Appendix 7-1-10 Outline of Station Facilities, Building & Plaza

Station	Stop	Distance	No. o	f Comm	uters	in 2005	(×	1.000)			cilities	Deserve		ion B	ıild		Stat Area (1.0	ion Plaza	l
	Train	km (Interval)	Total					Ticket		Ticket Window		Passage Width	Area(m²	west (east	Over- Track Style	Total	west side	east side
	· 		 			transie		Purchas		(unit)	(unit)	(n)				(*)	1 0+ ~	$2.0\pm \alpha$	$2.9\pm a$
Rawang	LSF	355. 5 (7. 7) 363. 2	•	12. 5	19. o		4. 4	6. 3	28. 5	(2.6)	$3 + \alpha$ (1.8)	$2.0 + \alpha$ (1.5)	$557 \pm a$	*	¥	(か)			$0.8\pm\alpha$
Kuang	S	363. 2 (2. 3)	10. o	5. o	5. o		1. 4	2. o	9. 0	(0.8)	(0.6)	(1.5) 2.5 (0.5)	270± α					$0.8\pm\alpha$	
H 1	H	365.5 (4.3)	8, 5	5. o	3. 5		1. 2	1. 7	7. 5	$\begin{pmatrix} 1+\alpha\\ (0.7) \end{pmatrix}$	$\frac{1+\alpha}{(0.5)}$	(0, 4)	$242\pm\alpha$	坎				$0.8\pm\alpha$	$0.5\pm \alpha$
Sungai Buloh	LS	369. 8 (5. 9)	6.5	4. 5	2. o		0.9	1. 3	4. 5	(0.6)	$\frac{1+\alpha}{(0.4)}$	(0,3)	$200 \pm \alpha$		*	١		$0.7\pm a$	$0.3\pm a$
Kepong	11	375. 7	18. o	9. 5	4.5	4. o	2. 5	3. 6	12. 5	(1.5)	(1.0)	2.5 (0.9)	$393 \pm \alpha$	☆			$2.8\pm\alpha$	$2.1\pm\alpha$	$0.7\pm \alpha$
H 2	H	(2. 8) 378. 5	28. 5	17. 5	11. o		4. o	5. 7	25. 5	$\begin{pmatrix} 2 + \alpha \\ (2, 3) \end{pmatrix}$	$1 + \alpha$ (1.6)	$2.0 + \alpha$ (1.4)	$523\pm \alpha$	☆	众	(*)	$4.4\pm\alpha$	$2.7\pm\alpha$	$1.7\pm \alpha$
Segambut	H	(2. o) 380. 5 (3. 7)	51. o	24. o	27. o		7.1	10. 2	46. o	$5+\alpha$ (4.1)	$3 + \alpha$ (2. 9)	$3.0 + \alpha$ (2.4)	$760\pm \alpha$	☆	☆	(*)	$7.9\pm \alpha$	$3.7\pm \alpha$	$4.2\pm \alpha$
Mall	H	384. 2	45. 5	5. o	23. 5	17. o	6. 3	9.1	25. 5	$4+\alpha$	$3+\alpha$	$3.0+\alpha$	$705 \pm \alpha$			*	$7.1\pm \alpha$	$0.8\pm \alpha$	$6.3\pm \alpha$
J.P. Menteri	11	(1.5) 385. 7	75. 5	14.5	36. o	25. o	10.5	15. 1	45. 5	(3.7) $5+\alpha$	(2.5) $4 + \alpha$	(2.1) $(2.6) + \alpha$	997±α			*	$11.7 \pm \alpha$	$2.2 \pm \alpha$	$9.5\pm \alpha$
K.L.	LS	(1.8) 387.5	112.5	38. 5	49. o	25. o	15. 6	22. 5	78. 5	(6.1) $8+\alpha$	(4.2) 6 + α	(3.5) 6.0+ α	$1343\pm \alpha$	(★	*	*)	$17.4\pm\alpha$	$6.0 \pm \alpha$	11. $4\pm \alpha$
Siputeh	·	(3. 8) 391. 3 (3. 2)	14.5	10. 5	4. o		2. o	2. 9	11. 5	(9, ο) 2+ α	(6.2) 1 + α	(5. 2) 2. 5	$344\pm \alpha$		ជ		$2.2\pm \alpha$	$1.6\pm \alpha$	$0.6\pm \alpha$
Salak South	S	394.5	75. 5	16. o	59. 5		10.5	15. 1	68. o	(1.2) $7+\alpha$	(0.8) 5 + α	(0.8) 4.0+ α	$997 \pm \alpha$			*	$11.7\pm\alpha$	$2.5\pm \alpha$	$9.2\pm \alpha$
Sungai Besi	H	(4.5) 399. o	67. o	6. o	61. o.		9.3	13. 4	47. o	(6.1) 4+ α	(4.2) $3+\alpha$	(3.5) 4.0+ α	916±α	*. ★	☆	(*)	$10.4\pm \alpha$	$0.9\pm \alpha$	$9.5\pm \alpha$
Serdang	S	(5. 1) 404 1	28. o	28. o	0.0		3. 9	5. 6	25. o	(5.4) 3+ α	(3.7) 2+ α	(3.1) 2.0+ α	517± α	☆	*	(*)	4. 3± α	$4.3\pm \alpha$	$0. o \pm \alpha$
Н 3	11	(4. 7) 408. 8	1	10. o	4. o		1. 9	2. 8	12. 5	(2.3) $2+\alpha$	$(1.6) \\ 1 + \alpha$	(1.3) 2.5	$336\pm \alpha$	☆			$2.2\pm\alpha$	$1.6\pm \alpha$	$0.6\pm \alpha$
Kajang	LSF	(5, 9) 414, 7	36. o	20. 5	15. 5		5. o	7. 2	32. 5	(1.2) $3+\alpha$	(0.8) 2+ α	(0.7) 2, o + α	$606 \pm \alpha$	☆	¥	(*)	5.6±α	$3.2\pm \alpha$	$2.4\pm a$
Bangi	S	(10. 9) 425. 6	13. o	9, o	4, 0		1. 8	2. 6	10. 5	$(2.9) \\ 1+a$	(2. ο) 1 + α	(1.7) 2.5	$321\pm\alpha$	* ☆	*		2. o± α	$1.4\pm \alpha$	$0.6\pm\alpha$
Batang Benar	SF	(9. 6) 435. 2	0.1	.0, 0	0. 1		_	_	_	(1, 1)	(0. 8) 1	(0.6) 2.5			*		-	_	-
Nilai	H	(4.5)	0.1	0.1	0. o		-		_	(-)	(-)	(-) 2.5	_	*			_	_	-
	s	439. 7 (7. 0)	0.1	0. 1	0. 0			_		(-)	(-)	(-) 2. 5	_	, ·	★			-	_
Labu		446. 7 (5. 3)						_	_	(-).	(-)	(-) 2.5	:	*	,,		_		
Tiroi	H	452. 0 (8. 8)	0.1	0.1	0.0		 	0 6	10 -	(-)	(-)	2.5	387± α	^	*		27+ 0	1. 1± α	1.6± α
Seremban	LSF	460.8	17. 5	7. o	10.5		2. 4	3. 5	16. o	(1.4)	$\frac{1+\alpha}{(1.0)}$	(0.8)	301 - α				<i>ω</i> , 1 ∸ α	1. 1 ÷ a	1. υ α
Total		(105.3)	653. 4						506. o									· · · · · · · · · · · · · · · · · · ·	

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Note:
Stop Train
LSF: Long Distance Train, DNU & Freight Train
LS: Long Distance Train & DNU
SF: U & Freight train
S: DNU (Refuge Tracks for Freight Train)
S: DNU (Refuge Tracks for Freight Train)
S: DNU (Halt)

**Existing or Constructed in the DTP

**\( \text{Station Building} \)
Station Building
S: Over-track Style Station (planned)
(**): Over-track Style Station Building

***
Removal of Station Building
K.L.: (**

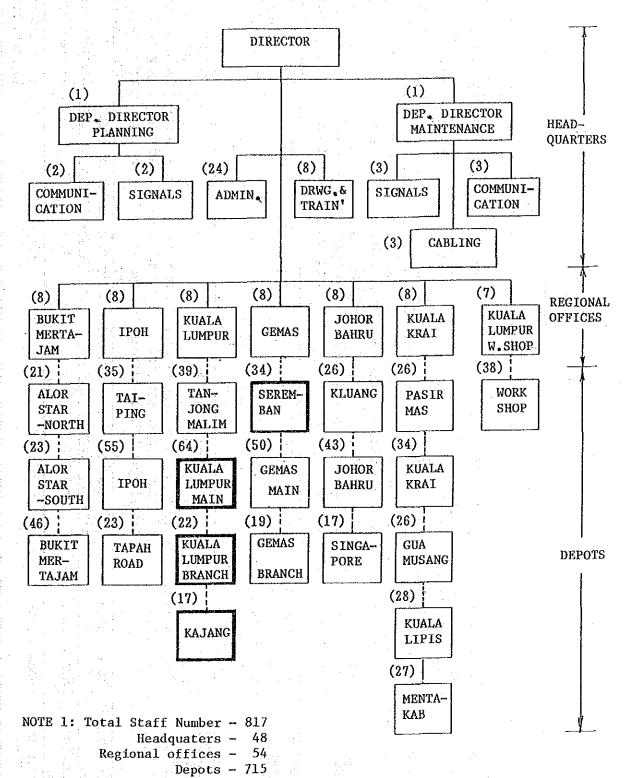
**
Rush hour Passengers

Station Passengers)

Station Passengers)

Station Day Passenge
```

Appendix 7-2-1 Organization of Signalling and Communications
Department, MRA



2: Figures in brackets show staff number

3: Data Source: Signalling & Communications Department, MRA

Appendix 7-2-2 Signalling and Telecommunication Systems Included in RBCS

			Included in RBCS		(RBCS 1/3)
No	SYS./EQUIPMENT	DTP SYSTEM	RBCS SYSTEM TO BE IMPROVED	DESCRIPTION	PROJECT LOCATION
<u>-i-</u>	BLOCK SYSTEM	Tokenless Block	Automatic Block System	8 sensot on low light signs	All inter-stations
ન <u>ે</u>	Signal	led: 2/3 aspects	intervals of 600 m	o aspect coron 118th sight	section, hereinafter
<u>2</u>		Partially instal-	Continuous track circuits	Jointless AF track circuit	referred to as
		led track circuits			'All inter-stations'
<u>ଳ</u>		Tokeniess block	Normal direction: Automatic	Exclusive indicators instal-	11 stations and
	Block Working		block system	led under the main starter	1 junction: Rawang,
		advance starter	Reverse direction: Tokenless	signal, instead of advance	Kuang, Sungei Buloh,
_ [.		signal	block system	starter signals	Kepong, Kuala Lumpur
~ .	SIGNAL	Colour light sig-	All colour light signals of	Inclusive of relocation of	Salak South Jct,
		nals of 2/3 aspect	3 aspect	some signals installed under	Serdang, Kajang,
	<u> </u>			DTP	Bangi, Batang Benar,
က		DC track circuit	AF track circuits	Available for ATP system	Labu and Seremban:
	DETECTION	in station yards			hereinafter referred
		and AF track cir-			to as 'All Stations'
		cuits between			
		stations	The control of the co		
4.		All relay inter-	All relay interlockings		Equipment rooms at
•	SYSTEM	lockings			5 stations: Rawang,
$\frac{\Box}{\Box}$) Relay logic	Relays mounted on		To provide for more effect-	Kuala Lumpur, Kajang
		relay racks	of track layout, and addi-	ive train operation and en-	Bangi & Seremban:
			tional signal installations	largement of DMU stabling	referred to as
				tracks	'Improved Stations'
6		Mosaic panel	Modification of mosaic panel	Modify face plates in line	
	Panel		with additional modules	with improved track layouts	Stationmaster's room
ଚ) Indication	Mosaic panel	- ditto -	- ditto -	at Improved Stations
	Panel				
4) Technician's Ind. Panel	Mosaic panel	- ditto -	- ditto -	Equipment rooms at Improved Stations
_]					

(RBCS 2/3)

N	SYS./EQUIPMENT	DTP SYSTEM	RBCS SYSTEM TO BE IMPROVED	DESCRIPTION	PROJECT LOCATION
ເດ	ATP SYSTEM	Optional Item	Employed: Continuous check-		
\overline{a}	Train-born		Ing system To apply emergency brake	Inclusive of additional	DMUs for RBCS & DTP
	Equipment		when receives 'Red' signal or no signals	installations for the DMUs to be procured by DTP	
(3)			AF track circuits to send	Available to use track cir-	The whole project
	Equipment		speed signals	cuits for train detection,	section, inclusive
				inclusive of replacement of DC track circuits within	of station yards
	<u> </u>			station yards	
ဖ					
\overline{a}		With sufficient	To allow local entry of	Modification of software and	Control Room and
			train descriptions, and	loading/alteration of data	Equipment Room in
		y and soft-	automatic train information	tables	CIC Centre
		ware for future	reporting		
6		TOW /DOM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	\$44.4.4.4.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	
<u>3</u>	_	וויין וייין	Available tol the above	Audicional interior modules	
	rdnipment		applications	IOF Fringe-boxes	
				Modification of interfaces	
				with TD and ARI systems	
က်		Batch processing	To print out automatically	Additional installations of	
	Machine	-	actual train timings, delays	Serial/Laser printers	
4	Fringe Box	Optional Item	To enable operators to input	Installation of VDUs and	Rawang. Seremban.
· .			train descriptions & monitor	Keyboards with processing	(5)
· ·			train operation conditions	units and MODEM	
۲.	. Signal Post	Within station	To allow MRA personnel along	To install telephone sets	All inter-stations
	Telephone	yards & on inter-	tracksides to communicate	to be mounted on block	родинал
:		mediate signals	with nearby stationmasters	signals	
			and/or train dispatchers		

(RBCS 3/3)

RBCS SYSTEM TO BE IMPROVED To enable adjoining trains to actuate ATP system for emergency stop To allow two-way, semiduplex To allow two-way, semiduplex To allow two-way, semiduplex To enable maintenance per- sonnel to communicate with any vehicle & any telephone connected with MRA telephone network, any personnel with service radio sets within a work area To provide passengers with prompt information by LED displays on train operations, including announcement of train approaching and departure timing and BGM To enable slave clocks to show synchronised accurate time To receive commercial power until railway-exclusive high tension power distribution lines be available by elec-	~		,		,,																								
Address Individual type Address Individual type Supply Address Supply Address Supply Address Address Address Augio Dry-cell clock Mains supply: To enable sdioning trains To enable adjoining trains To allow two-way, semiduplex To enable maintenance per- Subnot & allow two-way, semiduplex To enable maintenance per- Subnot & allow two-way, semiduplex To enable maintenance per- Subnot & allow two-way, semiduplex To enable maintenance per- Subnot & allow two-way, semiduplex To enable maintenance per- Subnot & allow two-way, semiduplex To enable maintenance per- Subnot & allow train operation To allow automatic broad- casting on train operations, including announcement of train approaching and departure timing and BGM To enable slave clocks to show synchronised accurate time To enable slave commercial power commercial power train operations, including announcement of train approaching and departure timing and BGM To enable slave clocks to show synchronised accurate time To enable slave clocks to show synchronised accurate time To enable maintenance per- To enable maintenance To allow automatic broad- Casting on train operations, including announcement of train approaching and departure timing and departure timing and bower commercial power train approaching and departure timing and bower train approaching and departure timing and departure		PROJECT LOCATION	DMUs for RBCS & DTP		Rawang, Kuala Lumpur	Bangi, Seremban		base stations for	train radio system	DMUs for RBCS & DTP				All stations											- 1				
Address Individual type Supply Address Individual type Supply Supply Address Standby Power: Intermand Intermand Intermation Supply Supply Commercial power Standby Power: Intermand Intermand Intermation Address Individual type Example Intermation Supply Supply Mains supply: Commercial power Standby Power: Intermand Intermation Address Individual type		DESCRIPTION	To modify train-borne equip-	equipment provided under DTP	To install base station	equipment and portable radio		mobile and portable tele-	phone sets					To install a processor, VDU/	keyboard, MODEM and displays	to be controlled directly	with the data from TD system	To install a control unit,	amplifiers, BGM instrument,	MODEM and speakers, to be	controlled directly by TD	and CTC systems			and wicket, ecc.	tion line from nearby II.N.	poles to the apparatus case-	for block signals; and power	failures can be detected
tadio Uniser I stadio Operation Waters I supply Manager I		RBCS SYSTEM TO BE IMPROVED		emergency stop	To allow two-way, semiduplex	communication between each	To enable maintenance per-	sonnel to communicate with	any vehicle & any telephone	connected with MRA telephone	network, any personnel	th service radio			prompt information by LED	displays on train operation	schedules	To allow automatic broad-	casting on train operations,	including announcement of	train approaching and depar-	ture timing and BGM	To enable slave clocks to	show synchronised accurate		10 receive commercial power	tension power distribution	lines be available by elec-	rified railway introduction
SYS./EQUIPMENT Train Radio System Yard Radio System System System Display Public Address System System Display Public Address System Synchronised Clock Power Supply			UHF: 800 MHZ	1 52			- I' .							None			-11	Individual type				i		-	- 1. C.	company of power	Standby Power:	UPS system with	engine generator
		SYS. /EQUIPMENT	Train Radio	25 S CO.	Yard Radio	System	Service radio	System						Passenger	Information	Display		Public Address	System				Synchronised	Clock	Domon Cunning	ביישמי השמי			\$ 100 miles 100
No 8. 8. 99. 121 121 123 141 141 143 144 145 145 145 145 145 145 145 145 145		No	∞.		ග		101							日				72	5-			1	က - ၂		:	# -1	. 4	· .	1

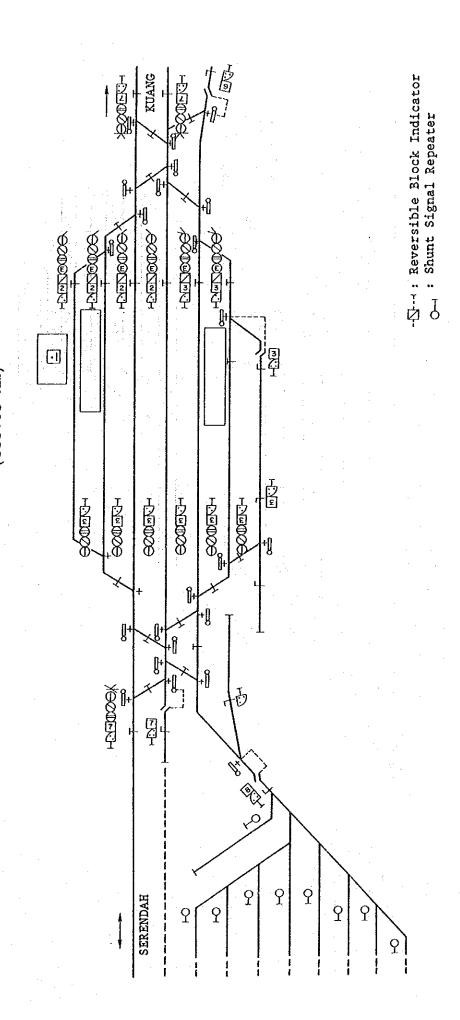


Fig. 1 Signalling Improvement Plan (Rawang)

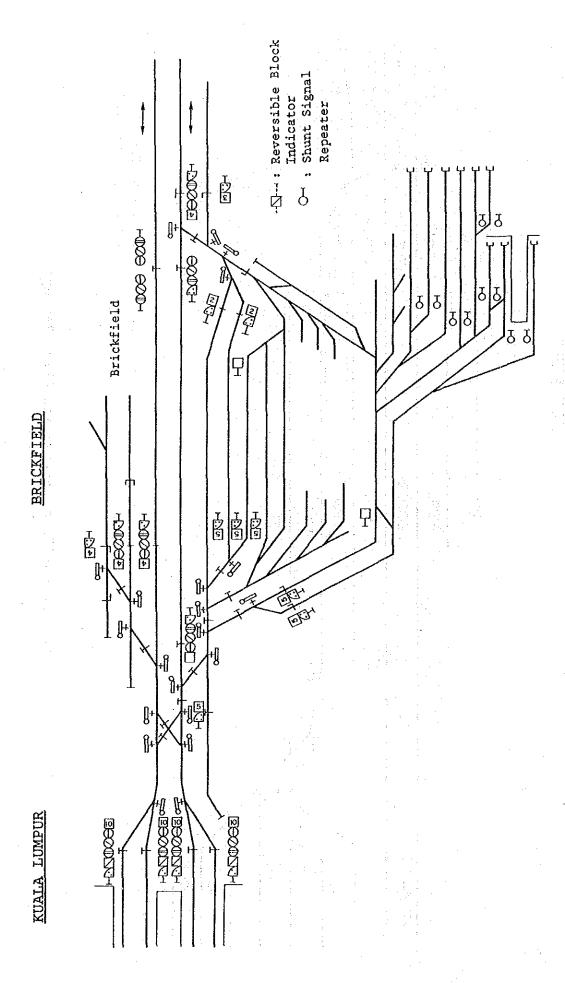
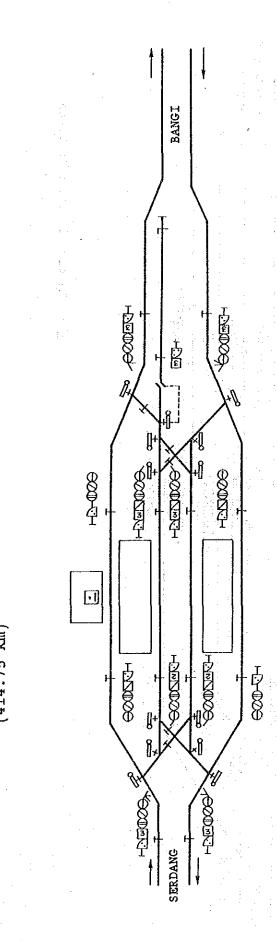
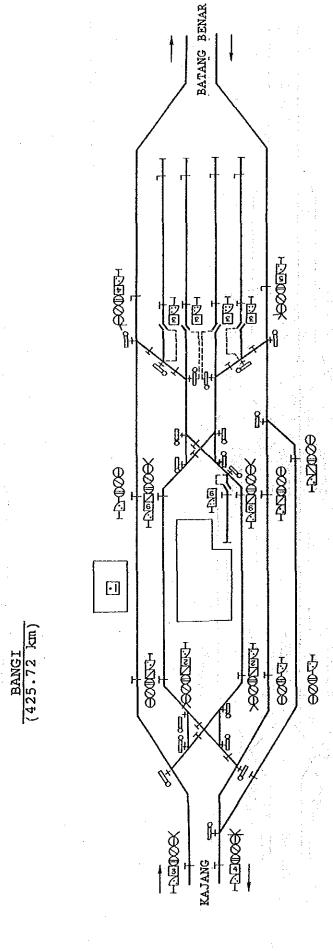


Fig. 2 Signalling Improvement Plan (K.L. & Brickfield Coach Shed)



-- Seversible Block Indicator

Fig. 3 Signalling Improvement Plan (Kajang)



-N-4: Reversible Block Indicator

Fig. 4 Signalling Improvement Plan (Bangi)

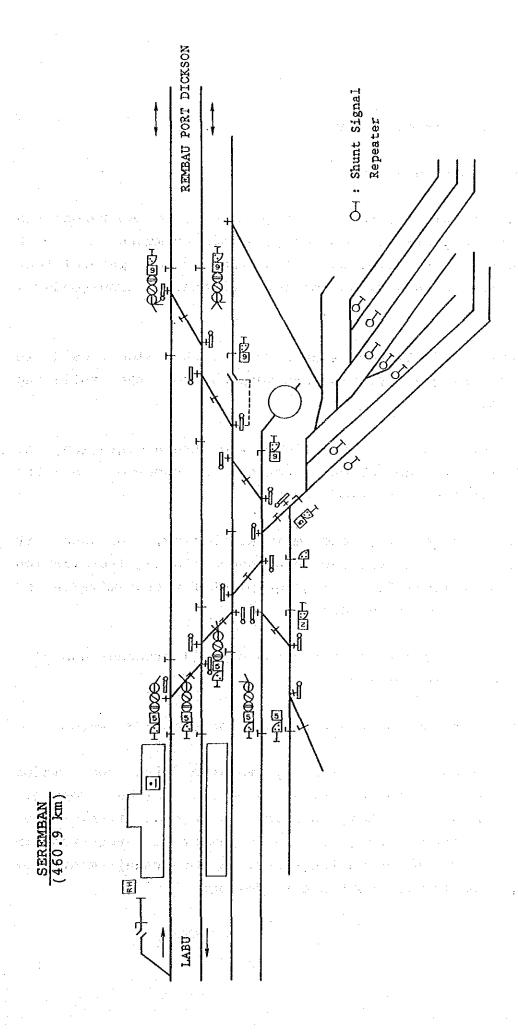


Fig. 5 Signalling Improvement Plan (Seremban)

Appendix 7-2-3 Track Circuit

(1) Train detection system

Train detection systems are classified into two types: the one is a continuous detection method by means of track circuit, loop coils, etc. The other is an intermittent detection method by use of axle counters, transponders, etc.

In this Project, the track circuit method widely used in modern railway systems are adopted for the following reasons:

- In view of safety and efficiency of train operation, the continuous detection function is superior to the intermittent detection function,
- High reliability and maintainability, because it utilizes rail itself, without necessitating installation of additional facilities/equipment for transmission of signal information, and
- Availability for the detection of rail breakage and also for data transmission.

(2) Requirements on the track circuit for the RBCS system

Track circuits are directly related with two major functions: train detection and wayside signal control. For the RBCS system, however, a signal transmission function from ground to can equipment is required in addition to the above functions. Major requirements of ATP system for the RBCS are as follows.

a. Train detection

Control length; 500 ~ 1000 m Shunting resistance: 0.5Ω (to be ascertained in the designing stage)

Leakage conductance: 0.5 s/km (ditto)

b. Wayside signal control

Commence of the State of the Commence of

Number of signal information to be transmitted through rail: 3 (R1, Y, G)

c. Signal transmission from rail to cab: 3 (R1, Y, G)

In addition to the above, in selecting the track circuit system the following particulars on the project section have to be taken into account:

- d. Interference resistivity: AC/DC electrification, Lightening
- e. Insulation for long rail: Non-insulation type
- f. Rail-breakage detection: Double-rail track circuit
- g. Maintenance: Durability to the surrounding conditions (temperature, flood, humidity, vandalism, etc.) Concentration of transmitting/receiving devices in the signal cabin

(3) Applicability for the RBCS system

Among several types of track circuits used in major railways in the world as shown in Table 1, the audio-frequency (hereinafter referred to as 'AF') track circuit is selected for the RBCS system due to the following reasons;

The track circuits using DC and commercial frequency (hereinafter referred to as 'CF') can not transmit signal information required for 4-aspect signalling method, which should be employed in the future moreover DC(double) and CF track circuits are not applicable to AC electrification.

Meanwhile, both the AF and low-frequency (hereinafter referred to as 'LF') track circuit satisfy the aforementioned functions required for the RBCS system. The pros and cons of the AF and LF track circuits are as follows:

- a. The LF track circuit can secure longer and better train detection function than the AF track circuit against deterioration of leakage conductance value, although the latter satisfies the control length required for the RBCS.
 - b. The AF track circuit is superior to the LF track circuit in the following aspects:
 - Larger numbers of information transmitted in the rail,
 - Easier to introduce can signal system and to constitute the non-insulation track circuit,
 - Smaller investment cost.

In consideration of the above, the AF track circuit of non-insulation type is selected for the RBCS section. however, it is recommended to ascertain that the maximum leakage conductance of the track, to be constructed by the DTP, will be less than 0.5 s/km which is widely adopted as the standard value in the modern railway systems.

Table 1 Comparison of Track Circuit

Track Circuit	DC (Single rail)	DC (Double rail)	CF	LF	AF (non-insulation)
Frequency (Hz/sec)	Zero	Zero	50 or 60	$25 \sim 400$ (80)	1000~3000
Max. control length (G≤0.5 s/km)	2, 5	2.5	2	7	1.2
Max. number of signal information trans-mitted in the rail	Z	7	8	7	4~10
Expansion to cab signal (ATP/ATC)	×	×	×	◁	0
Blectrification - AC	Control length become less than 1 km)	×	×	0	0
- DC	×	×	0	0	0
Non-insulation	×	×	×	◁	0
Centralization of ground facilities	×	×	×	◁	0
Maintenance (Periodical checking)	rail bondrail insulatorprimary battery	same as left same as left same as left	same as left same as left	same as left same as left	· same as left
Power consumption (W)	10	10	150	220	150
Investment cost	v-1	sud.		2.0	1.5
Rail breakage detection	×	\triangleleft	0	0	0
			Note:	: ○: possible X: impossible ∆: difficult	e e

A-7-45

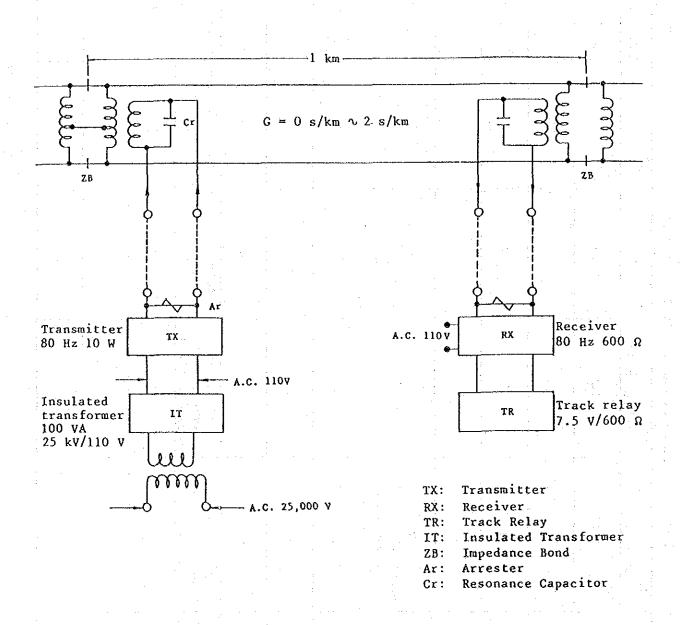


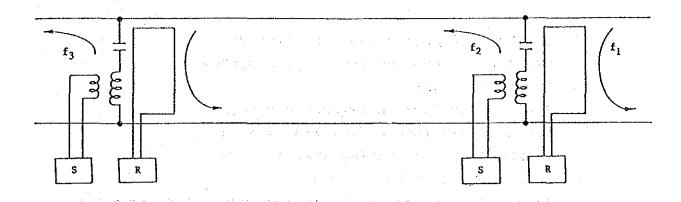
Fig. 1 Configuration of LF Code Track Circuit

Table 2 Characteristics of LF Code Track Circuit

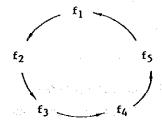
Items	Conditions
Applicability to electrification	A.C.
Variable range of leakage conductance	0 - 2 s/km
Control length of track circuit	Max. 1 km
Max. Shunting sensitivity	0.5 ohms
Max. traction current	A.C. 800A
Allowable interference current	50 Hz 40A 80 Hz 50 mA
Rail breakage detection	Possible
Non-insulation	Difficult (Boundary is not sharp.)
