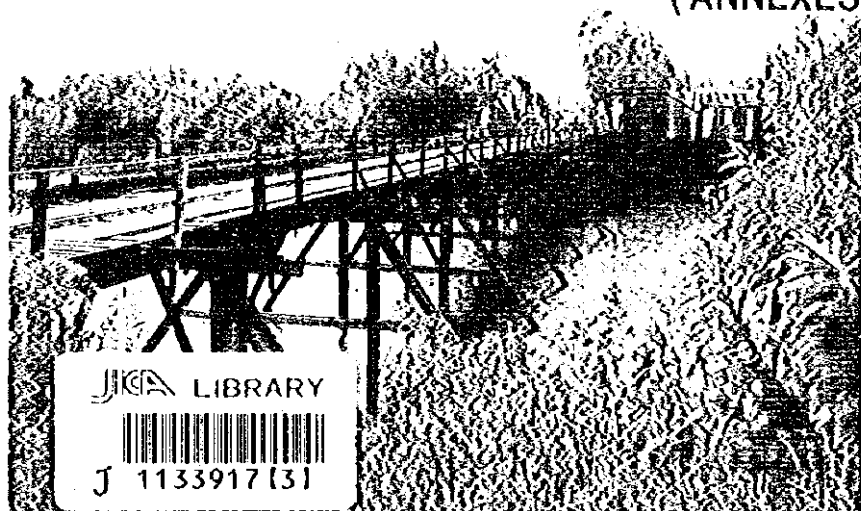


Ministerio de Obras Públicas y Transportes
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de la República de Paraguay

THE FEASIBILITY STUDY
ON
ARTERIAL ROAD DEVELOPMENT PROJECT
IN
THE CENTRAL EASTERN AREA
IN
THE REPUBLIC OF PARAGUAY



FINAL REPORT
(ANNEXES)



FEBRUARY, 1997

(C) INSTITUTO NACIONAL DE INVESTIGACIONES (C) 1997
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THE FEASIBILITY STUDY ON ARTERIAL ROAD DEVELOPMENT
PROJECT IN THE CENTRAL EASTERN AREA IN THE REPUBLIC OF PARAGUAY

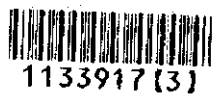
FINAL REPORT
(ANNEXES)

FEBRUARY, 1997

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YACHTING ENGINEERS

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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

**MINISTRY OF PUBLIC WORKS AND COMMUNICATIONS
THE REPUBLIC OF PARAGUAY**

**THE FEASIBILITY STUDY
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ARTERIAL ROAD DEVELOPMENT PROJECT
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**FINAL REPORT
(ANNEXES)**

FEBRUARY, 1997

**CENTRAL CONSULTANT INC. (JAPAN)
IN ASSOCIATION WITH
YACHIYO ENGINEERING CO., LTD. (JAPAN)**

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F-1

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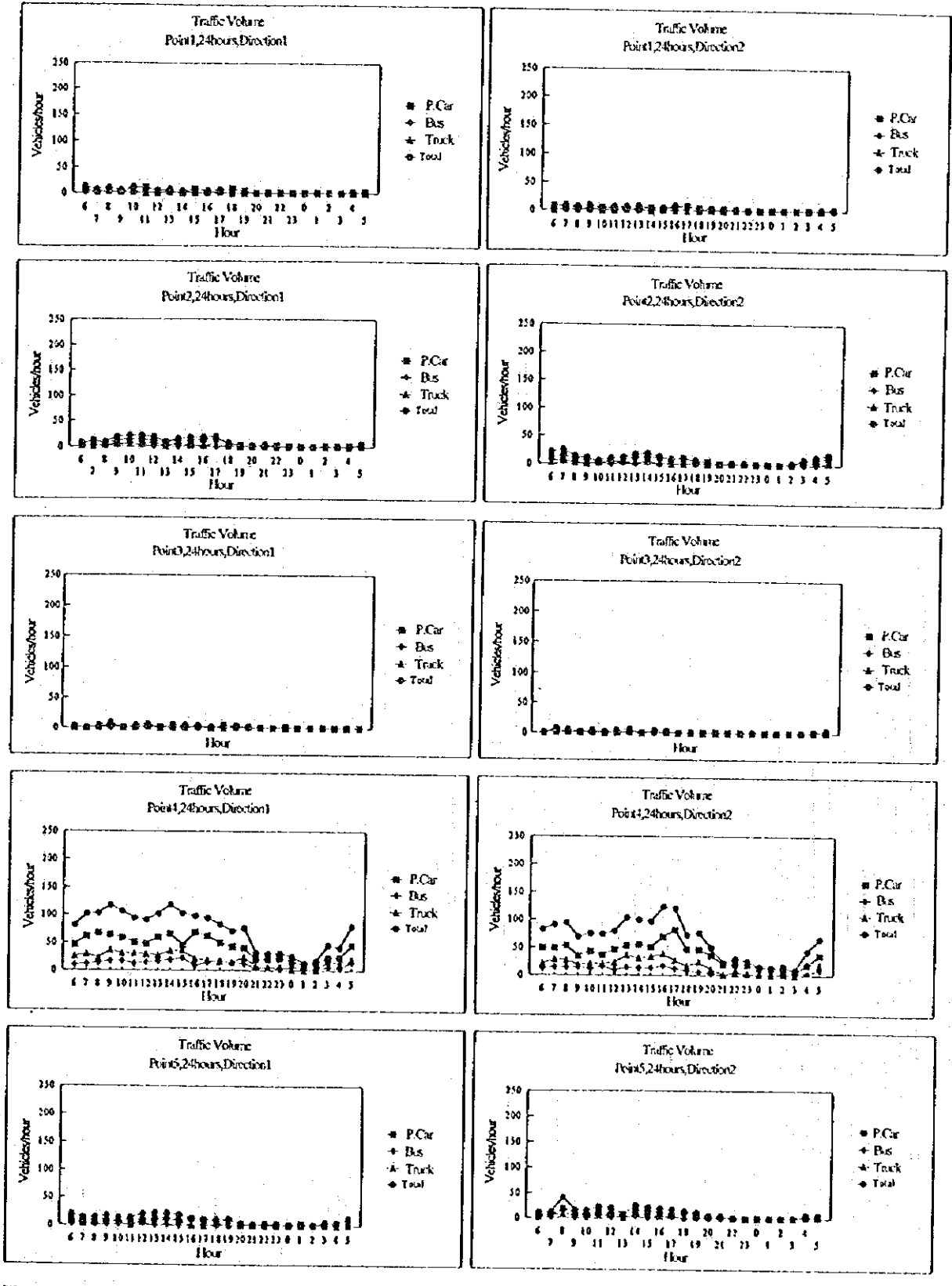
Initial Environmental Evaluation for Alternative Routes

Location of Community Facilities

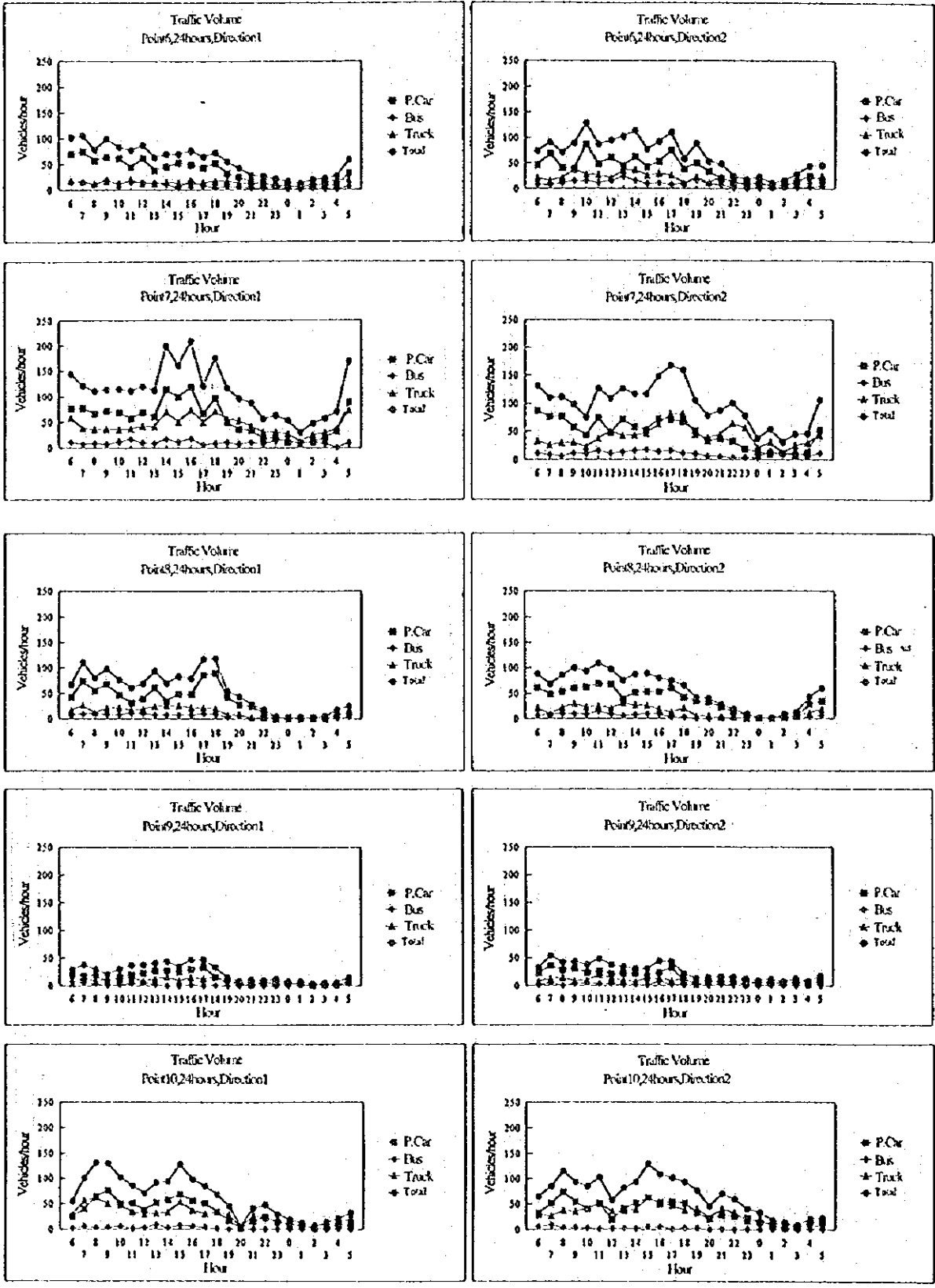
ANNEX A
TRAFFIC DATA

ANNEX A-1

24 Hours Traffic Volume Fluctuations



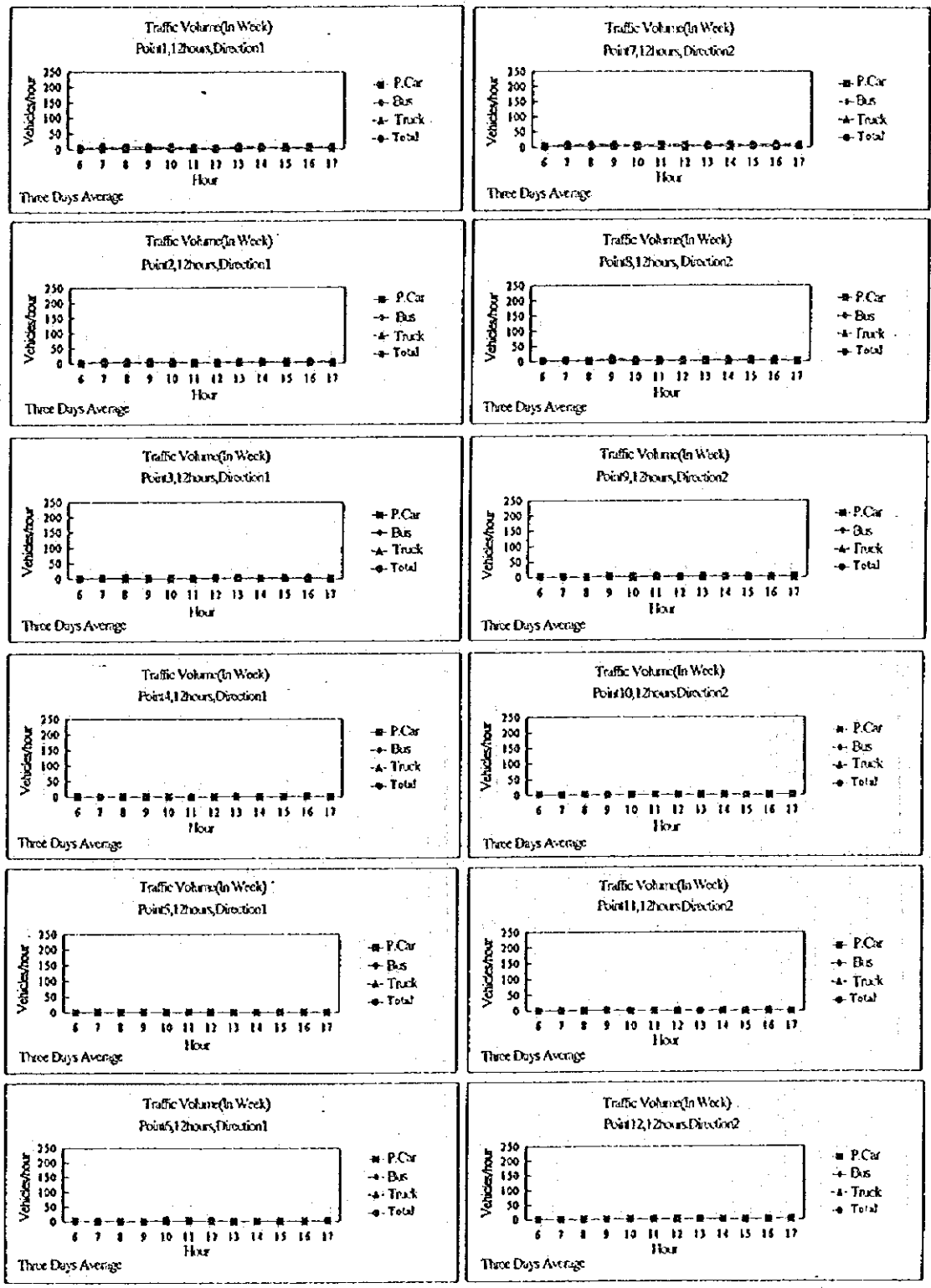
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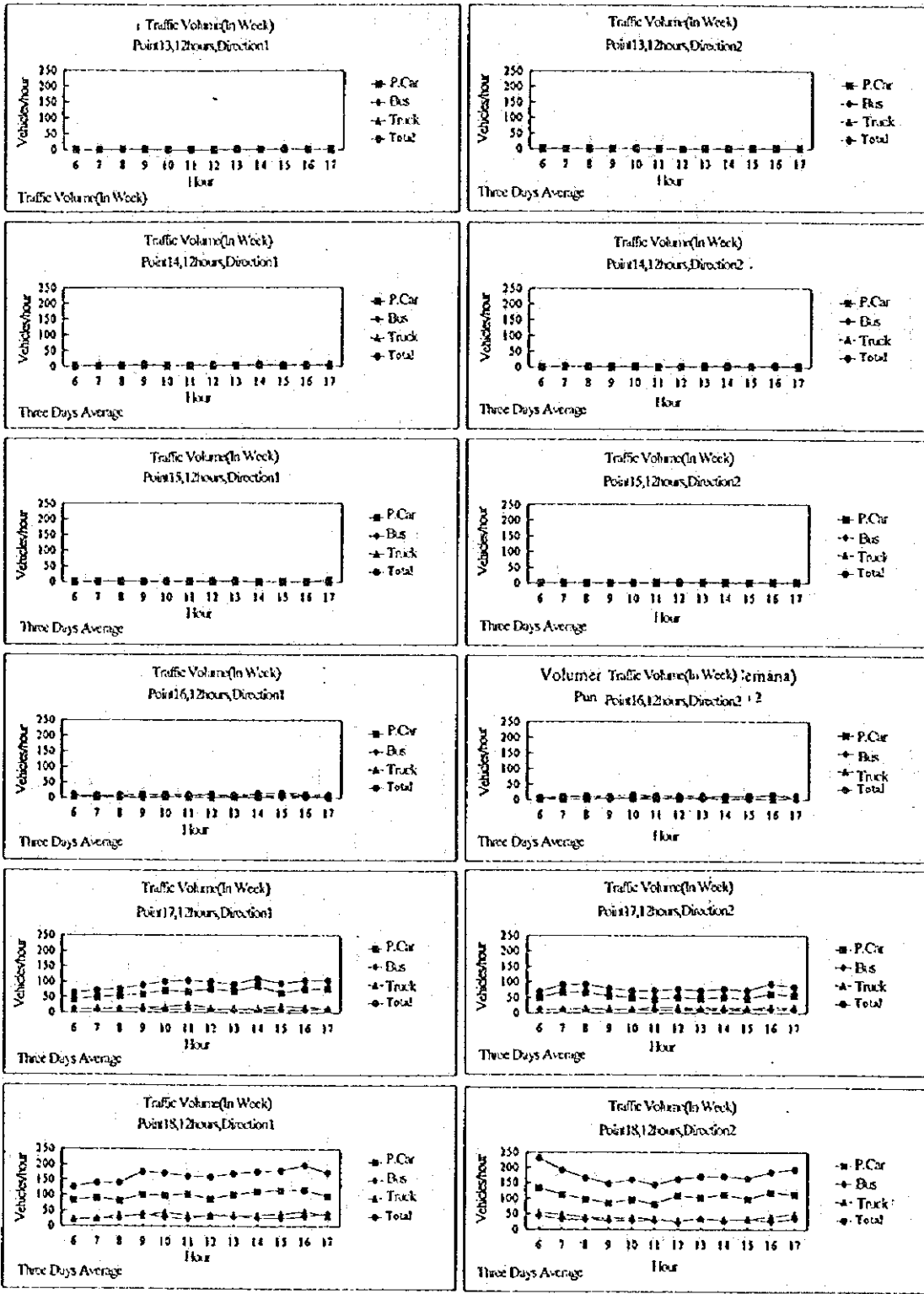
Annex A-1 24 hours Traffic Volume Fluctuation (2)

