JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
SRI LANKA TELECOM (SLT)

THE STUDY ON TELECOMMUNICATIONS NETWORKS IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

FINAL REPORT

VOLUME-III
FEASIBILITY STUDY FOR THE PRIORITY PROJECTS

MAY 1996

NIPPON TELECOMMUNICATIONS CONSULTING CO., LTD. (NTC)

JAPAN TELECOMMUNICATIONS ENGINEERING AND CONSULTING SERVICE (JTEC)

TOKYO, JAPAN

SSS JR 96-060

CURRENCY AND EQUIVALENT UNITS
As of May 1995

Currency Unit US\$ 1.00 SRs 1.00

Sri Lanka Rupees(SRs) SRs 50.0 US\$ 0.02

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
SRI LANKA TELECOM (SLT)

THE STUDY ON TELECOMMUNICATIONS NETWORKS IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

FINAL REPORT

VOLUME-III
FEASIBILITY STUDY FOR THE PRIORITY PROJECTS

MAY 1996



NIPPON TELECOMMUNICATIONS CONSULTING CO., LTD. (NTC)

JAPAN TELECOMMUNICATIONS ENGINEERING AND CONSULTING SERVICE (JTEC)

TOKYO, JAPAN

PREFACE

In response to a request from the Government of the Democratic Socialist Republic of Sri Lanka, the Government of Japan decided to conduct a study on Telecommunications Networks in the Democratic Socialist Republic of Sri Lanka and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Sri Lanka a study team headed by Mr. Tatsumi AMANO, Nippon Telecommunications Consulting Co., Ltd., three times between March 1995 and May 1996.

The team held discussions with the officials concerned of the Government of Sri Lanka, and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Democratic Socialist Republic of Sri Lanka for their close cooperation extended to the team.

May 1996

Kimio Fujita

President

Japan International Cooperation Agency

Mr. Kimio Fujita
President
Japan International Cooperation Agency

Dear Mr. Fujita:

3

Letter of Transmittal

It is our great pleasure to submit to you the Study Report on Telecommunications Networks in the Democratic Socialist Republic of Sri Lanka.

This report has been prepared by Nippon Telecommunications Consulting Co., Ltd. (NTC) and Japan Telecommunications Engineering and Consulting Service (JTEC), based on a contract with JICA. The study team conducted the works from March 1995 to May 1996.

The study aims at formulating the master plan for telecommunications networks development up to the year 2015 and feasibility study for priority projects which will be implemented by the year 2000, in the Democratic Socialist Republic of Sri Lanka.

Objective areas of the study covered the whole country for the master plan and several target areas for the feasibility study. Through field surveys and analyses of data / information collected, the master plan has been drawn up covering mainly development targets and strategies, network development plan, facilities plan, implementation plan, operation / maintenance / human resource plans as well as cost estimate and project evaluation. The feasibility study has been made for three priority projects identified as a result of the master plan study.

We wish to take this opportunity to express our deep gratitude to the officials concerned of the Japan International Cooperation Agency and other authorities concerned of the Government of Japan. We wish to offer our sincere appreciation to the officials concerned of Ministry of Posts and Telecommunications, Sri Lanka Telecom and other authorities concerned of the Government of Sri Lanka for their unlimited cooperation and assistance extended to the study team in connection with the execution of their duties.

Finally, we earnestly hope that this report will contirbute to future telecommunications development in the Democratic Socialist Republic of Sri Lanka.

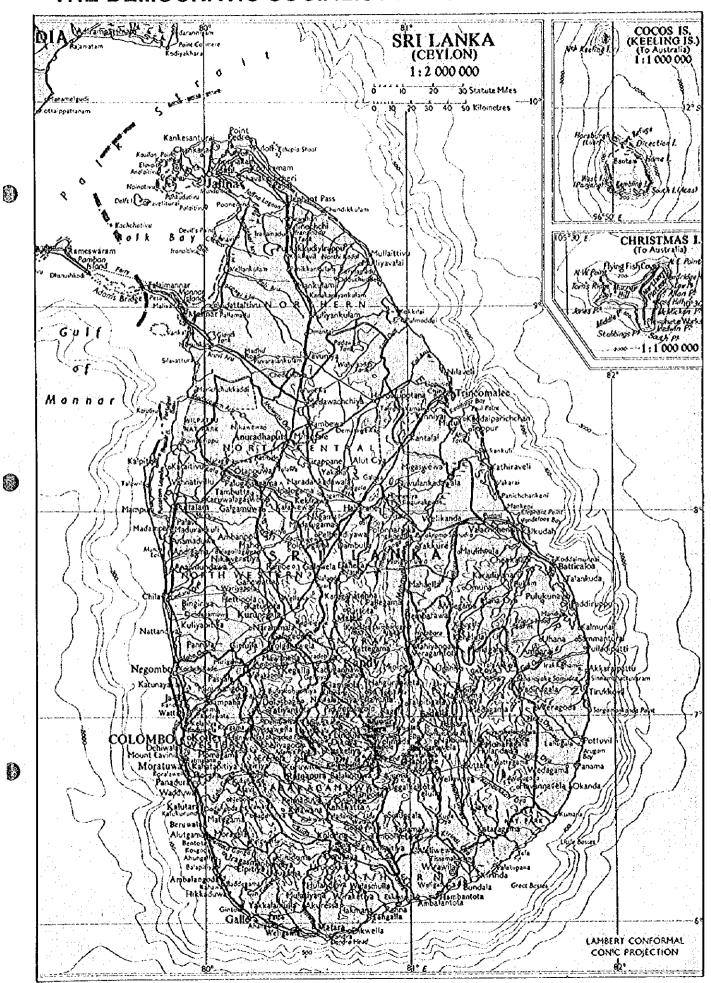
Very truly yours,

Tatsumi Amano

Team Leader

Study on Telecommunications Networks in the Democratic Socialist Republic of Sri Lanka

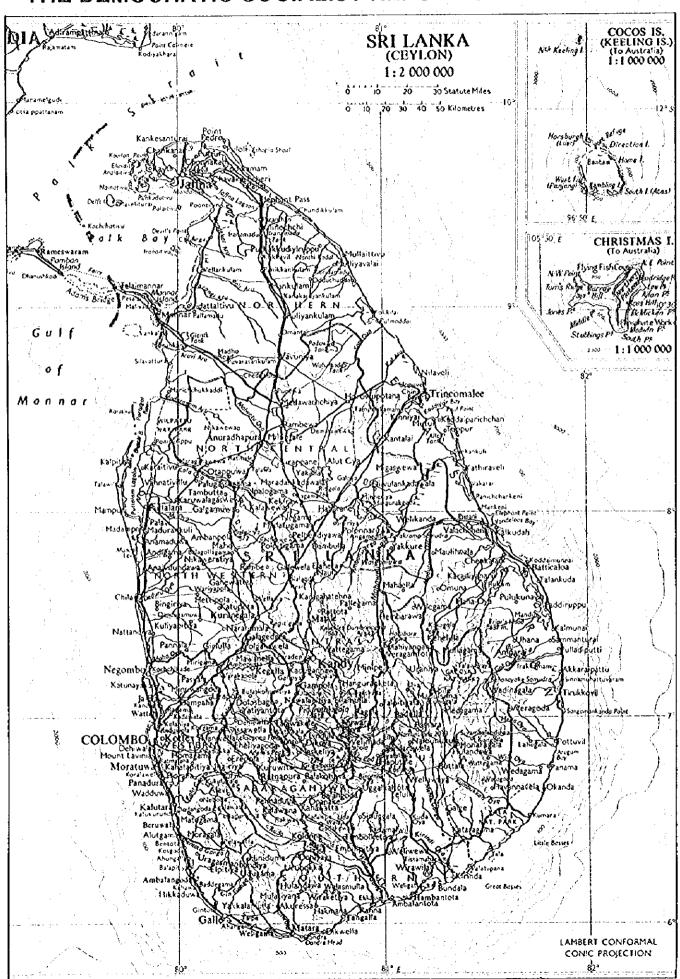
THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

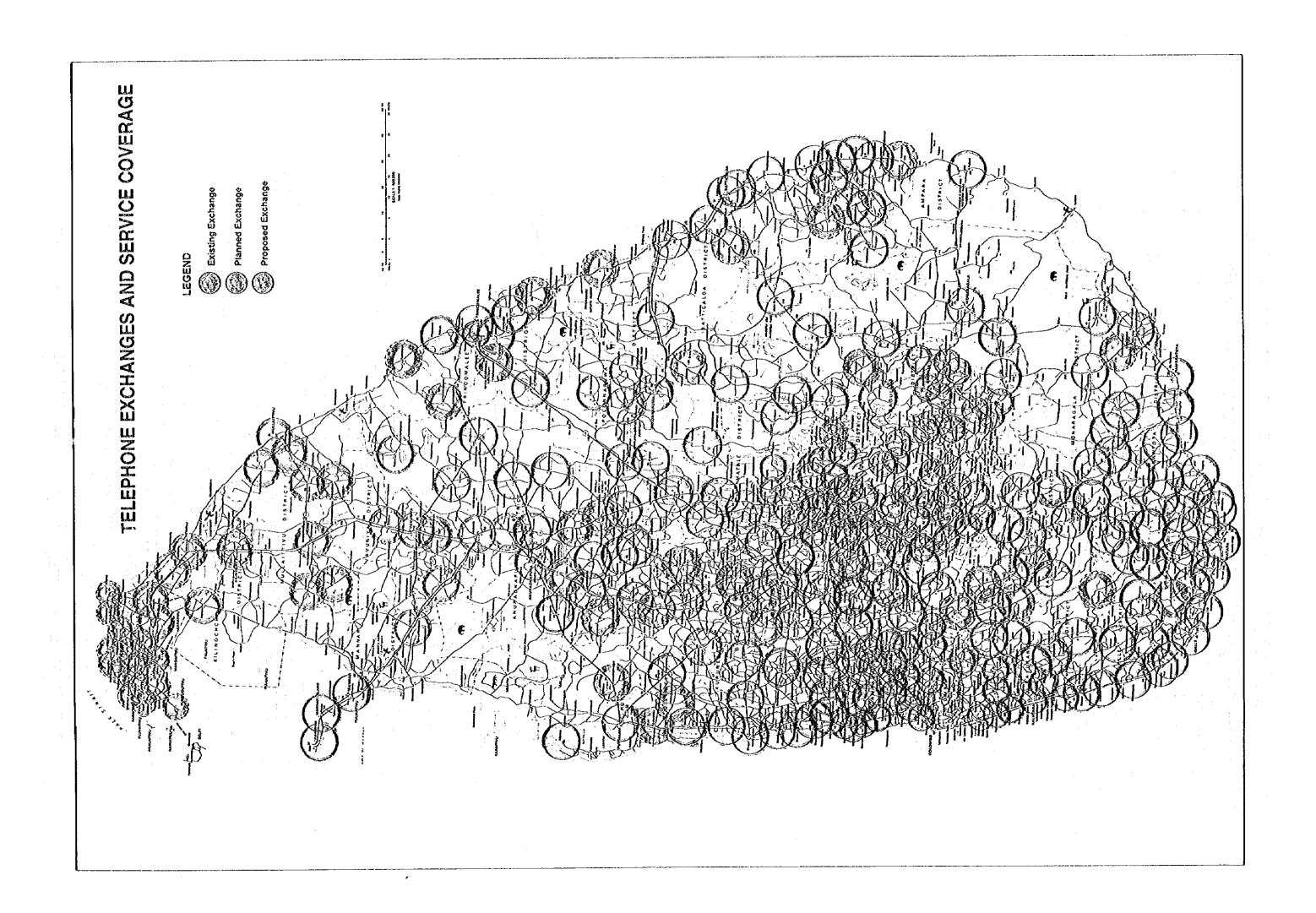


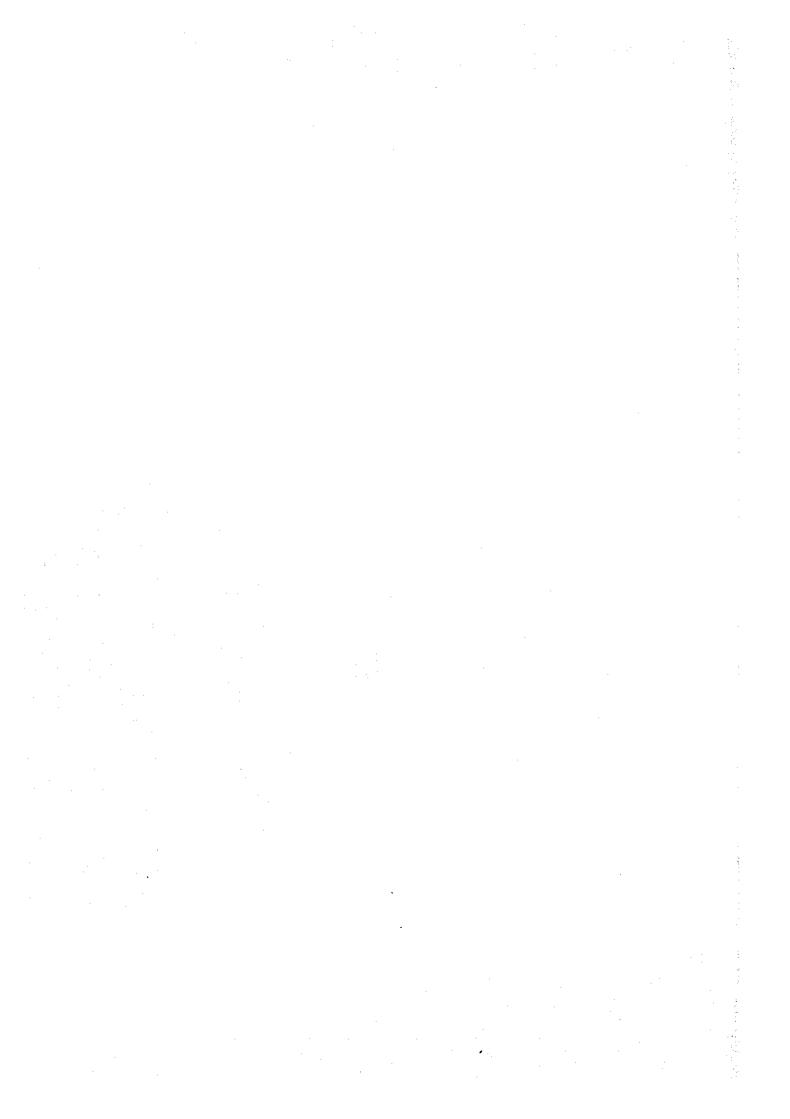
THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

9

)







)

CONTENTS

VOLUME-I SUMMARY	
VOLUME-II MASTER PLAN	
VOLUME-III FEASIBILITY STUDY FOR THE PRIORITY PRO	DJECTS
CHAPTER 1 INTRODUCTION	
Background of the Priority Projects Selection of Priority Projects for the Feasibility Study Precondition of the Feasibility Study Work Schedule for the Feasibility Study CHAPTER 2 FEASIBILITY STUDY ON LOCAL NETWORK EXPANSIGN PROJECT IN COLOMBO METRO AREA	1-3 1-6 1-11
1. Background of the Feasibility Study	
2. Objectives and Scope of the Project.	
3. Socio-Economy in the Objective Area	
4. Present Conditions of Telecommunications Services in the Objective Area	
5. Project Basic Design	
5.1 Forecast	
5.2 Network Plan	
5.3 Facilities Plant	2-72
6. Project Cost Estimate	
7. Project Implementation Plan	2-107
7.1 Implementation Schedule	2-112
7.2 Management on Project Implementation	2-115
7.3 Operation and Maintenance	
7.4 Human Resource Development	
8. Project Evaluation	2-126
9. Conclusion and Recommendation	Z-149
CHAPTER 3 FEASIBILITY STUDY ON CENTRAL RING FIBRE OPTIC TRANSMISSION NETWORK PROJECT)
1. Background of the Feasibility Study	
2. Objectives and Scope of the Project	3-2
3. Socio-Economy in the Objective Area	3-6
4. Present Conditions of Telecommunications Services in the Objective Area	3-7
5. Project Basic Design	3-11

5.1 Forecast		
5.2 Network Plan		
5.3 Facility Plan		
6. Project Cost Estimate		
7. Project Implementation Plan	3-31	
7.1 Implementation Schedule	3-31	
7.2 Management on Project Implementation	3-33	
7.3 Operation and Maintenance.	3-35	0
7.4 Human Resource Development		•
8. Project Evaluation	3-38	
9. Conclusion and Recommendations		
CHAPTER 4 FEASIBILITY STUDY ON NEW ISC, TSC AND EARTH STA	ATION	
1. Background of the Feasibility Study	4-1	
2. Objectives and Scope of the Project		
3. Socio-Economy		
4. Present Conditions of Telecommunications Services in Sri Lanka	4-6	
5. Project Basic Design		
5.1 Forecast		
5.2 Project Site		
5.3 Network Plan		
5.4 Facilities Plan		0
6. Project Cost Estimate		
7. Project Implementation Plan		:
7.1 Implementation Schedule		
7.2 Management on Project Implementation		
7.3 Operation and Maintenance	4.74	
7.4 Human Resource Development	7-1 1.77	
8. Project Evaluation		
9. Conclusion and Recommendation	4-102	
CHAPTER 5 OVERALL EVALUATION	5-1	
ANNEXES OF VOLUME-III	- - 	
Annex 1 Financial Analysis on Local Network Expansion Project		
in Colombo Metro Area	A1-1	
Annex 2 Financial analysis on Central Ring Fibre Optic Transmission		
Network Project	A2-1	
Annex 3 Financial Analysis on New ISC, TSC and Earth Station Project		·
VOLUME-IV SUPPORTING FOR MASTER PLAN		
VOLUME-V DATA BOOK		

LIST OF FIGURES

Figure 1-2-1 A Flow of Project Formation	
Figure 1-2-2 Three Priority Projects for Feasibility Study	1 4
Dure	1-4
Figure 1-2-3 Target Areas of Priority Projects	
Figure 1-3-1 Telephone Supply by SLT and Private WLL Operators	1-9
Figure 1-3-2 Telephone Supply Plan up to 2015	
Figure 1-5-1 Organisation for the Study	1-13
CHAPTER 2 FEASIBILITY STUDY ON LOCAL NETWORK EXPANSION PROJECT	
IN COLOMBO METRO AREA	۰.
Figure 2-2-1 Objective Areas of External Plant Expansion	
Figure 2-2-2 Objective Exchanges of Switching Facilities Expansion	
Figure 2-2-3 Objective Areas of Transmission System Expansion	
Figure 2-5-1 Existing Number Structure of Sri Lanka	
Figure 2-5-2 Number Structure for ISDN Era	
Figure 2-5-3 Existing Trunk Code First Digit	
Figure 2-5-4 DNC Scheme after WLL Network Introduction (Draft)	
Figure 2-5-5 Closed Numbering First Digit Assignment in Future (Draft)	
Figure 2-5-6 Signalling Links between Local and Tandem Exchanges	
Figure 2-5-7 Reference Clock Network in Colombo TSC Area	
Figure 2-5-8 Connection Loss Probability between Two Exchanges	
Figure 2-5-9 Transmission Loss Allocation	
Figure 2-5-10 Overlaid SLT and WLL Networks in 1997	
Figure 2-5-11 Traffic Flow after WLL Participation in Colombo in 2000	2-48
Figure 2-5-12 General View of SLT National Switching Network in 1995	2-50
Figure 2-5-13 Exchanges and RSU belonging Scheme	
in Colombo Metro Area as of April 1995	2-52
Figure 2-5-14 Exchanges and RSU belonging Scheme in Colombo Metro Area	
in 1997 Based on the Plan as of September 1995	2-54
Figure 2-5-15 Proposed Network in Colombo Metro Area in 2000	
Figure 2-5-16 Proposed Fibre Optic Transmission System	2-60
Figure 2-5-17 Transmission Ring Concept Chart	2-62
Figure 2-5-18 Exchanges and the Area for Feasibility Study	
Figure 2-5-19 Outline of Subscriber Cable Access System	
Figure 2-5-20 Cable Loss limitation between MDF and Telephone Set	
Figure 2-5-21 Outline of Cross-Connection Cabinet	
Figure 2-5-22 Demand Increase and Switching System Capacity	2-73
Figure 2-5-23 Countermeasure by 0.9 mm Diameter Cable	
(1/3) and Telephone Set with Amplifier	2-93
Figure 2-5-23 Countermeasure by Optical Fibre Access System	
(2/3)	2-94
Figure 2-5-23 Countermeasure by Establishment of RSU	
(3/3)	2-94
Figure 2-5-24 Example of Economical Cost Comparison	2-95
Figure 2-7-1 Switching System Facilities Implementation Time Schedule	
Figure 2-7-2 Transmission Facilities Implementation Time Schedule	

Figure 2-7-3	External Plant Implementation Time Schedule	2-114
Figure 2-7-4	A Model of Work Schedule for an Exchanges	
	of New Switching Technology	2-118
Figure 2-7-5	O&M Organisation Chart for the System	
Figure 2-8-1	Concept figure of Revenue distribution	
Figure 2-8-2	Result of Financial Analysis for Case A	2-146
Figure 2-8-3	Result of Financial Analysis for Case B	2-146
	EASIBILITY STUDY ON CENTRAL RING FIBRE OPTIC TRANSMISSIC	N
	ETWORK PROJECT	
Figure 3-2-1	Central Ring Transmission System Route Plan	3-3
Figure 3-2-2	Future National Transmission Network Plan	
Figure 3-4-1	National Transmission Network in 1997	
Figure 3-5-1	Expected Network Configuration	
Figure 3-5-2	Traffic Category related to Central Ring Transmission System	3-18
Figure 3-5-3	Transmission Capacity at Each Node Station	3-20
Figure 3-5-4	SSC Isolation	
Figure 3-7-1	Implementation Schedule	
Figure 3-7-2	O&M Zones for Central Ring Transmission System	
Figure 3-8-1	Concept figure of Revenue distribution	
Figure 3-8-2	Result of Financial Analysis	3-52
CHAPTER 4 F	EASIBILITY STUDY ON KOTUGODA NEW ISC, TSC AND ARTH STATION PROJECT	
Figure 4-2-1	Objective Telecommunications Facilities	1.1
Figure 4-4-1	Increase Trend of the Number of DELs and Waiters	
Figure 4-5-1	Location of Kotugoda New ISC/TSC Site	
Figure 4-5-2	Backbone Transmission Ring and Submarine Cable Landing Poin	
Figure 4-5-3	Existing Number Structure of Sri Lanka	
Figure 4-5-4	Number Structure for ISDN Era	
Figure 4-5-5	Existing Trunk Code First Digit	4 75
Figure 4-5-6	DNC Scheme after WLL Network Introduction (Draft)	4-23 1 21
Figure 4-5-7	Closed Numbering First Digit Assignment in Future (Draft)	4 22
Figure 4-5-8	Signalling Links between Local and Tandem Exchanges	4-34
Figure 4-5-9	Reference Clock Network in Colombo TSC Area	4~34 4 25
Figure 4-5-10	Connection Loss Probability between Two Exchanges	4-33 1 27
Figure 4-5-11	Transmission Loss Allocation	
Figure 4-5-12	Overlaid SLT and WLL Networks in 1997	4-39 4 49
Figure 4-5-13	Traffic Flow after WLL Participation in Colombo in 2000	
Figure 4-5-14	General View of SLT Network in 1995	4-43 7 A A
Figure 4-5-15	Exchanges and RSU Belonging Scheme	4-4/
	in Colombo Metro Area as of April 1995	1 10
Figure 4-5-16	Exchanges and RSU Belonging Scheme in Colombo Metro Area	4-40
riguic 15 to	in 1997 Based on the Plan as of September 1995	4.40
Figure 4-5-17	Proposed Network in Colombo Metro Area in 2000	 'ለ ናን
Figure 4-5-18	Existing International Transmission Systems	A-52 A 5A
Figure 4-5-19	Proposed New International Transmission Systems	
Figure 4-5-20	Demand Increase and Switching System Capacity	ርር•ተ በአ አ
Figure 4-7-1	Exchange Portion Implementation Time Schedule	4-00 4 70
Figure 4-7-2	Implementation Schedule for Earth Station	ዋ-70 <i>ለ ጎ</i> ን1
~ · b · · · · · · · ·		777 / 1

JICA Telecom Study v		Olumem - Conten
Figure 4-7-3	A Model of Work Schedule for New Switching Site	4-75
Figure 4-8-1	Concept figure of Revenue district	4-86
Figure 4-8-2	Result of Financial Analysis	4-94

LIST OF TABLES

CHAPTER 1	INTRODUCTION	
Table 1-3-1	Telephone Supply Plan by SSC considering Suppressed Demand	1-8
Table 1-3-2	Telephone Supply by SLT and Private WLL Operators	. 1-9
Table 1-3-3	Telephone Supply Plan up to 2015	
•	Based on an Assumption of WLL DEL Supply	1-10
Table 1-4-1	Work Schedule of the Study	1-11
Table 1-5-1	List of JICA Study Team Members	1-14
Table 1-5-2	List of Counterparts	1-15
Table 1-5-3	List of JICA Advisory Committee Members	
Table 1-5-4	List of Project Officers of JICA Headquarters	
CHAPTER 2	FEASIBILITY STUDY ON LOCAL NETWORK EXPANSION PROJECT	
	IN COLOMBO METRO AREA	
Table 2-3-1	Population of Divisional Secretariat by Sex and Age	
Table 2-3-2	Labour force by Divisional secretariat	2-11
Table 2-3-3	Subscribers and waiters of Telecommunication	2-12
Table 2-5-1	Fixed-line Telephone Demand in Colombo Metro SSC Area	
	in 2000 and 2005	
Table 2-5-2	Traffic Distribution Ratio by Call Categories	
Table 2-5-3	Traffic of Local (Main) Exchanges in Colombo Metro Area in 2005	.2-18
Table 2-5-4	Traffic Matrix between Main Exchanges	
	in Colombo SSC Area in 2005	
Table 2-5-5	Trunk Traffic of SSC in 2005	
Table 2-5-6	National Trunk Traffic Matrix in 2005	2-21
Table 2-5-7	Junction Circuit Matrix in Colombo Metro Area	
	to be Provided by 2000	2-23
Table 2-5-8	Number of Circuits of RSU-Main Exchange	٠.
	in Colombo Metro Area to be Provided by 2000	
Table 2-5-9	Trunk Circuit Matrix between SSCs to be Provided by 2000	
Table 2-5-10	Patterns of Existing National Significant Number	2-28
Table 2-5-11	3-digit Special Numbers for Public Services	
Table 2-5-12		2-31
Table 2-5-13		
	of NSN of Sri Lanka	.2-32
Table 2-5-14	Present Assignment of Exchange Codes	
	and Subscriber Numbers in Colombo (as of Dec. 1994)	
Table 2-5-15		.2-38
Table 2-5-16		
Table 2-5-17	0 ,	
Table 2-5-18	•	
Table 2-5-19		
Table 2-5-20	Exchange Structure and Capacity in 1997 (Planned)	.2-53
Table 2-5-21		
Table 2-5-22		
Table 2-5-23		.2-70
Table 2-5-24	Colombo TSC Capacity by Unit	.2-74

