

CITY BINS



Time & Motion Study

Organization: CITY BINS

Trip- 2 Date: 17th MAY 1997

Vehicle No. KAE 636 H

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	45980.9		9 : 32			
Loading-1	in	45995.8	14,900	10 : 0	28		westlands
	out			10 : 3		3	
Loading-2	in	45996.3	500	10 : 9	6		
	out			10 : 13		4	
Loading-3	in	45996.7	400	10 : 15	2		
	out			10 : 15		0	
Loading-4	in	45996.9	200	10 : 17	2		
	out			10 : 20		3	
Loading-5	in	45998	1,100	10 : 26	6		
	out			10 : 30		4	
Loading-6	in	45998.3	300	10 : 31	1		
	out			10 : 36		5	
Loading-7	in	45998.4	100	10 : 37	1		
	out			10 : 37		0	
Loading-8	in	45998.5	100	10 : 37	0		
	out			10 : 41		4	
Loading-9	in	45998.5	10	10 : 41	0		
	out			10 : 43		2	
Loading-10	in	45998.5	10	10 : 43	0		
	out			10 : 45		2	
Loading-11	in	45998.7	200	10 : 46	1		
	out			10 : 49		3	
Loading-12	in	45999	300	10 : 51	2		
	out			10 : 53		2	
Loading-13	in	45999.2	200	10 : 53	0		
	out			10 : 54		1	
Loading-14	in	45999.7	500	10 : 55	1		Waiyaki way
	out			10 : 56		1	
Loading-15	in	46000.3	600	10 : 57	1		
	out			11 : 2		5	
Loading-16	in	46001	700	11 : 4	2		
	out			11 : 7		3	
Loading-17	in	46001.2	200	11 : 8	1		
	out			11 : 11		3	
Loading-18	in	46001.4	200	11 : 11	0		
	out			11 : 15		4	
Loading-19	in	46001.9	500	11 : 17	2		
	out			11 : 19		2	
Loading-20	in	46002.3	400	11 : 21	2		
	out			11 : 22		1	
Loading-21	in	46002.4	100	11 : 22	0		
	out			11 : 24		2	
Loading-22	in	46002.5	100	11 : 24	0		
	out			11 : 25		1	
Loading-23	in	46002.6	100	11 : 25	0		
	out			11 : 26		1	
Loading-24	in	46003.3	700	11 : 29	3		
	out			11 : 30		1	

Time & Motion Study

Organization: CITY BINS

Trip- 2 Date: 17th MAY 1997

Vehicle No. KAE 636 H

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in	46003.8	500	11 : 32	2		
	out			11 : 36		4	
Loading-26	in	46004.8	1,000	11 : 40	4		
	out			11 : 41		1	
Loading-27	in	46006.6	1800	11 : 45	4		
	out			11 : 47		2	idling time-12:09
Loading-28	in	46008.8	2200	12 : 13	26		
	out			12 : 17		4	
Loading-29	in	46008.9	100	12 : 18	1		
	out			12 : 18		0	
Loading-30	in	46009.1	200	12 : 19	1		
	out			12 : 22		3	
Loading-31	in	46009.3	200	12 : 22	0		
	out			12 : 24		2	
Loading-32	in	46009.5	200	12 : 25	1		
	out			12 : 25		0	
Loading-33	in	46010	500	12 : 27	2		
	out			12 : 28		1	
Loading-34	in	46010.3	300	12 : 29	1		
	out			12 : 32		3	
Loading-35	in	46010.4	100	12 : 33	1		
	out			12 : 34		1	
Loading-36	in	46010.9	500	12 : 36	2		
	out			12 : 37		1	
Loading-37	in	46011.5	600	12 : 39	2		
	out			12 : 40		1	
Loading-38	in	46011.6	100	12 : 41	1		
	out			12 : 41		0	
Loading-39	in	46011.7	100	12 : 42	1		
	out			12 : 43		1	
Loading-40	in	46011.8	100	12 : 43	0		
	out			12 : 44		1	
Loading-41	in	46011.8	10	12 : 44	0		
	out			12 : 45		1	
Loading-42	in	46011.9	100	12 : 45	0		
	out			12 : 46		1	
Loading-43	in	46012	100	12 : 47	1		
	out			12 : 47		0	
Loading-44	in	46012.2	200	12 : 47	0		
	out			12 : 48		1	
Loading-45	in	46012.2	10	12 : 48	0		
	out			12 : 50		2	
Loading-46	in	46012.4	200	12 : 52	2		
	out			12 : 54		2	
Loading-47	in	46012.5	100	12 : 55	1		
	out			12 : 56		1	
Loading-48	in	46012.7	200	12 : 57	1		
	out			12 : 58		1	

Time & Motion Study

Organization: CITY BINS

Trip- 2 Date: 17th MAY 1997

Vehicle No. KAE 636 H

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (kn)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in	46012.9	200	12 : 58	0		
	out			13 : 0		2	
Loading-50	in	46013.1	200	13 : 2	2		
	out			13 : 8		6	
Loading-51	in	46013.6	500	13 : 10	2		
	out			13 : 10		0	
Loading-52	in	46013.6	10	13 : 10	0		
	out			13 : 11		1	
Loading-53	in	46013.6	10	13 : 11	0		
	out			13 : 12		1	
Loading-54	in	46013.7	100	13 : 12	0		
	out			13 : 13		1	
Loading-55	in	46014.6	900	13 : 16	3		Secta Enterprises
	out			13 : 33		17	
Loading-56	in	46014.7	100	13 : 35	2		
	out			13 : 36		1	
Loading-57	in	46014.8	100	13 : 36	0		
	out			13 : 37		1	
Loading-58	in	46015.3	500	13 : 41	4		Parklands
	out			13 : 45		4	
Loading-59	in	46015.3	10	13 : 45	0		AGIP
	out			13 : 55		10	
Loading-60	in	46016.2	900	13 : 57	2		
	out			14 : 0		3	
Loading-61	in	46016.5	300	14 : 1	1		
	out			14 : 2		1	
Loading-62	in	46016.5	10	14 : 2	0		
	out			14 : 3		1	
Loading-63	in	46016.6	100	14 : 3	0		
	out			14 : 3		0	
Loading-64	in	46017.2	600	14 : 5	2		
	out			14 : 7		2	
Loading-65	in	46017.5	300	14 : 9	2		Parklands - Individual houses
	out			14 : 9		0	
Loading-66	in	46018.2	700	14 : 11	2		Individual Houses
	out			14 : 11		0	
Loading-67	in	46018.3	100	14 : 11	0		Individual Houses
	out			14 : 11		0	
Loading-68	in	46018.4	100	14 : 11	0		Individual Houses
	out			14 : 12		1	
Loading-69	in	46019.1	700	14 : 14	2		Individual Houses
	out			14 : 15		1	
Loading-70	in	46019.2	100	14 : 15	0		Individual Houses
	out			14 : 16		1	
Loading-71	in	46019.3	100	14 : 16	0		Individual Houses
	out			14 : 18		2	
Loading-72	in	46019.4	100	14 : 20	2		Individual Houses
	out			14 : 20		0	

Time & Motion Study

Organization: CITY BINS

Trip- 2 Date: 17th MAY 1997

Vehicle No. KAF 636 H

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-73	in	46019.7	300	14 : 21	1		Individual Houses
	out			14 : 22		1	
Loading-74	in	46019.8	100	14 : 23	1		Individual Houses
	out			14 : 23		0	
Loading-75	in	46020	200	14 : 24	1		Individual Houses
	out			14 : 26		2	
Loading-76	in	46020.5	500	14 : 28	2		Individual Houses
	out			14 : 30		2	
Loading-77	in	46021.1	600	14 : 32	2		Individual Houses
	out			14 : 37		5	
Loading-78	in	46021.5	400	14 : 38	1		Individual Houses
	out			14 : 39		1	
Loading-79	in	46021.5	10	14 : 40	1		Individual Houses
	out			14 : 40		0	
Loading-80	in	46021.7	200	14 : 41	1		Individual Houses
	out			14 : 41		0	
Loading-81	in	46021.8	100	14 : 41	0		Individual Houses in
	out			14 : 43		2	
Loading-82	in	46021.8	10	14 : 43	0		Individual Houses in
	out			14 : 52		9	
Loading-83	in	46022.3	500	15 : 1	9		Individual Houses in
	out			15 : 3		2	
Loading-84	in	46022.9	600	15 : 5	2		Individual Houses in
	out			15 : 7		2	
Loading-85	in	46023.1	200	15 : 8	1		Individual Houses in
	out			15 : 9		1	
Loading-86	in	46023.7	600	15 : 10	1		Individual Houses in
	out			15 : 12		2	
Loading-87	in	46023.9	200	15 : 13	1		Individual Houses in
	out			15 : 19		6	
Loading-88	in	46023.9	10	15 : 19	0		Individual Houses in
	out			15 : 21		2	
Loading-89	in	46023.9	10	15 : 21	0		Individual Houses in
	out			15 : 23		2	
Loading-90	in	46024.1	200	15 : 23	0		Individual Houses in
	out			15 : 26		3	
Loading-91	in	46024.9	800	15 : 31	5		Individual Houses in
	out			15 : 31		0	
Dumping site	in	46038.1	13,200	15 : 55	24		
Start dumping		46038.1	10	15 : 58	3		
Finish dumping				16 : 32		34	
Dumping site	out			16 : 34	2		
Reach to workshop	in	46051.9	13,800	17 : 10	36		
Total			71,130		235	223	Total min.: 458 min.
Collection			29,220		142	189	
Transportation			41,900		66	0	
Inside the dumping site			10		5	34	Dumping time
Idling time					22		Idling Time

Time & Motion Study

Organization: CITY BINS

Trip- 2 Date: 17th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

 Estimated Volume: 6.75m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	74484.5		9 : 39			From Dumping Site
Loading-1	in	74498.5	14,000	10 : 15	36		South B Melili Road
	out			10 : 20		5	
Loading-2	in	74499	500	10 : 22	2		South B Shopping Centre
	out			10 : 23		1	
Loading-3	in	74500.5	1,500	10 : 28	5		South B Residential
	out			10 : 29		1	
Loading-4	in	74500.9	400	10 : 30	1		South B Residential
	out			10 : 32		2	
Loading-5	in	74500.9	0	10 : 33	1		South B Residential
	out			10 : 35		2	
Loading-6	in	74500.9	0	10 : 36	1		South B Residential
	out			10 : 37		1	
Loading-7	in	74501	100	10 : 38	1		South B Residential
	out			10 : 39		1	
Loading-8	in	74501.1	100	10 : 39	0		South B Residential
	out			10 : 40		1	
Loading-9	in	74501.1	0	10 : 41	1		South B Residential
	out			10 : 47		6	
Loading-10	in	74503.7	2,600	10 : 53	6		Mombasa Road
	out			10 : 56		3	
Loading-11	in	74507.8	4,100	11 : 4	8		South C Muhoho Road
	out			11 : 5		1	
Loading-12	in	74507.8	0	11 : 5	0		South C Muhoho Road
	out			11 : 6		1	
Loading-13	in	74508	200	11 : 8	2		South C Punda Milia Crescent
	out			11 : 8		0	
Loading-14	in	74508.1	100	11 : 10	2		South C Punda Milia Crescent
	out			11 : 11		1	
Loading-15	in	74508.1	0	11 : 11	0		South C Punda Milia Crescent
	out			11 : 12		1	
Loading-16	in	74508.3	200	11 : 13	1		South C Punda Milia Crescent
	out			11 : 15		2	
Loading-17	in	74508.5	200	11 : 16	1		South C Ndekwa Avenue
	out			11 : 19		3	
Loading-18	in	74508.7	200	11 : 20	1		South C Muhoho Road(Avenue)
	out			11 : 21		1	
Loading-19	in	74509	300	11 : 22	1		South C Oluvimu Road
	out			11 : 23		1	
Loading-20	in	74509.1	100	11 : 24	1		South C Sungura Road
	out			11 : 25		1	
Loading-21	in	74509.1	0	11 : 25	0		South C Sungura Road
	out			11 : 31		6	
Loading-22	in	74509.2	100	11 : 31	0		Sungura Estate
	out			11 : 33		2	
Loading-23	in	74509.3	100	11 : 34	1		Sungura Estate
	out			11 : 35		1	

Time & Motion Study

Organization: CITY BINS

Trip- 2 Date: 17th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-24	in	74509.3	0	11 : 38	3		Sungura Estate
	out			11 : 42		4	
Loading-25	in	74509.3	0	11 : 43	1		Sungura Estate
	out			11 : 44		1	
Loading-26	in	74509.3	0	11 : 45	1		Sungura Estate
	out			11 : 47		2	
Loading-27	in	74509.4	100	11 : 50	3		Kaisungur Road
	out			11 : 51		1	
Loading-28	in	74509.5	100	11 : 52	1		Muhoho Road(Avenue)
	out			11 : 55		3	
Loading-29	in	74510.1	600	12 : 0	5		off Muhoho Road
	out			12 : 0		0	off M.O.W Sports club
Loading-30	in	74510.8	700	12 : 4	4		Mugaya Estate
	out			12 : 5		1	
Loading-31	in	74510.9	100	12 : 6	1		Mugaya Estate
	out			12 : 7		1	
Loading-32	in	74511	100	12 : 10	3		Mugaya Estate
	out			12 : 12		2	
Loading-33	in	74512.3	1,300	12 : 15	3		K.M.A Estate (Muhoho Rd(Av))
	out			12 : 16		1	
Loading-34	in	74512.8	500	12 : 19	3		K.M.A Estate
	out			12 : 19		0	
Loading-35	in	74513	200	12 : 20	1		Ole Shapara Rd(Av)
	out			12 : 21		1	
Loading-36	in	74513.2	200	12 : 22	1		Rumi Rd
	out			12 : 23		1	
Loading-37	in	74513.3	100	12 : 25	2		Ndekwa Avenue
	out			12 : 27		2	
Loading-38	in	74513.4	100	12 : 29	2		Ndekwa Avenue
	out			12 : 30		1	
Loading-39	in	74513.5	100	12 : 31	1		Ndekwa Avenue
	out			12 : 31		0	
Loading-40	in	74513.8	300	12 : 34	3		Mufulu Avenue
	out			12 : 35		1	
Loading-41	in	74514	200	12 : 36	1		Mufulu Avenue
	out			12 : 37		1	
Loading-42	in	74514.2	200	12 : 38	1		Mufulu Avenue
	out			12 : 38		0	
Loading-43	in	74514.4	200	12 : 41	3		Ole Shapara Avenue
	out			12 : 43		2	
Loading-44	in	74515	600	12 : 45	2		Sungura road
	out			12 : 50		5	
Loading-45	in	74515.6	600	12 : 54	4		Ole Shapara Avenue
	out			12 : 57		3	
Loading-46	in	74515.8	200	12 : 59	2		Mtelo road
	out			13 : 0		1	
Loading-47	in	74515.9	100	13 : 1	1		Muhuti crescent
	out			13 : 4		3	

Time & Motion Study

Organization: CITY BINS

Trip- 2 Date: 17th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location		Milceage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-48	in	74516	100	13 : 7	3		Muhuti crescent
	out			13 : 9		2	
Loading-49	in	74516.3	300	13 : 10	1		Muhoho road
	out			13 : 11		1	
Loading-50	in	74516.5	200	13 : 12	1		Y.M.C.A Nairobi South
	out			13 : 24		12	
Loading-51	in	74516.7	200	13 : 25	1		Mtelo road
	out			13 : 26		1	
Loading-52	in	74516.8	100	13 : 28	2		Mtelo road
	out			13 : 29		1	
Loading-53	in	74516.9	100	13 : 30	1		Mtelo road
	out			13 : 30		0	
Loading-54	in	74517.9	1,000	13 : 40	10		Ole Shapara Avenue
	out			13 : 40		0	lunch break for 10 minits
Loading-55	in	74518.4	500	13 : 50	10		United Housing
	out			13 : 52		2	
Loading-56	in	74518.5	100	13 : 53	1		United Housing
	out			13 : 58		5	
Loading-57	in	74518.7	200	14 : 0	2		United Housing
	out			14 : 2		2	
Loading-58	in	74519	300	14 : 4	2		United Housing
	out			14 : 7		3	
Loading-59	in	74519.2	200	14 : 10	3		United Housing
	out			14 : 10		0	
Loading-60	in	74519.3	100	14 : 10	0		Akiba Estate
	out			14 : 11		1	
Loading-61	in	74519.8	500	14 : 14	3		Akiba Estate
	out			14 : 15		1	
Loading-62	in	74520	200	14 : 16	1		Kabiyet road
	out			14 : 17		1	
Loading-63	in	74520.1	100	14 : 18	1		Kabiyet road
	out			14 : 19		1	
Loading-64	in	74520.2	100	14 : 20	1		Kabiyet road
	out			14 : 20		0	
Loading-65	in	74520.5	300	14 : 24	4		Mai Mahiu road (Mila Estate)
	out			14 : 26		2	
Loading-66	in	74520.7	200	14 : 27	1		Mai Mahiu road (Mila Estate)
	out			14 : 30		3	
Loading-67	in	74521.3	600	14 : 31	1		Thogoto road
	out			14 : 35		4	
Loading-68	in	74521.6	300	14 : 36	1		kodi road 1
	out			14 : 37		1	
Loading-69	in	74521.9	300	14 : 38	1		kodi road 1
	out			14 : 40		2	
Loading-70	in	74522	100	14 : 40	0		kodi road 1
	out			14 : 42		2	
Loading-71	in	74522.2	200	14 : 43	1		kodi road 1
	out			14 : 45		2	

Time & Motion Study

Organization: CITY BINS

Trip- 2 Date: 17th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-72	in	74522.3	100	14 : 45	0		kodi road 1
	out			14 : 46		1	
Loading-73	in	74522.3	0	14 : 48	2		kodi road 1
	out			14 : 49		1	
Loading-74	in	74522.5	200	14 : 50	1		Nairobi West- Gandhi Ave.
	out			14 : 52		2	
Loading-75	in	74523.1	600	14 : 55	3		Nairobi west -Bukani road
	out			14 : 57		2	
Loading-76	in	74523.3	200	15 : 0	3		Nairobi west-Bukani road
	out			15 : 0		0	
Loading-77	in	74523.6	300	15 : 5	5		Niamey road
	out			15 : 9		4	
Loading-78	in	74524.2	600	15 : 10	1		Muthaiti road
	out			15 : 13		3	
Loading-79	in	74524.5	300	15 : 14	1		Kifaru Estate
	out			15 : 14		0	
Loading-80	in	74524.6	100	15 : 15	1		Kifaru Estate
	out			15 : 16		1	
Loading-81	in	74525.1	500	15 : 19	3		Kisauni road-Nairobi West
	out			15 : 20		1	
Dumping site	in	74540.4	15,300	15 : 52	32		Dandora
Start dumping		74540.4		16 : 0	8		
Finish dumping		74540.4		16 : 30		30	
Dumping site	out	74541.3	900	16 : 30	0		
Reach to workshop	in			17 : 10	40		
Total			56,800		276	175	Total min.: 451 min.
Collection			26,600		150	145	
Transportation			29,300		108		
Inside the dumping site			900		8	30	Dumping time
Idling time					10		Lunch Break

