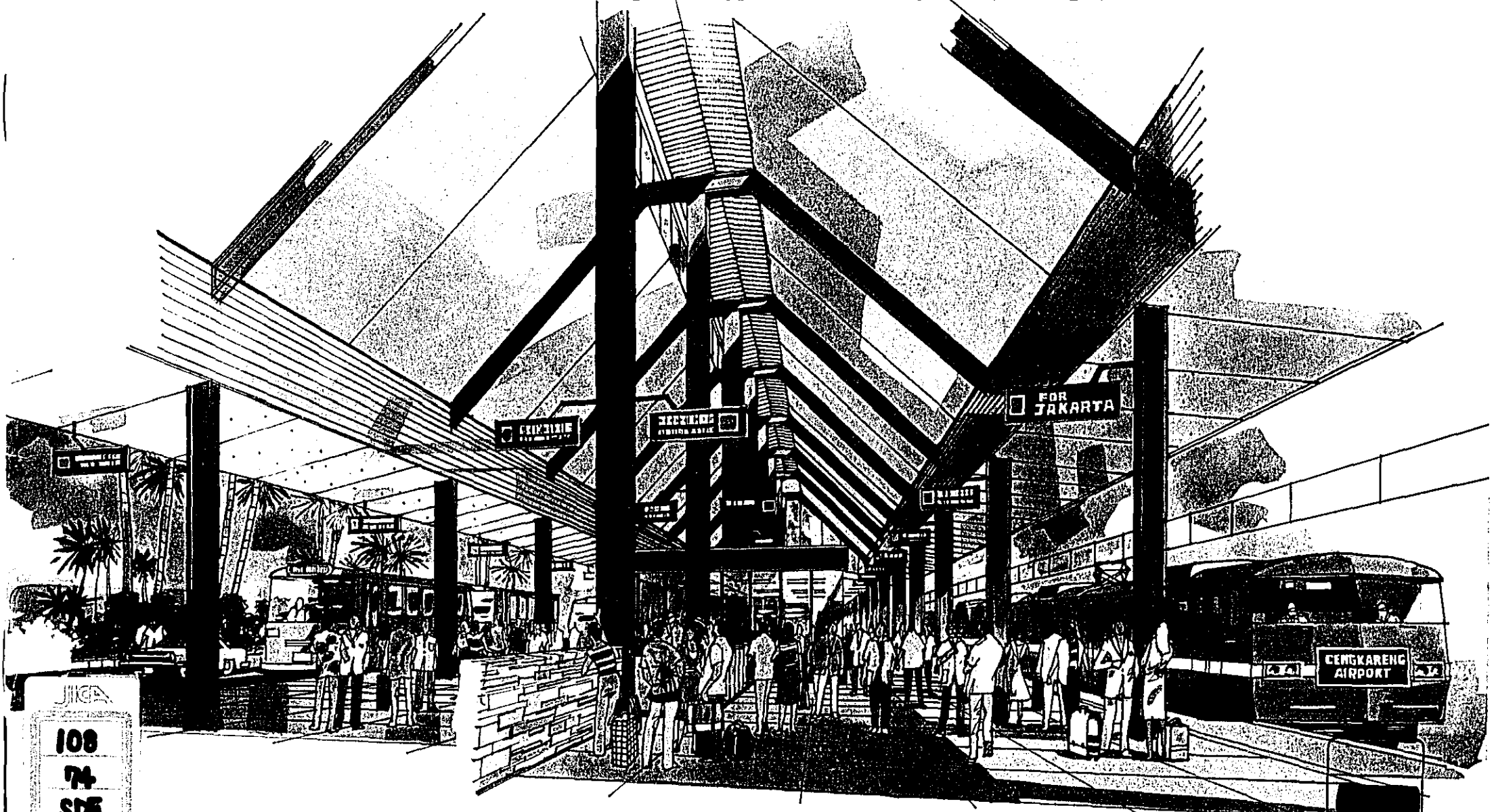


# NEW RAILWAY LINE JAKARTA — CENGKARENG AIRPORT



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Bird's Eye View of the New Railway Line  
The New Railway Line Directly Connecting with the Central Line at Jayakarta Station by  
Passing Over the Existing Lines Near Jakarta Kota Station

# INTRODUCTION

With the worldwide increase of airline passengers over the past decade or so, the aircraft themselves have had an increase of both their speed as well as their capacity. At many major airports around the world, problems are being caused by the increased time required for access to the airports and the uncertainty of on-time arrival because of the traffic congestion to and from the city center.

This above-mentioned surface traffic problem increases the actual travel time of passengers in spite of the shortening of flight time.

To resolve this traffic problem, railways have been introduced as access means to several major international airports.

The role of the New Railway Line for Jakarta International Airport Cengkareng (JIAC) will be to carry not only airline passengers but also airport employees and other visitors to the airport as safely, comfortably, and punctually as possible.

This brief paper is produced as an extract of "The Feasibility Study of New Railway Line for Cengkareng Airport—1983 JICA".

