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Report No: {PAD2085}

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT PAPER

ON A

PROPOSED ADDITIONAL FINANCING

IN THE AMOUNT OF SDR25.50 MILLION
(US$35 MILLION EQUIVALENT)
AND RESTRUCTURING

TO THE

PEOPLE'S REPUBLIC OF BANGLADESH

FOR A

CLEAN AIR AND SUSTAINABLE ENVIRONMENT PROJECT

December 12, 2016

Environment & Natural Resources Global Practice
SOUTH ASIA

CURRENCY EQUIVALENTS

(Exchange Rate Effective October 31, 2016)

Currency Unit	=	SDR
78.51 BDT	=	US$1
1.37385 US$	=	SDR1

FISCAL YEAR
July 1 – June 30

ABBREVIATIONS AND ACRONYMS

AAC	Autoclaved Aerated Concrete
ACB	Aerated Concrete Brick
ADB	Asian Development Bank
AF	Additional Financing
APC	Air Pollution Control
AQI	Air Quality Index
AQW	Air Quality Wing
BAEC	Bangladesh Atomic Energy Commission
BDT	Bangladesh Taka
BRT	Bus Rapid Transport
BUET	Bangladesh University of Engineering and Technology
C&AG	Controller and Auditor General
CAMS	Continuous Air Quality Monitoring Station
CASE	Clean Air and Sustainable Environment Project
CFP	Country Financing Parameters
CPF	Country Partnership Framework
DA	Designated Account
DMP	Dhaka Metropolitan Police
DNCC	Dhaka North City Corporation
DoE	Department of Environment
DSCC	Dhaka South City Corporation
DSM	Design, Supervision and Monitoring
DTCA	Dhaka Transport Coordination Authority
DTCB	Dhaka Transport Coordination Board
e-GP	Electronic Government Procurement
ESMF	Environmental and Social Management Framework
EOP	End of Project
ERD	Economic Relations Division
FAPAD	Foreign Aided Project Audit Directorate
FCK	Fixed Chimney Kiln
FM	Financial Management
FMR	Financial Management Report
FOB	Foot-Over-Bridge

GDP	Gross Domestic Product
GHG	Green House Gasses
GoB	Government of Bangladesh
GRS	Grievance Redress Service
HBRI	House Building Research Institute
IA	Implementing Agency
IDA	International Development Association
IOC	Incremental Operating Cost
IUFR	Interim Unaudited Financial Reports
IP	Implementation Progress
JICA	Japan International Cooperation Agency
MoEF	Ministry of Environment and Forests
MoHA	Ministry of Home Affairs
MoLGRDC	Ministry of Local Government, Rural Development and Co-operatives
MoRTB	Ministry of Road Transport and Bridges
MRT	Mass Rapid Transit
MTD	Model Tender Documents
MV	Motor Vehicles
NCT	National Competitive Tender
NMT	Non-Motorized Transport
NMV	Non-Motor Vehicles
OTM	Open Tendering Method
PD	Project Director
PDO	Project Development Objective
PIU	Project Implementation Unit
PM	Particulate Matter
PDRPA	Persons with Disabilities (Rights and Protection) Act, 2013
PPSD	Project Procurement Strategy for Development
RSTP	Revised Strategic Transport Plan
SME	Small and Medium Enterprises
STEP	Systematic Tracking of Exchanges in Procurement
ToR	Terms of Reference
UNCRPD	United Nations Convention on Rights of Persons with Disabilities
USFRM	United States Federal Reference Method
VSM	Variable Messaging Service

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BANGLADESH
CLEAN AIR AND SUSTAINABLE ENVIRONMENT PROJECT

CONTENTS

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ADDITIONAL FINANCINGDATA SHEET

Bangladesh

Clean Air and Sustainable Environment Project - Additional Financing (P160014)

SOUTH ASIA

GEN06

Basic Information – Parent			
Parent Project ID:	P098151	Original EA Category:	B - Partial Assessment
Current Closing Date:	15-Dec-2016		

