

FINANCING JAKARTA'S MASS TRANSIT SYSTEM

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ABSTRACT

To address the continuing population growth in Jakarta, which result in the worsening traffic condition, an integrated mass rapid transit network was planned. This network includes light rail, heavy rail, as well as conventional rail based transit.

The first stage of the 300 km line throughout DKI Jakarta comprise a North - South line running from Fatmawati in the South to Kota in the North, and an East - West line between Duri and Kemayoran. As part of the first stage, basic design for the North - South line has been carried out. The basic design is for an MRT system which extends from Blok M in the south to Kota in the North. Project financing scheme proposed in the basic design, as desired by the Government of Indonesia, is a Public Private Partnership (PPP) concept. This concept consist of Jakarta Metro Corporation (JMC) and three separate companies; Company A, Company B, and Company C. The JMC was further elaborated as "umbrella" company under which companies A, B, and C would fall.

1. PROJECT DEFINITION

1.1 Jakarta Transportation Network

The population of Jakarta will grow from some 9 million in 1995 to over 12 million in 2015. Commuting from the urban districts surrounding Jakarta will also increase. To address the continuing population growth and resultant worsening traffic conditions in Jakarta, an integrated mass transit network was planned including light rail, heavy rail and conventional rail based transit. An extensive system is envisage, eventually comprising as much as 300 km of line throughout DKI Jakarta and extending into the surrounding districts. The first stage of this line comprising a North-South line running from Fatmawati to Kota, and an East-West line between Duri and Kemayoran.

The North-South line is intended to serve the travel demand primarily between the residential areas of South Jakarta and the commercial areas along the Sudirman-Thamrin corridor, and as distributor of trips from other parts of the area to destinations along this corridor. The initial MRT line extends from Blok M in the South to Kota in the North, with provision for further extension to the South and North.

1.2 System Description

The MRT guide-way comprises a mix of bored tunnel and cut and cover tunnels, with transitions to ground level at the ends of the route. The majority of the route is in twin, single track bored tunnels with 5.5 m internal diameter. Top of rail is approximately 16 m below ground level.

Underground stations will typically have up to four entrances at ground level, leading down to a concourse level which will contain ticketing facilities, station facilities, plant rooms and ancillary accommodation. The concourse level also comprise of paid areas and un-paid areas.

The rolling stock was designed to comprise of 6 car trains, with a capacity of around 2,100 passengers at peak density of 7 passengers/m². Other features include:

- Length of train : around 135 m
- Power supply : 1500 V DC overhead line
- Motoring : 50% - 66%
- Maximum acceleration : 0.9 m/sec²
- Maximum braking rate : 0.9 m/sec²
- Maximum speed : 80 km/h

1.3 Construction and Land Requirements

The bored tunnels between stations will be constructed by the closed-face mechanical shield method. The tunnel structure will consist of pre-cast concrete segments. Tunnelling will commence from a number of off-road work sites along the route and will be driven through intermediate stations before being removed at a different worksite.

Stations and cut-and-cover tunnels will be constructed in excavations retained by diaphragm walls, secant pile walls or other systems as permitted by the soil conditions. Station excavations will be approximately 175 meters long by 22 meters wide and up to 19 meters deep. Excavation will be carried out from ground level and by plant in the excavation itself. Sub-surface utilities will have to be diverted or supported. Temporary traffic decks will be used to accommodate traffic over open excavations.

An optimistic overall construction period for the Blok M - Kota line will be approximately 60 months.

Estimate of the total essential land requirements for this line with a depot at Kota, are as shown in the following table.

Table 1: Land Requirements

Category	m ² (‘000)
Permanent acquisition	153.0
Permanent easement	55.6
Temporary use	75.2
Assumed public right of way	331.2

2. PROJECT COST

2.1 Construction Cost

The cost of the fully underground MRT system constructed from Blok M to Kota, with a depot at Kota is estimated to be as shown in the following table.

