UNITED REPUBLIC OF TANZANIA

MINISTRY OF WORKS, COMMUNICATIONS AND TRANSPORT

THE STUDY
ON
DAR ES SALAAM
ROAD DEVELOPMENT PLAN

FINAL REPORT
PART A : MASTER PLAN STUDY
PART B : FEASIBILITY STUDY

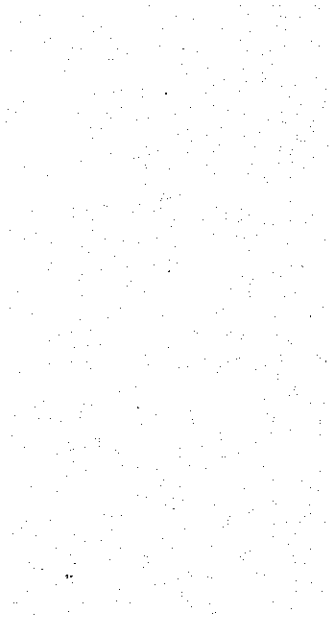
APPENDIX

MARCH 1993

JAPAN INTERNATIONAL COOPERATION AGENCY

JAPAN ENGINEERING CONSULTANTS CO., LTD.

NIPPON KOEI CO., LTD.



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CONTENTS

[Part A: Master Plan Study]

Chapter 3 Traffic Survey and Analysis

Chapter 4 Present Transportation System in Dar es Salaam

Chapter 5 Initial Environmental Examination

Chapter 6 Formulation of Urban Transportation Development Strategies

Chapter 7 Traffic Demand Forecast

Chapter 8 Road Development Plan

Chapter 10 Traffic Management Pan

Chapter 11 Short-term Development Plan and Implementation Schedule

[Part B: Feasibility Study on High Priority Projects]

Chapter 14 Engineering Survey and Analysis

Chapter 15 Preliminary Design

Chapter 16 Construction Plan and Cost Estimate

Chapter 17 Environmental Impact Assessment

Chapter 19 Environmental on Project Implementation

PART A : MASTER PLAN STUDY

APPENDICES

Chapter 3 Traffic Survey and Analysis

Appendix 3.1	Home Interview Survey Sheet
Appendix 3.2	Road side OD Survey Sheet
Appendix 3.3	12 hr Traffic Count Survey Sheet
Appendix 3.4	Traffic Direction Survey at Intersections
Appendix 3.5	12 hr Traffic Volume by Survey Station
Appendix 3.6	Traffic Capacity Calculation Method
Appendix 3.7	Traffic Movement at Major Intersection in the City Center
Appendix 3.8	Degree of Saturation at Major Intersection in the City Center

HOME INTERVIEW SURVEY SHEET

Zone	SQE NO. of Family in Zone	SQE Person NO.	Number of Family member *	Total amount of income per monthly rougthly *
				Tsh

*) WRITE in only case of head of a household

Address of your home at present	Address of your working place or your school	Sex	Age	Number of family member	Occupation	Type of industry engaged	Do you have a private automobile being able to use at any time? *)	Do you have a private motorcycle being able to use at any time?**)	Do you have a private bicycle being able to use at any time?
Ward / City / Dist. Zone No.	Ward / City / Dist. Zone No.	1 Male 2 Female			1 Employer 2 Employee 3 Student 4 Housekeeper 5 Unemployed 6 Self-Employed	1 Agriculture, Forestry, Fishery 2 Mining, Construction, Manufacturing 3 Commerce, Finance, Transportation, Service, Public Service, etc.	0 No 1 Yes	0 No 1 Yes	0 No 1 Yes

*) Except motorcycle
**) Except motorcycle and bicycle

	1st Trip	2nd Trip	3rd Trip	4th Trip
Address of departure Write only "home" in case that address is same as home.	Ward / City Zone No.	Ward / City Zone No.	Ward / City Zone No.	Ward / City Zone No.
Time of departure				
Travel time required to move from origin to destnation (minute)				
Trip purpose	1 Go to office/working place 2 Go to school 3 Business 4 Shopping 5 Come back home 6 Others	1 Go to office/working place 2 Go to school 3 Business 4 Shopping 5 Come back home 6 Others	1 Go to office/working place 2 Go to school 3 Business 4 Shopping 5 Come back home 6 Others	1 Go to office/working place 2 Go to school 3 Business 4 Shopping 5 Come back home 6 Others
Trip mode : select the following code in order of using the mode 1 walk 7 Passenger car 2 Bicycle 8 Ligth goods truck 3 Motorcycle 9 Medium goods truck 4 Taxi 10 Heavey goods truck 5 Minibus 11 Others 6 Bus on a regular route	1st mode	1st mode	1st mode	1st mode
	2nd mode	2nd mode	2nd mode	2nd mode
	3rd mode	3rd mode	3rd mode	3rd mode
	4th mode	4th mode	4th mode	4th mode
	5th mode	5th mode	5th mode	5th mode

HOME INTERVIEW SURVEY SHEET

(CONTINUE)

Zone	SQE NO. of Family in Zone	SQE Person NO.	Number of Family member *	Total amount of income per monthly rougthly *
				Tsh

*) WRITE in only case of head of a household

Address of your home at present	Address of your working place or your school	Sex	Age	Number of family member	Occupation	Type of industry engaged	Do you have a private automobile being able to use at any time? *)	Do you have a private motorcycle being able to use at any time?**)	Do you have a private bicycle being able to use at any time?
Ward / City / Dist. Zone No.	Ward / City / Dist. Zone No.	1 Male 2 Female			1 Employer 2 Employee 3 Student 4 Housekeeper 5 Unemployed 6 Self-Employed	1 Agriculture, Forestry, Fishery 2 Mining, Construction, Manufacturing 3 Commerce, Finance, Transportation, Service, Public Service, etc.	0 No 1 Yes	0 No 1 Yes	0 No 1 Yes

*) Except motorcycle
**) Except motorcycle and bicycle

	th Trip	th Trip	th Trip	th Trip
Address of departure Write only "home" in case that address is same as home.	Ward / City Zone No.	Ward / City Zone No.	Ward / City Zone No.	Ward / City Zone No.
Time of departure				
Travel time required to move from origin to destnation (minute)				
Trip purpose	1 Go to office/working place 2 Go to school 3 Business 4 Shopping 5 Come back home 6 Others	1 Go to office/working place 2 Go to school 3 Business 4 Shopping 5 Come back home 6 Others	1 Go to office/working place 2 Go to school 3 Business 4 Shopping 5 Come back home 6 Others	1 Go to office/working place 2 Go to school 3 Business 4 Shopping 5 Come back home 6 Others
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	2nd mode	2nd mode	2nd mode	2nd mode
	3rd mode	3rd mode	3rd mode	3rd mode
	4th mode	4th mode	4th mode	4th mode
	5th mode	5th mode	5th mode	5th mode

Appendix 3.2 Road side OD Survey Sheet

ROAD SIDE OD SURVEY SHEET

Date	Sheet No.	Station No.	Direction	Time of Interview	1. Type of vehicle	2. Origin Where did the trip begin ?	3. Destination Where will this end?	4. Trip purpose	5. Resident Are you living in Dar es Salaam ?
Interviewer			1 Up 2 Down		1 Motorcycle 2 Car, taxi 3 Light goods vehicle 4 Medium goods vehicle 5 Heavey goods vehicle 6 Bus(Mini)	Ward/city/dist.	Ward/city/dist.	1 Go to office/ working place 2 Go to school 3 Business 4 Shopping 5 Come back to home Others	1 Yes 2 NO
Superviser									

6. Average monthly income	7. Passengers aboard (including driver)	Commodity (only truck) 8. Type of Commodity	9. Loading capacity	10. Weight of commodity
(Tsh)		1. No luggage 2. Timber 3. Other Agricultural 4. Oil 5. Mineral 6. Machinary 7. Chemical 8. Construction Material 9. Miscellaneous	(tons)	(tons)

1. Type	2. Origin	3. Destination	4. Trip Purpose	5. Resident in Dar es Salaam or not	6. Average monthly income	7. passengers aboard (including driver)	8. Type of Commodity	9. Loading capacity	10. Weight of commodity
	Ward city dist. Zone No.	Ward city dist. Zone No.			Tsh			tons	tons
	Ward city dist. Zone No.	Ward city dist. Zone No.			Tsh			tons	tons
	Ward city dist. Zone No.	Ward city dist. Zone No.			Tsh			tons	tons
	Ward city dist. Zone No.	Ward city dist. Zone No.			Tsh			tons	tons
	Ward city dist. Zone No.	Ward city dist. Zone No.			Tsh			tons	tons
	Ward city dist. Zone No.	Ward city dist. Zone No.			Tsh			tons	tons
	Ward city dist. Zone No.	Ward city dist. Zone No.			Tsh			tons	tons

12hr TRAFFIC COUNT SURVEY SHEET

Date	Station No.	Road/Intersection	Direction	Start time	End time	Surveyor	Inspector	Sheet No.
			1. Up 2. Down					

Walk and Bicycle	AM						PM						Total
	6 – 7	7 – 8	8 – 9	9 – 10	10 – 11	11 – 12	12 – 1	1 – 2	2 – 3	3 – 4	4 – 5	5 – 6	
• Walk													
• Bicycle													

Note :

Ttpe of vehicle	AM						PM						Total
	6 – 7	7 – 8	8 – 9	9 – 10	10 – 11	11 – 12	12 – 1	1 – 2	2 – 3	3 – 4	4 – 5	5 – 6	
1. Motercycle													
2. Car, Taxi													
3. Light goods vehicle													
4. Medium goods vehicle													
5. Heavy goods vehicle													
6. Mini Bus													
7. Bus													
8. Others													
Total No.													
Total No. of pcu													

Note : .

12hr (NIGHT) TRAFFIC COUNT SURVEY SHEET

Date	Station No.	Road/Intersection	Direction	Start time	End time	Surveyor	Inspector	Sheet No.
			1. Up 2. Down					

Walk and Bicycle	PM						AM						Total
	6 – 7	7 – 8	8 – 9	9 – 10	10 – 11	11 – 12	0 – 1	1 – 2	2 – 3	3 – 4	4 – 5	5 – 6	
• Walk													
• Bicycle													

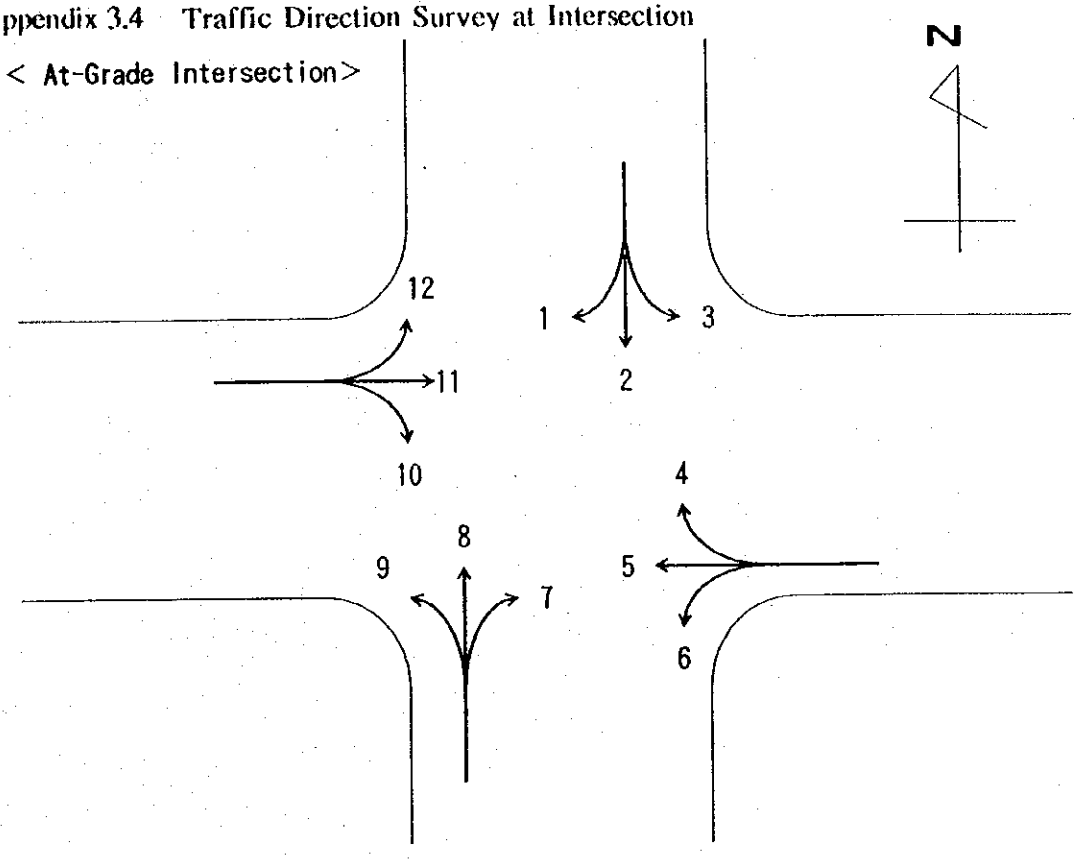
Note :

Tipe of vehicle	PM						AM						Total
	6 – 7	7 – 8	8 – 9	9 – 10	10 – 11	11 – 12	0 – 1	1 – 2	2 – 3	3 – 4	4 – 5	5 – 6	
1. Motercycle													
2. Car, Taxi													
3. Light goods vehicle													
4. Medium goods vehicle													
5. Heavy goods vehicle													
6. Mini Bus													
7. Bus													
8. Others													
Total No.													
Total No. of pcu													

Note :

Appendix 3.4 Traffic Direction Survey at Intersection

< At-Grade Intersection>



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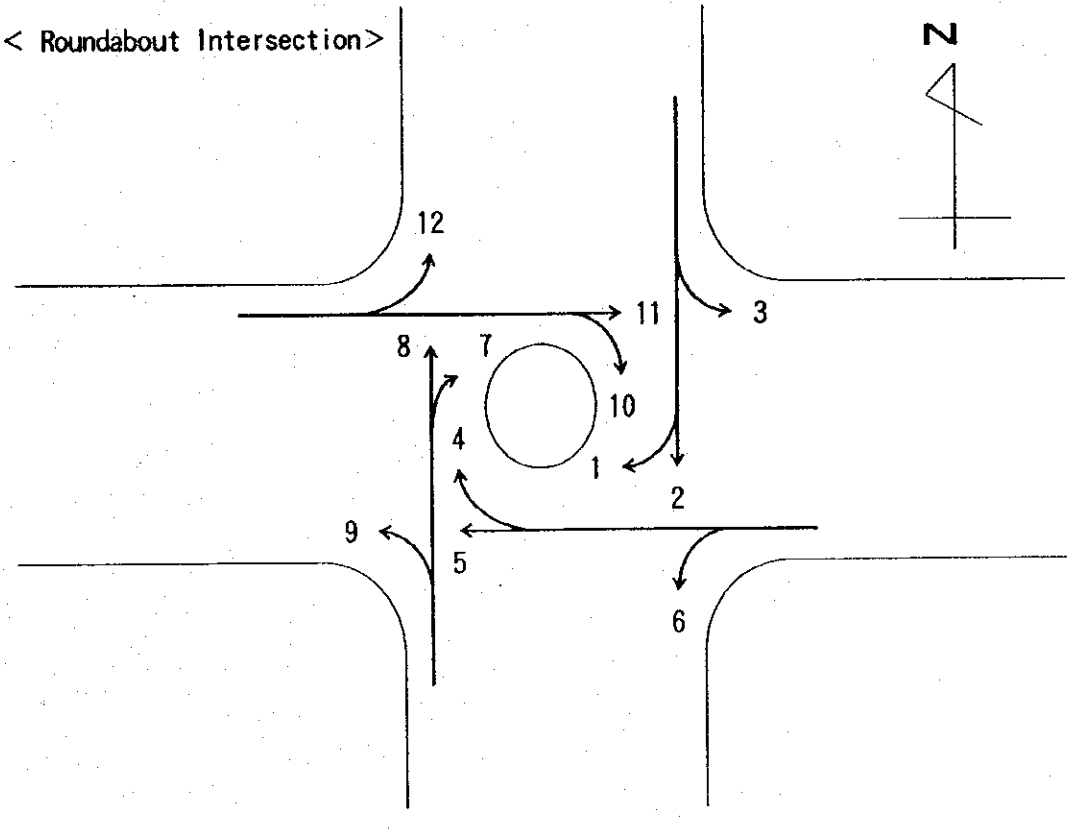


