DOMESTIC REFUSE DISPOSAL (K) LIMITED
(DRDS)

Time & Motion Study Organization:DRDS Trip- 1 Date:16th May 1997

Vehicle No. KAG 975 Loading Capacity:7 TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	33536.5		8 : 35			Caltex-Petrol-Woodley rd.
Loading-1	in	33538.5	2,000	8 : 44	9		Dennis Pritt rd. State house.
	out			8 : 45		1	Thomis state house rd.
Loading-2	in	33539.5	1,000	8 : 48	3		Milimani rd. Dennis Pritt rd.
	out			8 : 50		2	Kayahwe rd. Galama rd.
Loading-3	in	33542.5	3,000	8 : 56	4		Kilimani-Kirichwa road
	out			9 : 0		4	Kirichwa Gardens Jeikins
Loading-4	in	33543.5	1,000	9 : 2	2		court
	out			9 : 6		4	Therese (Kirichwa Gardens)
Loading-5	in	33543.6	100	9 : 7	1		gatheru(Kirichwa Gardens)
	out			9 : 8		1	ICRC
Loading-6	in	33544.1	500	9 : 10	2		
	out			9 : 13		3	
Loading-7	in	33544.4	300	9 : 15	2		
	out			9 : 16		1	
Loading-8	in	33544.5	100	9 : 16	0		Kimani Kairo
	out			9 : 17		1	
Loading-9	in	33544.7	200	9 : 18	1		Mtoni apartments
	out			9 : 24		6	Argwing Kodhek road
Loading-10	in	33545	300	9 : 26	2		Orchid vauey Diani rd.
	out			9 : 28		2	Medicins by monde
Loading-11	in	33545.1	100	9 : 29	1		Ole dume rd. Bernadared
	out			9 : 30		1	Oloitoktok rd. Village Estate
Loading-12	in	33545.3	200	9 : 31	1		Oloitoktok rd. Uiis (American
	out			9 : 32		1	Embassy) Gitanga rd. Gitanga
Loading-13	in	33545.9	600	9 : 35	4		Lane Maroi Avenue Kunde
	out			9 : 39		4	Lane
Loading-14	in	33546	300	9 : 41	2		
	out			9 : 42		1	
Loading-15	in	33546.1	100	9 : 43	1		
	out			9 : 44		1	
Loading-16	in		100	9 : 45	1		
	out			9 : 46		1	
Loading-17	in	33546.2	100	9 : 46	0		Ginge road
	out			9 49		3	
Loading-18	in	33546.3	100	9 : 50	1		Kunde road
	out			9 : 51		1	
Loading-19	in	33546.4	100	9 : 52	1		Hendred Ave (Njeri Kirira)
	out			9 : 53		1	Hendred Ave (Tina Tuja)
Loading-20	in	33546.5	100	9 : 54	1		Mbaazi Avenue
	out			9 : 55		1	
Loading-21	in	33546.6	100	9 : 56	1		
	out			9 57		1	
Loading-22	in	33546.8	200	9 : 59	2		
	out			10 : 0		1	Masanduku lane. Lavington
Loading-23	in	33546.9	100	10 : 0	0		vanga rd. Gitanga rd. Gitanga
	out			10 : 1		1	close. Gitanga rd. Clyde
Loading-24	in	33547.2	300	10 : 5	10		Gardens. Gitanga rd. Hatheru rd.
	out			10 : 6		1	

Time & Motion Study Organization:DRDS Trip- 1 Date:16th May 1997

Vehicle No. KAG 975 Loading Capacity:7 TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in	33547.35	150	10 : 7	1		
	out			10 : 9		2	
Loading-26	in	33547.65	300	10 : 10	1		
	out			10 : 11		1	
Loading-27	in	33547.85	150	10 : 14	3		Bistow flats. James Gachuru rd.
	out			10 : 15		1	Elmboro rd. Pizza corner. James
Loading-28	in	33549.85	2000	10 : 20	5		Gachuru rd. Kingara rd. Kingara
	out			10 : 25		5	court. Kangara lane.
Loading-29	in	33551.85	2000	10 : 30	5		
	out			10 : 32		2	Kingara apartment. Riara rd.
Loading-30	in	33552.05	200	10 : 33	1		Riara rd.
	out			10 : 34		1	
Loading-31	in	33552.15	100	10 : 36	2		
	out			10 : 37		1	
Loading-32	in	33552.25	100	10 : 38	1		
	out			10 : 40			
Loading-33	in	33552.35	100	10 : 41	1		Erro court
	out			10 : 44		3	Makini road
Loading-34	in	33552.45	100	10 : 45	1		Makini lane
	out			10 : 46		1	
Loading-35	in	33552.55	100	10 : 47	1		Riara road
	out			10 : 48		1	
Loading-36	in	33552.65	100	10 : 49	1		Masai court
	out			10 : 59		10	
Loading-37	in	33552.75	100	11 : 0	1		Riara lane
	out			11 : 1		1	Ole dume rd. Cric
Loading-38	in	33552.85	100	11 : 2	1		Ngong rd. Bitho homes. Ngong
	out			11 : 5		3	rd. Ndemi Gardens. Ngong rd.
Loading-39	in	33552.95	100	11 : 6	1		Ndemi rd. Balrwn rd. Ndemi rd.
	out			11 : 20		14	Ole dume rd. Muringa rd.
Loading-40	in	33553.05	100	11 : 21	1		Ndemi rd.
	out			11 : 24		3	
Loading-41	in	33553.2	150	11 : 29	5		
	out			11 : 30		1	
Loading-42	in	33553.3	100	11 : 31	1		
	out			11 : 32		1	
Loading-43	in	33553.4	100	11 : 33	1		
	out			11 : 35		2	
Loading-44	in	33553.5	100	11 : 36	1		
	out			11 : 37		1	
Loading-45	in	33553.6	100	11 : 38	1		Kilungiu road
	out			11 : 40		2	
Loading-46	in	33553.7	100	11 : 41	1		Kilungiu close. Elgeyo marak rd.
	out			11 : 42		1	Kilimani close. Muringa rd.
Loading-47	in	33553.85	150	11 : 45	14		Muringa rd.
	out			11 : 55		10	
Loading-48	in	33553.95	100	11 : 59	4		
	out			12 : 0		1	

Time & Motion Study Organization:DRDS Trip- 1 Date:16th May 1997

Vehicle No. KAG 975 Loading Capacity:7 TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in	33554.1	150	12 : 1	1		Ndemi road
	out			12 : 5		4	
Loading-50	in	33554.2	100	12 : 7	2		Ndemi court
	out			12 : 13		6	
Loading-51	in	33554.3	100	12 : 14	1		Oasis villas
	out			12 : 15		1	
Loading-52	in	33554.4	100	12 : 15	0		Russian house
	out			12 : 16		1	
Loading-53	in	33554.5	100	12 : 16	0		Magi House (Elegant flat)
	out			12 : 17		1	
Loading-54	in	33554.55	150	12 : 19	2		Kilimani court
	out			12 : 23		4	
Loading-55	in	33554.7	150	12 : 24	1		Kirichwa
	out			12 : 25		1	Kirichwa road
Loading-56	in	33554.9	200	12 : 26	1		Kirichwa lane
	out			12 : 27		1	
Loading-57	in	33555.05	150	12 : 28	1		Kirichwa lane
	out			12 : 30		2	
Loading-58	in	33555.15	100	12 : 30	0		Kirichwa lane
	out			12 : 31		1	Kirichwa road
Loading-59	in	33555.3	150	12 : 33	2		Kirichwa lane
	out			12 : 35		2	Flats Lenana rd.
Loading-60	in						Finish loading back to w/ shop
	out			12 : 40	5		Jerusalem (collect papers)
Loading-61	in			13 : 23	43		
	out			:			
Loading-62	in			:	0		
	out			:		0	
Loading-63	in			:	0		
	out			:		0	
Loading-64	in			:	0		
	out			:		0	
Dumping site	in	33570.3	15,000	14 : 45	82		Dandora
Start dumping				:			
Finish dumping				:		0	
Dumping site	out			15 : 35	50		
Reach to workshop	in	33585.3	15,000	17 : 0	85		
Total			49,150		383	136	Total min.:519 min.
Collection			17,150		165	136	
Transportation			32,000		168		
Inside the dumping site			0		50	0	Dumping time
Idling time							

Time & Motion Study Organization:DRDS Trip- 1 Date:16th May 1997

Vehicle No. KUL 647 Loading Capacity:2.8 TON Researcher's name: Arafa

No. of Crew: 3 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 30			
Loading-1	in		500	8 : 35	5		Lenana-Kilimani road
	out			8 : 40		5	
Loading-2	in		200	8 : 41	1		
	out			8 : 45		4	
Loading-3	in		70	8 : 46	1		
	out			8 : 48		2	
Loading-4	in		1,000	8 : 50	2		
	out			8 : 51		1	
Loading-5	in		100	8 : 52	1		
	out			8 : 54		2	
Loading-6	in		190	8 : 56	2		
	out			9 : 0		4	
Loading-7	in		500	9 : 3	3		Jibovu-Mtitu road
	out			9 : 9		6	
Loading-8	in		500	9 : 12	3		Mtitu-Theta road
	out			9 : 15		3	
Loading-9	in		200	9 : 17	2		
	out			9 : 20		3	
Loading-10	in		300	9 : 24	4		
	out			9 : 24		0	
Loading-11	in		1000	9 : 30	6		Lenana-denis road
	out			9 : 35		5	
Loading-12	in		1020	9 : 40	5		Denis-Maalim road
	out			9 : 45		5	
Loading-13	in		900	9 : 48	3		
	out			9 : 55		7	
Loading-14	in		800	10 : 0	5		
	out			10 : 4		4	
Loading-15	in		200	10 : 7	3		
	out			10 : 9		2	
Loading-16	in		600	10 : 9	0		
	out			10 : 10		1	
Loading-17	in		200	10 : 12	2		
	out			10 : 13		1	
Loading-18	in		200	10 : 14	1		Lenana road to woodland road
	out			10 : 15		1	
Loading-19	in		300	10 : 18	3		Lenana road to TRI hotel
	out			10 : 19		1	
Loading-20	in		150	10 : 20	1		
	out			10 : 24		4	
Loading-21	in		190	10 : 25	1		
	out			10 : 27		2	
Loading-22	in		100	10 : 30	3		
	out			10 : 31		1	
Loading-23	in		200	10 : 32	1		
	out			10 : 33		1	
Loading-24	in		70	10 : 34	1		
	out			10 : 37		3	

Time & Motion Study Organization:DRDS Trip- 1 Date:16th May 1997

Vehicle No. KUL 647 Loading Capacity:2.8 TON Researcher's name: Arafa

No. of Crew: 3 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in		210	10 : 40	3		
	out			10 : 41		1	
Loading-26	in		170	10 : 43	2		
	out			10 : 45		2	
Loading-27	in		400	10 : 47	2		Argwings road
	out			10 : 49		2	
Loading-28	in		700	10 : 50	1		Gemina road
	out			10 : 51		1	
Loading-29	in		100	10 : 52	1		
	out			10 : 54		2	
Loading-30	in		400	11 : 0	6		
	out			11 : 1		1	
Loading-31	in		250	11 : 2	1		
	out			11 : 3		1	
Loading-32	in		70	11 : 4	1		
	out			11 : 4		0	
Loading-33	in		1,000	11 : 10	6		Ngong road
	out			11 : 11		1	
Loading-34	in		300	11 : 12	1		Kabarnet
	out			11 : 13		1	
Loading-35	in		120	11 : 14	1		
	out			11 : 15		1	
Loading-36	in		1,400	11 : 20	5		Mugo Kibiro road
	out			11 : 23		3	
Loading-37	in		1,000	11 : 26	3		Woodland road
	out			11 : 27		1	
Loading-38	in		900	11 : 30	3		
	out			11 : 31		1	
Loading-39	in		200	11 : 32	1		
	out			11 : 33		1	
Loading-40	in		400	11 : 35	2		
	out			11 : 36		1	Sasam road
Loading-41	in		200	11 : 37	1		
	out			11 : 38		1	
Loading-42	in		150	11 : 39	1		To Dandora dumping site
	out			11 : 42		3	via Lenana road
Dumping site	in		14,000	12 : 15	33		
Start dumping				:			
Finish dumping				:		0	
Dumping site	out		12,000	13 : 10	55		
Reach to workshop	in		13,000	16 : 5	175		
Total			56,460		363	92	Total min.: 455 min.
Collection			16,960		95	92	
Transportation			27,500		213		
Inside the dumping site			12,000		55	0	Dumping time
Idling time							

Time & Motion Study Organization:DRDS Trip- 1 Date:16th May 1997

Vehicle No. KUL 647 Loading Capacity:2.4 TON Researcher's name: A. Ngaara

No. of Crew: 3 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	184055		11 : 45			
Loading-1	in	184055.5	500	11 : 46	1		Ring Kodhek road
	out			12 : 1		15	
Loading-2	in	185056.3	800	12 : 4	3		Ngong road
	out			12 : 10		6	
Loading-3	in	185056.4	50	12 : 11	1		Ngong road
	out			12 : 42		31	
Loading-4	in	185056.6	200	12 : 46	4		Ngong road to Mbagathi-Langata
	out			12 : 47		1	to Enterprise via Mombasa road
Loading-5	in	185069.6	13,000	13 : 10	23		
	out			13 : 45		35	
Loading-6	in			:	0		To Dumping site through
	out			:		0	Enterprise rd. Likoni rd. Jogoo rd,
Loading-7	in			:	0		Outering back Komarock-
	out			:		0	Mutarakwa rd.-Outering-Jogoo-
Loading-8	in			:	0		Likoni-Lunga Lunga to NCC
	out			:		0	vehicle weigh center. Hullingham
Loading-9	in			:	0		
	out			:		0	
Loading-10	in			:	0		
	out			:		0	
Loading-11	in			:	0		Idling time: 8:00 to 11:45
	out			:		0	
Loading-12	in			:	0		
	out			:		0	
Loading-13	in			:	0		
	out			:		0	
Loading-14	in			:	0		
	out			:		0	
Loading-15	in			:	0		
	out			:		0	
Loading-16	in			:	0		
	out			:		0	
Dumping site	in	185083.6	14,000	14 : 50	65		
Start duroping				15 : 0	10		
Finish dumping				16 : 0		60	
Dumping site	out			16 : 2	2		
Reach to workshop	in	185097.6	14,000	18 : 0	118		
Total			42,550		227	148	Total min.: 375 min.
Collection			14,050		31	88	
Transportation			28,500		184		
Inside the dumping site			0		12	60	Dumping time
Idling time							

Time & Motion Study Organization:DRDS Trip- 1 Date:16th May 1997

Vehicle No. KXX 829 Loading Capacity:2.8 TON Researcher's name: R. W. Nyagah

No. of Crew: 4 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			10 : 10			
Loading-1	in		3,150	10 : 30	20		Industrial area
	out			11 : 35		65	
Dumping site	in		4,800	12 : 45	70		
Start dumping				:			
Finish dumping				:			
Dumping site	out			13 : 5	20		Idling time:2hrs 20min
Reach to workshop	in		5,065	16 : 40	215		due to Mechanical problem
Total			13,015		325	65	Total min.: 390 min.
Collection			0		0	65	
Transportation			13,015		135		
Inside the dumping site			0		20	0	Dumping time
Idling time					170		Mechanical problem/Lunch break

Time & Motion Study Organization:DRDS Trip- 1 Date:17th May 1997

Vehicle No. KAG 975 Loading Capacity:7 TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 38			
Loading-1	in		2,500	8 : 49	11		Argwings Kodhek rd.-
	out			8 : 55		6	Marakwet Elgeyo rd.-Muringo
Loading-2	in		5,000	9 : 15	20		rd.-Blairlodge-Ngong rd.-
	out			9 : 25		10	Elgeyo-Marakwet rd.-
Loading-3	in		1,000	9 : 29	4		Highcourt Red close lane-Hotel
	out			9 : 31		2	county-Tamarid Rest.-Jogoo rd.-
Loading-4	in		700	9 : 34	3		Outering rd.-Airport North rd.-
	out			9 : 40		6	Embakasi village- Embakasi rd.-
Loading-5	in		10,000	10 : 43	63		Haile Selassie Ave.-American
	out			11 : 20		37	Embassy lunch break
Loading-6	in		200	11 : 30	10		Jerusalem
	out			11 : 35		5	Dandora Dumping site-Buru
Loading-7	in		100	11 : 40	5		Buru rd.-Mumias rd.-Outering
	out			11 : 50		10	rd.-Mutarakwa rd.-Komarock rd.
Loading-8	in		10,000	12 : 15	25		
	out			13 : 48		93	
Loading-9	in		5,000	14 : 30	42		
	out			14 : 50		20	
Loading-10	in			:	0		
	out			:		0	
Loading-11	in			:	0		
	out			:		0	
Loading-12	in			:	0		
	out			:		0	
Loading-13	in			:	0		
	out			:		0	
Loading-14	in			:	0		
	out			:		0	
Loading-15	in			:	0		
	out			:		0	
Loading-16	in			:	0		
	out			:		0	
Dumping site	in		4,000	15 : 10	20		Dandora
Start dumping				:			Juja rd.-Outering rd.-Thika rd.-
Finish dumping				:		0	Forest rd.-Museum-Hiu rd.-
Dumping site	out			16 : 10	70		Uhuru Highway-State house rd.-
Reach to workshop	in		15,000	17 : 0	50		Lenana rd.
Total			53,500		323	189	Total min.: 512 min.
Collection			32,000		172	189	
Transportation			21,500		81		
Inside the dumping site			0		70	0	Dumping time
Idling time							

Time & Motion Study Organization:DRDS Trip- 1 Date:17th May 1997

Vehicle No. KUZ 647 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 4 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 35			Lenana-Milimani rd.-Kenyatta-
Loading-1	in		5,100	8 : 50	15		Nyerere-Ulturu Highway-
	out			9 : 20		30	Citiromo-Ring rd west-Parklands
Loading-2	in		8,000	9 : 43	23		rd.-(to Mayfair Hotel)
	out			9 : 50		7	
Loading-3	in		40	9 : 52	2		from Mayfair-Limuru rd.-
	out			9 : 54		2	Muranga rd.-Thika rd.-Outering
Loading-4	in		30	9 : 55	1		rd.-Komarock rd.-Mtarakwa rd.
	out			9 : 58		3	(Dandora) Near Ebeneza Head
Loading-5	in			:			Emy then to Mtara rd.-Komarock
	out			:		0	rd.-Dumping site
Loading-6	in						
	out						
Loading-7	in						
	out						
Loading-8	in						
	out						
Loading-9	in						
	out						
Loading-10	in						
	out						
Loading-11	in						After Dumping- Komarock rd.-
	out						Outering rd. (stop for 2h 4min)-
Dumping site	in		13,000	10 : 10	12		Thika rd.- Muranga rd.- Forest rd.
Start dumping			1,000	10 : 21	11		Mesium Hill- Ulturu Highway-
Finish dumping				10 : 38		17	Kenyatta Ave.- Milimani rd.-
Dumping site	out		1,000	10 : 43	5		Ralph Bunche-Lenana rd.-
Reach to workshop	in		14,500	14 : 5	202		w/shop
Total			42,670		271	59	Total min.:330min.
Collection			8,070		26	42	
Transportation			32,600		105		
Inside the dumping site			2,000		16	17	
Idling time					124		