Table 2: Construction Cost

Element	Cost (US\$ million)
Civil works	
• Guideway	497.39
• Stations	476.94
• Miscellaneous	50.17
• Depot	50.83
• Contingency & provisions	166.31
Sub total civil works	1,241.64
E & M works	
• Rolling stock	110.00
• Stations and wayside	333.60
• Trackwork	50.66
• Depot equipment	46.30
• Contingency & provisions	45.95
Sub total E & M works	586.51
Project Management	54.84
Total Construction Cost	1,882.99

2.2 Land and Replacement Cost

The cost (at market value) of essential land for the project is as follows:

- Government owned land : US\$ 190 million.
- Private owned land : US\$ 121 million.

The cost of replacement of major components that have reached the end of their designated service life are estimated as:

- 2017 to 2021 : US\$ 53.15 million per year.
- 2022 to 2026 : US\$ 23.69 million per year.

2.3 Operation and Maintenance Costs

Pre-operating costs are estimated to be US\$ 5.08 million, US\$ 11.84 million, and US\$ 3.57 million in the year 2000, 2001, and 2002 respectively. Operating and maintenance costs are estimated to rise from around US\$ 40 million per year in 2002 to US\$ 46.6 million per year in 2030.

3. PROJECT INCOME

3.1 Direct Income

Direct income for the MRT can come from farebox revenues, letting of concessions within stations and renting of advertising space within stations. The average fares and income from fare revenues for the Blok M - Kota line, in 1995 prices, is as shown in the following table.

Table 3: Average Fare and Income

	2001	2006	Year 2011	2015	2030
Annual passengers (million)	130.2	149.4	169.2	188.1	225.3
Average fare (Rupiah)	1,200	1,388	1,575	1,725	2,003
Annual revenue (million US\$)	66	88	113	138	192

Income from the rental of retail and advertising spaces within stations can be in the vicinity of US\$ 514,800 and US\$ 5,040,000 per year.

3.2 Property Development

The introduction of an MRT into the urban fabric of Jakarta will encourage growth. The extent of this growth is related to accessibility to the MRT stations. Zones of high accessibility will be created in the immediate environs of the stations, followed by zones of medium to low accessibility.

Indirect income for the MRT can be gained from the sale of Property Development Rights (PDR). Revenue estimates were produced, based on Special Development Zones (SDZ) for specific areas of influence around each station and depot.

Revenue from the sale of PDR for the Blok M - Kota line was estimated at US\$ 437 million in 1996 prices and land values.

Due to the uncertainties inherent in property development this income can not be used to raise financing for the construction of the project.

4. PROJECT FINANCING

As part of the Basic Design, the Project Finance Study was undertaken, to evaluate the legal, commercial, and financing aspects of the implementation of the project with particular reference to:

- a. define the description of the project,
- b. maximise the feasibility and financial viability of the project for prompt implementation.

4.1 Ownership Structure

The Government of Indonesia expressed the desire to implement the project in the form of a Public Private Partnership (PPP). The generic concept of the PPP is to harness the potential contribution the private sector can make to a project through the accessing of private sector skills in a more effective way than via the normal public works approach. In the study, the consultants assumed the roles for the public and private sectors as outlined below:

Public sector roles

- a. The public sector is to establish and maintain the necessary institutional structure to enable the project to be undertaken under the PPP concept.
- b. Recognising the limitations on the financial viability of the project, the public sector will provide the financial support necessary to enable the project to be undertaken under the concept of PPP.
- c. To share the risks of the project with the private sector on the basis that such risks be allocated to those parties in the best position to control and manage such risks.
- d. To protect the public interest with respect to the economic viability of the project.

Private sector roles

- a. To provide expertise in the structuring of appropriate institutional, commercial, and contractual arrangements to implement the project under the PPP concept.
- b. To provide expertise in the areas of design of the project.
- c. To provide expertise in structuring and negotiating appropriate construction/ supply arrangements for the project.
- d. To operate and maintain the MRT system in accordance with best industry practice.
- e. To arrange the financing of the project with support from DKI Jakarta/ Government as required.
- f. To participate in the sharing of the project risks.

4.2 Jakarta Metro Corporation

The Government of Indonesia desires that the eventual form of the Public Private Partnership would consist of the Jakarta Metro Corporation (JMC) and three separate companies; Company A, Company B, and Company C (Figure 1).