Appendix 3.5 (1/3) 12 hour Traffic Volume by Survey Station

Station	Road Name	Direction	M/T	C/T	L/V	M/V	H/V	M/B	H/B	O	TOTAL	P	B
1	Bagamoyo	Up	41	621	450	660	166	154	64	17	2173	265	160
		Down	35	580	489	666	197	177	48	15	2207	417	156
		Both	76	1201	939	1326	363	331	112	32	4380	682	316
2	Morogoro	Up	48	620	492	341	135	394	156	30	2216	674	107
		Down	43	598	504	331	110	444	146	25	2201	824	103
		Both	91	1218	996	672	245	838	302	55	4417	1498	210
3	Pugu	Up	69	418	386	355	35	471	145	17	1896	713	547
		Down	55	392	356	356	43	397	130	11	1740	665	537
		Both	124	810	742	711	78	868	275	28	3636	1378	1084
4	Kilwa	Up	123	432	326	294	81	467	191	153	2067	2613	1160
		Down	82	382	296	283	29	465	141	142	1820	2871	949
		Both	205	814	622	577	110	932	332	295	3887	5484	2109
5	FERRY	Up	40	115	75	50	1	13	0	40	334	10865	1095
		Down	23	93	75	47	2	14	0	33	287	7404	887
		Both	63	208	150	97	3	27	0	73	621	18269	1982
6	Mwongozo	Up	7	6	9	15	1	3	0	4	45	198	674
		Down	7	9	7	14	6	7	0	11	61	332	647
		Both	14	15	16	29	7	10	0	15	106	530	1321
7	Mjimwema	Up	0	24	26	33	1	11	0	7	102	90	40
		Down	0	24	21	31	1	6	1	3	87	72	31
		Both	0	48	47	64	2	17	1	10	189	162	71
8	Mpkani	Up	92	1306	778	419	275	148	34	28	3080	260	100
		Down	76	1083	794	419	263	119	30	21	2805	305	110
		Both	168	2389	1572	838	538	267	64	49	5885	565	210
9	Port Access	Up	351	3173	1872	1130	335	821	113	93	7888	2759	930
		Down	266	2740	1765	1235	175	555	94	140	6970	2442	937
		Both	617	5913	3637	2365	510	1376	207	233	14858	5201	1917
10	Port Access	Up	130	1403	642	570	358	131	60	48	3342	635	331
		Down	163	1541	838	616	283	185	61	65	3752	912	407
		Both	293	2944	1480	1186	641	316	121	113	7094	1547	738
11	Port Access	Up	148	804	468	443	359	168	44	49	2483	1065	365
		Down	171	768	461	34	343	164	52	38	2031	1047	349
		Both	319	1572	929	477	702	332	96	87	4514	2112	714
12	Old Bagamoyo	Up	57	1564	636	197	14	159	36	10	2673	270	405
		Down	66	1448	600	217	12	179	31	7	2560	304	399
		Both	123	3012	1236	414	26	338	67	17	5233	574	804
13	Haile Selasie	Up	74	2065	675	170	11	103	5	21	3124	477	70
		Down	83	2030	673	164	6	68	5	6	3035	530	107
		Both	157	4095	1348	334	17	171	10	27	6159	1007	177
14	Bagamoyo	Up	200	3540	1385	374	68	801	97	27	6492	124	236
		Down	150	3699	1552	383	74	805	94	23	6780	607	250
		Both	350	7239	2937	757	142	1606	191	50	13272	731	486
15	Bagamoyo	Up	262	4865	2282	321	68	430	46	59	8333	669	386
		Down	221	4068	1918	265	59	375	28	41	6975	719	387
		Both	483	8933	4200	586	127	805	74	100	15308	1388	773
16	United Nations	Up	121	3018	958	107	11	53	13	5	4286	1571	191
		Down	95	2814	921	112	5	72	19	4	4042	1427	219
		Both	216	5832	1879	219	16	125	32	9	8328	2998	410
17	Upanga	Up	324	5546	1518	221	15	680	80	11	8395	949	463
		Down	273	5364	1482	269	16	781	73	13	8271	1047	301
		Both	597	10910	3000	490	31	1461	153	24	16666	1996	764
18	Ocean	Up	161	4525	1043	121	1	170	18	7	6046	727	217
		Down	142	4857	1091	135	4	187	24	8	6448	818	232
		Both	303	9382	2134	256	5	357	42	15	12494	1545	449
19	Shekilango	Up	145	1524	753	261	34	490	81	8	3296	1236	442
		Down	136	1335	706	261	24	344	50	34	2890	1296	477
		Both	281	2859	1459	522	58	834	131	42	6186	2532	919
20	Mwinjuma	Up	76	392	98	35	7	459	60	17	1144	2796	489
		Down	101	467	174	54	10	596	64	25	1491	2696	551
		Both	177	859	272	89	17	1055	124	42	2635	5494	1040

Note :

- M/C : Motorcycle
- C/T : Car & Taxi
- L/V : Light Goods Vehicle
- M/V : Medium Goods Vehicle
- H/V : Heavy Goods Vehicle
- M/B : Mini Bus
- H/B : Heavy Bus
- O : Others
- P : Pedestrian
- B : Bicycle

Appendix 3.5 (2/3) 12 hour Traffic Volume by Survey Station

Station	Road Name	Direction	M/T	C/T	L/V	M/V	H/V	M/B	H/B	O	TOTAL	P	O
21	Kinondoni	Up	194	2515	805	106	22	425	48	18	4135	1687	417
		Down	192	2585	798	246	18	479	48	16	4382	1297	389
		Both	386	5100	1603	354	40	904	96	34	8517	2984	806
22	Morocco	Up	189	2548	1022	390	41	1160	116	36	5502	2299	432
		Down	172	2232	930	349	37	1106	71	25	4922	3204	525
		Both	361	4780	1952	739	78	2266	187	61	10424	5503	957
23	Morocco	Up	285	3140	1244	440	19	1277	116	25	6546	1307	654
		Down	279	2813	1205	419	22	1452	137	19	6346	1780	586
		Both	564	5953	2449	859	41	2729	253	44	12892	3087	1240
24	New Kigogo	Up	262	1969	945	324	41	424	67	30	4062	2378	402
		Down	246	1817	851	275	37	393	52	27	3698	2400	368
		Both	508	3786	1796	599	78	817	119	57	7760	4778	770
25	New Kigogo	Up	314	2284	1090	462	60	733	69	21	5033	2467	338
		Down	276	1886	1206	389	57	717	62	29	4622	1926	287
		Both	590	4170	2296	851	117	1450	131	50	9655	4393	625
26	Chang'mbe	Up	228	1593	700	389	57	886	125	54	4032	3287	706
		Down	284	1533	731	381	56	819	107	53	3964	3057	660
		Both	512	3126	1431	770	113	1705	232	107	7996	6344	1366
27	Chang'mbe	Up	100	815	336	196	40	52	28	5	1573	478	229
		Down	95	682	341	167	33	43	27	7	1395	414	195
		Both	195	1498	677	363	73	95	55	12	2968	892	424
28	Morogoro	Up	225	1302	799	270	68	1263	577	140	4644	6296	639
		Down	268	1690	875	279	143	1344	679	191	5469	5490	789
		Both	493	2992	1674	549	211	2607	1256	331	10113	11786	1428
29	Morogoro	Up	522	4397	1629	487	31	2607	754	42	10669	13491	1369
		Down	451	4189	1745	343	20	2916	668	46	10378	5892	1032
		Both	973	8586	3374	830	51	5723	1422	88	21047	19383	2401
30	Uhuru	Up	380	2503	1104	373	155	1191	369	108	6182	5288	518
		Down	419	2950	1312	339	135	1478	385	94	7112	3995	493
		Both	799	5453	2416	712	290	2669	753	202	13294	9283	1011
31	Pugu	Up	400	3164	1738	899	306	1078	251	523	8359	1991	1382
		Down	387	3280	1794	1030	411	1096	331	524	8853	2145	1314
		Both	787	6444	3532	1929	717	2174	582	1047	17212	4136	2696
32	Pugu	Up	902	7989	3666	1392	106	1729	215	146	16145	6196	2793
		Down	846	6900	3430	1218	78	1548	144	104	14268	4139	1852
		Both	1748	14889	7096	2610	184	3277	359	250	30413	10337	4645
33	Kilwa	Up	162	750	421	272	166	464	188	55	2478	2932	805
		Down	143	799	504	256	193	575	224	48	2742	3025	816
		Both	305	1549	925	528	359	1039	412	103	5220	5957	1621
34	Kilwa	Up	227	2246	799	221	60	649	247	13	4462	850	543
		Down	208	2016	914	336	59	659	250	12	4454	764	449
		Both	435	4262	1713	557	119	1308	497	25	8916	1614	992
35	Bundari	Up	468	3480	1300	321	354	780	359	40	7102	1614	551
		Down	450	3981	1413	302	415	841	363	21	7786	1211	539
		Both	918	7461	2713	623	769	1621	722	61	14888	2825	1090
36	Ocean	Up	37	620	190	56	1	24	10	3	941	265	149
		Down	32	607	180	41	1	32	7	3	903	223	153
		Both	69	1227	370	97	2	56	17	6	1844	488	302
37	Upanga	Up	347	7040	1849	292	20	819	75	18	10460	2359	505
		Down	327	6571	1845	305	17	899	70	18	10052	1957	394
		Both	674	13611	3694	597	37	1718	145	36	20512	4316	899
38	Morogoro	Up	490	5819	2056	355	18	653	513	36	9940	8248	578
		Down	590	5497	1943	321	24	655	462	43	9535	5531	589
		Both	1080	11316	3999	676	42	1308	975	79	19475	13779	1167
39	Pugu	Up	673	7393	2879	761	47	358	90	26	12227	2193	618
		Down	608	6212	2560	634	50	287	101	44	10496	2103	549
		Both	1281	13605	5439	1395	97	645	191	70	22723	4296	1167
40	Gerezani	Up	388	2758	1078	498	64	548	285	15	5632	3538	486
		Down	351	2422	1067	484	77	525	233	21	5180	3364	510
		Both	739	5180	2145	982	141	1071	518	36	10812	6902	976

Note :

- **M/C** : Motorcycle
- **C/T** : Car & Taxi
- **L/V** : Light Goods Vehicle
- **M/V** : Medium Goods Vehicle
- **H/V** : Heavy Goods Vehicle
- **M/B** : Mini Bus
- **H/B** : Heavy Bus
- **O** : Others
- **P** : Pedestrian
- **B** : Bicycle

Appendix 3.5 (3/3) 12 hour Traffic Volume by Survey Station

Station	Road Name	Direction	M/T	C/T	L/V	M/V	H/V	M/B	H/B	O	TOTAL	P	O
41	Gerazani	Up	466	3608	1302	272	15	274	157	9	6103	1547	585
		Down	433	4482	1292	428	41	317	164	8	7165	1208	479
		Both	899	8090	2594	700	56	591	321	17	13268	2755	1064
42	Kivukoni Front	Up	167	2266	560	126	1	211	139	46	3516	13982	948
		Down	170	2005	407	122	0	204	133	39	3080	11560	777
		Both	337	4271	967	248	1	415	272	85	6596	25542	1725
43	Sokoine Drive	Up	164	2640	696	64	0	117	17	13	3911	4330	123
		Down	122	1948	401	53	0	67	12	6	2609	3743	115
		Both	286	4788	1097	117	0	184	29	19	6520	8073	238
44	Samora	Up	66	1273	296	18	0	50	1	0	1704	402	26
		Down	58	1537	362	36	1	39	11	1	2045	395	31
		Both	124	2810	658	54	1	89	12	1	3749	797	57
45	Ohio	Up	248	3808	1004	113	15	77	43	6	5314	1422	211
		Down	184	3617	885	92	24	153	46	11	5012	947	128
		Both	432	7425	1889	205	39	230	89	17	10326	2369	339
46	U.W.T.	Up	440	6774	2155	267	25	846	505	60	10872	3018	283
		Down	446	6858	1910	332	19	613	36	41	10055	2424	225
		Both	886	13432	4065	599	44	1259	541	101	20927	5442	508
47	U.W.T.	Up	266	5098	1734	333	103	199	103	38	7876	5506	194
		Down	352	4991	1823	344	122	304	393	35	8364	5331	279
		Both	620	10089	3557	677	225	503	496	73	16240	10837	473
48	Maktaba	Up	149	1865	579	72	9	968	444	29	4115	7689	170
		Down	257	3068	811	93	26	1001	82	22	5360	10396	295
		Both	406	4933	1390	165	35	1969	526	51	9475	18085	465
49	Morogoro	Up	386	3765	1163	163	0	58	6	93	5634	6636	436
		Down	348	3388	1056	159	1	134	44	80	5210	6544	404
		Both	734	7153	2219	322	1	192	50	173	10844	13179	840
50	Uhuru	Up	229	2586	844	145	7	592	415	79	4897	11043	371
		Down	202	1805	614	119	10	642	933	102	4427	11307	509
		Both	431	4391	1458	264	17	1234	1348	181	9324	22350	880
51	Samora	Up	446	3565	1364	271	4	198	26	42	5916	3452	559
		Down	321	2559	969	103	11	129	26	41	4159	3054	427
		Both	767	6124	2333	374	15	327	52	83	10075	6506	986
52	Sokoine	Up	370	4108	1142	231	16	1221	617	17	7722	6940	719
		Down	434	4185	1458	260	16	1177	968	15	8513	5110	736
		Both	804	8293	2600	491	32	2398	1585	32	16235	12050	1455
53	Samora	Up	395	4242	1214	112	3	138	18	39	6161	8394	281
		Down	353	3985	1135	91	12	265	32	12	5885	12069	236
		Both	748	8227	2349	203	15	403	50	51	12046	20463	517
54	Msimbazi	Up	269	2086	839	175	14	2290	257	63	5993	8239	614
		Down	287	1954	820	188	15	2390	240	68	5962	3658	429
		Both	556	4040	1659	363	29	4680	497	131	11955	11897	1043
55	Uhuru	Up	299	2604	969	200	3	695	404	76	5270	11793	433
		Down	282	2611	932	191	6	645	389	58	5114	7092	439
		Both	581	5215	1921	391	9	1340	793	134	10384	18885	872

Note :

- **M/C** : Motorcycle
- **C/T** : Car & Taxi
- **L/V** : Light Goods Vehicle
- **M/V** : Medium Goods Vehicle
- **H/V** : Heavy Goods Vehicle
- **M/B** : Mini Bus
- **H/B** : Heavy Bus

Appendix 3.6 (1/2) Traffic Capacity Calulation Method

Traffic Capacity Calculation Formula

The method of calculations are shown the following formula applied the Road Capacity Manual of Japan.

Possible Capacity

1) a single carriageway

$$C = 2{,}500\ r_L \cdot r_C \cdot r_N \cdot r_I \quad (p.c.u/h)$$

2) a dual carriageway

$$C = 2{,}200\ r_L \cdot r_C \cdot r_N \cdot r_I \times N \quad (p.c.u/h)$$

C : possible capacity

r_L : adjustment factor of lane width

r_C : " of lateral clearance

r_N : " of including motor cycle and bicycle

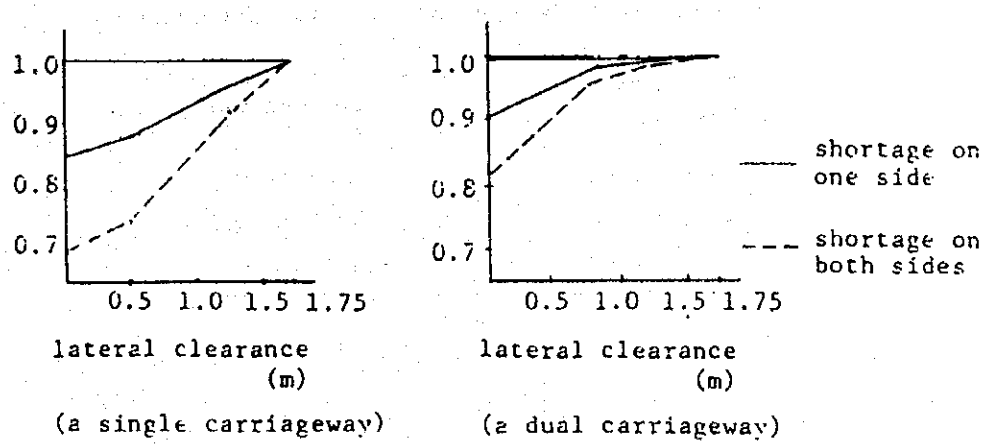
r_I : " of roadside conditions

N : No. of lanes.

- Adjustment for lane width (r_L)

lane width (m)	(r_L) Adjustment Factor
3.50	1.00
3.25	0.94
3.00	0.85
2.75	0.77

- Adjustment for lateral clearance (r_C)



(a single carriageway) (a dual carriageway)

- Adjustment for mixing of motorcycle and bicycle (r_N)

$$r_N = \frac{100}{100 + \alpha P_m + \beta \cdot P_B}$$

r_N : adjustment factor for including motor cycle and bicycle

α : conversion factors for passenger car in motor cycle

P_m : percentage of motor cycle (%)

β : conversion factors for passenger car in bicycle

P_B : percentage of bicycle (%)

- Adjustment for roadside condition (r_I)

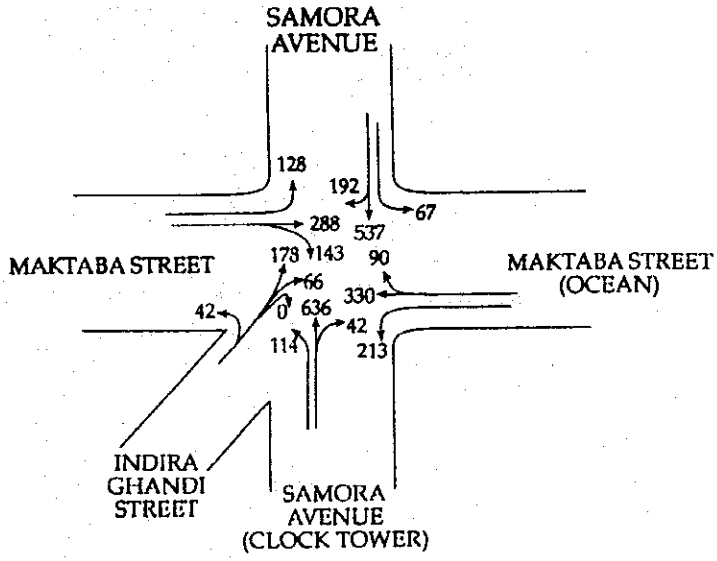
(1) Adjustment Factor for roadside conditions

Roadside conditions \ No. of lanes	2 lanes	Multi-lane
· free way	1.00	1.00
· mountainous area	0.90	0.95
· level terrain	0.85	0.90
· urban area	0.70	0.75

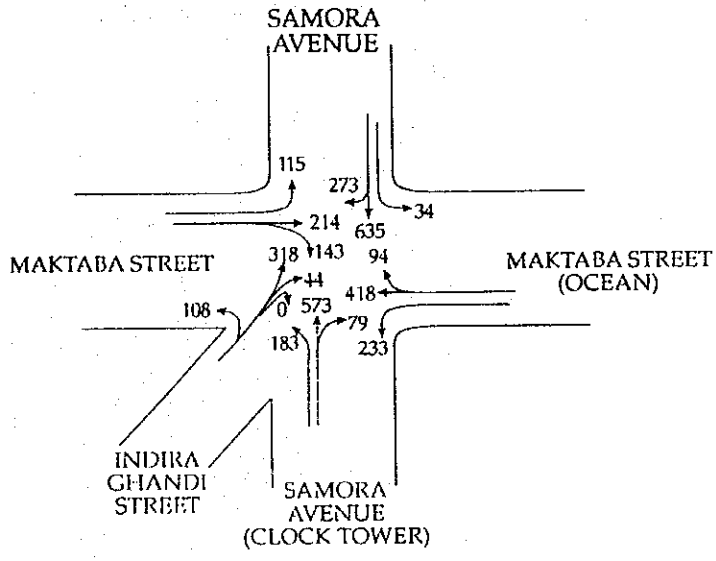
(2) Adjustment Factor for roadside conditions