Table 2-5-25	LE Capacity to be provided by 2000	2-75
Table 2-5-26	LE Capacity Breakdown and Switch Space Condition	
Table 2-5-27	Required Circuit Matrix in 2005	2-79
Table 2-5-28	Proposed Circuit Matrix	
Table 2-5-29	Circuit Convergence (Distribution of 2 Mbit/s Tributaries)	
Table 2-5-30	MUX Facilities Plan	
Table 2-5-31	Cable Route Plan	
Table 2-5-32	Exchange Situation and Demand for Feasibility Study	2-86
Table 2-5-33	Expected New Subscribers in this Project	
Table 2-5-34	Systems for High Loss Subscriber	
Table 2-5-35	Standard of Cable Loss	
Table 2-5-36	Cable Size of Primary Cable	
Table 2-5-37	Cable Size of Secondary Cable	
Table 2-5-38	Closure Types	
Table 2-5-39	Cross-Connection Cabinet Size	2-99
Table 2-5-40	Capacity and Type of Distribution Point	
Table 2-5-41	Standard of Manhole and Handhole	
Table 2-5-42	Standard Number of Spare Pipe(s)	
Table 2-5-43	Materials and Tools for Maintenance Use	
Table 2-5-44	Amount of Main Work inn this Project	
Table 2-5-45	Administrative Classification of External Plant	2-105
Table 2-6-1	Switching Facilities Project Cost	
Table 2-6-2	Transmission Facilities Project Cost	
Table 2-6-3	External Plant Project Cost	
Table 2-6-4	Project Splitting into Two Packages	
Table 2-7-1	Reference Staffing Standard for Optical Fibre Transmission	
Table 2-7-2	Required Number of Staff for O&M Centres	
Table 2-7-3	Classification of Operation and Maintenance Work	
	for External Plant.	2-124
Table 2-7-4	Trainces selected as a Key Person	
Table 2-8-1	Revenue Collecting Ratio	2-128
Table 2-8-2	Ratio of Import Duty	2-129
Table 2-8-3	Depreciation Method	2-129
Table 2-8-4	Total Investment Cost for External Plants	
Table 2-8-5	Expenditure Schedule	
Table 2-8-6	A Historical Tariff Level for Telecommunications	
Table 2-8-7	Revenue Distribution Ratio	2-135
Table 2-8-8	Subscriber Connection Schedule for External Plant Project	
Table 2-8-9	Total Annual Revenue for the Project	
Table 2-8-10	Annual (O&M) Costs for Case A	
Table 2-8-11	Annual (O&M) Costs for Case B	2-138
Table 2-8-12	Result of Financial Analysis for Case A	
Table 2-8-13	Assumption of Financing Plan (Case A)	
Table 2-8-14	Result of Financial Analysis for Case B (External Plant)	
Table 2-8-15	Assumption of Financing Plan for Case B	
Table 2-8-16	Major Financial Index for Case A	
Table 2-8-17	Major Financial Index for Case B (External Plant only)	

Table 2-8-18	The Result of the Sensitivity Analysis for Project A	2-143
Table 2-8-19	The Result of the Sensitivity Analysis	
	for Project B External Plant Project	2-143
Table 2-8-20	Foreign Exchange Premium	
Table 2-8-21	Telephone Call Charges from 1983 to 1993	
Table 2-8-22	Total Benefit Streams	
Table 2-8-23	Total Economic Project Cost in each project year	
Table 2-8-24	Total Economic O&M Cost (Case A)	
Table 2-8-25	Total Economic O&M Cost Case B)	
Table 2-8-26	Economic Cash Flow for Case A	
Table 2-8-27	Economic Cash Flow for Case B	
	EASIBILITY STUDY ON CENTRAL RING FIBRE OPTIC TRANSMISS	ION
	ETWORK PROJECT	
Table 3-2-1	Proposed Implementation Schedule	
Table 3-3-1	GRDP and Population in the Related Districts	
Table 3-4-1	Present Number of Exchanges and Subscribers	
Table 3-4-2	Existing 2 Mbit/s Streams between Each Node	
Table 3-5-1	Forecasted Direct Exchange lines (DEL) by TSC	
Table 3-5-2	Proposed Exchange Capacity of ISC, NSC and TSC	
Table 3-5-3	Total No. of 2 Mbit/s Streams between Each Node in 2005	
Table 3-5-4	Required No. of 2 Mbit/s Streams between Each Node in 2005	
Table 3-5-5	Traffic Category for Each Ring	
Table 3-5-6	2 Mbit/s Stream Matrix between Each SSC for Central Ring Sys	
Table 3-5-7	Distributions of 2 Mbit/s Tributaries	
Table 3-5-8	MUX Facilities Plan	
Table 3-5-9	Required Number of Fibre Optic Cable Cores	
Table 3-5-10	Cable Route Selection	
Table 3-5-11	Fibre Optic Cable Laying	the second secon
Table 3-6-1	Project Cost	
Table 3-7-1	Reference Staffing Standard for Optical Fibre Transmission	the state of the s
Table 3-7-2	Required Number of Staff for Each Station	
Table 3-8-1	Collecting Ratio	
Table 3-8-2	Ratio of Import Duty	
Table 3-8-3	Depreciation method	
Table 3-8-4	Total required capital cost	
Table 3-8-5	Expenditure Schedule	
Table 3-8-6	Historical Tariff Level for Telecommunications	
Table 3-8-7	Revenue Distribution Ratio	
Table 3-8-8	Total Annual Revenue for the project	
Table 3-8-9	Annual (O&M) Costs	
Table 3-8-10	Result of Financial Analysis	
Table 3-8-11	Assumption of Financing Plan	
Table 3-8-12	Major Financial Index	
Table 3-8-13	The result of the sensitivity analysis	
Table 3-8-14	Foreign Exchange Premium	
Table 3-8-15	Telephone call charges from 1983 to 1993	
Table 3-8-16	Benefit streams	3-57

Table 3-8-17	Total Economic Project Cost in each project year	3-57
Table 3-8-18	Total Economic O&M Cost	3-57
Table 3-8-19	Economic Cash Flow	3-58
	EASIBILITY STUDY ON KOTUGODA NEW ISC, TSC AND	
	ARTH STATION PROJECT	
Table 4-4-1	Number of DELs and Waiters for the Past 10 Years	
Table 4-5-1	Traffic Distribution Ratio by Call Categories	
Table 4-5-2	Calling Rate and ISC Traffic Distribution	
Table 4-5-3	ISC Traffic in 2005	
Table 4-5-4	Traffic of SSC in 2005	
Table 4-5-5	Domestic Side Incoming Circuits of ISC to be provided by 2000	
Table 4-5-6	Trunk Circuits to be provided by 2000	4-13
Table 4-5-7	Patterns of Existing National Significant Number	4-23
Table 4-5-8	3-digit Special Numbers for Public Services	
Table 4-5-9	SSCs and Their Trunk Codes	4-26
Table 4-5-10	Existing Assignment of the First and Second Digits	
	of NSN of Sri Lanka	4-27
Table 4-5-11	Present Assignment of Exchange Codes	
	and Subscriber Numbers in Colombo (as of Dec. 1994)	4-28
Table 4-5-12	Planned DNC in Future (Draft)	
Table 4-5-13	Probability of inadequately handled call attempts	
Table 4-5-14	Values of Sending, Receiving, Circuit and Overall Loudness Rating	
Table 4-5-15	Error Performance Objectives for International ISDN Connections	
Table 4-5-16	Time Allowed for One Call Unit	
Table 4-5-17	Planned Switch Capacity in 1997	
Table 4-5-18	Number of International Circuits required in Year 2005	4-56
Table 4-5-19	Expansion Plan for International Links	
Table 4-5-20	Antenna Orientation Parameters at Kotugoda	
Table 4-5-21	ISC Capacity by Unit to be Provided by 2000	4-60
Table 4-5-22	NSC Capacity by Unit to be Provided by 2000	4-61
Table 4-5-23	Colombo TSC Capacity by Unit	4-62
Table 4-5-24	Required Space for Switching System	4-65
Table 4-5-25	Required Floor Space for Earth Station Equipment Building	
Table 4-6-1	Switching System Project Cost	4-67
Table 4-6-2	Earth Station Project Cost	
Table 4-7-1	Operation and Maintenance Staff for Kotugoda Earth Station	
Table 4-8-1	Collecting Ratio	4-81
Table 4-8-2	Ratio of Import Duty	
Table 4-8-3	Depreciation method	
Table 4-8-4	Total Investment Cost	4-83
Table 4-8-5	Expenditure Schedule	
Table 4-8-6	A historical tariff level for Telecommunications.	
Table 4-8-7	Revenue Distribution Ratio	4-87
Table 4-8-8	Total Annual Revenue for the project	4-88
Table 4-8-9	Annual (O&M) Costs	4-88
Table 4-8-10	Result of Finical Analysis	4-90
Table 4-8-11	Assumption of Financing Plan	4-90

Table 4-8-12	Major Financial Index	4-91
Table 4-8-13	The result of the sensitivity analysis	
Table 4-8-14	Foreign Exchange Premium	
Table 4-8-15	Telephone call charges from 1983 to 1993	4-98
Table 4-8-16	Benefit streams	4-99
Table 4-8-17	Total Economic Project Cost in each project year	4-99
Table 4-8-18	Total Economic O&M Cost	
Table 4-8-19	Economic Cash Flow	4-100
CHAPTER 4 O	VERALL EVALUATION	
Table 5-1	Result of Financial Analysis (1997-2015)	5-1

ACRONYMS AND ABBREVIATIONS

ADB Asian Development Bank

AMPS Advanced Mobile Phone Services

ATM Asynchronous Transfer Mode

B-ISDN Broadband ISDN

BOO Build, Own and Operate

BOT Build, Operation and Transfer

BTT Turnover Tax CC Country Code

CCB Coin and Collection Box Telephone
CCS Common Channel Signalling System

CLR Circuit Loudness Rating

CSPDN Circuit Switched Public Data Network
DANIDA Danish International Development Agency

DEL Direct Exchange Line DF/R Draft Final Report

DGT Director General of Telecommunications

DN Destination Network
DNC Destination Network Code

DP Distribution Point

DRMASS Digital Radio Multiple Access Subscriber System

DUP Data User Part

EDCF Economic Development Co-operation Fund, Korea

EIRR Economic Internal Rate of Return
ERC Economic Restructure Credit
ERC II Economic Restructure Credit II

F/R Final Report F/S Feasibility Study

FDM Frequency Division Modulation FIRR Financial Internal Rate of Return

FIRROE Financial Internal Rate of Return on Equity
FIRROI Financial Internal Rate of Return on Investment

FISU Fill-in Signal Unit FM Frequency Modulation

FOTS Fibre Optic Transmission System

GCTNIP Greater Colombo Telecommunications Network Improvement Project

GDP Gross Domestic Product

GMDSS Global Maritime Distress and Safety System

GOSL Government of Sri Lanka

GRDP Gross Regional Domestic Product

GSM Global System for Mobile Communication

HF High Frequency IC/R Inception Report

IDA International Development Bank IDD International Direct Dialling IDN Integrated Digital Network

INI	Intelligent Naturals			
IN	Intelligent Network			
INMARSAT	International Maritime Satellite Organisation			
INTELSAT	International Satellite Organisation			
ISC	International Switching Centre			
ISDN	Integrated Services Digital Network			
ISPC	International Signalling Point Code			
ISUP	ISDN User Part			
IT/R	Interim Report			0
ITU	International Telecommunications Union			
JICA	Japan International Co-operation Agency			
LAN	Local Area Network	·	•	
LE	Local Exchange			
LR	Loudness Rating	•		
LSSU	Link Status Signal Unit			
M/P	Master Plan		·	
MF	Medium Frequency		•	
MIS	Management Information System			
MSU	Message Signal Unit			
MŢ₽	Message Transfer Part			
N-ISDN	Narrowband ISDN			
NPV	Net Present Value			
NSB	National Saving Bank			
NSC	National Switching Centre			_ :
NSN	National Significant Number			
O&M	Operation and Maintenance			
ODA	Official Development Assistance			
OECF	Overseas Economic Cooperation Fund, Japan			
OLR	Overall Loudness Rating			
PAD	Packet Assembly / Disassembly			
PCM	Pulse Code Modulation			
PDCA	Plan, Do, Check and Action	the second second second second second		
PDH	Presiochronous Digital Hierarchy		i e	
PIP	Public Investment Programme			
POTS	Plain Ordinary Telephone Service	·		
PSPDN	Packet Switched Public Data Network			
PSTN	Public Switched Telephone Network		•	
QC	Quality Control			
RLR	Receiving Loudness Rating			
RSU	Remote Switching Unit			
RTE	Regional Telecommunications Engineer			
SCCP	Signalling Connection Control Part			
SCP	Signal Control Point	-		
SCPC	Single Channel Per Carrier			
SDH	Synchronous Digital Hierarchy			
	International Submarine Cable			
	(via South East Asia - Middle East - Western I	Europe)		
SLR	Sending Loudness Rating		•	

SLT	Sri Lanka Telecom
SLTA	Sri Lanka Telecommunications Authority
SLTD	Sri Lanka Telecommunications Department
SN	Subscriber Number
SRS	Subscriber Radio System
SSC	Secondary Switching Centre
STD	Subscriber Trunk Dialling
TACS	Total Access Communications System
TC	Trunk Code
TCAP	Transaction Control Application Protocol
TDM	Tandem Switch
TMN	Telecommunications Management Network
TQC	Total Quality Control
TSC	Tertiary Switching Centre
TUP	Telephone User Part
UHF	Ultra High Frequency
UPT	Universal Personal Communications
VHF	Very High Frequency
WB	World Bank

List of SLT's Telephone Exchange Codes (Alphabetical Order)

PROGRAMMAN AND AND PROGRAMMAN	7
Exchange Name	Code
Ambanpola	A8P
Anuradhapura (OLD)	AD
Adampan	ADP
Ambalangoda	AG
Akuressa	AK
Alawwa	ALW
Angoda	AN
Anamaduwa	ANA
Angunukolapelassa	ANK
Agarapatana	AP
Ampitikanda	APK
Ampara	APR
Ambalantota	AQ
Akkaraipatthu	AR
Aralaganvila	ARG
Akurana	ARN
Attanakadawala	ATK
Ankumbura	AU
Achchuveli	AV
Awissawella	AW
Aranayaka	TAY
Ayagama	AYG
Bogawantalawa	IBA
Bambarabotuwa	BBT
Batticaloa	BC
Batticaloa 5ESS	BC1
Badulla	BD
Bandaragama	BDG
Badalgama	BDL
Baddegama	BE
Balangoda	BG
Bengamuwa	BGM
Bibile	ВІ
Badaikubura	ВК
Bakamuna	ВКМ
	
Belialta	BL
Boralanda	BLD
Bulathsinhala	BLS
Bingiriya	BN
Beruwala	BR .
Beralapanatara	BRP
Baduraliya	BRY.
Boralesgamuwa	BS :
Bentota	BT
Battuluoya	BTL
Bulatkohupitiya	BU
Bandarawela	BW
Buttala	BZ
China Bay	СВ

Cualifornia Managara	1 8.3.
Exchange Name	Code
Central Camp	CC
Cheddikulam	CDD
Cheddipalaiyam	CDP
Craig Head	CHD
Chunnakam	СК
Central North E-10	CN
Chavakachcheri	CV
Chilawathura	CVT
Chilaw	CW
Central City E-10B	CY
Dambulla	DB
Diyabeduma	DBD
Dodangoda	DD
Diddeniya	DDN
Dolosbage	DG
Dehiatta Kandiya	DHK
Deraniyagala	DI
Digana	DIN
Dunagaha	DJ
Dankotuwa	DK
Deniyaya	DN
Peradeniya	DN
Delft	DQ
Dodanduwa	DU
Dikwella	DW
Thimbolketiya	EH
Embilipitiya	EMB
Elpitiya	EPA
Eppawala	
Erukkalampiddi	ERK
Eravur	EV
Galhinna	GAN
Giribawa	GB
Galle CONT.	GC
Ganemulla	GE
Galagedara	GG
Galgamuwa	GGM
Galaha	GH
G.Ihala Korale	GIK
Galkiriyagama	GKY
Galle SSC	GL
Galenbindunawewa	GLE
Galnewa	GLN
Galewela	GLW
Galigamuwa	GM
Gomarankadawala	GMK
Galamunnai	GMW
Gelioya	GO
Gampola	GP

Exchange Name	Code
Gampaha	GQ
Gampaha 1	GQ1
Gampaha 2	GQ2
Girandurukotte	GRK
Ginigathena	GT
Giriulla	GU
Hakmana	HA
Hambantota	НВ
Habarana	HBR
Hokandara	HC
Habaraduwa	HD
Handessa	HDS
Haliela	HE
Hungama	HGB
Hingurana	HGR
Havelock TOWN	HK
Hikkaduwa	HKD
Hadummulla	НМ
Hingurakgoda	HN
Homagama .	но
Hapulale	HP
Hiripitiya	HPT
Horana	HR
Horowpathana	HRP
Hatton	HT
Halgran oya	НҮ
Heltipola	HZ
Ingiriya	liG
Inginiyagala	IGG
lakachi	lik
Imaduwa	IM .
Irataperiyakulam	IPK
Jaffna	JĀ
Jaela	JL
Kadugannawa	KA
Kataragama	KAG
Kaleliya	KAL
Kalpitiya	KAP
Kayts	KB
Kebitigollawa	квт
Kochchikade	КС
Kuchchaweli	KCH
Kochchikade (RS)	KCR
Koslanda	KD
Kotlegoda	KDE
Kodikamam	кок
Kaduwela	KOL
Kandaketiya	KDT
Kadawata	KOW
	II.O F F





List of SLT's Telephone Exchange Codes (Alphabetical Order)

Exchange Name	Code
Kotadeniyawa	KDY
Kegalle	KE.
Kiriella	KEL
Kurunegala	KG
Kahatagasdigiliya	KGD
Kelaniya	KI
Kiliveddi	KID
Kamburupitiya	KJ
Kalmune	KL
Kolonna	KLN
Kuliyapitiya	KLY
Kotmale	KM
Kirimetiyana	KMT
Kankasanture	KN
Kantale	KNT
	KNY
Kinniya	
Kilinochchi	KOD KOD
Kosgoda	KOK
Kotiyakumbura	KOM
Kosgama	KOP
Kotapola	
Katupota	KP
Kollupitiya	KPT
Корау	KPY
Karainagar	KRG
Katugastota	KS
Kalutara	КТ
Kathankudi	KTK
Katana	KTN
Katunayake	KTY
Kitulgala	ΚV
Karaveddy	KVD
Kehelwatta	KHW
Kuruwita	KW
Karawitagara	KWA
Kekirawa	KWA
Karuwalagaswewa	KWG
Kirindiwela	KWL.
Kalawana	KWN
Kotte	KX
Kandy (A)	KYA
Kandy (B)	KYB
Kandy (C)	KYC
Karadiyanaru	KYN
Kandy TSC	KYT
Lunugamwehera	LGW
Laggala Pallegama	LPG
Lunuwila	LU
Malwana	MAL

Exchange Name	Code
Mannar	MB
Mahakumbukkadawala	MBD
Marawila	МС
Madu Church	мсн
Maradana	MD
Medagama	MDG
Madurankuliya	MDK
Mundel	MDL
Madu Road	MDR
Mardankadawala	MDW
Maskeliya	ME
Moratuwa	MF
Mattegoda	MG
Magandena	MGD
Megahalenna	MGE
Negampaha	MGP
Matara	MH
Maharagama	MHG
Mirigama	MI
Middeniya	MIA
Monaragala	MJ
Makandura	MKD
Mankulam (Jaffna SSC)	MKL
Mankulam (Vavuniya SSC)	MKL
Murunkan	MKN
Mulliyawalai	MLI
Madulsima	MM
Mamaduwa	MMD
Medamahanuwara	MMN
Madolkele	MN
Mawanella	MNA
Manampitiya	MNP
Maha Oya	MO
Mulativu	MP
Maspota	MPT
Maho	MQ
Matugama	MR
Medirygiriya	MRG
Morawewa Melsiripura	MRW MSP
Manmunai South West	MSW
Matale	MT
Mihintale	MTE
Muthiyanwela	MTH
Maltakkuliya	MTK
Muruthalawa	MTW
Maturata	MU
Multur	MUT
Mt. Lavinia	MV
	لـــــات

	100-10
Exchange Name	Code
Mt. Lavinia CSE	MV(R)
Minuwangoda	MWG
Medawachchiya	MWI
Morawaka	MWK
Mawarala	MWR
Mawathagama	MWT
Madampe	MX
Manipay	MY
Mahiyanganaya	MYN
Nivitigala	NA
Neboda	NB
Narammala	NC
Negombo (CONT.)	NEC
Nochchiyagama	NCH
Nugegoda	ND
Nikadalupotha	NDP
Negombo	NE
Norton Bridge	NE
Nagoda	NF
Negombo (NX 61)	NG
Nintavur	NIT
Nikaweratiya	NK
Naula	NL
Nelululam	NLL
Nilaweli	NLV
Neluwa	NLW
Namunukula	NM :
Nanalan	NN -
Nedunkeni	NQ
Neriyakulam	NRK
Nawalapitiya	NT
Nainativu	NTV
Nuwera eliya	NW
Odduchuddan	ODU
Omantai	ОМ
Oluvil	ΟV
Pallai	PA
Pitabeddara	PBD
Padiyathalawa	PDT
Padaviya	PDY
Pelmadulla	PE
Panadura	PH
Passara	PJ
Padukka	PK
Punakari	PKR
Pannala	PL
Pallewela	PLA
Pallekele	PLK
Pelatiyawa	PLT

List of SLT's Telephone Exchange Codes (Alphabetical Order)

Exchange Name	Code
Palavi	PLV
Pulmodai	PME
Pooneryn	PN
Pinapana	PNP
Pallepola	POL.
Pointpedro	PQ
Polonnaruwa	PR
Polpithigama	PRG
Porativu	PRT
Pesale	PSL
Padawi Sripura	PSP
Pasyala	PSY
Pandattarippu	PT
Pulasthigama	PTG
Potuhera	PTH
Puthukudiyirippu	PTK
Pilimathalawa	PTL
Potuvil	PTV
Punkunduthivu	PUN
Pussellawa	PV
Polgahawela	PW
Pawatkulam	PWK
Puttalam	PΧ
Pundaluoya	PY
Piliyandala	PYL.
Rangala	RA
Ramboda	RB
Rambewa	RBW
Ruwanwella	RC
Rajakadaluwa	RD
Raddolugama	RDG.
Ragama	RG
Ridigama	RGM
Rambukkana	RK
Rikillagaskada	RKL
Ratmalana	RM
Rukmalgama	RMG
Ratnapura	RN
Ranpokunagama	RPK
Rakwana	RW
Rattota	RX
Ridimaliyadda	RY
Siyambalanduwa	SBD
Siyabaladuwa	SD
Sevanagala	SEV
Sigiriya	SG
Sithankermi	SKR
Sandalankawa	SL
Sammanthurai	SMT

	operative annual
Exchange Name	
Seruwawila	SW
Sooriyawewa	SYW
Ehaliyagoda	TBL
Tabuttegama	TBT
Trincomalee	TC
Tangalle	TG
Thalpota	THP
Telijjawila	TJ
Talawakele	TK
Tirrukkovil	TKV
Talawa	TL
Tillicoultry	TLC
Talaimannar	TM
Thunukkai	TNK
Tanamalwila	TNL
Toppur	TP
Thissamaharamaya	TR
Tirappane	TRP
Talatuoya	TT
Thawalama	TWL
Tampalakamam	TZ
Urubokka	ÜB
Udubeddawa	UBD
Undugoda	UD
Udappuwa	UDP
Udatultiripitiya	UDT
Uhana	UHN
Ulukkulama	UKL
Uyilankulama	UKM
Udugama	UM
Urapola	UO
Udupussellawa	UP
Upcot	UPC
Uva Paranagama	UPR
Ukuwela	UW
Veyangoda	VĠ
Valachchena	VH
Velanai	VI
Vaddukodde	VK
Vidattaltivu	VKM
Vakarai	VKR
Velvetiture	VL.
Veliveriya	VR
Vavuniya	VU
Wellawaya	WA
Watagoda	WB
Wedduwa	WD
Watawala	WF
Wilgamuwa	WG

Exchange Name	Code
Waltegama	WH
Welfampitiya	WI
Weligama	WJ
Warakapola	WK
Welikanda	WLK
Weligepola	WLP
Welimada	WM
Wariyapola	WP
Wattala	WT .
Watumulla	WTM
Wanathawilluwa	ww
Walasmulla	WU
Weeraketiya	WY
Anuradhapura	XA
Galle TSC	XG
Havelock TDM	XH
Yakkalamulla	YKM
Yatiyana	YMH
Central 5ESS	YS
Yatakalanpattuwa	YTP
Colombo ISC ARE13	ΖA
Colombo ISC NEAX61	ZN
Colombo ISC 5ESS	ZS







Major References

No.

<Socio-economy and Finance>

- 1 Annual Report, Central Bank of Sri Lanka, 1994
- 2 International Investor Guide to Sri Lanka, Richard Mann, 1993
- 3 The world in 1996, The economist, 1996
- 4 Telecommunications and Economic Development, World Bank, 1994
- 5 Challenge for the Telecommunications sector in the asia pacific region ADB & APTEL, 1991
- 6 Public Investment Programme 1995 1999 MOF, National Planning Dept., 1995
- 7 Statistical Abstract of the democratic socialist republic of Sri Lanka MOF, Department of Census and Statistics, 1994
- 8 Shri Lanka, Gillian wright, 1994
- 9 Sri Lanka Year 2000: Towards the 21 st century, a CRDS panel of Authors, 1995
- 10 Economic Valuation Techniques for the Environment John A.Dixon and Maynard M.Hufschmidt, 1986
- 11 The Economics of Telecommunications, John T. Wenders, 1987
- 12 Cost-Benefit Analysis, D.W.Pearce, 1989
- 13 Cost-Benefit Analysis, World Bank, 1989
- 14 Revised Colombo Metropolitan Regional Outline Structure Plan Urban Development Authority, 1995
- 15 Demographic survey, 1994, MOF, Dept. of Census and Statistics
- 16 Sri Lanka: Country economic Update FY93, World Bank, 1993
- 17 A strategy for skills-development and Employment policy in Sri Lanka Terence F.Kelly, 1992
- 18 Recent Trends in Foreign AID, Shakuntala Kuruppu, 1994
- 19 An Economic Financial and Investment Guide, Central Bank of Sri Lanka, 1992
- 20 Macroeconomic Policies, Crises, and Growth in Sri Lanka, World Bank, 1994
- 21 The Accelerated MAHAWELI programme and its IMPACT, GOSL
- 22 World Development Report, World Bank, 1992
- 23 World Telecommunication Development Report, World Bank, 1994
- 24 Privatisation, World Bank, 1992

<Telecommunications>

- 25 Sri Lanka Telecom. Annual Report-1993, SLT, 1994
- 26 Sri Lanka Telecom. Development Study Final Report, Ewbank Preece, 1990
- 27 The consultancy Service of the Network Management System Development for SLT Korea Telecom, 1992
- 28 Sri Lanka second Telecommunications Project Study Report, SOFRECOM, 1993
- 29 Yearbook of Common Carrier Telecommunications Statistics, ITU, 1994
- 30 CCITT Manual, General Network Planning, 1TU, 1983
- 31 CCITT Manual, Local Network Planning, ITU, 1979
- 32 CCITT Recommendations(Blue Book), ITU,1989

CHAPTER 1

INTRODUCTION

CHAPTER 1

INTRODUCTION

1. Background of the Priority Projects

1.1 General

0

0

To realise higher economic growth and equitable distribution of social benefits, the Government of Sri Lanka has been strongly emphasising the needs for adequate, efficient and reliable infrastructures in the national development policy. Telecommunications development is placed as a highest priority in the development policy for industrial development, higher productivity of agriculture and enhancing efficiency in the service sector.