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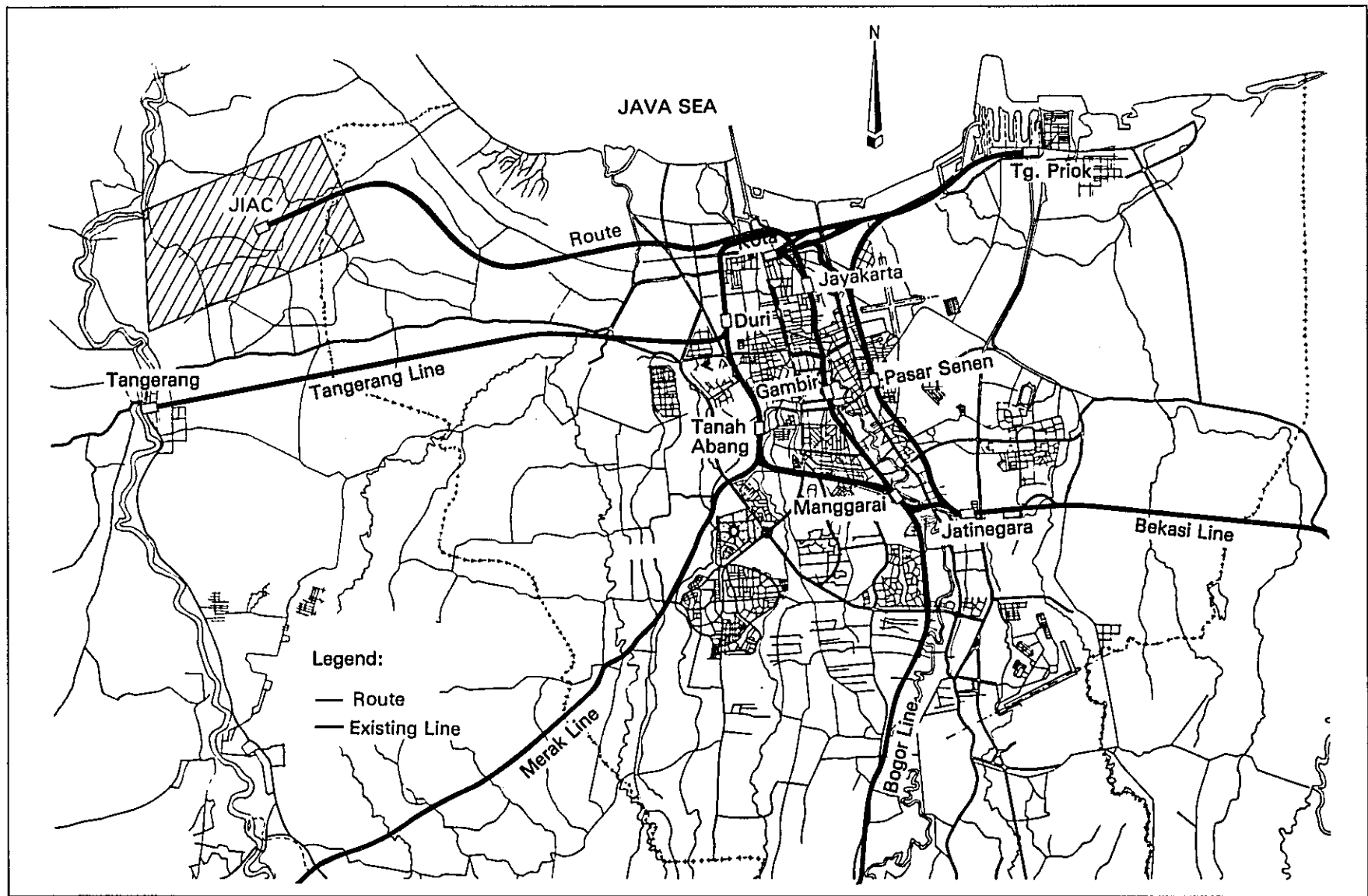


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## Some Examples of Airport Access Railways of the World

City (Country)	Airport	Distance between Airport and City Center (km)
Paris (France)	Charles de Gaulle	27
Frankfurt (West Germany)	Frankfurt	11
Zürich (Switzerland)	Kloten	10
Tokyo (Japan)	Narita	68
Sapporo (Japan)	Chitose	43