Degree of urbanaization	adjustment
Rural area	1.0 ∿ 0.9
Suburb	0.9 ∿ 0.8
Urban area	0.8 ∿ 0.7

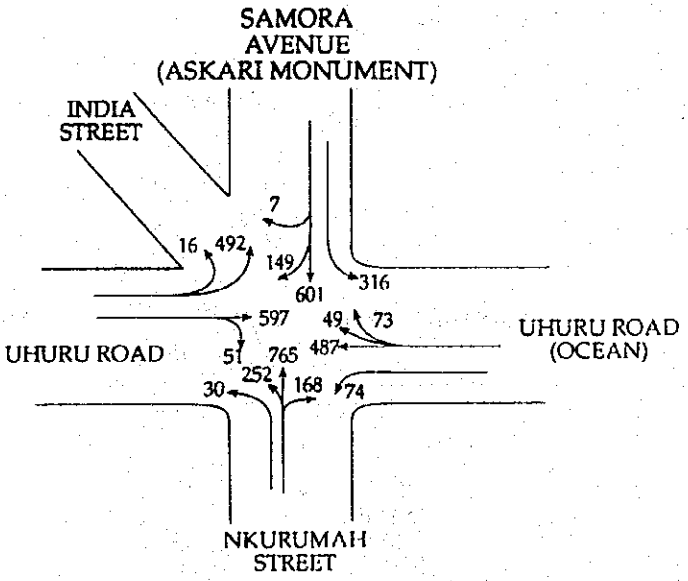
Appendix 3.7 Traffic Movement at Major Intersections in the City Center



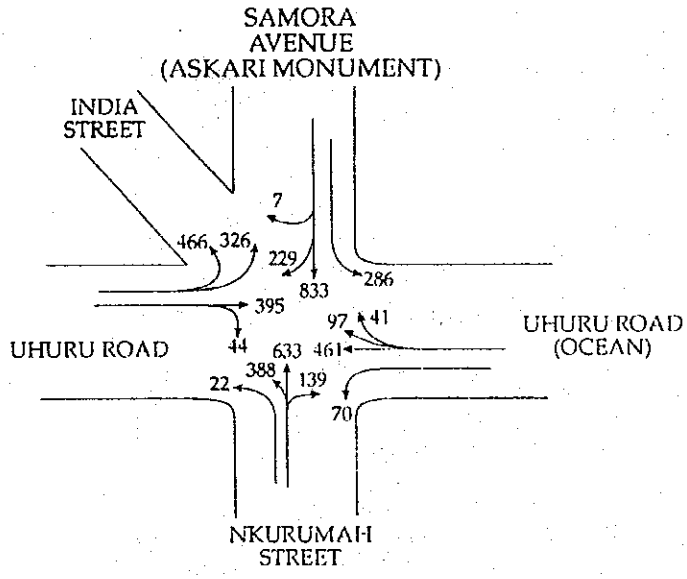
SAMORA – MAKTABA (ASKARI MONUMENT) INTERSECTION
(7 : 00 A.M. – 9 : 00 A.M.)



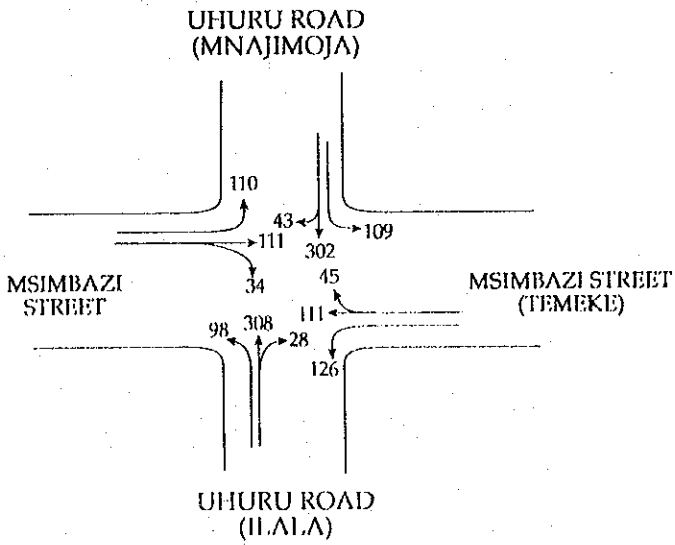
SAMORA – MAKTABA (ASKARI MONUMENT) INTERSECTION
(4 : 00 P.M. – 6 : 00 P.M.)



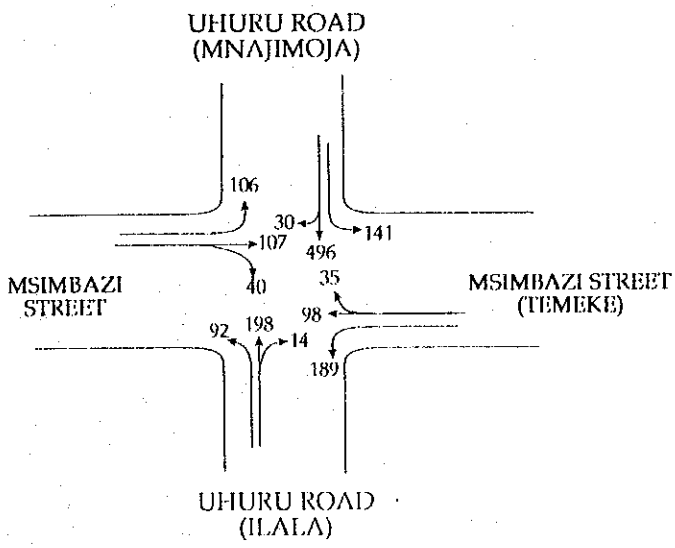
SAMORA – UHURU (CLOCK TOWER) INTERSECTION
(7 : 00 A.M. – 9 : 00 A.M.)



SAMORA – UHURU (CLOCK TOWER) INTERSECTION
(4 : 00 P.M. – 6 : 00 P.M.)



MSIMBAZI – UHURU INTERSECTION
(7 : 00 A.M. – 9 : 00 A.M.)



MSIMBAZI – UHURU INTERSECTION
(4 : 00 P.M. – 6 : 00 P.M.)

Appendix 3.8 Degree of Saturation at Major Intersections in the City Center

Samora and Maktaba Intersection
Morning Peak Hour

Direction		1	2+3	4	5+6	7	8+9	10	11+12	13+14+15
Lane		Right	Through Left	Right	Through Left	Right	Through Left	Right	Through Left	Through Right Left
Number of Lanes		1	1	1	1	1	1	1	1	1
Ideal Saturation Flow Rate (pcu/h(effective green time))		1800	2000	1800	2000	1800	2000	1800	2000	2000
Adjustment Factor	Lane Width (m)	0.95 2.5	1	0.95 2.5	1	0.95 2.5	1	0.95 2.5	1	1
	Approach Grade (%)	1	1	1	1	1	1	1	1	1
	Heavy Vehicles (%)	0.96 6.6	0.98 3.6	0.83 30	0.83 29.6	0.9 16.7	0.94 9.6	0.97 4	0.75 46.3	0.88 19.1
	Right Turns (%)	1	1	1	1	1	1	1	1	0.96 12.2
	Left Turns (%)	1	0.96 13.9	1	0.85 50.9	1	0.96 12.8	1	0.91 28.4	0.9 36.5
Saturation Flow Rate (pcu/h(effective green time))		1641.6	1881.6	1419.3	1411	1539	1804.8	1658.7	1365	1520.64
Traffic Volume(pcu/h))		84	293	53	177	18	388	130	377.5	157
Normalized Volume		0.0511696	0.1557185	0.0373424	0.1254429	0.0116959	0.2149823	0.0783746	0.2765568	0.103246
Degree of Saturation by Phase	Phase1	0.051	0.156			0.012	0.215			
	Phase2				0.125				0.277	
	Phase3			0.037				0.078		
	Phase4									0.103
	Phase5									
Degree of Saturarion		0.724								

DEGREE OF SATURATION AT INTERSECTION

Samora and Uhuru Intersection
Morning Peak Hour

Direction		1+2	3+4	5+6	7+8	9	10+11+12	13	14+15+16
Lane		Right	Through Left	Right	Through Left	Right	Through Left	Right	Through Left
Number of Lanes		1	1	1	1	1	1	1	1
Ideal Saturation Flow Rate (pcu/h(effective green time))		1800	2000	1800	2000	1800	2000	1800	2000
Adjustment Factor	Lane Width (m)	0.95 2.5	1	0.95 2.5	1	0.95 2.5	1	0.95 2.5	1
	Approach Grade (%)	1	1	1	1	1	1	1	1
	Heavy Vehicles (%)	0.88 20	0.97 6	0.91 15.7	0.74 55.1	0.93 12.3	0.97 5	0.96 6.7	0.83 28.5
	Right Turns (%)	1	1	1	1	1	1	1	1
	Left Turns (%)	1	0.91 28.2	1	0.96 15	1	0.85 78.2	1	0.85 52.6
Saturation Flow Rate (pcu/h(effective green time))		1504.8	1765.4	1556.1	1420.8	1590.3	1649	1641.6	1411
Traffic Volume(pcu/h))		101	407	64.5	535	88	562.5	15.5	871
Normalized Volume		0.0671186	0.2305427	0.0414498	0.3765484	0.0553355	0.3411158	0.009442	0.6172927
Degree of Saturation by Phase	Phase1		0.231				0.341		
	Phase2	0.067				0.055			
	Phase3				0.377				0.617
	Phase4			0.041				0.009	
Degree of Saturation		1.066							

DEGREE OF SATURATION AT INTERSECTION

Msimbazi and Uhuru Intersection
Morning Peak Hour

Direction		1	2+3	4	5+6	7	8+9	10	11+12
Lane		Right	Through Left	Right	Through Left	Right	Through Left	Right	Through Left
Number of Lanes		1	1	1	1	1	1	1	1
Ideal Saturation Flow Rate (pcu/h(effective green time))		1800	2000	1800	2000	1800	2000	1800	2000
Adjustment Factor	Lane Width (m)	0.95 2.5	1	0.95 2.5	1	0.95 2.5	1	0.95 2.5	1
	Approach Grade (%)	1	1	1	1	1	1	1	1
	Heavy Vehicles (%)	0.74 60	0.74 58	0.74 64.3	0.78 39.1	0.74 57.9	0.74 52.8	0.74 64.3	0.79 38.5
	Right Turns (%)	1	1	1	1	1	1	1	1
	Left Turns (%)	1	0.92 28.7	1	0.85 50.9	1	0.93 23.9	1	0.87 44
Saturation Flow Rate (pcu/h(effective green time))		1265.4	1361.6	1265.4	1326	1265.4	1376.4	1265.4	1374.6
Traffic Volume(pcu/h))		33	413.5	61.5	178.5	39	424	31	153
Normalized Volume		0.0260787	0.3036868	0.0486012	0.1346154	0.0308203	0.30805	0.0244982	0.1113051
Degree of Saturation by Phase	Phase1	0.026	0.304			0.031	0.308		
	Phase2				0.135				0.111
	Phase3			0.049				0.025	
	Phase4								
Degree of Saturation		0.523							

Chapter 4 Present Transportation System in Dar es Salaam

Appendix 4.1	Trunk Roads and Regional Roads Identified by MWCT
Appendix 4.2	Revised Classification of Trunk Roads and Regional Roads Identified by the Study Team
Appendix 4.3	Result of Road Inventory Survey
Appendix 4 4	Road Density Calculation
Appendix 4.5	Pavement Conditions of Road Network in DSM Region
Appendix 4.6	Bridge Conditions on Major Roads in DSM Region

Appendix 4.1 Trunk Roads and Regional Roads indentified by MWCT

(1) Trunk road

Link No.	Name of Trunk Road	Length (km)	Lane No.	
DTR-1	Pugu Road	12.8	4	/*
DTR-2	Mandara Road (Port Access)	16.0	4	/*
DTR-3	Morogoro Road	2.7	4	
		30.4	2	
DTR-4	Kilwa Road	15.2	2	
DTR-5	New Bagamoyo Road	5.4	4	
		30.7	2	
DTR-6	Sum Mujoma(Mpakani) Rd	3.9	2	
DTR-7	Morocco Road	4.0	2	
DTR-8	Sokoine Drive	1.7	2	
DTR-9	Uhuru Road	1.2	4	
		4.0	2	
DTR-10	Samora Avenue	1.7	2	
DTR-11	Ocean Road	3.4	2	
DTR-12	Kinondoni Road	1.8	2	
DTR-13	United Nations	2.0	2	
DTR-14	Jamhuri Street	1.1	2	
DTR-15	Azikiwe/Maktaba Str.	1.8	2	
DTR-16	Gerezani Road	1.4	2	
DTR-17	Ohio Street	0.7	2	
DTR-18	Kenyata/Toure Drive	7.6	2	
DTR-19	Zanaki Street	1.0	2	
DTR-20	Morogoro NIT	1.4	2	
DTR-21	Chang'ombe Road	4.6	2	/*
DTR-22	Mzimbazi Road	1.7	4	/*
DTR-23	Libya Street	0.5	2	
DTR-24	Bandari Road	2.0	2	
DTR-25	Old Kigogo/Mandera Road	1.0	2	
DTR-26	Kagera Street	2.4	2	
DTR-27	Haile Sellasie	5.4	2	
DTR-28	Temeke/Mbagala	3.3	2	
DTR-29	Old Kigogo	6.5	2	
DTR-30	Nkurumah Street	0.3	2	
DTR-31	New Kigogo	2.8	2	
DTR-32	Kivokuni Front	1.2	2	
DTR-33	Old Bagamoyo	8.4	2	
DTR-34	Uhulu/Railway	0.5	2	
DTR-35	Chole Road	3.0	2	
DTR-36	Mikocheni Access	1.3	2	
DTR-37	Beach Access at Kunduchi	3.5	2	
DTR-38	Mwinjima/Shekilango Road	5.0	2	
DTR-39	Mwinjima/N. Bagamoyo Rd.	3.6	2	/*
DTR-40	Shekilango Road	3.8	2	
	Total	212.7		

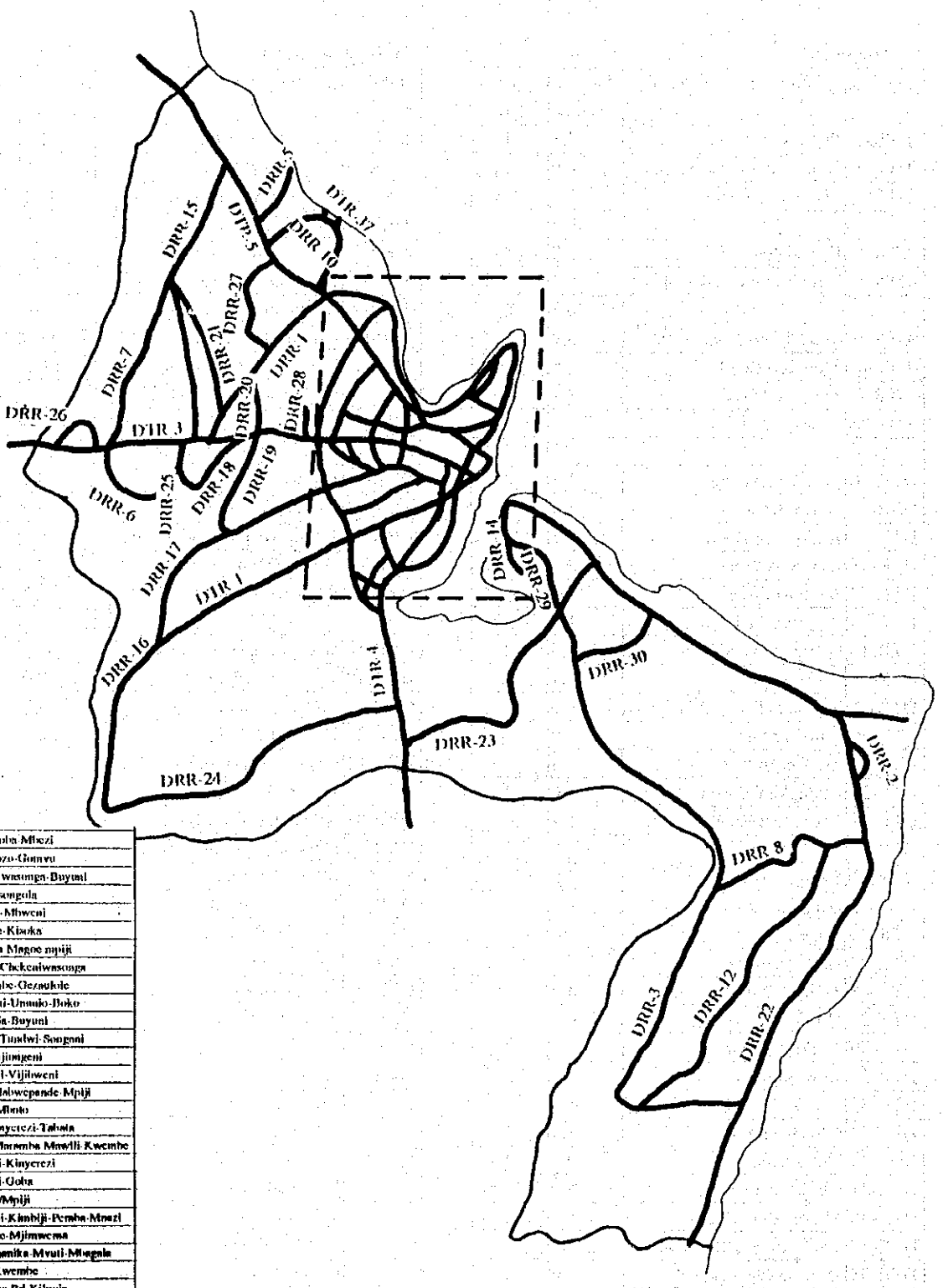
(2) Regional Road

Link No.	Name of Trunk Road	Length (km)	Lane No.
DRR-1	Kawe-Goba-Mbezi	16.0	1
DRR-2	Mwongozo-Gomvu	12.5	1
DRR-3	Chekeni wasonga-Buyuni	43.1	1
DRR-4	Pugu-Msongala	20.0	1
DRR-5	Bunju A-Mbewni	6.4	2
DRR-6	Kwembe-Kisoka	13.9	1
DRR-7	Kibamba-Magoe mpiji	9.0	1
DRR-8	Kimbiji-Chekeniewasonga	11.5	1
DRR-9	Kikwambe-Gezaulole	20.0	1
DRR-10	Kunduchi-Ununio-Boke	11.4	2
DRR-11	Msongola-Buyuni	16.0	1
DRR-12	Kibiji-Tundwi-Songani	18.0	1
DRR-13	Pugu-Kajiungeni	8.3	1
DRR-14	Kivukoni-Vijibweni	6.5	1
DRR-15	Bunju-Mabwepande-Mpiji	24.1	1
DRR-16	DIA-G/Mboto	7.2	2
DRR-17	Pugu-Kinyerezi-Tabata	3.5	2
		9.0	1
DRR-18	Mbezi-Maramba mili-Kwembe	8.0	1
DRR-19	Temboni-Kinyerezi	9.0	1
DRR-20	Temboni-Goba	5.7	1
DRR-21	Goba-M/Mpiji	8.3	1
DRR-22	Kivukoni-Kimbiji-Pemba-Mnazi	43.0	2
		13.4	1
DRR-23	Kongowe-Mjimwema	17.6	2
DRR-24	Pugu-Chanika-Mvuti-Mbagala	46.4	2
DRR-25	Mbezi-Kwembe	4.5	1
DRR-26	Morogoro Rd-Kiluvia	2.3	1
DRR-27	Wazo Hill- Goba	11.3	1
DRR-28	Kibo-Msewe	1.5	1
DRR-29	Tungi-Kibada	5.9	2
DRR-30	Kibada-Gezaulple	14.5	1
	Total	447.8	