In 1988, the Government of Sri Lanka set up the short-term telecommunications development target aiming at the total provision of 500,000 telephone lines including the existing lines by the end of year 1995 based on the master plan formed under the support of Asian Development Bank.

However, due to unstable social condition, shortage of the budget and delay in design work, some difficulties will be expected on achievement of the development targets. At present, approximately 180,000 telephone lines in whole country are supplied. In spite of an development effort, 187,000 of applicants are still on the waiting lists. In order to clear this situation, a master plan with a long-term view and adequate development strategies is required, while the present master plan is of short-term and already outdated.

Considering the above condition, the Government of Sri Lanka requested the Government of Japan to revise and update the master plan to incorporate the latest changes in policy and environment and to extend a development target year to the year 2015. In response to the request, the Government of Japan dispatched a Study Team of Japan International Cooperation Agency (JICA). The Study Team has carried out the study in accordance with the Scope of Work of the Study agreed upon between Sri Lanka Telecom (SLT) and JICA.

1.2 Objectives of the Study

Q Phase-I Study

To formulate a long-term plan for the development of telecommunications networks in the Democratic Socialist Republic of Sri Lanka up to the year 2015.

☐ Phase-II Study

To conduct a feasibility study for the priority project(s) identified in consequence of the Phase-I Study.

This Volume-III of the Study Report covers a Feasibility Study for three priority projects selected from a urgent development program in the Master Plan for the development of telecommunications networks in the Democratic Socialist Republic of Sri Lanka up to the year 2015. The priority projects aim to be completed by the year 2000.

The feasibility study as Phase-II Study has been carried out in accordance with the work plan and schedule of the study which were discussed and agreed upon between SLT and JICA. The study work has been done both in Sri Lanka and in Japan. The major items of the feasibility study are referred to in the following:

The Feasibility Study in Sri Lanka (18 October - 14 December 1995)

- a) Explanation and discussion of the Interim Report:
- b) Decision of objective priority projects for feasibility study;
- c) Collection of data and information regarding the priority projects from a view of both technical and socio-economic points;
- d) Field survey for the objective priority projects;
- e) Preparation of scope of work for the objective priority projects;
- f) Explanation and discussion of scope of work for the objective priority projects:

The Feasibility Study in Japan (15 December 1995 - 14 February 1996)

- a) Socio-economic analysis for the objective area;
- b) Technical study and project basic design;
- c) Project cost estimate;
- d) Preparation of project implementation plan;
- e) Project evaluation;
- f) Preparation of draft final report consisting of master plan and feasibility study;

2. Selection of Priority Projects for the Feasibility Study

2.1 Selection of the Priority Projects

In the Phase-I Study for preparing a Master Plan, a project implementation plan up to the year 2015 was prepared. The project implementation plan consists of short-term, medium-term and long-term plans. The priority projects for the feasibility study were selected from the short-term plan as a urgent programme consisting of twenty one (21) projects which aims to meet rapidly growing telephone demand and to catch up 100% fulfilment to the waiting demand by the year 2001. The details of project formation and selection of the priority projects for feasibility study are referred to in Section 2 of Chapter 16 in Volume-II. The following figure 1-2-1 shows a flow of project formation:

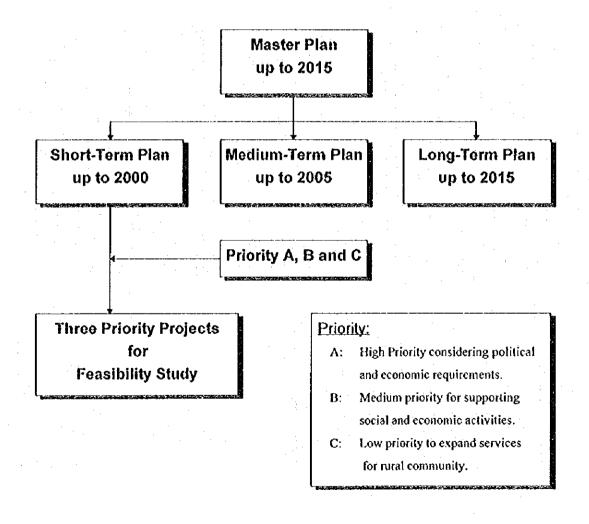
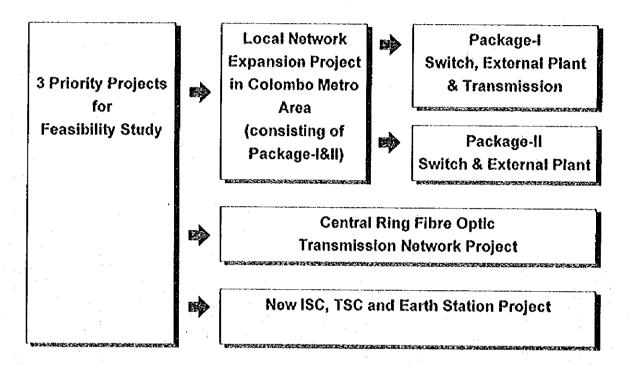


Figure 1-2-1 A Flow of Project Formation

2.2 Priority Projects Selected for the Feasibility Study

Through the discussion between SLT and JICA Study Team, three priority projects were agreed to conduct feasibility study as shown in Figure 1-2-2. The target areas of priority projects are shown in Figure 1-2-3.



Note: details oh the scope of projects are referred to in later Chapters.

Figure 1-2-2 Three Priority Projects for Feasibility Study

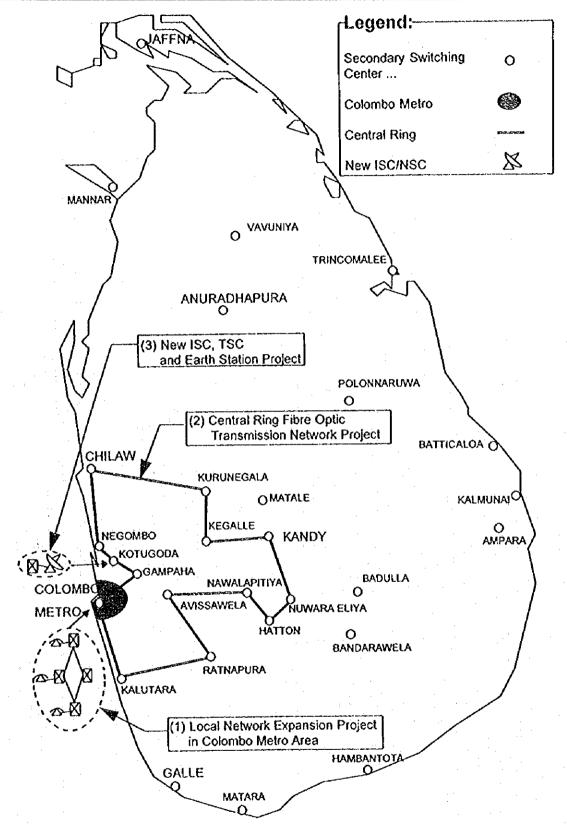


Figure 1-2-3 Target Areas of Priority Projects

3. Precondition of the Feasibility Study

3.1 General

Up to the present, private participation in value-added telecommunications services has been promoted in Sri Lanka. In addition, POTS which is major service of basic telecommunication services is also going to be opened to private WLL operators under the telecommunications policy in Sri Lanka. In this circumstances, there will be difficulty to make detail planning and design in the feasibility study without any precondition. Because network configuration and supply volume, etc. will be unforeseeable depending on business strategies of respective private operators. Accordingly, this feasibility study is carried out in consideration of the following:

- D Impacts by Participation of Private Wireless Local Loop (WLL) Operators

 D. Modified Telephone DEL Supply Plan for Facellittic Starter
- ☐ Modified Telephone DEL Supply Plan for Feasibility Study
- ☐ Future Progress of Telephone Network Expansion by SLT

3.2 Impacts by Participation of Private WLL Operators

By participation of private WLL operators into POTS, the feasibility study is carried out taking into account:

- a) Quicker network expansion by both SLT and private operators will bring higher telephone DEL supply speed.
- b) The higher supply speed will bring more expressed demand by activating suppressed demand.
- c) By sound competition among SLT and private operators including mobile telephone operators, various qualities of service will be much improved.
- d) Corporate efficiency of SLT will be much improved by the competition.
- e) A burden for the Government in the telecommunications sector will be reduced.

Considering the above, this feasibility study is carried out on condition that the future telephone demand consists of satisfied demand (DEL) + registered waiters + suppressed demand which is estimated as 20% of expressed demand.

()

3.3 Modified Telephone DEL Supply Plan for Feasibility Study

By participation of private WLL operators into POTS, the feasibility study is carried out on condition that:

- a) More suppressed demand will be remarkably expressed in consequence of completion of on-going projects by both SLT and private operators after the year 2000.
- b) The supply of DELs by private WLL operators is assumed as 200,000 in 2000 and 300,000 in 2005.
- c) The accumulated supply of DELs by SLT is estimated as 614,000 in 2000 and 873,000 in 2005. The figures of DEL are almost same as those of the original supply plan based on the expressed demand basis in the master plan.
- d) The provision of DELs by SLT will be mainly made by subscriber cables which is dimensioned covering the next 5 year demand.

3.4 Future Progress of Telephone Network Expansion by SLT

As priority projects are depending on future progress of telephone network expansion by SLT, the feasibility study is carried out on condition that:

- a) The accumulated number of DELs by the completion of on-going projects by the end of 1997 will reach to 571,200.
- b) In addition to the above number of DELs, the number of DELs to be newly supplied by SLT by the year 2000 will be 312,000.

From the above expected scenario mentioned in the subsections 3.2, 3.3 and 3.4, various planning values for the feasibility study are referred to in Figure 1-2-1 and Figure 1-2-2 and Table 1-2-1 to Table 1-2-3.

3.5 Project Site for New ISC, TSC and Earth Station

Regarding new ISC, TSC and earth station project, the new site has not been decided by SLT during the study period. In consequence, this feasibility study is carried out on condition that the new site will be located at Kotugoda, because of a limited study period.

()

Table 1-3-1 Telephone Supply Plan by SSC considering Suppressed Demand

No. SSC		Car	Capacity in 1997	1 260	SLT Exp.		Demand in 2000	in 2000			Demand in 2005	n 2005	•
		Switch	Cable	Eff. Lines	in 2000	Total	% of WLL	WLLS	SLT	Total	% of WLL	WLLs	SLT
8 Colombo	8	306,027	388,690	298,992	180,631	465,427	30%	139,628	325,799	685,176	30%	205,553	479,623
1 Ampara	ra	3,644	4,650	3,577	0	2,891	%0L	585	2,602	4,079	10%	408	3,671
2 Anuradhapura	dhapura	7,050	12,130		4,756	10,639	% 01	1.064	9,575	13,118	10%	1,312	11,806
3 Awissawella	awella	5.000	8,770		5,826	8,273	%0L	827	7.446	12,029	10%	1,203	10,826
4 Badulla	la	6.972	10,870	6,972	3,092	8.807	401	881	7,926	11,182	10%	1,118	10,064
5 Bandarawela	arawela	3,940	5,900		2,865	6,042	10%	604	5,438	7,561	10%	756	6,805
6 Batticaloa	aloa	7,196	9.300	7,154	3,636	8,455	401	846	7,609	11,989	10%	1,199	10,790
7 Chilaw	۸	8,470	18,700	8,470	0	9,254	%01	925	8,329	12,857	10%	1,286	11,571
9 Galle		19,555	18,550	14,269	8,371	20,105	%07	4,021	16,084	28,300	20%	2,660	22,640
10/Gampaha	aha	11,484		11,484	23,140	30,910	72%	7,728	23,182	46,165		11,541	34,624
11 Hambantota	antota	8,402			4,238	10,266	10%	1,027	9,239	14,045		1,405	12,640
12 Hatton	١	2,850	3,385	2,604	0	2.777	%0 1	278	2,499	3,434	10%	343	3,091
13 Jaffna	į	0	0	ō	29,371	27,398	%02	5,480	21,918	39,162	722%	9,791	29,371
14 Kalmune	ine	6,524	6,400	4,923	6,082	8,672	%OL	867	7,805	12,228	10%	1,223	11,005
15 Kalutara	ıra	50,820	67,825	50,820	0	29,209	20%	5,842	23,367	42,485	72%	10,621	31,864
16 Kandy	,	47,254	62,930	47,254	0	44,868	25%	11,217	33,651	63,792	25%	15,948	47.844
17 Kegalle	le	6,672	10,368	6,672	6,170	11,144	%0'L	1,114	10,030	16,052	70%	3,210	12,842
18 Kurunegala	egala	15,260	20,800	15,260	7,583	22,074		4,415	17,659	30,457	722%	7,614	22,843
19 Mannar	ar	1,400		308	1,541	1,528		153	1,375	2,054	10%	205	1.849
20 Matale	•	10,628	14,985	10,628	0	8,326	%01	833	7,493	10,440	10%	1,044	9,396
21 Matara	a	15,200	20,600	15,200	0	17,968	70%	3,594	14,374	25,117	70%	5,023	20,094
22 Nawalapitiya	lapitiya	1,394	3,380	1,394	0	1.471		147	1,324	2,093	10%	209	1,884
23 Negombo	oqu	13,600	25,200	13,600	12,778	23,896		4 779	19,117	35,171	72%	8,793	26,378
24 Nuwera Eliya	ra Eliya	4,912	8,975	4,912	1,235	5,522	10%	552	4,970	6,830	10%	683	6,147
25 Polonnaruwa	naruwa	5,450	9,400	5,450	0	4,951	10%	495	4.456	6,374	10%	637	5,737
26 Ratnapura	pura	10,178	12,670	9.746	3,900	11,993	10%	1,199	10,794	17,058	20%	3,412	13,646
27 Trincomalee	malee	4,650	7,470	4,650	3,634	6,516	40%	652	5.864	9,204	40%	920	8,284
28 Vavuniya	ıiya	2,500	4,700		2,711	4,370	10%	437	3,933	6,790	10%	279	5,211
Total	Į.	587,032	815,566	571,231	311,560	813,752	75%	199,894	613,858	1,174,242	76%	301,696	872,546
Colombo	န္တ	306,027	388,690	298,992	180,631	465,427	30%	139,628	325,799	685,176	30%	205,553	479,623
Other SSCs	SCs	281,005	426,876	272,239	130,929	348,325	17%	60,266	288,059	489,066	20%	96,143	392,923

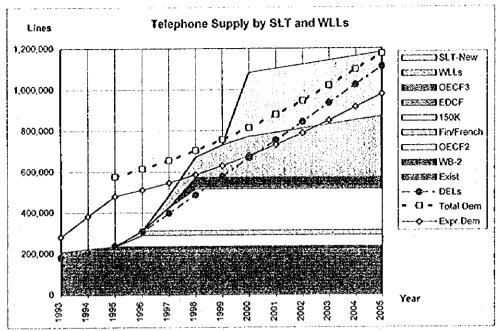


Figure 1-3-1 Telephone Supply by SLT and Private WLL Operators

Table 1-3-2 Telephone Supply by SLT and Private WLL Operators

Year	Exist	W8-2	OFCF2	Fin/Frenc	150K	EDCF	OECF3	Wils
1993	207,227	0	0	0	0	0	Ō	0
1994	222,636	0	0	0	0	0	0	0
1995	222,636	11,064	0	0	0	. 0	. 0	0
1996	222,636	11,064	55,318	22,646	0	0	0	0
1997	222,636	11,064	55,318		113,389	0	0	60,000
1998	222,636	11,064	55,318		204,543	10,000		100,000
1999	222,636	11,064	55,318		204,543	10,000	45,024	160,000
2000	222,636	11,064	55,318		204,543	10,000	45,024	200,000
2001	222,636	11,064	55,318		204,543	10,000	45,024	220,000
2002	222,636	11,064	55,318		204,543	10,000	45,024	240,000
2003	222,636	11,064	55,318	22,646	204,543	10,000	45,024	260,000
2004	222,636	11,064	55,318		204,543	10,000	45,024	280,000
2005	222,636	11,064	55,318	22,646	204,543	10,000	45,024	300,000
			PORTOR PROPERTY.					
Year	SLT-New	Total	Expr.Dem	Total Dem	150 000	Expr.DEL	Supp.DEL	DELs:
							AND DESCRIPTIONS	The second secon
1993	Ó	207,227				180,720		180,720
1993 1994		207,227 222,636	281,836 383,011	0		180,720 207,227		180,720 207,227
	0	207,227	281,836 383,011 480,679	0 0 576,815		180,720 207,227 237,000		180,720 207,227 237,000
1994	0 0	207,227 222,636	281,836 383,011 480,679 511,303	0 0 576,815 613,564		180,720 207,227 237,000 307,000		180,720 207,227 237,000 307,000
1994 1995	0 0 0	207,227 222,636 233,700 311,664 485,053	281,836 383,011 480,679 511,303 545,869	0 576,815 613,564 655,043		180,720 207,227 237,000 307,000 397,000		180,720 207,227 237,000 307,000 397,000
1994 1995 1996	0 0 0 0	207,227 222,636 233,700 311,664	281,836 383,011 480,679 511,303 545,869	0 576,815 613,564 655,043 703,337		180,720 207,227 237,000 307,000 397,000 487,000		180,720 207,227 237,000 307,000 397,000 487,000
1994 1995 1996 1997	0 0 0 0	207,227 222,636 233,700 311,664 485,053	281,836 383,011 480,679 511,303 545,869 586,114 629,600	0 0 576,815 613,564 655,043 703,337 755,520		180,720 207,227 237,000 307,000 397,000 487,000 577,000		180,720 207,227 237,000 307,000 397,000 487,000 577,000
1994 1995 1996 1997 1998	0 0 0 0 0 0 0 312,000	207,227 222,636 233,700 311,664 485,053 671,231 731,231 1,083,231	281,836 383,011 480,679 511,303 545,869 586,114 629,600 678,127	0 676,815 613,564 655,043 703,337 755,520 813,752		180,720 207,227 237,000 307,000 397,000 487,000 577,000 667,000		180,720 207,227 237,000 307,000 397,000 487,000 577,000 687,000
1994 1995 1996 1997 1998 1999	0 0 0 0 0 0 312,000 312,000	207,227 222,636 233,700 311,664 485,053 671,231 731,231 1,083,231	281,836 383,011 480,679 511,303 545,869 586,114 629,600 678,127 731,811	0 676,815 613,564 655,043 703,337 755,520 813,752 878,173		180,720 207,227 237,000 307,000 397,000 487,000 577,000 667,000 731,811	21,954	180,720 207,227 237,000 307,000 397,000 487,000 577,000 687,000 753,765
1994 1995 1996 1997 1998 1999 2000	0 0 0 0 0 0 312,000 312,000 312,000	207,227 222,636 233,700 311,664 485,053 671,231 731,231 1,083,231 1,103,231 1,123,231	281,836 383,011 480,679 511,303 545,869 586,114 629,600 678,127 731,811 788,234	0 676,815 613,564 655,043 703,337 755,520 813,752 878,173 945,881		180,720 207,227 237,000 307,000 397,000 487,000 577,000 667,000 731,811 788,234	21,954 55,176	180,720 207,227 237,000 307,000 397,000 487,000 577,000 687,000 753,765 843,410
1994 1995 1996 1997 1998 1999 2000	0 0 0 0 0 0 312,000 312,000 312,000	207,227 222,636 233,700 311,664 485,053 671,231 731,231 1,083,231 1,103,231 1,123,231 1,143,231	281,836 383,011 480,679 511,303 545,869 586,114 629,600 678,127 731,811 788,234 850,024	0 676,815 613,564 655,043 703,337 755,520 813,752 878,173 945,881 1,020,029		180,720 207,227 237,000 307,000 397,000 487,000 577,000 667,000 731,811 788,234 850,024	21,954 55,176 85,002	180,720 207,227 237,000 307,000 397,000 487,000 577,000 687,000 753,765 843,410 935,026
1994 1995 1996 1997 1998 1999 2000 2001	0 0 0 0 0 0 312,000 312,000 312,000 312,000	207,227 222,636 233,700 311,664 485,053 671,231 731,231 1,083,231 1,103,231 1,123,231	281,836 383,011 480,679 511,303 545,869 586,114 629,600 678,127 731,811 788,234 850,024	0 676,815 613,564 655,043 703,337 755,520 813,752 878,173 945,881		180,720 207,227 237,000 307,000 397,000 487,000 577,000 667,000 731,811 788,234	21,954 55,176 85,002 108,032	180,720 207,227 237,000 307,000 397,000 487,000 577,000 687,000 753,765 843,410

Note: The volume shows approx. effective capacity for DELs connection.

Table 1-3-3 Telephone Supply Plan up to 2015 Based on an Assumption of WLL DEL Supply

Α	В	C	Ď	Ē	F	G	Н		J	к	T T
Year	Expre.Dem	20%Suppre	Total Dem	Fill Rate	Expre.DEL	Fill Rate	Supp.DEL	Total DEL	LL's DE	LL Shar	SLT's DEL
	DEL+Waiter	Demand	(B+C)	(F/B)%		(H/C)%		(F+H)		(J/I)%	(I-J)
1993	281,836		7 Page 2 10 - 10 2 10 2 10 2 10 2 10 2 10 2 10	64%	180,720		FORTHCHE ED.	180,720	Louis Company of the	0%	180,720
1994	383,011			54%	207,227			207,227		0%	207,227
1995	480,679	96,136	576,815	49%	237,600			237,000		0%	237,000
1996	511,303	102,261	613,564	60%	307,000			307,000		0%	307,000
1997	545,869	109,174	655,043	73%	397,000			397,000	60,000	15%	337,000
1998	586,114	117,223	703,337	83%	487,000			487,000	100,000	21%	387,000
1999	629,600	125,920	755,520	92%	577,000			577,000	160,000	28%	417,000
2000	678,127	135,625	813,752	98%	667,000			667,000	200,000	30%	467,000
2001	731,811	146,362	878,173	100%	731,811	15%	21,954	753,765	220,000	29%	533,765
2002	788,234	157,647	945,881	100%	788,234	35%	55,176	843,410	240,000	28%	603,410
2003	850,024	170,005	1,020,029	100%	850,024	50%	85,002	935,026	260,000	28%	675,026
2004	915,526	183,105	1,098,631	100%	915,526	59%	108,032	1,023,558	280,000	27%	743,558
2005	978,536	195,707	1,174,243	100%	978,536	68%	133,081	1,111,617	300,000	27%	811,617
2006	1,045,326	209,065	1,254,391	100%	1,045,326	75%	156,799	1,202,125	320,000	27%	882,125
2007	1,115,688	223,138	1,338,826	100%	1,115,688	79%	176,279	1,291,967	340,000	26%	951,967
2008	1,181,592	236,318	1,417,910	100%	1,181,592	84%	198,507	1,380,099	360,000	26%	1,020,099
5009	1,250,336	250,067	1,500,403	100%	1,250,336	87%	217,558	1,467,894	380,000	26%	1,087,894
2010	1,310,795	262,159	1,572,954	100%	1,310,795	93%	243,808	1,554,603	400,000	26%	1,154,603
2011	1,374,981	274,996	1,649,977	100%	1,374,981	97%	266,746	1,641,727	420,000	26%	1,221,727
2012	1,442,318	288,464	1,730,782	100%	1,442,318	100%	288,464	1,730,782	440,000	25%	1,290,782
2013	1,512,441	302,488	1,814,929	100%	1,512,441	100%	302,488	1,814,929	460,000	25%	1,354,929
2014	1,586,358	317,272	1,903,630	100%	1,586,358	100%	317,272	1,903,630	480,000	25%	1,423,630
2015	1,663,173	332,635	1,995,808	100%	1,663,173	100%	332,635	1,995,808	500,000	25%	1,495,808

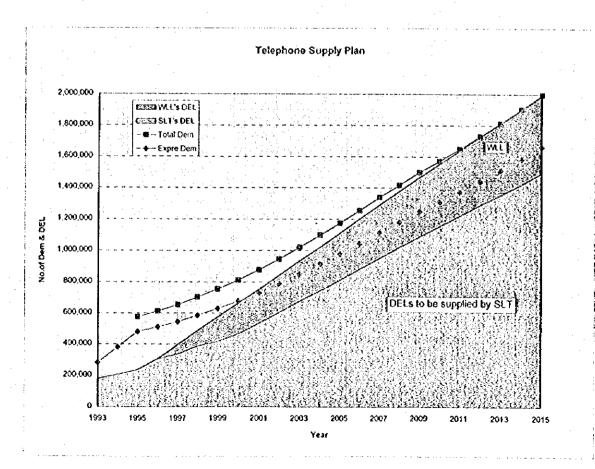


Figure 1-3-2 Telephone Supply Plan up to 2015

4. Work Schedule for the Feasibility Study

4.1 Overall Time Schedule of the Study

The study period consisting of Phase-I and Phase-II Study is from the end of March 1995 up to the middle of April 1996. The time schedule of this Study by study stage is shown in Table 1-4-1. The feasibility study was carried out in the period of Second Study in Sri Lanka and Second Study in Japan.

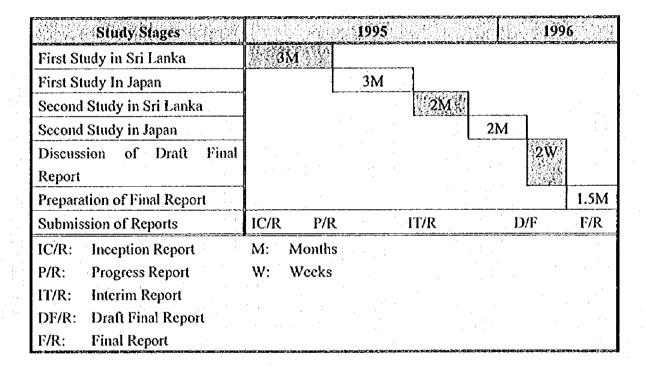


Table 1-4-1 Work Schedule of the Study

4.2 Progress in the Second Study in Sri Lanka

During the second study in Sri Lanka from 18th October to 14th December 1995, the study team carried out the following work together with counterparts:

- a) Explanation and discussion of Interim Report submitted from the study team;
- b) Selection of priority projects for feasibility study;
- c) Presentation and discussion on Joint Work-Shop with JICA team and telecommunications sector in Sri Lanka, chaired by Secretary of MPT, held on 8th Nov. 1995;

- d) Collection of data and information for feasibility study;
- e) Field survey for priority projects selected for the feasibility study;
- Preparation of a report consisting of basic conditions of feasibility study and outlines of project scope;
- g) Technology transfer through field survey and project basic design;
- h) Explanation and discussion of basic conditions of feasibility study and outlines of project scope.

4.3 Progress in the Second Study in Japan

During the second study in Japan from 15th December 1995 to 13th February 1996, the study team prepared a draft final report consisting of a master plan and feasibility study for three (3) priority projects. The study team carried out the following work:

- a) Modification of the master plan submitted as Interim Report;
- b) Basic design and cost estimate for the priority projects selected for feasibility study;
- c) Evaluation of objective priority projects for feasibility study;
- d) Preparation of a draft final report consisting of a master plan study and feasibility study.

4.4 Progress in the Third Study in Sri Lanka

During the third study in Sri Lanka from 14th to 26th February 1996, the study team carried out explanation and discussion of a draft final report with SLT key personnels, counterparts and other officials from organisations concerned. Contents of the draft final report has been basically accepted.