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New Railway Line Route Map

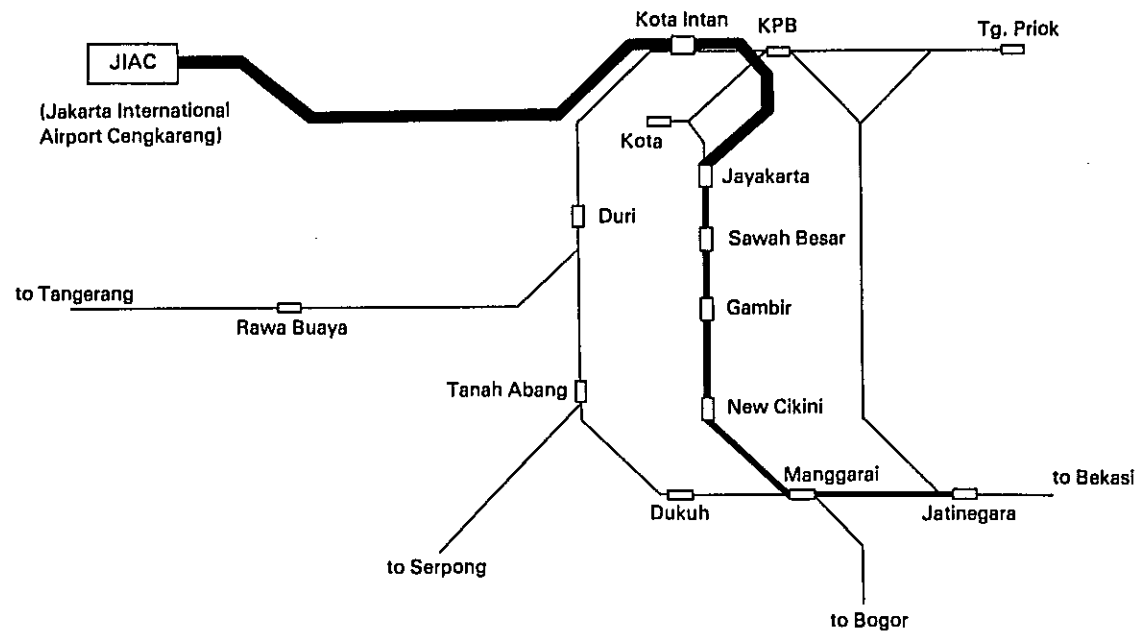
## **ROUTE**

In order to determine the optimum route, ten alternatives were evaluated from the viewpoints of geology, land acquisition, technology of construction work, construction cost, traffic demand, train operation and etc.

Out of ten alternate routes, the optimum route has been selected as a result of the evaluation.

The route passes through the costal area of better geological conditions between the Cengkareng Access Highway and the Tangerang Railway Line. Air Passengers can make good connections with the Western Line at Kota Intan station. Near Jakarta Gudang, the New Railway Line turns to the south and joins with the Central Line at Jayakarta station, after crossing over the existing railway line by grade separation.

Total length of the Route is 19.8km (JIAC—Jayakarta), 76% of which is composed of embankment and the rest is of elevated concrete structure including bridges. The average height of the embankment is 2 meters.



**Sketch of Routes**

**Distance and Travel Time**

Stations	Distance (km)	Travel Time (minutes)
Kota Intan	17.4	13.5
Jayakarta	19.8	17.5
Sawah Besar	22.2	21.5
Gambir	24.0	25.0
New Cikini	26.8	29.0
Manggarai	28.3	32.0
Jatinegara	31.0	36.5

Stage	Year	Track	Train Formation	Train Headway
1st (a)	— 1997	Single	4 railcars	20'
1st (b)	1998 — 2006	Single	8 railcars	20'
2nd	2007 —	Double	8 railcars	10'

## TRAIN OPERATION

The train operation is planned so as to offer good accessibility to the airport in connection with the improved JABOTABEK railway network.

The Airport Train will be operated from JIAC to Jatinegara station through the Central Line.

The New Railway Line will be constructed in two stages, a single track in the first stage when the traffic demand remains small, with train formation composed of 4 railcars operating every 20 minutes.

In the latter part of the first stage, in accordance with increased traffic demand, the train formation will also be expanded to 8 railcars with 20 minutes headway.

In the second stage, to cope with further increase of traffic demand, an additional track is to be constructed to make a double track for shortening the train headway to 10 minutes.

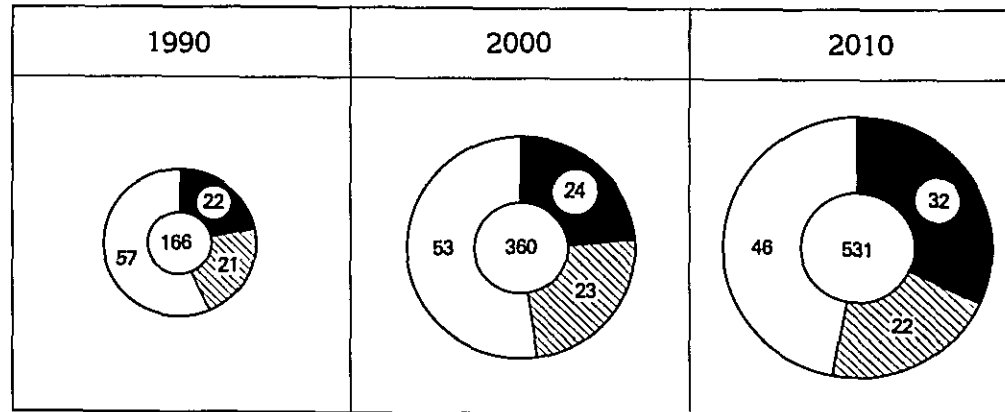
To ensure the safety of high speed train operation, an automatic blocking system, relay interlocking devices and ATS (Automatic Train Stop) devices will be adopted.