Basic Information – Additional Financing (AF)			
Project ID:	P160014	Additional Financing Type (from AUS):	Restructuring
Regional Vice President:	Annette Dixon	Proposed EA Category:	B-Partial Assessment
Country Director:	Qimiao Fan	Expected Effectiveness Date:	06-Mar-2017
Senior Global Practice Director:	Julia Bucknall	Expected Closing Date:	15-Dec-2018
Practice Manager/Manager:	Kseniya Lvovsky	Report No:	PAD2085
Team Leader(s):	Harinath Sesha Appalarajugari, Lia Carol Sieghart, Shigeyuki Sakaki		

Borrower

Organization Name	Contact	Title	Telephone	Email
Economic Relation Division, Ministry of Finance	Kazi Shofiqul Azam	Additional Secretary	880-2-9180675	addl_secy2@erd.gov.bd

Project Financing Data - Parent (Clean Air and Sustainable Environment Project-P098151) (in XDR Million)

Key Dates

Project	Ln/Cr/TF	Status	Approval Date	Signing Date	Effectiveness Date	Original Closing Date	Revised Closing Date
P098151	IDA-45810	Effective	12-May-2009	27-May-2009	19-Aug-2009	31-Dec-2014	15-Dec-2016

Disbursements

Project	Ln/Cr/TF	Status	Currency	Original	Revised	Cancelled	Disbursed	Undisbursed	% Disbursed
P098151	IDA-45810	Effective	XDR	42.20	42.19	0.01	36.51	5.68	86.54

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Project Financing Data - Additional Financing Clean Air and Sustainable Environment Project - Additional Financing (P160014)(in US D Million)					
[ ] Loan [ ] Grant [ ] IDA Grant					
[X] Credit [ ] Guarantee [ ] Other					
Total Project Cost:	36.58		Total Bank Financing:	35.00	
Financing Gap:	0.00				

Financing Source – Additional Financing (AF)	Amount
BORROWER/RECIPIENT	1.58
International Development Association (IDA)	35.00
Financing Gap	0.00
Total	36.58

Policy Waivers	
Does the project depart from the CAS in content or in other significant respects?	No
Explanation	
Does the project require any policy waiver(s)?	No
Explanation	

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
Harinath Sesha Appalarajugari	Team Leader (ADM Responsible)	Senior Environmental Specialist	Pollution Management	GEN06
Lia Carol Sieghart	Team Leader	Program Leader	Team Leader	SACBN
Shigeyuki Sakaki	Team Leader	Sr. Transport. Spec.	Transport	GTI06
Md Kamruzzaman	Procurement Specialist (ADM Responsible)	Procurement Specialist	Procurement	GGO06
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Mohammad Reaz Uddin Chowdhury	Financial Management Specialist	Financial Management Specialist	Financial Management	GGO24
Dr. M. Khaliquzzaman	Team Member	Consultant	Air Quality and Safeguards	GSU06
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Iqbal Ahmed	Safeguards	Environmental	Environment	GEN06

	Specialist	Specialist	Management	
Janet Bably Halder	Team Member	Program Assistant	Program Assistant	SACBD
Jorge Luis Alva-Luperdi	Counsel	Senior Counsel	Legal	LEGES
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Syed Ahmed Ali	Team Member	Consultant	Procurement	GGO06

Extended Team

Name	Title	Location

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
Bangladesh	Dhaka Division	Dhaka			
Bangladesh		People's Republic of Bangladesh			

Institutional Data

Parent (Clean Air and Sustainable Environment Project-P098151)

Practice Area (Lead)

Environment & Natural Resources

Contributing Practice Areas

Transport & ICT

Additional Financing Clean Air& Sustainable Environment Project-Additional Financing (P160014)

Practice Area (Lead)

Environment & Natural Resources

Contributing Practice Areas

Transport & ICT

Consultants (Will be disclosed in the Monthly Operational Summary)

Consultants Required? Consulting services to be determined

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I. Introduction

1. This Project Paper seeks the approval of the Executive Directors to provide an additional credit in the amount of SDR25.50 million (US$35 million equivalent) to the *Bangladesh: Clean Air and Sustainable Environment Project* (CASE - P098151; Credit 4581-BD). The Government of Bangladesh (GoB) will contribute US$1.58 million towards the project. Considering the continuous nature of project activities of the parent project and the additional financing (AF) operation, the team also seeks approval to (i) revise the results framework to reflect the higher results expected due to AF; and (ii) extend the closing date of the project from December 15, 2016 to December 15, 2018, which aligns with the closing date of the proposed AF operation (P160014).

