Appendix 12. 9. 2 Design Traffic Number (DTN)

Name of Roads	IDT in 1994Yeae				Initial Traffic Number in Terms of Heavy Vehicle			Adjustment Factor				DTN in 2004Year				DTN in 2014Year			
	Medium Goods	Heavy Goods	Bus	Total	Medium Goods	Heavy Goods	Bus	2004 Year Traffic Growth Rate Medium/Heavy 2%	Bus 10%	2014 Year Traffic Growth Rate Medium/Heavy 2%	Bus 10%	Medium Goods	Heavy Goods	Bus	Total	Medium Goods	Heavy Goods	Bus	Total
					①	②	③	④	⑤	⑥	⑦	①×④	②×④	③×⑤		①×⑥	②×⑥	③×⑦	
P-1 Morogoro road																			
-Up to Port Ac. J.	1695	258	389	2342	509	181	167	0.55	0.80	1.21	2.86	280	100	134	514	616	220	478	1314
P-2 New bagomoyo road																			
Upanga road	887	117	374	1378	267	82	113	0.55	0.80	1.21	2.86	147	46	91	284	324	100	324	748
-Central area road	34	1	0	35	11	1	0	0.55	0.80	1.21	2.86	7	1	0	8	14	2	0	16
New bagamoyo road																			
-Up to Mpakani J.	1073	130	226	1429	322	91	68	0.55	0.80	1.21	2.86	178	51	55	284	390	111	195	696
-Beyond Mpakani J.	481	61	61	603	145	43	18	0.55	0.80	1.21	2.86	80	24	14	112	176	52	51	279
P-5 Mwinjima Area Group																			
Mwinjima road	348	38	124	510	105	27	38	0.55	0.80	1.21	2.86	58	15	31	104	128	33	109	270
Mwinjima L-1	33	1	0	34	10	1	0	0.55	0.80	1.21	2.86	6	1	0	7	12	1	0	13
Morocco road	568	79	47	694	171	56	15	0.55	0.80	1.21	2.86	95	31	12	138	207	68	43	318
Kinondoni road	18	0	160	178	6	0	48	0.55	0.80	1.21	2.86	4	0	39	43	8	0	138	146
Shekilango road	267	20	12	299	81	14	4	0.55	0.80	1.21	2.86	45	8	4	57	99	17	12	128
Makanya road	18	0	0	18	6	0	0	0.55	0.80	1.21	2.86	4	0	0	4	8	0	0	8
P-7 Central Area Group																			
Central Area roads	34	1	0	35	11	1	0	0.55	0.80	1.21	2.86	7	1	0	8	14	2	0	16
Bandari road	1042	218	89	1349	313	153	27	0.55	0.80	1.21	2.86	173	85	22	280	379	186	78	643
Nkurumah road	33	1	0	34	10	1	0	0.55	0.80	1.21	2.86	6	1	0	7	12	1	0	13
Sokoine road	171	21	855	1047	52	15	257	0.55	0.80	1.21	2.86	29	9	206	244	63	19	736	818
Gerezani road	994	198	126	1318	299	139	38	0.55	0.80	1.21	2.86	165	77	31	273	362	169	109	640
Kivukoni road	157	18	126	301	48	13	38	0.55	0.80	1.21	2.86	27	8	31	66	59	16	109	184
Maktaba road	203	25	0	228	61	18	0	0.55	0.80	1.21	2.86	34	10	0	44	74	22	0	96
Ohio road	34	1	0	35	11	1	0	0.55	0.80	1.21	2.86	7	1	0	8	14	2	0	16
Ocean road	33	1	0	34	10	1	0	0.55	0.80	1.21	2.86	6	1	0	7	12	1	0	13
P-8 Kariakoo Area Group																			
Kariakoo Area roads	44	46	0	90	14	33	0	0.55	0.80	1.21	2.86	8	19	0	27	17	40	0	57
Msinbazi road	712	171	591	1474	214	120	178	0.55	0.80	1.21	2.86	118	66	143	327	259	146	510	915
P-9 Chango' mbe Area Group																			
Chango' mbe Area roads																			
-Factory area roads	85	9	158	252	26	7	48	0.55	0.80	1.21	2.86	15	4	39	58	32	9	138	179
-Residence area roads	33	1	0	34	10	1	0	0.55	0.80	1.21	2.86	6	1	0	7	12	1	0	13
Chango' mbe road	1209	60	136	1405	363	42	41	0.55	0.80	1.21	2.86	200	24	33	257	440	51	118	609

Appendix 12. 9. 3 Effective Thickness of Existing Pavement

Name of Roads	Overlay Length	Existing Pavemant Thickness		Conversion Factor		Effective Thickness (Te)
		Surface	Base	Surface	Base	
	(km)	(mm)	(mm)	(mm)	(mm)	(mm)
		①	②	③	④	①×③+②×④
P-1 Morogoro road	–	–	–	–	–	–
–Up to Port Ac. J.	–	–	–	–	–	–
P-2 New bagamoyo road	2. 30	–	–	–	–	–
Upanga road	–	–	–	–	–	–
–Central area road	0. 30	25	250	0. 8	0. 4	120
New bagamoyo road						
–Up to Morocco J.	–	–	–	–	–	–
–Beyond Morocco J.	2. 00	120	30	0. 8	0. 4	110
P-5 Mwinjima Area Group	7. 03	–	–	–	–	–
Mwinjima road	0. 75	20	100	0. 8	0. 4	55
Mwinjima L-1	–	–	–	–	–	–
Morocco road	2. 78	35	130	0. 8	0. 4	80
Kinondoni road	–	–	–	–	–	–
Shekilango road	2. 00	10	115	0. 8	0. 4	55
Makanya road	1. 50	50	100	0. 8	0. 4	80
P-7 Central Area Group	17. 08	–	–	–	–	–
Central Area roads	6. 10	25	250	0. 8	0. 4	120
Bandari road	2. 00	60	120	0. 8	0. 4	95
Nkurumah road	0. 36	25	250	0. 8	0. 4	120
Sokoine road	0. 82	25	250	0. 8	0. 4	120
Gerezani road	1. 39	60	120	0. 8	0. 4	95
Kivukoni road	1. 22	25	250	0. 8	0. 4	120
Maktaba road	0. 93	25	250	0. 8	0. 4	120
Ohio road	0. 96	25	250	0. 8	0. 4	120
Ocean road	3. 30	50	180	0. 8	0. 4	110
P-8 Kariakoo Area Group	3. 70	–	–	–	–	–
Kariakoo area roads	2. 02	20	150	0. 8	0. 4	75
Msinbazi road	1. 68	35	250	0. 8	0. 4	130
P-9 Chango' mbe Area Group	4. 78	–	–	–	–	–
Chango' mbe Area roads						
–Factory area roads	1. 35	25	220	0. 8	0. 4	110
–Residence area roads	1. 66	25	220	0. 8	0. 4	110
Chango' mbe road	1. 77	50	200	0. 8	0. 4	120

Appendix 12. 9. 4 Required Thichness of Overlay

Name of Roads	Overlay Length (km) ①	CBR Val. (%) ②	DTN in 2004 Year ③	Full-depth Thick. (Ta) in 2004 (mm) ④	Effective Thickness (Te) (mm) ⑤	Overlay Thickness (mm) ⑥-④-⑤
P-1 Morogoro road	–	–	–	–	–	–
-Up to Port Ac. J.	–	–	–	–	–	–
P-2 New bagamoyo road	2. 30	–	–	–	–	–
Upanga road	–	–	–	–	–	100
-Central area road	0. 30	8	8	135	120	25
New bagamoyo road						
-Up to Morocco J.	–	–	–	–	–	–
-Beyond Morocco J.	2. 00	8	284	225	110	100
P-5 Mwinjima Area Group	7. 03	–	–	–	–	–
Mwinjima road	0. 75	10	104	170	55	100
Mwinjima L-1	–	–	–	–	–	–
Morocco road	2. 78	10	138	175	80	100
Kinondoni road	–	–	–	–	–	–
Shekilango road	2. 00	6	57	195	55	100
Makanya road	1. 50	8	4	125	80	50
P-7 Central Area Group	17. 08	–	–	–	–	–
Central Area roads	6. 10	8	8	135	120	25
Bandari road	2. 00	8	280	205	95	100
Nkurumah road	0. 36	8	7	135	120	25
Sokoine road	0. 82	8	244	205	120	80
Gerezani road	1. 39	8	273	205	95	100
Kivukoni road	1. 22	8	66	175	120	60
Maktaba road	0. 93	8	44	175	120	60
Ohio road	0. 96	8	8	135	120	25
Ocean road	3. 30	8	7	135	110	25
P-8 Kariakoo Area Group	3. 70	–	–	–	–	–
Kariakoo area roads	2. 02	8	27	160	75	90
Msinbazi road	1. 68	8	327	210	130	80
P-9 Chango' mbe Area Group	4. 78	–	–	–	–	–
Chango' mbe Area roads						
-Factory area roads	1. 35	8	58	175	110	70
-Residence area roads	1. 66	8	7	135	110	25
Chango' mbe road	1. 77	10	257	185	120	70

