

TABLE 2 HIGHWAY LIST IN STRATEGY MODIFIED 2B

Sl No.	Description	Length (Km) Specification	Comment
1	Gulshan-1 to Badda (Pragoti Saroni)	0.60km 2-lane dual	Completed
2	Argagaon Road (Bangladesh Betar) to Mirpur Section 2 through Senpara Parbata	3.6km 2-lane dual	This is proposed as a dual 2-lane highway to assist in the development of the area west of Begum Rokeya Sarani. Traffic figures vary between 500 pcus/hr and 2,500 pcus/hr. There is likely to be traffic generated due to local needs and the proposal for a dual 2-lane seems acceptable.
3	Bangla College to Kafrul intersecting Rokeya Sharoni	3.66km 2-lane dual	This is proposed as a dual 2-lane highway to assist in the development of the area west of Begum Rokeya Sarani. Traffic figures vary between 1,000 pcus/hr and 3,000 pcus/hr. The proposed dual 2-lane highway seems acceptably sized.
4	Ashulia to Aricha Road (C & B More)	7.00km 2-lane	The previous phase developed the Western Embankment Circular Ring Road and Phase 3a now proceeds to develop roads to the west of the River Turag. The opening of Scheme #4 will be coordinated with Scheme #30 (see below) also developed in this phase. The scheme connects the Western Embankment Circular Ring Road with the Western Bypass and is a 2-lane road of 7 kms being developed by LGED. Traffic flows are predicted as 500 pcus/hr and a 2-lane road is perfectly adequate for this flow.
5	From Airport Road near Khilkhet to First Balu Bridge (Isapura) via Baruna (Nikunja - Yousufganj)	6.50km 2-lane dual	As well as developing the western areas, this phase provides additional impetus to developments to the east of the city. Scheme #5 is proposed by RHD as an upgrading to dual 2-lane highway status over a length of 6.5 kms. It intersects first with the Eastern By-pass, then the Eastern Embankment Road and finally joins the Dhaka By-Pass as Scheme #6 (see below). Traffic flows are predicted as 2,000 pcus/hr which shows the need for a dual 2-lane highway.
6	From first Balu Bridge near Tek Noadda to Sitalakhya River near Kanchan	6.00km 2-lane dual	In accordance with Scheme #5 (see above) this scheme completes the east-west highway between Khilkhet and the Dhaka By-pass acting as an encouragement to develop the eastern areas. It is proposed by RHD and is 6 kms in length. Flows at 500 pcus/hr are below the capacity provided by this highway but it is important to maintain continuity of the cross-section. However, staged construction could be considered with dualling occurring after say 10 years. The Feasibility Study should investigate this stage construction.
7	Zia Colony to Mirpur Cantonment - Pallabi	6.30km 2-lane dual	This is planned as a 6.3kms dual 2-lane road aimed at opening up the area south and west of the International Airport. It will create a much needed east-west link in the northern part of the city allowing traffic from the western parts of the area to access the Airport without having to make large detours. The project by DCC and Cantonment Board links to Scheme #63 (see below) which together will connect through to the Eastern embankment road (Scheme #18). In fact the traffic predictions at 4,500 pcus/hr are in excess of the capacity of a dual 2-lane road and the feasibility study should investigate the expansion to dual 3-lanes either at the outset or in the third phase. Whatever the decision in terms of construction, it is essential to obtain the right-of-way to allow this widening to be achieved.

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8	Bijoy Saroni to Tongi Diversion Road (from Rangs Y Jn.)	0.80km 2-lane dual	This scheme has been in mind for some years but has become very difficult due to the presence of the Rang's building on the east side of the intersection. It is however, an essential east-west link in the strategic network. Planned as an 800m long dual 2-lane highway it is the responsibility of RAJUK. Traffic flows in 2024 are 2,500 pcus/hr justifying the design for a dual 2-lane highway.
9	Konakhola to Hazratpur	17.00km m 2-lane	This project is planned to encourage development in the south-western areas and is proposed by RHD as a 2-lane road. Traffic flows are 1,000 pcus/hr and the upgrading as proposed will be sufficient to increase the safety aspects of this road. Consideration should be given to acquiring a 50m right-of-way to allow for future widening.
10	Hazratpur to Hemayetpur	8.00km 2-lane	A 2-lane road proposed by RHD carrying 1,000 pcus/hr in 2024.
11	Sonargaon (Panthapath) Rampura (Hatirjheel) to Bridge	3.60km 2-lane dual	This key link in the network is planned by DCC as a dual 2-lane highway of 3.6 kms in length. It passes through poor soil conditions and the area is liable to flooding. As a result it is designed to be on a viaduct. Traffic figures in 2024 amount to 3,000 pcus/hr and justify a dual 2-lane highway. However, it is considered that, since it will be on viaduct and there will be no possibility of widening in the future the recommendation is to design for dual 3-lanes thereby ensuring additional capacity beyond the 20 year horizon. Costs have been increased by 40% to allow for the additional lane on the viaduct.
12	Tunnel connecting Shahid Jahangir Gate (Cantonment) & Rokeya Saroni	0.90km 3-lane dual	Originally a new project identified by STP it is intended to provide a much needed east-west connection for the city. It will lead directly west from the end of the recently constructed Mohakhali Flyover. The alignment is not yet fixed but is anticipated to connect on the west side of the airport into Agargaon Road. Anticipated as a dual 3-lane road tunnel. It is essential to move ahead in year 1 with the pre-feasibility study and enter into discussions with the relevant agencies. Cost estimate includes all design and tendering. It will require careful study how the tunnel will join in to the Mohakhali Flyover and the anticipated Elevated Expressway from Gulistan (see project #44 below). Traffic flows in 2024 are 4,000 pcus/hr which is between the capacity of a dual 2-lane and a dual 3-lane highway.
13	Merul Badda - Babur Jaiga - Balirpar - Parain - Gofakandial	13.00km m 2-lane dual	The Dhaka By-pass (see Scheme #20) will be opened within the first phase and the up-grading of scheme #13 has been included in order to provide a new connection to the By-pass. It is shown as an upgrading scheme under the control of RHD. This route also is brought forward in the program in order to provide a land-based link to the Ferry terminal proposed for upgrading at Baurpur/Kayetpara. Traffic flows in 2024 are 2,500 pcus/hr, which is within the capacity of a dual 2-lane highway.
14	Bashaboo Jame Mosque to Trimohini Ghdaraghat via Shekker Jaiga Bridge	6.30km 2-lane dual	This scheme is included to encourage the development of the lands to the east of the city. Traffic flows are predicted as 2,000 pcus/hr requiring a dual 2-lane highway. The scheme stretches 6.3 kms from the city to the Eastern By-pass at Keodata. It is being developed by RAJUK and needs to be coordinated with construction of the bridge over the Balu River (Scheme #37) also included in this phase.

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15	Tongi Ghorashal Road (via Kaliganj)	25.00k m 2-lane	The Dhaka By-pass (see Scheme #20) will be opened within the first phase and the up-grading of scheme #15 has been included in order to provide a new connection to the By-pass by upgrading. For the first phase, it is recommended for construction from Tongi to the By-pass only. The second part is scheduled for Phase 2. Traffic flows in 2024 are 500 pcus/hr which is within the capacity of a 2-lane highway.
16	Fatulla - Muktarpur - Munshiganj road	9.00km 2-lane	A 2-lane road proposed by RHD carrying 1,000 pcus/hr in 2024.
17	Hemayetpur - Singair - Manikganj road	32.00k m 2-lane	A 2-lane road proposed by RHD carrying 1,000 pcus/hr in 2024.
18	Circular Road (ring road) over embankment (Ashulia to Buriganga 2nd bridge (Babu bazar))	25.00k m 2-lane dual	In order to organize the western areas of the city and to begin the process of encouraging development to the west, it is recommended that the road located on the embankment be developed in this phase. Proposed by RHD as a 25 km long dual 2-lane highway upgrading scheme provides a key link in the strategic network linking into the numerous ferry terminals along the Turag River. Traffic projections to 2024 vary between 1,000 - 2,000 pcus/hr showing that a dual 2-lane road is correct for this route. The construction of this route together with the implementation of BRT Line 2 along Gabtali-Mirpur Road will provide good land-based connection to the Ferry Terminal at Gabtali.
19	Connecting roads to Keraniganj, Nawabgonj & Dohar from Buriganga 3rd Bridge (both side approaches)	4.00km 2-lane dual	In conjunction with Scheme #35 (see below) this highway is proposed by RHD as a dual 2-lane highway in two sections amounting to 4.0 kms. Traffic flows at 1,000 pcus/hr show that a dual 2-lane facility will be required. However, the scheme forms approach roads to the bridge over the Buriganga at Basilia which is scheduled as dual 3-lanes. The STP recommends that scheme #19 be investigated for construction as a dual 3-lane road. Costs have been increased accordingly. There should also be a good land-based connection made to the ferry terminal recommended for improvement at Basilia.
20	Dhaka Bypass	48.00k m 2-lane	This is a key highway in the plan to open up development in the areas to the east. Proposed by RHD as a dual 3-lane highway it stretches for 30 kms from the Chittagong Road in the south to just north of Tongi in the north. It links with Scheme #62 (see below and also scheduled for this phase) to create a continuous link to Narayanganj. The scheduling has been delayed for two reasons – firstly the assumption that the Eastern Embankment will have a higher priority due to flood control and secondly due to the timing for the development of the areas to the east. There is also some concern that traffic figures varying between 1,500 pcus/hr and 3,000 pcus/hr do not appear to justify the dual 3-lanes throughout, It is recommended however, that right-of-way of 60m be secured so that a dual 3-lane highway can be achieved when required.
21	NMT road from BDR Rifles gate (Jigatala) to New Market (problem with Bangladesh Rifles Project)	1.00km 1-lane	A single lane road included to divert NMT traffic and improve traffic management on Mirpur Road.
22	Progati Sarani (Baridhara - Beraid - Balu River - Murapara) to Bhulta (Nawabganj)	16.00k m 2-lane	A 2-lane road carrying 500 pcus/hr in 2024 proposed by RAJUK and serving the ever expanding eastern areas.

SI No.	Description	Length (Km) Specification	Comment
23	Eastern Bypass [Joydebpur (Board bazar) - Mausaid - Barun - Baburjaiga - New Narayanganj] road (Chittagong Highway)	30.00k m 3-lane dual	This is a key highway in the plan to open up development in the areas to the east. Proposed by RHD as a dual 3-lane highway it stretches for 30 kms from the Chittagong Road in the south to just north of Tongi in the north. It links with Scheme #62 (see below and also scheduled for this phase) to create a continuous link to Narayanganj. The scheduling has been delayed for two reasons – firstly the assumption that the Eastern Embankment will have a higher priority due to flood control and secondly due to the timing for the development of the areas to the east. There is also some concern that traffic figures varying between 1,500 pcus/hr and 3,000 pcus/hr do not appear to justify the dual 3-lanes throughout, It is recommended however, that right-of-way of 60m be secured so that a dual 3-lane highway can be achieved when required.
24	Malibagh Chowrasta Gulbagh - Janapath (Bishaw road)	0.67km 2-lane dual	This scheme is in the early days of preparation and needs to be accelerated in the planning process. It is proposed by RAJUK as a dual 2-lane highway of 670m. It has been included in the early phase due to the need to accommodate a leg of the BRT Line 1. With flows in 2024 of 2,000 pcus/hr this justifies a dual 2-lane highway plus one extra lane for the BRT Line 1. Costs have been increased to allow for the additional lane.
25	Zikatata - Hazaribagh (Sikder Medical College) road	1.60km 2-lane	A key link in the local network providing access from the Western Embankment to the Dhanmondi area. It is proposed by RAJUK and with traffic figures at 1,000 pcus/hr it should be developed as a dual 2-lane highway. Increased right-of-way should be secured accordingly. Costs have been increased from a single 2-lane highway to dual 2-lanes.
26	Link road along rail track between Moghbazar and Malibagh rail crossing	1.20km 2-lane dual	This is a new link connecting Shahhed Tazuddin with DIT Road. It is well used and the proposal for a dual 2-lane highway by RAJUK is a sound one justified on traffic grounds of 2,500 pcus/hr. There is a need to review the other projects in the area notably Scheme #64 which is the Mogh Bazar Mouchak Flyover project.
27	Mohammadpur Bus Stand Embankment Berry Bandh) - upgradation	0.70km 2-lane dual	This scheme together with Scheme #28 provides a good connection between Muhammadpur and the embankment. It is a DCC scheme which will upgrade the 700m section to a full dual 2-lane highway. Traffic flows in 2024 are predicted at 1,000 pcus/hr just exceeding the capacity of a 2-lane road but providing spare capacity for a dual 2-lane road.
28	Mohammadpur Shia Mosque (near Japan Garden City) - Mohammadpur Bus Stand (Widening)	0.60km 2-lane dual	This scheme together with Scheme #27 provides a good connection between Muhammadpur and the embankment. It is a DCC scheme which will upgrade the 600m section to a full dual 2-lane highway. Traffic flows in 2024 are predicted at 1,000 pcus/hr just exceeding the capacity of a 2-lane road but providing spare capacity for a dual 2-lane road.
29	Rasulpur Bridge (Embankment) - Peelkhana road - Azimpur Old Grave yard Eden Girls Cillege	1.50km 2-lane	This 1.5kms section is proposed by DCC for upgrading to a dual 2-lane highway. Since it provides a key link between the BUET area and the embankment road (also being recommended for improvement in this phase) traffic figures at 1,000 pcus/hr show that a dual 2-lane highway will suffice to 2024. Even so the right of way to expand is suggested and a feasibility study is required here before proceeding to dual 3-lanes. The cost estimate has been increased from US\$1m to allow for a dual 3-lane highway.

SI No.	Description	Length (Km) Specification	Comment
30	Western By-pass from Dhaka EPZ (Savar) to Abdullapur (Dhaka - Mawa Highway) via Hemayetpur Bhakurta Taranagar - kalindi	37.00km 2-lane dual	The Western By-pass is planned so as to open up the western areas for development and to provide a key corridor to control this development. It connects the EPZ at Savar running due south to intersect with Scheme #9 above. It is proposed by RHD as a 37 kms long dual 2-lane highway. Traffic figures at 1,000 pcus/hr suggest that this could be phased. However, it is recommended that 60m right-of-way be acquired since the highway is a key project in opening up the western areas and the alignment needs to be safeguarded for future expansion to a dual 3-lane facility when required.
31	Motijheel Shapla Chattar to Kamlapur Railway Station (Widening)	0.50km 2-lane	A 2-lane road widening to serve traffic destined to the main railway station (slated for a primary Metro/BRT interchange point in the future plan). The link carries 1,500 pcus/hr in 2024 and consideration should be given in the Feasibility Study to widening this to dual 2-lanes.
32	Pallabi (Mirpur) to Uttara 3rd Phase up to Tongi - Ashulia road (Dhour)	6.50km 2-lane dual	This dual 2-lane highway proposed by RAJUK is to the west of Uttara and will complete the basic infrastructure in this area and open up the land for expansion. Traffic flows show 1,500 pcus/hr in 2024 and suggest that the road should be developed as a dual 2-lane road.
33	Uttara Sector-10 to Embankment road to the West	3.00km 2-lane dual	With the upgrading of the embankment Circular Ring Road proposed in this phase (see scheme #18), it is recommended that the Uttara New Town should be connected to this highway by Scheme #33. This is a dual 2-lane road proposed by RAJUK over a distance of 3 kms. Traffic flows of 2,000 pcus/hr show that a dual 2-lane road is required and this is supported by the strategic nature of the highway connecting east-west in the northern part of the area.
34	Construction of Muktarpur bridge over river Dhaleswari	1.52km 2-lane dual	Although this project does not reveal a large demand in traffic terms (1,000 pcus/hr), it provides a key link in the strategic network and deserves to be included. It is proposed by RHD as a dual 2-lane road of 1.5kms and could be phased as traffic builds up.
35	Construction of Buriganga 3rd bridge near Basila	0.70km 3-lane dual	In conjunction with Scheme #19 (see above) this bridge is proposed by RHD with a dual 3-lane cross-section over a distance of 700ms. Traffic flows of 1,000 pcus/hr do not support the suggestion that this should be a dual 3-lane facility but there is logic in allowing for future expansion when constructing a river crossing of this size. Scheme #19 forms the approach roads to the bridge which are also scheduled for improvement in this phase.
36	Construction of 3rd bridge over Sitalakkhya at Demra	1.08km 3-lane dual	This scheme connects with Scheme #69 and will allow further access from the southern part of the city to the eastern development areas. Proposed by RHD at just over 1km in length and will be built as dual 3-lanes wide. Although this is wider than the needs according to the traffic projected (2,500 pcus/hr in 2024), it is prudent to develop a wider bridge to permit later widening.
37	Construction of bridge over Balu river at Keodata	0.04km 2-lane dual	This bridge links with Scheme #14 (see above and included within this phase). It is a dual 2-lane bridge of 40m length proposed by RHD and, with traffic levels of 2,000 pcus/hr, justifies the need for a dual 2-lane road.

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39	Mohammadpur Krishi Market to Mirpur Road (Sohrawardy Hospital)	1.20km	2-lane	This 2-lane road will combine with Scheme #40 to create a good connection to the Western Embankment Circular Ring Road. It is a proposal by DCC and will be a useful service to the Sohrawardy Hospital. Flows in 2024 are 1,000 pcus/hr.
40	Krishi Market & Baitul Aman (Y Junction) to Embankment to the west	1.50km	2-lane	This 2-lane road will combine with Scheme #39 to create a good connection to the Western Embankment Circular Ring Road. It is a proposal by DCC and will be a useful service to the Sohrawardy Hospital. Flows in 2024 are 1,500 pcus/hr.
42	Mirpur-14 (Sagorika) to Airport Road (Banani Railway Station) along the fringe of Kurmitola Golf Course	1.60km	2-lane dual	DCC have proposed this link which connects New Airport Road from the Kafrul area. The STP study has shown the need to develop a dual 2-lane east-west link across the city on the alignment of Kemal Ataturk Rd. This connection could be by way of an underpass although the potential conflict with a future Metro Line 4 and the Elevated Expressway (Scheme #44) should be noted when planning this scheme. The underpass would cross both the Airport Road and the Intercity Railway Line and provide a much needed east-west link in this part of the city. A section of the Golf Course could also be preserved by use of the underpass. This key link will also be in the alignment of Metro Line 5 planned possibly as an elevated train. A cost of \$5m has been added for the underpass. Flows vary between 2,500 - 3,500 pcus/hr requiring a dual 2-lane highway as a minimum. The feasibility study should investigate whether the underpass should be constructed at dual 3-lane standard.
43	Mirpur Zoo to Embankment (Berry Bund) to the west	1.00km	2-lane	Although not significant in strategic terms this provides a useful link to a major generator. It can also be considered as providing continuity for an east-west link together with scheme #42. It is proposed as a 2-lane road by DCC and traffic flows in 2024 are 1,000 pcus/hr.
44	Elevated Express way	20.00km	2-lane dual	This scheme has been discussed in section 9.4.11. Some planning has been undertaken by RHD and the Government has been in discussions with a consortium from Thailand. It is understood that work on the final designs has started. Although it is in an advanced stage of construction, it is considered that the main construction would not be undertaken in Phase 1. Costs have been included in Phase 2 but could be removed since it is anticipated that this would be a PPP arrangement of some sort. The current estimates are USD\$330m and 5% has been included for preliminary works to be completed in Phase 1. It is also important to review the designs in coordination with schemes #52 and #64 since there should be a connection between all three schemes particularly in term of tolling strategies.
45	Bashabo Kadamtola Road up to Manikdi	3.65km	2-lane dual	A dual 2-lane highway upgrading proposed by RAJUK and completing the connections from the southern part of the city to the eastern areas. The traffic flows in 2024 are 2,000 pcus/hr justifying the facility being built at dual 2-lanes.
46	Dayaganj - Postogola (Jurain)	1.80km	2-lane dual	Completed
47	Road over Dholai Khal (Box-culvert) from Loharpul (Gandaria) to Dayaganj	1.90km	2-lane	Completed
48	Road over Debdulai Khal (Box-culvert) from Dayaganj to Dholaipar	1.00km	2-lane	Completed

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49	Road over Gerani Khal (Box-culvert) from Dayaganj to Dholpur	1.35km 2-lane	Completed
50	Construction of Mohakhali Flyover	1.20km 2-lane dual	Completed
51	Construction of Khilgaon Flyover	1.78km 2-lane single	Completed
52	Jatrabari - Gulistan Flyover	7.00km 2-lane dual	This scheme was discussed in section 9.4.11. An agreement has been signed by the Government with a private consortium and work on the final designs has started. The current estimate is US\$120m and 5% has been added for the above negotiations, design and preliminary works. It is also important to review the designs in coordination with schemes #44 and #64 since there should be a connection between all three schemes particularly in term of tolling strategies.
53	Dhalka (Postogola) - Fatullah - Narayanganj (Chashara) road improvement	10.50km 2-lane dual	Completed
54	Eastern Embankment along Balu river, Tongji, Demra (Chittagong Highway)	30.00km 2-lane dual	The real justification for the embankment will be made by others on the basis of flood protection. However, the STP study has shown the justification of some form of highway on this alignment. Traffic figures vary from 500 pcus/hr to 1,000 pcus/hr and do not warrant the planned dual 2-lane highway primarily because of the presence of the Eastern By-pass (scheme #23 as distinct from the Dhaka Bypass scheme #20) further to the east. It is recommended that scheme #54 be reduced to a 2-lane road. The costs have been reduced from the estimated US\$413m but much more work is required on this scheme to identify an accurate cost and a viable scheme. However, it has been included since without the embankment (with or without the highway) it will not be possible to develop the areas to the east of the city and the west of the Balu River in a safe environment. It should be noted further that a large part of the cost is for the embankment itself and might reasonably be removed from the STP estimates.
55	Uttara Sector-8 to Uttarakhan Trimukh (Balu river embankment)	5.50km 2-lane	Together with Scheme #56, this provides the basic road infrastructure in the northern part of the eastern development areas. It is proposed by RAJUK as a 2-lane highway but it is recommended that the right-of-way be acquired to permit eventual widening to dual 2-lanes. Flows in 2024 are 1,500 pcus/hr which will exceed the capacity of a 2-lane road.
56	Uttara Sector-4 - Dakhinkhan - Khordi	6.00km 2-lane	Together with Scheme #55, this provides the basic road infrastructure in the northern part of the eastern development areas. It is proposed by RAJUK as a 2-lane highway but it is recommended that the right-of-way be acquired to permit eventual widening to dual 2-lanes even though flows in 2024 are only 500 pcus/hr.
57	Nabinagar - EPZ - Chandra road improvement	20.00km 2-lane dual	A scheme proposed by RHD and completing the connection to the Western By-pass. Flows in 2024 are just 500 pcus/hr but a dual 2-lane highway would seem to be justified eventually due to its key role in the development of the western areas.