ANNEX A-2

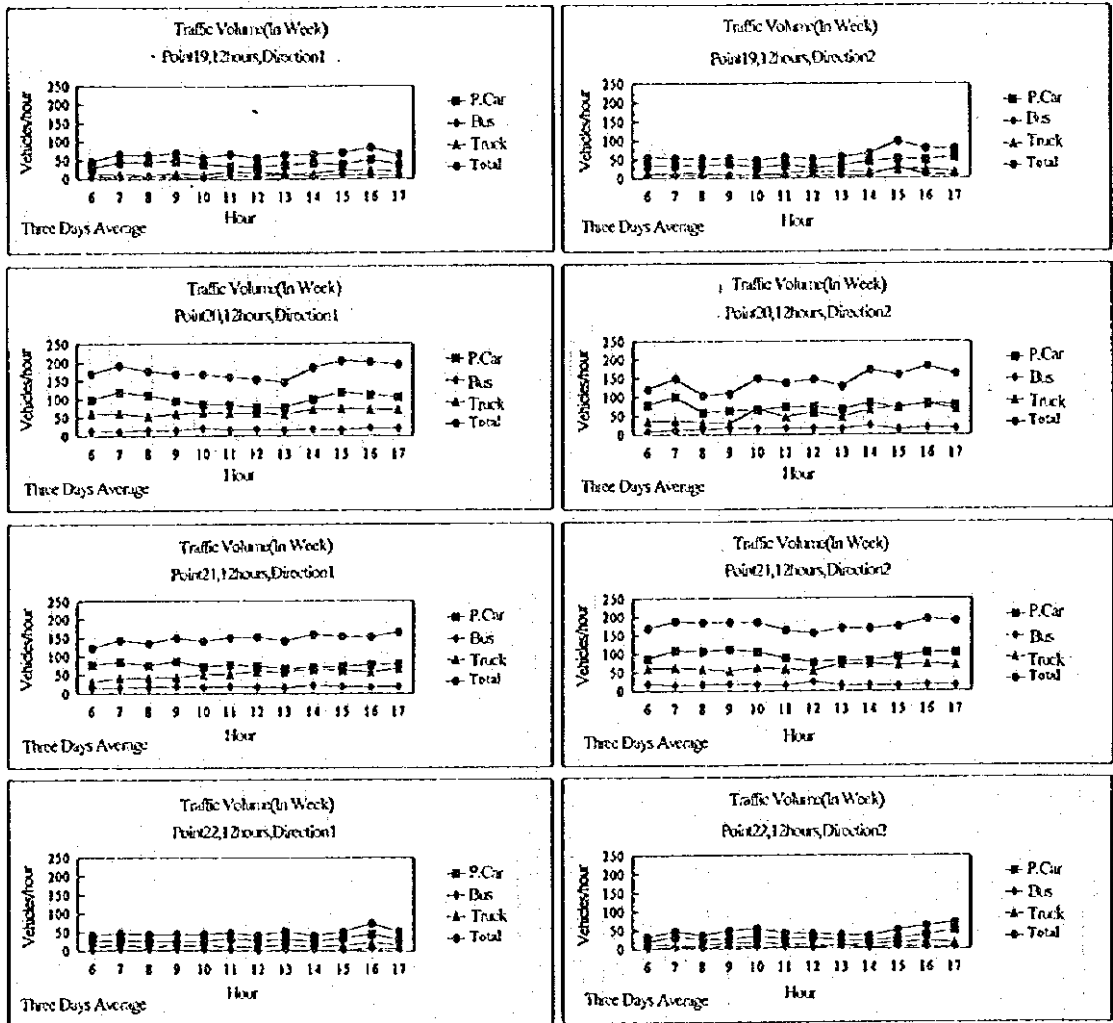
12 Hours Traffic Volume Fluctuations



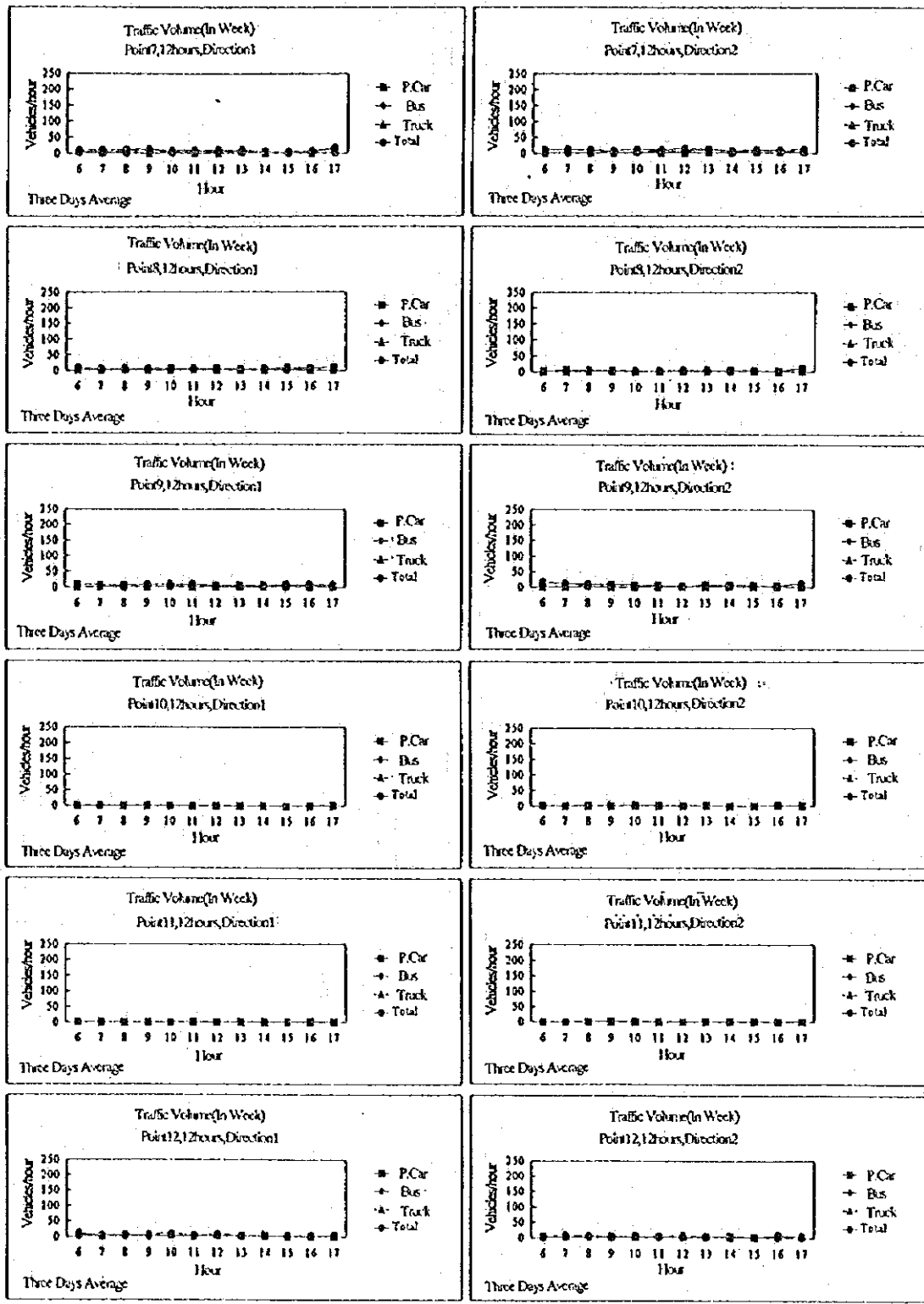
Annex A-2 12 hours Traffic Volume Fluctuation (3 Weekdays Average) (1)



Annex A-2 12 hours Traffic Volume Fluctuation (3 Weekdays Average) (2)



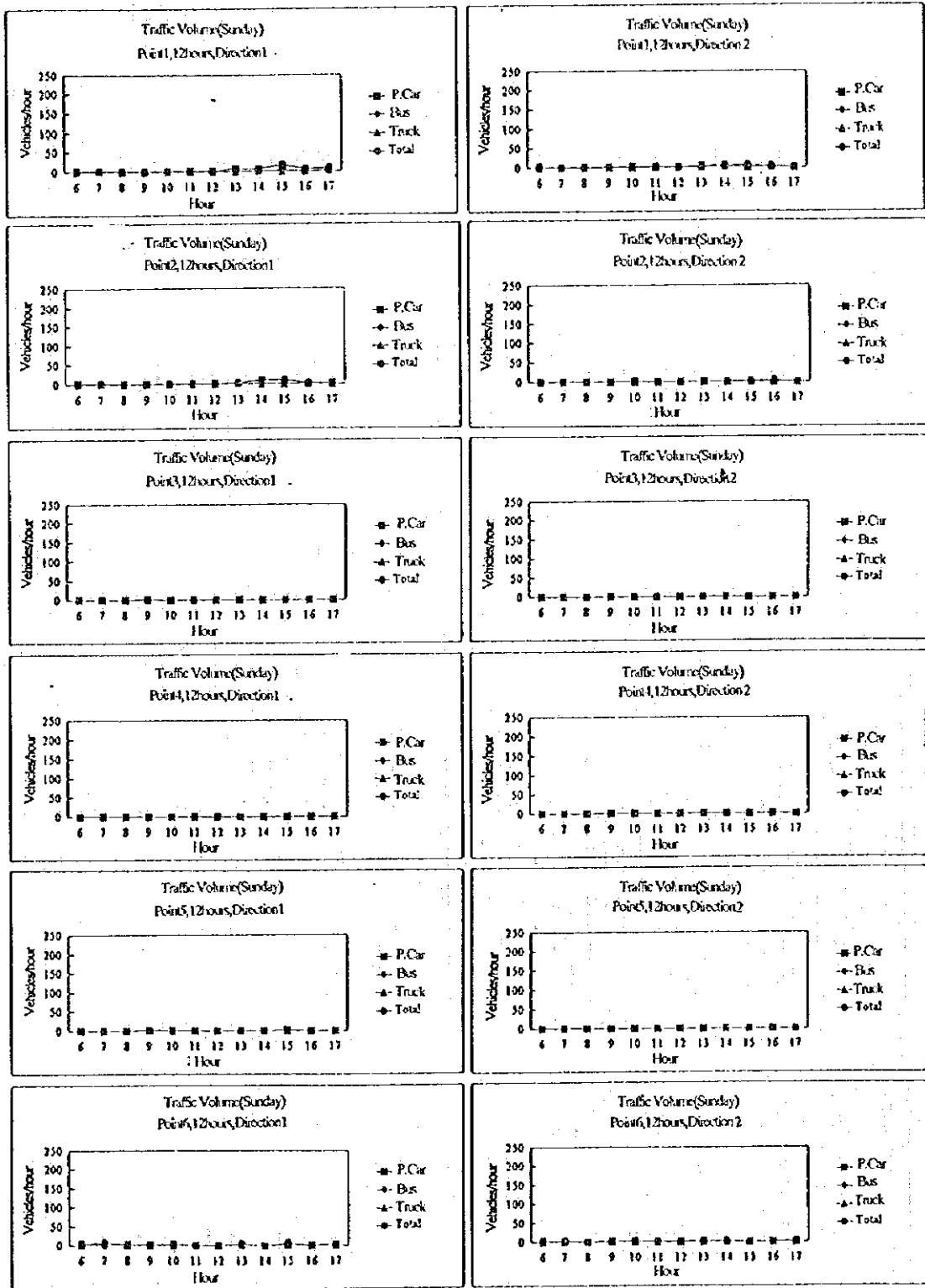
Annex A-2 12 hours Traffic Volume Fluctuation (3 Weekdays Average) (3)



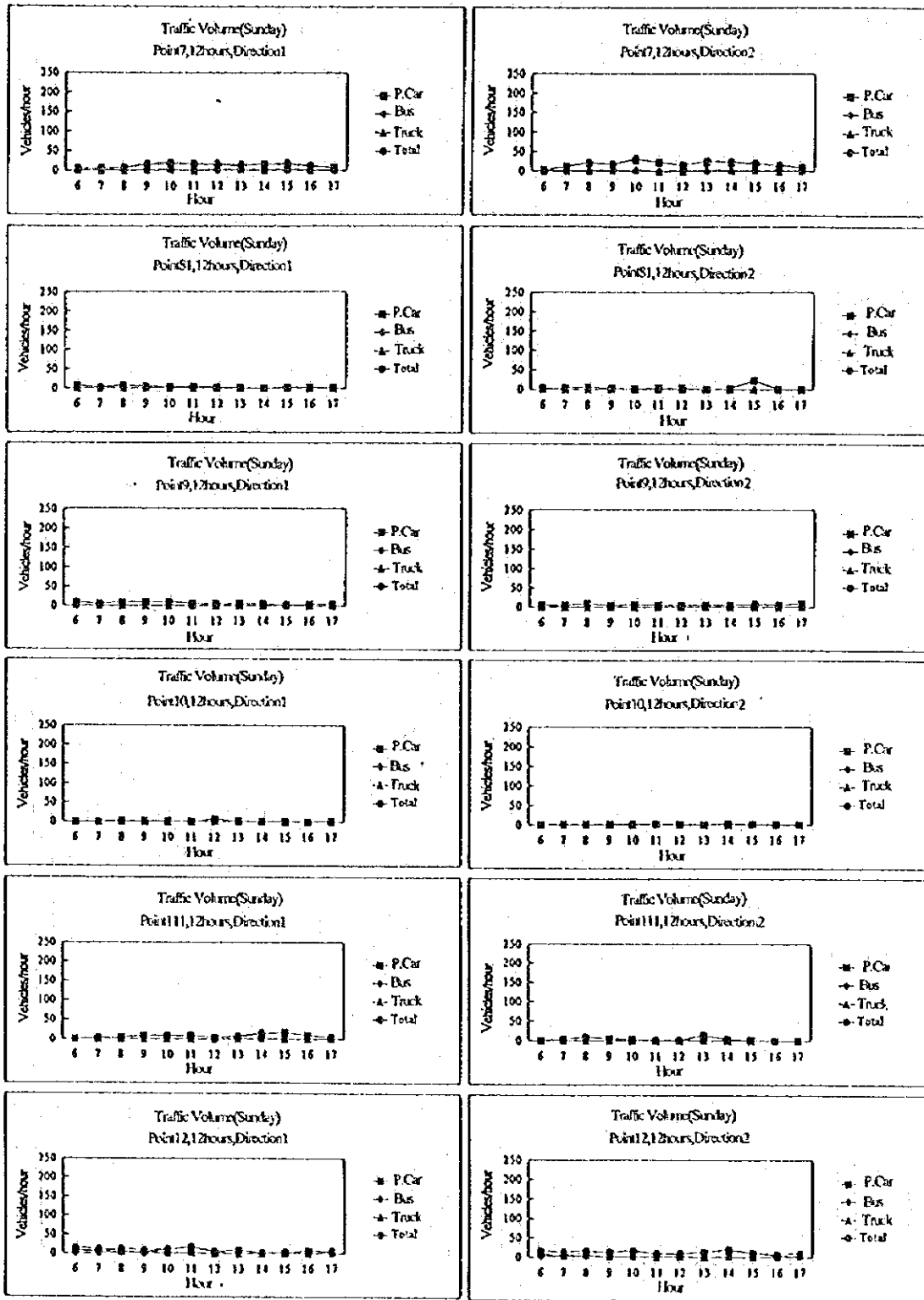
Annex A-2 12 hours Traffic Volume Fluctuation (3 Weekdays Average) (4)

ANNEX A-3

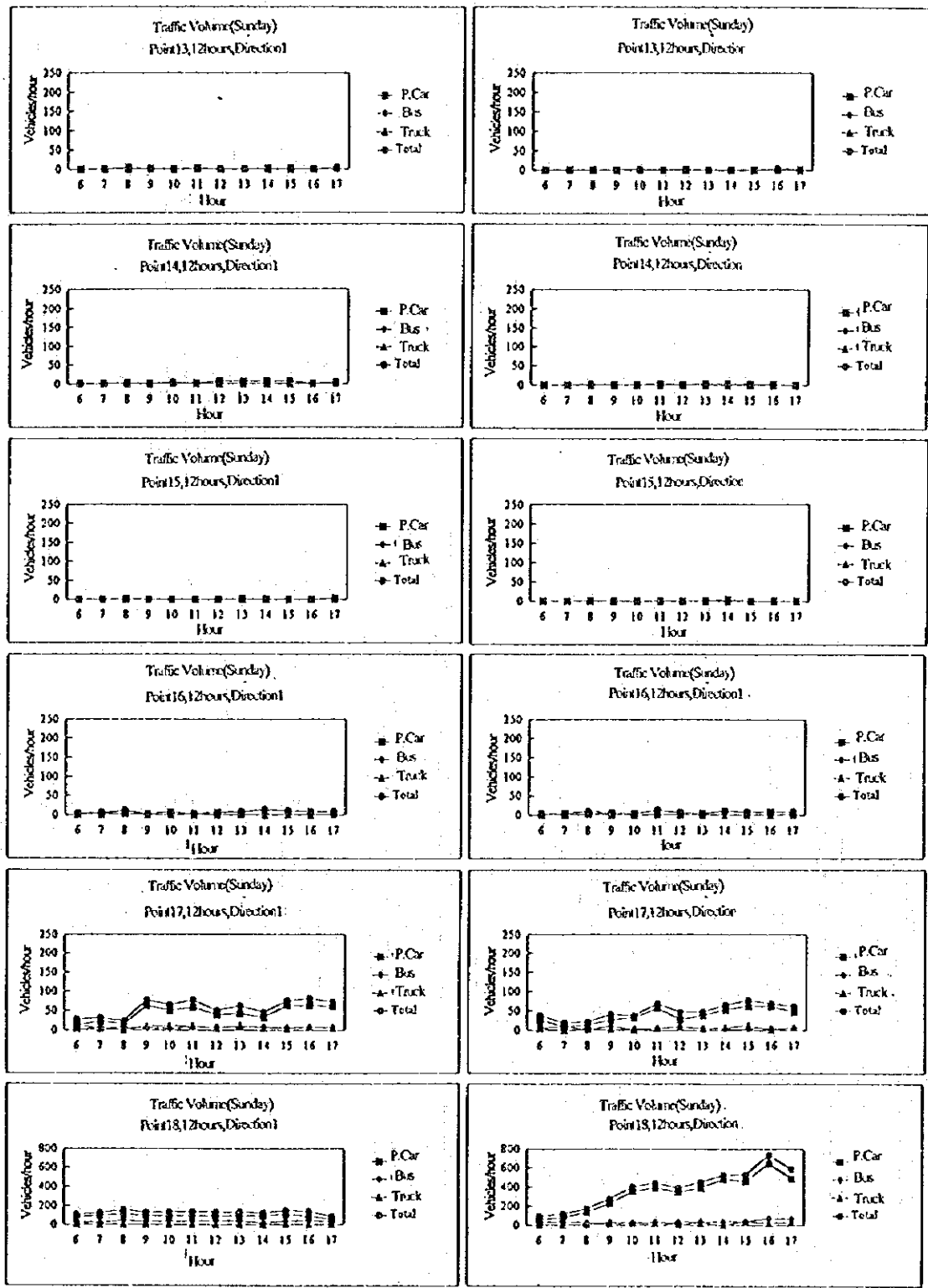
12 Hours Traffic Volume Fluctuations(Sunday)



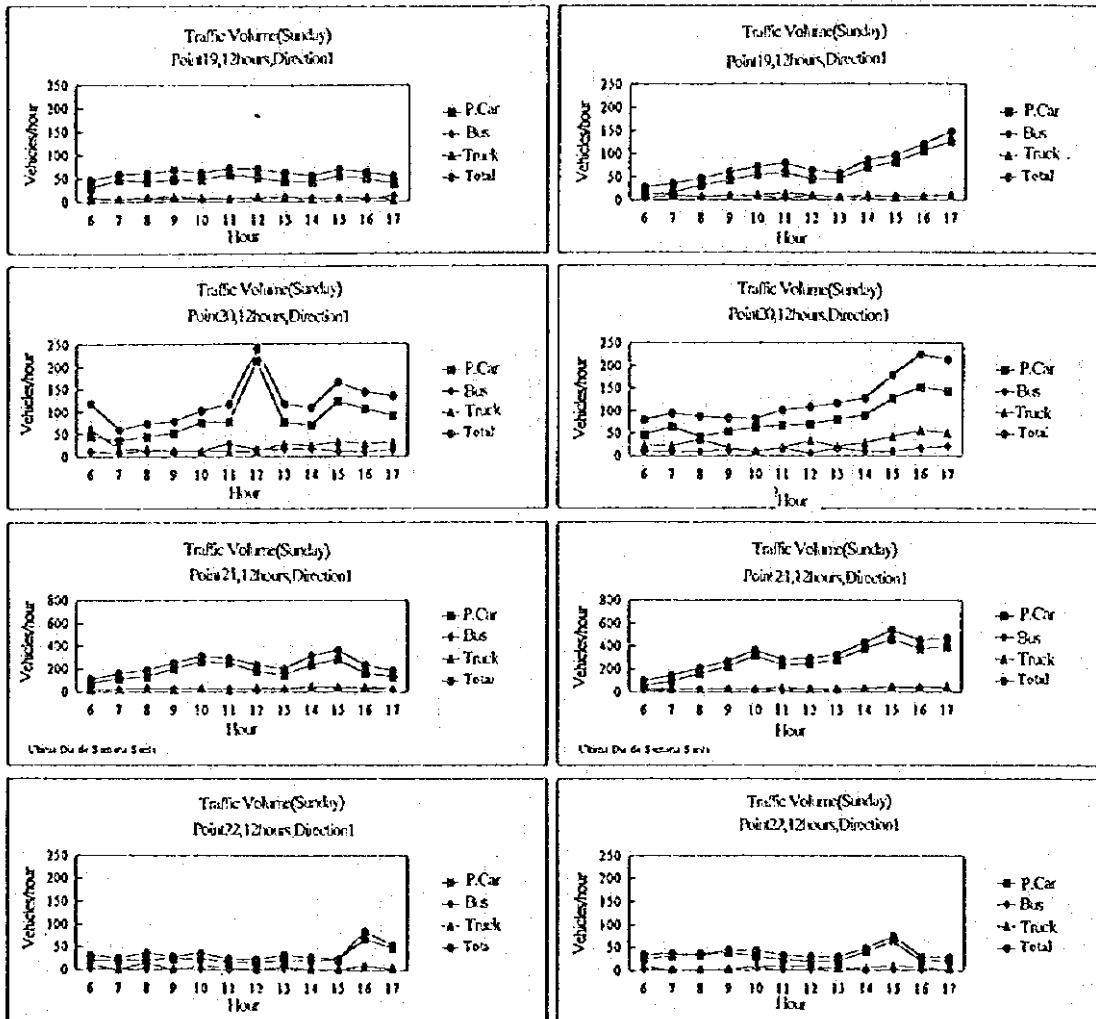
Annex A3 12 hours Traffic Volume Fluctuation (Sunday) (1)