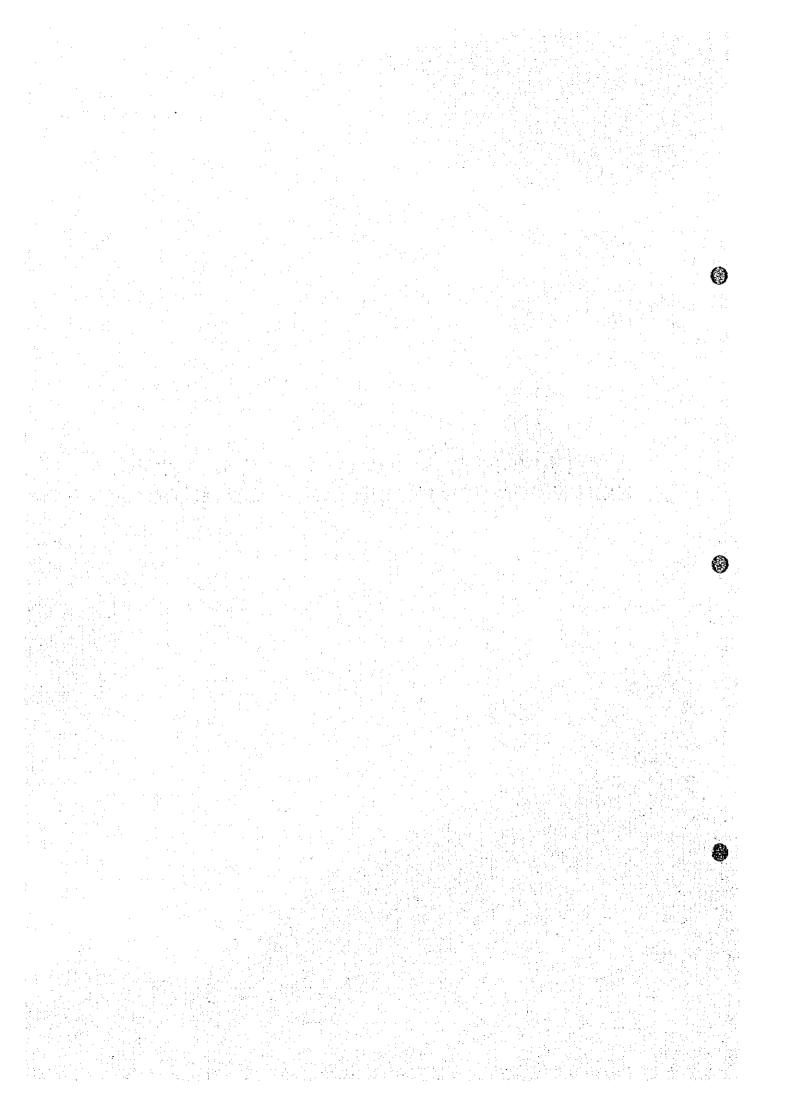
4.5 Progress in the Third Study in Japan

During the third study in Japan from 15th April 1996 to 29th April 1996, the study team prepared a final report consisting of a master plan and feasibility study for three (3) priority projects based on the results of explanation and discussion on the draft final report.

 $\{ \ \}$

CHAPTER 2

FEASIBILITY STUDY ON LOCAL NETWORK EXPANSION PROJECT IN COLOMBO METRO AREA



CHAPTER 2

FEASIBILITY STUDY ON LOCAL NETWORK EXPANSION PROJECT IN COLOMBO METRO AREA

1. Background of the Feasibility Study

SLT is required to provide more telecommunications facilities for international and national traffic to meet the rapid increase of telephone demand in coming years. In 1997, telecommunications facilities capacity of SLT network will be around 597,000 lines in switching capacity and around 937,000 lines in external plant, while JICA Study Team forecasts around 1,174,000 lines of telephone demand in 2005. SLT's capacity will become insufficient in 2000, even in the case that private networks other than SLT provide about a quarter of the demand in 1997, in the local, trunk and international network. This feasibility study was planned to find a project to solve the demand-fulfilment gap in relation to the local and trunk network in Colombo Metro Area.

Before this feasibility study, SLT has driven forward its plans to meet the requirements pointed out in the new telecommunications policy, in line with the National Policy on Telecommunications which follows the Economic Policy Statement of the Government of Sri Lanka announced on 13th September 1994.

The Government of Sri Lanka intends to achieve the following targets:

- a) Telephone to be made available on demand by 1998. All waiters' lists to be cleared by this time. Those who are far away from cable networks will be provided the service by wireless means.
- b) To provide telephones, telegraph and facsimile access to all villages and villagers by 1998.

It was estimated, in keeping with the aspirations of the people and the demand arising from rapid economic growth, that the requirement for telephone (Direct Exchange Lines, DEL) will be in the following order of magnitude:

December 1995 - 460,000 lines;

December 1998 - 565,600 lines;

December 2000 - 636,000 lines.

0

In response to the requirements, SLT is expanding its network adding around 385,600 new lines to the existing approximately 180,000 lines by the year 1998. The on-going programmes by means of financing by World Bank, OECF, Finnish Export Credit, ADB, French Protocol, EDCF Korea, SLT fund and the supplier's credit for "150,000 Lines" were expected to meet the requirement. Those programmes are being carried out by introducing new digital switches, providing subscriber network by cables or radio systems, and expanding transmission network linking exchanges, whole the country except areas where there is security problem.

According to a recent study on telecommunications demand conducted by Japan International Cooperation Agency (JICA), however, it has been found that the telecommunications facilities planned to be provided by the year 1997 will be insufficient to meet the demand after the year 2000. This feasibility study aims to conduct a study of projects to be implemented by the year 2000.

This feasibility study puts focus on the telecommunications facilities related to the local switching facilities, external plant and transmission facilities linking those exchanges in Colombo Metro Area.

2. Objectives and Scope of the Project

2.1 Objectives

This project is aimed to provide telecommunications facilities by the year 2000 to meet increasing telephone demand in Colombo Metro Area.

JICA Study Team forecasts a total of 1,174,000 fixed telephone subscriber lines and another 196,000 mobile telephone lines in the year 2005 as presented in its Master Plan Study. JICA Study Team advises Sri Lanka Telecom (SLT) to provide telecommunications facilities with which SLT can satisfy the demand in its network in due waiting time and with adequate grade of service. The forecast number of telephone subscriber lines is five times comparing to the existing. The traffic will increase corresponding to the telephone subscriber lines. For ensuring a smooth traffic flow to foreign countries and in the country, including that to WLL networks in the country, switching system capacity, transmission system capacity and external plant capacity should be duly expanded. Such capacity should be available by the year 2000.

This project is consisted of three parts; a) Switching facilities plan for expanding telephone switch capacity, b) Transmission facilities plan for expanding transmission network capacity, and c) External plant plan for expanding external plant capacity, in the relevant area.

2.2 Feasibility Study Area and Project Locations

The feasibility study area for the local network expansion project was decided taking account of the capacity expansion plan under the on-going projects in Colombo Metro Area. Figure 2-2-1 shows the fundamental feasibility study area, where the external plant feasibility study was conducted. The feasibility study area was expanded, however, in the case of switching and transmission facilities because of their characteristics forming the network. Thus feasibility study areas differs by facilities and, accordingly, the locations to be involved in this project (hereinafter referred to as Project Locations) differ by facilities.

The external plant feasibility study area included the exchanges the planned capacity of which was definite before the study started. As a result of the study, it was concluded that the all exchanges in the study area should be expanded with the capacity. Accordingly, the project locations are same as the exchange areas selected for feasibility study.

As to the switching facilities plan, the all units of switching system located in Colombo Metro Area, which form the Colombo SSC Area network being linked closely, were put under the study, because it was not practical to conduct the study cutting the network in pieces. Transit switches were also included in the study as part consisting the network. Figure 2-2-2 shows exchanges in Colombo SSC Area marking with rectangular those requiring switching capacity expansion or the project locations.

As to the transmission facilities, because of the same reason as the switching facilities, all nodes in the Colombo SSC Area were put under the study. As a result of the study, it was concluded that Mattegoda, Padukka, and Rukmalgama should be excluded of this project. Figure 2-2-3 shows the nodes in Colombo SSC Area. In Figure 2-2-3, the nodes marked with parenthesis are those excluded of this projects.

2.3 Project Packaging

This project is formed in one package. This project can be split into packages, if required. Upon splitting the project, attention should be paid so that each package is properly made up to provide a balanced network in relation to the traffic flow and facilities usage.

In splitting the project, the capacity of the switching facilities and external plant should be balanced at each exchange. Grouping of switching system units should be in harmony with the switching network structure. Splitting the proposed transmission facilities is not advantageous, because it is designed as a complete system.

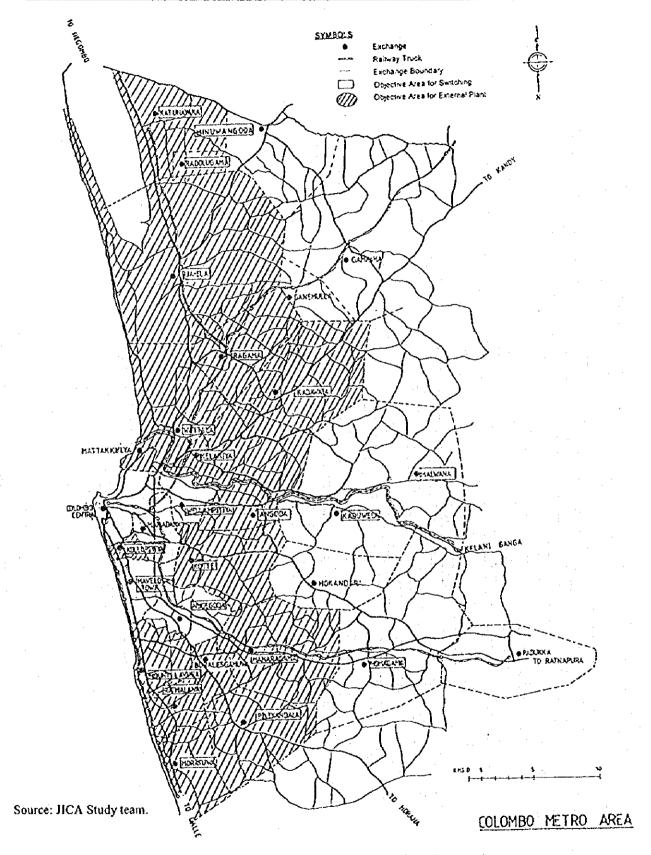


Figure 2-2-1 Objective Areas of External Plant Expansion

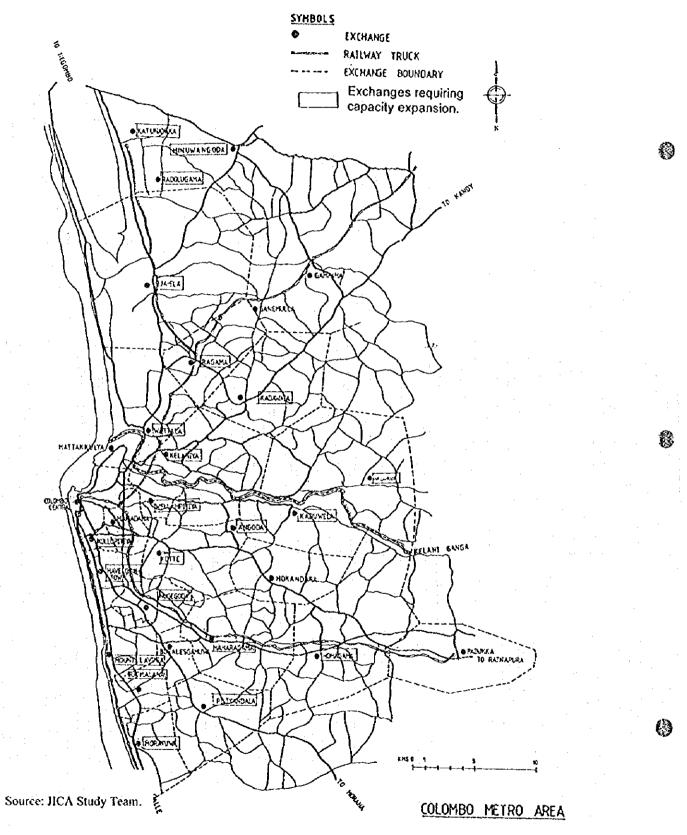


Figure 2-2-2 Objective Exchanges of Switching Facilities Expansion

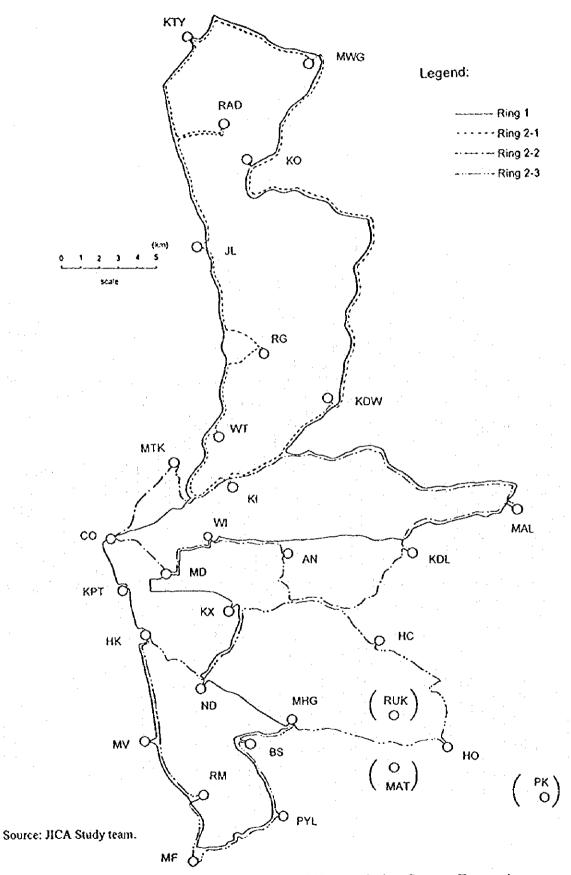


Figure 2-2-3 Objective Areas of Transmission System Expansion

2.3 Scope of the Project

This project includes the purchase, installation, testing and training of the following telecommunications facilities.

2.3.1 Switching System

A total capacity of around 144,000 subscriber lines will be increased for the local exchanges in Colombo Metro Area by introducing 16 units of switching system and expanding existing 7 exchanges, under this project by 2000. Furthermore, two units of transit switching system with a total capacity of inter-exchange circuits of 42,000 will be introduced under this project by 2000.

2.3.2 Transmission System

Fibre optic cable transmission systems, of SDH (Synchronous Digital Hierarchy) transmission technology, for the junction network in Colombo Metro Area covering the traffic demand in the year 2005.

The backbone system and some area based sub-systems will be divided for hierarchical and flexible network structure.

2.3.3 External Plant

Primary cables connected to local exchanges, secondary cables, civil facilities, and supplementary equipment, which are required to satisfy the demand in 2005.

3. Socio-Economy in the Objective Area

With the Government of Sri Lanka making strong efforts to develop and expand its economy and trade, the targeted area would seem likely to develop into a centre of related activities. With government support, foreign capital investment in the region will help to strengthen industry infrastructure. Over time, businesses associated with the utilities, transportation, communication, and similar sectors will be inevitably established within the area.

Various industries are already operating in the northern part of the targeted area. Notable economic activity is underway in an extended free trade zone located near the Katunayake Airport and continuing into Ja-Ela, Ragama, and Wattala. About one half of local residents work in this free trade zone, with remainder commuting daily to Colombo to work in the city's commercial district. In response to this success, a second free trade zone is under consideration for the Kelaniya and Biya Gama area. This new project is based on the assumption that population growth in the area will provide sufficient labour resources for the zone.

The area under consideration is easily accessible from both sea and air, which would facilitate physical distribution of commodities. It will eventually become a thriving distribution centre, making the importance of the information communications business there all the more evident.

Now that considerable foreign capital has been invested in Sri Lanka and further economic growth achieved, one of development strategies should include a focus on establishing a national communications infrastructure in the coming years.

Table 2-3-1 Population of Divisional Secretariat by Sex and Age

Divisional Secretariat	Total Population	S	ex	age group				
		male	female	0-14	15-65	65&Over		
Biyagama	108,991	52,816	56,175	16,695	83,543	8,753		
Kelaniya	128,416	61,074	67,342	10,721	89,605	10,090		
Manara-kadawata	128,994	63,851	65,143	21,994	94,423	12,577		
Ja.Ela	140,059	69,911	70,148	19,640	108,515	11,904		
Wattala	127,117	63,199	63,918	21,090	95,674	10,353		
katana-katunayake Raddolugama	4,738 10,555	n.a			÷			
Kollupitiya	12,912							
Mattakkuliya	61,520							
Angoda	11,000	. :						
Nugegoda-kotte	129,144	1:						
Maharagama	119,581	57,397	62,184	15,460	92,416	11,705		
Piliyandala Boralesgamuwa	183,132							
Mt.Lavinia . Dehiwala] Rathmalana	209,937	102,924	107,014	30,193	159,681	20,063		
Moratuwa	186,321	90,619	95,702	28,966	141,633	15,722		

Source: SLT.

Table 2-3-2 Labour force by Divisional secretariat

Divisional	Total labour	Employed	Unemployed
Secretariat	Force		
Biyagama	42,900	36,138	6,762
Kelaniya	52,115	42,142	9,973
Manara-kadawata	48,324	43,850	4,474
Ja.Ela	55,628	47,242	8,386
Wattala	46,724	1,100	7,402
katana-katunayake	8,400	6,750	2,600
Raddolugama	9,350		
Kollupitiya	2,184	2,029	155
Mattakkuliya	17,294	13,450	3,844
Angoda		6,780	
Nugegoda-kotte	60,050	34,918	25,132
Maharagama	48,503	41,409	7,094
Piliyandala	1	67,659	
Boralesgamuwa			
Mt.Lavinia . Dehiwala Rathmalana	77,673	70,182	7,491
Moratuwa	71,086	62,837	8,249

Source: SLT

Table 2-3-3 Subscribers and waiters of Telecommunication

Divisional	RTE	NO of Local	No of IDD	NO of
Secretariat	Area	Subscribers	Subscribers	Wailers
Biyagama	Maradana	419		980
Kelaniya	Maradana	1,541	105	5,708
Manara-kadawata	Maradama	656	40	3,130
Ja.Ela	Wattala	1,323	129	4,349
Wattala	Wattala	1,374	145	4,402
katana-katunayake 🧻	Negombo	1,592		
Raddolugama		205	256	3,680
Kollupitiya	Colombo	4,047	920	2,723
Mattakkuliya	Central	2,335	256	1,464
Angoda	kotte	326	25	1,828
Nugegoda-kotte	kotte	6,350	869	9,398
Maharagama		1,749	120	8,726
Piliyandala	Ratmalana	676	40	3,921
Boralesgamuwa	1.7	1,454	83	1,058
Mt.Lavinia . Dehiwala	Rathmalana	12,390	656	5,746
Rathmalana		5,709	230	1,182
Moratuwa	Rathmalana	1,524	78	4,260

Source: SLT

4. Present Conditions of Telecommunications Services in the Objective Area

4.1 Available Services

SLT offers various telecommunications services and those services are all available in the objective area, or actually Colombo SSC Area. Besides SLT, as the objective area is the national capital of Sri Lanka, most of private operating entities in Sri Lanka are located there to exploit their asset for services.

As the leading network provider of Sri Lanka, SLT provides;

- a) Plain ordinary telephone service (of domestic and international service);
- b) Telex service (of domestic and international service);
- c) Telegram service (of domestic and international service);
- d) Leased circuits service;
- e) Public payphone service;
- f) Cellular mobile service;
- g) Packet switched service under joint venture with Indian Saga;
- h) Radio maritime services including INMARSAT services.

Private telecommunications network operating companies are providing various services supplementing the basic telecommunications services offered by SLT. There are four (4) providers of cellular mobile telephone service, five (5) providers of paging service, two (2) providers of stored and forward facsimile service, three (3) providers of data transmission service, one (1) provider of mobile radio trunking service and three (3) providers of payphone service.

4.2 Telephone Demand

Telephone demand has not been fulfilled and remained unsatisfactory for more than a decade. The number of waiters for basic telephone service exceeded the lines in use in number in 1994. The objective area occupied around a half of the unfulfilled application of the country as at end of December 1995.

SLT offers basic telecommunications services to the public having around 280 exchanges scattered in the country. SLT's total capacity of telephone exchange was 237,000

(1)

with 180,000 subscriber lines in service as at the end of 1994. The fixed line telephone service, which is one of the most important service of the basic telecommunications services, has been offered by only SLT up to now. In order to accelerate telephone demand fulfilment speed, two (2) wireless local loop (WLL) networks are to be introduced to provide fixed line telephone service in 1997.

In the objective area, SLT had 29 exchange to offer telecommunications services to the public as at December 1994. The total capacity was around 159,000 in switching system and around 189,000 in primary loops. The exchanges were digital except one unit situated at Mount Lavinia.

SLT has increased the main lines or direct exchange lines (DEL) at an annual increase rate of 8.5 % for the past 10 years. The number of DELs at the end of the year 1994 recorded 180,724. However, the numbers of waiters recorded 45,924 in the year 1985 came up to 186,245 as of the end of 1994, i.e., it increased at an average increase rate of 16.8 % per year, which is almost double of DEL increase rate.

The objective area had a total of 124,032 telephone lines in use as at the end of 1994. This was around 67 % of the national total. The objective area had a waiting list of around 89,000 telephone lines registered formally to SLT. In addition to this, around 10% of the formally registered waiting applications were then assumed as suppressed demand.

SLT plans to have a local exchange switching capacity of 316,000 subscriber lines and a total of external plant capacity of 506,000 primary lines in Colombo SSC Area in the year 1997 by on-going projects under way. All the exchanges will be digital when the projects end in the year 1997.

The service grade for the lines in use was poor, i.e., the successful call rate remained to mark around 30% in the national average in 1994. The number of faults per month per 100 DELs counted 25.99 as the national average, which was 16.78 in the objective area, in 1994.

5. **Project Basic Design**

5.1 Forecast

3

5.1.1 **Demand Forecast**

As discussed in Sec. 3 "Preconditions of the Feasibility Study", Chapter 1, Volume III, JICA Study Team forecast 813,752 telephone lines, 1,174,243 telephone lines and 1,995, 808 telephone lines in the whole country in the year 2000, 2005 and 2015, receptively. The telephone demand includes a certain extent of hidden demand besides the demand apparently expressed.

The demand was forecast for the whole country based on a regression formula obtained through analysing correlation between Gross Domestic Per Capita (GDP) and the penetration rate of telephone lines of selected countries. ITU Data as at 1992 of selected 50 countries were collected for the analysis. The regression formula applied to forecast telephone demand is as follows. The national telephone demand was divided to local areas in reference to their expressed demand, in principle.

 $Ln ((ML + WE) / POP \times 100) = -5.149 + 0.9692 \times Ln (GDP/POP)$

Where,

Ln:

National logarithmic operator;

ML:

Number of main lines as at 1992;

WE:

Number of registered waiters as at 1992;

POP: Population as at 1992;

GDP: GDP at 1992 price.

As to the demand of the objective area or in Colombo Metro SSC Area, JICA Study Team forecasts 465,427 fixed telephone subscriber lines in 2000 and 685,176 fixed telephone subscriber lines in 2005. As mentioned in Chapter 1, JICA Study Team also assumes 70% of the total demand will be catered by SLT in that area.

JICA Study Team recommends SLT to provide more telephone facilities as the planned capacity for the year 1997 to be provided by the on-going projects will not be sufficient to meet the said demand in the year 2000. Table 2-5-1 shows the demand breakdown by exchange of the objective area.

Table 2-5-1 Fixed-line Telephone Demand in Colombo Metro SSC Area in 2000 and 2005

Exchange	Demand (Total)		[Demand (SLT)					
	<u> </u>		%SLT= 7	0%				
	2000	2005	2000	2005				
Angoda	4,613	6,773	3,229	4,74				
Boralesgamuwa	5,494	8,066	3,846	5,640				
Central	94,474	138,724	66,132	97,104				
Havelock	48,272	70,882	33,790	49,617				
Hokandara	3,091	4,538	2,164	3,177				
Homagama	5,410	7,943	3,787	5,560				
Ja-Ela	11,756	17,558	8,229	12,29				
Kadawata	7,848	11,720	5,494	8,204				
Kaduwela	3,086	4,532	2,160	3,172				
Katunayake	9,535	14,243	6,675	9,970				
Kelaniya	15,028	22,445	10,520	15,712				
Kollupitiya	14,502	21,293	10,151	14,905				
Kotte	35,465	52,075	24,826	36,453				
Maharagama	19,306	28,348	13,514	19,844				
Malwana	2,899	4,330	2,029	3,031				
Maradana	37,876	55,614	26,513	38,930				
Mattakkuliya	8,136	11,946	5,695	8,362				
Matlegoda	3,074	4,516	2,152	3,161				
Minuwangoda	2,850	4,256	1,995	2,979				
Moraluwa	10,114	14,850	7,080	10,395				
Mount Lavinia	33,803	49,636	23,660	34,745				
Nugegoda	38,933	57,167	27,253	40,017				
Padukka	1,854	2,722	1,298	1,905				
Piliyandala	9,661	14,186	6,763	9,930				
Raddolugama	3,053	4,560	2,137	3,192				
Ragama	5,086	7,595	3,560	5,317				
Ratmalana	12,936	18,995	9,055	13,297				
Rukmalgama	1,025	1,505	718	1,054				
Wattala	11,971	17,880	8,380	12,516				
Wellampitiya	4,276	6,278	2,993	4,395				
Total	465,427	685,176	325,798	479,622				

5.1.2 Traffic forecast

(1) Conditions

Traffic in the objective area was forecast on the condition that a) the total number of subscribers of fixed lines of SLT would be 479,626 and b) the total number of WLL would be 205,553 lines, respectively, in Colombo Metro Area in the year 2005. These values were obtained multiplying 70% to the total demand forecast in that area in the year 2005.

The traffic was calculated assuming a calling rate (origination) of 0.08 erlangs per subscriber line per busiest one hour in Colombo Metro Area, 0.055 erlangs in areas other than Colombo Metro Area taking the mean value. These values were decided learning after SLT's planning values.

Traffic distribution by call categories was assumed learning after SLT's planning values and in consideration of WLL networks' participation which would take a total of 26% of subscribers in the whole country. Table 2-5-2 shows the assumed traffic distribution by call categories for traffic forecast.

Table 2-5-2 Traffic Distribution Ratio by Call Categories

Area	CR	SLT Netw	ork	*********	Other netv	Total	
	(Erl)	Own	Within SSC	Others	WLL	Others	
Colombo SSC Area	0.080	8.9%	46.6%	16.5%	26.0%		
Other areas	0.055	8 9%	14.8%	49.3%	26.0%	1.0%	100.0%

C.R.: Traffic per line per busiest one hour.

Source: JICA Study Team.

The traffic matrix was made up based on the gravity model, or the methodology presented in General Network Planning, GAS-3, ITU-T.

(2) Calculation outcome

a) Local exchange traffic in Colombo Metro Area

The traffic of local exchanges of the objective area was calculated under the conditions stated in the previous paragraph. The traffic was calculated by main exchange, placing remote switch units under corresponding main exchange. Dividing the exchange into switching system units and its dimensioning are discussed in Sec. 5.3. Table 2-5-3 shows the calculation outcome

of each main exchange traffic. The remote switch unit will have no links to other exchanges but its main exchange. Table 2-5-4 shows the traffic matrix between local (main) exchanges.