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58	Jatrabari - Khanchpur bridge (widening of polder road to 8 lane)	8.50km	4-lane dual	With the addition of the eastern embankment road (Scheme #54) it is logical to connect this to the city. Scheme #13 was recommended for inclusion in Phase 1, providing a good link in the central part of the area. Scheme #58 proposed by RHD as a dual 4-lane highway will provide a good connection in the southern areas. Following traffic projections, which show 1,500 pcus/hr in 2024, it is recommended that this be built first as a dual 2-lane highway with the possibility of widening later but the right-of-way should be obtained in Phase 2. Costs are attributed to this phase pending the Feasibility Study on the possible widening.
59	Berulia (Dhour) - Ashulia - EPZ road	15.00km	2-lane dual	The previous phase developed the Western Embankment Circular Ring Road and Phase 3a now proceeds to develop roads to the west of the River Turag. The opening of Scheme #59 will be coordinated with Schemes #4 and #30 (see above) also developed in this phase. The scheme connects the Western Embankment Circular Ring Road with the Western Bypass and flows of 1,000 pcus/hr show that a dual 2-lane road should be developed.
62	Dhaka (link road) - Narayanganj road up to IWT Terminal with an over-pass	10.50km	2-lane dual	As noted in Scheme #23 above, this road links with the Eastern By-pass to create a strong north-south link in the eastern development areas. With traffic flows of 1,500 pcus/hr a dual 2-lane highway is required.
63	Pallabi to west Embankment via North Rupnagar	2.00km	2-lane	This scheme connects with Scheme #7 to form a continuous east-west link between the Airport and the western parts of the city. The western embankment road (Scheme #18) has been recommended for this phase and the Zia Colony Road (Scheme #7) has been included in Phase 1. It is logical to construct this link #63 to the same standards as the connecting links and hence STP recommends that this scheme be designed as a dual 2-lane highway even though traffic figures at 1,000 pcus/hr hardly justify this. Costs have been increased accordingly.
64	Flyover at Malibagh-Moghbar (Combined)	2.00km	2-lane dual	This scheme is under feasibility study and preliminary design. Further work is required on Detailed Design and financing. Although private finance is anticipated the costs have been included. Current estimate is US\$26m and 5% has been allowed for further development works. It is also important to review the designs in coordination with schemes #44 and #52 since there should be a connection between all three schemes particularly in term of tolling strategies.
69	Jatrabari crossing to Demra Ghat (Sitalakhya 3rd bridge) road	7.50km	3-lane dual	his scheme is also planned to encourage the development of the lands to the east of the city. It is a proposed by RHD as a dual 3-lane highway stretching 7.5 kms from the city to the Eastern By-pass at Tarabo. Scheme #69 needs to be coordinated with construction of the bridge over the Balu River (Scheme #36) included in Phase 3b.
70	Road connecting Buriganga 1st and 2nd bridges via Subhadia & Zinjira (South of Buriganga river)	3.50km	2-lane dual	This is a dual 2-lane highway proposed by RHD on the southern side of the river and connecting the two main arterials crossing the river. Flows in 2024 are just 1,000 pcus/hr but it is a key link in the infrastructure there.
73	Construction of the Link Ramna Star gate to Notre Dam College Road	2.14km	2-lane dual	Completed

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74	BIWTA Pangaon Inland Container Terminal to First Buriganga Bridge Road (Toll Road)	4.30km	2-lane dual	A proposed road by BIWTA connecting the new ICD terminal. It is proposed as a dual 2-lane highway of 4.3 kms. BIWTA have suggested this as Toll Road a concept which requires further analysis. However, costs have not been included as part of the STP network

3.8 OTHER RECOMMENDATIONS FOR POLICY MANAGEMENT:

Throughout the course of the STP Study, a large number of issues have been raised, covering a broad spectrum of elements within the multi-modal transport system. Having selected a modified Strategy 2b as the preferred one, it became apparent that there were some recommendations that are more significant, more substantial and more important than others in influencing and shaping the character and quality of the Dhaka area transportation system. As a result, a set of seven recommendations have been labelled as 'Primary Recommendations', each of which is summarized below. The intent is not to diminish the importance and relevance of other recommendations, but rather to emphasize and stress the strategic importance of these seven primary recommendations. Another ten recommendations are also presented below for other issues on unitary authority, governance, land- use, reservation of right-of-way and rickshaw improvements. Each of the recommendations were dealt with in greater details, discussed problems and issues, advisors and stakeholders views and with further recommendations in Chapter-9 and Chapter-10.

Recommendations:

1. **Traffic Management:** Establishing a program to reclaim the full potential capacity of the existing road space.
2. **Bus System Consolidation:** Restructure bus operation from a large number of small operators into a smaller number of large operators.
3. **Integrated Multi-Modal Mass Rapid Transit System:** Proceed with the planning, design, development and implementation of an integrated mass rapid transit system.
4. **Selected Highway Projects:** Provide selected highway projects that serve basic access requirements to major areas of development.
5. **Road Safety Improvements:** Improve methods of driver training and testing, vehicle road worthiness inspection and design layout of highways.
6. **Pedestrian Facilities:** Implement a program of pedestrian facility provision to serve pedestrians better and encourage people to walk from choice rather than from necessity.
7. **Intercity Railway Resolution:** Commission a feasibility study to evaluate and resolve the options of improving the railway within Dhaka.
8. **Land Use Development Plan:** Adopt Regional Growth Centers and Satellite Cities land use development strategy as an over all frameworks for future land use and development.
9. **Prepare Area Plans for Satellite Cities:** Plan should serve as the framework for guiding the coordination and implementation of urban development, services, and infrastructure investment.

10. **Establishment of a Single Government Entity (Unitary authority):** Establish a single entity with responsibility for land use, transportation, and the integration of the two, at the level of strategic/structure planning.
11. **Proceed with Implementation of three important land used related items:** (i) construction of the Eastern Embankments; (ii) creation of water retention ponds; (iii) and reservation of critical roadway rights-of-way.
12. **Plan and Implement high density development in the areas surrounding mass rapid transit stations:** to be done urgently in view of capturing high land values at transit stations.
13. **Capture a portion of the value added to the land:** government can recover a portion of value added to the land surrounding the mass rapid transit stations.
14. **Rickshaw Licensing System:** Establish a program for re-licensing of rickshaw owners and operators and a means to improve the skills of the drivers and the quality of the vehicles.
15. **Numerical Control of Rickshaw:** Rely upon travel demand and market forces to determine the number of rickshaws in operation, rather than through the control of license numbers.
16. **Redefining the role and Operating Network for Rickshaws:** continue with the planning and implementation of gradual program that redefines the role of rickshaws as one of the neighborhood circulation system and feeder services to mass rapid transit stations, including suitable facilities to provide such services.
17. **Design Improvement of Rickshaws:** encourage and support efforts to improve the design of rickshaws as well as the associated maintenance facilities and procedures.

Detailed description of each of the above recommendations including issues led the findings, proper justification and framework for their implementation can be seen in Chapter-9 of the Final Report of the Strategic Transport Plan.

3.9 PRIORITY POLICIES AND PROGRAMS FOR JAPANESE ASSISTANCE

After reviewing the STP reports, recommendations, working papers, re-visiting project sites and detailed discussion with the JICA Mission the Consultants arrives some conclusions regarding selecting the priority policies and programs for Japanese assistance. The selected policies will be multi-year program which continuously improve the transport system in Dhaka and will have long term impacts and benefits to the city dwellers. Three main policies suggested are:

1. Improving Existing Traffic Management System
2. Study, Design and Implementation of Mass Rapid Transit System
3. Institutional Development and Governance in DMA organizations

3.9.1 TRAFFIC MANAGEMENT RECOMMENDATIONS

Introduction

At the present time, the level of driver competence and their behaviour patterns in the city are very poor. In addition, the highways and pedestrian paths have been taken over by traders and others who use the running surfaces for uses other than transportation. This causes traffic congestion and delays and reduces the carrying capacity of the highways. One of the major untapped transport related assets of Dhaka is the substantial unused traffic capacity inherent in the existing highway system that is now being wasted through inappropriate use and poor driver behaviour.

Recommendation #1 above has stressed the need to reclaim the lost capacities in the existing highway system and introduce discipline on the road by the use of traffic management measures. The concept requires that good practice in organization and priorities is implemented within the existing right of way. No land acquisition is required and no displacement of persons results. Only recovering the right-of-way may improve lots of traffic discipline in the city. In such cases, any non-conforming uses such as illegal structures forming pinch points and persons who carry on their businesses on the road itself will be affected.

It is recommended that a program be instituted to move forward in a positive and definitive manner to reclaim the full capacity of the existing public right-of-way and highway space. This reclamation can be achieved by: -

- (a) Relocating or removing uses which are not appropriate. Prominent among these inappropriate uses are – street traders who set up stalls on the pedestrian ways and also on the highways themselves, bus ticket sales booths, solid waste skips, building materials again blocking the footpaths and highways and haphazard uncontrolled parking of rickshaws and other vehicles.
- (b) Providing better organization and improvement in the operational practices of drivers. This poor behaviour is a direct result of not controlling the licensing scheme rigorously. It is known that licenses can be obtained without having taken any formal instruction or testing procedure. As a result, drivers are not competent to handle their vehicles properly and are unaware of the rules of the road. The result is inefficient operations, congestion and danger.

Although driver education and licensing is a wider issue, this first recommendation concentrates on what can be achieved by undertaking correct traffic management of the main arterial links. By re-planning the main links and intersections, the city would gain an essential and cost-effective resource for very little outlay. Substantial economic benefits can be anticipated from this action. Section 9.6 provides more details about this task and the Terms of Reference for the project are included in the companion report on Phase 1 projects.

Specific Issues

In implementing these traffic management schemes the following principles have been suggested by the STP should be adopted:-

- The right-of-way should be clearly defined and all obstructions removed within these confines. This will entail a gradual clearance of illegal trading areas, surplus building materials left over from construction and items such as solid waste containers deposited on the road itself.
- The road design standards should be reviewed to ensure that they are appropriate for urban design conditions in Dhaka. Once accepted the highway functional classification should be implemented to the extent possible consistent with the need to avoid land acquisition and person displacement. The primary effect of enforcing the functional classification will be to design the correct number of running lanes and the methods to protect these running lanes from other non-conforming uses. A specific impact which is prevalent in Dhaka is the use of the nearside lane for haphazard parking and waiting areas. In an arterial classification in which a dual-3 lane highway is planned, all three running lanes must be clear of obstruction and available for moving traffic.
- The intersection geometry will also be controlled by the urban design standards and this will include sight lines, specification of lanes for turning traffic and properly placed stop lines. Correct movement through the intersection should be organized by the use of channelization islands. These islands will not only channel traffic movements correctly, they will also provide pedestrian refuges for safer pedestrian crossing movements.
- On the running lanes, it is essential to provide clear surface markings in order to channel traffic into the correct lanes. This should be included well in advance of the intersections so that vehicles adopt the correct lane for their movements through the intersection. At the intersection, clear lane markings will designate lanes for left and right turns and for straight ahead movements. The right and left turns will need to be segregated in some instances in order to prevent bad turning practices (for example making right turns from other than the right lane or other designated lane).
- In some instances on faster moving arterials (New Airport Road for example) overhead gantry signs should be installed in order to provide better advanced warning of lane designations. The advanced direction signing will avoid or minimise last minute decisions about lane changes. At present in Dhaka there is a lack of consistency in direction signing and this should be resolved by a program of review of all arterials and their signing. This will be a major contributor to the reduction of collisions.
- Parking should be prohibited on arterials highways unless it is possible to designate spaces such that they do not interfere with the free flow of traffic. In most cases this should not pose a difficulty since adequate parking areas can usually be located on nearby side roads. At bus stops, there will be a need to provide properly designed spaces for the use of feeder services provided by either rickshaws or CNGs.
- The services provided for pedestrian movements are divided into to Linear (along the footpath) and Transverse (across the highway). The present condition of footpaths in Dhaka is appalling and dangerous. Pedestrians are forced into the road itself due to poor footpath design and misuse of the footpath space. As part of the traffic management improvements, the footpaths should be cleared of obstructions and properly paved. Regarding pedestrian crossings, the policy needs to be reviewed and revised and a fully overt program put into effect to protect the pedestrian. When on a

crossing the pedestrian must have right-of-way and drivers must first of all be aware of this and secondly must know that if they violate the rules they will be caught and punished.

- Where bus public transport uses the arterials, two major factors are needed within traffic management planning. Firstly, if the bus service operates under normal conditions within the traffic stream, the minimum requirements will be that stops are organised such that buses will pull off the running lanes into bus lay-bys. In more advanced circumstances there will be Bus Only lanes and these should be clearly designated and protected from other traffic in relevant sections by low kerbs or other separators. The BRT system, of course, will have its own exclusive right-of-way protected by kerbs and other barriers.
- The policy and role for rickshaws has been published in the parallel volume on Urban Transport Policy. Some highway sections will be designated as being "Rickshaw Free". On these sections, signing must be posted to advise rickshaw drivers that they must not enter and suitable waiting areas should be provided on side roads such that they can make efficient connections for feeder services. Where rickshaw movements are restricted, there should be parallel routes created and maintained in the neighbourhoods so that rickshaw operation is made more efficient.

3.9.2 Study, Design and Implement Integrated Multi-Modal Mass Rapid Transit System

A metropolitan area the size of Dhaka, needs some form of mass rapid transit system to provide good quality transport for a large number of users. As the area continues to grow, the need for such a system becomes even more acute. A number of candidate systems were considered during the study and their applicability was identified using a number of criteria. Principal among the criteria were – capital cost, capacity provided and ability to construct. The three main candidate systems considered were Metro (heavy rail based, completely segregated and a blend of over elevated and underground), LRT (Light Rail Transit either street running or elevated/underground) and BRT (Bus Rapid Transit either street running or elevated/underground).

Capacity is highest with Metro (up to 60,000 passengers per hour) and about the same for LRT and BRT (about 25,000 passengers per hour). In terms of capital cost Metro is the most expensive and BRT the least expensive.

System	Capacity (pax/hr)	Power Source	Cost (US\$m/km)
Metro	60,000	Electric	50-150
LRT	25,000	Electric	20-50
BRT	25,000	Electric CNG	2-10

In terms of ability to construct, the BRT system is a clear winner with simple traffic management methods only required to implement the basic system and no power supply challenges. Metro, due to the need to have complete segregation is the most difficult to construct and will be either underground in tunnel¹ or on elevated track. LRT is more difficult to implement than BRT and offers very little difference in capacity. For these reasons, LRT was not considered further as a viable proposition at this time.

The study also investigated the future role of the railways and the waterways networks. Both of these systems have the potential to provide useful capacity. However, in the case of railways,

there is a need for considerable investment to bring the present system up to the necessary quality (see Recommendation #7). The waterway already has an extensive network of ferries and smaller boats providing service between the outlying areas and the city area. However, as with the railways, there is a need for large investments and organisational improvements to make this system an integrated part of the whole system. The work on traffic assessments has shown that the attraction of waterway transport is low in comparison with other forms due to the speed differential. For this to be a practical contender in the multi-modal system there will be a need to identify and implement a fast boat system.

As described in section 9.2, the Preferred Strategy calls for short-term investment in a BRT-based mass rapid transit system together with a gradual development of a Metro-based system. The essential part of achieving this integration of all the available systems is to begin with a co-ordinated approach from all authorities which provide transportation services with a view to realising the best attributes of each and all systems.

3.9.3 Institutional Development and Governance in DMA Organizations

At present, the land use planning functions are separated from the transportation planning functions. Whereas RAJUK has developed the Structure Plan and is responsible for its implementation, the transportation and traffic functions are spread among BRTA, DTCCB, DCC and the Police. The planning control function which should be part of the overall planning process is the responsibility of RAJUK but there is little evidence that this function is being exercised. The lack of coordination between land use planning and transportation planning is evidenced by the manner in which development occurs that is not in accordance with the Structure Plan and leads to situations where suitable transportation is not available to serve the needs of the new development.

In order to achieve integration between transportation and land used development, it is recommended that the Government establish a Unified Authority that is responsible for the planning of both land use and transportation at the strategic level. The policies related to the establishment and responsibilities of a Unified Authority are discussed in some detail in the STP Urban Transport Policy document. The organizational structure and functions of a Unitary Authority are presented and discussed at length in the STP Institutional Strengthening and Capacity Building Report.

The Mass Rapid Transit (MRT) is the highly demanded system to reduce the transport problems of Dhaka. The government is also convinced that construction of MRT is the primary solution to the growing transport problem in the city. To start with the initial work a separate Mass Transit Authority should be established. The Japanese assistance can help create these two organizations towards solving urban transport problems.