### Estimated Trip Volume Related to JIAC

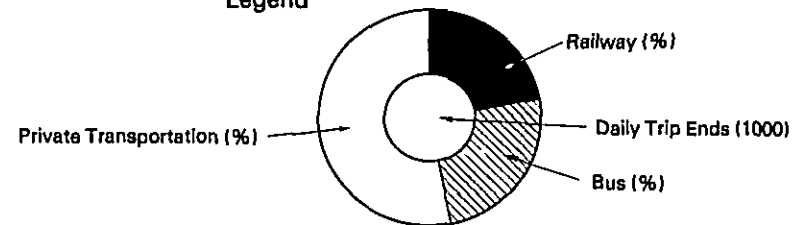
Unit: 1,000 trips/day

	1990	2000	2010
Air Passengers	39	86	128
Visitors	84	185	276
Employees	43	89	127
<b>Total</b>	<b>166</b>	<b>360</b>	<b>531</b>
<b>Growth Rate (% p.a.)</b>	<b>8.1</b>	<b>4.0</b>	

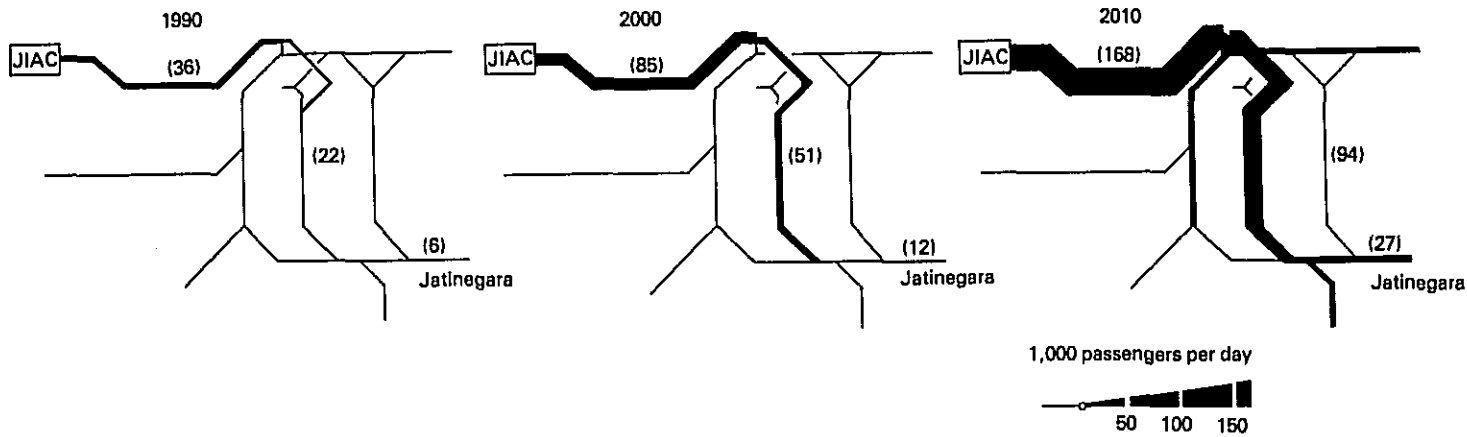
### Estimated Transport Modal Share of JIAC