Time & Motion Study Organization:DRDS Trip- 1 Date:19th May 1997

Vehicle No. KAG 975 Loading Capacity:73TON Researcher's name: K. Njuguna

No. of Crew: 4 Estimated Volume:10 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 16			Lenana road-Denis road
Loading-1	in		500	8 : 20	4		Cauetx on Dennis pritt rd.-
	out			8 : 25		5	State house rd.-Uhuru Highway
Loading-2	in		4,000	8 : 40	15		Museum hiu rd.-Forest rd.-
	out			9 : 50		70	Luhya lane visa Oushwai Place
Loading-3	in		100	9 : 51	1		Alkimia-Limuru rd.-Forest rd.-
	out			9 : 52		1	Ring rd.-Ngaro-Centsal meat-
Loading-4	in		1,000	9 : 59	7		Muranga rd.-Muihaiga rd.-
	out			10 : 10		11	Moundsmere-Muthaiga rd.-
Loading-5	in		1,200	10 : 15	5		Muthaiga lane near clanson
	out			10 : 19		4	court-Muthaiga rd.-American
Loading-6	in		500	10 : 22	3		Embassy-Muthaiga rd.-
	out			10 : 24		2	Waiyasha Avenue-Mutundu
Loading-7	in		300	10 : 29	5		close-Mua park rd.-Kiambu rd.
	out			10 : 30		1	Ridge way springs-Kiambu rd.
Loading-8	in		500	10 : 31	1		Ridge way rd.-Ridge way-
	out			10 : 31		0	Kigwa lane-Kigwa rd.-Kigwa
Loading-9	in		5,000	10 : 37	6		Ridge-Garden Estate rd.-Thika
	out			10 : 39		2	rd.-Garden Estate rd.-Kigwa
Loading-10	in		1,000	10 : 42	3		lane-Ridge ways rd.-Kiambu rd.
	out			10 : 44		2	New Runda Estate-Ruarka drive-
Loading-11	in		4000	10 : 50	6		Runda Crescent-Runda drive-
	out			11 : 6		16	New Runda Estate-Ruarka rd.-
Loading-12	in		10000	11 : 20	14		Limuru rd.-Rossylne Lone tree
	out			11 : 25		5	Estate
Loading-13	in		15000	11 : 45	20		
	out			11 : 50		5	
Loading-14	in		2000	12 : 11	21		
	out			12 : 12		1	
Loading-15	in		1000	12 : 15	3		
	out			12 : 17		2	
Loading-16	in		3000	12 : 24	7		Rdsslyne Estate
	out			12 : 25		1	
Loading-17	in		100	12 : 25	0		Limuru road
	out			12 : 26		1	Trid Estate-United Nations Ave.
Loading-18	in		500	12 : 29	3		Gigiri Area-United Nations Ave.
	out			12 : 31		2	Wispers Ave.-Wispers Estate
Loading-19	in		2,000	12 : 39	8		Magnolia close- Gardenia rd.-
	out			12 : 40		1	Lobelia drive-United Nations
Loading-20	in		2,000	12 : 45	5		Ave.-Limuru rd.-Red Hill rd.-
	out			12 : 47		2	Thigiri Estate-Red Hill rd.-Red
Loading-21	in		1,000	12 : 51	4		Hill Drive-Elkins-Red Hill
	out			12 : 59		8	Groove-Martelia-Red Hill rd.-
Loading-22	in		500	13 : 0	1		Thigiri Ridge rd.-
	out			13 : 3		3	
Loading-23	in		200	13 : 5	2		Kontula
	out			13 : 7		2	
Loading-24	in		3,000	13 : 15	8		Thigiri Gardens(No56)
	out			13 : 16		1	Thigiri Gardens(Kelly)

Time & Motion Study Organization:DRDS Trip- 1 Date:19th May 1997

Vehicle No. KAG 975 Loading Capacity:73TON Researcher's name: K. Njuguna

No. of Crew: 4 Estimated Volume:10 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in		1,500	13 : 19	3		Thigiri Ridge rd.-Thigiri close
	out			13 : 20		1	
Loading-26	in		200	13 : 21	1		Thigiri close-Thigiri lane
	out			13 : 24		3	
Loading-27	in		1000	13 : 26	2		
	out			13 : 27		1	
Loading-28	in		100	13 : 27	0		
	out			13 : 28		1	
Loading-29	in		500	13 : 29	1		
	out			13 : 30		1	
Loading-30	in		100	13 : 30	0		
	out			13 : 31		1	
Loading-31	in		500	13 : 36	5		
	out			13 : 42		6	
Loading-32	in		500	13 : 44	2		
	out			13 : 45		1	
Loading-33	in		200	13 : 46	1		Thigiri ridge road
	out			13 : 48		2	Thigiri road
Loading-34	in		800	13 : 58	10		Thigiri road
	out			13 : 59		0	
Loading-35	in		300	13 : 59	0		Thigiri rd.- Peponi rd.
	out			14 : 0		1	The Vauey- Peponi rd.-Lowel
Loading-36	in		500	14 : 1	1		Kabete rd.-Parklands rd.-
	out			14 : 5		20	Waiyaki way-Ring rd.-
Loading-37	in		5,000	14 : 25	20		Westlands-Liza Apartment-
	out			14 : 30			Rhapta rd.-Ring rd.-Westlands
Loading-38	in			:	0		Parklands-Forest rd.-Ring rd.-
	out			:		0	Ngara rd.-Njunja rd.-Ndasdora
Loading-39	in			:	0		Outering rd.-Thika rd.-Forest rd.-
	out			:		0	Museum Hill rd.-Uhuru
Dumping site	in		20,000	16 : 0	90		Highway-State house rd.-
Start dumping				:			Lenana rd.
Finish dumping				:		0	
Dumping site	out			17 : 10	70		
Reach to workshop	in		15,000	17 : 35	25		
Total			104,600		383	186	Total min.:569 min.
Collection			69,100		194	186	
Transportation			35,500		119		
Inside the dumping site			0		70	0	Dumping time
Idling time							Tea Break

Time & Motion Study Organization:DRDS Trip- 1 Date:19th May 1997

Vehicle No. KUL 647 Loading Capacity:2.8 TON Researcher's name: Arafa

No. of Crew: 3 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			11 : 8			
Loading-1	in		3,000	11 : 15	7		Lenana Denis road 3min stop for
	out			11 : 16		1	refueling
Loading-2	in		2,000	11 : 20	4		Denis Milimani road
	out			11 : 24		4	
Loading-3	in		3,500	11 : 28	4		Milimani Lenana resturant
	out			11 : 40		12	
Loading-4	in		4,000	11 : 47	7		Lenana-Ngnong road
	out			11 : 49		2	
Loading-5	in		13,000	12 : 5	16		Mucai-Ring road-Mongo
	out			12 : 6		1	road
Dumping site	in		16,000	12 : 55	49		
Start dumping				:			
Finish dumping				:			
Dumping site	out			14 : 0	65		
Reach to workshop	in		19,000	15 : 45	105		
Total			60,500		257	20	Total min.:277 min.
Collection			22,500		31	20	
Transportation			38,000		100		
Inside the dumping site			0		65	0	Dumping time
Idling time					61		mechanical problem/Fuel

Time & Motion Study Organization:DRDS Trip- 1 Date:19th May 1997

Vehicle No. KUS 997 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 4 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 12			workshop -Woodlands road
							Denis pritt rd.-Petro station
							Fueling for 5 min.
Loading-1	in		5,500	9 : 5	53		Denis pritt-Woodlands-
	out			9 : 10		5	Mbagathi way-Lang'ata-
Loading-2	in		4,000	9 : 40	30		Lusaka-Enterprise rd.-Likoni-
	out			11 : 1		81	Lunga Lunga rd.-(opp KNTC)
Loading-3	in		8	11 : 2	1		(Weight taking of the truck)
	out			11 : 3		1	from Lunga Lunga -Outering
Loading-4	in		12	11 : 7	4		rd.-Airport North rd.-
	out			11 : 10		3	Kenya Airways
Loading-5	in		10	11 : 11	1		Kenya Airways
	out			11 : 12		1	Kenya Airways
Loading-6	in		12	11 : 13	1		Kenya Airways
	out			11 : 17		4	Kenya Airways
Loading-7	in			11 : 50	33		Kenya Airways
	out			12 : 20		30	
Loading-8	in		755	12 : 28	8		Outering rd.-Airways North rd.-
	out			15 : 2		154	Mombasa rd.- Enterprise rd.-
Loading-9	in			:	0		(then art Emergency stop)
	out			:		0	then after stop-Homabay rd.-
Loading-10	in			:	0		(To general pritters) then after
	out			:		0	loading-Homabay- Enterprise
Loading-11	in			:	0		rd.-Likonird.-Jogoo rd.-
	out			:		0	Outering rd.-Mtarakwa rd.-
Loading-12	in			:	0		Komarock rd.-Dumping site
	out			:		0	
Loading-13	in			:	0		
	out			:		0	
Loading-14	in			:	0		
	out			:		0	
Loading-15	in			:	0		
	out			:		0	
Dumping site	in		10,000	16 : 10	68		After Dumping-Komarock rd.-
Start dumping			1,000	16 : 20	10		Outering rd.-Thika rd.- Muranga
Finish dumping				16 : 58		38	Forest rd.-Uhuru Highway-
Dumping site	out		1,000	17 : 3	5		Kenyatta Avenue-Milimani rd.
Reach to workshop	in		14,800	18 : 11	68		Lonana rd.-W/shop
Total			37,097		282	317	Total min.: 599 min.
Collection			10,297		131	279	
Transportation			24,800		131		
Inside the dumping site			2,000		15	38	Dumping time.:53
Idling time					5		Fuelling

Time & Motion Study Organization:DRDS Trip- 1 Date:20th May 1997

Vehicle No. KAG 975 Loading Capacity:3TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:15.9 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 35			Lenana road-Dennis Pritt road
Loading-1	in		1,800	8 : 45	10		Woodland rd.-Valey rd.-Ngong
	out			9 : 15		30	rd.-Mucar drive-Mimosa Court-
Loading-2	in		1,000	9 : 17	2		Ngong rd.-Ring rd.-Kilimani-
	out			9 : 24		7	Gardenia Courts-Sasam Court
Loading-3	in		200	9 : 25	1		Chadia Ave.-Masaba rd.-
	out			9 : 27		2	Kilimani Court-Masaba rd.-
Loading-4	in		1,000	9 : 30	3		Elgeyo rd.-Marakwet rd.-
	out			9 : 34		4	Mingi Property-Kirichwa
Loading-5	in		1,000	9 : 38	4		Gardens-Argwings Kodhek rd.-
	out			9 : 45		7	Tigoni rd.-Duncan Court-
Loading-6	in		1,000	9 : 49	4		Tigoni rd.-Chcuka rd.-Nanu
	out			9 : 55		6	Apartments-Chcuka rd.-
Loading-7	in		700	9 : 56	1		Lenana rd.-Back to w/shop
	out			10 : 10		14	10:00 to 11:07 Lenana rd. Galana
Loading-8	in		2,000	11 : 15	65		rd.-Argwings Kodhek rd.-
	out			11 : 21		6	Ole Odume rd.-Oloi tok tok rd.-
Loading-9	in		1,500	11 : 24	3		Village(sky)-Estate-Gitanga rd.-
	out			11 : 26		2	Muthangai rd.-Stone House-
Loading-10	in		100	11 : 27	1		Muthangai close-Mutthangai
	out			11 : 27		0	rd.-Mageta rd.-Mugumo rd.-
Loading-11	in		200	11 : 28	1		Oleguguini Place-Mji Kendo rd.-
	out			11 : 29		1	Mugumo rd.-Mzima Spring
Loading-12	in		1000	11 : 30	1		Tende Drive-Mzima Springs rd.
	out			11 : 30		0	
Loading-13	in		800	11 : 31	1		
	out			11 : 34		3	
Loading-14	in		600	11 : 35	1		
	out			11 : 36		1	
Loading-15	in		1000	11 : 38	2		
	out			11 : 39		1	
Loading-16	in		200	11 : 39	0		
	out			11 : 46		7	
Loading-17	in		700	11 : 49	3		Mzima springs
	out			11 : 50		1	
Loading-18	in		500	11 : 50	0		Mugumo road
	out			11 : 51		1	
Loading-19	in		1,000	11 : 52	1		Mugumo road
	out			11 : 53		1	
Loading-20	in		500	11 : 54	1		Mugumo road
	out			11 : 54		0	
Loading-21	in		100	11 : 54	0		Mugumo road
	out			11 : 55		1	
Loading-22	in		500	11 : 56	1		Muthangari road
	out			12 : 5		9	On Muthangari road
Loading-23	in		300	12 : 6	1		Jacaranda road
	out			12 : 8		2	
Loading-24	in		200	12 : 9	15		Jacaranda road
	out			12 : 10		1	

Time & Motion Study Organization:DRDS Trip- 1 Date:20th May 1997

Vehicle No. KAG 975 Loading Capacity:3TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:15.9 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in		300	12 : 10	0		Jacaranda road
	out			12 : 11		1	Ramisi rd.-
Loading-26	in		700	12 : 13	2		James Gichuru road
	out			12 : 20		7	Gitanga rd.
Loading-27	in		300	12 : 21	1		Gitanga court
	out			12 : 22		1	Gitanga rd.
Loading-28	in		200	12 : 23	1		Amboseli rd.
	out			12 : 34		11	Lavington Court
Loading-29	in		300	12 : 35	1		Amboseli garedns
	out			12 : 35		0	Amboseli garedns
Loading-30	in		100	12 : 35	0		Amboseli garedns
	out			12 : 36		1	Amboseli Avenue
Loading-31	in		500	12 : 37	1		Amboseli Avenue(along)
	out			12 : 37		0	Amboseli rd.
Loading-32	in		700	12 : 40	3		along Amboseli rd.
	out			12 : 41		1	
Loading-33	in		1,000	12 : 44	3		James Gichuru road
	out			12 : 45		1	Isaac Gathanju rd.
Loading-34	in		1,000	12 : 46	1		O'washiko rd.
	out			12 : 46		0	Isaac Gathanju rd.
Loading-35	in		1,000	12 : 47	1		Chaibi drive
	out			12 : 48		1	Njumbi road
Loading-36	in		700	12 : 50	2		Njumbi road(No.10&11)
	out			12 : 51		1	Njumbi road(No.30)
Loading-37	in		200	12 : 52	1		Njumbi road(No.)
	out			12 : 53		1	Njumbi road(No.65)
Loading-38	in		400	12 : 54	1		Njumbi road(No.26)
	out			12 : 54		0	Njumbi road(No.42)
Loading-39	in		200	12 : 54	0		
	out			12 : 56		2	Elmolo
Loading-40	in		1,000	12 : 59	3		Elmolo drive
	out			12 : 59		0	Pizza Corner
Loading-41	in		700	13 : 0	1		James Gichuru road
	out			13 : 1		1	Kanjata rd. Loreto Convent
Loading-42	in		800	13 : 5	4		James Gichuru road
	out			13 : 6		1	Kabasiran rd.
Loading-43	in		500	13 : 7	1		
	out			13 : 9		2	
Loading-44	in		200	13 : 10	1		
	out			13 : 30		20	
Loading-45	in		800	13 : 35	5		
	out			13 : 36		1	
Loading-46	in		500	13 : 37	1		
	out			13 : 45		8	
Loading-47	in		1000	13 : 46	37		
	out			13 : 47		1	
Loading-48	in		800	13 : 49	19		
	out			13 : 50		1	

Time & Motion Study Organization:DRDS Trip- 1 Date:20th May 1997

Vehicle No. KAG 975 Loading Capacity:3TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:15.9 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in		500	13 : 51	1		Kabasiran Avenue
	out			13 : 51		0	Musagitou rd. Waiyaki way.
Loading-50	in		1,000	13 : 54	1		Waiyaki way cross.
	out			13 : 55		1	Waiyaki way. Elite Garden
Loading-51	in		1,000	13 : 59	4		Kabasiran Avenue. along
	out			14 : 9		10	Kabasiran Avenue. Njokis
Loading-52	in		800	14 : 10	1		Office.
	out			14 : 10		0	Kabasiran Avenue. James
Loading-53	in		1,000	14 : 15	5		Gachuru rd. Waiyaki way.
	out			14 : 19		4	Parklands rd. Forest rd. Luyia
Loading-54	in		800	14 : 24	5		lane. Forest lane flats. Limuru
	out			14 : 25		1	rd. Forest rd. Ring rd. Ngara
Loading:55	in		6,000	14 : 36	11		lunch break
	out			14 : 46		10	Jerusalem
							Buru Buru rd. Mumias rd.
Dumping site	in		11,000	15 : 40	54		Outering rd. Mutarakwa rd.
Start dumping				:			Juja rd. Komarock rd.
Finish dumping				:		0	Dandora, Outering rd , Thika rd ,
Dumping site	out			17 : 0	80		Forest rd., Museum Hill rd.,
Reach to workshop	in		15,000	17 : 30	30		Uhuru Highway, State House
							rd, Lenana rd.
Total			68,900		404	196	Total min.:600 min.
Collection			41,100		230	196	
Transportation			27,800		94		
Inside the dumping site			0		80	0	Dumping time
Idling time							

Time & Motion Study Organization:DRDS Trip- 1 Date:20th May 1997

Vehicle No. KUL 647 Loading Capacity:2.4 TON Researcher's name: A. Ngaara

No. of Crew: 4 Estimated Volume:10 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 30			
Loading-1	in		8,000	9 : 10	40		Lenana -Woodlands road
	out			9 : 15		5	
Loading-2	in		7,000	9 : 40	25		
	out			9 : 45		5	
Loading-3	in		1,000	9 : 50	5		
	out			10 : 0		10	Tea break: 10:10-10:25
Loading-4	in		3,500	10 : 30	30		
	out			12 : 10		100	
Loading-5	in			:			
	out			:		0	To Dumping through State
Loading-6	in			:	0		House way-Uhuru Highway
	out			:		0	Enterprise road-Lusaka road
Loading-7	in			:	0		Jogoo road-Outering road
	out			:		0	Komarock-Mutarakwa road
Loading-8	in			:	0		to Dandora
	out			:		0	
Dumping site	in		15,000	13 : 55	105		
Start dumping				14 : 0	5		
Finish dumping				15 : 5	65	65	
Dumping site	out			15 : 15	10		
Reach to workshop	in			:			
Total			34,500		285	185	Total min.:470 min.
Collection			11,500		45	120	
Transportation			23,000		145	0	
Inside the dumping site			0		80	65	Dumping time
Idling time					15		Tea break

Time & Motion Study Organization:DRDS Trip- 2 Date:20th May 1997

Vehicle No. KUL 647 Loading Capacity:2.4 TON Researcher's name: A. Ngaara

No. of Crew: 4 Estimated Volume:10 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			15 : 15			Dumping site Dandora
Loading-1	in		14,000	15 : 45	30		Komarock-Outering rd.-
	out			16 : 22		37	Mutarakwa-Jogoo-Lusaka-
Loading-2	in			:			Enterprise-Homebay-Dumping
	out			:		0	site-through Homebay-
Loading-3	in			:	0		Enterprise-Lusaka-Jogoo-
	out			:		0	Outering-Mutarakwa-
Loading-4	in			:	0		KomarockTo Dumping site
	out			:		0	then to Komarock-Outering
Loading-5	in			:	0		to staff's home back to
	out			:		0	Mutarakwa-Outering-Thika rd.-
Loading-6	in			:	0		Muranga-Forest-Museum-
	out			:		0	Uhuru Highway-University
Loading-7	in			:	0		way-State house rd.-
	out			:		0	Woodlands-Lenana back
Loading-8	in			:	0		to W/shop
	out			:		0	
Loading-9	in			:	0		
	out			:		0	
Loading-10	in			:	0		
	out			:		0	
Loading-11	in			:	0		
	out			:		0	
Loading-12	in			:	0		
	out			:		0	
Loading-13	in			:	0		
	out			:		0	
Loading-14	in			:	0		
	out			:		0	
Loading-15	in			:	0		
	out			:		0	
Loading-16	in			:	0		
	out			:		0	
Dumping site	in		14,000	17 : 13	51		Dandora Dumping Site
Start dumping				17 : 19	6		
Finish dumping				17 : 28		9	
Dumping site	out			17 : 35	7		
Reach to workshop	in		24,000	18 : 40	65		DRDS Workshop
Total			52,000		159	46	Total min.: 205 min.
Collection			0		0	37	
Transportation			52,000		146	0	
Inside the dumping site			0		13	9	Dumping time
Idling time							

Time & Motion Study Organization:DRDS Trip- 1 Date:20th May 1997

Vehicle No. KUZ647 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 5 Estimated Volume:10 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 31			Woodlands-Denis rd.
Loading-1	in		1,000	8 : 33	2		Argwing Kodhek road
	out			8 : 41		8	
Loading-2	in		5,400	8 : 52	11		Githanga road
	out			8 : 54		2	
Loading-3	in		800	8 : 55	1		James Gichuru road
	out			8 : 56		1	
Loading-4	in		100	8 : 57	1		ORR and associates
	out			9 : 4		7	Apartments
Loading-5	in		330	9 : 6	2		
	out			9 : 10		4	
Loading-6	in		120	9 : 11	1		
	out			9 : 12		1	
Loading-7	in		8	9 : 12	0		River Dale Apartments
	out			9 : 13		1	
Loading-8	in		100	9 : 15	2		Riverside Garden
	out			9 : 16		1	
Loading-9	in		50	9 : 17	1		
	out			9 : 18		1	
Loading-10	in		1,660	9 : 20	2		
	out			9 : 40		20	Riverside Drive
Loading-11	in		100	9 : 41	1		
	out			9 : 42		1	
Loading-12	in		1100	9 : 43	1		
	out			9 : 49		6	
Loading-13	in		50	9 : 49	0		
	out			9 : 53		4	
Loading-14	in		500	9 : 54	1		
	out			9 : 56		2	
Loading-15	in		100	9 : 56	0		
	out			9 : 59		3	
Loading-16	in		400	10 : 0	1		
	out			10 : 1		1	
Loading-17	in		400	10 : 2	1		Along Riverside Drive
	out			10 : 8		6	
Loading-18	in		350	10 : 9	1		
	out			10 : 11		2	
Loading-19	in		900	10 : 13	2		
	out			10 : 17		4	
Loading-20	in		1,000	10 : 18	1		
	out			10 : 19		1	
Loading-21	in		750	10 : 19	0		River side Bank
	out			10 : 24		5	
Loading-22	in		500	10 : 25	1		Kirichwa Groove flats
	out			10 : 26		1	
Loading-23	in		650	10 : 27	1		Along Riverside Drive
	out			10 : 30		3	
Loading-24	in		40	10 : 30	11		
	out			10 : 31		1	

