an option is to set the tax to cover SWM costs excluding or partly recovering disposal investment costs.	100 % of operating and investment costs of SWM will be recovered through waste tax.
F3. Financing Capital Expenditures in landfill facilities	MB is responsible	Acquire external soft loans. Introduce the waste tax.	100 % cost recovery from waste tax
F4. Procurement of collection trucks	MB financed the purchase of RASUB's trucks. MB owns RASUB's trucks.	RASUB and contractors will be responsible for purchases themselves. MB will have no procurement responsibility.	All contractors including RASUB will be responsible for truck procurement. MB has no procurement responsibility.
G. Public Education & Information Program	None	MB will prepare and implement a public education program for the citizens. The program will cover waste handling manner and recycling, etc. The program will also inform the citizens of new SWM developments. By 2000, MB will establish a training center for those involved in SWM at both public and private sectors.	
H. Training of SWM personnel	Little	Regular training should be provided for SWM personnel (both managers & engineers) in the public and private sectors.	
I. Research & Development (R & D)	Little	MB should establish a R & D section responsible for improvement of solid waste management standards. R & D topics will include standardization of disposal methods according to area conditions, collection efficiency improvement and recycling technology, etc.	









JICA