2. The project has contributed to improvements in Air Quality Management in Bangladesh and Traffic Management initiatives in Dhaka. This is reflected in 'Satisfactory' rating of the Project Development Objective (PDO) and 'Moderately Satisfactory' rating of Implementation Progress (IP), with 86.54 percent disbursement of IDA credit. Encouraged by the good performance of the project, the GoB seeks AF to help cover the financing gap for activities aimed at augmenting and sustaining air quality management initiatives in Bangladesh, testing models for improving traffic management system in Dhaka and designing follow-on air quality and traffic management programs to scale up support for the country's sustainable urbanization and growth.

3. The AF operation will support the following activities and would require about 24 months for implementation.

Component 1: Environment

- Augmenting and sustaining air quality management initiatives: For better monitoring and analysis of air quality data that is generated in the country, a central air quality laboratory with modern facilities is being proposed through AF. Five additional continuous air quality monitoring stations (in addition to the network that currently covers only eight major cities) will also be established through AF. The stack monitoring capacity of DoE, will also be strengthened for better monitoring and enforcement of air emissions from critical industrial sectors such as brick kilns, steel mills and other industries.

- Financing gap to essential infrastructure: The Department of Environment (DoE) is expanding its organizational strength and activities on regulatory and policy reforms, enforcement, monitoring and quality control. The current project is supporting the design and construction of a new building using the 'green building concept' to accommodate space for additional staff, centralized reference laboratories, research and development facilities and training centers. The building was designed as 11 stories with ground floor and two basements. The current credit (after considering the savings due to currency fluctuation) supports construction up to six stories. The proposed AF operation will support the completion of remaining five stories of the building and help improve DoE's management capacity to deliver better results.

- Policy and institutional capacity strengthening**:** In order to strengthen the regulatory regime for air quality management in the country, GoB proposes to enact Clean Air Act in the 7th Five Year Plan (2016-20). The project through AF will help drafting the act through a wider consultative process and a review of international experiences to incorporate best practices. The capacity building efforts will be further strengthened to support sustainable air quality management beyond the project. The AF will also support dissemination of low emission brick manufacturing technologies and research activities on cleaner technologies and related training.

Component 2: Transport

- Financing gap for operationalizing the traffic signals: Under the parent project, Dhaka South City Corporation (DSCC) /Dhaka North City Corporation (DNCC), has improved and repaired traffic signal systems at 62 intersections and is installing new system at 29 intersections. Due to unexpected deterioration of the signal infrastructure, which was deemed to remain functional and not included in the scope of the repair work in the parent project, the system is unstable and prone to frequent breakdowns. The deterioration was mainly due to vandalism and lack of sufficient maintenance. Besides, limited capacity of Dhaka Metropolitan Police (DMP) on traffic management has made it difficult to plan and start the operation of traffic signals. Activities proposed through AF aim to address these critical aspects by supporting additional repair work and maintenance of signal infrastructure at 91 intersections, improvements to sidewalks, provision of traffic management equipment for traffic police, etc.

- Addressing the mobility needs of people with disabilities: While accessibility of the disabled people was not specifically considered in the design of the parent project, it has become an integral part of the agenda in pedestrian mobility, as GoB enacted the Persons with Disabilities Rights and Protection Act (PDRPA) 2013, which is intended to comply with United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), which became effective in 2008. In light of the above, the AF will help developing appropriate options for the mobility needs of disabled people and pilot these interventions in Dhaka.