In addition to the above programs following few roads can be considered for Japanese assistance

I/D	Name	Comment	Cost (\$m)
7	Zia Colony - Mirpur	This is planned as a 6.3kms dual 2-lane road aimed at opening up the area south and west of the International Airport. It will create a much needed east-west link in the northern part of the city allowing traffic from the western parts of the area to access the Airport without having to make large detours. The project by DCC and Cantonment Board links to Scheme #63 (see below) which together will connect through to the Eastern embankment road (Scheme #18). In fact the traffic predictions at 4,500 pcus/hr are in excess of the capacity of a dual 2-lane road and the feasibility study should investigate the expansion to dual 3-lanes either at the outset or in the third phase. Whatever the decision in terms of construction, it is essential to obtain the right-of-way to allow this widening to be achieved.	14.0

I/D	Name	Comment	Cost (\$m)
12	Tejgaon Airport Tunnel	Originally a new project identified by STP it is intended to provide a much needed east-west connection for the city. It will lead directly west from the end of the recently constructed Mohakhali Flyover. The alignment is not yet fixed but is anticipated to connect on the west side of the airport into Agargaon Road. Anticipated as a dual 3-lane road tunnel. It is essential to move ahead in year 1 with the pre-feasibility study and enter into discussions with the relevant agencies. Cost estimate includes all design and tendering. It will require careful study how the tunnel will join in to the Mohakhali Flyover and the anticipated Elevated Expressway from Gulistan (see project #44 below). Traffic flows in 2024 are 4,000 pcus/hr which is between the capacity of a dual 2-lane and a dual 3-lane highway.	50.0
18	Circular Ring Road	In order to organise the western areas of the city and to begin the process of encouraging development to the west, it is recommended that the road located on the embankment be developed in this phase. Proposed by RHD as a 25 kms long dual 2-lane highway the upgrading scheme provides a key link in the strategic network linking into the numerous ferry terminals along the Turag River. Traffic projections to 2024 vary between 1,000 pcus/hr to 2,000 pcus/hr showing that a dual 2-lane road is correct for this route. The construction of this route together with the implementation of BRT Line 2 along Mirpur Road will provide good land-based connection to the Ferry Terminal at Gabtali.	10.0
32	Pallabi – Uttara 3	This 2-lane dual highway proposed by RAJUK is to the west of Uttara and will complete the basic infrastructure in this area and open up the land for expansion. Traffic flows show 1,500 pcus/hr in 2024 and suggest that the road should be developed as a 2-lane dual road.	15.0
54	Eastern Embankment/ Bypass	The real justification for the embankment will be made by others on the basis of flood protection. However, the STP study has shown the justification of some form of highway on this alignment. Traffic figures vary from 500 pcus/hr to 1,000 pcus/hr and do not warrant the planned dual 2-lane highway primarily because of the presence of the Eastern By-pass (scheme #23 as distinct from the Dhaka Bypass scheme #20) further to the east. It is recommended that scheme #54 be reduced to a 2-lane road. The costs have been reduced from the estimated US\$413m but much more work is required on this scheme to identify an accurate cost and a viable scheme. However, it has been included since without the embankment (with or without the highway) it will not be possible to develop the areas to the east of the city and the west of the Balu River in a safe environment. It should be noted further that a large part of the cost is for the embankment itself and might reasonably be removed from the STP estimates.	120.0

Comments on Sector Survey on Urban Transport

1. As regards the comments on current experience of Bangladesh in development of Metro rail (elevated or sub-way) we like to draw your kind attention that initially no country could have experience of such projects from before until they had been constructing the Metro. All such countries now having Metro System in operation received technical and financial assistances from foreign countries which had previous experiences. For example Delhi Metro Rail Corporation (DMRC) received financial and technical assistance from OECF-JBIC, technology transferred from different countries including Germany, Italy and Japan in relation to technical design, civil construction, railway tracking, manufacturing of trains and other rolling stocks, etc. In case of Manila EDSA LRT, technology was supplied by Sumitomo Corporation of Japan in a consortium with Mitsubishi Heavy Industry for civil construction, tracks, electro-mechanical works, etc and CKD Doprovini, Italy for manufacturing, testing, commissioning of trains, and Kaiser Engineering for program management and technical design, supervision and commissioning the project. The Bangkok sub-way system was built under public - private partnership with technology transferred from different countries particularly US, Japan and European nations. Calcutta Underground was constructed under the Russian technical and financial assistance.
2. Availability of alternative technology is no problem now-a-days as most of the Mega Cities in the world are having some kind of Mass Rapid Transit (MRT) system and all developed and many developing countries acquired their technology. The question is now, buying technology and process of transfer it appropriately to the incumbent country which to be determined during the negotiation. Bangladesh although has no structural standard for sub-ways or elevated trains but the country has design standards for big bridges over mighty rivers like Ganges, Meghna and Jamuna and for over and under passes. Bangladeshi engineers, economists and technologists are intellectually excellent people to work with and all local inputs can be provided locally satisfactorily. Bangladesh will be appreciated a Japanese consortium to be engaged to help build the Dhaka Metro System both elevated and sub-way routes with requisite transfer of technology.
3. The STP stipulated the Public-Private Partnership (PPP) system will be used where internationally renowned high quality firms and consortiums will participate for program management, operation and maintenance and foreign partners will provide technical and management support until the local resources are developed. Alternatively if it is owned by the GOB and expatriate partners jointly then an experienced foreign management contractor may be employed for management, operation and maintenance. This model is being followed in Bangladesh in case of operation, maintenance and management of Jamuna Bridge. As regards the feasibility and design study of metro system in Dhaka the experienced foreign consultants will be appointed under international bidding system. They will evaluate all aspects of technical, economic, financial, socioeconomic and environmental issues and make provisions for addressing them in appropriate manner. They will be estimating feasibility level costs for alternative options and recommend the best option. It has been seen that combined metro system including elevated and underground tunneling system is preferable due to reduced cost and higher construction efficiency, the case of Delhi Metro construction can be mentioned in this case. The costs proposal of Dhaka Metro System given in the STP was notional cost based on experiences of neighboring countries and consultants own acumen. However, few actual and notional costs from past experience can be given in the following Table:

Metro System	Length in km	Total cost	Cost/km
EDSA LRT, Manila	22 km	\$ 675.5	\$ 30 million
MRTA Sub-way, Bangkok (2004)	21 km	\$ 2.75 billion	\$78.57 million

BTS Sky Train, Bangkok, (2006)	139km	\$6.62 billion	\$47.66 million
Calcutta Underground Metro, India (1972-1995)	16.45 km	\$468.8 million	\$28.5 million
Calcutta Elevated Metro (1999-2000)	8.7 km	\$216 million	\$24.82
Delhi Metro (mixed system) (completed in 2007)	65km (44km elevated, 10 km at-grade and 11 km Underground)	\$2642.28 million	\$40.65
Delhi Metro Underground (proportional)	11 km	\$748 million	\$ 68 million

The ToR for STP asked the consultants to provide the Conceptual Plan and Strategy Options not required detail costing. It was assumed that during feasibility study and detailed design the proper costing will be estimated. Accordingly the consultants prepared their reports. However, the following 2 Tables on the Fixed Assets (Schedule-4) and Work-in Capital (Schedule-5) of Delhi Metro will give you the salient pictures of the actual project costs break-down by components:

Table-1: Fixed Assets

DESCRIPTION	Balance as at 1.4.2006	Additions/Adjustment During the year	TOTAL	Capitalised During the year	Balance as at 31.3.2007
Buildings	1,593,826,255	4,300,069,033	5,893,895,288	3,153,659,583	2,740,235,705
Structures (Via. Duct, Bridges & Tunnels)	2,839,689,254	3,273,042,720	6,112,731,974	2,290,857,512	3,821,874,462
Rolling Stock	76,490,180	1,267,797,445	1,344,287,625	612,186,387	732,101,238
Signaling & Telecom Equipments	309,923,265	1,531,026,424	1,840,951,689	1,570,992,474	269,959,215
Permanent Way	485,362,354	21,126,856	506,489,210	465,265,372	41,203,838
Traction Equipments	205,241,765	419,789,970	625,031,735	301,761,283	323,270,452
Escalators & Elevators	69,983,249	94,892,425	164,875,674	120,525,159	44,350,515
AFC Equipments	133,164,659	205,134,236	338,298,895	284,817,502	53,481,393
Plant & Machinery	145,046,234	1,347,456,637	1,492,502,871	916,406,160	576,096,711
Incidental Expenses During Construction (Net)	74,860,655	(162,769,774)	(87,909,119)	157,978,194	(245,887,313)
IT System	1,358,166	2,065,388	3,423,554	-	3,423,554
Temporary Assets	-	11,340,665	11,340,665	-	11,340,665
Office Equipment	-	1,089,841	1,089,841	-	1,089,841
TOTAL - CURRENT YEAR	5,934,946,036	12,312,063,866	18,247,009,902	9,874,469,626	8,372,540,276
- PREVIOUS YEAR	35,608,138,841	21,270,056,824	56,878,195,665	50,943,249,629	5,934,946,036

Table-2: Capital and Work - in-progress

PARTICULARS	CURRENT YEAR					PREVIOUS YEAR				
	Operation	Real Estate	Consultancy	Incidental Expenditure During Construction	Gross for the Year ended on 31.3.2007	Operation	Real Estate	Consultancy	Incidental Expenditure During Construction	Gross for the Year ended on 31.3.2006
EMPLOYEE COST										
Salary, allowances and benefits	346,679,170	16,599,539	1,232,637	234,267,523	570,938,069	222,284,596	14,545,495	1,247,411	193,779,800	431,823,299
Contribution to PF and other funds	26,458,437	1,949,525	134,542	15,886,470	44,175,975	15,161,010	1,472,395	112,877	15,284,705	32,921,578
Staff Welfare Expenses	28,654,854	1,232,589	35,857	6,988,444	36,912,563	24,389,777	482,295	19,465	5,254,426	30,675,966
OPERATIONS AND ADMINISTRATION EXPENSES										
Consultancy and Professional Charges	36,136,936	6,599,647	17,012,858	229,746,647	282,455,337	15,659,426	6,188,275	54,623,519	865,550,160	442,533,380
Traveling and conveyance	16,966,353	1,369,565	1,297,829	21,695,813	41,283,601	9,669,918	1,217,747	1,896,751	21,269,092	33,854,538
Real Estate Expenses (Land Acquisition)	-	20,256,368	-	-	20,256,368	-	68,665,267	-	-	68,665,267
Stores Consumed	43,141,651	899,307	9	531	44,161,522	28,524,009	6,535	223	467,289	28,968,055
Tractor Expenses	214,923,686	-	-	-	214,923,686	114,696,799	-	-	8,787,021	123,483,820
Repairs and Maintenance										
Plant and Machinery	54,604,629	7,423,019	2,586	3,715,666	65,745,932	48,759,785	5,504,372	1,824	1,172,586	55,946,927
Buildings	11,335,220	3,627,575	36,133	7,697,234	22,696,133	2,469,212	686,855	22,959	5,613,624	9,152,940
Others	11,157,329	3,825,335	48,116	10,507,739	24,739,519	5,660,277	2,471,382	44,618	9,154,225	16,730,702
House Keeping Expenses	122,637,480	3,970,677	12,217	4,806,385	130,526,159	60,219,181	1,676,105	5,466	3,361,938	65,263,660
Auditors Remuneration										
Audit Fees	49,370	49,669	1,279	243,911	336,729	12,571	32,866	1,123	234,020	260,560
Tax Audit Fees	25,436	33,200	669	164,946	228,555	8,563	22,402	764	159,416	161,145
Insurance Expenses	5,242,660	119,238	3,110	590,623	5,855,621	5,054,931	106,913	3,649	769,801	6,826,254
Advertisement and Publicity	7,174,799	9,739,215	14,929	15,130,491	26,952,535	7,532,589	4,244,144	39,428	11,652,094	23,468,255
Legal Expenses	84,821	27,507	15,866	5,263,425	5,371,319	261,638	182,907	2,829	1,264,572	1,702,346
Lease Rent (Office)	737,668	854,380	21,702	4,133,068	5,726,767	453,257	1,166,592	39,577	8,251,704	6,884,130
Training and Recruitment Expenses	2,295,565	153,160	3,525	647,293	3,085,583	-	122,515	4,135	872,530	899,329
Telephone and Other Communication Expenses	15,114,947	1,181,866	166,955	9,269,753	25,672,821	11,747,645	1,078,482	104,734	10,121,899	23,044,960
Printing and Stationery	12,126,527	2,760,714	92,032	16,574,416	31,653,669	13,213,529	1,494,774	352,745	13,619,000	25,780,042
Security Expenses	34,015,895	3,123,723	4,347	4,432,276	41,578,241	24,848,760	1,722,364	4,122	10,355,496	36,821,342
Vehicle Hire and Maintenance Charges	26,010,166	3,995,225	496,900	22,550,955	47,043,056	9,671,482	2,733,786	212,624	22,947,858	34,365,742
Land Licenses Fee	22,426,462	-	-	36,159,939	59,587,582	39,519,382	-	-	31,644,938	71,564,299
Assets written off	6,936,761	162,460	4,228	-	7,103,479	15,477,819	51,573	1,760	-	15,531,152
Electricity and Water Expenses	237,519,382	6,734,584	26,317	19,065,347	263,446,059	150,602,053	16,131,314	29,911	18,777,228	176,260,316
Wealth Tax	-	-	-	416,050	416,050	-	-	-	747,351	747,351
Print Period Expenses	-	-	-	4,401,247	4,401,247	-	-	-	3,267,859	3,267,859
Environment protection Expenses	67,748	-	-	792,116	859,864	259,606	-	-	408,417	776,417
Miscellaneous Expenses	16,074,721	39,659,727	80,151	12,210,375	66,807,974	8,423,746	1,171,307	155,839	26,797,553	36,548,955
Fringe Benefit Tax	-	-	-	7,826,967	7,826,967	-	-	-	7,864,142	7,864,142
TOTAL	1,287,579,199	129,867,508	20,648,058	684,758,159	2,102,832,923	835,721,735	127,156,445	58,730,643	789,227,791	1,820,836,814

It is shown that majority of cost involves building and structures, viaducts and tunnelling about 60%. The remaining cost are for system of which plant and machinery 8%, rolling stock 13%, signalling, telecommunication 7%, track and traction equipments 9%, escalators and elevators 1.5% and AFC 1.6%

Comments (3):

The full detailed information to be collected during the feasibility study of the tunnel construction between Jahangir Gate and Rokeya Sarani. This short term review has very limited scope for discussing land appropriation. Over the ground there are installations of BAF, National Parade ground and old run way.

It is informed from the DTCB that Ministry of Communications has instructed them to prepare Concept papers for priority projects. At present DTCB is preparing the concept papers based on the ToR for priority projects prepared by STP.

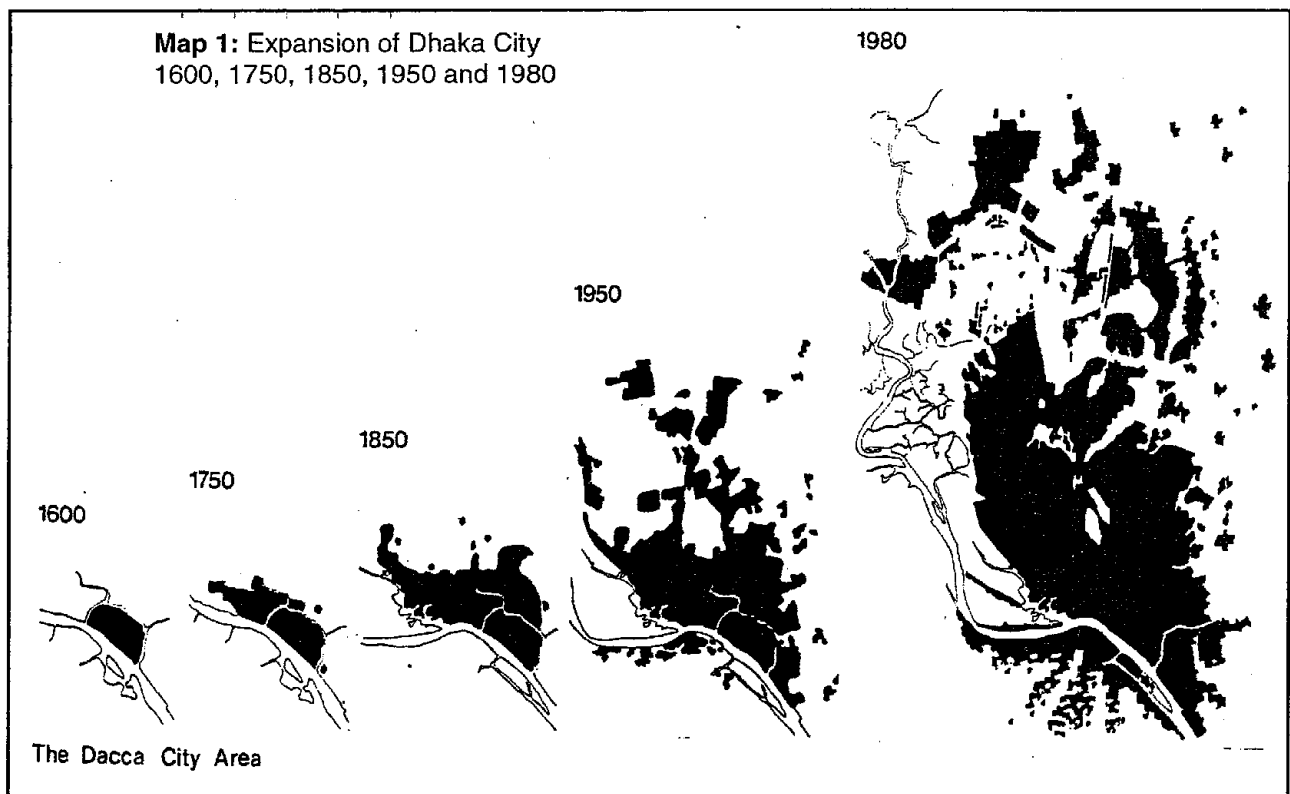
The justification for Eastern Bypass cum Embankment is still necessary both for traffic movement and flood protection. The Saidabad-Jatbari- Katchpur section of Dhaka-Chittagong Highway remains choked with heavy traffic most of the time of the day. In the evening peak it takes 2-3 hours to cross the 10 km section of road. The people traveling the road (called economic lifeline) are disparately looking for a Bypass to enter the city. I believe that if feasibility study is done now, there will be required volume of diverted traffic to justify the road. However, for making it more viable land use plan adjacent to the embankment (at least 100 meter both sides) should be carried out for commercial utilization.

Regarding the provision of LRT in Dhaka the Consultants of STP and the Advisory Committee agreed that LRT will not be suitable to serve the purpose of commuting in medium and long term in Dhaka, the most densely populated city of the world, due its capacity limitations. Therefore, LRT option was not discussed in detail.

4. History, Population Growth and STP Considerations

4.1 Background of Dhaka City

Dhaka existed as a small urban centre even before Islam Khan, the Mughal Subedar, arrived here in 1608 and then set up his capital of the Bengal Subah, in 1610. He named the city Jahangir Nagar, after the Emperor in Delhi. The nucleus of this Pre-Mughal city was close to the river, in and around what is now known as Bangla Bazar. Islam Khan's administrative and residential quarters were set up at the site of the present day Central Jail. The early expansion of the city was around the Chawk, Lalbagh and the river front. River Buriganga offered the unique opportunity of communication linkage with the south and eventually to foreign lands. The Mughal city (1610 - 1764) developed over a fairly large territory, extending from the river Buriganga continuously to Shahbag and Mohammadpur and to Postagola and in a non-contiguous sporadic manner to Tejgaon and even to Tongi in the north. The highest population of the city at any point of time during the Mughal period was about 2,00,000 (Karim in *Banglapaedia*, Vol. 3, p.193), and not 900,000 as some popular history writers might have claimed. Even the figure of 200,000 in the mid 17th Century or early 18th century was a very large population, considering the settlement pattern and housing form. The inner built-up area of



the Mughal city was probably limited to 15-20 square miles.

Dhaka in the early phases grew on comparatively higher lands, but no land between the river and Tejgaon (or even Tongi) was higher than 25 feet above sea level. Most of the land was below

15 feet of elevation. The city therefore grew leap-frog and contiguous expansion took place through filling of low lands or water bodies. During the early phase of the British period (1765-1947), urban development required filling of the ponds and low lands, sometimes prisoners used to be engaged for the purpose. Topographic condition indeed played a significant role in the territorial expansion of the city.