Time & Motion Study Organization:DRDS Trip- 1 Date:20th May 1997

Vehicle No. KUZ647 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 5 Estimated Volume:10 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in		60	10 : 31	0		
	out			10 : 34		3	
Loading-26	in		1,000	10 : 36	2		
	out			10 : 37		1	
Loading-27	in		660	10 : 38	1		
	out			10 : 39		1	Prespress Production
Loading-28	in		400	10 : 39	0		
	out			10 : 42		3	
Loading-29	in		1100	10 : 46	4		Ring road Riverside Drive
	out			10 : 47		1	
Loading-30	in		800	10 : 48	1		Woodoff Kidergarden
	out			10 : 50		2	
Loading-31	in		700	10 : 51	1		Laikipia Close
	out			10 : 52		1	
Loading-32	in		600	10 : 53	1		
	out			10 : 54		1	
Loading-33	in		880	10 : 55	1		Laikia close
	out			11 : 3		8	
Loading-34	in		1,300	11 : 6	4		
	out			11 : 7		3	
Loading-35	in		1,250	11 : 10	6		
	out			11 : 16		1	
Loading-36	in		1,000	11 : 17	1		Githunguri road to
	out			11 : 18		3	Kangundo road
Loading-37	in		1,480	11 : 21	3		Tabere Cresent
	out			11 : 24		3	
Loading-38	in		1450	11 : 27	3		Elite Homes-Ketton College
	out			11 : 28		1	Oleketuado road
Loading-39	in		100	11 : 29	1		
	out			11 : 39		3	
Loading-40	in		1,650	11 : 42	1		
	out			11 : 43		5	
Loading-41	in		1,880	11 : 48	5		Gichuru road-Mandora road
	out			11 : 51		3	Gem lane
Loading-42	in		500	11 : 53	2		
	out			12 : 25		32	
Loading-43	in		250	12 : 26	1		Dik Dik-
	out			12 : 28		2	Mandera road-Gatundu road-
Loading-44	in		100	12 : 28	0		SIAYA road
	out			12 : 29		1	
Loading-45	in		110	12 : 29	0		
	out			12 : 30		1	
Loading-46	in		100	12 : 30	0		
	out			12 : 31		1	
Loading-47	in		200	12 : 32	1		
	out			12 : 34		2	
Loading-48	in		880	12 : 38	4		Gatundu Crescent
	out			12 : 40		2	
Loading-49	in		100	12 : 41	1		Mwingi road
	out			12 : 42		1	
Loading-50	in		900	12 : 46	4		Vihiga road
	out			12 : 48		2	

Time & Motion Study Organization:DRDS Trip- 1 Date:20th May 1997

Vehicle No. KUZ647 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 5 Estimated Volume:10 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-51	in		150	12 : 49	1		
	out			12 : 50		1	
Loading-52	in		190	12 : 51	1		Mukueni road
	out			12 : 52		1	
Loading-53	in		1,450	12 : 55	3		Mukueni-Nyeri-Othaya
	out			12 : 57		2	road
Loading-54	in		100	12 : 59	2		Othaya road-Mugoiri road
	out			13 : 1		2	Kaputei road
Loading-55	in		110	13 : 2	1		Kaputei rd.-Mazeras rd.-
	out			13 : 3		1	Oloi tok tok rd.-Ole Odume-
Loading-56	in		140	13 : 4	1		Argwing Kodhek rd.-Galana rd.
	out			13 : 6		2	Kayahwe rd.-Denis pritt rd.-
Loading-57	in		130	13 : 7	1		State House rd.-Arboretum rd.-
	out			13 : 9		2	State House rd.-University way-
Loading:58	in		105	13 : 10	1		Moi Ave.-Slip rd.-Muranga-
	out			13 : 11		1	Thika rd.-Ring rd. Ngara-
Loading-59	in		11000	13 : 49	38		Juja rd.-First Ave.-Buru Buru
	out			14 : 9		20	rd.-Mumus rd.-Outering-
							Mtarakwa-Komarock rd.-
Dumping site	in		5,000	14 : 30	21		Dumping site-Komarock-Outering
Start dumping			1,000	14 : 40	10		Thika rd.-Muranga-Forest rd.-
Finish dumping				15 : 39		59	Museum Hill rd.-Uhuru Highway-
Dumping site	out		1,000	15 : 43	4		Kenyatta Ave.-Kulmani rd.-Ralph
Reach to workshop	in		15,000	16 : 44	61		Bunchie rd.-Lenana rd.-W/shop
Total			71,233		238	264	Total min.:502 min.
Collection			48,233		140	205	
Transportation			21,000		84		
Inside the dumping site			2,000		46	59	Dumping time
Idling time							

Time & Motion Study Organization:DRDS Trip- 1 Date:21th May 1997

Vehicle No. KUZ647 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 5 Estimated Volume:16 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 17			Lenana rd. Woodlands rd.
Loading-1	in		1,000	8 : 21	4		Denis Pritt rd. Caltex petro
	out			8 : 24		3	station. Fuelling
Loading-2	in		4,500	8 : 36	12		State house rd. Arboterum
	out			8 : 46		10	Ring rd drive site. Chiromo.
Loading-3	in		1,900	8 : 49	3		Ring rd. westlands road
	out			9 : 16		27	Wood Vale Glove
Loading-4	in		3,500	9 : 22	6		Wood Vale Glove. Mpaka rd.
	out			9 : 35		13	Parklands rd. Msapo close.
Loading-5	in		2,600	9 : 44	9		(mayfair casino) Ujijo rd.
	out			9 : 50		6	Ngara rd. Kipande rd.
Loading-6	in		1,000	9 : 53	3		Muranga rd. Kijabe sta.
	out			9 : 56		3	(opp. serigrap Hics) Harry Thku
Loading-7	in		1,100	10 : 0	4		rd. Moi Ave. City Hall way
	out			10 : 4		4	Taifa rd. Harambee Ave.
Loading-8	in		1,200	10 : 9	5		Parliament rd. Haileselasie
	out			10 : 15		6	Ave. Parliament rd. Red Cross
Loading-9	in		2,000	10 : 25	10		lane.(Hotel county) Parliament
	out			10 : 33		8	rd. Haileselasie. Kenya
Loading-10	in		500	10 : 35	2		railways. Haileselasie. Cathedral
	out			10 : 41		6	rd. Hgong rd. Bishop's Garden
Loading-11	in		1200	10 : 45	4		Towers. Bishop rd. Fifth Ngong
	out			10 : 54		9	Ave. Valley rd. Milmani rd.
Loading-12	in		1000	10 : 57	3		Milmani rd. Ralph Bunchie rd.
	out			11 : 2		5	State house rd. Ralph Bunchie
Loading-13	in		1500	11 : 6	4		rd. Lenana rd. (Lenana sports
	out			11 : 18		12	bar& re) Lenana rd. Woodlands
Loading-14	in		2100	11 : 23	5		Argwings Kodhek rd. Valles.
	out			11 : 25		2	Ngong rd. Mucai drive.
Loading-15	in		200	11 : 26	1		Along much drive
	out			11 : 27		1	Mbagathi road
Loading-16	in		800	11 : 29	2		Sunview Academy
	out			11 : 31		2	
Loading-17	in		1,000	11 : 36	5		Mbagathi rd. Ngumo Estate
	out			11 : 38		2	Mbagathi rd. Mbagathi way
Loading-18	in		3,500	11 : 47	9		Langata rd (Straaimore Couege)
	out			12 : 2		15	Olesangale. Langata. Aerodrome
Loading-19	in		2,800	12 9	7		Bunyala. Masaba rd. Masaba
	out			12 : 10		1	rd. Bunyala. Baricho. Lusaka
Loading-20	in		1,500	12 : 14	4		Mombasa. Melili rd .Kiganjo
	out			12 : 23		9	Ave.Muhoho Ave. Muhoho.
Loading-21	in		3,000	12 : 28	5		Kiganjo.Melili rd. Mombasa
	out			12 : 30		2	Enterprise rd. Opposite L22
Loading-22	in		4,000	12 : 44	14		Enterprise rd.(United States
	out			12 : 48		4	Mission) Enterprise rd. Likoni
Loading-23	in		250	12 : 50	2		rd. Jogoo rd. Nile rd.
	out			12 : 53		3	
Loading-24	in		1,000	12 : 56	33		Then Ojuolo rd. Buru Buru rd.
	out			13 : 56		60	Mumius rd. Outering rd.

Time & Motion Study Organization:DRDS Trip- 1 Date:21th May 1997

Vehicle No. KUZ647 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 5 Estimated Volume:16 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in		4,300	14 : 15	19		Mtarakwa rd. Komarock rd.
	out			14 : 36		21	Dumping site
Loading-26	in			:			
	out			:			
Dumping site	in		4,500	14 : 51	15		Komarock rd. Outering rd. Thika
Start dumping				15 : 2	11		rd. Muranga rd. Forest rd.
Finish dumping				15 : 39	63	37	Museum rd. Uhuru Highway.
Dumping site	out		1,000	15 : 49	10		Kenyatta Ave. Mulimani rd.
Reach to workshop	in		15,000	16 : 20	31		Ralph Bunchie rd. Lenana rd.
							W/shop
Total			67,950		305	271	Total min.:576min.
Collection			46,450		171	234	
Transportation			20,500		50	0	
Inside the dumping site			1,000		84	37	Dumping time
Idling time							

Time & Motion Study Organization:DRDS Trip- 1 Date:21st May 1997

Vehicle No. KXX 829 Loading Capacity:3TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:15.9 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	4137338		8 : 46			Lenana rd. Woodlands rd.
Loading-1	in	4137345	8,000	9 : 19	33		Dennis Pritt rd.(Cautex)
	out			9 : 20		1	Kayahwe rd. Galana rd.
Loading-2	in	4137355	10,000	9 : 55	35		Elgeyo markwet rd. Ngong rd.
	out			10 : 3		8	Motoni rd. Lusumpuko.
Loading-3	in	4137360	5,000	10 : 15	12		Motoni rd. Ngong rd. Elgeyo
	out			10 : 23		8	Markwet rd. Argwings Kodhek
Loading-4	in	4137362	2,200	10 : 24	1		rd. Kayahwe rd. Dennis Pritt rd.
	out			10 : 46		22	State Hse rd. University way.
Loading-5	in	4137384	4,000	10 : 56	10		Slip rd. Muranga rd. Park rd.
	out			11 : 0		4	Nairobi Institute. Ring rd.
Loading-6	in	4137424	8,400	11 : 20	20		Ngara. Jogoo rd. Lusaka rd.
	out			11 : 27		7	Enterprise rd. Lsiolo rd. Tim
Loading-7	in	4137508	1,100	11 : 45	18		Jounts. Grandprix Motors ltd.
	out			12 : 14		29	Enterprise rd. Likoni rd.
Loading-8	in	4137519	2,100	12 : 16	2		Nova Industries. Likoni rd.
	out			12 : 20		4	Enterprise rd. Rujistic centre
Loading-9	in	4137540	2,300	12 : 30	10		(No loading) Enterprise rd.
	out			13 : 30		60	Mombasa rd. Airport North rd.
Loading-10	in						Embakasi Village
	out						Embakasi Village flats
Loading-11	in						Airport North rd.
	out						Kenya Airways
Loading-12	in						Airport North rd.
	out						Outering rd. Mutarakwa rd.
							Juja rd. Komarock rd.
Dumping site	in	4137663	1,200	13 : 54	24		Dandora
Start dumping				:			Juja rd. Outering rd. Thika rd.
Finish dumping				:			Forest rd. Museum Hill rd.
Dumping site	out	4137675		14 : 30	36		State Hse rd. Lenana rd.
Reach to workshop	in	4137785	11,000	17 : 50	200		
Total			55,300		401	143	Total min.:544 min.
Collection			35,100		108	143	
Transportation			20,200		257	0	
Inside the dumping site			0		36	0	Dumping time
Idling time							

Time & Motion Study Organization:DRDS Trip- 1 Date:22nd May 1997

Vehicle No. KAG 975 Loading Capacity:3TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:15.9 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 27			Lenana rd. Dennis pritt rd.
Loading-1	in		500	8 : 30	3		Cautex along Dennis pritt rd.
	out			8 : 31		1	Kayahwe rd. Argwings kodhek
Loading-2	in		5,000	8 : 47	16		rd. Gitanga rd. Muthangai rd.
	out			8 : 51		4	Kolloh rd. James Gichuru rd.
Loading-3	in		500	8 : 52	1		Waiyaki way. Shinyanju rd.
	out			8 : 52		0	Loresh
Loading-4	in		500	8 : 54	2		(No.72)(No.135)
	out			8 : 58		4	Thego lane. Kipthagat Groove
Loading-5	in		600	8 : 59	1		Kaumoni rd.
	out			8 : 59		0	along Kaumoni rd. Kaumoni
Loading-6	in		1,000	9 : 0	1		Cresent. Chikamata. Kaumoni
	out			9 : 0		0	Crescent. Kaptagat rd. Loresho
Loading-7	in		500	9 : 1	1		Ridge. Loresho rise. Loresho
	out			9 : 1		0	vale. Loresho Groove.
Loading-8	in		300	9 : 1	0		Kibagare way. Kibagare lane.
	out			9 : 6		5	Kibagare close. Kibagare lane.
Loading-9	in		500	9 : 7	1		along Kibagare lane
	out			9 : 12		5	(Bruzzone & Nyachae's
Loading-10	in		1,200	9 : 15	3		Place
	out			9 : 15		0	
Loading-11	in		1000	9 : 19	4		
	out			9 : 20		1	
Loading-12	in		500	9 : 20	0		
	out			9 : 21		1	
Loading-13	in		700	9 : 24	3		
	out			9 : 30		6	
Loading-14	in		1000	9 : 32	2		
	out			9 : 35		3	
Loading-15	in		1000	9 : 36	1		
	out			9 : 41		5	
Loading-16	in		1200	9 : 44	3		
	out			9 : 45		1	
Loading-17	in		1,000	9 : 46	1		Kabarage valley
	out			9 : 48		2	along Kabagare valley. Loresho
Loading-18	in		2,000	9 : 56	8		ridge rd. Lower kabete rd. Hill
	out			9 : 57		1	view. Hill view crescent. Hill
Loading-19	in		1,000	9 : 59	2		view rise.
	out			10 : 4		5	Hill view rise
Loading-20	in		600	10 : 6	2		
	out			10 : 10		4	
Loading-21	in		400	10 : 11	1		Turkana drive
	out			10 : 12		1	Lake view drive
Loading-22	in		300	10 : 13	1		Elemanta close
	out			10 : 14		1	Naecha rd.
Loading-23	in		1,500	10 : 19	5		along lower Kabete rd.
	out			10 : 20		1	
Loading-24	in		150	10 : 20	10		along lower Kabete rd.
	out			10 : 21		1	

Time & Motion Study Organization:DRDS Trip- 1 Date:22nd May 1997

Vehicle No. KAG 975 Loading Capacity:3TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:15.9 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in		200	10 : 21	0		Lower Kabete road
	out			10 : 22		1	cross, lower kabete rd. along
Loading-26	in		600	10 : 23	1		Lower Kabete road
	out			10 : 29		6	Lower Kabete road
Loading-27	in		2000	10 : 31	2		Ngecha road(Jones)
	out			10 : 31		0	Kitusuru rd.
Loading-28	in		3000	10 : 35	4		
	out			10 : 41		6	
Loading-29	in		400	10 : 42	1		along Kitusuru rd.
	out			10 : 45		3	
Loading-30	in		700	10 : 46	1		tate close
	out			10 : 49		3	Kitusuru rd.
Loading-31	in		1000	10 : 51	2		along Kitusuru rd.
	out			10 : 51		0	(vance No. 3.0)
Loading-32	in		300	10 : 52	1		(No. 2.8 & No. 2.5)
	out			10 : 53		1	
Loading-33	in		1,000	10 : 55	2		Kitusuru rd. cross
	out			10 : 56		1	Kitusuru rd. Peponi rd. along
Loading-34	in		1,200	11 : 0	4		Peponi rd. Spring valley rd.
	out			11 : 0		0	along Spring valley rd.
Loading-35	in		500	11 : 1	1		Bendera lane(along)
	out			11 : 1		0	Spring valley road
Loading-36	in		1,000	11 : 4	3		along Spring valley rd.(cross)
	out			11 : 15		11	along Spring valley rd.(cross)
Loading-37	in		700	11 : 17	2		China Radio International
	out			11 : 21		4	Nairobi Burea
Loading-38	in		300	11 : 25	4		Peponi rd, Peponi Garden
	out			11 : 27		6	(universal house)
Loading-39	in		300	11 : 28	1		Peponi rd. Muanzi rd.
	out			11 : 29		1	Bhagsana court, Mwanzi rd.
Loading-40	in		2,000	11 : 34	5		Aitec
	out			11 : 35		1	Peponi rd. Generalmathnge
Loading-41	in		3,500	11 : 40	5		rd. along Generalmathnge rd.
	out			11 : 44		4	Lower Kabete rd. along Lower
Loading:42	in		350	11 : 45	1		Kabete rd.
	out			11 : 49		4	Lower No. 15
Loading-43	in		400	11 : 50	1		Lower Kabete rd. cross,
	out			11 : 50		0	Kyuna rd. along Kyuna rd.
Loading-44	in		800	11 : 54	4		Mugumo crescent
	out			11 : 54		0	
Loading-45	in		500	11 : 55	1		
	out			11 : 58		3	
Loading-46	in		500	11 : 59	1		
	out			11 : 59		0	
Loading-47	in		1000	12 : 1	11		
	out			12 : 5		4	
Loading-48	in		1000	12 : 7	2		
	out			12 : 10		3	

Time & Motion Study Organization:DRDS Trip- 1 Date:22nd May 1997

Vehicle No. KAG 975 Loading Capacity:3TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:15.9 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in		1,000	12 : 15	5		Kyuna rise
	out			12 : 15		0	Kyuna crescent
Loading-50	in		600	12 : 16	1		along Kyuna crescent
	out			12 : 27		11	Avocado villas
Loading-51	in		1,000	12 : 30	3		Grevillea Groove
	out			12 : 37		7	along Grevillea Groove
Loading-52	in		500	12 : 40	3		(Brookside Garden)
	out			12 : 40		0	Brookside rd. Brookside
Loading-53	in		1,000	12 : 44	4		Groove. Brookside close.
	out			12 : 45		1	Brookside lane. Brookside
Loading-54	in		700	12 : 47	2		Park.
	out			12 : 49		2	
Loading-55	in		1,000	12 : 51	2		
	out			12 : 55		4	Waiyaki way. Parkland rd.
Loading-56	in			:			Forest rd. Muranga rd. Thika
	out			:			rd. Outering rd.
Dumping site	in		18,000	13 : 30	35		After Dumping Dandora
Start dumping				:			Dumping rd. Outering rd.
Finish dumping				:		0	Thika rd. Forest rd. Waiyaki
Dumping site	out			14 : 30	60		way. State house rd.
Reach to workshop	in		15,000	15 : 30			Lenana rd.
Total			85,000		247	139	Total min.:386 min.
Collection			51,500		149	139	
Transportation			33,500		38	0	
Inside the dumping site			0		60	0	Dumping time
Idling time							