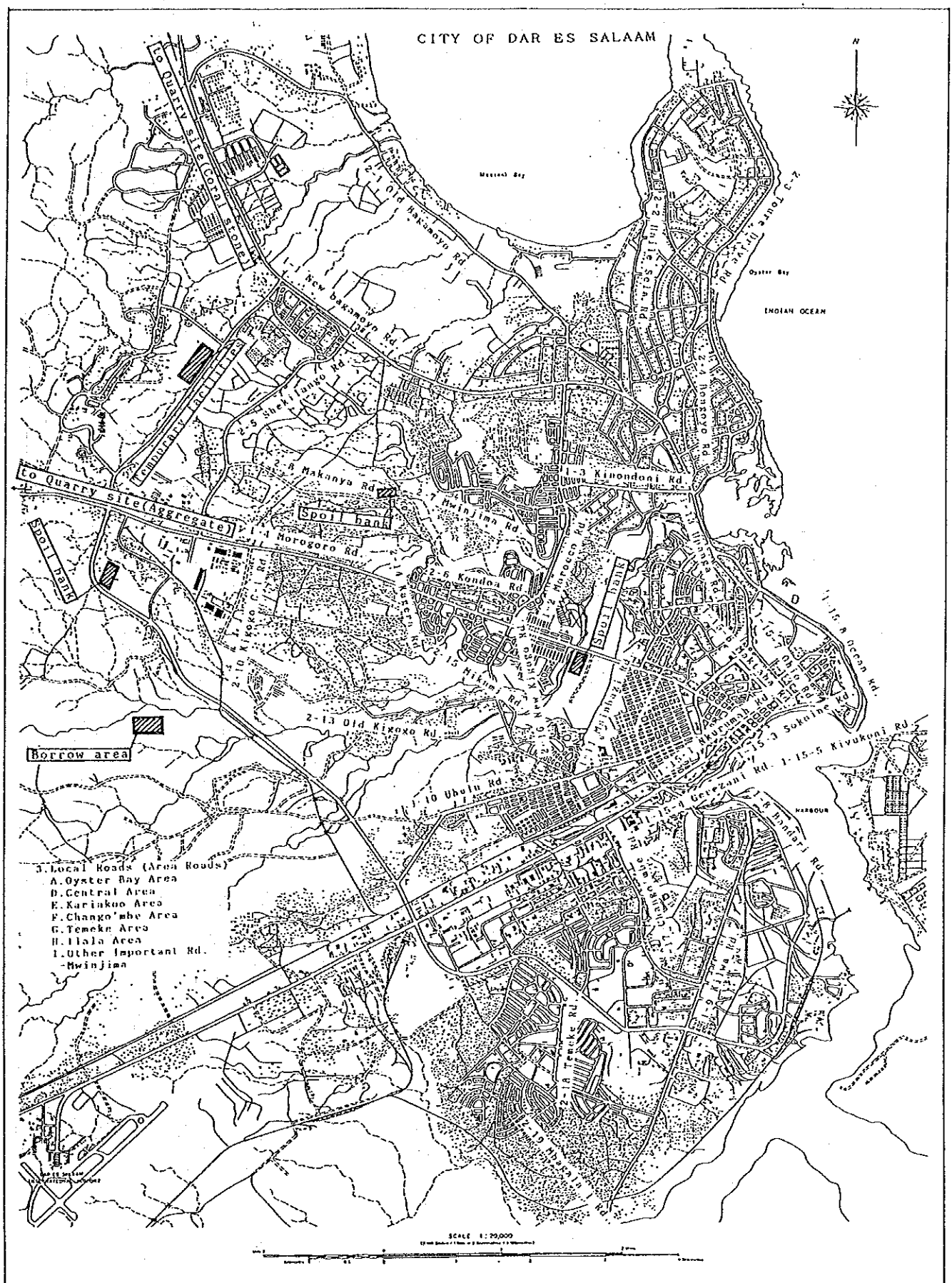
Appendix 12. 9. 5 Required Thickness of Reconstruction

Name of Roads	Reconst-ruction Length (km) ①	CBR Val. % ②	DTN in 2014 Year ③	Full-depth Thick. (Ta) in 2014 (mm) ④	Pavement structure of Reconstruction: Surface (mm) ⑤	Base (mm) ⑥	Subbace (mm) ⑦	(Ta) ⑤×1.0+⑥ ×0.35+⑦×0.25	Total Thickness (mm)
P-1 Morogoro road	–	–	–	–	–	–	–	–	–
* -Up to Port Ac. J.	–	8	1314	245	100	200	300	245	600
P-2 New bagamoyo road	1. 38	–	–	–	–	–	–		–
*Upanga road		8	748	235	100	200	300	245	600
-Central area road	0. 23	8	16	150	50	150	250	165	450
New bagamoyo road									
* -Up to Morocco J.	–	8	696	235	100	200	300	245	600
-Beyond Morocco J.	1. 15	8	696	235	100	200	300	245	600
P-5 Mwinjima Area Group	9. 35	–	–	–	–	–	–	–	–
Mwinjima road	1. 40	10	270	185	70	200	250	200	520
Mwinjima L-1	1. 50	10	13	150	50	150	250	165	450
Morocco road	0. 80	10	318	185	70	200	250	200	520
Kinondoni road	0. 35	10	146	165	50	150	250	165	450
Shekilango road	1. 80	6	128	215	100	200	300	245	600
Makanya road	3. 50	8	8	135	50	150	250	165	450
P-7 Central Area Group	3. 70	–	–	–	–	–	–	–	–
Central Area roads	3. 70	8	16	150	50	150	250	165	450
Bandari road	–	–	–	–	–	–	–	–	–
Nkurumah road	–	–	–	–	–	–	–	–	–
Sokoine road	–	–	–	–	–	–	–	–	–
Gerezani road	–	–	–	–	–	–	–	–	–
Kivukoni road	–	–	–	–	–	–	–	–	–
Maktaba road	–	–	–	–	–	–	–	–	–
Ohio road	–	–	–	–	–	–	–	–	–
Ocean road	–	–	–	–	–	–	–	–	–
P-8 Kariakoo Area Group	24. 68	–	–	–	–	–	–	–	–
Kariakoo area roads	24. 68	8	57	165	50	150	250	165	450
Msinbazi road	–	–	–	210	–	–	–	–	–
P-9 Chango' mbe Area Group	9. 04	–	–	–	–	–	–	–	–
Chango' mbe Area roads									
-Factory area roads	5. 41	8	179	175	70	200	250	200	520
-Residence area roads	3 63	8	13	150	50	150	250	165	450
Chango' mbe road	–	–	–	–	–	–	–	–	–

*Widening

CHAPTER 13 CONSTRUCTION PLAN COST ESTIMATE

LIST OF APPENDICES



Appendix 13.1 General Layout of Construction Facilities

APPENDIX 13.2 Detailed Breakdown of Majour Work Quantities (1/9)

Work Item : LOT A-1-I New Bagamoyo Group (1/2) New bagamoyo road

Item No.	Description		Unit	Total	Work Item					
					Overlay	Reconst-ruction	Widening	Drainage	Bus bay	Inter-section
	1.Earth Works									
E-1	Clearing and removal of unsuitable materials		sq.m	76,000			69,200			6,800
E-2	Waste excavation	common	cu.m	11,900		3,900	4,600			3,400
E-3	Waste excavation	rock	cu.m	10,700			10,700			
E-4	Embankment	borrowed material	cu.m	11,900			11,900			
E-5	Embankment	excavated material	cu.m	9,660			9,660			
E-6	Removal of existing pavement		cu.m	3,250		970	2,070			210
	2.Pavement Works									
P-2	Sub-base course pavement		cu.m	15,300		2,400	11,300		600	1,000
P-3	Base course pavement		cu.m	9,910		1,610	7,250		390	660
P-4	Shoulder pavement		cu.m	1,970			1,970			
P-5	Prime coat		sq.m	47,600		8,050	34,300		1,940	3,310
P-6	Asphalt pavement		ton	13,900	3,000	1,900	7,800		400	800
P-7	Sidewalk		sq.m	18,700			13,900		2,900	1,900
P-8	Kerb stone		lin.m	4,960			4,600			360
P-9	Boundary block		lin.m	11,500			9,600		1,000	900
	3.Drainage Works									
D-1	Side riprap drainage		sq.m	2,440			2,440			
D-2(B)	Side flume drainage	400 x 500	lin.m	1,800			1,800			
D-3	L-shaped side ditch		lin.m	3,270			1,800		870	600
D-4&5	Catch pit and Man hole		nos.	85			30	6	29	20
D-7(A)	Pipe culvert	Diam.= 300 mm	lin.m							
D-6&7(B)	Pipe culvert	Diam.= 600 mm	lin.m	750					150	600
D-7(C)	Pipe culvert	Diam.= 1,000 mm	lin.m	140				140		
D-8	Re-installation of existing drainage		lin.m							
	4.Others									
O-1	Road lighting pole	L type	nos.							
O-2	Road lighting pole	Y type	nos.	25			25			
O-3	Traffic signal		sec.	4			4			
O-4	Pedestrian bridge		no.							
O-5	Relocation of utilities	Telephone line	lin.m	3,500			3,500			
O-6	Relocation of utilities	Water supply valve	nos.	4			4			
O-7	Relocation of utilities	Power supply	lin.m	3,500			3,500			

APPENDIX 13.2 Detailed Breakdown of Majour Work Quantities (2/9)

Work Item : LOT A-1-II New Bagamoyo Group (2/2) Upanga road

Item No.	Description		Unit	Total	Work Item					
					Overlay	Reconst-ruction	Widening	Drainage	Bus bay	Inter-section
	1.Earth Works									
E-1	Clearing and removal of unsuitable materials		sq.m	18,700			11,900			6,800
E-2	Waste excavation	common	cu.m	7,150		280	4,750			2,120
E-3	Waste excavation	rock	cu.m							
E-4	Embankment	borrowed material	cu.m							
E-5	Embankment	excavated material	cu.m							
E-6	Removal of existing pavement		cu.m	1,040		340				700
	2.Pavement Works									
P-2	Sub-base course pavement		cu.m	5,570		350	3,610		130	1,480
P-3	Base course pavement		cu.m	3,680		210	2,400		80	990
P-4	Shoulder pavement		cu.m							
P-5	Prime coat		sq.m	27,500		1,400	20,800		400	4,900
P-6	Asphalt pavement		ton	6,270	100	160	4,770		100	1,140
P-7	Sidewalk		sq.m	7,060			5,810			1,250
P-8	Kerb stone		lin.m	510						510
P-9	Boundary block		lin.m	2,830			2,440			390
	3.Drainage Works									
D-1	Side riprap drainage		sq.m							
D-2(B)	Side flume drainage	400 x 500	lin.m	2,890			2,500			390
D-3	L-shaped side ditch		lin.m	2,890			2,500			390
D-4&5	Catch pit and Man hole		nos.	59			42	4		13
D-7(A)	Pipe culvert	Diam.= 300 mm	lin.m							
D-6&7(B)	Pipe culvert	Diam.= 600 mm	lin.m							
D-7(C)	Pipe culvert	Diam.= 1,000 mm	lin.m	44				44		
D-8	Re-installation of existing drainage		lin.m							
	4.Others									
O-1	Road lighting pole	L type	nos.	66			66			
O-2	Road lighting pole	Y type	nos.							
O-3	Traffic signal		sec.	4			4			
O-4	Pedestrian bridge		no.							
O-5	Relocation of utilities	Telephone line	lin.m	1,800			1,800			
O-6	Relocation of utilities	Water supply valve	nos.							
O-7	Relocation of utilities	Power supply	lin.m	1,800			1,800			

APPENDIX 13.2 Detailed Breakdown of Majour Work Quantities (3/9)