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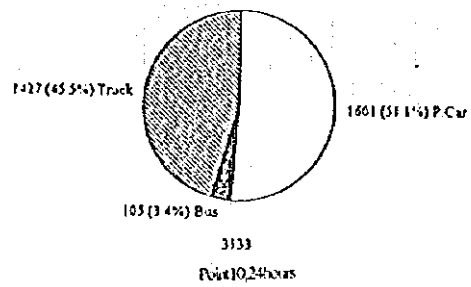
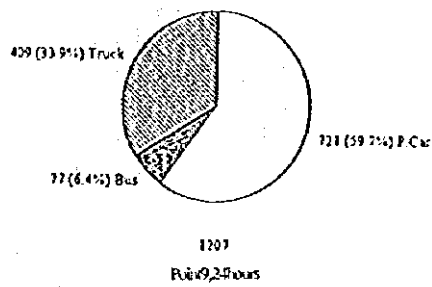
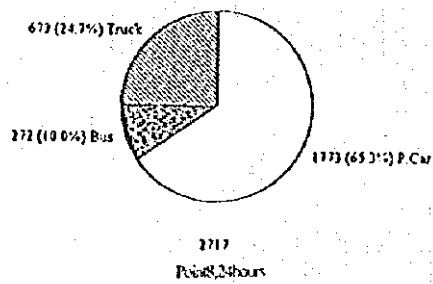
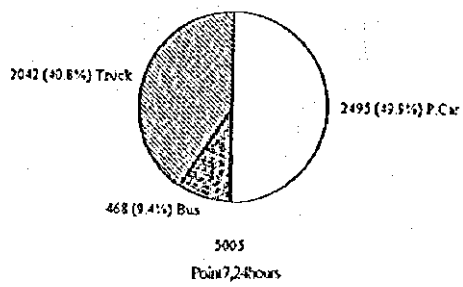
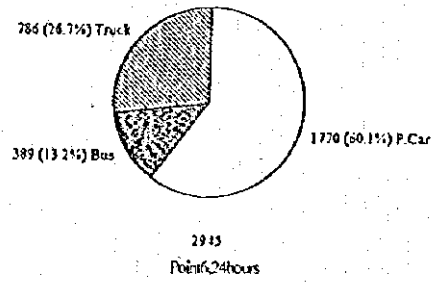
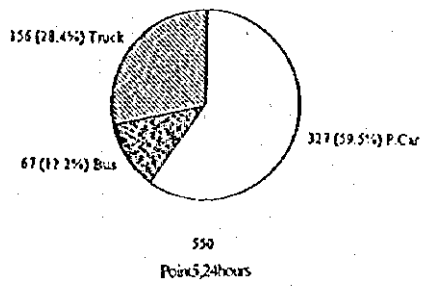
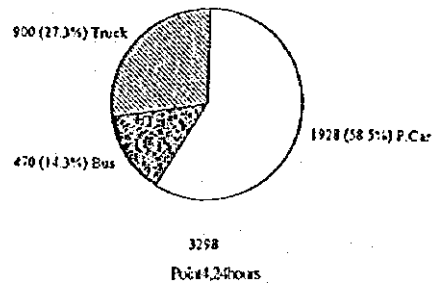
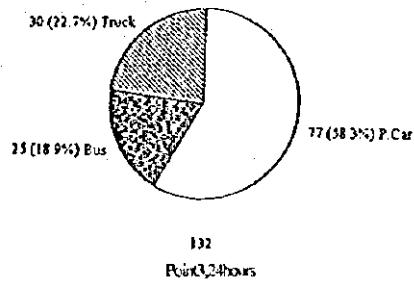
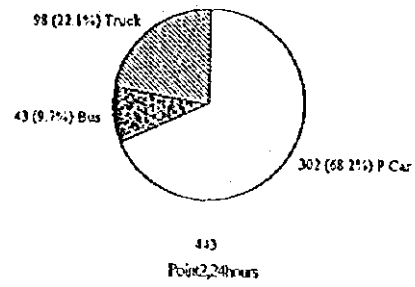
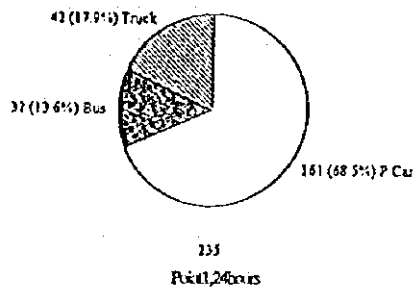
Annex A3 12 hours Traffic Volume Fluctuation (Sunday) (3)



Annex A-3 12 hours Traffic Volume Fluctuation (Sunday) (4)

ANNEX A-4

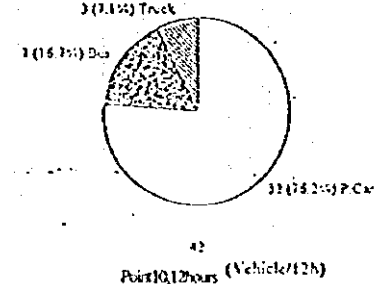
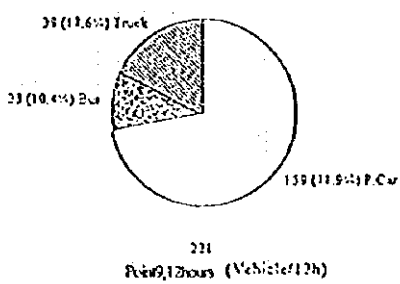
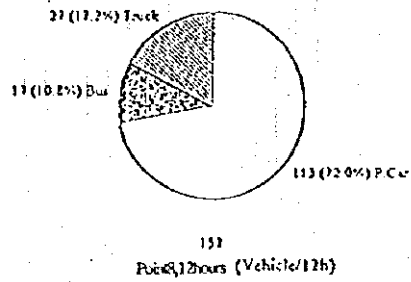
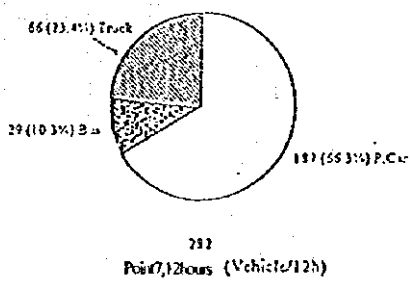
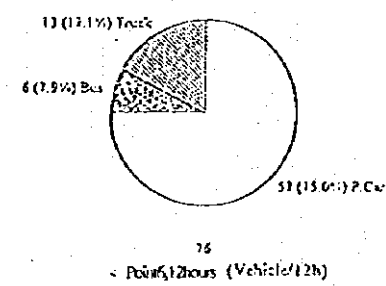
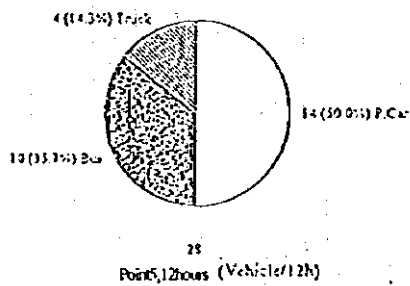
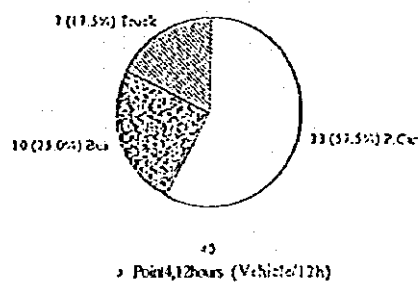
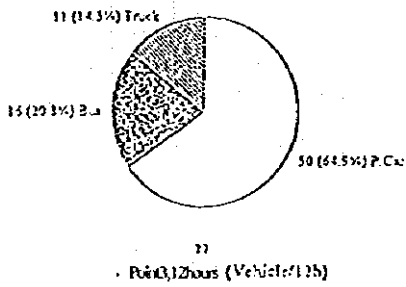
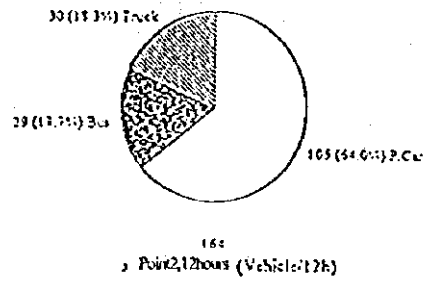
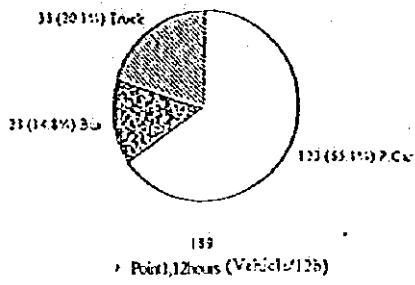
24 Hours Traffic Volume Composition



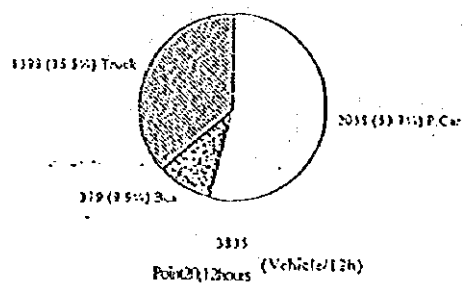
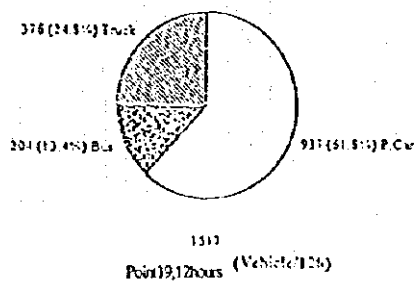
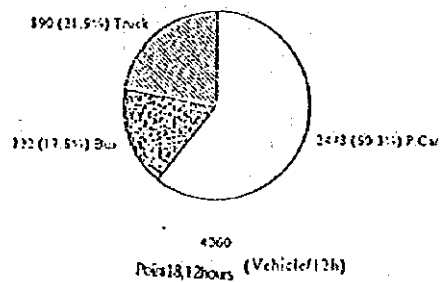
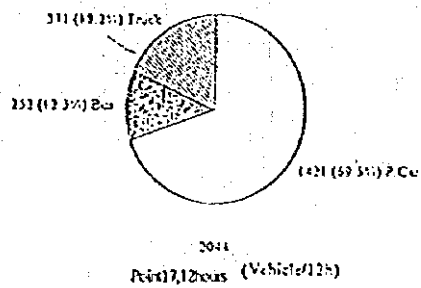
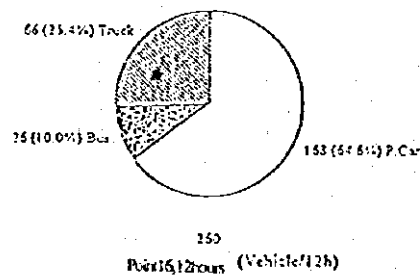
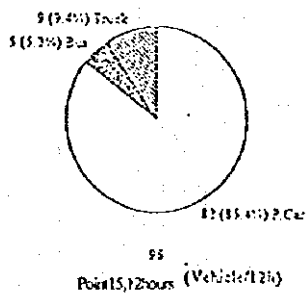
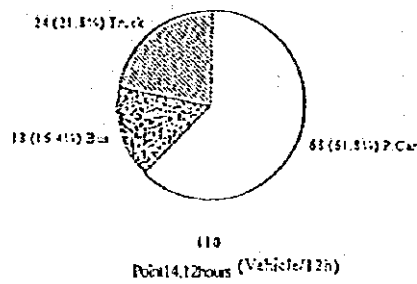
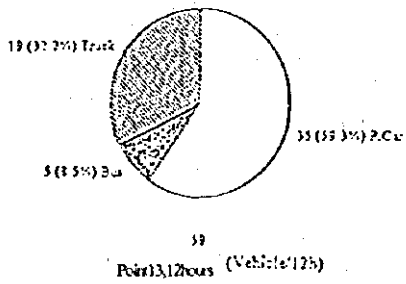
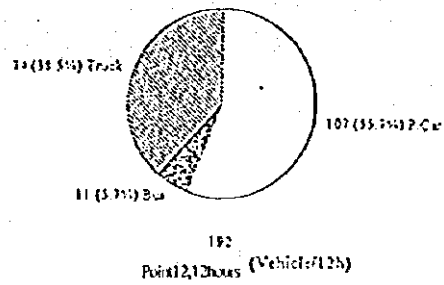
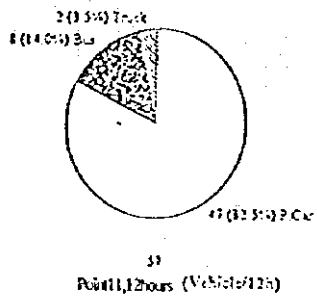
Annex A-4 24 hours Traffic Volume Composition
A- 15

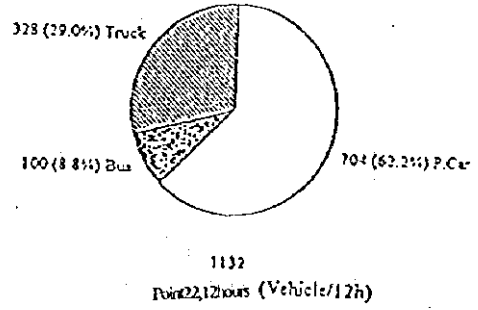
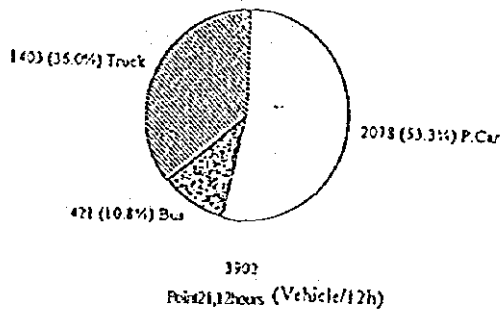
ANNEX A-5

**12 Hours Traffic Volume Composition
(3 Weekdays Average)**



Annex A-5 12 hours Traffic volume Composition (3 Weekdays Average) (1)

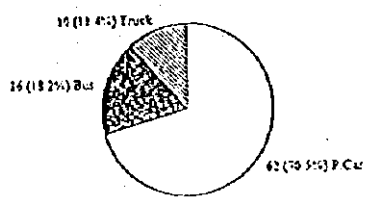




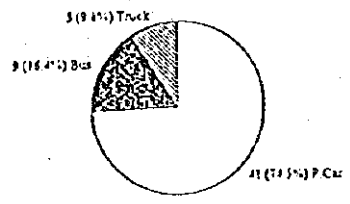
Annex A-5 12 hours Traffic volume Composition (3 Weekdays Average) (3)

ANNEX A-6

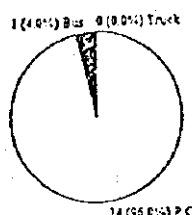
**12 Hours Traffic Volume Composition
(Sunday)**



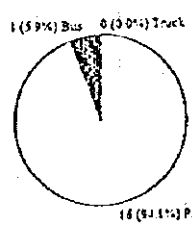
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Point 1, 12 hours (Vehicle/12h)



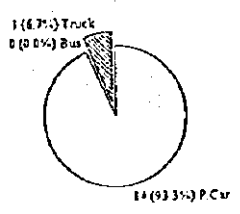
53
Point 2, 12 hours (Vehicle/12h)



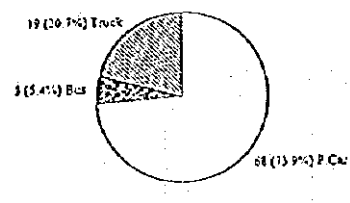
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Point 3, 12 hours (Vehicle/12h)



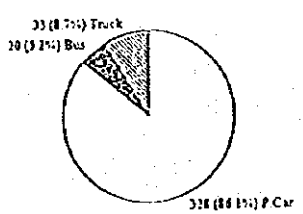
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Point 4, 12 hours (Vehicle/12h)



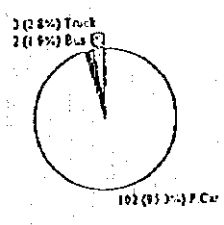
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Point 5, 12 hours (Vehicle/12h)



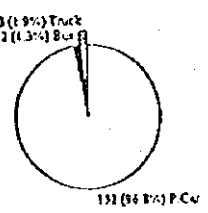
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Point 6, 12 hours (Vehicle/12h)



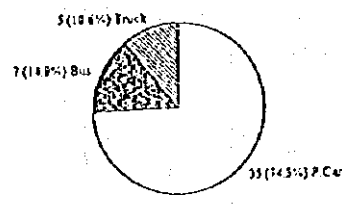
261
Point 7, 12 hours (Vehicle/12h)



107
Point 8, 12 hours (Vehicle/12h)

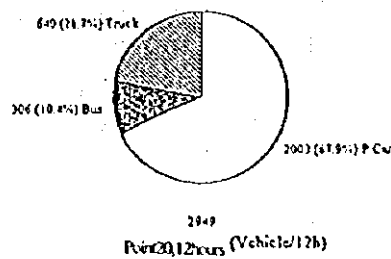
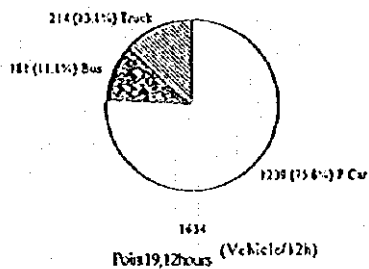
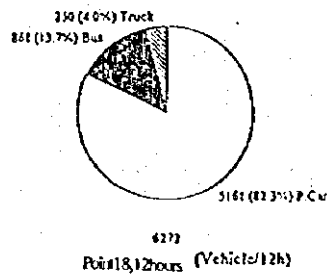
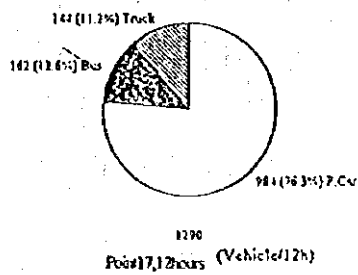
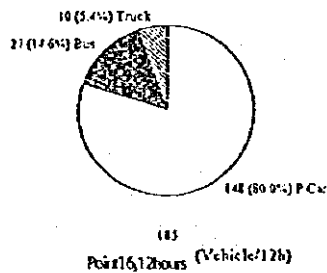
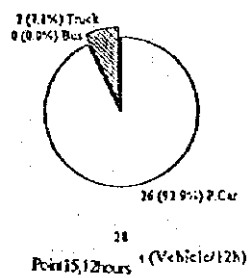
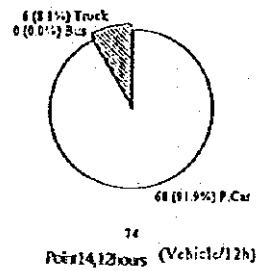
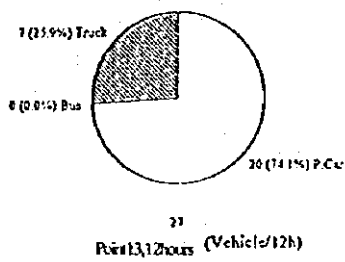
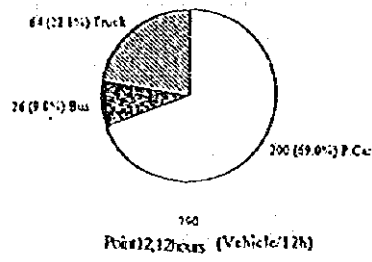
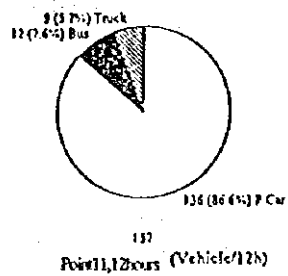


137
Point 9, 12 hours (Vehicle/12h)

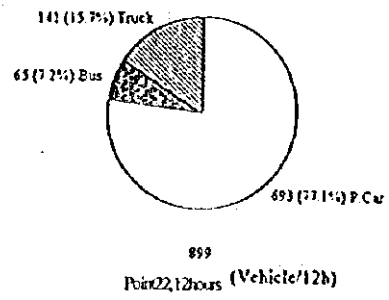
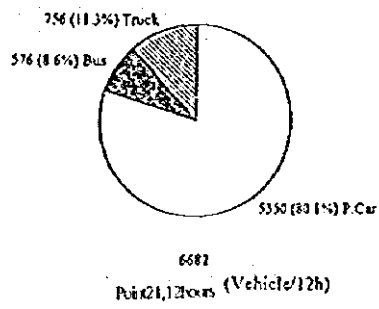


47
Point 10, 12 hours (Vehicle/12h)

Annex A-6 12 hours Traffic volume Composition (Sunday) (1)



Annex A-6 12 hours Traffic volume Composition (Sunday) (2)

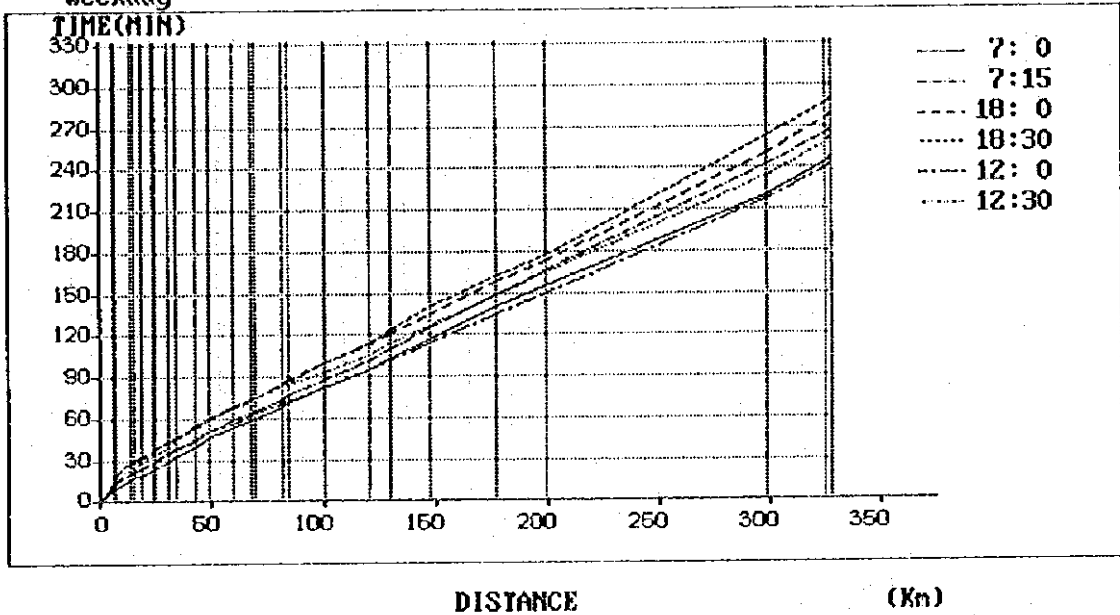


Annex A-6 12 hours Traffic volume Composition (Sunday) (3)