II. Background and Rationale for Additional Financing

Country Context

4. Bangladesh has achieved average growth rate of about 6 percent in the last two decades with relatively low inflation, fairly stable domestic debt, interest, and exchange rates. The country's Gross Domestic Product (GDP) is estimated at US$195.10 billion in 2015 with a share of industry at 28.10%[1]. At the current rate of growth, the GDP is estimated to be US$278 billion in 2021 with a share of industry at 37%. This growth is expected to be faster in urban areas and the major cities are expected to grow even faster than the other urban areas. At current growth trends, the cost of environmental pollution is estimated at 4.3% of the GDP out of which 23% is caused by urban air pollution[2]. It is estimated that a reduction of urban air pollution by 20% to 80% could save between 1,200 to 3,500 lives annually and up to 230 million cases of respiratory diseases could be avoided every year. In economic terms, this is estimated to be equivalent to US$170 to US$500 million in savings per year due to reduced health care costs and increased productivity. In the absence of a planned approach to pollution abatement and management, the present environmental condition in Bangladesh is likely to deteriorate even further. Pollution burden is also expected to disproportionately impact the poor. Systematic planning for abatement of air pollution for the next 5-10 years especially in and around the major urban centers is thus essential to minimize health impacts and also achieve targeted economic growth of Bangladesh.

Sector Context

5. The main objectives relating to environment, climate change, and disaster management as identified by the 7th Five Year Plan of GoB are[3]: (i) ensure appropriate environment management systems for sustainable development; (ii) enhance enforcement for pollution control; and (iii) enhance, preserve,

1 Bangladesh Development Update, October, 2016

[2]Bangladesh Country Environmental Analysis (WB, 2006)

[3] Bangladesh 7th 5 year Plan 2016- 2020, Section 8.3 (P434)

conservation of natural resources. These objectives are to be pursued along with attainment of better environmental governance. Among the above overall objectives of 7th Five Year Plan, air quality management has been identified as one of the high priority issues by GoB and specific actions have been planned to improve air quality in Dhaka and other large cities. In addition, enactment of the 'Clean Air Act[4]' has also been identified as one of the priority policy initiatives by the Government for better management of air quality in Bangladesh.

6. GoB is also in the process of major restructuring/expansion of its capacity to effectively monitor and enforce environmental regulations, in order to achieve the 7th five year plan objectives of improving overall environmental management and reducing the pollution levels in the country. The main constraints to this endeavor are, availability of resources and technical capacity of various executing and regulatory agencies. Financial and capacity building support from development partners, hence is needed to address these constraints.

7. With regard to traffic and transportation scenario, Dhaka is known as one of the most congested cities in the world, where the cost of congestion is estimated at US$3.8 billion a year.[5] The road congestion can be attributed to various factors, such as inadequate road network, poor public transport services, high mode mix (non-motorized and motorized traffic together), and ineffective traffic control. While congestion of cars attracts more attention, there are still about 41 percent people walking or using bicycle, about 23 percent opting for public transport and about 24 percent using cycle rickshaws.[6] GoB is keen to invest more on public transport, such as through the first Metro and Bus Rapid Transport (BRT) lines, and to improve the environment for Non-Motorized Transport (NMT).

Project Background

8. The CASE project was approved by the Board of Directors on May 12, 2009 with an IDA credit in the amount of SDR42.20 million (US$62.19 million). The Project Development Objective (PDO) is to '*improve air quality and safe mobility in Dhaka through the implementation of demonstration initiatives in urban transport and brick making*'.

9. The PDO is sought to be achieved by integrating environmental and transport concerns and priorities with two specific components addressing each. The environment component focuses on strengthening the capacity of the Ministry of Environment and Forests (MoEF) and Department of Environment (DoE) in air quality monitoring and demonstrating the effectiveness of new brick kiln technologies to reduce air emissions. The transport component supports demonstration investments in urban transport in Dhaka. The transport component is implemented by DSCC/ DNCC under the Ministry of Local Government, Rural Development and Cooperatives (MoLGRDC) and Dhaka Transport Coordination Authority (DTCA) under the Ministry of Road Transport and Bridges (MoRTB). In June 2013, the closing date of the project was extended from December 31, 2014 to December 15, 2016.

10. The PDO and Implementation Progress (IP) of the project are rated as 'Satisfactory' and 'Moderately Satisfactory' respectively. In terms of results, two PDO indicators related to the pedestrians using Foot-Over-Bridges (FOBs) and sidewalks have achieved End of Project (EOP) targets. Other two indicators related to vehicular traffic and brick kilns adopting cleaner technology are expected to achieve EOP targets by December 2016. As of October, 2016, the project has disbursed SDR36.51 million (86.54 percent) of the total SDR42.20 million IDA commitments. The majority of the works and activities for the

[4] Ibid, Section 2.2 (P28)

[5] Tanzila Khan, Stamford University Bangladesh, and Md. Rashedul Islam, Bangladesh Water Development Board. Estimating Costs of Traffic Congestion in Dhaka City. International Journal of Engineering Science and Innovative Technology (IJESIT) Volume 2, Issue 3, May 2013.