The railway was introduced in Dhaka in 1885, first linking the city with Narayanganj and to Mymensingh in 1886. It was meant for inter-city or inter-regional communication and goods movement. Even today, the railway is only marginally used for commuter journeys, although it has great potential for such journeys.

The river ways played the most important role for transportation next to the railway for interregional communication. Dhaka was always connected to all the regions by good waterways.

Motor vehicles, for either private or public use, became noticeable only after the creation of Pakistan in 1947 when Dhaka became the capital of the province of East Bengal, later called East Pakistan.

Intra-city bus service was only beginning to function. The other transports were horse carriages and increasingly, cycle rickshaws. Few taxis operated between Victoria Park in old Dhaka and Narayanganj in the 1950s. Population of the city was limited, less than 3,50,000 in 1951 and not over 550,000 in 1961.

The city remained small (only 35 sq. miles in 1961) and compact. It experienced growth impetus beginning in the mid fifties and rapid growth throughout the sixties and very rapid growth since after the Liberation of the country in December 1971.

Dhaka city became the national capital of Bangladesh evolving from a provincial capital after Independence in 1971. Since then, the influx of people occurred due to several socio-economic factors, such as growing population pressure in rural areas, frequent and severe natural calamities, law and order situation in remote and isolated areas and the availability of more socio-economic opportunities in Dhaka.

In 1981 the population of the city became 3,440,147 and by 2001 the DMDP area contained 107,10,000. The settlement pattern within DMDP at the present time is shown in Map 2. It has kept this momentum of population growth and consequent aerial or physical expansion at a rapid rate till today. The trend is most likely to continue into the future, reaching 30 million by 2030 (according to STP of DUTP).

Other contributing factors are natural growth of population and annexation of new areas to the existing city limit. Quoting Professor Nazrul Islam from Dhaka Now, annexation of new areas contributed 44.15 percent of the growth during 1981-1991 while 22.31 percent was contributed by natural growth during the same period while the other 33.53 percent increase took place due to migration of rural people into Dhaka city.

Table 1: The Population and Annual Growth Rate of Dhaka and in the Urban Areas of Bangladesh, 1901-2001

Year	Bangladesh (Urban)		Dhaka	
	Urban Population (thousand)	Annual growth rate (Percent)	Population (thousand)	Annual growth rate (Percent)
1901	702	-	104	-
1911	807	1.39	154	1.8
1921	878	0.84	169	0.9
1931	1,073	2.00	196	1.5
1941	1,537	3.59	296	4.2
1951	1,820	1.58	336	1.3
1961	2,641	3.72	557	5.2
1974	6,274	6.62	1,774	10.4
1981	13,228	10.03	3,440	8.1
1991	22,455	5.43	6,844	6.5
2001	28,605	3.25	10,710	4.5

Sources : Calculated from BBS, 1994, 2000 (Islam, N. 2006).

Notes:

1. Population figures between 1901 and 1961 refer to Dhaka Municipal / City Corporation area. The 1974 figure refers to Dhaka Metropolitan Area.
2. The 1974 figure is adjusted from original recorded figure of 1,680,000.
3. The 1981 figure refers to Dhaka Statistical Metropolitan Area (DSMA), which included Dhaka City Corporation, Narayanganj and Tongi municipalities and rural areas. In 1981, the population of Dhaka Metropolitan Area was 2,807,000.
4. In 1991 figure refers to Dhaka Megacity which includes SMA designated in 1981 and entire Narayanganj Sadar, Bandar, Keraniganj, Uttara, Savar and Gazipur Sadar thanas.

Dhaka, the largest city in the country enjoys district primacy in the urban hierarchy and the percent of Urban Population contained in Dhaka was 30.5 percent of the National Urban Population in the year 1981. This increased to 37.4 percent in 2001 and is estimated to be 37.5 percent in 2005.

Table 2 : The Primacy of Dhaka in the National and National Urban context

Year	Population of Dhaka (million)	Percent of National Population	Percent of National Urban Population
1974	1.77	3.0	28.3
1981	3.44	3.8	25.7
1991	6.84	5.8	30.5
2001	10.71	8.0	37.4
2005	12.00	8.6	37.5

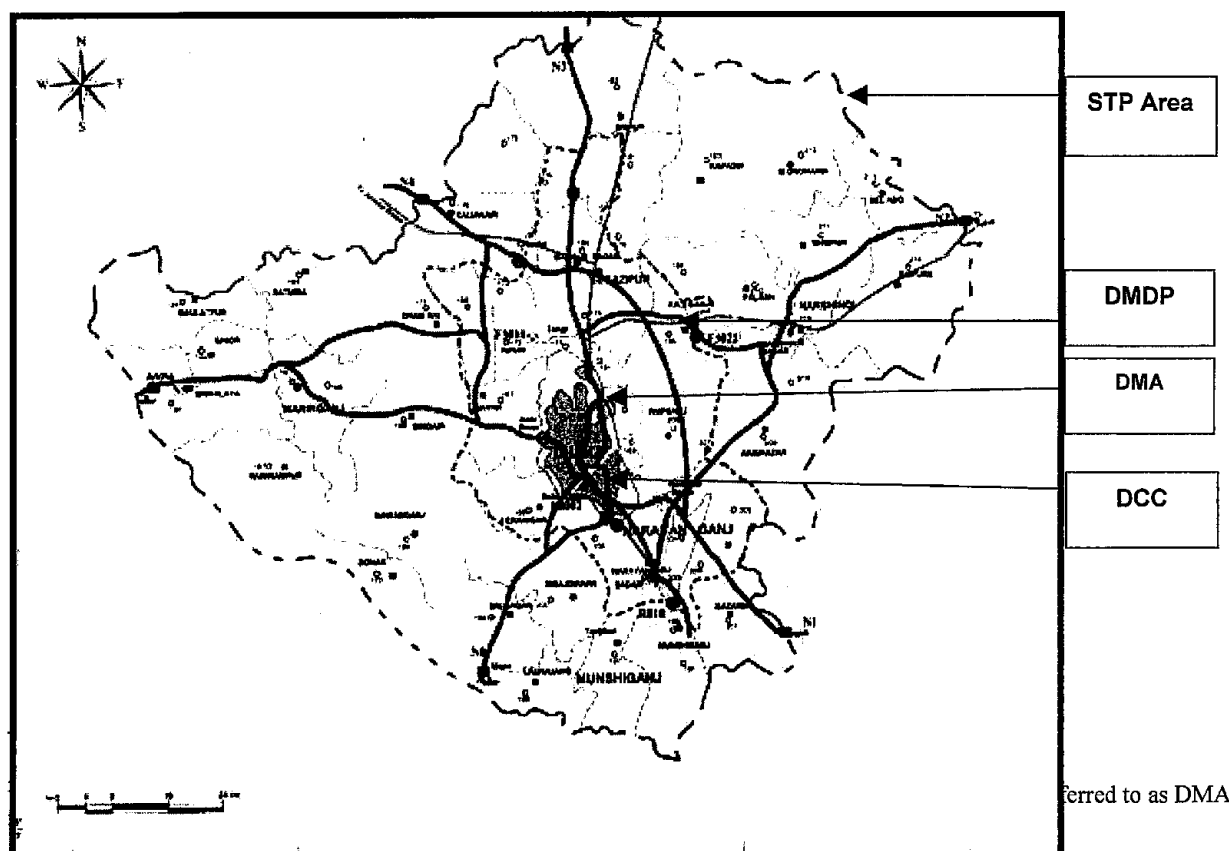
Source : Calculated from BBS, 1994, and estimate for 2005, (Islam, N. 2006).

Planning for STP Study Area

Dhaka city presently has several administrative and planning boundaries. Commonly these are DCC, DMA, DMDP and STP boundaries as shown in Map with area and population.

Authority	Area in Sq. Km. (Sq Mile)	Population
DCC ¹	290 (120)	6.7 m
Dhaka Metropolitan Area ²	360 (139)	10.7 m
Dhaka Metropolitan Development Plan (DMDP) ³	1528 (590)	12 m
STP Area	7440 (2976)	19 m

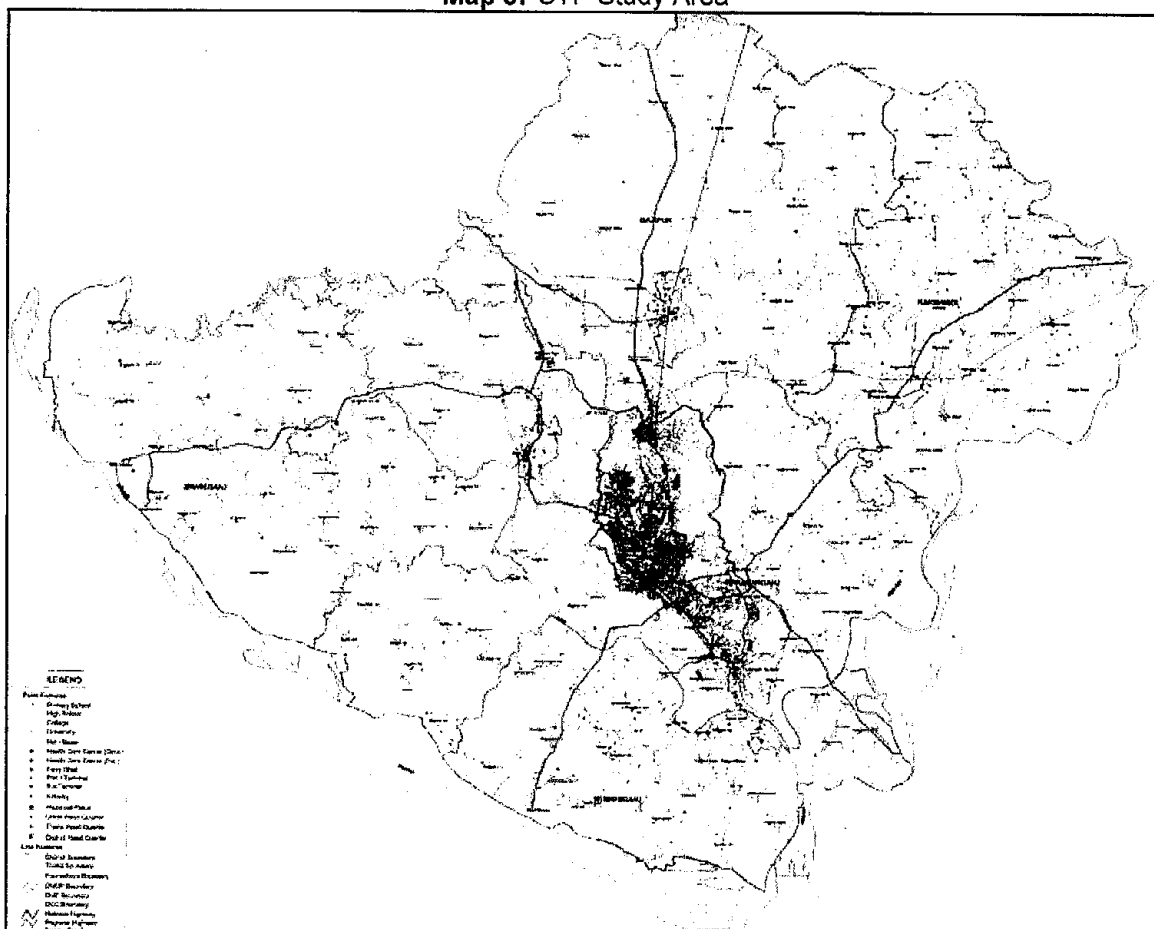
Source: Dhaka Now, N Islam, 2005.



The Strategic Transport Planning (STP) Study Area has a total area of 7440 square kilometers (Map 3) and a population of 17.3 million in 2001 which comprises of the following areas; (i) Dhaka Metropolitan Area (DMA) and (ii) Six districts of (Greater Dhaka Districts) i.e., Dhaka, Narayanganj, Gazipur, Munshiganj, Narsinghdi and Manikganj.

The population of Dhaka increased from a modest figure of just over one million in 1971 to more than 10 million in 2001. Improvement in the civic facilities and services in general and transport system in particular have not kept pace with the increase in population in the city. Moreover, the area of jurisdiction of the city of Dhaka also expanded beyond the Dhaka District and the City Corporation. The boundary relationships of DCC, DMDP and STP with area and population is provided in Map 3.

Map 3: STP Study Area



Source: SSUT Study, 2008.

The adjacent districts, namely, Narayanganj, and Gazipur have virtually become an integral part of the Metropolitan Dhaka. The districts other than Dhaka in the STP Area show different levels of urbanization based on their industrial and commercial expansion potential. The population figures for 2001 relating to the districts of the STP Study Area are presented in Table 3.

Table 3: Population in STP Study Area in 2001

District	Population ('000)			Urbanization (%)	Area (km ²)	Population Density *
	Urban	Rural	Total			
Dhaka	7,901	717	8,618	91.7	1,464	5,887
Gazipur	904	1,119	2,023	44.7	1,800	1,124
Manikganj	97	1,205	1,302	7.5	1,379	946
Munshiganj	167	1,122	1,289	13.0	955	1,350
Narayanganj	1,206	965	2,171	55.6	701	3,097
Narsinghdi	364	1,538	1,902	19.1	1,141	1,667
STP Study Area (Greater Dhaka Area)	10,639	6,666	17,305	61.5	7,440	2,326
Bangladesh	28,605	95,246	123,851	23.1	147,570	839

* No. of persons/sqkm of area. (Source : Population Census Report, 2001, Table 5.2)

The above figures establish the level of urbanization. About 92% of the population of Dhaka lives in urban areas of Dhaka district followed by Narayanganj (55.6%), Gazipur (44.7%) and so on. Considering the advantageous position of Dhaka and its surrounds, it appears that the increasing level of urbanization of the city will lead to more and more densification in years to come.

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Using the base year (2004) and the corresponding growth rates (2004-2014 and 2014-2024) obtained for different levels of population density at the thana level, a population projection exercise has been carried out. The summary results on population, growth rates and density in terms of person/km² for 2014 and 2024 are presented in Table below.

Table 4: Projected Population

District Under STP Study	2004 (Base Year)			2014			2024		
	Growth Rate (%Pa)	Population (x 1000)	Density (p/k ²)	Growth Rate (%Pa)	Population (x 1000)	Density (p/k ²)	Growth Rate (%Pa)	Population (x 1000)	Density (p/k ²)
Dhaka	4.33	9800	6696	3.74	14147	9666	3.43	19825	13545
Gazipur	1.93	2146	1232	2.23	2676	1537	2.37	3383	1942
Manikganj	1.90	1381	1001	1.74	1640	1189	1.66	1933	1402
Munshiganj	2.63	1393	1459	2.47	1778	1862	2.29	2229	2334
Narayanganj	3.31	2397	3156	3.67	3436	4524	4.12	5147	6776
Narsinghdi	2.78	2068	1813	2.62	2679	2349	2.45	3413	2992
STP Study Area	3.45	19185	2579	3.23	26357	3543	3.15	35930	4830
Bangladesh	1.40	135568	919	1.2	152743	1035	1	168724	1143

Source: Consultants' Estimates (STP).

Vision of Greater Dhaka Area

The Strategic Transport Planning (STP) study area comprises of DMA and part of six districts, namely - Dhaka, Narayanganj, Gazipur, Munshiganj, Narshingdi & Manikganj. In support of growth for urban centers of the outer study area, population, density of the district towns and

their status of urbanization is shown in table above. As these districts show different levels of urbanization compared to Dhaka based on their industrial and commercial expansion potential, these centres must be developed and connected by good communication routes with DMA so that they became the future supporting urban centres of Dhaka and support development of the STP concept. A brief description of these districts is given with their boundary relations with DMA shown in **Map 3**.

Gazipur District: Originally a subdivision of Dhaka District it was upgraded to a zila in 1984. It has five thanas and two municipalities (Pourashava). The two municipalities are Tongi Pourashava and Gazipur Pourashava and both of these are included within the DMA boundary. Almost 15 percent of the district area is included within DMA area. The entire zila is also within the immediate catchment of Dhaka city or zone of influence. Gazipur due to its natural highland and good communication with Dhaka city has become the residence of many who work in Gazipur by commuting. The bus and rail service is very good. Currently important infrastructure projects like the Jamuna Access Road and Jamuna Railway have greatly influenced development of Gazipur district. It is very urgent to make adequate landuse planning for Gazipur so that it can serve as an important catchment area of Dhaka City.

Narsinghdi District: The district forms the eastern boundary of DMA. It was one of the former subdivisions of Dhaka district. Though close to Dhaka access to Narsinghdi is not easy due to vast areas of low lying land and Balu river bordering the two districts. There is no direct road and bridge connecting the two. Thus to reach Narsinghdi one has to take a train or road via Tongi and Kaliganj to the north or travel through Rupganj from Dhaka Sylhet road to the south. There is no indication in the DMA master plan of how to utilize this influence area for the benefit of the city.

Narayanganj District: Narayanganj and Dhaka has always been interrelated for trade and commerce. Also good access road between the two made communication easy so commuting by road and rail has existed from the sixties. In fact the people of Narayanganj have always depended on Dhaka for employment, education as well as all other facilities. But due to limited urban land Narayanganj pourashava is very congested and planning of the area is essential. The Narayanganj pourashava is divided into two parts by the river *Sitalakhya*. In the absence of a connecting bridge these areas remain remote to the people who daily travel to Dhaka for job and other purposes. The area east of Dhaka city and bordering the *Sitalakhya* River are low and undeveloped. The Rupganj thana area to the east is close to Dhaka yet separated by two rivers *Balu* and *Sitalakhya*. To bring these low lands to urban use flood protection measures are needed.

Munshiganj District: Though this district is not within the DMA boundary it falls within the area of influence. The district is reached from the Dhaka *Narayanganj* road. Also transportation by river is possible and is a major mode of travel. *Munshiganj* is not a very urbanized area. Other

than the pourashava area it is mostly of rural character. To plan it as a catchment area of Dhaka city the communication system needs to be improved.

Manikganj District: Manikganj district borders the DMA area to the west with the mighty *Dhaleswari* River forming a natural boundary from north to south. Communication is only from the Dhaka Aricha highway and north of Dhamrai Upazila. Communication by river from Sadarghat is also a common mode particularly in the monsoon period. Through Manikganj is not within the boundaries of DMA it falls in the catchment area of Dhaka's zone of influence. With improved communication Manikganj can provide support to the growing need of population absorption of Dhaka city.

Important Planning Considerations for STP

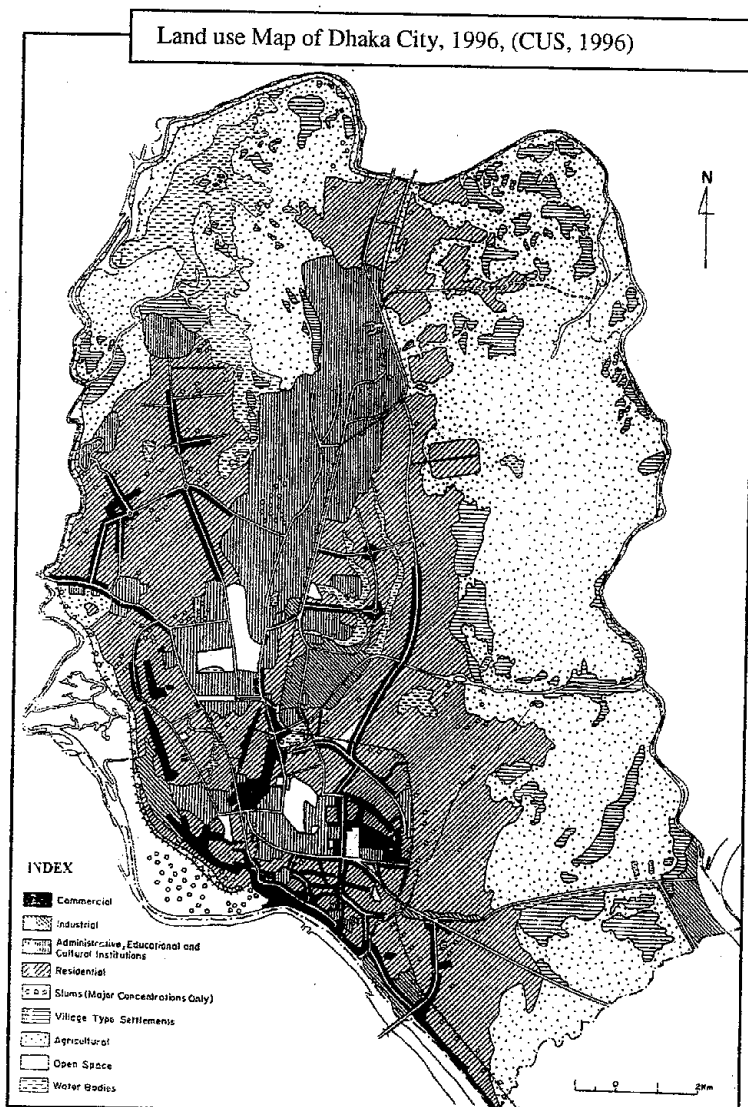
Out of the three proposed scenarios in STP the growth pole/Satellite couture scenario has been adopted for implementation. In this context it is necessary to examine the growth poles within the STP boundaries. These growth poles are districts of greater Dhaka are identified cities with their own municipalities. They are at various levels of urbanization depending on their commercial, industrial and other potentials related to communication with surrounding districts.