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 19th MAY 1997

Vehicle No. KAE 636 H

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	46051.9		8 : 23			The truck had no trash
Loading-1	in	46056	4,100	8 : 48	25		Industrial area (The Wrigley Co. (EA)LTD.)
	out			9 : 46		58	
Loading-2	in	46059.9	3,900	9 : 58	12		Masaba road
	out			10 : 2		4	
Loading-3	in	46060.1	200	10 : 3	1		Upper Hill
	out			10 : 3		0	
Loading-4	in	46061	900	10 : 5	2		Casia court
	out			10 : 5		0	
Loading-5	in	46061.3	300	10 : 5	0		
	out			10 : 6		1	
Loading-6	in	46061.8	500	10 : 8	2		
	out			10 : 11		3	
Loading-7	in	46062.1	300	10 : 11	0		
	out			10 : 12		1	
Loading-8	in	46062.4	300	10 : 13	1		
	out			10 : 13		0	
Loading-9	in	46062.8	400	10 : 14	1		
	out			10 : 16		2	
Loading-10	in	46063.5	700	10 : 18	2		Longonot road
	out			10 : 26		8	
Loading-11	in	46068.4	4,900	10 : 37	11		Mbangati way
	out			10 : 37		0	
Loading-12	in	46068.9	500	10 : 39	2		Ngumo Estate
	out			10 : 40		1	
Loading-13	in	46069	100	10 : 41	1		
	out			10 : 41		0	
Loading-14	in	46069.1	100	10 : 41	0		
	out			10 : 42		1	
Loading-15	in	46069.3	200	10 : 45	3		
	out			10 : 45		0	
Loading-16	in	46069.4	100	10 : 46	1		
	out			10 : 46		0	
Loading-17	in	46069.4	10	10 : 47	1		
	out			10 : 47		0	
Loading-18	in	46069.4	10	10 : 47	0		
	out			10 : 47		0	
Loading-19	in	46069.5	100	10 : 48	1		
	out			10 : 50		2	
Loading-20	in	46069.7	200	10 : 52	2		
	out			10 : 53		1	
Loading-21	in	46070.2	500	10 : 53	0		Mtongwe road
	out			10 : 53		0	
Loading-22	in	46070.7	500	10 : 55	2		Longinye rd.
	out			10 : 56		1	
Loading-23	in	46070.9	200	10 : 58	2		
	out			10 : 58		0	
Loading-24	in	46071.2	300	10 : 59	1		
	out			10 : 59		0	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 19th MAY 1997

Vehicle No. KAE 636 II

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in	46071.5	300	11 : 0	1		City mortury
	out			11 : 0		0	Ngong rd.
Loading-26	in	46072.2	700	11 : 2	2		
	out			11 : 2		0	Woodland road
Loading-27	in	46073.5	1,300	11 : 5	3		
	out			11 : 5		0	
Loading-28	in	46073.7	200	11 : 6	1		
	out			11 : 6		0	
Loading-29	in	46074.1	400	11 : 8	2		Lenana road
	out			11 : 8		0	
Loading-30	in	46074.4	300	11 : 9	1		state house road
	out			11 : 16		7	
Loading-31	in	46076.7	2,300	11 : 20	4		
	out			11 : 22		2	
Loading-32	in	46078.2	1,500	11 : 25	3		Ring road riverside drive
	out			11 : 26		1	
Loading-33	in	46078.8	600	11 : 28	2		Chiromo Estate
	out			11 : 32		4	
Loading-34	in	46078.8	10	11 : 38	6		
	out			11 : 38		0	
Loading-35	in	46079.3	500	11 : 40	2		Chiromo Mortury
	out			11 : 41		1	
Loading-36	in	46080.1	800	11 : 43	2		Garden road
	out			11 : 43		0	
Loading-37	in	46080.3	200	11 : 45	2		
	out			11 : 46		1	
Loading-38	in	46081	700	11 : 49	3		Raju Estate
	out			11 : 53		4	
Loading-39	in	46081.2	200	11 : 54	1		Raju Estate
	out			11 : 58		4	
Loading-40	in	46081.5	300	11 : 59	1		Riverside
	out			12 : 0		1	
Loading-41	in	46081.6	100	12 : 0	0		
	out			12 : 0		0	
Loading-42	in	46082.1	500	12 : 1	1		Riverside Lane
	out			12 : 2		1	
Loading-43	in	46082.2	100	12 : 2	0		
	out			12 : 2		0	
Loading-44	in	46082.6	400	12 : 4	2		
	out			12 : 4		0	
Loading-45	in	46082.8	200	12 : 5	1		
	out			12 : 7		2	
Loading-46	in	46083.4	600	12 : 9	2		Riverside Groove
	out			12 : 9		0	
Loading-47	in	46083.8	400	12 : 11	2		Riverside
	out			12 : 12		1	
Loading-48	in	46084.8	1,000	12 : 15	3		Riverside Gardens
	out			12 : 16		1	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 19th MAY 1997

Vehicle No. KAF 636 H

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in	46085.8	1,000	12 : 20	4		Garden close
	out			12 : 20		0	
Loading-50	in	46086	200	12 : 21	1		Jalipa Flats
	out			12 : 22		1	
Loading-51	in	46087.5	1,500	12 : 25	3		Laikipia Road
	out			12 : 27		2	
Loading-52	in	46088.4	900	12 : 31	4		Riverside ring rd.
	out			12 : 32		1	
Loading-53	in	46088.8	400	12 : 34	2		Kileleshwa
	out			12 : 34		0	
Loading-54	in	46089	200	12 : 35	1		Kileleshwa
	out			12 : 35		0	
Loading-55	in	46089.5	500	12 : 37	2		Kangundo road
	out			12 : 37		0	
Loading-56	in	46089.6	100	12 : 41	4		Kileleshwa
	out			12 : 41		0	
Loading-57	in	46090.4	800	12 : 43	2		Kileleshwa
	out			12 : 45		2	
Loading-58	in	46091.8	1,400	12 : 51	6		Elite Shelter
	out			12 : 53		2	
Loading-59	in	46092.4	600	12 : 55	2		
	out			12 : 56		1	
Loading-60	in	46092.5	100	12 : 57	1		Raju Estate
	out			13 : 3		6	
Loading-61	in	46093.9	1,400	13 : 5	2		Dik Dik Gardens
	out			13 : 5		0	
Loading-62	in	46094.4	500	13 : 7	2		Kenya High School
	out			13 : 9		2	
Loading-63	in	46094.9	500	13 : 12	3		Raju Estate
	out			13 : 14		2	
Loading-64	in	46095.3	400	13 : 16	2		Gatundu Close
	out			13 : 16		0	
Loading-65	in	46095.4	100	13 : 17	1		Gatundu Close
	out			13 : 17		0	
Loading-66	in	46096.1	700	13 : 21	4		Siaya road
	out			13 : 21		0	
Loading-67	in	46096.7	600	13 : 24	3		
	out			13 : 25		1	
Loading-68	in	46099.6	2,900	13 : 37	12		Kileleshwa
	out			13 : 38		1	
Loading-69	in	46100	400	13 : 40	2		Raju Estate
	out			13 : 42		2	
Loading-70	in	46101.2	1,200	13 : 46	4		Mbaozi close
	out			13 : 47		1	
Loading-71	in	46101.4	200	13 : 50	3		Dagoretti Corner
	out			13 : 54		4	Egyptian Embassy

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 19th MAY 1997

Vehicle No. KAE 636 H

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Dumping site	in	46124.9	23,500	14 : 43	49		
Start dumping				15 : 5	22		
Finish dumping				:			
Dumping site	out			15 : 55	50		
Reach to workshop	in	46139.2	14,300	16 : 15	20		
Total			87,330		331	141	Total min.: 472 min.
Collection			45,430		165	141	
Transportation			41,900		94	0	
Inside the dumping site			0		72	0	Dumping time
Idling time							

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 19th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	74554.7		8 : 24			
Loading-1	in	74556.2	1,500	8 : 39	15		Nairobi west-Muthaiti road
	out			8 : 45		6	
Loading-2	in	74560	3,800	8 : 50	5		Dam Estate
	out			8 : 56		6	
Loading-3	in	74568.4	8,400	9 : 10	14		Karen Langata road
	out			9 : 10		0	
Loading-4	in	74573.6	5,200	9 : 16	6		Karen Langata road
	out			9 : 17		1	
Loading-5	in	74578.6	5,000	9 : 25	8		Karen Langata View Rise
	out			9 : 26		1	
Loading-6	in	74588.6	10,000	9 : 43	17		Karen ressurection road
	out			9 : 44		1	
Loading-7	in	74598.4	9,800	9 : 55	11		Karen Ngong road
	out			9 : 55		0	
Loading-8	in	74604.3	5,900	10 : 2	7		Agip Naivasha road
	out			10 : 4		2	
Loading-9	in	74605	700	10 : 7	3		Lavington Naivasha road
	out			10 : 9		2	
Loading-10	in	74605.6	600	10 : 10	1		Lavington Riara road
	out			10 : 11		1	
Loading-11	in	74605.9	300	10 : 14	3		Lavington Riara road
	out			10 : 15		1	
Loading-12	in	74607.7	1,800	10 : 20	5		lavington Gitanga road
	out			10 : 29		9	
Loading-13	in	74607.8	100	10 : 30	1		lavington Gitanga road
	out			10 : 39		9	
Loading-14	in	74607.9	100	10 : 40	1		lavington Gitanga road
	out			10 : 44		4	
Loading-15	in	74608.6	700	10 : 46	2		lavington Gitanga road
	out			10 : 55		9	
Loading-16	in	74608.7	100	10 : 55	0		lavington Gitanga road
	out			10 : 56		1	
Loading-17	in	74609.2	500	10 : 57	1		Lavington Kolloh road
	out			10 : 58		1	
Loading-18	in	74609.9	700	10 : 59	1		Lavington Kolloh road
	out			10 : 59		0	
Loading-19	in	74610.3	400	11 : 0	1		Lavington James Gichuru road
	out			11 : 0		0	
Loading-20	in	74610.8	500	11 : 2	2		Lavington James Gichuru road
	out			11 : 5		3	
Loading-21	in	74611.2	400	11 : 6	1		Lavington Owashika road
	out			11 : 6		0	
Loading-22	in	74611.9	700	11 : 8	2		Lavington Owashika road
	out			11 : 8		0	
Loading-23	in	74612.5	600	11 : 10	2		Lavington Chalbi Drive
	out			11 : 13		3	
Loading-24	in	74613.1	600	11 : 15	2		Lavington Njumbi road
	out			11 : 15		0	

Time & Motion Study

Organization: CITY BINS

Trip- 1

Date: 19th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in	74614.1	1,000	11 : 19	4		Lavington Chalbi Drive
	out			11 : 19		0	
Loading-26	in	74614.4	300	11 : 22	3		Lavington Isaac Gathanju Rd
	out			11 : 22		0	
Loading-27	in	74615	600	11 : 25	3		Lavington Isaac Gathanju Rd
	out			11 : 25		0	
Loading-28	in	74616.3	1,300	11 : 28	3		Lavington Elmolo Drive
	out			11 : 31		3	
Loading-29	in	74619.1	2,800	11 : 39	8		Lavington Muhoya road
	out			11 : 39		0	
Loading-30	in	74619.4	300	11 : 40	1		Lavington Ole nguruone Rd
	out			11 : 41		1	
Loading-31	in	74620.5	1,100	11 : 44	3		Lavington
	out			11 : 45		1	
Loading-32	in	74621.4	900	11 : 46	1		Lavington Mageta road
	out			11 : 47		1	
Loading-33	in	74622.3	900	11 : 50	3		Lavington Muthangari road
	out			11 : 50		0	
Loading-34	in	74623.6	1,300	11 : 53	3		Lavington Kiputi road
	out			11 : 56		3	
Loading-35	in	74623.8	200	11 : 56	0		Lavington Oloitokitok Rd
	out			11 : 57		1	
Loading-36	in	74626	2,200	12 : 0	3		Kilimani Elegeyo Marakwet Rd
	out			12 : 1		1	
Loading-37	in	74626.1	100	12 : 2	1		Kilimani Elegeyo Marakwet Rd
	out			12 : 5		3	
Loading-38	in	74626.6	500	12 : 7	2		Kilimani Kilungu road
	out			12 : 7		0	
Loading-39	in	74627.1	500	12 : 11	4		Kilungu Rd
	out			12 : 13		2	
Loading-40	in	74628.8	1,700	12 : 21	8		Kirichwa Rd
	out			12 : 22		1	
Loading-41	in	74629.4	600	12 : 25	3		Kirichwa road
	out			12 : 25		0	
Loading-42	in	74629.8	400	12 : 27	2		Menelik Road
	out			12 : 29		2	
Loading-43	in	74629.9	100	12 : 29	0		Menelik Road
	out			12 : 30		1	
Loading-44	in	74630	100	12 : 32	2		Menelik road
	out			12 : 32		0	
Loading-45	in	74630.2	200	12 : 34	2		Kindaruma road
	out			12 : 35		1	
Loading-46	in	74630.4	200	12 : 37	2		Kindaruma road
	out			12 : 38		1	
Loading-47	in	74630.5	100	12 : 39	1		Kindaruma road
	out			12 : 42		3	
Loading-48	in	74630.5	0	12 : 42	0		Wood Avenue
	out			12 : 44		2	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 19th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in	74630.7	200	12 : 45	1		Wood Gardens
	out			12 : 46		1	
Loading-50	in	74630.9	200	12 : 47	1		Wood Gardens
	out			12 : 50		3	
Loading-51	in	74631	100	12 : 52	2		Wood Avenue
	out			12 : 59		7	
Loading-52	in	74631.2	200	13 : 0	1		Chania Avenue
	out			13 : 0		0	
Loading-53	in	74631.5	300	13 : 1	1		Chania Avenue
	out			13 : 2		1	
Loading-54	in	74631.8	300	13 : 5	3		Chania Avenue
	out			13 : 6		1	
Loading-55	in	74632.2	400	13 : 7	1		Chania Avenue
	out			13 : 8		1	
Loading-56	in	74632.6	400	13 : 10	2		Chania Avenue
	out			13 : 14		4	
Loading-57	in	74632.7	100	13 : 15	1		Wood Avenue
	out			13 : 15		0	
Loading-58	in	74633	300	13 : 16	1		Komo Lane
	out			13 : 19		3	
Loading-59	in	74633.4	400	13 : 22	3		Argwings Kodhek Rd
	out			13 : 26		4	
Loading-60	in	74633.9	500	13 : 30	4		Lenana road
	out			13 : 31		1	
Loading-61	in	74634.2	300	13 : 32	1		Spanish Villas (Lenana Rd)
	out			13 : 35		3	
Loading-62	in	74634.7	500	13 : 37	2		Lenana road
	out			13 : 39		2	
Loading-63	in	74635.3	600	13 : 42	3		Likoni Lane
	out			13 : 44		2	
Loading-64	in	74636.1	800	13 : 45	1		Tigoni road
	out			13 : 46		1	
Loading-65	in	74636.2	100	13 : 47	1		Tigoni road
	out			13 : 48		1	
Loading-66	in	74636.6	400	13 : 52	4		Jabavu villas (Jabavu Rd)
	out			13 : 55		3	
Loading-67	in	74636.7	100	13 : 57	2		Kasuku road
	out			14 : 0		3	
Loading-68	in	74637.2	500	14 : 1	1		Lenana road
	out			14 : 1		0	
Loading-69	in	74637.3	100	14 : 4	3		Lenana road
	out			14 : 9		5	
Dumping site	in	74657.6	20,300	14 : 47	38		
Start dumping				15 : 0	13		
Finish dumping				15 : 30		30	
Dumping site	out	74672.8	15,200	15 : 50	20		
Reach to workshop	in			16 : 15	25		

Time & Motion Study

Organization: CITY BINS

Trip- 1

Date: 19th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Total		118,100		308	163	Total min.: 471min.
Collection		81,100		197	133	
Transportation		21,800		78		
Inside the dumping site		15,200		33	30	Dumping time
Idling time						

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 20th MAY 1997

Vehicle No. KAE 636 II

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 3

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	46139.2		8 : 29			
Loading-1	in	46145.1	5,900	8 : 52	23		Eastleigh section 3
	out			8 : 55		3	
Loading-2	in	46145.9	800	8 : 59	4		Eastleigh section 2
	out			8 : 59		0	
Loading-3	in	46148.7	2,800	9 : 8	9		Kariokor
	out			9 : 8		0	
Loading-4	in	46148.9	200	9 : 9	1		Kariokor
	out			9 : 15		6	
Loading-5	in	46150.3	1,400	9 : 20	5		Pangani
	out			9 : 21		1	
Loading-6	in	46150.5	200	9 : 22	1		Ngara
	out			9 : 24		2	
Loading-7	in	46151.7	1,200	9 : 29	5		Juja road
	out			9 : 30		1	
Loading-8	in	46152.7	1,000	9 : 33	3		Garissa road
	out			9 : 35		2	
Loading-9	in	46153.1	400	9 : 37	2		Kipanga Athumani St
	out			9 : 38		1	
Loading-10	in	46153.2	100	9 : 38	0		Kipanga Athumani St
	out			9 : 40		2	
Loading-11	in	46153.3	100	9 : 41	1		Kipanga Athumani St
	out			9 : 44		3	
Loading-12	in	46153.8	500	9 : 46	2		Juja road Estate
	out			9 : 47		1	
Loading-13	in	46154	200	9 : 48	1		Juja road Estate
	out			9 : 48		0	
Loading-14	in	46154.7	700	9 : 51	3		North View Rd
	out			9 : 57		6	
Loading-15	in	46155	300	9 : 58	1		Bustani Lane
	out			9 : 58		0	
Loading-16	in	46155.4	400	10 : 0	2		Juja Rd
	out			10 : 0		0	
Loading-17	in	46155.5	100	10 : 1	1		
	out			10 : 5		4	
Loading-18	in	46155.8	300	10 : 7	2		Pangani
	out			10 : 19		12	
Loading-19	in	46156.6	800	10 : 41	22		Pangani
	out			10 : 42		1	
Loading-20	in	46157	400	10 : 43	1		
	out			10 : 43		0	
Loading-21	in	46157.1	100	10 : 44	1		Pareto Rd
	out			10 : 45		1	
Loading-22	in	461587.3	200	10 : 48	3		
	out			10 : 51		3	
Loading-23	in	46158.8	1,500	10 : 54	3		Muranga road
	out			10 : 55		1	
Loading-24	in	46158.9	100	10 : 59	4		
	out			11 : 2		3	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 20th MAY 1997