Time & Motion Study Organization:DRDS Trip- 1 Date:22nd May 1997

Vehicle No. KUZ647 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 4 Estimated Volume:10 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			9 : 4			Lenana rd. woodlands rd. Denis
							Pritt. Caltex
							Fueling for 4 min.
Loading-1	in		3,500	9 : 18	14		Denis pritt-Kayahwerd-Galana
	out			9 : 25		7	rd-Argwings-Kilichwa-(Masaba
Loading-2	in		6,000	9 : 39	14		Hos.(OPP))-Kilichwa-Argwings-
	out			9 : 41		2	Galana-Kayahwe-Denis Pritt-
Loading-3	in		100	9 : 42	1		State house rd-Arboretum rd-
	out			9 : 45		3	State house rd.-Uhuru Highway
Loading-4	in		800	9 : 47	2		Museum Hill-Westlands rd-
	out			9 : 51		4	(Ledmar court)
Loading-5	in		300	9 : 53	2		westlands rd.-Mukinduri rd.-
	out			9 : 55		2	Mwkinduri close-
Loading-6	in		250	9 : 57	2		Chiromo Lane-Ojijo rd.-Ojijo
	out			10 : 0		3	close-Parklands rd.-Wambugu
Loading-7	in		200	10 : 2	2		Groove.
	out			10 : 3		1	
Loading-8	in		100	10 : 3	0		Wambugu Gloove
	out			10 : 4		1	
Loading-9	in		350	10 : 6	2		Wambugu Gloove
	out			10 : 9		3	
Loading-10	in		500	10 : 11	2		Parklands rd.-Masari rd.-
	out			10 : 12		1	Bhanderi rd.
Loading-11	in		150	10 : 13	1		
	out			10 : 13		0	Bhanderi rd.
Loading-12	in		150	10 : 14	1		M.P.shar staff apartments
	out			10 : 21		7	
Loading-13	in		250	10 : 22	1		Opposite
	out			10 : 23		1	
Loading-14	in		300	10 : 25	2		Parklands road
	out			10 : 26		1	(opposite Impala Hotel)
Loading-15	in		600	10 : 30	4		
	out			10 : 32		2	As Lis
Loading-16	in		300	10 : 35	3		Waiyaki way
	out			10 : 38		3	at cmm offices
Loading-17	in		400	10 : 39	1		Sports road
	out			10 : 41		2	ahead of cetenary house
Loading-18	in		800	10 : 45	4		Lenana road
	out			10 : 47		2	
Loading-19	in		100	10 : 47	0		Sunny Vale Apartments
	out			10 : 49		2	
Loading-20	in		100	10 : 49	0		Opposite the above
	out			10 : 51		2	
Loading-21	in		650	10 : 52	1		David Osieli rd.
	out			10 : 52		0	
Loading-22	in		100	10 : 52	0		along David Osieli road
	out			10 : 53		1	
Loading-23	in		50	10 : 53	4		Liza Apartments
	out			10 : 56		3	

Time & Motion Study Organization:DRDS Trip- 1 Date:22nd May 1997

Vehicle No. KUZ647 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 4 Estimated Volume:10 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-24	in		100	10 : 57	1		Sports road
	out			11 : 0		3	
Loading-25	in		800	11 : 2	2		
	out			11 : 3		1	
Loading-26	in		400	11 : 3	0		
	out			11 : 7		4	
Loading-27	in		300	11 : 8	1		
	out			11 : 51		43	Rapta road
Loading-28	in		200	11 : 52	1		
	out			11 : 53		1	Mimosa road
Loading-29	in		100	11 : 53	0		
	out			11 : 54		1	Hamptom House
Loading-30	in		1000	11 : 56	2		
	out			11 : 57		1	Opp. Hamptom House
Loading-31	in		100	11 : 58	1		
	out			11 : 58		0	
Loading-32	in		1,200	12 : 1	3		church rd. Waiyaki way
	out			12 : 7		6	(American Rewgee committee)
Loading-33	in		500	12 : 9	2		Muthangari drive. Mahiga
	out			12 : 10		1	Mairu ave.
Loading-34	in		1,000	12 : 13	3		waiyaki way. Brook side drive.
	out			12 : 19		6	
Loading-35	in		250	12 : 20	1		Mutundu Lane(Agrivilla)
	out			12 : 24		4	
Loading-36	in		350	12 : 26	2		school lane
	out			12 : 26		0	
Loading-37	in		400	12 : 28	2		Kenya power staff quarters
	out			12 : 31		3	
Loading-38	in		200	12 : 32	1		Karuma road (Kabete Lane)
	out			12 : 33		1	
Loading-39	in		1,500	12 : 35	2		Lower Kabete rd. Peponi rd.
	out			12 : 41		6	General Mathenge Drive
Loading-40	in		200	12 : 42	1		along General Mathenge Drive
	out			12 : 44		2	
Loading-41	in		1,000	12 : 49	5		Oshwal Jain Pry school
	out			12 : 51		2	
Loading-42	in		200	12 : 56	5		Oshwal Jain Pry Girls hostels
	out			12 : 59		3	
Loading-43	in		600	13 : 2	3		Msanaka ave.
	out			13 : 4		2	
Loading-44	in		150	13 : 6	2		Ndovu Ahame Lane
	out			13 : 20		14	
Loading-45	in		200	13 : 22	2		Parklands-2nd Avenue
	out			13 : 24		2	
Loading-46	in		200	13 : 26	2		1st ave. parklands. Masari rd.
	out			13 : 36		10	parklands rd. Forest rd.
Loading-47	in		100	13 : 37	1		Ring rd. Ngra. Juja rd. Buru Buru
	out			13 : 41		4	rd. Mumius rd. Outering.

Time & Motion Study Organization:DRDS Trip- 1 Date:22nd May 1997

Vehicle No. KUZ647 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 4 Estimated Volume:10 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Dumping site	in		13,000	14 : 57	76		Mtarakwa rd. Komarock rd.
Start dumping			800	15 : 5	8		Dumping site- Komarock.
Finish dumping				15 : 39		34	Outering. Thika. Muranga. Forest.
Dumping site	out		800	15 : 42	3		Museum. Uhuru H/way.
Reach to workshop	in		15,000	17 : 1	79		Kenyatta ave. Milimani.
							Ralph Bunchie. Lenana. w/shop
Total			56,700		274	207	Total min :481 min.
Collection			23,600		94	173	
Transportation			31,500		165		
Inside the dumping site			1,600		11	34	Dumping time
Idling time					4		Fuelinbg

Time & Motion Study Organization:DRDS Trip- 1 Date:22nd May 1997

Vehicle No. KXX 829 Loading Capacity:2.4 TON Researcher's name: A. Ngaara

No. of Crew: 5 Estimated Volume:20 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	413788		9 : 0			DRDS w/shop. Lenana rd.
Loading-1	in	413798	10,000	9 : 43	43		Woodland. (Ourings kodhek/
	out			9 : 45		2	woodland reundabout)
Loading-2	in	413798.7	700	9 : 47	2		bck to w/shop through
	out			9 : 48		1	woodland Lenana then out
Loading-3	in	413799	300	9 : 49	1		Lenana woodland, Dennis
	out			9 : 51		2	Pritt to Garage, out through
Loading-4	in	413800	1,000	9 : 55	4		Dennis Pritt, State house
	out			9 : 59		4	University way, Uhuru Highway
Loading-5	in	413800.8	800	10 : 2	3		Chiromo rd, Ring rd, West lands
	out			10 : 3		1	Ring rd, Parklands, General
Loading-6	in	413801.6	800	10 : 7	4		Matherge drive, 3rd Parklands
	out			10 : 9		2	Ave, back to Maori, Mutati,
Loading-7	in	413801.8	200	10 : 10	1		Wangapala, General Mathenge
	out			10 : 11		1	Ring rd. Parklands. Ring rd.
Loading-8	in	413802	200	10 : 13	2		Westlands. Chiromo, Crossway
	out			10 : 14		1	lane, Chiromo, River side drive
Loading-9	in	413802.7	700	10 : 15	1		Mzima spring rd. Mageta ,
	out			10 : 18		3	Gitanga, Ole odume, Argwings
Loading-10	in	413803	300	10 : 19	1		kodhek, Galona, Lenana, Ralph
	out			10 : 22		3	Burnche, Milinoni, Kenyatta
Loading-11	in	413804	1000	10 : 35	13		Ave. Ngong lane, Haille silasie
	out			10 : 36		1	Uhuru Highway, Lusaka, Dunga
Loading-12	in	413804.3	300	10 : 37	1		Paresgalbm Enterprise, road A
	out			10 : 39		2	(in & out) Enterprise Mombasa
Loading-13	in	413814	9700	11 : 4	25		Airport, North rd, To Kairways,
	out			11 : 10		6	out, Airport North rd. Through
Loading-14	in	413832	18000	11 : 58	48		pipeline to Outering, Muterakwa
	out			12 : 10		12	Komarock to Dumping site
Loading-15	in	413841	9000	12 : 34	24		Komarock, Outering, Thika,
	out			14 : 10		96	Muranga, Forest, Uhuru
Loading-16	in			:			Highway, University, State
	out			:			house, woodland, Lenana to
Dumping site	in	413854	13,000	15 : 4	54		w/shop
Start dumping				15 : 7	3		
Finish dumping				15 : 30		23	
Dumping site	out			15 : 33	3		Vehicle developed problem
Reach to workshop	in	413882	28,000	19 : 25	232		16:00-18:50
Total			94,000		465	160	Total min : 625 min.
Collection			43,000		130	137	
Transportation			51,000		159		
Inside the dumping site			0		6	23	Dumping time
Idling time					170		vehicle developed problem

Time & Motion Study Organization:DRDS Trip- 1 Date:23rd May 1997

Vehicle No. KAG 975 Loading Capacity:3TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:15.9 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 37			Lenana rd., Woodlands rd.,
Loading-1	in		500	8 : 41	4		Dennis Pritt rd., Cautex along
	out			8 : 45		4	Dennis Pritt rd., & also for fuel,
Loading-2	in		400	8 : 46	1		Woodland rd.,
	out			8 : 46		0	
Loading-3	in		150	8 : 47	1		along Lenana rd. (vandex house)
	out			8 : 49		2	
Loading-4	in		200	8 : 53	4		Along Lenana road
	out			8 : 56		3	cross Lenana rd., Mtito andei rd.,
Loading-5	in		300	8 : 59	3		Kidram consoutium, Lenana rd.,
	out			9 : 0		1	Theta lane
Loading-6	in		250	9 : 4	4		along Theta lane
	out			9 : 10		6	along Lenana rd.
Loading-7	in		200	9 : 11	1		
	out			9 : 12		1	
Loading-8	in		300	9 : 14	2		Lenana rd. cross,
	out			9 : 15		1	Makuyu lane
Loading-9	in		500	9 : 19	4		Lenana rd.,
	out			9 : 19		0	Woodlands rd.,Dennis Pritt rd
Loading-10	in		200	9 : 21	2		(along)Icse residence &
	out			9 : 24		3	Parking
Loading-11	in		200	9 : 26	2		along Dennis Pritt rd.
	out			9 : 30		4	Rose ave.
Loading-12	in		150	9 : 30	0		The insurance centre
	out			9 : 31		1	Dennis Pritt rd.
Loading-13	in		250	9 : 35	4		Kitale lane
	out			9 : 38		3	Dennis Pritt rd.
Loading-14	in		350	9 : 41	3		Maalim juma rd.
	out			9 : 44		3	Dennis Pritt rd.
Loading-15	in		400	9 : 46	2		Likoni lane(along)
	out			9 : 48		2	
Loading-16	in		150	9 : 49	1		Rurner Apartment
	out			9 : 55		6	
Loading-17	in		900	9 : 59	4		Dennis Pritt rd. along Dennis
	out			10 : 0		1	Pritt rd. along Kayahwe rd.
Loading-18	in		200	10 : 1	1		
	out			10 : 2		1	
Loading-19	in		300	10 : 3	1		Sai villa
	out			10 : 5		2	Kayahwe rd.
Loading-20	in		150	10 : 6	1		along kayahwe rd.
	out			10 : 9		3	
Loading-21	in		100	10 : 10	1		Along galana road
	out			10 : 12		2	junction of Kayahwe & Galana
Loading-22	in		170	10 : 13	1		along Lenana rd.
	out			10 : 14		1	Turbo rd.
Loading-23	in		400	10 : 15	1		Ithingu court(No loading)
	out			10 : 16		1	
Loading-24	in		200	10 : 19	10		Along Turbo road
	out			10 : 21		2	

Time & Motion Study Organization:DRDS Trip- 1 Date:23rd May 1997

Vehicle No. KAG 975 Loading Capacity:3TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:15.9m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in		200	10 : 22	1		Presby Terian church of E.A
	out			10 : 24		2	
Loading:26	in		300	10 : 25	1		Along Nyangumi road
	out			10 : 28		3	
Loading:27	in		200	10 : 29	1		along Lenana rd.
	out			10 : 30		1	
Loading:28	in		100	10 : 30	0		along Lenana rd.
	out			10 : 31		1	
Loading-29	in		200	10 : 32	1		along Kasuku rd.
	out			10 : 34		2	(No. 9,10)
Loading-30	in		200	10 : 34	0		Jabavu rd. (along)
	out			10 : 35		1	chaka rd.
Loading-31	in		150	10 : 36	1		along chaka rd.
	out			10 : 37		1	
Loading-32	in		100	10 : 37	0		nanu apartments
	out			10 : 41		4	
Loading-33	in		200	10 : 44	3		Along Chaka road
	out			10 : 46		2	Tigoni rd., Argwings rd.
Loading-34	in		1,000	10 : 51	5		Across Argwings kodhek rd.
	out			10 : 53		2	Argwings Kodhek rd.
Loading-35	in		1,000	11 : 4	11		along Marcus Garvey rd.
	out			11 : 4		0	
Loading-36	in		200	11 : 5	1		along Marcus Garvey rd.
	out			11 : 6		1	
Loading-37	in		300	11 : 7	1		Robin lane
	out			11 : 7		0	
Loading-38	in		800	11 : 11	4		along Marcus Garvey rd.
	out			11 : 11		0	
Loading-39	in		800	11 : 14	3		along Galuva rd.
	out			11 : 14		0	
Loading-40	in		800	11 : 16	2		along Galuva rd.
	out			11 : 16		0	Gorge Padmore lane
Loading-41	in		2,000	11 : 30	14		Ngong rd. Rose ave. Galuva rd.
	out			11 : 31		1	Kamburu drive. along Kabarnet
Loading-42	in		200	11 : 32	1		rd. along Kabarnet rd.
	out			11 : 33		1	Jamhuri crescent
Loading-43	in		350	11 : 35	2		along Jamhuri crescent
	out			11 : 36		1	Joseph Kangethe rd., Muga
Loading-44	in		2000	11 : 41	5		Kibiru rd., Ngong rd., Ring rd.,
	out			11 : 43		2	Kilimani. along Ring rd. Kilimani
Loading-45	in		300	11 : 45	2		Sasam court along
	out			11 : 46		1	Chania rd.
Loading-46	in		500	11 : 48	2		Orchid courts along
	out			11 : 50		2	Ring rd. Kilimani
Loading-47	in		100	11 : 51	1		Gardenia Courts
	out			11 : 51		0	Kindaruma rd.
Loading-48	in		500	11 : 53	2		along wood rd.
	out			11 : 57		4	chania rd.

Time & Motion Study Organization:DRDS Trip- 1 Date:23rd May 1997

Vehicle No. KAG 975 Loading Capacity:3TON Researcher's name: K. Njuguna

No. of Crew: 3 Estimated Volume:10 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in		500	12 : 0	3		Along Chania road
	out			12 : 0		0	Komo lane
Loading-50	in		300	12 : 1	1		along Komo lane
	out			12 : 2		1	wood avenue
Loading-51	in		500	12 : 4	2		along wood ave.
	out			12 : 7		3	Lenana rd.
Loading-52	in			12 : 13	6		back to w/shop
	out			12 : 20		7	Lenana rd., woodlands rd.,
							State house rd., Uhuru H/way
							University way., Museum Hill rd.
							Forest rd.
							Muranga rd. Thika rd., Outering
							rd., Juja rd., Komarock rd.
Dumping site	in		15,000	12 : 55	35		Dandora, Komarock, Juja,
Start dumping				:			Outering, Thika, Muranga,
Finish dumping				:			Forest, Museum Hill, Uhuru
Dumping site	out			13 : 36	41		H/way, University way, State
Reach to workshop	in		15,000	16 : 15	159		House rd., Woodlands rd.,
							Lenana rd.
Total			50,720		369	96	Total min.:465min.
Collection			20,220		25	96	
Transportation			30,500		198		
Inside the dumping site			0		41	0	Dumping time
Idling time					105		

Time & Motion Study Organization:DRDS Trip- 1 Date:23rd May 1997

Vehicle No. KUS 997 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 5 Estimated Volume:16m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 31			Lenana-Woodlands-Denis Pritt
Loading-1	in		1,000	8 : 35	4		Caltex
	out			8 : 37		2	Fueling
Loading-2	in		1,000	8 : 40	3		Denis Pritt-State house rd-State
	out			8 : 42		2	House ave.-(Thiomi's)
Loading-3	in		800	8 : 46	4		State house ave-State house rd.
	out			8 : 48		2	Milimani road
Loading-4	in		2,500	8 : 58	10		State house rd.-Dennis Pritt rd.-
	out			9 : 0		2	Kayanwe-Argwings Kodhek-
Loading-5	in		400	9 : 4	4		Kirichward.-Kirichwa Gardens
	out			9 : 10		6	
Loading-6	in		100	9 : 11	1		Kirichwa Gardens
	out			9 : 12		1	
Loading-7	in		80	9 : 14	2		Kirichwa Gardens
	out			9 : 29		15	
Loading-8	in		1,000	9 : 31	2		along Argwings Kodhek rd.
	out			9 : 38		7	
Loading-9	in		500	9 : 40	2		Argwings Kodhek rd.-Ole
	out			9 : 44		4	Odume rd.-Diani rd.
Loading-10	in		400	9 : 45	1		
	out			9 : 46		1	
Loading-11	in		400	9 : 48	2		Ole Odume rd.-Gitanga rd.-
	out			9 : 49		1	Argwings Kodhek rd.-Korosho
Loading-12	in		600	9 : 51	2		rd.
	out			9 : 52		1	
Loading-13	in		100	9 : 53	1		
	out			9 : 54		1	
Loading-14	in		350	9 : 55	1		
	out			9 : 57		2	
Loading-15	in		380	9 : 59	2		Along Hendred rr.-Gihge rd.
	out			10 : 0		1	
Loading-16	in		200	10 : 1	1		
	out			10 : 2		1	
Loading-17	in		600	10 : 4	2		Hendred Avenue along
	out			10 : 6		2	Mbagathi Avenue
Loading-18	in		100	10 : 6	0		
	out			10 : 10		4	
Loading-19	in		180	10 : 12	2		
	out			10 : 13		1	
Loading:20	in		100	10 : 14	1		
	out			10 : 15		1	
Loading-21	in		80	10 : 17	2		
	out			10 : 18		1	
Loading-22	in		300	10 : 26	8		Vahga rd.-Githanga road
	out			10 : 28		2	Gitanga close
Loading-23	in		800	10 : 31	3		along Gitanga rd.
	out			10 : 33		2	
Loading-24	in		100	10 : 35	20		Gitahga rd.-along Hathero rd.
	out			10 : 36		1	

Time & Motion Study Organization:DRDS Trip- 1 Date:23rd May 1997

Vehicle No. KUS 997 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 5 Estimated Volume:16m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in		80	10 : 36	0		
	out			10 : 39		3	
Loading-26	in		800	10 : 45	6		Gitahga rd.-James Gichuru-
	out			10 : 55		10	Isaac Gichanju/Pizza Corner
Loading-27	in		3500	11 : 15	20		James Gichuru rd.-Gitanga rd.-
	out			11 : 20		5	Mgong rd.-Riara rd.
Loading-28	in		100	11 : 21	1		(error court)
	out			11 : 22		1	
Loading-29	in		200	11 : 24	2		
	out			11 : 25		1	
Loading-30	in		200	11 : 25	0		
	out			11 : 28		3	
Loading-31	in		200	11 : 30	2		along Makini rd.
	out			11 : 33		3	(Masaai court)
Loading-32	in		200	11 : 35	2		
	out			11 : 38		3	
Loading-33	in		150	11 : 39	1		Masaai court
	out			11 : 42		3	
Loading-34	in		300	11 : 44	2		
	out			11 : 46		2	
Loading-35	in		250	11 : 48	2		
	out			11 : 50		2	
Loading-36	in		100	11 : 51	1		Ole Odume road-Baldwin
	out			11 : 53		2	crescent
Loading-37	in		100	11 : 54	1		
	out			11 : 55		1	
Loading-38	in		1,000	11 : 57	2		
	out			11 : 59		2	
Loading-39	in		200	12 : 1	2		
	out			12 : 5		4	
Loading-40	in		500	12 : 11	6		Demi road
	out			12 : 12		1	
Loading-41	in		100	12 : 13	1		
	out			12 : 14		1	
Loading-42	in		1,400	12 : 19	5		Elgeyo Markwet road-
	out			12 : 24		5	Kilimani close
Loading-43	in		800	12 : 27	3		Elgeyo Markwet road-
	out			12 : 30		3	Oasis villas
Loading-44	in		200	12 : 31	1		
	out			12 : 33		2	
Loading-45	in		100	12 : 36	3		
	out			12 : 38		2	
Loading-46	in		200	12 : 40	2		
	out			12 : 41		1	
Loading-47	in		100	12 : 42	15		Elgeyo Markwet road-
	out			12 : 43		1	(International aid Sweden)
Loading-48	in		100	12 : 45	2		
	out			12 : 47		2	

