

REPUBLIC OF GUATEMALA
MUNICIPALITY OF GUATEMALA
THE STUDY ON SOLID WASTE MANAGEMENT
IN METROPOLITAN AREA OF GUATEMALA CITY

FINAL REPORT
VOLUME IV DATA FILE

SEPTEMBER 1991

JAPAN INTERNATIONAL COOPERATION AGENCY

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国際協力事業団

22920

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I. Colleaction Information

Existing Data Relevant to Collection Service : General

Table 1-1-1

No. of sources	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
	Sept. 1983 (1983) 1350000	Dec. 1986 (1989) 1783000	June 1987 (1989) 1783000	Fed. 1987 (1987) 1307000	Jan. 1987 (1987) 1847000	Jan. 1989 (1989) 1800000	Nov. 1987 (1981) 1134000	Dec. 1989 (1981) 1130000
1) Population	(1990) 1800000				(1990) 2138000		(1985) 1500000	(1983) 1350000
	(2000) 2500000				(1993) 2475000			(1985) 1500000
2) SW Generating Sources								
No. of Households				2620000		300000		
No. of Shops						20000		
No. of Workshops						2000		
No. of Hospitals					8	200		
No. Pub. Institutions					Schools 110 Park10	1200		(1987) 1780000
Road (Km)	500			920 (1840)		1200		
1 (Km ²)						1000		
3) Non served Population						30000		
4) Generation rate (Xg/cap a day)	(1976) 0.64	0.5	Av. Domestic 0.583	Domestic 0.42			0.6	
	(1990) 0.70		Upper-class 0.900	Non-Domestic 0.17				
			Middle&M.Upper 0.556	(Total 0.60) Natural day				
			Middle-lower 0.648	Domestic 0.49				
			Lower class 0.464	Non-D 0.21				
				(Total 0.70)				
				Working day				

Table 1-1-2

Existing Data Relevant to Collection Service : General

No. of sources	No. 1 Sept. 1983	No. 2 Dec. 1986	No. 3 June 1987	No. 4 Feb. 1987	No. 5 Jan. 1987	No. 6 Jan. 1989	No. 7 Nov. 1987	No. 8 Dec. 1989
5) Specific Weight (t/m ³)	0.16	Aver 0.225			0.16	0.225		Same as No. 3
	(0.3 by MCD)		Upper-class 0.172	Compacted density				
			middle & m-upper	in compaction car				
			0.207 middle-lower		0.42			
			0.248 Lower class					
			0.244					
6) Waste Quantity (t/D)	(1984) 864	Discharged 1040	Domert 910		(1989) 1108.2	1200		
	(1990) 1260	Collected 800	Market 185		(1990) 1284.8			
		NonDomestic 450	Total 1095		(1993) 1485.0			
			(Working day)					
7) Composition		Organic 64				Type A	Organic Matters	Same as No. 7
or Types (%)		Others 36				Type B	more than 60	

Table 1-1-3

Existing Data Relevant to Collection Service :

No. of sources	No.1 Sept. 1983	No.2 Dec. 1986	No.3 June 1987	No.4 Feb. 1987	No.5 Jan. 1987	No.6 Jan. 1989	No.7 Nov. 1987	No.8 Dec. 1989
							Metal 1.5	
							Glass, ceramics	
							4.07	
							Cellulose 15.69	
							Plastic 5.60	
							Clothes 1.70	
							Woods 0.29	
							Leather/rubber	
							1.02	
							Subtle matters	
							0.53	
							Organic matters	
							63.80	
							Inert matters	
							5.80	600-750
							(Total 100.00)	
Hu. (Kcal/Kg)			920					
								In Organic matters
								75-80
Water Content			60					
Others (%)			40					

Table 1-1-4 Existing Data Relevant to Collection Service :

No. of sources	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8
8) Road sweeping efficiency	Sept. 1983	Dec. 1986	June 1987	Fed. 1987	Jan. 1987	Jan. 1989	Nov. 1987	Dec. 1989
Manual (Km/cap.D)	1.8			Day time				
				1.84				
				Nighth time				
				0.8				
No. of Workers	298			170				274
Mechanical (Kms/Sweeper.H)	7.0 (Km/H)			35 Km/D				
Refuse collected (t/D)				70 (t/D)				
9) No. of Waste collectors	187							183
10) No. of markets	22				22		24	
Satelites	17				16		30	
Refused collected				115 (t/D)				
11) Pub. Institutions	131					128		
12) Illegal dump sites	more than 220					1200		

Data on Collection Service : Total Waste Quantity Generated and Collection Rate

Table 1-2

No. of sources	No.1 Sept.1983	No.3 June.1987	No.4 Feb.1987	No.5 Jan.1987	No.6 Jan.1989
Total Waste Q.generated	1490 (t/D)	910	(1984) 957	1200	480
Non-domestic collected by Municipality	450	*1 245	256.17		
Domestic collected by Privates	350	417	*2 537.6 (357.5)		480
Domestic non collected	690	203	163.23 (343.33)		240
Directly hauled	-	45	-		-
Collection Rate					
Non-collected	25 %	46.3 %	25-35 %	17 (35.9)	20 %
Collected	45 %	53.7 %	75-65 %	83 (64.1)	80 %
Municipal	- 25 %	-30.2% (non domesti)	-15 a 20 %	-27 % (26.8)	-40 %
Private	- 50 %	-23.5% (domestic)	-40 a 50 %	-56 % (37.3)	-40 %
Individual Hauled	-	-	- 5 %		
				*1	
				*2	
				Market 115	Incase of two
				Road sweep 70	trip number
				Dump site R 60	() Adjusted by
				Total 245	1.33 trips

Market List in the Study Area

Table 1-3-1

City	No. Public	Satellite	Name	Zone	Shop Number			Personel	
					Indoor	Outdoor	Peddliens	Market Depart	M C D
Guatemala	1		Central	1	759	F	F	25	
	2		Terminal	4	4134	3445	G	105	
	3		Sur Dos	1	877	M	M	20	
	4		Presidents	1	368	M	M	14	
			4.1	Satellite	8	-	100	F	
			4.2	Satellite	3	-	F	F	
	5		Colon	1	358	M	M	12	
			5.1	Satellite	1	-	-	-	
	6		Parroquia	6	518	F	F	14	Mon to Fri 1
			6.1	Satellite	6	-	80	F	
			6.2	Hipodromo del Norte	2	-	M periodic	M	
	7			Cervantes	3	157	-	-	12
		7.1	Satellite	1	-	-	F		
8			Palmita	5	422	M	F	15	
		8.1	Satellite	5	-	M	M		Mon to Fri 1
		8.2	Santa Ana	5	-	112	M		Mon to Fri 2
9			Guarda Viejo	11	669	M	M	27	Mon to Thu 8
10			Villa de Guadalupe	10	99	F	F	10	
11			Granero	4	1153	1130	G	24	
12			Tomatero	4	40	M	F	10	

Table 1-3-2 Market List in the Study Area

City	No. Public	Satellite	Name	Zone	Shop Number			Personal	
					Indoor	Outdoor	Peddle	Market Depart	M C D
	13		San Martin de Porres	6	289	F	F	14	
		13-1	Satellite Maya	18		284	M		
		13-2	Satellite San Antonio	6		M	M		
		13-3	Satellite Zona 6	6		M	M		
	14		Florida	19	562	M	F	12	
		14-1	Satellite Florida	19		M	M		
	15		El Gallito	3	248	M	M	11	
		15-1	Satellite	3					
		15-2	Satellite	3					
	16		San José Mercantil	7	170	M	M	9	
		16-1	Satellite 6 de Octubre	7		M	M		
		16-2	Satellite Bethania	7	157	F	F		
		16-3	Satellite Landivar	7					
	17		Candelaria	6	32			4	
	18		Reformita	12	185	F	F		
	19		Asuncion	5	121	M	M	6	
		19-1	Satellite	5		M	M		
		19-2	Satellite	5					
	20		Flores	3	57			7	
	21		Roosevelth	11	198	M	M	10	

Table 1-3-3
Market List in the Study Area

City	No. Public	Satellite	Name	Zone	Shop Number			Personal	
					Indoor	Outdoor	Peddle	Market Depart	M C D
	22		Santa Fé	13	88			6	
	23		Bethania	7	140	F	F	7	
		23-1	Satellite Campos	14					
		23-2	San Rafael La Laguna	18		M	M		
		23-3	Alameda	18		F	F		
		23-4	Tapias	18					
		23-5	Noruega	6					
		23-6	Martinico	6					
Sub Total	23	25			11644	5622		374	12
Mixco	1		El Milagro		400	G	G		
	2		San Francisco		75	F	F		
	3		Central			F	F		
		3-1	Belén			M	M		
		3-2	Io. de Julio						
Sub Total	3	3			475				
V.Nue	1		Ciudad Real			M	M		
		1-1	Villa Lobos			F	M		
		1-2	Tres Banderas			F	F		
		1-3	Mezquital			F	F		
		1-4	Justo Rufino Barrios						

Table 1-3-4
Market List in the Study Area

City	No. Public	Satellite	Name	Zone	Shop Number			Personel	
					Indoor	Outdoor	Peddlers	Market Depart	M C D
SubTotal	1	4							
Chinautla	1		Municipal		?	M	M		
		1-1	Nueva Chinautla		?	F	M		
Subtotal	1	1							
Santa Catarina Pinula , Villa Canales have no markets in the study Area									
Total	28	33			*12199	*5622		*374	12

*1 denotes the number so far beome known.

*2 it has been informed that the total number of authorized peddlers attains at more than 10000.

* Codes.

F = few

G = great number

M = many

Table 1-4

Collection Service for Hospitals, Health Centers and Clinics.

No.	Name	Zona	Frequency	
			Twice/Week	Weekdays
1	Hospital General	1		0
2	Hospital Militar	10		0
3	Hospital San Vicente	7		0
4	Hospital Roosevelt	11		0
5	Centro de Salud Santa Elena	3		0
6	Centro de Salud San Rafael II	18		0
7	Dispensario No.2	5		0
8	Casa del Nino No.4	5		0
9	Cancerologia	11		0
10	Clinica del Nino Sano	12		0
11	Cosulta Externa	11		0
12	Maternidad Roosevelt	11		0
13	Escuealas de Enfermeras	11		0
14	Dispensario	18	0	
15	Dispensario No.1	12	0	
16	Dispensario No.2	12	0	
17	Dispensario	7	0	
18	Dispensario No.1	19	0	
19	Dispensario No.2	19	0	

N.B. As for the Schools attended by the municipal service teams, informations about their names and number have not been received due to lack of existing data, but their number is about 110.

Distribution of Clandestine Dump Sites

Table 1-5

Zone No.	Area 1 (Ha)	Population 2	Dumping Site 3	Pop. density (Cap/Km ²)	2/3	No. of markets
1	639	78787		12330		6
2	801	21075	21	2631	1004	1
3	412	55660	14	13510	3976	6
4	100	5044	17	5044	267	3
5	530	94086	33	17752	2851	6
6	610	82356	46	13501	1790	8
7	1410	153594	86	10893	1786	5
8	1320	25630	12	19417	2136	1
9	236	7098	8	3008	887	
10	577	24115	14	4179	1723	1
11	1138	51609	30	4535	1720	2
12	12351	80301	9	6486	8922	1
13	736	26503	23	3601	1152	1
14	531	18231	17	3433	1072	1
15	927	15311	21	1652	729	

Table 1-6 Distribution of Clandestine Dump Sites

Zone No.	Area 1 (Ha)	Population 2	Dumping Site 3	Pop. density (Cap/Km ²)	2/3	No. of markets
16	907	7406	9	817	823	
17	1725	10999	21	638	524	
18	4026	191112	48	4747	3982	4
19	108	31730	2	2938	15865	2
21			14			
22		84169				
23						
24	2340	6542		280		
25	3321	5366		162		
	22444	(1076724)	(445)			
Mixco						6
Villanueva						5
Chinautla						2

Table 1-7-1 Dwelling Distribution, Service Zone and No. of Illegal dumping Sites.

