

Time & Motion Study

Organization: DRDS

Trip- 1 Date: 18th Nov. 1997

Vehicle No. KUZ 647

Loading Capacity: 2.55t

Researcher's name: Mercy S. Nyauira

No. of Crew: 3

Estimated Volume: 5.625.m³

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Dumping site in		9,500	16 : 50	120		Dandora
Start dumping			16 : 53	3		
Finish dumping			17 : 13		20	
Dumping site out			17 : 25	12		
Reach to workshop in			18 : 15	50		
Total		59,450		420	155	Total min.: 575 min.
Collection		48,950		180	135	
Transportation		10,500		105		
Inside the dumping site		0		15	20	Dumping time.: 35 min.
Idling time				120		

Time & Motion Study

Organization: DRDS

Trip- 1 Date: 20th Nov. 1997

Vehicle No. KUZ 647

Loading Capacity: 2.55t

Researcher's name: Mercy S. Nyaura

No. of Crew: 3

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 40			
Loading-1	in		3,000	8 : 56	16		Kilimani
	out		0	9 : 4		8	
Loading-2	in		8,000	9 : 15	11		Kabasirian
	out		0	9 : 20		5	
Loading-3	in		1,500	9 : 25	5		Waiyaki
	out		0	9 : 28		3	
Loading-4	in		5,000	9 : 34	6		Loresho
	out		0	9 : 36		2	
Loading-5	in		700	9 : 37	1		Loresho
	out		0	9 : 38		1	
Loading-6	in		200	9 : 39	1		Loresho
	out		0	9 : 39		0	
Loading-7	in		300	9 : 49	10		Loresho
	out		0	9 : 50		1	
Loading-8	in		1,000	10 : 0	10		Loresho
	out		0	10 : 0		0	
Loading-9	in		900	10 : 5	5		Loresho
	out		0	10 : 7		2	
Loading-10	in		2,000	10 : 25	18		Loresho
	out		0	10 : 25		0	
Loading-11	in		2,000	10 : 35	10		Hill View
	out		0	10 : 37		2	
Loading-12	in		400	10 : 38	1		Hill View
	out		0	10 : 51		13	
Loading-13	in		200	10 : 53	2		Hill View
	out		0	10 : 54		1	
Loading-14	in		1,000	11 : 0	6		Lake View
	out		0	11 : 3		3	
Loading-15	in		200	11 : 4	1		Lake View
	out		0	11 : 4		0	
Loading-16	in		2,000	11 : 11	7		Lower Kabete
	out		0	11 : 12		1	
Loading-17	in		900	11 : 15	3		Lower Kabete
	out		0	11 : 15		0	
Loading-18	in		100	11 : 16	1		Lower Kabete
	out		0	11 : 16		0	
Loading-19	in		300	11 : 18	2		Lower Kabete
	out		0	11 : 20		2	
Loading-20	in		500	11 : 24	4		Lower Kabete
	out		0	11 : 24		0	
Loading-21	in		1,200	11 : 27	3		Kitisuru
	out		0	11 : 28		1	

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Loading Capacity: 2.55t

Researcher's name: Mercy S. Nyaura

No. of Crew: 3

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-22	in		100	11 : 28	0		Kitisuru
	out		0	11 : 29		1	
Loading-23	in		2,000	11 : 57	28		Spring Valley
	out		0	11 : 59		2	
Loading-24	in		800	12 : 1	2		Spring Valley
	out		0	12 : 1		0	
Loading-25	in		1,000	12 : 8	7		Spring Valley
	out		0	12 : 9		1	
Loading-26	in		100	12 : 10	1		Spring Valley
	out		0	12 : 10		0	
Loading-27	in		150	12 : 11	1		Spring Valley
	out		0	12 : 11		0	
Loading-28	in		200	12 : 13	2		Spring Valley
	out		0	12 : 14		1	
Loading-29	in		500	12 : 23	9		Genral Mathenge Drive
	out		0	12 : 24		1	
Loading-30	in		1,000	12 : 30	6		Kyuna
	out		0	12 : 30		0	
Loading-31	in		900	12 : 37	7		Kyuna
	out		0	12 : 37		0	
Loading-32	in		1,200	12 : 40	3		Kyuna
	out		0	12 : 40		0	
Loading-33	in		900	12 : 43	3		Kyuna
	out		0	12 : 43		0	
Loading-34	in		200	12 : 44	1		Kyuna
	out		0	12 : 44		0	
Loading-35	in		500	12 : 45	1		Kyuna
	out		0	12 : 47		2	
Loading-36	in		150	12 : 48	1		Kyuna
	out		0	12 : 48		0	
Loading-37	in		100	12 : 49	1		Kyuna
	out		0	12 : 49		0	
Loading-38	in		350	12 : 51	2		Kyuna
	out		0	12 : 53		2	
Loading-39	in		400	13 : 10	17		Kyuna
	out		0	13 : 10		0	
Loading-40	in		700	13 : 12	2		Grevellia Grove
	out		0	13 : 19		7	
Loading-41	in		100	13 : 20	1		Grevellia Grove
	out		0	13 : 21		1	
Loading-42	in		1,000	13 : 23	2		Brookside Gardens
	out		0	13 : 23		0	
Loading-43	in		800	13 : 25	2		Brookside Close
	out		0	13 : 26		1	

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Trip- 1 Date: 20th Nov. 1997

Vehicle No. KUZ.647

Loading Capacity: 2.55t

Researcher's name: Mercy S. Nyauira

No. of Crew: 3

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-44	in		1,000	13 : 27	1		Brookside Close
	out		0	13 : 27		0	
Loading-45	in		100	13 : 29	2		Brookside Close
	out		0	13 : 30		1	
Loading-46	in		300	13 : 33	3		Brookside Park
	out		0	13 : 34		1	
							14:00-14:30 Lunch Break
							Kurura Rd.-Parklands Rd.-
Dumping site	in		10,000	15 : 0	86		Forest Rd.-Ring Rd. Ngara-
Start dumping				15 : 8	8		Juja Rd.-Komorok Rd.
Finish dumping				15 : 45		37	
Dumping site	out			15 : 49	4		
Reach to workshop	in			16 : 25	36		
Total			55,950		362	103	Total min.: 465 min.
Collection			42,950		212	66	
Transportation			13,000		108		
Inside the dumping site			0		12	37	Dumping time.: 49 min.
Idling time					30		

Time & Motion Study

Organization: DRDS

Trip- 1 Date: 12th Nov. 1997

Vehicle No. KXX 829

Loading Capacity: 2.55t

Researcher's name: Diana Gachuhi

No. of Crew: 4

Estimated Volume: 5.625m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	4177688		8 : 51			Lenana Rd.
Loading-1	in		9,000	9 : 3	12		Chaka Rd.(Nana Apartments)
	out		0	9 : 28		25	
Loading-2	in		17,000	9 : 51	23		Kariobangi North on
	out			10 : 0		9	Outering Rd.
Dumping site	in		9,000	10 : 12	12		Dandora
Start dumping				10 : 14	2		
Finish dumping				11 : 24		70	
Dumping site	out			11 : 27	3		
Reach to workshop	in						
Total			35,000		52	104	Total min.: 156 min.
Collection			17,000		23	34	
Transportation			18,000		24		
Inside the dumping site			0		5	70	Dumping time.: 75 min.
Idling time							

Time & Motion Study

Organization: DRDS

Trip- 2 Date: 12th Nov. 1997

Vehicle No. KXX 829

Loading Capacity: 2.55t

Researcher's name: Diana Gachuhi

No. of Crew: 4

Estimated Volume: 5.625m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out			11 : 27			
Loading-1	in		14,000	11 : 46	19		Outer Ring Rd. to
	out		0	13 : 19		93	Old Airport(Embakasi)
Loading-2	in		15,000	13 : 39	20		Jogoo Road to
	out		0	13 : 47		8	Kimathi Estate
Dumping site	in		15,000	14 : 8	21		Dandora
Start dumping				14 : 12	4		
Finish dumping				14 : 33		21	
Dumping site	out			14 : 40	7		
Reach to workshop	in						
Total			44,000		71	122	Total min.: 193 min.
Collection			15,000		20	101	
Transportation			29,000		40		
Inside the dumping site			0		11	21	Dumping time.: 32 min.
Idling time							

Time & Motion Study

Organization: DRDS

Trip- 3 Date: 12th Nov. 1997

Vehicle No. KXX 829

Loading Capacity: 2.55t

Researcher's name: Diana Gachuhi

No. of Crew: 4

Estimated Volume: 5.625m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out			14 : 40			From Dumping Site
Loading-1	in		14,000	15 : 6	26		Outer Ring Rd. to
	out		0	15 : 40		34	Old Airport(Embakasi)
Loading-2	in		16,000	16 : 2	22		Dandora-Mutarakua Rd.
	out		0	16 : 20		18	
Dumping site	in		15,000	16 : 22	2		Dandora
Start dumping				16 : 26	4		
Finish dumping				16 : 46		20	
Dumping site	out			16 : 55	9		
Reach to workshop	in			18 : 45			Lenana Rd.-D. R. D. S.
Total			45,000		63	72	Total min.: 135 min.
Collection			16,000		22	52	
Transportation			29,000		28		
Inside the dumping site			0		13	20	Dumping time.: 33 min.
Idling time							