#### Legend







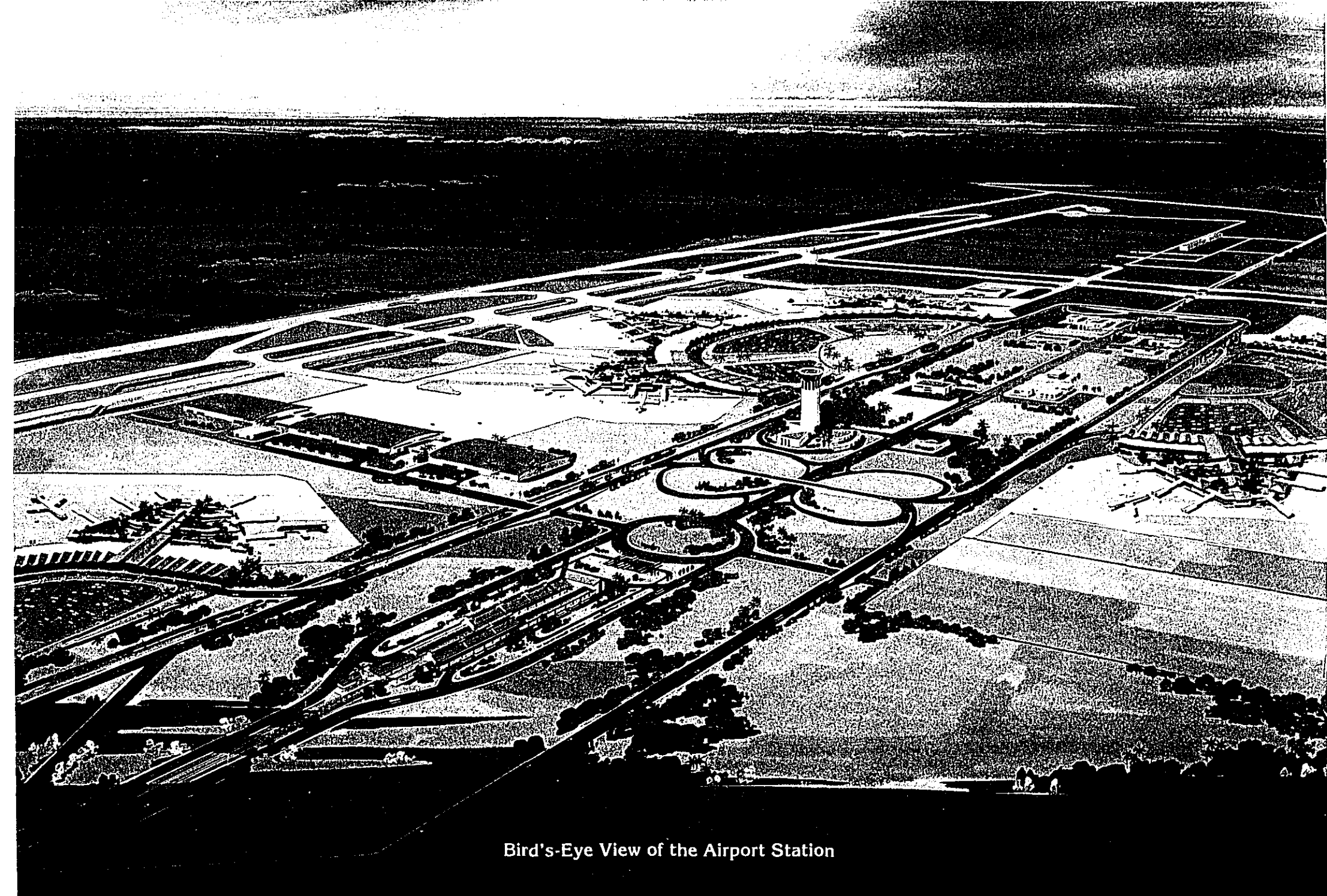
**Estimated Railway Traffic Volume**

## TRAFFIC DEMAND

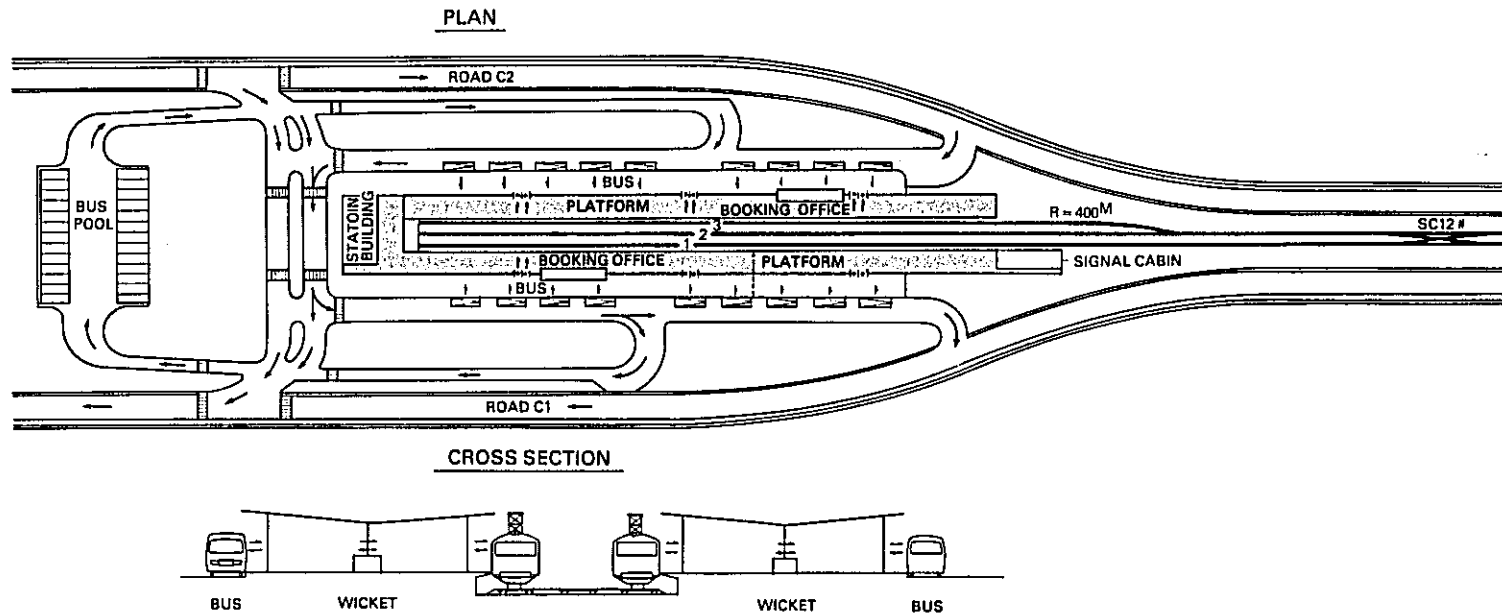
The total number of daily person trip ends of JIAC is estimated to be 166, 360 and 531 thousand for the years 1990, 2000 and 2010, respectively. The annual growth rates are 8.1 and 4.0% for the periods of 1990—2000 and 2000—2010.

The number of daily railway passengers is estimated to be 36, 85 and 168 thousand passengers for the respective years and the railway share among all transportation modes is calculated as 22, 24 and 32% respectively.

The estimated distribution patterns of railway passengers over the whole railway network are as shown above.