Total

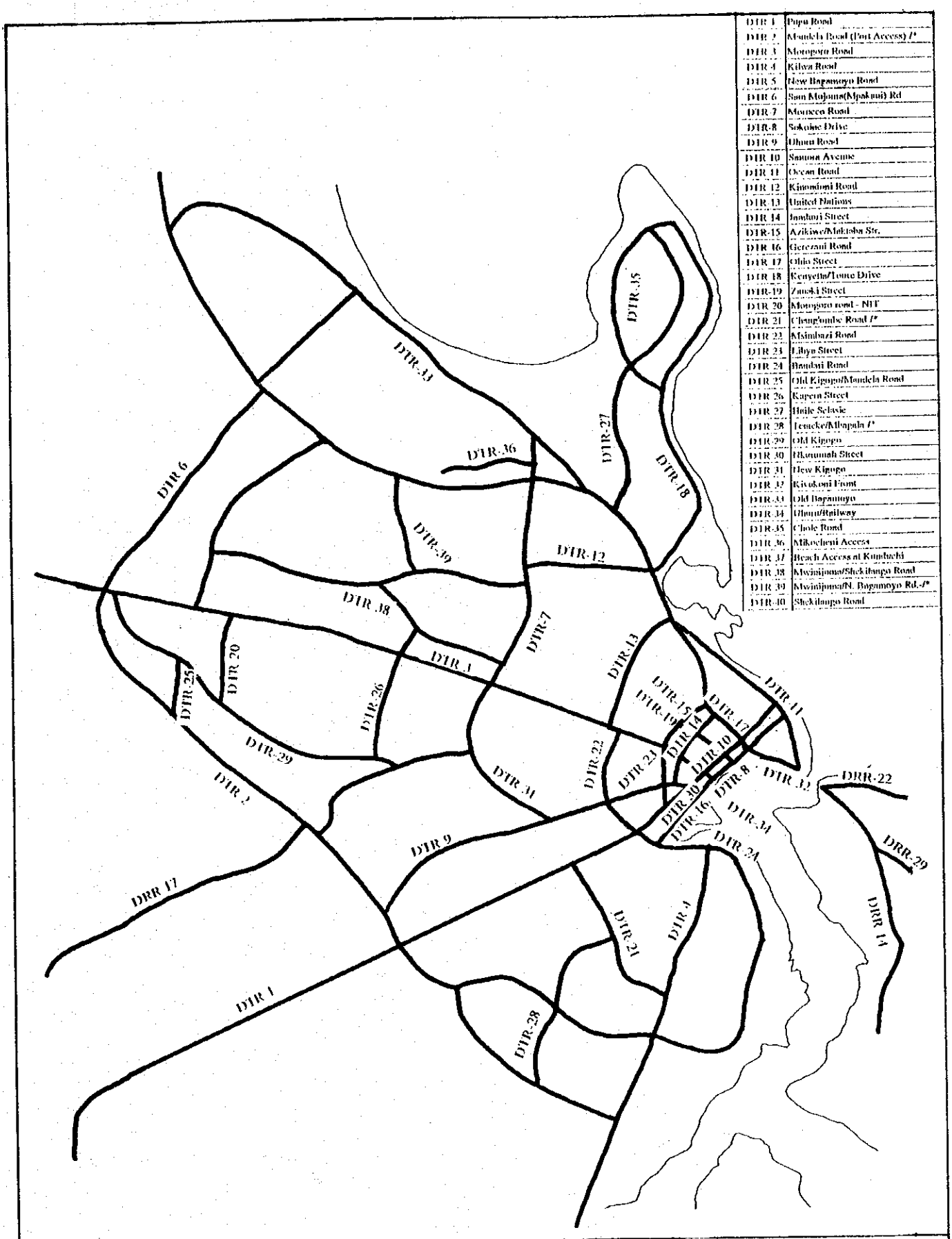
	Trunk Road Total	212.7	
	4 - lane roads		39.8
	2 - lanes roads		172.9
	Regional Road Total	447.8	
	2 - lanes roads		141.4
	1 - lane roads		306.4
	Grand Total	660.5	

Note /*: Road length was adjusted by the Study Team on the basis of Road Inventory Survey.

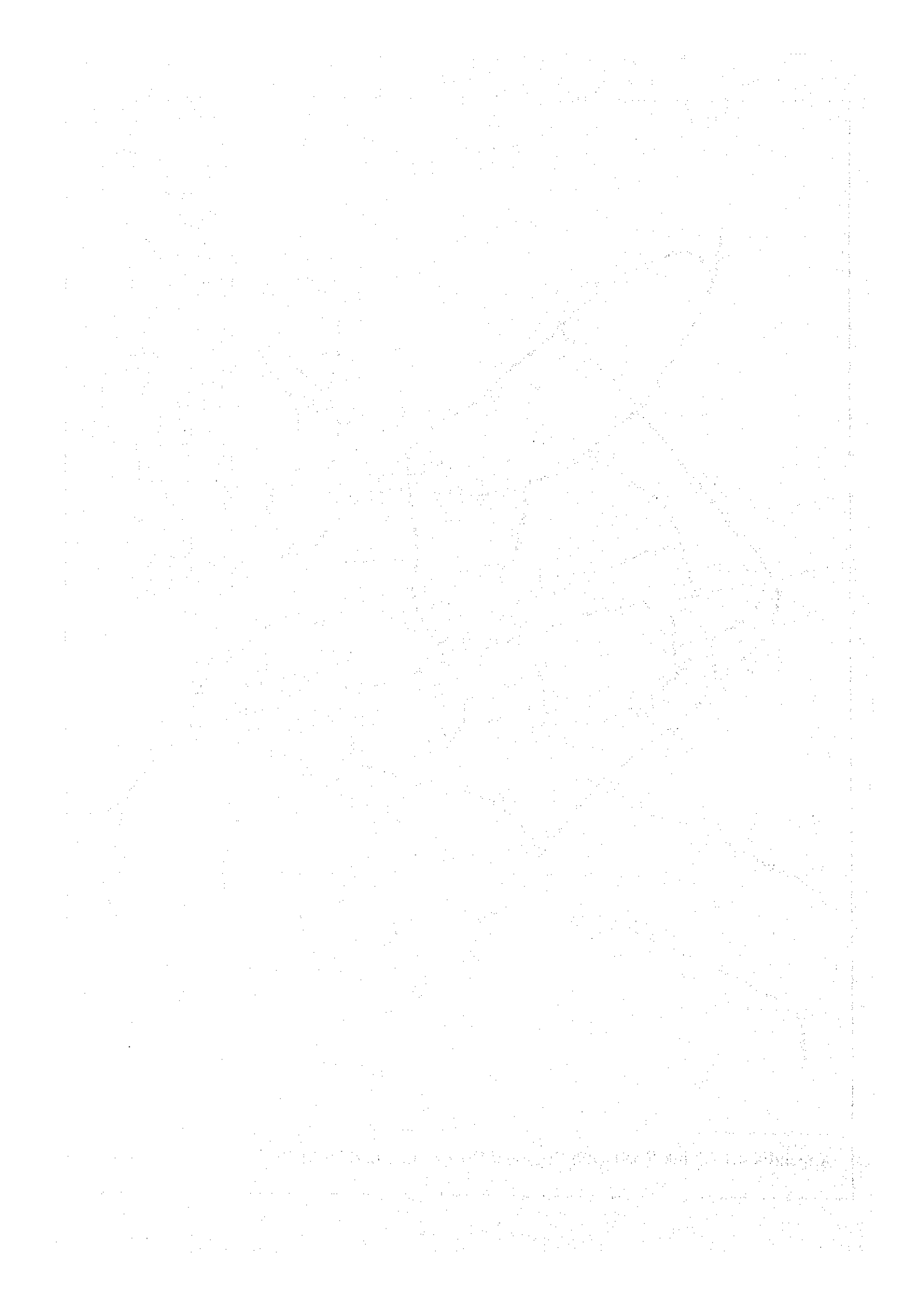


DRR-1	Kwe-Goba-Mbezi
DRR-2	Mwongozo-Gonvu
DRR-3	Chekeni wasunga-Buyuni
DRR-4	Pugu-Msongola
DRR-5	Banju A-Mbweni
DRR-6	Kwembe-Kisuka
DRR-7	Kibamba Magoe mpiji
DRR-8	Kimbiji-Chekeniwasunga
DRR-9	Mkwambe-Gezaulole
DRR-10	Kinduchi-Unnuio-Boko
DRR-11	Msongola-Buyuni
DRR-12	Kimbiji-Tundwi-Soogeni
DRR-13	Pugu-Kajiungeni
DRR-14	Kivukoni-Vijibweni
DRR-15	Banju-Mabwepande-Mpiji
DRR-16	DIA G/Mbuto
DRR-17	Pugu-Kinyerezi-Tabata
DRR-18	Mbezi-Msumbu Mawili-Kwembe
DRR-19	Temboni-Kinyerezi
DRR-20	Temboni-Goba
DRR-21	Goba-M/Mpiji
DRR-22	Kivukoni-Kimbiji-Pemba-Mnazi
DRR-23	Kongowe-Mjimwema
DRR-24	Pugu-Chamika-Mvuti-Mtoginla
DRR-25	Mbezi-Kwembe
DRR-26	Morogoro Rd-Kiluvia
DRR-27	Waza Hill-Goba
DRR-28	Kibo-Msewe
DRR-29	Tungi-Kibada
DRR-30	Kibada-Gezaulole

Appendix 4.1 Trunk Roads and Regional Roads Identified by MWCT



Appendix 4.1 Trunk Roads and Regional Roads Identified by MWCT



Appendix 4.2 Revised Classification of Trunk Roads and Regional Roads idenitified by the Study Team

(1) Trunk Roads Identified by MWCT (Jan. 4,1993)

Link No.	Name of Trunk Road	Length (km)	Lane No.	Classification made by DCC	Recommended Road Classification made by the Study Team				
					Trunk	Regional	District	Main Feeder	Minor Feeder
DTR-1	Pugu Road	12.8	4	Arterial Road	o				
DTR-2	Mandela Road (Port Access)-/*	16.0	4	Arterial Road	o				
DTR-3	Morogoro Road	2.7	4	Arterial Road	o				
		30.4	2	Arterial Road	o				
DTR-4	Kilwa Road	15.2	2	Arterial Road	o				
DTR-5	New Bagamoyo Road	5.4	4	Arterial Road	o				
		30.7	2	Arterial Road	o				
DTR-6	Sam Mujoma(Mpakani) Rd	3.9	2	Arterial Road	o				
DTR-7	Morocco Road	4.0	2	Arterial Road	o				
DTR-8	Sokoine Drive	1.7	2	Arterial Road	o				
DTR-9	Uhuru Road	1.2	4	Arterial Road	o				
		4.0	2	Arterial Road	o				
DTR-10	Samora Avenue	1.7	2	Arterial Road	o				
DTR-11	Ocean Road	3.4	2	Arterial Road	o				
DTR-12	Kinondoni Road	1.8	2	Arterial Road	o				
DTR-13	United Nations	2.0	2	Arterial Road	o				
DTR-14	Jamhuri Street	1.1	2	Collector Road		o			
DTR-15	Azikiwe/Maktaba Str.	1.8	2	Arterial Road	o				
DTR-16	Gerezani Road	1.4	2	Arterial Road	o				
DTR-17	Ohio Street	0.7	2	Arterial Road	o				
DTR-18	Kenyetta/Toure Drive	7.6	2	Collector Road		o			
DTR-19	Zanaki Street	1.0	2	Collector Road		o			
DTR-20	Morogoro road - NIT	1.4	2	Collector Road		o			
DTR-21	Chang'ombe Road-/*	4.6	2	Collector Road		o			
DTR-22	Msimbazi Road	1.7	4	Arterial Road	o				
DTR-23	Libya Street	0.5	2	Collector Road		o			
DTR-24	Bandari Road	2.0	2	Arterial Road	o				
DTR-25	Old Kigogo/Mandela Road	1.0	2	Cllector Road		o			
DTR-26	Kagera Street	2.4	2	Collector Road		o			
DTR-27	Haile Selasie	5.4	2	Collector Road		o			
DTR-28	Temeke/Mbagala-/*	3.3	2	Collector Road		o			
DTR-29	Old Kigogo	6.5	2	Collector Road		o			
DTR-30	Nkurumah Street	0.3	2	Area Road		o			
DTR-31	New Kigogo	2.8	2	Collector Road		o			
DTR-32	Kivukoni Front	1.2	2	Area Road		o			
DTR-33	Old Bagamoyo	8.4	2	Collector Road		o			
DTR-34	Uhuru/Railway	0.5	2	Area Road		o			
DTR-35	Chole Road	3.0	2	Collector Road		o			
DTR-36	Mikocheni Access	1.3	2	Collector Road		o			
DTR-37	Beach Access at Kunduchi	3.5	2	Collector Road		o			
DTR-38	Mwinijuma/Shekilango Road	5.0	2	Collector Road		o			
DTR-39	Mwinijuma/N. Bagamoyo Rd.-/*	3.6	2	Collector Road		o			
DTR-40	Shekilango Road	3.8	2	Collector Road		o			
	Total (1)	212.7			144.5	68.2	0.0	0.0	0.0

Note /*: Length of road is adjusted based on the Road Inventory Survey conducted by the Study Team.

(2) Regional Roads Identified by MWCT (Jan. 4,1993)

Link No.	Name of Trunk Road	Length (km)	Lane No.	Classification made by DCC	Recommended Road Classification made by the Study Team				
					Trunk	Regional	District	Main Feeder	Mior Feeder
DRR-1	Kawe-Goba-Mbezi	16.0	1	Local Road		o			
DRR-2	Mwongozo-Gomvu	12.5	1	Local Road			o		
DRR-3	Chekeni wasonga-Buyuni	43.1	1	Local Road		o			
DRR-4	Pugu-Msongola	20.0	1	Local Road			o		
DRR-5	Bunju A-Mbweni	6.4	2	Local Road			o		
DRR-6	Kwembe-Kisoka	13.9	1	Local Road			o		
DRR-7	Kibamba-Magoe mpiji	9.0	1	Local Road			o		
DRR-8	Kimbiji-Chekeniwasonga	11.5	1	Local Road			o		
DRR-9	Mikwambe-Gezaulole	20.0	1	Local Road			o		
DRR-10	Kunduchi-Ununio-Boko	11.4	2	Local Road		o			
DRR-11	Msongola-Buyuni	16.0	1	Local Road			o		
DRR-12	Kimbiji-Tundwi-Songani	18.0	1	Local Road			o		
DRR-13	Pugu-Kajiungeni	8.3	1	Local Road			o		
DRR-14	Kivukoni-Vijibweni	6.5	1	Local Road			o		
DRR-15	Bunju-Mabwepande-Mpiji	24.1	1	Local Road		o			
DRR-16	DIA-G/Mboto	7.2	2	Local Road		o			
DRR-17	Pugu-Kinyerezi-Tabata	3.5	2	Local Road		o			
		9.0	1	Local Road		o			
DRR-18	Mbezi-Maramba Mawili-Kwembe	8.0	1	Local Road			o		
DRR-19	Temboni-Kinyerezi	9.0	1	Local Road			o		
DRR-20	Temboni-Goba	5.7	1	Local Road			o		
DRR-21	Goba-M/Mpiji	8.3	1	Local Road			o		
DRR-22	Kivukoni-Kimbiji-Pemba-Mnazi	43.0	2	Local Road		o			
		13.4	1	Local Road		o			
DRR-23	Kongowe-Mjimwema	17.6	2	Local Road		o			
DRR-24	Pugu-Chanika-Mvuti-Mbagala	46.4	2	Local Road		o			
DRR-25	Mbezi-Kwembe	4.5	1	Local Road			o		
DRR-26	Morogoro Rd-Kiluvia	2.3	1	Local Road			o		
DRR-27	Wazo Hill- Goba	11.3	1	Local Road			o		
DRR-28	Kibo-Msewe	1.5	1	Local Road			o		
DRR-29	Tungi-Kibada	5.9	2	Local Road			o		
DRR-30	Kibada-Gezaulole	14.5	1	Local Road			o		
Other Important Roads Identified by the Study Team for Regional Roads									
	Bongoyo Street	0.8	2	Collector road		o			
	Kondoa Street	1.2	2	Collector road		o			
	University Road	3.8	2	Collector road		o			
	Mikuni Street	1.1	2	Collector road		o			
	Mbagala II	2.2	2	Collector road		o			
	Mahunda Street	2.0	2	Collector road		o			
	Total (2)	458.9				245.8	213.1		

(3) Other Roads

	Main Feeder Roads (inside the city)	87.2	2	Local Road				87.2	
	(outside the city)	163.8	1	Local Road				163.8	
	Minor Feeder Roads (outside the city)	227.4	1	Local Road					227.4
	Total (3)	478.4						251.0	227.4