ANNEX A-7

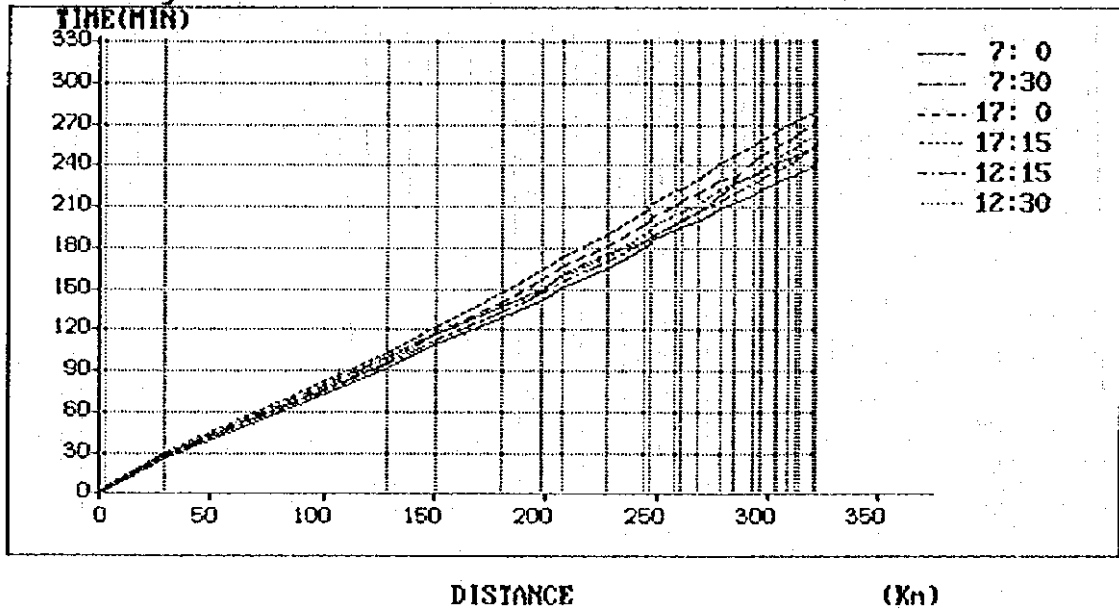
Travel Speed Survey Result

Travel Speed Survey Result
Direction : Asuncion->Ciudad del Este
Weekday



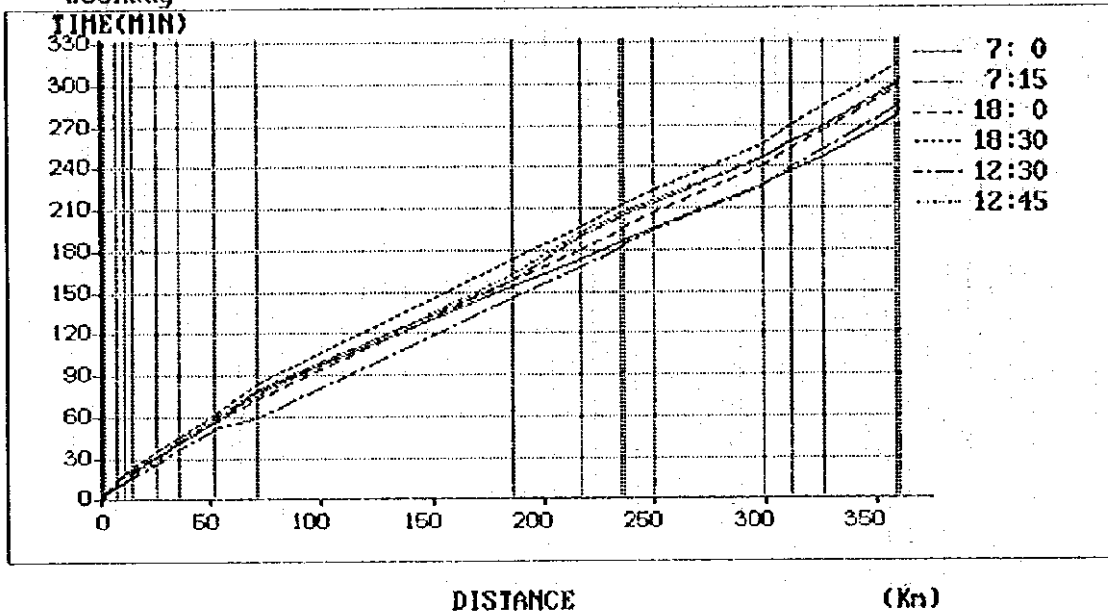
Annex A-7 Travel Speed Survey Results (1)

Travel Speed Survey Result
Direction : Ciudad del Este->Asuncion
Weekday



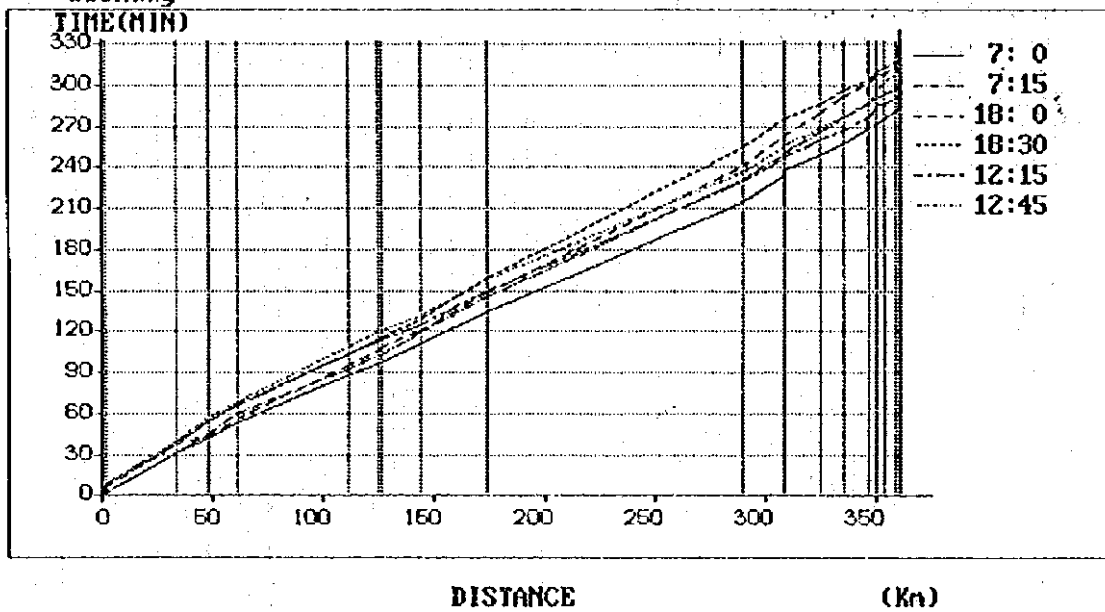
Annex A-7 Travel Speed Survey Results (2)

Travel Speed Survey Result
 Direction : San Lorenzo->Encarnacion
 Weekday



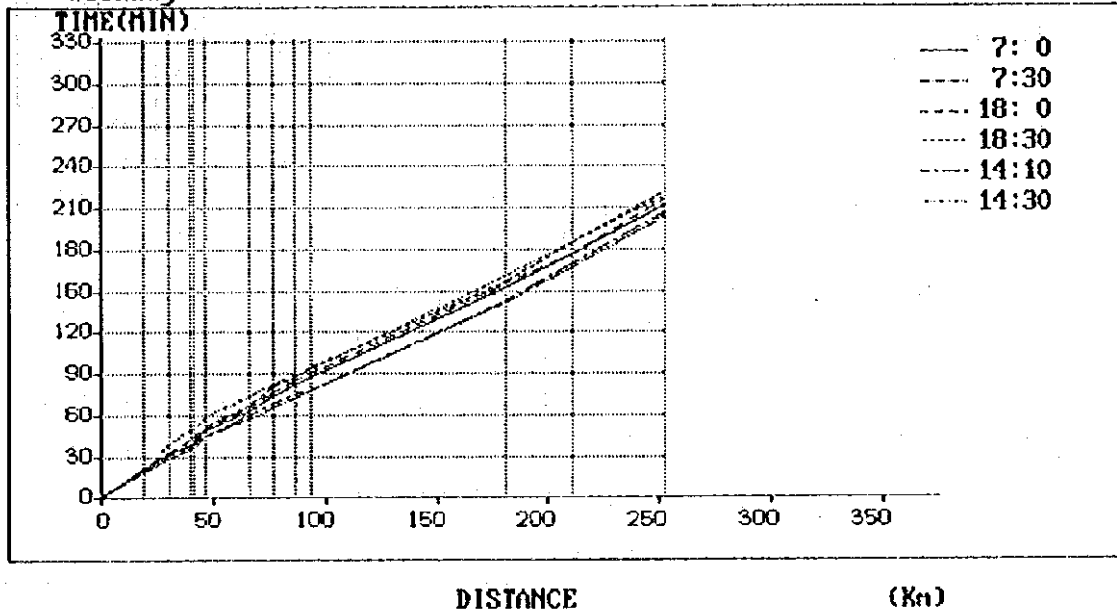
Annex A-7 Travel Speed Survey Results (3)

Travel Speed Survey Result
 Direction : Encarnacion->San Lorenzo
 Weekday



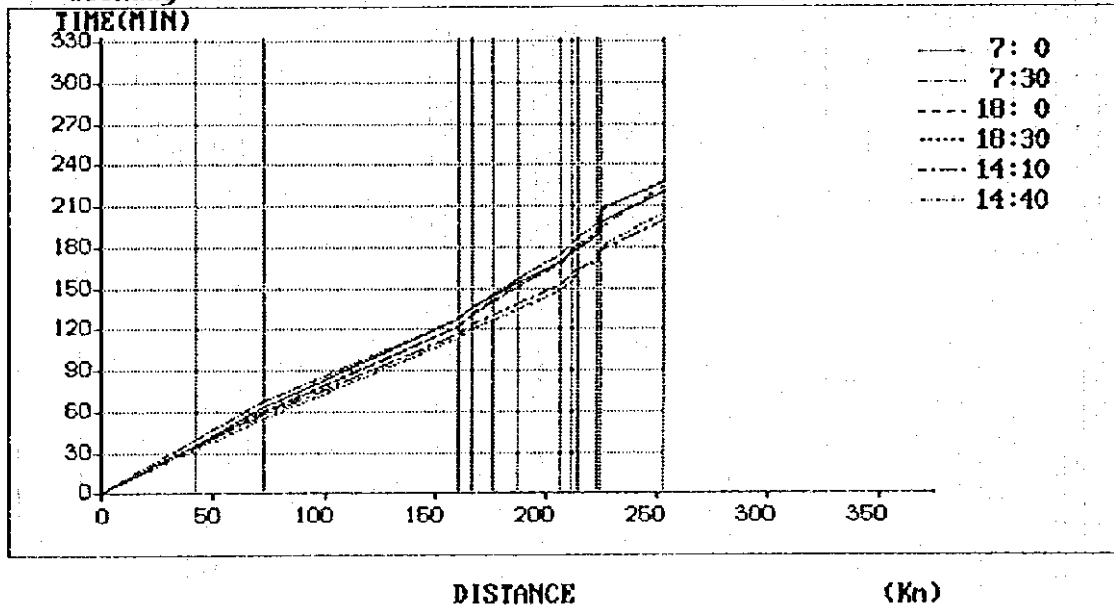
Annex A-7 Travel Speed Survey Results (4)

Travel Speed Survey Result
Direction : Encarnacion->Enpalme Ruta 7
Weekday



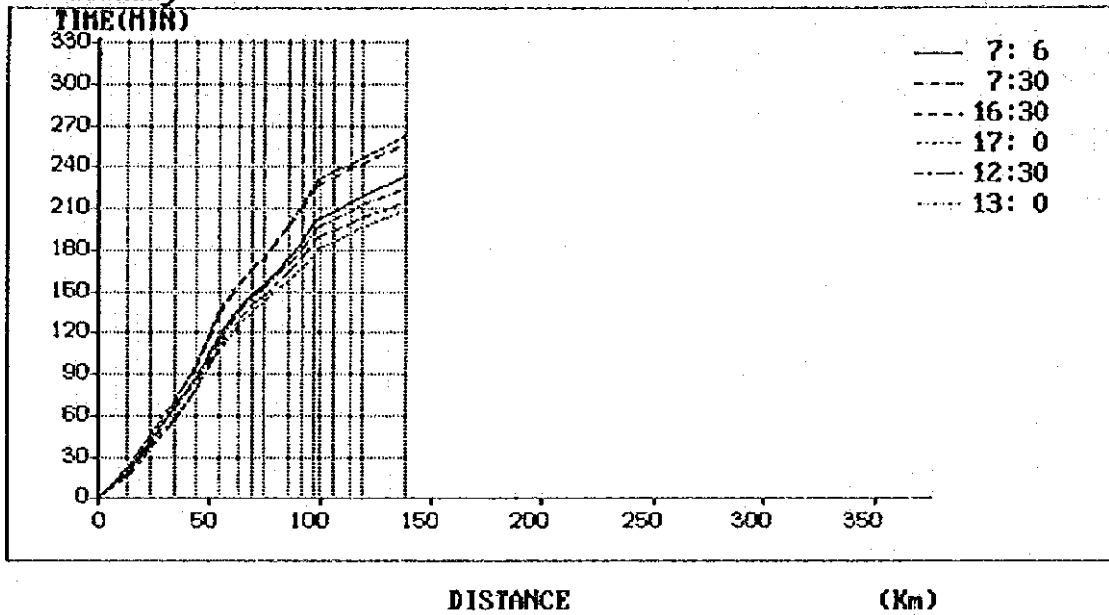
Annex A-7 Travel Speed Survey Results (5)

Travel Speed Survey Result
Direction : Enpalme Ruta 7->Encarnacion
Weekday



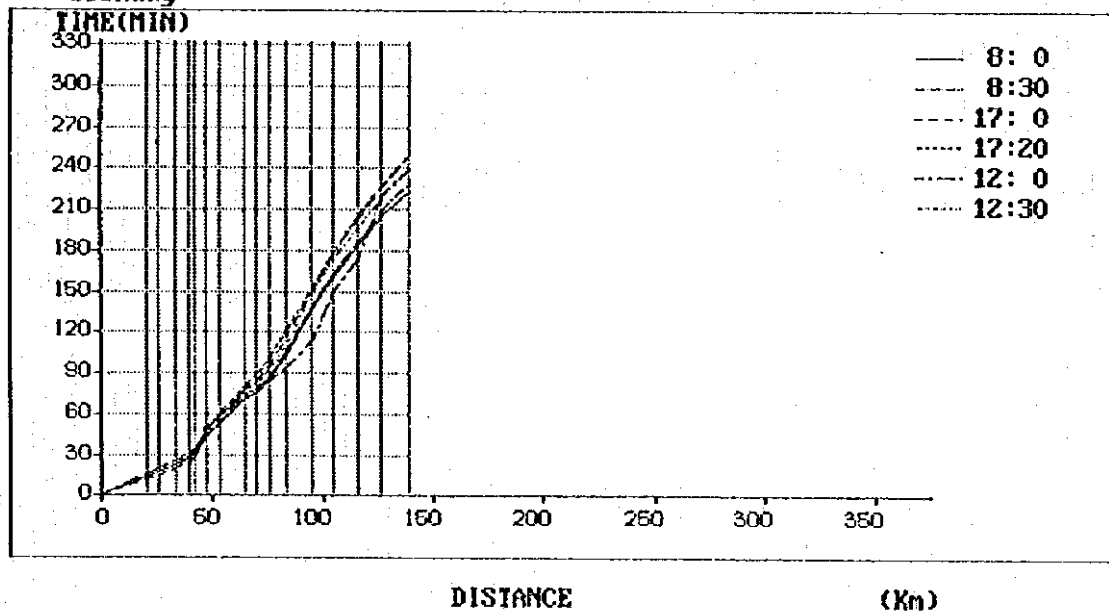
Annex A-7 Travel Speed Survey Results (6)

Travel Speed Survey Result
Direction : Paraguari->Cnel. Oviedo
Weekday



Annex A-7 Travel Speed Survey Results (7)

Travel Speed Survey Result
Direction : Cnel. Oviedo->Paraguari
Weekday

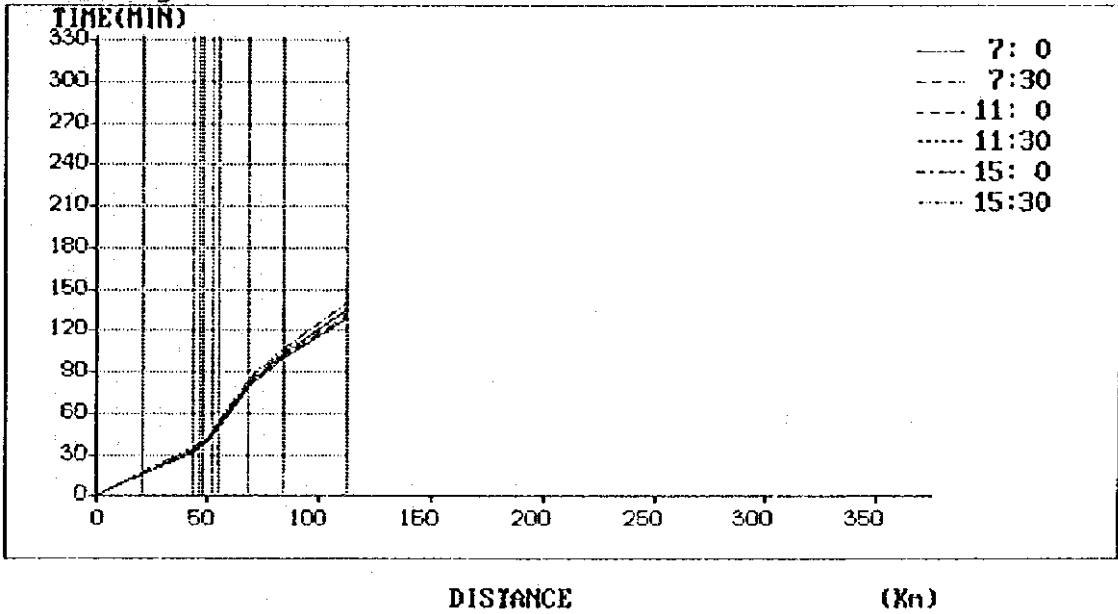


Annex A-7 Travel Speed Survey Results (8)

Travel Speed Survey Result

Direction : ruta 2 (San Jose)->ruta 1 (Carapegua)

Weekday

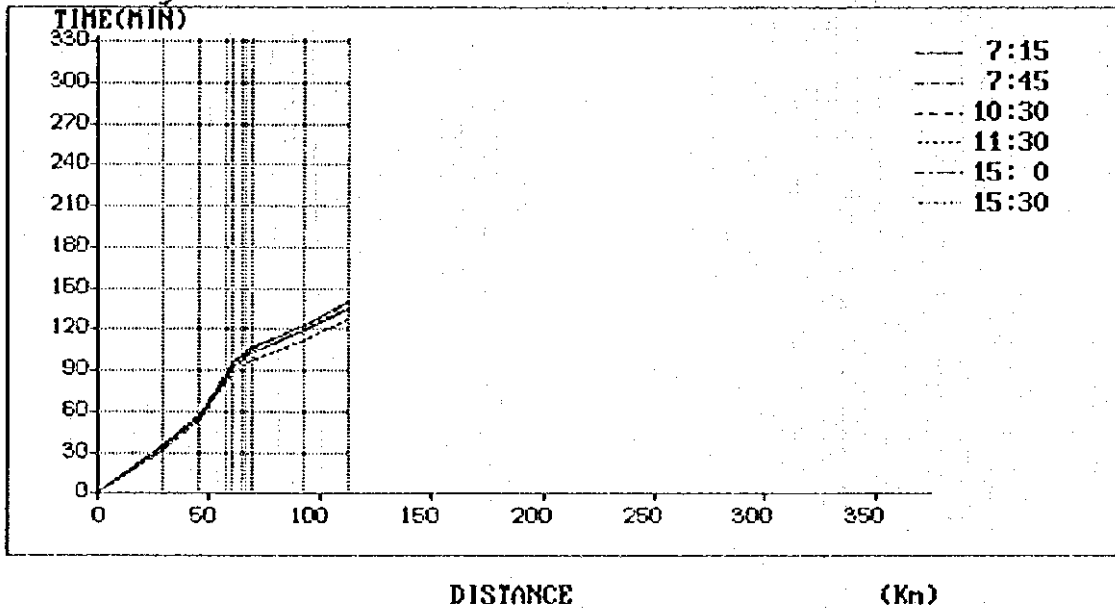


Annex A-7 Travel Speed Survey Results (9)

Travel Speed Survey Result

Direction : ruta 1 (Carapegua)->ruta 2 (San Jose)

Weekday



Annex A-7 Travel Speed Survey Results (10)