Work Item : LOT A-2 Morogoro Road

Item No.	Description		Unit	Total	Work Item					
					Widening	Drainage	Bus bay	Inter-section		
	1.Earth Works									
E-1	Clearing and removal of unsuitable materials		sq.m	206,000	205,000			1,000		
E-2	Waste excavation	common	cu.m	50,600	48,100			2,500		
E-3	Waste excavation	rock	cu.m	0						
E-4	Embankment	borrowed material	cu.m	33,200	33,200					
E-5	Embankment	excavated material	cu.m	20,700	20,700					
E-6	Removal of existing pavement		cu.m	9,620	9,620					
	2.Pavement Works									
P-2	Sub-base course pavement		cu.m	31,700	28,500		1,700	1,500		
P-3	Base course pavement		cu.m	20,300	18,200		1,100	1,000		
P-4	Shoulder pavement		cu.m	7,140	7,140					
P-5	Prime coat		sq.m	95,200	84,600		5,600	5,000		
P-6	Asphalt pavement		ton	22,000	19,500		1,300	1,200		
P-7	Sidewalk		sq.m	40,400	29,500		8,900	2,000		
P-8	Kerb stone		lin.m	12,900	12,500			400		
P-9	Boundary block		lin.m	30,400	27,700		1,800	900		
	3.Drainage Works									
D-1	Side riprap drainage		sq.m	8,170	8,170					
D-2(B)	Side flume drainage	400 x 500	lin.m	0						
D-3	L-shaped side ditch		lin.m	2,010			1,370	640		
D-4&5	Catch pit and Man hole		nos.	80		10	50	20		
D-7(A)	Pipe culvert	Diam.= 300 mm	lin.m	640				640		
D-6&7(B)	Pipe culvert	Diam.= 600 mm	lin.m	2,750	1,420		1,330			
D-7(C)	Pipe culvert	Diam.= 1,000 mm	lin.m	180		180				
D-8	Re-installation of existing drainage		lin.m	0						
	4.Others									
O-1	Road lighting pole	L type	nos.	0						
O-2	Road lighting pole	Y type	nos.	98	98					
O-3	Traffic signal		sec.	3	3					
O-4	Pedestrian bridge		no.	1	1					
O-5	Relocation of utilities	Telephone line	lin.m	5,700	5,700					
O-6	Relocation of utilities	Water supply valve	nos.							
O-7	Relocation of utilities	Power supply	lin.m	11,400	11,400					

APPENDIX 13.2 Detailed Breakdown of Majour Work Quantities (4/9)

Work Item : LOT A-3 Chang'ombe Area Group

Item No.	Description		Unit	Total	Chang'ombe area		Chang'ombe		
					Overlay	Reconst-ruction	Overlay		
	1.Earth Works								
E-1	Clearing and removal of unsuitable materials		sq.m						
E-2	Waste excavation	common	cu.m	12,700		12,700			
E-3	Waste excavation	rock	cu.m						
E-4	Embankment	borrowed material	cu.m						
E-5	Embankment	excavated material	cu.m						
E-6	Removal of existing pavement		cu.m	12,400		12,400			
	2.Pavement Works								
P-2	Sub-base course pavement		cu.m	12,600		12,600			
P-3	Base course pavement		cu.m	9,250		9,250			
P-4	Shoulder pavement		cu.m						
P-5	Prime coat		sq.m	50,500		50,500			
P-6	Asphalt pavement		ton	12,100	2,700	7,400	2,000		
P-7	Sidewalk		sq.m						
P-8	Kerb stone		lin.m						
P-9	Boundary block		lin.m						
	3.Drainage Works								
D-1	Side riprap drainage		sq.m						
D-2(B)	Side flume drainage	400 x 500	lin.m						
D-3	L-shaped side ditch		lin.m						
D-4&5	Catch pit and Man hole		nos.						
D-7(A)	Pipe culvert	Diam.= 300 mm	lin.m						
D-6&7(B)	Pipe culvert	Diam.= 600 mm	lin.m						
D-7(C)	Pipe culvert	Diam.= 1,000 mm	lin.m						
D-8	Re-installation of existing drainage		lin.m	1,750		1,750			
	4.Others								
O-1	Road lighting pole	L type	nos.						
O-2	Road lighting pole	Y type	nos.						
O-3	Traffic signal		sec.						
O-4	Pedestrian bridge		no.						
O-5	Relocation of utilities	Telephone line	lin.m						
O-6	Relocation of utilities	Water supply valve	nos.						
O-7	Relocation of utilities	Power supply	lin.m						

APPENDIX 13.2 Detailed Breakdown of Majour Work Quantities (5/9)

Work Item : LOT A-4 Kariakoo Area Group

Item No.	Description		Unit	Total	Kariakoo area		Msimbazi		
					Overlay	Reconst-ruction	Overlay		
	1.Earth Works								
E-1	Clearing and removal of unsuitable materials		sq.m						
E-2	Waste excavation	common	cu.m	37,200		37,200			
E-3	Waste excavation	rock	cu.m						
E-4	Embankment	borrowed material	cu.m						
E-5	Embankment	excavated material	cu.m						
E-6	Removal of existing pavement		cu.m	22,600		22,600			
	2.Pavement Works								
P-2	Sub-base course pavement		cu.m	33,300		33,300			
P-3	Base course pavement		cu.m	26,600		26,600			
P-4	Shoulder pavement		cu.m						
P-5	Prime coat		sq.m	136,000		136,000			
P-6	Asphalt pavement		ton	22,300	3,000	15,300	4,000		
P-7	Sidewalk		sq.m						
P-8	Kerb stone		lin.m						
P-9	Boundary block		lin.m						
	3.Drainage Works								
D-1	Side riprap drainage		sq.m						
D-2(B)	Side flume drainage	400 x 500	lin.m						
D-3	L-shaped side ditch		lin.m						
D-4&5	Catch pit and Man hole		nos.						
D-7(A)	Pipe culvert	Diam.= 300 mm	lin.m						
D-6&7(B)	Pipe culvert	Diam.= 600 mm	lin.m						
D-7(C)	Pipe culvert	Diam.= 1,000 mm	lin.m						
D-8	Re-installation of existing drainage		lin.m	2,500		2,500			
	4.Others								
O-1	Road lighting pole	L type	nos.						
O-2	Road lighting pole	Y type	nos.						
O-3	Traffic signal		sec.						
O-4	Pedestrian bridge		no.						
O-5	Relocation of utilities	Telephone line	lin.m						
O-6	Relocation of utilities	Water supply valve	nos.						
O-7	Relocation of utilities	Power supply	lin.m						

APPENDIX 13.2 Detailed Breakdown of Majour Work Quantities (6/9)

Work Item : LOT A-5 Mwinjima Area Group (1/2)

Item No.	Description		Unit	Total	Mwinjima area		Mwinjima,L	Shekilango road	
					Overlay	Reconst-ruction	Reconst-ruction	Overlay	Reconst-ruction
	1.Earth Works								
E-1	Clearing and removal of unsuitable materials		sq.m	0					
E-2	Waste excavation	common	cu.m	19,800		3,900	2,100		5,700
E-3	Waste excavation	rock	cu.m	0					
E-4	Embankment	borrowed material	cu.m	0					
E-5	Embankment	excavated material	cu.m	0					
E-6	Removal of existing pavement		cu.m	7,380		1,180	750		1,490
	2.Pavement Works								
P-2	Sub-base course pavement		cu.m	14,900		2,500	1,900		3,600
P-3	Base course pavement		cu.m	10,500		2,000	1,500		2,400
P-4	Shoulder pavement		cu.m	0					
P-5	Prime coat		sq.m	57,400		9,800	8,300		11,900
P-6	Asphalt pavement		ton	18,600	1,200	1,600	900	3,000	2,700
P-7	Sidewalk		sq.m	2,160					
P-8	Kerb stone		lin.m	0					
P-9	Boundary block		lin.m	680					
	3.Drainage Works								
D-1	Side riprap drainage		sq.m	0					
D-2(B)	Side flume drainage	400 x 500	lin.m	0					
D-3	L-shaped side ditch		lin.m	680					
D-4&5	Catch pit and Man hole		nos.	20					
D-7(A)	Pipe culvert	Diam.= 300 mm	lin.m	0					
D-6&7(B)	Pipe culvert	Diam.= 600 mm	lin.m	0					
D-7(C)	Pipe culvert	Diam.= 1,000 mm	lin.m	0					
D-8	Re-installation of existing drainage		lin.m	0					
	4.Others								
O-1	Road lighting pole	L type	nos.	0					
O-2	Road lighting pole	Y type	nos.	0					
O-3	Traffic signal		sec.	0					
O-4	Pedestrian bridge		no.	0					
O-5	Relocation of utilities	Telephone line	lin.m	0					
O-6	Relocation of utilities	Water supply valve	nos.	0					
O-7	Relocation of utilities	Power supply	lin.m	0					

APPENDIX 13.2 Detailed Breakdown of Majour Work Quantities (7/9)

Work Item : LOT A-5 Mwinjima Area Group (2/2)

Item No.	Description		Unit	Morocco road			Kinondoni	Makanya road	
				Overlay	Reconst-ruction	Bus bay	Reconst-ruction	Overlay	Reconst-ruction
	1.Earth Works								
E-1	Clearing and removal of unsuitable materials		sq.m						
E-2	Waste excavation	common	cu.m		2,100		700		5,300
E-3	Waste excavation	rock	cu.m						
E-4	Embankment	borrowed material	cu.m						
E-5	Embankment	excavated material	cu.m						
E-6	Removal of existing pavement		cu.m		990		340		2,630
	2.Pavement Works								
P-2	Sub-base course pavement		cu.m		1,500	400	600		4,400
P-3	Base course pavement		cu.m		1,200	300	500		2,600
P-4	Shoulder pavement		cu.m						
P-5	Prime coat		sq.m		6,000	1,500	2,400		17,500
P-6	Asphalt pavement		ton	4,800	1,000	200	300	900	2,000
P-7	Sidewalk		sq.m			2,160			
P-8	Kerb stone		lin.m						
P-9	Boundary block		lin.m			680			
	3.Drainage Works								
D-1	Side riprap drainage		sq.m						
D-2(B)	Side flume drainage	400 x 500	lin.m						
D-3	L-shaped side ditch		lin.m			680			
D-4&5	Catch pit and Man hole		nos.			20			
D-7(A)	Pipe culvert	Diam.= 300 mm	lin.m						
D-6&7(B)	Pipe culvert	Diam.= 600 mm	lin.m						
D-7(C)	Pipe culvert	Diam.= 1,000 mm	lin.m						
D-8	Re-installation of existing drainage		lin.m						
	4.Others								
O-1	Road lighting pole	L type	nos.						
O-2	Road lighting pole	Y type	nos.						
O-3	Traffic signal		sec.						
O-4	Pedestrian bridge		no.						
O-5	Relocation of utilities	Telephone line	lin.m						
O-6	Relocation of utilities	Water supply valve	nos.						
O-7	Relocation of utilities	Power supply	lin.m						

APPENDIX 13.2 Detailed Breakdown of Majour Work Quantities (8/9)

Work Item : LOT A-6 Central Area Group (1/2)