Concentration of devices	Possible
Number of signal aspect indication	4 aspect
Transmission of multiple information to the cab	Possible
Type of impedance bond	Resonance type with external condenser
Ambient temperature range	-10°C ~ 70°C
Humidity	≤ 95% (45°C)
Power source	A.C. 110 V (90 V ~ 120 V) D.C. 24V <u>+</u> 10X

Table 3 Characteristics of Non-insulated AF Track Circuit

Items	Conditions
Applicability to electrification	A.C.
Variable range of leakage conductance	0 - 0.5 s/km
Max. control length of track circuit	1.2 km with end-sending
Max. Shunting sensitivity	0.5 ohms
Max. overlap section	100 m
Max. value of traction current	A.C. 800A
Allowable harmonics interference current	6/f 1.65 (A) f: kHz
Unbalanced current factor	₹ 5%
Rail breakage detection	Possible
Range of device concentration	Within 5 km
Number of signal aspect indication	Max. 6 aspect
Pararell condenser	None
Ambient temperature range	-10°C ~ 70°C
Humidity	<pre>< 95% (45°C)</pre>
Power source	A.C. 110 V (90 V ~ 120 V) D.C. 24V + 10%



Cyclic combination of frequency



- S Transmitter: Voltage sending
- R Receiver : Voltage & current receiving

Fig. 2 Configuration of Non-insulated AF Track Circuit

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Appendix 7-4-1 Contents of Inspection and Repair

(1) Major item of POH:

- 1. Overhaul of engine and transmission
- 2. Overhaul of cooling and fueling system
- Car-body repair (outside/inside/window/door system)
- 4. Bogie repair (bogie frame/wheel-set)
- 5. Overhaul of air-braking system
- 6. Repair of electrical items (controller/safety device/telecommunications system)
- 7. Repair of accommodation (seat/light/air-condition)
- 8. Overhaul of diesel engine generator
- 9. Painting (some line and marks)

(2) Major items of IOH:

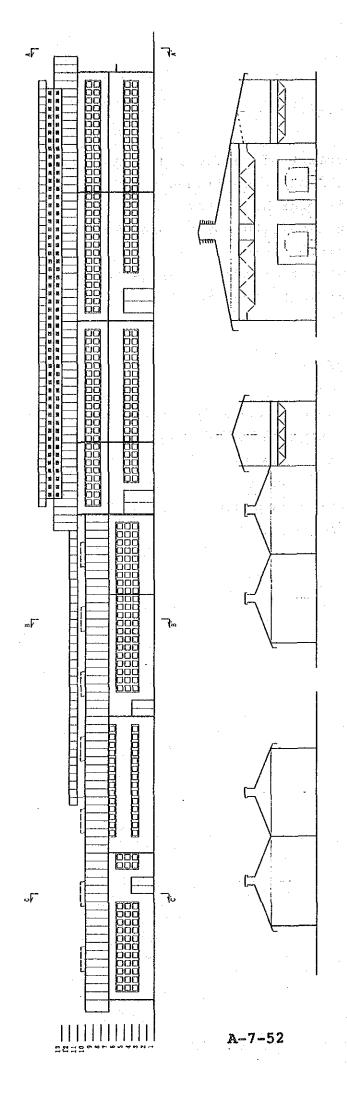
- 1. Repair of engine and transmission
- 2. Repair of cooling and fueling system
- Car-body repair (inside/door system)
- 4. Bogie repair (bogie frame/wheel-set)
- 5. Inspection and repair of air-braking system
- Inspection and repair of electrical items (controller/safety device/telecommunications system)
- Repair of accommodation (seat/light/air-condition)
- 8. Inspection and repair of diesel engine generator

(3) Major points of M-I/R:

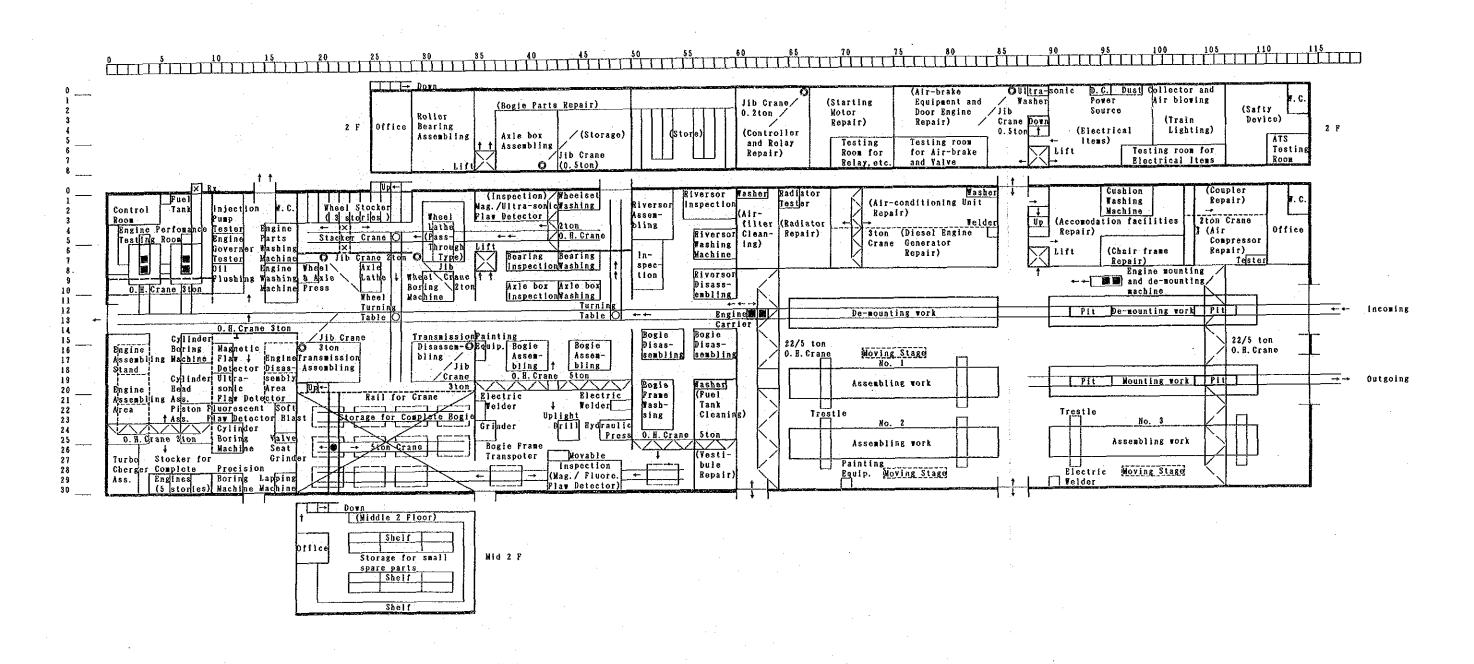
- 1. Inspection/adjustment of engine and transmission
- 2. Inspection/adjustment of cooling and fueling system
- 3. Inspection of air-braking system
- 4. Inspection/clean air-filter of air-intake
- 5. Inspection of safety device
- 6. Inspection/adjustment of brake linkage and cylinder
- 7. Inspection/replacement of brake block

(4) Major points of P-O/I:

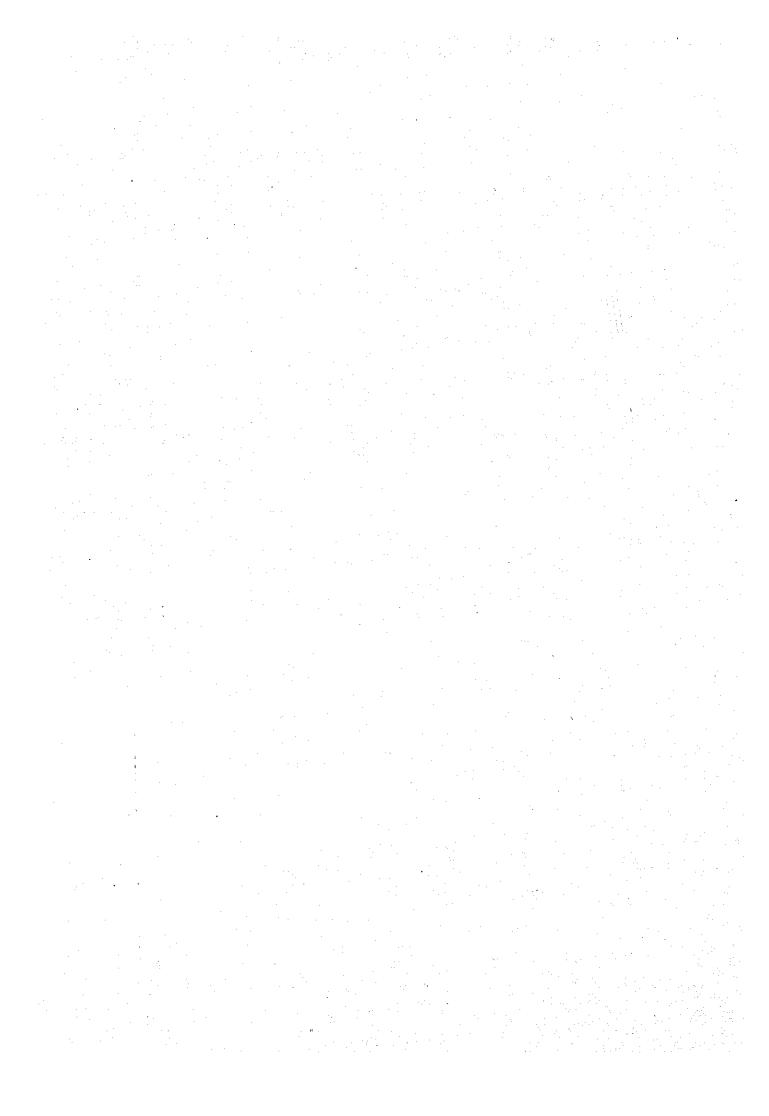
- 1. Check fuel, engine oil, cooling water, temperature
- 2. Check brake blocks and brake linkage
- 3. Check tyre profile, flaw and defects of wheel-set
- 4. Check safety device and controller
- 5. Check door and telecommunication system
- 6. Check air-conditioning unit



Appendix 7-4-2 General View of the Main Building for the DMU Repair Shop



Appendix 7-4-3 Plant and Machinery Layout for the Main DMU Repair Shop



Appendix 7-4-4 Plant and Machinery for Workshop

Table 1 List of Plant and Machinery for POH and IOH, installed in the Workshop

Table 2 List of Plant and Machinery for POH and IOH, installed in the Workshop

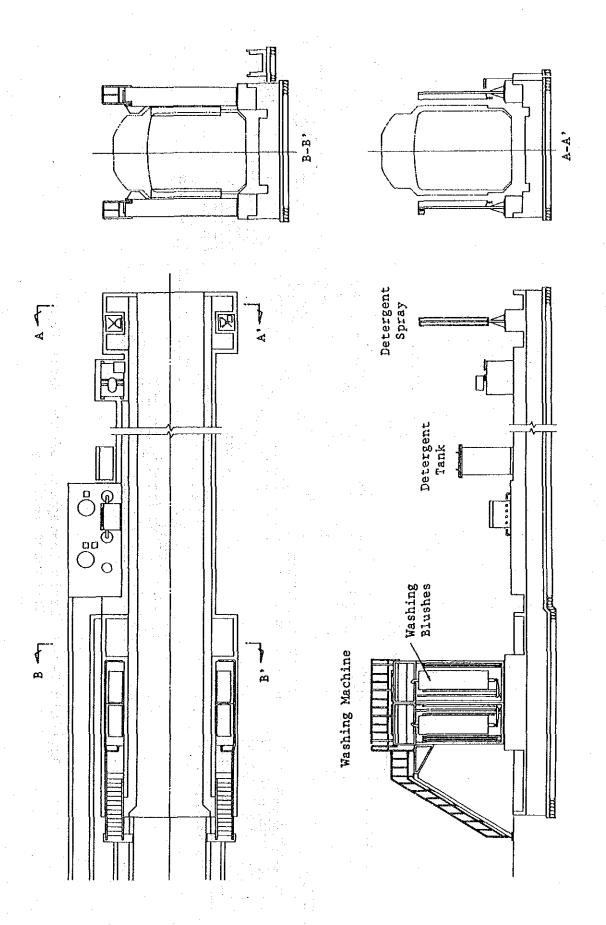
			1
	Overhead crane (2ton/span-6m)		1
in the Army	Wheel lathe (Pass-through type)		1
Wheel and	Wheel stocker (3 stories) [with stacker crane]		1
Λxle	Wheel and axle press (200 ton)		1
Repair	Wheel boring machine		1
Shop	Axle lathe		1
SHOD	Wheelset washing machine		1
	Bearing washing facility		1
•	Axle box washing machine		1
tiga kanada a kanada ka	Magnetic flaw detecting facilities		1
	Magnetic Ilaw detecting facilities		1
	Ultra-sonic flaw detecting facilities		1 .
;	Oil dumper testing machine		9
	Wheel turning-table		2
1 P	Jib crane (2 ton)		4
•	Jib crane (0.5 ton)		1
$(\mathcal{A}_{i,j}) = (\mathcal{A}_{i,j}) = (A$	Painting equipment		2
	Others		1
	Overhead crane (3ton/span-10m)		2
	Overhead crane (3ton/span-8m)		1
Engine	Jib crane (3 ton) [for transmission]		2
Repir	Engine washing machine		1
	Engine parts washing machine		1
Shop	Flaw detector (Magnetic)		1
The second second	Flaw detector (Fluorescent)		1 -
	Flaw detector (Vitra-sonic)		î
			ī
	JOI t DIAGE	ļ	1
	Precision boring machine		1
•	Cylinder boring machine	1 6 4	1 · · · ·
	Engine stand		3
	Valve seat grinder		Ţ
	Lapping machine		1
	Engine performance testing machine		1
	Oil flushing facility		1
	Engine governer tester		1
	Injection pump tester		1
	Dynamic balancing machine		1
•	Stocker for complete engines (4 stories)		1
	Forklift (3ton)		1
	Transporting car		2
	Painting equipment		1
·			1
	Others		
	The state of the s		1
	Pipe bending and threading machine		1
	Cushion cleaning machine		1
Other	Vacuum cleaner	F	1
Items:	Industrial sewing machine	'	1
Repair	High-presser washing machine for air-con. element		2
Shop	Air-conditioning unit tester		1
· · · · · · · · · · · · · · · · · · ·	Air compressor tester		1
	Radiator tester		1
	Air-filter cleaner		1
l	Transporting car		2
•	Others		1
	CONC.	-	:
1			

Table 3 List of Plant and Machinery for POH and IOH, installed in the Workshop

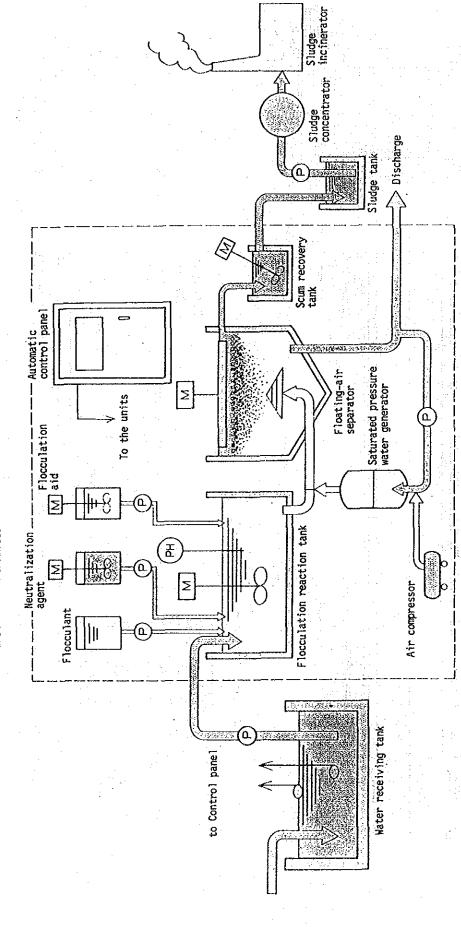
	(0.10)		
	Waste water treatment facilities (240 ton/day)	ļ ,	
Facilities	Waste oil collecting facility	1	
for	Air-conditioning (500 sq.m)	1	
Anti-water-	Roof ventilater (Electric: 160 Cub.m/min)	14	
	Compressor for hi-press air supplying	1	
	Electrical facilities for power and lighting etc.	Ī	
General use		1 1	
	Water supplying and drinage	1.	
	Cago Elevetor (2 stories / 3 ton)	Z	
	DMU Repair Shop (Main Bay 1,210 sq.m)	1	
Building	[Steel Structure Hi-roof]		
Du1146	DMU Repair Shop (Main Bay 1,800 sq.m)	1	
·	[Steel Structure Low-roof]		
	Office & small shops (Sub Bay 1, 160 sq.m)	1	
	[Concrete Block 2 stories]	1	
1		1	
	Incoming Inspection (Steel Structure 205 sq.m)	1	
	Battery Maintenance Shop (Demolishing & Built)	l	
	(Steel Structure 450 sq.m)	}	

Appendix 7-4-5 List of Equipment for Daily Maintenance at the DMU Depot

(1) Rawang DMU's Depot 1) Re-fueling & water supply facility 2) Waste water treatment facility 3) 2 ton-crane (for air-con. unit) 4) Inspection shed and pit-line (for 1 car) 5) Un-scheduled repair shed (600 sq. m) 6) Buildings (for maintenance staffs) (2) K.L. DMU's Depot 1) Automatic car washing machine (with chemical washing) 2) Buildings (for maintenance staffs) (3) Sentul DMU's Depot 1) Re-fueling & water supply facility (Small scale/ 2 positions) 2) Inspection shed (extention 120 m) (from 1-car train to 7-car train) 3) Lifting jacks (1set for 40 ton) 4) 2 ton-crane (for air-con. unit) 5) Air-compressor 6) Buildings (for maintenance staffs) (4) Bangi DMU's Depot 1) Water supply facility 2) Automatic car washing machine (water washing only) 3) Buildings (for maintenance staffs) (5) Seremban DMU's Depot 1) Re-fueling & water supply facility 2) Waste water treatment facility 1) Compaction shed and nit-line 25 m	Daily Maintenance Facilities for DMU's Depots	Number Machin	
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2) Waste water treatment facility 3) 2 ton-crane (for air-con. unit) 4) Inspection shed and pit-line (for 1 car) 5) Un-scheduled repair shed (600 sq. m) 6) Buildings (for maintenance staffs) (2) K.L. DMU's Depot 1) Automatic car washing machine (with chemical washing) 2) Buildings (for maintenance staffs) 1 (3) Sentul DMU's Depot 1) Re-fueling & water supply facility (Small scale/ 2 positions) 2) Inspection shed (extention 120 m) (from 1-car train to 7-car train) 3) Lifting jacks (lset for 40 ton) 4) 2 ton-crane (for air-con. unit) 5) Air-compressor 6) Buildings (for maintenance staffs) (4) Bangi DMU's Depot 1) Water supply facility 2) Automatic car washing machine (water washing only) 3) Buildings (for maintenance staffs) (5) Seremban DMU's Depot 1) Re-fueling & water supply facility 2) Waste water treatment facility 3) 2 ton-crane (for air-con. unit) 1	1) Rawang Dmu S Depot	150	m
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3) 2 ton-crane (for air-con. unit)		ì	m
3/2 ton-clane (for all con. unit)		_	
		-	_
4) Inspection shod and pit it in	4)Inspection shed and pit-line	2.5	m
(for 1 car)			
5)Buildings (for maintenance staffs)	5)Buildings (for maintenance staffs)	. 1	

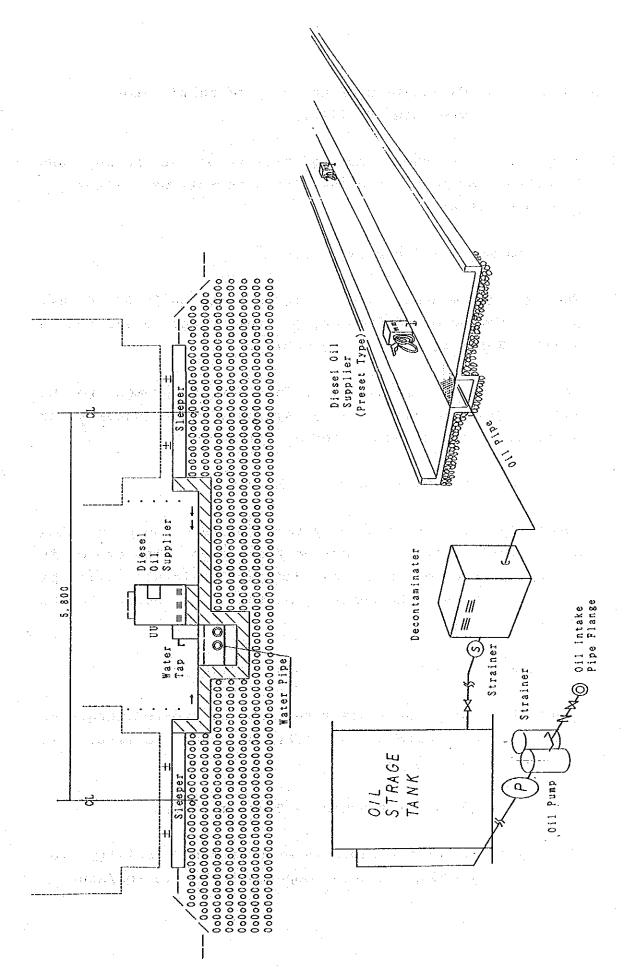


Appendix 7-4-6 Outline of the Automatic Car Washing Machine



Conception (flow sheet) for the floating-air separating waste water treatment facilities.

Appendix 7-4-7 Basic Conception of the Waste Water Treatment Facility



Appendix 7-4-8 Refueling Equipment and Piping System for the Stabling Lines

Appendix 7-4-9 Calculation of Capacity of Waste Water Treatment Facilities

 The areas of the refueling facilities at Rawang and Seremban DMU depots are calculated as follows (Refer to Appendix 7-4-8):

150 m (1) x 3.8 m (w) = 570
$$m^2$$

2. The maximum monthly rainfall in this region is 635.4 mm, or an average of 26.5 mm/day of rain (Nov.1984/Petaling Jaya). Refer to table 1 and Table 2.

If the maximum rainfall for a rain day is assumed to be 200 % greater than the above average, the quantity of waste water can be calculated as follows.

$$570 \text{ m}^2 \times 0.0265 \times 2.0 = 30.2 \text{ m}^3/\text{day}$$

Generally, it is extremely rare to have such a high concentration rainfall continue for 2 days. Therefore, it is reasonable to assume that 2nd day's rainfall will be average. Thus, the quantity of the waste water to be treated is:

$$570 \text{ m}^2 \times 0.0265 \times (2+1) = 45.32 \text{ m}^3/2 \text{ days.}$$

Since this volume of waste water must be treated within 48 hours, the treatment capacity of the facility is calculated as follows:

$$45.32 \text{ m}^3/2 \text{ days } (48 \text{ hours}) = 0.944 \text{ m}^3/\text{hours}$$

The capacity of the waste water treatment facility for refueling equipment is then computed to be 1.0 ton/hour.

As for the size of the water receiving tank for temporary storage of rain, its volume is calculated to be:

 $50 m^3 = 5 m(1) \times 5 m(w) \times 2 m(h)$.

Table 1 Data of Rainfall (1)

PERKHIDMATAN KAJICUACA MALAYSIA

Station: PETALING JAYA

Lat.: 3° 06' N Long.: 101° 39' E Ht, above M.S.L.: 45.7 m.

Records of Monthly Rainfall Amount Unit: $\mbox{mm}.$

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
1969	168.9	53.8	140.2	99.3	380.5	221.0	81.3	480.6	98.5	402.3	220.0	198.1	2544.5
1970	232.7	29.7	235.7	257.5	245.1	52.1	126.0	40.6	196.6	158.0	188.5	262.4	2024.91
1971	466.3	174.7	194.3	253.5	149.1	103.4	269.2	223.3	248.4	160.5	213.4	368.8	2824.9
1972	96.3	173.5	35.1	221.0	77.7	161.3	60.2	56.9	185.2	257.3	310.6	289.1	1924.2
1973	137.9	225.3	151.4	405.4	565.9	101.1	68.8	286.5	123.7	322.3	241.8	316.0	2946.1
1974	86.4	106.4	191.0	306.6	161.5	50.8	120.9	17.3	237.5	125.2	249.4	176.8	1829.81
1975	78.7	179.0	193.1	281.6	154.1	70.8	235.3	172.2	210.2	228.3	192.0	115.2	2110.5
1976	188.4	117.2	413.8	281.9	67.4	146.7	66.1	287.8	53.4	301.7	271.9	225.1	2427.4
1977	144.8	127.6	210.5	201.2	320.0	152.2	85.8	110.0	147,7	392.2	251.1	160.0	2303.1
1978	187.8	162.4	283.0	170.5	213.3	. 11.8	78.0	. 114.5	193.6	252.4	178.2	195,0	2040.5
1979	78.4	136.3	217,2	302.3	75.9	200.2	183.5	102.3	189.7	297.9	460.5	157.9	2402.11
1980	91.4	178.8	297.7	264.6	133.0	180.9	134.2	238.8	137.5	159.6	440.7	238.6	2495.8
1981	151.6	267.8	183.1	451.0	457.2	19.3	156.0	112.8	210.8	308.4	281.3	143.0	2742.3
1982	60.8	325.9	402.3	545.6	151.2	250.5	83.7	221.8	209.8	316.3	439.7	248.4	3256.0
1983	206.3	177.4	148.6	157.1	378.5	132.3	151.5	117.7	232.6	376.4	261.3	216.3	2556.0-
1984	202.9	498.1	146.3	240.8	236.5	119.6	183.7	124.0	198.1	125.1	635.4	307.5	3018.0
1985	94.8	185.2	297.7	174.4	423.4	11.7	105.4	124.9	172.9	283.0	257.2	288.0	2418.6
1986	206.7	107.2	228.2	334.6	205.8	107.2	290.9	55.1	127.8	198.4	205.6	182.6	2300.1-
1987	231.8	140.2	250.7	326.3	272.2	165.1	66.1	158.3	203.9	602.3	215.7	343.2	2975.8
1983	272.9	331.5	234.4	411.1	216.5	228.4	191.1	322.2	363.9	107.8	323.3	118.3	3154.7
1989	203.0	105.7	351.0	166.6	82.2	157.4	97.4	171.1	296.3	269.1	375.1	434.2	2709.1
1996	1954	146.2	2042	270.2	2356	83.2	±9.⊃						2524 (Ave.)

Records of Number of Raindays

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual	
1971	14	11	15	17	11	12	14	18	16	16	17	23	184-	
1972	9	14	8	20	13	15	8	9	14	19	24	24	177	
1973	12	11	21	27	26	15	11	16	17	25	20	21	222	
1974	15	14	13	20	15	9	15	6	22	15	18	17	179 ·	
1975	15	22	20	19	12	11	22	14	23	15	24	23	220	
1976	12	14	22	22	10	16	13	12	14	26	21	15	197 ·	
1977	13	13	12	14	17	11	12	14	15	25	20	18	184	
1978	15	17	23	16	19	7.	16	9	12	21	19	16	190 ·	
1979	14	13	19	17	11	14	14	15	19	25	26	14	201 `	
1980	13	16	23	19	14	13	18	17	17	18	25	22	215	
1981	8	14	16	26	23	4	9	9	20	19	27	18	193 ·	
1982	7	17	24	25	17	12	13	16	11	22	25	. 18	207 ·	
1983	12	9	15	16	- 23	11	15	15	19	14	15	12	176 ·	
1984	23	21	22	. 18	. 17	11	15	10	17	19	26.5*	19	216	
1985	10	17	24	12	19	3	11	7	20	22	29	17	19t -	
1986	17	10	19	26	16	9	9	- 8.	15	22	22	15	183	
1987	14	9	16	21	11	15	16	15	18	25.1	20	22	201 -	
1988	22	19	24	19	15	13	17	20	20	16	22	- 11	218	
1989	18	13	21	14	16	13	10	16	23	19	24	16	203	
1990	11	10	\5	21	14	10	8						198 (Ava.)	-

9 _ 12 75mm/day Bal

 $2524 \div 198 = 12.75$ mm/day

Bahagian Kajiklim Perkhidmaan Kajienzez Malaysis

Dibekalkan olch

Table 2 Data of Rainfall (2)

Station: P	Station: Petaling Jaya		PER	CHIDMAT.	PERKHIDMATAW KAJICUAGA MALAYSIA	DACA M	VLAYSIA							
Lat.: 30 Long.: 101 Ht. above M	Lat.: 30 06'N Long.: 101 39'E Tt. above M.S.L.: 45.7 m.	Re	Records of Mean, Annual	Mean, Annual	Highest, Rainfall	r, Lowes	Lowest of Monthly and Raindays		and					
Period	Rainfall (mm.)	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oot.	Nov.	Dec.	Annual
1969-1989	Mean	170.9	181.1	228.8	282.7	236.5	125.9	135,0	168.5	192.3	268.9	296.0	237.3	2523.9
	Highest	466.3	1.864	413.8	545.6	565.9	250.5	290.9	480.6	363.9	602.3	635.4	434.2	3256.0
	Year of Highest	1971	1984	1976	1982	1973	1982	1986	1969	1988	1987	1984	1989	1982
	Lowest	60.8	29.7	35.1	99.3	4.19	11.7	60.2	17.3	53.4	107.8	178.2	115.2	1829.8
	Year of Lowest	1982	1970	1972	1969	1976	1985	1972	1974	1976	1988	1978	1975	1974
1						-								
	Number of Raindays				-									
1971-1989	Mean	14	14	5	19	16	11	<u>در</u>	ដ	17	20	22	18	196
	Highest	23	2.5	24	27	26	16	22	20	23	26	29	24	222
	Year of Highest	1984	1975	SEV.	1973	1973	1976	1975	1988	1975,	1976	1985	1972	1973
437	Lowest	7	σ	ω	12	10	ന	∞	9	11	14	15	TT.	176
a.	Year of Lowest	1982	1983,	1972	1985	1976	1985	1972	1974	1982	1983	1983	1988	1983

Note: SEV. - Several Occasions

Appendix 7-5-1 Existing Roof Ventilation of K.L. Station

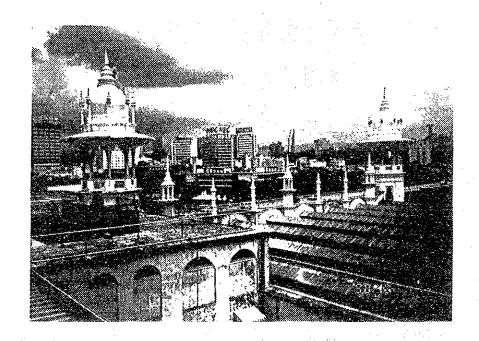


Photo 1 Natural Type Ventilators of K.L. Station Roof

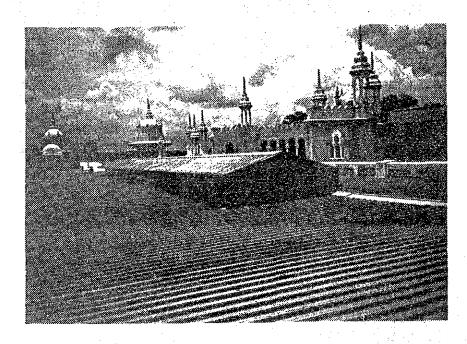


Photo 2 Proposed Site for Instration of Cooling Tower

Records of Temperature and Relative Humidity in Petaling Jaya Table 1

PERKITUINTAN KAJICUACA MALAYSIA-

Statton ? PETALING JAYA

3° 06'N 101° 39'E

Late.: Ledg.:

onorth.	L 37 I S M outside all		٠				٠							:	
, , , , , , , , , , , , , , , , , , , ,	1.04	• e		1				4.1					. : .		4
Perfod	No. of years	No. of years Tumperature (°C)	Jan.	Feb.	Mar.	Apri	May	Jun.	Jul.	Aug	Scp	Oct.	Nov.	Dec.	Annual
1971-1989	19	24 Hr. mean	26.7	27.0	27.3	27.4*	27.7	27.6	27.2	27.2	26.9	26.9	26.5	26.5	27,1
		Mean Daily max.	32.5	33.2	33.5	33.5	33.3	33.1	32,6	32.7	32.5	32.6	32.1	32,1	32.8
		Mean Daily min.	22.9	23.2	23.7	24.0	24.2	23.9	23.4	23.5	23.4	23.5	23.4	23.1	23.5
		Mighest max.	35.7	36.5	36.8	37.0	36.8	36.3	36.4	35.8	35,9	36.6	34.9	35.2	37.0
		Year of Highest max.	1972,	1983	1983	1979	1979	1978	1981	1981	1979	1979	SEV	1971	1979
		Lowest min.	20.4	19.9	21.2	21.1	21.9	21.1	20.9	20.6	21.5	21.1	21.1	21.0	19.9
		Year of Lowest min.	1985	1977	1971	1974	1972	1985	1982	1973	1984	1973	1976	1979,	1977
		Relative Hunidity (2)		•				:						.* •	
1971-1989	19	24 Hr. mean	78.5	78.5	79.5	81.9	80.9	78.8	79.2	78.5	81,1	82.0	83.9	81.8	80.4
1975-1989	15	Mean Daily Max.	95.5	95.3	95.7	96.2	95.4	7.76	8.46	0.46	95.3	95.8	96.7	0.96	95.4
		Mean Dally Min.	50.8	49.7	51.9	55.1	56.1	54.1	54.7	53.7	55.8		58.7	54.9	54.3
; ;;		Lowest Min.	35	31	33	38	36	76	38	32	36		43	36	26
		Year of Lowest Min.	SEV	1976,	1983	1983	1979	1985	1981, 1985	1976	1987	1979	1976	1981	1985

Note: *mean for 18 years only SEV - several occasions

Bahugian Kajiklim Perklidmatun Kajienses Melessi.