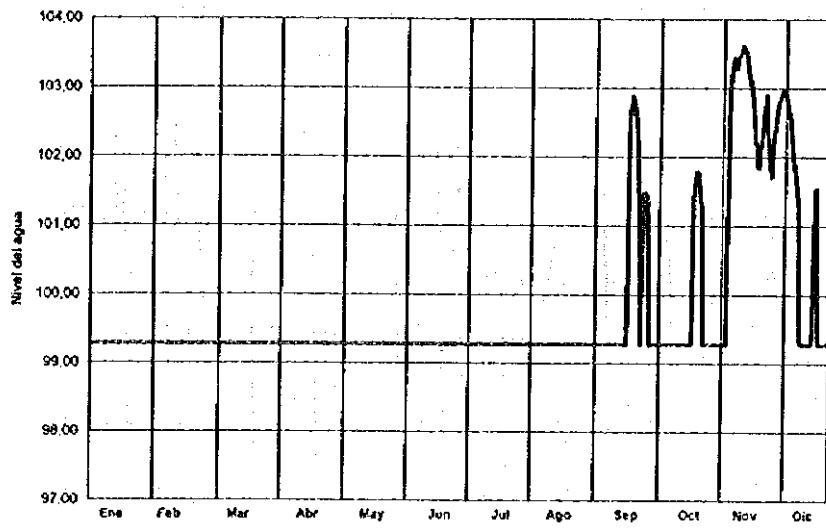
ANNEX A-8

Future Trip Generation and Attraction

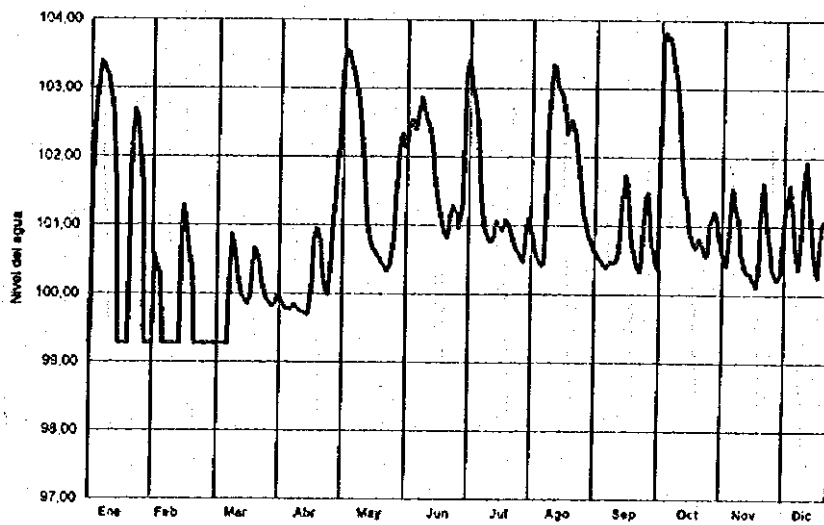
ANNEX B
HYDROLOGICAL DATA

ANNEX B-1

Record of Water Level of Tebiculary Mi River



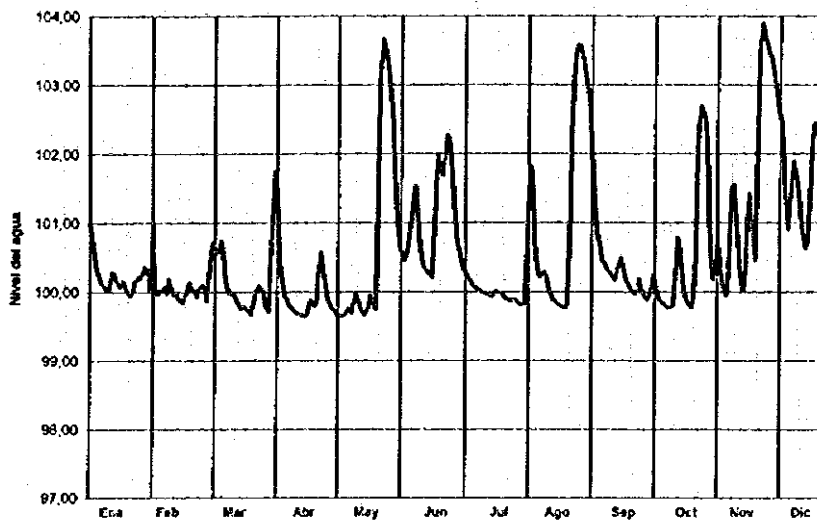
1.972



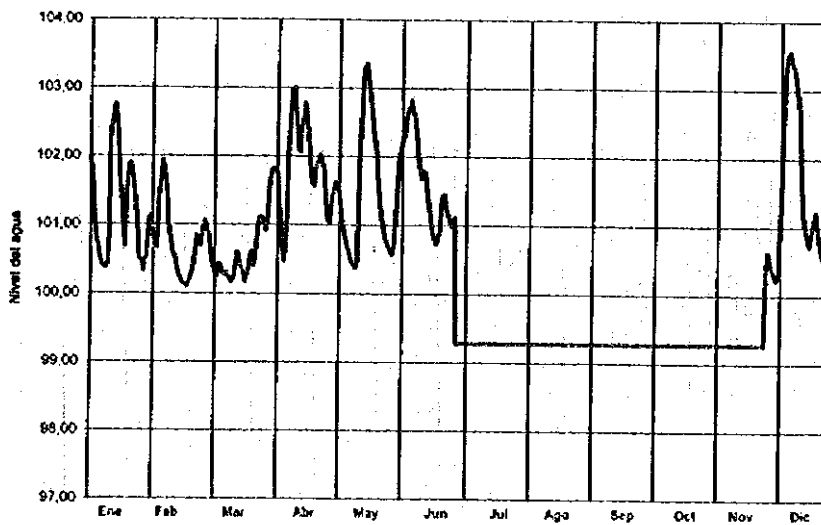
1.973

Zero gauge : El. 99.277 (surveyed by JICA Team)

Water Level at ANNP Station, Tebicuary Mi River



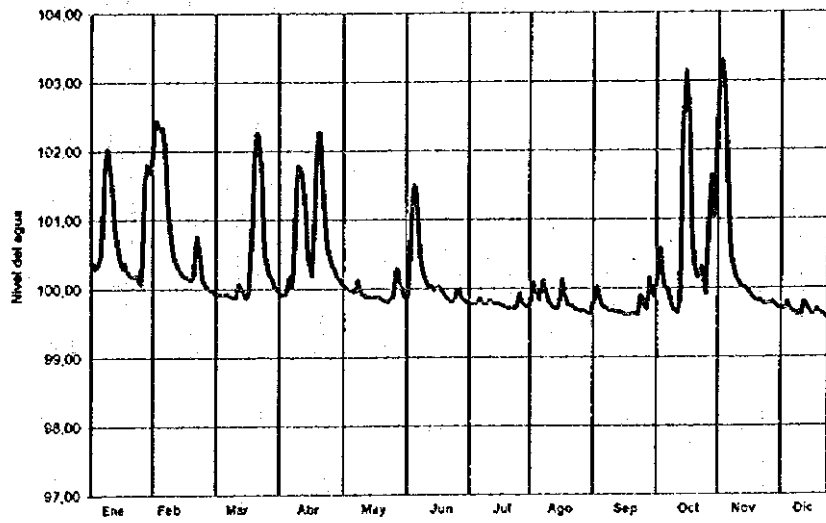
1.974



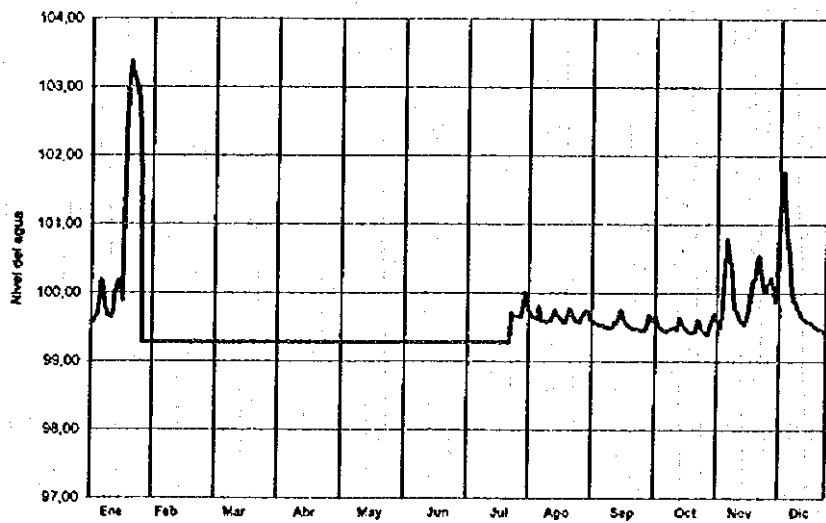
1.976

Zero gauge : EL 99.277 (surveyed by JICA Team)

Water Level at ANNP Station, Tebicuary Mi River



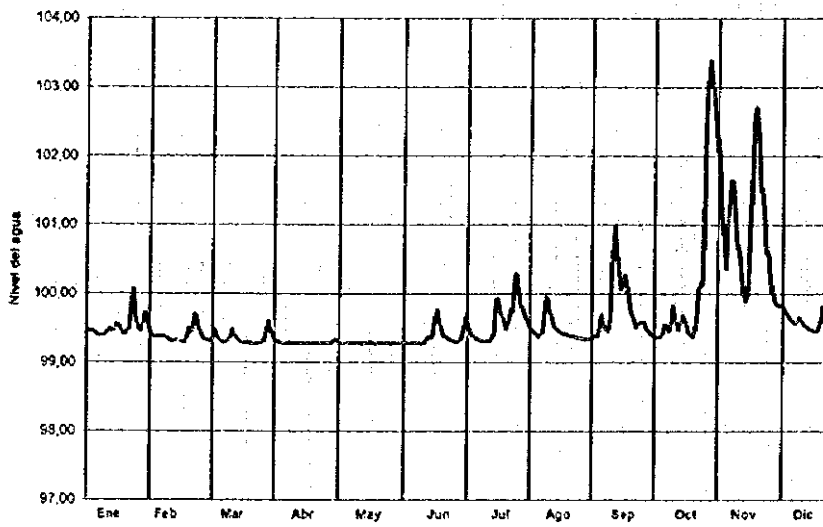
1.976



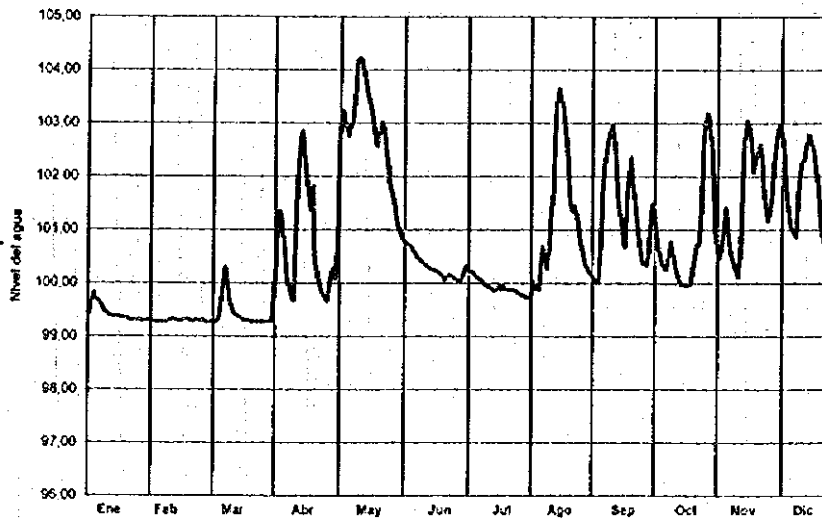
1.977

Zero gauge : EL 99.277 (surveyed by JICA Team)

Water Level at ANNP Station, Tebicuary Mi River



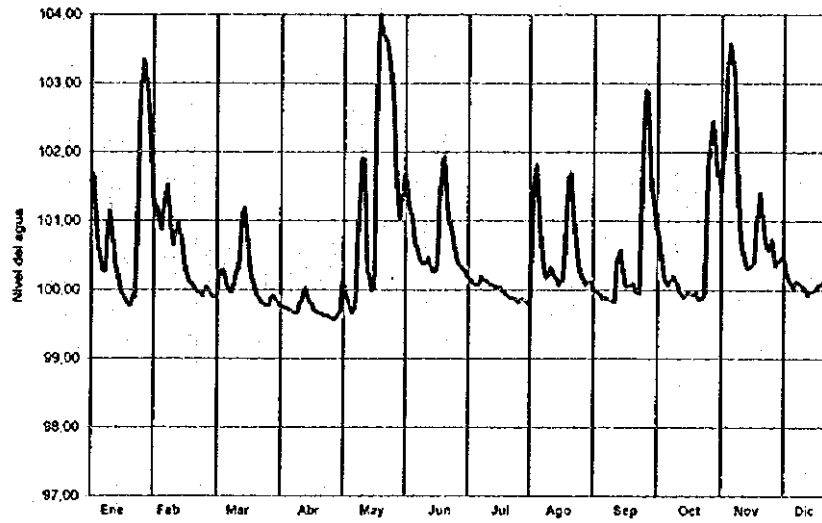
1.978



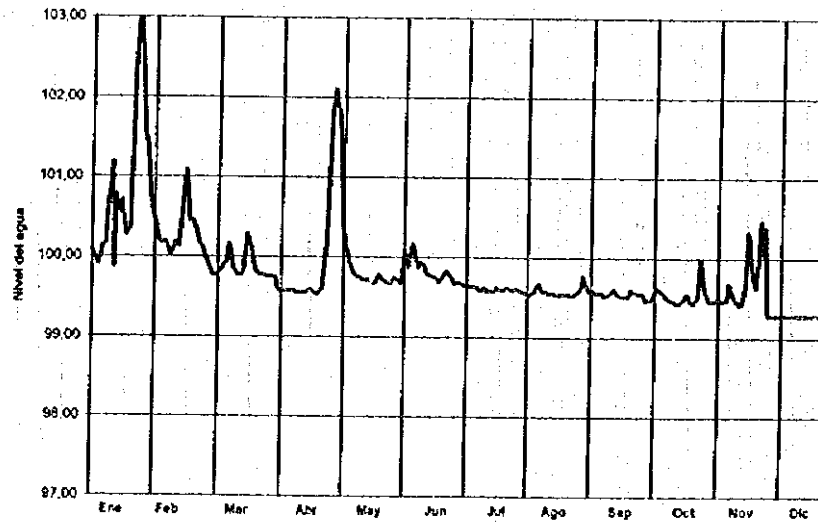
1.979

Zero gauge : EL 99.277(surveyed by JICA Team)

Water Level at ANNP Station, Tebicuary Mi River



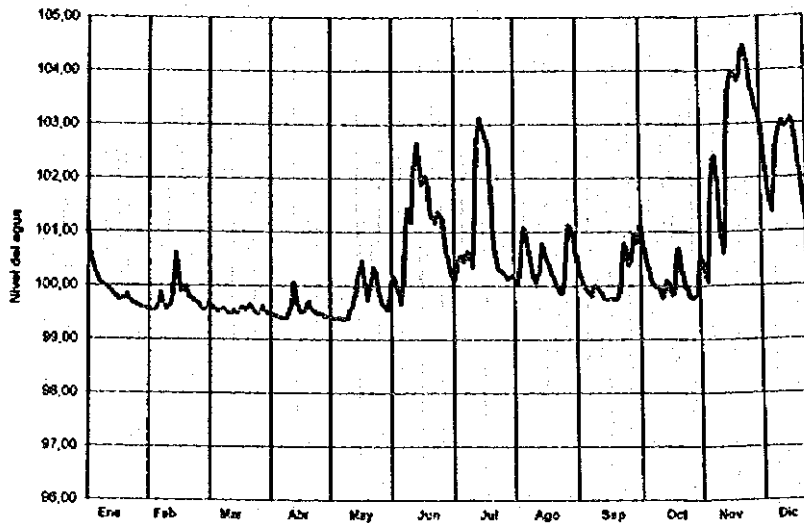
1.980



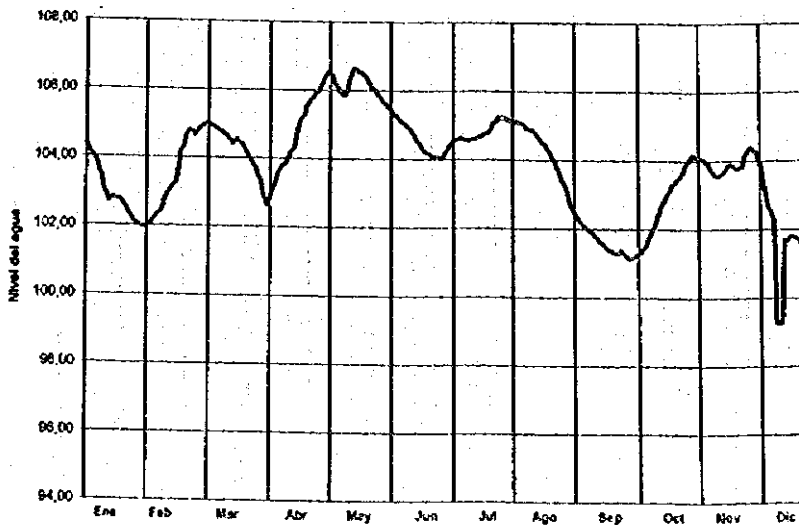
1.981

Zero gauge : El. 99.277(surveyed by JICA Team)

Water Level at ANNP Station, Tebicuary Mi River



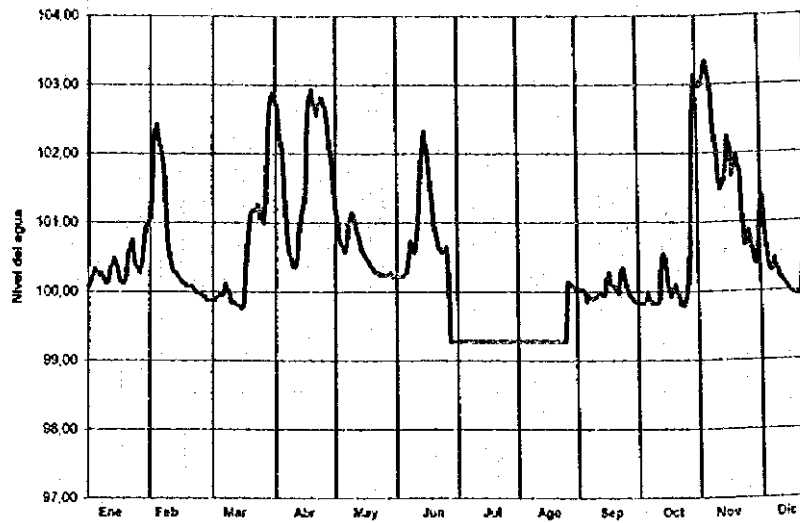
1.982



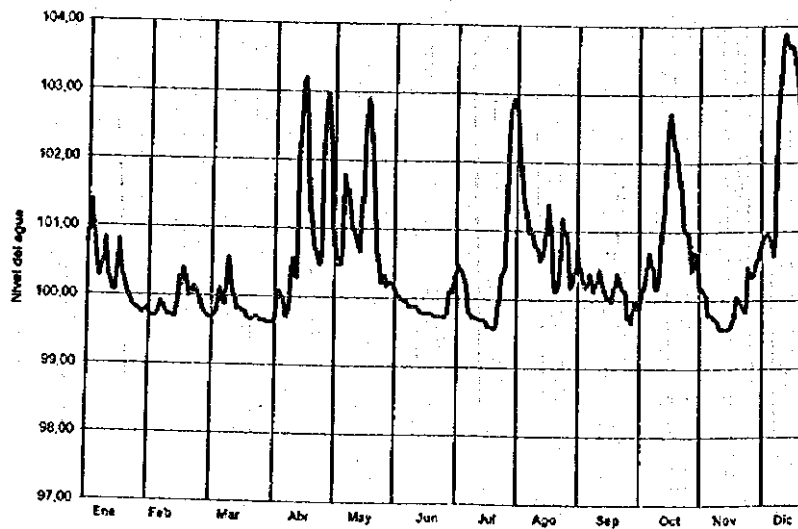
1.983

Zero gauge : EL 99.277(surveyed by JICA Team)

Water Level at ANNP Station, Tebicuary Mi River



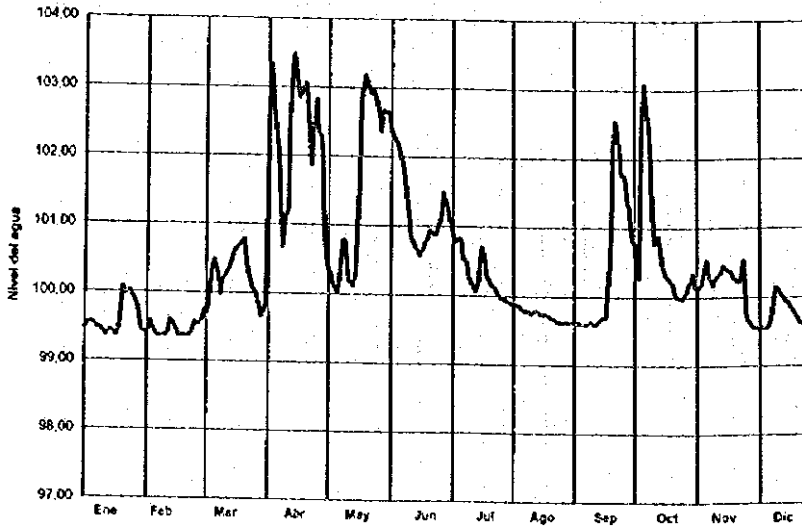
1.984



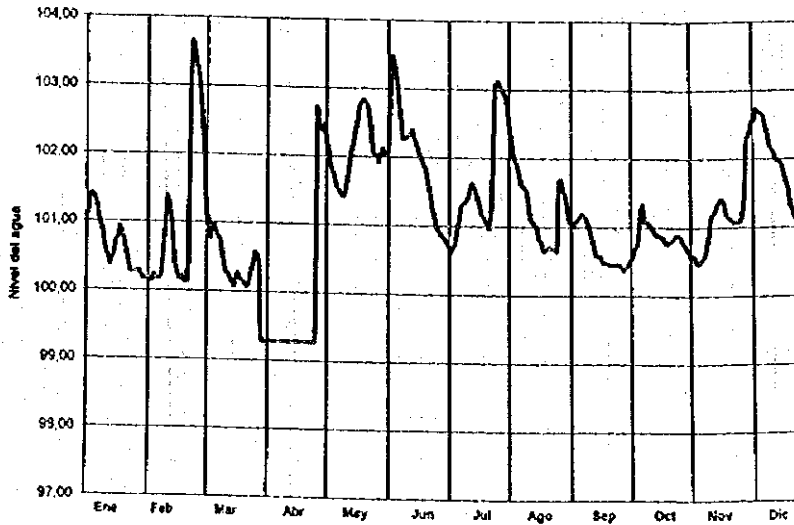
1.985

Zero gauge : EL 99.277 (surveyed by JICA Team)