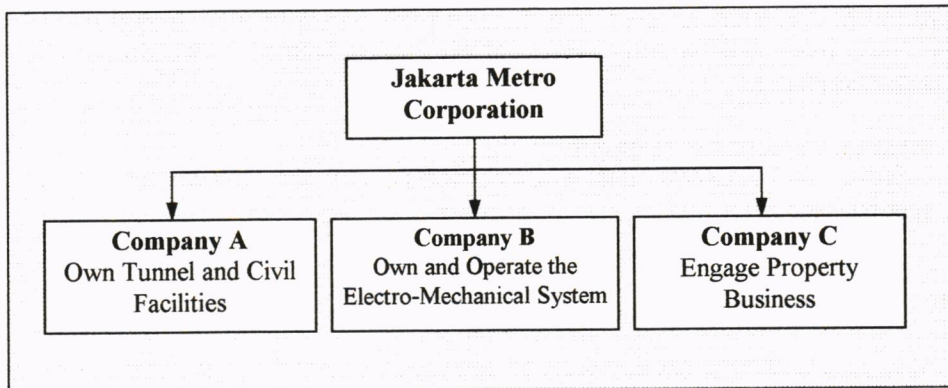


Figure 1 : Ownership Structure Envisaged

The JMC was further elaborated as an “umbrella” company under which companies A, B, and C would fall. The roles of companies A, B, and C were defined as follows:

- Company A will own the tunnel and civil facilities of the project.
- Company B will own and operate the electro-mechanical system of the project.
- Company C will engage in the property business of the project.

Subject to how the provisions of the Railway Law (Law No. 13 of 1992) are reconciled with the proposed authorisation of the DKI Jakarta Governor to implement the Blok M - Kota MRT system, it is likely that the regulatory structure will follow that provided for in the Railway Law. Assuming this is so, there will be a need to establish an Executing Body in the form of a state-owned enterprise. It is conceivable that JMC could be the Executing Body. The conceptual regulatory structure is set out in Figure 2.

Given the likelihood that the composition of the ownership of Company A, B, and C will differ, it would not be possible for JMC to be the holding company, for those companies. JMC could possibly be the holding company for DKI's equity investment in Companies A, B, and C. It was also assumed that JMC will be wholly owned by DKI Jakarta.

The JMC's role could therefore be:

1. the executing body;
2. parent company of Company A which will own the civil works (and possibly fixed E & M);
3. holding company for DKI's share-holding in Company B and C.

In these roles, JMC should be in a position to co-ordinate the implementation of subsequent phases of the MRT system.