Dibekaikan oleh

/2a

Records of Temperature and Relative Humidity in Subang Table 2

PERKHIDMATAN KASICUACA MALAYSIA

Station ; Kuala Lumpur International Lat.: 3 07'N Long.: 101 33'E

Long.:

Ht. above	Ht. above M.S.L.: 16.5m.														
Period	No. of years	No. of years Temperature (°C)	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
1968-1989	22	24 Hr. mean	26.1	26.5	26.7	26.9	27.1	27.0	26.6	26.6	26.4	26.4	26.1	26.0	26.5
		Meun Daily max.	31.9	32.7		32.9	32.7	32.5	32.0	32.2	31.8	31.8	31.3	31.4	32.2
		Mean Daily min.	22.1	22.3	22.7	23.3	23.5	23.1	22.7	22.7	22.8	22.9	22.9	22.5	22.8
		Highest max.	34.7	35.7		35.8	35.2	36.8	35.4	35.9	35.4	34.7	34.8	34.7	36.8
		Year of Highest max.	1979		1987	1987	1988,	1985	1986	1981	1986	1988	1988,	1989	1985,
		Lowest min.	18.6	18.1	18.7	21.2	21.0	18.9	20.0	20.0	20.3	20.2	20.6	20.0	18.1
		Year of Lowest min.	1979,	1968,	1968	1971	1976	1985	1976	1976	1986	1978	SEV.	1975	1968,
		Relative Humidity (%)													
1968-1989	22	24 Hr. mean	82.4	81.5	82.6	84.7	84.2	82.9	82.6	82.3		85.0	86.5	85.0	83.7
		Mean Daily Max.	98.5	98.2	98.3	7.86		97.9	7.76	9.76	98.1	98.4	98.7	98.7	98.2
		Mean Daily Min.	52.6		52.3	56,4	57.7	56.1	56.2	55.0		57.8	60.1	57.7	55.8
		Lowest Min.	93	56	28		37	25	34	31		88	44	38	25

- Several occasions Note: Sev.

1985

Year of Lowest Min.

Buhugian Kajiklim Perkhidmalan Kajicuaca Malaysia Dibekalkan olek

Appendix 7-5-3 NOx Emission Data of Diesel Engine (600 PS)

DLESEL ENGINE (600PS) EMISSIONS DATA

NITROUS OXIDE VS POWER

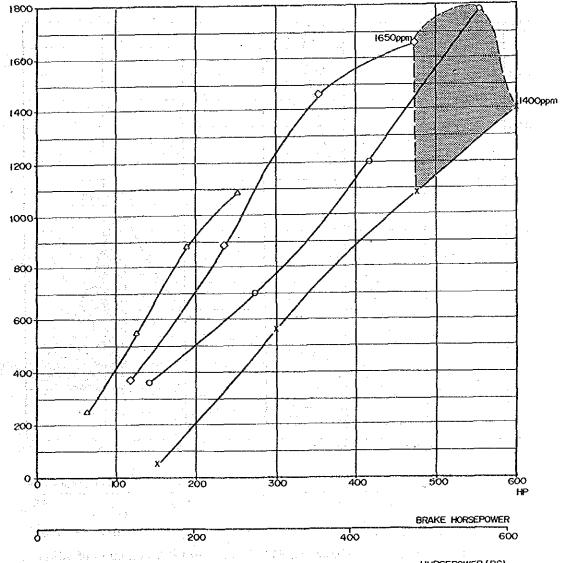
× 2100 rpm (Max. PS)

Nitrous Oxide (NOx) PPM

o 1800 rpm

п 1500 rpm (Max. Torgue)

a 1200 rpm



HURSEPOWER (PS)

Note: In case of using engine between 475 PS and 600 PS, emission of exhaust gas (NOx) will be in the dark area.

The state of the second of the second

Source: KTA-19 diesel engine emission data, Cummins Engine (Japan) Ltd.

Appendix 7-5-4 CO Emission Data of Diesel Engine (600 PS)

的过去式和复数 医皮肤的 有效量

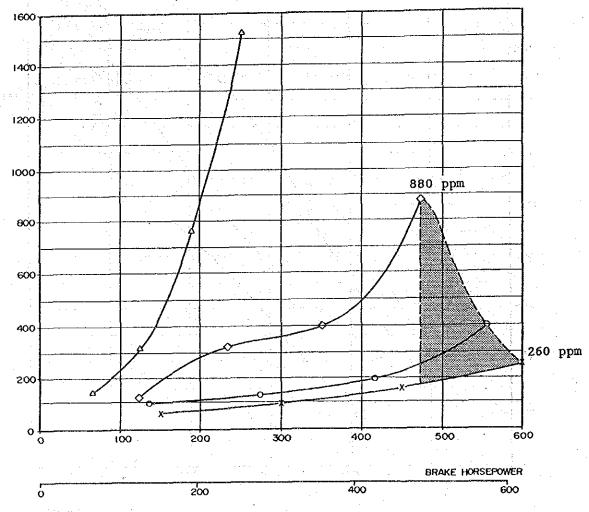
DLESEL ENGINE (600PS) EMISSIONS DATA

× 2100 rpm (Max. PS)

Carbon Monoxide (co) PPM

o 1800 rpm I 1500 rpm (Max. Torgue)

△ 1200 rpm

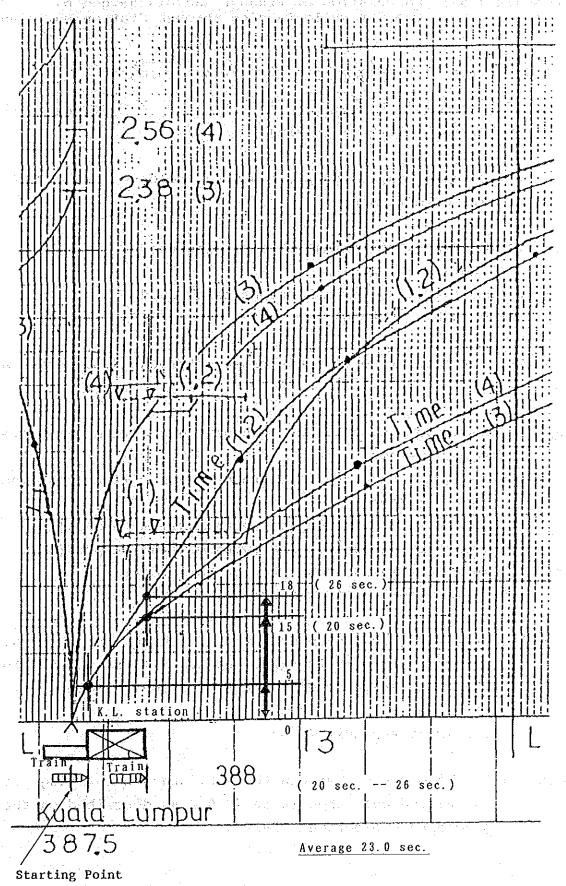


HORSEPOWER (PS)

Note: In case of using engine between 475 PS and 600 PS, emission of exhaust gas (CO) will be in the dark area.

Source: KTA-19 diesel engine emission data, Cummins Engine (Japan) Ltd.

Appendix 7-5-5 Detailed Run Curres of the DMU Train at K.L. Station



- Appendix 7-5-6 Calculation of Exhaust Gas Discharged by One Car While Passing Through Station Building
 - Q = $(t1 \times q1 \times \frac{273+TKL}{273+T1} + t2 \times q2 \times \frac{273+TKL}{273+T2}) \times n$ = $(2.5 \times 1.17 \times \frac{273+33}{273+554} + 17.5 \times 1.77 \times \frac{273+33}{273+493}) \times 5$ = $67.281 = \frac{67.28}{273+554} \times \frac{67.28}{273+493} \times \frac{67$
 - Q: Per-train quantity of exhaust gas released into K.L. Station (m³/train)
- t1 : Time (sec.) of maximum torque being used (0 km/h 30 km/h)
- t2 : Time (sec.) of maximum output being used (30 km/h 50 km/h)

However, t1 + t2: time of train passage through K.L. Station (sec)

- q1 : Per-engine quantity of exhaust gas (with maximum torque) (m3/sec)
- q2 : Per-engine quantity of exhaust gas (with maximum output) (m3/sec)
- T1 : Temperature of exhaust gas (with maximum torque)('C)
- T2 : Temperature of exhaust gas (with maximum output) ('C)
- TKL: Temperature inside K.L. Station Building ('C)
- n : Per-train number of engines
- Note 1: It takes 16.0 seconds from 0 km/h to 30 km/h.

 However, because it takes the train 13.5 seconds to
 reach the entrance of the K.L. station building:

 t1 = 2.5 sec, t2 = 17.5 sec

 (Refer to Appendix 7-5-5)
- Note 2: The temperature within the K.L. station building is calculated only when it is 33.0°C as described on the preceding subsection 7-5-1(2).

- Appendix 7-5-7 Computed Quantity of Harmful Exhaust Gas
 Discharged by One Train While It Passes Through
 Station Building
- 1) NOx Gas

QN = (t1 x q1 x PN1 x
$$\frac{273+T_{KL}}{273+T_1}$$

+ t2 x q2 x PN2 x $\frac{273+T_{KL}}{273+T_2}$) x n x φ x ρ
= (2.5 x 1.17 x $\frac{1650}{10^6}$ x $\frac{273+33}{273+554}$
+ 17.5 x 1.77 x $\frac{1400}{10^6}$ x $\frac{273+33}{273+493}$) x 5 x 0.9 x 0.5
= $\frac{0.04299}{10^6}$ (m³/train)

QN : Per-train quantity of NOx gas released into K.L. station Building (m³/train)

PN1: NOX concentration in exhaust gas (with maximum torque)

PN2: NOx concentration in exhaust gas (with maximum output)

 φ : Discount rate (600 PS: 550 PS)

 ρ : Coasting rate (due to speed restriction in K.L. station yard.)

The preceding subsection applies to other matters.

2) CO Gas

Qc = (t1 x q1 x Pc1 x
$$\frac{273+TKL}{273+T1}$$

+ t2 x q2 x Pc2 x $\frac{273+TKL}{273+T2}$) x n x φ x ρ
= (2.5 x 1.17 x $\frac{880}{10^6}$ x $\frac{273+33}{273+554}$
+ 17.5 x 1.77 x $\frac{260}{10^6}$ x $\frac{273+33}{273+493}$) x 5 x 0.9 x 0.5
= $\frac{0.009383}{273+100}$ (m³/train)

Qc : Per-train quantity of CO gas released into K.L. station Building (m3/train)

Pc1 : CO concentration in exhaust gas (with maximum torque)

Pc2: CO concentration in exhaust gas (with maximum output)

The preceding subsection applies to other matters.

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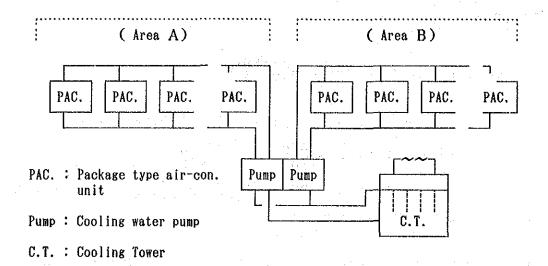


Fig. 1 Piping Diagram for Water Cooled System

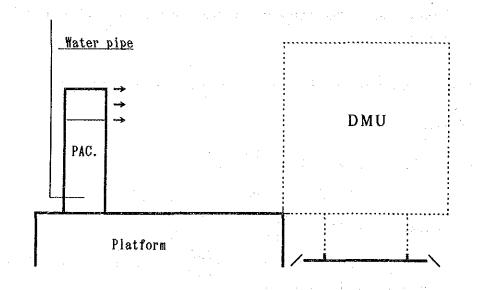


Fig. 2 Direct Blow Cooling System on a Platform

FEEDER-BUS COMMUTER TRANSPORT

Appendix 8-5-1 Investment Cost and Operation/Maintenance Cost

Table 1: Feeder-Bus Unit Price

Item	Breakdown	Unit	Amount (Rgt)	Source
. Bus Procurement	Bus (60 seats)	Rgt/car	130,000	Δ
10 mg/s	. Import portion	on / "122	80,000	
	. Local portion	1 "	50,000	
	Mini Bus (25+10)) : "	70,000	$\triangle \bullet$
	. Import portion		50,000	•
	Local portion	ì.	20,000	
. Bus stop at rai		Rgt/uni		*
Facility	Labour (20%)	. н	5,000	
	Material (80%)	n n	20,000	
Bus stop on fee		. 11	12,000	
road	Labour (20%)		2,400	
	Material (80%)	ei .	9,600	
. Feeder Road		Rgt/km	180,000	*
Construction	Labour (20%)	т —	36,000	
	Material (80%)	n .	144,000	
. Land Acquisitio	n	Rgt/ha	50,000-130,000	
. Bus Maintenance	Bus	Rgt/car.k	m 0.18	0
. bus Maintenance	Mini Bus	Rgc/car.k	0.09	•
	nini bas	•		_
. Labour Wage	Bus	Rgt/car.y	ear 41,000	0
	Mini Bus	#	34,000	@
. Fuel	Bus	Rgt/car.k	m 0.14	0
	Mini Bus	ri .	0.07	•
. Bus stop at rai Maintenance	lway station	Rgt/Unit	year	*
Bus stop on fee	der road	и	840	*
, Feederbus Road Maintenance		Rgt/km.ye	ar 9,600	*

Note:

- O Bus Company
- * City Hall
- △ License Board (Ministry of Transport)
- Atur
- ☐ KVPS (Property Market Report 1989)

	Table 2:	Investment	ot Cost	and (Opera	ıtion,	/Mair	Operation/Maintenance	Cost 1993	WT 1	997 WT	2005 WT	r.
- - - -	Bus Bus Bus Bus Bus Road Road	dry	Lities Lities 1			Bus Mini 1	Bus	Import Local Local Local Labor Material Labor Material	1224 1955 1955 782 617 2468 55	0.00001000	20187 12616 19867 7946 6563 26255 167 526	36080 22550 20500 8200 7351 29404 700	! !
Operation/ Maintenance	Bus Bus Wade Wade Fuel Rost	Operation/Maj Operation/Maj Station Faci	/Maintenance /Maintenance acilities	ω ω		٠.	e e e	Bus Mini Bus Bus Mini Bus Bus Mini Bus	s 1827 1827 1329 1129 1142 16215	<u> ეგეგ44ებ</u> ნ	2317 1938 10345 13509 1802 1507 1763	4010 2160 18491 139491 3119 2573 2000	
	No. o No. o No. o No. o Avera Avera Avera Avera	r Pa nger m m m m nge ing ing enge enge	senge km Rati m/yea km/y km/d	rs crcar r/car ear/car ay/pers	uos L		er in de la companya	Bus Mini Bus Bus Mini Bus	10572 32922 32923 8 2031 8 3	35112 35135 35135 35135 35135	132085 417501 12877 21542 0.75 0.75 48 50 411 3.1	184805 292082 24003 0.75 0.75 450 3.1 0.35	

POLLUTION CONTROL MEASURES

Appendix 9-4-1 Annual Reduction of Exhaust Gas in RBCS Project

Status of engine use	Number of revolutions (rpm)	Amount of Exhaust Gas (m ³ /sec)	Temperature of Exhaust Gas
Maximum Output	2,100	1.77	493
Maximum torque	1,500	1.177	554
Idling	625	0.206	150

Table 1 Emission Data for Diesel Engine (19,000cc)

2. The quantity of exhaust gas under standard conditions (0°C, 1 atm.) is calculated from the figures in Table 1 as follows:

1) 2,100 rpm --- 1.700 x
$$\frac{273}{273 + 493} = 0.6308$$
 Nm³/sec

2) 1,500 rpm --- 1.177 x
$$\frac{273}{273 + 554} = 0.3885$$
 Nm³/sec

3) 625 rpm --- 0.206 x
$$\frac{273}{273 + 150} = \frac{0.1329}{150}$$
 Nm³/sec

- 3. Considering that the running pattern of train, the same method of calculation used in section 6-6 (Calculation of Fuel Consumption) is applied. To estimate the quantity of exhaust gas produced by the different types of train operation listed below, computed as follows:
 - a) Power running $(0.6308 + 0.3885)/2 = 0.5097 \text{ Nm}^3/\text{sec}$
 - b) Coasting $0.6308 \times 0.1 + 0.1329 \times 0.9 = 0.1827 \text{ Nm}^3/\text{sec}$
 - c) Idling 0.1329 Nm³/sec

The amount of annual exhaust gas from DMUs is calculated using these data (see Tables 2 and 3).

Table 2 Emission per Engine

Table 2 Emission per Engine

								sion of Exhaust Gas
Sheduled Ac Section Operation Pe			Acceleration Period (Sec.	AccelerationCruising,)Ratio (%) Coasteri	bo ct	60	L. ation	D T
Time (Sec.) Loc			ocal Rappid		E 08			5min) (Nm3/sec) (Nm3/sec) (Nm3/sec) (Nm3)
Rawang>> K.L. 2.160 1.1 Northern Rawang < K.L. (KL 1/2) 1.0	1.1	1,1	02 46 70	90	000	c	5	493 deg/cl554 deg/cl50 deg/c 196.180 65.149 0.987
Average 2, 160	1	1,05		· · · · · · · · · · · · · · · · · · ·)) ,)			
2, 1	2, 1	!	09				<u> </u>	(one way/one engine) Total 262.316 Nm3
1/2)	1,17	1.17	80 63 6					
(Nb 4) Average 1,14		1,14	olas		2. 2. 2.	C	С	206.443 76.218 0.815 283.477
K.L. << Bangi 2,400 1,124	-	1, 12						
Tine	2.2	2.27		1			<u>~</u>	(one way/one engine) Total 288.477 Nms
Southern (Rapid) Seremban (KL 1/2) Part (KL 4)			1,682 1,782 1,798					288 458 110.512 0.325
	3,420		1,440	46.43	53.57	2 0	2.5	
	3,420		34.6	1.		·	_1>	7, 22
Nound trip time	0.040		0,1,0					Total 399.356 Nm3
)> Seremban 1,1 tle)	1, 1	1, 124						166.589 7.728 0.276
2.2	2.2	2, 2	86	87.74	12.26	0,0	0	183.322
Round Trip Time 3,900 3,4	<u> </u>	က	422					(one way/one engine) Total 174.593 Nm3

Table 3 Emission per Year

L	THE PERSON NAMED AND PE	Emission of	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Year 1997		7 7 7 1	100	10000	1	Year 2005	
Route	Route Section	Exhaust das (Nm3) one way and one engine)	Number of Trains	Number of Engines	Sectional Emission of Exhaust Gas per Day	Number of Trains	Number of Engines	Sectional Emission of Exhaust Gas per Day	Number of Trains / Day	Number of Engines	Sectional Emission of Exhaust Gas per Day
Rawang>> K. L. (Local) Rawang << K. L. (Local)	- K. L.	262, 316		Ave. 3.6842	1 .	∞ ∞	1000 (100) (1000 (1000 (100) (1000 (1000 (100) (1000 (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (100) (1000 (100) (1000 (100) (100) (1000 (100) (100) (1000 (100) (100) (100) (100) (1000 (100) (The second secon	102		.138,781
K. L. (Local) K. L. << (Local)	> Bangi) - Bangi)	2003, 4	တ	3. 68 42.	72,063	ණ ග	-4	78,240	- 23	w	102,052
K. L>>	>> Seremban						2		-		
(Rapid) K.L. << (Rapid)		419.324	*** ***	3.6842	52, 526	о»	4	57.028	34	(71.285
Bangi>> (Shuttle)	>> Seremban tle)	500	2.2		4, 033	22		4,033	22		4.033
Bangi <<- (Shutt	Bangi << Seremban (Shuttle)										
	Grand Total			Nm3/Year	77,988,408	2	Nm3/Year	84, 547, 188		Nm3/Year	113, 570, 182
		¥									

Appendix 9-5-1 Waste Water Treatment Conducted by JR Group

(Oil and grease - SS: unit mg/l)

Type of waste water	Туре	PH	Oil and grease	COD	BOD	SS
Waste water from workshop	- A	10.2	150	68	70	135
	В	7.1	3.5	16	14	10
Waste water from cleaning	Α.	6.0	35	34	40	70
car bodies and parts	В	7.0	2.2	8	5	9
Waste water containing	A	8.4	120	26	10	40
grease and emulsion for metal shaping	В	7.0	2.8	5	3	3
Waste water from cleaning,	A	9.2	25	30	36	190
paining and other operations	В	7.2	1.0	4	6	8

(Note) Type A : Before treatment B : After treatment

PH : PH Value

BOD: Biochemical Oxygen Demand

COD: Chemical Oxygen Demand SS: Suspended Solid JR : Japanese Railway

ECONOMIC ANALYSIS

Appendix 11-2-1 Units Cost for Time Value

(1) Growth Rate of Consumer Index

Market Programs	a care de c	* v '	
	1985*-1	1990*-2	1990/1985
Consumer Index	125.1	136.8	1.09

*-1: Department of Statistic (June, 1987)

Broken Broken Broken Broken Broken

*-2: Department of Statistic (June, 1990)

Average index from January to June

(2) Time Value for Vehicle Type (M\$/hour/vehicle)

44.7	Occupancy	Time V	/alue
PARTIES FAIR	(Per Person) *-1	1985* ⁻¹	1990
Passenger Car	1.8	4.57	4.98
Buses	30.0	32.10	34.99
Motorcycle	1.2	1.28	1.40

 \star^{-1} : Klang Valley Transportation Study, 1987

(3) Time Value for Driver/Conductor (M\$/year/vehicle)

			s.		
				1985*-1	1990
Taxi		\$14.0		7390	8055
Bus	100	8000		28420	30978
Van/Picl	c-Up	•	4.5	7390	8055
	orry			14200	15478

 \star^{-1} : Klang Valley Transportation Study, 1987

(4) Time Value for Railway User (M\$/hour/person)

	1985* ⁻¹	1990
Non Vehicle Owner	1.07	1.17

 \star^{-1} : Klang Valley Transportation Study, 1987

Appendix 11-2-2 Running Cost and Fixed Cost

2.2							
	er egyt	2.35	eria. Es				
	Motor-	Moter	Taxi	Bus-Stage	Van/	Medium	
	Cycle	car			Pick-up	Lorry	٠
	a sa ing						
1.Fuel consumption(Km/l)	28	9	10	5	9	5	
2.Fuel cost(\$/l)	0.73	0.73	0.73	0.65	0.65	0.65	•
3.0il consumption(1/1000km)	0.560	1.410	2.120	2.820	2.120	2.820	
4.0il cost(\$/l)	4.130	6.270	6.270	3.880	3.880	3.880	
5.Tyre cost(\$)	49	424	405	2545	558	2545	
6.Tyre usefull life(1000km)	60		50	60	20	20	
7.Vehicle cost less tax(\$)	3217	21897	18877	104000	25481	66474	
8.Vehicle cost less tax and tyre(\$)	3168	21473	18472	101455	24923	63929	
9.Maintenance and repair rate(%/year)	7	8	19	19	8	15	
10.Annual maintenace cost(\$)	222	1718	3510	19276	1994	9589	
11.Annual running Km	11200	19200	96000	104000	24000	48000	
12.Vehicle average life(year)	7	10	5	12	10	10	
13.Residual value(\$)	475	4295	4618	15218	2492	9589	
14.Capital recovery factor at 12%	0.2191	0.1770	0.2774	0.1770	0.1770	0.1770	
15.Sinking fund factor at 12%	0.0991	0.0579	0.1574	0.0579	0.0579	0.0579	
16.Annual depreciation and interest	647	3552	4397	17076	4267	10760	
a.interest(\$)	262	1834	1626	9890	2024	5326	
b.Depreciation(\$)	385	1718	2771	7186	2243	5434	
17.Time related depreciation						.*	
a.Percent(%)	70	70	15	30	40	30	
b.Annually(\$)	269	1202	416	2156	897	1630	
18.Distance related depreciation		-					
a.Annually(\$)	115	515	2355	5030	1346	3804	
b.Per km(Cent)	1.03	2,68	2.45	4.84	5.61	7.92	
19.Time Related Cost(\$ per annual)	to defend		35 18 F		.,'	111	
a.Depreciation	269	1202	416	2156	897	1630	
b.Interest	262	1834	1626	9890	2024	5326	
c.Crew cost	0	0	8055	30978	8055	15478	٠.