There is a difference between density levels of DCC area and urban pourashavas of DMA and STP. Urban centers around DCC and within the STP boundaries must be planned to accommodate the increase of population in future. For this careful planning for future investment in physical and social infrastructure must be made and is a very important aspect of the STP implementation. Planning intervention to support the thrust of growth are;

- Improve communication with DCC to all these urban centers through road, rail and waterways.
- Investment for development of these regional centers in commerce, industry as well as social and physical infrastructure.
- Development of these centers as model urban centers where physical planning is implemented in a balanced way. All income groups must have access to facilities particularly residential land use.
- Encourage growth of EPZ's and agro based industries in these centers. Large scale educational and health institutions should be forced to move out of Dhaka city and relocated in these towns.
- Plan urban development of the region while protecting agricultural and open land; forestry and natural wetlands including low lands.

4.2 Land Use and Environment

There is no official statistics on the land use pattern of either the Dhaka Statistical Metropolitan Area or of the Dhaka Megacity. Even the Master Plan of 1959 for the city did not provide either a map or a quantitative statement of the existing land use of the time. In 1975, the Centre for Urban Studies (CUS) produced a generalized land use map of the central city areas (of approximately 130 sq. kms.) of that time (CUS, 1975). According to this map approximately 54 percent of the central city was under residential use. The proportions occupied by commercial activity and administrative function were respectively 6 percent and 14 percent. Transportation, industrial, education, open space and other uses together accounted for 26 percent of the land use of which roads accounted for only 8 percent. The remaining 10 percent was in non-urban and agricultural uses or low lands.



In another survey of the land use pattern of Dhaka city or DMA is the one conducted in 1991 by the Japanese International Cooperation Agency (JICA). It was shown that only 19 percent of the total area of Dhaka (265 Kms at the time) fell under residential use, 8 percent under the category of commercial, industrial and institutional use, roads and other (unspecified) categories took 11 percent, village settlements covered 4 percent, agriculture 45 percent and water bodies covered 14 percent (JICA and GOB, 1991). According to this study only 39 percent of the city area was under urban use and the rest 61 percent was non-urban rural or semi-rural, agricultural land. CUS produced an updated land use map of central part of Dhaka City for 1996 as well as one for the Dhaka Metropolitan Area. According to this map, nearly 35 percent of DMA still remained non-urban or agricultural.

The residential land use structure of Dhaka city is characterized by very low density (100-300 persons per hectare) areas of the upper income groups covering large areas of the city and extremely high densities (1500-4000 persons per hectare) of residential space for the lower income group and the poor. Another characteristic of the land use structure of Dhaka is the mixed nature of uses, particularly in the traditional old city areas. Even in the modern commercial, residential and industrial areas developed in a planned and segregated manner since the sixties, imposition of strict zoning has been difficult. These areas are gradually being transformed into mixed use zones. Remarkable dramatic changes are taking place in residential areas, originally planned as pure residential district in the city into non-residential uses. They are also experiencing height increase and densification.

For the purpose of showing the vast changes in the natural and built up area of Dhaka city and its environs a broad land use ratio of built up and non-built up area and proportion of area covered by water is shown in table below. STP prepared maps comparing land use of 1984 and 2004 are shown.

Land Use of Dhaka

Land use 2004



Land use 1984



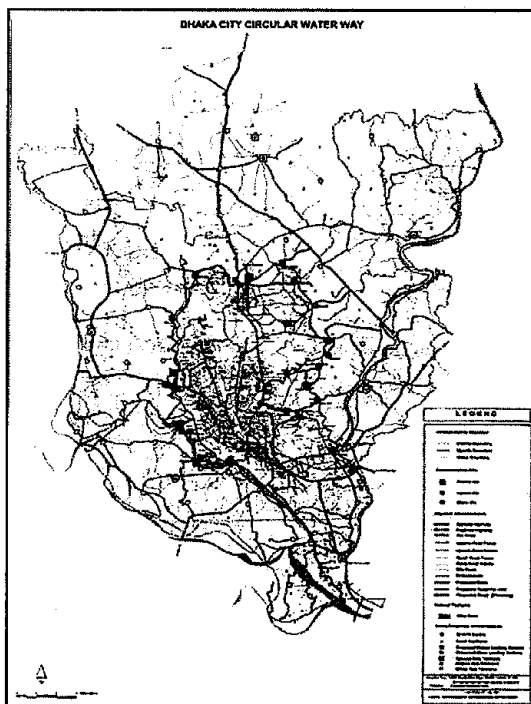
The present study has prepared a Map 2 showing land use and settlements within DMDP area. The proportion of land, open area and water body calculated from this Map in DMDP, DMP and DCC area is shown in table below;

Table 5: Proportion of built up area in 2008

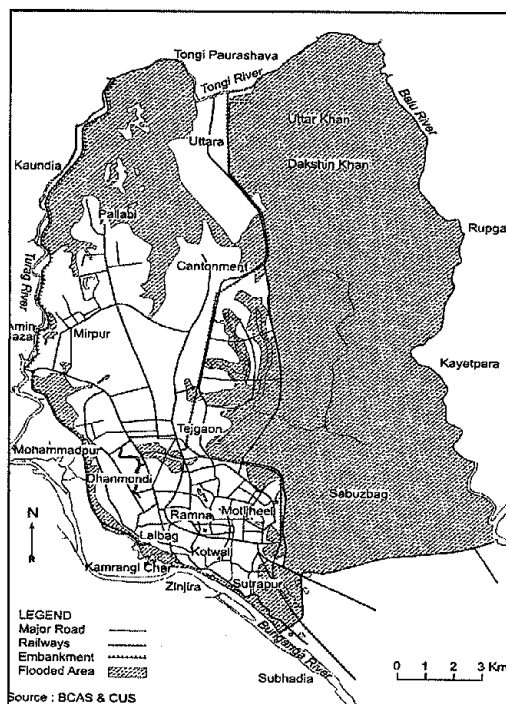
Broad Land use	DMDP		DCC	
	Area (Hectare)	%	Area (Hectare)	%
Built Up area	60358.11	41.43	26209.94	82.04
Non-built up area	80075.06	54.97	5274.76	16.51
River Area	5247.61	3.60	462.20	1.45
Total	145680.78 (1457.23 sq.km.)	100	31946.9 (319.56 sq.km.)	100

Source: Arc Bangladesh, March 2008.

Circular Water ways



Flooding in Dhaka, 1998



Circular Water ways

The city is surrounded by a circular waterway system consisting of the Buriganga, the Balu, the Turag, the Tongi and the Sitalakhya rivers. These waterways carry a sizeable amount of freight traffic from the adjoining areas bound for Dhaka. The policy⁴ statement is that ‘The government will integrate the inland waterways with the city land transport system so that the movement of freight traffic from motor launches landing stations into the city will be made more efficient.’

A 29 km circular waterway was opened on 3 March 2005 from Sadarghat to Ashulia to make a total water way of 110 kilometers after completion of the first and second phase. But the project faces uncertainty as the immediate past government did not approve it second phase despite disbursement of the fund by the donor in time and failure to introduce any passenger service on the route. An initiative was launched on April 12, 2005 to have inter-district passenger vessels operate along the waterway and 14 private sector launches started to ply from Gabtali and Shinnirtek landing

⁴ Stated in Policy 20 of STP.

stations on four inter-district routes. But the initiative failed and was abandoned after 45 days due to poor turnover of passengers as well as lack of roads linking the landing stations with the city streets.

Condition of Drainage and Flood Control

Due to unplanned and unregulated rapid urban expansion, Dhaka city suffers seriously from problems of drainage and stagnation of rain water. The situation has turned very bad in recent years both in the old city areas and new parts. Unwise closure of natural and old artificial drainage and navigational canals has aggravated the situation. Main streets now go under a meter of water after every heavy monsoon shower.

Because of the topographic condition of Dhaka, most parts of the city are vulnerable to annual flooding during the monsoon months. But at times of abnormal floods, nearly 75 percent of Dhaka goes under water. Such situations were experienced in 1954 and again in 1987, 1988, 1998 and 2004, the latest two being the most severe. During such periods, the settlements of the poor are the worst affected although other areas also are not spared.

The floods cause colossal economic loss to the city and also affect the health of the people. The severity of floods has intensified partly due to unplanned urban development but also due to wrong physical planning. Efforts are now being made to open up some of the closed canals for the purpose of improving drainage. Originally there were about 43 canals in the city, restoration plans for 17 have been proposed. After the 1988 flood a city flood protection embankment project in the western edge of the city was taken up hastily. A huge amount of money has been spent, its impact has so far been both negative and positive; it causes water logging inside the embankment area due to rains, while also protecting part of the city from river flooding. Currently (2005) a study is in progress to cordon the city with a long embankment along with the proposed Eastern By-pass Road. This might cause serious water logging in the eastern part of the city. The huge and densely populated area known as DND (Dhaka-Narayanganj-Demra) project area suffers these days very seriously from water logging in the rainy season. Flooding and drainage problem will continue to pose a serious problem for the city in the future. The condition is apprehended to further worsen due to the unplanned and often illegal earth filling of wetlands in and around the city by unscrupulous real estate companies. Environmental activists of the Bangladesh Poribesh Andolon (BAPA) have protested such activities but only to very limited success. There are allegations of an unholy alliance between these companies and some dishonest officials of the city's development authority.

Negligence of DCC and DWASA to maintain canals and drainage channels is a major cause of water logging within the city. However, DWASA has undertaken a project funded by the World Bank for excavation of the following 15 canals;

1. Kashaibari Khal
2. Hazaribagh Khal
3. Manda Khal
4. Kalyanpur Branch Khal
5. Baunia Khal
6. Digun Khal
7. Mohakhali Khal
8. Segunbagicha Khal
9. Abdullahpur Khal
10. Sutibhola Khal
11. Shahjadpur Khal
12. Begunbari Khal
13. Khilgaon Bashabo Khal
14. Ramchandrapur Khal and
15. Katasur Khal.

Population Growth and Dominant Land Use

Responding to the rapid growth of population even in the early fifties, the Government felt the need for modern urban planning for the city, and passed the Town Improvement Act 1953, set up the first town planning and development institution, the Dhaka Improvement Trust or DIT (in 1955) and the first full fledged Master Plan in 1959 for implementation during 1960-80.

During the first decade of the plan period, the city experienced significant development in the form of wide new arterial roads, planned segregated functional districts like residential areas, commercial areas, industrial areas, medical areas, educational areas and so on. The construction of the Sher-e-Bangla Nagar, "Second Capital", also began in the sixties. New Dhaka took the appearance of a generally planned modern city, while old Dhaka remained rather pre-industrial. Throughout the fifties and the sixties, the city developed more or less on flood free land. The city was developing pretty much along the DIT Plan and some upper – income residential areas such as Dhanmondi, Gulshan, Banani, Uttara etc. came-up along the plan.

The forces of development in the sixties were mainly administrative, political, educational, commerce and business and some industrial investment. The large industrial centers were located in the adjacent towns of Tongi in the north, Demra and Adamjee Nagar and Narayanganj in the east and south-east, while several smaller industrial zones were established in the city's suburbs, like Tejgaon, Mirpur, Shyampur and Hazaribag. Over the years these industrial zones have become part of the central city.

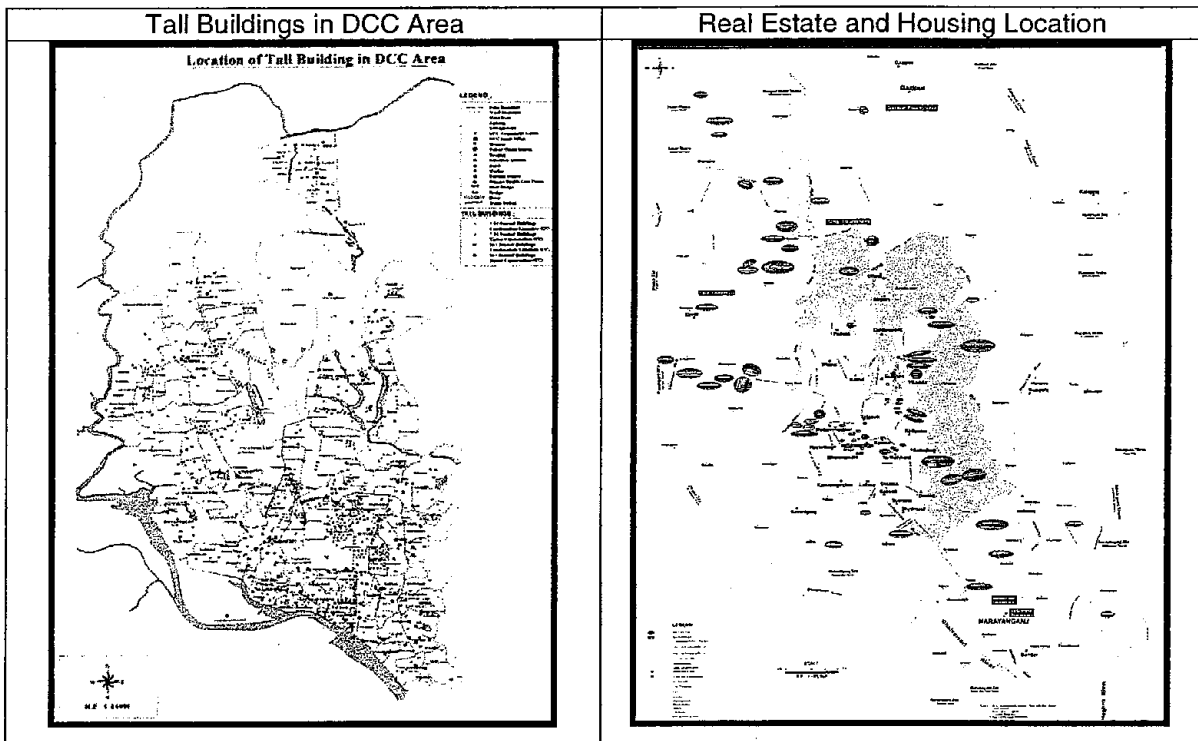
The Liberation of the country dramatically altered the urban structure of Dhaka. The new political status of Dhaka as capital of the new independent state with a large population resulted in growth of administrative function and employment. Foreign missions were set up. Business started to flourish. But in the initial years after Liberation, it was aid money which had a lot of influence on economic rebuilding and also physical construction. The economy did not pick up until the late 70's or early eighties. Trading was the principal strength beside administration. Large new planned high-income residential areas prospered in Uttara and Baridhara. Old ones like Gulshan and Banani continued to flourish. Dhanmondi began transformation, from low rise-low density to middle-rise and middle-density or even high density. Beginning in the mid eighties, the principal source of national income, in addition to traditional sources like agriculture

and old industries, turned out to be remittance by Bangladesh expatriate workers and the export oriented garments industries.

The impact of both of these new income sources became obvious in the physical development of Dhaka City. Remittances impacted on land and housing investment, garments had multifarious influences, through the addition of nearly 2 million people in the workforce, in slumming of the city, in construction of over



2000 factory buildings all over the city, in fostering linked economic activities, in transportation (container trucks etc.). Later, an EPZ was also set up in the outer suburbs of Dhaka (Savar). The garment owners joined the ranks of the rich class in Dhaka and supported the growing housing market. Garments have been the single most important force of urban restructuring of Dhaka during the last two decades.



The real estate and apartment housing sector grew in response to the economic prosperity (black or white). Nearly 100,000 new modern housing units were added to the stock by developers during the last two and a half decades. Much of these have come in the planned central areas, but the most recent trend is in both planned residential plots (as in Goran, Banasri or Bashundhara) and apartments in high-rise complex blocks in inner city areas or suburbs (as in Japan Garden City or Lake City Concord). The trend is also paralleled by large scale filling of water bodies and low lands in and around Dhaka with consequent negative impact on the

environment. Low lands across the Buriganga River have also been brought under urban development. The two bridges over the river is facilitating this process.

The highlands available to the north and northwest of Dhaka have also rapidly been utilized for housing and other urban purposes. Dhaka is clearly growing along the highway corridors, to a distance of 80 kms from the city center to the north and lesser distances in other directions.

Flood protection measures have also helped bringing new areas under full urban use. Western suburbs of Dhaka is now protected from floods by an embankment, as a result, earth filling (by dredgers) inside the bunds is taking place fast. Vast areas in the east may also become available for urban development once the proposed eastern Bypass cum Embankment project along the Balu River is implemented risking of course, environmental large new satellite town, Purbachal, between Balu River and Sitalakhya.

Characteristics of Housing Areas

Housing is the major land use and in general can be grouped into four categories high income, middle income and low income areas. The fourth are slums and squatter settlements which are 90 percent unauthorized. Income wise the population of Dhaka city is broadly divided into three groups and some sub-groups in each group (Islam, 2004) as shown in table below.

Table 6: Income Groups in Dhaka (DCC) (Popⁿ 7.5 m) and DMDP, (Popⁿ 12 m) in 2004

Income Group (monthly household income in taka)	DCC 2004			DMDP 2004	
		%	million	%	Million
Hardcore Poor <2500	25	40	3.0	40	4.8
Moderate Poor 2500-4500	15				
Lower Middle = 4500-10,000	20	50	1.5	55	6.6
Middle Middle = 10,000-25,000	20		1.5		
Upper Middle = 25,000-50,000	10		0.75		
Lower -Upper 50,000-100,000	7	10	0.75	5	0.6
Upper-Upper 100,000+	3				

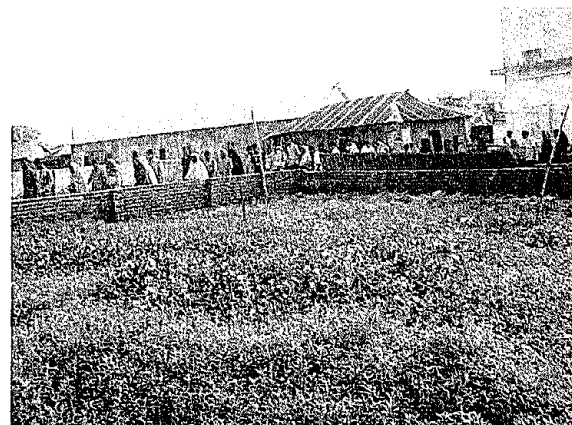
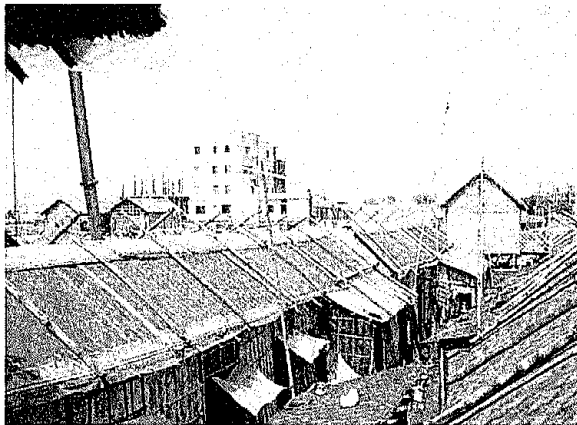
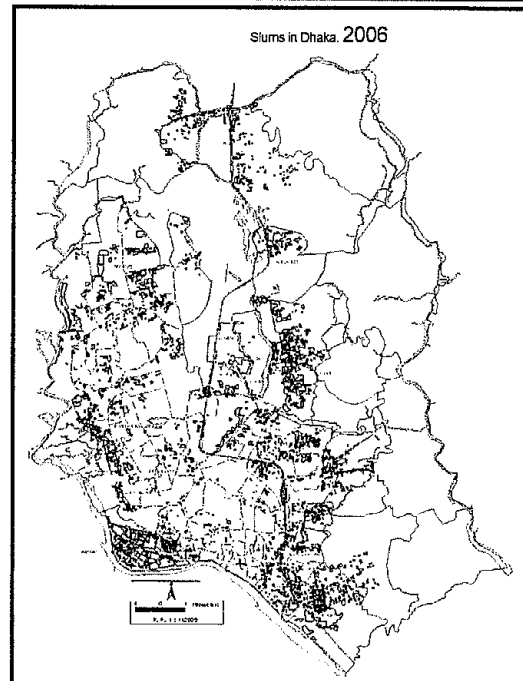
Source: N Islam, 2004. US\$ 1 = 59.50 Tk.