Time & Motion Study Organization:DRDS Trip- 1 Date:23rd May 1997

Vehicle No. KUS 997 Loading Capacity:5TON Researcher's name: R.W. Nyagah

No. of Crew: 5 Estimated Volume:10 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in		300	12 : 51	4		Kilichwa road
	out			12 : 52		1	
Loading-50	in		400	12 : 56	4		Kilichwa road-along Kilichwa
	out			12 : 59		3	lane
Loading-51	in		180	13 : 1	2		
	out			13 : 4		3	
Loading-52	in		100	13 : 6	2		Ngong road-Ndemi Gardens
	out			13 : 7		1	
Loading-53	in		2,500	13 : 12	5		
	out			13 : 16		4	
				:			Ngong rd.-Ring rd.-Kilimani-
				:			Argwings Kodhek rd.-Chaka rd.
				:			Kasuku rd.-Lenana rd.
				:		0	(The vehicle had a mechanical
				:	0		problem for 49 min.)
				:		0	Then back to
				:	0		Woodlands road-State house road
				:		0	Uhuru High way-Forest road
							Muranga road-Thika road-
Dumping site	in		16,500	15 : 49	153		Outering road-Komarock rd.-
Start dumping			1,000	15 : 56	7		Dumping site-Komarock
Finish dumping				16 : 30		34	Outering-Thika-Muranga-Forest
Dumping site	out		1,000	16 : 39	9		Museum Hill-Uhuru H/way
Reach to workshop	in		15,000	17 : 30	51		Kenyatta ave.-Mulimani-
							Ralph Bunchie-Lenana-w/shop
Total			59,930		399	172	Total min :571min.
Collection			25,430		224	138	
Transportation			32,500		159		
Inside the dumping site			2,000		16	34	Dumping time
Idling time					49		Mechanical problem

Time & Motion Study Organization:DRDS Trip- 1 Date:23rd May 1997

Vehicle No. KXX 829 Loading Capacity:2.4 TON Researcher's name: A. Ngaara

No. of Crew: 4 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	41382		7 : 3			DRDS, W/shop-out through
Loading-1	in	41388.9	7,000	7 : 26	23		lenana, woodlands(to Garage)
	out			7 : 47		21	Denis Pritt to woodlands Lenana
Loading-2	in	41389	100	7 : 56	9		Ralph Bunchie, Kenyatta ave.
	out			7 : 58		2	Nyerere, University way, Uhuru
Loading-3	in	41389.1	100	8 : 3	5		H/way, Chiromo rd, Ring rd,
	out			8 : 18		15	Westlands, Parklands, Kanna rd,
Loading-4	in	41389.2	100	8 : 21	3		Kenyra close, Waiyaki way,
	out			8 : 31		10	Kboduale Groove, Urgo lane,
Loading-5	in	41389.3	100	8 : 32	1		woodlands Groove, Mpolarak,
	out			8 : 42		10	parkland rd, Ojijo rd, back to
Loading-6	in	413897	7,700	9 : 9	27		Parklands road, Moseri, 2n ave.
	out			9 : 12		3	parklands, Limuw rd. Forest rd,
Loading-7	in	413902	5,000	9 : 37	25		Ring rd, Ngala, Mbono rd,
	out			9 : 42		5	Leurview rd (in & out), Muronga
Loading-8	in	413905	3,000	9 : 52	10		Tom Mbeya, River rd, Moi ave.
	out			10 : 1		9	Cibihallway, Tanta rd (in & out),
Loading-9	in	413906	1,000	10 : 4	3		Herambee ave. L.Tumbo ave.
	out			10 : 10		6	Hauleselosire Ngong rd, Br shop
Loading-10	in	413906.3	300	10 : 12	2		rd, Argwings Kodhek Valley rd,
	out			10 : 14		2	Ngong, Mucai drive (in & out),
Loading-11	in	413908.5	2200	10 : 20	6		Ngong Valley rd, woodlands,
	out			10 : 23		3	Lenana rd, back to woodland
Loading-12	in	413908.7	200	10 : 24	1		State house, state house ave,
	out			10 : 52		28	state house rd, University way,
Loading-13	in	413909.1	400	10 : 54	2		Uhuru H/way, Muswn Hill,
	out			10 : 56		2	prest rd, Muranga rd, Thika rd,
Loading-14	in	413910.2	1100	10 : 59	3		Outering rd, Komarock rd,
	out			11 : 18		19	to Dumping site Mukun Dandora
Loading-15	in	413911	800	11 : 21	3		
	out			11 : 30		9	
Loading-16	in	413913	2000	11 : 35	5		
	out			11 : 37		2	
Dumping site	in	413930.4	17,400	12 : 25	48		
Start dumping				12 : 30	5		
Finish dumping				13 : 29		59	
Dumping site	out	413930.5	100	13 : 33	4		
Reach to workshop	in			:			
Total			48,600		185	205	Total min.:390 min.
Collection			24,100		105	146	
Transportation			24,400		71	0	
Inside the dumping site			100		9	59	Dumping time
Idling time							

Time & Motion Study Organization:DRDS Trip- 2 Date:23rd May 1997

Vehicle No. KXX 829 Loading Capacity:2.4 TON Researcher's name: A. Ngaara

No. of Crew: 4 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	413930		13 : 35			Dandora dumping site-out
Loading-1	in	413945	15,000	14 : 0	25		through Komarock-Mutarakwa
	out			14 : 35		35	Outering-Jogoo-Lusaka
Loading-2	in			:			Enterprise-Homabay-Collection
	out			:		0	site-General Printers-Then out
Loading-3	in			:	0		through Homabay-Enterprise
	out			:		0	Lusaka-Lusaka-Outering
Loading-4	in			:	0		Mutarakwa -Komarock
	out			:		0	dumping site
Dumping site	in	413960	15,000	15 : 2	27		dumping site out through
Start dumping				15 : 9	7		Komarock-Outering-Thika-
Finish dumping				15 : 23		14	Muranga-Forest-Museum-hill
Dumping site	out			15 : 55	32		Uhuru H/way-University way
Reach to workshop	in	413981	21,000	17 : 2	67		State house-Denis Pritt-
							woodland-Lenana-w/shop
Total			51,000		158	49	Total min.: 207 min.
Collection			0		0	35	
Transportation			51,000		119		
Inside the dumping site			0		39	14	Dumping time
Idling time							

Time & Motion Study Organization:DRDS Trip- 1 Date:24th May 1997

Vehicle No. KXX 829 Loading Capacity:2.4 TON Researcher's name: A. Ngaara

No. of Crew: 4 Estimated Volume:6 m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	413981		8 : 24			DRDS w/shop out-
Loading-1	in	413988	7,000	8 : 47	23		Lenana rd.-Woodlands-Petrol
	out			9 : 30		43	station for fueling
Loading-2	in			:			Denis Pritt, State house rd.,
	out			:		0	University way, Uhuru H/way,
Loading-3	in			:	0		Museum Hill, Ojijo rd., Parklands
	out			:		0	rd., (Mayfair Hotel) Mpaka rd.
Loading-4	in			:	0		out-Mpaka rd., Parklands rd.,
	out			:		0	Forese rd., Muranga rd.,
Loading-5	in						Thika rd., Outering rd.,
	out						Komarock to Dandora
Loading-6	in						
	out						(Hooked a traffic jam along
Loading-7	in						Outering rd. for about 1hr.)
	out						
Dumping site	in	414004	16,000	10 : 59	89		Komarock rd. to Dumping site
Start dumping				12 : 5	66		in.
Finish dumping				12 : 29		24	
Dumping site	out			12 : 35	6		
Reach to workshop	in			:			
Total			23,000		184	67	Total min.: 251 min.
Collection			0		0	43	
Transportation			23,000		112		
Inside the dumping site			0		72	24	Dumping time
Idling time							

KENYA REFUSE HANDLERS
(KRH)

Time & Motion Study Organization:K.R.H Trip- 1 Date:20th May 1997

Vehicle No.KIM 206 Loading Capacity:1 TON Researcher's name: F.Mwatua

No. of Crew: 2 Estimated Volume:3m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 43			Kalyan Buil. - Kimani st.
Loading-1	in		750	8 : 45	2		Kaunda street-Corner House
	out		0	9 : 3		18	
Loading-2	in		50	9 : 5	2		Kaunda street-Town House
	out		0	9 : 7		2	
Loading-3	in		120	9 : 9	2		Kaunda street-Maman Ngina
	out		0	9 : 11		2	St. Salama House
Loading-4	in		1,000	9 : 16	5		Webera st. M. Ngna- C.
	out			9 : 32		16	Hallway Parliament rd.
Loading-5	in			:			Protection House
	out			:		0	
Dumping site	in		20,000	10 : 10	38		
Start dumping			4	10 : 11	1		
Finish dumping			0	10 : 23		12	
Dumping site	out		4	10 : 55	32		
Reach to workshop	in		23,000	12 : 15	80		
Total			44,928		162	50	Total min.: 212 min.
Collection			1,170		39	38	
Transportation			43,750		90		
Inside the dumping site			8		33	12	Dumping time
Idling time					30		on way back

Time & Motion Study Organization:K.R.H Trip- 1 Date:21st May 1997

Vehicle No.KIM 206 Loading Capacity:1 TON Researcher's name: F.Mwatua

No. of Crew: 2 Estimated Volume:$3m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			9 : 36			
Loading-1	in		750	9 : 40	4		Kaunda street -Corner House
	out		0	10 : 7		27	
Loading-2	in		50	10 : 10	3		Kaunda street-Town House
	out		0	10 : 11		1	
Loading-3	in		120	10 : 13	2		Mama Ngina street-Wabera
	out		0	10 : 33		20	salama house
Loading-4	in		1,000	10 : 39	6		Webera street -City Hall way
	out			10 : 48		9	Parliament road Protection H
Loading-5	in			:			
	out			:		0	To Dumping via Harambee
Loading-6	in			:	0		Avenue-Uhuru Highway
	out			:		0	Airport road-Outering-Embakasi
Loading-7	in			:	0		Quarry
	out			:		0	
Dumping site	in		20,000	11 : 21	33		
Start dumping			4	11 : 23	2		
Finish dumping			0	11 : 30		7	
Dumping site	out		4	11 : 33	3		
Reach to workshop	in		23,500	12 : 38	65		
Total			45,428		118	64	Total min.:182 min.
Collection			1,170		11	48	
Transportation			44,250		102		
Inside the dumping site			8		5	7	Dumping time
Idling time						9	

Time & Motion Study Organization:K.R.H Trip- 1 Date:22nd May 1997

Vehicle No.KIM 206 Loading Capacity:1 TON Researcher's name: F.Mwatua

No. of Crew: 2 Estimated Volume:3m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			9 : 26			Kalyan House-Kimathi-Kaunda st
Loading-1	in		750	9 : 28	2		Kaunda street-Corner House
	out		0	9 : 55		27	
Loading-2	in		50	9 : 56	1		Kaunda st.-Town house
	out		0	9 : 57		1	
Loading-3	in		1,100	10 : 1	4		Wabera st.-City Hall Way
	out		0	10 : 2		1	
Loading-4	in			:			
	out			:		0	
Loading-5	in			:	0		
	out			:		0	
Dumping site	in		20,000	10 : 31	29		To Dumping through
Start dumping			5	10 : 33	2		Uhuru Highway-Mombasa road
Finish dumping			0	10 : 37		4	Outering road-Embakasi Quarry
Dumping site	out		5	10 : 54	17		
Reach to workshop	in		23,000	12 : 33	99		Mechanical problem on
							the way back
Total			44,910		154	33	Total min.:187 min.
Collection			1,150		5	29	
Transportation			43,750		130		
Inside the dumping site			10		19	4	Dumping time
Idling time					55		Mechanical problem

TACENTAC

Time & Motion Study Organization:TACENTAC Trip- 1 Date:16th May 1997

Vehicle No. 1 Loading Capacity:6.5 TON Researcher's name: G. Chege

No. of Crew: 5 Estimated Volume:5m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 45			Mombasa road-Kapiti rd.-
Loading-1	in			9 : 8	23		South C Mbugari Estate
	out			9 : 11		3	
Loading-2	in			9 : 13	2		Mbugari Estate
	out			9 : 19		6	
Loading-3	in			9 : 21	2		Halai Estate
	out			9 : 25		4	
Loading-4	in			9 : 26	1		Halai Estate
	out			9 : 27		1	
Loading-5	in			9 : 28	1		Memon Estate
	out			9 : 29		1	
Loading-6	in			9 : 31	2		Mugoya Phase II
	out			9 : 33		2	
Loading-7	in			9 : 36	3		
	out			9 : 40		4	
Loading-8	in			9 : 43	3		
	out			9 : 46		3	
Loading-9	in			9 : 48	2		
	out			9 : 49		1	
Loading-10	in			9 : 50	1		Mugoya Phase I
	out			9 : 52		2	
Loading-11	in			9 : 54	2		
	out			9 : 56		2	
Loading-12	in			10 : 1	5		
	out			10 : 5		4	
Loading-13	in			10 : 6	1		
	out			10 : 9		3	
Loading-14	in			10 : 12	3		KMA Estate
	out			10 : 15		3	
Loading-15	in			10 : 17	2		
	out			10 : 19		2	To Dumping via Muhoho
Loading-16	in			:			Avenue-Kink rd.Mobasa road-
	out			:			Old Airport-Outering-
Dumping site	in			11 : 4	45		Mutarakwa Dandora
Start dumping				11 : 8	4		
Finish dumping				11 : 45		37	
Dumping site	out			11 : 47	2		
Reach to workshop	in			:			
Total			0		104	78	Total min.:182 min.
Collection			0		30	41	
Transportation			0		68	0	
Inside the dumping site			0		6	37	Dumping time
Idling time					6		Pick up crew

Time & Motion Study Organization:TACENTAC Trip- 2 Date:16th May 1997

Vehicle No. 1 Loading Capacity:6.5 TON Researcher's name: G. Chege

No. of Crew: 5 Estimated Volume:5m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out			11 : 47			
Loading-1	in			12 : 29	42		Belle Vue Estate
	out			12 : 39		10	
Loading-2	in			12 : 45	6		South End -Estate
	out			12 : 50		5	
Loading-3	in			12 : 51	1		
	out			12 : 54		3	
Loading-4	in			12 : 55	1		
	out			13 : 0		5	
Loading-5	in			13 : 1	1		Akiba (Ph IV)
	out			13 : 15		14	(via kapifr. rd-Mombasa rd.)
Loading-6	in			13 : 30	15		Imara Daima Estate
	out			13 : 34		4	(Imara / Daima Drive)
Loading-7	in			13 : 35	1		Lily Close
	out			13 : 38		3	
Loading-8	in			13 : 40	2		MG crescent
	out			13 : 45		5	Zanzibar Bank & Yago lanes;
Loading-9	in			13 : 46	1		Teak & Tamarind closes
	out			13 : 47		1	Siala-Rose-Quinine Lanes
Loading-10	in			13 : 48	1		Podo lane & Ober close
	out			13 : 51		3	
Loading-11	in			13 : 53	2		Nandi flame and Mugumo Lanes
	out			13 : 57		4	
Loading-12	in			13 : 59	2		Coffee, Cypress Boabab, Bombax
	out			14 : 14		15	Acacia and Avocado lanes
Loading-13	in			:			To Dandora Dumping site via
	out			:		0	Mombasa road-Old airport road
				:			Outering road-Mutarakwa to
				:			dumping site
				:			
				:			
				:			
				:			
Dumping site	in			14 : 47	33		Dandora
Start dumping				:			
Finish dumping				:		0	Via Motarakwa rd.- Outering rd.-
Dumping site	out			15 : 23	36		Old Airport rd.- Mombasa rd.-
Reach to workshop	in			15 : 50	27		Imara Daima
Total			0		171	72	Total min.: 243 min.
Collection			0		33	72	
Transportation			0		102		
Inside the dumping site			0		36	0	
Idling time					17		

Time & Motion Study Organization:TACENTAC Trip- 1 Date:17th May 1997

Vehicle No.1 Loading Capacity:6.5 TON Researcher's name: G.Chege

No. of Crew: 5 Estimated Volume:6m^3

Location		Mileage (m)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			9 : 51			Mombasa road-Mbagathi way
Loading-1	in			10 : 28	37		Ngobit road-Ngumo Estate
	out			10 : 34		6	Phase I
Loading-2	in			11 : 4	30		Nairobi west-Kisauni
	out			11 : 9		5	
Loading-3	in			11 : 10	1		Nairobi west- Gandhi Avenue
	out			11 : 14		4	
Loading-4	in			11 : 16	2		Nairobi west -Msufi road
	out			11 : 20		4	
Loading-5	in			11 : 49	29		'Nairobi west
	out			12 : 5		16	
Loading-6	in			12 : 6	1		'Nairobi west
	out			12 : 9		3	
Loading-7	in			12 : 9	0		'Nairobi west
	out			12 : 17		8	
Loading-8	in			12 : 20	3		'Nairobi west - Kifaru estate
	out			12 : 36		16	
Loading-9	in			12 : 37	1		'Nairobi west- Swara Estate
	out			12 : 39		2	
Loading-10	in			12 : 40	1		'Nairobi west
	out			12 : 42		2	
Loading-11	in			12 : 43	1		'Nairobi west Vekari Estate
	out			12 : 45		2	
Loading-12	in			12 : 47	2		'Nairobi west- Soma road
	out			12 : 52		5	
Loading-13	in			12 : 54	2		'Nairobi west - Muthaiti Avenue
	out			12 : 56		2	
Loading-14	in			12 : 57	1		'Nairobi west
	out			12 : 59		2	
Loading-15	in			13 : 12	13		'Nairobi west
	out			13 : 18		6	
Loading-16	in			13 : 20	2		
	out			13 : 21			
Loading-17	in			13 : 25	4		Muhoho Avenue
	out			13 : 26		1	
Loading-18	in			13 : 27	1		South C Estate
	out			13 : 34		7	
Loading-19	in			13 : 35	1		
	out			13 : 38		3	
Loading-20	in			13 : 39	1		
	out			13 : 40		1	
Loading-21	in			13 : 42	2		
	out			13 : 43		1	
Loading-22	in			13 : 45	2		
	out			13 : 48		3	
Loading-23	in			13 : 50	2		
	out			13 : 54		4	

Time & Motion Study Organization:TACENTAC Trip- 1 Date:17th May 1997

Vehicle No.1 Loading Capacity:6.5 TON Researcher's name: G.Chege

No. of Crew: 5 Estimated Volume:6m^3

Location		Mileage (m)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-24	in			13 : 58	4		Muhiti close
	out			14 : 0		2	
Loading-25	in			14 : 2	2		Mtelo road
	out			14 : 6		4	
Loading-26	in			14 : 8	2		Heshima road
	out			14 : 12		4	
Loading-27	in			14 : 13	1		
	out			14 : 14		1	
Loading-28	in			14 : 14	0		
	out			14 : 16		2	
Loading-29	in			14 : 18	2		Mufuti avenue
	out			14 : 23		2	
Loading-30	in			14 : 25	2		Rumi road
	out			14 : 26		1	
Loading-31	in			14 : 27	1		
	out			14 : 35		1	Akiba Phase II
Loading-32	in			14 : 36	1		
	out			14 : 37		1	
Loading-33	in			14 : 38	1		Akiba(PH II)
	out			14 : 46		8	
Loading-34	in			14 : 48	2		
	out			14 : 50		2	
Loading-35	in			14 : 52	2		
	out			14 : 55		3	Muhoho Avenue
Loading-36	in			14 : 58	3		
	out			15 : 0		2	
Loading-37	in			15 : 3	3		Mugoya Estate(Magda lane)
	out			15 : 5		2	
Loading-38	in			15 : 6	1		
	out			15 : 7		1	
Loading-39	in			15 : 8	1		Mugoya Army
	out			15 : 11		3	
Loading-40	in			15 : 13	2		
	out			15 : 15		2	
Loading-41	in			15 : 17	2		
	out			15 : 18		1	
Loading-42	in			15 : 22	4		
	out			15 : 26		4	
Loading-43	in			15 : 30	4		Ruby Estate(Muholo Avenue)
	out			15 : 40		10	Mombasa road-old airport rd
Loading-44	in			15 : 42	2		outering road-mutarakwa rd
	out			15 : 50		8	to Dandora

Time & Motion Study Organization:TACENTAC Trip- 1 Date:17th May 1997

Vehicle No.1 Loading Capacity:6.5 TON Researcher's name: G.Chege

No. of Crew: 5 Estimated Volume:$6m^3$

Location		Mileage (m)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Dumping site	in			16 : 43	53		
Start dumping				:			
Finish dumping				:		0	
Dumping site	out			17 : 31	48		
Reach to workshop	in			18 : 0	29		
Total			0		311	167	Total min.: 478 min.
Collection			0		144	114	
Transportation			0		66		
Inside the dumping site			0		48	0	Dumping time
Idoling time					53	53	