d.Overhead	0	0	5236	17657	3383	10835	
Total	532	3037	15333	60681	14359	33269	
e.Operation hours per annual	1000	1750	3000	3500	2500	3500	
f.Time cost per hour(\$ per hour)	0.53	1.74	5.11	17.34	5.74	9.51	
g.Fleet factor	0.000	0.000	1.000	0.700	0.500	0.700	
g.Effective value(\$ per hour)	0.000	0.000	5.111	12.136	2.872	6.654	
20.Distance related cost							
a.Depreciation	115	515	2355	5030	1346	3804	
b.Maintenance	222	1718	3510	19276	1994	9589	
c.Fuel cost	292	1557	7008	13520	1733	6240	
d.Engin oil cost	26	170	1276	1138	197	525	
e.Tyre cost	9	163	778	4411	670	6108	
f.Total	664	4123	14927	43376	5940	26266	
g.Annual km	11200		the second second second		24000	48000	
h.Running cost(cent per km)	5.93	the second second			24.75	54.72	
a.Fuel and oil cost	2.84			and the second	8.04	14.09	
b.others	3.09		6.92	27.61	16.71	40.63	

Appendix 11-2-3 Vehicle Running Cost by Travel Speed
Unit:100 Vehicle-Km (M\$)

		するまするの とり こうずいりゅう	PART OF STATE		
Speed	Km/h	Motercycle	Motercar	Bus	Truck
	5	8.70	28.20	140.77	184.43
	10	8.17	26,91	112.10	147.05
	15	7.35	25.91	88.63	116.24
1	20	6.98	24.62	72.99	95.73
· .	25	6.72	23.76	62.57	82.14
++ 5	30	6.33	23.33	54.74	71.83
	35	6.06	22.33	50.89	66.67
	40	5,93	21.90	48.28	63.39
	45	5.93	21.47	45.68	59.88
	50	6.06	21.47	42.96	56.36
	55	6.06	21.90	41.71	54.72
1.	60	6.19	22.33	43.07	56.48
	65	6.33	23.33	44.32	58.12
1: .	70	6.59	24.19	45.68	59.88
	75	6.85	25.05	46.92	61.52
	80	7.25	25,91	48.28	63.39

Appendix 11-3-1 Economic Analysis for Base Case

						Discount Rat		Benefit-Cos Benefit/Cos EIRR Unit:1000M\$	28,81%	
Year 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015	3131 2795 0 0 0 0 0 0 0 0 0 0 0 0	1760 1571 26766 23197 0 1695 0 0 1370 0 262 0 901 0 0 0 118 0 0	Telecom 0 0 18236 22805 0 0 0 0 0 0 2142 2501 0 0 0 0 0 805	DNU & Workhop P 0 0 0 0 147130 0 0 0 7373 19342 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Bus rocurement 0 0 0 32727 1547 1382 1234 1101 983 9000 802 690 29 26 23 8411 406 363 317 283 239 2310	E Facility 0 0 18921 253 226 202 180 161 144 128 114 102 0 0 0 0 0	Access Road 0 0 487 18 16 15 13 12 10 9 8 7 0 0 0	Unit:1000M\$ Land Purchase	Sub Total	
2016 2017 2018 2019 2020 2021 2022 Total	0 0 0 0 0 0 0 5926	546 0 0 0 0 38 -791 57754	0 0 0 0 321 398 -1238 46659	8566 -8883 197623	206 177 7 7 6 2159 -1612 62823	0 0 0 0 20430	0 0 0 0 0 0 0 597	0 0 0 0 0 0 402	177 7 771 327 11161 -12524 392213	
Year 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013	Fuel & Personnel 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Station 80 0 0 0 0 961 910 813 726 690 616 398 355 317 283 225 202 180 161	Telecom 0 0 0 0 1817 1622 1449 1293 1155 1031 921 822 734 655 585 522 466 416 372 332 296	DMU & Workshop 0 0 0 0 7374 6584 6247 5578 1307 1167 1042 931 1996 1782 1591 1421 1268 1133 1011 903 806 720	0 0 18487 17232 16035 14896 13817 12799 11840 10939 10096 9014 8049 7186 6416 5729 5115 4567 4078	0 0 31174 28633 26600 24345 18806 17277 15848 14535 14952 13354 11923 10645 9505 8486 7577 6765 6040 5393	4367 45002 212868 64184 32128 35581 45122 21457 18422 24992 41087 18256 14284 11949 10669 17915 8893 8058 7082 6323 6395	Time Saving 0 0 0 40152 38138 36094 34050 32030 32030 26275 24494 21870 19527 17435 15567 13899 12410 11080 9893 8833	64886 56588 49323 42965 37403 36682 28299 24571 21587 19274 17209 19644 13917 12426 11091 9902 8835	Total 0 0 0 130321 103024 92682 83373 74995 67455 64812 54574 49066 43457 38801 34644 35241 27816 24835 22171 179795
2015 2016 2017 2018 2019 2020 2021 2022 Total	542 484 432 386 345 308 275 245 28737	144 128 114 102 91 81 73 65 9386	236 211 188 168 150 134 120 107 16069	643 574 512 457 408 365 326 291 46437	3251 2902 2591 2314 2066 1845 1647 1470 198021	4815 4299 3839 3428 3060 2732 2440 2178 298650	8179 5164 4016 3435 3831 3059 13600 -10346 690864	7887 7042 6287 5613 5012 4475 3996 3567 463806	8957 7051 6292 5541 4947 4417 5042 2697	16844 14092 12579 11154 9959 8892 9038 6264 073521

FINANCIAL ANALYSIS

Appendix 12-7-1 Financial Analysis for Railway Service (Unit: 1000 M\$)

Income Statement								÷																						
THEORY OF COMME	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Operating Profit	0	0	. 0	0	1,774	4,704	7,447	8,695	6,623	9,377	12,313	15,113	7,677	7,677	7,677	7,677	7,677	7,677	7,677	7,677	7,677	7,677	7,677	7,677	7,677	7,677	7,677	7,677	7,677	7,677
Operating Revenue	0	. 0	0	0	39,379	42,352	15,325	48,298	51,272	54,245	57,218	60, 191	63,164	63,164	63,164	63,164	63,164	63,164	63,164	63,164	63,164	63,161	63,164	63,164	63,164	63,164	63,164	63,164	63,164	63,164
Operating Expense	0	0	0	0	37,605	37,648	37,878	39,604	44,648	41,868	44,904	45,077	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,467	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487
Maintenance Cost Personnel Cost	0	0	0	0	18,625 2,095	16,625 2,138	18,738 2,181	19,579 2,225	22,035 2,268	22,119 2,352	22,119 2,389	22,164 2,425	26,708 2,462	26.708 2,462	26,708 2,462	26,708 2,462	25,708 2,462	26,708 2,462	26,708 2,452	26,788 2,462	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462
Tuel Cost Depreciation Cost	0	0 0	0	0	2,605 14,280	2,605 14,280	2,605 14,353	2,605 15,195	3,079 17,267	3,079 17,318	3,079 17,318	3,079 17,409	5,190 21,127	5,190 21,127	5,190 21,127	5, 190 21, 127	5,190 21,127	5,190 21,127	5,190 21,127	5,190 21,127	5,190 21,127	5,190 21,127	5,190 21,127	5,190 21,127	5,190 21,127	5,190 21,127	5,190 21,127	5,190 21,127	5,190 21,127	5,190 2),127
Investment	-																							•						
Titi co mone				14			*						_				_											10 005	1 010	200 001
Investment Total	3,596 0	3,596 0	47, 124 26, 659	306,684 70,246	0	3,653 3,473	16,825 3,862	49,172 6,414	3,765 2,893	0	<u>0</u>	93,939 12,419	0	0	24,146 7,004	0	0	0	1,049	0	0	908 153	0	0	31,433 7,949	0	0	16,825 3,862	177	238,994 31,506
Foreign Currency Total	3,596	3,596	20,465	236,438	0		12,963	42,758	872	0	. 0	81,520	0	0	17,142	0	0	0	872	U	0	755	0	0	23,481	0	0	12,963		207,488
Civil Vork	0	0	21,376 18,461	32,983 24,135	0 D	3,653 3,473	0	<u>0</u>	3,765 2,893	0	<u>0</u>	1,059 304	0	0	4,555 1,026	<u>0</u>	<u>0</u>	0.	1,049 177	0	<u>ó</u>	908 153	<u>0</u>	0	10,060 1,301	<u>u</u>	<u>U</u>		1,049 177	<u>0</u>
Local Currency Foreign Currency	Ö	Ö	2,915	8,848	Ŏ		ō	ō	872	0	0	755	. 0	0	3,529	. 0	0	0	872	Đ	Ō	755	0	0	8,759	0	0		872	- 0
Signal & Telecon	<u>0</u>	0	25,748 8,198	35,954 14,504	0	0	0	0	. O	0	0	. 0 0	0	0	19,591 5,978	0	<u>.</u> 0	<u>0</u> _	0	0	<u>0</u> 0	0	<u>0</u>	0	19,591 5,978	0	0	0	0	3,724 819
Local Currency Foreign Currency	Ö	Ö	17,550	21,450	ő	Ö	ũ	Ŏ	Ō	0	. 0	- 0	0	G	13,613	0	. 0	0	0	0	0	0	0	0	13,613	0	0	0	0	2,905
Rolling Stock	<u>0</u>	0	<u>0</u>	235,270 30,687	0	<u>0</u>	0 0	49,172 6,414	0	0	0 0	92,880 12,115	0	0	0 0	· 0	0	<u>0</u>	0	0	0	0	0	0	0	0	0	0	0	235,270 30,687
Local Currency Foreign Currency	0	û	Ŏ	201,583	ő	Ō,	0	42,758	0	0	0	80,765	. 0	0	0	0	0	. 0	. 0	0	0	0	0	0	0	0	0	Û	0	204,583
Mechinery at Depot	0	. 0	<u> </u>	2,477	0	0	Ď	0	0	0	0	<u>0</u>	D	0 n	. <u>0</u>	<u>0</u> .	0	<u>0</u>	0	0	0 0	0	0 0	<u>0</u>	1,782 670	<u>D</u>	0	0 0	0	0
Local Currency Foreign Currency	0	0	,0 ,0	920 1,557	0	0	0	Ö	0	Õ	ő	Ŏ	Ŏ	Õ	0	. 0	0	0	. 0	0	0	0	0	0	1,112	0	0	0	Q	0
Mechinery at Workshop	<u>0</u>	<u>o</u>	<u>0</u>	<u> </u>	0	0	16,825	<u>0</u>	0	0	0	0	0	0 n	0	0	<u>0</u>	0	0	0	<u>0</u>	.,0 0	0	0	0	0	<u>0</u> 0	16,825 3,862	0	<u>0</u> 0
Local Currency Foreign Currency	0	0	. B	0	0	0	3,862 12,963	. 0	0	0	. 0	Ö	Ö	Õ	0	0	0	0 0	0 0	0	0	0	0	0	0	0	0	12,963 0	0	0 0
Enginering & Consul (Foreign c -Salvage Value		3,596	0		<u>.</u>	V			V																***************************************			***************************************		327,864
Int. During Construction	216	521	3,462	23,082																										
Finance Program										2002		2004	2005	2008	2007	2008	2009	2010	2011	2012	2012	2014	2015	2016	2017	2018	2019	2020	2021	2022
Finance	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2001 n	2000	2003	5010	1011	. 0	0	0	0	0	0011	0	0	0	0	0 :
Borrowing Repayment	3,812 0-	4,117 0	50,586 0	329,766 0	0	3,653 0	16,825 0	49, 172 55, 469	3,765 55,469	55,990	58,394	93,939 65,419	65,956	65,956	10,488	23,908	23,386 75,200	20,982 51,217	13,958 40,260	13,420 26,840	13, 120 13, 120	13,420 0	Ō	Ŏ	Ö	0	0	Ö	Õ	0
Balance Interest	3,812 216	7,928 521	58,514 3,462	388,280 23,082		391,933 31,355	408,758 32,701	402,462 36,634	350,758 32,498	294,768 28,061	236,374 23,581	264,894 26,425	198,937 21,192	132,981 15,915	122,493 10,638	98,585 9,799	7,887	6,016	4,337	3,221	2,147	1,074	ŏ	ŏ	ŏ	Ö	ŏ	Õ	ŏ	Ď
_			-	·				•		•					•		ing the second of the second o				:									
Net Cash Flow Cumulative Net Cash Flow	0	0	0	0	-15,008 -15,008	-12,370 -27,378	-10,900 -38,278	-68,214 -106,492	-64,077 -170,569	-57,356 -227,925		-59,322 -339,591	-58,344 -397,935	-53,068 -451,003	-16,469 -467,472	-4,904 -472,375	-2,469 -474,844	1,805 -473,039	9,460 -463,579	12,163 -451,416	13,237 -438,180	13,402 -424,778 -		28,804 -367,170	-2,629 -369,800	28,804 -340,996	28,804 -312,192	11,979 -300,214	27,755 -272,459	
Cash Flow Statement												5 A									٠.;									
Cash In	3,812	4,117	50,586	329,766	18,055	22,637	38,626	73,061	27,655	26,695	29,631	126,461	28,804	28,804	28,804	28,804	28,804	28,804	28,804	28,804	28,804	28,804	28,804	28,804	28,804	28,804	28,804	28,804	28,804	28,804
Operating Profit Depreciation	0	0	0	0		4,704 14,280		8,695 15,195	6.623 17.267	9,377 17,318	12,313 17,318	15,113 17,409	7,677 21,127	7,677 21,127	7,677 21,127	7,677 21,127	7,677 21,127	7.677 21,127	7,677 21,127	7,677 21,127	7,677 21,127	7,677 21,127	7,677 21,127	7,677 21,127	7.677 21,127	7,677 21,127	7,677 21,127	7,677 21,127	7,677 21,127	7,677 21,127
Borrowing	3,812	4,117	50,586	329,766		3,653	16,825	49,172	3,765	0	. 0	93,939	0	0	0	0	. 0	0	0	0	0	· . 0	0	0	0	0	0	0	Ū	0
Cash Out Investment	3,812 3,596		50,586 47,124		31,052 0			141,275 49,172	91,732 3,765	84,051 0		185,783 93,939	87,148 0		45,272 24,146	33,707 0	31,273 0	26,998 0	19,344 1,049	16,641 0	15,567 0	15,401 908	0 0	0	31,433 31,433	0 0	<u>0</u>	16,825 16,825	1,049 1,049	-88,870 -88,870
Int. During Construction Repayment	216 0	52I 0		23,082		0	0	0 55,469	0 55,469	0	0	0 65,419	ō	. 0	0 10,488	0 23,968	0 23,386	0 20,982	0 13,958	0 13,420	0 13,420	0 13,420	. 0	Ö	0	0	0	0	0	0
Interest	Ö :	ō	o o	Ŏ		31,355	32,701	36,634	32,498	28,061	23,58}	26, 125	21,192		10,638	9,799	7,887	6,016	1,337	3,221	2,147	1,074	0	Ő	Ō	Ö	Ö	Ŏ	ŏ	ŏ
Cash Flow for FIRR	-3,596	-3,598	-47,124	-306,684	16,055	15,331	4,976	-25,283	20, 125	26,695	29,631	-61,417	28,804	28,804	4,658	28,804	28,804	28,804	27,755	28,804	28,804	27,896	28,804	28,804	-2,629	28,804	28,804	11,979	27,755	117.673
FTRRX 2.54X																	•					-								•

Appendix 12-7-2 Financial Analysis for Feeder Bus Service (Unit: 1000 M\$)

					•																1	4								·
Income Statement							****	2000	2041	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	0.100		2,371	2,371	2,371	2.371	2,371	2,371	2,371	2,371	2,371	2,371	2,371	2,371	2,371	2,371	2,371	2,371	2,371
Operating Profit	0	0	0	0	866	1,031	1,195	1,360	1,524	1,689	1,899	2,109	2,371_	2,411	2,011					2,0,1	2,011		2,072	2,012	4,511				21013	
Operating Revenue	0	0	0	0	39,626	41,603	43,560	45,557	47,534	49,511	51,488	53,465	55,442	55,442	55,442	55,442	55,442	55,442	55;442	55,442	55,442	55,442	55,442	55,442	55,442	55,442	55,442	55,442	55,442	55,442
Operating Expense Rus Mini Rus	0 0 0	0 0	0 0 0	D 0 0	38,759 17,183 21,576	40,572 18,855 21,717	42,384 20,527 21,857	44,197 22,199 21,998	46,009 23,871 22,139	47,822 25,543 22,279	49,589 27,215 22,374	51,358 28,887 22,469	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,564	53,071 30,507 22,584
Maintenance Cost Bus Mini bus	0 0 0	0 0	<u>0</u> 0 0	0 0 0	4,257 2,318 1,939	4,496 2,529 1,966	4,735 2,741 1,994	4,975 2,953 2,022	5,214 3,164 2,050	5,453 3,376 2,077	5,692 3,588 2,105	5,932 3,799 2,133	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160	6,171 4,011 2,160
Personnel Cost Bus Mini Bus	0 0 0	0	0 0 0	0 0 0	23,630 10,332 13,498	24,923 11,357 13,566	26,016 12,382 13,634	27,109 13,407 13,702	28,202 14,432 13,770	29, 295 15, 457 13, 838	30,354 16,482 13,872	31,413 17,507 13,906	32,431 18,491 13, 9 40	32,431 18,491 13,940	32,431 18,491 13,940	32,431 18,491 13,940	32,431 18,491 13,940	32,431 18,491 13,940	32,431 18,491 13,940	32,431 18,491 13,940	32,431 18,491 13,940	32,431 18,491 13,940	32,431 18,491 13,940	32,431 18,491 13,940	32,431 18,491 13,940	32,431 18,491 13,940 4,800	32,431 18,491 13,940 4,860	32,431 18,491 13,940 4,800	32,431 18,491 13,940 4,800	32,431 18,491 13,940 4,800
Fuel Cost Bus Mini Bus	0. 0	0 0 0	0 0 0	0 0 0	3,311 1,803 1,508	3,497 1,967 1,529	3,683 2,132 1,551	3,869 2,297 1,573	4,055 2,461 1,594	4,241 2,626 1,616	4,427 2,790 1,637	4,614 2,955 1,659	4,800 3,119 1,680	4,800 3,119 1,680	4,800 3,119 1,680	4,800 3,119 1,680	4,600 3,119 1,680	4,600 3,119 1,680	4,800 3,119 1,680	4,800 3,119 1,680	4,600 3,119 1,680	4,800 3,119 1,680	4,800 3,119 1,680	4,800 3,119 1,680	4,800 3,119 1,680	3,119 1,680	3,119 1,680	3,119 1,680	3,119 1,680	3,119 1,680
Depreciation Cost Bus Hini Bus	0 0	0 0 0	<u>0</u> 0 0	0 0 0	7,362 2,730 4,632	7,656 3,001 4,655	7,950 3,272 4,678	8,244 3,543 4,702	8,538 3,813 4,725	8,833 4,684 4,748	9,115 4,355 4,760	9,398 4,626 4,772	9,669 4,886 4,783	9,669 4,886 4,783	9,669 4,886 4,783	9,669 4,886 4,783	9,669 4,886 4,783	9,669 4,886 4,783	9,669 4,886 4,783	9,669 4,886 4,783	9,669 4,886 4,783	9,669 4,896 4,783	9,669 4,886 4,783	9,669 4,886 4,783	9,669 4,886 4,783	9,669 4,886 4,783	9,669 4,886 4,763	9,669 4,886 4,783	9,669 4,686 4,783	9,669 4,686 4,783
<u>Investment</u>	•			0	60,550	3,390	3,390	3,390	3,390	3,390	31,110	3,460	3,330	140	140	140	60,620	3,460	3,460	3,390	3,390	3,390	31,110	3,460	3,330	140	140 40	140 40	60,620 20,560	3,460 1,310
Investment Total Local Currency Total Foreign Currency Total	0	0	0	0		1,290 2,100	1,290 2,100	1,290 2,100	1,290 2,100	1,290 2,100	9,210 21,900	1,310 2,150	1,260 2,070	40 100	40 100	40 100	20,560 40,060 32,760	1,310 2,150 3,250	1,310 2,150 3,250	1,290 2,100 3,250	1,290 2,100 3,250	1,290 2,100 3,250	9,210 21,900 3,250	1,310 2,150 3,250	1,260 2,070 3,120	. 40 100 0	100	100	40,060 32,760	2,150 3,250
Bus Local Currency Foreign Currency	0 0	0 0	0 0 0	0 0 0	32,760 12,600 20,160	3,250 1,250 2,000	3,250 1,250 2,000	3,250 1,250 2,000	3,250 1,250 2,000	3,250 1,250 2,000	3,250 1,250 2,000	3,250 1,250 2,000	3,120 1,200 1,920	0	. 0	6	12,600 20,160	1,250 2,000	1,250 2,000	1,250 2,000	1,250 2,000	1,250 2,000	1,250 2,000	1,250 2,000	1,200 1,920	0 0	0 0	0 0	12,600 20,160 27,860	1,250 2,000 210
Hini Bus Local Currency Foreign Currency -Salvage Value	0 0 0	0	0 0 0	0 0 0	*******************	140 49 100	140 40 100	140 40 100	140 40 100	140 40 100	27,860 7,960 19,900	210 60 150	210 60 150	140 40 100	140 40 100	140 40 100	27,860 7,960 19,900	210 60 150	210 60 150	140 40 100	140 40 100	140 40 100	27,860 7,960 19,900	210 60 150	210 60 150	40 100	40 100	40 100	7,960 19,900	60 150 54,790
Int. During Construction Finance Program	υ		. 0	•				2022			2003	Anna	2005	2006	2007	2002	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Finance Borrowing	1993	1994	1995	1996 0	1997 60,550	1998 3,390	3,390	3,390	3,390 8,650	3,390 9,134	3,320 9,619	3,320 10,103	3,190 10,587	0 11,071	0 11,546	0 3,370	0 3,341	0 2,857	0 2,373	0 1,889	0 1,404	930	0 456	0	0	0	0 0	0 0	0	0 0
Repayment Balance Interest	0	0	0	0	60,550 4,844	63,940 5,115	67,330 5,386	70,720 5,658	65,460 5,929	59,716 5,508	53,417 5,043	46,634 4,539	39,237 3,986	28,166 3,139	16,620 2,253	13,250 1,330	9,909 1,060	7,051 793	4,679 564	2,790 374	1,386 223	456 111	0 36	0	Ô	ő	Ö	Ö	Ö	. 0
Net Cash Flow Camulative Net Cash Flow	0	0	0	0	3,384 3,384	3,572 6,956	3,759 10,715	3,946 14,661	-4,516 10,144	-4,121 6,023		-3,276 -28,690	-2,673 -31,363		-1,899 -35,573	7,200 -28,373	-52,982 -81,355	4,930 -76,425	5,643 -70,782	6,387 -64,395	7,022 -57,373	7,609 -49,764	-19,562 -69,326	8,580 -60,746	8,710 -52,037	11,900 -40,137	11,900 -28,237	11,900 -16,337		63,370 -1,548
Cash Flow Statement																11		40.540	10.010		19.040	12,040	12,040	12,040	12,040	12,040	12,040	12,040	12,040	12,040
Cash In Operating Profit Depreciation Borrowing	0 0 0	0 0 0 0	0 0 0 0	0 0 0	68,778 866 7,362 60,550	12,077 1,031 7,656 3,390	12,535 1,185 7,950 3,390	12,994 1,360 8,244 3,390	13,452 1,524 8,538 3,390	13,911 1,689 8,833 3,390	14,334 1,899 9,115 3,320	14,826 2,109 9,398 3,320	15,230 2,371 9,669 3,190	12,040 2,371 9,669 0	12,040 2,371 9,669 0	12,040 2,371 9,669 0	12,040 2,371 9,669 0	12,040 2,371 9,669 0	12,040 2,371 9,669 0	12,040 2,371 9,669 0	12,040 2,371 9,669 0	2,371 9,669 0	2,371 9,669 0	2,371 9,669 0	2,371 9,669 0	2,371 9,669 0	2,371 9,669 0	2,371 9,669 0	2,371 9,669 0 60,620	2,371 9,669 0 -51,330
Cash Out Investment Int. During Construction Repayment Interest	0 0 0	0 0 0 0	0 0 0	0 0 0 0	65,394 60,550 0 0 4,844	8,505 3,390 0 0 5,115	8,776 3,390 0 0 5,386	9,048 3,390 0 0 5,658	17,969 3,390 0 8,650 5,929	18,032 3,390 0 9,134 5,508	45,771 31,110 0 9,619 5,043	18,102 3,460 0 10,103 4,539	17,903 3,330 0 10,587 3,986	14,350 140 0 11,071 3,139	13,939 149 0 11,546 2,253	4,840 148 0 3,370 1,330	65,021 60,629 0 3,341 1,060	7,110 3,460 0 2,857 793	6,397 3,460 0 2,373 564	5,653 3,390 0 1,889 374	5,017 3,390 0 1,404 223	4,431 3,390 0 930 111	31,602 31,110 0 456 36	3,460 3,460 0 0	3,330 3,330 0 0 0	140 140 0 0 0	140 140 0 0	140 0 0 0	60,620 0 0	-51,330 0 0
Cash Flow for FIRR	п	O	O	0	-52,322	5,297	5,755	6,214	6,672	7,131	-20,096	8,046	8,710	11,900	11,900	11,900	-48,580	8,580	8,580	8,650	8,650	8,650	-19.070	8,580	8,710	11,900	11,900	11,900	-48,580	63,370
FIRRX 5.21%																· ·		at a												

Appendix 12-7-3 Financial Analysis for Railway Service & Feeder Bus Service (Unit: 1000 M\$)

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Income Statement	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Operating Profit	O	0	O	0	2.641	5,735	8,643	10,054	8,147	11,066	14,212	17,222	10.047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10.047	10,047	10,047	10,047	10,047
Railway Feeder Bus	0	0	0	0	1,774 866	4,704 1,031	7,447 1,195	8,695 1,360	6,623 1,524	9,377 1,689	12,313 1,899	15,113 2,109	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371	7,677 2,371
Operating Revenue Railway Feeder Bus	0 0 0	0 0 0	0 0 0	0 0 0	79,005 39,379 39,626	83,955 42,352 41,603	88,905 45,325 43,580	93,855 48,298 45,557	98,805 51,272 47,534	103,755 54,245 49,511	108,705 57,218 51,488	113,655 60,191 53,465	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442	118,605 63,164 55,442
Operating Expense Railway Feeder Bus	0 0 0	0 0 0	0 0 0	0. 0	76,364 37,605 38,759	78,220 37,648 40,572	80,262 37,878 42,384	83,801 39,604 44,197	90,658 44,648 46,009	92,690 44,868 47,822	94,493 44,904 49,589	96,433 45,077 51,356	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	109,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071	108,558 55,487 53,071
investment						100																								
Investment Total Railway Total	3,596 3,596	3,596 3,596	47,124	306,684	60,550	7,043 3,653	20,215	52,562 49,172	7,155	3,390	31,110	97,399 93,939	3,330	140	24,286 24,146	140	60,620	3,460	4,509 1,049	3,390	3,390	4,298 908	31,110	3,460	34,763 31,433	140	140 0	16,965 16,825		242,454
Local Carrency Total Foreign Currency Total	3,596	0 3,596	47,124 26,659 20,465	306,684 70,246 236,438	0	3,473 180	16,825 3,862 12,983	6,414 42,758	3,765 2,893 872	0 0	0	12,419 81,520	0	0	7,004 17,142	0.	0	0	177 872	0	0	153 755	0	0	7,949 23,484	0	0	3,862 12,963	1,049 177 872	238,994 31,506 207,488
Feeder Bus Total Local Currency Total Foreign Currency Total	0 0 0	0 0	0 0 0	0 Q O	60,550 20,540 40,010	3,390 1,290 2,100	3,390 1,290 2,100	3,390 1,290 2,100	3,390 1,290 2,100	3,390 1,290 2,100	31,110 9,210 21,900	3,460 1,310 2,150	3,330 1,260 2,070	140 40 100	140 40 100	140 40 100	60,620 20,560 40,660	3,460 1,310 2,150	3,460 1,310 2,150	3,390 1,290 2,100	3,390 1,290 2,100	3,390 1,290 2,100	31,110 9,210 21,900	3,460 1,310 2,150	3,330 1,260 2,070	140 40 100	140 40 100	140 40 100	60,620 20,580 40,060	3,460 1,310 2,150
-Salvage Value Int, During Construction													٠																	
Finance Progres Finance Total Railway	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Borrowing Repayment Balance Interest	3,812 0 3,812 216	4,117 0 7,928 521	50,586 0 58,514 3,462	329,766 0 388,280 23,082	0 0 388,280 31,062	3,653 0 391,933 31,355	16,825 0 408,758 32,701	49,172 55,469 402,462 36,634	3,765 55,469 350,758 32,498	0 55,990 294,768 28,061	0 58,394 236,374 23,581	93,939 65,419 264,894 26,425	0 65,956 198,937 21,192	0 65,956 132,981 15,915	0 10,488 122,493 10,638	0 23,908 98,585 9,799	0 23,386 75,200 7,887	0 20,982 54,217 6,016	0 13,958 40,260 4,337	0 13,420 26,840 3,221	0 13,420 13,420 2,147	0 13,420 0 1,074	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0
Feeder Bus Borrowing Repayment Balance Interest	0 0 0	0 0 0	0 0 0	0 0 0	60,550 0 60,550 4,844	3,390 0 63,940 5,115	3,390 0 67,330 5,386	3,390 0 70,720 5,858	3,390 8,650 65,460 5,929	3,390 9,134 59,716 5,508	3,320 9,619 53,417 5,043	3,320 10,103 46,634 4,539	3,190 10,587 39,237 3,986	0 11,071 28,166 3,139	0 11,546 16,620 2,253	0 3,370 13,250 1,330	0 3,341 9,909 1,060	0 2,857 7,051 793	0 2,373 4,679 564	0 1,889 2,790 374	0 1,404 1,386 223	930 456 111	0 456 0 36	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	8 0 0	0 0 0
Net Cash Flow	. 0	0	0	0	-11,624	-8,799	-7,141	-64,267	-68,593	-61,478	-83,782	-62,597	-61,018	-55,378	-18,368	2,297	-55,451	6,735	15,102	18,550	20,259	21,011	9,241	37,383	6,080	40,703	40,703			181,043
Outwative Net Cash Flow Cash Flow Statement	0	U	0	U	-11,624	-20,422	-27,563	-91,831	-160,424	-221,902	-305,684	-368,281	-429,299	-484,677	-503,045	~500,748	-556,199	-549,464	-534,361	-515,811	-495,550 ·	-474,541	~465,300	-427,917	-421,836	-381,133	-340,429	-316,551	-337,377	-156,333
	3 019	4 117	E0 E00	200 466	04 022	94 754	61 101	00.055	41 107	40 000	43 000	141 202	44 000	10 042	40 042	40 043	40.049	10.042		40.043	40 013	40 042	40.042	10 013	. 40 040	40 013	40.040	40.045	40.040	40 043
Cash In Operating Profit Depreciation Borrowing	3,812 0 0 3,812	4,117 0 0 4,117	50,586 0 0 50,586	329,766 0 0 329,766	84,833 2,641 21,642 60,550	34,714 5,735 21,936 7,043	51,161 8,643 22,303 20,215	85,055 10,054 23,439 52,562	41,107 8,147 25,805 7,155	40,606 11,066 26,150 3,390	43,965 14,212 26,433 3,320	141,287 17,222 26,806 97,259	44,033 10,047 30,796 3,190	40,843 10,047 50,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0	40,843 10,047 30,796 0
Cash Out Investment Int. During Construction Repayment Interest	3,812 3,596 216 0 0	4,117 3,596 521 0	50,586 47,124 3,462 0 0	329,766 306,684 23,082 0 0	96,456 60,550 0 0 35,906	43,513 7,043 0 0 36,470	58,302 20,215 0 0 38,087	150,323 52,562 0 55,469 42,292	109,701 7,155 0 64,119 38,427	102,083 3,390 0 65,125 33,569	127,747 31,110 0 68,013 28,624	203,884 97,399 0 75,521 30,964	105,051 3,330 0 76,544 25,177	96,222 140 0 77,028 19,054	59,211 24,286 0 22,034 12,892	38,547 140 0 27,278 11,129	96,294 60,620 0 26,727 8,947	34,108 3,460 0 23,839 6,609	25,741 4,509 0 16,331 4,901	22,293 3,390 0 15,308 3,595	20,585 3,390 0 14,824 2,370	19,832 4,298 0 14,350 1,184	31,602 31,110 0 456 36	3,460 3,460 0 0	34,763 34,763 0 0	140 140 0 0 0	140 140 0 9	16,965 16,965 0 0	61,669 61,669 0 0	-140,200 -140,200 0 0 0
Cash Flow for FIRR	-3,596	-3,596	-47,124	-306,684	-36,267	20,628	10,731	-19,069	26,797	33,826	9,535	-53,371	37,513	40,703	16,557	40,703	-19,777	37,383	36,334	37.453	37,453	36,545	9,733	37,383	6.080	40,703	40,703	23,878	-20,826	181,043
FIRR																						;	•							

Appendix 12-9-1 Financial Analysis for Railway Service (Unit: 1000 M\$)
Alternative 1

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Income Statement																						:		÷						
	1993	1994	1995	1996	1997	1999	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
D			0	G	11,335	14,863	18,204	20,049	18,575	21,926	25,460	28,858	22,019	22,019	22,019	22,019	22,019	22,019	22,019	22,019	22,019	22,019	22,019	22,019	22,019	22,019	22,019	22,019	22,019	22,019
Operating Profit									63,223	66,794	70,364	73,935	77,506	77,506	77,506	77,506	77,536	77,506	77,506	77,506	77,506	77,506	77,506	77,596	77,506	77,506	77,506	77,506	77,506	77,506
Operating Revenue	0		0	ų.	48,940	52,511	56,082	59,652					55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487	55,487
Operating Expense Naintenance Cost	0	0	<u>0</u>	0	37,605 18,625	37,648 18,625	37,87 <u>8</u> 18,738	39,604 19,579	22,035	44,868 22,119	44,904 22,119	45,077 22,164	26,708	26,708	26,708	26,708	26,708	26,708	26,708	26,708	26,708	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462	26,708 2,462
Personnel Cost	Ď	Ō	0	0		2,138 2,605	2,181 2,605	2,225 2,605	2,268 3,079	2,352 3,079	2,389 3,079	2,425 3,079	2,462 5,190	2,462 5,190	2,462 5,190	2,462 5,190	2,462 5,198	2,462 5,190	2,462 5,190	2,462 5,190	2,462 5,190	5,190	5,190	5,190	5,190	5,190	5,190	5,190 21,127	5,190 21,127	5,190 21,127
Puel Cost Depreciation Cost	. 0	0	0	0	14,280	14,280	14,353	15,195	17,267	17,318	17,318	17,409	21,127	21,127	21,127	21,127	21,127	21,127	21,127	21,127	21,127	21,127	21,127	21,127	21,127	21,127	21,127	21,161	21,121	61,121
Investment													•																	÷
				1		٠.					٠,		•	•	04 140		٥	0	1,049	n	n	908	. 11	n	31,433	0	0	16,825_	1,049	238,994
Investment Total	3,596	3,596 0	47,124 26,659	306,684 70,246	0	3,653 3,473	16,825 3,862	49,172 6,414	3,765 2,893	0	0	93,939 12,419	. <u>U</u>	0	24,146 7,004	0	0	0	177	<u> </u>	0	153 755	Ŏ	Ö	7,949 23,484	0	0	3,862 12,963		31,506 207,488
Local Currency Total Foreign Currency Total	3,596	3,596	20,465		ŏ	180	12,963	42,758	872	0	0	81,520	0	0	17,142	0	0	0	872	Q	Ü	100	Ü	Ų			•	12,505		0
Civil Work	0	0	21,376	32,983	0	3,653	0	Q	3,765	<u> </u>	ŏ	1,059 304	. 0	0 0	4,555 1,026	<u>0</u>	0	<u>0</u>	1,049 177	0	0	908 153	0	0	10,060 1,301	0	Ü	D D	1,049 177	0
Local Currency Foreign Currency	Ð 0	0	18,461 2,915	24,135 8,848	0	3,473 180	0	0	2,893 872	. Đ	0	755	. 0	0	3,529	Ŏ	ő	Ŏ	872	Ö	0	755	0	0	8,759	0	Đ	0	872	C
	n	0	25,748	35,954	n	n	6	. 0	. 0	0	0	Ū	0	0	19,591	0	0	0	0	0	<u>0</u> _	<u> </u>	Ŏ	0	19,591 5,978	0	0	<u>0</u>	. 0	3,724 819
Signal & Telecom Local Currency	0	0	8,198	14,504	0	0	0	Û	0	0	0	0	0	0 0	5,978 13,613	0	0	0	0	0	0	0	0	0	13,613	Ö	ŏ	ŏ	Õ	2,905
Foreign Currency	Ð	0	17,550	21,450	Ü			40.170	•	0	n	n2 880	n	n	· n	n	'n	h	ñ	Ð	Đ	. 0	0	8	0	0	0	0	<u>ā</u>	235,270
Rolling Stock Local Currency	<u>0</u>	0	<u>0</u>	235,270 30,687	0	0	0	49,172 6,414	0	0	0	92,880 12,115	Ö	0	Ö	0	Ö	0	0	0	0	0	0	0 N	0 0	0	O O	0 Q		30,687 204,583
Foreign Currency	õ	0	0	204,583	0	. 0	. 0	42,758	Ū	0	0	80,765	0	U	U	U	U	U	U	U	0			0	1 792	n	0	n	0	0
Mechinery at Depot	0	0	Ō	2,477	Ŏ	0	0	0	<u>, 0</u>	0	Û A	<u>0</u>	0	<u>0</u>	<u>8</u>	<u>G</u> _	0	0	0_	0		<u> </u>	0	0	1,782 670	0	0	Ŏ	Û	Ò
Local Currency Foreign Currency	0	8	0	920 1,557	ő	Ö	O	ŏ	Ö	ŏ	0	0	0	0	0	0	0	0	0	0	0	0	8	Û	1,112	υ	Ų		-	•
Mechinery at Workshop	Ð	6	0	0	0	0	16,825	Q	0	0	Q	<u> </u>	0	<u>0</u>	0	<u>0</u>	9	<u> </u>	<u> </u>	<u>0</u>	<u>G</u>	0	0	0 0	0	0	<u>0</u>	16,825 3,862	8	Q.