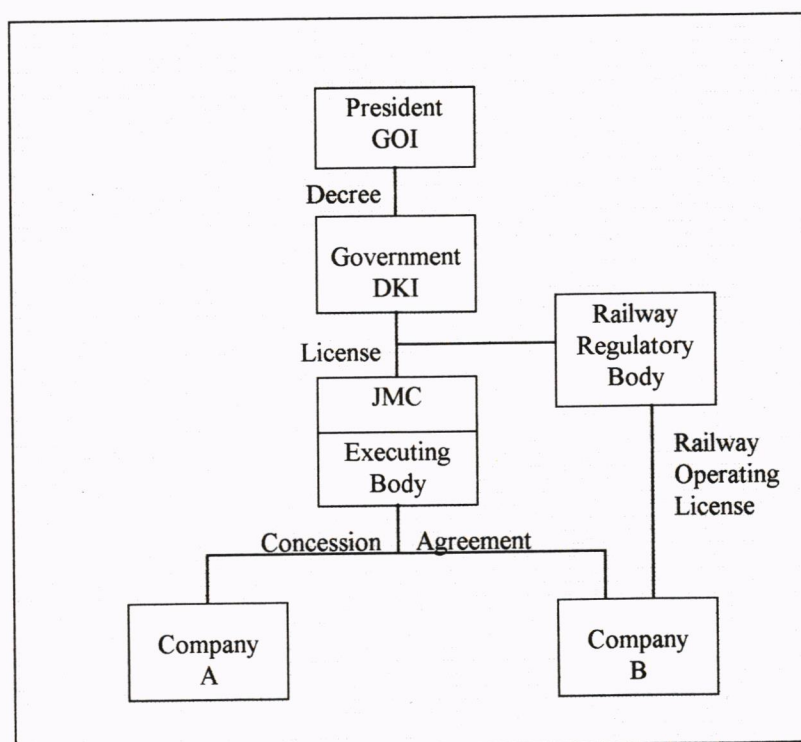


Figure 2 : Conceptual Regulatory Structure

4.3 Finance Plan

The level of finance from the private sector is a direct function of the level of forecast net farebox revenues from the project, since private sector finance would be serviced from this source. The portion of the project cost that cannot be financed by the private sector will have to be financed by the public sector, through the Jakarta Metro Fund (JMF).

The total cost to be financed by Company A and Company B was calculated as shown in the following table.

Table 4: Cost to be Financed by Company A and Company B

Item	Cost (US\$ millions)
Company A	
• Civil costs	1,242
• E & M costs	365
• Land & land tax	313
• Project management fee	55
• Pre-operating expenses	35
• Escalation for inflation and devaluation	349
Total Company A Costs	2,359
Company B	
• E & M costs	221
• Pre-operating expenses	71
• Escalation for inflation and devaluation	63
Total Company B Costs	355
Total Project Cost	2,714

Both public and private financing will be in the form of debt and equity. Two financing plan were considered. The sources of equity and debt for the baseline financing plan are shown in the following table.

Table 5: Baseline Financing Plan

Source	Amount (US\$ millions)
Company A Equity	
• DKI Jakarta	100
• Preference shares	100
Company A Debt	
• Bilateral Soft Loan	1,104
• ECA Supported Finance	867
• Yankee Bond Placement	500
• Rupiah Term Loan	500
• Rupiah Bond	200
Total Company A Financing	3,371
Company B Equity	
• DKI Jakarta	36
• Private sector	143
Company B Debt	
• ECA Supported Finance	227
Total Company B Financing	406
Total Project Financing	3,777

The average yearly payments that JMF will need to make with respect to the financing of Company A are as shown in the following table for the baseline financing case.

Table 6: Average Yearly Payment by JMF

Average Annual JMF Payments (US\$ million)				
year 6 - 10	year 11 - 15	year 16 - 20	year 21 - 25	year 26 - 30
430	474	331	243	273

The equity internal rate of return (in US\$) of Company B is 21.9 % with a debt to equity ratio of 1.42 and a debt service coverage ratio of 1.22

In this baseline financing plan the largest proportion of Company A debt would be raised from one bilateral source. There is some doubt regarding the feasibility of raising this financing.

5. DKI JAKARTA CONTRIBUTION

5.1 Obligations of the Regional Government

In connection with the plans to construct the Blok M - Kota line without taking in consideration which system will be further constructed, the Regional Government of DKI Jakarta must start to allocate as their contribution funds in the form of:

- Equity to the amount of US\$ 25 million annually during 5 years.
- Reimbursement of loan to the amount of US\$ 35 million annually during 25 years.

In accordance with provisional report of consultant assigned to handle Government finance (ALMEC Corporation), the above mentioned contribution will return each time there will be additions or extensions of MRT track, which requires US\$ 1,500 million. Such contribution if compared with the current development budget in DKI Jakarta, constituting 5 % - 7 % will undergo increases in the future. Such large contribution will be felt as burden if the source will be only from the existing Original Regional Revenue (PAD). Therefore other sources need to be exploited.

5.2 Search for New Revenue Sources

Exploitation of new revenue sources constitute an attempt to provide the required funds, specifically sources which support the Original Regional Revenue (PAD). The effort should always be based on prevailing laws and regulations, in other words all the effort are allowed by laws, and also by taking into consideration the existing jurisprudential. The target of the exploitation of these sources shall be directed towards existing sources which nevertheless are still potential for improvement, and new sources created or may be obtained from the said project.