Item No.	Description		Unit	Total	Central area		Bandari	Nkurumah	Sokoine
					Overlay	Reconst-ruction	Overlay	Overlay	Overlay
	1.Earth Works								
E-1	Clearing and removal of unsuitable materials		sq.m						
E-2	Waste excavation	common	cu.m	4,760		4,760			
E-3	Waste excavation	rock	cu.m						
E-4	Embankment	borrowed material	cu.m						
E-5	Embankment	excavated material	cu.m						
E-6	Removal of existing pavement		cu.m	7,480		7,480			
	2.Pavement Works								
P-2	Sub-base course pavement		cu.m	6,800		6,800			
P-3	Base course pavement		cu.m	4,080		4,080			
P-4	Shoulder pavement		cu.m						
P-5	Prime coat		sq.m	27,200		27,200			
P-6	Asphalt pavement		ton	18,500	2,900	3,100	3,200	200	1,400
P-7	Sidewalk		sq.m						
P-8	Kerb stone		lin.m						
P-9	Boundary block		lin.m						
	3.Drainage Works								
D-1	Side riprap drainage		sq.m						
D-2(B)	Side flume drainage	400 x 500	lin.m						
D-3	L-shaped side ditch		lin.m						
D-4&5	Catch pit and Man hole		nos.						
D-7(A)	Pipe culvert	Diam.= 300 mm	lin.m						
D-6&7(B)	Pipe culvert	Diam.= 600 mm	lin.m						
D-7(C)	Pipe culvert	Diam.= 1,000 mm	lin.m						
D-8	Re-installation of existing drainage		lin.m	740		740			
	4.Others								
O-1	Road lighting pole	L type	nos.						
O-2	Road lighting pole	Y type	nos.						
O-3	Traffic signal		sec.						
O-4	Pedestrian bridge		no.						
O-5	Relocation of utilities	Telephone line	lin.m						
O-6	Relocation of utilities	Water supply valve	nos.						
O-7	Relocation of utilities	Power supply	lin.m						

APPENDIX 13.2 Detailed Breakdown of Majour Work Quantities (9/9)

Work Item : LOT A-6 Central Area Group (2/2)

Item No.	Description		Unit	Gerezani	Kivukoni	Maktaba	Ohio	Ocean	
				Overlay	Overlay	Overlay	Overlay	Overlay	
	1.Earth Works								
E-1	Clearing and removal of unsuitable materials		sq.m						
E-2	Waste excavation	common	cu.m						
E-3	Waste excavation	rock	cu.m						
E-4	Embankment	borrowed material	cu.m						
E-5	Embankment	excavated material	cu.m						
E-6	Removal of existing pavement		cu.m						
	2.Pavement Works								
P-2	Sub-base course pavement		cu.m						
P-3	Base course pavement		cu.m						
P-4	Shoulder pavement		cu.m						
P-5	Prime coat		sq.m						
P-6	Asphalt pavement		ton	3,000	1,500	1,600	500	1,100	
P-7	Sidewalk		sq.m						
P-8	Kerb stone		lin.m						
P-9	Boundary block		lin.m						
	3.Drainage Works								
D-1	Side riprap drainage		sq.m						
D-2(B)	Side flume drainage	400 x 500	lin.m						
D-3	L-shaped side ditch		lin.m						
D-4&5	Catch pit and Man hole		nos.						
D-7(A)	Pipe culvert	Diam.= 300 mm	lin.m						
D-6&7(B)	Pipe culvert	Diam.= 600 mm	lin.m						
D-7(C)	Pipe culvert	Diam.= 1,000 mm	lin.m						
D-8	Re-installation of existing drainage		lin.m						
	4.Others								
O-1	Road lighting pole	L type	nos.						
O-2	Road lighting pole	Y type	nos.						
O-3	Traffic signal		sec.						
O-4	Pedestrian bridge		no.						
O-5	Relocation of utilities	Telephone line	lin.m						
O-6	Relocation of utilities	Water supply valve	nos.						
O-7	Relocation of utilities	Power supply	lin.m						

CHAPTER 14 ECONOMIC ANALYSIS AND EVALUATION

LIST OF APPENDICES

Appendix 14.1 Characteristics of Representative Vehicle

Vehicle Category	Car Taxi	Light Goods	Medium Goods	Heavy Goods	Bus
Representative Vehicle	Totyta Corola	Toyota Pick-up	ISUZU NKR	Scania	Layland
Vehicle Price (Tsh.)					
- Rental	1,000,000	1,360,000	4,032,000	17,600,000	12,500,000
- Economic	400,000	816,000	2,880,000	14,600,000	10,331,000
Type of Fuel	Gasolin	Gasolin	Diesel	Diesel	Diesel
Consumption Rate (litter/1000Km)	83.3	111.1	200	200	200
Fuel Price (Tsh./litter)					
- Rental	96.2	96.2	39.1	39.1	39.1
- Economic	77.0	77.0	37.0	37.0	37.0
Engine Oil					
Engine Oil Consumption Rate (litter/1000Km)	1	1	2	4	4
Engine Oil PRICE (Tsh./litter)					
- Retail	375	375	325	325	325
- Economic	295	295	245.5	245.5	245.5
Number of Tyre (including spear)	5	5	7	7	7
Tyre LIfe (Km)	80,000	70,000	60,000	40,000	40,000
Unit Tyre Price (tsh.)					
- Retail	6,625	6,625	11,085	52,745	43,297
- Economic	4,969.5	4,701.8	8,313.8	39,558.8	32,472.8
Maintenance Labour Cost per Annum (Tsh.)	7,200	18,000	36,000	45,500	42,000
Vehicle Utilization					
- Annual Operation Distance (Km)	12,000	15,000	50,000	60,000	90,000
- Annual Operation Hours	2,400	2,400	2,400	2,400	3,200
- Vehicle Use in Years	8	8	15	15	10

APPENDICES: SCOPE OF WORK AND MINUTES OF MEETINGS

LIST OF APPENDICES

Appendix 16-1 SCOPE OF WORK

SCOPE OF WORK

FOR

THE FEASIBILITY STUDY
ON
ROAD IMPROVEMENT AND MAINTENANCE IN DAR ES SALAAM

IN

THE UNITED REPUBLIC OF TANZANIA

AGREED UPON BETWEEN

DAR ES SALAAM CITY COUNCIL

AND

THE JAPAN INTERNATIONAL COOPERATION AGENCY

ON
5TH OF OCTOBER, 1988

Mr. M. M. Hyera
Ag. City Director
Dar es Salaam City Council

Mr. Moriyasu Furuki
Leader of the Preliminary Study
Team,
The Japan International
Cooperation Agency (JICA)

Mr. I. N. Kimambo
Commissioner for Construction
and Maintenance
Ministry of Communications and Works

Endorsed by

Mr. M. T. Kibwana
Commissioner for External Finance
Ministry of Finance, Economic Affairs
and Planning

I. INTRODUCTION

In response to the request of the Government of the United Republic of Tanzania (hereinafter referred to as "GOT"), the Government of Japan decided to conduct the Feasibility Study on Road Improvement and Maintenance in Dar es Salaam in the United Republic of Tanzania (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter reffered to as "JICA"), the official agency responsible for the implementation of the technical cooperation programme of the Govenment of Japan, will undertake the Study, in close cooperation with the authorities concerned of the Government of Tanzania.

The present document sets forth the scope of work with regard to the Study.

II. OBJECTIVE OF THE STUDY

The Objective of the Study is to carry out a feasibility study to improve the major city roads and the maintenance system in Dar es Salaam.

III. STUDY AREA

The Study area will cover the city of Dar es Salaam.

IV. SCOPE OF THE STUDY

In order to achieve the objective mentioned above, the Study shall over the following items.

1. Study on Existing Data and Conditions
   (1) Socio-Economic Status
   (2) Traffic Condition including Traffic Safety Aspects
   (3) On-going Road Projects and Other Relevant Projects
   (4) Transportation Plans and Other Related Plans
   (5) Organization for Administration, Maintenance, Improvement and Research

2. Execution of Traffic Surveys
   (1) Road-side OD Interview Survey
   (2) Traffic Counting Survey
   (3) Data Processing and Analysing

3. Execution of Road Inventory Survey
   (1) Inspection of Road Structure
   (2) Inspection of Pavement Condition
   (3) Inspection of Drainage
   (4) Identification of Existing Road Condition Problems and Issues

4. Prediction of Future Traffic Demand
   (1) Establishment of Traffic Prediction Framework
   (2) Projection of Future Traffic OD Table
   (3) Traffic Assignment on Road Networks

5. Identification of Necessary Improvement (Upgrading & Rehabilitation)
   (1) Classification of Roads
   (2) Selection of Major Road Network for the Further Study
   (3) Identification of Improvement Measures for the Roads

6. Formulation of Upgrading and Rehabilitation Plan
   (1) Cost Estimation
   (2) Preliminary Evaluation
   (3) Identification of High Priority Projects
   (4) Implementation Programme Proposal

7. Preliminary Engineering Design and Economic Evaluation of High Priority Projects
   (1) Execution of Supplementary Site Surveys
   (2) Execution of Preliminary Engineering Design
   (3) Economic Analysis and Evaluation

8. Formulation of Road Maintenance System
   (1) Proposal of Maintenance Procedure
   (2) Proposal of Required Personnel, Equipments and Facilities including Cost Estimates
   (3) Recommendation for Maintenance System Operation

V. STUDY SCHEDULE

The Study will generally be carried out in accordance with the attached tentative schedule.

VI. REPORTS

JICA will prepare and submit the following reports in English to the GOT.

1. Inception Report
   Twenty (20) copies at the beginning of the Study in Tanzania.

2. Progress Report
   Twenty (20) copies within four (4) months after commencement of the Study.

3. Interim Report
   Twenty (20) copies within nine (9) months after commencement of the Study.

4. Draft Final Report
   Twenty (20) copies within twelve (12) months after commencement of the Study.

5. Final Report
   Fifty (50) copies within two (2) months after receiving the written comments on the Draft Final Report from the GOT.
   The comments made by the arthorities concerned of Tanzania, shall be submitted to JICA within three (3) weeks after explanation of the Draft Final Report.

VII. UNDERTAKING OF THE GOVERNMENT OF TANZANIA

1. To facilitate smooth conduct of the Study, the Government of Tanzania shall take necessary measures;
   (1) to ensure the safety of the Japanese study team,
   (2) to permit the members of the Japanese study team to enter, leave and sojourn in Tanzania for the duration of their assignment therein, and exempt them from alien registration requirement and consular fees,

(3) to exempt the members of the Japanese study team from taxes, duties and other charges on surveying and office equipment, machinery such as levels, transits, typewriters, photo-copying machines, personal computers, traffic counters etc. and other materials brought into Tanzania for the implementation of the Study,

(4) to exempt the members of the Japanese study team from income tax and other charges of any kind imposed on or in connection with any emolument or allowance paid to the members of the Japanese study team for their services in connection with the implementation of the Study,

(5) to provide necessary facilities to the Japanese study team for remittance as well as utilization of the funds introduced into Tanzania from Japan in connection with the implementation of the Study,

(6) to secure permission for entry into private properties or restricted areas for the conduct of the Study,

(7) to secure permission for the Japanese study team to take all data and documents (including photographs) to Japan, for analysis during the implementation of the Study,

(8) to provide medical services as needed. Its expenses will be chargeable on the members of the Japanese study team.

2. The Government of Tanzania shall bear claims, if any arises against members of the Japanese study team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese study team.