Water Level at ANNP Station, Tebicuary Mi River



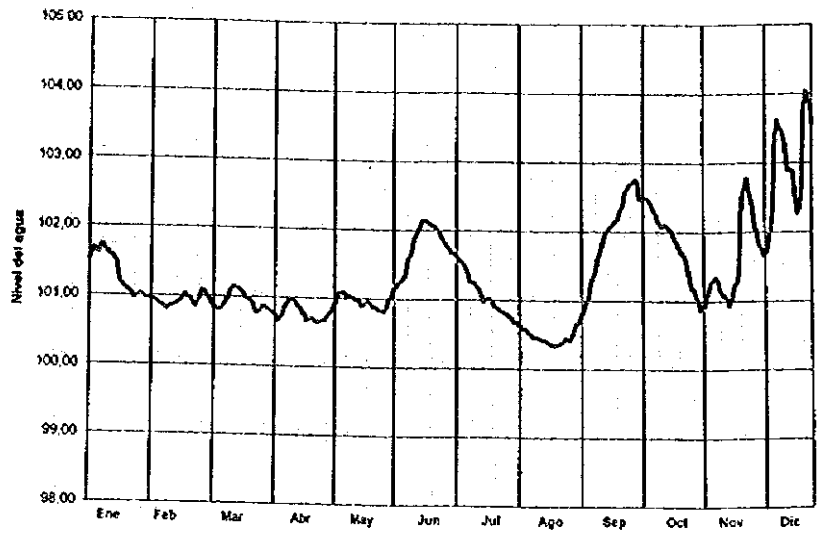
1.986



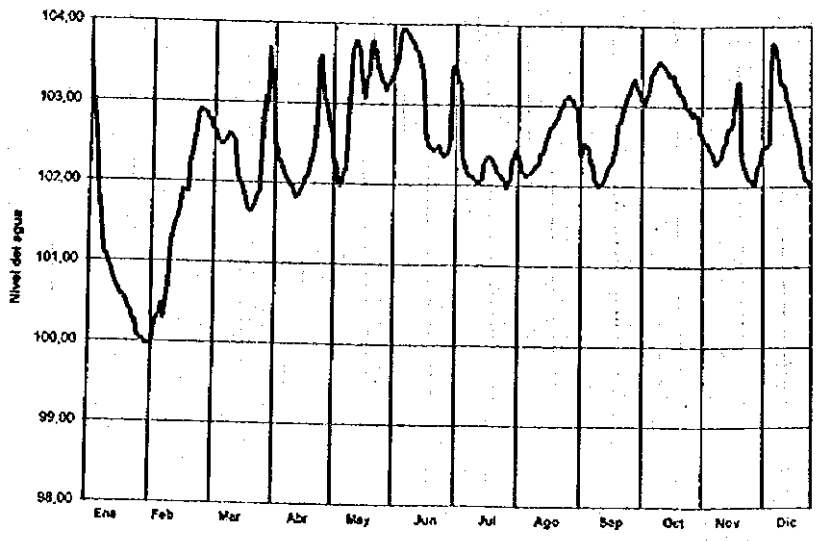
1.987

Zero gauge : El 99.177 (surveyed by JICA Team)

Water Level at ANNP Station , Rio Tebicuary Mi



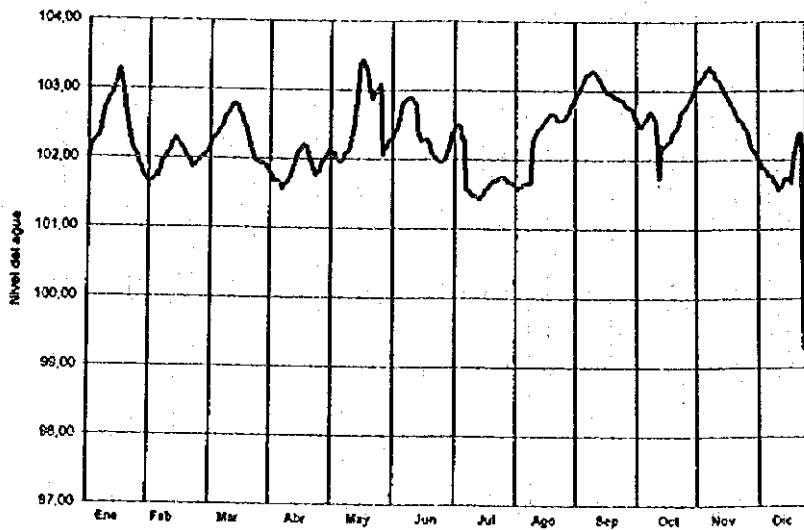
1.991



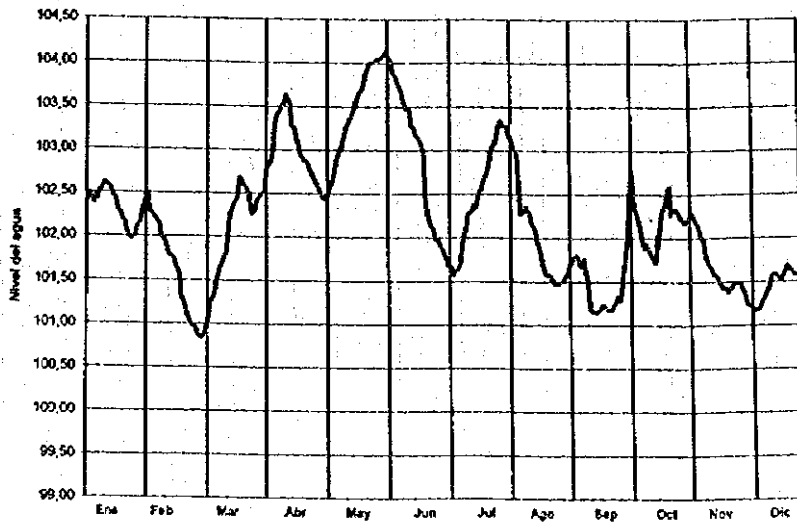
1.992

Zero gauge : EL 99.277 (surveyed by JICA Team)

Water Level at ANNP Station, Tebicuary Mi River



1.993



1.994

Zero gauge : EL 99.277(surveyed by JICA Team)

Water Level at ANNP Station, Tebicuary Mi River

ANNEX B-2

Calculation of Probable Flood

**TIME OF RECURSION
10 YEARS**

TRIANGULAR HYDROGRAM											
NAME			BASIN 04			CODE:					
CARACTERISTIC ELEMENTS											
A (km ²):		3,07		AH (m):		35,00					
L (km):		1,75		I (%):		2,00					
CALCULATED ELEMENTS											
lc (hs):		0,90		lb (hs):		1,67					
lp (hs):		0,63		At (hs):		0,18					
lr (hs):		1,05		qp (m ³ /s):		10,19					
EFFECTIVE PRECIPITATION				CN: 70				TR: 10			
At (hs)		i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)	
0,00		0,00		0,00		0,00		0,00		0,00	
0,18		175,36		3,14		3,43		0,13		0,13	
0,36		129,86		4,65		5,08		0,61		0,48	
0,54		103,02		5,54		6,04		1,01		0,40	
0,72		86,02		6,16		6,72		1,34		0,33	
0,90		74,25		6,65		7,26		1,62		0,28	
1,07		66,19		7,11		7,76		1,89		0,28	
1,25		60,56		7,59		8,29		2,20		0,30	
1,43		55,89		8,01		8,74		2,47		0,27	
1,61		51,95		8,38		9,14		2,71		0,25	
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)		qi (m ³ /s)		Q							
		0,13		0,48		0,40		0,33		0,28	
		0,13		0,48		0,40		0,33		0,28	
0,00		0,00		0,00		0,00		0,00		0,00	
0,18		2,91		0,37		0,00		0,00		0,37	
0,36		5,82		0,75		1,40		0,00		2,15	
0,54		8,73		1,12		2,80		1,17		5,09	
0,72		9,31		1,20		4,20		2,34		8,69	
0,90		7,57		0,97		4,48		3,51		11,68	
1,07		5,83		0,75		3,64		3,75		13,42	
1,25		4,09		0,53		2,80		3,05		14,33	
1,43		2,34		0,30		1,96		2,34		14,64	
1,61		0,60		0,08		1,13		1,64		14,38	

TRIANGULAR HYDROGRAM											
NAME	BASIN 05								CODE: :		
CARACTERISTIC ELEMENTS											
A (km ²):	9,62						AH (m):	35,00			
L (km):	2,50						I (%):	1,40			
CALCULATED ELEMENTS											
tc (hs):	1,56						tb (hs):	2,92			
tp (hs):	1,09						At (hs):	0,31			
tr (hs):	1,83						qp (m ³ /s):	18,29			
EFFECTIVE PRECIPITATION					CN: 70			TR: 10			
At (hs)	i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)		
	0,00		0,00		0,00		0,00		0,00	0,00	
	0,31		139,33		4,35		4,54		0,42	0,42	
	0,63		93,84		5,87		6,11		1,04	0,62	
	0,94		71,99		6,75		7,03		1,50	0,45	
	1,25		60,67		7,58		7,90		1,97	0,48	
	1,56		52,98		8,28		8,62		2,40	0,43	
	1,88		47,17		8,85		9,21		2,76	0,37	
	2,19		42,62		9,32		9,71		3,08	0,32	
	2,50		38,96		9,74		10,14		3,37	0,28	
	2,81		35,93		10,11		10,53		3,62	0,26	
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)									Q (m ³ /s)	
		0,42	0,62	0,45	0,48	0,43	0,37	0,32	0,28	0,26	
0,00	0,00	0,00								0,00	
0,31	5,23	2,19	0,00							2,19	
0,63	10,45	4,39	3,26	0,00						7,65	
0,94	15,68	6,58	6,52	2,37	0,00					15,47	
1,25	16,73	7,02	9,78	4,73	2,48	0,00				24,01	
1,56	13,60	5,71	10,43	7,10	4,97	2,22	0,00			30,43	
1,88	10,47	4,40	8,48	7,57	7,45	4,44	1,91	0,00		34,25	
2,19	7,34	3,08	6,53	6,16	7,95	6,67	3,82	1,67	0,00	35,87	
2,50	4,21	1,77	4,58	4,74	6,46	7,11	5,73	3,35	1,49	0,00	
2,81	1,08	0,45	2,62	3,32	4,97	5,78	6,11	5,02	2,98	1,34	

TRIANGULAR HYDROGRAM											
NAME			BASIN 06			CODE:					
CHARACTERISTIC ELEMENTS											
A (km ²):		13,45		AH (m):		30,00					
L (km):		3,40		I (%):		0,88					
CALCULATED ELEMENTS											
tc (hs):		2,21		tb (hs):		4,13					
tp (hs):		1,55		At (hs):		0,44					
tr (hs):		2,58		qp (m ³ /s):		18,08					
EFFECTIVE PRECIPITATION				CN: 70				TR: 10			
At (hs)		i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)	
0,00		0,00		0,00		0,00		0,00		0,00	
0,44		115,61		5,11		5,25		0,68		0,68	
0,88		74,90		6,62		6,80		1,38		0,70	
1,33		58,58		7,77		7,98		2,02		0,64	
1,77		48,99		8,66		8,90		2,56		0,55	
2,21		42,33		9,36		9,61		3,01		0,45	
2,65		37,42		9,92		10,19		3,40		0,38	
3,09		33,62		10,40		10,68		3,73		0,33	
3,54		30,59		10,82		11,11		4,03		0,29	
3,98		28,11		11,18		11,49		4,29		0,26	
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)		qi (m ³ /s)		Q							
		0,68 0,70		0,64 0,55		0,45 0,38		0,33 0,29		0,26	
0,00		0,00		0,00		0,00		0,00		0,00	
0,44		5,17		3,49		0,00		0,00		3,49	
0,88		10,33		6,98		3,63		0,00		10,61	
1,33		15,50		10,47		7,26		3,30		21,02	
1,77		16,54		11,17		10,88		6,59		2,83	
2,21		13,44		9,08		11,61		9,89		5,66	
2,65		10,35		6,99		9,44		10,55		8,50	
3,09		7,25		4,90		7,27		8,58		9,06	
3,54		4,16		2,81		5,09		6,60		7,37	
3,98		1,07		0,72		2,92		4,63		5,67	
										6,06	
										6,33	
										5,16	
										3,05	
										1,37	
										35,92	

TRIANGULAR HYDROGRAM												
NAME		BASIN 07						CODE:				
CHARACTERISTIC ELEMENTS												
A (km ²):		68,38			AH (m):		20,00					
L (km):		10,00			l (%):		0,20					
CALCULATED ELEMENTS												
tc (hs):		8,09			lb (hs):		15,12					
tp (hs):		5,66			At (hs):		1,62					
tr (hs):		9,46			qp (m ³ /s):		25,12					
EFFECTIVE PRECIPITATION				CN: 70				TR: 10				
At (hs)		i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)		
0,00		0,00		0,00		0,00		0,00		0,00		
1,62		51,84		8,39		8,02		2,04		2,04		
3,24		32,58		10,54		10,08		3,32		1,28		
4,85		24,32		11,80		11,29		4,15		0,83		
6,47		19,62		12,70		12,14		4,76		0,61		
8,09		16,56		13,39		12,81		5,25		0,49		
9,71		14,38		13,96		13,35		5,66		0,41		
11,32		12,75		14,44		13,81		6,01		0,35		
12,94		11,48		14,85		14,20		6,31		0,31		
14,56		10,45		15,22		14,55		6,59		0,27		
HYDROGRAM OF PROJECT												
At		qi		EFFECTIVE PRECIPITATION								Q
(hs)	(m ³ /s)											m ³ /s
		2,04	1,28	0,83	0,61	0,49	0,41	0,35	0,31	0,27		
0,00	0,00	0,00										0,00
1,62	7,18	14,64	0,00									14,64
3,24	14,36	29,29	9,22	0,00								38,51
4,85	21,53	43,93	18,44	5,93	0,00							68,30
6,47	22,97	46,87	27,65	11,85	4,40	0,00						90,77
8,09	18,67	38,10	29,50	17,78	8,79	3,51	0,00					97,68
9,71	14,38	29,33	23,98	18,96	13,19	7,01	2,92	0,00				95,40
11,32	10,08	20,56	18,46	15,42	14,07	10,52	5,84	2,51	0,00			87,37
12,94	5,78	11,79	12,94	11,87	11,44	11,22	8,76	5,01	2,20	0,00		75,23
14,56	1,48	3,03	7,42	8,32	8,80	9,12	9,35	7,52	4,39	1,96		59,90

TRIANGULAR HYDROGRAM											
NAME:		BASIN 15						CODE:			
CHARACTERISTIC ELEMENTS:											
A (km ²):		39,10			AH (m):		64,00				
L (km):		7,65			I (%):		0,84				
CALCULATED ELEMENTS											
tc (hs):		3,66			tb (hs):		6,84				
tp (hs):		2,56			At (hs):		0,73				
tr (hs):		4,28			qp (m ³ /s):		31,77				
EFFECTIVE PRECIPITATION						CN: 70		TR: 10			
At (hs)		i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)	
	0,00		0,00		0,00		0,00		0,00		0,00
	0,73		84,88		6,21		6,09		1,03		1,03
	1,46		55,19		8,07		7,92		1,98		0,95
	2,19		42,54		9,33		9,15		2,72		0,74
	2,93		34,96		10,23		10,03		3,29		0,57
	3,66		29,87		10,92		10,71		3,75		0,46
	4,39		26,18		11,49		11,27		4,14		0,39
	5,12		23,38		11,97		11,74		4,47		0,33
	5,85		21,16		12,38		12,14		4,76		0,29
	6,58		19,37		12,75		12,50		5,03		0,26
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)		qi (m ³ /s)		Q							
		1,03	0,95	0,74	0,57	0,46	0,39	0,33	0,29	0,26	m ³ /s
0,00	0,00	0,00									0,00
0,73	9,08	9,38	0,00								9,38
1,46	18,15	18,76	8,60	0,00							27,36
2,19	27,23	28,14	17,20	6,74	0,00						52,09
2,93	29,05	30,02	25,81	13,49	5,14	0,00					74,46
3,66	23,62	24,41	27,53	20,23	10,29	4,17	0,00				86,62
4,39	18,18	18,79	22,38	21,59	15,43	8,33	3,50	0,00			90,02
5,12	12,75	13,17	17,23	17,55	16,46	12,50	7,01	3,03	0,00		86,95
5,85	7,31	7,56	12,08	13,51	13,38	13,33	10,51	6,06	2,67	0,00	79,10
6,58	1,88	1,94	6,93	9,47	10,30	10,84	11,22	9,09	5,34	2,39	67,50

TRIANGULAR HYDROGRAM											
NAME		BASIN 08						CODE:			
CHARACTERISTIC ELEMENTS											
A (km ²):		9,54			AH (m):		50,00				
L (km):		4,50			I (%):		1,11				
CALCULATED ELEMENTS											
tc (hs):		1,92			tb (hs):		3,59				
tp (hs):		1,35			At (hs):		0,38				
tr (hs):		2,25			qp (m ³ /s):		14,74				
EFFECTIVE PRECIPITATION						CN: 70			TR: 10		
At (hs)	i (mm/h)	p (cm)	p' (cm)	Pe (cm)	A Pe (cm)						
0,00	0,00	0,00	0,00	0,00	0,00						
0,38	124,98	4,81	5,01	0,58	0,58						
0,77	82,14	6,32	6,58	1,27	0,68						
1,15	63,57	7,33	7,64	1,83	0,56						
1,54	53,49	8,23	8,57	2,37	0,54						
1,92	46,40	8,92	9,30	2,82	0,45						
2,31	41,13	9,49	9,89	3,20	0,38						
2,69	37,03	9,97	10,39	3,53	0,33						
3,08	33,75	10,39	10,82	3,83	0,30						
3,46	31,06	10,75	11,20	4,09	0,27						
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)	Q									
		0,58	0,68	0,56	0,54	0,45	0,38	0,33	0,30	0,27	m ³ /s
0,00	0,00	0,00									0,00
0,38	4,21	2,46	0,00								2,46
0,77	8,42	4,92	2,88	0,00							7,81
1,15	12,64	7,38	5,77	2,35	0,00						15,50
1,54	13,48	7,88	8,65	4,69	2,28	0,00					23,50
1,92	10,96	6,40	9,23	7,04	4,56	1,89	0,00				29,12
2,31	8,44	4,93	7,50	7,51	6,84	3,77	1,61	0,00			32,16
2,69	5,91	3,46	5,78	6,11	7,30	5,66	3,22	1,40	0,00		32,91
3,08	3,39	1,98	4,05	4,70	5,93	6,03	4,82	2,80	1,24	0,00	31,57
3,46	0,87	0,51	2,32	3,30	4,57	4,91	5,15	4,20	2,49	1,12	28,55

TRIANGULAR HYDROGRAM											
NAME E:	BASIN 09						CODE:				
CARACTERISTIC ELEMENTS											
A (km ²):	12,98			AH (m):			30,00				
L (km):	5,00			I (%):			0,60				
CALCULATED ELEMENTS											
tc (hs):	2,76			tb (hs):			5,15				
tp (hs):	1,93			At (hs):			0,55				
tr (hs):	3,22			qp (m ³ /s):			13,99				
EFFECTIVE PRECIPITATION						CN:	70		TR:	10	
At (hs)	i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)		
	0,00		0,00		0,00		0,00		0,00		0,00
	0,55		101,44		5,59		5,75		0,88		0,88
	1,10		65,25		7,19		7,40		1,69		0,81
	1,65		51,12		8,45		8,69		2,44		0,75
	2,20		42,40		9,35		9,62		3,02		0,58
	2,76		36,44		10,04		10,33		3,49		0,47
	3,31		32,08		10,61		10,91		3,89		0,40
	3,86		28,74		11,09		11,41		4,23		0,35
	4,41		26,09		11,50		11,83		4,54		0,30
	4,96		23,93		11,87		12,21		4,81		0,27
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)									Q (m ³ /s)	
		0,88	0,81	0,75	0,58	0,47	0,40	0,35	0,30	0,27	
0,00	0,00	0,00									0,00
0,55	4,00	3,53	0,00								3,53
1,10	8,00	7,06	3,24	0,00							10,30
1,65	11,99	10,59	6,47	2,99	0,00						21,06
2,20	12,80	11,30	9,71	5,99	2,31	0,00					29,31
2,76	10,40	9,19	10,35	8,98	4,62	1,88	0,00				35,03
3,31	8,01	7,07	8,42	9,58	6,94	3,77	1,59	0,00			37,37
3,86	5,61	4,96	6,48	7,79	7,40	5,65	3,18	1,38	0,00		36,84
4,41	3,22	2,84	4,54	6,00	6,02	6,03	4,78	2,76	1,22	0,00	34,18
4,96	0,83	0,73	2,61	4,20	4,63	4,90	5,10	4,14	2,44	1,09	29,83