Zona No.	Asociation			Cooperative Vehicle	Total	Service Zone Association	Serv. Zone Cooperative (Accumulation)	No. of Illegal dumping sites
	Manual Cart	Wagon	Vehicle					
Guatemala1			1		1	No data obtained	3	
2			3		3	tained	1	21
3	3	4	6		13	#	1	14
4					0	#	1	17
5		2	2	5	9	#	3	33
6	3	18	33		54	#	6	46
7	2	2	29	1	34	#	6	86
8			1		1	#	4	12
9					0	#	3	8
10					0	#	3	14
11			2	3	5	#	14	30
12			9		9	#	15	9
13			2		2	#	3	23
14			2		2	#	2	17
15					0	#	2	21
16			2		2	#	-	9
17		2	6		8	#	-	21

Table 1-7-2

Dwelling Distribution, Service Zone and No. of Illegal dumping Sites.

Zona No.	Asociation			Cooperative Vehicle	Total	Service Zone Association	Serv. Zone Cooperative (Accumulation)	No. of Illegal dumping sites
	Manual Cart	Wagon	Vehicle					
18	2	3	34	20	59	»	7	48
19			5	1	6	»	2	2
21			1		1	No data ob-	1	
22			1		1	obtained	-	14
24					0	»	-	Numerous
25					0	»	-	»
Mixco			13	1	14	»		»
Villa Nueva			1		1	»		»
S. Pedro. Sa			1		1	»		-
Progreso			1	1	2	»		-
Uncertain			15		15	»		-
Sub Total	10	31	170	32	243			
Total			211	32	243			

Number of Vehicles and Loading Capacity

Table 1-8

Type	Association			Cooperative			Individual		
	Number	Body Cap. (m ³)		Number	Body Cap. (m ³)		Total	Ave. Cap. m ³	
		Total	Ave		Total	Ave.		Total	Ave. Cap. m ³
Manual cart	16	16.72	*1	1.19	-	-	-	-	-
Wagon	36	78.74		2.19					
Vehicle	180	2667.54		14.82	35	541.99	15.48	12	14.82 *2
Total	232	2763		-	35	541.97	-	12	

*1 - Two carts without volume mention.

*2 - Same as Association case.

Number of Collection Workers (Private Sectors)

Table 1-9

Type	Association				Cooperative				Individual	
	Total Number	No. of Drivers	No. of Workers	Av. (Cap/Veh)	Total Number	No. of Drivers	No. of Workers	Av. (Cap/Veh)	Total Number	(Cap/Veh.)
Manual cart	21 (33)	4 (16)	17	2.1	-	-	-	-	-	-
Wagon	56 (78)	14 (36)	42	2.2	-	-	-	-	-	-
Vehicle	487 (652)	74 (180)	413	3.6	137 (148)	24 (35)	113	4.2	44	3.6
Total	564 (763)	92 (232)	472	137 (148)	24 (35)	113		44		

Number of Households Attended by Private Sectors.

Table 1-10

Type	Association			Cooperative			Individual	
	No./Day	No./Tot	2/1	Av. No./Day	No/Day	No/Tot.	2/1	Av. No./Day
Manual cart	770	1224	1.59	48.1	-	-	-	-
Wagon	3205	5320	1.66	98.0	-	-	-	-
Vehicle	39478	64276	1.63	235.0 *1	12650	26000	2.1 *	395.3
Total	43453	70820	1.63	-	12650	26000	2.1	1.63
								235.0

*1 - 12 Trucks do not mention households' number (168)

*2 - 3 Trucks do not mention households' number (32)

Distribution of Service Routes and Work Schedule (Frequency)

Day Time Collection Service

Table 1-11-1

Route No	Calendar Days							
	Collection Route	Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	Bell service for "La Florida", Zona 19	1	1	1	1	1		
2	Bell service for the colonies;	1	1	1	1			
	Juana de Arco							
	La Barreda							
	Atlántida							
	Santa Elena							
	El Limón							
	La Maya							
	Municipal Clinic of Col. Maya							
3	Bell service for the colonies;	1				1		
	Santa Rosita							
	Cobías							
	Las Vacas							
	Concepción Las Lomas							
	Sabana Arriba							
4	Bell service for the colonies;		1		1			
	Reyna Barrios y Escuela							
	El Caminero							
	Cantón 21							
	Boca del Monte							
5	Bell Service for the colonies;			1				
	Castanás							
	Nimajuyú							
	Venezuela							
	Ciudad Real							
6	Bell service for the colonies;					1		
	La Esperanza							
	Vásquez							
	Justo Rufino Barrios							
7	Bell service for the colonies;	1	1	1				
	Mezquital							
	La Esperanza							
	Exodo							
	Villalobos zona 12							
	Dust boxes on Aquilar Batres							

Distribution of Service Routes and Work Schedule (Frequency)

Day Time Collection Service

Table 1-11-2

Route No	Calendar Days							
	Collection Route	Mon	Tue	Wed	Thu	Fri	Sat	Sun
8	Bell service for the colonies;	1						
	La Verbena y Escuela							
	6th October							
	Sport Fields, zona 7							
	International Airport, zona 13							
9	Bell service for the colonies;		1		1	1		
	Bethania							
	El Gallito							
	Av.Cementerio							
10	Bell Service for Ciudad Peronia		1		1			
	Domestic Airterminals							
11	Domestic Service for the colonies		1		1			
	San Antonio Noriega							
	Presbiteriana							
	30 de Junio							
12	Bell service for the colonies;	1			1			
	Banvi Elida Espana							
	Prado							
	Amparo II							
	Granizo I, II, III							
	Sakerty							
	Nino Dormido							
	4 de Febrero, zona 7							
	Illegal sheds (Galeras)							
13	Bell service for the colonies;	1						
	Martinico							
	Proyectos IV-3, IV-1, IV-4							
	Quintanal, zona 6							
14	"la Tarminal" Market	1	1	1	1	1	1	1
15	Markets; La Asunción	1	1	1	1	1	1	1
	Santa Ana							
	La Palmita							

Distribution of Service Routes and Work Schedule (Frequency)

Day Time Collection Service

Table 1-11-3

Route No	Calendar Days							
	Collection Route	Mon	Tue	Wed	Thu	Fri	Sat	Sun
	Satelite							
	Predio La Unión							
	35.Av.18 Calle, zona 5							
	Registro Civil							
	3er.Cuerpo de la Policia Nacional							
	Esc.Policia nacional							
16	Markets;El Jocote	1	1	1	1	1	1	1
	La Betania							
	Depository of 4 de Feb.Puente del Incienso							
	Montón Los Espantos							
	Montón Calzada San Juan							
	Montón Anillo Periférico							
	1er.Cuerpo Policia Nacional							
	Jardin Infantil,, zona 7							
17	Central Station, Depository & Refuse Boxes	1	1	1	1	1	1	1
	Depositories ; La Aurora							
	Depositories ; Paredón No.1 & No.2							
	Sport Fields La Pradera							
	Markets;La Villa and its Satelite Z.14							
18	Markets;San Martin	1	1	1	1	1	1	1
	Candelaria							
	Satelite zona 6							
	Carbonera							
	Ceibas							
	Swch							
	El Rastro							
	Los Pinos							
	Izotes							
	Workshops of 60.Cuerpo P.N.							
	Policia Militar Ambulante							
	Munipal Clinic of Zona 6							
	Montón de la 8a.calle,16 av.zona 6							
19	3Av.y 24 Calle,zona 1							
	0 Av.33 calle, zona 4							
	Empagua							
	9 Av. y 8 Calle,Zona 8							

Distribution of Service Routes and Work Schedule (Frequency)

Day Time Collection Service

Table 1-11-4

Route No	Calendar Days							
	Collection Route	Mon	Tue	Wed	Thu	Fri	Sat	Sun
	3 Av.y 27 Calle,Zona 8							
	Stadium El Trèbol							
	Guatel,Zona 8							
	Matket La Reformita							
20	Makets;La Palmita	1	1	1	1	1	1	1
	La Presidenta							
	3 Calle linear, zona 1							
	14 Av. y 17 calle, zona 1							
	19 Av.y 20 Calle linear, zona 1							
	Educación Estètica							
21	Bread Factory "Europa"	1	1	1	1	1		
	Federal School							
	Municipal Fire Station							
	National Institute of Agricultural							
	Comercialization (INDECA)							
	Bolpasa							
	Palo de Hule							
	40 Calle zona 8							
	Anillo Perifèrico							
Aguilar Batres Road								
22	Service for the Public Gardens -8-	1	1	1	1	1		
23	Collection of refuse boxes in Trèbol	1	1	1	1	1	1	1
	Market Roosevelt							
24	Support Service for Manual Sweeping	0	0	0	0	0		
25	Periphery Distric of Roosevelt	0	0	0	0	0		
26	Public Gardens;Central	0	0	0	0	0	0	0
	Centenario							
	Market "Central"							
	Farmacia Estaral							
	20.Cuerpo de la policia Nacional							
	Dirección General de la Policia Na-							
	cional							
Casa del Nino								
Plazuela Barrios								
27	Collection service for hospitals	1	1	1	1	1		

Distribution of Service Routes and Work Schedule (Frequency)

Table 1-11-5

Day Time Collection Service

Route No	Calendar Days							
	Collection Route	Mon	Tue	Wed	Thu	Fri	Sat	Sun
28	Service for refuse boxes in av.	1	1	1	1	1	1	1
	Las Americas and Forestal							
29	Markets; San José, zona 7	0	0	0	0	0	0	0
	La Florida, zona 7							
	Montones; El Rodeo							
	El Centro Comercial							
	Ganga Dentro (El Tecolote)							
30	Service for pica - pollos	1	1	1	1	1		
31	Review service for refuse boxes &			1	1	1		
	Demestic Airterminals							
32	Clandestine heaps in zona II			1				
33	Clandestine heaps in San Refael							
	District in zona 18							
Total Number of Frequency		24	24	23	25	22	10	10

Distribution of Service Routes and Work Schedule (Frequency).

-- Nocturnal Collection Service

Table 1-12

Route No	Calendar Days							
	Collection Route	Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	Markets;La Parroquia	1	1	1	1	1		
	Colón							
	Clandestine heap removal;							
	14 Av.17 calle zona 1							
	20 Calle linear,zona 1							
	Trash Collection out of dustbins in ;							
	Plazuela Barrios							
	6 av.18 calle,zona 1							
	Centro Cívico Frente a la Placita							
2	Markets;Central	1	1	1	1	1		
	La Placita							
	Sur Número 2							
	Review of La Presidenta							
3	Markets; San José	1	1	1	1	1		
	Roosevelt							
	La Reformita							
4	Transh Collection Service out of Disting M:	1	1	1	1	1		
	Mateo Flores, Zona 4							
	Liceo Guatemala							
	Centro Financiero							
	Av.Reforma							
	Obelisco							
	Puente Pamplona							
	The Rotary of Trébol							
	Roosevelt Road The Industria Park							
5	Markets:La Asunción	1	1	1	1	1		
	La Palmita							
	Comisariato del Ejercito, zona 5							
	Clandestine heap removal:San Gaspar							
		4	4	4	4	4		

DISTRIBUCION DE RUTAS
TRANSPORTE MUNICIPAL NOCTURNO
DEPARTAMENTO DE LIMPIEZA

Table 1-13

RUTAS	DIA						
	LUNES	MARTES	MIERCOLES	JUEVES	VIERNES	SABADO	DOMINGO
1. - Mercado La Parroquia, colon, Montones 14 Av.Z.1., 20 Calle Linea Zone 1, Toneles Plazuela Barricos y 6ta. Av. 18 Calle Zona 1, Centro Civico, Frente a La Placita.	X	X	X	X	X		
2. - Mercado Central, La Placita Sur No. 2, Repaso Mercado Presidente.	X	X	X	X	X		
3. - Mercado San Jose, Roosevelt y Reformita.	X	X	X	X	X		
4. - Servicio de Toneles Mateo Flores Zona 5, Liceo Guatemala, Centro Financiero, Av. Reforma, Obelisco, Puente Pamplona, Rotonda del Trebol, Carretera Roosevelt, Parque de La Industria.	X	X	X	X	X		
5. - Mercado Asuncion, Laga Palmita y Comisariato del Ejercito Zona 5. Monton San Gaspar.	X	X	X	X	X		

Nota: - Elaborado en Base a Informes de Trabajo.