Vehicle No. KAE 636 11

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 3

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in	46158.9	10	11 : 2	0		
	out			11 : 2		0	
Loading-26	in	46159.1	200	11 : 3	1		
	out			11 : 4		1	
Loading-27	in	46159.2	100	11 : 4	0		Okoth Aura Rd
	out			11 : 4		0	
Loading-28	in	46161.2	2,000	11 : 10	6		Desai Road
	out			11 : 11		1	
Loading-29	in	46161.3	100	11 : 12	1		Desai Road
	out			11 : 13		1	
Loading-30	in	46161.9	600	11 : 14	1		Muranga road
	out			11 : 20		6	
Loading-31	in	46162.5	600	11 : 21	1		Kenjeku Rd
	out			11 : 24		3	
Loading-32	in	46162.7	200	11 : 24	0		
	out			11 : 26		2	
Loading-33	in	46163.2	500	11 : 28	2		Mushebi road
	out			11 : 28		0	
Loading-34	in	46163.9	700	11 : 31	3		Mushebi road
	out			11 : 31		0	
Loading-35	in	46164.1	200	11 : 32	1		Mushebi road
	out			11 : 34		2	
Loading-36	in	46164.4	300	11 : 35	1		Mushebi road
	out			11 : 35		0	
Loading-37	in	46164.8	400	11 : 38	3		Raju Estate
	out			11 : 40		2	
Loading-38	in	46165	200	11 : 40	0		
	out			11 : 40		0	
Loading-39	in	46165.1	100	11 : 40	0		Galla Lane
	out			11 : 43		3	
Loading-40	in	46165.2	100	11 : 43	0		Kolobot Road
	out			11 : 45		2	
Loading-41	in	46165.3	100	11 : 45	0		Kolobot Road
	out			11 : 45		0	
Loading-42	in	46165.5	200	11 : 46	1		Forest road
	out			11 : 52		6	
Loading-43	in	46165.9	400	11 : 53	1		parklands road
	out			11 : 57		4	
Loading-44	in	46165.9	10	11 : 58	1		parklands road
	out			11 : 58		0	
Loading-45	in	46166.1	200	12 : 0	2		parklands road
	out			12 : 2		2	
Loading-46	in	46166.2	100	12 : 4	2		Wambugu road
	out			12 : 5		1	
Loading-47	in	46166.6	400	12 : 6	1		Wambugu road
	out			12 : 7		1	
Loading-48	in	46166.7	100	12 : 7	0		Wambugu road
	out			12 : 7		0	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 20th MAY 1997

Vehicle No. KAE 636 II

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 3

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in	46167.1	400	12 : 9	2		Wambugu road
	out			12 : 32		23	
Loading-50	in	46167.2	100	12 : 35	3		Wambugu road
	out			12 : 37		2	
Loading-51	in	46167.4	200	12 : 39	2		Wambugu road
	out			12 : 52		13	
Loading-52	in	46167.8	400	12 : 53	1		Wambugu road
	out			12 : 57		4	
Loading-53	in	46167.8	10	12 : 58	1		Wambugu road
	out			12 : 58		0	
Loading-54	in	46167.8	10	12 : 59	1		
	out			13 : 4		5	
Loading-55	in	46168.4	600	13 : 5	1		First Parklands Avenue
	out			13 : 6		1	
Loading-56	in	46168.5	100	13 : 7	1		First Parklands Avenue
	out			13 : 7		0	
Loading-57	in	46168.8	300	13 : 10	3		First Parklands Avenue
	out			13 : 16		6	
Loading-58	in	46169	200	13 : 19	3		First Parklands Avenue
	out			13 : 21		2	
Loading-59	in	46169.2	200	13 : 21	0		First Parklands Avenue
	out			13 : 23		2	
Loading-60	in	46170.3	1,100	13 : 32	9		Second Ave Parklands
	out			13 : 34		2	
Loading-61	in	46170.6	300	13 : 36	2		Second Ave Parklands
	out			13 : 38		2	
Loading-62	in	46170.8	200	13 : 40	2		Msanako Rd
	out			13 : 41		1	
Loading-63	in	46171	200	13 : 43	2		
	out			13 : 44		1	
Loading-64	in	46171.5	500	13 : 47	3		
	out			13 : 48		1	
Loading-65	in	46172.4	900	13 : 54	6		Mtama road
	out			14 : 2		8	
Loading-66	in	46172.8	400	14 : 4	2		
	out			14 : 6		2	
Loading-67	in	46174	1,200	14 : 15	9		
	out			14 : 16		1	
Loading-68	in	46174.4	400	14 : 19	3		
	out			14 : 22		3	
Loading-69	in	46174.8	400	14 : 23	1		Bhanderi Rd
	out			14 : 24		1	
Loading-70	in	46175	200	14 : 25	1		Bhanderi Rd
	out			14 : 25		0	
Loading-71	in	46175.2	200	14 : 26	1		
	out			14 : 26		0	
Loading-72	in	46175.2	10	14 : 30	4		
	out			14 : 32		2	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 20th MAY 1997

Vehicle No. KAF 636 11

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 3

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-73	in	46175.2	10	14 : 32	0		
	out			14 : 32		0	
Loading-74	in	46175.2	10	14 : 33	1		
	out			14 : 33		0	
Loading-75	in	46175.8	600	14 : 34	1		
	out			14 : 35		1	
Loading-76	in	46175.9	100	14 : 36	1		
	out			14 : 36		0	
Loading-77	in	46176.1	200	14 : 38	2		
	out			14 : 39		1	
Loading-78	in	46176.6	500	14 : 41	2		2nd Avenue Parklands
	out			15 : 2		21	
Loading-79	in	46177.9	1,300	15 : 8	6		5th Avenue Parklands
	out			15 : 8		0	
Loading-80	in	46178	100	15 : 9	1		5th Avenue Parklands
	out			15 : 9			
Loading-81	in	46178	0	15 : 10	1		
	out			15 : 13		3	
Loading-82	in	46178.2	200	15 : 13	0		Mpaka Rd
	out			15 : 14		1	
Loading-83	in	46178.5	300	15 : 15	1		6th Parkland Ave
	out			15 : 18		3	
Loading-84	in	46178.7	200	15 : 22	4		6th Parkland Ave
	out			15 : 23		1	
Loading-85	in	46179.2	500	15 : 24	1		6th Parkland Ave
	out			15 : 24		0	
Loading-86	in	46179.3	100	15 : 26	2		6th Parkland Ave
	out			15 : 28		2	
Loading-87	in	46179.4	100	15 : 29	1		City Park Estate
	out			15 : 30		1	
Loading-88	in	46181.4	200	15 : 37	7		City Park Estate
	out			15 : 39		2	
Loading-89	in	46181.8	400	15 : 41	2		City Park Estate
	out			15 : 45		4	
Loading-90	in	46182.4	600	15 : 52	7		City Park Estate
	out			15 : 53		1	
Loading-91	in	46182.9	500	15 : 54	1		City Park Estate
	out			15 : 55		1	
Dumping site	in			:			To workshop: Vehicle
Start dumping				:	0		developed mechanical
Finish dumping				:		0	problems and could not
Dumping site	out			:	0		proceed to Dumping site
Reach to workshop	in	46191.5	8,600	16 : 30	35		

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 20th MAY 1997

Vehicle No. KAE 636 H

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 3

Estimated Volume:

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Total		50,570		267	214	Total min.: 481 min.
Collection		36,070		209	214	
Transportation		14,500		58	0	
Inside the dumping site		0		0	0	Dumping time
Idling time						

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 20th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	74672.5		8 : 29			(From 8:29 to 9:25am mechanical
Loading-1	in	74692.8	20,300	9 : 40	71		Problem) Lavington Kabasirani
	out			9 : 40		0	
Loading-2	in	74693.6	800	9 : 41	1		Lavington Manyani West Av
	out			9 : 41		0	
Loading-3	in	74694.5	900	9 : 45	4		Lavington Musa Gitau
	out			9 : 45		0	
Loading-4	in	74695.5	1,000	9 : 47	2		Lavington Waiyaki Way
	out			9 : 48		1	
Loading-5	in	74698.3	2,800	9 : 51	3		Mountain view Estate
	out			9 : 54		3	Off Waiyani Ways
Loading-6	in	74698.4	100	9 : 54	0		Mountain view Estate
	out			9 : 55		1	Off Waiyaki Ways
Loading-7	in	74698.6	200	9 : 56	1		Mountain view Estate
	out			9 : 57		1	Off Waiyani Ways
Loading-8	in	74698.7	100	9 : 58	1		Mountain view Estate
	out			9 : 59		1	Off Waiyani Ways
Loading-9	in	74698.8	100	10 : 4	5		Mountain view Estate
	out			10 : 4		0	Off Waiyani Ways
Loading-10	in	74699.4	600	10 : 6	2		Mountain view Estate
	out			10 : 8		2	Off Waiyani Ways
Loading-11	in	74700.1	700	10 : 10	2		Mountain view Estate
	out			10 : 11		1	Off Waiyani Ways
Loading-12	in	74700.5	400	10 : 15	4		Mountain view Estate
	out			10 : 15		0	Off Waiyani Ways
Loading-13	in	74700.6	100	10 : 16	1		Mountain view Estate
	out			10 : 16		0	Off Waiyani Ways
Loading-14	in	74700.7	100	10 : 17	1		Mountain view Estate
	out			10 : 20		3	Off Waiyani Ways
Loading-15	in	74704.6	3,900	10 : 25	5		Loresho Shinyalu Road
	out			10 : 26		1	
Loading-16	in	74705	400	10 : 26	0		Loresho Shinyalu Road
	out			10 : 30		4	
Loading-17	in	74705.1	100	10 : 31	1		Loresho Thego road
	out			10 : 32		1	
Loading-18	in	74706.1	1,000	10 : 32	0		Loresho Thego road
	out			10 : 34		2	
Loading-19	in	74707	900	10 : 36	2		Loresho Thego road
	out			10 : 39		3	
Loading-20	in	74708.4	1,400	10 : 41	2		Loresho Mweiga road
	out			10 : 42		1	
Loading-21	in	74710.2	1,800	10 : 44	2		Loresho Kyuna road
	out			10 : 45		1	
Loading-22	in	74711.2	1,000	10 : 46	1		Loresho Mugumo crescent
	out			10 : 46		0	
Loading-23	in	74712.1	900	10 : 50	4		Loresho Kyuna road
	out			10 : 50		0	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 20th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

 Estimated Volume: 6.75m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-24	in	74714	1,900	10 : 55	5		westlands grevillia Groove
	out			10 : 55		0	
Loading-25	in	74714.9	900	10 : 59	4		westlands grevillia Groove
	out			11 : 0		1	
Loading-26	in	74715.2	300	11 : 2	2		westlands grevillia Groove
	out			11 : 4		2	
Loading-27	in	74715.4	200	11 : 5	1		westlands grevillia Groove
	out			11 : 6		1	
Loading-28	in	74715.8	400	11 : 8	2		westlands grevillia Groove
	out			11 : 9		1	
Loading-29	in	74716	200	11 : 11	2		westlands grevillia Groove
	out			11 : 12		1	
Loading-30	in	74716.5	500	11 : 13	1		westlands grevillia Groove
	out			11 : 15		2	
Loading-31	in	74716.9	400	11 : 20	5		westlands Off Muguga Gardens
	out			11 : 21		1	
Loading-32	in	74717.5	600	11 : 21	0		Brookside Gardens
	out			11 : 21			
Loading-33	in	74719.1	1,600	11 : 26	5		School Lane-westlands
	out			11 : 30		4	
Loading-34	in	74720.1	1,000	11 : 33	3		School Lane(Upper)-westlands
	out			11 : 34		1	
Loading-35	in	74720.5	400	11 : 35	1		Brookside Drive(Lower)-Westlands
	out			11 : 36		1	
Loading-36	in	74720.6	100	11 : 38	2		Brookside Drive(Lower)-Westlands
	out			11 : 41		3	
Loading-37	in	74720.9	300	11 : 43	2		Brookside Drive(Lower)-Westlands
	out			11 : 46		3	
Loading-38	in	74721	100	11 : 48	2		Brookside Drive(Lower)-Westlands
	out			11 : 49		1	
Loading-39	in	74721.2	200	11 : 51	2		Brookside Drive(Lower)-Westlands
	out			11 : 54		3	
Loading-40	in	74721.5	300	11 : 54	0		Lower Kabete road
	out			11 : 59		5	
Loading-41	in	74721.6	100	11 : 59	0		Lower Kabete road
	out			12 : 0		1	
Loading-42	in	74722.4	800	12 : 5	5		General Mathenge Drive (Lower)
	out			12 : 8		3	
Loading-43	in	74722.7	300	12 : 10	2		General Mathenge Drive (Lower)
	out			12 : 12		2	
Loading-44	in	74723	300	12 : 14	2		General Mathenge Drive (Lower)
	out			12 : 15		1	
Loading-45	in	74723.2	200	12 : 17	2		General Mathenge Drive (Lower)
	out			12 : 19		2	
Loading-46	in	74723.6	400	12 : 22	3		General Mathenge Drive (Lower)
	out			12 : 25		3	
Loading-47	in	74723.8	200	12 : 26	1		Donyo Sabuk Lane
	out			12 : 30		4	
Loading-48	in	74724.5	700	12 : 32	2		Peponi road

Time & Motion Study

Organization: CITY BINS Trip- 1 Date: 20th May 1997

Vehicle No. KAD 554 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
			12 : 32		0	
out						
Loading-49	74724.9	400	12 : 35	3		Peponi road
out			12 : 35		0	
Loading-50	74725.6	700	12 : 36	1		Donyo Sabuk Lane
out			12 : 38		2	
Loading-51	74726.1	500	12 : 40	2		General Mathenge Drive
out			12 : 40		0	
Loading-52	74726.2	100	12 : 41	1		General Mathenge Drive
out			12 : 46		5	
Loading-53	74726.3	100	12 : 47	1		General Mathenge Drive
out			12 : 48		1	
Loading-54	74726.5	200	12 : 50	2		The Pine Wood Grove
out			12 : 50		0	
Loading-55	74726.7	200	12 : 51	1		The Pine Wood Grove
out			12 : 51		0	
Loading-56	74727.4	700	12 : 55	4		Shanzu road
out			12 : 55		0	
Loading-57	74732.8	5,400	13 : 4	9		Kitisuru Road
out			13 : 6		2	
Loading-58	74734.5	1,700	13 : 9	3		Kitisuru Road
out			13 : 12		3	Lunch Break from 1:12-1:34
Loading-59	74738.5	4,000	13 : 34	22		Lake view cross road
out			13 : 34		0	
Loading-60	74739.1	600	13 : 38	4		Lake view cross road
out			13 : 39		1	
Loading-61	74739.6	500	13 : 41	2		Lake view cross road
out			13 : 42		1	
Loading-62	74740.1	500	13 : 45	3		Hill View
out			13 : 45		0	
Loading-63	74741.4	1,300	13 : 50	5		Spring Valley road
out			13 : 50		0	
Loading-64	74742.4	1,000	13 : 53	3		Spring Valley road
out			13 : 55		2	
Loading-65	74743.4	1,000	13 : 56	1		Peponin road (Lower)
out			13 : 57		1	
Loading-66	74743.6	200	13 : 58	1		Peponi close
out			13 : 58		0	
Loading-67	74743.7	100	14 : 0	2		peponi road (Lower)
out			14 : 0		0	
Loading-68	74744.3	600	14 : 1	1		Muthaiga Thigiri rigde
out			14 : 3		2	
Loading-69	74745.9	1,600	14 : 7	4		Muthaiga Thigiri Lane
out			14 : 9		2	
Loading-70	74748.4	2,500	14 : 15	6		Red hill road Nyali Estate
out			14 : 16		1	
Loading-71	74750.3	1,900	14 : 21	5		Red hill road Nyali Estate
out			14 : 21		0	
Loading-72	74751.4	1,100	14 : 26	5		Red hill road Nyali Estate
out			14 : 27		1	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 20th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-73	in	74754.9	3,500	14 : 33	6		Roselyn close
	out			14 : 33		0	
Loading-74	in	74756.7	1,800	14 : 40	7		Roselyn close
	out			14 : 40		0	
Loading-75	in	74759.1	2,400	14 : 45	5		Gigin United Nations
	out			14 : 45		0	
Loading-76	in	74760.4	1,300	14 : 49	4		Wispers Avenue (Gigin)
	out			14 : 50		1	
Loading-77	in	74760.5	100	14 : 54	4		Wispers Avenue (Gigin)
	out			14 : 55		1	
Loading-78	in	74762.4	1,900	14 : 58	3		Lobelia Drive Gigin Estate
	out			15 : 4		6	
Loading-79	in	74763.3	900	15 : 6	2		Fuchsia Close
	out			15 : 7		1	
Loading-80	in	74764.2	900	15 : 14	7		Daisy Close
	out			15 : 14		0	
Loading-81	in	74764.7	500	15 : 16	2		Camella Close
	out			15 : 16		0	
Loading-82	in	74768.2	3,500	15 : 25	9		Limuru road
	out			15 : 30		5	
Loading-83	in	74770.4	2,200	15 : 31	1		Runda road
	out			15 : 35		4	
Loading-84	in	74771.2	800	15 : 38	3		Runda road
	out			15 : 39		1	
Loading-85	in	74776.9	5,700	15 : 51	12		Runda road
	out			15 : 54		3	
Loading-86	in	74778.9	2,000	15 : 59	5		Ridgeways Estate Ridgeway Road
	out			15 : 59		0	
Loading-87	in	74779.6	700	16 : 0	1		Ridgeways Estate Ridgeway Road
	out			16 : 0		0	
Loading-88	in	74780.7	1,100	16 : 4	4		Kigwa Lane
	out			16 : 7		3	
Loading-89	in	74780.8	100	16 : 7	0		Kigwa Lane
	out			16 : 10		3	
Dumping site	in	74793.7	12,900	16 : 30	20		
Start dumping		74793.7		16 : 39	9		
Finish dumping		74793.7		17 : 5		26	
Dumping site	out	74794.8	1,100	17 : 10	5		
Reach to workshop	in	74809.1	14,300	17 : 40	30		
Total			136,600		401	150	Total min.: 551min.
Collection			88,000		188	124	
Transportation			47,500		121		
Inside the dumping site			1,100		14	26	Dumping time
Idling time					78		Lunch break/Mechanical problem