Collection in the form of tax

Some types of collections proposed and which can be classified as tax are as follows:

- a. Tax on fuel for motorised vehicles: the original name is *Opsen Pajak* (excise). The sale of gasoline which is based on Article 13 Law No. 11/1957.
- b. Tax on the settlement of road congestion or road congestion pricing: this tax is new and relates itself to the project being constructed.
- c. Special tax of costs replacement (Baat Belasting): this is a Regional Tax which is already in progress but adjustment of the regional regulation will be needed which regulates this matter (Regional Regulation No. 1/1972).
- d. Street light tax: is Regional Tax already applied but adjustment is needed of its Regional Regulation to provide for its target and its schedule of charges. This type can be acknowledge to have a rather large potential and easy to collect.

- e. Tax on transfer of land ownership: this kind of collection is not performed on the basis of UUPA/1960 (Law No. 5). But till this moment, collection is performed by virtue of Decree of the State Minister/Chairman of BPN, No. 2/11992. The collection is meant to be charged 0.25 %, for which the collection is delivered to the Public Notary. This revenue includes revenue of the Central Government.
- f. Number of employee tax: along the corridor where the payment shall be the responsibility of the company. This type of collection is new, and in close relationship with the existence of the MRT project. If this can be approved, this type of tax is very potential.

Besides the six proposed type of tax, there are some collections which have a rather high potential, and very possible to collect additional charges, among others:

- a. Airport Tax: aside from having a rather large potential, each passenger taking off from Jakarta sill surely enjoy the service provided by the Regional Government of DKI Jakarta, so that it is rather fair if they are subjected to 25 % Airport Tax paid.
- b. Harbour Pass: till this moment not even one of the charges existing in the harbour constitute a Regional collection. It is therefore proper if to the Regional Government opportunities will be provided to obtain a share as a source of Original Regional Revenue.
- c. Additional Television Tax: based on the same consideration, it would be proper and would be very helpful in the performance of collection, if the Regional Government be allowed an opportunity to increase 25 % of the amount of tax foe one year.
- d. Additional Motorised Vehicle Tax: this type is very possible to be included as a collection system for Road Congestion Pricing e.g. 25 % of indebted PKB, under the provision that it will be limited to passenger cars/personal cars only. While public vehicles, two and three wheeled will not be charged.
- e. Additional Motorised Vehicles Change of Ownership Tax: The basis of thought is the same as is proposed for PKB, if approved addition of 25 % will provide a large support for the funding of the construction of MRT project in DKI Jakarta. This may also be limited to passenger/personal cars.

Non-Tax Charges

Aside from the charges classified as Tax as indicated above, increase of revenue can be performed to non-tax charges, both those having direct relationship with the principle of increasing PAD for the purpose of the funding of the MRT Project:

- a. Retribution in the field of city planning: this is in direct relation with the project, especially if changes of land-use will occur along the corridor.
- b. Retribution in the field of urban land reform: this also is made very possible by change of ownership, thus from this type it is also very possible to perform charge collection.

- c. Retribution on licenses: its potential is very large to experience increase both license for building construction (IMB), company license in the field of tourism, license of place of business, license of trade, etc.
- d. Sanitary retribution: this type of retribution has a very large potential considering the large number of families, the number of enterprises, stores, industries, and other business. Through more proper and efficient exploitation this kind of retribution will produce hundreds of billions.
- e. Parking retribution: similar to sanitary retribution, this type of collection has a very large potential. This type of retribution is not very difficult to collect since the Regional government in this case the DIPENDA DKI Jakarta has data on vehicles. The main target of collection are on parking spaces along the corridor.

6. CONCLUSION

- a. The construction of the MRT project has been approved by the Regional Government, hence fund requirement will be the responsibility of the Regional Government of DKI Jakarta.
- b. Bearing responsibility for the funding of the project, DKI Jakarta must increase its Original Regional Revenue as a whole, considering the applying financial system now is pot system.
- c. The existence of this project will improve or overcome transportation problems. From the viewpoint of revenue of the Central Government, the state owned company (BUMN / BUMD) will enjoy rather large increase.

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