3. Dar es Salaam City Council (hereinafter referred to as "DCC") and Ministry of Communications and Works shall be the counterpart agencies to the Japanese study team, and DCC shall be a contact agency and shall act as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

4. DCC shall, at its own expense, provide the Japanese study team with the followings, in cooperation with other organizations concerned;

(1) available data and information related to the Study,

(2) full-time counterpart personnel,

(3) appropriate number of personnel for O.D. survey

(4) suitable office space with necessary equipments in Dar es Salaam

M. Hyz   Imq   M. H.

(5) credentials or identification cards.

VIII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures;

1. to dispatch, at its own expense, study team to Tanzania,
2. to pursue technology transfer to the Tanzanian counterpart personnel in the course of the Study,

IX. JICA and DCC shall consult with each other in respect of any matter that is not agreed upon in this document and may arise from or in connection with the Study.

TENTATIVE STUDY SCHEDULE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
WORK IN JAPAN														
WORK IN TANZANIA														
REPORT PRESENTATION	IC/R				PR/R				IT/R			DF/R		F/R

A-16-7

Appendix 16-2 MINUTES OF MEETING

MINUTES OF MEETING

ON

THE FEASIBILITY STUDY ON ROAD IMPROVEMENT AND MAINTENANCE IN DAR ES SALAAM

IN

THE UNITED REPUBLIC OF TANZANIA

BETWEEN

THE JAPANESE PRELIMINARY STUDY TEAM

AND

THE JOINT TEAM OF TANZANIAN GOVERNMENT

DAR ES SALAAM, 5TH OF OCTOBER, 1988

Mr. M. M. Hyera
Ag. City Director
Dar es Salaam City Council

Mr. Moriyasu Furuki
Leader of the Preliminary
Study Team
The Japan International Cooperation
Agency

Mr. I. N. Kimambo
Commissioner for Construction
and Maintenance
Ministry of Communications and Works

Endorsed by

Mr. M. T. Kibwana
Commissioner for External Finance
Ministry of Finance, Economic Affairs
and Planning

In response to the request of the Government of the United Republic of Tanzania, for the Feasibility Study on Road Improvement and Maintenance in Dar es Salaam (hereinafter referred to as "the Study"), the Government of Japan decided to dispatch, through the Japan International Cooperation Agency (hereinafter referred to as "JICA") responsible for the implementation of the technical cooperation programme of the Government of Japan, the Preliminary Study Team headed by Mr. Moriyasu Furuki to Tanzania from 29th of September to 7th of October, 1988, in order to discuss and to exchange views on the Study with authorities concerned of Tanzanian Government.

As a result of the series of discussion, both sides have agreed upon and signed the Scope of Work as attached hereafter. (Appendix I)

The meetings agreed as follows;

1. The Title of the Study is "The Feasibility Study on Road Improvement and Maintenance in Dar es Salaam".

2. The target-year of the Study shall be 2000.

3. The Definitions of "Upgrading" and "Rehabilitation" are "widening and reconstructing the existing road" and "pavement overlay and other major repair works".

4. DCC agreed to provide about 300 person day(tentatively 30 persons X 10 days) and several supervising engineers for the traffic survey at its own expense.

5. Team requested Tanzanian side two vehicles for the Study, however, due to shortage of vehicles in Tanzanian Government, was strongly advised to prepare the vehicles by Japanese side for the smooth execution of the study.

6. The Study shall be carried out under the supervision of a Steering Committee consisting of representatives of the Tanzanian authorities concerned:

   (1) The City Director, DCC, shall be responsible for chairing the committee.

(2) The participation shall include, (among others), the representatives from the following government departments;

a) Commissioner for Construction and Maintenance
   Ministry of Communications and Works
b) The City Engineer, DCC
c) Director of Planning and Research
   Ministry of Communications and Works
c) Commissioner for External Finance
   Ministry of Finance, Economic Affairs and Planning
d) Traffic Commandant
   Ministry of Home Affairs

7. With regard to technology transfer, Tanzanian side stressed the need of on-the-job training as well as training in Japan.

8. In view of the critical road/road traffic situation in Dar es Salaam, Tanzania side had emphasized of conducting the study at the earliest possible time.

9. List of attendance on the discussions is attached hereafter. (Appendix II)

Appendix II

List of Attendants

Japanese study Team		Joint Team of Tanzanian Government	
1. Mr. Moriyasu Furuki,	Leader	1. Mr. I. N. Kimambo Ministry of Communications & Works (MOCW)	
2. Mr. Masahiro Yagi	Member	2. Mr. F. Barozi,	MOCW
3. Mr. Masayuki Mori	Member	3. Mr. D. J. Mariki,	MOCW
4. Mr. Akira Fujimoto	Member	4. Mr. H. J. Urio,	MOCW
5. Mr. Hiroshi Murakami	Member	5. Mr. S. M. Tibanyenda,	MOCW
6. Mr. Katsuyasu Nakata	Member	6. Mr. F. Marmo,	MOCW
		7. Mr. Kalebe,	MOCW
		8. Mr. T. S. Mnyone,	MOCW
		9. Mr. T. Komuro, (JICA Expert)	MOCW
JICA Tanzania Office		10. Mr. Y. Motosaku, (JICA Expert)	MOCW
1. Mr. Nobuo Toida (Resident Representative)		11. Mr. M. Hyera,	DCC
		12. Mr. D. R. Kibaha	DCC
		13. Mrs. S. T. Sijaona	DCC
		14. Mr. P. Gasinzigwa	DCC

MINUTES OF MEETING
FOR
INCEPTION REPORT
OF
THE FEASIBILITY STUDY ON ROAD IMPROVEMENT AND MAINTENANCE IN DAR ES SALAAM
BETWEEN
DAR ES SALAAM CITY COUNCIL
AND
THE JICA STUDY TEAM

Dar es Salaam, March 21, 1989

Mr. G. P. Chale
Acting City Director
Dar es Salamm City Council
Tanzania

Mr. Hirokazu Itoh
Leader of the Study Team
Japan International Cooperation Agency, Japan

Endorsed by:

for Mr. I. N. Kimambo
Commissioner
Construction and Maintenance
Ministry of Communication and Works

Mr. Kotarou Nagasawa
Leader of the Advisory Committee, Japan

The Feasibility Study
on
Road Improvement and Maintenance
in
Dar es Salaam

Minutes of Meeting

In pursuance of the Preliminary Study conducted in October, 1988 last year, the Japan International Cooperation Agency (hereinafter referred to as "JICA") has organized and despatched the Study Team, headed by H. Itoh, to conduct the feasibility on Road Improvement and Maintenance in Dar es Salaam (hereinafter referred to as "the Study").

The Study Team submitted twenty (20) copies of the Inception Report to the City Director of Dar es Salaam City Council (hereinafter referred to as "DCC"), on March 17, 1989, in accordance with the Scope of Work (hereinafter referred to as "S/W") agreed upon between the Preliminary Study Team and DCC on October 5, 1988.

The Study Team and DCC, with the presence of MOCW and other government agencies concerned, held a series of discussions during 18th to 20th March, 1989 concering the Inception Report for the Study.

As a result of series of discussion, the following minutes has been agreed upon and signed by both the Study Team and DCC:

1. Inception Report

   DCC acknowledged the receipt of 20 copies of Inception Report, and agreed in principle the content and methodology of the study described in the Inception Report.

2 Road Links Proposed by DCC

Tanzanian side proposed to the Study Team to delete three road links of Bagamoyo Road, Upanga Street and Mpakani Road from the list of road networks originally proposed by Tanzanian government since these three roads have been already committed by other doner country for its improvement. These roads, however, should be considered when the selection of road network is made for formulating the road improvement plan in terms of short, middle and long plans. Tanzanian side requested, instead of the above roads deleted, to include other roads of old Bagamoyo Road, old Kigogo Road, Temeke area streets and Ilala commercial and residential area streets.

The Study Team agreed to the above request and prepared the Table 1 showing the revised list of road links with a total lenght of 167 km approx.

3. Counterpart Personnels

DCC agreed to provide the following counterpart personnel:

Counterparts	Assignment	Name	Govn't
1-Chief counterpart	full-time	Mr. P. Gasinzigwa	DCC
1-Traffic engineer	as required	to be named	MOCW
1-Highway engineer	as required	Mr. Rwegumisa	MOCW
1-Soil/Materials engr.	as required	to be named	MOCW
1-Mechanical engineer	as required	Mr. Boma	DCC
1-Road maintenance engr.	as required	Mr. Kisisa	DCC
1-Economist	as required	Mr. Matome	DCC

4. Provision of Assistance for Traffic Survey

DCC agreed to provide about 300 person-days of traffic survey assistance and several supervising engineers for the traffic survey at its own expenses in accordance with the S/W.

5. Topographical Maps

DCC agreed to make necessary arrangement to obtain the topographical maps to be used for the Study from the Survey Department, Ministry of Land. The maps required for the Study are the one with a scale of 1/5,000 and 1/2,500 if

6. Steering Committee

To facilitate smooth conduct of the Study, DCC organizes the Steering Committee, chaired by the City Director, consisting of the representatives of the following government authorities concerned:

a) Commissioner for Construction and Maintenance, Ministry of Communications and Works.
b) The City Engineer, DCC.
c) Director of Planning and Research, Ministry of Communications and Works.
d) Commissioner for External Finance, Ministry of Finance,
e) Traffic Commandant, Ministry of Home Affairs.

7. Attendance on the Discussion

List of the Attendance on the discussion is shown in Table 2 attached herewith.

Table 1: Road Links Proposed by DCC

No.	Name of Road	Length (km)	Remarks
Group 1: Trunk Roads, Collector Roads, and Main Streets			
1.	Old Bagamoyo Road	8.4	
2.	Old Kigogo Road	6.0	
3	Shekilango Road	4.4	
4	Morocco Road	6.8	Incl. Magomeni & Kigogo R.
5	Kinondoni Street	0.7	
6	Morogoro Road	8.0	Incl. 3 km of TRM
7	Uhuru Road	2.3	
8	Gerezani Street	12.0	Incl. Bandari & Kilwa Str.
9	Chang'ombe Road	8.0	Incl. Temeke & Mhagala Road
	Sub-total (1)	56.6 km	
Group 2: Other Roads and Streets in the City			
A	Oyster Bay residential area str.	19.0	
B	Mwinjuma Road	2.4	
C	Magomeni Commercial area streets	3.2	
D	Central area str.	16.9	
E	Kariakoo Commercial area streets	31.4	
F	Chang'ombe area str.	14.6	
G	Temeke area streets	13.0	
H	Ilala Commercial and Residential area streets.	10.3	
	Sub-total (2)	110.8 km	
	Total (1)+(2)	167.4 km	

Table 2: List of Attendants

Tanzanian Government

1.	Mr. G. P. Chale	Ag. City Director, DCC
2.	Mr. A. C. Masenha	City Engineer, DCC
3.	Mr. D. R. L. Kibaha	Deputy City Engineer, DCC
4.	Mr. B. Mwamuingila	City Engineer, DCC
5.	Mr. Paul Gasinzigwa	A.E.E.(Roads), DCC
6.	Mr. Tibanyenda S.M.	Principal Engr. Research & Studies, MOCW
7.	Mr. J. L. Ngumbulu	Sr. Engr, Design for Roads and Airports, MOCW
8.	Mr. S. T. Rwegumisa	Design Engineer, MOCW
9.	Mr. Y. Motosaku	P/E of Kibiti-Lindi Road Project, JICA Expert, MOCW
10.	Mr. M. Kubota	JICA Expert, MOCW