Time & Motion Study

Organization: CITY BINS Trip- 2 Date: 20th May 1997

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON Researcher's name: A. Wanjohi

No. of Crew: 3

Estimated Volume: 3.94m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out			:			
Loading-1	in	6458.3	25,500	10 : 34			Westlands Houses
	out			10 : 34		0	
Loading-2	in	6458.4	100	10 : 36	2		Westlands Houses
	out			10 : 38		2	
Loading-3	in	6458.6	200	10 : 40	2		Westlands Houses
	out			10 : 42		2	
Loading-4	in	6458.9	300	10 : 44	2		Westlands Houses
	out			10 : 46		2	
Loading-5	in	6459.2	700	10 : 47	1		Westlands Houses
	out			10 : 51		4	Lantana Road
Loading-6	in	6459.7	500	10 : 53	2		Westlands Houses
	out			10 : 54		1	Sports road
Loading-7	in	6460	300	10 : 57	3		Westlands Houses
	out			10 : 59		2	Westlands Ave
Loading-8	in	6460.2	200	11 : 0	1		Westlands Ave
	out			11 : 4		4	
Loading-9	in	6460.3	100	11 : 5	1		Westlands Ave
	out			11 : 5		0	
Loading-10	in	6460.4	100	11 : 7	2		Sports road
	out			11 : 9		2	
Loading-11	in	6460.5	100	11 : 11	2		Sports road
	out			11 : 12		1	
Loading-12	in	6460.6	100	11 : 12	0		Sports road
	out			11 : 13		1	
Loading-13	in	6460.6		11 : 13	0		Sports road
	out			11 : 14		1	
Loading-14	in	6460.7	100	11 : 15	1		Sports road
	out			11 : 16		1	
Loading-15	in	6460.8	100	11 : 22	6		Sports road
	out			11 : 24		2	
Loading-16	in	6460.9	100	11 : 26	2		Sports road
	out			11 : 30		4	
Loading-17	in	6461	100	11 : 31	1		Sports road
	out			11 : 31		0	
Loading-18	in	6461.1	100	11 : 32	1		Sports Road West
	out			11 : 33		1	
Loading-19	in	6461.4	300	11 : 34	1		Mvuli road
	out			11 : 34		0	
Loading-20	in	6461.5	100	11 : 35	1		Mvuli road
	out			11 : 36		1	
Loading-21	in	6462.2	700	11 : 38	2		Hill crest Hotel-Waiyaki way
	out			11 : 41		3	
Loading-22	in	6462.9	700	11 : 43	2		Mimosa Road
	out			11 : 49		6	
Loading-23	in	6463	100	11 : 49	0		Mvuli road
	out			11 : 54		5	
Loading-24	in	6463.8	800	11 : 55	1		David Osieli road
	out			11 : 55		0	

Time & Motion Study

Organization: CITY BINS Trip- 2 Date: 20th May 1997

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON Researcher's name: A. Wanjohi

No. of Crew: 3

Estimated Volume: 3.94m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in	6464.2	400	11 : 57		2	East Church Road
	out			11 : 59		2	
Loading-26	in	6464.3	100	11 : 59		0	East Church Road
	out			12 : 1		2	
Loading-27	in	6464.5	200	12 : 2		1	East Church Road
	out			12 : 3		1	
Loading-28	in	6465.1	600	12 : 5		2	Mangu Gardens-Lilly court
	out			12 : 9		4	
Loading-29	in	6465.7	600	12 : 12		3	Body Wise Fitness
	out			12 : 14		2	
Loading-30	in	6465.8	100	12 : 16		2	
	out			12 : 17		1	
Loading-31	in	6466.3	500	12 : 19		2	Prime Executive Apartments
	out			12 : 28		9	
Loading-32	in	6466.9	600	12 : 30		2	Terrace Close
	out			12 : 31		1	
Loading-33	in	6470.7	3,800	12 : 39		8	Museum Hill
	out			12 : 43		4	
Loading-34	in	6470.8	100	12 : 43		0	Muthithi road
	out			12 : 44		1	
Loading-35	in	6471.1	300	12 : 45		1	Muthithi road
	out			12 : 49		4	
Loading-36	in	6471.1	0	12 : 49		0	Muthithi road
	out			12 : 53		4	
Loading-37	in	6471.3	200	12 : 54		1	Muthithi road
	out			12 : 55		1	
Loading-38	in	6471.5	200	12 : 56		1	Chiromo road
	out			12 : 58		2	
Loading-39	in	6471.9	400	13 : 0		2	Westlands Road
	out			13 : 1		1	
Loading-40	in	6472	100	13 : 3		2	Westlands Road
	out			13 : 4		1	
Loading-41	in	6472.2	200	13 : 5		1	Westlands Road
	out			13 : 10		5	
Loading-42	in	6472.2	0	13 : 11		1	Westlands Road
	out			13 : 11		0	
Loading-43	in	6472.3	100	13 : 12		1	Westlands Road
	out			13 : 15		3	
Loading-44	in	6472.7	400	13 : 18		3	Muthithi road
	out			13 : 20		2	
Loading-45	in	6473.3	600	13 : 22		2	
	out			13 : 23		1	
Loading-46	in	6473.4	100	13 : 24		1	Mogotio road
	out			13 : 25		1	
Loading-47	in	6473.5	100	13 : 26		1	
	out			13 : 28		2	
Loading-48	in	6473.7	200	13 : 29		1	
	out			13 : 30		1	

Time & Motion Study

Organization: CITY BINS Trip- 2 Date: 20th May 1997

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON Researcher's name: A. Wanjohi

No. of Crew: 3

Estimated Volume: 3.94m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in	6473.8	100	13 : 31	1		Mogotio road
	out			13 : 32		1	
Loading-50	in	6474	200	13 : 33	1		Mogotio road
	out			13 : 34		1	
Loading-51	in	6474.1	100	13 : 37	3		Lunch Break
	out			13 : 55		18	Lunch Break
Loading-52	in	6474.2	100	13 : 57	2		Muthithi road
	out			14 : 0		3	
Loading-53	in	6474.4	200	14 : 1	1		
	out			14 : 2		1	
Loading-54	in	6474.5	100	14 : 3	1		Mpaka road
	out			14 : 3		0	
Loading-55	in	6475	500	14 : 5	2		May Fair Court Hotel
	out			14 : 7		2	
Loading-56	in	6475.4	400	14 : 8	1		The Crescent
	out			14 : 10		2	
Loading-57	in	6475.5	100	14 : 11	1		The Crescent
	out			14 : 11		0	
Loading-58	in	6475.6	100	14 : 12	1		The Crescent
	out			14 : 15		3	
Loading-59	in	6476.1	500	14 : 17	2		
	out			14 : 19		2	
Loading-60	in	6476.2	100	14 : 19	0		Parklands road
	out			14 : 22		3	
Loading-61	in	6476.6	400	14 : 25	3		Maua close
	out			14 : 27		2	
Loading-62	in	6476.7	100	14 : 29	2		
	out			15 : 7		38	
Loading-63	in	6477	300	15 : 9	2		Ring road
	out			15 : 16		7	
Loading-64	in	6477.9	900	15 : 19	3		General Mathenge road
	out			15 : 24		5	
Loading-65	in	6478.2	300	15 : 25	1		General Mathenge road
	out			15 : 26		1	
Loading-66	in	6478.9	700	15 : 29	3		Elda Ravine Drive
	out			15 : 30		1	
Loading-67	in	6479	100	15 : 32	2		Elda Ravine Drive
	out			15 : 32		0	
Loading-68	in	6479.2	200	15 : 33	1		Elda Ravine Gardens
	out			15 : 34		1	
Loading-69	in	6479.9	700	15 : 36	2		Elda Ravine Gardens
	out			15 : 36		0	
Loading-70	in	6480	100	15 : 37	1		Elda Ravine Gardens
	out			15 : 37		0	
Loading-71	in	6480.7	700	15 : 41	4		General Mathenge road
	out			15 : 41		0	
Loading-72	in	6481.1	400	15 : 43	2		3rd Parklands road
	out			15 : 43		0	

Time & Motion Study

Organization: CITY BINS Trip- 2 Date: 20th May 1997

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON Researcher's name: A. Wanjohi

No. of Crew: 3

Estimated Volume: 3.94m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-73	in	6481.2	100	15 : 44	1		3rd Parklands road
	out			15 : 45		1	
Loading-74	in	6481.3	100	15 : 46	1		3rd Parklands road
	out			15 : 47		1	
Loading-75	in	6481.5	200	15 : 49	2		3rd Parklands road
	out			15 : 50		1	
Loading-76	in	6481.7	200	15 : 51	1		Kusi Lane
	out			15 : 54		3	
Loading-77	in	6481.8	100	15 : 56	2		Suzo Lane
	out			15 : 56		0	
Loading-78	in	6482.1	300	15 : 58	2		Suzo Lane
	out			15 : 59		1	
Loading-79	in	6482.5	400	16 : 2	3		4th Parklands road
	out			16 : 4		2	
Loading-80	in	6483	500	16 : 5	1		4th Parklands road
	out			16 : 6		1	
Loading-81	in	6483.3	300	16 : 8	2		Mutate Lane
	out			16 : 9		1	
Loading-82	in	6483.4	100	16 : 10	1		Mutate Lane
	out			16 : 11		1	
Loading-83	in	6483.5	100	16 : 13	2		Mutate Lane
	out			16 : 13		0	
Loading-84	in	6483.6	100	16 : 14	1		Mutate Lane
	out			16 : 16		2	
Loading-85	in	6483.7	100	16 : 16	0		Mutate Lane
	out			16 : 20		4	
Loading-86	in	6483.8	100	16 : 21	1		Masari road
	out			16 : 27		6	
Loading-87	in	6484.1	300	16 : 28	1		3rd parklands road
	out			16 : 30		2	
Loading-88	in	6484.2	100	16 : 30	0		4th parklands road
	out			16 : 30		0	
Loading-89	in	6484.8	600	16 : 32	2		4th parklands road
	out			16 : 34		2	
Loading-90	in	6485	200	16 : 35	1		4th parklands road
	out			16 : 37		2	
Loading-91	in	6485.5	500	16 : 39	2		Githuri road
	out			16 : 41		2	
Loading-92	in	6485.7	200	16 : 42	1		Githuri road
	out			16 : 45		3	
Loading-93	in	6485.8	100	16 : 46	1		Githuri road
	out			16 : 49		3	
Loading-94	in	6486	200	16 : 50	1		Iregi road
	out			16 : 53		3	
Loading-95	in			:			
	out			:			
Loading-96	in			:	0		To workshop-Vehicle
	out			:		0	did not go to Dumping site

Time & Motion Study Organization: CITY BINS Trip- 2 Date: 20th May 1997
 Vehicle No. KAH 850S Loading Capacity: 3.29 TON Researcher's name: A. Wanjohi
 No. of Crew: 3 Estimated Volume: 3.94m³

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Dumping site in			:	0		
Start dumping			:	0		
Finish dumping			:		0	
Dumping site out			:	0		
Reach to workshop in	6494.5	8,500	17 : 20	27		
Total		62,100		174	232	Total min.: 406 min.
Collection		28,100		147	232	
Transportation		34,000		27	0	
Inside the dumping site		0		0	0	Dumping time
Idling time						Lunch Break

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 21st MAY 1997

Vehicle No. KAE 636 11

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 2

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	46191.5		10 : 37			It had trash
Loading-1	in	46193.1	1,600	10 : 44	7		Kisauni Rd
	out			10 : 51		7	
Loading-2	in	46193.2	100	10 : 52	1		Nairobi West
	out			10 : 55		3	
Loading-3	in	46193.4	200	10 : 57	2		Bukani Rd
	out			10 : 57		0	
Loading-4	in	46193.9	500	10 : 59	2		
	out			11 : 1		2	
Loading-5	in	46194.1	200	11 : 3	2		Nairobi West
	out			11 : 3		0	
Loading-6	in	46194.3	200	11 : 5	2		Matati Ave
	out			11 : 5		0	
Loading-7	in	46194.5	200	11 : 6	1		
	out			11 : 7		1	
Loading-8	in	46194.8	300	11 : 8	1		
	out			11 : 8		0	
Loading-9	in	46194.9	100	11 : 8	0		
	out			11 : 9		1	
Loading-10	in	46194.9	10	11 : 10	1		
	out			11 : 12		2	
Loading-11	in	46195.1	200	11 : 13	1		
	out			11 : 14		1	
Loading-12	in	46195.1	10	11 : 15	1		Bukani Rd
	out			11 : 16		1	
Loading-13	in	46195.6	500	11 : 18	2		Kodi road 1
	out			11 : 19		1	
Loading-14	in	46195.7	100	11 : 20	1		Kodi road 1
	out			11 : 20		0	
Loading-15	in	46195.7	10	11 : 20	0		Kodi road 1
	out			11 : 20		0	
Loading-16	in	46195.8	100	11 : 20	0		
	out			11 : 21		1	
Loading-17	in	46195.9	100	11 : 21	0		Kodi road 1
	out			11 : 21		0	
Loading-18	in	46196	100	11 : 22	1		Kodi road 1
	out			11 : 23		1	
Loading-19	in	46196	10	11 : 23	0		Kodi road 1
	out			11 : 24		1	
Loading-20	in	46196.2	100	11 : 25	1		Kodi road 1
	out			11 : 27		2	
Loading-21	in	46196.2	20	11 : 27	0		Kodi road 1
	out			11 : 28		1	
Loading-22	in	46196.2	10	11 : 28	0		Kodi road 1
	out			11 : 30		2	
Loading-23	in	46196.3	100	11 : 30	0		Kodi road
	out			11 : 30		0	
Loading-24	in	46196.3	20	11 : 31	1		Kodi road
	out			11 : 32		1	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 21st MAY 1997

Vehicle No. KAE 636 11

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 2

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in	46196.3	20	11 : 32	0		Kodi road
	out			11 : 33		1	
Loading-26	in	46196.5	200	11 : 34	1		Kodi road
	out			11 : 35		1	
Loading-27	in	46196.5	50	11 : 35	0		Kodi road
	out			11 : 36		1	
Loading-28	in	46196.6	100	11 : 37	1		Kodi road
	out			11 : 38		1	
Loading-29	in	46196.8	200	11 : 38	0		Muhoho Ave
	out			11 : 43		5	
Loading-30	in	46196.9	100	11 : 43	0		
	out			11 : 45		2	
Loading-31	in	46197.2	300	11 : 46	1		Maihahiu Rd
	out			11 : 46		0	
Loading-32	in	46197.6	400	11 : 47	1		
	out			11 : 49		2	
Loading-33	in	46197.6	10	11 : 50	1		Kabiyet road
	out			11 : 50		0	
Loading-34	in	46197.7	100	11 : 51	1		
	out			11 : 51		0	
Loading-35	in	46197.7	50	11 : 52	1		
	out			11 : 52		0	
Loading-36	in	46197.9	200	11 : 53	1		Kabiyet road
	out			11 : 56		3	
Loading-37	in	46198	100	11 : 56	0		Kabiyet road
	out			11 : 57		1	
Loading-38	in	46198.1	300	11 : 57	0		Kabiyet road
	out			11 : 59		2	
Loading-39	in	46198.4	300	12 : 1	2		
	out			12 : 8		7	
Loading-40	in	46198.6	200	12 : 9	1		Ole shapara Rd
	out			12 : 11		2	
Loading-41	in	46199	400	12 : 12	1		South C
	out			12 : 13		1	
Loading-42	in	46199.3	300	12 : 14	1		South C
	out			12 : 14		0	
Loading-43	in	46199.4	100	12 : 15	1		South C
	out			12 : 15		0	
Loading-44	in	46199.6	200	12 : 17	2		South C
	out			12 : 20		3	
Loading-45	in	46199.8	200	12 : 21	1		South C
	out			12 : 29		8	
Loading-46	in	46199.9	100	12 : 30	1		
	out			12 : 30		0	
Loading-47	in	46200	100	12 : 30	0		
	out			12 : 31		1	
Loading-48	in	46200.1	100	12 : 31	0		
	out			12 : 31		0	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 21st MAY 1997

Vehicle No. KAE 636 H

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 2

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in	46200.9	800	12 : 34	3		South C
	out			12 : 34		0	
Loading-50	in	46201	100	12 : 35	1		South C
	out			12 : 35		0	
Loading-51	in	46201.1	100	12 : 36	1		South C
	out			12 : 37		1	
Loading-52	in	46201.4	300	12 : 39	2		Ole shapara Lane
	out			12 : 39		0	
Loading-53	in	46201.6	200	12 : 43	4		
	out			12 : 45		2	
Loading-54	in	46201.6	50	12 : 46	1		
	out			12 : 47		1	
Loading-55	in	46201.7	100	12 : 48	1		Mtelo road
	out			12 : 49		1	
Loading-56	in	46201.7	10	12 : 49	0		Mtelo road
	out			12 : 52		3	
Loading-57	in	46201.8	100	12 : 52	0		Mtelo road
	out			12 : 52		0	
Loading-58	in	46201.8	10	12 : 53	1		Mtelo road
	out			12 : 54		1	
Loading-59	in	46201.8	20	12 : 54	0		Mtelo road
	out			12 : 56		2	
Loading-60	in	46201.9	100	12 : 57	1		Mtelo road
	out			12 : 58		1	
Dumping site	in	46244	42,100	13 : 53	55		
Start dumping				14 : 48	55		
Finish dumping				14 : 53		5	
Dumping site	out			14 : 55	2		
Reach to workshop	in	46251.3	7,300	15 : 50	55		
Total			60,210		227	86	Total min.: 313 min.
Collection			9,210		53	81	
Transportation			51,000		117	0	
Inside the dumping site			0		57	5	Dumping time
Idling time							