- Estadística.

Distribution of Service Routes and Work Schedule (Frequency).

- Convoy System (day and night)

Table 1-14-1

Route No	Calendar Days							
	Collection Route	Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	Nocturnal Service	1	1	1	1	1		
	Markets; El Gallito							
	De Flores							
	El Cantonal							
	La Presidenta							
	El Progreso.							
	Clandestine; 2Av.30 calle, zona 3							
	Heaps 5a.Av.5 Calle, zona 11							
	Market "Tomatero" zona 4							
	El Repollero							
	Depositories: La Terminal, zona 4							
	(Markets) El Granero, zona 4							
2	(Diurnal Service No.1)	1	1	1	1	1	1	1
	Markets: La Parroquia							
	Colón							
	La Reformita							
	Roosevelt							
	San José							
	De Flores							
	El Gallito							
	El Cantoral							
	Ride of Sweeping Teams to and from the Municipal Estate in Zona 2							
	Depository of "El Granero", zona 4							
	Emergency Service							
3	(Diurnal Service No.2)	1	1	1	1	1	1	1
	Ride of sweeping teams to and from the Municipal Estate in zona 2							
	Clandestine feap removal							
	Patio Sillas, zona 4							
	El Repollero, zona 9							
	Depositories; La Terminal							
	El Granero							

Distribution of Service Routes and Work Schedule (Frequency).

- Convoy System (day and naight)

Table 1-14-2

Route No	Calendar Days							
	Collection Route	Mon	Tue	Wed	Thu	Fri	Sat	Sun
4	Exceptional Service and / or Emergency							
	ones;by Judgements of the chief, on -the-							
	spot supervision's ordens complaints of							
	neighborhood etc.							
	(Previous schematization impossble)							
		3	3	3	3	3	2	2
	(2)	(2)	(2)	(2)	(2)	(1)	(1)	

DISTRIBUCION DE RUTAS
TRANSPORTE MUNICIPAL "CONVOY" (DIURNO Y NOCTURNO)
DEPARTAMENTO DE LIMPIEZA

Table 1-15

RUTAS	DIA						
	LUNES	MARTES	MIERCOLES	JUEVES	VIERNES	SABADO	DOMINGO
1. - MERCADOS:EI Gallito, De Flores, El Cantonal, La Presidenta, El Progreso. MONTONES:30 Calle 2a. Av Zona 3 5a. Av. y 5a. Calle Zona 11, Tomatero Zone 4, El Repollero, DEPOSITOS:La Terminal, El Granero Zona 4. (Servicio Nocturno)	X	X	X	X	X		
2. - MERCADOS:La Parroquia, Colon, La Reformita, Roosevelt San Jose, De Flores, El Gallito, Cantonal. Predio Municipal Zona 12, Ir y Traer Cuadrillas de Barrido. Deposito El Granero Zona 4. Servicio de Emergencia (Turno Diurno)	X	X	X	X	X	X	X
3. - Predio Municipal Zona 2. Monton Patio Sillas, El Repollero Zonas 4 y 9. Deposito La Terminal y el Granero. Llevar y Traer Cuadrillas de Barrido (Turno Diurno)	X	X	X	X	X	X	X
4. - Servicios Especiales Y/O De Emergencia : Ya que por observaciones del Jefe Supervision de Campo, ordenes Superiores, Quejas de los Vecinos, ETC.(De Antemano no Esquematzadas)							

Nota:--ELABORADO EN BASE A INFORMES DE TRABAJO.

-ESTADISTICA

Distribution of Service Routes and Work Schedule Rutas Municipales.

Table 1-16-1

Route	Truck No.	Service day	Collection Route (Markets and Clandestine Sites included)
1	MB.4	Monday and Thursday Tuesday and Friday Wednesday	Instituto Federico Mora, Iro de Julio, Escuela de Parvulos (Nursery) #43 zona 19 Florida zona 19 Monserrat 1 y 2, Mixco. Colonia La Isla, Iro de Julio, zona 19.
2	MB.12	Monday, Wednesday and Friday	Colonia Verbena, zona 7. Escuela de Verbena, Col 6 de Octubre, zona 7; deposito de Aeronautica Civil.
3	MB.21	Tuesday and Thursday Monday and Thursday Wednesday and Friday Wednesday	Ciudad Peronia Mixco y deposito Aeronautica Civil. Colonia Villalobos, Mexquital, El Exodo.2 Colonia La Esperanza, El Exodo, Col.Vazquez, Col.Justo Rufino Barrios Guajitos Colonia.Villalobos.
4	MB.31	Monday and Friday Tuesday and Thursday Wednesday	Col.Martinico, Melgar Dias, Proyectos 4.3,4.4,4.10, Cipresales y Quintanal zona 6. Barrio San Antonio, Col.Noriega, San Juan de Dios, 30 de Julio y Colonia La Reinita zona 6. San Judas Tadeo, Colonia Lourdes, Col.Los Angeles, 10 de Mayo, Col.Las Victorias, Col.Ferrocarrilera y Col.Monja Blanca.
5	MB.35	Monday and Thursday Tuesday and Friday Wednesday	Col.Bambi, Col.Alida de Espana. Esc.#64, Esc.#90, Esc.Plan Internacional, Col.El Amparo I y II .Col.Akerti, Col.El nino Dormido. Col.4 de Febrero zona 7. Zona 3 de la "0" Av. 3ra. Calle hasta la 6 Av. 17 Calle. Col.Santa Elena de 18 Calle 19 Av. 1ra Calle 31 Av. 20 Calle y 30 Av. Zona 3, la. Av. 21 Calle zona 3 hasta 6ta. Av. 40 Calle.

Table 1-16-2 Distribution of Service Routes and Work Schedules Rutas Municipales.

Route	Truck No.	Service day	Collection Route (Markets and Clandestine Sites included)
6	MB.42	Tuesday and Thursday Monday and Wednesday Friday	Esc. John P. Kennedy, Col. Kennedy, San Rafael, Inst. Pemen # 2, Col. El Paraiso I y II, Esc. El Paraiso #437, Col. Alameda, Esc. Alameda No. 439 y 134, Col. el Renacimiento. Juana de Arco, Esc. Juana de Arco, Col. y Esc. de la Barreda, Col. Atlántida, Col. Santa Elena I y II, Col. El Limón, Esc. Fe y Alegría zona 18, Col. La Maya. Col. Santo Domingo, Col. Las Vacas, Esc. Aceituno, Col. Santa Rosita, Col. Mario Méndez, Concepción Las Lomas, Residenciales Colibri zonas 5 y 17.
7	MB.43	Monday Tuesday and Thursday Wednesday and Friday	Col. Santo Domingo, Col. Las Vacas, Esc. Aceituno, Col. Santa Rosita Col. Mario Méndez, Concepción Las Lomas, Residenciales Colibri zonas 5 y 7. Col. Reyna Barrios, Col. Forestal zona 13, Col. El Caminero boca del Monte, Canton 21 zona 14. Col. Santo Domingo, Col. La Fuente zona 5, Col. Castañas, Ciudad Real, Col. Venezuela.
8	MB.1		Operativo en la zona 9
9	MB.2		Operativo en la terminal.
10	MB.3		26 Av. 29 y 30 calle zona 5, 31 Av. 21 Calle zona 5, Mercado Asunción, Registro Civil, 3er. Cuerpo de la P.N. 31 Av. 27 Calle zona 5, 35 Av. 23 calle zona 5, Mercado Santa Ana, Mercado Palmita Mercado Santa Ana.

Table 1-16-3 Distribution of Service Routes and Work Schedule Rutas Municipales.

Route	Truck No.	Service day	Collection Route (Markets and Clandestine Sites included)
11	MB.6		Monton del Jocote, Mercado de Betania, Oep.4 de Febrero, Monton del Puente del Incienso, Escuela de Parvulos No 65 Rep.de Uruguay. Esc. Vicenta La Parra, Rep.de Korea, Jardin Infantil, Monton frente a la iglesia de San José 5ta Samayoa, 11Av. 5ta. Calle, monton de la Calzada San Juan Anillo periférico, 1er Cuerpo de la P.N.
12	MB.7		Estacion Central, deposito y toneles de santa Fé, 4ta calle entre 16 y 17 Av. zona 14, Paredon 1 y 2, campos La Pradera, Esc.Nacional A.Salazar, merc.La Villa, Campos Landivar y Depositos de la Aurora Garita de la P.N.,mercado La Villa, 17 Av. 2da.Calle zona 14.
13	MB.9		24 Calle San Gaspar,"0" Av. 4ta.calle zona 4,Empagua zone 4, 9 Av. 31 calle zona 1,3 av. 27 Calle zona 8,3 av."8" 26 calle z.1.,38 C. tanque Z. 8. colegio de Ingenieros, Guatel Z. 8., Esc. Sta.Toruna Reformita.
14	MB.10		Mercado Florida, monton Tecolote,El Rodeo, mercados de San José.
15	MB.11		Operativo en la zona 18.
16	MB.13		Hipodromo del Norte, Parque Morazan, Isabel la Catolica Parque San Sebastian, Parque Recoleccion, Cerrito del Carmen Proyecto 4-4, Parque Infantil Colon, Guarderia Infantil, Viaducto 24, Parque la labor, Parque San Pedrito, Parque Ciudad Vieja.
17	MB.14		Servicio de Picapollo. Nota:
18	MB.15		Toneles iniciando en la Calzada San Juan, finalizando en la Aurora por la Plaza Tecun (Los dos carriles).

Table 1-16-4 Distribution of Service Routes and Work Schedule Rutas Municipales.