Table 2-5-3 Traffic of Local (Main) Exchanges in Colombo Metro Area in 2005

Main	Demand	Traffic	%SLT Net	work		%Private	Networks
Exchange	for SLT in 2005	(Org., Erl)		Local	Others	WLL.	Others
		0.08	8.9%	46.6%	16.5%	26.0%	2.0%
Central City	20,000	1,600.0	142.1	745.9	264.0	416.0	32.
Central North	24,896	1,991.7	176.9	928.5	328.6	517.8	39.
Central NSC	24,000	1,920.0	170.5	895.1	316.8	499.2	38.
Havelock TDM	15,400	1,232.0	109.4	574.4	203.3	320.3	24.0
Havelock Town	24,423	1,953.8	173.5	910.9	322.4	508.0	39.
Kollupitiya-1	8,500	680.0	60.4	317.0	112.2	176.8	13.0
Kolle-1	24,000	1,920.0	170.5	895.1	316.8	499.2	38.
Maradana-1	16,536	1,322.9	117.5	616.7	218.3	343.9	26.
Nugegoda-1	24,000	1,920.0	170.5	895.1	316.8	499.2	38.4
Ratumalana-1	16,395	1,311.6	116.5	611.5	216.4	341.0	26
Angoda-2	3,717	297.4	26.4	138.6	49.1	77.3	5.9
Central New	20,000	1,600.0	142.1	745.9	264.0	416.0	32.0
Central TUM	22,000	1,760.0	156.3	820.5	290.4	457.6	35.
Haveock New	18,617	1,489.4	132.3	694.3	245.7	387.2	29.8
Ja-Ela-2	5,791	463.3	41.1	216.0	76.4	120.5	9.
Kadawata-2	4,404	352.3	31.3	164.3	58.1	91.6	7.0
Kalunayake-1	17,671	7,413.7	125.5	659.1	233.3	367.6	28.3
Kalunayake-2	4,970	397.6	35.3	185.4	65.6	103.4	8.0
Kelaniya-1	11,600	928.0	82.4	432.6	153.1	241.3	18.0
Kelaniya-2	7,912	633.0	56.2	295.1	104.4	164.6	12.
Kollupitiya-2	6,405	512.4	45.5	238.9	84.5	133.2	10.7
Koile-2	12,453	996.2	88.5	464.4	164.4	259.0	193
Maharagama-1	23,480	1,878.4	166.8	875.7	309.9	488.4	37.6
Maharagama-2	8,044	643.5	57.1	300.0	106.2	167.3	12.3
Maradana-2	22,394	1,791.5	159.1	835.2	295.6	465.8	35.8
Mattakuliya-2	2,825	226.0	20.1	105.4	37.3	58.8	4.
Moraluwa-2	6,000	480.0	42.6	223.8	79.2	124.8	9.6
Mt. Lavinia-3	20,995	1,679.6	149.1	783.0	277.1	436.7	33.0
Mt. Lavinia-4	13,750	1,100.0	97.7	512.8	181.5	286.0	22.0
Nugegoda-2	16,017	1,281.4	113.8	597.4	211.4	333.2	25.0
Pikyandala-2	4,930	394.4	35.0	183.9	65.1	102.5	7.
Ratmalana-2	6,297	503.8	44.7	234.9	83.1	131.0	10.1
Wallala-1	13,317	1,065.4	94.6	496.7	175.8	277.0	21.
Wallala-2	4,516	361.3	32.1	168.4	59.6	93.9	7.
Wellanpitiya-2	3,371	269.7	23.9	125.7	44.5	70.1	5.4
	479,626	38,370	3,407	17,888	6,331	9,976	767