Time & Motion Study

Organization: DRDS

Trip- 1 Date: 13th Nov. 1997

Vehicle No. KXX 829

Loading Capacity: 2.55t

Researcher's name: Diana Gachuhi

No. of Crew: 4

Estimated Volume: 5.625m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out		0	9 : 22			Lenana Rd. 20min. Idling (Petrol Station)
Loading-1	in		9,300	9 : 49	27		Arwing Kodhek-Gitanga Rd.
	out		0	10 : 19		30	to Stagecoach Bus-Station
Loading-2	in		4,000	11 : 5	46		State House Rd.-Chirono Rd.-
	out		0	11 : 45		40	Thika Rd.-Outering(Horuma)
Loading-3	in		16,000	11 : 57	12		Limuru Rd.-Parklands
	out		0	11 : 59		2	
Loading-4	in		1.3	12 : 0	1		6th Avenue Parklands
	out		0	12 : 1		1	
Loading-5	in		2	12 : 3	2		5th Avenue Parklands
	out		0	12 : 3		0	
Loading-6	in		1	12 : 4	1		5th Avenue Parklands
	out		0	12 : 13		9	
Loading-7	in		0.5	12 : 13	0		5th Avenue Parklands
	out		0	12 : 14		1	
Loading-8	in		1.3	12 : 15	1		Wangapala Rd.-Parklands
	out		0	12 : 16		1	
Loading-9	in		1.3	12 : 17	1		Wangapala Rd.-Parklands
	out		0	12 : 17		0	
Loading-10	in		2.67	12 : 19	2		Parklands
	out		0	12 : 20		1	
Loading-11	in		2.7	12 : 22	2		Highridge Shopping Center
	out		0	12 : 23		1	
Loading-12	in		2.7	12 : 25	2		3rd Avenue Parklands
	out		0	12 : 26		1	
Loading-13	in		2.5	12 : 28	2		3rd Avenue Parklands
	out		0	12 : 30		2	
Loading-14	in		2	12 : 31	1		Ring Rd.-Parklands
	out		0	12 : 32		1	
Loading-15	in		28,000	13 : 0	28		Bible Translation Center
	out		0	13 : 2		2	Lower Hill
Loading-16	in		17,000	13 : 19	17		Enterprise Rd.-Industrial
	out		0	13 : 22		3	Area
Loading-17	in		12,000	13 : 26	4		Likoni Rd.-Industrial Area
	out		0	13 : 35		9	
							Idling Time 10 min.
							Likoni Rd.-Outering Rd.-
Dumping site	in		20,000	14 : 1	26		Dandora
Start dumping				14 : 8	7		
Finish dumping				14 : 27		19	
Dumping site	out			14 : 29	2		
Reach to workshop	in			15 : 3	34		

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Organization: DRDS

Trip- 1 Date: 13th Nov. 1997

Vehicle No. KXX 829

Loading Capacity: 2.55t

Researcher's name: Diana Gachuhi

No. of Crew: 4

Estimated Volume: 5.625m³

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Total		106,320		218	123	Total min.: 341 min.
Collection		77,020		122	104	
Transportation		29,300		57		
Inside the dumping site		0		9	19	Dumping time.: 28 min.
Idling time				30		

Time & Motion Study

Organization: DRDS

Trip- 1 Date: 15th Nov. 1997

Vehicle No. KXX 829

Loading Capacity: 2.55t

Researcher's name: Diana Gachuhi

No. of Crew: 3

Estimated Volume: 5.625m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 25			Idling time 7 min. (Petrol Station)
Loading-1	in		19,000	8 : 51	26		Langata Rd.-Industrial Area
	out		0	9 : 26		35	General Printers
Loading-2	in		4,700	9 : 33	7		Enterprise Rd.
	out			9 : 43		10	
							Enterprise Rd.-Jogoo Rd.-
Dumping site	in		15,000	10 : 16	33		Outering Rd.-Dandora
Start dumping				10 : 20	4		
Finish dumping				10 : 26		6	
Dumping site	out			10 : 40	14		
Reach to workshop	in			11 : 30	50		Outering Rd.-Thika Rd.- Lenana Rd.-D. R. D. S.
Total			38,700		134	51	Total min.: 185 min.
Collection			4,700		7	45	
Transportation			34,000		102		
Inside the dumping site			0		18	6	Dumping time.: 24 min.
Idling time					7		

Time & Motion Study

Organization: DRDS

Trip- 1 Date: 17th Nov. 1997

Vehicle No. KXX 829

Loading Capacity: 2.55t

Researcher's name: Diana Gachuhi

No. of Crew: 3

Estimated Volume: 5.625m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 29			Lenana Rd.-Mombasa Rd.-
Loading-1	in		20,000	8 : 59	30		Industrial Area
	out		0	10 : 5		66	Rolmills Ltd.
Loading-2	in		7,000	10 : 20	15		Enterprise Rd.-General
	out		0	11 : 4		44	Printing Ltd.
Loading-3	in		5,300	11 : 12	8		Enterprise Rd.
	out		0	11 : 26		14	
Loading-4	in		4,000	11 : 32	6		Lwaka Rd.-Industrial Area
	out		0	11 : 36		4	
							Lusaka rd.-Jogoo rd.-
Dumping site	in		28,000	12 : 2	26		Outer ring rd.- Dandora
Start dumping				12 : 18	16		
Finish dumping				12 : 38		20	
Dumping site	out			12 : 40	2		
Reach to workshop	in						
Total			64,300		103	148	Total min.: 251 min.
Collection			16,300		29	128	
Transportation			48,000		56		
Inside the dumping site			0		18	20	Dumping time.: 38 min.
Idling time							

Time & Motion Study

Organization: DRDS

Trip- 2 Date: 17th Nov. 1997

Vehicle No. KXX 829

Loading Capacity: 2.55t

Researcher's name: Diana Gachuhi

No. of Crew: 3

Estimated Volume: 5.625m³

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site out			12 : 40			Dandora-Outering Rd.-
Loading-I in		28,000	13 : 8	28		Jogoo Rd.-Lusaka Rd.-
out		0	14 : 12		64	General Printing Ltd.
						Lusaka Rd.-Jogoo Rd.-
Dumping site in		32,000	14 : 40	28		Outering Rd.-Dandora
Start dumping			14 : 46	6		
Finish dumping			15 : 20		34	
Dumping site out			15 : 26	6		
Reach to workshop in			16 : 45	79		
Total		60,000		147	98	Total min.: 245 min.
Collection		0		0	64	
Transportation		60,000		135		
Inside the dumping site		0		12	34	Dumping time.: 46 min.
Idling time						

Time & Motion Study

Organization: DRDS

Trip- 1 Date: 18th Nov. 1997

Vehicle No. KXX 829

Loading Capacity: 2.55t

Researcher's name: Diana Gachuhi

No. of Crew: 4

Estimated Volume: 5.625m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 43			8 min. Idling Time (Petrol Station)
Loading-1	in		6,000	9 : 2	19		Lenana Rd.-Ralph Bunch
	out		0	9 : 39		37	Rd.-Valley Rd.
Loading-2	in		2,000	9 : 41	2		5th Ngong Avenue
	out		0	10 : 3		22	
Loading-3	in		1,000	10 : 4	1		5th Ngong Avenue
	out		0	11 : 46		102	
Loading-4	in		1,700	12 : 1	15		Masaba rd.-Bunyala rd.-
	out		0	13 : 1		60	CMC Ltd.(Industrial Area)
							Outering Rd.-
Dumping site	in		19,000	13 : 28	27		Dandora
Start dumping				13 : 35	7		
Finish dumping				14 : 37		62	
Dumping site	out			14 : 39	2		
Reach to workshop	in						
Total			29,700		73	283	Total min.: 356 min.
Collection			4,700		18	221	
Transportation			25,000		38		
Inside the dumping site			0		9	62	Dumping time.: 71 min.
Idling time					8		

Time & Motion Study

Organization: DRDS

Trip- 2 Date: 18th Nov. 1997

Vehicle No. KXX 829

Loading Capacity: 2.55t

Researcher's name: Diana Gachubi

No. of Crew: 4

Estimated Volume: 5.625m³

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out		14 : 39			Outering Rd.-Mombasa Rd.-
Loading-1	in	20,000	15 : 6	27		Enterprise Rd.
	out	0	15 : 9		3	(Industrial Area)
						Back to the Workshop
Dumping site	in		:			after very heavy rains
Start dumping			:			which hindered garbage
Finish dumping			:			collection
Dumping site	out		:			
Reach to workshop	in		16 : 0	51		Lenana Rd.-D. R. D. S.
Total		20,000		78	3	Total min.: 81 min.
Collection		0		0	3	
Transportation		20,000		78		
Inside the dumping site		0		0	0	Dumping time.: min.
Idling time						