Advisory Committee

1.	Mr. K. Nagasawa	Chairman of the Advisory Committee
2.	Mr. K. Ooshima	Member of the Advisory Committee
3.	Mr. H. Murakami	Coordinator of JICA Headquaters

JICA Tanzania Office

1.	Mr. Nobuo Toida	Resident Representative of JICA Tanzania Office
2.	Mr. Hiromi Motomura	Resident Staff of JICA Tanzania Office

JICA Study Team

1.	Mr. H. Itoh	Team Leader/Maintenance engineer
2.	Mr. H. Shinkai	Deputy Team Leader/Highway Planner
3.	Mr. H. Mutoh	Transport Planner
4.	Mr. K. Iizawa	Highway Engineer

MINUTES OF MEETING
FOR
PROGRESS REPORT
OF
THE FEASIBILITY STUDY ON ROAD IMPROVEMENT AND MAINTENANCE IN DAR ES SALAAM
BETWEEN
DAR ES SALAAM CITY COUNCIL
AND
THE JICA STUDY TEAM

Dar es Salaam, June 22, 1989

Mr. G. P. Chale
Acting City Director
Dar es Salamm City Council
Tanzania

Mr. Hirokazu Itoh
Leader of the Study Team
Japan International Cooperation Agency, Japan

Endorsed by:

Mr. I. N. Kimambo
Commissioner
Construction and Maintenance
Ministry of Communication and Works

The Feasibility Study
on
Road Improvement and Maintenance
in
Dar es Salaam

Minutes of Meeting for Progress Report

Date : June 22, 1989
Place : Karimjee Hall
Attendance: See Appendix A-2

In accordance with the Scope of Work (hereinafter referred to as "S/W") agreed upon between the Preliminary Study Team and DCC on October 5, 1988, the Study Team submitted twenty (20) copies of the Progress Report to the City Director of Dar es Salaam City Council (hereinafter referred to as "DCC"), on June 19, 1989.

After submission of the report, Mr. H. Itoh, Team Leader of the Study Team, and members of the Study Team made briefing on the Progress Report.

As a result of series of discussion made during 20th to 22nd June, 1989, both DCC and the Study Team confirmed the following:

1. Progress Report
   DCC acknowledged the receipt of 20 copies of Progress Report, and agreed in principle the content and output of the field survey described in the Progress Report.

2. Population and Employment Projection
   DCC agreed to the estimated target figures of population and employment in 2000 on the Dar es Salaam made by the Study Team with an average growth rate of 5.0 % per annum.

DCC also agreed to the distribution of the future population and employment to each traffic zone which was estimated by the Study Team in accordance with the basic concept of Master Plan.

3. Transport Projection

DCC agreed to the annual growth rate of total daily traffic movement on the inner cordon line estimated by the Study Team as follows:

Estimated average growth rate of traffic movement in 1989 - 2000; 4.0 % per annum

4. Roads Selected for Further Study

DCC agreed to the roads selected by the Study Team as shown in Appendix A-1 for further study on formulation of improvement plan in terms of short, middle and long plans. Total length of the roads selected is estimated to be 205.3 km.

As noticed the Study Team as per letter Re/P.2/182/32 d.d. 18/5/1989, the improvement project on Upanga, Mpakani and New Bagamoyo Roads are scheduled to be implemented soon with financial assistance of Italian Government, but not finalized yet. DCC therefore will inform the Study Team through JICA Dar es Salaam Office of the final decision on this issue within one month after the date of signing this minutes, upon approval of higher authority of the government.

5, Road Maintenance and Operation System

DCC agreed in principle to the new organization of road maintenance recommended by the Study Team subject to the approval of higher authority.

Appendix A-1: Roads Selected for Further Study

Name of Roads	Total Length	Proposed Roads by DCC	Roads Selected by the St. Tm.
1. [Arterial Roads]			
1-1 New Bagamoyo Road	35.0	13.0*	23.0
- Up to Wazo Hill	(23.0)	-	(23.0)
- Wazo Hill to Boundary	(13.0)	(13.0)*	-
1-2 Morocco	3.5	3.5	3.5
1-3 Kinondoni	1.7	0.7	0.7
1-4 Morogoro	33.0	9.5	9.5
- Up to TRM 4.5km	(9.5)	(9.5)	(9.5)
- Other Section	(23.5)	-	-
1-5 United Nat.	2.0	-	-
1-6 UWT	1.9	-	-
1-7 Port Access	15.6	-	-
1-8 Bandari	2.2	2.2	2.2
1-9 Kilwa	15.7	8.6	8.6
- Up to 8.6km	(8.6)	(8.6)	(8.6)
- Beyond 8.6km	(7.1)	-	-
1-10 Uhuru	5.0	2.8	2.8
1-11 Msimbazi /5	1.6	1.6	1.6
1-12 Mpakani	3.9	-	-
1-13 Upanga	1.8	-	1.8
1-14 Pugu	17.4	-	-
1-15 Central Area			
1-15-1 Nkurumah /4	0.3	0.3	0.3
1-15-2 Samora	0.8	-	-
1-15-3 Sokoine /4	0.8	0.8	0.8
1-15-4 Gerezani	1.2	1.2	1.2
1-15-5 Kivukoni /4	1.0	1.0	1.0
1-15-6 Maktaba /4	0.9	0.9	0.9
1-15-7 Ohio /4	1.0	1.0	1.0
1-15-8 Ocean /4	3.2	3.2	3.2
Sub-total (1)	148.5 km	50.3 km	62.1 km
2. [Collector Roads]			
2-1 Old Bagamoy	8.2	8.2	8.2
2-2 Haile Sall. /1	5.0	5.0	5.0
2-3 Toure Drive /1	5.6	5.6	5.6
2-4 Bongoyo /1	0.8	0.8	0.8
2-5 Shekilango	3.8	3.8	3.8

2-6	Kondoa /3	1.2	1.2	1.2
2-7	Mwinjuma /2	2.4	2.4	2.4
2-8	Makanya	5.0	5.0*	5.0
2-9	University	3.8	-	-
2-10	Kigogo C-1	1.3	2.0*	2.0
2-11	Kigogo C-2	1.8	-	-
2-12	Kigogo C-3	1.9	-	-
2-13	Old Kogogo	6.8	6.8	6.8
2-14	Kagera /3	2.0	2.0	2.0
2-15	Mikumi	1.1	1.1*	1.1
2-16	New Kigogo	2.7	2.7	2.7
2-17	Chango'mbe	4.6	4.6	4.6
2-18	Temeke	1.9	1.9	1.9
2-19	Mbagala I	1.4	1.4	1.4
2-20	Mbagala II	2.2	-	-
2-21	Mahunda	2.0	-	-
	Sub-total (2)	65.5 km	54.5 km	54.5 km

3. [Local Roads (Area Roads Proposed by DCC)]

A.	Oyster Bay Area	8.1	8.1	8.1
B.	Mwunijuma Area	-	-	-
C.	Magomeni Area	-	-	-
D.	Central Area /4	10.3	10.3	10.3
E.	Kariakoo Area /5	30.0	30.0	30.0
F.	Chango'mbe Area	14.6	14.6	14.6
G.	Temeke Area	13.9	13.9	13.9
H.	Ilala Area	10.3	10.3	10.3
I.	Other Important Roads			
	- Shaurimoyo	1.0	1.0*	-
	- Manxese L-1	1.5	1.5*	-
	- Mwinjuma L-1	1.5	1.5*	1.5
	Sub-total (3)	91.2km	91.2km	88.7km
	Total (1)+(2)+(3):	305.2km	196.0km	205.3km

Note:

(1) The roads with /1 to /5 are located in the areas proposed by DCC as follows:
/1; Oyster Bay Area, /2; Mwinjuma Area, /3; Magomeni Area
/4; Central Area, /5; Kariakoo Area

(2) Roads with * are additionally proposed by DCC.

(3) Roads with underline are selected by the Study Team for further study with a total length of 200 km approx.

Appendix A-2: LIST OF ATTENDANTS

Tanzanian Government

[DCC]

1. Mr. G.P. Chale :Acting City Director
2. Mr. A.C. Masenha :City Engineer
3. Mr. D.R.L. Kibaha :Deputy City Engineer
4. Mr. B. Mwamuingila :City Economist
5. Mr. Paul Gasinzigwa :Chief Counterpart/Road Engineer

[MOCW]

1. Mr. I. N. Kimambo :Commissioner for Construction and Maintenance
2. Mr. F. Barozi :Chief Engineer for Construction
3. Mr. Tibanyenda S. M. :Principal Engineer, Research & Studies
4. Mr. J.L. Ngumbulu :Senior Engineer, Design for Roads and Airports
5. Mr. H. G. Urio :Senior Engineer for Construction and Contract
6. Mr. S.T. Rwegumisa :Counterpart/Design Engineer

JICA Study Team

1. Mr. H. Itoh :Team Leader/Maintenance engineer
2. Mr. H. Shinkai :Deputy Team Leader/Highway Engineer
3. Mr. H. Mutoh :Transport Planner
4. Mr. A. Nakaseko :Traffic Engineer

Appendix 16-5 MINUTES OF MEETING FOR INTERIM REPORT

MINUTES OF MEETING
FOR
INTERIM REPORT
OF
THE FEASIBILITY STUDY ON ROAD IMPROVEMENT AND MAINTENANCE IN DAR ES SALAAM
BETWEEN
DAR ES SALAAM CITY COUNCIL
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Dar es Salaam, October 31, 1989

Mr. Sigiti D. T. R. Mayeye
City Director
Dar es Salamm City Council
Tanzania

Mr. Hirokazu Itoh
Leader of the Study Team
Japan International Cooperation Agency, Japan

Endorsed by;

Mr. I. N. Kimambo
Commissioner
Construction and Maintenance
Ministry of Communication and Works

Endorsed by;

Mr. Kotarou Nagasawa
Chairman of the Advisory Committee, JICA

Endorsed by;

Mr. R. Mhagama
Deputy Permanent Secretary
Planning Commission

The Feasibility Study
on
Road Improvement and Maintenance
in
Dar es Salaam

Minutes of Meeting for Interim Report

Date : October 31, 1989
Place : Conference Room of Planning Commission
Attendance: See Appendix 1

In accordance with the Scope of Work (hereinafter referred to as "S/W") agreed upon between Japan International Cooperation Agency (herein-after referred to as "JICA") and Dar es Salaam City Council (hereinafter referred to as "DCC") on October 5, 1988, the Study Team submitted twenty (20) copies of the Interim Report to the City Director of DCC on October 20, 1989, and Mr. H. Itoh, Team Leader of the Study Team, made briefing of the Interim Report on October 24, 1989.