Time & Motion Study Organization:TACENTIC Trip- 1 Date:20th May 1997

Vehicle No.1 Loading Capacity:6.5 TON Researcher's name: G.Chege

No. of Crew: 4 Estimated Volume:$6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			9 : 10			Mombasa rd- Kapiti rd.-
Loading-1	in			9 : 33	23		Muhoho avenue- South C
	out			9 : 39		6	Area Mbugani Estate
Loading-2	in			9 : 40	1		
	out			9 : 45		5	
Loading-3	in			9 : 47	2		
	out			9 : 56		9	
Loading-4	in			10 : 1	5		Halai Estate
	out			10 : 7		6	
Loading-5	in			10 : 7	0		Memon Estate
	out			10 : 9		2	
Loading-6	in			10 : 11	2		Mugoya-Ph II
	out			10 : 19		8	
Loading-7	in			10 : 21	2		
	out			10 : 24		3	
Loading-8	in			10 : 25	1		
	out			10 : 34		9	
Loading-9	in			10 : 36	2		Mugoya PH I
	out			10 : 39		4	
Loading-10	in			10 : 40	1		
	out			10 : 47		1	
Loading-11	in			10 : 48	1		
	out			10 : 59		11	
				11 : 0	1		Vehicle Broke Down
				11 : 3	3		
Loading-12	in			11 : 5	2		
	out			11 : 8		3	
Loading-13	in			11 : 9	1		
	out			11 : 12		3	
Loading-14	in			:			
	out			:		0	
				:	0		
				:		0	
Dumping site	in			:	0		
Start dumping				:	0		
Finish dumping				:		0	
Dumping site	out			:	0		
Reach to workshop	in			:	0		
Total			0		47	70	Total min.:117 min.
Collection			0		24	70	
Transportation			0		23		
Inside the dumping site			0		0	0	Dumping time
Idling time					4		

Time & Motion Study Organization:TACENTIC Trip- 1 Date:21st May 1997

Vehicle No.1 Loading Capacity:6.5 TON Researcher's name: G.Chege

No. of Crew: 4 Estimated Volume:$6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 30			Mombasa- Old Airport- Outer
Loading-1	in			:			ring- Mutarakwa rd.
	out			:		0	
Dumping site	in			9 : 2	32		Dandora
Start dumping				:			
Finish dumping				:		0	
Dumping site	out			9 : 48	46		
Reach to workshop	in			:			
Total			0		78	0	Total min.: 78 min.
Collection			0		0	0	
Transportation			0		32		
Inside the dumping site			0		46	0	Dumping time
Idling time							

Time & Motion Study Organization:TACENTIC Trip- 2 Date:21st May 1997

Vehicle No.1 Loading Capacity:6.5 TON Researcher's name: G.Chege

No. of Crew: 5 Estimated Volume:6m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			9 : 48			
Loading-1	in			10 : 29	41		Ngobit road
	out			10 : 44		15	
Loading-2	in			10 : 54	10		nairobi west-Gandhi avenue
	out			10 : 55		1	
Loading-3	in			10 : 56	1		Kisauni road
	out			10 : 58		2	
Loading-4	in			11 : 3	5		Bukani road
	out			11 : 7		4	
Loading-5	in			11 : 10	3		Paa crescent
	out			11 : 15		5	
Loading-6	in			11 : 17	2		
	out			11 : 21		4	
Loading-7	in			11 : 23	2		
	out			11 : 28		5	
Loading-8	in			11 : 29	1		kifaru crescent
	out			11 : 36		7	
Loading-9	in			11 : 37	1		Swara crescent
	out			11 : 44		7	
Loading-10	in			11 : 45	1		
	out			11 : 52		7	
Loading-11	in			11 : 53	1		Vekaria Estate
	out			11 : 56		3	
Loading-12	in			11 : 57	1		Suma road
	out			12 : 7		10	
Loading-13	in			12 : 12	5		Muthaiti Avenue
	out			12 : 29		17	
Loading-14	in			12 : 30	1		Muhoho Avenue
	out			12 : 37		7	
Loading-15	in			12 : 38	1		Thogoto road
	out			12 : 41		3	
Loading-16	in			12 : 41	0		
	out			12 : 46		5	
Loading-17	in			12 : 47	1		
	out			12 : 50		3	
Loading-18	in			12 : 52	2		
	out			13 : 1		9	
Loading-19	in			13 : 3	2		Muhuti Close
	out			13 : 5		2	
Loading-20	in			13 : 8	3		Mtelo road
	out			13 : 9		1	
Loading-21	in			13 : 11	2		Heshima road
	out			13 : 16		5	
Loading-22	in			13 : 18	2		Mufulu Avenue
	out			13 : 25		7	
Loading-23	in			13 : 26	1		
	out			13 : 30		4	

Time & Motion Study Organization:TACENTIC Trip- 2 Date:21st May 1997

Vehicle No.1 Loading Capacity:6.5 TON Researcher's name: G.Chege

No. of Crew: 5 Estimated Volume:6m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-24	in			13 : 32	2		
	out			13 : 40		8	
Loading-25	in			13 : 41	1		
	out			13 : 50		9	
Loading-26	in			13 : 51	1		
	out			13 : 56		5	
Loading-27	in			13 : 57	1		
	out			14 : 3		6	
Loading-28	in			14 : 5	2		Mugoya Estate
	out			14 : 18		13	
Loading-29	in			14 : 20	2		Mugoya Army
	out			14 : 28		8	
Loading-30	in			14 : 29	1		Ruby Estate
	out			14 : 41		12	
Loading-31	in			14 : 45	4		Muhoho Avenue-Link rd.
	out			14 : 55		10	Mombasa rd-Old Airport-.
Loading-32	in			14 : 56	1		Outering road-Mutarakwa road
	out			15 : 9		13	to Dandora
Dumping site	in			15 : 59	50		
Start dumping				:			
Finish dumping				17 : 3		64	
Dumping site	out			17 : 58	55		
Reach to workshop	in			:			
Total			0		209	281	Total min.: 490 min.
Collection			0		8	181	
Transportation			0		111		
Inside the dumping site			0		55	64	Dumping time
Idling time					35	36	

Time & Motion Study Organization:TACENTIC Trip- 1 Date:23rd May 1997

Vehicle No.1 Loading Capacity:6.5 TON Researcher's name: G.Chege

No. of Crew: 4 Estimated Volume:6m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 48			
Loading-1	in			9 : 7	19		Mbugani Estate
	out			9 : 22		15	
Loading-2	in			9 : 24	2		Mbugani Estate
	out			9 : 38		14	
Loading-3	in			9 : 41	3		Halai Estate
	out			9 : 46		5	
Loading-4	in			9 : 47	1		
	out			9 : 54		7	
Loading-5	in			9 : 55	1		Memon Estate
	out			9 55		2	
Loading-6	in			9 : 57	2		mugoya -Phase II
	out			10 : 4		1	
Loading-7	in			10 : 5	1		
	out			10 : 8		1	
Loading-8	in			10 : 9	1		
	out			10 : 13		2	
Loading-9	in			10 : 15	2		Mugoya -Phase I
	out			10 : 17		2	
Loading-10	in			10 : 18	1		
	out			10 : 22		4	
Loading-11	in			10 : 24	2		
	out			10 : 28		4	
Loading-12	in			10 : 29	1		
	out			10 : 31		2	
Loading-13	in			10 : 32	1		
	out			10 : 37		5	
Loading-14	in			10 : 40	3		KMA Estate
	out			10 : 43		3	
Loading-15	in			10 : 44	1		Muhoho Avenue- Link rd.-
	out			10 : 49		5	Mombasa rd-Old airport rd-
Loading-16	in			:			Outering road-Mutarakwa road-
	out			:		0	Dandora
Dumping site	in			11 : 39	50		
Start dumping				:			
Finish dumping				:		0	
Dumping site	out			12 : 24	45		
Reach to workshop	in			:			
Total			0		136	72	Total min.:208 min.
Collection			0		22	72	
Transportation			0		69		
Inside the dumping site			0		45	0	Dumping time
Idling time							

Time & Motion Study Organization:TACENTIC Trip-2 Date: Date:23rd May 1997

Vehicle No.1 Loading Capacity:6.5t Researcher's name:G.Chege

No. of Crew:4 Estimated Volume:15m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			12 : 24			
Loading-1	in			12 : 56	32		Belle Vue Estate
	out			13 : 5		9	
Loading-2	in			13 : 10	5		South End Estate
	out			13 : 13		3	
Loading-3	in			13 : 14	1		
	out			13 : 24		10	
Loading-4	in			13 : 24	0		
	out			13 : 39		15	
Loading-5	in			13 : 39	0		Akiba-Phase IV
	out			13 : 43		4	
Loading-6	in			13 : 43	0		
	out			13 : 50		7	Daima Imara Drive
Loading-7	in			13 : 50	0		MG Crescent
	out			13 : 59		9	
Loading-8	in			14 : 15	16		
	out			14 : 26		11	
Loading-9	in			14 : 27	1		
	out			14 : 30		3	Nandi Flame Lane
Loading-10	in			14 : 31	1		
	out			14 : 35		4	
Loading-11	in			14 : 36	1		
	out			14 : 41		5	To Dumping site via
Loading-12	in			14 : 42	1		Mombasa road-Old Airport road
	out			14 : 56		14	Outer ring Mutarakwa road
							Dandora
Dumping site	in			15 : 29	33		
Start dumping				:			
Finish dumping				:		0	
Dumping site	out			16 : 3	34		
Reach to workshop	in			16 : 45	42		
Total			0		167	94	Total min.: 261 min.
Collection			0		77	94	
Transportation			0		56		
Inside the dumping site			0		34	0	Dumping time
Idling time					51		lunch break

ENVIROCLEAN SERVICES

Time & Motion Study Organization; E.C Trip- 1 Date:16th May 1997

Vehicle No. KJY 545 Loading Capacity:7 TON Researcher's name: J.Orago

No. of Crew: 4 Estimated Volume: $5m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	1809.6		14 : 43			Umoja workshop
Loading-1	in	1820.9	11,300	15 : 10	27		South B
	out			15 : 22		12	
Loading-2	in	1829.8	8,900	15 : 45	23		Yaya Center
	out			16 : 47		62	
Loading-3	in			:			Umoja Estate- Outer ring rd.
	out			:		0	Jogoo rd. Likoni rd.
Loading-4	in			:	0		Entertprise rd. Dar-es-salaam rd.
	out			:		0	Mukema rd. Back to Mukema rd.
Loading-5	in			:	0		Dunga rd. Lusaka rd. Uhuru
	out			:		0	highway
Loading-6	in						
	out						Bunyaca rd. Kiambere rd.
Loading-7	in						Matumbato rd. Hospital rd.
	out						Mara rd. Hospital rd. Ngong rd.
Loading-8	in						Valley rd. A/ kodhek rd. Yayac
	out						avenue. Kenyatta avenue.
Loading-9	in						Nyerere rd. University way
	out						Mudanga rd. Thika rd.
							Outer ring rd. Komarock rd.
Dumping site	in	1849.6	19,800	17 : 32	45		
Start dumping				:			
Finish dumping				:		0	
Dumping site	out	1850.5	900	17 : 49	17		Dandora
Reach to workshop	in	1854.5	4,000	18 : 15	26		Umoja
Total			44,900		138	74	Total min.: 212 min.
Collection			8,900		23	74	
Transportation			35,100		98		
Inside the dumping site			900		17	0	Dumping time
Idling time							

Time & Motion Study Organization; E.C Trip- 1 Date:17th May 1997

Vehicle No. KJY 545 Loading Capacity:7 TON Researcher's name: J.Orago

No. of Crew: 6 Estimated Volume: $5m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	1857		7 : 10			Umoja workshop
Loading-1	in	1860.2	3,200	7 : 22	12		Pioner
	out			7 : 24		2	
Loading-2	in	1861.3	1,100	7 : 28	4		Outering road
	out			7 : 30		2	
Loading-3	in	1863.2	1,900	7 : 38	8		Mesora
	out			7 : 39		1	
Loading-4	in	1864.5	1,300	7 : 44	5		BuruBuru II
	out			7 : 45		1	
Loading-5	in	1864.9	400	7 : 49	4		BuruBuru II
	out			7 : 50		1	
Loading-6	in	1865.5	600	7 : 53	3		BuruBuru II
	out			7 : 55		2	
Loading-7	in	1865.9	400	7 : 57	2		BuruBuru II
	out			7 : 58		1	
Loading-8	in	1866.4	500	8 : 0	2		BuruBuru II
	out			8 : 3		3	
Loading-9	in	1867.1	700	8 : 6	3		BuruBuru II
	out			8 : 11		5	
Loading-10	in	1867.8	700	8 : 13	2		BuruBuru II
	out			8 : 14		1	
Loading-11	in	1868	200	8 : 15	1		BuruBuru II
	out			8 : 16		1	
Loading-12	in	1868.7	700	8 : 19	3		BuruBuru II
	out			8 : 20		1	
Loading-13	in	1869.2	500	8 : 23	3		BuruBuru II
	out			8 : 25		2	Total min.: 212 min.
Loading-14	in	1869.6	400	8 : 27	2		BuruBuru II
	out			8 : 30		3	
Loading-15	in	1871.6	2000	8 : 38	8		BuruBuru II
	out			8 : 40		2	
Loading-16	in	1871.8	200	8 : 41	1		BuruBuru II
	out			8 : 42		1	
Loading-17	in	1872.4	600	8 : 47	5		
	out			8 : 48		1	BuruBuru III-Rabai road
Loading-18	in	1872.9	500	8 : 51	3		
	out			8 : 53		2	BuruBuru III-Rabai road
Loading-19	in	1873.1	200	8 : 54	1		
	out			8 : 55		1	BuruBuru III-Rabai road
Loading-20	in	1874.2	1,100	9 : 0	5		
	out			9 : 2		2	BuruBuru III-Rabai road
Loading-21	in	1874.5	300	9 : 5	3		
	out			9 : 7		2	BuruBuru III-Rabai road
Loading-22	in	1875.2	700	9 : 9	2		
	out			9 : 10		1	BuruBuru III-Rabai road
Loading-23	in	1875.9	700	9 : 14	4		
	out			9 : 17		3	BuruBuru III-Rabai road

Time & Motion Study Organization; E.C Trip- 1 Date:17th May 1997

Vehicle No. KJY 545 Loading Capacity:7 TON Researcher's name: J.Orago

No. of Crew: 6 Estimated Volume: $5m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Dumping site	in	1881.2	5,300	9 : 35	18		To Dumping through Mumias
Start dumping				:			road-Outering-Komarock
Finish dumping				:			to Dandora
Dumping site	out	1881.6	400	9 : 55	20		
Reach to workshop	in			:			
Total			24,600		124	41	Total min.:165min.
Collection			18,300		81	41	
Transportation			5,900		23		
Inside the dumping site			400		20	0	Dumping time
Idling time							

Time & Motion Study Organization; E.C Trip- 2 Date:17th May 1997

Vehicle No. KJY 545 Loading Capacity:7 TON Researcher's name: J.Orago

No. of Crew: 6 Estimated Volume: $5m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	1881.6		9 : 55			Dumping site
Loading-1	in	1888.1	6,500	10 : 19	24		BuruBuru shopping center-
	out			10 : 26		7	Mumias road
Loading-2	in	1888.7	600	10 : 28	2		BuruBuru- IV-Mumias road
	out			10 : 29		1	
Loading-3	in	1889.2	500	10 : 30	1		BuruBuru- IV-Mumias road
	out			10 : 32		2	
Loading-4	in	1889.7	500	10 : 34	2		BuruBuru- IV-Mumias road
	out			10 : 36		2	
Loading-5	in	1889.9	200	10 : 38	2		BuruBuru- IV-Mumias road
	out			10 : 40		2	
Loading-6	in	1890.9	1,000	10 : 45	5		BuruBuru- IV-Mumias road
	out			10 : 46		1	
Loading-7	in	1891.3	400	10 : 47	1		BuruBuru- IV-Mumias road
	out			10 : 49		2	
Loading-8	in	1891.8	500	10 : 50	1		BuruBuru- IV-Mumias road
	out			10 : 52		2	
Loading-9	in	1892.6	800	10 : 57	5		BuruBuru- IV-Mumias road
	out			10 : 59		2	
Loading-10	in	1893.2	600	11 : 3	4		BuruBuru- IV-Mumias road
	out			11 : 4		1	
Loading-11	in	1893.8	600	11 : 7	3		BuruBuru- IV-Mumias road
	out			11 : 8		1	
Loading-12	in	1894.5	700	11 : 11	3		BuruBuru-Phase V-Mumias
	out			11 : 12		1	road
Loading-13	in	1894.9	400	11 : 14	2		BuruBuru-Phase V-Mumias
	out			11 : 15		1	Total min.: 212 min.
Loading-14	in	1895.6	700	11 : 17	2		BuruBuru-Phase V-Mumias
	out			11 : 18		1	road
Loading-15	in	1896.1	500	11 : 20	2		BuruBuru-Phase V-Mumias
	out			11 : 21		1	road
Loading-16	in	1897.3	1200	11 : 24	3		BuruBuru-Phase V-Mumias
	out			11 : 25		1	road
Loading-17	in	1897.9	600	11 : 31	6		BuruBuru-V
	out			11 : 32		1	Rabai road
Loading-18	in	1899.1	1,200	11 : 37	5		BuruBuru - III
	out			11 : 38		1	Rabai road
Loading-19	in	1903.3	4,200	11 : 54	16		Tena Estate-Jogoo road
	out			11 : 56		2	
Loading-20	in	1904.9	1,600	12 : 12	16		Tena Estate-Outering road
	out			12 : 14		2	To Dumping site via
Loading-21	in	1906	1,100	12 : 17	3		Outering road-Komarock
	out			14 : 22		125	road

Time & Motion Study Organization; E.C Trip- 2 Date:17th May 1997

Vehicle No. KJY 545 Loading Capacity:7 TON Researcher's name: J.Orago

No. of Crew: 6 Estimated Volume: $5m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Dumping site	in	1913.4	7,400	14 : 43	21		Dandora
Start dumping				:			
Finish dumping			.	:		0	
Dumping site	out	1913.9	500	14 : 59	16		
Reach to workshop	in	1918.9	5,000	15 : 30	31		
Total			37,300		176	159	Total min.:335 min.
Collection			17,900		84	159	
Transportation			18,900		76		
Inside the dumping site			500		16	0	Dumping time
Idling time							

Time & Motion Study Organization; E.C Trip- 1 Date:19th May 1997

Vehicle No. KJY 545 Loading Capacity:18TON Researcher's name: J.Orago

No. of Crew: 4 Estimated Volume; $12m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	2015.2		14 : 30			From Town
Loading-1	in	2019.4	4,200	16 : 2	92		Yaya Center
	out			16 : 59		57	
Loading-2	in			:			Kenyatta Avenue -Valley road
	out			:		0	A/kodhek rd-Yaya Center-
Loading-3	in			:	0		back with A/kodhek rd. -Valley
	out			:		0	rd.Kenyatta Avenue - Nyrere rd.
Loading-4	in			:	0		University way-Slip road
	out			:		0	Muranga road-Thika
Loading-5	in			:	0		road-Outering road-Komarock
	out			:		0	road to Dandora
Dumping site	in	2039	19,600	17 : 55	56		
Start dumping				:			
Finish dumping				:		0	
Dumping site	out	2039.7	700	18 : 12	17		
Reach to workshop	in	2044.8	5,100	18 : 45	33		
Total			29,600		198	57	Total min.: 255 min.
Collection			0		17	57	
Transportation			28,900		181		
Inside the dumping site			700		0	0	Dumping time
Idling time							

Time & Motion Study Organization; E.C Trip- 1 Date:21st May 1997

Vehicle No. KJY 545 Loading Capacity:7 TON Researcher's name: J.Orago

No. of Crew: 4 Estimated Volume: $5m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	2113.9		14 : 50			Umoja workshop
Loading-1	in	2123.7	9,800	15 : 25	35		Yaya Center
	out			16 : 29		64	
Loading-2	in			:			
	out			:		0	from Umoja Outering rd.-Jogoo
Loading-3	in			:	0		rd.-Likoni rd.-Uhuru H/way-
	out			:		0	Bunyala rd.-Kiamber rd.-
Loading-4	in			:	0		Mutumbago rd.-Hospital rd.-
	out			:		0	Ngong rd.-Valley rd.-
Loading-5	in			:	0		A/kodhek rd.-Yaya center-
	out			:		0	back with kodhek-Valley road-
Dumping site	in	2142.9	19,200	17 : 10	41		Kenyatta Ave-Nyrere road-
Start dumping				:			University way-Slip road
Finish dumping				:		0	Muranga road-Thika
Dumping site	out	2143.8	900	17 : 25	15		Outering road-Komarock road
Reach to workshop	in	2147.9	4,100	18 : 5	40		to Dandora
Total			34,000		131	64	Total min.:195 min.
Collection			0		0	64	
Transportation			33,100		116		
Inside the dumping site			900		15	0	Dumping time
Idling time							