	Total(1)+(2)+(3)	1,150.0			144.5	314.0	213.1	251.0	227.4
		100.0%			12.6%	27.3%	18.5%	21.8%	19.8%

Appendix 4.3 Results of Road Inventory Survey

(Jan. 4,1994)
(1/2)

Link No.	Name of Trunk Road	Length (km)	Lane No.			Surface Condition (km)					Remarks
			4-Lanes	2-Lanes	1-Lane	Asphalt			Gravel	Earth	
						Good	Fair	Bad			
(1) Trunk Roads											
DTR-1	Pugu Road	12.8	12.8			7.0	5.8				
DTR-2	Mandala Road (Port Access)	16.0	16.0				15.5	0.5			
DTR-3	Morogoro Road	2.7	2.7			2.7					
		30.4		30.4		0.9	23.5	6.0			
DTR-4	Kilwa Road	15.2		15.2			8.2	7.0			
DTR-5	New Bagamoyo Road	5.4	5.4			5.4					
		30.7		30.7			4.2	26.5			
DTR-6	Sam Mujoma(Mpakani) Rd	3.9		3.9		3.9					
DTR-7	Morocco Road	4.0		4.0		4.0					
DTR-8	Sokoine Drive	1.7		1.7		1.7					
DTR-9	Uhuru Road	1.2	1.2				1.2				
		4.0		4.0				4.0			
DTR-10	Samora Avenue	1.7		1.7		1.7					
DTR-11	Ocean Road	3.4		3.4		3.4					
DTR-12	Kinondoni Road	1.8		1.8		1.8					
DTR-13	United Nations	2.0		2.0			2.0				
DTR-15	Azikiwe/Maktaba Str.	1.8		1.8		1.8					
DTR-16	Gerezani Road	1.4		1.4		1.4					
DTR-17	Ohio Street	0.7		0.7		0.7					
DTR-22	Msimbazi Road	1.7	1.7					1.7			
DTR-24	Bandari Road	2.0		2.0		2.0					
	Total length (1)	144.5	39.8	104.7	0.0	38.4	60.4	45.7	0.0	0.0	
(2) Regional Roads											
DTR-14	Jamhuri Street	1.1		1.1		1.1					
DTR-18	Kenyatta/Toure Drive	7.6		7.6			7.6				
DTR-19	Zanaki Street	1.0		1.0		1.0					
DTR-20	Morogoro Road - NIT	1.4		1.4					1.4		
DTR-21	Chang'ombe Road	4.6		4.6			4.6				
DTR-23	Libya Street	0.5		0.5		0.5					
DTR-25	Old Kigogo/Mandela Road	1.0		1.0					1.0		
DTR-26	Kagera Street	2.4		2.4					2.4		
DTR-27	Haile Selasie	5.4		5.4			2.7		2.7		
DTR-28	Temeke/Mbagala	3.3		3.3		3.3					
DTR-29	Old Kigogo	6.5		6.5					6.5		
DTR-30	Nkurumah Street	0.3		0.3		0.3					
DTR-31	New Kigogo	2.8		2.8			2.8				
DTR-32	Kivukuni Front	1.2		1.2		1.2					
DTR-33	Old Bagamoyo	8.4		8.4		6.4			2.0		
DTR-34	Uhuru/Railway	0.5		0.5		0.5					
DTR-35	Chole Road	3.0		3.0					3.0		
DTR-36	Mikocheni Access	1.3		1.3					1.3		
DTR-37	Beach Access at Kunduchi	3.5		3.5			3.5				
DTR-38	Mwinyijuma/Sinza Road	5.0		5.0		1.5			3.5		Mkanya Rd. included
DTR-39	Mwinyijuma/N. Bagamoyo Rd.	3.6		3.6		2.2			1.4		
DTR-40	Shekilango Road	3.8		3.8		3.8					
DRR-1	Kawe-Goba-Mbezi	16.0			16.0					16.0	
DRR-3	Chekeni wasonga-Buyuni	43.1			43.1					43.1	
DRR-10	Kunduchi-Ununio-Boko	11.4		7.5	3.9		4.5		3.0	3.9	
DRR-15	Bunju-Mabwepande-Mpiji	24.1			24.1					24.1	
DRR-16	DIA-G/Mboto	7.2		7.2			7.2				
DRR-17	Pugu-Kinyerezi-Tabata	3.5		3.5					3.5		
		9.0			9.0					9.0	
DRR-22	Kivukoni-Kimbiji-Pemba-Mnazi	43.0		43.0					43.0		
		13.4			13.4					13.4	
DRR-23	Kongowe-Mjimwema	17.6		17.6					17.6		

(Continued)

(2/2)

Link No.	Name of Trunk Road	Length (km)	Lane No.			Surface Condition (km)					Remarks
			4-Lanes	2-Lanes	1-Lane	Asphalt			Gravel	Earth	
						Good	Fair	Bad			
DRR-24	Pugu-Chanika-Mvuti-Mbagala	46.4		46.4					46.4		
Regional roads identified by the Study Team as regional road											
	Bongoyo street	0.8		0.8					0.8		
	Kondoa Street	1.2		1.2					1.2		
	University Road	3.8		3.8		3.8					
	Mikumi Street	1.1		1.1					1.1		
	Mbagala II	2.2		2.2			2.2				
	Mahunda Street	2.0		2.0					2.0		
	Total length (2)	314.0	0.0	204.5	109.5	25.6	35.1	0.0	143.8	109.5	
(3) District Roads											
DRR-2	Mwongozo-Gomvu	12.5			12.5					12.5	
DRR-4	Pugu-Msongola	20.0			20.0					20.0	
DRR-5	Bunju A-Mbweni	6.4			6.4				5.4	1.0	
DRR-6	Kwembe-Kisoka	13.9			13.9					13.9	
DRR-7	Kibamba-Magoe mpiji	9.0			9.0					9.0	
DRR-8	Kimbiji-Chekeniwasonga	11.5			11.5					11.5	
DRR-9	Mikwambe-Gezaulole	20.0			20.0					20.0	
DRR-11	Msongola-Buyuni	16.0			16.0					16.0	
DRR-12	Kimbiji-Tundwi-Songani	18.0			18.0					18.0	
DRR-13	Pugu-Kajiungeni	8.3			8.3					8.3	
DRR-14	Kivukoni-Vijibweni	6.5			6.5					6.5	
DRR-18	Mbezi-Maramba Mawili-Kwembe	8.0			8.0					8.0	
DRR-19	Temboni-Kinyerezi	9.0			9.0					9.0	
DRR-20	Temboni-Goba	5.7			5.7				5.7		
DRR-21	Goba-M/Mpiji	8.3			8.3					8.3	
DRR-25	Mbezi-Kwembe	4.5			4.5				4.5		
DRR-26	Morogoro Rd-Kiluvia	2.3			2.3				2.3		
DRR-27	Wazo Hill- Goba	11.3			11.3				5.0	6.3	
DRR-28	Kibo-Msewe	1.5			1.5					1.5	
DRR-29	Tungi-Kibada	5.9			5.9					5.9	
DRR-30	Kibada-Gezaulple	14.5			14.5					14.5	
	Total length (3)	213.1	0.0	0.0	213.1	0.0	0.0	0.0	22.9	190.2	
(4) Major Feeder Roads											
	2- lanes paved roads inside the city	87.2		87.2		10.0	0.0	77.2	0.0	0.0	/*
	1- lane unpaved roads outside the city	163.8			163.8				163.8		
	Total (4)	251.0	0.0	87.2	163.8	10.0	0.0	77.2	163.8	0.0	
(5) Minor Feeder Roads											
	1- lane unpaved roads outside the city (5)	227.4	0.0	0.0	227.4	0.0	0.0	0.0	75.8	151.6	/* =478.4-251.0

	Total (1)+(2)+(3)+(4)+(5)	1150.0	39.8	396.4	713.8	74.0	95.5	122.9	406.3	451.3	

Note /*: Breakdown of Pavement Condition (Source: Feasibility Study on Road Improvement and Maintenance in DSM, JICA 1990)

(4) Major Feeder Roads (2-lanes paved roads inside the city areas)	251.0	0.0	87.2	163.8	0.0	0.0
- 87.2 km of roads are assumed to be 2 lanes paved road being in fair condition; (=251.0 x 1/3)						
- 2/3 of paved road is assumed to be in bad conditoin;						
(5) Minor Feeder Roads (1-lane un-paved outside the city areas)	227.4	0.0	0.0	0.0	75.8	151.6
- 1/3 of unpaved road is assumed to be gravel road;				(=227.4x1/3)		
- 2/3 of unpaved road is assumed to be earth road;						

Appendix 4.3 Result of Road Inventory Survey

Link No.	Name of Roads	Beginning Point	Ending Point	Length (km)	Road Classification	Lane No.	Carriage-way width	Pavement Type	Right-of-way width	Land use Pattern	Traffic Capacity	ADT Vol	Congestion Ratio	Existing Bridge No.	Existing Colvert No.
DTR-1	Pugu Road	New Bagamoyo	DSM Airport	12.80	Trunk Road	4	14.40	Asphalt	13.50	Commerce/	52,600	42,640	0.81		
										Industry	52,600	49,231	0.94		
DTR-2	Mandela	Morogoro/ Sam Nujoma	Bandari	16.00	Trunk Road	4	20.40	Asphalt	42.20	Agriculture/ Commerce	60,200	16,689	0.28		
DTR-3	Morogoro Road	Sokoine	Reginal Boundary	33.10	Trunk Road	2	7.50	Asphalt	13.60	Residence/	52,600	26,594	0.51	3	
						4	60.00		45.00	Agriculture	14,700	25,010	1.70		
											11,800	13,171	1.21		
DTR-4	Kilwa Road	Bandari	Reginal Boundary	15.20	Trunk Road	2	7.00	Asphalt	9.00	Residence/	21,000	10,512	0.50	3	
									22.00	Agriculture	17,300	13,149	0.76		
DTR-5	New Bagamoyo	Pugu UWT	Reginal Boundary	36.10	Trunk Road	4	7.00	Asphalt Gravel	22.00	Residence/ Industry	52,600	26,495	0.54	6	
											13,000	12,340	0.95		
DTR-6	Sam Nujoma	New Bagamoyo	Mandela Morogoro	3.90	Trunk Road	2	7.50	Asphalt	10.70	Residence/ Public	19,900	11,939	0.60		
DTR-7	Morocco Road	New Bagamoyo	Morogoro	4.00	Trunk Road	2	7.50	Asphalt	14.60	Residence/ Commerce	12,100	19,826	1.64		
DTR-8	Sokoine Drive	Luthuli	Gerezani	1.70	Trunk Road	2	9.50	Asphalt	17.70	Commerce	12,600	26,264	2.08		
DTR-9	Uhuru Road	Pugu	Mandela	5.20	Trunk Road	2	9.00	Asphalt	15.60	Commerce/	50,800	25,642	0.50		
						4	12.80			Residence	13,400	26,331	1.97		
DTR-10	Samora Avenue	Luthuli	Uhuru	1.70	Trunk Road	2	6.00	Asphalt	12.50	Commerce	12,600	14,531	1.15		
DTR-11	Ocean Road	Upanga	Kivukoni	3.40	Trunk Road	2	7.00	Asphalt	10.90	Residence	18,000	2,465	0.14		
DTR-12	Kinondoni	New Bagamoyo	Morocco	1.80	Trunk Road	2	7.50	Asphalt	16.90	Residence/ Commerce	16,300	15,279	0.94		
DTR-13	United Nations Road	New Bagamoyo	Morogoro	2.00	Trunk Road	2	10.50	Asphalt	18.40	Commerce	17,300	11,981	0.69		
DTR-14	Jamhuri Street	Aggrey	Maktaba/ Azikiwe	1.10	Regional Road	2	9.50	Asphalt	17.30	Commerce					
DTR-15	Maktaba/Azikiwe Street	Kivukoni	UWT	0.90	Trunk Road	4	12.00	Asphalt	25.10	Commerce	15,300	14,487	0.95		
DTR-16	Gerezani Street	Pugu	Sokoine	1.40	Trunk Road	2	10.00	Asphalt	14.20	Commerce	13,000	16,370	1.26		
							7.00				18,300	17,298	0.95		

Appendix 4.3 Result of Road Inventory Survey

Link No.	Name of Roads	Beginning Point	Ending Point	Length (km)	Road Classi-fication	Lane No.	Carriage-way width	Pavement Type	Right-of-way width	Land use Pattern	Traffic Capacity	ADT Vol	Congestion Ratio	Existing Bridge No.	Existing Colvert No.
DTR-17	Ohio Street	Kivukoni	New Bagamoyo	0.70	Trunk Road	2	9.00	Asphalt	18.30	Residence/ Commerce	13,500	12,493	0.93		
DTR-18	Kenyatta / Toure Drive	New Bagamoyo	Masaki Street	7.60	Regional Road	2	6.50	Asphalt	16.00	Residence	11,500	5,292	0.46		
DTR-19	Zanaki Street	Sokoine Drive	UWT	1.00	Regional Road	2	9.50	Asphalt	16.70	Residence/ Industry					
DTR-20	Morogoro Road-NIT	Morogoro Road	Old Kigogo Road	1.40	Regional Road	2	6.50	Gravel	8.20	Residence	11,500	2,510	0.22		
DTR-21	Chang'ombe Road	Pugu Road	Temeke	4.60	Regional Road	2	7.00	Asphalt	25.80	Industry/ Residence	14,100 18,000	5,201 15,711	0.37 0.87		
DTR-22	Msimbazi Road	Morogoro	Pugu/ Gerezani	1.70	Trunk Road	2	12.60	Asphalt	23.00	Commerce	16,400	21,738	1.33		
DTR-23	Libya Street	Zanaki/ Mtendeni	UWT	0.50	Regional Road	2	7.00	Asphalt	13.70	Commerce					
DTR-24	Bandari Road	Mandela	Gerezani	2.00	Trunk Road	2	7.00	Asphalt	14.40	Commerce	14,700	31,280	2.13		
DTR-25	Old Kigogo / Mandela	Mandela	Old Kigogo	1.00	Regional Road	2	6.50	Gravel		Residence					
DTR-26	Kagera Street	Makanya	Morogoro	2.40	Regional Road	2	7.50	Gravel	11.00	Residence	12,700	2,500	0.20		
DTR-27	Haile Sellasie Road	Msasani Street	New Bagamoyo	5.40	Regional Road	2	6.50	Gravel	16.00	Residence	11,500	9,809	0.89		
DTR-28	Temeke/Mbagala	Port Access	Kilwa Road	3.30	Regional Road	2	6.00	Gravel	15.80	Residence/ Commerce	11,500	6,832	0.49 0.59		
DTR-29	Old Kigogo Road	New Kigogo	Morogoro Road	6.50	Regional Road	2	6.50	Gravel	11.70	Residence	11,500	3,482	0.30		
DTR-30	Nkrumah Street	Samora Avenue	UWT/ Nkrumah	0.30	Regional Road	2	9.50	Asphalt	14.90	Commerce/ Residence	15,900	13,480	0.85		
DTR-31	New Kigogo Road	Morogoro Road	Uhuru Road	2.80	Regional Road	2	7.00	Asphalt	10.90	Residence	10,500 10,500	14,185 18,290	1.35 1.74		
DTR-32	Kivukoni Front	Ocean Road	Sokoine	1.20	Regional Road	2	5.00	Asphalt	8.00	Commerce	18,000	9,012	0.50		
DTR-33	Old Bagamoyo Road	New Bagamoyo	New Bagamoyo	8.40	Regional Road	2	6.50	Asphalt/ Gravel	10.00	Residence	12,400	8,899	0.72		

Appendix 4.3 Result of Road Inventory Survey

Link No.	Name of Roads	Beginning Point	Ending Point	Length (km)	Road Classification	Lane No.	Carriageway width	Pavement Type	Right-of-way width	Land use Pattern	Traffic Capacity	ADT Vol	Congestion Ratio	Existing Bridge No.	Existing Colvert No.
DTR-34	Uhuru Street/Railway	Samora Avenue	Msimbazi	0.50	Regional Road	2	9.50	Asphalt	14.00	Commerce	13,400	16,341	1.22		
DTR-35	Chole Road	Toure Drive	Masaki Street	3.00	Regional Road	2		Gravel	6.50	Residence					
DTR-36	Mikocheni Access	Morocco Road	Regent Estate	1.30	Regional Road	2		Gravel	6.50	Residence					
DTR-37	Beach Access	DRR-10	DRR-10	3.50	Regional Road	2		Asphalt	6.50	Residence					
DTR-38	Mwinyijuma/Sinza	Shekilango Road	Morocco Road	5.00	Regional Road	2	6.50	Asphalt Gravel	10.00	Residence	10,200	2,500	0.25		
DTR-39	Mwinyijuma/New Bagamoyo	Morocco Road	Mwananyamala	3.60	Regional Road	2	7.00	Asphalt	12.10	Residence	10,200	5,960	0.58		
DTR-40	Shekilango Road	New Bagamoyo	Morogoro	3.80	Regional Road	2	6.50	Asphalt	14.90	Residence/ Industry	10,200	11,136	1.09		