Time & Motion Study

Organization: DRDS

Trip- 1 Date: 19th Nov. 1997

Vehicle No. KXX 829

Loading Capacity: 2.55t

Researcher's name: Diana Gachuhi

No. of Crew: 4

Estimated Volume: 5.625m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 43			Lenana Rd.-State house Rd.-
Loading-1	in		7,000	8 : 55	12		Kileleshaia
	out		0	9 : 0		5	
Loading-2	in		10,000	9 : 10	10		Argwings Kodhek Rd.-
	out		0	9 : 17		7	Kirichiwa Rd.
Loading-3	in		24,000	9 : 34	17		Kingara Rd.-Ngong Rd.-
	out		0	9 : 36		2	Miotoni Rd.
Loading-4	in		25,000	9 : 54	18		James Gichura Rd.-
	out		0	10 : 7		13	Lavington Shopping Center
Loading-5	in		22,000	10 : 35	28		Muthangari Rd.-State House
	out		0	10 : 42		7	Rd.-Muranga Rd.-Ngara
Loading-6	in		16,000	11 : 8	26		River Rd.-Jogoo Rd.-
	out		0	11 : 14		6	Enterprise Rd.-Isiolo Rd.
Loading-7	in		7,000	11 : 27	13		Enterprise Rd.-Pate Rd.
	out		0	11 : 32		5	
Loading-8	in		8,000	11 : 41	9		Migwani Rd.-Enterprise
	out		0	11 : 41		0	Rd.-Rode A
Loading-9	in		6,000	11 : 59	18		Enterprise Rd.-Mombasa Rd.
	out		0	12 : 3		4	
							Mombasa Rd.-North
							Airport Rd.-outering Rd.-
Dumping site	in		32,000	12 : 29	26		Dandora
Start dumping				12 : 34	5		
Finish dumping				12 : 58		24	
Dumping site	out			13 : 5	7		
Reach to workshop	in			14 : 30	85		Outerling Rd.-Thika Rd.-
							Statehouse Rd.-Lenana Rd.
Total			157,000		274	73	Total min.: 347 min.
Collection			118,000		139	49	
Transportation			39,000		123		
Inside the dumping site			0		12	24	Dumping time.: 36 min.
Idling time							

Time & Motion Study

Organization: DRDS

Trip- 1 Date: 20th Nov. 1997

Vehicle No. KXX 829

Loading Capacity: 2.55t

Researcher's name: Diana Gachuhi

No. of Crew: 4

 Estimated Volume: 5.625m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 43			Idling time 6 min. Fuel Sta.
							Statehouse Rd.-Chiromo Rd.
Loading-1	in		6,700	8 : 59	16		Westlands Rd.
	out		0	9 : 3		4	
Loading-2	in		1,300	9 : 6	3		Westlands Rd.
	out		0	9 : 11		5	
Loading-3	in		1,400	9 : 14	3		Mukinduri Close
	out		0	9 : 14		0	
Loading-4	in		300	9 : 15	1		Mukinduri Close
	out		0	9 : 18		3	
Loading-5	in		500	9 : 19	1		Mogotio Close
	out		0	9 : 20		1	
Loading-6	in		2,000	9 : 23	3		Ojijo Close-Parklands
	out		0	9 : 25		2	
Loading-7	in		3,000	9 : 28	3		Parklands Rd.-Mayfair
	out		0	10 : 2		34	Hotel
Loading-8	in		600	10 : 3	1		Parklands Rd.
	out		0	10 : 6		3	
Loading-9	in		700	10 : 7	1		Shirachi Rd.-Parklands
	out		0	10 : 9		2	
Loading-10	in		500	10 : 10	1		Bhanderi Rd.-Parklands
	out		0	10 : 22		12	
Loading-11	in		1,200	10 : 24	2		Wanbugu Rd.-Parklands
	out		0	10 : 26		2	
Loading-12	in		1,000	10 : 33	7		Wanbugu Grove-Parklands
	out		0	10 : 36		3	
Loading-13	in		1,800	10 : 39	3		Westlands Rd.
	out		0	10 : 42		3	
Loading-14	in		3,300	10 : 51	9		Westlands-Brookside
	out		0	11 : 55		64	Drive
Loading-15	in		5,000	12 : 12	17		2nd & 3rd Avenue
	out		0	13 : 25		73	Parklands
Loading-16	in		18,000	13 : 43	18		Thika Rd.-Outering Rd.-
	out		0	13 : 50		7	Kariobangi North
Dumping site	in		8,000	13 : 58	8		Outering Rd.-Dandora
Start dumping				14 : 0	2		
Finish dumping				14 : 43		43	
Dumping site	out			14 : 45	2		
Reach to workshop	in		18,000	15 : 35	50		Steta House rd.-Lenana rd.
Total			73,300		151	261	Total min.: 412 min.
Collection			40,600		73	218	
Transportation			32,700		68		
Inside the dumping site			0		4	43	Dumping time.: 47 min.
Idling time					6		



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TACENTAC



Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 12th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 2

Estimated Volume: 9m³

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop out			8 : 15			Unloaded garbage from previous day
Dumping site in		15,000	8 : 45	30		Dandora
Start dumping		50	8 : 47	2		
Finish dumping		0	9 : 13		26	
Dumping site out		50	9 : 15	2		Mileage not working
Reach to workshop in			:			
Total		15,100		34	26	Total min.: 60 min.
Collection		0		0	0	
Transportation		15,000		30		
Inside the dumping site		100		4	26	Dumping time.: 30 min.
Idling time						

Time & Motion Study

Organization: Tacentac

Trip- 2 Date: 12th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 15m3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			9 : 15			Ngummo Nairobi - West &
Loading-1	in		20,000	9 : 52	37		South C Areas
	out			9 : 56		4	Akiba Estate Msa Rd
Loading-2	in		100	9 : 56	0		
	out			10 : 21		25	Idling time (22mins)
Loading-3	in		100	10 : 23	2		
	out			10 : 29		6	Idling time (5mins)
Loading-4	in		10,000	11 : 10	41		Ngummo Estate
	out			11 : 20		10	Idling time (8mins)
Loading-5	in		50	11 : 21	1		
	out			11 : 34		13	Idling time (10mins)
Loading-6	in		5,000	11 : 43	9		Nairobi West
	out			11 : 48		5	Idling time (4mins)
Loading-7	in		150	11 : 50	2		
	out			11 : 58		8	Idling time (5mins)
Loading-8	in		200	12 : 0	2		
	out			12 : 4		4	
Loading-9	in		200	12 : 7	3		
	out			12 : 10		3	
Loading-10	in		50	12 : 11	1		
	out			12 : 19		8	Idling time (7mins)
Loading-11	in		100	12 : 21	2		
	out			12 : 29		8	Idling time (5mins)
Loading-12	in		100	12 : 30	1		
	out			12 : 47		17	Idling time (3mins)
Loading-13	in		75	12 : 48	1		
	out			12 : 53		5	
Loading-14	in		50	12 : 53	0		
	out			13 : 3		10	
Loading-15	in		75	13 : 4	1		
	out			13 : 7		3	
Loading-16	in		75	13 : 7	0		
	out			13 : 22		15	Idling time (2mins)
Loading-17	in		100	13 : 24	2		
	out			13 : 34		10	Idling time (7mins)
Loading-18	in		50	13 : 35	1		Idling time & Lunch (50mins)
	out			14 : 45		70	
Loading-19	in		500	14 : 55	10		South C
	out			15 : 6		11	Idling time (7mins)
Loading-20	in		500	15 : 20	14		
	out			15 : 33		13	Idling time (8mins)
Loading-21	in		100	15 : 35	2		
	out			16 : 4		29	Idling time (13mins)

Time & Motion Study

Organization: Tacentac

Trip- 2 Date: 12th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 15m3

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-22	in	75	16 : 6	2		
	out		16 : 18		12	
Loading-23	in	150	16 : 23	5		
	out		16 : 49		26	Idling time (10mins)
Loading-24	in	200	16 : 54	5		
	out		17 : 8		14	Idling time (2mins)
Loading-25	in	800	17 : 22	14		
	out		17 : 38		16	Idling time (4mins)
Loading-26	in	100	17 : 39	1		
	out		17 : 44		5	
Loading-27	in	300	18 : 2	18		
	out		18 : 30		28	Idling time (12mins)
Dumping site	in		:			Didn't go to dump site
Start dumping			:			
Finish dumping			:			
Dumping site	out		:			
Reach to workshop	in	13,000	19 : 5	35		
Total		52,200		212	378	Total min.: 590 min.
Collection		19,200		140	194	
Transportation		33,000		72		
Inside the dumping site		0		0	0	Dumping time.: min.
Idling time					184	

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 14th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 15m³

Location		Milceage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 40			South C - Imara Daima Areas
Loading-1	in		10,000	9 : 10	30		Idling time 13mins
	out			9 : 17		7	Mbugani Estate
Loading-2	in		20	9 : 17	0		
	out			9 : 21		4	9:22-9:24 Idling time 2mins
Loading-4	in		75	9 : 25	4		
	out			9 : 35		10	Idling time 1min
Loading-5	in		300	9 : 38	3		Halai Estate
	out			9 : 45		7	Idling time 5mins
Loading-6	in		100	9 : 46	1		
	out			9 : 51		5	
Loading-7	in		100	9 : 51	0		
	out			9 : 58		7	
Loading-8	in		200	10 : 0	2		Mugoya
	out			10 : 10		10	
Loading-9	in		75	10 : 11	1		
	out			10 : 14		3	
Loading-10	in		250	10 : 16	2		
	out			10 : 24		8	
Loading-11	in		100	10 : 25	1		
	out			10 : 32		7	
Loading-12	in		200	10 : 34	2		
	out			10 : 35		1	
Loading-13	in		200	10 : 37	2		
	out			10 : 39		2	
Loading-14	in		200	10 : 43	4		
	out			10 : 44		1	
Loading-15	in		75	10 : 44	0		
	out			10 : 54		10	Idling time 4mins
Loading-16	in		50	10 : 55	1		
	out			11 : 6		11	Idling time 2mins
Loading-17	in		150	11 : 8	2		
	out			11 : 16		8	Idling time 2mins To Dandora
Dumping site	in		33,000	12 : 0	44		Idling time 15mins
Start dumping			50	12 : 1	1		
Finish dumping			0	12 : 30		29	
Dumping site	out		50	12 : 33	3		Idling time 2mins
Reach to workshop	in			:			
Total			45,195		103	130	Total min.: 233 min.
Collection			2,095		23	101	
Transportation			43,000		46		
Inside the dumping site			100		2	29	Dumping time.: 31 min.
Idling time					32	14	