Route	Truck No.	Service day	Collection Route (Markets and Clandestine Sites included)
19	MB.18		3 Calle linea 7 Calle linea, mercado Placita, 14 Av. 17 Calle. 19 Calle linea, 20 Calle linea, toneles de la Placita, mercado Presidenta, 6 Av.16 Calle, educacion Estética 1 av.3 Calle zona 1, Instituto Central Para Varones, 16 av.11 Calle Escuela Rafael Ayau Dispensario Municipal.
20	MB.19		Incorporado a operativos efectuados por el barrio.
21	MB.22		Seijas Suich Carbonera, San Martin, El Rastró, El Pinto, 8 calle 16 av.zona 6,merc Satélite zona 6,18 Calle 15 av. zona 6, merc. Candelaria,Policia de Hacienda, Talleres de P.N.,6to.de la P.N.,Laboratorio No.1 Raymonth, Esc Orosco Posadas.
22	MB.24		En la Terminal.
23	MB.25		Contorno de los campos del Roosevelt, zona 11
24	MB.26		Repaso de toneles en la tarde (12am a 7pm) trebol.estacion Central Estadio Olimico, Av.La Reforma, Obelisco, Calzada San Juan, Boule var Liberacion, La Aurara y La Reforma.
25	MB.27		En la Terminal.
26	MB.28		En la Terminal.
27	MB.29		Parque Central, Plaza Central, Mercado Central, 7mo. Cuerpo de la P.N.,Farmacia Estatal, 2do. Cuerpo de la P.N., Casa del Nino, Parque Concordia, 11AV.19 Calle zona 1, Unidad Ejecutora.
28	MB.34		Palo de Hule, Bomberos el Trebol, esc. José Joaquín Palma, Pan. Europa, 16 Av.9,10,11 y 12 zona 12, 16 Av. 13 calle zona 12 24 Av. 18 Calle, Indéca, Bolpasa, Final del Anillo Perifrico. zona 12.
29	MB.37		Hospitales.
30	MB.40		Toneles por Las Américas, La Reforma, rumbo de la Municipalidad, Matéo Flores, Paeque La Industria, Plaza Berlin.
31	MB.41		Montones clandestinos zona 19.

Table 1-17 Diurnal Collection and Transport Service (Annual Record, 1989)

ITEM	1	2	3	4	5	6	7	8	NOTE
MONTH	Waste Volume Collected (M ³ /Month)	Trip Number Por Month (Times/Month)	No. of Workes (Av. P/Day)	No. of Markets (Av. No./Day)	Av. No. of Vehicles Truck Loader	Efficiency (M ³ /Trip/Truck)	No. of Toneles	Trip Number Par Day (Trip/Truck/D)	
1	9803	708	71	15	* 18	13.85	182	157	
2	10077	722	84	15	21	13.96	269	1.38	Pica-pollo
3	10873.5	755	87	16	22	14.40	921	1.37	Bags 115
4	9231.6	620	72	14	18	14.90	1911	1.38	
5	10253.75	755	76	13	19	13.58	2270	1.59	
6	9844.5	670	82	19	21	14.69	351.7	1.28	
7	9463.25	631	71	15	18	15.00	2507	1.40	
8	11031.5	735	78	17	20	15.01	4157	1.47	
9	11054.5	822	80	17	20	13.45	2418	1.64	
10	12061.7	828	81	14	20	14.57	2181	1.56	
11	11159.6	744	94	12	24	15.00	3103	1.24	
12	10891.5	746	93	11	24	14.60	3024	1.24	
Total	125745.4	8736	969	178	245				
	10478.7	728	80.8	14.8	20.4	14.39		1.43	
NOTE					* Calculated	Calculation:	Total:	No. of Working	
					on 4 Pers/Veh	1/2		days uncertain	
					3/4			Calculated on	
								25 D/month	
								2+5+D	

Table 1-18 Nocturnal Collection and Haul Service (Annual Record, 1989)

ITEM	1	2	3	4	5	6	7	8	NOTE
MONTH	Waste Volume Collected (M ³ /Month)	Trip Number Por Month (Times/Month)	No. of Workes (Av.P/Day)	No. of Markets (Av.No/Day)	Av. No. of Vehicles Truck Loader	Efficiency (M ³ /Trip/Truck)	No. of Toneles	Trip Number Par Day (Trip/Truck/D)	
1	4047	376	15		4	10.76		3.76	
2	3527	323	17		4	10.92		3.23	
3	3720	337	16		4	11.04		3.37	
4	3486.5	321	16		4	10.86		3.21	
5	2963	193	17		4	15.35		1.93	
6	3974	275	21		5	14.45		2.20	
7	3720	248	20		5	15.00		1.98	
8	3964	267	24		6	14.85	76	1.78	12 Bags
9	5277	441	28		7	11.97	143	2.52	205 Bags
10	2862.5	192	30		8	14.91	30	0.96	
11	3145.5	209	31	13	8	15.05		1.05	
12	2974.5	197	31	12	8	15.10		0.99	
Total	43661.0	3379	266		67				Bica pollo
Av.	3638.4	281.6	22.2	12.2		12.93		2.02	Bags?
									217 Pieces/
									month
NOTE					4 persons/	Calculation:1/2	Total=	No. of Working	
					Vehicle (Av).			days Uncertain	
								Calculated on	
								25 D/month	
								2÷5÷D	

Table 1-19 Diurnal Collection and Transport Service (Semiannual Jan. to June, 1990)

ITEM	1	2	3	4	5	6	7	8	NOTE
MONTH	Waste Volume Collected (M ³ /Month)	Trip Number Por Month (Times/Month)	No. of Workes (Av. P./Day)	No. of Markets (Av. No./Day)	Av. No. of Vehicles Truck Loader	Efficiency (M ³ /Trip/Truck)	No. of Tonneles	Trip Number Par Day (Trip/Truck/D)	
1	11872	793	85	11	21	14.97		1.51	
2	11798.25	790	93	14	23	14.93	2724	1.37	
3	13221.5	831	102	15	24	15.91	3336	1.39	
4	12350.25	822	85	13	22	15.02	2954	1.49	
5	11964.75	800	83	12	20	14.96	2631	1.60	
6	12064.5	804	86	14	28	15.01	5450	1.15	12 Markets Washed
7									
8									
9									
10									
11									
12									
Total	73271.25	4840	534	79	138	90.62		8.51	
Av.	12211.88	806.67	89	13.17	23	15.10		1.42	
NOTE						Calculation: 1/2	Total=	No. of Working	
								Days Uncertain	
								Calculated on	
								25 D/month	
								2+5+D	

Table 1-20 Nocturnal Collection and Transport Service (Semiannual Jan. to June, 1990)

ITEM	1	2	3	4	5	6	7	8	NOTE
MONTH	Waste Volume Collected (M ³ /Month)	Trip Number Por Month (Times/Month)	No. of Workes (Av. P/Day)	No. of Markets (Av. No/Day)	Av. No. of Vehicles Truck Loader	Efficiency (M ³ /Trip/Truck)	No. of Toneles	Trip Number Par Day (Trip/Truck/D)	
1	2575	185	27	10	5	14.90		1.48	
2	2415	161	25	10	4	15.0		1.61	
3	2357	155	23	9	4	15.21		1.55	
4	2116	143	22	9	4	14.8	104	1.43	
5	2859	171	23	9	5	16.72	42	1.37	
6	2260	171	23	9	5	13.20	42	1.37	
7									
8									
9									
10									
11									
12									
Total	14582	986	143	56	27	89.83		8.81	
Av.			23.83	9.3	4.5	14.97		1.47	
NOTE						Calculation: 1/2	Total:	No. of Working	
								days uncertain.	
								Calculated on	
								25 D/month	
								2 ÷ 5 ÷ D	

Table 1-21

ITEM	1	2	3	4	5	6	7	8	NOTE
MONTH	Waste Volume Collected (M ³ /Month)	Trip Number Por Month (Times/Month)	No. of Workes (Av. P./Day)	No. of Markets (Av. No./Day)	Av. No. of Vehicles Truck Loader	Efficiency (M ³ /Trip/Truck)	No. of Toneles	Trip Number Par Day (Trip/Truck/D)	
1	15745	1247	12		(3) 2	12.63	2263		
2	9256	1170	12		(3) 2	7.91			
3	18091	1504	13		(3) 2	12.03			
4	12406	1519	13		(3) 2	8.17			
5	14337	1640	11	10	(4) 2	8.74	16.40		
6	8021	1482	10	10	(3) 2	5.41	19.76		
7									
8									
9									
10									
11									
12									
Total	27835	8562	71		- 12				
Av.	12972.5	1427	11.83		3.5 2				
NOTE						Calculation: 1/2	Total: No. of Working		days uncerting.
					Av.				Calculated on
			Av. 13/day		Trucks 3				D/month
					Loader 2				2 ÷ 5 ÷ D

Survey on Number of Trucks in coming in the Trébol by
Sector and by Time Period (7:00-16:00)

Table 1-22-1

Survey No.	Division	Data	Number of Truck by time Period											Tptal			
			7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	Mean Number	M ³ /Car				
	Asociation	30 Jul.	0	2	4	14	13	13	24	25	28						
		Mon.															
		31 Jul.	2	4	3	5	11	15	35	25	24						
		Tue.															
		Average													124	17.0	
1	Cooperative	30 Jul.	0	0	1	2	2	1	6	8	2						
		Mon.															
		31 Jul.	1	1	0	1	4	4	4	4	10						
		Tue.															
		Average													26	16.5	
1	Independent	30 Jul.	0	0	0	0	0	0	0	3	1						
		Mon.															
		31 Jul.	0	0	1	0	0	0	1	1	0						
		Tue.															
		Average													4	14.0	
1	Municipal	30 Jul.	1	5	10	10	6	9	21	3	0						
		Mon.															
		31 Jul.	2	5	4	6	6	26	4	0	0						
		Tue.															
		Average													59	15.36	

Survey on Number of Trucks in coming in the Trébol by Sector and by

Time Period (7:00-16:00)

Table 1-22-2

Survey No.	Division	Data	Number of Truck by time Period										Tptal	
			7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	Mean Number	M ² /Car	
Individuals	30 Jul.	0	2	2	10	11	2	2	5	2	36			
	Mon.													
	31 Jul.	2	9	7	4	4	14	5	9	13	69			
	Tue.													
	Average										52		3.75	
Wagons	30 Jul	0	0	0	0	0	6	12	9	5	32			
	Mon.													
	31 Jul.	1	1	1	2	1	6	10	7	6	35			
	Tue													
	Average										34		3	

Survey on Number of Trucks in coming in the Trébol by
Sector and by Time Period (7:00-16:00)

Table 1-23-1

Survey No.	Division	Data	Number of Truck by time Period											Tptal			
			7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	Mean Number	M ³ /Car				
2	Asociation	9 Aug.	0	3	3	9	19	26	25	24	16	125					
		Thu.															
		10 Aug.	1	1	4	8	17	23	23	24	19	120					
		Fri.															
		11 Aug	2	3	2	8	21	28	22	27	8	121					
		Sat															
		13 Aug	4	1	5	7	19	14	27	31	19	127					
		Mon															
		14 Aug	2	1	5	12	5	19	24	31	17	121					
		Tue															
		Average											123				
		Cooperative															
		9 Aug.	0	0	1	0	3	7	6	6	2	1	20				
		Thu.															
10 Aug.	0	1	0	0	6	1	8	8	4	5	25						
Fri.																	
11 Aug.	0	1	2	2	5	4	11	11	1	1	27						
Sat.																	
13 Aug.	0	0	1	2	4	2	4	4	3	5	21						
Mon.																	
14 Aug.	0	0	0	3	1	3	7	7	6	5	25						
Tue																	
Average											24				11.2		

Survey on Number of Trucks in coming in the Trébol by
Sector and by Time Period (7:00-16:00)

Table 1-23-2

Survey No.	Division	Data	Number of Truck by time Period											Tptal			
			7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	Mean Number	M ³ /Car				
2	Independent	9 Aug.	0	0	0	0	1	2	4	1					9		
		Thu.															
		10 Aug.	1	0	0	0	0	0	2	1					4		
		Fri.															
		11 Aug.	0	0	0	0	1	2	1	0					5		
		Sat.															
		13 Aug	0	1	0	0	0	1	0	1					3		
		Mon.															
		14 Aug.	0	0	0	0	0	0	1	3	0				4		
		Tue.															
		Average												5	11.2		
2	Municipal	9 Aug	0	6	9	4	5	7	27	3	0			61			
		Thu.															
		10 Aug	0	4	6	11	4	17	17	2	0			61			
		Fri.															
		11 Aug.	2	3	6	4	14	4	1	0	0			34			
		Sat.															
		13 Aug.	6	3	11	12	3	9	21	10	0			75			
		Mon.															
		14 Aug.	2	2	8	7	26	11	5	2	0			63			
		Tue															
		Average												59			

Survey on Number of Trucks in coming in the Trébol by
Sector and by Time Period (7:00-16:00)

Table 1-23-3

Survey No.	Division	Data	Number of Truck by time Period												Tptal					
			7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	Mean Number	M ³ /Car							
2	Individuals	9 Aug.	0	4	11	10	4	3	2	8	9	51								
		Thu.																		
		10 Aug.	1	8	13	10	7	12	8	6	10	75								
		Fri.																		
		11 Aug.	3	12	12	12	12	1	14	10	2	78								
		Sat.																		
		13 Aug.	2	3	9	9	7	9	5	12	11	67								
		Mon.																		
		14 Aug.	7	8	5	10	13	2	6	11	10	72								
		Tue.																		
		Average											67							
		2	Wagons	9 Aug.	0	0	2	2	12	8	8	4	4	40						
				Thu.																
				10 Aug.	0	0	1	1	5	10	6	9	4	36						
Fri.																				
11 Aug.	1			0	2	2	10	7	7	9	2	40								
Sat.																				
13 Aug.	0			1	0	4	3	7	16	9	6	44								
Mon.																				
14 Aug.	1			0	2	0	6	5	12	5	5	36								
Tue.																				
Average													39					3.0		

Table 1-24 Number of Trucks in-coming into the Thébol by Sector and by Time period.