Time & Motion Study Organization: E.C Trip- 1 Date:23rd May 1997

Vehicle No. KJY 545 Loading Capacity:7 TON Researcher's name: J.Orago

No. of Crew: 6 Estimated Volume: $5m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	2224		14 : 52			Umoja workshop
Loading-1	in	2234.3	10,300	15 : 25	33		DT Dobie
	out			15 : 44		19	
Loading-2	in	2236.8	2,500	16 : 0	16		South B
	out			16 : 13		13	
Loading-3	in	2245.9	9,100	16 : 36	23		Yaya Center
	out			17 : 43		67	
Loading-4	in	2250.7	4,800	18 : 14	31		Town Center
	out						
Loading-5	in			:			Vehicle Broke down and could
	out			:		0	proceed to Dumping site
Dumping site	in			:			
Start dumping				:	0		
Finish dumping				:		0	
Dumping site	out			:	0		
Reach to workshop	in			:	0		
Total			26,700		103	99	Total min.: 202 min.
Collection			16,400		70	99	
Transportation			10,300		33		
Inside the dumping site			0		0	0	Dumping time
Idling time							

5.2.4 Daily Records of the Time and Motion Study for Each Collection Vehicle (Second Survey)

NAIROBI CITY COUNCIL

Time & Motion Study Organization: NCC Trip- 1 Date: 12th November 1997

Vehicle No. KAB388Q Loading Capacity: 7TON Researcher's name: Kenneth Wanyoike

No. of Crew: 5 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	30591		10 : 40			Jogoo Rd - Ngara Estate
Loading-1	in	30599	8,000	11 : 20	40		Westlands area
	out			12 : 5		45	Parklands Rd
Loading-2	in	30601	2,000	12 : 15	10		Forest Rd
	out			13 : 45		90	Dandora site
Loading-3	in	30602	1,000	14 : 0	15		Kaloleni Depot
	out			14 : 5		5	
Loading-4	in	30605	3,000	14 : 20	15		
	out			15 : 20		60	
Dumping site	in	30613	8,000	16 : 15	55		Dandora
Start dumping				16 : 21	6		
Finish dumping				16 : 22		1	
Dumping site	out	30614	1000	16 : 30	8		
Reach to workshop	in	30621	7000	16 : 48	18		
Total			30000		167	201	Total min.: 368 min.
Collection			6000		40	200	
Transportation			23000		113		
Inside the dumping site			1000		14	1	Dumping time.: 15 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 15th November 1997

Vehicle No. KAH006Y Loading Capacity: 7TON Researcher's name: Kenneth Wanyoike

No. of Crew: 2 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	15944		9 : 0			Jogoo Rd to
Loading-1	in	15955	11,000	9 : 45	45		Komorock Estate
	out			9 : 48		3	then to dumping site
Dumping site	in	15965	10,000	11 : 5	77		at Dandora
Start dumping				11 : 12	7		
Finish dumping				11 : 14		2	
Dumping site	out	15966	1,000	11 : 20	6		
Reach to workshop	in			:			
Total			22,000		135	5	Total min.: 140 min.
Collection			0		0	3	
Transportation			21,000		122		
Inside the dumping site			1,000		13	2	Dumping time.: 15 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 2 Date: 15th November 1997

Vehicle No. KAH006Y Loading Capacity: 7TON Researcher's name: Kenneth Wanyoike

No. of Crew: 2 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	15966		11 : 20			Komarok Estate
Loading-1	in	15974	8,000	11 : 45	25		Outering Rd
	out			11 : 48		3	Dumping site
Dumping site	in	15983	9,000	12 : 10	22		Dandora
Start dumping				12 : 14	4		
Finish dumping				12 : 16		2	
Dumping site	out	15984	1,000	12 : 20	4		
Reach to workshop	in			:			
Total			18,000		55	5	Total min.: 60 min.
Collection			0		0	3	
Transportation			17,000		47		
Inside the dumping site			1,000		8	2	Dumping time.: 10 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 3 Date: 15th November 1997

Vehicle No. KAH006Y Loading Capacity: 7TON Researcher's name: Kenneth Wanyoike

No. of Crew: 2 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	15984		12 : 20			Dumping site along
Loading-1	in	15992	8,000	12 : 45	25		Outering Rd to Komorock
	out			12 : 48		3	Estate for loading then
Dumping site	in	16001	9,000	13 : 10	22		back to dumping site at
Start dumping				13 : 13	3		Dandora
Finish dumping				13 : 15		2	
Dumping site	out	16002	1,000	13 : 20	5		
Reach to workshop	in			:			
Total			18,000		55	5	Total min.: 60 min.
Collection			0		0	3	
Transportation			17,000		47		
Inside the dumping site			1,000		8	2	Dumping time.: 10 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 4 Date: 15th November 1997

Vehicle No. KAH006Y Loading Capacity: 7TON Researcher's name: Kenneth Wanyoike

No. of Crew: 2 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	16002		13 : 20			
Loading-1	in	16010	8,000	20 : 0	400		
	out			20 : 3		3	
Dumping site	in	16020	10,000	20 : 35	32		Dandora, Outering Rd,
Start dumping				20 : 38	3		Jogoo Rd, Kaloleni depot
Finish dumping				20 : 40		2	
Dumping site	out	16021	1,000	20 : 45	5		
Reach to workshop	in	16030	9,000	21 : 3	18		
Total			28,000		458	5	Total min.: 463 min.
Collection			0		0	3	
Transportation			27,000		450		
Inside the dumping site			1,000		8	2	Dumping time.: 10 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 16th November 1997

Vehicle No. KAH006Y Loading Capacity: 7TON Researcher's name: Kenneth wanyoike

No. of Crew: 4 Estimated Volume: $4m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	16053		8 : 48			From depot along Jogoo Rd
Loading-1	in	16058	5,000	10 : 8	80		to Pumwani sub-depot
	out			12 : 0		112	where there was idling time
Dumping site	in	16071	13,000	12 : 25	25		before the truck headed
Start dumping				12 : 27	2		to Eastleigh area. Then Thika
Finish dumping				12 : 29		2	Rd to dumping site at
Dumping site	out	16072	1,000	12 : 35	6		Dandora.
Reach to workshop	in			:			
Total			19,000		113	114	Total min.: 227 min.
Collection			0		0	112	
Transportation			18,000		105		
Inside the dumping site			1,000		8	2	Dumping time.: 10 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 2 Date: 16th November 1997

Vehicle No. KAH006Y Loading Capacity: 7TON Researcher's name: Kenneth wanyoike

No. of Crew: 4 Estimated Volume: $4m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	16072		12 : 35			From dumping site along
Loading-1	in	16091	19,000	13 : 40	65		Thika Rd to Eastleigh area
	out			15 : 35		115	Then back to Dandora site
							through Juja Rd
							The truck headed to
							Kaloleni depot through
							Outering Rd and Jogoo Rd
Dumping site	in	16099	8,000	16 : 0	25		
Start dumping				16 : 4	4		
Finish dumping				16 : 6		2	
Dumping site	out	16100	1,000	16 : 10	4		
Reach to workshop	in	16108	8,000	16 : 28	18		
Total			36,000		116	117	Total min.: 233 min.
Collection			0		0	115	
Transportation			35,000		108		
Inside the dumping site			1,000		8	2	Dumping time.: 10 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 17th November 1997

Vehicle No. KUL992 Loading Capacity: 7TON Researcher's name: Kenneth Wanyoike

No. of Crew: 10 Estimated Volume: $5m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	232443		10 : 25			Jogoo Rd Ngara depot
Loading-1	in	232450	7,000	11 : 0	35		Parklands Estate
	out			11 : 8		8	Brookside Estate
Loading-2	in	232454	4,000	11 : 15	7		Forest Rd
	out			11 : 25		10	Thika Rd
Loading-3	in	232455	1,000	11 : 30	5		Dandora Site
	out			11 : 40		10	Juja Rd
Loading-4	in	232456	1,000	11 : 45	5		Eastleigh
	out			12 : 4		19	Kaloleni depot
Loading-5	in	232458	2,000	12 : 10	6		
	out			12 : 15		5	
Loading-6	in	232460	2,000	12 : 20	5		
	out			12 : 35		15	
Dumping site	in	232473	13,000	13 : 5	30		Dandora
Start dumping				13 : 10	5		
Finish dumping				14 : 5		55	
Dumping site	out	232474	1,000	14 : 9	4		
Reach to workshop	in	232484	10,000	15 : 10	61		
Total			41,000		163	122	Total min.: 285 min.
Collection			10,000		28	67	
Transportation			30,000		126		
Inside the dumping site			1,000		9	55	Dumping time.: 64 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 19th November 1997

Vehicle No. KUL961 Loading Capacity: 7TON Researcher's name: Kenneth Wanyoike

No. of Crew: 9 Estimated Volume: $5m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			9 : 0			From depot Jogoo Rd
Loading-1	in		5,000	9 : 15	15		Industrial area After loading
	out			10 : 30		75	Enterprise Rd
							Jogoo Rd Buruburu to
							dumping site at Dandora
Dumping site	in		8,000	11 : 25	55		Dandora
Start dumping			0	11 : 27	2		
Finish dumping			0	11 : 29		2	
Dumping site	out		1,000	11 : 33	4		
Reach to workshop	in			:			Mileage problem
Total			14,000		76	77	Total min.: 153 min.
Collection			0		0	75	
Transportation			13,000		70		
Inside the dumping site			1,000		6	2	Dumping time.: 8 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 2 Date: 19th November 1997

Vehicle No. KUL961 Loading Capacity: 7TON Researcher's name: Kenneth Wanyoike

No. of Crew: 9 Estimated Volume: $5m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out			11 : 33			From dumping site
Loading-1	in		9,000	12 : 15	42		Outering Rd to Industrial
	out			12 : 40		25	area along Lunga Lunga Rd
Loading-2	in		3,000	13 : 0	20		Then to dumping site
	out			13 : 45		45	through Jerico estate
Dumping site	in		10,000	14 : 20	35		Dandora
Start dumping				14 : 24	4		
Finish dumping				14 : 26		2	
Dumping site	out		1,000	14 : 30	4		
Reach to workshop	in			:			
Total			23,000		105	72	Total min.: 177 min.
Collection			3,000		20	70	
Transportation			19,000		77		
Inside the dumping site			1,000		8	2	Dumping time.: 10 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 3 Date: 19th November 1997

Vehicle No. KUL961 Loading Capacity: 7TON Researcher's name: Kenneth Wanyoike

No. of Crew: 9 Estimated Volume: $4m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out			14 : 30			From dumping site
Loading-1	in		11,000	15 : 10	40		Outering Rd to
	out			15 : 30		20	godown in Industrial area
							back to dumpingsite along
							Mombasa Rd
							The truck headed back to
							Kaloleni along Jogoo Rd
Dumping site	in		11,000	16 : 10	40		Dandora
Start dumping				16 : 16	6		
Finish dumping				16 : 18		2	
Dumping site	out		1,000	16 : 22	4		
Reach to workshop	in		8,000	16 : 30	8		
Total			31,000		98	22	Total min.: 120 min.
Collection			0		0	20	
Transportation			30,000		88		
Inside the dumping site			1,000		10	2	Dumping time.: 12 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 20th November 1997

Vehicle No. KAB389Q Loading Capacity: 7TON Researcher's name: Kenneth Wanyoike

No. of Crew: 7 Estimated Volume: $4m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	22685		9 : 50			Jogoo Rd - Madaraka Estate
Loading-1	in	22691	6,000	10 : 40	50		Lusaka Rd - dumping site
	out			12 : 11		91	at Dandora
Dumping site	in	22708	17,000	12 : 50	39		Dandora
Start dumping				12 : 53	3		
Finish dumping				12 : 55		2	
Dumping site	out	22709	1,000	13 : 0	5		
Reach to workshop	in			:			
Total			24,000		97	93	Total min.: 190 min.
Collection			0		0	91	
Transportation			23,000		89		
Inside the dumping site			1,000		8	2	Dumping time.: 10 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 2 Date: 20th November 1997

Vehicle No. KAB389Q Loading Capacity: 7TON Researcher's name: Kenneth Wanyoike

No. of Crew: 7 Estimated Volume: $4m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	22709		13 : 0			From dumping site along
Loading-1	in	22726	17,000	13 : 43	43		Outering Rd - Jogoo Rd
	out			14 : 50		67	back to Mataraka Estate
							then to dumping site along
							Lusaka Rd - Enterprise Rd
							in Industrial area - back to
							kaloleni depot along
							Outering Rd and Heshima
							Rd
Dumping site	in	22743	17,000	15 : 45	55		Dandora
Start dumping				15 : 48	3		
Finish dumping				15 : 50		2	
Dumping site	out	22744	1,000	15 : 55	5		
Reach to workshop	in	22752	8,000	16 : 13	18		
Total			43,000		124	69	Total min.: 193 min.
Collection			0		0	67	
Transportation			42,000		116		
Inside the dumping site			1,000		8	2	Dumping time.: 10 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 21th November 1997

Vehicle No. KAB389Q Loading Capacity: 7TON Researcher's name: Kenneth Wanyoike

No. of Crew: 2 Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	22772		10 : 15			From depot through Jogoo
Loading-1	in	22776	4,000	10 : 25	10		Rd to Makandara Estate
	out			:			Tractor failed to show up.
							No collection.
							The truck headed back to
							depot at Kaloleni.
Dumping site	in			:			
Start dumping				:			
Finish dumping				:		0	
Dumping site	out			:			
Reach to workshop	in	22780	4,000	12 : 15	110		
Total			8,000		120	0	Total min.: 120 min.
Collection			0		0	0	
Transportation			8,000		120		
Inside the dumping site			0		0	0	Dumping time.: min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 13th November 1997

Vehicle No. KWE073 Loading Capacity: 7TON Researcher's name: Emily Njeri

No. of Crew: 6 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	167346		9 : 40			From depot to loading
Loading-1	in	167360	14,000	10 : 20	40		point
	out			10 : 28		8	- Lusaka Rd Mbagathi
Loading-2	in	167365	5,000	10 : 40	12		way to Ngong Rd
	out			10 : 45		5	Another loadings along
Loading-3	in	167366	1,000	10 : 51	6		Lunga Lunga Rd
	out			11 : 4		13	
Loading-4	in	167368	2,000	11 : 9	5		To dumping site
	out			11 : 21		12	Lusaka Rd - Jogoo Rd
Loading-5	in	167376	8,000	11 : 42	21		Outering Rd
	out			12 : 11		29	
							Back to depot through
							Outering Rd - Heshima Rd
							and Jogoo Rd
Dumping site	in	167397	21,000	13 : 51	100		Dandora
Start dumping		167397.5	500	13 : 59	8		
Finish dumping		167397.5	0	14 : 32		33	
Dumping site	out	167398	500	14 : 39	7		
Reach to workshop	in	167409	11,000	15 : 13	34		
Total			63,000		233	100	Total min.: 333 min.
Collection			16,000		44	67	
Transportation			46,000		174		
Inside the dumping site			1,000		15	33	Dumping time.: 48 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 14th November 1997

Vehicle No. KAB388Q Loading Capacity: 7TON Researcher's name: Emily Njeri

No. of Crew: 2 Estimated Volume: $4m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	30741		10 : 42			The lorry came to depot
Loading-1	in	30750	9,000	10 : 48	6		full of garbage so from
	out			10 : 52		4	depot direct to dumping
							site through Jogoo Rd
							Outering Rd
Dumping site	in	30762	12,000	11 : 8	16		Dandora
Start dumping		30762.5	500	11 : 10	2		
Finish dumping		30762.5	0	11 : 20		10	
Dumping site	out	30763	500	11 : 22	2		To second trip
Reach to workshop	in			:			
Total			22,000		26	14	Total min.: 40 min.
Collection			0		0	4	
Transportation			21,000		22		
Inside the dumping site			1,000		4	10	Dumping time.: 14 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 2 Date: 14th November 1997

Vehicle No. KAB388Q Loading Capacity: 7TON Researcher's name: Emily Njeri

No. of Crew: 2 Estimated Volume: $4m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	30771		11 : 22			From dumping site
Loading-1	in	30773	2,000	11 : 55	33		- through Outering Rd
	out			11 : 59		4	Komorock Rd - Loading
							done along Komorock Rd
							To dumping site; Outering
							Rd
Dumping site	in	30781	8,000	12 : 20	21		Dandora
Start dumping		30781.5	500	12 : 24	4		
Finish dumping		30781.5	0	12 : 25		1	
Dumping site	out	30782	500	12 : 30	5		to the third trip
Reach to workshop	in			:			
Total			11,000		63	5	Total min.: 68 min.
Collection			0		0	4	
Transportation			10,000		54		
Inside the dumping site			1,000		9	1	Dumping time.: 10 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 3 Date: 14th November 1997

Vehicle No. KAB388Q Loading Capacity: 7TON Researcher's name: Emily Njeri

No. of Crew: 2 Estimated Volume: $4m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	30790		13 : 0			From dumping site
Loading-1	in	30791	1,000	13 : 6	6		through Outering Rd
	out			13 : 9		3	Komorock Rd
							- Loading was done at
							Komorock Rd
							- to dumping site through
							Outering Rd
Dumping site	in	30799	8,000	13 : 29	20		- Back to depot ; Heshima
Start dumping		30799.6	600	13 : 32	3		Rd, Jogoo Rd, Dandora
Finish dumping		30799.6	0	13 : 34		2	
Dumping site	out	30800	400	13 : 36	2		
Reach to workshop	in	30812	12,000	14 : 20	44		
Total			22,000		75	5	Total min.: 80 min.
Collection			0		0	3	
Transportation			21,000		70		
Inside the dumping site			1,000		5	2	Dumping time.: 7 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 16th November 1997

Vehicle No. KUL994 Loading Capacity: 7.7TON Researcher's name: Emily Njeri

No. of Crew: 12 Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	174273		8 : 20			From depot, through
Loading-1	in	174280	7,000	9 : 0	40		Lusaka Rd - Langata Rd
	out			:			to Langata cemetary
							- there was no loading
							since the vehicle had taken
							crew to work at that place.
							- we took 3 hrs at that place
							through the same route to
							depot
Dumping site	in			:			No dumping
Start dumping				:			
Finish dumping				:			
Dumping site	out			:			
Reach to workshop	in	174284	4,000	12 : 40	220		Kaloleni
Total			11,000		260	0	Total min.: 260 min.
Collection			0		0	0	
Transportation			11,000		260		
Inside the dumping site			0		0	0	Dumping time.: min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 17th November 1997

Vehicle No. KAB391Q Loading Capacity: 7TON Researcher's name: Emily Njeri

No. of Crew: 2 Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	12426		10 : 45			- From depot through Jogoo
Loading-1	in	12433	7,000	11 : 0	15		Rd , Lusaka Rd to garage
	out			:			- There was no collection
							The vehicle stayed there
							at around 1hr and 30
							minuites and later used to
							larry the spare parts from
							that place to the depot.
Dumping site	in			:			No dumping
Start dumping				:			
Finish dumping				:			
Dumping site	out			:			
Reach to workshop	in	12440	7,000	13 : 4	124		Kaloleni
Total			14,000		139	0	Total min.: 139 min.
Collection			0		0	0	
Transportation			14,000		139		
Inside the dumping site			0		0	0	Dumping time.: min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 18th November 1997

Vehicle No. KAH019Y Loading Capacity: 7TON Researcher's name: Emily Njeri

No. of Crew: 2 Estimated Volume: $4m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	2369		10 : 20			From depot, Jogoo Rd
Loading-1	in	2381	12,000	10 : 40	20		Lusaka Rd, Mbagathi way
	out			10 : 42		2	Ngong Rd to Dagoretti
Loading-2	in	2388	7,000	10 : 57	15		depot. There was an idling
	out			11 : 3		6	time of 12mins.
							- Loadings were done
							along Ngong Rd and
							Milimani court
							- to dumping site through
							Industrial area Lusaka Rd
							Jogoo Rd, Outering Rd
Dumping site	in	2409	21,000	11 : 50	47		Dandora
Start dumping		2409	0	11 : 54	4		
Finish dumping		2409	0	11 : 55		1	
Dumping site	out	2410	1,000	11 : 58	3		to the 2nd trip
Reach to workshop	in			:			
Total			41,000		89	9	Total min.: 98 min.
Collection			7,000		3	8	
Transportation			33,000		67		
Inside the dumping site			1,000		7	1	Dumping time.: 8 min.
Idling time					12		

Time & Motion Study Organization: NCC Trip- 2 Date: 18th November 1997

Vehicle No. KAH019Y Loading Capacity: 7TON Researcher's name: Emily Njeri

No. of Crew: 2 Estimated Volume: $4m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	2431		12 : 30			From dumping site
Loading-1	in	2437	6,000	12 : 45	15		Outering Rd, Jogoo Rd,
	out			:			Haile Selassie Ave,
							to Ngong Rd
							- the loading was done
							along milimani commercial
							court ie same route
							(Ngong Rd)
							- To dumping site through
							Industrial area, Jogoo Rd,
							Outering Rd.
Dumping site	in	2453	16,000	13 : 20	35		Dandora
Start dumping		2453	0	13 : 22	2		
Finish dumping		2453	0	13 : 23		1	
Dumping site	out	2453.5	500	13 : 27	4		to the third trip
Reach to workshop	in			:			
Total			22,500		56	1	Total min.: 57 min.
Collection			0		0	0	
Transportation			22,000		50		
Inside the dumping site			500		6	1	Dumping time.: 7 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 3 Date: 18th November 1997