Appendix 4.3 Result of Road Inventory Survey

Link No.	Name of Roads	Beginning Point	Ending Point	Length (km)	Road Classification	Lane No.	Carriage-way width	Pavement Type	Right-of-way width	Land use Pattern	Traffic Capacity	ADT Vol	Congestion Ratio	Existing Bridge No.	Existing Culvert No.
DRR-1	Kawe-Goba-Mbezi	Kawe	Mbezi	16.00	Regional Road	1	5.80	Gravel Earth		Residence/ Agriculture					22
DRR-2	Mwongozo-Gomvu	Mwongozo	Gomvu	12.50	District Road	1	5.50	Earth							
DRR-3	Chekeni wasonga-Buyuni	Chekeni wasonga	Buyuni	43.10	Regional Road	1	5.80	Earth		Agriculture/ Residence/Fores					2
DRR-4	Pugu-Msongola	Pugu	Msongola	20.00	District Road	1		Earth		Residence/ Agriculture/ Forest					
DRR-5	Bunju A - Mbweni	BunjuA	Mbweni	6.40	District Road	1	5.40 3.20	Gravel Earth		Agriculture/ Forest					3
DRR-6	Kwembe - Kisoa	Kwembe	Kisoa	13.90	District Road	1	4.50	Earth		Residence/ Agriculture					23
DRR-7	Kibamba-Magoe mpiji	Kibamba	Magoe mpiji	9.00	District Road	1	4.30	Earth		Residence/ Agriculture					9
DRR-8	Kimbiji-Chekeniwasonga	Kimbiji	Chekeniwasonga	11.50	District Road	1	3.00	Earth		Forest					0
DRR-9	Mkwambe-Gezaulole	Mikwambe	Gezaulole	20.00	District Road	1		Earth							
DRR-10	Kunduchi-Ununio-Boko	Ununio	Boko	11.40	Regional Road	2 1	6.00	Gravel Earth		Industry/ Residence/ Agriculture.					14
DRR-11	Msongola - Buyuni	Msongola	Buyuni	16.00	District Road	1		Earth							
DRR-12	Kimbiji-Tundwi-Songani	Kimbiji	Songani	18.00	District Road	1	3.00	Earth		Forest					0
DRR-13	Pugu Kajiungeni	Pugu	Kajiungeni	8.30	District Road	1		Earth							
DRR-14	Kivukoni-Vijibweni	Kivukoni	Vijibweni	6.50	District Road	1	2.80	Earth		Residence/ Agriculture					3
DRR-15	Bunju-Mabwepande-M-Mpiji	Bunju	Mpiji	24.10	Regional Road	1	5.40	Earth		Residence/ Agriculture/ Forest					9

Appendix 4.3 Result of Road Inventory Survey

Link No.	Name of Roads	Beginning Point	Ending Point	Length (km)	Road Classification	Lane No.	Carriage-way width	Pavement Type	Right-of-way width	Land use Pattern	Traffic Capacity	ADT Vol	Congestion Ratio	Existing Bridge No.	Existing Culvert No.
DRR-16	DIA - Gongolamboto	DIA	Gongolamboto	7.20	Regional Road	2	7.60	Asphalt		Residence					9
DRR-17	Pugu-Kinyerezi-Tabata	Kinyerezi	Tabata	12.50	Regional Road	2 1	6.00 3.00	Gravel Earth		Residence/ Agriculture				1	12
DRR-18	Mbezi_Maramba mawili-Kwembe	Maramba mawili	Kwembe	8.00	District Road	1	4.00	Earth		Residence/ Agriculture					
DRR-19	Temboni-Kinyerezi	Temboni	Kinyerezi	9.00	District Road	1	4.00	Earth		Residence/ Agriculture					
DRR-20	Temboni-Goba	Temboni	Goba	5.70	District Road	1	4.50	Gravel		Residence/ Agriculture					6
DRR-21	Goba-M/Mpiji	Goba	M/Mpiji	8.30	District Road	1	5.00	Earth		Residence/ Agriculture					15
DRR-22	Kivukoni-Kimbiji-Pemba-Mnazi	Kivukoni	Pemba-Mnazi	56.40	Regional Road	2 1	6.00 3.00	Gravel Earth		Residence/ Agriculture/ Forest					67
DRR-23	Kongowe-Mjimwema	Kongowe	Mjimwema	17.60	Regional Road	2	8.00	Gravel		Residence/ Agriculture					11
DRR-24	Pugu-Chamika-Mvuti-Mbagala	Pugu	Mbagala	46.40	Regional Road	2	6.80	Gravel Earth		Residence/ Agriculture					65
DRR-25	Mbezi-Kwembe	Mbezi	Kwembe	4.50	District Road	1	4.90	Gravel		Residence/ Agriculture					10
DRR-26	Morogoro Road-Kiluvia	Morogoro	Kiluvia	2.30	District Road	1	4.70	Gravel		Residence/ Agriculture					5
DRR-27	Wazo Hill-Goba	Wazo Hill	Goba	11.30	District Road	1	5.80	Earth Gravel		Residence/ Agriculture					6
DRR-28	Kibo-Msewe	Kibo	Msewe	1.50	District Road	1	3.00	Earth		Residence					
DRR-29	Tungi-Kibada	Tungi	Kibada	5.90	District Road	1	4.20	Earth		Residence/ Agriculture					5
DRR-30	Kibada-Gezaulole	Kibada	Gezaulole	14.50	District Road	1	3.00	Earth		Residence/ Agriculture					8

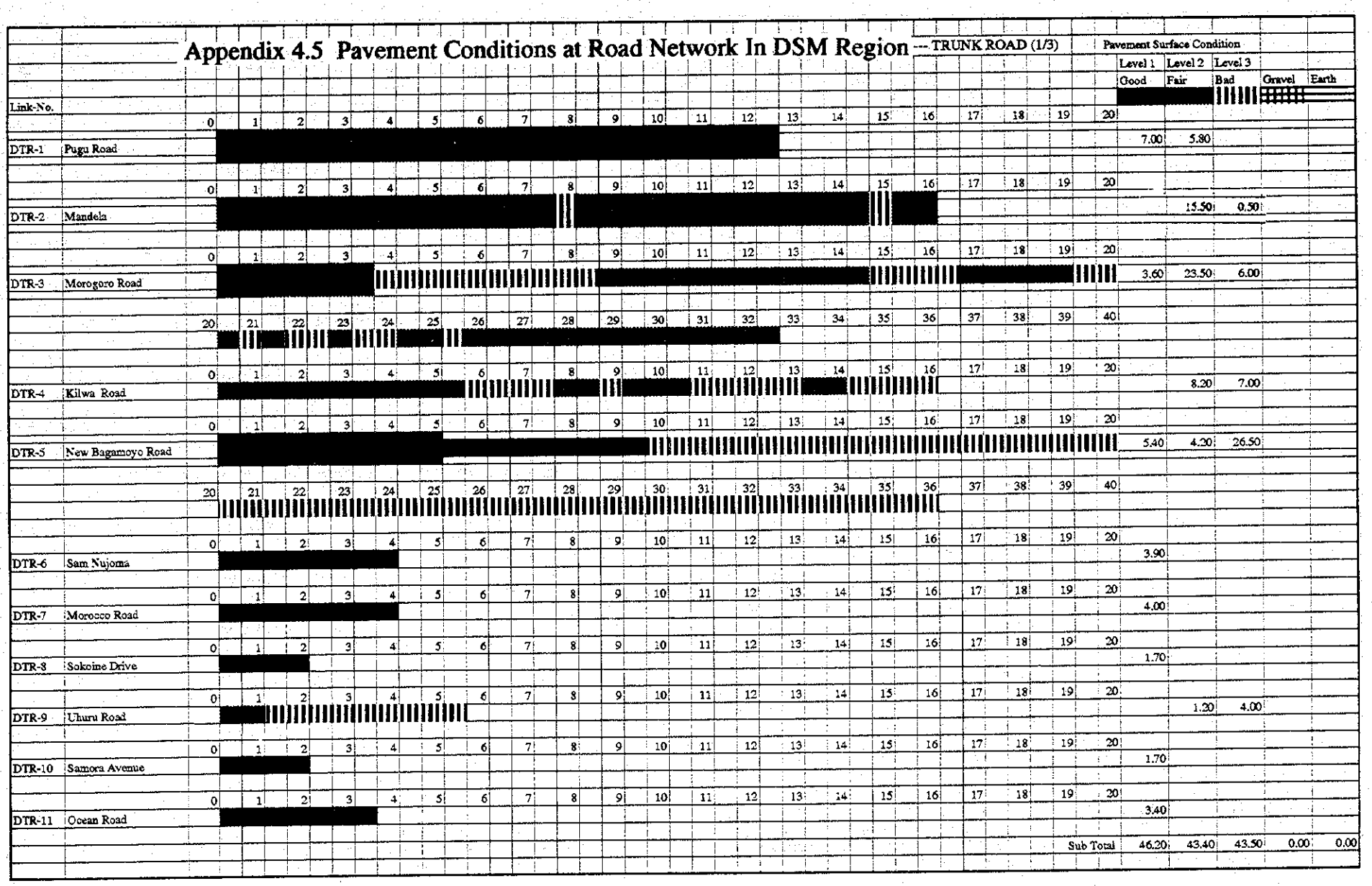
Appendix 4.4 Road Density Calculation

Traffic			Road Length by Classification								Total Road	Population	Road Density	Density
Zone	Trunk Road	Weighted	Trunk Road	Weighted	Regional Rd.	Weighted	Regional Rd.	Weighted	District Rd.	Weighted	Length		(m/1,000 person)	Level
No.	4 lanes	Length(x1.5)	2 lanes	Length(x1.0)	2 lane	Length(x0.75)	1 lane	Length(x0.5)	1 lane	Length(x0.5)	(km)			1 to 5
10	0.00	0.00	5.10	5.10	3.40	2.55	0.00	0.00	0.00	0.00	7.65	27,000	283.33	3
20	4.40	6.60	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	7.40	27,889	265.34	3
30	2.00	3.00	5.70	5.70	1.20	0.90	0.00	0.00	0.00	0.00	9.60	5,372	1,787.04	5
40	1.00	1.50	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50	20,827	168.05	2
50	1.50	2.25	1.30	1.30	0.00	0.00	0.00	0.00	0.00	0.00	3.55	22,527	157.59	2
60	0.00	0.00	1.40	1.40	1.00	0.75	0.00	0.00	0.00	0.00	2.15	35,048	61.34	1
70	4.80	7.20	0.00	0.00	3.40	2.55	0.00	0.00	0.00	0.00	9.75	42,868	227.44	3
80	1.50	2.25	4.50	4.50	2.70	2.03	0.00	0.00	0.00	0.00	8.78	72,892	120.38	2
90	4.50	6.75	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	7.75	26,772	289.48	3
100	3.20	4.80	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	5.30	48,247	109.85	2
110	0.00	0.00	0.00	0.00	2.90	2.18	0.00	0.00	0.00	0.00	2.18	21,222	102.49	2
120	0.00	0.00	2.60	2.60	2.80	2.10	0.00	0.00	0.00	0.00	4.70	73,665	63.80	1
130	3.40	5.10	1.80	1.80	0.00	0.00	0.00	0.00	0.00	0.00	6.90	42,387	162.79	2
140	0.00	0.00	4.20	4.20	3.60	2.70	0.00	0.00	0.00	0.00	6.90	72,508	95.16	1
150	0.00	0.00	1.80	1.80	2.40	1.80	0.00	0.00	0.00	0.00	3.60	53,991	66.68	1
160	0.00	0.00	1.00	1.00	1.40	1.05	0.00	0.00	0.00	0.00	2.05	58,413	35.09	1
170	0.00	0.00	3.00	3.00	3.60	2.70	0.00	0.00	0.00	0.00	5.70	54,499	104.59	2
180	2.00	3.00	0.00	0.00	2.30	1.73	0.00	0.00	0.00	0.00	4.73	45,963	102.80	2
190	0.00	0.00	0.40	0.40	22.70	17.03	0.00	0.00	0.00	0.00	17.43	51,293	339.71	4
200	0.00	0.00	5.60	5.60	3.00	2.25	3.00	1.50	0.00	0.00	9.35	44,085	212.09	3
210	2.00	3.00	12.60	12.60	6.50	4.88	0.00	0.00	1.50	0.75	21.23	46,980	451.79	5
220	1.00	1.50	0.00	0.00	2.50	1.88	6.50	3.25	0.00	0.00	6.63	18,465	358.79	4
221	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.50	2.25	2.25	3,048	738.19	5
230	0.00	0.00	0.00	0.00	1.00	0.75	1.50	0.75	0.00	0.00	1.50	33,690	44.52	1
240	5.50	8.25	0.00	0.00	0.50	0.38	0.00	0.00	0.00	0.00	8.63	36,910	233.68	3
250	0.00	0.00	0.00	0.00	6.70	5.03	1.00	0.50	0.00	0.00	5.53	45,203	122.23	2
260	3.00	4.50	0.00	0.00	1.80	1.35	0.00	0.00	0.00	0.00	5.85	91,144	64.18	1
270	0.00	0.00	2.80	2.80	0.00	0.00	0.00	0.00	0.00	0.00	2.80	39,417	71.04	1
280	0.00	0.00	4.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	40,866	97.88	1
281	0.00	0.00	0.00	0.00	11.40	8.55	0.00	0.00	11.40	5.70	14.25	5,452	2,613.72	5
	39.80	59.70	62.10	62.10	86.80	65.10	12.00	6.00	17.40	8.70	201.60	1,208,643		

Traffic			Road Length by Classification								Total Road	Population	Road Density	Density
Zone	Trunk Road	Weighted	Trunk Road	Weighted	Regional Rd.	Weighted	Regional Rd.	Weighted	District Rd.	Weighted	Length		(m/1,000 person)	Level
No.	4 lanes	Length(x1.5)	2 lanes	Length(x1.0)	2 lane	Length(x0.75)	1 lane	Length(x0.5)	1 lane	Length(x0.5)	(km)			1 to 5
282	0.00	0.00	4.90	4.90	5.00	3.75	0.00	0.00	3.50	1.75	10.40	18,624	558.42	5
283	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13,408	0.00	1
290	0.00	0.00	0.00	0.00	9.60	7.20	0.00	0.00	0.00	0.00	7.20	6,652	1,082.38	5
291	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.75	8.50	4.25	5.00	3,003	1,665.00	5
300	0.00	0.00	7.50	7.50	14.00	10.50	0.00	0.00	13.40	6.70	24.70	2,557	9,659.76	5
310	0.00	0.00	0.00	0.00	11.00	8.25	2.90	1.45	8.30	4.15	13.85	22,743	608.98	5
311	0.00	0.00	11.00	11.00	0.00	0.00	0.00	0.00	5.40	2.70	13.70	2,159	6,345.53	5
312	0.00	0.00	8.70	8.70	0.00	0.00	18.60	9.30	6.80	3.40	21.40	9,977	2,144.93	5
320	0.00	0.00	9.60	9.60	0.00	0.00	15.50	7.75	21.20	10.60	27.95	4,753	5,880.50	5
321	0.00	0.00	0.00	0.00	0.00	0.00	4.00	2.00	32.20	16.10	18.10	16,751	1,080.53	5
330	0.00	0.00	0.00	0.00	5.00	3.75	0.00	0.00	5.00	2.50	6.25	6,226	1,003.85	5
331	0.00	0.00	0.00	0.00	26.50	19.88	0.00	0.00	26.50	13.25	33.13	13,351	2,481.09	5
340	0.00	0.00	0.00	0.00	13.60	10.20	0.00	0.00	17.50	8.75	18.95	26,078	726.67	5
341	0.00	0.00	0.00	0.00	9.60	7.20	0.00	0.00	0.00	0.00	7.20	6,730	1,069.84	5
342	0.00	0.00	0.00	0.00	0.00	0.00	12.00	6.00	10.50	5.25	11.25	2,821	3,987.95	5
343	0.00	0.00	0.00	0.00	12.30	9.23	43.00	21.50	19.00	9.50	40.23	6,465	6,221.96	5
	39.80	59.70	103.80	103.80	193.40	145.05	109.50	54.75	195.20	97.60	460.90	1,370,941		

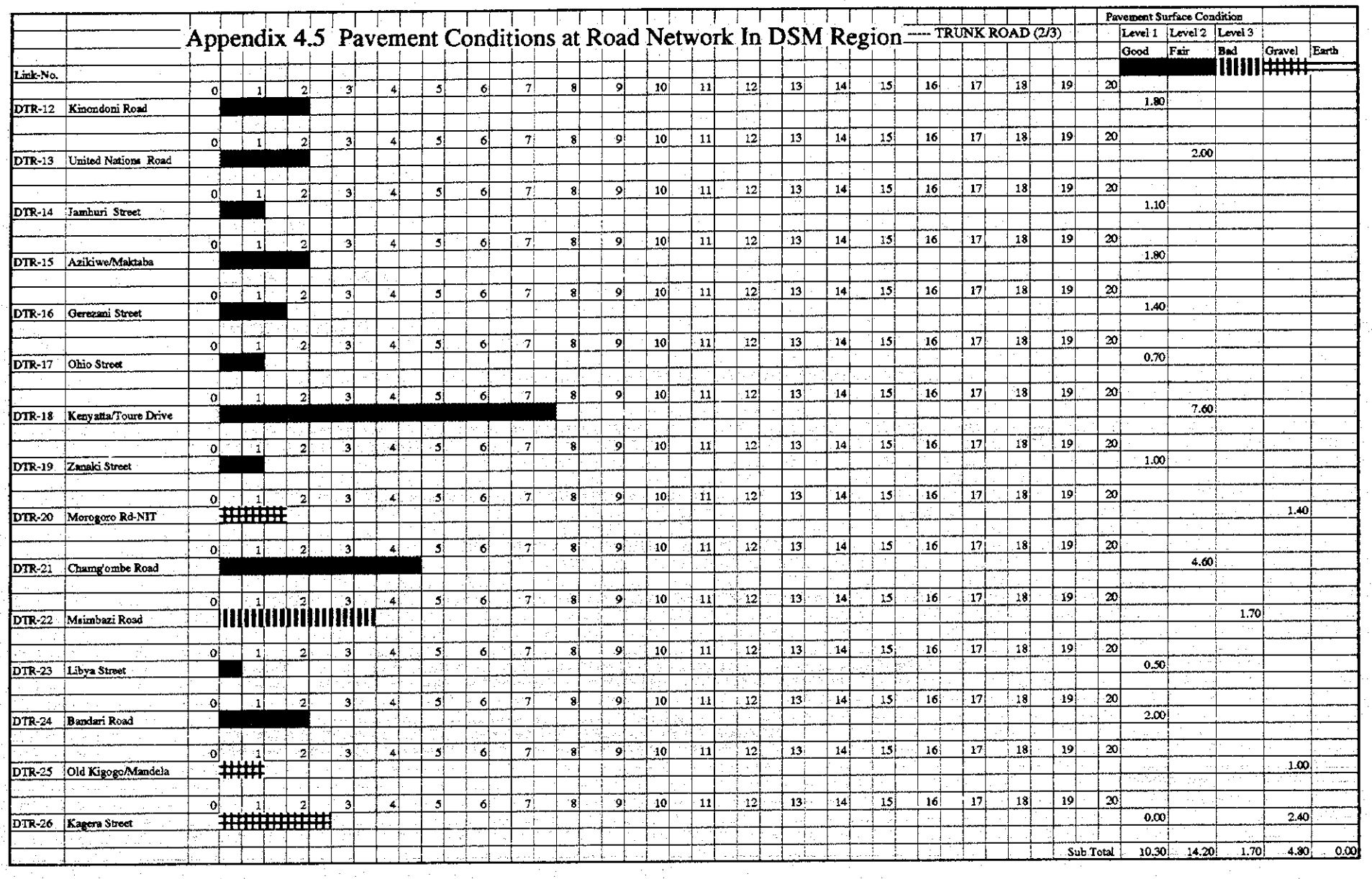
Appendix 4.5 Pavement Conditions at Road Network In DSM Region