Time & Motion Study

Organization: Tacentac

Trip- 2 Date: 14th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 9m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out			12 : 33			
Loading-1	in		21,000	13 : 5	32		
	out			13 : 14		9	Idling time 2mins
Loading-2	in		1,500	13 : 22	8		
	out			13 : 29		7	
Loading-3	in		50	13 : 29	0		
	out			13 : 30		1	
Loading-4	in		50	13 : 30	0		Idling time 6mins
	out			13 : 37		7	
Loading-5	in		75	13 : 39	2		
	out			13 : 44		5	
Loading-6	in		75	13 : 45	1		
	out			13 : 50		5	Idling time 1min
Loading-7	in		50	13 : 51	1		
	out			13 : 58		7	
Loading-8	in		50	13 : 58	0		
	out			14 : 0		2	
Loading-9	in		75	14 : 1	1		
	out			14 : 4		3	
Loading-10	in		100	14 : 6	2		
	out			14 : 8		2	
Loading-11	in		11,000	14 : 37	29		
	out			14 : 49		12	Idling time 1min
Loading-12	in		150	14 : 51	2		
	out			15 : 1		10	Idling time 2mins
Loading-13	in		200	15 : 3	2		
	out			15 : 14		11	
Loading-14	in		300	15 : 15	1		
	out			15 : 20		5	
Dumping site	in		15,000	15 : 50	30		Dandora
Start dumping			50	15 : 54	4		
Finish dumping			0	16 : 18		24	
Dumping site	out		50	16 : 20	2		
Reach to workshop	in		15,000	16 : 50	30		
Total			64,775		147	110	Total min.: 257 min.
Collection			13,675		49	74	
Transportation			51,000		92		
Inside the dumping site			100		6	24	Dumping time.: 30 min.
Idling time						12	

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 15th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 16m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			9 : 16			Akiba (MsaRd), Ngummom
Loading-1	in		5,000	9 : 30	14		Nbi-West & South C Areas
	out			10 : 8		38	Akiba Estate (Idling time 37)
Loading-2	in		25	10 : 8	0		
	out			10 : 37		29	Idling time 28mins
Loading-3	in		50	10 : 37	0		
	out			10 : 52		15	Idling time 14mins
Loading-4	in		10,000	11 : 15	23		Idling time 2mins
	out			11 : 21		6	Ngummo Estate
Loading-5	in		5,000	11 : 31	10		Nairobi - West
	out			11 : 34		3	
Loading-6	in		50	11 : 35	1		
	out			11 : 40		5	Idling time 2mins
Loading-7	in		100	11 : 42	2		
	out			11 : 46		4	
Loading-8	in		150	11 : 48	2		
	out			12 : 5		17	Idling time 15mins
Loading-9	in		200	12 : 7	2		
	out			12 : 15		8	Idling time 5mins
Loading-10	in		200	12 : 17	2		
	out			12 : 26		9	Idling time 6mins
Loading-11	in		150	12 : 27	1		
	out			12 : 30		3	
Loading-12	in		100	12 : 31	1		
	out			12 : 38		7	
Loading-13	in		100	12 : 39	1		
	out			12 : 43		4	
Loading-14	in		75	12 : 44	1		
	out			12 : 45		1	
Loading-15	in		100	12 : 46	1		
	out			12 : 58		12	Idling time 7mins
Loading-16	in		75	12 : 58	0		
	out			13 : 0		2	
Loading-17	in		50	13 : 1	1		
	out			13 : 5		4	
Loading-18	in		75	13 : 6	1		
	out			13 : 7		1	
Loading-19	in		75	13 : 8	1		
	out			13 : 12		4	Idling time 3mins
Loading-20	in		150	13 : 13	1		
	out			13 : 22		9	Idling time 8mins
Loading-21	in		175	13 : 24	2		Mechanical hitch & Lunch
	out			13 : 59		35	23mins

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 15th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 16m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-22	in		400	14 : 6	7		South C
	out			14 : 21		15	Idling time 11mins
Loading-23	in		75	14 : 22	1		
	out			14 : 26		4	
Loading-24	in		300	14 : 33	7		
	out			14 : 38		5	Idling time 4mins
Loading-25	in		400	14 : 45	7		
	out			14 : 47		2	
Loading-26	in		200	14 : 48	1		
	out			14 : 52		4	
Loading-27	in		300	14 : 54	2		
	out			14 : 57		3	
Loading-28	in		200	14 : 58	1		
	out			14 : 59		1	
Loading-29	in		250	15 : 1	2		
	out			15 : 6		5	
Loading-30	in		150	15 : 7	1		
	out			15 : 14		7	Idling time 5mins
Loading-31	in		100	15 : 15	1		
	out			15 : 29		14	Idling time 12mins
Loading-32	in		100	15 : 30	1		
	out			15 : 35		5	Idling time 2mins
Loading-33	in		200	15 : 37	2		
	out			15 : 46		9	Idling time 2mins
Loading-34	in		150	15 : 47	1		
	out			15 : 53		6	Idling time 3mins
Loading-35	in		100	15 : 54	1		
	out			15 : 57		3	
Loading-36	in		200	15 : 59	2		
	out			16 : 3		4	
Loading-37	in		75	16 : 4	1		
	out			16 : 8		4	
Loading-38	in		300	16 : 15	7		
	out			16 : 30		15	Idling time 10mins
Loading-39	in		50	16 : 30	0		
	out			17 : 20		50	Idling time 40mins
							To Dandora

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 15th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 16m³

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Dumping site in		22,000	18 : 45	85		Idling time 7mins
Start dumping		25	18 : 50	5		
Finish dumping		0	19 : 25		35	
Dumping site out		25	19 : 27	2		
Reach to workshop in		15,000	19 : 50	23		
Total		62,500		227	407	Total min.: 634 min.
Collection		20,450		96	135	
Transportation		42,000		115		
Inside the dumping site		50		7	35	Dumping time.: 42 min.
Idling time				9	237	

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 18th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 15m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 38			South C Area
Loading-1	in		11,000	8 : 57	19		Mbugani
	out			9 : 4		7	Idling time 5mins
Loading-2	in		100	9 : 5	1		
	out			9 : 9		4	
Loading-3	in		100	9 : 11	2		
	out			9 : 16		5	
Loading-4	in		25	9 : 16	0		
	out			9 : 18		2	
Loading-5	in		300	9 : 22	4		Halai
	out			9 : 28		6	
Loading-6	in		100	9 : 30	2		
	out			9 : 34		4	Idling time 1min
Loading-7	in		50	9 : 35	1		
	out			9 : 36		1	
Loading-8	in		150	9 : 38	2		South C
	out			9 : 42		4	Idling time 2mins
Loading-9	in		100	9 : 43	1		
	out			9 : 48		5	
Loading-10	in		100	9 : 50	2		
	out			9 : 52		2	
Loading-11	in		100	9 : 55	3		
	out			10 : 1		6	
Loading-12	in		150	10 : 3	2		
	out			10 : 7		4	
Loading-13	in		50	10 : 7	0		
	out			10 : 10		3	
Loading-14	in		50	10 : 10	0		
	out			10 : 15		5	
Loading-15	in		25	10 : 15	0		
	out			10 : 30		15	Idling time 12mins
Loading-16	in		100	10 : 32	2		
	out			10 : 52		20	Idling time 13mins
Dumping site	in		21,000	11 : 40	48		Idling time 20mins
Start dumping			50	11 : 47	7		Dandora
Finish dumping			0	12 : 20		33	
Dumping site	out		50	12 : 22	2		
Reach to workshop	in			:			
Total			33,600		98	126	Total min.: 224 min.
Collection			1,500		22	60	
Transportation			32,000		47		
Inside the dumping site			100		9	33	Dumping time.: 42 min.
Idling time					20	33	