Local Currency Foreign Currency	0	0	0 n	0	0	0	3,862 12,963	0	0	. 0	0	. 0	. 0	.0	Ö	. 0	. 0	ů.	0	0	Ď	Ď	0	0	0	0	0	12,983 n	0	0 8
Enginering & Consul (Foreign	c 3,598	3,596	Ŏ	Ō	0	0_	9	0	0	0	0	<u>0</u>	0	0	. 0	<u> </u>	0	0		<u>U</u>	<u> </u>	<u> </u>	<u></u>		y				.,	327,864
-Salvage Value Int. During Construction	216	521	3,462	23,682			-																							
•																														
Finance Program	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Finance				_	0	3,653	16,825	49,172	3,765	n	0	93,939	'n	. 0	0	0	0	. 0	. 0	0	. 0	. 0	0	0	0	0	0	0	0	O O
Borrowing Repay me nt	3,812 0	4,117 0	50,586 0	0	0	0	0	55,469	55,469	55,990	58,394	65,419	65,956	65,956 132,981	10,468 122,493	23,908 98,585	23,386 75,200	29,982 54,217	13,958 40,260	13,420 26,840	13,420 13,420	13,420 0	0	0 0	υ 0	0	0	Ŏ	0	Ö
Balance Interest	3,812 216	7,928 521	58,514 3,462	388,280 23,082	388,260 31,062	391,933 31,355	408,758 32,701	402,462 36,634	350,758 32,498	294,768 28,061	236,374 23,581	264,894 26,425	198,937 21,192	15,915	10,638	9,799	7,887	6,016	4,337	3,221	2,147	1,074	0	0	0	. 0	G	0	0	O
																		•				·				42 145	43 145	96 390	42,096	132 015
Net Cash Flow	0	. 0	0	0		-2,212		-56,860 -64,661	-52,126 -116 287	-44,807	-39,198 -200,792	-45,577 -248 389	-44,003 -290 372	-38,726 -329,098	-2,127 -331,225	9,438 -321,386	11,873 -309,913	16,147 -293,766	23,801 -269,965	26,505 -243,460	27,578 -215,881	27,744 -188,137	43,145 -144,992	43,145 -101,846	11,712 -90,134	-46,988	-3,145 -3,843	22,478	64,574	
Cumulative Het Cash Flow	0	0	. U	0	-5,447	-7,658	-7,002	~04,001	-110,101	101,004	200,132	-240,000	Lagiail	223,000	V01,0PP	0011100	000,010													
Cash Flow Statement																14.1		an air		49 145	49 145	42 145	42 145	42 145	43,145	43,145	43,145	43,145	43,145	43,145
Cash In	3,812	4,117	50,586	329,766		32,796 14,863	49,382 18,204	84,415 20,049	39,606 18,575	39,244 21,926	42,778 25,460	140,205 28,858	43,145 22,019	43,145 22,019	22 019	43,145 22,019	43,145 22,019	43,145 22,019	43,145 22,019	43,145 22,019	43,145 22,019	43,145 22,019	43,145 22,019	43,145 22,019	22.019	22,019	22.019	22,019	22,019	22,819
Operating Profit Depreciation	0	0,	0	0	14,289	14,280	14,353	15, 195	17,267	17,318	17,318	17,409	21,127	21, 127 0	21,127 0	21,127 0	21,127 0	21,127 0	21,127 0	21,127 0	21,127	21,127 0	21,127	21,127	21,127	21,127 0	21,127 0	21,12 <i>1</i> 0	21,127 0	21,127 0
Borrowing	3,812	4,117	50,586	329,766	-0	3,653	16,825	49,172	3,765	,0	0	93,939	- : -					·					a	Q	31,433	α	α	16,825	1,049	-88,870
Cash Out	3,812 3,596	4,117 3,596		329,766 306,684		35,008 3,653	49,526 16,825		91,732 3,765	84,051 0	81,975 0	185,783 93,939	87,148 0	81,871 0	45,272 24,146	33,707 0	31,2/3 0	26,998 0	19,344 1,049	0	15,567 0	15,401 908	Ŏ.	0	31,433	0	0	16,825		-88,870 0
Investment Int. During Construction	216	521	3,462	23,082	0	0	0	0 55,469	0 55,469	0 55,990	0 58,394	0 65,419	9 65,956	0 65,956	0 10,488	0 23,908	0 23,386	0 20,982	0 13,958	0 13,420	0 13,420	0 1 3,42 0	Û	U 0	0 0	0	ນ 10	0	0	0
Repayment Interest	0 0	0	0	0			32,701	36,634	32,498	28,061	23,581	26,425	21,192	15,915	10,638	9,799	7,887	6,016	4,337	3,221	2,147	1,074	0	0	0	0	0	Đ	. 0	0
Cash Flow for FIER	~3.596	-3,596	-47.124	-306,684	25,6 <u>16</u>	25,490	15,732	-13,929	32,076	39,244	42,778	-47,673	43,145	43,145	18,999	43,145	43,145	43,145	42,096	43,145	43,145	42,237	43,145	43,145	11,712	43,145	43,145	26,320	42,096	132,015
Own from fact there																	-	•												

Appendix 12-9-2 Financial Analysis for Feeder Bus Service (Unit: 1000 M\$)

Alternative 1

Income Statement									,						6464	0000	9000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	-					11,611	11,611	11,611	11.611	11,611	11,611	11,611	11,611
Operating Profit	. 0	0	0	0	7,471	7,965	8,459	8,952	9,446	9,940	10,480	11,019	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,011	11,011	11,011	,				
						,																			***	04.000	C4 C00	04 693	C4 C07	64,682
Operating Revenue	0	0	0	0	46,230	48,536	50,843	53,149	55,456	57,762	60,069	62,375	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	04,002
								•																						
Operating Expense	G	0	0	0	38,759	40,572	42,384	44,197	46,009	47,822	49,589	51,356	53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071 30,507									
Bus Nini Bus	0	0	0	0	17,183	18,855 21,717	20,527 21,857	22,199 21,998	23,871 22,139	25,543 22,279	27,215 22,374	28,887 22,469	30,507 22,564	30,507 22,564	30,507 22,564	30,507 22,564	30,507 22,564	30,507 22,564	30,507 22,564	30,507 22,564	22,564	22,554	22,564	22,564	22,561	22,564	22,564	22,584	22,564	22,564
AUH DUS	ď		, ,		21,010				•								4,45	-	2.	•									P 191	e 121
Maintenance Cost	0	0	0	0	4,257	4,496	4,735	4,975	5,214 3,164	5,453 3,376	5,692 3,588	5,932 3,799	6,17L 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011	6,171 4,011
Bus fini bus	U 0	0	0	0	2,318 1,939	2,529 1,966	2,741 1,994	2,953 2,022	2,050	2,077	2,105	2,133	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160
		1 .						14								80 431	30,431	20 421	22 421	32,431	32,431	32,431	32,431	32,431	32,431	32,431	32,431	32,431	32,431	32,431
Personnel Cost Bus	<u>ð</u>	<u>0</u>	<u>0</u>	0	23,830 10,332	24,923 11,357	26,016 12,382	27,109 13,407	28,202 14,432	29,295 15,457	30,354 16,482	31,413 17,597	32,431 18,491	32,431 18,491	32,431 18,491	32,431 18,491	32,431 18,491	32,431 18,491	32,431 18,491	18,491	18,491	18,491	18,491 13,940							
Mini Bus	Ö	Ö .	Ö	: 0	13,498	13,568	13,634	13,702	13,770	13,838	13,872	13,906	13,940	13,940	13,940	13,940	13,940	13,940	13,940	13,940	13,940	13,940	1						4,800	4,800
fuel Cost	<u>,</u>	0	ŏ	0	3,311	3,497 1,967	3,683 2,132	3,869 2,297	4,055 2,461	4,241 2,626	4,427 2,790	4,614 2,955	4,800 3,119	4,800 3,119	4,800 3,119	4,800 3,119	4,600 3,119	4,800 3,119	4,800 3,119	4,800 3,119	4,800 3,119	4,800 3,119	3,119	4,600 3,119	4,800 3,119	4,800 3,119	4,800 3,119	4,800 3,119	3,119	3,119
Bus Kini Bus	0	0 0	0 0	0 0	1,803 1,508	1,529	1,551	1,573	1,594	2,626 1,616	1,637	1,659	1,680	1,680	1,686	1,680	1,680	1,680	1,680	1,680	1,680	1,680	1,580	1,689	1,680	1,680	1,680	1,680	1,680	1,680
Depreciation Cost	0	0.,	0	0	7,362	7,656	7,950	8,244	8,538	8,833	9,115	9,398	9,669	9,669	9,669	9,669 4,886	9,669 4,886	9,669 4,886	9,669 4,886	9,669 4,886	9,669 4,886	9,669 4,886	9,669 4,886	9,669 4,886	9,569 4,886	9,669 4,886	9,669 4,886	9,669 4,886	9,669 1,886	9,669 4,886
dus Iini Bus	0	0	0	0	2,730 4,632	3,001 4,655	3,272 4,678	3,543 4,702	3,813 4,725	4,084 4,748	4,355 4,760	4,626 4,772	4,886 4,783	4,886 4,783	4,886 4,783	4,783	4,783	4,783	4,783	4,783	4,783	4,783	4,783	4,783	4,783	4,783	4,783	4,783	4,783	4,783
					1			+						٠								Ē								
Investment					į																**	· .					120	540	en esn	3,460
nvestment Total	0	0	0	. 0	60,550	3,390	3,390	3,390 1,290	3,390 1,290	3,390 1,290	31,110 9,210	3,460 1,310	3,330 1,260	140 40	140	140	60,620 20,560	3,4 <u>60</u> 1,310	3,460 1,310	3,390 1,290	3,390 1,290	3,390 1,290	31,110 9,210	3,460 1,310	3,330 1,260	140 40	40	140 40	60,620 20,560	1,310
Local Currency Total Foreign Currency Total	O O	0	0	0	20,540 40,010	1,290 2,100	1,290 2,100	2,100	2,100	2.100	21,900	2,150	2,070	100	100	1,00	40,060	2,150	2,150	2,100	2,100	2,100	21,900	2,150	2,070	100	100	100	40,060	2,150
lus .	0	8	0	. 0	32,760	3,250	3,250	3,250	3,250	3,250	3,250	3,250	3,120	<u> </u>	<u>Q</u>	0	32,760	3,250 1,250	3,250 1,250	3,250 1,250	3,250 1,250	3,250 1,250	3,250 1,250	3,250 1,250	3,120 1,200	0	0	0	32,760 12,600	3,250 1,250
ocal Currency Foreign Currency	0 0	0	0	0 0		1,250 2,000	1,200 1,920	0	0	0	12,600 20,160	2,000	2,000	2,000	2,000	2,000	2,000	2,000	1,920	Ð	0	0	20,160	2,000						
lini Bus	n	n	6	n	27,790	140	140	140	140	140	27,860	210	210	140	140	140	27,860	210	210	140	140	140	27,860	210	210 60	140 40	140 40	140 40	27,860 7,960	210 60
ocal Ourrency	0	Õ	0	0 n	7,940 19,850	40 100	40 100	40 100	40 100	40 100	7,960 19,930	60 150	60 150	40 100	40 100	40 100	7,960 19,900	60 150	60 150	40 100	40 100	40 100	7,960 19,900	60 150	150	100	100	100	19,900	150 54,790
oreign Omrency Salvage Value		v ^	۰		13,600	100	100	100	100	***	10,000			7.7																34,190
Int. During Construction	บ	U	U	ŧ																										
Finance Program	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
inance Forrowing	0	0	0	0	60,550	3,390	3,390	3,390	3,390	3,390	3,320	3,320	3,190	0	0	0	0	0	0	0 1,889	0 1,404	930	0 456	0	0	0 N	0	0	0	0
Repayment Salance	0	0	0	0	0 6 0,550	0 63,940	0 67,330	0 70,720	8,650 65,460	9,134 59,716	9,619 53,417	10,103 46,634	10,587 3 9,237	11,071 28,166	11,546 16,620	3,370 13,250	3,341 9,909	2,657 7,051	2,373 4,679	2,790	1,386	456	0 36	0	0	0	0	Ů O	0	0 6
Interest	ő	õ	Ō	0	4,844	5,115	5,386	5,658	5,929	5,508	5,043	4,539	3,986	3,139	2,253	1,330	1,060	793	564	374	223	. 111	30	v	U	u	·	٠	•	v
				•	0.000	10 505	11 000	11 520	2 400	4 121	-22,857	5,635	6,567	6,930	7,341_	16,440	-43,741	14.170	14,883	15,627	16,263	16,849	-10,322	17,820	17,950	21,140	21,140	21,140	-39,340	72,610
let Cash Flow Davilative Net Cash Flow	0	0	Ü	0	9,988 9,988	10,505 20,494	11,022 31,516	11,539 43,055	3,406 46,461	50,591		33,370	39,937	46,866	54,207	70,648	26,906	41,077	55,960	71,587		104,699	94,376	112,197	130,147	151,287	172,427	193,567	154,227	226,837
ash Flow Statement			-	÷							•									ē										
Ash In	0	0	0	0	75,382	19,010	19,799	20,587	21,375	22,163	22,915	23,737	24,470	21,280	21,280	21,280	21,280			21,280	21,280	21,280	21,280 11,611	21,280 11,611	21,260 11,611	21,280 11,611	21,280 11,611	21,280 11,611	21,280 11,611	21,280 11,611
perating Profit Depreciation	0	0	0	0	7,471	7,965 7,656	8,459 7,950	8,952 8,244	9,446 8,538	9,940 8,833	10,480 9,115	11,019 9,398	11,611 9,669	11,611 9,669	11,611 9,669	11,611 9,669	11,611 9,669	11,611 9,669	11,611 9,669	11,611 9,669	11,611 9,669	11,611 9,669	9,669	9,669	9,669	9,669	9,669	9,669	9,669	9,669
orrowing	· ŏ	Ö	ő	Ö	60,550	3,390	3,390	3,390	3,390	3,390	3,320	3,320	3,190	0	0	0	0	. 0	0	' 0	. 8	U	0	.0			410		•	
ash Out	0	0	0	. 0	65,394	8,505	8,776	9,048	17,969	18,032	45,771	18,102	17,903 3,330	14,350 140	13,939 140	4,840 140	65,021 60,620	7,110 3,460	6,397 3,460	5,653 3,390	5,017 3,390	4,431 3,390	31,602 31,110	3,460 3,460	3,330 3,330	140 140	140 140	140 140	60,620 60,620	-51,330 -51,330
nvestment nt. During Construction	. 0	0	0	0 0	60,550 0	3,390 0	3,390 0	3,390 0	3,390 0	3,390 0	31,110 0	3,460 0	0	0	0	0	0	. 0	0	0 1,889	0 1,404	930	0 456	0	0	0	0 0	0 0	0	0 0
epayment nterest	0	. 0	. 6	0	0 4,844	0 5,115	0 5,386	0 5,658	8,650 5,929	9,134 5,508	9,619 5,043	10,103 4,539	10,587 3,986	11,071 3,139	11,546 2,253	3,370 1,330	3,341 1,060	2,857 793	2,373 564	374	223	111	36	. 0	Õ	ō	. 0	0	Ó	0
ash Flow for FIRR	a	a ·	. 0	a	-45,718	12,230	13,019	1.5		15,383	100	16,957	17,950	21,140	21,140	21,140	-39,340	17,820	17,820	17,890	17,890	17,890	-9,830	17,820	17,950	21,140	21,140	21,140	-39,340	72,610
		· · ·					101010	*******													•									
YIRKX, 26.38X					:																									

Appendix 12-9-3 Financial Analysis for Railway Service & Feeder Bus Service (Unit: 1000 M\$)

Alternative 1

									-																					
Income Statement	1993	1994	1995	1996	1997	1998	1999	2000	2001	2 002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Operating Profit	9	0	0	<u>0</u>	18,896 11,335	22,827 14,863	26,562 18,204	29,001 20,049	28,021 18,575	31,866 21,926	35,940 25,460	39,877 28,858	33,630 22,019	33,630 22,019	33,630 22,019	33,630 22,019	33,630 22,019	33,630 22,019	33,630 22,019	33,630 22,019	33,630 22,019	33,630 22,019	33,630 22,019 11,611	33,630 22,019 11,611	22,019 11,611	33,630 22,019 11,611	33,630 22,019 11,611	33,630 22,019 11,611	33,630 22,019 11,611	33,630 22,019 11,611
Railway Feeder Bus	0	0	0	Õ	7,471	7,965	8,459	8,952	9,446	9,940	10,480	11,019	11,611	11,611	11,611	11,611 142,188	11,611	11,611	11,611	11,611	11,611	11,611	142, 188	142,188	142,188	142, 188	-	142,188	142,188	142,188
Operating Revenue Railway	0	0	0	0	95,170 48,940	101,047 52,511	106,924 56,082 50,843	112,602 59,652 53,149	118,679 63,223 55,456	124,556 66,794 57,762	130,433 70,364 60,069	136,310 73,935 62,375	142,188 77,505 64,682	142,188 77,506 64,682	142,138 77,506 64,682	77,506 64,682	77,506 64,682	77,506 61,682	77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682
Feeder Bus	0	U 0	'n	υ ຄ	46,230 76,364	48,536 78,220	80,262	83,801	90,658	92,690	94,493	96,433	108,558	108,558	108,558	108,558	108,558	108,558	108,558	108,558	108,558	108,558	108,558 55,487	108,558 55,487	108,558 55,487	108,558 55,487	108,558 55,487	108,558 55,487	108,558 55,487	108,558 55,487
Operating Expense Railway Feeder Bus	0	Ğ O	g O	0 0	37,605 38,759	37,648 40,572	37,876 42,384	39,604 44,197	44,648 46,009	44,868 47,822	44,904 49,589	45,077 51,356	55,487 53,071	55,487 53,071	55,487 53,071	55,487 53,071	55,487 53,071	55,487 53,071	55,487 53,071	55,487 53,071	55,487 53,071	55,487 53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071
Investment	·											. 4		• • • • • • • • • • • • • • • • • • • •					. 500	. 100	4 400	4 000	25 110	3,460	34,763	140	140	16,965	61,669	242,454
Investment Total Railway Total	3,596 3,596	3,596 3,596	47,124 47,124	306,684 306,684	60,550 0	7,043 3,653	20,215 16,825	52,562 49,172	7,155 3,765	3,390 0	0	97,39 <u>9</u> 93,939	3,330	140 0	24,286 24,146 7,004	140 0	60,620 0	3,460 0	4,509 1,049 177	3,390 0	3,190 0	4,298 908 153	31,110 0 0	0	31,433 7,949	0	0	16,825 3,862	1,049 177	238,994 31,506
Local Carrency Total Foreign Ourrency Total	0 3,596	0 3,596	26,659 20,465	70,246 236,438	0	3,473 180	3,862 12,963	6,414 42,758	2,893 872	0	0	12,419 81,520	0	0	17,142	ŏ	. Ŏ	ő	872	Ö	Ō	755	0	0	23,494	0	0	12,963	872 60,620	207,488 3,460
Feeder Bis Total	0	<u>0</u>	0	0	60,550 20,540	3,390 1.290	3,390 1,290	3,390 1,290	3,390 1,290	3,390 1,290	31,110 9,210	3,460 1,310	3,330 1,260	140 40	140 40	140 40	60,620 20,560	3,460 1,310	3,460 1,310	3,390 1,290 2,100	3,390 1,290 2,100	3,390 1,290 2,100	31,110 9,210 21,900	3,460 1,310 2,150	3,338 1,260 2,070	40 100	40 100	140 40 100	20,560 40,060	1,310 2,150
Foreign Currency Total	ŏ	Ö	Ō	0	40,010	2,100	2,160	2,100	2,100	2,100	21,900	2,150	2,070	100	100	100	40,060	2,150	2,150	2,100	2,100	2,100	21,500	2,100					ŕ	-
-Salvage Value Int, Paring Construction		•																												
Finance Program	1993	1994	1935	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Finance Total Railway	0.019	4.317	50,586	329,766	0	3,653	16,825	49,172	3,765	0	. 0	93,939	0	. 0	0	. 0	0	0	0	. 0	0	0	0	0	0	0	0	0	0	0
Betrowing Repayment Balance	3,812 0 3,812	4,117 0 7,928	50,560 0 58,514	323,100 0 388,280	0 388,280	391,933	0 408,758	55,469 402,462	55,469 350,758	55,990 294,768	58,394 236,374	65,419 264,894	65,956 198,937	65,956 132,981	10,488 122,493	23,908 93,585	23,386 75,200 7,887	20,982 54,217 6,016	13,958 40,260 4,337	13,420 26,840 3,221	13,420 13,420 2,147	13,420 0 1,074	U 0 0	U Q Q	0	0 0	0	0	Ω 0	Ö D
Interest	216	521	3,462	23,082	31,062	31,355	32,701	36,634	32,498	28,061	23,581	26,425	21,192	15,915	10,638	9,799	1,001	0,010	4,007	3,221	2,131	1,015	J	·	·	_		_		
Feeder Bus Borrowing	9	0	0	0	60,550	3,390	3,390 0	3,390 0	3,390 8,650	3,390 9,134	3,320 9,619	3,320 10,103	3,190 10,587	0 11,071	0 11,546	0 3,370	0 3,341	0 2,857	0 2,373	0 1,889	0 1,404	930	0 458	0	0	0	0	0 0	Ü 0	0 0
Repayment Balance Interest	0	0	0	0	60,550 4,844	63,940 5,115	67,330 5,386	70,720 5,658	65,460 5,929	59,716 5,508	53,417 5,043	46,634 4,539	39,237 3,986	28, 166 3, 139	16,620 2,253	13,250 1,330	9,909 1,060	7,051 793	4,679 564	2,790 374	1,386 223	456 111	0 36	0	. 0	Ö	0 -	ō	0	Õ
Het Cash Flow	00	0	0	0	4,542	8,294	10,879	-45,321 -21,607	-48,720 -70 326	-40,677 -111,003	-62,054	-39,942 -212,999	-37,436 -250,435	-31,798 -282,231	5,214 -277.017	25,879 -251,138	-31,869 -283,007	30,317 -252,690	38,684 -214,005	42,132 -171,873	43,841 -128,032	44,593 -83,439	32,823 -50,615	60,966 10,350	29,663 49,013	64,286 104,298	64,286 168,584	47,461 216,044		204,625 423,426
Culturtive Net Cash Flow	0		0	0	4,542	12,835	23,714	-21,001	-10,020	111,000	110,001	212,000	200,100				•													•
Cash Flow Statement Cash In	3,812	4,117	50,586	329,766		51,807	69,181	105,602	60,981	61,407	65,693	163,942	67,616	64,426	64,426 33,630	64,426 33,630	54,426 33,630	64,426 33,630	64,426 33,630	64,426 33,630	64,426 33,630	64,426 33,630	64,426 33,630	64,426 33,630	64,426 33,639	64,426 33,630	64,426 33,630	64,426 33,639	64,426 33,630	64,426 33,630
Operating Profit Depreciation	0 0	0	0	0	21,642	22,827 21,936	26,662 22,303	29,001 23,439 52,562	28,021 25,805 7,155	31,866 26,150 3,390	35,940 26,433 3,320	39,877 26,806 97,259	33,630 30,796 3,190	33,630 30,796 0	30,796 0	30,796 0	30,796 0	30,796	30,796 0	30,796 0	30,796 0	30,796 0	30,796 0	30,796 0	20,796 0	30,796 0	30,796 0	30,796 0	30,796 0	30,796 0
Borrowing	3,812 3,812	4,117 4,117	50,586 50,58 5	329,766 329,766	60,550 96,456	7,043 43,513	20,215 58,302	150,323	109,701	102,083	127,747	203,884	105,051	96, 222	59,211	38,547	96,294	34,108	25,741	22,293	20,585	19,832	31,602	3,460 3,460	34,763 34,763	140 140	140 140	16,965 16,965		-140,200 -140,200
Cash Out Investment Int. During Construction	3,596 216	3,596 521	47,124 3,462	306,684 23,082		7,043 0	20,215 0	52,562 0	7,155 0	3,390 0	31,110	97,399 0	3,330 0	140 0	24,286 0 22,034	140 0 27,278	60,620 0 26,727	3,460 0 23,839	4,509 0 16,331	3,390 0 15,308	3,390 0 14,824	4,298 0 14,350	31,110 0 456	0 0 0	37,100 0	0	0 0	0	0	0
Repayment Interest	0	0	0	0 0	0 35,906	0 36,470	0 38.087	55,469 42,292	64,119 38,427	65,125 33,569	68,013 28,624	75,521 30,964	76,544 25,177	77,028 19,054	12,892	11,129	8,947	6,809	4,901	3,595	2,370	1,184	36	Ö	0	0	0	0	0	0
Cash Flow for FTER	-3,596	-3,598	-47,124	-306,684	-20,102	37,721	28,751	-122	46,671	54,627	31,263	-30,716	61,096	64,286	40,140	64,286	3,806	60,966	59,917	61,036	61,036	60,128	33,316	60,966	29,563	64,286	64,286	47,461	2,751	204,625

Appendix 12-9-4 Financial Analysis for Railway Service (Unit: 1000 M\$)
Alternative 2

Income Statement							1000	9000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	1993	1994	1995	1996		1998		2000	2001						14, 136	14,136	14, 136	14,136	14,136	14,136	14.136	14,136	14,136	14,136	13,771	13,771	13,771	13,771	13,771	13,622
Operating Profit	0	0 .	0	0	10,326	13,256	15,999	17,247	15,175	17,929	20,865	23,666	16,229	16,229			63, 164	63,164	63,164	63,164	63,164	63,164	63,164	63,164	63,164	63, 164	63,164	63,164	63,164	63,164
Operating Revenue	0	0	0	0	39,379	42,352	45,325	48,298	51,272	54,245	57,218	60,191	63,164	63,164	63,164	63,164				49,028	49,028	49,028	49,028	49,028	49,393	49,393	49,393	49,393	49,393	49,542
Operating Expense Maintenance Cost	0	0 n	0 0	0	29,053 18,625	29,096 18,625	29,326 18,738	31,052 19,579	36,096 22,035	36,316 22,119	36,352 22,119	36,525 22,164	46,935 26,708	46,935 26,768	49,028 26,708	49,028 26,708	49,028 26,708	49,028 26,708	49,028 26,708	26,708 2,462										
Personnel Cost Fuel Cost	Ď	0	0	0	2,095	2,138 2,605	2,181 2,605	2,225 2,605	2,268 3,079	2,352 3,079	2,389 3,079	2,425 3,079	2,462 5,190	2,462 5,190	2,462 5,190	2,462 5,190	2,462 5,190	2,462 5,190	2,462 5,190	5,190	5.190	5,190	5,190 14,668	5,190 14,668	5,190 15,032	5,190 15,032	5,190 15,032	5,190 15,032	5,190 15,032	5,190 15,181
Depreciation Cost	Ö	0	ō	ŏ		5,728	5,801	6,643	8,714	8,766	8,766	8,856	12,575	12,575	14,668	14,668	14,668	14,668	14,668	14,668	14,668	14,668	14,000	14,000	10,002	101002	10,002	,	•-•	
<u>Investment</u>											•																			
				140 200		2 652	16,825	49,172	3,765	Λ	n	93,939	O.	0	24, 146	0	0_	0	1,049	0	. 0	908	. 0	0	31,433	0	0	16,825 3,862	1,049 177	238,994 31,506
Investment Total Local Currency Total	0	8	0	8	Q.	3,653 3,473	3,882 12,963	6,414 42,758	2,893 872	0	0	12,419 81,520	0	0	7,004 17,142	0	· 0	0	177 872	0	Û	153 755	Û	0 8	7,949 23,484	. 0	ů	12,963		207,488
Foreign Currency Total		IJ	0	143,208	0	180	14,503	42,130	3,765		n	1,059	0	Û	4,555	0	0	0	1,049	0	0	908	. 0	0	10,060	<u>0</u>	0	0	1,049 177	0
Civil Work Local Currency	0	0	0	<u>v</u>		3,653 3,473	0	0	2,893 872	0 0	0	304 755	Õ	0	1,026 3,529	0	0 0	0	177 872	0	0	153 755	0	0	1,301 8,759	0	0	0	872	Ó
Foreign Currency	0	0.	0	. 0	0	180		. 0	612	0		in.		a	19,591	n	n	0	0	0	0	0	0	0	19,591	0	<u> </u>	<u>0</u>	0	3,724
Signal & Telecos Local Currency	<u>0</u>	<u>0</u>	0	0	0	0	0	0	0	Q	Ů.	0	0	0	5,978 13,613	0	0	0	0 Q	0	0	0 Q	0 0	0	5,978 13,613	0	0	u Q	0	819 2,905
Foreign Currency	0	0	0	0	0	0	0	U	U	U	V	00.000	n	0	13,010	n	n		. U	0	0	0	0	9	0	0	0	<u>o</u>	0	235,270
Rolling Stock Local Currency	0	0	0	143,208 0		0	0	49,172 6,414	0	<u>v</u>	0	92,880 12,115	0	Ď	0	0	Ô	0	0	0	0	0 0	0	- G 8	0	0	0	0	0 0	30,687 204,583
Foreign Currency	0	0	0	143,208	0	0	0	42,758	0	9		80,765		0	u 	0		0		0	n	n	0	0	1,782	0	0	0	0	0
Mechinery at Depot Local Currency	0	0	0	<u>0</u>	0	0	0	0	<u>0</u>	0	0	, O	0	<u></u>	Ŏ	Ö	0	0	0	0	8	0 0	0	0	670 1,112	0	0	0	0	- 8 0
Foreign Currency	0	Û	0	0	8	0	8	0	в	C	0	Q .		ų.	0	U	U	. 0	•	0	0	. п	n	0	0	o`	0	16,825	0	0
Mechinery at Workshop Local Currency	0	0	0	<u>0</u>	0	<u>0</u>	16,825 3,862	0	0	<u>0</u>	0	<u>0</u>	0	0	<u>, , , , , , , , , , , , , , , , , , , </u>	0	0	0	Ů	0	0	0	0	0	0	0	0	3,862 12,963	0	0
Foreign Currency Enginering & Consul (Foreign c	Š	Č N	0	Q :	Q 0	0	12,963 0	0	. 0	0	0	0 0	0 0	0 0	0	0 0	0	. U	0 0	, <u>0</u>	Ď	Ď	Ö	ŏ	<u>G</u>	Ġ	0	0	0	0 303,792
-Salvage Value	0		n	8,592																										•
Int. During Construction	·	·	Ū	0,202																				:						
Finance Program	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2 020	2 021	2022
Finance	1933	1001		151,801	ı n	3,653	16,825	49,172	3,765	D	0	93,939	8	0	8	8	. 6	0	0	. 0	0	0	0	0	0	0	0	0	0	0
Borrowing Repayment	0	ğ -	Ö	151,801	0 151,801	0 155,454	. 0	21,686 199,765	21,686 181,844	22,208 159,636	24,611 135,025	31,636 197,328	32,174 165,155	32,174 132,981	10,488 122,493	23,908 98,585	23,386 75,200	20,982 54,217	13,958 40,260	13,420 26,840	13,420 13,420	13,420 0	0	0	10	0	Ö	0	0	0 n
Balance Interest	0	Ô	0	8,592		12,436	13,782	17,716	16, 282	14,548	12,771	18,317	15,786	13,212	10,638	9,799	7,887	6,016	4,337	3,221	2,147	1,074	U .	U	U	U	v	v		
		,				0 540	. 0.010	15 519	-14 670	-10,060	-7,751	-17,431	-10 156	-16 582	-16,469	-4,904 _	-2,469_	1,805	9,460	12, 163	13,237	13,402		28,804	-2,629		28,804	11,979	27,755	93,602
Net Cash Flow Camulative Net Cash Flow	<u>v</u>	0	0	0	3,911 3,911	6,548 10,459	8,019 18,477				-28,925	46,356	-65,512	-82,035		-103,467		-104,131	-94,671	-82,508	-69,271	-55,869	-27,065	1.738	-891	27,912	56,716	68,695	96,449	190,051
Cash Flow Statement								•															÷							
Cash In	0	0	0	151,801		22,637	38,626	73,061	27,655	26,695	29,631		28,804	28,804	28,804	28,804 14,136	28,804	28,804 14,136	28,804 14,136	28,604 14,136	28,804 14,136	28,804 14,136	28,804 14,136	28,804 14,136	28,804 13,771	28,804 13,771	28,804 13,771	28,804 13,771	28,894 13,771	28,804 13,622