--- TRUNK ROAD (1/3)



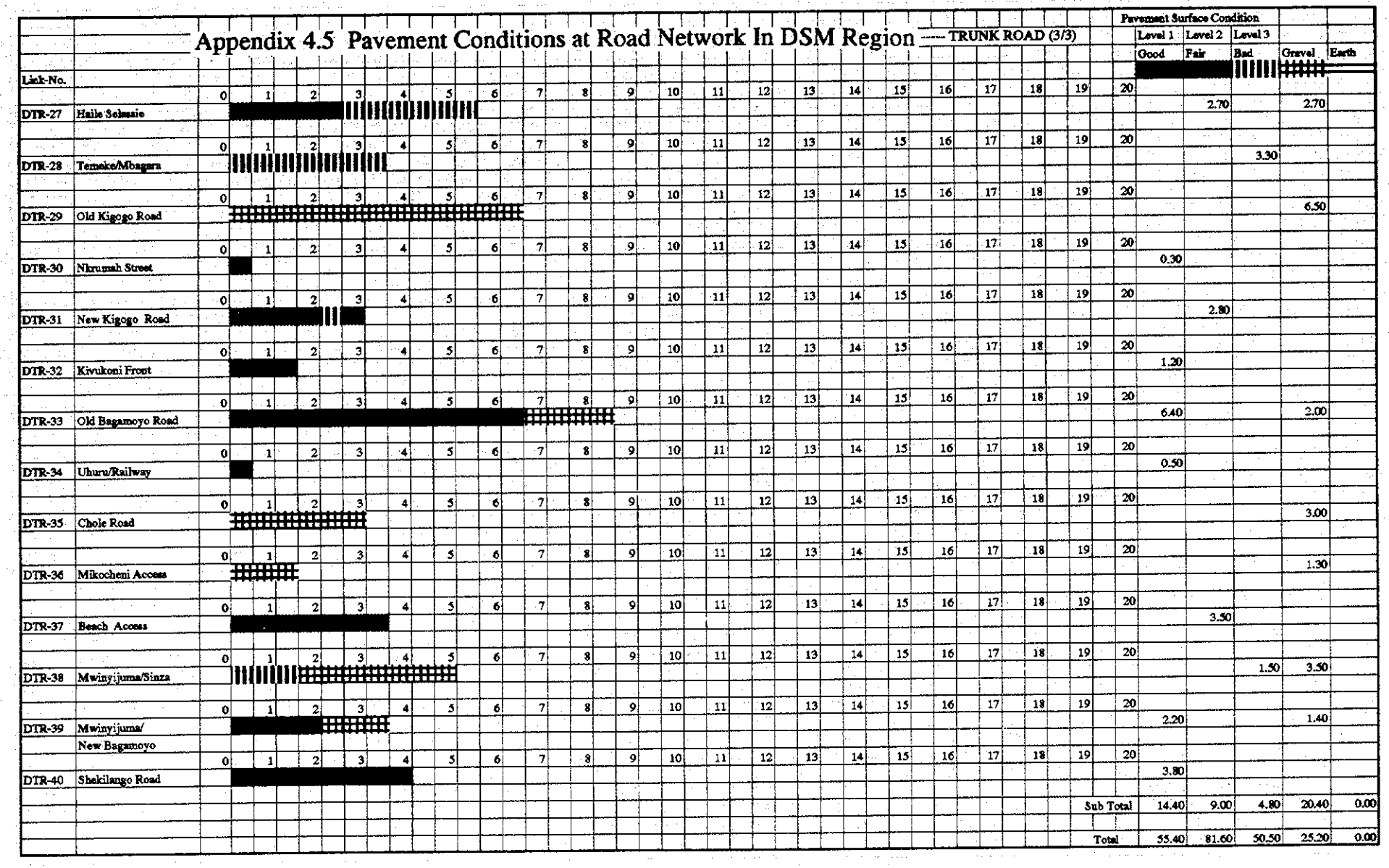
Appendix 4.5 Pavement Conditions at Road Network In DSM Region

---- TRUNK ROAD (2/3)



Link-No.		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	Pavement Surface Condition				
			Level 1	Level 2	Level 3		
			Good	Fair	Bad	Gravel	Earth
DTR-12	Kinondoni Road		1.80				
DTR-13	United Nations Road			2.00			
DTR-14	Jamhuri Street		1.10				
DTR-15	Azikiwe/Maktaba		1.80				
DTR-16	Gerezani Street		1.40				
DTR-17	Ohio Street		0.70				
DTR-18	Kenyatta/Toure Drive			7.60			
DTR-19	Zanaki Street		1.00				
DTR-20	Morogoro Rd-NIT					1.40	
DTR-21	Chamg'ombe Road			4.60			
DTR-22	Msimbazi Road				1.70		
DTR-23	Libya Street		0.50				
DTR-24	Bandari Road		2.00				
DTR-25	Old Kigogo/Mandela					1.00	
DTR-26	Kagera Street		0.00			2.40	
		Sub Total	10.30	14.20	1.70	4.80	0.00

Appendix 4.5 Pavement Conditions at Road Network In DSM Region ----- TRUNK ROAD (3/3)



Link-No.		Pavement Surface Condition				
		Level 1	Level 2	Level 3		
		Good	Fair	Bad	Gravel	Earth
DTR-27	Haile Selassie		2.70		2.70	
DTR-28	Temeke/Mbagara			3.30		
DTR-29	Old Kigogo Road				6.50	
DTR-30	Nkrumah Street	0.30				
DTR-31	New Kigogo Road		2.80			
DTR-32	Kivukoni Front	1.20				
DTR-33	Old Bagamoyo Road	6.40			2.00	
DTR-34	Uhuru/Railway	0.50				
DTR-35	Chole Road				3.00	
DTR-36	Mikocheni Access				1.30	
DTR-37	Beach Access		3.50			
DTR-38	Mwinyijuma/Sinza			1.50	3.50	
DTR-39	Mwinyijuma/ New Bagamoyo	2.20			1.40	
DTR-40	Shekilango Road	3.80				
	Sub Total	14.40	9.00	4.80	20.40	0.00
	Total	55.40	81.60	50.50	25.20	0.00

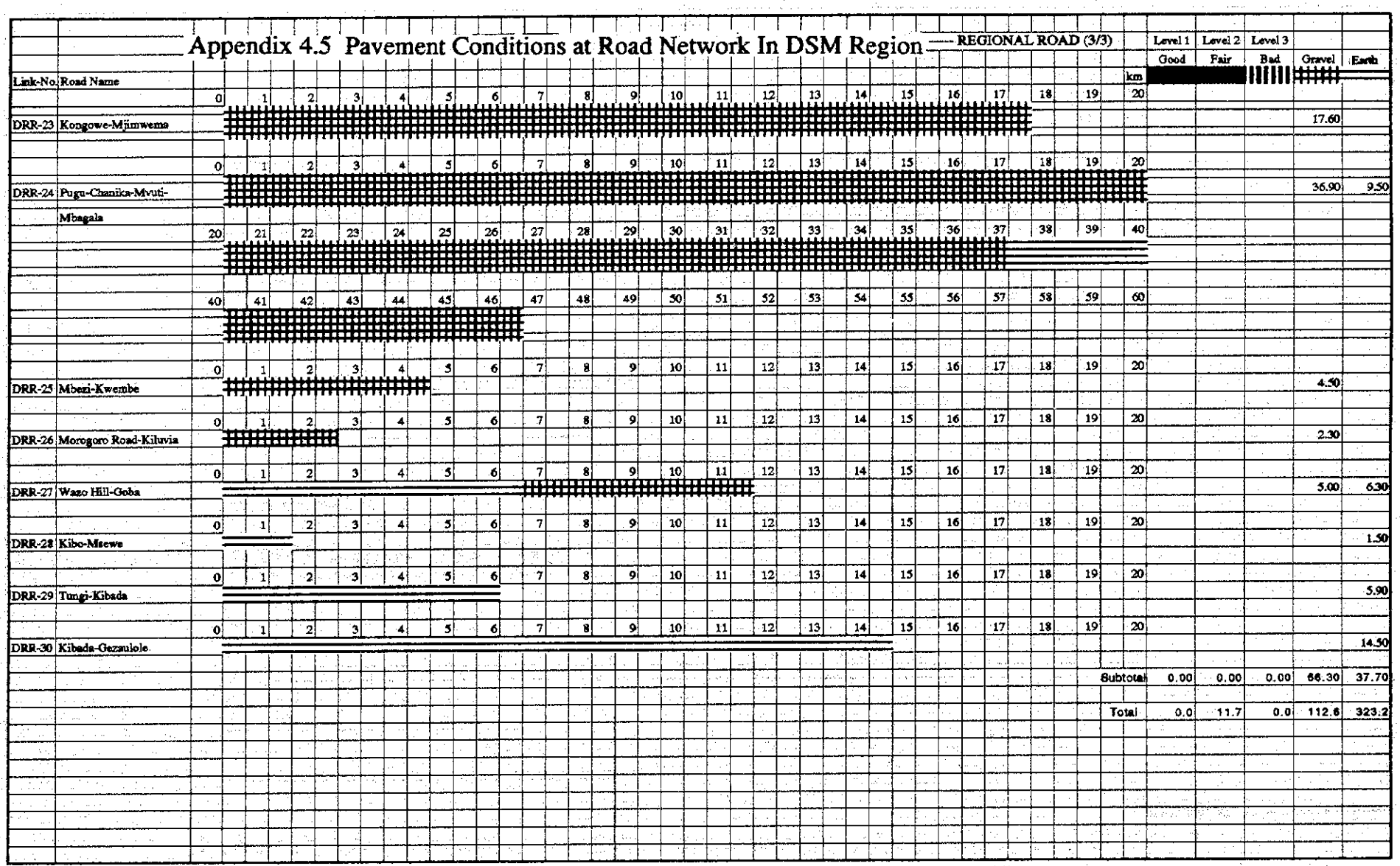
Appendix 4.5 Pavement Conditions at Road Network In DSM Region — REGIONAL ROAD (1/3)

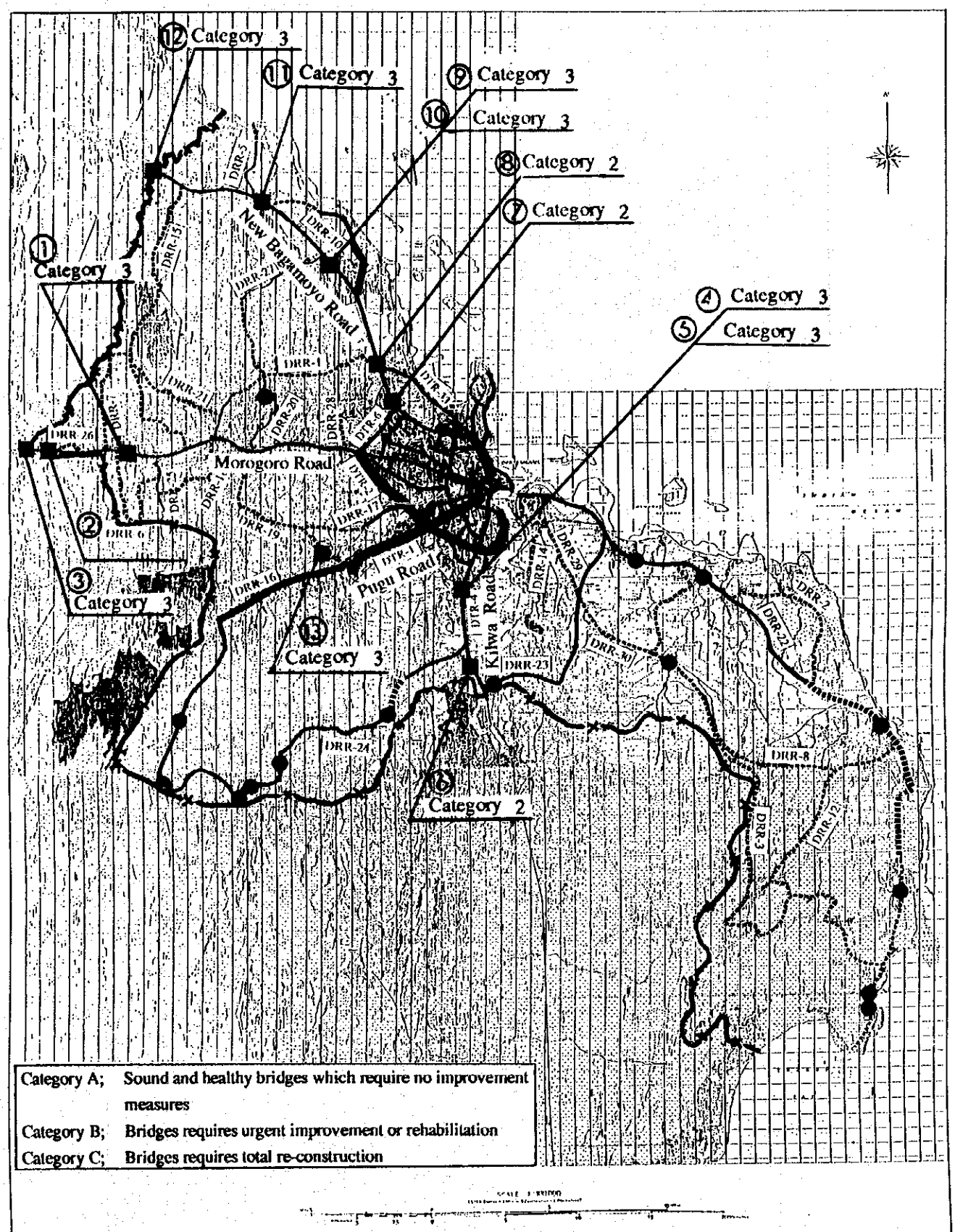
Link-No.	Road Name	km	Level 1 Good	Level 2 Fair	Level 3 Bad	Gravel	Earth
DRR-1	Kawe-Goba-Mbezi	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20				4.00	12.00
DRR-2	Mwongozo-Gomvu	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20					12.50
DRR-3	Chekeni Wasonga-Buyuni	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20					43.10
		20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40					
		40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60					
DRR-4	Pugu-Msongola	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20					20.00
DRR-5	Bunju A -Mbweni	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20				5.10	1.00
DRR-6	Kwembe-Kisoka	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20					13.90
DRR-7	Kibamba-Magoe mpiji	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20					9.00
DRR-8	Kimbiji-Chekenewasonga	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20					11.50
DRR-9	Mkwambe-Gezaulole	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20					20.00
DRR-10	Kunduchi-Ununio-Boko	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20		4.50		3.00	3.90
DRR-11	Msongola - Buyuni	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20					16.00
DRR-12	Kimbiji-Tundwi-Songani	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20					18.00
		Subtotal	0.00	4.50	0.00	12.10	180.90

Appendix 4.5 Pavement Conditions at Road Network In DSM Region ---- REGIONAL ROAD (2/3)

Link-No.	Road Name	km	Level 1 Good	Level 2 Fair	Level 3 Bad	Gravel	Earth
DRR-13	Pugu Kajiungeni	8.30					8.30
DRR-14	Kivukoni-Vijibweni	6.50					6.50
DRR-15	Bunju-Mabwepande-M-Mpiji	24.10					24.10
DRR-16	DIA - Gongolamboto	7.20		7.20			
DRR-17	Pugu-Kinyerezi-Tabata	12.50				3.50	9.00
DRR-18	Mbezi_Maramba mawili-Kwembe	8.00					8.00
DRR-19	Temboni-Kinyerezi	9.00					9.00
DRR-20	Temboni-Goba	5.70				5.70	
DRR-21	Goba-M/Mpiji	8.30					8.30
DRR-22	Kivukoni-Kimbiji-Pemba-Mnazi	56.40				25.00	31.40
	Subtotal	136.00	0.00	7.20	0.00	34.20	104.60

Appendix 4.5 Pavement Conditions at Road Network In DSM Region





Appendix 4.6 Bridge Condition on Major Roads in DSM Region

Appendix 4.6 Bridge Condition on Major Roads in DSM Region

No.	Link No.	Road Name	Bridge Location	Bridge Type	Bridge Size Length (m)	Bridge Size Width (m)	Span Arrangement	Substructure Type	River Name	Condition	Category
	DTR-3	Morogoro Road	From Mandela JCT								
1			17.5km	Single Span Steel Girder Bridge	14.6m	6.9m		R.C. Abutments		Steel Girder Rusting	3
										Handrails Damaged.Narrow	
2			22.1km	Single Span Steel Girder Bridge	21.0m	7.0m		R.C. Abutments	Kiruya River	Handrails severly Damaged	3
								on Piles		Steel Girders Rusting.Narrow	
3			23.4km	Single Span Steel Girder Bridge	24.2m	7.0m		R.C. Abutments		Erosion	3
										Handrails Damaged.Narrow	
	DTR-4	Kilwa Road	From Bandari Road							Minor Erosion	
4			6.0km	Single Span R.C. Slab	8.0m	6.9m		R.C. Abutments	Mzinga River	Parapets Damaged	3
										Concrete Spalling	
5			6.1km	Single Span R.C. Slab	6.7m	6.9m		R.C. Abutments	Mzinga River	Parapets Damaged	3
										Concrete Spalling	
6			12.2km	3 Span Steel Girder Bridge	38.0m	6.9m	(12.8m+12.5m+12.7m)		Mzinga River	Parapets Damaged	2
								retaining Wall Type		DrainPipes are clogged	
								R.C. rigid frame piers			
	DTR-5	New Bagamoyo Rd	From Sam Nujoma JCT					with 2-0.5m.sq columns			
7			0.6km	2 Span Steel Girder Bridge	25.5m	7.0m	(12.8m+12.7m)	R.C. Abutments	Mlalakua River	Handrails Damaged	2
								R.C. Pier		Minor Corrosion on Steel Girders	
8			3.5km	60'-70' Skewed Steel Girder Bridge	17.8m	7.0m		Concrete Abutments	Mbezi River	Handrails Damaged	2
										Minor Scour	
9			11.2km	9 Panels Bailey Bridge	27.0m	4.1m		Stone Masonry Abutments	Tegeta River	Serious Erosion at Abutments	3
10			11.5km	5 Span R.C. Slab Bridge	28.3m	4.0m	(5@5.65m)	R.C. Abutments	Tegeta River	Handrails Missing	3
								R.C. Rigid Frame Piers		Bushes around opening s	
								with 3-0.4m.sq.columns		Narrow	
11			18.7km	5 Span R.C. Slab Bridge	28.8m	4.0m	(5@5.75m)	Stone Masonry Abutments	Nyakasangwe River	Handrails Severly Damaged	3
								R.C. Rigid Frame Piers		Narrow	
								with 3-0.4m.sq.columns			
12			25.5km	3 Span Steel Girder Bridge	33.7m	3.9m		R.C. Abutments	Mpiji River	Handrails Severly Damaged	3
								R.C. Piers		Corrosion on Steel Girders	
										Severe scour	
										Narrow.Bushes around openings	