After a series of discussion during 24th to 28th October, 1989, the following subjects has been confirmed and agreed upon by both the Study Team and DCC:

1. Interim Report

DCC acknowledged the receipt of 20 copies of Interim Report, and agreed in principle the content and output of the study results described in the Interim Report.

2. Issue of New Bagamoyo Road

The three links including Upanga Road, Mpakani Road and New Bagamoyo Road up to Wazo Hill were deleted from the list of priority roads upon request by the Tanzanian side because of the agreement on the implementation of the said project by Italian Government as stated in the Minutes of Meeting for Inception Report dated on March 21, 1989.

The Study, however, revealed that the package of New Bagamoyo Group with a total length of 9.8 km including Upanga Road (1.8 km) and New Bagamoyo Road up to Mpakani Junction (8.0 km) was evaluated to be one of the highest ranked project among the priority road packages and recommended to implement those roads as soon as possible due to serious pavememt deterioration, heavily congested road, expected impacts on the economic and social activities of the influences areas.

Meanwhile, although, the Italian Government agreed in principle to undertake the said project, nothing definite has yet been decided by both parties as of now. Tanzanian Government has decided to exclude a portion of the road from Tanganika Roundabout to Mpakani Road Junction (9.8 km) from the list of proposal sent to Italian Government.

Under such a situation, Tanzanian side request the Japanese side to re-consider and include the said New Bagamoyo Group into the Short-term Plan under this Study. In this regard, Tanzanian side agreed to provide the Study Team necessary data and information by conducting required surveys under the supervision of the Study Team for the roads of New Bagamoyo Group.

The Japanese side agreed with the above request made by the Tanzainan Government.

3. High Priority Projects

Both Tanzanian side and the Study Team agreed to select the high priority projects as shown in Table 1 which is to be implemented in the Short-term Plan from 1990 to 1994. The Study Team will carry out supplemental surveys and engineering design for those high priority projects selected.

4. Allocation of Local Budget to Road Maintenance Depot

DCC stated to allocate the necessary local budget required for operating and maintaining the new road depots proposed by the Study Team.

5. Relocation of Utilities and Land Aquisition and Compensation

DCC stated, at his own cost, to remove and relocate the existing utilities, if necessary, such as water pipe-line, electric line, telephone cable and line, street light, street trees, etc.

DCC also stated to compensate the cost required for land aquisition and removal of the existing buildings and houses which might be affected by the construction of the Project.

6. Execution Body for the Implementation of The Project

DCC will be responsible for the implementation of the Project and act as the executing agency for the Project in co-operation with MOCW. Project office will be established under the City Engineer of DCC for smooth operation and progress of the Project.

7. General Comments on the Interim Report

Tanzanian side requested the Study Team to review and re-study the items as shown in Table 2 attatched herewith.

Table 1 Summary of High Priority Projects

Package No.	Improvement Measures	Unit	Quantities
(1) Category A: Improvement of Road Structures			
P-1	Widening of Morogoro Road (Morocco Junc. - Port Access)	Km	5.0
P-2	Widening of New Bagamoyo Road	km	9.8
	Upanga Road	km	(1.8)
	New Bagamoyo Road up to Mpakani J.	km	(8.0)
P-9	Chang'ombe Group	km	19.2
	Chang'ombe Area Road	km	(14.6)
	Chang'ombe Road	km	(4.6)
P-8	Kariakoo Group	km	31.6
	Kariakoo Area Roads	km	(30.0)
	Msimbazi Road	km	(1.6)
P-5	Mwinjuma Group	km	16.9
	Mwinjuma Area Roads	km	(2.4)
	Mwinjuma L-1	km	(1.5)
	Morocco Road	km	(3.5)
	Kinondoni Road	km	(0.7)
	Shekilango Road	km	(3.8)
	Mkanya Road	km	(5.0)
P-7	Central Area Group	km	20.9
	Central Area Roads	km	(10.3)
	Bandari Road	km	(2.2)
	Nkurumah Road	km	(0.3)
	Sokoine Road	km	(0.8)
	Gerezani Road	km	(1.2)
	Kivukoni Road	km	(1.0)
	Maktaba Road	km	(0.9)
	Ohio Road	km	(1.0)
	Ocean Road	km	(3.2)
	Total		103.4km
(2) Category B: Urgent Repair of Pot-holes			
U-1	Important Roads selected by the Study Team for Study		205.3km
(3) Category C: Improvement of Maintenance System			
M-1	Construction of Main Depot	no.	1
M-2	Provision of Equipment	Sum	1 Set
M-3	Technical Assistance/Training	year	3

Table 2 Comments on the Interim Report by DCC

A. Tanzanian side requests the Study Team to review the following engineering subjects proposed under Category A "Improvement of Road Structures":

A-1; Widening of Bandari Road from 2 to 4 lanes (Middle-term Plan) to connect with Port Access Road.

A-2; Extention of widening section of the Chang'ombe Road up to Port Access Road near Chang'ombe Police Station in order to complete the New Middle Ring Road proposed by the Study Team in the Long-term Plan.

A-3; Grade-separated junctions on Morogoro Road/Port Access, Kilwa Road/Port Access and Pugu Road/Port Access Junctions.

A-4; Pedestrian bridges across Morogoro Road at Manzese, U.N. Road at Muhimbili Hospital, Morocco Road/Morogoro Junction, Morogoro/UWT Junction.

A-5; Review on dimention of bus bays proposed in the Report taking into account the size of the public buses.

A-6; Provision of a separate off-loading/loading lanes at Manzese, Morogoro Road.

A-7; Improvement and rehabilitation of storm drainage system is not a part of this Study, however, urgent rectification of this situation is necessary to extend the pavement life.

B. Tanzanian side also request the Study Team to review the following items in connection of road maintenance to be provided under Category C "Improvement of Road Maintenance System":

B-1; Increase of number of patching units from 2 to 4 to carry out routine maintenance in their respective areas.

B-2; Provision of equipment required for road monitoring system proposed by the Study Team, such as computer for data base, transport equipment for routine patrol, etc.

B-3; Road Maintenance Equipment

Type and numbers of equiment required for maintenance and workshop should be reviewed to meet the requirement for routine and periodic maintenance in accordance with the definition on the work items agreed upon by both DCC and the Study Team.

Appendix 2 shows the type and number of equipment proposed by DCC for reference.

B-4; The new main road depot is proposed to be incorporated into the already earmarked site for the pre-mix plant located along Port Access. The layout of the new main road depot should be modified accordingly so as to incorporate the pre-mix plant and the necessary materials.

Appendix 1: List of Attendants

Tanzanian Government

Planning Commission

1. Mr. R. Mhagama	Deputy Permanent Secretary
2. Mr. A. Mwaisumo	Senior Economist

Ministry Of Finance

1. Mr. P. J. Mbena	

DCC

1. Mr. Sigiti D.T.R.Mayeye	City Director
2 Mr. B. Mwanwingira	City Economist
3. Mr. A. C. Masenha	City Engineer

MOCW

1. Mr. K. Sekwao	Chief Designer
2. Mr. M. Kubota	JICA Expert, MOCW

Japanese Govrenment

Advisory Committee

1. Mr. K. Nagasawa	Chairman of the Advisory Committee
2. Mr. K. Ohshima	Member of the Advisory Committee

JICA Headquaters

1. Mr. K. Nakagawa	Dequty Director, First Development Study Division, JICA

JICA Tanzania Office

1. Mr. Nobuo Toida	Resident Representative

JICA Study Team

1. Mr. H. Itoh	Team Leader/Maintenance engineer
2. Mr. H. Shinkai	Deputy Team Leader/Highway Planner
3. Mr. H. Mutoh	Transport Planner

Appendix 2

EQUIPMENT FOR ROAD MAINTENANCE

1. ROUTINE MAINTENANCE (4 Sub Depots)

7 ton Tipper trucks	8	
LWB Lorries with crane	4	
Motor Graders	4	
Tractor & Drags	4	
Monitoring vechicles (Pick ups)	4	
Bitumen sprayers (200 lts)	4	
2 tons Hand Rollers	4	
2 ton Dumpers	4	
Excavator (0.4 cum)	4	
Road sweeper (7-9 t)	4	
Motor Cycles	4	
Hand Rammers	16	
Asphalt cutters	4	
Wheel Burrows	8	
Hand Shivels	20	
Rakes	20	
Watering cans	8	
Picks	20	
Catlasses	40	
Masons tools	4	sets
Road marking set	4	

2. PERIODIC AND URGENT MAINTENANCE

Tipper Trucks (7 tons) 8(G)& 5(O) =	13	
Steel wheeled Roller (8-10 t)	2	
Pneumatic Tyred Roller (8-10 t)	2	
Motor Grader	1	
Bulldozer (D7 with ripper)	1	
Shovel loader (2 cum)	2	
Water Bowzer	2	
LWB (with crane)	1	
Paver (Asphalt) (3.6 m)	1	
Gully Trap Emptier	1	

Compressor (3.5 cum)	1
Supervisery Vehicles (Pick up)	4
Double Cabin Pick-up (3.5 t)	2
Motor Cycles	4

EQUIPMENT FOR WORKSHOP

Welding Machine 1(P)& 2(W) =	3
Lathe (10 inch)	2
Generator (8 KVA) 1(P) & 1(W) =	3
Comressor	1
Round Saw	2
Chain Block 1(R)& 1(P)& 1(W) =	3
Fuel Pump (Petrol(1)& Dissel(1)) =	2
Mobile service Truck (with tools)	1
Tool box (for Mechanics) 1(P)& 4(W) =	5

MINUTES OF MEETING FOR DRAFT FINAL REPORT
OF
THE FEASIBILITY STUDY
ON
ROAD IMPROVEMENT AND MAINTENANCE IN DAR ES SALAAM
BETWEEN
DAR ES SALAAM CITY COUNCIL
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Dar es Salaam, March 23, 1990

Mr. Sigiti D. T. Mayeye
City Director
Dar es Salaam City Council
Tanzania

Mr. Hirokazu Itoh
Leader of the Study Team
Japan International Cooperation
Agency (JICA), Japan

Endorsed by:

Mr. I. N. Kimambo
Commissioner
Construction and Maintenance
Ministry of Communication and Works

Endorsed by:

Mr. Kotarou Nagasawa
Chairman of The Advisory Committee
JICA

The Feasibility Study
on
Road Improvement and Maintenance
in
Dar es Salaam

Minutes of Meeting for the Draft Final Report

Date : March 23, 1990
Place : Conference Room, Planning Commission
Attendance: See Appendix 2

In accordance with the Scope of Works (hereinafter referred to as "S/W") agreed upon between Japan International Coopecation Agency (hereinafter referred to as "JICA") and Dar es Salaam City Council (hereinafter referred to as "DCC") on October 5, 1988, the Study Team submitted twenty (20) copies of the Draft Final Report to the City Director of DCC as scheduled, and Mr. H. Itoh, Team Leader of the Study Team, and their member made briefing of the report on March 16, 1990.