Operating Profit Depreciation	8	0	0	0	5,728	13,256 5,728	15,999 5,601	17,247 6,643	15,175 8,714	8,766	20,865 8,766	23,666 8,856	16,229 12,575		14,136 14,668	14,668 1	14,668	14,668	14,568 0	14,668	14,668 8		14,668 0	14,668 0	15,632 0	15,032 0	15,032 0	15,032 0	15,032 0	15, 181 0
Borrowing	0	0	0	151,801	0	3,653	16,825	49,172	3,765	0	0	93,939	0	Q 45 800	45.000	·		26 000		16.641	15,567	15,401	0	0	31,433	0	Đ	16,825		-64,798
Cash Out Investment	0 0	Q	0	151,801 143,208	12,144 0	16,089 3,653	30,607 16,825	88,574 49,172	41,733 3,785	36,755 0	37,382 0	143,892 93,939	47,960 0	45,386 0	24,146	33,707 0	91,613	26,998 0	19,344 1,049	16,641 8	0	908	0	0	31,433 0	Q 0	Q 0	16,825 0	1,049 0	-64,798 0
Int. During Construction Repayment	Ö n	0	0	8,592 0		0	0	0 21,686	0 21,686	22,208	0 24,611	0 31,636	0 32,174	0 32,174	0 10,488	23,998	23,386	20,982	13,958	13,420	13,420	13,420	0	Ö O	0	0 - 0	0 n	0 0	0 0	0 0
Interest	ő	ŏ	ő	ŏ		12,436		17,716	16,282	14,548	12,771	18,317	15,786	13,212	10,638	9,799	7,887	6,016	4,337	3,221	2,147	1,074	98 804	-	~2_62Q	28,804	28,804	11,979	27,755	93,602
Cash Flow for FIRR	0	0	0	-143,208	16,055	15,331	4,976	-25,283	20,125	26,695	29,631	-61,417	28,604	28,804	4,658	28,804	28,804	28,804	27,755	205,894	28,804	61,050	20,804	60.009	-6,965	μσ, υν ι	20,004	111010	91,1100	
																														

Appendix 12-9-5 Financial Analysis for Railway Service & Feeder Bus Service Alternative 2

Income Statement							1000	7000	9001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	1993	1994	1995	1996	1997	8661	1999	2000 18.606	2001 16,699	2002 19,618	22,764	25,774	18,600	18,600	16,596	16,506	16,506	16,506	16,506	16,506	16,506	16,506	16,506	16,506	16,142	16,142	16,142	16,142	16,142	15,893
Operating Profit Railway	<u>0</u>	8	8	8	11,193 10,326 866	14,287 13,256 1,031	17, 195 15, 999 1, 195	17,24? 1,360	15,175 1,524	17,929 1,689	20.865 1.899	23,666 2,109	16,229 2,371	16,229 2,371	14,136 2,371	14,136 2,371	14,136 2,371	14,136 2,371	14,136 2,371	14,136 2,371	14,136 2,371	14, 136 2,371	14,136 2,371	14,136 2,371	13,771 2,371	13,771 2,371	13,771 2,371	13,771 2,371	13,7/1 2,371	13,622 2,371
Feeder Bus	. 10	Ů	u	0	79,005	83,955	88,905	93,855	98,805	103,755	108,705	113,655	118,605	118,605	118,605	118,605	118,605	118,605	118,605	118,605	118,605	118,605			118,605	118,605 63,164	118,605 63,164	118,605 63,164	118,605 63,164	118,605 63,164
Operating Revenue Railway	0	0	<u>y</u> 0	0	39,379 39,626	42,352 41,603	45,325 43,580	48,298 45,557	51,272 47,534	54,245 49,511	57,218 51,488	60,191 53,465	63,164 55,442	63,164 55,442	63,164 55,442	63,164 55,442	63,164 55,442	63,164 55,442	63,164 55,442	63,164 55,442	63,164 55,442	63,164 55,442	63,164 55,442	63,164 55,442	63,164 55,442	55,442	55,442	55,442	55,442	55,442
Feeder Bus Operating Expense	ń	0	. 0	D	67,812	69,668	71,710	75,249	82,106	84,138	85,941	87,681	100,006	100,006	102,099	102,099	102,099 49,028	102,099 49,028	102,099 49,028	102,099 49,028	102,099 49,028	102,099 49,028	102,099 49,028	102,099 49,028	102,463 49,393	102,463 49,393	102,463 49,393	102,463 49,393	102,463 49,393	102,612 49,542
Railway Feeder Bus	0	0	0	0	29,053 38,759	29,096 40,572	29,326 42,384	31,052 44,197	36,096 46,009	36,316 47,822	36,352 49,589	36,525 51,356	46,935 53,071	46,935 53,071	49,028 53,071	49,028 53,071	53,071	53,071	53,071	53,071	53,071		53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071
Investment	·			1		<i>3</i> -		* .													,	٠				٠				
Investment Total	0	0		143,208	60,550	7,043	20,215	52,562	7,155	3,390	31,110	97,399 93,939	3.330	140 8	24,286 24,146	140	60,620 0	3,460 0	4,509 1,049	3,390 0	3,390 0	4,298 908	31,110 0	3,460 0	34,763 31,433	140 0	140 0	16,965 16,825	1,049	242,454 238,994
Railway Total Local Carrency Total	<u>0</u>	0	0	143,208	0 0	3,653 3,473	16,825 3,862 12,963	49,172 6,414 42,758	3,765 2,893 872	0	. 0	12,419 81,520	0	0	7,604 17,142	0	0	0	177 872	0	0	153 755	0 0	0 0	7,949 23,484	0	0	3,862 12,963	177 872	31,506 207,488
Foreign Currency Total				143,208	60,550	180 3,390	3,390	3,390	3,390	3,390	31,110	3,460	3,330	140	140	140	60,620	3,460	3,460	3,390	3,390	3,390	31,110	3,460	3,330	140	140 40	140 40	60,620 20,560	3,460 1,310
Feeder Bus Total Local Currency Total	0	0	0	0	20,540 40,010	1,290 2,100	1,290 2,100	1,290 2,100	1,290 2,100	1,290 2,100	9,210 21,900	1,310 2,150	1,260 2,070	40 100	40 100	40 100	20,560 40,060	1,310 2,150	1,310 2,150	1,290 2,100	1,290 2,100	1,290 2,100	9,210 21,960	1,310 2,150	1,260 2,070	40 109	100	100	40,060	2,150
Foreign Currency Total -Salvage Value	v	•	. 4		444414	2,100			-,															٠.					-	
Int, During Construction	÷	-	•																											
Finance Program				1							2009	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2001	2003	2000	2007	2000	2003					5411								
Finance Total Railway	1993	1994	1995		1997		:. · ·			2002	2003		000 3	0003	2007	e n	1	0	0	0	0	0	0	0	0	Q	0	0	0	0
Finance Total	1993 0 0	1994 0 0	0	151,801 0	0 0	3,653 0	16,825 0	49,172 21,686	3,765 21,686	0 22,208	0 24,611	93,939 31,636	0 32,174	0 32,174	0 10,488	0 23,908	0 23,386	0 20,982 54,217	0 13,958 40,260		0 13,420 13,420	0 13,420 0	0	0 0	0	0	0 0 0	0	0	0 0 0
Finance Total Railway Borrowing	1993 0 0 0 0	1994 0 0 0 0	1995 0 0 0		1997 0 0 151,801 12,144		16,825	49,172	3,765	0	0	93,939	0 32,174	0 32,174	0	0	.0	0 20,982	0 13,958	0 13,420	0 13,420	0 13,420	0 0 ·0 ·0	0 0 0	0 0 -3 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0 0
Finance Total Railway Borrowing Repayment Balance Interest Feeder Bus	1993 0 0 0	1994 0 0 0	0	151,801 0 151,801	0 0 151,801 12,144	3,653 0 155,454 12,436	16,825 0 172,279 13,782	49,172 21,686 199,765 17,716	3,765 21,686 181,844 16,282	0 22,208 159,636 14,548	0 24,611 135,025 12,771	93,939 31,636 197,328	0 32,174 165,155	0 32,174 132,981	0 10,468 122,493 10,638	0 23,968 98,585 9,799	0 23,386 35,200 7,887	0 20,982 54,217 6,016	0 13,958 40,260 4,337	0 13,420 26,840 3,221	0 13,420 13,420 2,147	0 13,420 0 1,074	0	0 0 0	0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0
Finance Total Railway Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment	1993 0 0 0 0	1994 0 0 0 0	0	151,801 0 151,801 8,592 0	0 0 151,801 12,144 60,550 0	3,653 0 155,454 12,436 3,390 0	16,825 0 172,279 13,782 3,390 0	49,172 21,686 199,765 17,716	3,765 21,686 181,844	0 22,208 159,636	0 24,611 135,025	93,939 31,636 197,328 18,317 3,320 10,103 46,634	32,174 165,155 15,786 3,190 10,597 39,237	0 32,174 132,981 13,212 0 11,071 28,156	0 10,468 122,493 10,638 0 11,546 16,620	0 23,808 98,585 9,799 0 3,370 13,250	0 23,386 35,200 7,887 0 3,341 9,909	0 20,982 54,217 6,016 0 2,857 7,051	0 13,958 40,260 4,337 0 2,373 4,679	0 13,420 26,840 3,221 0 1,889 2,790	0 13,420 13,420 2,147 0 1,404 1,386	0 13,420 0 1,074 0 930 456	0 456 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
Finance Total Railway Borrowing Repayment Balance Interest Feeder Bus Borrowing	1993 0 0 0 0 0	1994 0 0 0 0 0	0	151,801 0 151,801	0 0 151,801 12,144	3,653 0 155,454 12,436	16,825 0 172,279 13,782	49,172 21,686 199,765 17,716	3,765 21,686 181,844 16,282 3,390 8,650	0 22,208 159,636 14,548 3,390 9,134	24,611 135,025 12,771 3,320 9,619 53,417 5,043	93,939 31,636 197,328 18,317 3,320 10,103 46,634 4,539	32,174 165,155 15,786 3,190 10,507 39,237 3,986	0 32,174 132,991 13,212 0 11,071 28,156 3,139	0 10,488 122,493 10,638 0 11,546 16,620 2,253	0 23,968 96,565 9,799 0 3,370 13,250 1,330	23,386 35,200 7,887 0 3,341 9,909 1,060	0 20,982 54,217 6,016 0 2,857 7,051 793	0 13,958 40,260 4,337 0 2,373 4,679 564	0 13,420 26,840 3,221 0 1,889 2,790 374	0 13,420 13,420 2,147 0 1,404 1,386 223	0 13,420 0 1,074 0 930 456 111	0 456 0 36	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0
Finance Total Railvey Borrowing Repayment Balance Interesi Feeder Bus Borrowing Repayment Balance	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1994 0 0 0 0 0	0	151,801 0 151,801 8,592 0	0 0 151,801 12,144 60,550 0 60,550	3,653 0 155,454 12,436 3,390 0 63,940	16,825 0 172,279 13,782 3,390 0 67,330	49,172 21,686 199,765 17,716 3,390 0 70,720 5,658	3,765 21,686 181,844 16,282 3,390 8,650 65,460	0 22,208 159,636 14,548 3,390 9,134 59,716	24,611 135,025 12,771 3,320 9,619 53,417 5,043	93,939 31,636 197,328 18,317 3,320 10,103 46,634	32,174 185,155 15,786 3,190 10,587 39,237 3,986 -21,830	0 32,174 132,991 13,212 0 11,071 28,156 3,139 -18,893	0 10,468 122,493 10,638 0 11,546 16,620	0 23,908 98,585 9,799 0 3,370 13,250 1,330 2,297	0 23,386 35,200 7,887 0 3,341 9,909 1,060	0 20,982 54,217 6,016 0 2,857 7,051 793 6,735	0 13,958 40,260 4,337 0 2,373 4,679 564 15,102	0 13,420 26,840 3,221 0 1,889 2,790 374 18,550	0 13,420 13,420 2,147 0 1,404 1,386	0 13,420 0 1,074 0 930 456 111 21,011	0 456 0 36	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 40,703 28,479	0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0
Finance Total Railway Borrowing Repayment Balance Interesi Feeder Rus Borrowing Repayment Balance Interest Het Cash Flow	1993 0 0 0 0 0 0 0	1994 0 0 0 0 0 0 0 0	0	151,801 0 151,801 8,592 0	0 0 151,801 12,144 60,550 0 60,550 4,844 7,295	3,553 0 155,454 12,436 3,390 0 63,940 5,115	16,825 0 172,279 13,782 3,390 0 67,330 5,386	49,172 21,686 199,765 17,716 3,390 0 70,720 5,658	3,765 21,686 181,844 16,282 3,390 8,650 65,460 5,929 -18,595	22,208 159,636 14,548 3,390 9,134 59,716 5,508	24,611 135,025 12,771 3,320 9,619 53,417 5,043	93,939 31,636 197,328 18,317 3,320 10,103 46,634 4,539	32,174 185,155 15,786 3,190 10,587 39,237 3,986 -21,830	0 32,174 132,991 13,212 0 11,071 28,156 3,139 -18,893	0 10,468 122,493 10,638 0 11,546 16,620 2,253	0 23,908 98,585 9,799 0 3,370 13,250 1,330 2,297	0 23,386 35,200 7,887 0 3,341 9,909 1,060	0 20,982 54,217 6,016 0 2,857 7,051 793 6,735	0 13,958 40,260 4,337 0 2,373 4,679 564 15,102	0 13,420 26,840 3,221 0 1,889 2,790 374 18,550	0 13,420 13,420 2,147 0 1,404 1,386 223 20,259	0 13,420 0 1,074 0 930 456 111 21,011	0 456 0 36		-52,928	-12,224	28,479	52,357	31,532	188,503
Finance Total Railway Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment Balance Interest Net Cash Flow Cultuative Net Cash Flow Cash Flow Statement Cash In	1993 0 0 0 0 0 0 0	1994 0 0 0 0 0 0 0 0	0	151,801 0 151,801 8,592 0 0 0	0 0 0 151,801 12,144 60,550 0 60,550 4,844 7,295 7,295	3,653 0 155,454 12,436 3,390 0 63,940 5,115 10,120 17,414	16,825 0 172,279 13,762 3,390 0 67,330 5,386 11,777 29,192	49,172 21,586 199,765 17,716 3,390 70,720 5,658 -11,566 17,625	3,765 21,586 181,844 16,282 3,390 8,650 65,460 5,929 -18,595 -969	0 22,268 159,636 14,548 3,390 9,134 55,716 5,508 -14,162 -15,151	0 24,611 135,025 12,771 3,320 9,619 53,417 5,043 -39,163 -54,340	93,939 31,636 197,328 18,317 3,320 10,103 46,634 4,539 -20,707 -75,046	32,174 165,155 15,786 3,199 10,587 39,237 3,986 -21,830 -96,876	0 32,174 132,961 13,212 0 11,071 28,166 3,139 -16,893 -15,769	0 10,488 122,493 10,638 0 11,546 16,620 2,253 -18,368 -134,137	0 23,908 98,585 9,799 0 3,370 13,250 1,330 2,297	0 23,386 35,200 7,887 0 3,341 9,909 1,060	0 20,982 54,217 6,016 0 2,857 7,051 793 6,735	0 13,958 40,260 4,337 0 2,373 4,679 564 15,102	0 13,420 26,840 3,221 0 1,889 2,790 374 18,550	0 13,420 13,420 2,147 0 1,404 1,386 223 20,259 -126,644 40,843 16,566	0 13,420 0 1,074 0 930 456 111 21,011 -105,633	0 456 0 36 9,241 -96,392 40,843 16,506	-59,008 40,843 16,506	-52,928 40,843 16,142	-12,224 40,843 16,142	28,479 40,843 16,142	52,357 40,843 16,142	31,532 49,843 16,142	188,503 40,843 15,993
Finance Total Railway Borrowing Repayment Balance Interesi Feeder Bus Borrowing Repayment Balance Interest Met Cash Flow Cultuative Net Cash Flow Cash Flow Statement Cash In Operating Profit Bepreciation	1993 0 0 0 0 0 0 0	1994 0 0 0 0 0 0 0 0 0	0	151,601 0 151,601 8,592 0 0 0 0	0 0 151,801 12,144 60,550 0 60,550 4,844 7,295 7,295 84,833 11,193 13,090	3,553 0 155,454 12,436 3,390 0 63,940 5,115 10,120 17,414 34,714 14,287 13,384	16,825 0 172,279 13,762 3,390 0 67,330 5,366 11,777 29,192	49,172 21,586 199,765 17,716 3,390 0 70,720 5,658 -11,566 17,626 86,055 18,606 14,887	3,765 21,686 181,844 16,282 3,390 8,650 65,460 5,929 -18,595 -969 41,107 16,699 17,253	22, 228 159, 636 14, 548 3, 390 9, 134 59, 716 5, 508 -14, 162 -15, 151 40, 606 19, 618 17, 598	3,320 9,619 53,417 5,043 3,320 9,619 53,417 5,043 -39,169 -54,340 43,965 22,764 17,881	93,939 31,636 197,328 18,317 3,320 10,103 46,639 -20,707 -75,046 141,287 25,774 18,254	32,174 165,155 15,786 3,190 10,587 39,237 3,986 -21,830 -96,876 44,033 18,600 22,244	0 32,174 132,981 13,212 0 11,071 28,186 3,139 -16,893 -115,769	0 10,488 122,493 10,638 0 11,546 16,620 2,253 -18,368 -134,137	0 23,908 98,585 9,799 0 3,370 13,250 1,330 2,297 -131,840	0 23,386 75,200 7,887 0 0 3,341 8,909 1,060 -55,451 -187,231	0 20,982 54,217 6,016 0 2,857 7,051 793 6,735 -180,555	0 13,258 40,250 4,337 0 2,373 4,679 564 15,102 -165,453	0 13,420 26,840 3,221 0 1,889 2,790 374 18,550 -146,903	0 13,420 13,420 2,147 0 1,404 1,386 223 20,259 -126,644	0 13,420 0 1,074 0 930 456 111 21,011 105,633	0 456 0 36 9,241 -96,392	-59,008 40,843	-52,928 40,843	-12,224 40,843	28,479	52,357 40,843	31,532 40,843	188,503
Finance Total Railway Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment Balance Interest Net Cash Flow Culturive Net Cash Flow Cash Flow Statement Cash In Operating Profit Depreciation Borrowing	1993 0 0 0 0 0 0 0 0	0 8 0 0 0 0 0 0	0	151,601 0 151,601 8,592 0 0 0 0 151,601	0 0 0 151,801 12,144 60,550 0 60,550 4,844 7,295 7,295 84,833 11,193 13,090 60,550	3,653 0 155,454 12,436 3,390 0 63,940 5,115 10,120 17,414 34,714 14,287 13,384 7,043	16,825 0 172,279 13,762 3,390 0 67,330 5,386 11,777 29,192 51,161 17,195 13,751 20,215	49,172 21,586 199,765 17,716 3,390 0 70,720 5,658 -11,566 17,626 86,055 18,606 14,887 52,562	3,765 21,586 181,844 16,282 3,390 6,650 65,460 5,929 -18,595 -969 41,107 16,699 17,253 7,155	22,208 159,636 14,548 3,390 9,134 59,716 5,508 -14,182 -15,151 40,606 19,618	3,320 9,619 3,320 9,619 53,417 5,043 -39,189 -54,340	93,939 31,636 197,328 18,317 3,320 10,103 46,634 4,539 -20,707 -75,046	32,174 165,155 15,786 3,199 10,567 39,237 3,986 -21,830 -96,876	0 32,174 132,981 13,212 0 11,071 28,156 3,139 -16,893 -15,769 40,643 18,660 22,244 0 59,736	0 10,488 122,493 10,638 0 11,546 16,620 2,253 -18,368 -134,137	0 23,908 98,585 9,799 0 3,370 13,250 1,330 2,297 -131,840 40,843 16,506 24,337 0 38,547	0 23,386 75,200 7,887 0 3,341 9,909 1,060 -55,451 -187,291 40,843 16,506 24,337 0 96,294	0 20,982 54,217 6,016 0 2,857 7,051 783 6,735 -180,555 40,843 16,506 24,337 9 34,108	0 13,958 40,250 4,337 0 2,373 4,679 564 15,102 -165,453 16,506 24,337 0 25,741	0 13,420 26,840 3,221 0 1,889 2,790 374 18,550 -146,903 40,843 16,566 24,337 0	0 13,420 13,420 2,147 0 1,404 1,386 223 20,259 -126,644 40,843 16,506 24,337 0	0 13,420 0 1,074 0 930 456 111 21,011 -105,633 40,843 16,506 24,337 0	0 456 0 36 9,241 -96,392 40,843 16,506 24,337 0	-59,008 40,843 16,506 24,337 0	-52,928 40,843 16,142 24,701 0	40,843 16,142 24,701 0	28,479 49,843 16,142 24,701 0	52,357 40,843 16,142 24,701 0 16,965	31,532 48,843 16,142 24,701 0 61,869	40,843 15,993 24,850 0
Finance Total Railway Borrowing Repayment Balance Interesi Feeder Rus Borrowing Repayment Balance Interest Net Cash Flow Culturive Net Cash Flow Cash Flow Statement Cash In Operating Profit Depreciation Borrowing Cash Out Investment	1993 0 0 0 0 0 0 0 0	0 8 0 0 0 0 0 0	0	151,601 0 151,601 8,592 0 0 0 0 0 0 151,601 151,601 151,601	0 0 151,801 12,144 60,550 0 60,550 4,844 7,295 7,295 84,833 11,193 13,090	3,553 0 155,454 12,436 3,390 0 63,940 5,115 10,120 17,414 34,714 14,287 13,384	16,825 0 172,279 13,762 3,390 0 67,330 5,366 11,777 29,192	49,172 21,586 199,765 17,716 3,390 0 70,720 5,658 -11,566 17,626 86,055 18,606 14,887	3,765 21,686 181,844 16,282 3,390 8,650 65,460 5,929 -18,595 -969 41,107 16,699 17,253	22,228 159,636 14,548 3,390 9,134 59,716 5,508 -14,182 -15,151 40,606 19,618 17,598 3,390	24,611 135,025 12,771 3,320 9,619 53,417 5,043 -39,163 -54,340 43,965 22,764 17,681 3,320	93,939 31,636 197,328 18,317 3,320 10,103 46,634 4,539 -20,707 -75,046 141,287 25,774 18,254 97,259	32,174 165,155 15,786 3,199 10,597 39,237 3,986 -21,830 -96,876 44,033 18,600 22,244 3,199 55,863 3,330 0	0 32,174 132,591 13,212 0 11,071 22,156 3,139 -18,893 -115,769 40,843 18,660 22,244 0 59,736	0 10,468 122,493 10,638 0 11,546 16,620 2,253 -18,368 -134,137 40,843 16,506 24,337 0 59,211 24,266 0	0 23,908 98,585 9,799 0 3,370 13,250 1,330 2,297 -131,840 40,843 16,506 24,337 0 38,547 140 0	0 23,386 35,200 7,887 0 3,341 9,999 1,060 -55,451 -187,281 40,843 16,506 24,337 0 96,294 60,620 0	0 20,982 54,217 6,016 0 2,857 7,051 793 6,735 -180,555 40,843 16,506 24,337 0 34,108 3,460 0	0 13,258 40,260 4,337 0 2,373 4,679 564 15,102 -165,453 40,843 16,566 24,337 0 25,741 4,509 0	0 13,420 26,840 3,221 0 1,889 2,790 374 18,550 -146,903 40,643 16,506 24,317 0 22,293 3,390	0 13,420 13,420 2,147 0 1,404 1,386 223 20,259 -126,644 40,843 16,506 24,337 6 20,585 3,390 0	0 13,420 0 1,074 0 930 456 111 21,011 -105,633 40,843 16,566 24,337 0 19,832 4,298	0 456 0 36 9,241 -96,392 40,843 16,506 24,337 0 31,602 31,100	-59,008 40,843 16,506 24,337 0	-52,928 40,843 16,142 24,701 0	-12,224 40,843 16,142 24,701 0	28,479 40,843 16,142 24,701 0	52,357 40,843 16,142 24,701 0	31,532 48,843 16,142 24,701 0 61,869	40,843 15,993 24,850 0
Finance Total Railway Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment Balance Interest Het Cash Flow Cultuative Net Cash Flow Cash Flow Statement Cash In Operating Profit Depreciation Borrowing Cash Out Investment Int. During Construction Repayment	1993 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 8 0 0 0 0 0 0	0	151,601 0 151,601 8,592 0 0 0 0 0 0 0 151,601 151,601	0 0 0 151,801 12,144 60,550 0 0 60,550 4,844 7,295 7,295 84,833 11,193 13,090 60,550 77,538 60,550 0 0	3,653 0 155,454 12,436 3,390 0 63,940 5,115 10,120 17,414 34,714 14,287 13,384 7,043 24,594	16,825 0 172,279 13,782 3,390 67,336 5,386 11,777 29,192 51,161 17,195 13,751 20,215 39,384	49,172 21,566 199,765 17,716 3,390 9 70,720 5,658 -11,566 17,626 86,055 18,606 14,887 52,562 97,621 52,562	3,765 21,686 181,844 16,282 3,390 8,650 65,460 5,929 -18,595 -969 41,107 16,699 17,253 7,155 59,702	22,208 159,636 14,548 3,390 9,134 59,716 5,508 -14,182 -15,151 40,606 19,618 17,593 3,390 54,787	24,611 135,025 12,771 3,320 9,619 53,417 5,043 -39,169 -54,340 43,965 22,764 17,881 3,320 83,154	93,939 31,636 197,328 18,317 3,320 10,103 46,634 4,539 -20,707 -75,046 141,287 25,774 18,254 97,259 161,994	32,174 165,155 15,786 3,190 10,567 39,237 3,986 -21,830 -96,876 44,033 10,660 22,244 3,190 65,863	0 32,174 132,981 13,212 0 11,071 28,156 3,139 -16,893 -15,769 40,843 18,660 22,244 0	0 10,488 122,493 10,638 0 11,546 16,620 2,253 -18,368 -134,137 40,843 16,596 24,337 0 59,211	0 23,908 96,585 9,799 0 3,370 13,250 1,330 2,297 -131,840 40,843 16,556 24,337 0 38,547	0 23,386 35,200 7,887 0 3,341 9,909 1,060 -55,451 -187,291 40,843 16,566 24,337 0 96,294 60,620	0 20,982 54,217 6,016 0 2,857 7,051 783 6,735 -180,555 40,843 16,506 24,337 9 34,108	0 13,958 40,250 4,337 0 2,373 4,679 564 15,102 -165,453 40,643 16,566 24,337 0 25,741 4,509	0 13,420 26,840 3,221 0 1,889 2,790 374 18,550 -146,903 40,843 16,566 24,337 0	0 13,420 13,420 2,147 0 1,404 1,386 223 20,259 -126,644 40,843 16,506 24,337 0	0 13,420 0 1,074 0 930 456 111 21,011 -105,633 40,843 16,506 24,337 0	0 456 0 36 9,241 -96,392 40,843 16,506 24,337 0	-59,008 40,843 16,506 24,337 0	-52,928 40,843 16,142 24,701 0 34,763 34,763	40,843 16,142 24,701 0 140	28,479 40,843 16,142 24,701 0 140	52,357 40,843 16,142 24,701 0 16,965	31,532 48,843 16,142 24,701 0 61,869	40,843 15,993 24,850 0 -116,128 -116,128
Finance Total Railway Borrowing Repayment Balance Interest Feeder Bas Borrowing Repayment Balance Interest Het Cash Flow Culumtive Net Cash Flow Cash Flow Statement Cash In Operating Profit Depreciation Borrowing Cash Out Investment Int. During Construction	1993 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 8 0 0 0 0 0 0		151,601 0 151,601 8,592 0 0 0 0 0 0 151,601 151,601 151,601	0 0 0 151,801 12,144 69,550 0 60,550 4,844 7,295 7,295 84,833 13,090 60,550 77,538 60,550 0 16,988	3,653 0 155,454 12,436 3,390 0 63,940 5,115 10,120 17,414 14,287 13,384 7,043 24,594 7,043 0 0	16,825 0 172,279 13,762 3,390 0 67,330 5,386 11,777 29,192 51,161 17,195 13,751 20,215 0 0 19,169	49,172 21,566 199,765 17,716 3,390 0 70,720 5,658 -11,566 17,625 86,055 18,666 14,887 52,562 97,621 52,562 21,688 23,374	3,765 21,686 181,844 16,282 3,399 6,650 65,460 5,929 -18,595 -969 17,253 7,155 59,702 7,155 59,702 7,155 0	22,268 159,636 14,548 3,390 9,134 59,716 5,508 -14,162 -15,151 40,606 19,618 17,593 3,390 54,787 3,390 31,342 20,056	0 24,611 135,025 12,771 3,320 9,619 53,417 5,043 -39,169 -54,340 43,965 22,764 17,881 3,320 63,154 31,110 0 34,230 17,814	93,939 31,636 197,328 18,317 3,320 10,103 46,634 4,539 -20,707 -75,046 141,287 25,774 18,254 97,259 161,994 97,399 041,739	32,174 165,155 15,786 3,199 10,597 3,927 3,986 -21,830 -96,876 44,033 18,600 22,244 3,190 65,863 3,330 42,761	0 32,174 132,981 13,212 0 11,071 28,156 3,139 -16,893 -115,769 40,643 18,660 22,244 0 59,736 100 43,245	0 10,488 122,493 10,638 0 11,546 16,620 2,253 -18,368 -134,137 40,843 16,506 24,337 0 59,211 24,726 0 22,034	0 23,908 98,585 9,799 0 3,370 13,250 1,330 2,297 -131,840 40,843 16,506 24,337 0 38,547 140 0 27,278	0 23,386 75,200 7,887 0 0 3,341 9,999 1,060 -55,451 -187,231 40,843 16,506 24,337 8 96,294 60,620 0 26,727	0 20,982 54,217 6,016 0 2,857 7,051 793 6,735 -180,555 40,843 16,506 24,337 9 34,108 3,460 0 23,839	13,958 40,250 4,337 0 2,373 4,679 564 15,102 -165,453 16,506 24,337 0 25,741 4,509 16,331	0 13,420 26,840 3,221 0 1,889 2,790 374 18,550 -146,903 40,843 16,506 24,337 6 22,293 3,390 0 15,308	0 13,420 13,420 2,147 0 1,404 1,386 223 20,259 -126,644 40,843 16,506 24,337 6 20,585 3,380 0 14,624	0 13,420 0 1,074 0 930 456 111 21,011 -105,633 16,506 24,337 0 19,832 4,288 0 14,350	0 456 0 36 3,241 -96,392 40,843 16,566 24,337 0 31,602 31,110 0 456	-59,008 40,843 16,506 24,337 0	-52,928 40,843 16,142 24,701 0 34,763 34,763	40,843 16,142 24,701 0 140	28,479 40,843 16,142 24,701 0 140	52,357 40,843 16,142 24,701 0 16,965 16,965 0 0	31,532 48,843 16,142 24,701 0 61,869	188,503 40,843 15,993 24,850 0 -116,128 -116,128 0 0

Appendix 12-9-6 Financial Analysis for Railway Service (Unit: 1000 M\$) Alternative 3-A