TRIANGULAR HYDROGRAM																					
NAME ::		BASIN 10				CODE:															
CHARACTERISTIC ELEMENTS																					
A (km ²):		20,13		AH (m):		10,00															
L (km):		5,10		I (%):		0,20															
CALCULATED ELEMENTS																					
tc (hs):		4,94		tb (hs):		9,23															
tp (hs):		3,46		At (hs):		0,99															
tr (hs):		5,77		qp (m ³ /s):		12,12															
EFFECTIVE PRECIPITATION						CN: 70		TR: 10													
At (hs)		i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)											
0,00		0,00		0,00		0,00		0,00		0,00											
0,99		69,50		6,86		6,93		1,44		1,44											
1,97		45,61		9,01		9,09		2,69		1,24											
2,96		34,66		10,27		10,36		3,51		0,83											
3,95		28,26		11,16		11,27		4,14		0,62											
4,94		24,01		11,86		11,97		4,64		0,50											
5,92		20,97		12,42		12,54		5,05		0,42											
6,91		18,67		12,90		13,02		5,41		0,36											
7,90		16,86		13,32		13,44		5,73		0,32											
8,89		15,40		13,68		13,81		6,01		0,28											
HYDROGRAM OF PROJECT																					
EFFECTIVE PRECIPITATION																					
At (hs)		qi (m ³ /s)		Q																	
		1,44		1,24		0,83		0,62		0,50		0,42		0,36		0,32		0,28		Q	
0,00		0,00		0,00																0,00	
0,99		3,46		4,99		0,00														4,99	
1,97		6,92		9,99		4,30		0,00												14,29	
2,96		10,38		14,98		8,60		2,87		0,00										26,46	
3,95		11,08		15,99		12,90		5,74		2,15		0,00								36,78	
4,94		9,01		13,00		13,77		8,60		4,31		1,73		0,00						41,40	
5,92		6,93		10,00		11,19		9,18		6,46		3,46		1,45		0,00				41,74	
6,91		4,86		7,01		8,62		7,46		6,89		5,19		2,89		1,25		0,00		39,31	
7,90		2,79		4,02		6,04		5,74		5,60		5,53		4,34		2,49		1,09		0,00	
8,89		0,72		1,03		3,46		4,03		4,31		4,50		4,63		3,74		2,19		0,98	

TRIANGULAR HYDROGRAM																					
NOMBRE:		BASIN 14				CODE:															
CHARACTERISTIC ELEMENTS																					
A (km ²):		3800,00				AH (m):		150,00													
L (km):		100,00				l (%):		0,15													
CALCULATED ELEMENTS																					
tc (hs):		48,00				tb (hs):		89,72													
tp (hs):		33,60				At (hs):		9,60													
tr (hs):		56,12				qp (m ³ /s):		235,22													
EFFECTIVE PRECIPITATION						CN: 70			TR: 10												
At (hs)		i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)											
0,00		0,00		0,00		0,00		0,00		0,00											
9,60		14,50		13,92		10,89		3,87		3,87											
19,20		8,37		16,08		12,57		5,08		1,21											
28,80		6,02		17,34		13,56		5,82		0,74											
38,40		4,75		18,24		14,26		6,35		0,54											
48,00		3,94		18,93		14,80		6,78		0,42											
57,61		3,38		19,50		15,24		7,13		0,35											
67,21		2,97		19,98		15,62		7,43		0,30											
76,81		2,65		20,39		15,94		7,69		0,26											
86,41		2,40		20,76		16,23		7,92		0,23											
HYDROGRAM OF PROJECT																					
EFFECTIVE PRECIPITATION																					
At (hs)		qi (m ³ /s)		Q																	
				m ³ /s																	
		3,87		1,21		0,74		0,54		0,42		0,35		0,30		0,26		0,23			
0,00		0,00		0,00																0,00	
9,60		67,20		260,14		0,00														260,14	
19,20		134,41		520,28		81,08		0,00												601,36	
28,80		201,61		780,42		162,15		49,69		0,00										992,26	
38,40		215,10		832,61		243,23		99,37		36,12		0,00								1211,32	
48,00		174,85		676,84		259,49		149,06		72,23		28,46		0,00						1186,07	
57,61		134,61		521,06		210,94		159,02		108,35		56,92		23,52		0,00				1079,82	
67,21		94,37		365,29		162,40		129,27		115,59		85,38		47,04		20,07		0,00		925,04	
76,81		54,13		209,52		113,85		99,52		93,96		91,09		70,57		40,13		17,51		736,14	
86,41		13,88		53,74		65,30		69,77		72,34		74,05		75,29		60,20		35,02		521,23	

TRIANGULAR HYDROGRAM											
NAME E:		BASIN 01				CODE:					
CHARACTERISTIC ELEMENTS											
A (km ²):	23,38		AH (m):		25,00						
L (km):	6,60		I (%):		0,38						
CALCULATED ELEMENTS											
tc (hs):	4,18		tb (hs):		7,81						
tp (hs):	2,92		At (hs):		0,84						
tr (hs):	4,88		qp (m ³ /s):		16,63						
EFFECTIVE PRECIPITATION				CN: 70		TR: 10					
At (hs)	i (mm/h)	p (cm)	p' (cm)	Pe (cm)	A Pe (cm)						
0,00	0,00	0,00	0,00	0,00	0,00						
0,84	77,77	6,50	6,52	1,24	1,24						
1,67	50,78	8,49	8,51	2,33	1,09						
2,51	38,89	9,75	9,78	3,12	0,79						
3,34	31,84	10,64	10,67	3,72	0,60						
4,18	27,13	11,34	11,37	4,21	0,48						
5,01	23,74	11,90	11,94	4,61	0,41						
5,85	21,17	12,38	12,42	4,97	0,35						
6,69	19,15	12,80	12,84	5,27	0,31						
7,52	17,50	13,16	13,20	5,55	0,28						
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)									Q m ³ /s	
0,00	0,00	1,24	1,09	0,79	0,60	0,48	0,41	0,35	0,31	0,28	0,00
0,84	4,75	5,88	0,00								5,88
1,67	9,50	11,76	5,19	0,00							16,95
2,51	14,25	17,63	10,39	3,77	0,00						31,79
3,34	15,21	18,81	15,58	7,54	2,85	0,00					44,79
4,18	12,36	15,29	16,62	11,31	5,71	2,30	0,00				51,23
5,01	9,52	11,77	13,51	12,07	8,56	4,60	1,93	0,00			52,44
5,85	6,67	8,25	10,40	9,81	9,13	6,90	3,86	1,66	0,00		50,02
6,69	3,83	4,73	7,29	7,55	7,42	7,36	5,79	3,33	1,46	0,00	44,94
7,52	0,98	1,21	4,18	5,30	5,71	5,98	6,18	4,99	2,93	1,31	37,79

TRIANGULAR HYDROGRAM																					
NAME E:		BASIN 03						CODE:													
CHARACTERISTIC ELEMENTS																					
A (km ²):		17,60		AH (m):		65,00															
L (km):		4,70		I (%):		1,38															
CALCULATED ELEMENTS																					
tc (hs):		2,14		tb (hs):		3,99															
tp (hs):		1,49		At (hs):		0,43															
tr (hs):		2,50		qp (m ³ /s):		24,49															
EFFECTIVE PRECIPITATION				CN: 70				TR: 10													
At (hs)		i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)											
0,00		0,00		0,00		0,00		0,00		0,00											
0,43		117,89		5,04		5,11		0,62		0,62											
0,85		76,64		6,55		6,65		1,30		0,68											
1,28		59,79		7,66		7,78		1,90		0,60											
1,71		50,08		8,56		8,69		2,44		0,53											
2,14		43,31		9,25		9,39		2,88		0,44											
2,56		38,31		9,82		9,97		3,25		0,37											
2,99		34,44		10,30		10,45		3,57		0,33											
3,42		31,35		10,71		10,87		3,86		0,29											
3,84		28,82		11,08		11,25		4,12		0,26											
HYDROGRAM OF PROJECT																					
EFFECTIVE PRECIPITATION																					
At (hs)		qi (m ³ /s)								Q (m ³ /s)											
		0,62		0,68		0,60		0,53		0,44		0,37		0,33		0,29		0,26			
0,00		0,00		0,00																0,00	
0,43		7,00		4,36		0,00														4,36	
0,85		13,99		8,72		4,74		0,00												13,46	
1,28		20,99		13,08		9,48		4,21		0,00										26,77	
1,71		22,39		13,96		14,22		8,42		3,73		0,00								40,33	
2,14		18,20		11,35		15,17		12,63		7,46		3,07		0,00						49,68	
2,56		14,01		8,74		12,33		13,48		11,19		6,15		2,62		0,00				54,50	
2,99		9,82		6,12		9,49		10,96		11,94		9,22		5,23		2,28		0,00		55,24	
3,42		5,63		3,51		6,66		8,43		9,70		9,84		7,85		4,56		2,02		52,58	
3,84		1,45		0,90		3,82		5,91		7,47		8,00		8,37		6,83		4,04		47,15	

TRIANGULAR HYDROGRAM											
NAME E:		BASIN 02				CODE:					
CHARACTERISTIC ELEMENTS											
A (km ²):	9,22			AH (m):	60,00						
L (km):	2,80			I (%):	2,14						
CALCULATED ELEMENTS											
tc (hs):	1,33			tb (hs):	2,49						
tp (hs):	0,93			At (hs):	0,27						
tr (hs):	1,56			qp (m ³ /s):	20,58						
EFFECTIVE PRECIPITATION				CN: 70		TR: 10					
At (hs)	i (mm/h)	p (cm)	p' (cm)	Pe (cm)	A Pe (cm)						
0,00	0,00	0,00	0,00	0,00	0,00		0,00				
0,27	150,43	4,01	4,18	0,31	0,31		0,31				
0,53	103,59	5,52	5,76	0,89	0,57		0,57				
0,80	80,13	6,40	6,68	1,32	0,43		0,43				
1,06	66,54	7,09	7,39	1,69	0,37		0,37				
1,33	58,44	7,78	8,12	2,10	0,41		0,41				
1,60	52,25	8,35	8,71	2,45	0,35		0,35				
1,86	47,36	8,83	9,21	2,76	0,31		0,31				
2,13	43,39	9,24	9,64	3,04	0,28		0,28				
2,40	40,10	9,61	10,02	3,29	0,25		0,25				
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)									Q	
		0,31	0,57	0,43	0,37	0,41	0,35	0,31	0,28	0,25	m ³ /s
0,00	0,00	0,00									0,00
0,27	5,88	1,83	0,00								1,83
0,53	11,76	3,66	3,38	0,00							7,03
0,80	17,64	5,48	6,75	2,54	0,00						14,77
1,06	18,82	5,85	10,13	5,07	2,19	0,00					23,24
1,33	15,30	4,76	10,81	7,61	4,39	2,40	0,00				29,95
1,60	11,78	3,66	8,79	8,11	6,58	4,79	2,07	0,00			34,01
1,86	8,26	2,57	6,76	6,60	7,02	7,19	4,14	1,82	0,00		36,10
2,13	4,74	1,47	4,74	5,08	5,71	7,67	6,22	3,65	1,63	0,00	36,16
2,40	1,21	0,38	2,72	3,56	4,40	6,23	6,63	5,47	3,26	1,47	34,12

TRIANGULAR HYDROGRAM																					
NAME E:		BASIN 11				CODE:															
CARACTERISTIC ELEMENTS																					
A (km ²):		231,77				AR (m):		40,00													
L (km):		17,00				I (%):		0,24													
CALCULATED ELEMENTS																					
tc (hs):		12,15				tb (hs):		22,72													
tp (hs):		8,51				At (hs):		2,43													
tr (hs):		14,21				qp (m ³ /s):		56,66													
EFFECTIVE PRECIPITATION						CN: 70		TR: 10													
At (hs)		i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)											
0,00		0,00		0,00		0,00		0,00		0,00											
2,43		39,71		9,65		8,72		2,46		2,46											
4,86		24,29		11,81		10,67		3,72		1,26											
7,29		17,92		13,07		11,81		4,52		0,80											
9,72		14,36		13,96		12,61		5,11		0,59											
12,15		12,06		14,66		13,24		5,58		0,47											
14,59		10,44		15,22		13,75		5,97		0,39											
17,02		9,23		15,70		14,19		6,30		0,33											
19,45		8,29		16,12		14,56		6,59		0,29											
21,88		7,54		16,49		14,89		6,85		0,26											
HYDROGRAM OF PROJECT																					
EFFECTIVE PRECIPITATION																					
At (hs)		qi (m ³ /s)		Q																	
		2,46		1,26		0,80		0,59		0,47		0,39		0,33		0,29		0,26		Q	
0,00		0,00		0,00																0,00	
2,43		16,19		39,75		0,00														39,75	
4,86		32,38		79,51		20,46		0,00												99,97	
7,29		48,57		119,26		40,92		12,94		0,00										173,12	
9,72		51,81		127,24		61,38		25,88		9,54		0,00								224,04	
12,15		42,12		103,43		65,48		38,83		19,08		7,58		0,00						234,40	
14,59		32,43		79,63		53,23		41,42		28,62		15,16		6,30		0,00				224,35	
17,02		22,73		55,82		40,98		33,67		30,53		22,74		12,60		5,39		0,00		201,73	
19,45		13,04		32,02		28,73		25,92		24,82		24,26		18,90		10,79		4,72		170,15	
21,88		3,34		8,21		16,48		18,17		19,11		19,72		20,16		16,18		9,44		131,68	

**TIME OF RECURSION
25 YEARS**

TRIANGULAR HYDROGRAM											
NAME E:		BASIN 04				CODE:					
CARACTERISTIC ELEMENTS											
A (km ²):		3,07		AH (m):		65,00					
L (km):		1,75		I (%):		3,71					
CALCULATED ELEMENTS											
tc (hs):		0,70		tb (hs):		1,31					
tp (hs):		0,49		At (hs):		0,14					
tr (hs):		0,82		qp (m ³ /s):		13,05					
EFFECTIVE PRECIPITATION				CN: 70		TR: 25					
At (hs)		i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)	
0,00		0,00		0,00		0,00		0,00		0,00	
0,14		215,40		3,01		3,29		0,10		0,10	
0,28		169,91		4,75		5,18		0,65		0,55	
0,42		137,53		5,77		6,30		1,13		0,48	
0,56		116,06		6,49		7,08		1,52		0,39	
0,70		100,86		7,05		7,69		1,86		0,33	
0,84		89,50		7,51		8,19		2,14		0,29	
0,98		80,67		7,90		8,62		2,39		0,25	
1,12		74,66		8,35		9,11		2,70		0,31	
1,26		69,71		8,77		9,57		2,99		0,29	
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)		qi (m ³ /s)		Q							
				m ³ /s							
		0,10 0,55		0,48 0,39		0,33 0,29		0,25 0,31		0,29	
0,00		0,00								0,00	
0,14		3,73		0,38		0,00				0,38	
0,28		7,46		0,76		2,04		0,00		2,81	
0,42		11,18		1,15		4,09		1,79		7,02	
0,56		11,93		1,22		6,13		3,57		12,40	
0,70		9,70		0,99		6,54		5,36		17,07	
0,84		7,47		0,77		5,32		5,72		19,74	
0,98		5,23		0,54		4,10		4,65		20,75	
1,12		3,00		0,31		2,87		3,58		20,74	
1,26		0,77		0,08		1,65		2,51		19,98	

TRIANGULAR HYDROGRAM										
NAME E:		BASIN 05				CODE:				
CHARACTERISTIC ELEMENTS										
A (km ²):	9,62		AH (m):		35,00					
L (km):	2,50		I (%):		1,40					
CALCULATED ELEMENTS										
tc (hs):	1,56		tb (hs):		2,92					
tp (hs):	1,09		At (hs):		0,31					
tr (hs):	1,83		qp (m ³ /s):		18,29					
EFFECTIVE PRECIPITATION			CN: 70				TR: 25			
At (hs)	i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)	
0,00	0,00		0,00		0,00		0,00		0,00	
0,31	160,97		5,03		5,24		0,67		0,67	
0,63	108,32		6,77		7,05		1,51		0,84	
0,94	83,07		7,79		8,11		2,09		0,59	
1,25	69,99		8,75		9,11		2,70		0,61	
1,56	61,10		9,55		9,94		3,23		0,54	
1,88	54,40		10,20		10,62		3,69		0,46	
2,19	49,15		10,75		11,20		4,09		0,40	
2,50	44,92		11,23		11,70		4,44		0,35	
2,81	41,43		11,65		12,14		4,76		0,32	
HYDROGRAM OF PROJECT										
EFFECTIVE PRECIPITATION										
At (hs)	qi (m ³ /s)									Q (m ³ /s)
		0,67	0,84	0,59	0,61	0,54	0,46	0,40	0,35	0,32
0,00	0,00	0,00								0,00
0,31	5,23	3,51	0,00							3,51
0,63	10,45	7,03	4,37	0,00						11,39
0,94	15,68	10,54	8,73	3,06	0,00					22,33
1,25	16,73	11,25	13,10	6,13	3,16	0,00				33,63
1,56	13,60	9,14	13,97	9,19	6,33	2,80	0,00			41,43
1,88	10,47	7,04	11,36	9,80	9,49	5,60	2,39	0,00		45,67
2,19	7,34	4,93	8,74	7,97	10,12	8,39	4,77	2,08	0,00	47,01
2,50	4,21	2,83	6,13	6,14	8,23	8,96	7,16	4,16	1,84	0,00
2,81	1,08	0,73	3,52	4,30	6,34	7,28	7,63	6,24	3,69	1,66

TRIANGULAR HYDROGRAM											
NAME		BASIN 07				CODE:					
CHARACTERISTIC ELEMENTS											
A (km ²):	68,38				AH (m):	20,00					
L (km):	10,00				I (%):	0,20					
CALCULATED ELEMENTS											
tc (hs):	8,09				tb (hs):	15,12					
tp (hs):	5,66				At (hs):	1,62					
tr (hs):	9,46				qp (m ³ /s):	25,12					
EFFECTIVE PRECIPITATION				CN: 70				TR: 25			
At (hs)	i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)		
	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
	1,62	59,79	9,67	9,25	2,79	2,79	2,79	2,79	2,79	2,79	
	3,24	37,57	12,15	11,62	4,39	4,39	4,39	4,39	4,39	4,39	
	4,85	28,03	13,60	13,01	5,40	5,40	5,40	5,40	5,40	5,40	
	6,47	22,62	14,63	14,00	6,15	6,15	6,15	6,15	6,15	6,15	
	8,09	19,08	15,43	14,76	6,75	6,75	6,75	6,75	6,75	6,75	
	9,71	16,57	16,09	15,38	7,24	7,24	7,24	7,24	7,24	7,24	
	11,32	14,69	16,64	15,91	7,66	7,66	7,66	7,66	7,66	7,66	
	12,94	13,23	17,12	16,37	8,03	8,03	8,03	8,03	8,03	8,03	
	14,56	12,05	17,54	16,77	8,36	8,36	8,36	8,36	8,36	8,36	
HYDROGRAM OF PROJECT)											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)										Q
		2,79	1,60	1,02	0,75	0,59	0,49	0,42	0,37	0,33	m ³ /s
0,00	0,00	0,00									0,00
1,62	7,18	19,99	0,00								19,99
3,24	14,36	39,98	11,50	0,00							51,48
4,85	21,53	59,97	23,01	7,29	0,00						90,27
6,47	22,97	63,98	34,51	14,58	5,37	0,00					118,44
8,09	18,67	52,01	36,82	21,87	10,74	4,26	0,00				125,70
9,71	14,38	40,04	29,93	23,33	16,11	8,53	3,54	0,00			121,48
11,32	10,08	28,07	23,04	18,97	17,19	12,79	7,08	3,03	0,00		110,17
12,94	5,78	16,10	16,15	14,60	13,97	13,65	10,62	6,06	2,65	0,00	93,81
14,56	1,48	4,13	9,27	10,24	10,76	11,09	11,33	9,09	5,30	2,36	73,57