After a series of discussion made between the Study Team and the officials of DCC, MOCW and other government agency concerned during 19th to 22nd March, 1990, the following subjects have been confirmed and agreed upon by both the Study Team and DCC.

1. Draft Final Report

DCC acknowleged the receipt of 20 copies of the Draft Final Report and agreed in principle to the contents and output of the study results described in the draft report.

2. Early Implementation of the High Priority Projects

The government of Tanzania appreciated the recommendations on high priority projects proposed by the Study in the Short-term Plan (1990 - 1994).

Since the situation of road network in Dar es Salaam City is getting worse due to insufficient funds for road maintenance which have caused a serious effect on the city's as well as nationwide's economic, social and administrative activities, Tanzanian government is very much concerned for early implementation of these high priority projects proposed in the Short-term Plan.

In this regard, the government of Tanzania has decided to place the first priority on its implementation and to request the Japanese Government to provide financial and technical assistances for early realization of the high priority project in this Study.

The Study Team agreed to convey the above request to the Japanese government concerned.

3. Allocation of Local Budget to the Road Maintenance

The government of Tanzania stated to allocate a suffeient amount of local budget required for maintenance and operation of the main depot to be established under Category C in the Project.

Necessary staff for the main depot shall be arranged by the DCC with recruitment from other government agency concerend and private sectors by the time of completion of main depot.

4. Relocation of Exsiting Utilities and Houses

The DCC is responsible for relocating and protecting the existing utilities and houses, such as the telephone cables, electric wire lines, water main etc, which might be affected by the execution of the project. The DCC stated to allocate the necessary local funds required and relocate and protect these existing utilities and houses prior to the implementation of the projects.

5. Preparatory Work Required for Main Depot

The DCC stated to carry out at his own cost the necessary arrangement including clearing and levelling works for the new Main Depot which is supposed to be constructed at Mabibo along Nelson Mandela (Port Access) Road.

The Study Team agreed to review the layout of the new Main Depot taking into consideration the proposed plan of asphalt plant prepared by the DCC.

6. Necessity of Urgent Rectification of Storm Water Drainage System

The Study Team understands the necessity of urgent rectification of storm water drainage system which might affect the project roads. However, these urgent rectifications will be limitted within the right-of way of the proposed roads in the Study in accordance with the S/W.

The Study Team suggests to the Tanzanian government to conduct urgent study on rehabilitation and improvement of storm water drainage system in Dar es Salaam so that it does not interfere with the project roads after completion of the Project.

7. General Commments on the Draft Final Report

Appendix 1 shows the comments made by Tanzanian government on the Draft Final Report and its reply given by the Study Team.

These comments and reply shall be further reviewed in Japan and incorporated in the Final Report in accordance with the S/W.

APPENDIX 1

COMMENTS ON DRAFT FINAL REPORT MADE BY TANZANIAN GOVERNMENT

The following are the comments made by the Tanzanian government on the Draft Final Report and the reply given by the Study Team:

1. Bus Bays (Pg. 10-3, A-5)
   All important bus routes should be provided with bus bays e.g. Upanga Road.

   Answer:
   The Study Team investigated the causes of congestion on each important road during the field survey and identified the following roads which have been congested primarily due to the shortage or inappropriate location of bus stops and bus bays:

   - Uhuru, Morogoro, Morocco and New Bagamoyo roads.

   Bus bays on the Upanga road will be reconstructed because of the widening of exsiting road.

2. Last part (Pg. 10 5, B-1)
   The word either should be omitted and the sentence modified.

   Answer:
   Accepted.

3. Technical Assistance & Training Programme (Pg.10 5,C-3)
   No indication of training of engineers is made other than mechanics and operators.

   Answer:
   Acceptable.
   The Study Team will review the programme accordingly.

4. Equipment for Road Maintenance (Pg. 10-9, Table 10.2)
A clear list showing equipment for patchwork, general maintenance etc. to be provided.

Answer:
Please refer to the Paragraph 9.3 "Requirement for Bitumen Patching Maintenance" and 9.4 "Requirement of Routine Maintenance" (Pg.9-6 through 9-8) of Main Report.

5. Topographical survey (Pg. 12-2)
Precaution taken against inaccurate levels as x-section were taken at longer intervals (50m) and no permanent BM were confirmed. And whether a Temporary Bench Mark (TBM) was established.

Answer:
The Study Team judged that the accuracy of topographic survey is sufficient enough to the level of preliminary engineering design. X-sections will be taken at short intervals of 20 m during the detailed design stage for the tendering purpose. TBM were established by the Study Team along the proposed widening sections, namely Upanga, New Bagamoyo and Morogoro Roads, and their location and temporary elevation used for the design are shown in the Drawings of the Study.

6. Water Main (Pg.12-3)
In addition to the precaution proposed provisions for water main to cross the road should be made.

Answer:
The Study Team agreed to the comment, however the maps or drawings available in National Urban Water Authority does not indicate the accurate depth or exact location of the water main laid beneath the proposed roads. Therefore, the Study Team suggests to the government to provide the inspector or superintending engineer recruited from the agency concerend so that these mains would not be interefered with by the construction of the project roads.

7. Sampling (Pg.13-5)

It is proposed that one source of borrow materials for embankment is Ubungo. This area has been squatted, hence compensation has to be paid.

Answer:

Agreed. The Study Team has already considered the necessity of compensation in the Project. The reasons why the Study Team has selected the borrow area at Ubungo are (1) materials are suitable for road structures and (2) location of the area is very close to the construction site, thus transportation cost of materials could be saved.

8. Pavement Structural Survey (Pg.12-15)

Accuracy of the representative samples as in some areas only one samples was taken.

Answer:

The Study Team conducted samplings of 80 pieces in Phase 1 (April - June, 1989) and 26 pieces in Phase 2 (October November, 1989) to obtain the sufficient data required for design of pavement structures. Please refer to the Appendix 12.6 and 12.7 respectively.

9. Typical X-sections (Pg.12-15)

- On Fig. 12.7, New Bagamoyo Road, street lighting is missing.
- A central median of 7.5 m on Morogoro Road is considered too wide.
- The X-section do not show the max. limit of constructions.

Answer:

- Street light will be provided on Upanga Road. The typical cross section shall be modified accordingly.

- Wider median has been introduced on Morogoro road taking into account the following:
  * Existing Morogoro road (7.5 m) shall be used for the existing traffic during the construction of widening, thus the construction cost of detour roads during the construction would be minimized.

* Wide midian strip might be developed to cope with future traffic increase.
* Right-of-way reserved by the government is sufficient enough to provide wide median strip.

The construction of the proposed road shall be conducted within the right-of-way in principle with the exception of truck terminal to be constructed at Manzese Market Area on Morogoro Road.

10. Asphalt Plant (Pg.13-5)

City council has a 60 t/hr plant. Let the contractor use this facility.

Answer:

It should be discussed during the implementation stage, however the Study Team considers that it may be difficult to force the contractor to use the government asphalt since the contractor has a obligation to complete their works within the contract period at their own risk. If the asphalt plant is broken down, who will compensate the loss and time suffered to the contractor?

11. Construction Package (Pg.13-5)

DCC will sign the contract with one contractor. Is it anticipated that sub-contractors will be engaged?

Answer:

It depends on the prime contractor to be employed for the Project.

12. Overlay (Pg.13-7)

25 mm is too thin, 50 mm is OK.

Answer:

Thickness of the pavement was determined using the design standard of Asphalt Institute of USA. The Study Team believed that minimum thickness of 25 mm is reasonable and practical design.

13. Sitting Board on Bus Bays (Pg.13-9)

No size is given to bus stop roof. Experience has shown that no sitting board is provided. This is essential for the elderly.

Answer:

Accepted.

The drawing (Sheet No.44) shall be revised accordingly.

14. Main Depot (Pg.13-10, Lot C)

This condition of the government's cleaning and levelling the site should be removed.

Answer:

The Study Team considered that these works are the government responsibility.

15. Land Compensation Cost (Pg.13-12)

(ii) Temporary rent cost is not clear.

Answer:

It should cover the cost of contractor's temporary camps and workshops, however, these costs have not been included in the project costs, since these temporary facilities were assumed to be constructed on the ground of Dar es Salaam University nearby Mpakani Road at free of charge since these facilities shall be demolished after completion of the project.

16. Corrections (Pg.5-10, A-2-4)

Fig.S.B.1 not seen. Probably this is Fig.S.A.2.

Answer: As pointed out.

17. Urgent Repair (Pg.S-3)

Duration too short.

Answer:

The Study Team determined the duration urgent repair in the short period taking into account the characticity of the urgency of the work.

18. Improvement of Tanganyika Motors Roundabout

The DCC requests the Study Team to re-study the design of new intersection at Tanganyika Motors taking into consideraion the possibility of opening the traffic flow from Upanga to Maktaba Road.

Answer:

It is impossible to change the present design in the Draft Final Report since it has been designed in accordance with the basic layout submitted by the Study Team at the time of Interim Report and approved by the DCC.

It should be noted that it is very difficult to obtain smooth traffic flow because of the irregular cross-shaped intersection. Unless the road at Tanganyika Motors shall be closed or grade separated intersection shall be provided on the Upanga-UWT road, it might be impossible. The imporant factors to be considered in the design are to maintain the stream of major traffic flow smoothly, thus the traffic flow on Upanga-UWT and Upanga-Ohio should be given the first priority in the design.

The parking lots and U-turn facility shall be considered in the design of intersection as requested by the DCC.

APPENDIX 2: LIST OF ATTENDANTS AT THE MEETING

Tanzanian Side

- Planning Commission

1.	Mr. R. Mhagama	Deputy Permanent Secretary
2.	Mr. T. E. I. Kimoko	Director of Economic Services

- Ministry of Finance

1.	Mr. P. J. Mbena	Officer in charge

- Dar es Salaam City Council

1.	Mr. Sigit D. T. Mayeye	City Director
2.	Mr. A. C. Masenha	City Engineer

- Ministry of Communication and Works

1.	Mr. I. N. Kimambo	Commissioner of Const. and Maint.
2.	Mr. J. L. Ngumbulu	Senior Engineer Design

Japanese Side

- Advisory Committee

1.	Mr. K. Nagasawa	Chairman of the Committee, Ministry of Construction, Japan
2.	Mr. A. Fujimoto	Member of the Committee, Ministry of Construction, Japan

- JICA Headquaters

1.	Mr. H. Murakami	Manager, First Development Study Division, JICA

- JICA Tanzania Office

1.	Mr. N. Toida	Resident Representative of JICA Tanzania

- JICA Study Team

1.	Mr. H. Itoh	Team Leader/Maintenance Engineer
2.	Mr. H. Shinkai	Deputy Team Leader/Highway Planner
3.	Mr. H. Mutoh	Transport Planner
4.	Mr. K. Mastuda	Economist