Bird's-Eye View of the Airport Station



**Layout of Airport Station**

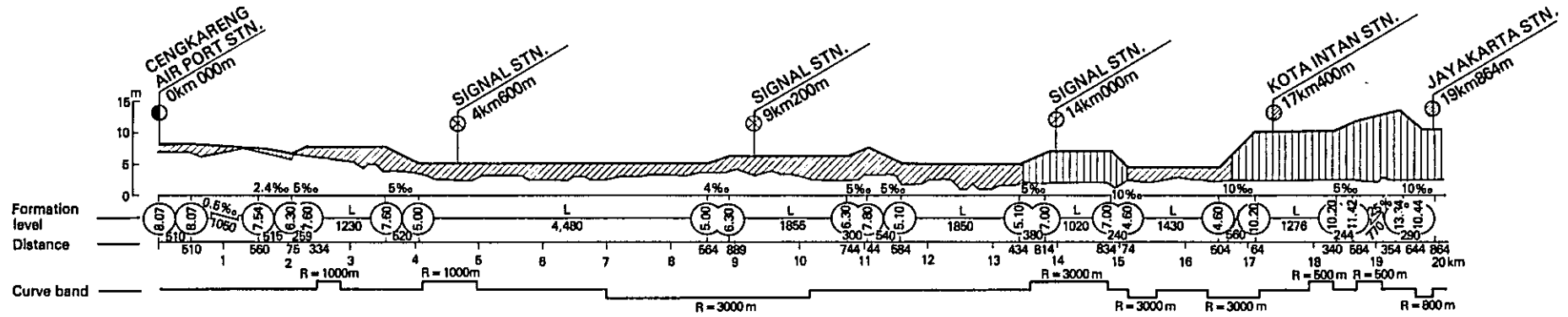
## AIRPORT STATION

Considerations are taken for the location of the Airport Station from the view point of the following factors;

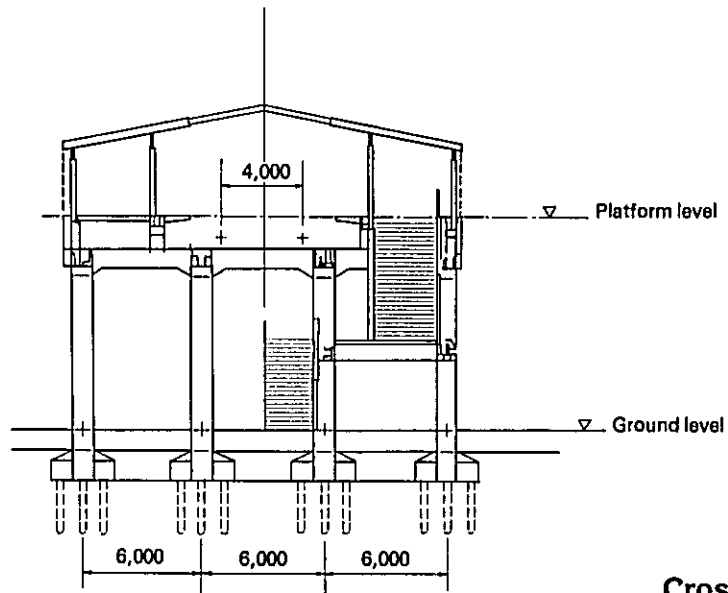
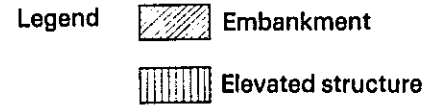
- 1) Low construction cost
- 2) No interference with the Airport facilities and other traffic
- 3) Architectural harmony with other airport facilities

Layout of the Airport Station is selected taking account of the following conditions;

- 1) Shorter walking distance for passengers changing to buses and railway.
- 2) Keeping the height of the floor of bus, train and platforms on the same level, thus ensuring easy transfer of passengers.
- 3) Low construction cost and easy maintenance
- 4) For an attractive gateway to Indonesia, the Station will be surrounded with a green-belt zone.