As seen in table the upper income group is only about 10 percent of the population of DCC and about 5 percent in DMDP area and the middle income group 55 percent. The housing areas of the high and middle income groups are easily identifiable as shown in Maps.

CUS identified nearly 5000 slum clusters in DMA with a total population of 3.4 million⁵. The slum population within DCC area was estimated as 2.5 million. Slums in Dhaka are seen in central as well as peripheral locations.

⁵ The 2005 survey titled as 'Slums of Urban Bangladesh: Mapping and Census, 2005' was conducted by CUS.

The formal system for housing delivery is proportionately small and in absence of any recent housing statistics, only a rough estimate of the dwelling units by major sub-systems is possible. For the 7.5 million people in central city or DCC/DMA area there are about 1.0 million dwelling units while the DMDP area may have 1.6 million dwelling units, assuming an average per dwelling unit occupancy of 7.5 persons.



In absence of the formal system's capability to supply housing to growing number of urban poor population the informal sector has taken over the process of supply. The ultimate result is a growing sprawl of unplanned housing and proliferation of slums, squatters and homeless people, particularly within DCC and the fringes.

Existing housing by income groups in Dhaka city, type of housing density, location and type of transport used are provided in Table below;

Table 7: Dhaka urban area existing housing characteristics by income group, location, density and type of transport provider

Income Group (% of city population)	Tenure Characteristics (Type of land tenure)	Housing Characteristics (Sub-systems)	Location (dominant areas only)	Type of Transport Used (Percent of Total)
Upper Income Group (10%)	- Private owner occupied housing in unplanned areas (with freehold land tenure)	- One storied bungalow	Old town, intermediate zone	Private Cars, Jeep, Sedan 1-2 or More vehicles per family
	- Private owner occupied and rental housing in planned areas (with leasehold tenure)	- Two and three storied mansion	Intermediate and outer zones (Dhanmondi, Gulshan, Baridahara, Banani, Uttara)	
	- Public (rental) housing in planned areas (on public land)	- Duplexes, Triplexes	Ramna, She-e-Bangla Nagar	
	- Private Luxury apartment housing, owner occupied and rental (with freehold/shared freehold tenure)	- High class apartments	Intermediate and inner suburbs	
Middle Income Group (50%)	- Private owner occupied and rental housing sub-system in unplanned area (with freehold land tenure)	- Two to multi storied walk up	Old town, intermediate zone, outer and suburban zones (Dhanmondi, Uttara, Mirpur, Shyamali, Moghbazar, Ramna, Wari,)	Visually 1 car/vehicle per family 10% Car 20% Bus 20% Rickshaw, Auto rickshaw(CNG), Motor cycle
	- Private owner occupied and rental housing sub-system in planned areas mainly developed by RAJUK (with leasehold land tenure)	- Six-storied apartments (up to six stories)	Intermediate and outer zones (Mohammadpur, Lalmatia, Khilgaon, Shajahanpur)	
	- Public housing (rental and ownership flats) planned area (on public land)	- Row houses in high density old areas.	Ramna, Azimpur, Motijheel, Dhaka University and BUET Campus	
	- Private multi-storeyed apartments and cooperatives both owner occupied and rental (with freehold and cooperative form of tenure)	- Multi-storied apartments	- Inner, intermediate and fringe zones (Agargaon, Kallyanpur, Mohalhari, Kamapur and other locations)	
Lower Income Group (40%)	- Resettlement Colonies by NHA - Government lower grade employees housing - Squatters - Bustees - Conventional Inner City Tenement Slums - Others (Accommodation in industrial and commercial units)	- Pucca structures of two and three stories - Housing plots	- Mirpur, Mohammadpur, Tongi, Bashabo, Wari	5% Bus 5% Rail, Launch, Boat 30% Pedestrian
		- Kutcha, semi-pucca and occasional pucca structures of two and three stories - Almost 98% are unplanned and unauthorised.	- Inner, intermediate and fringe zones (all along the rail line between Gandaria and Mohakhali, University Area, Kamapur and other locations) - Intermediate and fringe zones, [Mohammadpur, Mirpur, Bashabo, Dattapara(Tongi), Chanpara (Demra) - Extensively located in inner, intermediate and fringe zones (Keraniganj, Kamrangir char) - Mostly inner city zone(Kalyanpur, Kuri) - Mostly suburban and intermediate zones - Diverse location (Tongi, Badda)	

Source: Based on Islam 1985 – 86 and 2006; Shafi and Payne 2007 and Consultant's Estimate.

Traffic Characteristics by Income Groups

The three identified income groups also have very distinct methods of transportation as per their need. The need varies according to their employment, education, social and physical needs. These are identified and analyzed by needs and activities of the income groups and shown below;

Income group	Needs Generating Traffic Movement	Type of Activity	Type of Movement Generated
High Income Group (10% of City Population)	- Occupation - Employment - Social - Education - Physical (Health related)	- Business, Jobs - Marriage, Party, Concerts, Religious Ceremony - School, College, University, Coaching, Training	• Long Distance travel within city only by private vehicles (All family members)
Middle Income Group (50% of City Population)	- Occupation - Employment - Social - Education - Physical (Health related)	- Business, Jobs - Marriage, Party, Concerts, Religious Ceremony - School, College, University, Coaching, Training	• Short and long distance travel within city by private vehicles and public transport (All family members)
Low Income Group (40% of City Population)	- Employment - Social	- Employment related works - Social gathering	• Short and long distance travel within city and outside by foot, bicycle or public transport (road, rail, waterway)



4.3 Organizations and Responsibilities for Planning and Administration

There is no single institution at Dhaka megacity level for its management. Dhaka mega city consists of a large municipal (city) corporation, DCC, five other municipal authorities⁶ and their adjacent rural areas administered by District and Thana offices and Union Parishads. RAJUK is the only metropolitan scale agency, but as a strategic planning agency its activities are also limited to urban planning, land development and building control. Since there is no single administrative authority to look after the development of Dhaka mega city, the level of performance in planning, administration and management of the whole mega city region is very low. The city has, therefore, grown largely without a planning framework. Moreover, the formal administrative and management unit's ability is

⁶ Narayanganj, Kadam Rasul, Tongi, Gazipur and Savar.

also very weak, as often illustrated by massive dislocations in traffic, inadequacies in infrastructure, failure in maintaining law and order situation and ever increasing violence and crimes.

Because of its status as the national capital, a Divisional (macro-regional) and District (meso-regional) head quarters, Dhaka has a multiplicity of organizations at different levels. For instance, as many as 20 ministries out of a total 38 and 41 different organizations are effectively involved in the planning and development of urban affairs in the Dhaka mega city region (**Appendix 1**). Four types of institutions are involved in the urban development process of Dhaka, such as national, sectoral, special and local.⁷

Among the several national level agencies are the National Economic Council (NEC), the Planning Commission and the Board of Investment (BOI). Each of these institutions plays important role in urban development decision making for Dhaka and also for other cities.

The special agencies for urban development which are involved in Dhaka are the Rajdhani Unnayan Kartripakhya (RAJUK), the Dhaka Water and Sewerage Authority (DWASA), the Dhaka Electric Supply Authority (DESA), the Dhaka Metropolitan Police (DMP) and the Cantonment Board (CB). RAJUK (formerly Dhaka Improvement Trust or DIT) was established in 1956 according to the 1953 Town Improvement Act with responsibility of preparation and implementation of Master Plan for the City. The Dhaka Transport Coordination Board (DTCB) was formed in 2001 under an Act of Parliament to coordinate transportation activities in the Dhaka metropolitan region.

Dhaka City Planning Issues

In city planning and building control RAJUK as the authority is autonomous and does not exercise much controlling power. DCC does not have the power for coordination among the big number of agencies. Improvement of management as proposed by STP study by incorporating the heads of various agencies i.e., RAJUK, DESA & DPHE with DCC will foster positive development.

The need for proper physical planning as a strategy for making Dhaka liveable is the most important measure due to the following main reasons;

- The tremendous pressure on land due to population pressure has resulted in unplanned development with dire environmental consequences. Informal development here mainly refers to housing as the major landuse with ancillary uses particularly commercial, education, health, industry and transportation centers
- The 1996 Master Plan provided a structure plan for the city without any area development plans. More than a decade has passed but RAJUK could not complete the DAP with help of private consulting companies the task of preparation is still ongoing. If

⁷ Sectoral agencies dominate these institutions (66.7%). Special agencies like RAJUK and local agencies such as municipal authorities account for about 12 percent each, followed by national agencies (9.5%). (Islam, 2006)

the DAP is being prepared in the right direction the area development plans must take cognition of the current informal development all over DMA and plan accordingly.

Some essential codes and policies are not practiced by the government in the urban management process and pose serious problems in environment and housing are;

- The lack of enactment of the Bangladesh National Building Code (BNBC), 1993.
- The lack of 'Detail Area Plan' or local plans of the city prevent control of land use.
- The non-adoption of the Building Construction Rule of June 2006 by RAJUK till to date is allowing a lot of mal practices. More information on Building Construction Rule, Floor Area Ratio and Parking is provided in **Appendix 2**.
- The National Housing Policy prepared in 1993 and revised in 1998 has not been able to provide any shelter programme for the large number of squatters and slum dwellers of Dhaka city.

All this make difficult the practice of modern development control essential for management of a mega city. The gap between policy and implementation needs to be a bit highlighted. For example, land management is essential to make any city liveable. A city like Dhaka with so much physical constrains needs planning of detail land use for trade, business, industries and foremost for housing. Tanneries, garment industries etc. all need relocation while wetlands, canals need conservation and maintenance. The challenge for control of unplanned growth and improvement of slum and squatter settlements is a big issue in making Dhaka a liveable city. At the same time it is important to plan the land use for the future decades. Transportation planning plays a significant role in the management of the existing city life as well as for the future.

Proper planning of the city can bring improvements in provision of essential services and make the city liveable through the following;

- Extending services and management to maximum number of inhabitants and improvement of the tax base. For this enhancement of urban productivity and support to micro-economic growth is needed
- Strategies in positioning the city in the regional and global economic context
- Concentrated focus on reduction of urban poverty and shelter improvement.
- Control development by guiding for planned growth.

Each of these aspects in city management draws upon planning tools and guidelines at various stages of implementation of physical plans. To improve living conditions the urban poor population need tremendous support for employment generation, housing, infrastructure and services. Physical, social and employment provisions have to be made for them so that they in

turn will generate resources through services in transport, industry and employment in all other sectors.

Key Policy Issues of STP

THE LAND USE / TRANSPORTATION PLANNING PROCESS

Land use planning and transportation planning interact between themselves to determine development patterns. The two are so interconnected that they need to be considered simultaneously. Old Dhaka developed before the motor car as a complex network of pedestrian orientated passageways reflecting the predominant means of transport at the time. The new town areas (Ramna for example), reflect the land use planning principles of their time evolved on the basis of vehicular transport. In Dhaka as elsewhere, the public sector plays a vital role in transportation, particularly with regard to regulating the system. The most significant changes in land use patterns over the last few decades have resulted from major changes in the densities of residential areas causing changes in the characteristics of transportation. Clearly, there needs to be an integration of the two aspects.

Policy 1: To achieve integration between transportation and land use development, the government intends to create a unified authority that will be responsible for the planning of both land use and transportation systems. Whereas the two functions are currently separated, the new metropolitan authority will have responsibility for both functions. The policy therefore, will be drawn to place the Dhaka Metropolitan Regional Authority at the centre of strategic planning for the next 20 years and beyond.

Policy 2: The formulation of the most efficient plan and the creation of a new authority will not be enough on its own for successful implementation. What is most essentially needed is the political will and determination of the Government supported by the people's commitment to achieve the objective. The Government will create systems such that the climate will be amenable to encourage the public to participate in the policy drafting and comment on this Policy Document.

Policy 3: The Government acknowledges these mixed use areas and will endeavour to serve the needs of all the people with the most appropriate transport means. All housing and employment areas will be served with roads and streets suitable for the appropriate form of transport, be it walking or automobile and all other modes in between these two. There will be no discrimination between modes in terms of accessibility and the Government will serve low income workers who walk to work with the same degree of importance as it does high income families who drive. Accessibility is for all and the policy will manifest itself in the financial aspects of the development plan.

Policy 4: The Government will provide high quality transport systems to encourage and serve the preferred land use development as recommended in the STP report and will strengthen the process of land use control and planning permissions to make this happen.

Rajdhani Unnayan Kartripakkha (RAJUK)

The Dhaka Improvement Trust (DIT) was established in 1956 under the provision of the Town Improvement Act -1953 (TI Act 1953). The objectives of the Act are aiming to improve physical and urban condition of Dhaka City. DIT was a corporate body having supreme planning and development control power within its jurisdiction.

The Trustee Board was involved in policy making, planning and development control of Dhaka. Conventionally, the Board called on general and special meeting to take decisions and actions on raising problems. The major functions of the organization dealt with-

- preparation of development plans
- widening roads and reduce congestions
- lay out plans for better traffic circulation
- providing open spaces for recreation
- demolishing or constructing buildings and construction of roads, bridges and culverts
- acquiring of land under Town Improvement Act 1953 for area development
- providing urban facilities and services for public uses and for improvement schemes.

The Rajdhani Unnayan Kartripakkha (RAJUK) emerged through the ongoing crisis of planned and controlled development of Dhaka City. RAJUK was established in April 30, 1987 by replacing Dhaka Improvement Trust (DIT). The prime intension of the organization was to develop, improve, extend and manage the city and peripheral areas through a process of proper development planning and development control. But due to crisis in management and lack of resources in manpower RAJUK in the last two decades has not been able to carry out its duties and RAJUK can be blamed for the following conditions of Dhaka city;

- Proper development in terms of physical planning, development control and management
- Sporadic development throughout the peripheral areas which constitute mainly of low lands; wet land within DMDP and without planned access or services.
- Contradictory functions of RAJUK as an agency for planning and development control whilst doing land development is doing more harm than helping the city improve.

Planning Functions of RAJUK

Dhaka's area planning and control has been extended from 829 sq. kms to 1528 sq. kms in the nineties. Providing a metropolitan for this vast area became its primary responsibility and the status of the plan preparation process is still incomplete.

Dhaka Metropolitan Development Plan (1995 – 2015) In 1991 when this Master Plan was formulated Dhaka City had expanded to an area of 590 sq. miles with a population of 6 million. DIT was renamed RAJUK and was dealing with the metropolis without changes in its organizational structure. The Dhaka Metropolitan Development Plan (DMDP) was funded and executed by UNDP and the Government of Bangladesh. The objectives were;

- preparation of integrated development plans and priority sectoral plans,
- installation of sustainable capabilities in RAJUK to prepare and implement such plans,
- improving the capacities of RAJUK and related national training, research and advisory institutions.

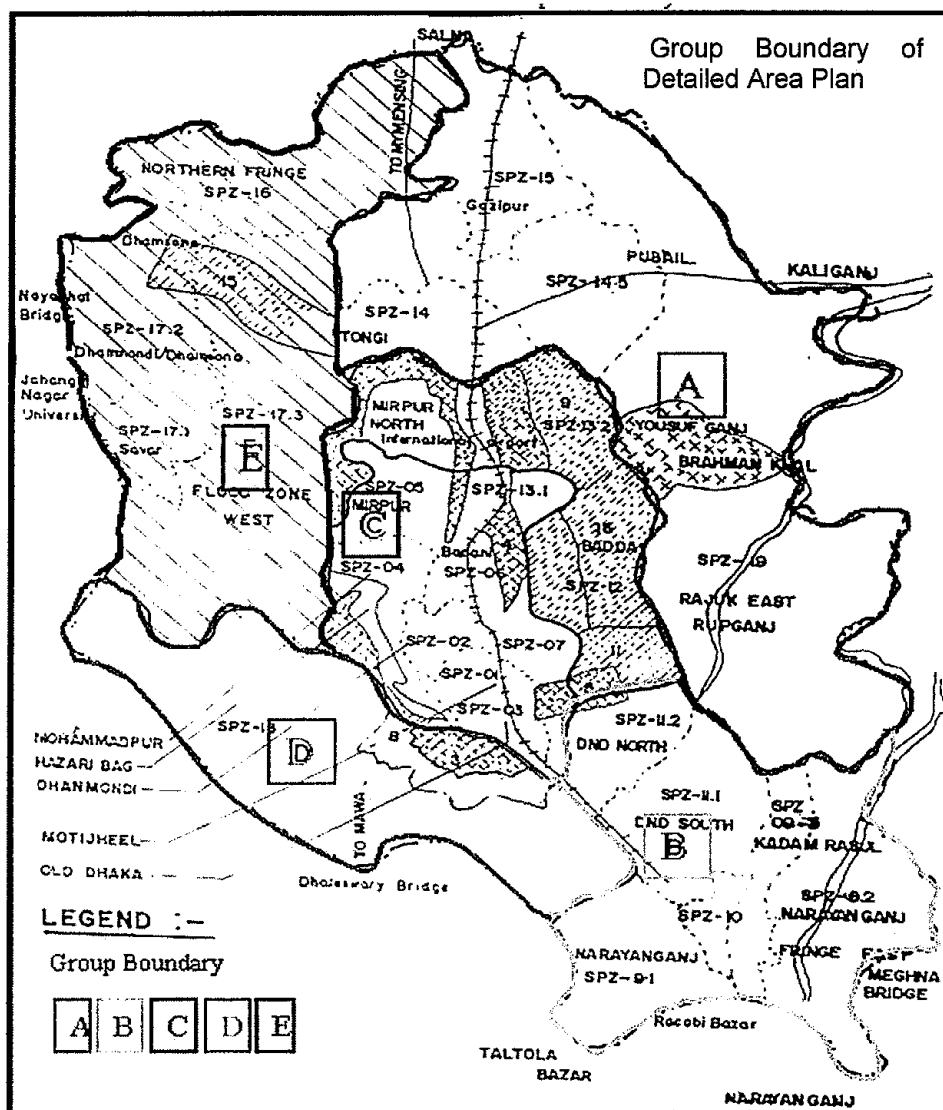
The assistance had four components; Planning, Drainage and Flood Control, Computerised Data and Mapping & National consultancy surveys.

The Consultants took 3 years from 1992–1995 to formulate the study. It took another two years to finalise reports and plans and the government counterpart in the project were actively involved in this study. The Master Plan reports are presented as a three tiered plan process containing the structure plan and the urban area plan are published in two gazzetted volumes.

The **Structure Plan** provides a long term strategy up to the year 2015 for development of the Dhaka Metropolitan Region and consist of a report and map at 1:50000 scale. It recommends spatial and sectoral policies for the DMDP area of control for an area about 590 square miles (1528 sq. km.).