Table 2-5-4 Traffic Matrix between Main Exchanges in Colombo SSC Area in 2005

	Joit: Erlang	g.									,,									
	Sichange Central City	14	- 00	939	950	77.5	E 29 4	-173	G 25 5	H 337	13.0	-111	3 8	733	M 816	215	83		18.2	7 7 8
ŀ	Sentral North	1 3−	939	00	1152	223	37.6	221	37.6	425	243	14.2	19	93 9	104.4	27.6	8.1	63	233	72
- jt	Jentral NSC	Ç.	90.0	3152	0.0	21.4	36.1	21.2	31.3	40 B	23.3	13 5	17	90 0	100 1	25.4	7.7	60	22 3	2.2
	lavelock TDM	0	17.5	72.4	21 S 35 T	82.2	827	74 8	34.2 57.6	21.1 35.5	33 9 57.0	14.4 24.2	35 59	17.5 29.4	19 5 32 8	50 Z	7.0	35 59	127	12
	lavelock Fown Collupreya-1	E	29.4	22.2	21.3	148	24.9	24 9	14.1	185	10 9	5.7	- 7	- 17.3	193	19.2	23	7 9	- 89	57
	Kolle-1	ľo-	25 5	327	313	34 2	57.6	14.1	0.0	363	67.0	750	121	25.5	28.4	422	87	8.5	25 6	25
	Waradana-1	h-	33.2	42.6	40.8	21.1	35 5	18.5	36.3	00	215	10 6	4.3	33.2	37.0	260	5.3	45	14.8	1.4
	Andedogs-1	ħ.	39 1	24.4	23.4	33 9	57.1	10.9	67.1	21.5 10.8	123	42 3 0 0	7.3	19.1	21.5	41 B	7.1	5.4 4.3	22 3 77.1	21
	Ratumalana 1 Ungoda 2	1 3-4	35	142	137	14.4	243	57	25 1 12 1	43	73	4.0	00	39		43	22	28	82	0.6
	Central New		733	93.9	900	17.5	29 4	17.3	25 5	33 2	19 0	11.1	3.8	00	816	215	6.3	4.9	182	1.8
	Central TDM	M	81.6	504.4	100.1	19.4	32.7	197	20 3	37.0	212	123	1.3	81.6	00	23 9	7.0	55	20.5	20
	Tayeock New	N	21 E	27.6	26.5	60.2	101.4	18.2	42.2	26 0 5 2	41.8	177	43	216	7.0	5.1	51	4.3 5.4	15 E	15
	Ja-Ela-Z Kadawata 2	0	63	8.1 63	7.B 6.0	42 35	7.0	23	87	45	6.4	4.3	28	49	5 5	43	6.4	0.0	14.5	TA
	Catunayaka-1	la l	183	23.5	22 5	12.7	21.4	70	257	14.9	22.4	77.1	83	183	20.1	157	47.8	74.6	00	1347
	Kalurayaka 2	R i	18	23	72	12	21	07	25	1,4	72	1.7	0.6	1.8	20	- 15	46	1.4	134 8	C.U
ľ	(elaniya-1	<u>।</u>	34.0	17.9	172	8.6	147	5 2	22.7	97	92	B 3	5 2 1 0	14.0 5.1	15 6 10.1	10 B	7.6	9 2 5 0	189	18
	(earrys-Z	6	9.1 12.9	11.7	11.2 35.5	5.7 11.0	9 6 18 6	3.1	14 B	138	8.1	- 42	13	129	34.4	13 6	17	13	52	05
	Collupitry 8-2 Colle-2	₩	119	15 3	14.7	15.0	27.0	86	857	17.0	31.4	117	5.7	119	13.3	197	4.1	4.0	12.0	12
	Maharagama-1	W	17.8	228	21.9	220	37.1	~ B9	52 6	185	. 77.5	58.9	9.4	17.8	198	27.1	90	B.3	28 9	26
	Vahalagama-2	IX.	7	60	58	58	9.8	24	139	4.9	20 3 30 1	15 5 15 Y	25 80	48.6	5 2 51 8	77 35 4	72	72 83	7.6 20.7	20
	Maradana-2 Mariakuliya-2	Ľ,	46 b	59.7 3.6	57.2 3.5	29.3	497	25.9	50 B	2.4	30.1	13.1	- 87	- 28	31.0	377	13	17	32	03
	Moratuwa Z	汰	45	5.7	35		8.7	22	92	42	130	29.0	1.6	45	50	- 64	23	19	7.9	oe
	VI Lavinia-3	AB	16.5	20 €	T9 8	24.0	40.3	87	34 2	15 5	62.4	76 3	1.9	15.1	17.9	29 5	6.4	5.2	20.9	20
	VIL Laviria-€	AC	9.6	12.3	51.6	14.3	24.1	5.2	20.4	9.3	37.2	45 5 26 2	29	11.6	132	17 6 25 9	38	3.1	125	12)
Į,	Yugagoda-2 Yiliyanda:a-2	AU AE	11.8 3.4	152	14.5	21.0	35.4 6.6	6 E	416	13.4	110 5	15.6		34	38		18	18	-81	- 08
	Raimalana Z	A.	37	17	4.5	4.6	8.1	19	E 3	3.6	14.1	47.4	13	37	43	59	1.7	1.4	··· 5 7	0.5
- 17	Nattala-1	AG	17.5	223	21,4	9.5	16 5	60	22 7	15.4	15.4	9.5	- 56	77.5	19.1	12.3	10.8	71.1	25.5	2.5
	Waltala 2	ХΗ	5.2	6.7	6.4	2.5	49 56	16	8 8 10 5	16 87	45	2 B	7	52 46	58	36	32	3 3	7.6	0.7
	Netarobya 2 IOTAL	М.	745.2	927.6	5 B	3.3 573.4	909.3	316.6	893.4	<u> 515.9</u>	893.1	609.9	138.3	745.2	819.7	593.Z	215.4	183 9	654.4	184.8
		L!	1	327.0	034.2			310.0	033.4		033.1	003.5	130.3			633.2				
_ [2	xchange		3	n	U	A	w	X	γ	z	W.	AB	XC	עאן	λE	AF .	AG	AFF	X	TOTAL
[1	exchange Central City	ķ	S 54.0	9.1	129	7119	W 17.8	X 4.7	Y 45.6	Z 39	W 45	AB 18.0	AC UE	ע <u>ג</u> 11.8	λE 3.4	AF 37	AG 17.6	AH 53	AT 16	TOTAL 745 6
- 10 10	exchange Central City Central North	А В С	3	n	U	A	w	X	γ	z	W.	AB	XC	11.8 15.1 14.5	AE 3.4	AF .	AG 17.6 22.5 21.6	AH 53 67 65	AI 4.6	TOTAL 745 6 928 1 894 7
	Exchange Central City Central North Central NSC Tayelock TUM	1-	S 340 340 340	9.1 11.7 11.2 5.7	129 165 358	7 11.9 15.3 14.5	W 17.8 22.8 21.8 22.0	X 4.7 50 58 58	7 45 6 59 6 57 2 29 6	Z 39 50 48	4.5 5.7 5.5 5.2	AB 16.0 20.5 19.7 23.9	AC 95	XD 11.8 15.1 14.5 21.0	AE 3.4 4.3 4.1 3.9	AF 37 47 45	AG 17.6 22.5 21.6	AH 53 67 85	AI 16 59 56 33	TOTAL 745 6 928 1 834 7 574 1
	exchange Central City Central North Central NSC Cavelock TUM Cavelock TOWN	ļc	S 340 380 372 88	9.1 11.7 11.2 5.7 9.6	129 165 158 110	7 11.9 15.3 14.5 16.0 27.0	77.8 22.8 21.8 22.0 37.0	X 4.7 50 58 58	7 45 6 59 6 57 7 29 6 49 8	2 39 50 48 19	45 57 55 52 87	AB 16 0 20 5 19 7 23 9 40 3	AC 95 123 117 143 240	11.8 15.1 14.5 21.0	AE 3.4 4.3 4.1 3.9 5.6	AF 37 47 45 48 80	AG 17.6 22.5 21.6 9.9 18.6	AH 53 67 65 30 50	AI 16 59 56 33 56	745 6 928 7 894 7 574 7
	exchange Central City Central North Central NSC Havefock TOM Havefock Town Kollophya-T	0 b m F	5 140 180 172 88 148 52	9.1 11.7 11.2 5.7 9.6 3.4	U 129 165 158 110 186	7119 153 145 160 270 68	77.8 22.8 21.8 22.0 37.0	X 4.7 50 58 58 98	7 45 6 59 6 57 7 29 6 49 8 25 9	Z 39 50 48 19 33	AX 45 57 55 52 87 22	AB 18.0 20.5 19.7 23.9 40.3 87	AC 8 6 12 3 14 3 24 8 5 2	XD 11.8 15.1 14.5 21.0 35.4 88	AE 3.4 4.3 4.1 3.9 6.6	AF 37 47 45 46 80	AG 17.6 22.5 21.6 9.9 18.6	AH 53 67 85	AI 16 59 56 33	TOTAL 745 6 928 1 834 7 574 1
	exchange Central City Central North Central NSC Cavelock TUM Cavelock TOWN	ļc	S 34 0 18 0 17 2 8 8 8 14 8	9.1 11.7 11.2 5.7 9.6	129 165 158 110	7 11.9 15.3 14.5 16.0 27.0	77.8 22.8 21.8 22.0 37.0	X 4.7 50 58 58	7 45 6 59 6 57 7 29 6 49 8	2 39 50 48 19 33 12 43	45 57 55 52 87 22 97	AB 18.0 20.5 19.7 23.9 40.3 87 34.1	AC 96 123 117 143 240 52 204 93	XD 11.8 15.1 14.5 21.0 35.4 8.8 41.8	AE 34 3 4 1 3 9 5 6 1 6 8 2 3 3	37 47 45 46 80 19 83	AG 17.6 22.5 21.6 9.9 18.6 6.0 22.9	AH 53 67 85 30 50 18 69	AI 45 59 56 33 56 20 505 67	707AL 745 6 928 7 834 7 574 7 910 5 316 9 834 7 618 5
	exchange Central City Central North Central NSC Tayelock TOM Tayelock Town Coruphya-1 Cotto-1 Varadana-1 Nogogoda-1	0 b m F	S 180 180 172 88 148 52 225 142	91 117 112 57 96 34 149 97	U 129 165 158 110 186 94 105 138	7 11 9 15 3 14 5 16 0 27 0 6 8 8 5 7 17 0 3 1 4	W 17.8 22.8 21.8 22.0 37.0 8.9 52.5 18.5 77.5	4.7 50 58 58 98 24 139 49	7 45 6 59 6 57 7 29 6 49 8 25 9 50 9 73 1	2 39 50 48 19 33 72 43 33	45 57 55 52 87 22 97 47	AB 18.0 20.5 19.7 23.9 40.3 87 34.1 15.6 62.4	AC 95 123 117 143 240 52 204 93 372	XD 11.8 15.1 14.5 21.0 35.4 8.8 41.8 13.3 13.05	AE 34 13 41 39 66 16 82 33	AF 37 47 45 80 19 83 36	AG 17.6 27.5 21.6 9.9 18.6 6.0 22.9 15.6	AH 53 67 85 30 50 18 69	AI 46 59 56 33 56 20 50 5 67 50 5	745 6 428 7 834 7 574 7 910 5 910 5 910 5 814 7 613 5 824 7
	charge Central City Central North Central NSC Tayelock TOM Tayelock Town Koffer T Waradana T Kateriana T Rateriana T	- U - U - U - U - U - U - U - U - U - U	5 14.0 18.0 17.2 8.8 14.8 5.2 72.5 14.2 14.2 8.4	9.1 11.7 11.2 5.7 9.6 3.4 14.9 9.2 9.3 9.5 5.5	129 165 158 110 186 94 105 138 82	9 11 9 15 3 14 5 16 0 27 0 5 8 5 7 17 0 31 4 11 7	W 17.8 22.8 21.8 22.0 37.0 8.9 52.5 18.5 77.5 58.9	47 60 58 58 98 24 139 49 205	7 45 6 59 6 57 7 29 6 49 8 25 9 50 9 73.1 30 2	2 39 50 48 19 33 12 43 33 29	45 57 55 52 87 22 97 47 130	AB 18 0 20 5 19 7 23 9 40 3 87 34 1 15 6 62 4 78 3	AC 96 123 11.7 143 240 52 20.4 93 37.2 45.5	XD 11.8 15.1 14.5 21.0 35.4 8.8 41.8 13.3 13.0 13.0 26.3	AE 34 13 39 66 16 82 33 11 3 66	AF 37, 47, 45, 48, 80, 19, 83, 36, 140,	AG 17.6 22.5 21.6 9.9 18.6 6.0 22.9 15.6 15.5 9.6	API 53 67 65 30 50 18 69 47	AT 46 59 56 33 56 70 50 5	745 6 745 6 928 7 574 7 910 5 316 9 834 7 618 5 834 7
	Exchange Central City Central North Central North Central NSC Cent	- U - U - U - U - U - U - U - U - U - U	S 180 180 172 88 148 52 225 142 242 84 82	9.1 11.7 11.2 5.7 9.6 3.4 14.9 9.7 9.3 5.5	U 12 9 16 5 15 8 10 5 10 5 10 5 10 5 10 5 10 5 10	7 11 9 15 3 14 5 16 0 27 0 6 8 8 5 7 17 0 3 1 4	W 17.8 22.8 21.8 22.0 37.0 8.9 52.5 18.5 77.5	4.7 50 58 58 98 24 139 49	7 45 6 59 6 57 7 29 6 49 8 25 9 50 9 73 1	2 39 50 48 19 33 72 43 33	45 57 55 52 87 22 97 47	AB 18.0 20.5 19.7 23.9 40.3 87 34.1 15.6 62.4	AC 95 123 117 143 240 52 204 93 372	XD 11.8 15.1 14.5 21.0 35.4 8.8 41.8 13.3 13.05	AE 34 13 41 39 66 16 82 33	AF 37 47 45 80 19 83 36	AG 17.6 27.5 21.6 9.9 18.6 6.0 22.9 15.6	AH 53 67 85 30 50 18 69	AI 46 59 56 33 56 20 50 5 67 50 5	707AL 745 6; 928 7 894 7 574 7 910 5; 318 9 894 7 618 5; 894 7 611 2 618 5; 745 8;
	charge Central City Central North Central NSC Tayelock TOM Tayelock Town Koffer T Waradana T Kateriana T Rateriana T	- U - U - U - U - U - U - U - U - U - U	5 14.0 18.0 17.2 8.8 14.8 5.2 72.5 14.2 14.2 8.4	9.1 11.7 11.2 5.7 9.6 3.4 14.9 9.2 9.3 9.5 5.5	729 165 158 110 186 94 105 138 82 423 129	V 11.9 15.3 14.5 16.0 27.0 6.6 85.7 17.0 31.4 11.7 5.7	77.8 22.8 21.8 22.0 37.0 8.9 52.5 18.5 77.5 53.9 17.8	X 4.7 5 0 5 8 5 8 9 8 2 4 13 9 4 9 20 5 15 6 2 7 5 7	7 45 6 59 6 57 2 29 6 49 8 25 9 50 9 73 1 30 2 15 1 8 0 48 6 51 8	Z 39 50 48 19 33 12 43 33 33 12 18 10 39 42	45 5.7 5.5 5.7 8.7 2.2 9.7 4.7 13.0 29.0 14.5 14.5 5.0	AB 18:00 20:5 19:7 23:9 40:3 87 34:1 15:6 62:4 78:3 16:00 17:9	AC 96 123 117 143 240 52 204 93 372 455 96	AD 11.8 15.1 14.5 21.0 35.4 6.8 41.8 13.3 13.05 26.3 41.8 13.1	AE 3.4 4.3 4.1 3.9 5.6 5.6 5.7 1.3 1.5 6.1 3.4 3.8 3.8 3.8 3.8 3.8 3.8 3.8 3.8 3.8 3.8	AF 37 47 45 80 80 19 83 36 140 47.9	AG 17.8 22.5 21.6 22.9 48.6 6.0 22.9 15.6 15.5 9.6 17.6 19.5 17.6 19.5 19.5 19.5 19.5 19.5 19.5 19.5 19.5	AH 53 67 85 50 50 18 69 47 47 29 53	AI 46 59 56 33 56 70 50 50 75 17 45 51	707AL 745 6 928 7 894 7 574 7 910 5 316 9 894 7 613 5 894 7 611 2 138 8 745 8 820 7
	exchange Sentral City Sentral North Sentral North Favelock TOM Favelock New	C D E F C H I J K L M K	S 140 180 172 80 148 52 725 142 142 84 84 555 760	91 11.7 11.7 9.6 3.4 14.9 9.2 9.3 5.5 40 9.1	729 165 158 1105 186 94 105 138 427 139 123 136	9 11 9 15 3 14 5 15 16 16 16 16 16 16 16 16 16 16 16 16 16	W 17.8 22.8 21.8 22.0 37.0 8.9 52.5 18.5 77.5 53.9 9.4 17.8 19.6 27.1	X 4.7 50 58 58 74 139 49 205 156 25 77	7 45 6 59 6 57 7 29 6 49 8 25 9 50 9 73.1 30 7 15.1 6 0 48 6 51 8	2 39 50 48 19 33 72 43 33 29 18 10 39	48 57 55 52 87 22 97 43 43 29 0 18 45 50	AB 18:00 20:5 19:7 23:9 40:3 87 34:1 15:6 62:4 78:3 15:0 16:0 17:9 52:5 52:5 52:5 16:0 17:9 52:5 52:5 52:5 52:5 52:5 52:5 52:5 52	AC 96 123 117 143 52 204 52 204 93 372 455 29 96 106	AD 11.8 15.1 14.5 21.0 35.4 6.8 41.8 13.3 13.05 26.3 41.8 13.1 13.1	AE 3.4 4.3 4.1 3.9 6.6 8.2 3.3 11.3 15.6 1.5 3.4 3.8	AF 37 47 45 86 89 83 36 140 473 13 37 43	AG 17.8 22.5 21.6 9.9 18.6 0.0 22.9 15.6 15.5 9.6 5.7 17.2 12.2	AH 53 67 65 30 18 69 47 47 29 17 53 59	AI 46 59 56 33 56 70 50 50 50 50 50 50 50 50 50 50 50 50 50	707AL 745 6 928 7 834 7 574 7 910 5 316 9 834 7 613 5 715 8 717 2 138 6 745 6 840 7 641 2 642 6
	exchange Central City Central North Central North Central North Central North Central North Cardoth Town Central County Central County Central North Central Now Central Town	C D E F G H I J K L W	5 14 0 19 19 19 19 19 19 19 19 19 19 19 19 19	9.1 117 5.7 9.6 3.4 14.9 9.3 5.5 40 9.1 7.7 7.7 5.0	129 158 158 110 186 94 105 138 42 42 43 139 143 143 143	9 11.9 13.3 14.5 16.0 27.0 6.8 85.7 17.0 31.4 11.7 5.7 11.9	W 17.8 22.8 22.0 37.0 8.9 52.5 17.5 53.9 9.4 17.8 19.6 29.0 29.0 29.0 29.0 29.0 29.0 29.0 29.0	4.7 50 58 58 98 74 139 205 156 25 47 52 72	7 45 6 59 6 57 7 29 8 49 8 25 9 50 9 73 1 30 7 15 1 6 0 48 6 51 8 51 8 51 8	Z 39 5.0 4.8 19 33 33 32 9 18 10 39 4.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3	45 5.7 5.5 5.7 8.7 2.2 9.7 4.7 13.0 29.0 14.5 14.5 5.0	AB 18:00 20:5 19:7 21:9 40:3 87 34:1 15:6 62:4 78:3 45:6 16:0 17:2 9:5 83	AC 96 123 11.7 143 240 52 20.4 37.2 455 96 10.6 17.6	AD 11.8 15.1 14.5 21.0 35.4 6.8 41.8 13.3 13.05 26.3 41.8 13.1	AE 3.4 4.3 4.1 3.9 5.6 1.6 8.2 3.3 11.3 15.6 1.5 3.4 3.4 4.8	AF 37, 475 486 80 19 83 83 140 47,9 13 37, 47,9	AG 17.6 22.5 29.6 60 22.9 15.5 9.6 5.7 17.6 19.5 17.2 18.5 18.5 18.5 18.5 18.5 18.5 18.5 18.5	AH 53 67 85 50 50 18 69 47 47 29 53	AI 46 59 56 33 56 70 50 50 75 17 45 51	707AL 745 6 928 7 894 7 574 7 910 5 316 9 894 7 613 5 894 7 611 2 138 8 745 8 820 7
	Exchange Senter City Senter North Senter Nor	ACMMON'S HONGO	S 14 0 18 0 18 0 18 0 18 0 18 0 18 0 18 0	9.1 11.7 11.2 5.7 9.6 3.4 9.7 9.3 5.5 40 9.1 10.2 7.1 7.1 6.0	729 165 158 1105 186 94 105 138 427 139 123 136	9 11 9 15 3 14 5 15 16 16 16 16 16 16 16 16 16 16 16 16 16	W 17.8 22.8 21.8 22.0 37.0 37.0 52.5 18.5 77.5 53.9 9.4 17.8 19.6 27.1	X 4.7 50 58 58 74 139 49 205 156 25 77	7 486 596 597 296 498 259 509 73.1 307 15.1 60 486 518 365 63	2 39 50 48 19 33 72 43 33 29 18 10 39	45 57 55 52 87 22 97 47 430 290 18 45 50 64	AB 18:00 20:5 19:7 23:9 40:3 87 34:1 15:6 62:4 78:3 15:0 16:0 17:9 52:5 52:5 52:5 16:0 17:9 52:5 52:5 52:5 52:5 52:5 52:5 52:5 52	AC 96 123 117 143 52 204 52 204 93 372 455 29 96 106	AD 11.8 15.1 14.5 21.0 35.4 88 41.8 13.0 35.4 18.8 13.0 26.3 11.8 13.1 25.9	AE 3.4 4.3 4.1 3.9 5.6 6.8 7.3 7.5 1.5 1.5 3.4 3.8 4.8	AF 37 47 45 86 89 83 36 140 473 13 37 43	AG 17.8 22.5 21.6 9.9 18.6 0.0 22.9 15.6 15.5 9.6 5.7 17.2 12.2	AH 53 67 85 30 50 18 69 47 29 47 53 59 36 33 37	AI 46 59 56 33 56 70 50 57 50 17 50	TOTAL 745 6 928 7 928 7 930 5 376 9 834 7 676 5 834 7 676 5 834 7 138 6 745 6 820 7 634 7 634 7 634 7 634 7 634 7 634 7 634 7
	exchange Zentral City Central North Central North Favelock Town Competing 1 Kosto-1 Ko	C D E F C H I J K L M K	5 14 0 19 19 19 19 19 19 19 19 19 19 19 19 19	9.1 11.7 11.7 5.7 9.2 3.4 14.9 9.3 40 9.1 10.2 7.1 5.0 6.0	129 1655 158 110 186 193 193 129 129 136 137 136 137	V 119 153 145 150 150 150 150 150 150 150 150 150 15	W 1/8 72 8 72 8 72 8 72 8 75 77 8 75 77 8 75 77 8 75 77 8 75 77 8 75 77 8 75 77 8 75 77 8 75 75 75 75 75 75 75 75 75 75 75 75 75	4.7 5.0 5.8 5.8 9.8 2.4 13.9 4.9 20.5 15.6 2.5 4.7 5.7 2.7 2.4 2.7 2.7 7.7	456 596 597 296 498 259 731 302 15.1 60 486 518 365 72 63 740	2 39 50 48 19 33 32 32 32 32 42 42 42 42 42 42 42 42 42 42 42 42 42	### ##################################	AB 1800 20 5 197 23 9 7 34 1 15.6 62 4 9 16 0 0 16	AC 98 123 11.7 12.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5	AD 11.8 15.1 14.5 21.0 35.4 41.8 41.8 13.9 13.9 4.5 11.8 3.9 4.4 3.9 13.9	AE 344 43 41 39 66 82 33 11 3 4 8 4 8 18 16 6 2 0 0 0 0 0	AF 37/ 45/ 45/ 80/ 199/ 83/ 36/ 14/3/ 13/ 37/ 47/3/ 13/ 59/ 14/3/ 59/ 17/ 47/5	AG 17.6 22.5 21.6 6.0 22.9 15.6 5.7 17.6 19.5 17.6 19.5 17.1 17.1 17.1 17.1 17.1 17.1 17.1 17	AH 53 67 85 30 50 18 69 47 47 17 53 53 33 33 37 07	AI 46 59 56 33 58 70 50 50 50 50 50 50 50 50 50 50 50 50 50	707 AU 745 6 928 7 928 7 936 5 318 9 834 7 619 5 834 7 611 2 138 6 820 7 620 7 620 7 63 6 64 7 65 6 65 7 65 6 65 7 65 7 65 7 65 7 65
	exchange central City central North central North flavelock TOM flavelock New flaveloc	COMPACE	\$ 140	9.1 11.7 11.7 9.6 3.4 14.9 9.3 9.3 9.1 10.2 7.7 5.0 6.0 12.4 12.4 12.4 12.4 38.7	U 129 1655 158 110 186 194 105 138 129 13 144 144 152 145 152 152 153 153 154 154 155 155 155 155 155 155 155 155	119 153 160 270 685 857 170 314 117 57 119 133 197 41 40 120	W 178 22 8 22 8 22 6 37 0 6 8 9 9 4 178 178 27 178	4.7 5.0 5.8 5.8 2.4 13.9 4.9 20.5 15.6 2.5 4.7 5.2 7.7 7.4 4.2 2.7 7.7 7.7	45 6 59 6 59 7 7 29 6 49 8 25 9 50 9 50 9 15 1 60 6 43 6 51 8 56 5 72 7 20 9 19 8	Z 399 500 488 199 33 33 33 39 100 39 42 24 25 16 43 45 45 45 45 45 45 45 45 45 45 45 45 45	AX 45 57 55 57 57 57 47 47 45 50 50 64 4 73 50 64 65 65 65 65 65 65 65 65 65 65 65 65 65	AB 1800 20 5 197 23 9 40 3 45 6 24 4 5 6 6 2 4 5 6 6 2 4 5 6 6 2 4 6 6 2 6 6 2 6 6 6 2 6 6 6 6 6 6	AC 98 12 12 13 14 13 14 13 14 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	AD 11.8 15.1 14.5 21.0 35.4 18.6 13.3 13.5 26.3 15.1 25.9 4.4 3.9 13.9 13.9	AE 344 139 666 82 333 15 34 38 18 18 62 62 92 9	AF 37 47 45 80 19 83 83 83 84 47 33 7 47 47 47 47 47 47 47 47 47 47 47 47 4	AG 17.6 22.5 21.6 22.5 21.6 22.9 15.6 22.9 15.6 22.9 15.6 22.9 17.6 19.5 25.8 25.8 25.8 25.8 25.8 25.8 25.8 25	AH 53 67 85 30 50 18 69 47 47 29 17 53 59 33 33 77 61	Al 46 59 56 33 56 75 50 75 50 15 15 40 0 0 4	TOTAL 745 6 928 7 928 7 930 5 936 9 937 7 930 5 937 7 639 5 934 7 639 5 934 7 639 5 934 7 639 6 945 9 162 9 162 9 163 8
	exchange Zentral City Central North Central North Flavelock Town Compenya F Controlly F Controll F Control F Contro	COMPACE	S 14 0 18 0 19 19 18 0 19 18 0 18 18 18 18 18 18 18 18 18 18 18 18 18	91 117 117 91 96 34 93 93 93 91 91 707 71 50 60 124 127 387 00	129 165 158 110 186 186 186 186 105 138 129 134 136 136 136 137 136 137 138 138 138 138 138 138 138 138 138 138	119 153 145 160 2700 887 170 314 117 57 119 133 197 40 120 120 68	W 17.8 22.8 27.0 8.9 52.5 18.5 77.5 54.9 9.4 17.8 19.6 27.1 9.0 26.1 17.8 17.8 17.8 17.8 17.8 17.8 17.8 17	4.7 50 58 58 98 24 13.9 4.9 205 15.6 25 4.7 52 7.7 24 27 7.7 07	7 48 6 59 6 57 7 29 6 49 8 25 9 50 9 73.1 30 2 15.1 8 0 48 6 51 8 36 5 72 7 20 9 20 9	2 39 50 48 19 33 72 43 33 18 10 39 12 43 18 10 39 10 10 10 10 10 10 10 10 10 10 10 10 10	### ##################################	AB 1800 205 197 219 403 87 34 1 156 62 45 160 17.9 52 5 21 0 20 160 17.9 17.9 17.9 17.9 17.9 17.9 17.9 17.9	AC 9 8 12 3 11 7 14 3 2 4 5 5 2 9 4 5 5 10 8 10 8 10 8 10 8 10 8 10 8 10 8	AD 11.8 15.1 14.5 21.0 35.4 88 41.8 13.3 13.0 26.3 45.7 13.1 25.9 4.4 3.9 13.9 13.9 88 88	AE 34434139 6666 62 29 19	AF 37 47 45 48 80 83 36 473 13 37 37 43 59 17 67 67 67 67 67 67 67 67 67 6	AG 17.6 22.5 23.6 6.0 22.9 15.6 5.7 17.2 17.2 17.2 17.2 17.2 17.2 17.2 17	AH 53 67 85 30 18 69 47 29 17 29 35 33 33 33 37 77 07	Al 4 5 9 5 6 3 3 3 5 6 7 2 0 10 5 5 0 7 5 0 7 5 1 7 4 1 1 1 5 1 1 5 1 5 1 5 1 5 1 5 1 5 1 5	707AU 745 6 928 7 934 7 574 7 930 5 944 7 633 6 944 7 635 8 947 7 611 2 948 8 947 7 612 9 948 9
	Exchange Zentrar City Zentrar North Zentrar NSC Tayalook I DM Tayalook I DM Tayalook I Town Corticphys I Cotto I Waradana I Nugepoda I Reviorata New Zentrar New Zentrar New Tayalook Ne	COMPACE	\$ 140	9.1 11.7 11.7 9.6 3.4 14.9 9.3 9.3 9.1 10.2 7.7 5.0 6.0 12.4 12.4 12.4 12.4 38.7	U 129 1655 158 110 186 194 105 138 129 13 144 144 152 145 152 152 153 153 154 154 155 155 155 155 155 155 155 155	119 153 160 270 685 857 170 314 117 57 119 133 197 41 40 120	W 178 22 8 22 8 22 6 37 0 6 8 9 9 4 178 178 27 178	4.7 5.0 5.8 5.8 2.4 13.9 4.9 20.5 15.6 2.5 4.7 5.2 7.7 7.4 4.2 2.7 7.7 7.7	45 6 59 6 59 7 7 29 6 49 8 25 9 50 9 50 9 15 1 60 6 43 6 51 8 56 5 72 7 20 9 19 8	Z 399 500 488 199 33 33 33 39 100 39 42 24 25 16 43 45 45 45 45 45 45 45 45 45 45 45 45 45	AX 45 57 55 57 57 57 47 47 45 50 50 64 4 73 50 64 65 65 65 65 65 65 65 65 65 65 65 65 65	AB 1800 20 5 197 23 9 40 3 45 6 24 4 5 6 6 2 4 5 6 6 2 4 5 6 6 2 4 6 6 2 6 6 2 6 6 6 2 6 6 6 6 6 6	AC 98 12 12 13 14 13 14 13 14 13 14 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	AD 11.8 15.1 14.5 21.0 35.4 18.6 13.3 13.5 26.3 15.1 25.9 4.4 3.9 13.9 13.9	AE 344 139 666 82 333 15 34 38 18 18 62 62 92 9	AF 37 47 45 80 19 83 83 83 84 47 33 7 47 47 47 47 47 47 47 47 47 47 47 47 4	AG 17.6 22.5 21.6 22.5 21.6 22.9 15.6 22.9 15.6 22.9 15.6 22.9 17.6 19.5 25.8 25.8 25.8 25.8 25.8 25.8 25.8 25	AH 53 67 85 30 50 18 47 47 47 53 59 36 33 77 151 105 37	4 b 5 9 5 5 6 7 0 7 5 0	TOTAL 745 6 928 7 894 7 574 7 910 5 916 5 844 7 618 5 844 7 618 5 844 7 618 6 745 6 860 7 864 2 664 2 658 6 755 6
	Exchange Zentral City Central North Favelock Town Controllys I Controllys Z C Controllys Z C	COMPACE	S 14 0 18 0 18 0 18 0 18 0 18 0 18 0 18 0	91177177717777777777777777777777777777	129 165 158 1100 186 93 138 129 138 129 136 177 143 152 152 153 152 153 153 153 153 153 153 153 153 153 153	9 119 133 145 150 150 150 150 150 150 150 150 150 15	W 17.8 22.8 21.8 22.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37	47 60 58 98 74 139 49 205 156 25 47 52 77 24 22 77 77 18 65 65	7 48 6 59 6 59 7 2 59 8 50 9 7 50 1 8 5 6 3 7 6 9 7 19 8 7	2 39 50 48 19 33 72 43 29 18 10 39 42 24 43 43 43 44 46 64 64 64 64 64 64 64 64 64 64 64	45 57 57 55 57 22 87 42 43 18 45 50 64 23 35 35 37 22 43 42 43 43 43 45 45 45 45 45 45 47 47 47 47 47 47 47 47 47 47 47 47 47	AB 18:00 20:51 19:70 20:51 19:70 20:51 19:70 20:51 19:70 20:51 19:70 20:51 19:70 19:	AC 98 123 11.7 14.3 24.0 24.0 29.5 29.5 29.5 29.5 29.5 29.5 29.5 29.5	118 151 145 2100 354 88 4133 1305 1305 148 1319 1319 1319 1319 1319 1319 1319 131	AE 34 43 34 41 37 39 48 48 48 62 29 12 38 31 48 31 48	AF 37 47 48 80 19 83 36 140 473 37 59 77 77 05 28 18 18 18 18 18 18 18 18 18 1	43 17.6 22.5 21.6 22.5 21.6 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5	AH 53 67 85 300 500 18 47 47 47 53 53 33 37 77 105 105 133 27 57	AT	707AU 745 6 928 7 938 4 7 574 7 936 5 834 7 636 5 834 7 611 2 138 6 820 7 638 6 155 3 422 4 223 8 424 7 238 8
	exchange central City central North central North favelock 1 DM favelock New faveloc	CO E F C R L J K L W K O P O K S T O V	S 14 0 18 0 18 0 18 0 18 0 18 0 18 0 18 0	9.1 11.7 11.7 9.6 3.4 9.7 9.7 9.7 9.7 10.7 7.1 5.0 6.0 12.4 12.4 12.4 12.4 12.4 12.4 12.4 12.4	129 165 158 1100 186 105 138 128 128 128 136 136 136 136 136 136 137 144 152 152 153 164 165 165 165 165 165 165 165 165 165 165	119 133 148 160 270 68 857 177 177 177 177 197 40 120 120 120 120 120 120 120 120 120 12	17.8 22.8 21.8 22.0 37.0 37.0 37.0 52.5 53.9 9.4 17.8 19.8 27.1 90.0 28.6 28.6 24.6 24.6 24.6 24.6 24.6 24.6 24.6 24	4.7 8.0 5.8 9.8 9.8 13.9 20.5 15.6 2.5 4.7 5.2 7.7 2.4 4.7 2.7 7.7 4.7 7.7 4.7 7.7 1.8 8.6 9.8 9.8 9.8 9.8 9.8 9.8 9.8 9.8 9.8 9.8	7	2 399 500 48 8 12 12 12 12 12 12 12 12 12 12 12 12 12	43 57 57 57 57 87 22 97 130 290 16 45 50 81 80 80 80 80 80 81 80 81 81 82 82 83 83 84 85 84 86 86 87 87 87 87 87 87 87 87 87 87 87 87 87	AB 18:0 20:5 19:7 21:9 40:3 87:7 34:1 15:5 62:4 59:5 20:5 17:9 5:2 21:0 6:5 16:0 6:5	AC 98 123 117 143 24 00 52 20 4 5 5 29 9 5 5 17 6 4 7 2 9 5 9 5 8 4 9 5 5 8 6 6 6 6 8 6 6 8 6 6 8 6 6 6 8 6 6 6 8 6 6 6 6 8 6	AD 118 151 145 210 354 88 4133 1305 263 456 118 39 139 139 139 139 139 139 148 179 50 481 170 170 170 170 170 170 170 170 170 17	AE 3.4 13 3.9 6.6 6.2 13 3.4 15.6 16.2 16.2 16.2 16.2 16.2 16.2 16.2 16	AF 37 475 80 19 83 56 140 473 137 57 57 57 57 57 57 57 57 57 5	AG 1786 225 2166 620 229 156 620 229 156 620 1	53 57 50 50 50 18 59 47 29 17 59 59 59 33 33 77 51 105 53	Al	TOTAL 745 6 928 7 939 7 574.7 930 5 936 9 834 7 649 5 834 7 641 5 838 7 659 6 842 7 859 7 659 6 850 7 859 7 659 6 850 7 859 7 859 7 859 7 859 7 859 7 859 7 859 7 859 7 859 7 859 7 859 7 859 7 859 7 859 7 859 8 850 7 859 8 850 7
	exchange Zentrar City Zentrar North Zentrar North Tavelock Town Kontpohya Town Kontpohya Town Kontpohya Town Kontpohya Town Kontpohya Town Zentrar New Zentrar New Zentrar New Zentrar New Zentrar New Zentrar New Zentrar Town Zentrar Jown Zentrar Jown Zentrar Town Zentrar Town Zentrar Town Zentrary Zentr	CO E F C R L J K L W K O P O K S T O V	S 14 0 18 0 17 2 14 8 4 18 18 18 18 18 18 18 18 18 18 18 18 18	911771172 96 3.4 4.5 9.7 9.7 9.7 9.7 9.7 9.7 9.7 9.7 9.7 9.7	1729 165 158 1100 186 1705 175 175 177 177 177 177 177 177 177 17	119 143 145 160 270 270 270 857 170 1177 57 1197 197 40 108 69 49 49 49 49 49 49 49 49 49 49 49 49 49	W 17.8 22.8 21.8 22.0 37.0 37.0 37.0 37.0 37.0 37.0 37.0 37	4.7 8.0 5.8 5.8 5.8 5.8 13.9 4.9 20.5 15.6 4.7 7.7 7.7 7.7 7.7 1.8 6.5 93.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	7 456 536 577 286 259 559 559 737 307 737 307 151 436 436 436 436 437 437 438 438 439 439 439 439 439 439 439 439 439 439	2 39 50 48 19 33 72 43 29 18 10 39 42 24 43 43 43 44 46 64 64 64 64 64 64 64 64 64 64 64	45 57 57 55 57 22 87 42 43 18 45 50 64 23 35 35 37 22 43 42 43 43 43 45 45 45 45 45 45 47 47 47 47 47 47 47 47 47 47 47 47 47	AB 18:00 20:51 19:70 20:51 19:70 20:51 19:70 20:51 19:70 20:51 19:70 20:51 19:70 19:	AC 98 123 11.7 14.3 24.0 24.0 29.5 29.5 29.5 29.5 29.5 29.5 29.5 29.5	118 151 145 2100 354 88 4133 1305 1305 148 1319 1319 1319 1319 1319 1319 1319 131	AE 34 43 34 41 37 39 48 48 48 62 29 12 38 31 48 31 48	AF 37 47 48 80 19 83 36 140 473 37 59 77 77 05 28 18 18 18 18 18 18 18 18 18 1	43 17.6 22.5 21.6 22.5 21.6 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5	AH 53 67 85 300 500 18 47 47 47 53 53 33 37 77 105 105 133 27 57	AT	707AU 745 6 928 7 938 4 7 574 7 936 5 834 7 636 5 834 7 611 2 138 6 820 7 638 6 155 3 422 4 223 8 424 7 238 8
	exchange central City central North central North favelock 1 DM favelock New faveloc	CO E F C R L J K L W K O P O K S T O V	\$\\\ 140\\\\ 140\\\\\\\\\\\\\\\\\\\\\\\\\	9.1 11.7 11.7 9.6 3.4 9.7 9.7 9.7 9.7 10.7 7.1 5.0 6.0 12.4 12.4 12.4 12.4 12.4 12.4 12.4 12.4	129 165 158 110 186 194 105 129 129 129 136 136 137 147 147 152 152 153 167 177 179 179 179 179 179 179 179 179 17	119 153 145 150 150 150 150 150 150 150 150 150 15	77.8 72.8 72.8 72.0 72.0 73.0 89.5 77.5 53.9 94.4 17.8 99.4 17.8 99.2 10.3 20.0 10.3 20.0 20.0 20.0 20.0 20.0 20.0 20.0 2	4.7 80 58 58 58 58 13.9 4.9 205 15.6 25 4.7 7.7 7.7 4.2 2.7 7.7 6.7 4.8 93.1 93.1 93.1 96.6 96.6 96.6 96.6 96.6 96.6 96.6 96	4366 596 597 296 298 298 298 298 298 307 307 307 438 438 438 439 439 439 439 439 439 439 439 439 439	2 39 50 48 19 33 32 32 32 43 32 42 42 42 42 42 42 42 42 42 42 42 42 42	45 57 55 52 87 92 92 130 290 290 290 290 290 290 45 50 84 23 30 45 45 50 64 45 50 64 45 50 64 45 50 64 64 64 64 64 64 64 64 65 66 66 66 66 66 66 66 66 66 66 66 66	AB 18:00 20:5 19:7 23:9 40:3 87:7 34:1 15:6 47:8 34:1 15:6 47:8 34:1 15:6 47:8 34:1 15:6 47:1 15	AC 96 123 117 143 240 252 204 255 299 96 176 25 172 5 29 25 29 25 29 25 29 25 29 25 29 25 25 29 25 25 25 25 25 25 25 25 25 25 25 25 25	11.8 15.1 14.5 21.0 35.4 88 41.8 13.3 13.3 13.7 13.1 13.1 13.1 13.1 13.9 13.9 13.9 13.9	AE 3.4 13.9 6.6 8.2 3.9 13.6 15.6 15.6 15.6 16.6 17.6 18.6 18.6 18.6 18.6 18.6 18.6 18.6 18	AF 377 477 458 80 199 83 360 473 473 473 473 473 475 577 475 577 475 477 577 577 577 577	77.6 77.6 77.6 77.6 77.6 77.6 77.6 77.6	53 57 50 50 50 50 50 50 50 50 50 50 50 50 50	AT 45 59 56 50 56 57 50 57 50 57 50 57 50 57 50 57 50 57 50 50 50 50 50 50 50 50 50 50 50 50 50	TOTAL 745 6 928 7 894 7 574.7 910 5 916 5 844 7 611 5 745 6 845 7 611 5 845 7 615 5 845 7 615 5 845 7 615 5 745 6 845 7 745 6 845 7 845 7 845 7 845 7 845 7 845 8
	exchange Zentral City Central North Lavelock Town Lavelock Town Lavelock Town Controlly at Co	C D E F G H I J K L M K U P O K S T U V W X Y Z X X X X X X X X X X X X X X X X X	S 140 180 180 180 180 180 180 180 180 180 18	9.11 11.7 11.7 11.7 9.6 3.4 9.3 9.3 9.3 9.3 9.0 10.2 10.2 10.2 10.2 10.3 10.3 10.3 10.3 10.3 10.3 10.3 10.3	729 155 158 158 158 158 158 158 158 158 158	1199 1333 1455 1600 2700 565 857 1707 177 177 177 177 179 171 170 170 170 170 170 170 170 170 170	17.8 22.8 21.8 22.0 37.0 37.0 8.9 52.5 14.8 19.8 19.8 20.0 20.0 20.0 20.0 20.0 20.0 20.0 20	4.7 80 80 58 58 58 13.9 4.9 205 15.6 25 4.7 7.7 7.7 7.7 18 65 93.1 00 65 54	436 576 577 296 496 496 436 436 436 436 518 436 436 436 436 436 436 436 436 436 436	2 39 50 6 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	AX 45 57 55 57 55 57 57 55 57 57 57 57 57 57	AB 1800 2055 1977 219 4073 1877 219 219 219 219 219 219 219 219 219 219	AC 98 123 1173 1133 1133 1133 1133 1133 1133	XD 118 151 145 250 354 418 133 458 259 43 139 139 139 139 139 139 139 139 139 13	AE 3.4 13 41 3.9 5.6 5.2 15.5 15.6 5.2 15.6 5.2 15.6 5.2 15.6 5.2 15.6 5.2 15.6 5.2 15.6 15.6 15.6 15.6 15.6 15.6 15.6 15.6	AF 37/47/45/46/46/46/46/46/46/46/46/46/46/46/46/46/	AG (7,8 AG (7,	AH 53 67 78 78 79 79 79 79 79 79 79 79 79 79 79 79 79	AT 46 59 56 33 58 70 50 51 45 40 60 60 60 60 60 60 60 60 60 60 60 60 60	TOTAL 745 6 928 7 936 7 936 9 934 7 936 5 936 9 934 7 635 8 937 7 611 2 936 9 937 7 612 2 938 9 938 9 938 9 938 9 938 9 938 9 938 9 938 9 938 9 938 7 938 9 938 9 938 9 938 7 98 7 98 7 98 7 98 7 98 7 98 7 98 7 9
	Exchange Sentral City Sentral North Sentral North Sentral North Sentral North Sentral Sentral Sentral Sentral Sentral North Sentral North Sentral North Sentral North Sentral North Sentral North Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral	C D E F G H I J K U M K U P O K S T U V W X Y Z X K K K	S 140 180 191 191 191 191 191 191 191 191 191 19	917 117 96 34 92 93 93 97 97 97 107 124 127 00 124 128 128 128 128 128 128 128 128 128 128	0 129 155 158 110 125 158 158 158 158 158 158 158 158 158 15	119 119 119 119 119 119 119 119 119 119	77.8 72.8 72.8 72.0 73.0 73.0 73.0 73.0 73.0 73.0 73.0 73	4.7 5.0 5.8 5.8 5.8 5.8 5.8 5.8 5.2 13.9 20.5 15.6 22.7 24.7 27.	4366 536 5376 2366 2368 2589 2599 2509 307 151 606 518 535 539 706 738 738 738 738 738 738 738 738 738 738	2 39 50 6 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	A 45 57,55 57,55 57,75 57,72 72,73 73,73 7	AB 18:0 20:5 20:5 20:5 20:5 20:5 20:5 20:5 20	AC U6 123 117 118 118 118 118 118 118 118 118 118	XD 113 151 11 145 151 151 151 151 151 151 151	AE 3.4 4.3 4.1 3.9 6.6 8.2 3.3 11.3 15.6 1.6 1.6 1.6 1.6 1.6 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7	AF 37/47/47/45/48/48/48/48/48/48/48/48/48/48/48/48/48/	XG	AH 53 67 7 85 30 30 30 30 30 30 30 30 30 30 30 30 30	AT 45 59 56 5 33 58 50 50 50 50 50 50 50 50 50 50 50 50 50	TOTAL 745 6 928 7 939 7 9317 9316 9 834 7 6318 6 834 7 611 2 138 6 844 7 615 5 844 7 615 5 845 7 645 6 855 8 855 7 655 8 855 7 655 8 855 7 655 8 855 7 655 8 855 7 655 8 855 7 655 8 855 7 655 8 855 7 755 7 757 7
	exchange Zentrar City Zentrar North Zentrar North Tavelock Town Compobys 1 Costo-1 Voradana-1 Zentrar New Zentrar Toxn Zentr	C D E F C H = J X L M N U P O N S T U V W X Y Z X X X X X X X X X X X X X X X X X	\$ 140 \$ 140	9.1 11.7 11.7 9.6 3.4 9.2 9.3 9.3 9.7 10.2 7.1 5.0 12.4 12.4 12.5 12.4 12.5 12.4 12.5 12.4 12.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5	U 129 155 158 110 185 186 187 187 187 187 187 187 187 187 187 187	1199 1333 1455 1600 2700 565 857 1707 177 177 177 177 179 171 170 170 170 170 170 170 170 170 170	17.8 22.8 21.8 22.0 37.0 37.0 8.9 52.5 14.8 19.8 19.8 20.0 20.0 20.0 20.0 20.0 20.0 20.0 20	4.7 80 80 58 58 58 13.9 4.9 205 15.6 25 4.7 7.7 7.7 7.7 18 65 93.1 00 65 54	436 576 577 296 496 496 436 436 436 436 518 436 436 436 436 436 436 436 436 436 436	2 39 50 6 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	AX 45 57 55 57 55 57 57 55 57 57 57 57 57 57	AB 1800 2055 1977 219 4073 1877 219 219 219 219 219 219 219 219 219 219	AC 98 123 1173 1133 1133 1133 1133 1133 1133	XD 118 151 145 250 354 418 133 458 259 43 139 139 139 139 139 139 139 139 139 13	AE 3.4 13 41 3.9 5.6 5.2 15.5 15.6 5.2 15.6 5.2 15.6 5.2 15.6 5.2 15.6 5.2 15.6 5.2 15.6 15.6 15.6 15.6 15.6 15.6 15.6 15.6	AF 37/47/45/46/46/46/46/46/46/46/46/46/46/46/46/46/	AG (7,8 AG (7,	AH 53 67 78 78 79 79 79 79 79 79 79 79 79 79 79 79 79	Al 45 59 58 33 58 70 50 75 67 50 75 17 48 51 40 40 40 40 40 40 40 40 40 40 40 40 40	TOTAL 745 6 928 7 934 7 934 7 9315 316 9 834 7 619 5 834 7 611 2 138 6 138 6 138 6 138 7 138 6 143 2 143 2 143 2 143 2 143 2 143 2 143 2 143 2 143 2 143 2 143 2 143 2 143 2 143 2 143 2 143 3 1
	Exchange Sentral City Sentral North Sentral North Sentral North Sentral North Sentral Sentral Sentral Sentral Sentral North Sentral North Sentral North Sentral North Sentral North Sentral North Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral Sentral	C D E F G H I J K U M K U P O K S T U V W X Y Z X K K K	\$ 140	917 117 117 96 34 9 92 92 93 93 93 93 93 93 93 93 93 93 93 93 93	0 129 155 158 158 158 158 158 158 158 158 158	119 119 119 119 119 119 119 119 119 119	77.8 72.8 72.8 72.0 73.0 73.0 74.0	4.7 8 0 5 8 5 8 5 8 5 8 5 8 5 2 13 9 20 5 15 6 2 5 4 7 7 7 7 7 7 4 2 2 2 7 7 7 7 7 7 7 7 6 8 6 9 3 1 0 0 0 6 8 0 6 8 1 4 7 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8	4366 5365 572 259 259 509 731 307 15.1 518 518 548 729 129 129 129 129 129 129 129 129 129 1	2 39 50 68 19 50 68 19 50 68 19 50 68 19 50 50 68 19 50 6	AA 45 57 55 57 57 55 57 57 57 57 57 57 57 57	AB 18:0 20:5 19:7 23:9 40:3 87.3 15:6 62:4 78:3 15:6 62:4 78:3 15:6 62:4 78:5 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 15:6 70:6 70:6 70:6 70:6 70:6 70:6 70:6 70	AC 96 123 117 143 240 252 204 255 259 96 176 176 175 175 175 175 175 175 175 175 175 175	XD 113 151 145 210 354 148 133 131 155 188 137 139 139 139 139 139 139 139 139 139 139	AE 3.4 1.3 3.9 6.6 8.2 3.3 1.3 1.5 3.4 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.8	AF 37/47/47/45/48/80 199 83 346 199 199 199 199 199 199 199 199 199 19	778 45 40 178 40	AH 53 67 78 85 30 89 47 79 79 79 79 79 79 79 79 79 79 79 79 79	AT 45 59 56 55 56 77 50 55 50 75 50 75 50 75 50 75 75 75 75 75 75 75 75 75 75 75 75 75	TOTAL 745 6 928 7 894 7 574.7 910 5 916 5 844 7 618 5 845 7 618 5 845 7 618 5 845 7 618 5 845 7 618 5 845 7 85 8 85 8 85 8 85 8 85 8 85 8 85 8 8
	exchange Zentral City Zentral North Zentral North Lavelock Town Controlly at Con	C D E F G H I J K L M N U P D N S T U V W X Y Z X X X X X X X X X X X X X X X X X	S 140 800 177 178 178 178 178 178 178 178 178 178	9.11771177 9.00 9.00 9.00 9.00 9.00 9.00 9.00 9.	U 129 155 5 158 1100 155 158 158 158 158 158 158 158 158 158	119 119 119 119 119 119 119 119 119 119	17.8 22.8 21.6 21.0 37.0 8.9 52.5 18.5 17.8 19.8 17.8 19.8 20.1 20.1 20.1 20.1 20.1 20.1 20.1 20.1	4.7 8.0 5.8 9.8 2.4 13.9 4.9 20.5 15.6 4.7 2.7 7.7 2.4 2.2 7.7 7.7 1.8 6.5 93.1 0.0 6.5 4.7 4.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1	4366 5365 5372 2595 5372 2595 5373 7337 7337 7357 7357 7357 7357 7	2 39 50 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	43	AB 1800 2055 1977 2199 4073 471 1556 274 1800 270 1978 2100 270 1978 1800 271 1975 1800 271 1975 1975 1975 1975 1975 1975 1975 19	AC 98 123 117 143 143 143 143 143 143 143 143 143 143	XD 118 151 145 210 354 418 418 418 418 418 419 511 125 44 39 43 139 139 139 139 139 139 139 139 139 13	AE 3.4 13 39 56 82 33 156 82 156 168 173 188 188 188 188 188 188 188 188 188 18	AF 37/47/47/45/48/48/48/48/48/48/48/48/48/48/48/48/48/	AG (7,8 AG (7,	AH 53 67 78 85 30 50 18 89 47 77 99 17 53 33 77 70 77 15 53 55 36 56 56 56 56 57 72 72 72 72 72 72 72 72 72 72 72 72 72	AT 46 59 56 33 56 70 50 50 50 50 50 50 50 50 50 50 50 50 50	TOTAL 745 6 928 7 938 7 936 5 936 9 937 7 936 5 937 7 635 5 834 7 631 5 836 7 635 6 835 7 641 2 836 7 65 6 85 7 745 6 85 7 85 7 745 7 85 7 85 7 85 7 85 7 85 7 85 7 85 7 8
	Exchange Zentrar City Zentrar New Zentrar New Lavelock Town Lavelock Town Lavelock Town Alloration Alloration Lavelock Town Lavelock New Lavelock New Lavelock New Lavelock New Lavelock Town Lavelock Lavelo	C D E F G F I J K L M K U P O R S I U V W X Y Z K K K K K K K K K K K K K K K K K K	S 140 180 180 180 180 180 180 180 180 180 18	917 117 117 96 34 92 93 93 93 97 100 124 100 124 129 129 129 129 129 129 129 129 129 129	0 129 155 158 110 125 158 158 158 158 158 158 158 158 158 15	119 119 119 119 119 119 119 119 119 119	77.8 72.8 72.8 73.0 8.9 52.5 77.5 53.9 94.4 17.8 90.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 2	4.7 50 58 58 58 58 58 58 58 52 47 205 156 27,7	Y 4366 536 537 537 537 537 537 537 537 537 537 537	2 39 50 6 6 6 6 2 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	AA 45 57 55 57 57 55 57 57 57 57 57 57 57 57	AB 1800 205 205 205 205 205 205 205 205 205 2	AC	XD 113 151 145 210 354 148 133 131 155 188 137 139 139 139 139 139 139 139 139 139 139	AE 3.4 4.3 4.1 3.9 6.6 8.2 3.3 11.3 15.6 15.6 18.6 18.7 18.7 18.7 18.7 18.7 18.7 18.7 18.7	AF 37/47/47/45/48/80 199 83 346 199 199 199 199 199 199 199 199 199 19	778 45 40 178 40	AH 53 67 78 85 30 89 47 79 79 79 79 79 79 79 79 79 79 79 79 79	AT 45 59 56 55 56 77 50 55 50 75 50 75 50 75 50 75 75 75 75 75 75 75 75 75 75 75 75 75	TOTAL 745 6 928 7 894 7 574.7 910 5 916 5 844 7 618 5 845 7 618 5 845 7 618 5 845 7 618 5 845 7 618 5 845 7 85 8 85 8 85 8 85 8 85 8 85 8 85 8 8
	exchange Zentral City Zentral North Zentral North Lavelock Town Controlly at Con	C D E F G H I J K L M N U P D N S T U V W X Y Z X X X X X X X X X X X X X X X X X	S 140 800 177 178 178 178 178 178 178 178 178 178	9.11771177 9.00 9.00 9.00 9.00 9.00 9.00 9.00 9.	U 129 155 5 158 1100 155 158 158 158 158 158 158 158 158 158	119 119 119 119 119 119 119 119 119 119	77.8 72.8 72.0 72.0 73.0 73.0 73.0 74.0 74.0 74.0 74.0 74.0 74.0 74.0 74.0 75.0 75.0 75.0 75.0 76.0	4.7 8.0 5.8 9.8 2.4 13.9 4.9 20.5 15.6 4.7 2.7 7.7 2.4 2.2 7.7 7.7 1.8 6.5 93.1 0.0 6.5 4.7 4.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1	4366 5365 5372 2595 5372 2595 5373 7337 7337 7357 7357 7357 7357 7	2 39 50 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	43 57 55 57 57 55 57 57 57 57 57 57 57 57	AB 1800 2055 1977 2199 4073 471 1556 274 1800 270 1978 2100 270 1978 1800 271 1975 1800 271 1975 1975 1975 1975 1975 1975 1975 19	AC 98 123 117 143 143 143 143 143 143 143 143 143 143	XD 113 151 11 145 151 145 151 151 151 151 151	AE 3.4 139 66 823 339 156 156 34 1139 156 1736 188 188 188 188 188 188 188 188 188 18	AF 37/47/47/47/47/47/47/47/47/47/47/47/47/47	XG 778 778 788 788 788 788 788 788 788 78	AH 53 67 7 85 30 50 00 18 8 99 94 7 7 7 95 35 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	AT 45 59 56 53 3 58 50 50 50 50 50 50 50 50 50 50 50 50 50	TOTAL 745 6 928 7 939 7 574 7 574 7 574 7 576 7 576 7 577 5 894 7 617 5 894 7 617 5 894 7 618 5 894 7 618 5 894 7 618 5 895 7 188 6 895 7 188 6 895 7 188 6 895 7 188 6 895 7 188 7