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Income Statement											. 6004	0004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004		28,870	28,870	28,870	28,870	28,870	28,870	28,870	28,870	28,870	28,870	28,870	28,870	28,870	28,870	28,870	28,870	28,870
Operating Profit	0	0	. 0	0	17,049	20,576		26,079	24,876	28,278_	31,812	35,221	28,870		77,506	77,506	77,506	77,506	77,506	77,506	77,506	77,506	77,506	77,506	77,506	17,506	77,506	77,506	77,506	77,506
Operating Revenue	0	0	. 0	0	48,940	52,511	56,082	59,652	63,223	66,794	70,364	73,935	77,506	77,506	48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636
Operating Expense Maintenance Cost Personnel Cost Ruel Cost Depreciation Cost	0 0 0 0 8	0 0 0 0 0	0 0 0 0	0 0 0 0	31,891 18,625 2,095 2,605 8,567	31,935 18,625 2,138 2,605 8,567	32,091 18,738 2,181 2,605 8,567	33,573 19,579 2,225 2,605 9,164	38,347 22,035 2,268 3,079 10,966	38,515 22,119 2,352 3,079 10,966	38,552 22,119 2,389 3,079 10,966	38,714 22,164 2,425 3,079 11,045	48,636 26,768 2,462 5,190 14,275	48,636 26,768 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,768 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,798 2,462 5,190 14,275	26,708 2,462 5,190 14,275							
Investment										•																	_		010	204 502
Investment Yotal	3,596	3,596	0	209,653	0	0	14,927	42,758	918	<u>0</u> _	0	81,560	0	00	2,613 140	0	. <u>D</u>	0	918 46	0	0	795 40	0	0	4,437. 652	0		14,927	46	201,583
Local Currency Total Foreign Currency Total	0 3,59 6	0 3,596	0	840 208,813	0	0	1,964 12,963	0 42,758	46 872	0	· 0	40 81,529	0	.0	2,673	Ŏ	Ŏ	Õ	872	C	. 0	755	0	0	3,785	0	0	12,963		204,583
Civil Work	0	0	0	2,813	0	0	0	0	918	0	ō	795	0	<u>G</u>	2,813 140	0	0	<u>0</u>	918 45	0	<u>0</u>	795 40	D 0	0	2,813 140	0	0	8	918	0
Local Currency Foreign Currency	0	0 0	0	140 2,673		0	0	0 0	46 872	8	. 0	40 755	0	0	2,673	Õ	Ŏ	Ŏ	872	. 0	0	755	0	0	2,673	0	0	g -	872	0
Signal & Telecom	0	. 0	. 0	0	0	0	0	0	Q	<u> </u>	<u>0</u> .	<u>0</u>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<u>u</u>	0	0	0
Local Currency Foreign Currency	0	0	0	0	0	0	0	0	0	0	0	0	0	. 8	ő	Ô	Ö	ō	0	0	0	0	0	0	0	0	0	Ū.	U	004 503
Rolling Stock	0	0	0	204,583	0	0	. 0	42,758	0	<u> </u>	<u> </u>	80,765	0	0	0	<u>0</u>	0	0	0	0	. 0	0	0	0	0	0	0	<u>0</u>	0	204,583
Local Currency Foreign Currency	0 8	. O	0	0 204,583	0	0	0	0 42,758	. 0	. 0	. 0	80,765	Û	. 0	Ö	. 0	ő	Ō	0	. 0	. 0	0	0	0	. 6	0	0	Ü	. 0	204,583
Mechinery at Depot	0	Q	Ō	2,257	0	0	0	0	0	0	0	0	0	00	0	0	0	0	0	0	0	0	0	0	1,624 512 1,112	<u>v</u> 0	. 0	9 0	0	Ö
Local Currency Foreign Currency	0	0	0	700 1,557	0	0	0	0	8	Ö	ä	ă	0	0	G	0	0	0	0	0 -	. 0		u	U	1,116	n	n	14,927	ภ	0
Mechinery at Workshop	Q	<u>o</u>	0	0	<u> </u>	0	14,927	0	0	0	0	<u>0</u>	0	0	<u>0</u> 0	0	0	. 0	. 0	0	0	<u>.</u> 0	0	0	<u>v</u>	<u>y</u>	<u>v</u>	1,964 12,963	0	0
local Currency Foreign Currency	0	0	0	0	0	0	1,964 12,963	. 0	Û	0	0	ŏ	8	Ö a	Q 0	0	0	Q 0	0 0	0	0	0	U 0	U 0	0	0	0	12,300	ŏ	0 243,442
Enginering & Consul (Foreign -Salvage Value		3,596	<u></u> U		<u> </u>	<u>V</u> .		<u>V</u>	<u>v</u>		<u></u>																			
Int. During Construction	216	521	634	13,264													÷					•								
Finance Program	****	****	1005	1000	1007	1998	: 1999	2000	2001	2002	2003	2064	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Finance	1993	1994	1995		1997	1290	14,927	42,758	918		0	81,560	0	Đ	0		. 0	0	0	0	0	0 11,651	0	9	0	0	0	0	0	0
Borrowing Repayment	3,812 0 3,812	4,117 0 7,928	634 0 8,563	0	231,480	231,480	0 246,497	33,069 256,096	33,069 223,946	33,069 190,877	35,201 155,676	41,309 195,927	41,440 154,487	41,440 113,046	8,372 104,674	20,023 84,651	20,023 64,628	17,891 46,737	11,783 34,954	11,651 23,303	11,651 11,651	932	. 0	0	Ŏ S	Ŏ 0	0	0	0 0	0
Balance Interest	216	521	634			18,518	19,713	23,133	20,561	17,916	15,270	18,979	15,674	12,359	9,044	8,374	6,772	5,170	3,739	2,796	1,864	29,767	43,145	43,145	38,708	43,145	43, 145	28,218	42,227	82,004
Het Cash Flow	0	0	0	0	7,097	10,625 17,722	12,845 30,567	-20,958 9,608	-17,789 -8,180	-11,740 -19,921	-7,693 -27,614	-14,022 -41,636			22,917 -43,342	14,748 -28,594	16,350 -12,243	20,084 7,811	26,706 34,547	28,698 63,245	29,630 92,874	122,641	165,787			290,786			404,378	486,382
Camulative Net Cash Flow	U	v	J	·	7,007		00,00.																							
Cash Plow Statement	3,812	A 117	634	222.917	25,616	29, 143	47,484	78,001	36,759	39,244	42,778	127,826	43,145				43,145	43,145	44 474	43,145	20 070	43,145	28.870	23, 870	43,145 28,870	28,870	28,870	43,145 28,870	28,87D	43,145 28,870
Cash In Operating Profit	0	Tu.t.t 0	0	0	17.049	20,576 8,567	23,990	26,079	24,876 10,966	28,278 10,966	31,812 10,966	35,221 11,045	28,870 14,275	28,870 14,275	28,870 14,275	28,870 14,275	28,870 14,275	28,870 14,275	14,275	14,275	14,275	14,275	14,275	14,275 0						
Depreciation Borrowing	3,812	4,117	634			0	14,927	42,758	918	. 0	0	81,560	0	0	0.	0	0	O2 001	. V	14 AA9 .	13,516	13,379	0		4,437	0	0	14,927	918	-38,859
Cash Out	3,812 3,596	4,117 3,596	634 0	222,917 209,653		18,518 0	34,640 14,927	98,960 42,758	54,548 918	50,984 0	50,471 0	141,848 81,560	57,115 0	53,799 0	20,229 2,813	28,397 0	0	23,061 0	16,440 918 0	14,448 0	0 13,210	795 0	0	0	4,437 0	0	0	14,927 0	918 0	-38,859 0
Investment Int. During Construction	216 0	521 0	634 0			0	0	33,069	33,069	33,069	35,201	0 41,309		0 41,440	0 8,372	20,023	20,023	17,891	11,763	11,651	11,651	11,651 932	0	0	8	0	0 0	Q Q	0	0 8
Repayment Interest	ő	0	ŏ	Ŏ	18,518	18,518	10 712	22 122	20 501	17 GIR	15 270	18, 979	15.674	12,359	9,044	8,374	6,772	5,170	3,739	2,796	1,864		43.145	43.145	38,708	43,145	43,145	28,218	42,227	82,004
Cash Flow for FIRR	-3,596	-3,596	0	-209,653	25,616	29,143	17,630	-7,515	34,923	39,244	42,778	<u>-35,294</u>	43,145	43,145	40,332	43,145	43,145	43,145	46,661	43,143	431149	701909	*****							
77004 40 079															4.5															

FIREX.

12.27%

Appendix 12-9-7 Financial Analysis for Railway Service & Feeder Bus Service (Unit: 1000 M\$) Alternative 3-A

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Income Statement	1993	1994	1995	1996	1997	1998	1993	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Operating Profit	0	. 0	0	0	24,520	28,541	32,449	35,032	34,322	38,219 28,278	42,292 31,812	46,241 35,221	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870	40,481 28,870 11,611
Railway Feeder Bus	0	0 0	0 0	0	17,049 7,471	20,576 7,965	23,990 8,459	26,079 8,952	24,876 9,446	9,940	10.480	11,019	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611 142,188	11,611	11,611	142,188
Operating Revenue	0	0	0	0	95,170 48,940	101,047 52,511	105,924 56,082	112,802 59,652	118,679 63,223	124,556 68,794	130,433 70,364	136,310 73,935	142,188 77,506	142,188 77,506	142,188 77,506	142,188 77,506	142,188 77,506 64,682	142,188 77,506 64,682	142,188 77,506 64,682	142,188 77,506 84,682	142,188 77,506 64,682	142,188 77,506 64,682	142,188 77,506 64,682	142,188 77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682	77,506 64,682
Railway Feeder Bus	0	0	0	0	46,230	48,536	50,843	53,149	55,456	57,762	60,069	62,375	64,682	64,682	64,682	64,682 101,707		101,707	101,707	101.707	101,707		101,707	101,707	101,707	101,707	101,707	101,707	101,707	101,707
Operating Expense Railway	<u>0</u>	0	<u>0</u>	0	70,650 31,891	72,506 31,935	74,476 32,091	77,770 33,573	84,357 38,347	86,337 38,515	88,141 38,552	90,070 38,714	101,707 48,636	101,707 48,636 53,071	101,707 48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071	48,636 53,071
Feeder Bus	Õ	Ō	0	0	38,759	40,572	42.384	44,197	46,009	47,822	49,589	51,356	53,071	33,071	30,071			10,0			•	,								
Investment						- 400	40.010	40.149	4,308	3,390	21 110	85,0 <u>20</u>	3,330	140	2,953	140 _	60,620	3,460	4,378	3,390	3,390		31,110	3,460	7,767	140	140	15.067	61,538 318	208,043 204,583
Investment Total Railway Total	3,596 3,596	3,596 3,596	0		60,550 0	3,390 0	18,317 14,927	46,148 42,758	918 46	3,350 0	0	81,560 40	0	0	2,813 140	0	0 G	0	918 46	0	0	40	0	<u>U</u>	4,437 652	0	0	14,927 1,964 12,963	46	0 204,583
Local Carrency Total Foreign Currency Total	0 3,596	0 3,596	. 0	840 208,813	0	0	1,964 12,963	42,758	872	Ö	Ŏ	81,520	. 0	0	2,673	0	0	0	872	0	0	755	0	. 0	3,785 3,330	140	140	140	60,620	3,460
Feeder Bus Total	0	0	D.	0	60,550 20,540	3,390 1,290	3,390 1,290	3,390 1,290	3,390 1,290	3,390 1,290	31,110 9,210	3,460 1,310	3,330 1,260	140 40	140 40	140 40	60,620 20,560	3,460 1,310	3,460 1,310	3,390 1,290 2,100	3,398 1,290 2,100	3,390 1,290 2,100	31,110 9,210 21,900	3,460 1,310 2,150	1,260 2,070	40 100	40 100	40 100	20,560 40,060	1,310 2,150
Local Currency Total Foreign Currency Total	0	0	Ö	õ	40,010	2,100	2,100	2,100	2,100	2,100	21,900	2,150	2,070	100	100	100	40,060	2,150	2,150	2,100	2,100	2,100	21,500	2,150	2,010	100				·
-Salvage Value Int, During Construction					·				•		·					*.														
Finance Progress	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Finance Total Railway								40 950	nta		n.	81 56A	ß	. 8	0	G	G	a	· 0	0		. : : 0	0	Ð	0	0 -	0	0	0	0
Finance Total Railway Borrowing Repayment	3,812 0	4,117 0	634 0	222,917 0	0	0	14,927 0	42,758 33,069	918 33,069	33,069	0 35,201 155,676	81,560 41,309	0 41,440 154,487	9 41,440 113,046	8,372 104,674	0 20,023 84,651	0 20,023 64,628	17,891 46,737	0 11,783 34,954	11,651 23,303	11,651 11,651	0 11,651 0	0	0 0	0 0 0	0 - 0 0	0 0 0	0 0 0	0 0 0	0 8 0
Railway Borrowing			634 0 8,563 634	222,917 0 231,480 13,264	0 0 231,480 18,518	0 0 231,480 18,518	14,927 0 246,407 19,713		33,069		0 35,201 155,676 15,270		0 41,440 154,487 15,674	8 41,440 113,046 12,359				17,891		11,651	11,651	0 11,651 0 932	0 0 0 0	0 0 0	0 0 0 0	0 - 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0
Bailway Borrowing Repayment Balance Interest Feeder Bus	3,812 0 3,812	4,117 0 7,928	0 8,563	0 231,480	18,518	0 231,480 18,518	0 246,407 19,713	33,069 256,096 23,133	33,069 223,946	190,877	155,676	41,309 195,927 18,979 3,460	154,487 15,674	113,046 12,359 0	104,674 9,044	84,651 8,374 0	64,628 6,772	17,891 46,737 5,170	34,954 3,739 0	11,651 23,303 2,796	11,651 11,651 1,864	932 0	0	0 0 0 0	0 0 0 0	0 - 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
Exilvay Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment	3,812 0 3,812	4,117 0 7,928	0 8,563	0 231,480		0 231,480	0 246,407	33,069 256,096	33,069 223,946 20,561 3,390 8,650 65,460	190,877 17,916 3,390 9,134 59,716	155,676 15,270 31,110 9,619 81,207	41,309 195,927 18,979 3,460 10,103 74,564	3,330 10,587 67,307	113,046 12,359 0 11,071 56,236	104,674 9,044 0 15,516 40,720	84,651 8,374 0 7,360 33,360	64,628 6,772 0 7,351 26,009	17,891 46,737 5,170 0 6,867 19,141	34,954 3,739 0 6,383 12,759	11,651 23,303 2,796 0 5,899 6,860	11,651 11,651 1,864 0 5,414 1,446	0 932 0 970 476	0 476 0	0 0 0 0 0	0 0 0 0	0 - 0 0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0 0
Railway Borrowing Repayment Balance Interest Feeder Bus Borrowing	3,812 0 3,812	4,117 0 7,928	0 8,563	0 231,480 13,264 0	18,518 60,550 0	0 231,480 18,518 3,390 0	246,407 19,713 3,390 67,330 5,386	33,069 256,096 23,133 3,390 0 70,720 5,658	33,069 223,946 20,561 3,390 8,650 65,460 5,929	190,877 17,916 3,390 9,134 59,716 5,508	31,110 9,619 81,207 7,266	41,309 195,927 18,979 3,460 10,103 74,564 6,773	154,487 15,674 3,330 10,587 67,307 6,232	113,046 12,359 0 11,071 56,236 5,385	0 15,516 40,720 4,499	84,651 8,374 0 7,360 33,360 3,258	64,628 6,772 0 7,351 26,009 2,669	17,891 46,737 5,170 0 6,867 19,141 2,081	34,954 3,739 0 6,383 12,759 1,531	11,651 23,303 2,796 0 5,899 6,860 1,021	11,651 11,651 1,864 0 5,414 1,446 549	0 932 0 970 476 116	0 476	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0
Bailway Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment Balance	3,812 0 3,812	4,117 0 7,928	0 8,563	0 231,480 13,264 0	18,518 60,550 0 60,550	0 231,480 18,518 3,390 0 63,940	0 246,407 19,713 3,390 0 67,330	33,069 256,096 23,133 3,390 0 70,720	33,069 223,946 20,561 3,390 8,650 65,460	190,877 17,916 3,390 9,134 59,716	155,676 15,270 31,110 9,619 81,207	41,309 195,927 18,979 3,460 10,103 74,564	3,330 10,587 67,307	113,046 12,359 0 11,071 56,236	104,674 9,044 0 15,516 40,720	84,651 8,374 0 7,360 33,360	64,628 6,772 0 7,351 26,009	17,891 46,737 5,170 0 6,867 19,141	34,954 3,739 0 6,383 12,759	11,651 23,303 2,796 0 5,899 6,860	11,651 11,651 1,864 0 5,414 1,446	0 932 0 970 476 116	0 476 0 38 32,802			0 0 0 0 0 0 0 0 3 64,286 424,108	0 0 0 0 0 0 0 0 0 64,288 488,394	0 0 0 0 0 0 0 0 0 49,359 537,752		
Bailway Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment Balance Interest Net Cash Flow	3,812 0 3,812 216 0 0	4,117 9 7,928 521 0 0 0	0 8,563	0 231,480 13,284 0 0 0	18,518 60,550 60,550 4,844 17,086	231,480 18,518 3,390 0 63,940 5,115 21,130	0 246,407 19,713 3,390 0 67,330 5,386 23,867 62,083	33,069 256,096 23,133 3,390 0 70,720 5,658 -9,419 52,663	33,069 223,946 20,561 3,390 8,650 65,460 5,929 -14,383 38,280	190,877 17,916 3,390 9,134 59,716 5,508 -7,610 30,671	155,676 15,270 31,110 9,619 81,207 7,266 -4,983 25,688	41,309 195,927 18,979 3,460 10,103 74,564 6,773 -10,481 15,206	154,487 15,674 3,330 10,587 67,307 6,232 -9,508 5,699	113,046 12,359 0 11,071 56,236 5,385 -5,970 -271	104,674 9,044 0 15,516 40,720 4,499 24,042 23,771	0 7,360 33,360 3,258 25,271 49,042	64,628 6,772 0 7,351 26,609 2,569 -33,010 16,032	17,891 46,737 5,170 0 6,867 19,141 2,081 28,957 44,988	34,954 3,739 0 6,383 12,759 1,531 36,612 81,600	11,651 23,303 2,796 0 5,899 6,860 1,021 39,668 121,269	11,651 11,651 1,864 0 5,414 1,446 549 41,557 162,826	0 932 0 970 476 116	0 476 0 38 32,802		359,823 64,426	424,108 64,426	488,394 64,426	537,752 64,426	540,640 64,426	695,254 64,426
Railway Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment Ralance Interest Net Cash Flow Culumtive Net Cash Flow Cash Flow Statement Cash In	3,812 0 3,812 216 0 0	4,117 9 7,928 521 0 0 0	0 8,563	0 231,480 13,284 0 0 0	18,518 60,550 60,550 4,844 17,086 17,086	0 231,480 18,518 3,390 63,940 5,115 21,130 38,216	0 246,407 19,713 3,390 0 67,330 5,386 23,867 62,083	33,069 256,096 23,133 3,390 0 70,720 5,658 -9,419 52,663 98,598 35,032	33,069 223,946 20,561 3,390 8,650 65,460 5,929 -14,381 38,280	190,877 17,916 3,390 9,134 59,716 5,508 -7,610 30,671	155,676 15,270 31,110 9,619 81,207 7,266 -4,983 25,688	41,309 195,927 18,979 3,460 10,103 74,564 6,773 -10,481 15,206	154,487 15,674 3,330 10,587 67,307 6,232 -9,508 5,699 67,756 40,481	113,046 12,359 0 11,071 56,236 5,385 -5,970 -271	104,674 9,044 0 15,516 40,720 4,499 24,042 23,771 64,426 40,481	84,651 8,374 0 7,360 33,360 3,258 25,271 49,042	64,628 6,772 0 7,351 26,009 2,669 -33,010 16,032	17,881 46,737 5,170 0 6,867 19,141 2,061 28,957 44,988	34,954 3,739 0 6,363 12,759 1,531 36,612 81,600 64,426 40,481	11,651 23,303 2,796 0 5,899 6,860 1,021 39,668	11,651 11,651 1,864 0 5,414 1,446 549 41,557	0 932 0 970 476 116 46,571 209,397	0 476 0 38 32,802 242,199	303,164	359,823	424,108	488,394	537,752	540,640	695,254
Bailway Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment Ralance Interest Net Cash Flow Culumtive Net Cash Flow Cash Flow Statement	3,812 0 3,812 216 0 0 0	4,117 0 7,928 521 0 0 0 0	0 8,563 634 0 0 0 0 0	0 231,480 13,284 0 0 0 0	18,518 60,550 60,550 4,844 17,086 17,086	231,480 18,518 3,390 63,940 5,115 21,130 38,216	0 246,407 19,713 3,390 67,330 5,386 23,867 62,083	33,069 256,096 23,133 3,390 0 70,720 5,658 -9,419 52,663	33,069 223,946 20,561 3,390 8,650 65,460 5,929 -14,381 38,280	190,877 17,916 3,390 9,134 59,716 5,508 -7,610 30,671	155,676 15,270 31,110 9,519 81,207 7,266 -4,983 25,688	41,309 185,927 18,979 3,460 10,103 74,564 6,773 -10,481 15,206	154,487 15,674 3,330 10,587 67,307 6,232 -9,508 5,699	113,046 12,359 0 11,071 56,236 5,385 -5,970 -271	104,674 9,044 0 15,516 40,720 4,499 24,042 23,771	0 7,360 33,360 3,258 25,271 49,042	64,628 6,772 0 7,351 26,009 2,669 -33,010 16,032	17,881 46,737 5,170 0 6,867 19,141 2,081 28,957 44,988	34,954 3,739 0 6,383 12,759 1,531 36,612 81,600	11,651 23,303 2,796 0 0 5,899 6,860 1,021 39,668 121,269	11,651 11,651 1,864 0 5,414 1,446 549 41,557 162,826	0 932 0 970 476 116 46,571 209,397 54,426 40,481 23,945 0	0 476 0 38 32,802 242,199 64,426 40,481 23,945 0	64,426 40,481 23,945 0	359,823 64,426 40,481 23,945 0	424,108 64,426 40,481	488,394 64,426 40,481 23,945 0	64,426 40,481 23,945 0	540,640 64,426 40,481 23,945 0	695, 254 64, 426 40, 481 23, 945 0
Railway Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment Ralance Interest Net Cash Flow Culumtive Net Cash Flow Cash Flow Statement Cash In Operating Profit Depreciation Borrowing Cash Out	3,812 0 3,812 216 0 0 0 0 0 0 0 0 0 0 0 3,812 0 3,812	4,117 0 7,928 521 0 0 0 0 0 4,117 0 4,117	0 8,563 634 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	231,480 13,284 0 0 0 0 0 0 0 222,917 222,917	18,518 80,550 0 60,550 4,844 17,086 17,086 100,998 24,520 15,929 60,550 83,912	0 231,480 18,518 3,390 0 63,940 5,115 21,130 38,216 48,154 28,541 16,223 3,390 27,024	0 246,407 19,713 3,390 0 67,330 5,386 23,867 62,083 67,283 32,448 16,517 18,317 43,416	33,069 256,086 23,133 3,390 0 70,720 5,658 -9,419 52,663 98,588 35,032 17,408 46,148	33,069 223,946 20,561 3,390 8,650 65,460 5,929 -14,381 38,280 58,134 34,322 19,504 4,308	190,877 17,916 3,390 9,134 59,716 5,508 -7,610 30,671 61,407 38,219 19,788 3,390 69,017	155,676 15,270 31,110 9,619 81,207 7,266 -4,983 25,688 33,483 42,292 20,081 31,110 58,466	41,309 195,927 18,979 3,460 10,103 74,564 6,773 -10,481 15,206 151,703 46,241 20,443 65,020	154, 487 15, 674 3, 330 10, 587 67, 307 6, 232 -9, 508 5, 699 67, 756 40, 481 23, 945 3, 330 77, 263	113,046 12,359 0 11,071 56,236 5,385 -5,970 -271 64,426 40,481 23,945	104,674 9,044 0 15,516 40,720 4,499 24,042 23,771 64,426 40,481	84,651 8,374 0 7,360 33,360 3,258 25,271 49,042	64,628 6,772 0 7,351 26,009 2,669 -33,010 16,032	17,881 46,737 5,170 0 6,887 19,141 2,081 28,957 44,988 64,428 40,481 23,945	34,954 3,739 0 6,363 12,759 1,531 36,612 81,600 64,426 40,481	11,651 23,303 2,796 0 0 5,899 6,860 1,021 39,668 121,269	11,651 11,651 1,864 0 5,414 1,446 549 41,557 162,826	0 970 476 116 46,571 209,397	0 476 0 38 32,802 242,199 64,426 40,481 23,945 0 31,624 31,110	303, 164 64, 426 40, 481	359,823 64,426 40,481	424,108 64,426 40,481	488,394 64,426 40,481	537,752 64,426 40,481	64,426 40,481 23,945 0 61,538 61,538	695,254 64,426 40,481
Railway Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment Ralance Interest Net Cash Flow Culumtive Net Cash Flow Cash Flow Statement Cash In Operating Profit Depreciation Borrowing Cash Out Investment Int. During Construction	3,812 0 3,812 216 0 0 0 0 0 0 3,812 0 3,812 3,812 3,596 216	4,117 9 7,928 521 0 0 0 0 0 0 4,117 0 4,117	0 8,563 634 0 0 0 0 0 0 0	0 231,480 13,284 0 0 0 0 0 0 222,917	18,518 80,550 0 60,550 4,844 17,086 17,086 100,998 24,520 15,929 60,550 83,912	0 231,480 18,518 3,390 63,940 5,115 21,130 38,216 48,154 16,223 3,390	0 246,407 19,713 3,390 0 67,330 5,386 23,867 62,083 32,448 16,517 18,317 43,416 18,317 0	33,069 256,096 23,133 3,390 0 70,720 5,658 -9,419 52,663 35,032 17,408 46,148 108,907 46,148	33,069 223,946 20,561 3,390 8,650 65,460 5,929 -14,383 38,280 58,134 34,322 19,504 4,308 72,517 4,308 0	190,877 17,916 3,390 9,134 59,716 5,508 -7,610 30,671 61,407 38,219 19,788 3,390 69,017 3,390 0	155,676 15,270 31,110 9,619 81,207 7,266 -4,983 25,688 33,483 42,292 20,081 31,110 98,466 31,110 0	41,309 195,927 18,979 3,460 10,103 74,564 6,773 -10,481 15,206 151,703 46,241 20,443 85,020	154,487 15,674 3,330 10,587 67,307 6,232 -9,508 5,699 67,756 40,481 23,945 3,330	113,046 12,359 0 11,071 56,236 5,385 -5,970 -271 64,428 40,481 23,945 0	0 15,516 40,720 4,499 24,042 23,771 64,426 40,481 23,945 0	84,651 8,374 0 7,360 33,360 3,258 25,271 49,042 64,426 40,481 23,945 0 39,155 140 27,383	64,628 6,772 0 7,351 26,009 2,569 -33,010 16,032 64,426 40,481 23,945 0 97,436 60,620 27,375	17,881 46,737 5,170 0 6,867 19,141 2,081 28,957 44,988 64,426 40,481 23,945 0 35,469 3,460 0 24,758	34,954 3,739 0 6,383 12,759 1,531 36,612 81,600 64,426 40,481 23,945 0 27,814 4,378 0 18,165	11,651 23,303 2,796 0 5,899 6,860 1,021 39,668 121,269 64,426 40,481 23,945 0 24,757 3,390 17,550	11,651 11,651 1,884 0 5,414 1,446 549 41,557 162,826 64,426 40,481 23,945 0 22,869 3,390 0 17,066	0 932 0 970 476 116 46,571 209,397 54,426 40,481 23,945 0 17,854 4,185 0 12,621	0 476 0 38 32,802 242,199 64,426 40,481 23,945 0 31,624 31,110 476	303,164 64,426 40,481 23,945 0	359,823 64,426 40,481 23,945 0	424,108 64,426 40,481 23,945 0	488,394 64,426 40,481 23,945 0	537,752 64,426 40,481 23,945 0	64,426 40,481 23,945 0 61,538	695, 254 64, 426 40, 481 23, 945 0
Railway Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment Ralance Interest Net Cash Flow Culturive Net Cash Flow Cash Flow Statement Cash In Operating Profit Depreciation Borrowing Cash Out Investment	3,812 0 3,812 216 0 0 0 0 0 0 0 3,812 0 3,812 3,812 3,586	4,117 97,928 521 0 0 0 0 0 0 0 4,117 4,117 4,117 3,596	0 8,563 634 0 0 0 0 0 0 0 0 534 634	0 231,480 13,284 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	18,518 80,550 0 60,550 4,844 17,086 17,086 100,998 24,520 15,929 60,550 83,912	0 231,480 18,518 3,390 0 63,940 5,115 21,130 38,216 48,154 28,541 16,223 3,390 27,024	0 246,407 19,713 3,390 0 67,330 5,386 23,867 62,083 67,283 32,448 16,517 18,317 43,416	33,069 256,086 23,133 3,390 0 70,720 5,658 -9,419 52,663 98,588 35,032 17,408 46,148	33,069 223,946 20,561 3,390 8,650 65,460 5,929 -14,383 38,280 58,134 34,322 19,504 4,308 72,517 4,368	190,877 17,916 3,390 9,134 55,716 5,508 -7,610 30,671 61,407 38,219 19,788 3,390 69,017 3,380	155,676 15,270 31,110 9,619 81,207 7,266 -4,983 25,688 33,483 42,292 20,081 31,110 58,466	41,309 195,927 18,979 3,460 10,103 74,564 6,773 -10,481 15,206 151,703 46,241 20,43 65,020 162,184 85,020 0	154, 487 15, 674 3, 330 10, 587 57, 307 6, 232 -9, 508 5, 689 67, 756 40, 481 23, 445 3, 330 77, 263 3, 330 0	113,046 12,359 0 11,071 56,236 5,385 -5,970 -271 64,426 40,481 23,945 0 70,395	104,674 9,044 0 15,516 40,720 4,499 24,042 23,771 64,426 40,481 23,945 0	64,651 8,374 0 7,360 33,360 3,258 25,271 49,042 64,426 40,681 23,945 0 39,155 140 0 27,383 11,632	64,628 6,772 0 7,351 26,009 2,669 -33,010 16,032 64,426 40,481 23,945 0 97,436 60,620 0 27,375 9,441	17,881 46,737 5,170 0 6,887 19,141 2,081 28,957 44,988 64,428 40,481 23,945 0 35,469 3,460 0 24,758 7,251	34,954 3,739 0 0,6,383 12,759 1,531 36,612 81,580 64,426 40,481 23,945 0 27,814 4,378 0 18,165 5,270	11,651 23,303 2,796 0 5,899 6,860 1,021 39,668 121,269 64,426 40,461 23,945 0 24,757 3,390 0 17,550 3,817	11,651 11,651 1,864 0 5,414 1,446 549 41,557 162,626 64,426 40,481 23,945 0 22,869 3,390 0 17,066 2,413	0 932 0 970 476 116 46,571 209,397 64,428 40,481 23,945 0 17,854 4,185 0 12,621 1,048	0 475 0 38 32,802 242,199 64,426 40,481 23,945 0 31,624 31,110 0 476 38	303, 164 64, 426 40, 481 23, 945 0 3, 460 0 0	54,425 40,481 23,945 0 7,767 7,767 0	64,426 40,461 23,945 0 140 0 0	64,426 40,481 23,945 0 140 0 0	64,426 40,481 23,945 0 15,067 15,067	64,426 40,481 23,945 0 61,538 0 0	695, 254 64, 426 40, 481 23, 945 0 -90, 189 0 0