Appendix 4.6 Bridge Condition on Major Roads in DSM Region

No.	Link No	Road Name	Location	Structure	Size		Span Arrangement	Substructure Type	River Name	Condition	Category
					Length	Width					
	DRR-17	Pugu-Kinyerezi-	From Tabata							Corrosion on Bailey parts	3
13		Tabata	10.6km	Bailey Bridge	41.7m	3.3m		Stone Masonry Abutments		Vegitations at openings	
					(7 Panels)						
	DRR-20	Temboni-Goba	From Temboni(Mbezi)							Headwall Damaged	
14			4.0km	5 Barrels 1.8mDiameter Culvert	14.6m	4.5m					
	DRR-22	Kivukoni-Kimbiji-	From Kivukoni								
15		Pemba Munazi	10.7km	3 Barrels 1.8mDiameter Culvert	11.1m	8.3m					
16			17.6km	Two 2.6m Pipe Arches Culvert	8.0m	7.0m				Minor Scour	
										Shrubs around openings	
17			17.7km	Eight 2.6m Pipe Arches Culvert	38.0m	6.1m					
18			32.7km	Three 1.8mDiameter Barrels +Two	30.0m	6.7m				Openings blocked by vegitations	
				Pipe Culverts(3.0m each) Culvert							
19			45.6km	Three 2.6m Pipe Arches Culvert	10.5m	8.35m					
20			53.0km	3 Barrels Culvert	9.7m	8.0m					
				2-0.9m(Diameter)+1-1.8m(D)							
21			54.2km	6 Barrels Culvert	9.5m	6.0m				Vegitations at the openings	
				2-0.9m(D)+1-1.8m(D)+3-0.6m(D)							
	DRR-23	Kongowe-	From Kongowe								
22		Mjimwema	0.4km	Two Adjacent Culverts							
				2 Barrels Culvert(1.8m(D))							
				1 Barrels Culvert(1.8m(D))							
	DRR-24	Pugu-Chanika-	From Pugu								
23		Mvuti-Mbagala	12.8km	Six Adjacent Culverts						Silting	
				5 0.9m(D) Each and 3 Barrels 0.9m(D)						Severery position	
24			21.2km	Two 2.6m pipe Arches Culvert	7.5m	9.1m					
25			28.5km	Eight Adjacent Culverts		6.5m					
				6-0.9m(D)+2 Barrels 0.9m(D) +							
				1-2.6m Pipe Arch							
26			38.0km	6-0.9m(D) Barrels Culvert	15.7m	9.2m					

Chapter 5 Initial Environmental Examination

Appendix 5.1 Project Description

Appendix 5.2 Site Description

Appendix 5.3 Physiographic Conditions

Appendix 5.4 Environmental Constraints

Appendix 5.5 Road Side Environment

Appendix 5.1

(1) Project Description

1) Subject Areas

1. Widening of Trunk roads in the CBD
2. Establishing and constructing Middle Ring Road
3. Widening of New Bagamoyo Road
4. Widening of Kilwa Road
5. Widening of Sam Nujoma Road

2) Background Information Objective of Projects

1. To ensure efficient circulation and control in the CBD
2. To reduce traffic concentrations into the CBD

3.,4.,& 5

To increase traffic capacity on trunk roads and to establish a trunk road network

3) Location

High priority roads which have been identified with the aim of promoting efficient traffic circulation in the city's CBD as well as in urban areas are as follows:

- Morocco, New Kigogo and Chang' ombe Roads
- Ohio, Sokoine Drive, Gerenani Roads

For descriptions of specific roadside environments for each road see appendix 5.4.

4) Executing Agencies

Ministry of Works, Communications, and Traffic (MWCT)

5) Major Components and Development Scale of Project

- Type of Project: Upgrading (Rehabilitation of function for trunk road)
- Characteristics of Road: Trunk road/ urban area/ plane area

6) Target year/Traffic Volume: 2000/ not yet

7) Length/ Width/ Lanes:

1. CBD (circulation)	5.0 km	20 m	4 lanes
2. CBD (reduce traffic)	10.4	45 m	4 lanes
3. Trunk road network (increase capacity)	13.2	45 m	4 lanes
4. "	3.2	45 m	4 lanes
5. "	3.9	45 m	4 lanes

Appendix 5.2

Site Description

Data collected during the field surveys was based on physical exploration of sites located in the Dar es Salaam regional urban area. This data was then further supplemented through the systematic acquisition of information from the government and private sectors.

The actual urbanized area of Dar es Salaam is situated on a coastal plane facing the Indian Ocean to the east, and bounded by hills on the west. The city regional area is characterized by four distinct land forms;

- shoreline immediately abutting the sea, (consisting of sand dunes and tidal swamps).
- a limestone coastal plain to the west of the shoreline extending up to the Pugu Hills which is (overlaid with Pleistocene clay or more recent sand layers) 15 - 30 meters above mean sea level

  Lakes or ponds are scattered throughout this landform where rich clay soils and zero gradient impede natural drainage.
- rivers originating from the Pugu Hills flowing to the east dissect this Coastal Plain in a series of steep sided U-shaped valleys, culminating in creeks and mangrove swamps of poorly drained silt clays and organic material, before entering the Indian Ocean.
- deeply dissected Pugu Hills, which bound the city region to the west averaging 100 to 200 meters above mean sea level and characterized by deep weathered slopes.

Over the years substantial development of major portions of this plain has occurred with the exception of river valley walls which have generally been used for agriculture.

Appendix 5.3

Physiographic Conditions

Temp-Humidity *

Dar es Salaam is characterized by a tropical coastal climate with a mean annual temperature of 26°C and an average humidity of 96% in the morning around 6:00 A.M. and 67% in the afternoon. The sun is generally directly overhead at the end of March and again at the end of September while it is southerly from October to February.

Wind *

The DSM area is affected mainly by two major wind movements, that of the south-east trade winds off the Indian Ocean between April to September and the north-easterly winds from general the direction of the Saudi Arabian desert between January to March. Wind velocities generally stay between 19 km/hr. between July and February then decreasing to 12 km/hr. The lack of wind in March generally corresponds to the high for that month.

Rainfall *

Rain falling within the DSM area (considered a favorable crop production area) drains to the Indian Ocean via a series of streams and rivers, not confined to one major drainage basin. The annual rainfall averages of over 1000mm is concentrated in two seasons, the "short" with duration between November and December with a monthly average of 75mm to 100mm per month; and the "long" between March and May with monthly averages of around 150mm to 300mm. See precipitation graph.

Evaporation *

The period of greatest evaporation extends from June through October which is considered the dry period; and the least evaporation occurring in April, which the month having the greatest rainfall and least wind movement. Due to this pattern the incidents of flooding at this time of year is greatly increased.

Appendix 5.4

Environmental Constraints

Water Pollution - Housing Pressure*

Water resources are an important component of any countries long-term development; especially in agriculture and industrial sectors. Most urban water supply networks such as Dar es Salaam's; (which meets only 47% of its demand), requires urgent rehabilitation and expansion. It is also estimated that 35% of the urban residents in Dar es Salaam rely on ground water sources which are un-reliable. It has been indicated that there are relatively high levels of fecal coliform are present in Dar es Salaam's ground water.

Some of the city's primary water sources consist of the eight bodies; rivers or creeks located to the west. In Dar es Salaam approximately 80% of the population lives in unplanned settlements with limited access to piped water and poor sanitary conditions, often in the floodplains or steep valley walls or landfill dumps. Many of these residential areas are forced to use surface and/or ground water which has been contaminated by human waste from pit latrines and seepage or direct discharge of industrial wastes into waterways.

Due to uncontrolled population growth insufficient land for housing has been made available. This un-availability helps to further density unplanned areas, and encroachment into environmentally sensitive areas is increasing at an alarming rate.

Marine Pollution*

Marine Pollution is currently concentrated along coastal regions of Urban communities. Land based sources of agricultural pollution, sewage and industrial contaminants contributed to the deterioration of these coastal areas. Raw sewage is probably the most serious problem to the marine environment because only about 15% of the residents of Dar es Salaam are connected to the city system in which the collected sewage is discharged untreated into the harbor.

Solid Waste*

In informal settlements city collection services do not exist and if any service does exist it is usually provided by individuals or community groups. As much as 70% of waste generated in informal settlements primarily consists of organic material which when not collected becomes a breeding ground for bacteria and vermin.

In other communities, the lack adequate road networks further hinders the provision of supportive services (latrine emptying, or refuse collection). Less than approximately 10% of the city of Dar es Salaam's solid waste is collected; of which the remainder of which is burnt and/or dumped along roads or in open spaces. The limited collected wastes are usually disposed of in crude landfill sites where smoke, and odors pollute nearby residential areas. Effected residential areas often use their political clout to close down the offending facility.

Waste from latrines is also deposited at landfill sites, where it poses potential health hazards to those residing in the immediate area.

Appendix 5.5

Road Side Environment

A visual survey of major roads in the Dar es Salaam urban region area was made to assess their condition and their environs. The following is a brief description of each major road in the survey.

(1) General condition of major roads

1) Old Bagamoyo Road

Old Bagamoyo Road is a 2-lane road running north from the Dar Es Salaam (DSM) city area. The road is paved in the city area but not in the suburbs. An examination of land use along this road finds stores located at the New Bagamoyo Road Junction. From this point up to Morocco road are wide green spaces and Coconuts trees more than 10 m in height which are planted along the road, providing an accent to the road scenery.

A vast low marshy area begins past the intersection with Morocco Road and continues into the suburbs northwest. House construction is currently active in this area and land is being converted to residential housing areas.

Where the road crosses Mlalakuwa River further north soil and sand accumulates under the bridge, causing extreme disturbances to the river stream and flooding. In the suburban areas, still further to the north, houses have been built along the road in addition to factories. There is a prevalence for garbage being dumped alongside the road side which poses problems in terms of sanitation and reduced visual scenery.

2) New Bagamoyo Road

This road runs north-northeast from the DES city area through Mikocheni, and Kawe areas. The road which is currently being widened to 4 lanes in the city area, however the road is not paved in the suburban areas. Land use along this road consists of a mix of public facilities, residential areas and educational buildings between the intersection with the Kinondoni Road in the city and Morocco Road further to the north. At present there have been "Baobab" trees typically found in the savanna, preserved in the median strip where new construction has taken place. The section between the intersection with Morocco Road and the intersection with Mpakani Road is a paved and is 2-lane. Most of the areas along this section is residential but some educational buildings have also been built. There amount of greenery is abundant along the road and lots are fairly open. After passing Mpakani intersection, the road becomes unpaved but efforts to pave this section are now underway. Proceeding further into the suburbs, the road condition worsens dramatically and improvements are desirable for safety reasons. The road crosses three rivers, the Kijitonyama, Mlalakuwa, and Mbezi, and problems associated with inflow of earth and sedimentation have becomes associated with all 3 rivers.

3) Morogoro Road

Morogoro road runs west from the DES city area to the Morogoro area. A section of this road is 4 lanes but the majority consists of a paved 2-lane road. An examination of land use along this road finds stores and offices packed tightly together in the city center. Beyond the intersection with United Nation Road, Morogoro Road crosses Msimbazi River, one of

the major rivers flowing through the city. Vast amounts of greenery and open spaces extend along this river and there is an athletic field (Jangwani Playing Fields) in this area. There are low-rise residential areas and lavish green gardens near the intersection of Morocco and New Kigogo Roads, where there are also many street stalls along the sidewalk. After this intersection to the west, the road changes to 2 lanes and adjacent houses are built on large plots. Heading further into the suburbs, a concentration of small stores form a commercial area where damage to the road is prevalent. This area is a high traffic congestion area with pedestrians, commuters, parked buses, etc., are in evidence. Furthermore, a few factories have been built near the intersection with Shekilango Road where there are also many medium story houses (3 or 4 stores) lined up along the road. After passing through the intersection with Shekilango Road and entering the suburbs, the number of buildings decreases and greenery becomes more extensive.

4) Pugu Road

Pugu road consists of 4 lanes in the city area changing to 2 lanes beyond the airport. An examination of land use along this road finds that residential areas are distributed near the center of the city but, beyond the intersection with Chang'ombe Road, there is a proliferation of factories and business sites which continue into the city. Further out past the airport, the road is dotted with small villages, where tall trees are found alongside the road side.

5) Kilwa Road

Kilwa road runs south from the DES city area to the Kilwa area. Most sections of the road are 2-lane but there are some 4-lane sections as well. Kilwa Road is paved in the city area but not in the suburbs. An examination of land use along this road finds that public facilities, offices, residents and educational buildings are distributed between the intersecting (starting point) with Bandari Road and the intersection with Mandela Road. Beyond Mandela Road, the International Trade Fair Ground (called "Saba Saba") occupies a vast site. Passing further into the suburbs, the road side becomes dotted with small villages. The road crosses the Mzinga River and Kizinga River immediately after their confluence and the low marshy areas along the river are used as paddy fields.

6) Mpakani Road

Mpakani road is a completely paved 2-lane road running along the northwest side of the DES city area. Upon examination land use along this road consists of vast green areas under the jurisdiction of Dar es Salaam University, with intermittent housing to either side.

7) Shekilango Road

This road is a completely paved 2-land road running along the northwest side of the DES city area almost parallel to Mpakani Road. Examination of land uses along the road reveals mostly housing in addition to automotive repair facilities (garages) and some small stores. The road crosses the Sinza and Kijitonyama rivers in which sand or silt accumulate on the riverbed in some places, resulting in flood control problems. Some sections of this road have drainage ditches but the water does not drain due to accumulations of soil and vegetation, in ditches and lack of appropriate maintenance control.

8) Nelson Mandela Road

Nelson Mandela road is a paved 4-lane road running west to southeast along the outer boundaries of the DES city area. An examination of land use reveals a residential area occupied by structures for industrial purposes, which occupy extensive land areas. The area between the intersection with Morogoro Road and the intersection with Pugu Road is divided between residential, industrial areas and green open space. There are many small shop stalls located along the sidewalk near the intersection with Uhuru and Pugu Road.

Green areas can be found where the road crosses the Ubungo and Msimbazi rivers. Marshes (green areas) along the Msimbazi River form a vast open space that continue into the city area along 250 -500 m wide strip up to the mouth of the river. Along the section between the intersection with Pugu Road and intersection with Kilwa Road continuing to the intersection with Bandari Road, there is a mixed distribution of residential and industrial areas, and mixed residential areas and public facilities.

There are also several warehouses in conjunction with port facilities along the road near the port.

9) Morocco Road

A completely paved 2-lane road running south to north in the center of the city. Upon examination of land use along this road reveals low-rise houses near the intersection with New Bagamoyo Road. As the road continues on to the south, there are clusters of small sized stores in a few places forming market centers. There is a wide open field area which serves as a sports ground for residents. After passing the intersection with Kinondoni and Mwinjuma Road, the road crosses the Sinza River and an extensive low marshy area with greenery. A portion of this marshy area has become farmland (plate 5.1.19). Currently, houses are being built on this low marshy land and flood problem are imminent.

10) New Kigogo Road

Like Morocco Road, New Kigogo Road is a completely paved 2-lane road running south to north in the center of the city. Examination of land use along this road reveals low-rise houses to the south from the intersection with Morogoro Road lining both sides of the road. After passing through the residential area, the road crosses two east-west flowing rivers, the Ubungo and Msimbazi. A low marshy area extends along these rivers, forming a vast open space. Houses are currently being built in this area and there is some concern about possible problems with flooding. After passing over the Msimbazi River, the area becomes populated with low-rise residences, office buildings and educational facilities.

11) Uhuru Road

Uhuru road extends to the west from the central DES city area with mostly 2-lane but in parts having 4-lanes. An examination of land uses along this road finds a mixed environment of houses, commercial facilities, business facilities and medium-story buildings. There is extreme damage to the road in this section, causing traffic congestion, and safety problems. Karume Stadium, which is a sports park, is located near the intersection with New Kigogo Road. Beyond this intersection are markets, low and medium-story houses lining the road. The road is covered with sand in this area and dust is stirred up by passing cars, resulting in deterioration of air quality. The road becomes 4-lane after this section where the environment improves drastically. Medium-story houses and educational facilities line the road in addition to small shops near the intersection with Mandela Road.

12) Chang'ombe Road

Chang'ombe Road is a 2-lane paved road running south of the DES city area. An examination of land use along this road shows a mixed environment of houses and factories around the intersection with Pugu Road many of which are 3 or 4 stories in height. The road in this area of mixed residential-industrial use is badly damaged due to heavy rains during the rainy season. There are presently no drainage system, arrangements which increases the likelihood of flooding in several different areas.

13) Kigamboni district

Kigamboni district is situated no further than 2 - 3 km from the central DES city area but is separated from the central city by Dar es Salaam harbor. Currently, traffic is dependent entirely on ferries, for access to the CBD and other areas. The existing road from Kigamboni to DSM requires a travel time of between 1 - 2 hours. In this area there are roads connecting villages but most of these roads are untouched, having no road maintenance performed, on then resulting in poor road conditions. An examination of land use along this road finds mostly farmland and a natural environment. Also in this area are villages and cottages mostly built along coastal areas.