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 21st May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 5.0625m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	74809.1		8 : 35			8:35-10:45 Mechanical problem
Loading-1	in	74811.2	2,100	10 : 49	134		South B Melili Road
	out			10 : 54		5	
Loading-2	in	74812	800	10 : 56	2		South B Shopping Centre
	out			10 : 57		1	Mchumbi Rd
Loading-3	in	74813.1	1,100	11 : 2	5		Gdden Gates
	out			11 : 6		4	
Loading-4	in	74813.5	400	11 : 7	1		South B. Sadi Road
	out			11 : 8		1	
Loading-5	in	74813.5	0	11 : 9	1		South B. Sadi Road
	out			11 : 13		4	
Loading-6	in	74813.6	100	11 : 13	0		South B Sadi Road
	out			11 : 14		1	
Loading-7	in	74813.6	0	11 : 15	1		South B Sadi Road
	out			11 : 16		1	
Loading-8	in	74813.6	0	11 : 16	0		South B Sadi Road
	out			11 : 17		1	
Loading-9	in	74813.7	100	11 : 19	2		South B Sadi Road
	out			11 : 20		1	
Loading-10	in	74813.7	0	11 : 20	0		South B Sadi Road
	out			11 : 21		1	
Loading-11	in	74813.8	100	11 : 21	0		South B Sadi Road
	out			11 : 29		8	
Loading-12	in	74816.6	2,800	11 : 34	5		South C Muhoho road (Ave)
	out			11 : 35		1	
Loading-13	in	74816.7	100	11 : 35	0		South C Muhoho road (Ave)
	out			11 : 36		1	
Loading-14	in	74816.7	0	11 : 36	0		South C Muhoho road (Ave)
	out			11 : 37		1	
Loading-15	in	74816.8	100	11 : 39	2		South C. Punda Milia Crescent
	out			11 : 41		2	
Loading-16	in	74816.9	100	11 : 42	1		South C. Punda Milia Crescent
	out			11 : 42		0	
Loading-17	in	74816.9	0	11 : 43	1		South C. Punda Milia Crescent
	out			11 : 43		0	
Loading-18	in	74817	100	11 : 44	1		South C. Punda Milia Crescent
	out			11 : 44		0	
Loading-19	in	74817.1	100	11 : 45	1		South C Mukariti road
	out			11 : 49		4	
Loading-20	in	74817.1	0	11 : 49	0		South C Mukariti road
	out			11 : 50		1	
Loading-21	in	74817.3	200	11 : 51	1		South C Ndekwa Av
	out			11 : 54		3	
Loading-22	in	74817.7	400	11 : 55	1		South C Oluvimu road
	out			11 : 57		2	
Loading-23	in	74817.8	100	11 : 57	0		South C Oluvimu road
	out			11 : 58		1	

Time & Motion Study

Organization: CITY BINS Trip- 1 Date: 21st May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 5.0625m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-24	in	74817.9	100	11 : 59	1		South C Sungura road
	out			12 : 0		1	
Loading-25	in	74817.9	0	12 : 0	0		South C Sungura road
	out			12 : 6		6	
Loading-26	in	74818	100	12 : 6	0		South C Sungura road
	out			12 : 7		1	
Loading-27	in	74818	0	12 : 7	0		South C Sungura road
	out			12 : 8		1	
Loading-28	in	74818.1	100	12 : 9	1		South C Sungura road
	out			12 : 10		1	
Loading-29	in	74818.1	0	12 : 11	1		South C Sungura road
	out			12 : 12		1	
Loading-30	in	74818.1	0	12 : 14	2		South C Sungura road
	out			12 : 15		1	
Loading-31	in	74818.2	100	12 : 20	5		South C Sungura road
	out			12 : 21		1	
Loading-32	in	74818.2	0	12 : 22	1		South C Sungura road
	out			12 : 25		3	
Loading-33	in	74818.3	100	12 : 28	3		Sungura Estate
	out			12 : 29		1	
Loading-34	in	74818.3	0	12 : 29	0		Sungura Estate
	out			12 : 30		1	
Loading-35	in	74818.3	0	12 : 31	1		Sungura Estate
	out			12 : 32		1	
Loading-36	in	74818.4	100	12 : 33	1		Muhoho Avenue
	out			12 : 35		2	
Loading-37	in	74818.4	0	12 : 36	1		Muhoho Avenue
	out			12 : 36		0	
Loading-38	in	74818.6	200	12 : 38	2		Muhoho Avenue
	out			12 : 40		2	
Loading-39	in	74819	400	12 : 43	3		off Muhoho Opposite
	out			12 : 44		1	M.O.W Sports
Loading-40	in	74819.1	100	12 : 45	1		off Muhoho Opposite
	out			12 : 46		1	M.O.W Sports
Loading-41	in	74819.7	600	12 : 49	3		Mugoya Estate
	out			12 : 50		1	
Loading-42	in	74819.7	0	12 : 50	0		Mugoya Estate
	out			12 : 51		1	
Loading-43	in	74819.8	100	12 : 51	0		Mugoya Estate
	out			12 : 52		1	
Loading-44	in	74819.8	0	12 : 52	0		Mugoya Estate
	out			12 : 53		1	
Loading-45	in	74820.2	400	12 : 54	1		Mugoya Estate
	out			12 : 54		0	
Loading-46	in	74820.6	400	12 : 55	1		Mugoya Estate
	out			13 : 0		5	
Loading-47	in	74821.2	600	13 : 2	2		KMA Estate
	out			13 : 2		0	
Loading-48	in	74821.9	700	13 : 5	3		KMA Estate

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 21st May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

 Estimated Volume: 5.0625m³

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
			13 : 6		1	
Loading-49	74822	100	13 : 10	4		Ole Shapara Avenue
			13 : 11		1	
Loading-50	74822.1	100	13 : 11	0		Ole Shapara Avenue
			13 : 12		1	
Loading-51	74822.2	100	13 : 13	1		Ndekwa Avenue
			13 : 15		2	
Loading-52	74822.2	0	13 : 15	0		Ndekwa Avenue
			13 : 19		4	
Loading-53	74822.3	100	13 : 19	0		Ndekwa Avenue
			13 : 20		1	
Loading-54	74822.3	0	13 : 21	1		Mufulu Avenue
			13 : 21		0	
Loading-55	74822.4	100	13 : 22	1		Mufulu Avenue
			13 : 22		0	
Loading-56	74822.4	0	13 : 23	1		Mufulu Avenue
			13 : 24		1	
Loading-57	74822.6	200	13 : 24	0		Mufulu Avenue
			13 : 25		1	
Loading-58	74822.8	200	13 : 25	0		Mufulu Avenue
			13 : 35		10	
Loading-59	74822.9	100	13 : 37	2		Mufulu Avenue
			13 : 37		0	
Loading-60	74823	100	13 : 38	1		Mufulu Avenue
			13 : 39		1	
Loading-61	74823.2	200	13 : 40	1		Uchumi road
			13 : 43		3	
Loading-62	74823.4	200	13 : 44	1		Uchumi road
			13 : 45		1	
Loading-63	74823.4	0	13 : 45	0		Uchumi road
			13 : 46		1	
Loading-64	74823.4	0	13 : 47	1		Uchumi road
			13 : 49		2	
Loading-65	74823.5	100	13 : 49	0		Ole Shapara Avenue (South C)
			13 : 52		3	
Dumping site	74840.4	16,900	14 : 28	36		
Start dumping			14 : 33	5		
Finish dumping			:			
Dumping site	74840.9	500	15 : 0	27		
Reach to workshop	74855.7	14,600	15 : 30	30		
Total		46,400		304	111	Total min.: 415 min.
Collection		12,300		72	111	
Transportation		33,600		70	0	
Inside the dumping site		500		32	0	Dumping time
Idling time				130		Mechanical problem

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 22th MAY 1997

Vehicle No. KAE 636 11

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	46231.7		8 : 39			
Loading-1	in	46233.7	2,000	8 : 53	14		Masaba road
	out			8 : 56		3	
Loading-2	in	46233.8	100	8 : 56	0		Masaba road
	out			8 : 58		2	
Loading-3	in	46234.8	1,000	9 : 0	2		
	out			9 : 0		0	
Loading-4	in	46235.1	300	9 : 1	1		
	out			9 : 2		1	
Loading-5	in	46235.5	400	9 : 4	2		
	out			9 : 5		1	
Loading-6	in	46235.6	100	9 : 5	0		
	out			9 : 6		1	
Loading-7	in	46235.8	200	9 : 7	1		
	out			9 : 7		0	
Loading-8	in	46236.1	300	9 : 9	2		
	out			9 : 10		1	
Loading-9	in	46236.5	400	9 : 11	1		
	out			9 : 11		0	
Loading-10	in	46237.8	1,300	9 : 17	6		
	out			9 : 19		2	
Loading-11	in	46241.8	4,000	9 : 26	7		Ngumogoy course
	out			9 : 27		1	
Loading-12	in	46242.4	600	9 : 29	2		
	out			9 : 30		1	
Loading-13	in	46242.4	10	9 : 30	0		
	out			9 : 31		1	
Loading-14	in	46242.5	100	9 : 32	1		
	out			9 : 33		1	
Loading-15	in	46242.6	100	9 : 33	0		
	out			9 : 35		2	
Loading-16	in	46242.8	200	9 : 38	3		
	out			9 : 38		0	
Loading-17	in	46242.9	100	9 : 39	1		Ngong road
	out			9 : 47		8	
Loading-18	in	46243.1	200	9 : 48	1		State house road
	out			9 : 48		0	
Loading-19	in	46244	900	9 : 51	3		Chiromo Estate
	out			9 : 53		2	
Loading-20	in	46244.2	200	9 : 54	1		Longonot road
	out			9 : 59		5	
Loading-21	in	46244.6	400	10 : 0	1		
	out			10 : 0		0	
Loading-22	in	46244.7	100	10 : 0	0		
	out			10 : 0		0	
Loading-23	in	46244.8	100	10 : 1	1		Ngong road
	out			10 : 2		1	
Loading-24	in	46245.6	800	10 : 3	1		Ngong road
	out			10 : 3		0	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 22th MAY 1997

Vehicle No. KAE 636 II

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in	46246.6	1,000	10 : 8	5		Woodlands road
	out			10 : 8		0	
Loading-26	in	46247	400	10 : 9	1		
	out			10 : 9		0	
Loading-27	in	46247.4	400	10 : 10	1		Woodlands road
	out			10 : 10		0	
Loading-28	in	46249.9	2,500	10 : 14	4		State house road
	out			10 : 18		4	
Loading-29	in	46251.3	1,400	10 : 21	3		State house road
	out			10 : 21		0	
Loading-30	in	46251.9	600	10 : 23	2		Chiromo Estate
	out			10 : 28		5	
Loading-31	in	46251.9	10	10 : 28	0		Chiromo Estate
	out			10 : 32		4	
Loading-32	in	46252.4	500	10 : 33	1		Chiromo Estate
	out			10 : 33		0	
Loading-33	in	46252.5	100	10 : 34	1		Ring road Riverside
	out			10 : 35		1	
Loading-34	in	46253.1	600	10 : 37	2		Ring road Riverside
	out			10 : 52		15	
Loading-35	in	46253.3	200	10 : 53	1		Ring road Riverside
	out			10 : 53		0	
Loading-36	in	46253.5	200	10 : 54	1		Garden road
	out			10 : 55		1	
Loading-37	in	46253.8	300	10 : 55	0		
	out			10 : 59		4	
Loading-38	in	46254.5	700	11 : 0	1		Riverside close
	out			11 : 1		1	
Loading-39	in	46254.5	10	11 : 2	1		Riverside close
	out			11 : 2		0	
Loading-40	in	46254.6	100	11 : 3	1		
	out			11 : 3		0	
Loading-41	in	46254.8	200	11 : 4	1		Riverside close
	out			11 : 6		2	
Loading-42	in	46255	200	11 : 6	0		Riverside close
	out			11 : 8		2	
Loading-43	in	46255.7	700	11 : 10	2		Riverside close
	out			11 : 12		2	
Loading-44	in	46255.8	100	11 : 13	1		
	out			11 : 13		0	
Loading-45	in	46256.1	300	11 : 15	2		Riverside drive
	out			11 : 15		0	
Loading-46	in	46256.2	100	11 : 16	1		Riverside drive
	out			11 : 16		0	
Loading-47	in	46257.4	1,200	11 : 20	4		Riverside drive
	out			11 : 21		1	
Loading-48	in	46257.5	100	11 : 21	0		Riverside drive
	out			11 : 21		0	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 22th MAY 1997

Vehicle No. KAE 636 H

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in	46258.3	800	11 : 23	2		Riverside
	out			11 : 27		4	
Loading-50	in	46261.7	3,400	11 : 34	7		Githunguri road
	out			11 : 35		1	
Loading-51	in	46262.1	400	11 : 36	1		
	out			11 : 39		3	
Loading-52	in	46262.8	700	11 : 39	0		
	out			11 : 40		1	
Loading-53	in	46263	200	11 : 40	0		
	out			11 : 41		1	
Loading-54	in	46263.2	200	11 : 41	0		Kileleshwa
	out			11 : 44		3	
Loading-55	in	46263.7	500	11 : 45	1		
	out			11 : 51		6	
Loading-56	in	46264.2	500	11 : 51	0		
	out			11 : 52		1	
Loading-57	in	46265	800	11 : 55	3		Gichugu Rd
	out			11 : 59		4	
Loading-58	in	46265.6	600	12 : 1	2		
	out			12 : 2		1	
Loading-59	in	46265.7	100	12 : 3	1		
	out			12 : 6		3	
Loading-60	in	46267.1	1,400	12 : 10	4		Mandera Rd
	out			12 : 11		1	
Loading-61	in	46267.1	10	12 : 12	1		Mandera Rd
	out			12 : 14		2	
Loading-62	in	46268.1	1,000	12 : 15	1		
	out			12 : 18		3	
Loading-63	in	46268.7	600	12 : 21	3		Siaya road
	out			12 : 23		2	
Loading-64	in	46269.4	700	12 : 29	6		Gatundo close
	out			12 : 31		2	
Loading-65	in	46270.3	900	12 : 33	2		Vihiga road
	out			12 : 35		2	
Loading-66	in	46271.2	900	12 : 36	1		
	out			12 : 39		3	
Loading-67	in	46272.2	1,000	12 : 40	1		
	out			12 : 40		0	
Loading-68	in	46273.3	1,100	12 : 44	4		Ole Odume Rd
	out			12 : 46		2	
Loading-69	in	46274.1	800	12 : 49	3		Hendred Ave
	out			12 : 52		3	
Loading-70	in	46274.4	300	12 : 53	1		
	out			12 : 54		1	
Loading-71	in	46275.6	1,200	12 : 59	5		Kingara Rd
	out			13 : 0		1	
Loading-72	in	46275.8	200	13 : 0	0		
	out			13 : 2		2	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 22th MAY 1997

Vehicle No. KAE 636 II

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Dumping site in			14 : 5	63		
Start dumping	46298.1	22,300	14 : 7	2		
Finish dumping			14 : 24		17	
Dumping site out			14 : 26	2		
Reach to workshop in	46312.1	14,000	15 : 50	84		
Total		80,440		287	144	Total min.: 431 min.
Collection		42,140		122	127	
Transportation		16,000		161	0	
Inside the dumping site		22,300		4	17	Dumping time
Idling time						

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 22nd May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 3.375m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	74855.7		8 : 44			
Loading-1	in	74860.1	4,400	9 : 7	23		Dam Estate - Langata Road
	out			9 : 7		0	
Loading-2	in	74860.1	0	9 : 7	0		Dam Estate - Langata Road
	out			9 : 8		1	
Loading-3	in	74868.8	8,700	9 : 21	13		Karen off Langata road
	out			9 : 25		4	
Loading-4	in	74873.9	5,100	9 : 32	7		Karen
	out			9 : 32		0	
Loading-5	in	74878.9	5,000	9 : 41	9		Karen Ngong View Rise
	out			9 : 42		1	
Loading-6	in	74889	10,100	9 : 56	14		Karen Resurrection Gardens
	out			10 : 4		8	
Loading-7	in	74896.6	7,600	10 : 16	12		Karen Nandi Road
	out			10 : 19		3	
Loading-8	in	74904.6	8,000	10 : 29	10		Ngong road
	out			10 : 34		5	
Loading-9	in	74905.4	800	10 : 37	3		Naivasha road
	out			10 : 40		3	
Loading-10	in	74906	600	10 : 51	11		Riara road off Naivasha Rd
	out			10 : 52		1	
Loading-11	in	74906.3	300	10 : 53	1		Riara road off Naivasha Rd
	out			10 : 53		0	
Loading-12	in	74908.2	1,900	10 : 59	6		Gitanga Road
	out			11 : 1		2	
Loading-13	in	74908.2	0	11 : 2	1		Gitanga road
	out			11 : 5		3	
Loading-14	in	74908.3	100	11 : 7	2		Laxmi Estate Gitanga Rd
	out			11 : 8		1	
Loading-15	in	74908.3	0	11 : 10	2		Gitanga Hill court
	out			11 : 10		0	
Loading-16	in	74908.3	0	11 : 11	1		Gitanga Hill court
	out			11 : 13		2	
Loading-17	in	74908.4	100	11 : 14	1		Gitanga road
	out			11 : 14		0	
Loading-18	in	74908.8	400	11 : 15	1		Gitanga road
	out			11 : 16		1	
Loading-19	in	74908.9	100	11 : 17	1		Gitanga road
	out			11 : 17		0	
Loading-20	in	74909.1	200	11 : 19	2		Jacaranda Avenue
	out			11 : 19		0	
Loading-21	in	74909.2	100	11 : 20	1		Jacaranda Avenue
	out			11 : 21		1	
Loading-22	in	74909.7	500	11 : 21	0		Jacaranda Avenue
	out			11 : 22		1	
Loading-23	in	74910.4	700	11 : 23	1		Kolloh Road
	out			11 : 24		1	
Loading-24	in	74910.7	300	11 : 25	1		James Gichuru road
	out			11 : 25		0	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 22nd May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 3.375m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in	74911.2	500	11 : 26	1		James Gichuru road
	out			11 : 29		3	
Loading-26	in	74911.7	500	11 : 30	1		Lavington Owashika road
	out			11 : 30		0	
Loading-27	in	74912.3	600	11 : 31	1		Lavington Convent Drive
	out			11 : 33		2	
Loading-28	in	74912.9	600	11 : 35	2		Lavington Chalbi Drive
	out			11 : 39		4	
Loading-29	in	74914	1,100	11 : 41	2		Lavington Njumbi road
	out			11 : 44		3	
Loading-30	in	74914.5	500	11 : 45	1		Lavington Njumbi road
	out			11 : 45		0	
Loading-31	in	74914.6	100	11 : 45	0		Lavington Njumbi road
	out			11 : 46		1	
Loading-32	in	74914.9	300	11 : 48	2		Lavington Njumbi road
	out			11 : 48		0	
Loading-33	in	74915.1	200	11 : 49	1		Isaac Gathanju Road
	out			11 : 50		1	
Loading-34	in	74915.5	400	11 : 51	1		Isaac Gathanju Road
	out			11 : 51		0	
Loading-35	in	74916.7	1,200	11 : 53	2		Isaac Gathanju Road
	out			11 : 54		1	
Loading-36	in	74918.9	2,200	12 : 0	6		Apple cross Rd
	out			12 : 3		3	
Loading-37	in	74919.5	600	12 : 4	1		Muhaya road (Avenue)
	out			12 : 5		1	
Loading-38	in	74920	500	12 : 6	1		Ole nguruone Road
	out			12 : 7		1	
Loading-39	in	74921	1,000	12 : 9	2		Mageta road
	out			12 : 10		1	
Loading-40	in	74921.7	700	12 : 11	1		Mageta road
	out			12 : 11		0	
Loading-41	in	74922	300	12 : 12	1		Mageta road
	out			12 : 12		0	
Loading-42	in	74922	0	12 : 15	3		Mageta road
	out			12 : 15		0	
Loading-43	in	74923.9	1,900	12 : 17	2		Kaputei Gardens
	out			12 : 18		1	
Loading-44	in	74926.3	2,400	12 : 23	5		Elgeyo Marakwet road
	out			12 : 23		0	Marakwet road
Loading-45	in	74926.4	100	12 : 24	1		Kilimani Elegeyo
	out			12 : 25		1	
Loading-46	in	74927	600	12 : 26	1		Kilimani
	out			12 : 27		1	
Loading-47	in	74927.4	400	12 : 29	2		Kilimani
	out			12 : 31		2	
Loading-48	in	74927.6	200	12 : 31	0		Kilimani
	out			12 : 33		2	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 22nd May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: m. M. S. Nyawira