Time & Motion Study

Organization: Tacentac

Trip- 2 Date: 18th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 4

Estimated Volume: 14m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out			12 : 22			South C Area
Loading-1	in		21,000	12 : 52	30		Belle - Vue Estate
	out			12 : 56		4	
Loading-2	in		250	13 : 2	6		
	out			13 : 7		5	
Loading-3	in		100	13 : 7	0		
	out			13 : 16		9	Idling time 2mins
Loading-4	in		75	13 : 18	2		
	out			13 : 22		4	
Loading-5	in		50	13 : 23	1		
	out			13 : 27		4	
Loading-6	in		50	13 : 27	0		
	out			13 : 37		10	
Loading-7	in		250	13 : 40	3		
	out			13 : 43		3	
Loading-8	in		75	13 : 44	1		
	out			13 : 50		6	
Loading-9	in		50	13 : 51	1		
	out			13 : 59		8	Idling time 1min
Loading-10	in		75	14 : 1	2		
	out			14 : 7		6	
Loading-11	in		50	14 : 8	1		
	out			14 : 15		7	Idling time 2 mins
Loading-12	in		50	14 : 16	1		
	out			14 : 21		5	
Loading-13	in		50	14 : 23	0		
	out			14 : 25		4	
Loading-14	in		100	14 : 27	2		
	out			14 : 28		1	
Loading-15	in		50	14 : 30	2		
	out			14 : 34		4	
Dumping site	in			:			discontinued work due to rainfall
Start dumping				:			
Finish dumping				:			
Dumping site	out			:			
Reach to workshop	in		11,000	14 : 58	24		
Total			33,275		76	80	Total min.: 156 min.
Collection			1,275		22	75	
Transportation			32,000		54		
Inside the dumping site			0		0	0	Dumping time.: min.
Idling time						5	

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 19th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 16m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			10 : 10			Akiba(Msa Rd) Ngunno,
Loading-1	in		5,000	10 : 23	13		Nbi-West & South C Areas
	out			10 : 33		10	Akiba Idling time 3mins
Loading-2	in		50	10 : 33	0		
	out			10 : 37		4	Idling time 2mins
Loading-3	in		50	10 : 38	1		
	out			10 : 43		5	Idling time 2mins
Loading-4	in		10,000	11 : 3	20		Ngommo
	out			11 : 6		3	
Loading-5	in		5,000	11 : 15	9		Mechanical hitch Nbi-West
	out			11 : 31		16	Idling time 6mins
Loading-6	in		100	11 : 31	0		
	out			11 : 35		4	
Loading-7	in		100	11 : 36	1		
	out			11 : 37		1	
Loading-8	in		150	11 : 38	1		
	out			11 : 41		3	
Loading-9	in		200	11 : 43	2		
	out			11 : 45		2	
Loading-10	in		50	11 : 46	1		
	out			11 : 48		2	
Loading-11	in		100	11 : 50	2		
	out			11 : 57		7	Idling time 1min
Loading-12	in		150	11 : 58	1		
	out			12 : 2		4	Idling time 1min
Loading-13	in		100	12 : 4	2		
	out			12 : 9		5	
Loading-14	in		50	12 : 9	0		
	out			12 : 10		1	
Loading-15	in		50	12 : 11	1		
	out			12 : 15		4	
Loading-16	in		100	12 : 16	1		
	out			12 : 23		7	Idling time 2mins
Loading-17	in		25	12 : 23	0		
	out			12 : 25		2	
Loading-18	in		75	12 : 26	1		
	out			12 : 29		3	
Loading-19	in		50	12 : 29	0		
	out			12 : 33		4	Idling time 1min
Loading-20	in		75	12 : 34	1		
	out			12 : 35		1	
Loading-21	in		50	12 : 36	1		
	out			12 : 42		6	

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 19th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 16m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-22	in		100	12 : 43	1		
	out			12 : 49		6	
Loading-23	in		50	12 : 50	1		Lunch
	out			13 : 17		27	Idling time 20min
Loading-24	in		350	13 : 22	5		
	out			13 : 25		3	
Loading-25	in		50	13 : 25	0		
	out			13 : 36		11	Idling time 7mins
Loading-26	in		500	13 : 43	7		
	out			13 : 45		2	
Loading-27	in		100	13 : 47	2		
	out			13 : 51		4	Idling time 3mins
Loading-28	in		50	13 : 52	1		
	out			13 : 53		1	
Loading-29	in		150	13 : 55	2		
	out			13 : 59		4	Idling time 2mins
Loading-30	in		150	14 : 1	2		
	out			14 : 4		3	
Loading-31	in		150	14 : 4	0		
	out			14 : 4		0	
Loading-32	in		350	14 : 12	8		
	out			14 : 14		2	
Loading-33	in		50	14 : 14	0		
	out			14 : 17		3	Idling time 1min
Loading-34	in		200	14 : 19	2		
	out			14 : 21		2	
Loading-35	in		75	14 : 22	1		
	out			14 : 23		1	
Loading-36	in		150	14 : 25	2		
	out			14 : 30		5	
Loading-37	in		100	14 : 31	1		
	out			14 : 34		3	
Loading-38	in		50	14 : 35	1		
	out			14 : 38		3	
Loading-39	in		150	14 : 40	2		
	out			14 : 43		3	
Loading-40	in		75	14 : 44	1		
	out			14 : 49		5	
Loading-41	in		150	14 : 51	2		
	out			14 : 53		2	
Loading-42	in		250	14 : 56	3		
	out			15 : 1		5	
Loading-43	in		300	15 : 4	3		
	out			15 : 8		4	

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 19th November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 16m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-44	in		150	15 : 10	2		
	out			15 : 14		4	
Loading-45	in		150	15 : 16	2		
	out			15 : 20		4	
Loading-46	in		200	15 : 22	2		
	out			15 : 23		1	
Loading-47	in		500	15 : 33	10		Idling time 2mins
	out			15 : 35		2	
Loading-48	in		50	15 : 36	1		
	out			15 : 45		9	Idling time 5mins
Dumping site	in		22,000	16 : 44	59		Idling time 5mins
Start dumping			75	16 : 55	11		Idling time 7mins
Finish dumping			0	18 : 12		77	
Dumping site	out		75	18 : 14	2		
Reach to workshop	in		15,000	18 : 45	31		
Total			63,275		225	290	Total min.: 515 min.
Collection			21,125		107	162	
Transportation			42,000		98		
Inside the dumping site			150		6	77	Dumping time.: 83 min.
Idling time					14	51	

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 21st November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 14m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 20			South C Area
Loading-1	in		10,000	8 : 38	18		
	out			9 : 17		39	Idling time 37mins
Loading-2	in		100	9 : 18	1		
	out			9 : 21		3	
Loading-3	in		50	9 : 21	0		
	out			9 : 29		8	Idling time 2mins
Loading-4	in		25	9 : 30	1		
	out			9 : 32		2	
Loading-5	in		250	9 : 34	2		
	out			9 : 43		9	Idling time 3mins
Loading-6	in		100	9 : 44	1		
	out			9 : 48		4	
Loading-7	in		50	9 : 49	1		
	out			9 : 53		4	Idling time 2mins
Loading-8	in		80	9 : 54	1		
	out			9 : 55		1	
Loading-9	in		300	9 : 57	2		
	out			10 : 0		3	
Loading-10	in		100	10 : 1	1		
	out			10 : 2		1	
Loading-11	in		150	10 : 4	2		
	out			10 : 6		2	
Loading-12	in		150	10 : 8	2		
	out			10 : 12		4	Idling time 1min
Loading-13	in		150	10 : 14	2		
	out			10 : 21		7	Idling time 5mins
Loading-14	in		100	10 : 23	2		
	out			10 : 25		2	
Loading-15	in		75	10 : 26	1		
	out			10 : 39		13	Idling time 4mins
Loading-16	in		150	10 : 41	2		
	out			10 : 54		13	Idling time 4mins
Loading-17	in		150	10 : 56	2		
	out			11 : 0		4	
Loading-18	in		75	11 : 1	1		
	out			11 : 9		8	
Loading-19	in		100	11 : 11	2		
	out			11 : 16		5	
Loading-20	in		75	11 : 16	0		
	out			11 : 20		4	
Loading-21	in		100	11 : 22	2		
	out			11 : 27		5	Idling time 2mins

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 21st November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 14m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-22	in		100	11 : 29	2		
	out			11 : 32		3	To Dandora
Dumping site	in		22,000	12 : 28	56		Idling time 15mins
Start dumping			50	12 : 35	7		
Finish dumping			0	13 : 8		33	
Dumping site	out		50	13 : 10	2		
Reach to workshop	in			:			
Total			34,530		113	177	Total min.: 290 min.
Collection			2,430		30	84	
Transportation			32,000		59		
Inside the dumping site			100		9	33	Dumping time.: 42 min.
Idling time					15	60	

Time & Motion Study

Organization: Tacentac

Trip- 2 Date: 21st November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 10m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			13 : 10			South C and Imara Daima
Loading-1	in		21,000	13 : 43	33		Areas
	out			13 : 49		6	
Loading-2	in		400	13 : 56	7		
	out			14 : 1		5	Idling time 3mins
Loading-3	in		75	14 : 1	0		
	out			14 : 3		2	
Loading-4	in		75	14 : 3	0		
	out			14 : 6		3	
Loading-5	in		150	14 : 7	1		
	out			14 : 11		4	Idling time 3mins
Loading-6	in		50	14 : 12	1		
	out			14 : 16		4	
Loading-7	in		50	14 : 17	1		
	out			14 : 19		2	
Loading-8	in		350	14 : 22	3		
	out			14 : 28		6	Idling time 2mins
Loading-9	in		150	14 : 30	2		
	out			14 : 35		5	Idling time 2mins
Loading-10	in		11,000	14 : 55	20		
	out			14 : 59		4	Idling time 2mins
Loading-11	in		150	15 : 0	1		
	out			15 : 3		3	
Loading-12	in		350	15 : 4	1		
	out			15 : 10		6	
Loading-13	in		250	15 : 11	1		
	out			15 : 17		6	
Loading-14	in		200	15 : 17	0		
	out			15 : 22		5	
Loading-15	in		150	15 : 27	5		
	out			15 : 28		1	
Loading-16	in		100	15 : 30	2		Idling time 1min
	out			15 : 32		2	
Dumping site	in		15,000	16 : 10	42		Dandora
Start dumping			50	16 : 12	2		
Finish dumping			0	16 : 37		25	
Dumping site	out		50	16 : 39	2		
Reach to workshop	in		15,000	17 : 8	29		
Total			64,600		153	89	Total min.: 242 min.
Collection			13,500		44	52	
Transportation			51,000		104		
Inside the dumping site			100		4	25	Dumping time.: 29 min.
Idling time					1	12	