(

b) National trunk traffic

The traffic of national trunk network was calculated under the conditions stated in the previous paragraph. The traffic was calculated by SSC. Table 2-5-5 shows the calculation outcome of each SSC traffic. Table 2-5-6 shows the traffic matrix between SSCs.

Table 2-5-5 Trunk Traffic of SSC in 2005

Unit: Erlang.

No.	SSC	Demand		%SLT Ne	twork		%Private	Networks
		for SLT in 2005	(Org., Erl)	Own	Local/SSC	Others	WEE	Olhers
	i		Traffic	8.9%	14.8%	49.3%	26.0%	1.0%
	Ampara	3,671		17.9	29.9	99.6	52.5	2.0
	Anuradhapura	11,806		57.7	96.1	320.2	168.8	6.5
	Awissawella	10,826		52.9	88.1	293.7	154.8	6.0
	Badulla	10,064	553.5	49.2	81.9		143.9	5.5
	Bandarawela	6,805		33.2	55.4	184.6	97.3	3.7
	Batticaloa	10,790	593.5	52.7	87.8	292.7	154.3	5.9
	Chi!aw	11,571	636.4	56.5	94.2	313.9	165.5	6.4
- 1	Colombo	479,623	38,369.8	3,407.0	17,888.0	6,331.0	9,976.2	767.4
	Galle	22,640	1,245.2	110.6	184.3	614.1	323.8	12.5
	Gampaha	34,624	1,904.3	169.1	281.8	939.2	495.1	19.0
	Hambantola	12,640		61.7	102.9	342.9	180.8	7.0
	Hallon	3,091	170.0	15.1	25.2	83.8	44.2	1.7
	Jaffna	29,371		143.4	239.1	796.7	420.0	16.2
	Kalmune	11,005	605.3	53.7	89.6	298.5	157.4	6.1
	Kalutara	31,864	1,762.5	155.6	259.4	864.3	455.7	17.5
	Kandy	47,844	2,631.4	233.7	389.5	1,297.8	684.2	26.3
	Kegalle	12,842	706.3	62.7	104.5	348.4	183.6	7.1
	Kurunegala	22,843		111.6	185.9	619.6	326.7	12.6
	Mannar	1,849	101.7	9.0	15.1	50.2	26.4	1.0
	Matale	9,396	516.8	45.9	76.5	254.9	134.4	5.2
	Malara	20,094		98.1	163.6	545.1	287.3	11.1
	Nawalapitiya	1,884	103.6	9.2	15.3	51.1	26.9	1.0
	Negombo	26,378		128.8	214.7	715.5	377.2	14.5
	Nuwara eliya	6,147	338.1	30.0	50.0	166.7	87.9	3.4
	Polonnaruwa	5,737		28.0	46.7	155.6	82.0	3.2
	Ralnapura	13,646		66.6	111.1	370 2	195.1	7.5
	Trincomalee	8,284	455.6	40.5	67.4	224.7	118.5	4.6
	Vavuniya	5,211	286.6	25.5	42.4	141.4	74.5	2.9
29	National total	872,546	59,980.6	5,326.1	21,088.5	16,989.9	15,595.2	983.5



Table 2-5-6 National Trunk Traffic Matrix in 2005

Sw. Centres	NS/18/88		Aviss	Chila	Gampa		Kegal	Kurun	Negom	Randy		Badul		Baltu	Hallo
NSCAMLUMBL	0.0	10,743.4	160.8	171.9	514.1	473.2	190.8	339.3	391.7	710.5	54.5	149.4	101.0		45
Colombo	10,743.4	0.0	162.0	318.8	629.6	505.4	202.2	418.8	549 2	753,1	44.2	130.9	85.5	140.1	40
Awissaweila	160.8	159.1	0.0	0.1	23.2	15.5	6.3	6.1	7.0	19.2	0.8	3.1	2.3	23	1.1
Chilaw	771.9	310.6	0.1	0.0		0.3	0.1	0.2	0.3	0.1	0.0	0.1	0.0	0.1	0.
Gampaha	514.1	617.0	23.1	0.4	0.0		16.1	18.8	40.0			7.3	52	5.2	3
Kalutara	473 2	495.9	15.5	0.3	40.3	0.0	10.3	14.0	19.€		28	9.4	7.4	7.7	3.
Kegalle	190.8	198.5	6.3	7.1	16.1	10.3	20	73.8	6.8	37.3		3.7	2.4	2.8	1,7
Kurunegara	339.3	410.3	6.0	0.3	18.8	14.0	13.8	0.0	10.3	49.0		5.5	3.4	5.2	1
Negombo	391.7	537.3	6.9	0.3	39.9	19.6	6.7	10.3			7.1	3.7	25	3.4	1.
Kandy	710.5	738.9	19.2	0.4	45.6	42.2	37.3	49.1	21.7	0.0			15.5	17.6	8.
Ampara	54.5	43.5	8.0	0.0	2.1	2.8	0.9	1.6	1.1	5.9		2.4	1.3	5.8	0.
Badulla	149.4	128.6	3.1	0.1	7.4	9.4	3.7	5.6	3.7	27.9		0.0	9.6	5.7	1.
Bandarawella	101.0	84.0	2.3	01	5.2	7.4	2.4	3.4	25			9.8	0.0	3.1	1
Batticaloa	160.2	137.6	2.3	0.1	6.2	7.7	2.8	5.2	3.4	17.6		5.7	3.1	0.0	0
Halfon	45.9	39.5	1.8	0.0	3.1	3.7	1.6	1.7	1.3	8.4	0.3	1.7	1.4	0.9	0
Kalmunee	153.5	135.8	2.4	0.1	6.3	8.1	29	5.1	3.5	18.1	12.0	6.5	3.5	34.6	1.
Matale	139.6	130.9	2.5	0.1	6.7	6.1	4.9	10.7	3.5		1.0	3.7	2.0	3.1	0.
Nawalapitiya	27.9	24.6	1.1	0.0	2.0	1.8	1.6	1.3	8.0	7.2	0.2	0.8	0.5	0.5	0
Nuwara Eliya	91.3	76.6	2.5	0.0	5.1	6.2	28	3.5	2.4			6.0		2.2	2.
Anuradhapura	1/5.3	206 2	2.1	0.1	6.4	6.7	2.8	6.4	4.0			2.9		4.4	0.
Jaffna	436.2	518.1	5.7	0.3	17.3	21.4	6.8	13.4	10.9			7.9		12.9	1.
Mannar	27.4	29.5	0.3	0.0	0.9	1.0	0.4	0.7	0.6	1.7	0.5	0.4	0.2	0.6	Ō.
Polonnaruwa	85.2	85.3	1.2	0.1	3.5	3.8	7.7	3.7	2.0			2.4	1.3	4.7	<u> </u>
Trincomalee	123.1	123.9	1.6	-07	4.7	5.5	2.1	4.2	2.8			2.5	16	6.7	0.
Vavunia	77.4	81.7	0.9	0.0	2.7	3.0	1.1	2.4	1.7	5.8		1.3	0.8	2.1	0.3
Galle	336.3	295.3	7.6	0.2	18.9	53.4	6.2	8.9	9.8	29.0	2.4	7.9	6.6	6.5	2.0
Hambantola	187.8	152.6	3.8	0.1	9.3	16.3	3.7	5.6	4.9	20.4	2.5	7.8	7.2	5.8	1.
Matara	298.4	252.5	6.2	0.2	15.3	34.0	5.4	7.9	8.0	26.9		8 2	7.1	6.6	2.3
Ramapura	202 €	184.8	9.4	0.1	16.2	28.9	5.6	6.7	6.9	24.6		5.5	4.7	3.6	3
TOTAL	16,578.7	16,952.0	457.8	494.2	1,457.1	1,348.0	843.2	958.3	1,120.2	2,023.8	154.9	424 R	237.1	455.5	130

	Kaimu	Matal	Nawai		Anura	Jaffn	Manna	Polo	Trac "	Vavun	Galle	Hamba			TOTAL
NSCAMEUMBE	163.5	139.6						85 2	123.1						16,578.7
Colombo	138.2	133 2	25.1	78.0	210.4	528.7	30.0	86.9	126.2	83.2		165.5	257.0		
Awissawella	24	2.5	1.1	2.4	2.1	5.7	0.3	1.2	1.6	0.9	7.6	3.8	62	9.4	454.7
Chilaw	0.1	0.1	0.0	0.0	0.1	0.3		0.1	0.1	0.0		0.1	0.1	0.1	486.1
Gampaha	6.3	6.7	2.0	5.1	6.4	17.3	0.9	3.5	4.7	2.6			15.2	16 2	1,454.1
Kalulara	8,1	6.1	1.8	6.2	6.8	21.4	1.0	3.8	5.5	3.0		16.2	33.9	28.9	1,338.3
Kegalle	2.9	4.9	1.6	2.8	2.8	6.8	0.4	1.7	2.1		6.2	3.7	5.4	56	539.5
Kurunegara	5.1	10.7	1.3	3.5	6.4	13.4	0.7	3.7	4.2	2.4	8.8	5.5	7.9	6.6	959.5
Negombo	3.5	3.4	8.0	2.4	4.0	10.9	9.6	2.0	2.8	1.6	9.7	4.8	7,9	6.8	1,107.9
Kandy	18.0	44.2	72	20.9	14.2	34.0		10.9	11.5	5.8	29.0		26.9	24.6	2,009.5
Ampara	12.0	10	0.2	8.6	1.2	3.8	0.2	1.1	1.5	0.6	2.4	2.5	2 8	1.3	154.2
Badulla	6.5	3.7	8.0	6.0	2.9	8.0		2.4	2.8	1.3	7.9		8 2	5.5	422.6
Bandarawella	3.5	2.0		1	1.7	5.0		1.3	1.6	0.8	5.6		7.1	4.7	285.8
8alticaloa	34.6	3.1	0.5	2.2	4.4	13 0	0.6	4.7	6.7	2.1	6.5		6.6	3.6	453,1
Hatton	1.0	0.9	0.5	2.1	0.7	1.8		0.5	0.6				23		129.8
Kalmunee	0.0	3.0	0,5	2.4	4.0	12.2	0.5	3.9	5.5	1,9		6.6	7.2	3.9	462.3
Malale	3.0	0.0	0.7	2.2	2.9	6.1	0.3	2.3	22	1.1	42		3.9	32	394.7
Nawalapitiya	0.5	0.7	0.0	8.0	0.4	1.0	0.1	0.3	0.3	0.2	1.1	07	1.0		79.1
Nuwara Eliya	2.4	2.2	8.0	0.0	1.5	4.0		1.1	13	0.6	4.7	3.7	4.5		258.2
Anuradhapura	4.0	2.8	0.4		0.0	18.9	1.2	3.5	6.2	6.6	4.9	3 3	4.5	2.8	495.8
Jaifna	12.2	6.1	1.0	4.0	18.9	0.0		6.9	17.0			10.9		8.4	1,233.6
Mannar	0.5		0.1	0.2	12	7.2	0.0	0.3	0.7	0.8	0.8	0.5	0.7	0.4	77.6
Polonnaruwa	3.9			*	3.6	6.9		0.0	4.0		2.9		5.8	1.8	241.0
Trincomalea	5.5		0.3		6.2	17.0		4.0	0.0	3.8		3.3	4.2	2.4	348.0
Vavunia	1.9		0.2		6.6	13.6		1.4	3.8	0.0	22	1.5	21	12	218.9
Galle	7.0	4.2	1.1		4.9	16.5		29		5.5	0.0		74 2		951.0
Hambanlola	6.6			3.7	3.3	11.0		2.3	3.3	1.5	19.7	0.0			531.0
Malara	7.2				4.5	15.5		28	4 2	21	74.2	28.0	0.0		844.0
Ranapura	3.9		1.2		28	8.4	0.4	1.8	2.4	1.2	17.1	8.1	13.8	0.0 576.2	573.1
TOTAL	454.5	396.9	79.4	259.4	800.1	1,244.7	78.1	242.6	350.3	220.4	956.0	633.7	848.1	010.2	50,155.3

()

5.1.3 Circuit Requirements

(1) Inter-exchange circuits in Colombo Metro Area

The number of circuits required to local exchanges in the year 2000 was calculated based on the traffic matrix between exchanges in the year 2005 which was obtained in the previous section.

In the calculation, the digital circuit modularity applied to was 30 channels, the per-link grade of service was 0.01, the lower threshold for direct circuit routing was 20.00 erlangs and the upper threshold for direct high usage circuit routing was 100 erlangs.

Table 2-5-7 shows the circuits matrix in Colombo Metro Area to be provided by the year 2000. The number of circuits between main exchange and remote switch unit is as shown in Table 2-5-8. The demarcation of switching system to "main" and "remote" is discussed in Sec. 5.3.1.

(2) Trunk and junction circuits

The number of trunk circuits to be provided by Colombo TSC and that of junction circuits to be provided by Colombo TDM switches were calculated based on the traffic matrices between SSCs and local exchanges in Colombo Metro, respectively, which were obtained in the previous section.

In the calculation, the digital circuit modularity applied to was 30 channels, the per-link grade of service was 0.01, the lower threshold for direct circuit routing was 20.00 erlangs and the upper threshold for direct high usage circuit routing was 100 erlangs. Table 2-5-9 shows the circuits matrix between SSCs to be provided by the year 2000. The number of junction circuits to be provided by Colombo TDM switches is found in the Table 2-5-7.