Day of Week	Mon	Tue	Wen	Thu	Fri	Sat	Sun	Total	Average
(1) Field Survey executed by The M C D, 30 Jul to 5 Aug., 1990 (7:00 ~ 15:00)									
Data	30 Jul	31 Jul	1 Aug	2 Aug	3 Aug	4 Aug	5 Aug		
Association	138	114	155	151	159	51	45	813	116
Cooperative	42	45	37	32	36	15	10	217	31
Municipal	87	84	51	47	45	26	22	362	52
Independent	14	16	30	35	29	16	5	145	21
Individual	81	77	54	35	31	33	14	325	46
Total	362	336	327	300	300	141	96	1862	266
(2) No.1 Field Survey held by the J S T, 30 and 31 Jul. (7:00 ~ 16:00)									
Data	30 Jul	31 Jul							
Association	155	159						314	157
Cooperative	22	29						51	26
Municipal	65	53						118	59
Independent	4	3						7	4
Individual	36	67						103	52
Total	282	311						593	298
(3) No.2 Field Survey held by The J S T, 9 Aug to 14 Aug except 12 Aug (7:00 ~ 16:00)									
Data	13 Aug	14 Aug	9 Aug	10 Aug	11 Aug				
Association	171	152	165	156	161			805	161
Cooperative	21	25	20	25	27			118	24
Municipal	75	63	61	61	34			294	59
Independent	3	4	9	4	5			25	5
Individual	67	72	51	75	78			343	69
Total	337	316	306	321	305			1585	317

Table 1-25

Work Results of the Municipal "Convoy" and nocturnal Service

Route No.	Date	ROUTE	Veh.No	No.of Persons	Work Schedule						Working Hours	Dist. Km Traveled	Trip number	Waste collected	Note	
					Departure	Collection Beginning	End of Collection	Arrival Trobol	Discharge (minutes)	Arrival						
1	8 Aug	Nocturnal	MB 18		18:00	18:20		22:50	15	23:30	5:30		2			
	16 Aug	"	MB 7		18:00	18:15		23:05	15	23:45	5:35		2			
2	8 Aug	"	MB 25		18:00	18:15		23:15	15	23:45	5:45	17	2			
	16 Aug	"	MB 9		18:00	18:30		23:15	15	23:45	5:45	? 8	2		Dubious	
3	8 Aug	"	MB 10		18:00	18:15		23:00	15	23:40	5:40	18	2			
	16 Aug	"	MB 10		18:00	18:25		23:00	15	23:30	5:30	23	2			
4	8 Aug	"	MB 37		18:00	18:35		23:00	20	23:45	5:45	26.7	1			
	16 Aug	"	MB 18		18:00	18:30		22:50	15	23:30	5:30	-	1			
5	8 Aug	"	MB 22		18:00	18:23		23:10	20	23:50	5:50		2			
	16 Aug	"	MB 22		18:00	18:30		23:00	20	23:40	5:40		2			
	8 Aug	Diurnal (markets) Parroquia, Colon, Cantonal, San Jose Granero, Embajada	MB 32		7:00			9:25 10:05 10:20 11:10 11:40 13:20 14:00								After the service, extraoperation to the Embassy
										18:00	11:00		7			

Work results of the Municipal "Diurnal" Collection.

Table 1-26-1

Route No.	Date	ROUTE	Veh.No	No.of Persons	Work Schedule						Working hours	Dist. Km Traveled	Trip number	Waste collected	Note
					Departure	Collection Beginning	End of Collection	Arrival Trehol	Discharge (minutes)	Arrival					
1	8. Aug	Bell Service in "La Florida", Z 19	-		7:12	7:52		13:12		13:50	6:38	48	1	15m ³	
	9. "	"	MB 10		7:09	7:17				13:50	6:41	22	1		Odometer
	17. "	"	MB 4		7:00	7:10	12:00	12:25	5	12:40	5:40	47	1		Failure
2	8 Aug	Campanas, colonias. Juana de Arco	C 42		7:00	7:23				14:05	7:05	-	1		
	9 "	La Barrera, Atlantida, Sta. Elena El Limón. La Maya, Dispensario Moal. de la Colonias Maya	C 42		7:00	7:10	13:00			13:55	6:55	45	1		different zone
3	17 Aug	Campanas, Colonias, Sta. Rosita Cobias, Las Vacas, Concepción Las Lomas y Sabana Arriba	C 42		7:00	7:14	13:00			13:30	6:30		1		
4	4 Aug	Campana, colonias, Reyna Barrios y Escuela, El Caminero, Cantón 21 y Boca del Monte	MB 7		7:15	7:45			13:35		14:00	6:45	49.7	1	
6	10 Aug	Campana colonias: La Esperanza Vásquez, Justo Rufino Barrios	MB 21		7:10				13:15		13:40	6:30	53.4	1	
7	16 Aug	Campana, colonias: Mezquital, La Esperanza, Exodo, Villalobos, Toneles Aguilar Batres	MB 34		7:10	7:19				10	13:30	6:20	19.7	1	Odometer mal func- tion
8	10 Aug	Campana Colonias: La Verbena y Escue- las, 6 de Octubre, Campos y Aeropue- rto Internacional			7:30	7:46		9:58							
	8 Aug		MB 6		7:20	7:28	13:15	13:30			14:00	6:30	40.2	2	
9	17 "	Campana Colonias; Bethania, El Galli to, Av. Cementerio y Av. Elena	MB 35		7:00	7:15	13:15	13:20			14:00	7:00			16

Table 1-26-2

Work results of the Municipal "Diurnal" Collection.

Route No.	Date	ROUTE	Veh.No	No.of Persons	Work Schedule						Working Hours	Dist. Km Traveled	Trip number	Waste Note
					Departure	Collection Beginning	End of Collection	Arrival Trebol	Discharge (minutes)	Arrival				
10	9 Aug	Campana Colonies: Ciudad peronia y Aeronautica Civil	MB 12		7:40	8:18				13:30	6:30	69.2	1	
11	8 Aug	Campana Colonies : San Antonio, Noruega, Presviteriana, 30 de Junio La Reinita.	MB 22		7:05	7:20	12:45			13:30	6:25	29.0	1	
14	8 Aug	Mercado La Terminal	MB 1		7:15	7:30	11:45	12:00	15	12:35	5:20	17	1	9.9 Deviation
	8 Aug	" "	-		7:14	7:30		10:08	12					
	14 "	" "	MB 24		7:10	7:30		12:16	12	14:02	6:32	14	2	21
	14 Aug	Mercado La Terminal	MB 27		7:00	7:15		9:35		12:33	5:23		2	
	16 Aug	" "	MB 28		7:10	7:30		12:10		12:55	5:55	15	2	
								9:58						
								12:36		13:40	6:20		2	
15	8 Aug	Mercados La Asunción, Sta. Ana, La Palmita, Satelite, Predio La Unión, 35Av.18Calle, Registro Civil, Policía Nacional	-		7:10	7:30	13:05	13:26	6	14:10	7:00	22	1	
20	14 Aug	Mercado: La Palmita, La Presidenta 3a. Calle Linea, 14Av. y 17 Calle. 20 Calle Linea, Educación Estetica.	MB 14		7:00		12:30		10	13:00	6:00		2	26
22	10 Aug	Servicio a Pargues	MB 13		7:00	7:08	12:30		11	14:05	7:05		1	
23	"	Servicio de Toneles del Trebol, Mercado Roosevelt	MB 15		7:00		12:45	13:00	10	14:00	7:00	42	1	14

Table 1-26-3

Work results of the Municipal "Diurnal" Collection.

Route No.	Date	ROUTE	Veh.No	No.of Persons	Work Schedule						Working Hours	Dist.Km Traveled	Trip number	Waste collected	Note
					Departure	Collection Beginning	End of Collection	Arrival Trehel	Discharge (minutes)	Arrival					
24	10 Aug	Apoyo a las actividades de barrido manual.	MB 19		7:08	7:30	13:20	13:00	8	14:15	7:07	—	1		
26	16 Aug	Parques:Central,Centenario,mercado Central,Farmacia Estatal 2 Policia Nacional,Casa del Nino.	MB 29		7:00	7:05	13:15	13:45		14:00	7:00	21	1		
27	16 Aug	Servicio a Hospitales	MB 37		7:00	7:33	13:05	13:17	15	13:50	6:50	29	1	27.3	Dubious
28	16 Aug	Servicios de toneles Av.Las Americas,y Col.Forestal	MB 26		6:55	7:02	12:00	12:05	5	12:20	6:25	35	1		
32	9 Aug	Montones Clandestinos.Z.11	MB 11		6:55	7:32	12:50	13:12	5	13:33	6:38		1		
33	16 Aug	Montones Clandestinos San Rafael La Laguna Z.18	MB 29		7:00	7:05	13:15	13:45		14:00	7:00	21	1		

Table 1-26-4

Work Results of the Municipal "Diurnal" Collection.

Route No.	Date	ROUTE	Veh.No	No.of Persons	Work Schedule						Working Hours	Dist. Km Traveled	Trip number	Waste collected	Note
					Departure	Collection Beginning	End of Collection	Arrival Trebol	Discharge (minutes)	Arrival					
	8 Aug	De Flores, San Jose, Roosevelt, Terminal, Granero	IV 44		7:15	7:45		10:30 10:55 11:35 11:35 12:05 13:45		14:30			5		

Table 1-26-5

Work Results of the Municipal "Diurnal" Collection.