No. of Crew: 3

Estimated Volume: 3.375m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in	74928.9	1,300	12 : 38	5		Kirichwa Gardens
	out			12 : 39		1	
Loading-50	in	74929.8	900	12 : 41	2		Kilimani
	out			12 : 41		0	
Loading-51	in	74930.1	300	12 : 44	3		Kilimani
	out			12 : 45		1	
Loading-52	in	74930.1	0	12 : 45	0		Kilimani
	out			12 : 49		4	
Loading-53	in	74930.2	100	12 : 51	2		Kilimani
	out			12 : 51		0	
Loading-54	in	74930.4	200	12 : 56	5		Kilimani Kindaruma Rd
	out			12 : 57		1	
Loading-55	in	74930.5	100	12 : 59	2		Kilimani Kindaruma Rd
	out			12 : 59		0	
Loading-56	in	74930.6	100	13 : 0	1		Kilimani Kindaruma Rd
	out			13 : 0		0	
Loading-57	in	74930.7	100	13 : 3	3		Kilimani Kindaruma Rd
	out			13 : 5		2	
Loading-58	in	74931	300	13 : 6	1		Kindaruma Road
	out			13 : 7		1	
Loading-59	in	74931.1	100	13 : 8	1		Kindaruma Road
	out			13 : 8		0	
Loading-60	in	74931.2	100	13 : 10	2		Wood Avenue
	out			13 : 10		0	
Loading-61	in	74931.7	500	13 : 11	1		Chania Avenue
	out			13 : 12		1	
Loading-62	in	74931.7	0	13 : 13	1		Chania Avenue
	out			13 : 13		0	
Loading-63	in	74932	300	13 : 15	2		Chania Avenue
	out			13 : 19		4	
Loading-64	in	74932.4	400	13 : 22	3		Chania Avenue
	out			13 : 22		0	
Loading-65	in	74932.9	500	13 : 25	3		Komo Lane
	out			13 : 27		2	
Loading-66	in	74933.5	600	13 : 29	2		Wood Avenue
	out			13 : 30		1	
Loading-67	in	74933.7	200	13 : 31	1		Argwings Khodek road
	out			13 : 34		3	
Loading-68	in	74934.4	700	13 : 39	5		Kilimani spanish Villas
	out			13 : 40		1	
Loading-69	in	74934.8	400	13 : 42	2		Lenana road
	out			13 : 44		2	
Loading-70	in	74935.4	600	13 : 48	4		Likoni Lane
	out			13 : 50		2	
Loading-71	in	74936.4	1,000	13 : 51	1		Chaka road
	out			13 : 54		3	
Loading-72	in	74936.4	0	13 : 54	0		Chaka road (Hirlingham)
	out			13 : 58		4	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 22nd May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: M. S. Nyawira

No. of Crew: 3

Estimated Volume: 3.375m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Dumping site	in	74953.6	17,200	14 : 43	45		DANDORA
Start dumping				14 : 49	6		
Finish dumping				15 : 8		19	
Dumping site	out	74954.5	900	15 : 10	2		
Reach to workshop	in	74969.2	14,700	15 : 48	38		
Total			113,500		306	118	Total min.: 424 min.
Collection			76,300		192	99	
Transportation			36,300		106	0	
Inside the dumping site			900		8	19	Dumping time
Idling time							

Time & Motion Study

Organization: CITY BINS Trip- 1 Date: 22nd May 1997

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON Researcher's name: A. Wanjohi

No. of Crew: 3

Estimated Volume: 7.875m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	6572.8	0	8 : 44			
Loading-1	in	6579	6,200	9 : 6	22		Argwings Khodek -Hurlingham
	out			9 : 10		4	
Loading-2	in	6579.3	300	9 : 12	2		Argwings Khodek -Hurlingham
	out			9 : 18		6	
Loading-3	in	6579.5	200	9 : 21	3		Argwings Khodek -Hurlingham
	out			9 : 24		3	
Loading-4	in	6580.1	600	9 : 28	4		Jabavu court-Hurlingham
	out			9 : 29		1	
Loading-5	in	6580.5	400	9 : 31	2		Jabavu road
	out			9 : 32		1	
Loading-6	in	6580.7	200	9 : 33	1		Mtito Andei road-Hurlingham
	out			9 : 39		6	
Loading-7	in	6580.9	200	9 : 40	1		Mtito Andei road-Hurlingham
	out			9 : 41		1	
Loading-8	in	6581.1	200	9 : 42	1		Cathy Flats-Kims Court
	out			9 : 43		1	
Loading-9	in	6581.4	300	9 : 44	1		Theta Lane-Hurlingham
	out			9 : 47		3	
Loading-10	in	6581.7	300	9 : 48	1		Makuyu Lane-Hurlingham
	out			9 : 49		1	
Loading-11	in	6582.2	500	9 : 52	3		Lenana road-Lenana Chambers
	out			9 : 53		1	
Loading-12	in	6582.3	100	9 : 53	0		Lenana road-Lenana Chambers
	out			9 : 55		2	
Loading-13	in	6582.7	400	9 : 57	2		Kasuku road-Hurlingham
	out			9 : 58		1	
Loading-14	in	6582.8	100	9 : 59	1		Jabavu Villas-Hurlingham
	out			10 : 0		1	
Loading-15	in	6583.3	500	10 : 3	3		Apartments-Hurlingham
	out			10 : 6		3	
Loading-16	in	6583.4	100	10 : 6	0		Apartments-Hurlingham
	out			10 : 12		6	
Loading-17	in	6583.4	0	10 : 13	1		Deep Apartments-Hurlingham
	out			10 : 16		3	
Loading-18	in	6583.6	200	10 : 18	2		Apartments-Hurlingham
	out			10 : 19		1	
Loading-19	in	6583.8	200	10 : 20	1		Marcus-Garvey Road
	out			10 : 21		1	
Loading-20	in	6584.2	400	10 : 23	2		Marcus-Garvey Road
	out			10 : 24		1	
Loading-21	in	6584.5	300	10 : 26	2		Afya Masonettes
	out			10 : 34		8	-Kamburu Drive
Loading-22	in	6584.7	200	10 : 35	1		Afya Masonettes
	out			10 : 35		0	-Kamburu Drive
Loading-23	in	6584.9	200	10 : 36	1		Afya Masonettes
	out			10 : 37		1	-Kamburu Drive
Loading-24	in	6585.3	400	10 : 39	2		Kindaruma Lane
	out			10 : 41		2	

Time & Motion Study

Organization: CITY BINS Trip- 1 Date: 22nd May 1997

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON

Researcher's name: A. Wanjohi

No. of Crew: 3

Estimated Volume: 7.875m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in	6585.3	0	10 : 42	1		Kindaruma Lane
	out			10 : 46		4	
Loading-26	in	6585.7	400	10 : 48	2		
	out			10 : 49		1	
Loading-27	in	6585.9	200	10 : 50	1		
	out			10 : 51		1	
Loading-28	in	6586.4	500	10 : 55	4		Melton Court-Holy Cross Brothers
	out			10 : 57		2	
Loading-29	in	6586.7	300	10 : 58	1		Kindaruma Road
	out			11 : 2		4	
Loading-30	in	6587.5	800	11 : 5	3		Ngong Lane
	out			11 : 9		4	
Loading-31	in	6587.8	300	11 : 12	3		
	out			11 : 13		1	
Loading-32	in	6587.9	100	11 : 14	1		Ngong road
	out			11 : 17		3	
Loading-33	in	6588	100	11 : 19	2		Ngong road
	out			11 : 20		1	
Loading-34	in	6588.5	500	11 : 21	1		Ngong road
	out			11 : 23		2	
Loading-35	in	6588.8	300	11 : 24	1		Ngong road
	out			11 : 27		3	
Loading-36	in	6589.5	700	11 : 29	2		OLE
	out			11 : 31		2	
Loading-37	in	6589.6	100	11 : 32	1		Sato Flats-Ngong road
	out			11 : 34		2	
Loading-38	in	6589.8	200	11 : 35	1		
	out			11 : 35		0	
Loading-39	in	6589.9	100	11 : 36	1		Masai Court-Ngong Rd
	out			11 : 37		1	
Loading-40	in	6589.9	0	11 : 37	0		Masai Court-Ngong Rd
	out			11 : 38		1	
Loading-41	in	6590	100	11 : 38	0		Masai Court-Ngong Rd
	out			11 : 48		10	
Loading-42	in	6590.2	200	11 : 49	1		Riara Lane
	out			11 : 51		2	
Loading-43	in	6590.3	100	11 : 52	1		Riara Lane
	out			11 : 53		1	
Loading-44	in	6591.1	800	11 : 54	1		Riara Villas-Ngong road
	out			11 : 58		4	
Loading-45	in	6591.2	100	11 : 59	1		Riara Villas-Ngong road
	out			12 : 1		2	
Loading-46	in	6591.4	200	12 : 6	5		Embassy of Egypt
	out			12 : 7		1	
Loading-47	in	6591.8	400	12 : 8	1		Bamboo Lane
	out			12 : 8		0	
Loading-48	in	6594	2,200	12 : 13	5		Woodley - Joseph Kongethe Rd
	out			12 : 14		1	
Loading-49	in	6594.1	100	12 : 15	1		Woodley - Joseph

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

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON

Researcher's name: A. Wanjohi

No. of Crew: 3

Estimated Volume: 7.875m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
	out			12 : 17		2	Kongethe Rd
Loading-50	in	6594.4	300	12 : 18	1		Woodley - Joseph
	out			12 : 21		3	Kongethe Rd
Loading-51	in	6595.7	1,300	12 : 25	4		Woodley - Joseph
	out			12 : 27		2	Kongethe Rd
Loading-52	in	6597.2	1,500	12 : 31	4		Friends in the West
	out			12 : 35		4	
Loading-53	in	6599.4	2,200	12 : 45	10		Hurlingham-Argwings
	out			12 : 45		0	Khodek road
Dumping site	in	6610.3	10,900	13 : 20	35		
Start dumping		6618.3	8,000	13 : 26	6		
Finish dumping				13 : 45		19	
Dumping site	out	6626.3	8,000	13 : 51	6		
Reach to workshop	in	6632.5	6,200	14 : 20	29		
Total			59,700		195	141	Total min.: 336 min.
Collection			26,600		119	122	
Transportation			17,100		64		
Inside the dumping site			16,000		12	19	Dumping time
Idling time							

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 23rd MAY 1997

Vehicle No. KAE 636 11

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	46312.1		8 : 24			
Loading-1	in	46317.4	5,300	8 : 34	10		1st Ave Eastleigh
	out			8 : 39		5	
Loading-2	in	46318.3	900	8 : 39	0		Seventh St. Eastleigh
	out			8 : 46		7	
Loading-3	in	46320.8	2,500	8 : 51	5		Kariokor
	out			8 : 54		3	
Loading-4	in	46321	200	8 : 55	1		
	out			8 : 55		0	
Loading-5	in	46322.6	1,600	8 : 59	4		Kariokor
	out			9 : 4		5	
Loading-6	in	46322.8	200	9 : 5	1		Park road
	out			9 : 9		4	
Loading-7	in	46323.9	100	9 : 11	2		Nyambene Drive
	out			9 : 12		1	
Loading-8	in	46324.7	800	9 : 16	4		Garissa Road
	out			9 : 18		2	
Loading-9	in	46325.1	400	9 : 19	1		Mgweni Rd
	out			9 : 19		0	
Loading-10	in	46325.1	10	9 : 20	1		Mgweni Rd
	out			9 : 21		1	
Loading-11	in	46325.2	100	9 : 21	0		Mgweni Rd
	out			9 : 21		0	
Loading-12	in	46325.3	100	9 : 22	1		
	out			9 : 22		0	
Loading-13	in	46325.8	500	9 : 25	3		Juja road
	out			9 : 27		2	
Loading-14	in	46325.9	100	9 : 28	1		
	out			9 : 28		0	
Loading-15	in	46326.1	200	10 : 17	49		North view Rd
	out			10 : 19		2	
Loading-16	in	46327.1	1,000	10 : 19	0		
	out			10 : 20		1	
Loading-17	in	46327.4	300	10 : 20	0		Norht view road
	out			10 : 21		1	
Loading-18	in	46327.5	100	10 : 22	1		(Muranga road)
	out			10 : 24		2	
Loading-19	in	46327.9	400	10 : 26	2		
	out			10 : 31		5	
Loading-20	in	46328.6	700	10 : 50	19		Fairview Rd
	out			10 : 52		2	
Loading-21	in	46328.9	300	10 : 52	0		Mbono Rd
	out			10 : 52		0	
Loading-22	in	46329.1	200	10 : 53	1		Chai Rd
	out			10 : 56		3	
Loading-23	in	46329.2	100	10 : 56	0		Chai Rd
	out			11 : 1		5	
Loading-24	in	46330.7	1,500	11 : 4	3		
	out			11 : 5		1	Muranga Rd

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 23rd MAY 1997

Vehicle No. KAE 636 II

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in	46330.8	100	11 : 6	1		
	out			11 : 6		0	Muranga Rd
Loading-26	in	46330.8	10	11 : 6	0		
	out			11 : 9		3	Muranga Rd
Loading-27	in	46330.8	10	11 : 9	0		
	out			11 : 10		1	
Loading-28	in	46330.9	100	11 : 10	0		
	out			11 : 12		2	
Loading-29	in	46331.1	200	11 : 14	2		
	out			11 : 14		0	
Loading-30	in	46331.2	100	11 : 15	1		Okoth Aura Rd
	out			11 : 15		0	
Loading-31	in	46331.3	100	11 : 15	0		Okoth Aura Rd
	out			11 : 17		2	
Loading-32	in	46332.3	1,000	11 : 21	4		Forest road
	out			11 : 25		4	
Loading-33	in	46332.8	500	11 : 28	3		Forest road
	out			11 : 30		2	
Loading-34	in	46333.5	700	11 : 33	3		Desai Rd
	out			11 : 33		0	
Loading-35	in	46333.6	100	11 : 34	1		Desai Rd
	out			11 : 35		1	
Loading-36	in	46334.2	600	11 : 36	1		Muranga Rd
	out			11 : 43		7	
Loading-37	in	46334.7	500	11 : 45	2		Kolobot Rd
	out			11 : 46		1	
Loading-38	in	46334.9	200	11 : 47	1		Mushembi Rd
	out			11 : 48		1	
Loading-39	in	46335.4	500	11 : 48	0		Ngara road
	out			11 : 52		4	
Loading-40	in	46335.7	300	11 : 53	1		Ngara road
	out			11 : 55		2	
Loading-41	in	46336.1	400	11 : 58	3		
	out			11 : 58		0	Kipkabus Rd
Loading-42	in	46336.5	400	11 : 59	1		
	out			11 : 59		0	Kipkabus Rd
Loading-43	in	46336.9	400	12 : 2	3		
	out			12 : 4		2	
Loading-44	in	46337.1	200	12 : 4	0		Munai Rd
	out			12 : 5		1	
Loading-45	in	46337.2	100	12 : 5	0		Munai Rd
	out			12 : 7		2	
Loading-46	in	46337.4	200	12 : 7	0		Kolobot Rd
	out			12 : 8		1	
Loading-47	in	46337.5	100	12 : 9	1		Kolobot Rd
	out			12 : 9		0	
Loading-48	in	46337.6	100	12 : 10	1		Forest road
	out			12 : 11		1	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 23rd MAY 1997