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 22nd November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 16m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			9 : 3			Akiba(Msa Rd) Ngummo,
Loading-1	in		5,000	9 : 20	17		Nbi-West & South C Areas
	out			9 : 38		18	Idling time 17
Loading-2	in		75	9 : 39	1		
	out			10 : 9		30	Idling time 28
Loading-3	in		50	10 : 9	0		
	out			10 : 24		15	Idling time 13
Loading-4	in		10,000	10 : 48	24		
	out			11 : 2		14	Idling time 10
Loading-5	in		50	11 : 2	0		
	out			11 : 19		17	Idling time 14
Loading-6	in		5,000	11 : 30	11		
	out			11 : 38		8	Idling time 5
Loading-7	in		150	11 : 40	2		
	out			11 : 41		1	
Loading-8	in		75	11 : 42	1		
	out			11 : 50		8	Idling time 7
Loading-9	in		100	11 : 51	1		
	out			12 : 0		9	Idling time 8
Loading-10	in		200	12 : 2	2		
	out			12 : 6		4	Idling time 1
Loading-11	in		150	12 : 7	1		
	out			12 : 13		6	Idling time 2
Loading-12	in		150	12 : 15	2		
	out			12 : 18		3	
Loading-13	in		100	12 : 19	1		
	out			12 : 23		4	
Loading-14	in		100	12 : 24	1		
	out			12 : 28		4	Idling time 1
Loading-15	in		50	12 : 29	1		
	out			12 : 42		13	Idling time 6
Loading-16	in		100	12 : 44	2		
	out			12 : 48		4	Idling time 2
Loading-17	in		100	12 : 50	2		
	out			12 : 57		7	Idling time 3
Loading-18	in		75	12 : 57	0		
	out			13 : 1		4	
Loading-19	in		75	13 : 1	0		
	out			13 : 3		2	
Loading-20	in		100	13 : 4	1		
	out			13 : 7		3	
Loading-21	in		150	13 : 7	0		
	out			13 : 18		11	Idling time 5

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 22nd November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 16m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-22	in		80	13 : 19	1		
	out			13 : 52		33	Lunch 25mins
Loading-23	in		400	13 : 56	4		
	out			14 : 7		11	Idling time 11
Loading-24	in		500	14 : 13	6		
	out			14 : 15		2	
Loading-25	in		150	14 : 16	1		
	out			14 : 19		3	
Loading-26	in		200	14 : 22	3		
	out			14 : 25		3	
Loading-27	in		180	14 : 26	1		
	out			14 : 29		3	Idling time 1
Loading-28	in		75	14 : 30	1		
	out			14 : 42		12	Idling time 9
Loading-29	in		50	14 : 46	4		14:44-14:45 1min Idling time
	out			14 : 48		2	Idling time 1
Loading-30	in		100	14 : 50	2		
	out			14 : 59		9	
Loading-31	in		75	15 : 0	1		
	out			15 : 1		1	
Loading-32	in		100	15 : 3	2		
	out			15 : 13		10	
Loading-33	in		100	15 : 14	1		
	out			15 : 18		4	
Loading-34	in		150	15 : 18	0		
	out			15 : 23		5	
Loading-35	in		75	15 : 23	0		
	out			15 : 29		6	Idling time 2
Loading-36	in		100	15 : 30	1		
	out			15 : 41		11	Idling time 7
Loading-37	in		200	15 : 43	2		
	out			15 : 47		4	
Loading-38	in		150	15 : 48	1		
	out			15 : 52		4	
Loading-39	in		150	15 : 53	1		
	out			15 : 56		3	
Loading-40	in		100	15 : 56	0		
	out			16 : 1		5	Idling time 2
Loading-41	in		150	16 : 2	1		
	out			16 : 4		2	
Loading-42	in		75	16 : 5	1		
	out			16 : 11		6	Idling time 2
Loading-43	in		150	16 : 13	2		
	out			16 : 18		5	Idling time 2

Time & Motion Study

Organization: Tacentac

Trip- 1 Date: 22nd November 1997

Vehicle No. KRX593

Loading Capacity: 6.5ton

Researcher's name: George Chege

No. of Crew: 5

Estimated Volume: 16m³

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-44	in	500	16 : 26	8		
	out		16 : 38		12	Idling time 2
Loading-45	in	100	16 : 39	1		
	out		16 : 48		9	Idling time 5
Dumping site	in	22,000	17 : 58	70		Idling time 10
Start dumping		50	18 : 5	7		
Finish dumping		0	18 : 41		36	
Dumping site	out	50	18 : 43	2		
Reach to workshop	in	15,000	19 : 8	25		
Total		62,860		219	386	Total min.: 605 min.
Collection		20,760		97	159	
Transportation		42,000		102		
Inside the dumping site		100		9	36	Dumping time.: 45 min.
Idling time				11	191	



ENVIROCLEAN SERVICES



Time & Motion Study

Organization: Enviro-Clean Trip- 1 Date: 14/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 4

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	64701		10 : 10			Buruburu-Jogoo Rd.-Hile Sellasie- Processional Way-Valley rd.
Loading-1	in	64708	7,000	10 : 30	20		Panafric Hotel-Donholm
	out			11 : 40		70	Idling Time 5min.(Petrol St.)
Dumping site	in	64716	8,000	12 : 20	40		Donholm-Jogoo Rd.-Upper Hill Rd.
Start dumping				12 : 25	5		
Finish dumping				12 : 38		13	
Dumping site	out	64717	1,000	12 : 44	6		
Reach to workshop	in			:			Ngong Rd.-Ring Rd.-Yaya Center
Total			16,000		71	83	Total min.: 154 min.
Collection			0		0	70	
Transportation			15,000		55		
Inside the dumping site			1,000		11	13	Dumping time.: 24 min.
Idling time					5		

Time & Motion Study

Organization: Enviro-Clean Trip- 2 Date: 14/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 4

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumpingsite	out	64717		12 : 44			Jogoo Rd.-Upper Hill-
Loading-1	in	64727	10,000	13 : 15	31		Ngong Rd.-Ring Rd.-Yaya
	out			15 : 0		105	Center
							Ngong Rd.-Upper Hill-
							Jogoo Rd.-Donholm
Dumping site	in	64737	10,000	15 : 50	50		Donholm-Jogoo Rd.-Mumias
Start dumping				15 : 52	2		Dumped at donholm
Finish dumping				16 : 5		13	
Dumping site	out	64737	0	16 : 7	2		
Reach to workshop	in	64741	4,000	16 : 20	13		South Rd.-Buruburu(Mesora)
Total			24,000		98	118	Total min.: 216 min.
Collection			0		0	105	
Transportation			24,000		94		
Inside the dumping site			0		4	13	Dumping time.: 17 min.
Idling time							

Time & Motion Study

Organization: Enviro-Clean

Trip- 1

Date: 16/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 4

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	64888		10 : 22			Buruburu-Jogoo Rd.-
							Industrial Area
Loading-1	in	64893	5,000	10 : 40	18		(D. T. Dobie)
	out			11 : 5		25	Industrial Area-Upper Hill Rd.-
Loading-2	in	64897	4,000	11 : 20	15		lower Hill Rd.-Processional Way-
	out			12 : 45		85	Valley Rd.(Pan Apic)
Dumping site	in	64905	8,000	13 : 20	35		Dunped at donholm
Start dumping				13 : 21	1		
Finish dumping				13 : 35		14	
Dumping site	out			13 : 38	3		
Reach to workshop	in	64909	4,000	13 : 50	12		
Total			21,000		84	124	Total min.: 208 min.
Collection			4,000		15	110	
Transportation			17,000		65		
Inside the dumping site			0		4	14	Dumping time.: 18 min.
Idling time							

Time & Motion Study

Organization: Enviro-Clean Trip- 1 Date: 18/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 4

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	64927		7 : 25			Buruburu-Jogoo Rd.-Lusaka Rd.-
Loading-1	in	64937	10,000	8 : 23	58		Enterprise Rd.-Bunyala-Lower
	out			9 : 50		87	Hill Valey Rd.(Pan -Afric Hotel) to Donholm
Dumping site	in	64945	8,000	10 : 20	30		Valloyrd-Processionarl Way-
Start dumping				10 : 22	2		Ahuru Highway-Airport Rd-
Finish dumping				10 : 40		18	Donholm
Dumping site	out			10 : 40	0		
Reach to workshop	in			11 : 7	27		Airport Rd-Msa Rd
							Uhum Highway-Pan Afric
Total			18,000		117	105	Total min.: 222 min.
Collection			0		0	87	
Transportation			18,000		115		
Inside the dumping site			0		2	18	Dumping time.: 20 min.
Idling time							