Route No.	Date	ROUTE	Veh.No	No.of Persons	Work Schedule						Working Hours	Dist. Km Traveled	Trip number	waste collected	Note
					Departure	Collection Beginning	End of Collection	Arrival Trebol	Discharge (minutes)	Arrival					
9 Aug		Parroquia, Gallito, Cantobnal, Roosevelt	IV 44		7:00	7:15		8:00 9:00 9:25 9:50 10:45 12:00							
9 Aug		Colon, San Jose, Flores	C 32		7:00						15:25	8			
9 Aug		Terminal, Z 14, Bethania	-		7:15						15:00	5			
9 Aug		Terminal	-		7:15						?	8			
16 Aug		Terminal	L15, C44		7:15						14:20	11			

Sumray of Hearing Survey

Table 1-27-1

ITEMS	Mixco	Villa Nueva	Villa Canales	Sta. Catarina Pinula	Chinaulte	Total
City Area (Km ²)	132	112	160	51	80	
Est. population in 1990	346000	28600	54000	25400	59130	
Study Area Pop. in 1990	329000	95000	(28000)			
Responsible Section	Public service	Public Service	Tesoreria	None	None (Tesoreria)	
Labour Force in SWM			None	None	None	
1) No. of Road Sweepers	7	6	None	None		
2) No. of Markets Sweepers	15	None	None	None	Administrator 1	
4) Truck driver	1	1	None	None	Collector 8	
5) collectors	2	3	None	None	Tariff collector 2	
(Total)	(25)	(10)	(0)	(0)	(11)	
Municipal owed-truck						
1) Number	1	1	1		None	
2) Type	Dumping	Dumping	Pick up		-	
3) Model	1980	1979	1968		-	
4) capacity (m ³ , t)	6m ³		6M ³		-	
Rent'a vehicle Number	Once a week 1	1	Private 1	Once/week 1	Rented 2	
Type	Power shovel	Truck	Truck 4m ³	Pick up		
Tariff (Q/month)		475		25 Q/week		
			Coverage 25% 7000		Coverage 1250 (muni)	
			in inhabitants		2000 (pri), Fam.	

Sumray of Hearing Survey

Table 1-27-2

ITEMS	Mixco	Villa Nueva	Villa Canales	Sta. Catarina Pinula	Chinautle	Total
Collection operation	7days/week	Mon to Sat.			Daily to markets	
					(muni) 3 Times/ Week (pri)	
Waste collected (Truck No.)	24Trucks/Week		8trip/month(G.City)			
			10trip/month(Muni)			
Waste collected, estimated(t)	50Ton/Week		78t/month		207t/month	
Bell Sevice		Mezquital, Peronia 2&1/Week	4days/month			
Dump Site	Trebol	Amatitlan	San Miguel Petapa		Trebol	
Markets	4	4			2	
Clandestine dump site	7	Numerous	Numerous	Numerous	Numerous	
Private collectors, registered	Non data	2 (Guat.V.N)				
Private collector, other				* 1	3	
Budget MCD/Total Budget (%)	2.2	3.6	0.2	0.15	10	

* 2 times/month service with a car 2t capacity

Road sweeping service (Mechanical) : Frequency

Table 1-28

Route No.	Frequency (Day/Week)					Note
1	7					Shift No.1 Nocturnal Service
2	1					Monday No.2
3	1					Tuesday
4	1					Thursday
5	1					Wednesday
6	1					Friday
7	2					Sat. and Sun.
8	5					Mon. to Fri.
9	2					Mon. and Tue. Shift No.3
10	7					Market La Placita
11	2					Thu. and Fri.
12	2					Sat. and Sun. Emergency Service.

Mecanical Sweeping Service (Annual Record, 1989)

Table 1-29

Sweeper No.	B - 1				B - 2				B - 3				B - 4			
	(a) Distance Swept-km	(b) Working days (D/m)	(a/b/ c) (km/d)	(km/H)	(a) Distance Swept-km	(b) Working days (D/m)	(a/b/ c) (km/d)	(km/H)	(a) Distance Swept-km	(b) Working days (D/m)	(a/b/ c) (km/d)	(km/H)	(a) Distance Swept-km	(b) Working days (D/m)	(a/b/ c) (km/d)	(km/H)
1	753.6				-				300.9							
2	729.3				104.2				690.95							
3	291.9				299.5				827.54				151.4			
4					1062.9				35.5				36.2			
5					1389.8				-							
6					1150.9											
7					768.6											
8					302.93				237.8							
9					832.1				1131.7				71.0			
10					523.4				1092.8				24.8			
11					1125.8				988.8							
12					1282.9				787.9							
Total (Average)	1774.8				8843.03				6093.89				283.4			

Total Distance Swept : 16995.12 (km)

Total Working Days : (D/Month)

Mean km/D : (km/D)

Mean km/H : (Km/H)

Mecanical Sweeping Service (Semiannual Jan to June,1990) Mean Person Number,8/D

Table 1-30

Sweeper No.	B - 1				B - 2				B - 3				B - 4			
ITEM	(a)	(b)	(a/b/		(a)	(b)	(a/b/		(a)	(b)	(a/b/		(a)	(b)	(a/b/	
MONTH	Distance	Working	c)	(km/H)	Distance	Working	c)	(km/H)	Distance	Working	c)	(km/H)	Distance	Working	c)	(km/H)
	Swept-km	days (D/m)	(km/d)		Swept-km	days (D/m)	(km/d)		Swept-km	days (D/m)	(km/d)		Swept-km	days (D/m)	(km/d)	
1					1033.5	29	35.64	6.48	1027.8	30	34.26	6.23	69.5	8	8.69	1.80
2					1154.4	28	41.23	7.5	501.30	17	29.49	5.36	131.7	12	10.98	2.00
3					943	29	32.52	5.91	930.7	29	32.09	5.84	132.1	13	10.16	1.85
4					1117.2	28	39.90	7.25	548.225	14	39.16	7.12	82.9	5	16.58	3.01
5					342.3	14	24.45	4.45	602.90	22	27.40	4.98	-	-	-	-
6					741.09	24	30.89	5.61	821.20	22	37.33	6.79	40.81	6	6.80	1.24
7																
8																
9																
10																
11																
12																
Total					5331.4	152	35.08	6.38	4432.125	134	33.08	6.01	457.01	44	10.39	1.89
(Average)					888.57	25.33			738.69	22.33			91.40	8.8		

Total Distance Swept : 10220.535 (km)

5.5H/D

5.5H/D

5.5H/p

Total Working Days : 330 (D/Month)

Mean km/D : 30.97 (km/D)

Mean km/H : 5.63 (Km/H)

Road Sweeping Service (Manual) : Downtown

Table 1-31

Route No.	Frequency (Day/Week)	Sweeper number	Total No of Sweepers	Efficiency (Im/day)	Total	Note
1	7	24	168	3500	588	
2	7	16	112	"	392	
3	7	3	21	"	73.5	
4	7	18	126	"	441	
5	7	18	126	"	441	
Total	35	79	553	3500	1935.5	

Road Sweeping Service (Manual) : Other districts.

Table 1-32

Route No.	Sweeper number (Aver.)	Mon to Fri	4 days/Week	3 days/Week	2 days/Week	One/Week	Note
1	4	0					"Terminal"Market,Z.4
2	5				0		Zonas 4.5.9.10.12.13
3	4				0		Zonas 4.9
4	4					0	Zona 9
5	11	0					Zonas 4.9
6	10	0					Zona 1
7	11	0					Zona 19
8	3	0					Sta.Ana,Satélite.Z.5
9	1	0					Zona 5
10	33					0	Z.5.8
11	33				0		Z.7
12	3	0					Market Parroquia
13	2						Z.2
14	2				0		Z.2, Parque Morazan, Av Simeon Canas.

Expected productivity 2874 linear meters/cap o day

Table 1-33 Road Sweeping Service (Manual) : Trébol district.

Route No.	Sweeper number	Mon to Fri	4 days/Week	3 days/Week	2 days/Week	One/Week	Note
(operation Posts.)							
1	6				Mon, Thu		"Terminal" Market, Z.4
2	6						Zonas 12,7.
3	1			Tue, Wed, Fri			Zonas 11
4	1	0					Zona 8,9,13
(Fixed Post)							
5	5	0					Zonas 4,9
6	2	0					Zona 1,3,8.
7	1	0					Zona 7,9,11.
8	1	0					Zonas 3,8,11,12.
							Zona 11

Expected productivity 2874 linear meters/cap o day

Table Sweeping Service (manual) = Terminal market and its surrounding roads.
Monday to Friday, with 28 sweepers productivity 2874 linear meters/cap a day.

Table 1-34 List of parks and Labourer Assignment and Frequency

Zone No.	No. of Parks	No. of Plazas	Sweeping Service	Pica-pollo service
1	9	6		
2	6	-		
-	-	-		Morazan Park by 2 persons Monday to Friday.
3	-	-		
4	1	-		
5	6	-		
6	7	2		
7	10	2	Sweeping service by the park section of Guatemala City.	
8	1	1		
9	2	2		
10	7	1		
11	11	-		
12	2	-		
13	3	-		
14	4	1		
15	4	-		
16	4	-		
17	2	-		
18	2	-		
19	2	-		

Table 1-35

Sweeping Service (Annual Record, 1989)

ITEM	Nocturnal Service						Diurnal Service					
	Personnel			Efficiency	Road Swept	Efficiency	Personnel			Road Swept	Efficiency	Efficiency
	1	2	Total	(m/cap/day)	(Km/Month)	(m/cap/H)	1	2	Total	(Km/Month)	(m/cap/day)	(m/cap/H)
MONTH	Foreman	Workers	Total	(m/cap/day)	(Km/Month)	(m/cap/H)	Foreman	Workers	Total	(Km/Month)	(m/cap/day)	(m/cap/H)
1	4	35	39	3147.2	2753.2	491.8	12	131	143	6993.6	2135.5	333.7
2	4	33	37	2815.0	2322.4	439.8	11	131	142	7365.154	2248.9	351.4
3	6	34	40	2996.5	2547.0	468.2	12	135	147	8174.79	2422.1	378.5
4	5	29	34	1716.1	1741.8	375.4	11	122	133	7092.24	2325.3	363.3
5				This service suspended.			11	151	162	7386.53	1956.7	349.4
6							11	149	160	9590.7	2574.7	402.3
7							11	133	144	7579.7	2279.6	356.2
8							10	143	153	9445.4	2642.1	412.8
9							11	144	155	7280.12	2022.3	316.0
10							11	144	155	7763.9	2156.6	337.0
11							12	152	164	9829.2	2586.6	404.2
12							12	157	169	8220.5	2094.3	327.2
Total	19	131	150	9364.4			135	1692	1827	96721.834		
Average	4.75	32.75	37.50	446.8	2341.1		11.25	141	152.25	8060.2	2286.6	357.3
Note	Person in Chay-			3/2 - 25days			Person in change				3/2-25 days	H=2x4H/Week
	ge(1) Not included			Weekx4Weeks			Av.3.83 (46Total)					x4Weeks
				* = 3/4			Not included					* = 3/4

The Terminal Market : Sweeping Service (Annual Record, 1989)

Table 1-36

ITEM MONTH	The Terminal Market						3 Zonas Sweeping Service					
	Personnel			Road Swept	Efficiency	Efficiency	Personnel			Road Swept	Efficiency	Efficiency
	1 Foreman	2 Workers	Total	(Km/Month)	3 (m/cap/day)	(m/cap/H)	1 Foreman	2 Workers	Total	(Km/Month)	(m/cap/day)	(m/cap/H)
1	3	32	35	1114	1392.5	217.6				3		
2	3	37	40	1220.3	1319.2	206.1						
3	3	36	39	1327	1474.4	230.4						
4	3	37	40	1129.2	1220.8	190.7						
5	5	53	58	1207.4	911.2	142.4						
6	5	48	53	1256.6	1047.2	163.6						
7	5	40	45	694.556	694.6	108.5						
8	4	42	46	880.9	839.0	131.1						
9	2	20	22	296.4	592.8	92.6						
10	2	24	26	588.8	981.3	153.3						
11	2	24	26	611.8	1019.7	159.3						
12	2	21	23	455.2	867.0	135.5						
Total	39	414	453	10782.156								
Average	3.25	34.5	37.75	898.5	1041.8	162.8						
Note	Person in Chay-- ge 1 ex cluded				3/2 - 25days	H=2x40H/W weekx4Weeks					3/2-25 days	H=2x40H/W week x4Weeks
						* = 3/4						

