

“What are the effects of the Master Plan?”

11. Evaluation of Transport Master Plan

11.1 Economic Evaluation

The benefit of the Master Plan is usually deduced from the result of calculation of both vehicle operation cost saving and time saving. Cost and benefit are compared under the project life of 25 years. Since the economic internal rate of return (EIRR) for the Master Plan attains the level of 18.8%, it can be concluded that the Plan is feasible from the point of the national economy. The benefit/cost ratio (B/C) of the Master Plan, applied with a discount rate of 12%, reaches 1.37 and the net present value (NPV) is Lei 5.7 trillion.

While the road sector has an EIRR of 16.5%, the public transport sector has as high an EIRR as 19.2%. In the road sector, the Inner Ring Road has a higher EIRR (25.4%) than the Middle Ring Road (15.4%), indicating the profitability of improving the Inner Ring Road. In the public transport sector, the tram has a higher EIRR (19.5%) than the metro (13.3%), indicating the advantage of a multi-modal transport system axis pattern centered around the latter.

11.2 Financial Considerations

The total investment amount of the projects reaches US\$ 2,175 million. As possible funding sources for the projects, the general accounts of the central government and the Municipality, the budgets of METROREX and RATB, the loans of international institutions, bilateral foreign aid, and private investment are examined.

From the following sources, US\$1,832 million is expected to be procured (Table 11.1);

- 1) To use the foreign assistance and soft loans from international lending agencies for projects which require a huge amount of funds and use of high-technology (mainly for the improvement of metro and tram).
- 2) To change the existing fuel tax into a tax earmarked for road improvement and to raise the tax rate by 10-15% (mainly to be used for road improvement).
- 3) To introduce the city planning tax for land and buildings owned by beneficiaries from the improvement of urban transport facilities. Tax rate is 500 thousand lei per 65m² of average space owned by households and offices (mainly used for improvement of street and piata).
- 4) To utilize the private funds for revenue-expected projects. One-third of the total investment is expected from private capital (mainly used for parking construction).

For the remaining US\$3,420 thousand, the following sources should be examined;

- 1) To introduce the capital gains tax within the CBD and the Metro extension area,
- 2) To apply the concession method, BOT method, etc.

Table 11.1 Expected Fund Sources

Source of Fund	Amount of Procured Fund (mil. US\$)
Foreign loan	1030.1
Fund from private sector	117.0
Revenue increment and decrease of fare evasion	287
Revenue from fuel surcharge tax	124.5
Assignment by Bucharest Municipality	206.6
Allocation from RATB	17.8
City planning tax	49.2
Others	342.3
Total fund procurement	2174.5

11.3 Environmental Evaluation

The following charts compare the emissions of Carbon Dioxide (Hereinafter, CO₂), a substance related to the global environmental issues and Nitrogen Oxide (NO_x), a major air pollutant, between the Do Nothing Case (Do Nothing) and the Master Plan Case (MP.OP). In view of the EURO2 emission restriction taking effect recently, we considered two possibilities: In Options 1 and 2 (Figures 11.1 and 11.2), the ratio of existing catalyst type engines occupies 25% and 90% of all the passenger cars, respectively. In Option 1, as shown below, the Master Plan Case results in the total emission of 27% less CO₂ and 20% less NO_x than the Do Nothing Case. In Option 2, the Master Plan Case results in the total emission of 21% less CO₂ and 74% less NO_x. In Option 2, in particular, the ratio of catalyst type engines with high NO_x emission contributes to this result. On the other hand, the CO₂ emission is somewhat increased, which is a characteristic of catalyst type engines. As a conclusion, this Master Plan is appropriate in terms of protection of urban environment because implementing only the projects proposed in this Master Plan can reduce the total emission of air pollutants even if the ratio of catalyst engines remains at the current level.