Time & Motion Study

Organization: Enviro-Clean

Trip- 2 Date: 18/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 4

Estimated Volume: 5.5m³

Location		Mileage (kn)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	64945		10 : 40			Airport Rd.-Usa Rd.-Uhuru Highway-Hail Selassie Av.
Loading-1	in	64954	9,000	11 : 7	27		Processional way-Valley Rd.-
	out			13 : 17		130	(Pan Afric) Donholm
Dumping site	in	64962	8,000	13 : 46	29		Valley Rd.-Uhuru Highway-
Start dumping				13 : 47	1		Airport Rd-Donholm
Finish dumping				14 : 17		30	(Dumped at Donholm)
Dumping site	out			14 : 19	2		
Reach to workshop	in	64966	4,000	14 : 31	12		
Total			21,000		71	160	Total min.: 231 min.
Collection			0		0	130	
Transportation			21,000		68		
Inside the dumping site			0		3	30	Dumping time.: 33 min.
Idling time							

Time & Motion Study

Organization: Enviro-Clean Trip- 1 Date: 19/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 4

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	64983		7 : 25			Buruburu-Jogoo Rd.-Lusaka Rd.-
Loading-1	in	64995	12,000	8 : 33	68		Enterprise Rd.-Bunyala-Upper
	out			9 : 58		85	Hill-Ngong Rd.-Yaya Center
Loading-2	in	64996	1,000	10 : 0	2		Chaka Rd.-Arwings Kodhek Rd.
	out			10 : 1		1	
Loading-3	in	64997	1,000	10 : 6	5		Residential(Elgeyo Marakwet
	out			10 : 7		1	Rd.) Arwing Kodhek Rd.
Loading-4	in	64998	1,000	10 : 12	5		Residential(Hurlingham)
	out			10 : 14		2	
Loading-5	in	64998	0	10 : 14	0		Residential(Hurlingham)
	out			10 : 15		1	
Loading-6	in	64999	1,000	10 : 16	1		Residential(Hurlingham)
	out			10 : 18		2	Ring Rd.-Milimani-Ngong Rd.
Loading-7	in	65000	1,000	10 : 23	5		Residential(Ngong Rd.)
	out			10 : 27		4	Ngong Rd.-Hsp Rd.-Upper
							Hill-Bunyala Rd.-Lusaka Rd.-
							Jogoo Rd.-Airport Rd.
Dumping site	in	65009	9,000	10 : 53	26		Donholm
Start dumping				10 : 54	1		(Dumping site)
Finish dumping				11 : 18		24	
Dumping site	out			11 : 19	1		
Reach to workshop	in	65013	4,000	11 : 40			
Total			30,000		114	120	Total min.: 234 min.
Collection			5,000		18	96	
Transportation			25,000		94		
Inside the dumping site			0		2	24	Dumping time.: 26 min.
Idling time							

Time & Motion Study

Organization: Enviro-Clean

Trip- 1 Date: 22/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 6

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	65060		7 : 0			Buruburu(Phase2)
Loading-1	in	65063	3,000	7 : 20	20		Buruburu(Phase2)
	out			7 : 21		1	
Loading-2	in	65064	1,000	7 : 25	4		Buruburu(Phase2)
	out			7 : 25		0	
Loading-3	in	65064.5	500	7 : 26	1		Buruburu(Phase2)
	out			7 : 27		1	
Loading-4	in	65065	500	7 : 35	8		Buruburu(Phase2)
	out			7 : 36		1	
Loading-5	in	65066	1,000	7 : 40	4		Buruburu(Phase2)
	out			7 : 41		1	
Loading-6	in	65066.3	300	7 : 42	1		Buruburu(Phase2)
	out			7 : 43		1	
Loading-7	in	65066.6	300	7 : 45	2		Buruburu(Phase2)
	out			7 : 45		0	
Loading-8	in	65066.9	300	7 : 46	1		Buruburu(Phase2)
	out			7 : 47		1	
Loading-9	in	65067	100	7 : 48	1		Buruburu(Phase2)
	out			7 : 50		2	
Loading-10	in	65067.25	250	7 : 51	1		Buruburu(Phase2)
	out			7 : 53		2	
Loading-11	in	65067.5	250	7 : 57	4		Buruburu(Phase2)
	out			7 : 59		2	
Loading-12	in	65067.7	200	8 : 0	1		Buruburu(Phase2)
	out			8 : 1		1	
Loading-13	in	65067.85	150	8 : 3	2		Buruburu(Phase2)
	out			8 : 4		1	
Loading-14	in	65068	150	8 : 5	1		Buruburu(Phase2)
	out			8 : 5		0	
Loading-15	in	65068.3	300	8 : 6	1		Buruburu(Phase2)
	out			8 : 6		0	
Loading-16	in	65068.6	300	8 : 8	2		Buruburu(Phase2)
	out			8 : 11		3	
Loading-17	in	65068.8	200	8 : 11	0		Buruburu II Residence
	out			8 : 14		3	
Loading-18	in	65069	200	8 : 15	1		Buruburu II Residence
	out			8 : 15		0	
Loading-19	in	65069.1	100	8 : 16	1		Buruburu II Residence
	out			8 : 16		0	
Loading-20	in	65069.3	200	8 : 17	1		Buruburu II Residence
	out			8 : 18		1	
Loading-21	in	65069.4	100	8 : 19	1		Buruburu II Residence
	out			8 : 19		0	

Time & Motion Study

Organization: Enviro-Clean

Trip- 1 Date: 22/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 6

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-22	in	65069.6	200	8 : 22	3		Buruburu II Residence
	out			8 : 24		2	
Loading-23	in	65069.7	100	8 : 24	0		Buruburu II Residence
	out			8 : 24		0	
Loading-24	in	65070	300	8 : 25	1		Buruburu II Residence
	out			8 : 26		1	
Dumping site	in	65073	3,000	8 : 45	19		Dumped at Dandora
Start dumping				8 : 45	0		
Finish dumping				8 : 59		14	
Dumping site	out	65073	0	9 : 0	1		
Reach to workshop	in						
Total			13,000		82	38	Total min.: 120 min.
Collection			7,000		42	24	
Transportation			6,000		39		
Inside the dumping site			0		1	14	Dumping time.: 15 min.
Idling time							

Time & Motion Study

Organization: Enviro-Clean

Trip- 2 Date: 22/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 6

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	65073		9 : 0			Buruburu(Phase III)Residence
Loading-1	in	65077	4,000	9 : 15	15		Buruburu(Phase III)Residence
	out			9 : 16		1	
Loading-2	in	65077.2	200	9 : 16	0		Buruburu(Phase III)Residence
	out			9 : 19		3	
Loading-3	in	65077.4	200	9 : 20	1		Buruburu(Phase III)Residence
	out			9 : 22		2	
Loading-4	in	65077.6	200	9 : 23	1		Buruburu(Phase III)Residence
	out			9 : 27		4	
Loading-5	in	65077.8	200	9 : 29	2		Buruburu(Phase III)Residence
	out			9 : 30		1	
Loading-6	in	65078	200	9 : 33	3		Buruburu(Phase III)Residence
	out			9 : 34		1	
Loading-7	in	65078.2	200	9 : 35	1		Buruburu(Phase III)Residence
	out			9 : 40		5	
Loading-8	in	65078.5	300	9 : 43	3		Buruburu(Phase III)Residence
	out			9 : 45		2	
Loading-9	in	65078.7	200	9 : 46	1		Buruburu(Phase III)Residence
	out			9 : 47		1	
Loading-10	in	65079	300	9 : 49	2		Buruburu(Phase III)Residence
	out			9 : 50		1	
Loading-11	in	65079.5	500	10 : 0	10		Buruburu(Phase III)Residence
	out			10 : 5		5	
							1 hour 50min.
							Serch for dumping site
Dumping site	in	65091	11,500	11 : 55	110		Dandora
Start dumping				11 : 55	0		
Finish dumping				12 : 0		5	
Dumping site	out			12 : 0	0		
Reach to workshop	in	65095	4,000	12 : 20	20		
Total			22,000		169	31	Total min.: 200 min.
Collection			2,500		24	26	
Transportation			19,500		145		
Inside the dumping site			0		0	5	Dumping time.: 5 min.
Idling time							

Time & Motion Study

Organization: Enviro-Clean Trip- 3 Date: 22/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 6