Table 1-37

The Terminal Market ; Cart Collection Service (Annual Record , 1989)

ITEM MONTH	1 Waste Volume Collected (M ³ /Month)	2 Trip Number per month (Times/Month)	3 No.of Workes (Av.P/Day)	4 No.of Markets (Av.No./Day)	5 Av.No.of Vehicles Truck Loader	6 Efficiency (m ³ /Trip/Truck)	7 No.de Toneles	8 Trip Number per day (Trip/Truck/D)	Note
1	455.18	85	7						
2	433.76	81	7						
3	353.43	66	6						
4	198.13	37	5						
5	133.88	25	5						
6	283.83	53	7						
7									
8									
9									
10									
11									
12									
Total	1858.2	347	37						
Average	309.7	57.8	6.2						
Note						Calculation:1/2	Total=	No.of Working days uncertain calculated on D/month 2-5-D	

Table 1-38

Sweeping Service (Semiannual Jan to June, 1990)

ITEM	The Terminal Market						3 Zonas Sweeping Service					
	Personnel			Road Swept	Efficiency	Efficiency	Personnel			Road Swept	Efficiency	Efficiency
	1 Foreman	2 Workers	Total	(Km/Month)	(m/cap/day)	(m/cap/H)	1 Foreman	2 Workers	Total	(Km/Month)	(m/cap/day)	(m/cap/H)
MONTH					3					3		
1	1	21	23	419.3	798.7	124.8	11	151	162	8154.9	2160.2	337.5
2	1	20	21	495.1	990.2	154.7	12	161	173	10157.9	2523.7	394.3
3	1	20	21	535.9	1071.6	167.4	11	190	201	10828.5	2279.7	356.2
4	1	21	22	415.1	790.7	123.5	12	193	205	8308.3	1721.9	269.1
5	1	15	16	514.7	1372.5	214.5	14	175	189	10827.6	2474.9	386.7
6	1	21	22	522.2	994.7	155.4	14	231	245	10510.7	1820.0	284.4
7												
8												
9												
10												
11												
12												
Total	6	118	125	2902.2			74	1101	1175	58787.9		
Average	1	19.67	20.83	483.7	936.0	153.7	12.3	183.5	195.8	9798.0	2135.8	333.7
Note					3/2 - 25days	H=2x40H/W	Persos				3/2-25 days	H=2x40H/We
					eeekx4Weeksin change	*=3/4	4 exclu-					ek
							ded					x4Weeks
												* = 3/4

Distribution of "Pica-Pollo" Routes Regular service Routes
(From Monday to Friday)

Table 1-39

No.	Designation and its limits
*1	Av.Las Américas,from obelisco to 20 Calle, Zona 13 & 14.
*2	Av.Reforma, from Puente Olimpico to Obelisco zonas 4,5,8,9,10.
3	Boulevard Liberation and 12 Calle, from obelisco to 12 Calle, and from 12 Calle of Boulevard Liberation to Av. Reforma, zonas 9 and 13.
*4	7 Av.from 24 Calle, zona 4 to Boulevard Liberation zona 9.
*5	6 Av.from 24 Calle to Boulevard Liberation zonas 4 & 9.
6	Hipodromo del Norte from 3 Calle to 11 Calle zona 2 and from 6 Av.to the Fito Mijangos Bridge above the Circular Road, zona 2.
7	Downtown District : from 21 to 24 Calle, 6 & 7 Av, zona 1.
8	Avenida Cementerio : from 13 to 26 Calle as for as Santa Marta College, zona 13.
9	Avenida Cestellana : from 5 to 10 Calle and 8 Calle from 0 to 5 Av., zonas 8 & 9.
10	7 Av.from Boulevard Liperation to 15 Callo and from 15 Calle to the Arcos or Juan Pablo II , zonal.
11	Diagonal 12,from Av. Castellana to the Aguilar Batres road, zonas 8,12 and 13.
12	Trebolito : from the Diagonal 12 to 13 Calle and from 11 Av. to 1 Av., zonas 3 & 7.
13	Cine Real : from Roosevelt Road to 33 Calle and from 7 Av., zonas 3 & 7.
14	6 Av. from Roosevelt Road to 8 Calle, zona 11.
15	Roosevelt Road, from 6 to 39 Av.,zona11 & 7.
16	San Juan Road, From 6 to 40 Av.,zona 7.

* Regular Service Routes to be swept on Sat, and Sun.
are No.1,2,4 and 5.

Distribution of "Pica-Pollo" Routes Intermittent service Routes
(Once a week)

Table 1-40

No.	Designation and its Limits
1	Mon. Anillo Periferico, from Av. Elena 8 & 9 Calle to the USAC (University) Vista Hermosa, from 6 Av. 2 Calle zona 10. to 25 Av. zona 15.
2	Tue. Av. Petapa, from 3 Calle to 52 calle zona 12, Aguilar Batres from 3 to 40 calle, zona 12. Campo Marte zona 5.
3	Wed. Calle Marti, Calzada José Milla and Vidaure, from the Belice Bridge to 6 Av. zonas 6 & 2. Calle Real de La Villa, from 2 and 6 Av. zona 10. Diagonal 8, from 5 Calle, zona 6 to 3 Calle zona 1. Diagonal 14 from 27 Calle to the Asuncion Bridge zona 5.
4	Wed. 15 Av. from boulevard Liberation to 20 calle zona 13.
5	Wed. 14 Av. or Av. Hincapie, from Boulevard Liberation to 20 Calle zona 13.
6	Once a Week. Boulevard los Proceres or 18 Calle, 19 and 20 Calle, from Obelisco to 20 Av. zonas 10 & 14.
7	Thu. Calle Road de la Villa, from 2 Calle, 6 Av. to 18 Av. zonas 10 & 5. 6 Calle zona 13, Campo Marte zona 5.
8	Fri. Vista Hermosa, Anillo Periferico, from Av. Elena, 8 Calle a 9 Calle to the Entrance of col. Bethania, zonas 3 & 7.
9	Thrice (Mon; Wed. and Fri.) a work Campo Marte : from calle Mariscal Cruz and from Av. Reforma to 12 Av. 32 Calle, from 12 Av. to 29 Av. Football Field.

Pica-Pollo Service (Annual Record, 1989)

Table 1-41

ITEM MONTH	Personnel			No. of bags Collected 4 (Bags/month)	Waste coll- ected Vol. 5 (Kg/month)	Efficiency		
	Personal in		Total			6 (Bags/cap/day)	7 (Kg/cap/day)	
	1 Foreman	2 Workers						
1	2	40	44	14019	15771.4	14.0	15.8	
2	2	42	46	15705	17218.1	14.6	16.4	
3	2	44	48	17395	19569.4	15.8	17.8	
4	2	35	39	20984	23609	24.0	27.8	
5	2	42	47	17011	19139.4	16.2	18.2	
6	2	42	47	15582	17529.8	14.8	16.7	
7	2	39	44	16471	18529.9	16.9	19.0	
8	2	41	46	16339	18381.4	15.9	17.9	
9	2	43	47	14459	16266.4	13.5	15.2	
10	2	48	52	18750	21093.8	15.6	17.6	
11	2	51	56	24845	27950.6	19.5	21.9	
12	2	52	56	22103	24845.9	17.0	19.1	
Total	24	519	572	213663	239905.1			
Average	2	43.25	47.67	17805.2	19992.1	17.8	18.9	
Note					Each bag contain. 2.5 Ibs/bag 1 Ib=0.45Kg 1.125Kg×4=5	6=4/2 25days	7=5/2 25days	

Table 1-42 Pica-Pollo Service (Semiannual Jan. to Jun, 1990)

ITEM MONTH	Personnel			No. of bags Collected 4 (Bags/month)	Waste coll- ected Vol. 5 (Kg/month)	Efficiency	
	Personal in Chayge	1	2			6 (Bags/cap/day)	7 (Kg/cap/day)
		Foreman	Workers				
1	2	2	53	22243	25023.4	16.8	18.9
2	2	3	53	22111	24874.9	16.7	18.8
3	2	2	51	25108	28246.5	17.3	22.2
4	2	2	45	17087	19222.9	15.2	17.1
5	2	2	45	24782	27879.8	22.0	24.8
6	2	2	50	21264	23922.0	17.0	19.1
7							
8							
9							
10							
11							
12							
Total	12	13	297	132594	149169.5		
Average	2	2.2	49.5	22099	24861.6	17.9	20.1
Note					Each bag contain Average 2.5 Ibs/bag 1 Ib=0.45Kg 1.125Kg x 4=5	6=4/2 25days	7=5/2 25days

Table 1-43

Waste Baskets or Waste Casks.

Total number ; 98

Location :

- a. From the footbridge of La Calzada San Juan, zona 7, to Pamplona, Zona 13 ; casks.
- b. In the sector of La Aurara, zona 13 ; 14 casks.
- c. Boulevard Liberation Obelisco, 12 casks.
- d. Av. Las Americas, zona 13, are for as Plaza Berlin, zona 13, 20 casks.
- e. Av. Reforma, Zonas 9 and 10 ; 12 casks.
- f. 10 Av. Puente Olimpico, Zona 5 ; 12 casks.
- g. Parque de la Industria, zona 9 ; 4 casks.
- h. 7 Av, .Zona 4 ; 1 casks.
- i. 18 Calle, Central Estation of FEGUA, Zona 1 ; 3 casks.

* Volume = $0.1m^3/cask.$

Peddlers ; aproximate number, 10000.

II. Amount and Composition of Domestic Solid Waste

2-1 Generation Unit of Domestic Solid Wastes: Summary

2-2 Solid Waste Composition

2-1. Generation Unit of
Domestic Solid Wastes
(DSW)

- Table 2-1-1 Generation Unit of DSW : Summary
- Table 2-1-2 Generation Unit of DSW in Tecum Uman
- Table 2-1-3 Generation Unit of DSW in Aeropuerto
- Table 2-1-4 Generation Unit of DSW in Las Victorias
- Table 2-1-5 Generation Unit of DSW in Mirador II
- Table 2-1-6 Generation Unit of DSW in La Parroquia
- Table 2-1-7 Generation Unit of DSW in Roosevelt
- Table 2-1-8 Generation Unit of DSW in Lourdes
- Table 2-1-9 Generation Unit of DSW in Trinidad

Table 2-1-1 Generation Unit of DSW (Summary)

Unit:kg/cap·day

Item	Class	Upper	Middle	Lower	Slum
		1 2	1 2	1 2	1 2
1990	Sample No.	60	49	47	51
		48	44	44	62
	Average	0.674	0.468	0.650	0.257
		0.852	0.726	0.539	0.394
1991	Sample No.	78	52	52	78
		61	48	52	66
	Average	0.730	0.465	0.516	0.239
		0.812	0.599	0.490	0.293
Total Sample No.		247	193	195	257
Sum Average		0.767	0.564	0.549	0.296