Vehicle No. KAH019Y Loading Capacity: 7TON Researcher's name: Emily Njeri

No. of Crew: 2 Estimated Volume: $4m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	2490.5		14 : 25			From dumping site through
Loading-1	in	2493	2,500	14 : 40	15		Outering Rd, Heshima Rd,
	out			15 : 50		70	Jogoo Rd, Haile Sellasie
Loading-2	in	2497	4,000	15 : 59	9		Ave, to Ngong Rd.
	out			:			
							First Loading was done
							along Kenyatta hospital
							and the other one along
							milimani commercial court.
							To dumping site
							Industrial area Lusaka Rd,
							Jogoo Rd, Outering Rd
							Back to depot, through
							Outering Rd, Heshima Rd,
							and Jogoo Rd
Dumping site	in	2510	13,000	16 : 50	51		
Start dumping		2510	0	16 : 54	4		
Finish dumping		2510	0	16 : 55		1	
Dumping site	out	2510.5	500	16 : 59	4		
Reach to workshop	in	2519.5	9,000	17 : 30	31		
Total			29,000		114	71	Total min.: 185 min.
Collection			4,000		9	70	
Transportation			24,500		97		
Inside the dumping site			500		8	1	Dumping time.: 9 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 19th November 1997

Vehicle No. KWE064 Loading Capacity: 7.7TON Researcher's name: Emily Njeri

No. of Crew: 4 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	27407		10 : 55			From depot through
Loading-1	in	27414	7,000	11 : 23	26		Lusaka Rd, Garage,
	out			11 : 26		5	Bunyara Rd, Uhuru highway
Loading-2	in	27417	3,000	11 : 29	3		University way Muranga Rd
	out			11 : 42		13	to Muthaiga
Loading-3	in	27418	1,000	12 : 2	20		
	out			12 : 46		44	Loading was done along
Loading-4	in	27419	1,000	12 : 49	3		Muthaiga Estate.
	out			12 : 50		1	
Loading-5	in	27420	1,000	12 : 54	4		To dumping site through
	out			12 : 56		2	Thika Rd and Outeirng Rd
Loading-6	in	27422	2,000	12 : 58	2		
	out			13 : 0		2	
Dumping site	in	27431	9,000	13 : 54	54		Dandora
Start dumping		27431	0	13 : 57	3		
Finish dumping		27431	0	13 : 59		2	
Dumping site	out	27432	1,000	14 : 2	3		To the 2nd trip
Reach to workshop	in			:			
Total			25,000		118	69	Total min.: 187 min.
Collection			8,000		32	67	
Transportation			16,000		80		
Inside the dumping site			1,000		6	2	Dumping time.: 8 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 2 Date: 19th November 1997

Vehicle No. KWE064 Loading Capacity: 7.7TON Researcher's name: Emily Njeri

No. of Crew: 4 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	27441		14 : 20			From dumping site
Loading-1	in	27443	2,000	14 : 27	7		through Outering Rd,
	out			14 : 47		20	Thika Rd, Muthaiga Rd.
Loading-2	in	27444	1,000	14 : 55	8		Loadings were done at
	out			14 : 56		1	Muthaiga Estate, Parklands
Loading-3	in	27446	2,000	15 : 1	5		and finally Westlands.
	out			15 : 14		13	
Loading-4	in	27447	1,000	15 : 28	14		To dumping site, through
	out			15 : 38		10	Muthaiga Rd, Muranga Rd
Loading-5	in	27448	1,000	15 : 44	6		Thika Rd and Outering Rd
	out			16 : 2		18	
							Back to depot through
							Outering Rd, Heshima Rd,
							Jogoo Rd
Dumping site	in	27462	14,000	16 : 55	53		Dandora
Start dumping		27462	0	16 : 57	2		
Finish dumping		27462	0	16 : 59		2	
Dumping site	out	27462.5	500	17 : 2	3		
Reach to workshop	in	27471.5	9,000	17 : 32	30		Kaloleni
Total			30,500		128	64	Total min.: 192 min.
Collection			5,000		33	62	
Transportation			25,000		90		
Inside the dumping site			500		5	2	Dumping time.: 7 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 20th November 1997

Vehicle No. KAH006Y Loading Capacity: 7TON Researcher's name: Emily Njeri

No. of Crew: 8 Estimated Volume: $4m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	16312		10 : 10			From depot, through
Loading-1	in	16324	12,000	11 : 0	50		Lusaka Rd to Madaraka
	out			12 : 15		75	The vehicle made one trip
							without loading
							Loading was later made on
							the same place ie Madaraka
							To dumping site, through
							industrial area Jogoo Rd,
							Heshima Rd and Outering
							Rd
							From dumping site through
							Outering Rd, Heshima Rd
							Jogoo Rd. The vehicle
							didn't make another trip
							because it had a mechanical
							problems.
Dumping site	in	16339	15,000	13 : 5	50		Dandora
Start dumping		16339	0	13 : 8	3		
Finish dumping		16339	0	13 : 10		2	
Dumping site	out	16339.5	500	13 : 15	5		
Reach to workshop	in	16348.5	9,000	13 : 50	35		Kaloleni
Total			36,500		143	77	Total min.: 220 min.
Collection			0		0	75	
Transportation			36,000		135		
Inside the dumping site			500		8	2	Dumping time.: 10 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 13th November 1997

Vehicle No. KAB289Q Loading Capacity: 7TON Researcher's name: Willy Mbuthia

No. of Crew: 6 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			8 : 30			Breakfast 8:45-9:00
Loading-1	in		2,000	9 : 2	32		
	out			9 : 45		43	Majengo
Loading-2	in		3,000	9 : 50	5		
	out			10 : 38		48	Pumwani Rd
Loading-3	in		400	11 : 16	38		
	out			11 : 42		26	Pumwani Rd
Loading-4	in		4,000	12 : 9	27		
	out			12 : 50		41	G.Warungi St
Loading-5	in		800	13 : 10	20		
	out			13 : 26		16	Eleventh St
Loading-6	in		3,000	13 : 28	2		
	out			13 : 42		14	Kariakor
Loading-7	in		200	13 : 48	6		
	out			13 : 55		7	Governments Head Quaters
Loading-8	in		100	14 : 4	9		
	out			14 : 12		8	Governments Head Quaters
Loading-9	in		200	14 : 18	6		
	out			14 : 24		6	Governments Head Quaters
Loading-10	in		50	14 : 25	1		
	out			14 : 26		1	Governments Head Quaters
Loading-11	in		100	14 : 28	2		
	out			14 : 30		2	Governments Head Quaters
Loading-12	in		20	14 : 31	1		
	out			14 : 34		3	Governments Head Quaters
Loading-13	in		100	14 : 35	1		
	out			14 : 37		2	Governments Head Quaters
Loading-14	in		200	14 : 38	1		
	out			14 : 43		5	Governments Head Quaters
Loading-15	in		400	14 : 45	2		
	out			14 : 55		10	Ziwani Rd
Loading-16			2,000	15 : 15	20		
				15 : 33		18	Juja Rd
Dumping site	in		12,000	16 : 57	84		Dandora dumping site
Start dumping			200	16 : 58	1		
Finish dumping				17 : 0		2	
Dumping site	out		200	17 : 2	2		
Reach to workshop	in		11,000	17 : 38	36		Jogoo Rd
Total			39,970		296	252	Total min.: 548 min.
Collection			14,570		156	250	
Transportation			25,000		122		
Inside the dumping site			400		3	2	Dumping time.: 5 min.
Idling time					15		

Time & Motion Study Organization: NCC Trip- 1 Date: 14th November 1997

Vehicle No. KUL992 Loading Capacity: 7TON Researcher's name: Willy Mbuthia

No. of Crew: 7 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	232251		10 : 53			Embakasi Drop
Loading-1	in	232283	32,000	12 : 55	122		Employees-11:10-11:15
	out			13 : 10		15	Garage repair 11:30-12:00
Loading-2	in	232284	1,000	13 : 12	2		
	out			13 : 46		34	Ngara Estate
Loading-3	in	232286	2,000	13 : 57	11		
	out			14 : 13		16	Park Rd
Loading-4	in	232290	4,000	14 : 34	21		
	out			14 : 40		6	Thika Rd
Dumping site	in	232303	13,000	15 : 24	44		Dandora dumping site
Start dumping		232304	1,000	15 : 27	3		
Finish dumping				15 : 56		29	
Dumping site	out	232305	1,000	16 : 10	14		
Reach to workshop	in	232316	11,000	16 : 39	29		Jogoo Rd
Total			65,000		246	100	Total min.: 346 min.
Collection			7,000		34	71	
Transportation			56,000		160		
Inside the dumping site			2,000		17	29	Dumping time.: 46 min.
Idling time					35		

Time & Motion Study Organization: NCC Trip- 1 Date: 15th November 1997

Vehicle No. KUL992 Loading Capacity: 7TON Researcher's name: Willy Mbuthia

No. of Crew: 6 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	232358		7 : 51			Lusaka Rd
Loading-1	in	232363	5,000	8 : 20	29		
	out			8 : 28		8	Langata Rd
Loading-2	in	232365	2,000	8 : 35	7		
	out			8 : 45		10	Langata Rd
Loading-3	in	232375	10,000	9 : 30	45		
	out			11 : 6		96	Langata Rd
Loading-4	in	232378	3,000	11 : 20	14		
	out			11 : 35		15	Langata Rd
Dumping site	in	232398	20,000	12 : 40	65		Dandora
Start dumping		232399	1,000	12 : 51	11		
Finish dumping				14 : 0		69	
Dumping site	out	232400	1,000	14 : 10	10		
Reach to workshop	in	232409	9,000	15 : 5	55		Jogoo Rd
Total			51,000		236	198	Total min.: 434 min.
Collection			15,000		66	129	
Transportation			34,000		149		
Inside the dumping site			2,000		21	69	Dumping time.: 90 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 17th November 1997

Vehicle No. KWE073 Loading Capacity: 7TON Researcher's name: Willy Mbuthia

No. of Crew: 8 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	167752		11 : 32			Dagoretti to collect loaders
				:			12:00-12:10
				:			
				:			Previous day's loading
				:			
Dumping site	in	167787	35,000	12 : 54	82		Dandora dumping site
Start dumping		167789	2,000	13 : 5	11		
Finish dumping				13 : 45		40	
Dumping site	out	167791	2,000	13 : 55	10		
Reach to workshop	in			:			Juja Rd
Total			39,000		103	40	Total min.: 143 min.
Collection			0		0	0	
Transportation			35,000		72		
Inside the dumping site			4,000		21	40	Dumping time.: 61 min.
Idling time					10		

Time & Motion Study Organization: NCC Trip- 2 Date: 17th November 1997

Vehicle No. KWE073 Loading Capacity: 7TON Researcher's name: Willy Mbuthia

No. of Crew: 8 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	167791		13 : 55			Thika Rd
Loading-1	in	167808	17,000	14 : 30	35		
	out			14 : 41		11	Lenana Rd
Loading-2	in	167808.2	200	14 : 44	3		
	out			14 : 52		8	Lenana Rd
Loading-3	in	167808.3	100	14 : 54	2		
	out			15 : 2		8	Lenana Rd
Loading-4	in	167810	1,700	15 : 7	5		
	out			15 : 8		1	Lenana Rd
Loading-5	in	167811	1,000	15 : 15	7		
	out			15 : 21		6	Woodmere St
Loading-6	in	167812	1,000	15 : 26	5		
	out			15 : 28		2	Kayahwe Rd
Loading-7	in	167812.2	200	15 : 31	3		
	out			15 : 33		2	Kayahwe Rd
Loading-8	in	167813.2	1,000	15 : 39	6		
	out			15 : 55		16	Galana Rd
Loading-9	in	167815.2	2,000	16 : 7	12		
	out			16 : 23		16	Wheels restaurant
Loading-10	in	167816.2	1,000	16 : 28	5		
	out			16 : 31		3	Motherland restaurant
Loading-11	in	167818.2	2,000	16 : 40	9		
	out			16 : 42		2	Thika Rd
Dumping site	in	167836.2	18,000	17 : 18	36		Dandora dumping site
Start dumping		167838.2	2,000	17 : 30	12		
Finish dumping				18 : 0		30	
Dumping site	out	167838.4	2,000	18 : 10	10		
Reach to workshop	in	167849.4	11,000	18 : 40	30		Jogoo Rd
Total			60,200		180	105	Total min.: 285 min.
Collection			10,200		57	75	
Transportation			46,000		101		
Inside the dumping site			4,000		22	30	Dumping time.: 52 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 19th November 1997

Vehicle No. KWE081 Loading Capacity: 7TON Researcher's name: Willy Mbuthia

No. of Crew: 8 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	192273		9 : 24			Lusaka Rd
Loading-1	in	192278	5,000	9 : 37	13		
	out			10 : 16		39	Witu St
Loading-2	in	192300	22,000	11 : 8	52		
	out			11 : 9		1	Langata Rd
Loading-3	in	192304	4,000	11 : 55	46		
	out			12 : 5		10	Langata Rd
Loading-4	in	192304.2	200	12 : 7	2		
	out			12 : 11		4	Langata Rd
Loading-5	in	########	50	12 : 13	2		
	out			13 : 0		47	Langata Rd
Loading-6	in	192315	10,750	13 : 40	40		
	out			14 : 30		50	Enterprices Rd
Loading-7	in	192320	5,000	14 : 50	20		
	out			15 : 46		56	Enterprices Rd
							Mombasa Rd
Dumping site	in	192342	22,000	16 : 30	44		Dandora dumping site
Start dumping		192344	2,000	16 : 35	5		
Finish dumping				17 : 5		30	
Dumping site	out	192346	2,000	17 : 15	10		
Reach to workshop	in	192355	9,000	17 : 35	20		Jogoo Rd
Total			82,000		254	237	Total min.: 491 min.
Collection			42,000		162	207	
Transportation			36,000		77		
Inside the dumping site			4,000		15	30	Dumping time.: 45 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 20th November 1997

Vehicle No. KUL993 Loading Capacity: 7TON Researcher's name: Willy Mbuthia

No. of Crew: 8 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	192736		9 : 36			Ngara to collect loaders
Loading-1	in	192763	27,000	12 : 46	210		9:41-10:05
	out			14 : 50		124	Madaraka Estate
Loading-2	in	192764	1,000	14 : 57	7		Recovery 10:46-11:10
	out			15 : 24		27	Kaloleni to collect mechanic
							Uhuru highway
							Recovery 12:12-12:20
Dumping site	in	192779	15,000	15 : 56	32		Dandora dumping site
Start dumping		192781	2,000	16 : 5	9		
Finish dumping				16 : 30		25	
Dumping site	out	192783	2,000	16 : 40	10		
Reach to workshop	in	192792	9,000	17 : 15	35		Jogoo Rd
Total			56,000		303	176	Total min.: 479 min.
Collection			1,000		7	151	
Transportation			51,000		221		
Inside the dumping site			4,000		19	25	Dumping time.: 44 min.
Idling time					56		

Time & Motion Study Organization: NCC Trip- 1 Date: 21th November 1997

Vehicle No. KWE064 Loading Capacity: 7TON Researcher's name: Willy Mbuthia

No. of Crew: 8 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	27549		10 : 18			Jogoo Rd
Loading-1	in	27560	11,000	10 : 57	39		Embakasi to collect
	out			11 : 0		3	Loaders 10:40-10:49
Loading-2	in	27561	1,000	11 : 3	3		
	out			11 : 36		33	Komorock Estate
Loading-3	in	27562	1,000	11 : 40	4		
	out			12 : 41		61	Komorock Estate
Dumping site	in	27567	5,000	13 : 8	27		Dandora dumping site
Start dumping		27569	2,000	13 : 21	13		
Finish dumping				13 : 22		1	
Dumping site	out	27572	3,000	13 : 31	9		Outering Rd
Reach to workshop	in			:			
Total			23,000		95	98	Total min.: 193 min.
Collection			2,000		7	97	
Transportation			16,000		57		
Inside the dumping site			5,000		22	1	Dumping time.: 23 min.
Idling time					9		

Time & Motion Study Organization: NCC Trip- 2 Date: 21th November 1997

Vehicle No. KWE064 Loading Capacity: 7TON Researcher's name: Willy Mbuthia

No. of Crew: 8 Estimated Volume: $6m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	27572		13 : 31			Outering Rd
Loading-1	in	27579	7,000	13 : 53	22		
	out			14 : 15		22	Komorok Estate
Loading-2	in	27580	1,000	14 : 20	5		
	out			14 : 50		30	Komorok Estate
Loading-3	in	27581	1,000	14 : 51	1		
	out			15 : 0		9	Komorok Estate
Dumping site	in	27589	8,000	15 : 32	32		Dandora dumping site
Start dumping		27590	1,000	15 : 36	4		
Finish dumping				15 : 37		1	
Dumping site	out	27591	1,000	15 : 43	6		Outering Rd
Reach to workshop	in	27602	11,000	16 : 5	22		Jogoo Rd
Total			30,000		92	62	Total min.: 154 min.
Collection			2,000		6	61	
Transportation			26,000		76		
Inside the dumping site			2,000		10	1	Dumping time.: 11 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 12th November 1997

Vehicle No. KAE034 Loading Capacity: 8TON Researcher's name: Brendah Dzuya

No. of Crew: 6 Estimated Volume: $12m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			9 : 48			Kaloleni depot to Ngara depot
Loading-1	in		7,000	10 : 4	16		Forest Rd
	out			10 : 28		24	
Loading-2	in		1,000	11 : 6	38		Limuru Rd
	out			11 : 17		11	(Old Muthaiga)
Loading-3	in		1,000	11 : 20	3		
	out			11 : 24		4	
Loading-4	in		2,000	11 : 45	21		Muthaiga Rd
	out			11 : 56		11	
Loading-5	in		1,000	11 : 57	1		
	out			11 : 59		2	
Loading-6	in		1,000	12 : 2	3		Muthaiga Rd
	out			:			Naivasha Ave
							Puncture
Dumping site	in			:			didn't reach the dumping
Start dumping				:			site
Finish dumping				:			No dumping
Dumping site	out			:			
Reach to workshop	in			:			
Total			13,000		82	52	Total min.: 134 min.
Collection			6,000		66	52	
Transportation			7,000		16		
Inside the dumping site			0		0	0	Dumping time.: min.
Idling time							

Time & Motion Study Organization: NCC Trip- 1 Date: 13th November 1997

Vehicle No. KAB388Q Loading Capacity: 4850 Researcher's name: Brendah Dzuya

No. of Crew: 7 Estimated Volume: $3m^3$

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	30639		10 : 25			From Kaloleni depot to
Loading-1	in	30646	7,000	11 : 17	52		Ngara depot
	out			11 : 18		1	Mpaka Rd
Loading-2	in	30648	2,000	11 : 27	9		Westlands
	out			11 : 50		23	
Loading-3	in	30650	2,000	11 : 53	3		3rd Ave Parklands
	out			12 : 8		15	
Loading-4	in	30651	1,000	12 : 13	5		2nd Ave Parklands
	out			12 : 16		3	
							2nd Ave Parklands
Dumping site	in	30666	15,000	12 : 35	19		Limuru Rd, Thika Rd
Start dumping				12 : 55	20		Outering Rd,
Finish dumping				12 : 55		0	D-site
Dumping site	out	30667	1,000	12 : 58	3		
Reach to workshop	in			:			
Total			28,000		111	42	Total min.: 153 min.
Collection			5,000		17	42	
Transportation			22,000		71		
Inside the dumping site			1,000		23	0	Dumping time.: 23 min.
Idling time							

Time & Motion Study Organization: NCC Trip- 2 Date: 13th November 1997

Vehicle No. KAB388Q Loading Capacity: 4850 Researcher's name: Brendah Dzuya

No. of Crew: 7 Estimated Volume: 4.5m^3

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from dumping site	out	30667		12 : 58			From D/site
Loading-1	in	30681	14,000	14 : 18	80		Limuru Rd to
	out			14 : 45		27	United Nations (unep)
Dumping site	in	30703	22,000	16 : 15	90		Limuru Rd
Start dumping				16 : 21	6		Thika Rd
Finish dumping				16 : 21		0	Outering Rd
Dumping site	out	30704	1,000	16 : 23	2		to Dandora
Reach to workshop	in			:			
Total			37,000		178	27	Total min.: 205 min.
Collection			0		0	27	
Transportation			36,000		170		
Inside the dumping site			1,000		8	0	Dumping time.: 8 min.
Idling time							