Table 2-5-7 Junction Circuit Matrix in Colombo Metro Area to be Provided by 2000

avesci (DM entra (DM		A	8	C	0	E	F	3	R	7	7	X _	<u> </u>	М	N	0	7	<u>r</u>	R
	XΤ	0	245	330	330	330	3905	270	330	350	390	330	T.	0	EUR)	0	0	1	1
	8	130	ö	90)	1500	1508	30h	30h	60h	306	30K	335	180	7200	360	210	210	420	†
	ē-	120	3800	- 6	1200	1200	306		306	30F	0	t o	0	900	0	0	ί — σ	0	1-
	ŏ	120	3608	1200		1504	306	- ō	30h	30h	306	0	- -	1200	30h			50F	
	~		3600	1200	150	1.00	30h	 	30%	307	306	 ö	ŏ	1200	30h	ō	ò		
entral NSC	<u>-</u>	120						305	80h	305	£04.	30h	lŏ	305	1200	lŏ	ŏ		⊢ -
avelock Town	F	T500	2704	30)6	30h	30h	0		6Un					30%				 	L
o¤uodiya-1	G	150	1800	0	. 0		306	0	լ Ե	0	0	0	0	0		0	0		1_
ote-1	H	120	3303	30h	30h	30h	50h	0	o	30h	6Gh	30h	۵	306	30h	0		335	1
faradana 1	-	150	2700	30h	30h	30h	308		306	—დ	0		to	30h	30h	0	t 0	9	-
		150	3000		301	30h	600	 6	60h	0	- c	30h	10	<u>-</u>	30h		tv	o	ŧ
secoda-1	,		2403	0			306	 ŏ	30h	Ť		5	lŏ	— ŏ	1	}	t -		
atumatana-1	K	120			_				301			ĕ	`		16		10	- ŏ	
ngoda-7	١.	306	150	Ū	C	0	0	0	L	0	0					<u>~</u>			
entral New	प	60h	3600	900	1200	1200	30%			30h	Q.	. 0	O	0			. 0		<u>L</u>
aveock New	N	1804	240	0	30h	30h	120u	0	30h	30h	305	0	0	. 0	0	0	Ū		1
3-E13-2	σ	60K	180	0		·	יס	0	7	0	0	0	0	U	0		0		1-
adawata 2	-	306	180	0					ها	ها	0	7		v	0	0	0	D	
	o-	1903	300	- 0	30h		ō'	—— <u> </u>	30h	 6			 		0	30h		- 0	Η-
		1500			301		<u> </u>			l ŏ	lŏ	ة	ة ا	- ŏ	 		ŏ	1800	╌
atunayake 2 :	R	0	90	0	_			-									—-ŏ	1000	
eiaกัya-1	5	7503	270	0	C	- 0	0	0	0				o	· ·	0				<u></u>
eraniya-2	Υ.	90h	180			0		0	0	ه		0	0	0	0	0			ı
oNuprtrys-2	Ū	1503	150	0	0	o'	0	300	0	- 0	. 0	٥	7	0	0	0	- 0	0	Γ
offe-2	<i>5</i>	703	210	ŏ		ļ.——-Ā	306	. 0	120u	o	306	— б	 -	٥	7	7	7	0	T-
	v		240	- 0	ŏ	×	306		306	 6	506	60 %	ō	- 	306	-	b		!
	11	2108	290			<u> </u>	- 5		3.0	 	900,		 6	8) · · · · · · · · · · ·	J	ŏ	6	١
faharagama 7	Λ.	90h	150	0	0	0			0						I		8		ــــ
faradana-2	Y	1503	330	306	60h	60h	30%	305	30h	90u	305	0	0	306	30h				L
lattakuliya-2	Z	30h	30		0	. 0	0	0	0	0	0	Ç	0	2	- 6		0		L
foralisma-2	A	60h	180		0		0	0	0	o	0	30h	0		- 0	0	0	10	Г
It Lavinia-3	AB	1800	270	0	····· ö		306		306	 	60h	60h	 	10	30h			- 0	1-
	AC.	1504	210	- 0	ŏ	· · · · · č	306	- 6		 ~	30h	306	 ŏ	- 0			- · · · · · · · · · · · · · · · · · · ·		
									306		1500	30h	- ~	č	30h	ŏ	ŏ	ŏ	١
	λD	1508	270	0	0	. 0	306	0	30n	0									_
iliyanda/a-2	ΑE	50h	150	0	. 0	. 0	. 0	0	o	. 0	0		0	0	0	0	0	. 0	L_
	AF.	30h	180	- 0	0	- 0	0	Ū		0	0	900	- C	U	0	0	0		i —
Valtala-1	ΑG	1808	270	—— r				0		<u></u> გ	0	٥	0		0	0	0	30%	_
	ХH	305	150			-		0		i		1 0	J	0	0		1	0	╌
		30	120		ŏ		l - š				- 	 	 	- -	 	-	ō	 6	-
	A?				_			390		630		750	15 Ĉ	870	810	240	210	750	ļ
		3,810																	
OTAL	. 1	0,010	7,830	870	1,110	1,080	1,050	350	1,050	630	1,027		L						L
VIAL	-		7,830	870	1,110	1,080	1,030	350	1,050	630	1,020		L		! -		L		L
	_	L	1.830	B70	1,110	1,080 W	1,030	7	1,050	[AX	7,029	IAC TAC	L	ΙΛΕ	I	AG	λĦ	A.	ייי עון
xchançe		3	7,830		7,110	1,080 W	X 6	7	2 0	L	XB.		L	L	AF G			A. 0	ייי
xchange lavelock TUIM	X.	80	<u> </u>	0 0	V 0	79	X 6	300	Ž 0	XX 0	XB 30v	AC 0	\U	AE 0	AF 0	AG 0	AH	A! 0	-
xchange lavelock TUM entral TUM	X Đ	390	270	0 0 270	V 0	77 0 420	X 0 230	9 30h 420	2 0 150	AA 0 240	30h 390	AC 0	XU 0	AE 0	AF 210		AH 0	150	-
xchange lavelock TUM entral TUM entral City	C	80	276	0 0 270 0	V 0	7 7	X 0 235	90h 420 30h	2 0 150	XX 0 240	30K 390 0	AC 0	XU 0	AE 0 180	AF 0	AG 0	AH 0	A. 0	
xchange lavelock TUM entral TUM entral City		390 0	270	0 270 0	9 330 0	77 0 420	X 0 245 0	30h 420 30h 60h	2 0 150	ZX 0 240 0	30h 30h 390 0	AC 0	XU 0	AE 0	AF 0	AG 0	AH 0 180 0	150	
xchange lavelock TOM entral TOM entral City entral No-th	C	80	276	0 270 0 0	330 0 0 0	78 0 720 0	240 0 0 0 0	30h 420 30h 60h 60h	2 0 150 0	7X 0 240 0 0	390 390 0	AC 0	360 0 0 0	780 190 0 0	AF 0	AG 0	AH 0 180 0	150	
xchangé lavelock TUM entral TUM entral City entral North entral NSC	C D	390 0	270	0 270 0	9 330 0	7 7	X 0 245 0	30h 420 30h 60h	2 0 150	ZX 0 240 0	390 390 0	AC 0	XU 0	190 0 0 0 0	AF 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AG 0	AH 0 180 0 0 0 0 0	A7 0 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchange faverock TUM entral TUM entral City entral North entral NSC faverock Town	9 0	390 0 0 0	7 0 270 0 0	0 270 0 0 0	V 0 336 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	78 0 720 0	X 0 245 0 0 0 0 0 0	90h 420 30h 60h 60h 30h	2 0 150 0	240 240 0 0	390 390 0	AC 0	360 0 0 0	780 190 0 0	AF 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AG 0	AH 0 180 0	150	-
xchange lavelock TOM entral TOM entral City entral North Sentral NSC lavelock Town (ofugitya-1	व न न व व	390 0 0	7 0 270 0 0	0 270 0 0 0 0	7 0 330 0 0 0 306	70 0 120 0 0 0 30h	X 0 230 0 0 0 0 0 0 0 0 0 0	30h 420 30h 60h 60h 30h	2 0 150 0 0	70X 240 0 0 0 0	305 390 0 0 0 306	AC 3000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 360 0 0 0 306	190 0 0 0 0	AF 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AG 620 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AH 0 180 0 0 0 0 0 0 0 0	A7. 150 0 0	
xchange lavelock 10M entral 10M entral 10M entral North entral North entral North lavelock 10Mn ontup@ya-1	9 0	390	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 270 0 0 0 0 0 300	0 330 0 0 0 306 0	78 0 720 0	X 0 230 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	930h 420 30h 60h 60h 30h 30h	2 0 150 0 0	70 240 0 0 0 0	30h 390 0 0 30h 30h 30h	AC 0 3300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	360 0 0 0	7E 0 190 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AF 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AG 0 420 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AH 0 1900 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A1	
xchanga avelock TOM entral TOM entral TOM entral North entral NSC avelock Town office Town office Town office Town	7207799	390 0 0 0	0 0 0 0	0 270 0 0 0 0 0 300	V 0 330 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 30h 30h 30h	X 0 230 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 420 30h 60h 60h 30h 30h	0 150 0 0 0	740 240 0 0 0 0 0	30h 390 0 0 30h 30h 0 30h	AC 0 3300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	360 0 0 0 0 336 0 306	7E 0 190 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AF 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AG 60 00 00 00 00 00 00 00 00 00 00 00 00	AH 0 180 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A! 6 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchange avelock 10M entral 10M entral City entral North entral North entral North (avelock Town offupitya-1 ote-1 faredana-1	व न न व व	390	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 270 0 0 0 0 0 300	9300 3300 0 0 3006 1200 3006	30h 30h 30h 30h 30h 30h	X 0 240 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 30h 30h 60h 30h 30h 30h 30h	2 0 150 0 0 0 0	240 240 0 0 0 0 0 0	30h 30h 0 0 30h 30h 0 50h	330 330 0 0 306 0 0	350 350 0 0 306 306 306	180 180 0 0 0 0 0	7 F C C C C C C C C C C C C C C C C C C	AG 420 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AH 0 180 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A7 0 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchange avelock 10M entral 10M entral City entral North entral North entral North (avelock Town offupitya-1 ote-1 faredana-1	न मध्यम्भवत	390 0 0 0	0 0 0 0	0 0 270 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 0 330 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 30h 30h 30h	X 0 240 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	33h 420 30h 60h 60h 30h 30h 30h 30h	0 150 0 0 0	240 240 0 0 0 0 0 0 0 0	30h 30h 390 0 0 30h 30h 0 60h	330 0 0 0 30h 0 0 0 30h 30h	AU 0 350 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AE 0 1300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7F 210 0 0 0 0 0 0 0 0	AG	AH 0 1800 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A7	
xchange flavelock TDM investor	7207799	390 390 0 0 0	000000000000000000000000000000000000000	0 270 0 0 0 0 300 0	9300 3300 0 0 3006 1200 3006	30h 30h 30h 30h 30h 30h	X 0 240 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 30h 30h 60h 30h 30h 30h 30h	2 0 150 0 0 0 0	240 240 0 0 0 0 0 0 0 0 0 0 0 0 0	78 30h 0 0 30h 30h 30h 60h 60h	330 0 0 0 0 0 30h 0 0 0 0 30h 0 0 0 0 0	350 350 0 0 306 306 306	AE 0 190 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AF 00 00 00 00 00 00 00 00 00 00 00 00 00	AG 420 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AH 0 1800 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A7 6 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchange avalock TDM entral TDM entral City entral North entral North e	קאלידמאהקמ	2 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0	0 0 270 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	30 420 0 30h 0 30h 0 50h 60h 60h	245 0 0 0 0 0 0 0 0	30h 420 30h 60h 30h 30h 30h 30h	2 0 150 0 0 0 0 0 0	240 240 0 0 0 0 0 0 0 0 0 0 0 0 0	78 30h 0 0 30h 30h 30h 60h 60h	330 0 0 0 0 0 30h 0 0 0 0 0 30h 0 0 0 0	AU 0 350 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AE 0 190 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7F 210 0 0 0 0 0 0 0 0	AG	AH 0 1800 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A7 6 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchanga angleck TDM entral TDM entral City antral NSC favelock Town oftpoppa 1 far adana 1 pagagada 1 (alumaana 1 ragoda 2 entral NSW	שראירבמיתפט	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 270 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 0 5300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	70 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	X 0 245 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 420 30h 60h 30h 30h 30h 30h 30h 30h	2 0 150 0 0 0 0 0 0	AX	306 306 0 0 306 306 306 606 606	XC 0 330 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 00 00 00 00 306 00 306 00 1506 306	AE 00 1300 00 00 00 00 00 00 00 00 00 00 00 00	0 0 0 0 0 0 0 0 0 0 0	AG	AH 0 1800 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchanga na slock TOM entral TOM entral City entral North entral NSC ravelock Town ontuphysa 1 ote 1 far adans 1 toggoda 1 faturmalans 1 upoda 2 entral New far eock New	שמחארן אמישפט	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	000000000000000000000000000000000000000	0 270 0 0 0 0 300 0 0 0 0	900 3300 0 0 3000 0 1200 3000 0 0 0 0	70 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 30h 420 30h 50h 30h 30h 30h 30h 30h 30h 30h 30h 30h 3	2 0 150 0 0 0 0 0 0 0	AX	30h 30h 30h 0 30h 30h 60h 60h 60h	AC 0 3300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AU	AE 00 00 00 00 00 00 00 00 00 00 00 00 00	0 0 0 0 0 0 0 0 0 0 0	AG	AH 0 180 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
schange and school to the control of	שראירבמיתפט	350 350 0 0 0 0 0	000000000000000000000000000000000000000	0 270 0 0 0 0 300 0 0 0 0	V 0 3300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77 0 120 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	X 0 235 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	900 30h 30h 60h 60h 30h 30h 30h 30h 30h 30h	2 0 1500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AX	30A 30C 0 0 0 30A 0 30A 0 60A 60A 60A 60A	AC	300 0 0 0 0 306 0 0 306 0 0 306 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AE 0 130 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	AG	AH	A. O	
cchange application anisal City anisal City anisal City anisal City anisal NSC avelock Town onughys 1 ode-1 as adans-1 upegoda 1 (alumalans-1 nyoda-2 actisal Sack New as eta-2 actisal Sack Sack as actis 2 actisal Sack as actis 2 actisal Sack actisal Sactisal Sack actisal Sack actisal Sack actisal Sack actisal Sack a	४० त्रज्ञात्रचात्रवज्ञाच्या	5 00 00 00 00 00 00 00 00 00 00 00 00 00	7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 270 0 0 0 0 3300 0 0 0 0 0	V 0 3300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 30h 30h 30h 30h 30h 30h 30h 00 30h	7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9 30h	2 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### CONTRACT CONTRAC	288 2308 200 200 200 200 200 200 200 200 200 2	AC	AU	AE	AF	AG 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AH	AT 0 1500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
ichanga analock TOM ensal TOM ensal City ensal City ental NSC avelock Town alupaya 1 ofe 1 faredana-1 Lipegoda 1 alumajana-1 njoda-2 ental New areook New a Clara 2 astewala-2 astwala-2 astwala-2 astwala-2	<u> </u>	350 350 0 0 0 0 0	000000000000000000000000000000000000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 0 3300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77 0 120 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 C C C C C C C C C C C C C C C C C C C	933h 420 30h 60h 30h 30h 30h 30h 30h 30h 30h 0 30h	2 0 1500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	240 240 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 30h 30h 0 0 0 30h 60h 60h 0 0 0 0	300 300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 30h 30h 30h 30h 30h 30h 30h 30h 30h	## D	AF	AG	AH	A' 0 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchanga analock TOM entral TOM entral TOM entral NSC services Town oluphya Tode T services Town oluphya T caumalana T popoda Z services New a Clark avecok New a Clark (3-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4	४० त्रज्ञात्रचात्रवज्ञाच्या	5 00 00 00 00 00 00 00 00 00 00 00 00 00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 270 0 0 0 0 300 0 0 0 0 0 0 0	V 0 3300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 30h 30h 30h 30h 30h 30h 30h 00 30h	X	9 30h 420 30h 60h 30h 30h 30h 30h 30h 30h 30h 30h 30h 3	2 0 1500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8X	30h 30h 00 00 00 00 00 00 00 00 00 00 00 00 0	330 330 0 0 0 30h 0 0 30h 30h 0 0 0 0 0	305 305 305 305 305 305 306 306 306 306 306	AE	AF	AG	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A' 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
Achanga Paralock TDM Paralock TDM Paralock Town Paralock Town	אס שראלו אחקר חקר א	350 350 00 00 00 00 00 00 00	000000000000000000000000000000000000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 0 3300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 30h 30h 30h 30h 30h 30h 30h 00 30h	7 C C C C C C C C C C C C C C C C C C C	933h 420 30h 60h 30h 30h 30h 30h 30h 30h 30h 0 30h	2 0 1500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	240 240 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 30h 00 00 00 00 00 00 00 00 00 00 00 00 0	300 300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AE 0 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AF	AG 6 420 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AH 0 1800 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A/ 150 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchanga na eleck TDM entral TDM entral City entral NSC favelock Town official NSC favelock Town official NSC favelock Town official NSC favelock Town official NSC favelock Town official NSC favelock Town favelock	<u> </u>	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 270 0 0 0 0 300 0 0 0 0 0 0	V 0 3300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	X	933h 420 30h 60h 30h 30h 30h 30h 30h 0 0 0 0	2 0 1550 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8X	AB	330 330 0 0 0 30h 0 0 30h 30h 0 0 0 0 0	305 305 305 305 305 305 306 306 306 306 306	AE	AF	AG	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A' 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchange favorect TDM central NSC favorect Town collector town central town central New factor	המאסים ארז ארן הממיח קמי	\$ \$50 \$50 \$50 \$50 \$50 \$50 \$50 \$50 \$50 \$5	7 77 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 276 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 0 3300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	X	30h 30h 30h 30h 30h 30h 30h 30h 30h 0 0 0	7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	500 C C C C C C C C C C C C C C C C C C	30h 30h 0 30h 30h 30h 60h 60h 60h 0 0 0 0	30h 30h 0 30h 0 30h 0 0 0 0 0 0 0 0 0 0	305 305 305 305 305 305 305 305 305 305	AE	AF 00 2100 00 00 00 00 00 00 00 00 00 00 00 00	AG 6 420 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AH	A: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchanga anelock TDM entral TDU entral City entral NSC antral NSC arelock Town office Town office Town office Town areock Town office Town office Town areock New action 2 (adamate T attomparke T (adamate T attomparke T (adamate T attomparke T (adamate T attomparke T (adamate T (adam	d - מאס אס אפראל - אמי מי מקס	\$ 50 00 00 00 00 00 00 00 00 00 00 00 00	7 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	V 0 3360 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 00 00 00 00 00 00 00 00 00 00 00 00	X	30h	2 0 1500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### CONTRACT CONTRAC	28 33x 33x 33x 33x 33x 33x 33x 33x 33x 33	AC	300 00 00 00 00 00 00 00 00 00 00 00 00	AE	AF 00 00 00 00 00 00 00 00 00 00 00 00 00	AG	AH	7. 0 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
inchange and according to the control of the contro	<u>לכומאס עס אפואן ואס יישקט</u>	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	7 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	V 0 3360 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	X	30h 30h 30h 30h 30h 30h 30h 30h 0 0 0 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	XX	239 300 0 0 300 300 0 300 500 600 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 30h 30h 30h 30h 30h 30h 30h 0 0 0	30h 30h 30h 30h 30h 30h 30h 00 00 00	AE	AF 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	420 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AH 0 1800 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7. 6 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchanga ravelock 10M entral 10M entral 10M entral 10M entral 10M entral NSC favelock Town follophysa 1 fore 1 favelock Town follophysa 1 fore 3 favelock Town follophysa 1 favelock Town favelock Town favelock Town favelock Town favelock New action 2 favelock New action 3 favelock New ac	346-104640381741-1467196	\$ 500 00 00 00 00 00 00 00 00 00 00 00 00	7 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	V 390 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	X	30h 420 30h 60h 30h 30h 30h 30h 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	240 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2/8 3/3/6 3/	AC 0 3330 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AE 0 193 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AF 00 00 00 00 00 00 00 00 00 00 00 00 00	AG	AH	7. 0 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchange and school to the control of	<u>לכומאס עס אפואן ואס יישקט</u>	\$ 350 00 00 00 00 00 00 00 00 00 00 00 00 0	7 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	V 390 0 0 0 0 306 0 1250 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 C C C C C C C C C C C C C C C C C C C	30h 420 30h 60h 30h 30h 30h 30h 0 0 0 0 0 0 0 30h	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### A	390 0 0 0 305 0 305 0 305 0 305 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AC 0 3350 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 00 300 00 00 300 00 300 00 00 00 00	AE 0 180 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AF 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	420 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AH	A7	
schange applick TDM entral City entral City entral City entral NSC avelock Town oflipping 1 for entral NSC avelock Town oflipping 1 for entral NSC avelock Town oflipping 2 for entral NSC avelock Town oflipping 2 entral NSC avelock Town oflipping 2 entral NSC avelock Town oflipping 2 entral NSC avelock NSC	346-104640381741-1467196	\$ 500 00 00 00 00 00 00 00 00 00 00 00 00	7 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	V 390 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	77 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	X	30h 420 30h 60h 30h 30h 30h 30h 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	240 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2/8 3/3/6 3/	AC 0 3330 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AE 0 193 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AF 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AG	AH	A7	
ichanga analock TOM entral FOM entral FOM entral NSC antral NSC antral NSC analock Town oftratory in the fragoda 1 atumalana 1 popoda 2 atumalana 1 popoda 3 atumalana 1 atumalana 2 atumalana 2 atumalana 2 atumalana 2 atumalana 2 atumalana 2 atumalana 2 atumalana 3 atumalana 2 atumalana 3 atumalana 3 atuma	4 4 5 4 6 4 6 4 6 4 6 4 6 4 6 6 6 6 6 6	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	1	0	V 390 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	X	30h 420 30h 30h 30h 30h 30h 30h 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### CONTRACT CONTRAC	288 398 0 0 0 305 0 305 0 0 0 0 0 0 0 0 0 0 0 0 0	AC 0 3350 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 00 300 00 00 300 00 300 00 00 00 00	AE 0 180 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AF 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AG	AH	87 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
ichanga anelock TOM entral TOM entral TOM entral NSC antral NSC are Social NSC are Social NSC are Social NSC are Social NSC atluma ana 1 popoda 2 entral NSC atluma ana 1 entral NSC entral NSC atluma ana 1 entral NSC entral NSC ent	N44846-1046-2086-146-146-146-1	\$ 350 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 390 0 0 0 306 0 1200 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	X	30h 30h 30h 30h 30h 30h 30h 0 0 0 0 0 0	2 0 0 1500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### A	398 0 0 0 0 306 0 306 0 506 0 506 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AC 3350 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	305 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AE	AF 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AG	AH	87 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchanga analogus to the control of t	**************************************	5 00 00 00 00 00 00 00 00 00 00 00 00 00	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 390 0 0 0 306 0 1250 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30h 60h 60h 60h 60h 60h 60h 60h 60h 60h 6	7 C C C C C C C C C C C C C C C C C C C	7 335h 3270 335h 605h 335h 335h 305h 305h 305h 305h 305h 3	2 0 1550 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	XX	28 30% 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	XC	305 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AE 0 190 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AF	AG	AH	87	
xchange and color to the color	**************************************	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 0 3500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	215 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 335h 4260 305h 606h 305h 305h 305h 0 0 0 0 0 305h 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	240 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	398 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	XC	AU	AE	AF	A3	AH	7 150 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
schange and school and	**************************************	\$ 350 00 00 00 00 00 00 00 00 00 00 00 00 0	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 390 0 0 0 0 306 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	80 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	210 00 00 00 00 00 00 00 00 00 00 00 00 0	7 335h 320 336 65h 335h 335h 335h 6 6 6 7 7 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### A	398 398 0 0 306 306 606 606 0 0 0 0 0 0 0 0 0 0 0 0 0	XC	NO	AE	XF	A3	AH	87 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchanga anelock TDM entral TDM entral City entral City entral NSC favelock Town offugitya 1 otto 2 favelock Town offugitya 1 color offugitya 1 favelock Town offugitya 1 favelock Town offugitya 1 favelock Town favelock New actor 2 faturaya e 1 atunaya e 1 atunaya e 1 atunaya e 2 otto 3 otto 2 otto 2 otto 2 otto 3 otto 2 otto 2 otto 3 otto 2 otto 3 otto 2 otto 3 otto 3 otto 2 otto 3 otto 4 otto 4 ott	**************************************	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 390 0 0 0 0 306 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	70 70 70 70 70 70 70 70 70 70 70 70 70 7	215 6 6 6 6 7 7 7 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	9 33h 1299 30h 1299 3	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### A Part	30% 30% 00 00 00 30% 60% 00 00 00 00 00 00 00 00 00	300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AU 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AE	AF	4200 CO	AH	87 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchanga analogue to the control of t		\$ 350 00 00 00 00 00 00 00 00 00 00 00 00 0	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 0 5500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	70 70 70 70 70 70 70 70 70 70 70 70 70 7	210 00 00 00 00 00 00 00 00 00 00 00 00 0	9 33h 1299 30h 1299 3	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### A	30% 30% 00 00 00 30% 60% 00 00 00 00 00 00 00 00 00	XC	NO	AE	XF	A3	AH	87 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchanga anelock TOM entral TOM entral City antral City antral NSC faredox Town oflugitys 1 offer 1 faredox Town oflugitys 1 offer 1 faredox Town action 2 entral New action 3 entral New a	NANAYA A A A A A A A A A A A A A A A A A	\$ 50 00 00 00 00 00 00 00 00 00 00 00 00	7700 C C C C C C C C C C C C C C C C C C	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 0 3900 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	80 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	215 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 33h 120 33h	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	240 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	398 398 0 0 0 306 606 606 0 0 0 0 0 0 0 0 0 0 0 0 0	AC	AU	AE	AF	4200 CO	AH	87 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
Achanga Investor TDM Investor TDM Investo	ないとのストライトをあるようとのようとのようとのよりとなれてなればない。	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 3900 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	70 70 70 70 70 70 70 70 70 70 70 70 70 7	7 C C C C C C C C C C C C C C C C C C C	7 33/h 220 33/h 220 33/h 220 33/h 220 33/h 23/h 23/h 23/h 23/h 23/h 23/h 23/h	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### A	28 30K 00 00 00 00 00 00 00 00 00 00 00 00 0	XC	NO NO NO NO NO NO NO NO	AE	XF	A3	AH	87 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
xchange and color to the color		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 0 5360 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	70 70 70 70 70 70 70 70 70 70 70 70 70 7	215 0 0 0 0 0 0 0 0 0 0 0 0 0	9 33h 1299 3	2 0 1550 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### A Part	28 30% 30% 30% 30% 30% 30% 30% 30% 30% 30%	AC	AU 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AE	AF	A3	AH	87	
xchanga andiscritum entral TUM entral City entral TUM entral City entral NSC factorism f		\$ 000000000000000000000000000000000000	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 390 0 0 0 0 306 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	70 70 70 70 70 70 70 70 70 70 70 70 70 7	200 000 000 000 000 000 000 000 000 000	7 33/h 12/0 33/h 12/0 33/h 12/0 33/h 12/0 33/h 13/h 13/h 13/h 13/h 13/h 13/h 13/h	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### A	398 398 0 0 0 306 606 606 606 606 606	AC	AU	AE	XF	A3	AH	0 1500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
schange and school to the control of		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V 0 5360 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	70 70 70 70 70 70 70 70 70 70 70 70 70 7	215 0 0 0 0 0 0 0 0 0 0 0 0 0	9 33h 1299 3	2 0 1550 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	### A Part	28 30% 30% 30% 30% 30% 30% 30% 30% 30% 30%	AC	AU 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AE	AF	A3	AH	87	

d ≠ Direct Final, u = Inter-unit Final (of a same building); h ≠ High usage; (nothing) = Rasic route Final.

Table 2-5-8 Number of Circuits of RSU-Main Exchange in Colombo Metro Area to be Provided by 2000

Exchange	Park Ser De Maria Caraller de La Caraller de La Caraller (de la Caraller de La Ca	DELs	Traffic	Circuits				
Remote	Main		(O/G)	to Main Exchange				
Switch Unit			(ed.)	(voice Ch.)				
NATIONAL PROPERTY AND PROPERTY OF THE PROPERTY		ATTACH THE BOOK OF THE PARTY OF	0	PRIPARIES COMMUNICATIONS	THE THE RESIDENCE IN			
Angoda	Cent. North	1,024	82	98	4			
Boralesgamua	Havelock town	5,646	452	478	16			
Hokandara	Havelock town	3,177	254	277	10			
Homagama	Maharagama	5,150	412	438	15			
Homagama	Nugegoda	500	40	53	2			
Ja-Ela	Katunayake	6,500	520	547	19			
Kadawata	Kelaniya	3,800	304	328	-11			
Kaduwela	Cent. North	3,172	254	277	10			
Malwana	Cent. North	3,031	242	265	9			
Maltegoda	Maharagama	3,161	253	276	10			
Minuwangoda	Katunayake	2,979	238	261	9			
Moratuwa	Ratmalana	6,000	480	507	17			
Mt. Lavinia	Havelock town	3,000	240	262	9			
Mt. Lavinia	Ratmalana	1,000	80	96	4			
Padukka	Maharagama	1,500	120	138	5			
Padukka	Nugegoda	500	40	53	2			
Piliyandala	Ratmalana	5,000	400	426	15			
Raddolugma	Katunayake	3,192	255	278	10			
Ragama	Wattala	5,317	425	451	16			
Rukumalgáma	Maharagama	1,054	84	101	4			
Wellanpitiya	Cent. North	4,395	352	376	13			
Total		69,098	5,528	5,986	210			

Table 2-5-9 Trunk Circuit Matrix between SSCs to be Provided by 2000

				A TSC		Awiss	Chila	Gampa		Kegal	Kurun	Negom	
NSCAMILIMBL	0	18,450	1,680			0	0	0	0	0	0	0	
COL-TSC	18,450	0	930		360	480	540		1,290	570	990	1,140	3
KAN-TSC	1,680	990	_	150	120	0	0	30	30	0	30	0	150
ANU-TSC	960	300			90	0	0	0	0	0	0		7
GAL-YSC	1,050	420	120	90	0	0	0	0	30	0	0	0	. (
Awissawela	0	510	0	0	0	0	0	0	0	Ö	0		{
Chilaw	0	540	0	-	-	_	0	0	0	0	0		- (
Gampaha	0	1,350	90			0	0	0	30	0	0	•	
Kalutara	0	1,110				0	0	30	. 0	0	0		7
Kegalle	0	540	60		_	0	0	0	Ō	0	. 0	Ő	7
Kurunegara	0	930	90		_	0	Ü	Ö	0	0	0	-	
Negombo	0	1,110					0	0	0	0	0	-	
Ampara	0	30	150		-	Ō	0	0	0	0	0	_	
Badulla	0	180			-	0	0	0	0	0	0		7
Bandarawella	0	120	210		-		0	0	0	0	0	0	(
Balticaloa	0	180	330	-	_	0	0		0	0	0		(
Hallon	O		150	4	_	_	0	0	0	O	0		0
Kalmunee	0	180	330			_	0	-	0	- 0	0	_	(
Malale	0	180	270		_	0	0	0	0	0	0	_	
Nawalapitiya	0	Q	120	1	1	0	Ū	0	0	0	0	_	
Nuwara Eliya	0	120	180	Ü		0	0	0	0	0	0		(
Jalina	0	630	90			-	0		0	0	0		
Mannar	0	0	0		0	0	0	0	0	0	0		
Polonnaruwa	0	120	0	4	_	0	0	0	0	0	0	-	(
Trincomalee	0	180	0		-	0	0	0	0	0	0	-	
Vavunia	0	120	0	4	0	0	0	0	0	. 0	0	-	
Hambantota	0	240				. 0	0	0	0	0	0	-	
Malara	0	360	60				0	0	Ű	0	0	-	7
Rainapura	0	300	60	1 -		0	0	0	0	0	0		
TOTAL	22,140	29,220	5,580	2,790	3,000	480	540	1,500	1.380	570	1,020	1,140	180
	Name and Advantage of the Advantage of t	**************************************	Commence of the Commence of th		habitation and	Manna	77-7-	Trinc	Vavun	Hamba	172127	Ratna	ITOTAL
Sw. Centres	Kalmu	Matai		Nuwar	Jalin					A PROPERTY NAMED IN			
NSCWLUMBL	0	.0	0	0	Ü	0	0	0	0	0	0	0	,
COL-TSC	180	180	C	1		0	120	. 180	120	210	300		26,970
KAN-TSC	360	300	120	1	90		0	0	0	60	60		.,
ANU-TSC	0	0	0	0	570	120	180	240	150	0	0	0	1,500

Sw. Centres		Kaimu	Matal	Nawai	Nuwar	Jalin	Manna		Trinc	Vavun	Hamba			TOTAL
NSCWLUM	JBN	0	0	0	0	Ű	0	Ū	0	0	Ū	0		22,170
COL-TSC		180	180	0	60	600	0	120	. 180		210	300	240	26,970
RANTSC		360	300	. 120	240	90	Ū	0	0		60	60	60	4,260
ANU-TSC		0	0	0	0	570	120	180	240	150	0	0	0	1,500
GAL-TSC		. 0	. 0	0	0	. 30	0	0	0	0	330	540	330	1,710
Awissaweia	ī	0	0	0	0	0	0	0	0	.0	0	0	0	510
Chilaw		. 0	. 0	0	Ō	0	0	0	0	0	0	0	0	540
Gampaha		0		0	7	0	0	0	0	0	0	0	0	1,530
Kalulara		C	0	C	0	0	0	0	0		0	0	0	1,440
Kegalle		. 0	: 0	0	0	0	0	0	-		0	0	0	600
Kurunegara	ī	0	0	0	0	0	_	0			0	0	0	1,020
Negombo		0	0	0	0	0	0	გ			0	0	. 0	1,140
Ampara		0	0	0	0	0	0	0	0	0	0	0	0	180
Badulia		0	0	0	0	0		0	0	_	-	0	0	480
Bandarawel	lla	0	0	0	-	Q	0	0	0		0	. 0	C	330
Ballicaloa		0	0	0		0	-	0	0	1	0	. 0	0	510
Hallon		0	0	0	C	0		0	0		0	0	. 0	180
Kalmunee		0	0	7	C	0	Ö	0	0		0	0	0	510
Matale		0	Q	<u> </u>	0	0	_	0				0	0	450
Nawalapitiy		. 0	0	0	0	0	0		0			0	0	120
Nuwara Eliy	ya	0	0	7	0	0	0	0	0		0	0	0	300
Jaifna	•	0	ō	0	1	0	0	0			0	ō	0	1,320
Mannar		0	0	0	0	0	0	0			0	0	0	120
Polonnaruw		0	0	0	0	0	0	O		I	0	0	0	300
Trincomale	e	0	0	0	0	0	0	C			_	0	0	420
Vavunia		0	0	0	0	0	0	0			0	0	0	270
Hambantota	a	0	0	0	0	0	0	,				0	0	600
Malara		0	0	0	0	0	0			0	0	0		930
Ratnapura		0	0	0	0	0	0	0	0	_	0	900	0	660
TOTAL		540	480	120	300	1,290	120	300	420	270	600	200	630	71,070