Profile of the New Railway Line



Cross Section of Kota Intan Station

# **RAILWAY FACILITIES**

## **1. Station Facilities on the New Railway Line**

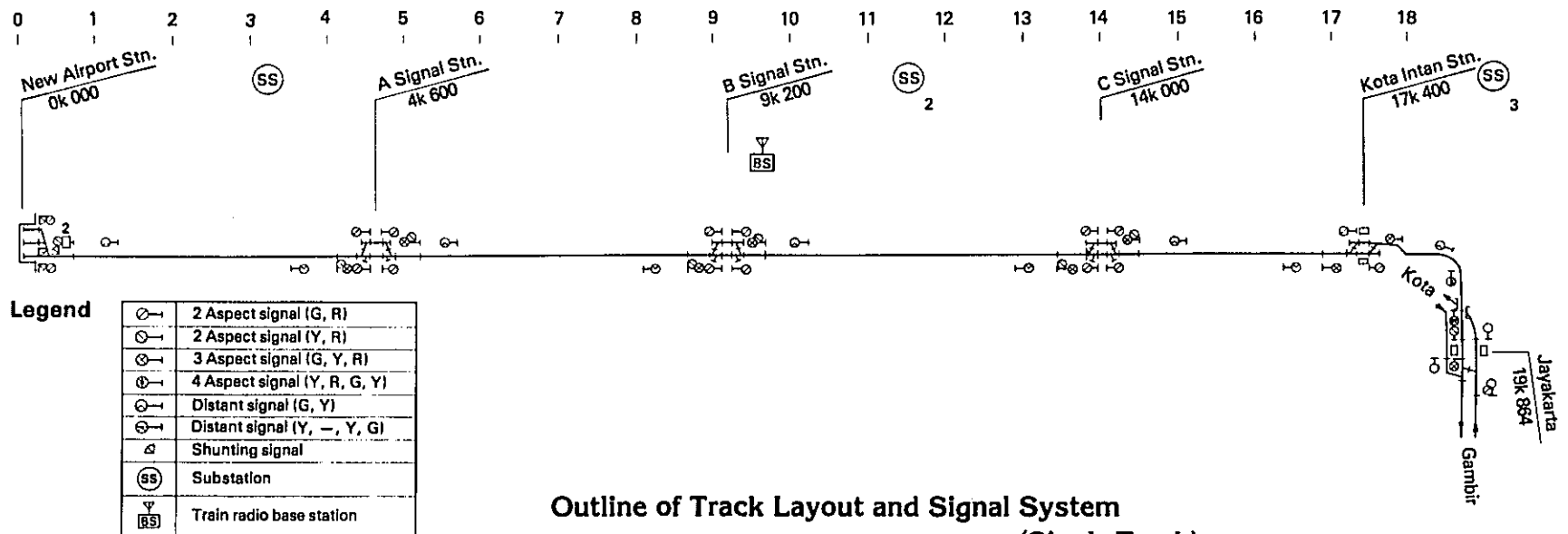
For the stage of single track operation, three intermediate signal stations will be constructed at appropriate intervals in order to facilitate the crossing of trains.

A new station, KOTA INTAN, will be constructed for convenience of passengers to and from the Western Line.

The New Railway Line will be connected with the Central Line at Jayakarta Station, which will be newly built, and a grade separated crossing will be provided in order to assure smooth train operation.

As far as the station facilities are concerned, high platforms will be built, so that rail passengers can benefit from smooth boarding and detraining.

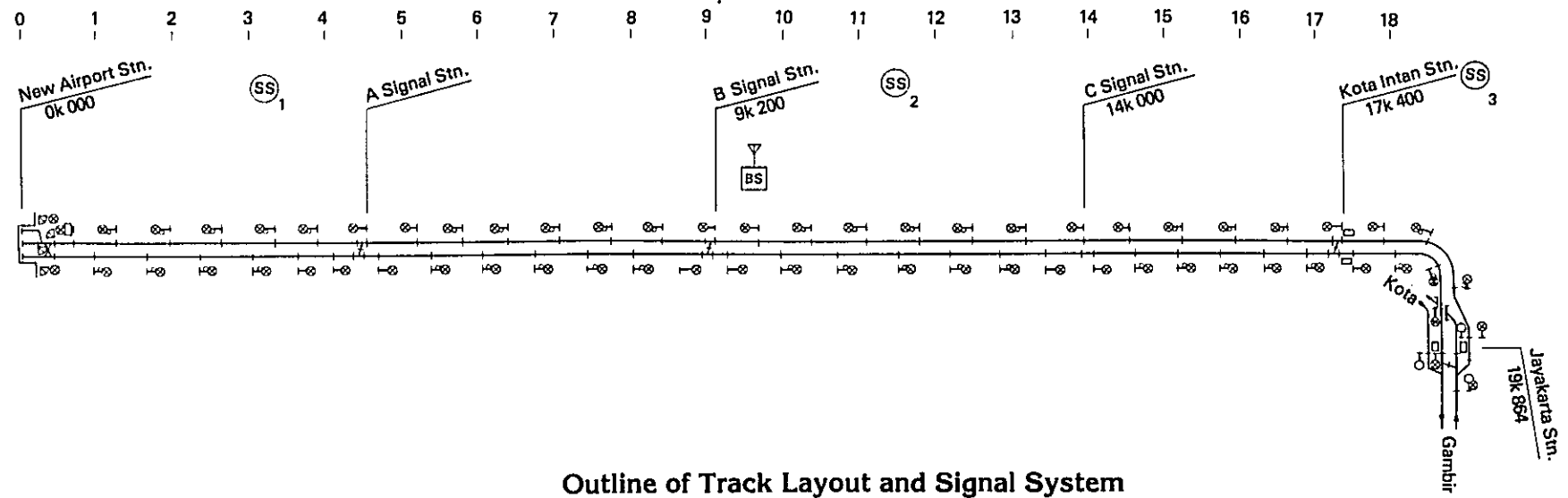
Also, a station plaza will be planned for providing smooth connection with feeder transportation means.