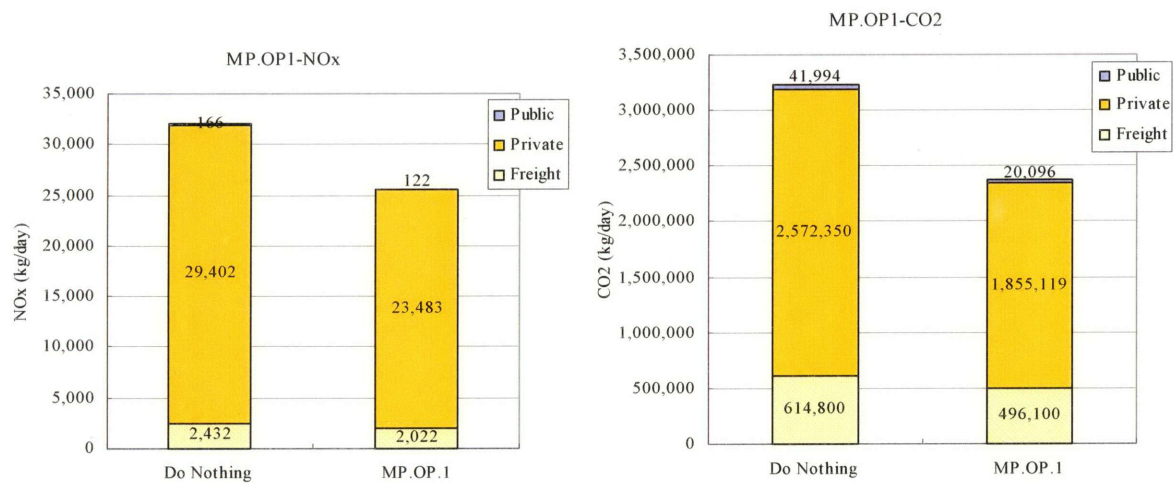


Figure 11.1 Comparison of NO_x and CO₂ Emission Amount (Option 1)

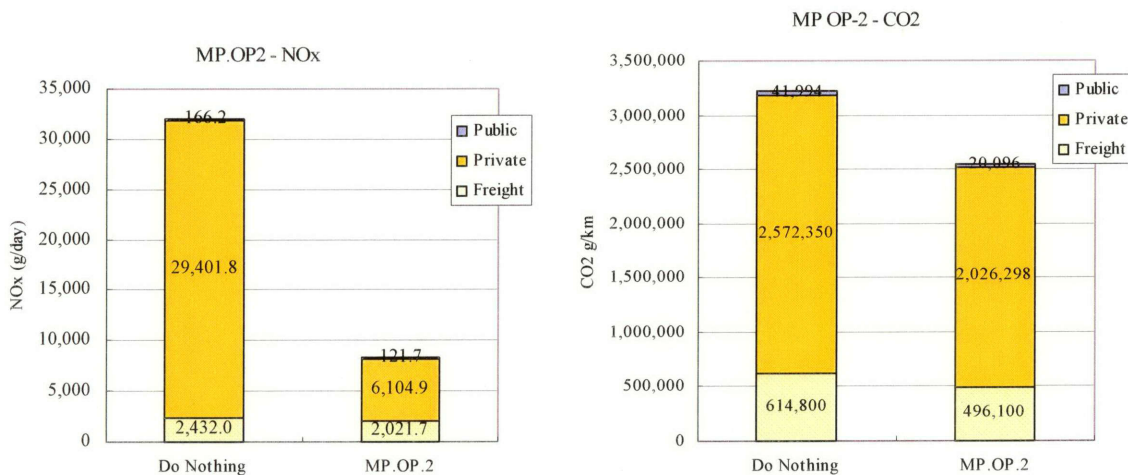


Figure 11.2 Comparison of NO_x and CO₂ Emission Amount (Option 2)

“How should the Master Plan be implemented?”

12. Implementation Plan

12.1 Schedule of Project Implementation

In order to formulate the investment schedule of the projects proposed by the transport master plan, following items were considered (Table 12.1).

- Projects which solve present problems efficiently without requiring large amount of investments should have priority.
- Projects which do not have constraints such as land acquisition problems should have priority.
- Economic and financial return should be considered.
- Projects which have a close relationship to each other should have related construction timing.
- Financial resources capability should be considered.
- Investment amount in each year should be equalized if possible.