Vehicle No. KAE 636 H

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in	46338.1	500	12 : 14	3		Parklands Rd
	out			12 : 14		0	
Loading-50	in	46338.5	400	12 : 15	1		Parklands Rd
	out			12 : 19		4	
Loading-51	in	46338.6	100	12 : 19	0		Parklands Rd
	out			12 : 20		1	
Loading-52	in	46338.9	300	12 : 21	1		Wambugu road
	out			12 : 22		1	
Loading-53	in	46338.9	10	12 : 22	0		Wambugu road
	out			12 : 22		0	
Loading-54	in	46339.1	200	12 : 23	1		Wambugu road
	out			12 : 23		0	
Loading-55	in	46339.2	100	12 : 24	1		Wambugu road
	out			12 : 24		0	
Loading-56	in	46339.5	300	12 : 25	1		Wambugu road
	out			12 : 30		5	
Loading-57	in	46339.6	100	12 : 30	0		Wambugu road
	out			12 : 30		0	
Loading-58	in	46339.7	100	12 : 31	1		Wambugu road
	out			12 : 32		1	
Loading-59	in	46339.8	100	12 : 32	0		Wambugu road
	out			12 : 33		1	
Loading-60	in	46339.9	100	12 : 34	1		Wambugu road
	out			12 : 34		0	
Loading-61	in	46340.4	500	12 : 36	2		Wambugu road
	out			12 : 38		2	
Loading-62	in	46340.6	200	12 : 40	2		Wambugu road
	out			12 : 40		0	
Loading-63	in	46340.9	300	12 : 41	1		First Parkland Ave
	out			12 : 42		1	
Loading-64	in	46341	100	12 : 43	1		First Parkland Ave
	out			12 : 43		0	
Loading-65	in	46341.1	100	12 : 44	1		First Parklands Avenue
	out			12 : 44		0	
Loading-66	in	46341.4	300	12 : 46	2		First Parklands Avenue
	out			12 : 51		5	
Loading-67	in	46341.4	10	12 : 52	1		
	out			12 : 55		3	First Parklands Avenue
Loading-68	in	46341.9	500	12 : 57	2		ITA Road
	out			12 : 57		0	
Loading-69	in	46341.9	20	12 : 58	1		ITA Road
	out			13 : 0		2	
Loading-70	in	46342.1	200	13 : 0	0		ITA Road
	out			13 : 0		0	
Loading-71	in	46342.2	100	13 : 1	1		II Parkland Ave
	out			13 : 2		1	
Loading-72	in	46342.4	200	13 : 2	0		II Parkland Ave
	out			13 : 4		2	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 23rd MAY 1997

Vehicle No. KAE 636 II

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-73	in	46342.5	100	13 : 5	1		II Parkland Ave
	out			13 : 5		0	
Loading-74	in	46342.7	200	13 : 6	1		II Parkland Ave
	out			13 : 8		2	
Loading-75	in	46342.8	100	13 : 9	1		II Parkland Ave
	out			13 : 9		0	
Loading-76	in	46342.9	100	13 : 10	1		II Parkland Ave
	out			13 : 11		1	Masari road
Loading-77	in	46343.1	200	13 : 12	1		
	out			13 : 17		5	
Loading-78	in	46343.3	200	13 : 18	1		Ave Parklands
	out			13 : 19		1	
Loading-79	in	46343.4	100	13 : 20	1		
	out			13 : 22		2	
Loading-80	in	46343.4	10	13 : 23	1		
	out			13 : 23		0	
Loading-81	in	46343.5	100	13 : 24	1		2nd Ave. Parklands
	out			13 : 25		1	
Loading-82	in	46343.5	10	13 : 26	1		Msanaka rd
	out			13 : 28		2	
Loading-83	in	46344	500	13 : 30	2		Msanaka rd
	out			13 : 33		3	2nd Ave. Parklands
Loading-84	in	46344	10	13 : 33	0		
	out			13 : 35		2	
Loading-85	in	46344.6	600	13 : 38	3		
	out			13 : 41		3	
Loading-86	in	46344.9	300	13 : 43	2		
	out			13 : 49		6	
Loading-87	in	46345.3	400	13 : 51	2		Moi Forces lane
	out			13 : 51		0	
Loading-88	in	46345.4	100	13 : 53	2		
	out			13 : 54		1	
Loading-89	in	46345.6	200	13 : 55	1		
	out			13 : 56		1	
Loading-90	in	46346.5	900	13 : 59	3		
	out			14 : 2		3	
Loading-91	in	46346.9	400	14 : 9	7		
	out			14 : 10		1	Bhanderi rd.
Loading-92	in	46347.2	300	14 : 11	1		
	out			14 : 11		0	
Loading-93	in	46347.2	10	14 : 13	2		Bhanderi rd.
	out			14 : 14		1	
Loading-94	in	46347.3	100	14 : 14	0		Bhanderi rd.
	out			14 : 17		3	
Loading-95	in	46347.5	200	14 : 17	0		
	out			14 : 19		2	
Loading-96	in	46348	500	14 : 21	2		1st Ave, Parklands
	out			14 : 24		3	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 23rd MAY 1997

Vehicle No. KAE 636 11

Loading Capacity: 4 TON

Researcher's name: M. Mapenzi

No. of Crew: 4

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-97	in	46348.1	100	14 : 24	0		1st Ave. Parklands
	out			14 : 25		1	
Loading-98	in	46348.3	200	14 : 25	0		1st Ave. Parklands
	out			14 : 27		2	
Loading-99	in	46348.5	200	14 : 28	1		Bato Bato rd.
	out			14 : 29		1	
Loading-100	in	46349.1	600	14 : 31	2		2nd Ave. Parklands
	out			14 : 33		2	
Loading-101	in	46350.1	1,100	14 : 36	3		City Park
	out			14 : 38		2	
Loading-102	in	46350.4	300	14 : 40	2		
	out			14 : 40		0	
Loading-103	in	46351.1	700	14 : 44	4		City Park shopping centre
	out			14 : 45		1	
Loading-104	in	46351.2	100	14 : 49	4		City Park shopping centre
	out			14 : 51		2	
Loading-105	in	46351.5	300	14 : 52	1		City Park shopping centre
	out			14 : 54		2	
Loading-106	in	46351.6	100	14 : 55	1		City Park shopping centre
	out			14 : 56		1	
Loading-107	in	46352.5	900	14 : 58	2		Limurur rd.
	out			15 : 0		2	
Loading-108	in	46353.6	1,100	15 : 2	2		Mwambao rd.
	out			15 : 5		3	
Loading-109	in	46354	400	15 : 8	3		6th Ave Parklands
	out			15 : 9		1	
Loading-110	in	46354.2	200	15 : 11	2		6th Ave Parklands
	out			15 : 12		1	
Loading-111	in	46354.9	700	15 : 15	3		6th Ave Parklands
	out			15 : 17		2	
Loading-112	in	46355	100	15 : 18	1		6th Ave Parklands
	out			15 : 19		1	
Loading-113	in	46355.2	200	15 : 19	0		
	out			15 : 19		0	
Loading-114	in	46355.4	200	15 : 20	1		
Dumping site	in	46367.4	12,000	15 : 44	24		
Start dumping				:			
Finish dumping		46369.4	2,000	:			
Dumping site	out			16 : 5	21		
Reach to workshop	in	46383.5	14,100	16 : 30	25		
Total			70,610		301	185	Total min.: 486 min.
Collection			37,210		221	185	
Transportation			31,400		59	0	
Inside the dumping site			2,000		21	0	Dumping time
Idling time							

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 23rd May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	74969.2		8 : 36			From 8:36-9:41 Mechanical problem
Loading-1	in	74990.5	21,300	10 : 16	100		Karen K.C.B Banking & finance
	out			13 : 52		216	Institution
Loading-2	in	75009	18,500	14 : 55	63		Aga Khan Estate off Waiyaki way
	out			14 : 56		1	
Loading-3	in	75013.6	4,600	15 : 3	7		Waiyaki way
	out			15 : 6		3	
Loading-4	in	75016.5	2,900	15 : 11	5		Mountain view off Waiyaki way
	out			15 : 15		4	
Loading-5	in	75016.8	300	15 : 15	0		Mountain view off Waiyaki way
	out			15 : 16		1	
Loading-6	in	75016.9	100	15 : 17	1		Mountain view off Waiyaki way
	out			15 : 20		3	
Loading-7	in	75017	100	15 : 21	1		Mountain view off Waiyaki way
	out			15 : 25		4	
Loading-8	in	75017	0	15 : 26	1		Mountain view off Waiyaki way
	out			15 : 26		0	
Loading-9	in	75017.6	600	15 : 29	3		Mountain view off Waiyaki way
	out			15 : 30		1	
Loading-10	in	75017.7	100	15 : 30	0		Mountain view off Waiyaki way
	out			15 : 31		1	
Loading-11	in	75018.3	600	15 : 33	2		Mountain view off Waiyaki way
	out			15 : 34		1	
Loading-12	in	75018.5	200	15 : 35	1		Mountain view off Waiyaki way
	out			15 : 37		2	
Loading-13	in	75018.7	200	15 : 38	1		Mountain view off Waiyaki way
	out			15 : 38		0	
Loading-14	in	75018.8	100	15 : 39	1		Mountain view off Waiyaki way
	out			15 : 41		2	
Loading-15	in	75023.1	4,300	15 : 51	10		Loresho Shinyalu Road
	out			15 : 54		3	
Loading-16	in	75023.5	400	15 : 55	1		Loresho Shinyalu Close
	out			15 : 59		4	
Loading-17	in	75024.1	600	16 : 0	1		Loresho road-Thego road
	out			16 : 0		0	
Loading-18	in	75024.6	500	16 : 0	0		Loresho Kaptagot Grove
	out			16 : 1		1	
Loading-19	in	75025.5	900	16 : 3	2		Loresho Kaumoni Lane
	out			16 : 3		0	
Loading-20	in	75026.7	1,200	16 : 6	3		Loresho Mweiga Rd
	out			16 : 6		0	
Loading-21	in	75028.7	2,000	16 : 9	3		Loresho kyuna Rd
	out			16 : 10		1	
Loading-22	in	75029.5	800	16 : 11	1		Loresho Mugumo Crescent
	out			16 : 11		0	
Loading-23	in	75030.5	1,000	16 : 14	3		Loresho Kyuna Lane
	out			16 : 15		1	

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 23rd May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-24	in	75032.5	2,000	16 : 20	5		Loresho Gituamba Lane
	out			16 : 21		1	
Loading-25	in	75032.8	300	16 : 23	2		Westlands -Grevillia Groove
	out			16 : 23		0	
Loading-26	in	75033.5	700	16 : 25	2		Westlands -Grevillia Groove
	out			16 : 26		1	
Loading-27	in	75033.8	300	16 : 27	1		Westlands -Grevillia Groove
	out			16 : 28		1	
Loading-28	in	75034	200	16 : 30	2		Westlands -Grevillia Groove
	out			16 : 31		1	
Loading-29	in	75034.3	300	16 : 34	3		Westlands -Grevillia Groove
	out			16 : 34		0	
Loading-30	in	75034.4	100	16 : 35	1		Westlands -Grevillia Groove
	out			16 : 35		0	
Loading-31	in	75034.6	200	16 : 36	1		Westlands -Grevillia Groove
	out			16 : 37		1	
Loading-32	in	75035	400	16 : 39	2		Westlands -Grevillia Groove
	out			16 : 39		0	
Loading-33	in	75035.4	400	16 : 40	1		Westlands off Muguga Garden
	out			16 : 41		1	
Loading-34	in	75035.8	400	16 : 43	2		Westlands off Muguga Garden
	out			16 : 44		1	
Loading-35	in	75036	200	16 : 45	1		Brookside Gardens
	out			16 : 45		0	
Loading-36	in	75037.5	1,500	16 : 49	4		School Lane Westlands
	out			16 : 49		0	
Loading-37	in	75037.6	100	16 : 50	1		School Lane Westlands
	out			16 : 51		1	
Loading-38	in	75038.7	1,100	16 : 55	4		School Lane Westlands
	out			16 : 56		1	
Loading-39	in	75039.1	400	16 : 56	0		Brookside Grove
	out			16 : 57		1	
Loading-40	in	75039.2	100	16 : 59	2		Brookside Grove
	out			17 : 1		2	
Loading-41	in	75039.5	300	17 : 9	8		Brookside Grove
	out			17 : 9		0	
Loading-42	in	75040	500	17 : 11	2		Brookside Grove
	out			17 : 12		1	
Dumping site	in			:			To workshop (No Dumping)
Start dumping				:	0		
Finish dumping				:		0	
Dumping site	out			:	0		
Reach to workshop	in	75053.1	13,100	17 : 50	38		

Time & Motion Study

Organization: CITY BINS

Trip- 1 Date: 23rd May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: M. S. Nyawira

No. of Crew: 3

Estimated Volume: 6.75m³

Location	Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Total		83,900		292	262	Total min.: 554 min.
Collection		49,500		154	262	
Transportation		34,400		73		
Inside the dumping site		0		0	0	Dumping time
Idling time				65		Mechanical problem

Time & Motion Study

Organization: CITY BINS

Trip- 1

Date: 23rd May 1997

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON

Researcher's name: A. Wanjohi

No. of Crew: 3

Estimated Volume: 7.875m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	6632.5		8 : 32			
Loading-1	in	6638.5	6,000	8 : 45	13		Chiromo Rd. Petrol Station
	out			8 : 46		1	Chiromo Rd
Loading-2	in	6639.1	600	8 : 49	3		Ring road
	out			8 : 50		1	
Loading-3	in	6639.5	400	8 : 52	2		Ring road
	out			8 : 57		5	
Loading-4	in	6639.8	300	8 : 59	2		Lantana road
	out			9 : 0		1	
Loading-5	in	6640	200	9 : 1	1		Lantana road
	out			9 : 4		3	
Loading-6	in	6640.5	500	9 : 8	4		Sports road
	out			9 : 10		2	
Loading-7	in	6640.8	300	9 : 12	2		westlands avenue
	out			9 : 13		1	
Loading-8	in	6641	200	9 : 14	1		westlands avenue
	out			9 : 17		3	
Loading-9	in	6641.3	300	9 : 19	2		Sports road
	out			9 : 22		3	
Loading-10	in	6641.4	100	9 : 23	1		Sports road
	out			9 : 23		0	
Loading-11	in	6641.4	0	9 : 25	2		Sports road
	out			9 : 27		2	
Loading-12	in	6641.5	100	9 : 28	1		Bitha Homes-Sports Road
	out			9 : 33		5	
Loading-13	in	6641.7	200	9 : 34	1		Bitha Homes-Sports Road
	out			9 : 35		1	
Loading-14	in	6641.8	100	9 : 36	1		Sports road
	out			9 : 39		3	
Loading-15	in	6642	200	9 : 43	4		Sports road
	out			9 : 45		2	
Loading-16	in	6642.4	400	9 : 46	1		Sports road
	out			9 : 47		1	
Loading-17	in	6643	600	9 : 49	2		Waiyaki way
	out			9 : 50		1	
Loading-18	in	6643.1	100	9 : 52	2		Hillcrest Hotel-Waiyaki way
	out			9 : 59		7	
Loading-19	in	6643.9	800	10 : 3	4		Hillcrest Hotel-Waiyaki way
	out			10 : 4		1	
Loading-20	in	6644.2	300	10 : 5	1		Hillcrest Hotel-Waiyaki way
	out			10 : 10		5	
Loading-21	in	6644.7	500	10 : 11	1		David Osieli road
	out			10 : 12		1	
Loading-22	in	6645.1	400	10 : 13	1		East Church Road
	out			10 : 16		3	
Loading-23	in	6645.2	100	10 : 16	0		East Church Road
	out			10 : 16		0	
Loading-24	in	6645.4	200	10 : 18	2		East Church Road
	out			10 : 18		0	

Time & Motion Study

Organization: CITY BINS Trip- 1 Date: 23rd May 1997

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON Researcher's name: A. Wanjohi

No. of Crew: 3

Estimated Volume: 7.875m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-25	in	6645.8	400	10 : 20	2		terrace close
	out			10 : 21		1	
Loading-26	in	6646.6	800	10 : 24	3		Mangu Gardens
	out			10 : 26		2	
Loading-27	in	6647.1	500	10 : 29	3		Body Wise Fitness Centre
	out			10 : 33		4	
Loading-28	in	6649.7	2,600	10 : 38	5		Kabarsiran Avenue
	out			10 : 38		0	
Loading-29	in	6650.7	1,000	10 : 40	2		Manyani Road West
	out			10 : 41		1	
Loading-30	in	6651.7	1,000	10 : 43	2		Musa Gitau Road
	out			10 : 44		1	
Loading-31	in	6658.7	7,000	10 : 53	9		Museum Hill
	out			10 : 54		1	
Loading-32	in	6658.8	100	10 : 55	1		Muthithi road
	out			10 : 56		1	
Loading-33	in	6659	200	10 : 57	1		Muthithi road
	out			10 : 58		1	
Loading-34	in	6659.2	200	10 : 59	1		Muthithi road
	out			11 : 0		1	
Loading-35	in	6659.4	200	11 : 1	1		Choiromo lane
	out			11 : 2		1	
Loading-36	in	6660	600	11 : 5	3		westlands road
	out			11 : 6		1	
Loading-37	in	6660.2	200	11 : 9	3		westlands road
	out			11 : 11		2	
Loading-38	in	6660.7	500	11 : 17	6		muthithi road
	out			11 : 18		1	
Loading-39	in	6661.3	600	11 : 20	2		muthithi road
	out			11 : 21		1	
Loading-40	in	6661.4	100	11 : 21	0		Mogotio road
	out			11 : 23		2	
Loading-41	in	6661.5	100	11 : 23	0		Mogotio road
	out			11 : 24		1	
Loading-42	in	6661.6	100	11 : 26	2		Mogotio road
	out			11 : 28		2	
Loading-43	in	6661.8	200	11 : 29	1		Mogotio road
	out			11 : 30		1	
Loading-44	in	6662	200	11 : 31	1		Mogotio road
	out			11 : 36		5	
Loading-45	in	6662.2	200	11 : 37	1		muthithi road
	out			11 : 41		4	
Loading-46	in	6662.3	100	11 : 42	1		muthithi road
	out			11 : 43		1	
Loading-47	in	6662.7	400	11 : 44	1		Parklands road
	out			11 : 45		1	
Loading-48	in	6662.9	200	11 : 46	1		May Fair Court Hotel-
	out			11 : 48		2	Msapo close