Table 2-1-2 Generation Unit of DSW in Tecum Uman

H1 Tecum Uman		Zone.15			Unit:kg/cap·day		
House No.	1990			1991			
	20.Aug.	22.Aug.	24.Aug.	18.Feb.	20.Feb.	22.Feb.	
2-45	0.80			0.27		0.59	
2-39	0.62			0.82	1.11	0.46	
2-50	0.66	0.44	0.84	1.08	1.26	0.58	
2-59	0.32	0.50		0.65	0.58	0.43	
2-65			3.38	0.83		1.86	
2-76	0.65		0.91	0.53	0.59	0.93	
2-79	0.12	0.22		0.20	0.39	0.23	
2-80	0.43	0.30	0.35	0.72	0.30	0.52	
2-86	0.28	0.24	0.09	0.15	0.98	0.26	
2-90	0.55	0.71	0.95	0.70	1.49	1.69	
11-14		0.70	0.29	0.75	0.43	0.61	
11-45		1.14		0.40	0.25	0.30	
11-65			0.56		1.23	0.44	
11-97	0.75	1.44	0.20		0.35	0.60	
12-00	0.39	0.29	0.35	0.63	0.25	0.59	
12-13	0.10	0.07	0.11	0.23	0.18	0.20	
12-24	0.36	0.27	0.30		0.36	0.47	
12-37	0.43	0.53	0.43		0.63	0.47	
12-48	0.56	1.17	1.19	1.01	0.86	1.03	
12-55				0.41	0.80	0.37	
12-60	0.61		1.00	0.72	0.82	0.35	
12-69				0.24	0.77		
12-73	1.82	2.97	2.50	4.17	2.80	2.50	
12-84				1.92	1.57	1.53	
12-85	0.51	0.14			0.95	0.21	
12-97	0.23	0.11	0.14	0.34	0.05	0.14	
12-98	1.21	0.20	0.27	0.41	0.45	0.12	
13-10	1.47			1.13		0.83	
13-18	1.04	0.50	0.61	0.30	0.21	0.10	
N	22.00	19.00	19.00	24.00	26.00	28.00	
N Total		60.00			78.00		
Total(V)	13.93	11.96	14.47	18.61	19.66	18.41	
Total(H)		40.36			56.68		
Average(v)	0.632	0.629	0.762	0.775	0.756	0.660	
Average(H)		0.674			0.730		

Table 2-1-3 Generation Unit of DSW in Aeropuerto

H2 Aeropuerto		Zone.13			Unit:kg/cap·day		
House No.	1990			1991			
	3.Sep.	5.Sep.	7.Sep.	20.Feb.	22.Feb.	25.Feb.	
5-00	0.78	0.82	1.18		0.90		
5-08	0.58	0.65	1.41	0.66	0.70	0.60	
5-15	0.37		0.80	0.10	0.74	0.15	
5-30				1.01		0.77	
5-46	1.39	0.98	1.00	0.58	1.10	0.47	
5-64	1.34	2.17	2.00	1.28	0.78	1.12	
5-70	0.11	0.18	0.17	0.32	0.62	0.28	
6-04	0.30	0.93	1.03	0.36	0.94	0.27	
6-48		1.42		0.83	0.58	0.77	
6-60	0.13	0.33		0.27	0.10	0.27	
12-29		0.85	0.30	0.73		0.51	
14-32		0.66	0.77	0.85	1.15	0.65	
14-41	0.93	3.75		2.12	1.33	0.70	
14-43	0.62	0.11	2.37	3.90	2.09	0.55	
14-45	0.81	0.28		0.94		0.85	
15-21		0.45		0.87	0.63	0.70	
15-29	0.61			0.44	0.27	0.64	
16-15	0.46	0.31	0.39	0.68	0.45	0.43	
16-18	1.07	1.15	1.67	2.90	2.25	0.87	
16-38	0.28	0.23	0.26	0.50	0.44	0.43	
17-39			0.61	0.61	0.29	0.75	
17-43	0.17	0.49		1.16	0.77	0.43	
N	16.00	18.00	14.00	21.00	19.00	21.00	
N Total	48.00			61.00			
Total(V)	10.95	15.76	13.96	21.11	16.13	12.21	
Total(H)	40.67			49.45			
Average(v)	0.684	0.876	0.997	1.005	0.850	0.581	
Average(H)	0.852			0.812			

Table 2-1-5 Generation Unit of DSW in Mirador II

M2 Mirador II Zone.11 Unit:kg/cap·day

House No.	1990			1991		
	14.Aug.	16.Aug.	19.Aug.	12.Feb.	14.Feb.	16.Feb.
11-13	2.02	0.19	0.34	0.54	0.35	0.57
11-21	0.39	0.31	1.70	0.36		0.49
11-29	0.94	2.31	0.28	0.48	0.41	
11-43	1.18	0.28	0.72			0.90
11-51	0.29	0.12		0.42	0.68	
11-88	0.18	0.23	0.36	1.03	0.38	
11-59	1.29	0.55	0.59	0.76	0.45	0.54
11-76	0.67	0.78	0.72	0.54	1.28	
11-86	2.29	1.47	0.70	1.29	0.77	0.72
11-91			0.67	0.22		0.28
12-03	1.08	0.82	0.82	1.31	1.05	1.16
12-08	0.12	0.21	0.08	0.27		0.58
12-19	0.84		0.84	0.53		0.05
12-35	0.18	0.23	0.56	0.28	0.49	0.42
12-59			0.86	0.84	1.17	0.45
12-70	0.48		1.38	0.91	0.76	0.40
12-74			0.92	0.56	0.50	
12-91	0.38	0.79		0.43	0.58	0.73
12-64				0.29		0.66
11-05				0.30	0.39	0.10
N	15.00	13.00	16.00	19.00	14.00	15.00
N Total		44.00			48.00	
Total(V)	12.28	8.29	11.59	11.36	9.26	8.05
Total(H)		32.16			28.67	
Average(v)	0.819	0.638	0.721	0.600	0.661	0.537
Average(H)		0.726			0.599	

Table 2-1-6 Generation Unit of DSW in La Parroquia

L1 La Parroquia Zone.6 Unit:kg/cap·day

House No.	1990			1991		
	13.Aug.	15.Aug.	17.Aug.	4.Feb.	6.Feb.	8.Feb.
2-19	0.18	0.24	0.34	0.26	0.25	0.16
2-35	0.44	0.48	0.83	0.46	0.30	0.43
2-63	2.40	1.25	0.15	0.24	0.29	2.20
2-45	0.38	0.10	0.45	0.26	0.54	0.50
2-54	0.38	0.51	0.60	0.60		1.44
18-46	0.45	0.27	0.48	0.58	0.76	0.77
18-64	0.42			0.05	0.29	0.40
18-68	0.46	0.93	0.94	0.15	0.35	0.24
18-72	0.41		0.18	0.27	0.09	0.27
18-77	0.29		0.39	0.09	0.24	0.10
18-85	2.05	0.93	1.10	0.51	0.76	0.63
19-61	0.22			0.32	0.39	0.32
19-96	1.09	1.22	0.70	0.99	0.88	0.79
19-97	0.91	0.75	0.44	0.74	0.28	1.23
19-98	0.76	0.61	0.87	0.54		0.31
20-09	0.28	0.20	0.29	0.31	0.32	0.15
20-16	1.25	0.94		1.24	0.88	0.10
20-30	0.96	0.38	0.93	0.81	0.75	1.08
N	18.00	14.00	15.00	18.00	16.00	18.00
N Total		47.00			52.00	
Total(V)	13.31	8.83	8.69	8.42	7.37	11.20
Total(H)		30.83			26.99	
Average(v)	0.739	0.631	0.579	0.470	0.460	0.618
Average(H)		0.650			0.516	

Table 2-1-8 Generation Unit of DSW in Lourdes

S1 Lourdes Zone.5		Unit:kg/cap·day				
House No.	1990			1991		
	27.Aug.	29.Aug.	31.Aug.	30.Jan.	1.Feb.	5.Feb.
2-19	0.00	0.09		0.02	0.04	0.11
2-21	0.27	0.18	0.03	0.08	0.68	
2-33				0.05		0.03
2-37	0.16			0.03	0.05	0.04
2-38	0.19	0.17	0.14	0.07	0.18	0.22
2-39	0.12	0.25		0.07	0.10	0.10
2-45	0.36	0.27		0.18	0.10	
2-60	0.24	0.71	0.48	0.56	0.53	0.19
2-67	0.09	0.62	0.12		0.11	0.46
2-75	0.91	0.19	0.04		0.13	0.25
2-78	0.15	0.35	0.28	0.07	0.12	0.11
2-80						0.67
2-82		0.16		0.27	0.28	0.65
3-15	0.37	0.73	0.57	0.25	0.29	0.19
3-18				0.25	0.08	0.05
3-22	0.47	0.29	0.30	0.45	0.17	0.31
3-24	0.18	0.20	0.17	0.37	0.07	0.17
3-27	0.10	0.36	0.37	1.00	0.27	0.37
3-31				0.15	0.07	0.05
3-37		0.45	0.22	0.38	0.18	0.37
3-41	0.04	0.04	0.13	0.08	0.07	0.09
3-48				0.25		0.19
3-51	0.09	0.28		0.21		0.05
3-55	0.28	0.13	0.22	0.21	0.18	0.06
3-64	0.13			0.43		0.23
3-69				0.42		0.04
3-70				0.34	0.24	0.16
3-71	0.04			0.19	0.44	0.34
3-94		0.42		0.67	0.60	
3-97				0.16	0.36	0.37
N	19.00	19.00	13.00	27.00	24.00	27.00
N Total		51.00			78.00	
Total(V)	4.21	5.11	3.09	7.21	5.54	5.89
Total(H)		12.41			18.64	
Average(v)	0.222	0.311	0.238	0.267	0.230	0.220
Average(H)		0.257			0.239	

Table 2-1-9 Generation Unit of DSW in Trinidad

S2 Trinidad Zone.1		Unit:kg/cap·day				
House No.	1990			1991		
	30.Aug.	1.Sep.	4.Sep.	30.Jan.	1.Feb.	5.Feb.
6-77	0.65	0.80		0.47	0.29	0.59
6-81				0.16		0.24
7-04	0.38	1.28	1.24			0.20
7-11				0.25	0.09	0.09
7-12	0.08	0.27		0.23	0.37	
7-17	0.47	0.17	0.31	0.09	0.30	
7-18	0.40	0.22		0.08	0.08	0.08
7-21	0.15	0.40	0.60		0.77	1.13
7-22	0.10	0.34	0.06		0.08	
7-23			0.04	0.17		0.02
7-24	0.80	0.69	0.23	0.11	1.09	0.11
7-27	0.55		0.54		0.21	0.21
7-31		0.83	0.03	0.25	0.53	0.83
7-32	0.07	1.09	0.32			
7-33	1.06		0.24		0.16	0.04
7-34	0.23	0.33	0.40		0.08	0.05
7-35	0.10	0.14	0.15	0.17	0.22	0.09
7-37		0.23				0.10
7-38	0.33	0.11		0.36		0.16
7-45	0.23	0.36	0.11	0.25	0.09	0.05
7-61	0.30		0.19	0.16	0.57	0.02
7-62	1.65	0.87		1.14	1.17	
7-65	0.53	0.31	0.14	1.04	0.45	0.41
7-70	0.64	0.61	0.44	0.20	0.06	
7-83A	0.05	0.39	0.03	0.37	0.51	0.43
7-99				0.04	0.18	0.04
8-13	0.33	0.25	0.17	0.17	0.25	0.32
8-15				0.10	0.22	0.21
7-36	0.39	0.20	0.09		0.15	0.19
N	22.00	21.00	19.00	20.00	23.00	23.00
N Total		62.00			66.00	
Total(V)	9.49	9.89	5.33	5.81	7.92	5.61
Total(H)		24.71			19.34	
Average(v)	0.431	0.471	0.281	0.291	0.344	0.244
Average(H)		0.394			0.293	