The **Urban Area Plan** provides a mid term strategy up to the year 2005 for development of the existing urban areas likely to come under urbanization pressure over the next decade. It delineates existing land uses and specific location of roads and other infrastructure facilities and provide indicative locations of land uses that yet to be in the urbanized areas. The specifications are to assist the government officials responsible for guiding and managing development control. Until such time as an area is covered by a Detailed Area Plan, control and management should be through the policies, guidelines, and regulations found in the Structure Plan, and to a greater extent, the Urban Area Plan.

Detailed Area Plan (DAP), with maps at 1:15000 scales or as appropriate, with supporting documents, will provide detailed planning for specific sub-areas. The planning execution of DAP has gone through many phases and today Dhaka city is divided into five areas for the purpose and five consulting companies have been working for 5-7 years with a completion date of June 2008. The Consultants team in 1994-96 conducted detail plans for two areas Badda and DND as model pilot plans. Between 1996 and 2002 RAJUK undertook planning of 16 areas of which six were completed but not made public.



Rajuk hired four local consulting firms -- Sheltech Private Limited, Development Design Consultants Limited (DDC), Engineering and Planning Consultants Limited (EPC) and Ganibangla Limited -- for the two-year DAP project involving Tk 23.22 crore. The entire study area -- 1,528 square kilometers -- was initially divided into five groups. Group-A covers northeast part, Group-B southeast part, Group-C central part, Group-D southwest part and Group-E northwest part.

DAP Considerations for Traffic and Transport

Within each DAP area the consultants have proposed transport routes alongwith land use.

These include;

- New roads with pedestrians facilities
- Road widening
- Water transport with landing stations

For pedestrians pathways for rickshaws local rotes etc. have been proposed.

Transportation Network

Study includes existing road, water and rail network in the study area, number of traffic moving in various directions, modal split of traffic, origin and destination of traffic, spot of traffic congestion, problems, due to traffic congestion etc. These data were collected through field observation, open discussion with pedestrians, drivers, local shopkeepers etc.

Information on the transportation network has been extracted from physical feature survey while 14 hours continuous survey has been carried out at these points for traffic count in various directions modal split of traffic and origin and destination (O-D) of traffic. Apart from traffic volume survey other supplementary issues regarding problems of transportation were also discussed with pedestrians, local people, drivers and shopkeepers.

Present STP study should coordinate with RAJUK to include these DAP proposed internal traffic and transport plans with STP proposed improvements. This should be done in the first phase to ensure and implement proper

Current Status of the Detailed Area Plan and Consequences in City Growth

- Drafted in 1995, the 20 year DMDP approved by the government in 1997 with retrospective effect could not be materialized in absence of the DAP (Detailed Area Plan).
- The DAP was scheduled to be completed within one year of the formulation of the DMDP. The DAP is important for urban planning and to ensure proper use of land of the 1530 square kilometers of the capital.
- Non completion of the DAP has been delaying implementation of the DMDP resulting in the filling up of vast low lying areas exposing the city to flood. It is also causing unplanned urbanization.
- The new building construction rules will not be effective to stop unplanned urbanization without DAP.

Concerns for Failure in DAP Execution

The DAP is crucial for planned urbanisation and development of the capital city and conservation of environment through proper implementation of Dhaka Metropolitan Development Plan (DMDP). Delay in implementation of the DMDP has resulted in the filling up of vast low-lying areas in and around the city exposing it to environmental hazards, flooding and water logging with even

insignificant volume of rainfall. Environmentalists express serious doubts whether DAP will contain original and detailed positions of the flood-flow zones, retention ponds, lakes, rivers, canals and Strategic Planning Zones (SPZ), as earmarked in the DMDP. For example, private housing developers have earth-filled rivers, main flood flow zones and sub-flood flow zones in peripheries.

Land Development Functions of RAJUK

RAJUK has developed vast areas of land to provide housing mainly to middle and high income groups. This planned residential areas of Dhaka city since 1960 are DIT and RAJUK executed land development projects. Dhanmondi, Gulshan, Banani, Uttara, Baridhara, Purbachal are examples.

Ongoing projects of RAJUK⁸ :

Housing Projects :

- Uttara Residential Model Town (3rd phase)
- Purbachal New Town at Yousufgonj and Rupgonj
- Jhilmil Residential Project
- Nam Village/Villa Apartments at Banani and Gulshan

Commercial Projects :

- Commercial Complex near Hotel Sonargaon, Kawran Bazar
- Hatir Jhil Area (Begun Bari) Development

Road Infrastructure :

- Link Road between star Gate (Ramna) and Notre Deme College (Motijheel)
- Link Road between Dayagonj and Jurain.
- Link Road between Pantha Path east to Rampura Bridge
- Link Road between Gulshan Circle-1 to Progoti Sarani

MIS (Management Information System)

- To Computerize regular activities of RAJUK.
- Ensure availability of organization's various information at a glance
- Ensure network connectivity among different local offices of RAJUK
- Prepare a plan and strategy to implement E-governance activity in RAJUK
- Ensure the better services to the public
- Increase the transparency in different stages of the processes
- Establish information- bridge among all departments of organization.

Others

- Gulshan-Banani-Baridhara Lake improvement
- Nikunja Lake Development
- Uttara Lake improvement
- Banani Park improvement

Dhaka City Corporation

The corporation was statute with the introduction of Dhaka Municipal Corporation in 1983⁹. In 1990, Dhaka Municipal Corporation was renamed Dhaka City Corporation and was divided into 10 zones to fulfill the objectives of decentralization.

⁸ Source: RAJUK website

⁹ Dhaka Municipality was established on August 1, 1864. Mr. Skinner, the district magistrate of Dhaka, was the first ex-officio chairman of Dhaka Municipality. Dhaka became the capital of Bangladesh with the independence of Bangladesh in 1971. Ward Commissioners elected one of their members as the municipality chairman with the introduction of Pourashava Ordinance, 1977, Dhaka Municipality was awarded the status of City Corporation in 1978 and the existing chairmen became the mayor of the corporation in March 1982.

In 1993 the government with a view to democratizing the city corporation, made drastic amendment to the 1983 ordinance and provided that the mayor and the commissioners would be elected by direct election on adult franchise.

According to the law, the executive power of the corporation is vested in and exercised by the mayor and the term of the elected body is five years¹⁰. It meets at least once a month for the transaction of business. As the central city administration, DCC is the large and the most visible and local important local government within the Dhaka Mega city Limits.

Authority

DCC lacks substantial authority to act as the voice of its constituency, namely, the city dwellers (Khan, 1997). In fact, DCC does not have the legal authority to control government agencies, NGOs and private sector entities, all of whom participate in the socio-economic development process of Dhaka. Dozens of urban-based NGOs are working in the city, but they are not accountable to DCC. The private sector is also functioning beyond DCC's jurisdiction. As a result, DCC does not have a comprehensive plan for the city's socio-economic development. Even if there were one, it could not be implemented under the present structure of authority.

A case in point is the deteriorating law and order situation in Dhaka and DCC's lack of control over the Dhaka Metropolitan Police (DMP). The DMP controls traffic regulations and law and order functions and is controlled by Ministry of Home Affairs. Beside enormous law and order problem has recently experienced severe problems of traffic congestion. Though DCC is responsible for installing traffic light devices, road dividers and other traffic signals, it has no control over the traffic. It is under the control of the central police. In fact, traffic violations as well as law and order problems are the two most serious aspects of city life over which DCC has no control.

Planning

Local level planning is an area where DCC faces severe problems. As per the Ordinance of DCC there should be a number of standing committees responsible for formulation of planning on the basis of local needs and priorities as identified through discussions, meetings and consultations. The constitution of the standing committees provides DCC with the scope for enhancing the level of people's participation in planning. However, the influence of central government in this regard militates against participatory planning. Due to these central government restraints,

¹⁰ The corporation constitutes eight standing committees and other committees to monitor and guide the diversified activities of the organization. The Chief Executive Officer, who is assisted by the Secretary. The Heads of Departments and Zonal Executive Officers, assists the Mayor about 11,000 employees carry out various duties, catering to civic needs.

DCC does not have a full-fledged planning cell nor an adequate number of planners in spite of the crucial role of planning in DCC's developmental activities. The other factor that has considerably undermined DCC's planning potential is the existence of a mega citywide central governmental organization- RAJUK. Though RAJUK is supposed to undertake physical planning and development control, this organization, in fact, does not accomplish either of these functions properly.

In terms of administrative structure Dhaka city is managed by the ward and zonal offices and DCC central body. While functions of the ward is somewhat visible that of the zonal office is quite vague. The central body holds all financial and administrative powers. The zones as intermediaries do not support the wards except for providing staff for maintenance of services mainly in the area of solid waste management and street lighting. Construction, repair and maintenance of roads, drains occur only for VIP areas.

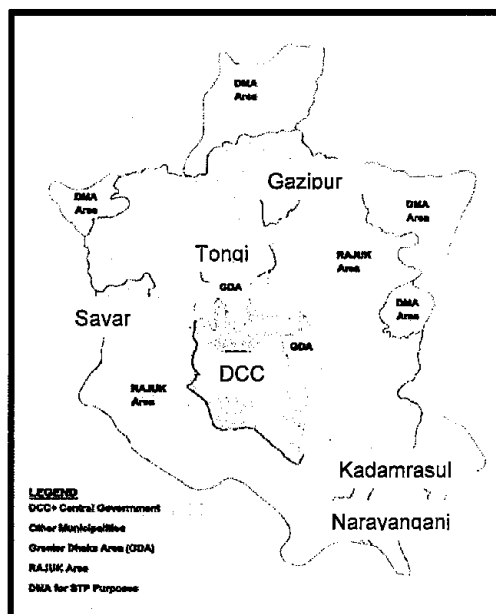
The DMP which should be most prominent and active is more busy with national and political affairs than control of local law and order. At present there are 33 police stations in DCC area under DMP and the city authority (DCC) even lacks any consultative status. The police administration is directly run by Ministry of Home Affairs and presently, in Dhaka city 1 police personnel is deployed for nearly 400 city dwellers in normal conditions.

Other Municipalities within DMDP

In addition to DCC there are five other municipalities within DMDP area. Their name, area and population is given below;

**Table 8:
General Information on Five Pourashava**

POURASHAVA	Area Sq. Km.	Population (1998)
DCC	290	6844000
Narayanganj	10.36	232980
Kadamrasul	10.50	126740
Tongi	32.36	186816
Gazipur	48.00	109991
Savar	14.08	203420



Source: Pourashava Statistical Year Book of Bangladesh, 1997-98.

4.4 Constraints for Planning and Improvement

Transport and land use planning statement¹¹ in STP states that for many years, transportation and land use planners have known about the interaction between the two disciplines. Land Use development results in a demand for transportation and the provision of transportation linkages encourages land use to take place in a planned way. In Dhaka, and in spite of there being a Structure Plan adopted by the government¹², there is a lack of guidance on city planning. Most importantly, the control on planning development is not exercised. Planning applications are not processed correctly and there is little or no evidence of Traffic Impact Assessments being made for new developments.

The lack of integration between land use planning and transportation planning results in uncontrolled and unplanned development, non-compliance and a poor mix of land uses leading to inefficiencies in the transportation system. The results are larger distances between linked land uses such as between residential and work places and the need to provide long haul transportation systems and other infrastructure to serve the land use developments. For shorter distances, where vehicular transportation is not required, local plans should investigate improvement of non-motorized transport and pedestrian facilities.

1.0 Planning and Improvement of Management of Dhaka City

Dhaka has grown rapidly since the 1950s and extremely fast since the early '70s. Its population increase has been phenomenal, economic growth has also been impressive but not socially equitable. The rapid population growth with substantial economic improvement has resulted in fast and rather uncontrolled expansion of the physical reality of the city. The victim of such growth have been the rivers, lakes, water bodies and surrounding wetlands. The reality of extreme population pressure demands extra-cautions and imaginative planning and development control intervention for the city to have a sustainable future. Water, greenery and open space are three elements that should deserve particular attention from political leaders, administrators, city planners, development thinkers and citizens alike. Dhaka is now a mega city of over 10 million people and would have 15.68 million people in 2015. The master plans are based on targetted population with projection of 15-20 years with estimated demand for land and services for the forecasted population.

Transferring the plan to an ongoing programme to adjust to changes in reality has been missing particularly since Liberation. We have seen that RAJUK and DCC are mainly engaged in day to day activities. For RAJUK some of the important areas of planning and action are;

Control of Unplanned Growth

There have been a number of negative interventions by the Government in their effort to improve the quality of life in cities such as removing slums and squatters, demolition of

¹¹ Issue 12 Transport and Land Use Planning.

¹² The Dhaka Metropolitan Development Plan, published by RAJUK in 1998.

unauthorized structures. These have proved to be acts violating human rights. Positive measures such as land use monitoring, measures against complains and reports on unplanned development etc. should be dealt with seriously. There is also the need to regularizing buildings constructed in vast areas of the city area. Control of land use zoning absence of which allows unplanned development of commercial institutional buildings and negative consequences for transportation planning is worthy of mentioning. The location of tall buildings in DCC and the location of land development projects shown in Maps in the STP study are examples.

Most recently prepared Map showing locations of schools and education institutions all over STP shows concerns for future transportation problems if land use control is not enforced.

RAJUK must plan and execute control through the detail area plans within the frame work of 2008-2015 in circulation with STP programmes.

Plans for Dhaka

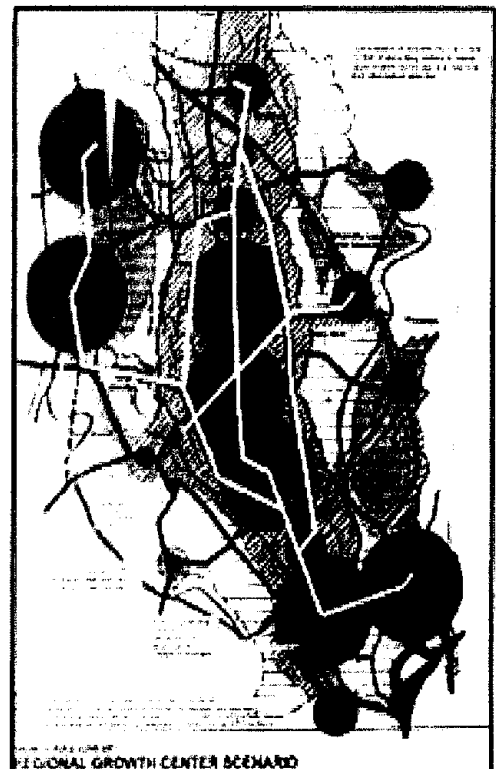
Dhaka Metropolitan Development Plan (DMDP)

- Initiated 1992
- Final plan –legally gazetted in 1997
- Three level of plans
 - Structure Plan
 - Urban Area Development Plan
 - Detailed Area Plan
- Based on 20-year Planning Horizon
- STP is to produce a Strategic Transport Plan ...with special emphasis on 'integrating the planned landuse for the future growth of the city mentioned in the Dhaka Metropolitan Development Plan (1995-2015)' with transport issues in the Dhaka Metropolitan Area (DMA) over the next 20-year planning horizon...' (emphasis added).
- STP's planning horizon is 2024-necessary to project 9 year beyond.

Selected Growth Strategy

Growth Pole Concept

- Geographic clustering
- Agglomeration economies (economics of scale)
- Spin-off, propulsive effects
- Concentrations on a few places
- Forward and backward industrial linkages maximized
- Bias toward urban areas
- Long term horizons
- Preferential treatment for certain areas



- Sustainable rather than dormitory communities

Proposed Application to Dhaka

Regional Growth Centers Scenario

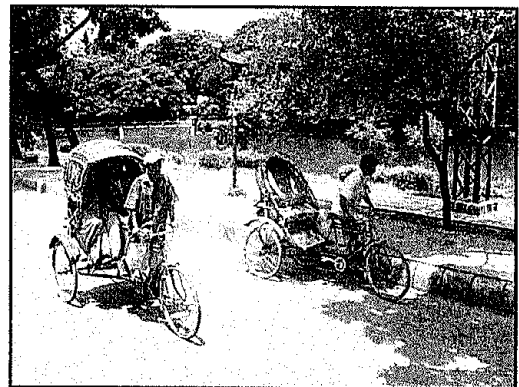
- EPZs are poorly recognized growth poles
- Given textile industry as the 'engine', EPZs will be increasingly important.
- EPZs re-conceptualized as full communities –not just factories.
- Latent re-development potential of Narayanganj realized.

Improvement of Slum and Squatter Settlements

In Dhaka city the government through mass eviction has tried to get rid of large scale slum and squatter settlements on public land. But this has not driven the poor out of the city rather it has created more private slums and deterioration of local infrastructure, aggravated pollution within residential neighbourhoods. City planning and management authorities need to carefully plan resettlement and rehabilitation of the urban poor and provide tenure security for a given period. Planned rehabilitation of poor settlements to areas of emerging industries and satellite towns requires planning efforts and vision. Today towns like Tongi have large scale unused govt. land and increasing squatter settlements. Re-planning of these areas to make land available for low income groups along with commercial, industrial uses is a task that should be immediately taken up. The notion that land is scarce in this metropolis is wrong, it only needs re-planning and reuse.

Rickshaw as a public Transport

The informal sector transport system of Dhaka is particularly notable by the tricycle –rickshaw. Owners are individuals who operate a fleet of rickshaws. The rickshaw pullers are mostly poor migrants who are slum dwellers and belong to the LIG category. Rickshaws are rented out to drivers on eight hours shifts.



Rickshaws are the most conspicuous type of passenger transport in Dhaka. These are three wheeled and paddled by human power, by men to be specific. It requires very little training for acquiring the driving skill, although many drivers hardly ever pick up the traffic rules of the city. Most of the parts of the cycle rickshaws are locally made or assembled. The rickshaw hardly causes any air pollution. There are also numerous cycle vans on three wheels which normally carry goods within the city.

Rickshaws have been recognized as one of the most unorganized and uncontrolled group of vehicles operating on the city roads. Regulation and control of rickshaws has been a complex and challenging issue. The Dhaka integrated Transport Study (DITS²) had assessed that about 21 percent of all daily trips within Dhaka is catered to by the rickshaws. It is acknowledged that the rickshaws of Dhaka play a significant role as an intermediate public transport system especially on the feeder and local road networks of Dhaka.

No one knows the exact number of the rickshaws operating in Dhaka. The DCC, which is the licensing authority for the cycle rickshaws, has issued licenses to about 78,000 rickshaws. But the actual number operating within Dhaka is estimated to be anywhere up to 3,00,000 vehicles. Thus about 300,000 to 400,000 people are directly employed in the rickshaw transport and another sizeable number are indirectly involved. DCC stopped registration of the cycle rickshaws with the perception that the growth will be deterred. Without a proper system of monitoring and enforcement in support of this initiative, this has not produced the required result. Instead, there has been unauthorized growth of the rickshaws in Dhaka. DCC is of the view that though they are the licensing authority for the rickshaws the responsibility of monitoring and penalizing unlicensed rickshaws lies with the Metropolitan Police. Dhaka Metropolitan Police (DMP) on the other hand argue that there is no provision in the Motor Vehicle Ordinance and the Metropolitan Police Ordinance to control and regulate the cycle rickshaws. Thus, one of the major transport service providers in Dhaka is apparently outside the ambit of law.

The role of the cycle rickshaw needs to be considered in context of the overall urban transport development strategy for Dhaka. It is true that the rickshaw is not an efficient mode of transport in terms of road space usage and the city's transport system would be better off if the same space could be used by more efficient public transport modes. In this direction the rickshaw movements are currently being restricted along high-density motor vehicle corridors and bus routes.

The general attitude towards rickshaws is more negative than positive. If analyzed the negative reasons could be summarized as ;

- Many dislike them as they are a symbol of under development
- They represent the migrants or unwanted people in the city.
- Rickshaws are blamed as the root cause for traffic congestion and the unruly condition of the roads.

The number of positive points in support of rickshaws are ;

- They are the only available transport for the vast number of middle & lower middle income group numbering about 3 million in the DCC area.
- They provide the only means of transport for children, women and elderly people in many areas of the city where there are no other public transport.