[6] JICA and DTCA. The Project on the Revision and Updating of the Strategic Transport Plan for Dhaka, Draft Final Report. November 2015.

remaining SDR5.67 million have also been committed by implementing agencies and are likely to be completed by the end of FY17.

11. Under the parent project, the environment component has significantly contributed to building the capacity of DoE in air quality management. A network of air quality monitoring stations (11 stations across eight major cities) is now fully functional. The Air Quality Wing (AQW) in DoE is managing the data quality, data analysis and report generation. The daily Air Quality Index (AQI) based on the air quality data has been published on the website for last three years. Twelve energy efficient and cleaner brick making technologies have been piloted in different parts of the country. New Brick Manufacturing Rules have been drafted and are in the final stage of adoption. The technical studies completed under this component provide a clear picture of the sources of air pollution and actions that need to be taken to address the problem.

12. Air quality data analysis indicates that pollution levels have not deteriorated in the past three years despite the recent industrial, transport and economic growth in the country. This is mainly due to policy level interventions such as banning fixed chimney kilns, etc. more use of cleaner fuels such as adoption of compressed natural gas for buses and trucks, and increased enforcement by DoE over this period. However, air quality still remains a major health issue with AQI exceeding 200[7] for about an average of 114 days a year in Dhaka and in other major cities of the country. Towards effectively managing air quality, the following immediate interventions are recommended by the technical studies: (i) adopting cleaner technologies in the polluting industries; (ii) effectively enforcing the vehicular emission standards; (iii) managing road dust; and (iv) better handling and control of construction material.

13. Under the parent project, the transport component supports capacity building through technical assistance and demonstration initiatives aimed at reducing conflict between motorized and NMT and congestion, as well as providing safe and better mobility for pedestrians and users of public transport. Investments under DSCC/DNCC sub-component include sidewalk improvements, construction of FOBs, intersection improvements and traffic signals. The sub-component completed reconstruction/repairing of 65 km sidewalks with drains and road pavements in various areas in Dhaka. This provides safe mobility resulting in 78% of pedestrians in targeted areas now using the sidewalks. So far, twenty one FOBs over busy and congested roads of Dhaka have been constructed. These FOBs provide safe crossing of the road and the combined usage rate at these locations is estimated at around 80%.

14. The DTCA subcomponent supports studies for bus restructuring and BRT system, and institutional strengthening. A detail design study for BRT Line 3 is being completed. DTCA was officially established following the passage by the Parliament of the DTCA Act on February 8, 2012. It has transitioned from the former Dhaka Transport Coordination Board (DTCB), now having more power for coordination of urban transport policies and projects.

15. While the efforts so far by the government mainly focused on road transport, highlighted by flyovers, it should be noted that there have been a few promising changes in the policy directions. One of those is the strengthening of the planning coordination mechanism of DTCA, partly supported by the parent project. The coordination capacity of DTCA has been strengthened through its man-power increase approved by the Ministry of Public Administration, and the mandatory review of project proposals requested by the Planning Commission. An urban transport master plan (Revised Strategic Transport Plan-RSTP, supported by JICA) has been developed by DTCA and approved by the cabinet in August 2016. RSTP puts more focus on public transport. The first metro line in Dhaka, Mass Rapid Transit (MRT) Line 6, is being constructed with support from JICA. The first BRT, Line 3, in the northern half, is being

[7] AQI as per DoE is categorized as follows: 0-50 Good, 51-100 Moderate, 101-150 Caution, 151-200 Unhealthy, 201-300 Very Unhealthy, 301-500 Extremely Unhealthy

constructed with support from Asian Development Bank (ADB), and the World Bank is providing support for the detail design study for the southern half.

16. In addition to concrete results, such as piloting cleaner brick technologies and, constructing/ rehabilitating sidewalks to improve mobility, the project has brought together various stakeholder agencies (such as MoEF, DoE, MoRTB and DSCC/DNCC, DMP) to achieve the broader objective of improving urban air quality and mobility. While this has demonstrated the benefits of such a collaborative effort between agencies, this has also laid the foundation for including an activity to establish an 'Institutional Coordination Mechanism for managing urban air quality' during the implementation of AF operation.