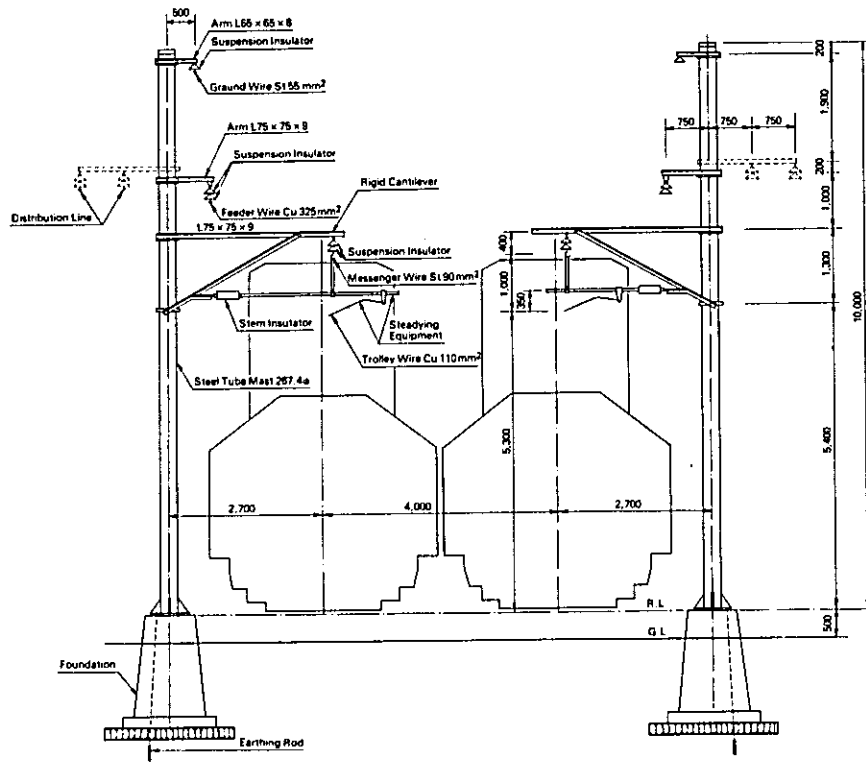
**Legend**

	2 Aspect signal (G, R)
	2 Aspect signal (Y, R)
	3 Aspect signal (G, Y, R)
	4 Aspect signal (Y, R, G, Y)
	Distant signal (G, Y)
	Distant signal (Y, -, Y, G)
	Shunting signal
	Substation
	Train radio base station

**Outline of Track Layout and Signal System (Single Track)**



**Outline of Track Layout and Signal System (Double Track)**



**Standard Mounting Between Stations  
(Straight Section)**

## 2. Electrification Facilities

The New Railway Line will be electrified using direct current of 1500 V, which is the same system as that of the JABOTABEK railway lines.

Substations will be installed along the New Railway Line.

The simple catenary system will be adopted with rigid cantilever arms, which are easier for maintenance work.

High-voltage power distribution lines will be installed along the New Railway Line in order to supply electric power to the lighting and electric facilities of stations, as well as to the signalling system.

## 3. Signalling and Telecommunications

For safe and high speed train operation, an automatic block system will be employed which is composed of colored light signals, electric switching machines, and interlocking devices.

Automatic train stopping devices will also be provided.

Alarm devices and automatic gates will be installed at the level crossings in order to ensure safety.

Telephone lines, train radio system, facsimile equipment and other telecommunication facilities will be prepared for train operation, maintenance, and guidance of passengers.

### Investment Scale

billion Rp

Stage		1st		2nd		Total
Number of track		Single Track		Double Track		
Construction Cost	Foreign Portion	24.7		13.6		38.3
	Domestic Portion	35.2		14.5		49.7
	Sub-total	59.9		28.1		88.0
Rolling Stock Cost	(Number of cars)	(22)	(21)	(43)		(86)
	Foreign Portion	7.5	7.1	14.6		29.2
	Domestic Portion	0.3	0.3	0.6		1.2
	Sub-Total	7.8	7.4	15.2		30.4
<b>Total</b>		<b>67.7</b>	<b>7.4</b>	<b>43.3</b>		<b>118.4</b>

### Work Schedule

( ) months

1st year	2nd year	3rd year	4th year
	Land Acquisition		
	Bank (18)		
	Elevated Structures		
	Track (19)		
	Electrification		
	Signalling & Telecom.		
	Airport Station		Rolling Stock
	Other Stations		
			Operation



# **INVESTMENT SCALE AND IMPLEMENTATION PLAN**

The New Railway Line construction will be implemented in two stages.

The single track will be constructed in the first stage, and the double track will be constructed in the second stage to cope with the increase of railway passengers.

Rolling stock will be prepared in three stages, as explained under the caption of "Train Operation".

Investment costs for each stage have been estimated assuming the prices under the economic conditions prevailing in September 1982.

A work schedule has been prepared for the single track construction. Necessary land for the right of way is to be acquired in the first stage for the double track construction as well.

## **EVALUATION OF PROJECT**

The value of the E.I.R.R. (Economic Internal Rate of Return) of the New Railway Line Project is estimated at **14.3%**.

Judging from this value, implementation of this project is very meaningful from the viewpoint of the national economy of Indonesia.

As for the other aspects, it is expected that the New Railway Line will bring about fuel saving, increased employment opportunities and a decrease of road traffic accident.

## **CONCLUSION**

After detailed study on this project, it can be concluded that the New Railway Line for Cengkareng Airport is fully feasible from the technical aspect and that the project has the great contribution to the future development of the international city of Jakarta from the view point of the nation's economy.

Since the new Airport is to be open to traffic in a few years, it is highly recommended that the project should be implemented at the earliest opportunity, all the necessary measures being taken toward the execution of its construction.

It is sincerely hoped that the implementation of this New Railway Line construction project will serve as an impetus to the other improvement works of the JABOTABEK Railway Lines, which will in turn open the way toward modernization of the whole railway system in Indonesia.

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