- Within local areas till such time as pedestrian walkways, bi-cycle routes and local public transport develop they are the only means of transportations.
- Finally they are the means of employment for a large number of the male migrant population in the city whose family members provide valuable services in the garments industries, solid waste management and as domestic helpers.

The reality of the situation is that the rickshaws are an essential part of life in Bangladesh and not only Dhaka. It is therefore necessary to accommodate the rickshaws and all those associated with it in Dhaka and all urban areas in a planned manner.

4.5 Public opinion of STP

Advisory committee recommendations, Improvements : Some Comments of the Advisory Group are;

Pedestrian First Policy

Pedestrian First Policy enunciated by the STP Consultants in Urban Transport Policy Final Report is strongly supported by the Advisory Committee and should be given a very high priority. The committee also recommended that pedestrian walk ways should be continuous, wheel chair accessible with adequate widths.

Roads Program

- ❖ Secure Right of way for all major Arterial Roads shown in ROADS ++(+) program in Phase 1. This will include all inner city roads shown in phase 1 as well as all outer city roads shown proposed in Exhibit 8-12. The right of way for all new roads should have at least 4 lane dual carriage provisions.
- ❖ Provision should be made on major arterial roads for separate and exclusive lanes for two wheeler and three wheeler motorized vehicles and non-motorized transport.
- ❖ Introduce designated city bus terminals in strategic locations (such as at origins – Mirpur, Mohammadpur, Azimpur and Uttara and at Destinations – Motijheel, Gulshan etc.) to better organize the intra city bus service. Move existing truck terminal to outside inner city areas along the main transportation routes and expand the newly planned terminals.
- ❖ Institute a program of road widening of the tertiary and neighborhood roads in the existing built up city areas. Implement RAJUK plan of widening lanes and by-lanes in the city.

Planning, Coordination and Implementation

- ❖ The STP Final Report advocates the setting up of a Unitary Authority that would deal with both the Land Use Planning and the Transportation Planning. Ideally this would be desirable. Practically the RAJUK has been responsible for land use planning and the development control process. It has also created the DMDP (1995-2015) Structure Plan and the Urban Area Plan and is currently in the delayed process of developing Detailed

Area Plans. The transportation functions are carried out by Roads and Highways, BRTA, DCC, and the police. DTCCB formed in 2001 has been entrusted with the overall transport planning in DMA and coordination of planning functions among implementing agencies. This has been correctly identified in the STP Report. For practical reasons and out of pragmatism, the Advisory Committee has advocated the parallel strengthening of both RAJUK and the DTCCB to carry out the respective functions more effectively. However it is also suggested that there be very close planning coordination between RAJUK and the DTCCB as well as between DTCCB and the various transportation plan implementing agencies such as Roads and Highways, DCC, BRTA, BRTC and the police.

- ❖ A Land use and Transport Coordination Committee (LUTCC) may be formed under Article 13 of DTCCB Act, 2001 in order to ensure effective coordination between land use and transport plans and also to guide transport-related organizations and agencies to take up plans, problems and projects in line with the strategy and recommendations of Structure Plan. The committee would be chaired by Executive Director, DTCCB and co-chaired by the Chairman, RAJUK. Dhaka City Corporation (DCC), the pourashava in the extended Dhaka Metropolitan Region and other concerned authorities / organizations would be the members of the LUTCC.
- ❖ For strengthening the capacity and the coordination between RAJUK and the DTCCB it is suggested that there should be a transportation planning cell in RAJUK and a Land use cell in the DTCCB.

ISSUE 2: PEDESTRIANS

Pedestrians are the most vulnerable of all road users and require special facilities for their protection. The absence of a clearly defined system makes travel by this mode of travel unpleasant and hazardous. Some of the important factors which need to be addressed are; the lack of pedestrian first priority policy; the absence of continuous footpaths on both the main routes and the neighbourhood streets; poorly designed badly located and ill advertised pedestrian crossings; encroachment on the footpath from traders and equipment and the absence of facilities for the movement of disabled persons, all contribute to a dangerous situation.

Concern of DCC and the World Bank over use of FOB by Pedestrians

The feasibility study for construction of footpath over bridge in 30 locations of Dhaka City has been initiated by Dhaka City Corporation for priority selection for construction. The study funded by World Bank is in the interest of improving pedestrian mobility and traffic movement in the city. The specific objectives of this survey are: i) To assess the list of locations (30) proposed for FOBs and related sidewalks from a needs, technical, environmental and social perspectives with a view to prioritize and ii) To determine key technical, environmental and social aspects in each prioritized location, which are critical to their viability for construction, use and operation.

The study is being done Centre for Urban Studies (CUS), Dhaka and final report is under process which prioritize all 30 locations for construction of FOBs based on social, technical and environmental aspects. **Appendix 3** has list of all the 30 locations.

In 2004, a study titled as 'Feasibility Study for Foot over Bridges in Dhaka City: Survey of Pedestrian Behaviour' was carried out by the Centre for Urban Studies (CUS), Dhaka for Dhaka Urban Transport Project to get some practical recommendations in order to improve pedestrian management capacity, providing feasible solutions for increasing the pedestrian facilities by designing user friendly FOBs, improving signalized intersections and suggesting appropriate, safe, convenient, aesthetically attractive and user friendly means for pedestrian crossing.

Appendix 1: Agencies for Urban Development in Dhaka City : their Status and Major Functions

Sl. No.	Name of Agency	Administrative Ministry/Agency	Major Functions
1.	National Economic Council (NEC)	National Economic Council	Investment in metropolitan areas
2.	Planning Commission	Ministry of Planning	National development planning, policies and strategies
3.	Urban Development Directorate	Ministry of Housing & Public Works	Nation-wide urban and regional planning
4.	Rajdhani Unnayan Karttripakkha (RAJUK)	Ministry of Housing & Public Works	Development planning: Dhaka metropolitan area, approval of housing projects
5.	National Housing Authorities (NHA)	Ministry of Housing & Public Works	Provision of public housing in urban areas
6.	Public Works Department (PWD)	Ministry of Housing & Public Works	Construction of public buildings and maintenance
7.	Deputy Commissioner of Settlements (DCS)	Ministry of Housing & Public Works	Land lease, title transfer
8.	Dhaka Water and Sewerage Authority (DWASA)	Ministry of Housing & Public Works	Provision of water supply and sewerage disposal Sanitation and drainage
9.	Dept. of Public Health Engineering (DPHE)	Ministry of Local Government, Rural Development and Cooperative	Sanitation
10.	Registrar, Cooperative Societies (Housing Sector)	Ministry of Local Government, Rural Development and Cooperative	Registration of housing cooperative societies
11.	Dept. of Environment	Ministry of Environment and Forest	Control of air and water pollution
12.	Telegraph and Telephone Board	Ministry of Post and Telecommunications	Provision of telephone and telegraph services.
13.	Power Development Board (PDB)/DESA	Ministry of Energy and Mineral Resources	Generation and supply of electric power
14.	Titas Gas	Ministry of Energy and Mineral Resources	Supply of fuel gas
15.	Roads and Highways Department (R&H)	Ministry of Communications	Construction and improvement of highways, major roads, bridges and related works
16.	Bangladesh Road Transport Corporation (BRTC)	Ministry of Communications	Provision of public transport (BUS) services.
17.	Bangladesh Railway (BR)	Ministry of Communications	Expansion and maintenance of rail transport
18.	Civil Aviation Authority	Ministry of Civil Aviation and Tourism	Development and maintenance of airports
19.	Bangladesh Parjatan Corporation (BPC)	Ministry of Civil Aviation and Tourism	Provision of facilities for tourists (parks, restaurants).
20.	Inland Water Transport Authority (BITA)	Ministry of Port, Shipping and Inland Water Transport	Expansion and maintenance of water transport.
21.	Dhaka Metropolitan Police (DMP)	Ministry of Home Affairs	Control traffic, collection of road tax and Licensing of vehicles.
22.	Fire Service and Civil Defence	Ministry of Home Affairs	Fire fighting and ambulance services
23.	Cantonment Board	Ministry of Defence	Provision and maintenance of services in cantonment areas.
24.	Survey of Bangladesh (SOB)	Ministry of Defence	Land records and aerial photography
25.	Space Research and Remote Sensing Organization (SPARSSO)	Ministry of Defence	Collection and analysis of satellite data

Sl. No.	Name of Agency	Administrative Ministry/Agency	Major Functions
26.	Board of Investment (BOI)	Prime Minister's Secretariat	Approval of industrial projects
27.	Small and Cottage Industry Corporation	Ministry of Industries	Development of small and cottage industry
28.	Directorates of Primary, Secondary and Technical Education	Ministry of Education	Construction, maintenance and supervision of schools and educational institutes.
29.	Universities	Ministry of Education	Higher education and research services.
30.	Bangladesh Water Development Board (BWRDB)	Ministry of Irrigation, Water Development and Flood Control	Embankment for flood protection
31.	House Building Finance Corporation (HBFC)	Ministry of Finance	Provision of loans for housing construction in the private sector
32.	Bangladesh Agricultural Development Corporation (BADC)	Ministry of Agriculture	Provision for marketing facilities
33.	Uddan Unnayan Board	Ministry of Agriculture	Development of horticulture
34.	Sports Federation	Ministry of Youth and Sports	Promotion and provision for facilities for games and sports
35.	NGO Affairs Bureau	Prime Minister's Secretariat	Construction and maintenance of local urban services
36.	Ministry of Land	Ministry of Land	Khas land
37.	Directorate of Health	Ministry of Health and Family Welfare	Health facilities
38.	Department of Social Welfare	Ministry of Social Welfare	Community Development and services, income generating activities, literacy programme
39.	Department of Women Affairs	Ministry of Women and children Affairs	Protection of women's rights, upliftment of women's development.
40.	Dhaka Transport Coordination Board (DTCB)	Ministry of Communications	Integrated transport policy and Planning.
41.	Dhaka City Corporation and 5 Pourashavas	Ministry of Local Government, Rural Development Cooperative	Multiple functions, particularly conservancy and other urban services.

Source: Islam, 2000 and additions

Appendix 2 : More Information on Building Construction Act, FAR, Parking and BNBC

Building Construction Act, 2007

The Building Construction Act was constituted 55 years ago during the Pakistan period. Dhaka City Building Construction Act, 2007 is a recently approved and published documents which include relevant rules such as, water bodies reservation rules, fire control rules, rules on controlling house tenants and private safety service rules etc.

Land-use and transport related building construction rules are highlighted. Up-to-date information of land development and rules of private and government housing project and safety issues are provided.

Chapter 6: Miscellaneous

71. Landscaping and Park

- (1) There must be an appropriate landscape design in the case of all government, commercial building and large building or complex.
- (2) Approval is needed in the case of constructing buildings in public parks and open spaces and in such places except the following case no approval for constructing structures or buildings will be given-
 - (i) Sports related structures.
 - (ii) Structures related with facilities of common people where height should not exceed 4m and 5% of that structure park or open space.
- (3) In the following cases, the decisions of City Development Authority will be needed-
 - (i) In the case of constructing any architectural structures.
 - (ii) In the case of constructing under ground structures of more than 100m² within the Uddyan (Park) if this does not cause any hamper to environment or cause any problem in the movement of vehicles.

73. Special Control:

- (1) In special areas, any prohibition defined by the government such as key point installation, national security, movement of airplane, prohibition related with telecommunication etc will be considered for constructing structure in that area and in the constructing of structures by the side of V.I.P roads defined by the Government, the conditions related with public welfare given by government will be considered.
- (2) Special areas identified in master plan or of national importance such as: National Smriti Soudha (Monument), cantonment areas, Takshal, Lalbag Fort, radio and television transmission centre etc. and in controlling height of structures near these areas, recommendations given in Master plan, orders and prohibitions given by government will be considered.
- (3) In case of constructing structures in areas defined for airport and related air funnels, rules related to definite height approved by private air movement authority will be considered.
- (4) In case of constructing structures in all important roads, intersections in Dhaka city, the Dhaka Traffic coordination Board Rules, 2001 approved for traffic system coordination and development in Dhaka City (19th rule in 2001) will be considered.

75. Rules for disabled persons:-

- (d) Minimum parking space or 5% of total space for parking in each structure should be defined for disabled persons.

5. Parking Act and Traffic Rules related Act**Parking and Traffic centre/Related standards**

- (a) If the entrance and exit are restriction free width of the entrance should not be less than 3m. If the entrance and out way are the same way the width should not be less than 5.5 m. No footpath or other hindrance should be allowed within this width.
- (b) Separate entrance and exit for bus and truck should be minimum 4.5m and 6.5m if combined.
- (c) Parking width for various vehicles and radius of vehicle turning are listed below:-

Types of Vehicles	Parking Width	Parking Length of turning	The radius	Outer Radius
1. Common Vehicle	2.4m	4.8m	4.7m	7.3m
2. Bus and truck	3.6m	10m	8.7m	12.8m
3. Multi axle truck/ Troller	3.6m	18m	6.9m	13.8m
4. Motor Cycle	1m	2m		

- (d) Drive way measures for common vehicles for various parking are listed below:-

Parking	One way traffic 'Bay' in one way	One way traffic 'Bay' in two way	Two way traffic
0°	3.5m	5m	5.5m
45°	4.0m	4.5m	5.5m
90°	5.5m	5m	5.5m

- (e) To keep in the parking place, the turning of vehicle movement should be completely within site but not allowed on the road way.
- (f) The direct angular parking from the road if necessary in the case of parking of not more than 4 vehicles the following conditions should be fulfilled-
- (1) Angular parking should be within 45°
 - (2) Parking should not be allowed within 15m from the bus stand.
 - (3) Parking should not be within 25m from the pedestrian crossing place or other intersection.
 - (4) Parking should not be allowed on National High way.
- (g) If it is necessary to stop footpath for entrance or exit in parking areas, it should be done keeping in mind advantages or disadvantages of the pedestrians.
- (h) If there is any provision for ramp in parking places the slope should be of minimum 1:8 and should not be more than 12m in one way and should be constructed at a distance of minimum 4.5m.
- (i) If entry and exit for ramps are separated minimum width should be 3m and if the entry and exit are the same, minimum width should be 6m.

- (j) In residential sites, in the case of parking of 100 vehicles and in other sites, in case of parking of 50 vehicles, there must be provision for separate traffic margins for parking bay. Easy movement of traffic in the related way should not be prohibited in any way.
- (k) The Head-Room of multi storey parking place and ramp should be 2.25m.
- (l) In case of sites with maximum 10m front-width, there must be only one entrance and one exit. If front width is more than 10m authority should not give permission for more than two entrances and exit.

Chapter 4 : FAR related rules

- A. 54. Highest FAR to be approved
 - 5. In calculating total FAR, the following parts should not be considered-
 - The parking space in which the highest number of vehicles which is mandatory according to this rule should not be more than the 50% of minimum number;
 - Driveway should be considered as part of parking space and such parking should not be defined.
- B. 56. Parking system
 - 2. The lay-out plan of the parking areas should be made in such way that each vehicle can enter the driveway or circulation area directly.
 - 3. In case of ramp way, the maximum slope should be 1: 8, the boundary of which should not begin within 4.5 m from the entrance way
- C. 57. The necessary provisions for roads
 - 1. In case of approval of construction of structures the minimum width of roads should be 6 m with footpath.
 - 2. If the minimum width of road is less than 6 m than the new development authority, during application for necessary change and enlargement, will ensure that it will give up half of the necessary plot to the authority and construction will not begin without such assurance.
 - 5. In case of housing areas or complex developed by private agencies, the minimum width of internal roads should be according to the Rules of Land Development by Private Housing Project, 2004 and if the width of roads private housing project is less than 7.62 m and if that project is although approved accurate correction should be done during approval
- D. 58. Footpath system-
 - 1. There must be provision of footpath system in case of adding new roads
 - 2. If footpath is not present on the front side roads and the authority gives the order to make footpath access, the user will be responsible to make the footpath
- E. 59. Simplification of edges of corner plot areas-
 - 2. In case of structures situated in the connection of two roads the edge should be parabolic
 - 3. The radius of the connection of two roadways should be dependent on the width of roads and traffic pattern.

Chapter 4 : Rules for Building Construction

47. Mandatory Open Space-

There must be open space according to Setback Rule 50 and Ground Coverage Rule 52.

48. Subdivision of plots-

4. In case of subdivision of plots, only in one private plot the minimum road width will be 3.65m and this will be appropriate for only for residential plots.
5. In more than one plots the road width will be 6m.

50. Setback-

3. No construction will be allowed within 4.5 m from the center of the road or 1.5 m from the boundary of the road.

53. Height of structures-

The height of the structures will be defined by the concerned authority in case of airport, microwave station, telecommunication station, important establishment or other special establishment.

Bangladesh National Building Code (BNBC)

The gazette notification on the building code was issued on November 15, 2006 but the government is yet to appoint any building officials or delegate any agency to bring the code into practice which is necessary for ensuring safe construction. The government has not adopted any mechanism to enforce Bangladesh National Building Code (BNBC) properly, letting accidents to occur at the construction sites and allowing flaws in building construction and demolition.

The Building Construction Act of 1953, amended in 2006, provides for punishment with seven years of imprisonment or a fine of Tk 50,000 or both in case of violation of the BNBC and the Building Construction Rules of 2006. The code is supposed to be updated every five year.

According to provision in the BNBC, the government has to designate authorities and appoint required number of building officials to enforce the code.

The BNBC is a complete set of codes to ensure sound construction, accountability of the professionals concerned, protection of environment and safe demolition. The code addresses all the safety concerns like fire hazard, stability and strength of a building and quality of construction. Professionals including civil engineers, architects and planners involved with any construction work will remain legally liable and answerable for any lapses in the professional responsibility, according to BNBC.

- As per BNBC provision, a building official should be a technical hand like engineer, architect and planner and have adequate authority not only to monitor a construction process but also to approve building design.
- Death due to non-compliance with the BNBC in both construction and demolition works in the city have been a recurrent phenomenon. At least four death incidents at construction sites have been reported in the city over a span of four months.
- In absence of proper implementation of BNBC, it is easy for any builder to get away with a faulty design and use of low quality construction materials.

Appendix 3: List of 30 FOBs to be constructed by DCC (Proposed)

#	Name	Location/Road/Area
1.	In front of planning commission	Begum Rokeya Sarani
2.	Taltala Bus Stand	Begum Rokeya Sarani
3.	Agargaon Bus Stand	Begum Rokeya Sarani
4.	Porishankhyan Bhaban	Begum Rokeya Sarani
5.	Mirpur Bangla High School crossing	Mirpur Section 11
6.	In front of NAM Garden Quarter	Mirpur- Kacukhet Road
7.	Sukrabad Bus stand crossing	Mirpur road
8.	College gate, Suhrawardi Hospital	Mirpur Road
9.	Darus Salam Apartment Complex	Mirpur road
10.	In front of Chandrima Super Market	Mirpur road
11.	Mohakahli – Rasulbag south crossing	Shahid Tajuddin Sarani
12.	Nabisco crossing at Tongi Diversion Road	Shahid Tajuddin Sarani
13.	Baridhara- Nordda Bust Stand	Progati Sarani
14.	In front of Uttar Badda Bazar	Progati Sarani
15.	Khilgaon Bagica-Khilgaon C Block	Janapath
16.	Maniknagar – Gopibag Crossing	Janapath
17.	In front of Rajuk Uttara Model College	Uttara
18.	Banani Chairman Bari Crossing	Airport Road
19.	Kawla Bus Stand	Airport Road
20.	Army Transit Camp (Joar Sahara Cantonment)	Air port Road
21.	Shantinagar Intersection	Shantinagar
22.	In front of press club	Topkhana road
23.	Shapla Chattar	Mothijheel CA
24.	Notor dame College	Mothijheel
25.	Mothijheel Government High School	Outer circular road
26.	Rampura Bazar Road	DIT Extension road
27.	Rajdhani Super Market	Narinda Crossing
28.	Saidabad Bus Terminal	Saidabad
29.	Bashundhara Shopping Mall	Panthapath
30.	Hotel Sonargaon	Kawranbazar