Time & Motion Study Organization: CITY BINS Trip- 1 Date: 23rd May 1997
 Vehicle No. KAH 850S Loading Capacity: 3.29 TON Researcher's name: A. Wanjohi
 No. of Crew: 3 Estimated Volume: 7.875m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-49	in	6663.4	500	11 : 52	4		The crescent
	out			11 : 54		2	
Loading-50	in	6663.5	100	11 : 54	0		The crescent
	out			11 : 55		1	
Loading-51	in	6664.6	1,100	12 : 0	5		Maua close
	out			12 : 2		2	
Loading-52	in	6664.7	100	12 : 3	1		La Papa Loca-Maua
	out			12 : 20		17	
Loading-53	in	6665.1	400	12 : 23	3		Ring road
	out			12 : 34		11	
Loading-54	in	6666	900	12 : 38	4		General Mathenge Drive
	out			12 : 41		3	
Loading-55	in	6666.3	300	12 : 42	1		General Mathenge Drive
	out			12 : 43		1	
Loading-56	in	6666.9	600	12 : 44	1		Eldama Ravine Drive
	out			12 : 47		3	
Loading-57	in	6667.1	200	12 : 49	2		Eldama Ravine Drive
	out			12 : 50		1	
Loading-58	in	6667.3	200	12 : 51	1		Eldama Ravine Gardens
	out			12 : 53		2	
Loading-59	in	6668	700	12 : 54	1		Eldama Ravine Drive
	out			12 : 55		1	
Loading-60	in	6668.2	200	12 : 56	1		Eldama Ravine Drive
	out			12 : 56		0	
Loading-61	in	6668.7	500	13 : 0	4		3rd Parklands
	out			13 : 1		1	
Loading-62	in	6669.1	400	13 : 3	2		3rd Parklands
	out			13 : 3		0	
Loading-63	in	6669.3	200	13 : 4	1		3rd Parklands
	out			13 : 5		1	
Loading-64	in	6669.5	200	13 : 6	1		
	out			13 : 8		2	
Loading-65	in	6669.7	200	13 : 8	0		4t Parklands road
	out			13 : 10		2	
Loading-66	in	6669.8	100	13 : 11	1		4t Parklands road
	out			13 : 13		2	
Loading-67	in	6669.9	100	13 : 14	1		4t Parklands road
	out			13 : 18		4	
Loading-68	in	6670.6	700	13 : 21	3		4t Parklands road
	out			13 : 22		1	
Loading-69	in	6671.1	500	13 : 24	2		4t Parklands road
	out			13 : 25		1	
Loading-70	in	6671.4	300	13 : 29	4		4t Parklands road
	out			13 : 30		1	
Loading-71	in	6671.5	100	13 : 30	0		4t Parklands road
	out			13 : 31		1	
Loading-72	in	6671.6	100	13 : 32	1		Mutati road
	out			13 : 33		1	

Time & Motion Study

Organization: CITY BINS Trip- 1 Date: 23rd May 1997

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON Researcher's name: A. Wanjohi

No. of Crew: 3

Estimated Volume: 7.875m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-73	in	6671.7	100	13 : 33	0		Mutati road
	out			13 : 35		2	
Loading-74	in	6671.7	0	13 : 36	1		Masari Road
	out			13 : 39		3	
Loading-75	in	6671.8	100	13 : 40	1		Masari Road
	out			13 : 44		4	
Loading-76	in	6672.2	400	13 : 45	1		3rd parklands road
	out			13 : 46		1	
Loading-77	in	6672.8	600	13 : 49	3		4th Parklands Avenue
	out			13 : 52		3	
Loading-78	in	6673.1	300	13 : 54	2		4th Parklands Avenue
	out			13 : 55		1	
Loading-79	in	6673.4	300	13 : 57	2		5th Parklands Avenue
	out			13 : 58		1	
Loading-80	in	6673.9	500	14 : 0	2		Githuri road
	out			14 : 3		3	
Loading-81	in	6674.1	200	14 : 4	1		Githuri road
	out			14 : 7		3	
Loading-82	in	6674.3	200	14 : 10	3		Iregi road
	out			14 : 14		4	
Loading-83	in	6674.6	300	14 : 15	1		parklands avenue
	out			14 : 16		1	
Dumping site	in	6678.1	3,500	14 : 37	21		
Start dumping		6686.1	8,000	14 : 43	6		
Finish dumping				15 : 7		24	
Dumping site	out	6694.1	8,000	15 : 13	6		
Reach to workshop	in	6700.8	6,700	16 : 10	57		
Total			68,300		257	201	Total min.: 458 min.
Collection			36,100		154	177	
Transportation			16,200		91	0	
Inside the dumping site			16,000		12	24	Dumping time
Idling time							

Time & Motion Study

Organization: CITY BINS Trip- 2 Date: 24th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: M. S. Nyawira

No. of Crew: 3

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	75068.9		9 : 40			From Dumping site
Loading-1	in	75081.8	12,900	10 : 30	50		Ridge ways Ridge way Road
	out			10 : 35		5	
Loading-2	in	75081.8	0	10 : 35	0		Ridge ways Ridge way Road
	out			10 : 40		5	
Loading-3	in	75082	200	10 : 41	1		Ridge ways Ridge way Road
	out			10 : 42		1	
Loading-4	in	75083	1,000	10 : 44	2		Ridge ways Ridge way Road
	out			10 : 44		0	
Loading-5	in	75083.6	600	10 : 45	1		Ridge ways Ridge way Road
	out			10 : 49		4	
Loading-6	in	75085.7	2,100	10 : 55	6		Runda (new)
	out			10 : 56		1	
Loading-7	in	75089.4	3,700	11 : 0	4		Runda (Old)
	out			11 : 5		5	
Loading-8	in	75090.7	1,300	11 : 7	2		Runda (Old)
	out			11 : 9		2	
Loading-9	in	75092.1	1,400	11 : 11	2		Runda (Old)
	out			11 : 12		1	
Loading-10	in	75092.1	0	11 : 13	1		Runda (Old)
	out			11 : 15		2	
Loading-11	in	75094.3	2,200	11 : 20	5		Limuru road (German School)
	out			11 : 26		6	
Loading-12	in	75098.2	3,900	11 : 31	5		wispers Avenue
	out			11 : 32		1	
Loading-13	in	75098.6	400	11 : 35	3		wispers Avenue
	out			11 : 36		1	
Loading-14	in	75100.2	1,600	11 : 40	4		Fuchsia Close
	out			11 : 41		1	
Loading-15	in	75100.5	300	11 : 42	1		Gardenia Road
	out			11 : 43		1	
Loading-16	in	75100.8	300	11 : 44	1		Magnolia close
	out			11 : 45		1	
Loading-17	in	75101.3	500	11 : 46	1		Bombax close
	out			11 : 46		0	
Loading-18	in	75101.4	100	11 : 48	2		Camelia close
	out			11 : 48		0	
Loading-19	in	75101.8	400	11 : 50	2		Ansellia Close
	out			11 : 54		4	
Loading-20	in	75105	3,200	11 : 59	5		Red Hill road
	out			12 : 0		1	
Loading-21	in	75106.4	1,400	12 : 1	1		Red Hill road
	out			12 : 2		1	
Loading-22	in	75107.9	1,500	12 : 7	5		Nyari Estate Red Hill Drive
	out			12 : 8		1	
Loading-23	in	75109.8	1,900	12 : 12	4		Nyari Estate Red Hill Drive
	out			12 : 12		0	

Time & Motion Study

Organization: CITY BINS

Trip- 2 Date: 24th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: M. S. Nyawira

No. of Crew: 3

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-24	in	75110.3	500	12 : 14	2		Nyari Estate Red Hill Drive
	out			12 : 14		0	
Loading-25	in	75110.8	500	12 : 15	1		Nyari Estate (Red Hill Drive)
	out			12 : 15		0	
Loading-26	in	75115.3	4,500	12 : 22	7		Thigiri Grove
	out			12 : 22		0	
Loading-27	in	75115.4	100	12 : 23	1		Thigiri Grove
	out			12 : 23		0	
Loading-28	in	75117	1,600	12 : 27	4		Thigiri Ridge
	out			12 : 28		1	
Loading-29	in	75120.8	3,800	12 : 33	5		Kitisuru road
	out			12 : 33		0	
Loading-30	in	75122.2	1,400	12 : 36	3		Kitisuru road
	out			12 : 39		3	
Loading-31	in	75124.9	2,700	12 : 43	4		peponi close
	out			12 : 43		0	
Loading-32	in	75126.7	1,800	12 : 45	2		Spring valley road
	out			12 : 45		0	
Loading-33	in	75128.2	1,500	12 : 50	5		Hill view crescent
	out			12 : 50		0	
Loading-34	in	75128.4	200	12 : 52	2		Hill view crescent
	out			12 : 52		0	
Loading-35	in	75129.2	800	12 : 55	3		Hill view rise
	out			12 : 57		2	
Loading-36	in	75129.8	600	13 : 0	3		Lake view magadi close
	out			13 : 0		0	
Loading-37	in	75129.8	0	13 : 1	1		Lake view Elemantaita Drive
	out			13 : 2		1	
Loading-38	in	75134	4,200	13 : 10	8		Pine Wood Grove Shanzu Rd
	out			13 : 10		0	
Loading-39	in	75134.3	300	13 : 11	1		Pine Wood Grove Shanzu Rd
	out			13 : 12		1	
Loading-40	in	75134.6	300	13 : 15	3		Pine Wood Grove Shanzu Rd
	out			13 : 16		1	
Loading-41	in	75134.7	100	13 : 16	0		Shanzu Rd General Mathenge
	out			13 : 19		3	
Loading-42	in	75134.8	100	13 : 20	1		Shanzu Rd General Mathenge
	out			13 : 20		0	
Loading-43	in	75134.9	100	13 : 21	1		General Mathenge Shazu road
	out			13 : 22		1	
Loading-44	in	75135.2	300	13 : 24	2		General Mathenge Shazu road
	out			13 : 26		2	
Loading-45	in	75135.6	400	13 : 30	4		General Mathenge
	out			13 : 32		2	
Loading-46	in	75136.1	500	13 : 36	4		General Mathenge
	out			13 : 36		0	
Loading-47	in	75136.2	100	13 : 39	3		General Mathenge
	out			13 : 40		1	
Loading-48	in	75136.5	300	13 : 43	3		General Mathenge

Time & Motion Study

Organization: CITY BINS Trip- 2 Date: 24th May 1997

Vehicle No. KAD 551 J

Loading Capacity: 2.6 TON

Researcher's name: M. S. Nyawira

No. of Crew: 3

Estimated Volume:

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
	out			13 : 45		2	
Loading-49	in	75136.7	200	13 : 45	0		Donyo sabuk lane
	out			13 : 49		4	
Loading-50	in	75137.1	400	13 : 53	4		peponi road
	out			13 : 54		1	
Loading-51	in	75138.1	1,000	13 : 54	0		Donyo sabuk Avenue
	out			13 : 55		1	
Loading-52	in	75138.3	200	13 : 56	1		Donyo sabuk Avenue
	out			13 : 56		0	
Loading-53	in	75138.3	0	13 : 57	1		Donyo sabuk Avenue
	out			13 : 58		1	
Loading-54	in	75139.4	1,100	14 : 0	2		Lower Kabete road
	out			14 : 3		3	
Loading-55	in	75139.4	0	14 : 4	1		Lower Kabete road
	out			14 : 6		2	
Loading-56	in	75139.5	100	14 : 8	2		
	out			14 : 10		2	
Dumping site	in	75152.9	13,400	14 : 35	25		Dandora
Start dumping				14 : 40	5		
Finish dumping				14 : 49		9	
Dumping site	out	75154.8	1,900	14 : 54	5		
Reach to workshop	in			15 : 30	36		
Total			85,900		263	87	Total min.: 350 min.
Collection			57,700		142	78	
Transportation			26,300		111	0	
Inside the dumping site			1,900		10	9	Dumping time
Idling time							

Time & Motion Study

Organization: CITY BINS Trip- 1 Date: 24th May 1997

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON Researcher's name: A. Wanjohi

No. of Crew: 3

 Estimated Volume: 7.875m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Start from workshop	out	6700.8		8 : 37			
Loading-1	in	6702.1	1,300	8 : 43	6		Mukundu road-South B
	out			8 : 44		1	
Loading-2	in	6702.6	500	8 : 46	2		Melili road
	out			8 : 49		3	
Loading-3	in	6704.2	1,600	8 : 54	5		Golden Gate
	out			8 : 57		3	
Loading-4	in	6704.6	400	8 : 59	2		Sadi road
	out			9 : 2		3	
Loading-5	in	6704.7	100	9 : 3	1		Sadi road
	out			9 : 7		4	
Loading-6	in	6704.8	100	9 : 7	0		Sadi road
	out			9 : 10		3	
Loading-7	in	6704.9	100	9 : 10	0		Sadi road
	out			9 : 12		2	
Loading-8	in	6707.3	2,400	9 : 18	6		Mombasa road
	out			9 : 19		1	
Loading-9	in	6711.3	4,000	9 : 37	18		Muhoho road-South C
	out			9 : 41		4	
Loading-10	in	6711.4	100	9 : 41	0		Pundamilia Crescent
	out			9 : 43		2	
Loading-11	in	6711.5	100	9 : 44	1		Pundamilia Crescent
	out			9 : 46		2	
Loading-12	in	6711.6	100	9 : 46	0		Mukangi road
	out			9 : 47		1	
Loading-13	in	6711.6	0	9 : 50	3		Mukangi road
	out			9 : 51		1	
Loading-14	in	6711.7	100	9 : 52	1		Ndekwa Avenue
	out			9 : 57		5	
Loading-15	in	6712.1	400	10 : 0	3		Dluvimu Road
	out			10 : 1		1	
Loading-16	in	6712.3	200	10 : 2	1		Sungura road
	out			10 : 3		1	
Loading-17	in	6712.4	100	10 : 4	1		Sungura Estate-Sungura road
	out			10 : 5		1	
Loading-18	in	6712.5	100	10 : 5	0		Sungura Estate-Sungura road
	out			10 : 6		1	
Loading-19	in	6712.5	0	10 : 9	3		Sungura road
	out			10 : 10		1	
Loading-20	in	6712.6	100	10 : 18	8		Sungura road
	out			10 : 20		2	
Loading-21	in	6712.7	100	10 : 21	1		
	out			10 : 24		3	
Loading-22	in	6713.1	400	10 : 27	3		
	out			10 : 30		3	
Loading-23	in	6713.7	600	10 : 34	4		Mugoya Estate
	out			10 : 36		2	

Time & Motion Study

Organization: CITY BINS Trip- 1 Date: 24th May 1997

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON Researcher's name: A. Wanjohi

No. of Crew: 3

Estimated Volume: 7.875m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-24	in	6713.8	100	10 : 37	1		Mugoya Estate
	out			10 : 37		0	
Loading-25	in	6714.4	600	10 : 40	3		Mugoya Estate
	out			10 : 42		2	
Loading-26	in	6714.5	100	10 : 43	1		Mugoya Estate
	out			10 : 45		2	
Loading-27	in	6715.1	600	10 : 47	2		K.M.A.
	out			10 : 48		1	(Kenya Medical Association)
Loading-28	in	6715.8	700	10 : 50	2		Rumi Road
	out			10 : 51		1	
Loading-29	in	6716	200	10 : 52	1		Rumi Road
	out			10 : 54		2	
Loading-30	in	6716.1	100	10 : 54	0		Ole shapara Avenue
	out			10 : 57		3	
Loading-31	in	6716.2	100	11 : 2	5		
	out			11 : 4		2	
Loading-32	in	6716.3	100	11 : 5	1		
	out			11 : 5		0	
Loading-33	in	6716.4	100	11 : 6	1		Ole shapara Avenue
	out			11 : 6		0	
Loading-34	in	6716.6	200	11 : 7	1		Mufulu Avenue
	out			11 : 8		1	
Loading-35	in	6716.8	200	11 : 11	3		Uchumi road
	out			11 : 11		0	
Loading-36	in	6716.9	100	11 : 12	1		Uchumi road
	out			11 : 13		1	
Loading-37	in	6717	100	11 : 13	0		Uchumi road
	out			11 : 15		2	
Loading-38	in	6717.1	100	11 : 16	1		Ole shapara Avenue
	out			11 : 17		1	
Loading-39	in	6717.2	100	11 : 18	1		Ole shapara Avenue
	out			11 : 18		0	
Loading-40	in	6717.3	100	11 : 20	2		Ole shapara Avenue
	out			11 : 22		2	
Loading-41	in	6717.4	100	11 : 23	1		Ole shapara Avenue
	out			11 : 25		2	
Loading-42	in	6717.5	100	11 : 25	0		Ole shapara Avenue
	out			11 : 27		2	
Loading-43	in	6717.5	0	11 : 28	1		
	out			11 : 31		3	
Loading-44	in	6717.6	100	11 : 32	1		Mtelo road
	out			11 : 41		9	
Loading-45	in	6717.7	100	11 : 42	1		Mufuti road
	out			11 : 45		3	
Loading-46	in	6717.8	100	11 : 48	3		Mufuti Crescent
	out			11 : 49		1	
Loading-47	in	6717.9	100	11 : 50	1		Mufuti Crescent
	out			11 : 50		0	

Time & Motion Study

Organization: CITY BINS

Trip- 1

Date: 24th May 1997

Vehicle No. KAH 850S

Loading Capacity: 3.29 TON

Researcher's name: A. Wanjohi

No. of Crew: 3

Estimated Volume: 7.875m³

Location		Mileage (km)	Distance (m)	Time	Moving time (min.)	Loading time (min.)	Remarks (route)
Loading-48	in	6718.2	300	11 : 54	4		Mufuti Crescent
	out			11 : 57		3	
Loading-49	in	6719.1	900	12 : 0	3		South C
	out			12 : 2		2	
Loading-50	in	6719.2	100	12 : 5	3		South C
	out			12 : 9		4	
Loading-51	in	6719.3	100	12 : 10	1		South C
	out			12 : 11		1	
Loading-52	in	6719.7	400	12 : 12	1		South C
	out			12 : 16		4	
Loading-53	in	6719.9	200	12 : 17	1		South C
	out			12 : 17		0	
Loading-54	in	6720	100	12 : 18	1		South C
	out			12 : 22		4	
Dumping site	in	6737	17,000	13 : 3	41		
Start dumping		6737.8	800	13 : 9	6		
Finish dumping				13 : 24		15	
Dumping site	out	6738.6	800	13 : 30	6		
Reach to workshop	in	6745.3	6,700	14 : 0	30		
Total			44,500		200	123	Total min.: 323 min.
Collection			17,900		111	108	
Transportation			25,000		77	0	
Inside the dumping site			1,600		12	15	Dumping time
Idling time							