TRIANGULAR HYDROGRAM											
NAME		BASIN 15						CODE:			
CARACTERISTIC ELEMENTS											
A (km ²):	39,10		AH (m):		64,00						
L (km):	7,65		I (%):		0,84						
CALCULATED ELEMENTS											
tc (hs):	3,66		lb (hs):		6,84						
lp (hs):	2,56		At (hs):		0,73						
lr (hs):	4,28		qp (m ³ /s):		31,77						
EFFECTIVE PRECIPITATION						CN: 70		TR: 25			
At (hs)	i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)		
	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	0,73	97,96	7,17	7,03	1,49	1,49	1,49	1,49	1,49	1,49	1,49
	1,46	63,65	9,31	9,13	2,71	1,22	2,71	2,71	2,71	2,71	1,22
	2,19	49,05	10,76	10,55	3,64	0,93	3,64	3,64	3,64	3,64	0,93
	2,93	40,31	11,79	11,56	4,35	0,70	4,35	4,35	4,35	4,35	0,70
	3,66	34,43	12,59	12,35	4,91	0,57	4,91	4,91	4,91	4,91	0,57
	4,39	30,18	13,24	12,99	5,39	0,47	5,39	5,39	5,39	5,39	0,47
	5,12	26,95	13,80	13,53	5,79	0,41	5,79	5,79	5,79	5,79	0,41
	5,85	24,39	14,27	14,00	6,15	0,36	6,15	6,15	6,15	6,15	0,36
	6,58	22,32	14,70	14,41	6,47	0,32	6,47	6,47	6,47	6,47	0,32
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)										
		1,49	1,22	0,93	0,70	0,57	0,47	0,41	0,36	0,32	Q m ³ /s
0,00	0,00	0,00									0,00
0,73	9,08	13,56	0,00								13,56
1,46	18,15	27,12	11,04	0,00							38,17
2,19	27,23	40,69	22,08	8,46	0,00						71,23
2,93	29,05	43,41	33,12	16,93	6,38	0,00					99,84
3,66	23,62	35,29	35,34	25,39	12,77	5,14	0,00				113,92
4,39	18,18	27,16	28,73	27,09	19,15	10,27	4,30	0,00			116,71
5,12	12,75	19,04	22,12	22,02	20,44	15,41	8,60	3,71	0,00		111,34
5,85	7,31	10,92	15,50	16,95	16,61	16,44	12,91	7,41	3,26	0,00	100,01
6,58	1,88	2,80	8,89	11,89	12,79	13,36	13,77	11,12	6,51	2,91	84,04

TRIANGULAR HYDROGRAM											
NAME		BASIN 08				CODE:					
CHARACTERISTIC ELEMENTS											
A (km ²):	9,54					AH (m):	50,00				
L (km):	4,50					I (%):	1,11				
CALCULATED ELEMENTS											
tc (hs):	1,92					tb (hs):	3,59				
tp (hs):	1,35					At (hs):	0,38				
tr (hs):	2,25					qp (m ³ /s):	14,74				
EFFECTIVE PRECIPITATION				CN: 70			TR: 25				
At (hs)	i (mm/h)	p (cm)	p' (cm)	Pe (cm)	A Pe (cm)						
0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
0,38	144,35	5,55	5,78	0,90	0,90	0,90	0,90	0,90	0,90	0,90	
0,77	94,79	7,29	7,60	1,80	0,90	0,90	0,90	0,90	0,90	0,90	
1,15	73,34	8,46	8,82	2,52	0,71	0,71	0,71	0,71	0,71	0,71	
1,54	61,70	9,49	9,89	3,20	0,68	0,68	0,68	0,68	0,68	0,68	
1,92	53,51	10,29	10,72	3,76	0,56	0,56	0,56	0,56	0,56	0,56	
2,31	47,42	10,94	11,40	4,23	0,47	0,47	0,47	0,47	0,47	0,47	
2,69	42,70	11,50	11,98	4,64	0,41	0,41	0,41	0,41	0,41	0,41	
3,08	38,92	11,97	12,47	5,01	0,36	0,36	0,36	0,36	0,36	0,36	
3,46	35,81	12,40	12,91	5,33	0,33	0,33	0,33	0,33	0,33	0,33	
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)										Q
		0,90	0,90	0,71	0,68	0,56	0,47	0,41	0,36	0,33	m ³ /s
0,00	0,00	0,00									0,00
0,38	4,21	3,78	0,00								3,78
0,77	8,42	7,56	3,81	0,00							11,37
1,15	12,64	11,34	7,61	3,01	0,00						21,96
1,54	13,48	12,10	11,42	6,01	2,88	0,00					32,41
1,92	10,96	9,84	12,18	9,02	5,75	2,36	0,00				39,15
2,31	8,44	7,57	9,90	9,62	8,63	4,71	2,00	0,00			42,43
2,69	5,91	5,31	7,62	7,82	9,21	7,07	3,99	1,73	0,00		42,75
3,08	3,39	3,04	5,34	6,02	7,48	7,54	5,99	3,46	1,53	0,00	40,42
3,46	0,87	0,78	3,07	4,22	5,76	6,13	6,39	5,20	3,06	1,37	35,97

TRIANGULAR HYDROGRAM											
NAME		BASIN 09					CODE:				
CARACTERISTIC ELEMENTS											
A (km ²):	12,98		AH (m):		30,00						
L (km):	5,00		I (%):		0,60						
CALCULATED ELEMENTS											
tc (hs):	2,76		tb (hs):		5,15						
tp (hs):	1,93		At (hs):		0,55						
tr (hs):	3,22		qp (m ³ /s):		13,99						
EFFECTIVE PRECIPITATION			CN: 70			TR: 25					
At (hs)	i (mm/h)	p (cm)	p' (cm)	Pe (cm)	A Pe (cm)						
0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
0,55	117,10	6,46	6,64	1,30	1,30	1,30	1,30	1,30	1,30	1,30	
1,10	75,28	8,30	8,54	2,34	1,05	2,34	2,34	2,34	2,34	2,34	
1,65	58,96	9,75	10,03	3,29	0,95	3,29	3,29	3,29	3,29	3,29	
2,20	48,89	10,78	11,09	4,01	0,72	4,01	4,01	4,01	4,01	4,01	
2,76	42,01	11,58	11,91	4,59	0,58	4,59	4,59	4,59	4,59	4,59	
3,31	36,99	12,23	12,58	5,08	0,49	5,08	5,08	5,08	5,08	5,08	
3,86	33,13	12,78	13,15	5,51	0,42	5,51	5,51	5,51	5,51	5,51	
4,41	30,07	13,26	13,64	5,88	0,37	5,88	5,88	5,88	5,88	5,88	
4,96	27,58	13,68	14,07	6,21	0,33	6,21	6,21	6,21	6,21	6,21	
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)	Q									
		1,30	1,05	0,95	0,72	0,58	0,49	0,42	0,37	0,33	m ³ /s
0,00	0,00	0,00									0,00
0,55	4,00	5,19	0,00								5,19
1,10	8,00	10,37	4,19	0,00							14,56
1,65	11,99	15,56	8,38	3,78	0,00						27,71
2,20	12,80	16,60	12,56	7,56	2,88	0,00					39,60
2,76	10,40	13,49	13,40	11,34	5,76	2,33	0,00				46,33
3,31	8,01	10,39	10,90	12,10	8,65	4,66	1,96	0,00			48,65
3,86	5,61	7,28	8,39	9,83	9,22	6,99	3,92	1,69	0,00		47,33
4,41	3,22	4,18	5,88	7,57	7,50	7,46	5,88	3,38	1,49	0,00	43,34
4,96	0,83	1,07	3,37	5,31	5,77	6,07	6,27	5,07	2,98	1,33	37,24

TRIANGULAR HYDROGRAM											
NAME		BASIN 10				CODE:					
CHARACTERISTIC ELEMENTS											
A (km ²):	20,13		AH (m):		10,00						
L (km):	5,10		I (%):		0,20						
CALCULATED ELEMENTS											
tc (hs):	4,94		lb (hs):		9,23						
tp (hs):	3,46		At (hs):		0,99						
tr (hs):	5,77		qp (m ³ /s):		12,12						
EFFECTIVE PRECIPITATION				CN: 70		TR: 25					
At (hs)	i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)		
	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	0,99	80,19	7,92	7,92	7,99	2,03	2,03	2,03	2,03	2,03	2,03
	1,97	52,59	10,39	10,39	10,48	3,60	3,60	3,60	3,60	3,60	3,60
	2,96	39,96	11,84	11,84	11,95	4,62	4,62	4,62	4,62	4,62	4,62
	3,95	32,58	12,87	12,87	12,99	5,39	5,39	5,39	5,39	5,39	5,39
	4,94	27,68	13,67	13,67	13,80	6,00	6,00	6,00	6,00	6,00	6,00
	5,92	24,17	14,32	14,32	14,45	6,51	6,51	6,51	6,51	6,51	6,51
	6,91	21,51	14,87	14,87	15,01	6,94	6,94	6,94	6,94	6,94	6,94
	7,90	19,43	15,35	15,35	15,49	7,33	7,33	7,33	7,33	7,33	7,33
	8,89	17,75	15,77	15,77	15,92	7,67	7,67	7,67	7,67	7,67	7,67
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)										Q (m ³ /s)
		2,03	1,57	1,03	0,76	0,61	0,51	0,44	0,38	0,34	
0,00	0,00	0,00									0,00
0,99	3,46	7,01	0,00								7,01
1,97	6,92	14,02	5,44	0,00							19,45
2,96	10,38	21,03	10,87	3,56	0,00						35,46
3,95	11,08	22,44	16,31	7,11	2,65	0,00					48,50
4,94	9,01	18,24	17,40	10,67	5,29	2,11	0,00				53,71
5,92	6,93	14,04	14,14	11,38	7,94	4,23	1,76	0,00			53,49
6,91	4,86	9,84	10,89	9,25	8,47	6,34	3,52	1,51	0,00		49,83
7,90	2,79	5,65	7,63	7,12	6,89	6,77	5,29	3,02	1,33	0,00	43,69
8,89	0,72	1,45	4,38	4,99	5,30	5,50	5,64	4,54	2,65	1,18	35,63

TRIANGULAR HYDROGRAM											
NAME		BASIN01						CODE:			
CHARACTERISTIC ELEMENTS											
A (km2):	23,38		AH (m):		25,00						
L (km):	6,60		I (%):		0,38						
CALCULATED ELEMENTS											
tc (hs):	4,18		tb (hs):		7,81						
tp (hs):	2,92		At (hs):		0,84						
tr (hs):	4,88		qp (m3/s):		16,63						
EFFECTIVE PRECIPITATION				CN: 70				TR: 25			
At (hs)	I (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)		
	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	0,84	89,74	7,50	7,52	1,76	1,76	1,76	1,76	1,76	1,76	1,76
	1,67	58,57	9,79	9,82	3,15	3,15	3,15	3,15	3,15	3,15	3,15
	2,51	44,84	11,24	11,27	4,14	4,14	4,14	4,14	4,14	4,14	4,14
	3,34	36,71	12,27	12,31	4,88	4,88	4,88	4,88	4,88	4,88	4,88
	4,18	31,28	13,07	13,11	5,48	5,48	5,48	5,48	5,48	5,48	5,48
	5,01	27,37	13,72	13,76	5,97	5,97	5,97	5,97	5,97	5,97	5,97
	5,85	24,40	14,27	14,32	6,40	6,40	6,40	6,40	6,40	6,40	6,40
	6,69	22,07	14,75	14,79	6,77	6,77	6,77	6,77	6,77	6,77	6,77
	7,52	20,18	15,17	15,22	7,11	7,11	7,11	7,11	7,11	7,11	7,11
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m3/s)									Q	
		1,76	1,39	0,99	0,74	0,59	0,50	0,43	0,37	0,33	m3/s
0,00	0,00	0,00									0,00
0,84	4,75	8,36	0,00								8,36
1,67	9,50	16,72	6,61	0,00							23,33
2,51	14,25	25,08	13,22	4,70	0,00						43,00
3,34	15,21	26,76	19,83	9,40	3,52	0,00					59,51
4,18	12,36	21,75	21,15	14,11	7,04	2,82	0,00				66,87
5,01	9,52	16,74	17,19	15,05	10,57	5,64	2,36	0,00			67,56
5,85	6,67	11,74	13,24	12,23	11,27	8,47	4,72	2,03	0,00		63,69
6,69	3,83	6,73	9,28	9,42	9,16	9,03	7,07	4,05	1,78	0,00	56,54
7,52	0,98	1,73	5,32	6,60	7,05	7,34	7,55	6,08	3,56	1,59	46,82

TRIANGULAR HYDROGRAM											
NAME		BASIN 03				CODE:					
CHARACTERISTIC ELEMENTS											
A (km ²):	17,60		AH (m):		65,00						
L (km):	4,70		I (%):		1,38						
CALCULATED ELEMENTS											
tc (hs):	2,14		tb (hs):		3,99						
lp (hs):	1,49		At (hs):		0,43						
lr (hs):	2,50		qp (m ³ /s):		24,49						
EFFECTIVE PRECIPITATION				CN: 70				TR: 25			
At (hs)	i (mm/h)		p (cm)		p' (cm)		Pe (cm)		A Pe (cm)		
	0,00		0,00		0,00		0,00		0,00		0,00
	0,43		136,14		5,81		5,90		0,95		0,95
	0,85		88,44		7,55		7,67		1,84		0,89
	1,28		68,97		8,84		8,97		2,61		0,77
	1,71		57,76		9,87		10,02		3,28		0,67
	2,14		49,94		10,67		10,83		3,83		0,55
	2,56		44,17		11,32		11,49		4,29		0,46
	2,99		39,70		11,87		12,05		4,70		0,40
	3,42		36,14		12,35		12,54		5,05		0,35
	3,84		33,22		12,77		12,97		5,37		0,32
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)									Q	
		0,95	0,89	0,77	0,67	0,55	0,46	0,40	0,35	0,32	m ³ /s
0,00	0,00	0,00									0,00
0,43	7,00	6,65	0,00								6,65
0,85	13,99	13,30	6,24	0,00							19,54
1,28	20,99	19,95	12,48	5,38	0,00						37,81
1,71	22,39	21,28	18,72	10,77	4,70	0,00					55,46
2,14	18,20	17,30	19,97	16,15	9,39	3,84	0,00				66,65
2,56	14,01	13,32	16,23	17,23	14,09	7,67	3,24	0,00			71,79
2,99	9,82	9,34	12,50	14,01	15,03	11,51	6,49	2,81	0,00		71,69
3,42	5,63	5,35	8,76	10,78	12,22	12,28	9,73	5,62	2,48	0,00	67,24
3,84	1,45	1,37	5,02	7,56	9,41	9,98	10,38	8,44	4,97	2,22	59,36

TRIANGULAR HYDROGRAM											
NAME		BASIN 02					CODE:				
CHARACTERISTIC ELEMENTS											
A (km2):	9,22					AH (m):	60,00				
L (km):	2,80					I (%):	2,14				
CALCULATED ELEMENTS											
tc (hs):	1,33					tb (hs):	2,49				
tp (hs):	0,93					At (hs):	0,27				
tr (hs):	1,56					qp (m3/s):	20,58				
EFFECTIVE PRECIPITATION			CN: 70				TR: 25				
At (hs)	i (mm/h)	p (cm)	p' (cm)	Pe (cm)	A Pe (cm)						
0,00	0,00	0,00	0,00	0,00	0,00		0,00				
0,27	173,84	4,63	4,83	0,52	0,52		0,52				
0,53	119,60	6,37	6,64	1,30	0,78		0,78				
0,80	92,47	7,39	7,71	1,86	0,56		0,56				
1,06	76,77	8,18	8,53	2,34	0,48		0,48				
1,33	67,41	8,97	9,36	2,86	0,52		0,52				
1,60	60,27	9,63	10,04	3,30	0,44		0,44				
1,86	54,62	10,18	10,62	3,69	0,39		0,39				
2,13	50,03	10,66	11,12	4,03	0,34		0,34				
2,40	46,23	11,08	11,56	4,34	0,31		0,31				
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m3/s)										Q
		0,52	0,78	0,56	0,48	0,52	0,44	0,39	0,34	0,31	m3/s
0,00	0,00	0,00									0,00
0,27	5,88	3,05	0,00								3,05
0,53	11,76	6,11	4,59	0,00							10,70
0,80	17,64	9,16	9,18	3,31	0,00						21,65
1,06	18,82	9,78	13,76	6,62	2,81	0,00					32,97
1,33	15,30	7,95	14,68	9,92	5,63	3,04	0,00				41,22
1,60	11,78	6,12	11,94	10,59	8,44	6,07	2,60	0,00			45,76
1,86	8,26	4,29	9,19	8,61	9,01	9,11	5,21	2,28	0,00		47,69
2,13	4,74	2,46	6,44	6,63	7,32	9,72	7,81	4,56	2,03	0,00	46,97
2,40	1,21	0,63	3,70	4,64	5,64	7,90	8,33	6,84	4,05	1,82	43,56

TRIANGULAR HYDROGRAM											
NAME		BASIN 11								CODE:	
CHARACTERISTIC ELEMENTS											
A (km ²):		231,77		AH (m):		40,00					
L (km):		17,00		I (%):		0,24					
CALCULATED ELEMENTS											
tc (hs):		12,15		tb (hs):		22,72					
tp (hs):		8,51		At (hs):		2,43					
tr (hs):		14,21		qp (m ³ /s):		56,66					
EFFECTIVE PRECIPITATION				CN: 70				TR: 25			
At (hs)	i (mm/h)	p (cm)	p' (cm)	Pe (cm)	A Pe (cm)						
0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
2,43	45,78	11,13	10,05	3,31	3,31	3,31	3,31	3,31	3,31	3,31	3,31
4,86	28,00	13,61	12,30	4,87	1,57	1,57	1,57	1,57	1,57	1,57	1,57
7,29	20,65	15,06	13,61	5,85	0,98	0,98	0,98	0,98	0,98	0,98	0,98
9,72	16,55	16,09	14,54	6,57	0,72	0,72	0,72	0,72	0,72	0,72	0,72
12,15	13,90	16,89	15,26	7,14	0,57	0,57	0,57	0,57	0,57	0,57	0,57
14,59	12,03	17,54	15,85	7,61	0,47	0,47	0,47	0,47	0,47	0,47	0,47
17,02	10,63	18,10	16,35	8,01	0,40	0,40	0,40	0,40	0,40	0,40	0,40
19,45	9,55	18,57	16,78	8,36	0,35	0,35	0,35	0,35	0,35	0,35	0,35
21,88	8,68	19,00	17,16	8,68	0,31	0,31	0,31	0,31	0,31	0,31	0,31
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)										Q (m ³ /s)
		3,31	1,57	0,98	0,72	0,57	0,47	0,40	0,35	0,31	
0,00	0,00	0,00									0,00
2,43	16,19	53,53	0,00								53,53
4,86	32,38	107,06	25,38	0,00							132,43
7,29	48,57	160,59	50,75	15,86	0,00						227,20
9,72	51,81	171,33	76,13	31,72	11,62	0,00					290,79
12,15	42,12	139,27	81,22	47,58	23,24	9,20	0,00				300,50
14,59	32,43	107,22	66,02	50,76	34,86	18,39	7,62	0,00			284,88
17,02	22,73	75,17	50,83	41,26	37,19	27,59	15,25	6,52	0,00		253,80
19,45	13,04	43,11	35,63	31,77	30,23	29,44	22,87	13,03	5,69	0,00	211,77
21,88	3,34	11,06	20,44	22,27	23,27	23,93	24,40	19,55	11,39	5,06	161,36

TRIANGULAR HYDROGRAM											
NAME		BASIN 12				CODE:					
CHARACTERISTIC ELEMENTS											
A (km ²):	300,00		AH (m):		45,00						
L (km):	26,80		I (%):		0,17						
CALCULATED ELEMENTS											
tc (hs):	16,46		tb (hs):		30,77						
tp (hs):	11,52		At (hs):		3,29						
tr (hs):	19,25		qp (m ³ /s):		54,15						
EFFECTIVE PRECIPITATION				CN: 70				TR: 25			
At (hs)	i (mm/h)	p (cm)	p' (cm)	Pe (cm)	A Pe (cm)						
0,00	0,00	0,00	0,00	0,00	0,00						
3,29	37,10	12,22	10,90	3,88	3,88						
6,59	22,32	14,70	13,11	5,48	1,60						
9,88	16,35	16,15	14,41	6,47	0,99						
13,17	13,04	17,18	15,33	7,19	0,72						
16,46	10,92	17,98	16,04	7,76	0,57						
19,76	9,43	18,63	16,62	8,24	0,47						
23,05	8,32	19,18	17,11	8,64	0,40						
26,34	7,46	19,66	17,54	8,99	0,35						
29,63	6,78	20,08	17,92	9,30	0,31						
HYDROGRAM OF PROJECT											
EFFECTIVE PRECIPITATION											
At (hs)	qi (m ³ /s)	Q									
		3,88	1,60	0,99	0,72	0,57	0,47	0,40	0,35	0,31	m ³ /s
0,00	0,00	0,00									0,00
3,29	15,47	60,01	0,00								60,01
6,59	30,94	120,02	24,76	0,00							144,78
9,88	46,41	180,03	49,52	15,33	0,00						244,87
13,17	49,52	192,06	74,28	30,65	11,18	0,00					308,18
16,46	40,25	156,13	79,25	45,98	22,36	8,83	0,00				312,55
19,76	30,99	120,20	64,42	49,05	33,55	17,66	7,31	0,00			292,18
23,05	21,72	84,26	49,60	39,88	35,79	26,49	14,61	6,24	0,00		256,86
26,34	12,46	48,33	34,77	30,70	29,09	28,26	21,92	12,47	5,44	0,00	210,98
29,63	3,20	12,40	19,94	21,52	22,40	22,97	23,38	18,71	10,89	4,83	157,04