12.2 Priority Project Selection

Priority projects to be studied were selected among the projects which have possibilities to be implemented within 2 or 3 years after the completion of the Study, using following criteria.

- Does the project match the city structure in the intensive multi-center development pattern from the perspective of strategy?
- Does the project concern the completion of a ring road?
- Does the project match the public transport improvement in the multi-modal transport axis pattern?
- Does the project contribute to the improvement of the central area?
- Can the project use the existing facilities?
- Does the project have a high efficiency?
- Do the fund procurement, land acquisition, and environmental effects have any problems?
- Is a new Study necessary?

As a result, the following five projects were selected.

- a. Inner Ring road linkage by Basarab overpass**
- b. Bottleneck Piatas improvement**
- c. Parking system development in central area**
- d. New type tram introduction**
- e. Fare system improvement**

12.3 Improvement of Public Transport Business

As the demand for public transport is on the decline, both the METROREX and RATB, unable to cover the service costs with the revenue from fares alone, currently have no choice but to rely on a large amount of subsidies. However, to continuously provide comfortable transport services, these transport entities must improve the basis of business and:

- 1) Improve the productivity by introducing a division-based accounting system to clearly identify earnings and costs,
- 2) Contract out work items that can be contracted out to downsize the organization,
- 3) Transfer the authority to the field operation departments,
- 4) Positively introduce a system that fuels demand, e.g., an improved fare system.
- 5) Create a section that forecasts demand and makes plans in order to respond to demand changes in the future.

12.4 Revision of Related Laws and Organizations

Appeal to the local and national governments for revision of the following laws and organizations.

- 1) A large amount of fund is required to implement a project. For financial sources to be secured, the related laws must be revised to enable the change of tax rates and the creation of new taxes.
- 2) Since different entities implement different projects, a coordinating organization run by the city office must be established to coordinate implementation of projects.
- 3) For parking and other facilities that may be run by privately owned companies, systems should be revised so that private capital can be easily introduced.

Table 12.1 Project Implementation Schedule

No.	Project	Short	Medium	Long	Cost (Mil.us \$)
Roads	1. Inner Ring Road (Basarab & West section)				63.1
	2. Inner Ring Road (South Section)				16
	3. Central Circulation Roads				49.6
	4. Connection Roads bw. IRR & Circulation Rds.				143.6
	5. Middle Ring Road				104.3
	6. Outer Ring Road				16.5
	7. Street Improvement				54.8
Intersections	Improvement of intersections				89.8
Traffic Management	1. Development of Parking Facilities				76.9
	2. Development of Signals & Traffic Management				31.5
Metro	1. Construction of M4 line (1 May - Laromet)				77
	2. Construction of M5 line (Drumul Taberei - Universitate)				257.5
	3. Construction of MR4 line (N. Grigorescu - L. de Centura)				88
	4. Modernization of rolling stocks				19.8
	5. Purchasing of new rolling stocks (1) for M2				127.6
	6. Purchasing of new rolling stocks (2)				48.4
Tram	1. Construction of Cross-center Linkages				28.6
	2. Construction of Tram Route along Middle Ring Road				47.3
	3. Construction of Tram Route along Inner Ring Road				15.4
	4. Construction of North-South Tram Route				31.9
	5. Introduction of New Tram system				319
	6. Rehabilitation of Tram Infrastructure in southwest				121
	7. Rehabilitation of Tram Infrastructure in other area				132
	8. Purchasing of Rolling Stocks				88
Trolley	Trolley route construction				0.8
Piata	1. Improvement of Gara de Nord				24.2
	2. Improvement of Pta. Obor				28.5
	3. Improvement of Pta. Sudului				3.1
	4. Improvement of Pta. Unirii				13.2
	5. Improvement of Pta. Universitatii				5.5
	6. Improvement of Passenger Facilities				1.1
Renovation of O/M system	1. New Ticketing Device system				19.6
	2. Other Renovations for Operation/Management				0
Others	1. Construction of Freight Terminals				8.5
	2. Street Environment				22.4
Total		673.7	608.8	892	2,174.5