Railway Borrowing Repayment Balance Interest Feeder Bus Borrowing Repayment Balance Interest Net Cash Flow Culumtive Net Cash Flow Cash Flow Statement Cash In Operating Profit Depreciation Borrowing Cash Out Investment Int. During Construction Kepayment	3,812 0 3,812 216 0 0 0 0 0 0 0 3,812 0 3,812 3,536 216 0	4,117 9,928 521 0 0 0 0 0 0 4,117 0 4,117 3,596 521 0 0	0 8,563 634 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	231,480 13,284 0 0 0 0 0 0 222,917 222,917 229,653 13,264	18,518 60,550 9 60,550 4,844 17,086 17,086 100,998 24,520 15,929 60,550 0 9 23,362	0 231,480 18,518 3,390 63,940 5,115 21,130 38,216 48,154 28,541 16,223 3,390 27,024 3,390 0 0 23,634	0 246,407 19,713 3,390 0 67,330 5,386 23,867 62,083 32,448 16,517 18,317 0 0 25,099	33,069 256,086 23,133 3,390 0 70,720 5,658 -9,419 52,663 98,598 35,032 17,408 46,148 108,007 46,148 103,069	33,069 223,946 20,561 3,390 8,650 65,460 5,929 -14,383 38,280 58,134 34,322 19,504 4,308 72,517 4,308 72,517 4,308 41,719	190,877 17,916 3,390 9,134 59,716 5,508 -7,610 30,671 61,407 38,219 19,788 3,390 69,017 3,390 42,203	155,676 15,270 31,110 9,619 81,207 7,266 -4,983 25,688 93,483 42,292 20,081 31,110 98,456 31,110 98,456 44,820	41,309 195,927 18,979 3,460 10,103 74,554 6,773 -10,481 15,206 151,703 46,241 20,443 65,020 162,184 85,020 51,412	3,330 10,587 6,232 -9,508 5,699 67,758 40,481 23,945 3,330 77,263 3,330 5,0028	113,046 12,359 0 11,071 56,236 5,385 -5,970 -271 64,426 40,481 23,945 0 70,395	104,674 9,044 0 15,516 40,720 4,499 24,042 23,771 64,426 40,481 23,945 0 40,383 2,933 2,933 23,888	84,651 8,374 0 7,360 33,360 3,258 25,271 49,042 64,426 40,481 23,945 0 39,155 140 27,383	64,628 6,772 0 7,351 26,009 2,569 -33,010 16,032 64,426 40,481 23,945 0 97,436 60,620 27,375	17,881 46,737 5,170 0 6,867 19,141 2,081 28,957 44,988 64,426 40,481 23,945 0 35,469 3,460 0 24,758	34,954 3,739 0 6,383 12,759 1,531 36,612 81,600 64,426 40,481 23,945 0 27,814 4,378 0 18,165	11,651 23,303 2,796 0 5,899 6,860 1,021 39,668 121,269 64,426 40,481 23,945 0 24,757 3,390 17,550	11,651 11,651 1,884 0 5,414 1,446 549 41,557 162,826 64,426 40,481 23,945 0 22,869 3,390 0 17,066	0 932 0 970 476 116 46,571 209,397 54,426 40,481 23,945 0 17,854 4,185 0 12,621	0 475 0 38 32,802 242,199 64,426 40,481 23,945 0 31,624 31,110 0 476 38	303,164 64,426 40,481 23,945 0	359,823 64,426 40,481 23,945 0	424,108 64,426 40,481 23,945 0	488,394 64,426 40,481 23,945 0	537,752 64,426 40,481 23,945 0	64,426 40,481 23,945 0 61,538 0 0	695, 254 64, 426 40, 481 23, 945 0

Appendix 12-9-8 Financial Analysis for Railway Service (Unit: 1000 M\$) Alternative 3-B

ncome Statement	•					÷							2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004			9,959	9,959	9,959	9,959	9,959	9,959_	9,959	9,959	9,959	9,959	9,959	9,959	9,959	9,959	9,959	9,959
erating Profit	0	0	0	0	5,107	7,764	10,306	11,524	9,449	11,981	14,643	17,181	9,959	9,959		58,594	58,594	58,594		58,594	58,594		58,594	58,594	58,594	58,594	58,594	58,594	58,594	58,594
erating Revenue	0	0	0	0	36,999	39,698	42,398	45,097	47,797	50,496	53,196	55,895	58,594	58,594	58,594					48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636	48,636
rating Dopense Intenance Cost Isonnel Cost I Cost Preciation Cost	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0 0		31,935 18,625 2,138 2,605 8,567	12,091 18,738 2,181 2,605 8,567	33,573 19,579 2,225 2,605 9,164	38,347 22,035 2,268 3,079 10,966	38,515 22,119 2,352 3,079 10,966	38,552 72,119 2,369 3,079 10,966	38,714 22,164 2,425 3,079 11,045	48,636 26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275	26,708 2,462 5,190 14,275						
estment											-	•													٠					
estment Total	3,596	3,596	0	209,653	0	0	14,927	42,758	918_	0	0_	81,560	0	0	2,813 140	0	8	0	918 46	0	0	795 40	. 0	0	4,437 652	0	0	14,927	46	204,583 0
al Currency Total reign Currency Total	0 3,596	0 3,596	0	840 208,813	0	0	1,964 12,963	0 42,758	46 872	0	8 0	48 81,520	0	0 G	2,673	0	0	ů	872	õ	. 0	755	. 0	Ö	3,785	0	0	12,963	872	204,583
il Work al Currency	0	0	0	2,813 140 2,673	0	0 0	0 0	0	918 46 872	0 0 0	0 0 0	795 40 755	0 0 0	0 0 0	2,813 140 2,673	0 0 0	0 0 0	0 0 0	918 46 872	0 0 0	0 0 0	795 40 755	0 0 0	0 0 0	2,813 140 2,673	0 8	0 0 0	0 0	918 46 872	0
eign Ourrency		0	n	,,,,,	0	0	0	. 0	0	0	0	0	0	0	<u>o</u>	<u>0</u>	0	0	<u> </u>	<u> </u>	<u> </u>	<u>0</u>	<u>.</u>	. 0	00	<u>0</u>	0 1	0	<u>0</u>	0.
nal & Telenom al Corrency eign Corrency	0	0	0	0	8 0	0	0	0	0	0	0	0	0 V	0	0	8	9	0	0	0	0	0 0	. 0	0	ő · o	Ŏ G	0	0	0	0 204,583
ling Stock al Currency eign Currency	0 0 0	0 0 0	. 0 0 0	204,583 0 204,583	0 0 0	0 0	0 0 0	42,758 0 42,758	0 8	0 0 0	0 0	80,765 0 80,765	0	0	0	0	0	0	0	0	0	0	6 0	0	0	0	0	0	0 8 a	204,583
hinery at Bepot al Currency reign Currency	0 0 8	0 0 0	0 0 0	2,257 700 1,557	0 0 0	0 0 0	0 0 0	0 6 0	8 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0	0	0. 0.	0 0	0	512 1,112	0	0	0	0	0
chinery at Workshop cal Currency celen Currency ginering & Consul (Foreign	0 0 0 c 3,596	0 0 0 3,596	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	14,927 1,964 12,963 0	0 0 0 8	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0 8	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1,964 12,963 0	0 0 0	0 0 0 243,442
alvage Value t. During Construction	216	521	634	13,264										•	÷															
ance Program	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2001	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
ance Todina	3,812	4,117		222,917	. 0	0	14,927	42,758	918	0	90	81,580	0	0	0	0	0	17 001	0 11,783	0 11,651	0 11.651	0 11,651	0 R	0	0	. 0	0	0	0 8	0
aysent ance erest	0 3,812 216	0 1,928 521	0	0 231,480 13,264	0 231,480 18,518	0 231,480 18,518	0 246,407 19,713	33,069 256,096 23,133	33,069 223,946 20,561	33,069 190,877 17,916	35,201 155,676 15,270	41,309 195,927 18,979	41,440 154,487 15,674	41,440 113,046 12,359	8,372 104,674 9,044	20,023 84,651 8,374	20,023 64,628 6,772	17,891 46,737 5,170	34,954 3,739	23,303	11,651 1,864	932	0	0	0	0	0	0	0	0
Cash Flow Hative Het Cash Flow	0	. 0	0	0	-4,844 -4,844	-2, <u>188</u> -7,032	-839 -7,871	-35,514 -43,385	-33,215 -76,600	-28,038 -104,638	-24,862 -129,500	-32,062 -161,552	-32,881 -194,443	-29,565 -224,608	4,066 -220,003	-4,163 -224,166	-2,561 -226,727	1,173 -225,554	7,795 -217,759	9,786 -207,973	10,718 -197,255	10,856 186,399 -	24,234 -162,165	24,234 -137,931	19,797 -118,134	24,234 -93,900	-69,666	9,307 -60,359	23,316 -37,043	63,093 26,050
Flow Statement																			٠.						04.024	01.004	24,234	24 224	24,234	24,234
h Io rating Profit reciation rowing	3,812 0 0 3,812	4,117 0 0 4,117	634 0 0 634	222,917 0 0 222,917		16,330 7,764 8,567 0	33,800 10,306 8,567 14,927	63,446 11,524 9,164 42,758	21,333 9,449 10,966 918	22,946 11,981 10,966 0	25,609 14,643 10,966 0	109,786 17,181 11,045 81,560	24,234 9,959 14,275 0	24,234 9,959 14,275 0	24,234 9,959 14,275 0	9,959 14,275 0	24,234 9,959 14,275 0	24,234 9,959 14,275 0	9,959 14,275 0	24,234 9,959 14,275 0	9,959 14,275 0	9,959 14,275 0	9,959 14,275 0	9,959 [4,275 0						
sh Out resisent During Construction regreent	3,812 3,596 216 0	4,117 3,596 521 0	0 634 0	222,917 209,653 13,264	18,518 0 0	18,518 0 0 0	34,640 14,927 0 0	98,960 42,758 0 33,069	54,548 918 0 33,069	50,984 0 0 33,069	50,471 0 0 35,201 15,270	141,848 81,560 0 41,309 18,979	57,115 0 8 41,449 15,674	53,799 0 0 41,440 12,359	20,229 2,813 0 8,372 9,044	28,397 0 0 20,023 8,374	26,795 0 0 20,023 6,772	23,061 0 0 17,891 5,170	16,440 918 0 11,783 3,739	14,448 0 0 11,651 2,796	13,516 0 0 11,651 1,864	13,379 795 0 11,651 932	0 0 0 0	0 0 0 0	4,437 4,437 0 0	0 0 0 0	0 0 0 0	14,927 14,927 0 0	918 918 0 0 8	-38,859 -38,859 0 0
terest	0	0	0	0	18,518	18,518	19,713	23,133	20,581	17,916			24,234	24,234	21,421	24,234		-	23,316			23,439	24,234	24,234	19,797	24,234	24,234	9,307	23,316	63,093
h Flow for FIRR	-3,596	-3,596	0	-209,653	13,674	16,330	3,946	-22,070	19,497	£4,990	€11003	-53,334		61,627	*11351															
BCX <u>5.12%</u>																														

Appendix 12-9-9 Financial Analysis for Railway Service & Feeder Bus Service (Unit: 1000 M\$) Alternative 3-B

		•														8089	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Income Statement	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2000						21,569	21,569	21,569	21,569	21,569	21,569	21,569	21,569	21,569
Operating Profit	0	8	<u> </u>	<u>Q</u>	12,578 5,107	15,728 7,764	18,765 10,306	20,477	18,896 9,449	21,921 11,981	25,123 14,643	28,200 17,181	21,569 9,959	9,959	9,959	9,959	9,959	9,959 11,611	9,959 11,611	9,959 11,611	9,959	9,959 11,611								
Railway Feeder Bus	0 0	. 0	0	0	7,471	7,985	8,459	8,952	9,446	9,940	10,480	11,019	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	11,611	123,276	123,276	123,276	123,276	123,276	123,276
Operating Revenue	0	Ō	0	0	83,229	88,235	93,240 42,398	98,246 45,097	103,252 47,797	108,258 50,496	113,264 53,196	118,270 55,895	123,276 58,594	123,276 58,591	123,276 58,594	58,594	58,594 64,682	58,594 64,682	58,594 64,682	58,594 64,682	58,591 64,682									
Railway Feeder Bus	0 0	0	0	0	36,999 46,230	39,698 48,536	50,843	53,149	55,456	57,762	60,069	62,375	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682	64,682		•	•	101,707	101,707
Operating Expense	0	0	0	0	70,650	72,506	74,476	77,770	84,357	86,337 38,515	88,141 38,552	90,070 38,714	101,707 48,636	48,636	48,636 53,071															
Railway Feeder Bus	0	0 0	0	0	31,891 38,759	31,935 40,572	32,091 42,384	33,573 44,197	38,347 46,009	47,822	49,589	51,356	53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,071	53,671	53,671	33,011
Investment																							٠				***		A4 E20	200 043
Investment Total	3,598	3,596	0	209,653	60,550	3,390	18,317	46,148	4,308	3,390	31,110 0	85,020 81,560	3,330	140 0	2,950 2,813	140 0	60,620 0	3,460 0	4,378 918	3,390 0	3,390	4 185 795	31,110 0	3.460 0	7,767 4,437	140 0	140 0	15,067 14,927	61,538 918	
Railway Total Local Carrency Total	3,596 0	3,596 0	0	209,653 840	0	. 0	14,927 1,964	42,758 0	918 46	<u>0</u>	0	40	 0 0	0	140 2,673	0	0	0	46 872	0	. 0	40 755	0	0	652 3,785	0	0	1,964 12,963	46 872	0 204,581
Foreign Currency Total	3,596	3,596	0	208,813	0	0	12,963	42,758	872		0	81,520		140	140	140	60,620	3,460	3.460	3,390	3,390	3,390	31,110	3,460	3,330	140	140	140	60,620	3,460
Feeder Bus Total Local Currency Total	0	0	0	0	60,550 20,540	3,390 1,290	3,390 1,290	3,390 1,290	3,390 1,290	3,390 1,290	31,110 9,210	3,460 1,310	3,330 1,260	40 100	40 100	40 100	20,560 40,060	1,310 2,150	1,310 2,150	1,290 2,100	1,290 2,100	1,290 2,100	9,210 21,900	1,310 2,150	1,260 2,070	40 100	40 100	40 100	20,560 40,060	1,310 2,150
Foreign Currency Total	Ö	. 0,	G	0	40,010	2,100	2,100	2,100	2,100	2,100	21,900	2,150	2,070	100	100	. 100	40,000	2,130	2,100	2,100	21102	-,								
-Salvage Value Int, During Construction																														
Finance Program	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2814	2015	2016	2017	2018	5018	2020	2021	2022
Finance Total	,,,,,,																	0	n	0	n	n	n	Ω	0	0	0	0	0	. 0
Railway Borrowing	3,812	4,117	634 0	222,917	0	. O	14,927 0	42,758 33,069	918 33,069	33,069	0 35,201	81,560 41,309	41,440	41,440	8,372	20,023	20,023	17,831	11,783	11,651 23,303	11,651 11,651	11.651	0	Õ O	0	. 0	0	0	0 0	. 0
Repayment Balance	3,812	7,928 521	8,563 634	231,480 13,264	231,480 18,518	231,480 18,518	246,407 19,713	256,096 23,133	223,946 20,561	190,877 17,916	155,676 15,270	195,927 18,979	154,487 15,674	113,046 12,359	104,674 9,044	84,651 8,374	64,628 6,772	46,737 5,170	34,954 3,739	2,796	1,864	932	0	Ö	ő	ŏ	Õ	Û	0	0
Interest	216	321	0,4	13,204	10,310	10,010	10,110	43,105	•				٠			:			_					•	^	0	n	n	۸	n
Feeder Bus Borrowing	0	0	. 0	0	60,550	3,390	3,390	3,390	3,390 8,650	3,390 9,134	31,110 9.619	3,460 10,103	3,330 10,587	0 11,071	0 15,516	7,360	7,351	6,867	6,383	5,699	5,414	970	476	0	0	0	. 0	8	đ	Ď
Repayment Balance	0	0	0	0	60,550	63,940	67,330 5,386	70,720 5,658	65,460 5,929	59,716 5,508	81,297 7,266	74,564 6,773	67,307 6,232	56, 236 5, 385	40,720 4,499	33,360 3,258	26,009 2,669	19,141 2,081	-12,759 1,531	6,860 1,021	1,446 549	476 116	0 38	0	0	0	0	0	Ö	ő
Interest	0	0	8	0	4,844	5,115		-	-29,809	-23,908	-22,152	-28,521		-24,881	5, 13 <u>1</u>	6,359	-51,921	10,045	17,700	20,757	22,645	27,660	13,890	42,054	37,747	45,374	45,374	30,447	-16,024	135,703 234,922
Het Cash Flow Outumtive Net Cash Flow	<u>0</u> .	0	0	0	5,144 5,144	8,317 13,462	10,183 23,645	-23,975 -330	-30,139	~54,047		-104,720	-133,139	-158,020	-152,889	-146,530	-198,452	-188,406	-170,706	~149,943	-127,304	-99,644	-85, <i>7</i> 53	-43,699	-5,952	39,422	84,796	115,243	99,219	234,922
Cash Flow Statement																•					. :						45 514	45.514	45.514	45,514
Cash In	3,812	4,117	634	222,917	89,057	35,341	53,599	84,033	42,707 18,896	45,109 21,921	76,314 25,123	133,663 28,200	48,844 21,569	45,514 21,569	21,569	21,569														
Operating Profit Depreciation	0	0	0	0		15,728 16,223	18,765 16,517	20,477 17,408	19,504	19,798	20,081	20,443 85.020	23,945 3,330	23,945	23,945	23,945 n	23,945 0	23,945 0	23,945 0											
Borrowing	3,812	4,117	634	222,917	60,550	3,390	18,317	46,148	4,308	3,390	31,110		77,263	70,395	40,383	39,155	97,436	35,469	27,814	24,757	22,869	17,854	31,624	3,460	7,767	140	140	15,067	61,538	-90, 189
Cash Out Investment	3,812 3,596	4,117 3,596	634 8	222,917 209,653	83,912 60,550	27,024 3,398	43,416 18,317	108,007 46,148	72,517 4,308	69,017 3,390	98,466 31,110	162,184 85,020	3,330	140	2,953	140	60,620	3,460	4,378	3,390	3,390 D	4,185 0	31,110 0	3,460 ზ	7,767 0	140 8	140 0	15,067 0	61,538 Q	-90,189 8
Int. During Construction	216 0	521 0	634 0	13,264 0	0	0	0	0 33,069	0 41,719	42,203	0 44,820	51,412	52,028	52,512	23,888	27,383	27,375	24,758	18,165 5 270	17,550 3,817	17,066 2,413	12,621 1,048	476 38	0 n	0	0	0	0 0	0	0 0
Repayment Interest	ő	ŏ	0	Ŏ	23,362	23,634	25,099	28,791	26,490	23,424	22,536	25,752	21,906	17,743	13,543	11,632	9,441	7,251	5,270	42,124	42,124	41,329	14,404	42,054	37,747	45,374	45,374	30,447	~16.024	135,703
Cash Flow for FIRE	-3,596	-3,596	. 0	-209,653	-32,043	28,561	16,965	-8,263	34,091	38,329	14,094	-36,377	42, 184	45,374	42,561	45,374	-15,106	42,054	41,135	92,129	16,151	11,923	17,741	721553	313131	W147.	14341-			

Chapter 13

LAND-USE PLANNING

- Appendix 13-1-1 List of Provided Materials on Urban Development Planning Integrated to RBCS in Japan
- (1) Materials on suburban housing development projects integrated to the urban railway development

A. Chiba New Town

- 1. Developer: Housing and Urban Development Corporation
- 2. Construction period; 1970 -
- 3. Area: 1,933 ha
- 4. Planned population: 176,000 population
- 5. Location: The eastern suburbs of Tokyo Metropolitan Area
- 6. Access to the centre of Tokyo
 Railway. A new railway line was planned to serve
 the convenient access from the New Town to the
 centre of Tokyo. The public and private sectors,
 related to the New Town development, established two
 railway companies for developing and operating the
 railway; the Hokusou Development Railway and the
 Housing Development Corporation Railway. The main
 part of the railway line is planned to start the
 operation in 1991.

Road. New Arterial roads were planned and are being developed for connecting the New Town to the existing inter-city highway and arterial road network.

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7. Materials provided

- Panel A-1: (1) Chiba New Town Land-Use Planning Map (with a scale of 1/25,000); (2) Location Map; and (3) Transportation Plan.
- Panel A-2: The explanation of Land *Use Plan.
- Panel A-3: (1) Development Process; (2) Land for Sale in Lots, and (3) Main progress Status (July 1989).

B. Tama New Town

- 1. Developer: (1) Tokyo Metropolitan Government; (2)
 Housing and Urban Development Corporation; and (3)
 Tokyo Metropolitan Housing Supply Corporation.
- 2. Construction period; 1966 -
- 3. Area: 3,020 ha
- 4. Planned population: 373,000 population
- 5. Location: The western suburbs of Tokyo Metropolitan Area (25 to 40 km far from the centre of Tokyo)
- 6. Access to the centre of Tokyo
 Railway. Two private railway companies developed
 two lines to connect the New Town to the centre of
 Tokyo; the Keio Sagamihara Line and the Odakyu Tama
 Line. These serve about a 35-minute ride access to
 Shinjuku.
 - Road. Arterial roads were planned and have been developed for connecting the New Town to the existing arterial road network.

7. Materials prepared

- Panel B-1: (1) The explanation on the basic plan;
 (2) Tama New Town Land-Use Planning Map
 (with a scale of 1/20,000); and (3)
 Location Map.
- Panel B-2: (1) Outline of the project; (2) New Residential Town Development Program; (3)

 Land Readjustment Program; (4) Related Public Facilities Development Program; (5) Maps of Tama New Town Development Area by Developer; and (6) the Development/Implementation Diagram by Major Facilities
- Panel B-3: (1) Roads and Railway; (2) Water Supply and Sewerage; and (3) History of Tama New Town.
 - Panel B-4: (1) Centres; (2) Parks and Open Spaces;
 (4) Housing; and (5) Education and
 Medical Facilities
- C. Tokyu Tama Den-en Toshi (Garden City)
 - 1. Developer: Tokyu Dentetu Ltd. (a private railway company)

The above private developer coordinated and established the land-ownership associations based on the Land Readjustment Act.

- 2. Construction period: 1955 -
- 3. Area: 5,000 ha
- 4. Planned population: 400,000 population

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- 5. Location: The southwestern suburbs of Tokyo Metropolitan Area (15 to 30 km far from the centre of Tokyo)
- 6. Access to the centre of Tokyo Railway. Tokyu Den-en Toshi Line which was developed by the same company.

Road. Tomei (Inter-City) Highway

7. Materials prepared

- Panel C-1: Tama Den-en Toshi Development Plan (a scale of 1/25,000)
- Panel C-2: Station and Local Centre; this area has been redeveloped into a more compact centre.

D. Seishin New Town

- 1. Developer: (1) Kobe Municipality; (2) Housing and Urban Development Corporation; and (3) Others
- 2. Construction period: 1971 -
- 3. Area: 1.287 ha
- 4. Planned population: 100,000 population

The New Town includes industrial developments, universities, and education/research institutions, etc.

5. Location: The western suburbs of Kobe City (10 to 15 km far from the centre of Kobe City)

6. Access to the Kobe City Centre
Railway. Kobe Municipality which was constructed by
the Municipality serves the direct access from the
New Town to the city Centre.

Road. A free-way and an arterial road link the New
Town to the City Centre.

7. Materials prepared

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Panel D-1: Location Map

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Panel D-2: Land Use Plans of (1) Seishin Housing
Development and Industrial Park, (2)
Second Seishin Housing Development and
Kobe High-Tec. Industrial Park, and (3)
Kobe Gakuen-Toshi Housing Development and
Industrial Development.

Panel D-3: Seishin-Chuo Centre Development around the station

Panel D-4: Gakuen-Toshi Centre Development around the station

Panel D-5: Suma Centre Development around the station

Panel D-6: Aerial photographs of the New Town and the railway constructions

E. Additional Material on Centre Development around Stations

Panel E-1: Higashi-Totsuka Station-Area

Approximately 100 ha area around the station
is planned for a housing development and is
under construction (December 1990). The
development method is the Land Readjustment.

It is located at the southwestern suburbs of Tokyo; (about 30-km far from the Centre of Tokyo.)

Centre Development Area, which is developed within a walking distance of the station, includes high-rise housing buildings. The residents of the high-rise buildings will go to the station on foot.

Panel E-2: Moriguchi-shi Station-Front-Area Redevelop-ment.

Moriguchi City is mainly a commuter town of Osaka.

Integrated to the track elevation project, the station-front-area was redeveloped by the Municipality.

The station-front-area redevelopment includes: a civic centre complex including concert halls, gymnasium; community facilities for aged citizens; and so on. In addition, the construction costs were financed by the cross subsidies of the project and the government subsidies.

Panel E-3: Kawasaki Station-front-area

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Kawasaki Station is located at a 18km distance from the Centre of Tokyo.

The station-front-area was redeveloped by the Kawasaki Municipality. The redeveloped area includes: intermodal transfer squares; shopping mall; and complex of shops, offices and housing.

The eastern square is well-designed in landscaping.

This project also was financed by the cross subsidies and the governmental aid.

- (2) Materials on the established town planning coordinated to the urban railway network
 - F. The Case of Saitama Prefecture
 - 1. Location: It is neighboring to the Tokyo Metropolitan Government Area
 - 2. Reference Materials

Panel F-1: Existing Land-Use Map (with a scale of 1/50,000)

Three radial lines connect the Prefecture to the Centre/Sub-Centre of Tokyo.

Areas within a 500-metre circle of the stations (green-colored circle) have been well-developed for commercial utilization (red-colored areas). Areas within a 2-km circle (red-colored circle) of the stations have been developed for mainly housing utilization (yellow-colored area). In addition the blue-colored areas shows industrial utilization areas.

Panel F-2: Established Town Planning Maps (with a scale of 1/50,000)

Local Governments have prepared the land-use regulation maps based on the City Planning Act. Areas around stations are planned/regulated for mainly commercial utilization and intensive land use (by high space-floor-index); these are red-colored.

Areas for housing utilization are planned mainly at the station-areas.

In Japan, the both of RBCS and the City Planning's regulation have encouraged compact commercial/business developments around the stations.