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	65091		12 : 0			Dandora-Kariobangi(s)- Buruburu II
Loading-1	in	65095	4,000	12 : 20	20		Sateway Super Market
	out			12 : 45		25	
Loading-2	in	65095.4	400	12 : 46	1		
	out			12 : 47		1	
Loading-3	in	65095.7	300	12 : 48	1		
	out			12 : 49		1	
Loading-4	in	65096	300	12 : 50	1		Buruburu III
	out			12 : 51		1	(Residence)
Loading-5	in	65096.4	400	12 : 55	4		Buruburu III
	out			12 : 56		1	(Residence)
Loading-6	in	65096.7	300	12 : 57	1		Buruburu III
	out			12 : 59		2	(Residence)
Loading-7	in	65097	300	13 : 0	1		Buruburu III
	out			13 : 2		2	(Residence)
Loading-8	in	65097.2	200	13 : 4	2		Buruburu III
	out			13 : 5		1	(Residence)
Loading-9	in	65097.4	200	13 : 5	0		Buruburu III
	out			13 : 7		2	(Residence)
Loading-10	in	65097.6	200	13 : 9	2		Buruburu III
	out			13 : 10		1	(Residence)
Loading-11	in	65097.8	200	13 : 11	1		Buruburu III
	out			13 : 12		1	(Residence)
Loading-12	in	65098	200	13 : 14	2		Buruburu III
	out			13 : 15		1	(Residence)
Loading-13	in	65098.2	200	13 : 16	1		Buruburu III
	out			13 : 18		2	(Residence)
Loading-14	in	65098.6	400	13 : 20	2		Buruburu III
	out			13 : 21		1	(Residence)
Loading-15	in	65098.8	200	13 : 23	2		Buruburu III
	out			13 : 24		1	(Residence)
Loading-16	in	65099	200	13 : 26	2		Buruburu III
	out			13 : 28		2	(Residence)
Loading-17	in	65099.4	400	13 : 30	2		
	out			13 : 31		1	
Loading-18	in	65099.7	300	13 : 32	1		
	out			13 : 33		1	
Loading-19	in	65100	300	13 : 35	2		
	out			13 : 36		1	
Loading-20	in	65100.3	300	13 : 37	1		
	out			13 : 38		1	
Loading-21	in	65100.6	300	13 : 40	2		
	out			13 : 50		10	

Time & Motion Study

Organization: Enviro-Clean

Trip- 3

Date: 22/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 6

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-22	in	65101	400	13 : 55	5		
	out			14 : 0		5	
Dumping site	in	65106	5,000	14 : 30	30		Dandora
Start dumping				14 : 30	0		
Finish dumping				14 : 50		20	
Dumping site	out			14 : 51	1		
Reach to workshop	in						
Total			15,000		87	84	Total min.: 171 min.
Collection			6,000		36	64	
Transportation			9,000		50		
Inside the dumping site			0		1	20	Dumping time.: 21 min.
Idling time							

Time & Motion Study

Organization: Enviro-Clean Trip-4 Date: 22/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 6

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	65106		14 : 51			Buru Buru IV Residence
Loading-1	in	65110	4,000	15 : 6	15		Buru Buru IV Residence
	out			15 : 8		2	
Loading-2	in	65111	1,000	15 : 13	5		Buru Buru IV Residence
	out			15 : 14		1	
Loading-3	in	65111.5	500	15 : 15	1		Buru Buru IV Residence
	out			15 : 17		2	
Loading-4	in	65113	1,500	15 : 30	13		Tena (Residence)
	out			15 : 32		2	
Loading-5	in	65113.5	500	15 : 33	1		Tena (Residence)
	out			15 : 36		3	
Loading-6	in	65114	500	15 : 40	4		Tena (Residence)
	out			15 : 50		10	
Loading-7	in	65115	1,000	15 : 50	0		Tena (Residence)
	out			16 : 0		10	
Dumping site	in	65119	4,000	16 : 20	20		Dumped at Dandora
Start dumping				16 : 21	1		
Finish dumping				16 : 30		9	
Dumping site	out			16 : 31	1		One hour idling time (lunch)
Reach to workshop	in	65121	2,000	17 : 37	66		
Total			15,000		127	39	Total min.: 166 min.
Collection			5,000		24	30	
Transportation			10,000		41		
Inside the dumping site			0		2	9	Dumping time.: 11 min.
Idling time					60		

Time & Motion Study

Organization: Enviro-Clean

Trip- 1 Date: 24/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 4

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	65140		10 : 0			Thika Rd, Uhuru highway,
Loading-1	in	65151	11,000	10 : 39	39		Kenyatta Ave, Valley Rd,
	out			12 : 5		86	Argwings Kodhek Rd,
							Yaya centre
Dumping site	in	65162	11,000	12 : 50	45		
Start dumping				12 : 52	2		
Finish dumping				13 : 1		9	
Dumping site	out			13 : 2	1		
Reach to workshop	in			:			
Total			22,000		87	95	Total min.: 182 min.
Collection			0		0	86	
Transportation			22,000		84		
Inside the dumping site			0		3	9	Dumping time.: 12 min.
Idling time							

Time & Motion Study

Organization: Enviro-Clean

Trip- 2

Date: 24/11/97

Vehicle No. KAB258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 4

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	65162		13 : 2			
Loading-1	in	65173	11,000	13 : 40	38		
	out			15 : 26		106	
Dumping site	in	65186	13,000	16 : 15	49		Yaya centre, Ngong Rd,
Start dumping				16 : 15	0		TSP Rd, Upper hill
Finish dumping				16 : 41		26	
Dumping site	out			16 : 41	0		Dumped at Dandora
Reach to workshop	in	65188	2,000	16 : 58	17		
Total			26,000		104	132	Total min.: 236 min.
Collection			0		0	106	
Transportation			26,000		104		
Inside the dumping site			0		0	26	Dumping time.: 26 min.
Idling time							

Time & Motion Study

Organization: Enviro-Clean Trip- 1 Date: 25/11/97

Vehicle No. KAB258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 4

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	65211		8 : 30			Buru Buru, Jogoo Rd,
Loading-1	in	65216	5,000	8 : 40	10		Lusaka Rd, Industrial area
	out			9 : 15		35	Commercial St, Uhuru high-
Loading-2	in	65220	4,000	9 : 35	20		way, Processional way,
	out			11 : 45		130	Pan Apic hotel
							Vehicle held in polic station
							for 1 1/2 hour (90mins)
Dumping site	in	65232	12,000	14 : 12	147		Dumping site - Dandora
Start dumping							
Finish dumping							
Dumping site	out						
Reach to workshop	in						
Total			21,000		177	165	Total min.: 342 min.
Collection			4,000		20	165	
Transportation			17,000		67		
Inside the dumping site			0		0	0	Dumping time.: min.
Idling time					90		

Time & Motion Study

Organization: Enviro-Clean Trip- 2 Date: 25/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 4

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	65232		14 : 12			Dandora, Thika Rd, Muranga
Loading-1	in	65243	11,000	15 : 17	65		Rd, Uhuru highway, kenyatta
	out			16 : 19		62	Ave, Argwings Kodhek Rd, Yaya centre
							Paused at the head office for 30mins
Dumping site	in	65256	13,000	17 : 10	51		Dandora
Start dumping				17 : 11	1		
Finish dumping				17 : 20		9	
Dumping site	out			17 : 21	1		
Reach to workshop	in	65257	1,000	17 : 30	9		
Total			25,000		127	71	Total min.: 198 min.
Collection			0		0	62	
Transportation			25,000		95		
Inside the dumping site			0		2	9	Dumping time.: 11 min.
Idling time					30		

Time & Motion Study

Organization: Enviro-Clean

Trip- 1 Date: 12/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 3

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	64632		9 : 20			Buru Buru, Jogoo Rd,
Loading-1	in	64639	7,000	9 : 40	20		Jogoo Rd, Ngong Rd
	out			11 : 25		105	(PANAFRIC)
Dumping site	in	64646	7,000	11 : 55	30		
Start dumping				11 : 58	3		
Finish dumping				12 : 15		17	Off to the garage
Dumping site	out	64646	0	12 : 16	1		
Reach to garage	in	64650	4,000	12 : 25	9		
Total			18,000		63	122	Total min.: 185 min.
Collection			0		0	105	
Transportation			18,000		59		
Inside the dumping site			0		4	17	Dumping time.: 21 min.
Idling time							

Time & Motion Study

Organization: Enviro-Clean Trip- 2 Date: 12/11/97

Vehicle No. KAE258X

Loading Capacity: 2t

Researcher's name: Rhoda Wagaki

No. of Crew: 3

Estimated Volume: 5.5m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from garage	out	64650		12 : 30			Huruma Rd, Thika Rd,
Loading-1	in	64660	10,000	13 : 0	30		Hurlingham residentials
	out			13 : 1		1	
Loading-2	in	64660.5	500	13 : 2	1		
	out			13 : 2		0	
Loading-3	in	64662	1,500	13 : 10	8		
	out			13 : 10		0	
Loading-4	in	64662.3	300	13 : 15	5		
	out			13 : 16		1	
Loading-5	in	64662.3	0	13 : 17	1		
	out			13 : 18		1	
Loading-6	in	64662.6	300	13 : 19	1		
	out			13 : 22		3	
Loading-7	in	64663	400	13 : 25	3		Yaya centres
	out			14 : 52		87	
Loading-8	in	64663.5	500	14 : 58	6		
	out			15 : 0		2	Ngong Rd, town, Jogoo Rd,
Dumping site	in	64673	9,500	15 : 30	30		Donholm
Start dumping				15 : 30	0		
Finish dumping				15 : 40		10	
Dumping site	out	64673	0	15 : 50	10		
Reach to workshop	in	64683	10,000	16 : 10	20		
Total			33,000		115	105	Total min.: 220 min.
Collection			3,500		25	95	
Transportation			29,500		80		
Inside the dumping site			0		10	10	Dumping time.: 20 min.
Idling time							



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