Rationale for Additional Financing

17. **Component 1- Environment:** The rationale for the proposed AF is based on the need to sustain and augment the activities of the environment component, to better demonstrate the effectiveness of project outcomes. The activities proposed in the AF, thus are essentially a continuation of earlier activities which will enhance the geographical coverage of the Continuous Air Quality Monitoring Stations (CAMS) and address the financing gap for the completion of on-going activities such as DoE building. The AF will also support capacity building activities and also the initiatives towards the development of non-fired bricks, which will reduce the pressure on the use of top soil for clay fired bricks.

18. **Component 2 – Transport:** For the transport component, the project needs additional resources for (a) the improvement of signal and intersection infrastructure, (b) capacity building of DSCC/DNCC and DMP's traffic management activities, and, (c) traffic study and awareness campaigns. The AF will also support initiatives to analyze the measures required to address the mobility needs of the people with disabilities and a small scale demonstration pilot.

Relation to Country Partnership Framework (CPF)

19. Climate change and environment management is one of the key focus areas of the Country Partnership Framework (CPF) for FY 2016-20, for Bangladesh. Further, it is also widely accepted that environmental externalities (air and water pollution, solid and hazardous wastes, land degradation, resource depletion) have a disproportionately high adverse impact on the poor. The objectives of reducing impact of environmental threats of both the parent project and the AF, hence align with CPF for FY 2016-20 and World Bank's continued mission to support poverty reduction and natural resource and pollution management.

III. Proposed Changes

Summary of Proposed Changes

Additional financing of US$35 million is proposed to support the activities aimed at augmenting and sustaining the air quality management and traffic management initiatives implemented by the parent project. These activities include (i) development of essential infrastructure to expand air quality monitoring network in Bangladesh, establishment of fully equipped air quality lab, completion of main building for the Department of Environment (DOE) and policy and institutional strengthening, through the environment component being implemented by DoE; and (ii) improvement of signal and intersection infrastructure, capacity building, traffic study and awareness campaign, and pilot implementation of activities to address the mobility needs of disabled people, through the Transport Component being implemented by Dhaka South City Corporation (DSCC). No new activities are envisaged in the AF, for the sub-component being implemented by Dhaka Transport Co-ordination Agency (DTCA). The overall objectives and components of the project will also remain unaltered.

Change in Implementing Agency	Yes [ ] No [X]
Change in Project's Development Objectives	Yes [ ] No [X]
Change in Results Framework	Yes [X] No [ ]
Change in Safeguard Policies Triggered	Yes [ ] No [X]
Change of EA category	Yes [ ] No [X]
Other Changes to Safeguards	Yes [ ] No [X]
Change in Legal Covenants	Yes [ ] No [X]
Change in Loan Closing Date(s)	Yes [X] No [ ]
Cancellations Proposed	Yes [ ] No [X]
Change in Disbursement Arrangements	Yes [ ] No [X]
Reallocation between Disbursement Categories	Yes [X] No [ ]
Change in Disbursement Estimates	Yes [X] No [ ]
Change to Components and Cost	Yes [X] No [ ]
Change in Institutional Arrangements	Yes [ ] No [X]
Change in Financial Management	Yes [ ] No [X]
Change in Procurement	Yes [X] No [ ]
Change in Implementation Schedule	Yes [X] No [ ]
Other Change(s)	Yes [ ] No [X]

Development Objective/Results

Project's Development Objectives

Original PDO

To improve air quality and safe mobility in Dhaka through the implementation of demonstration initiatives in urban transport and brick making.

Explanation:

No Changes to the PDO are proposed. The PDO remains unchanged for the AF.

Change in Results Framework

Explanation:

All four PDO indicators of the project are on track to achieve the targets. While the PDO indicators on pedestrians using FOBs and side-walks have achieved the End of Project (EOP) targets, the indicators on brick kilns and vehicular traffic flow are on track to achieve the EOP targets. As part of the AF, a new PDO indicator to monitor the impact of operationalization of traffic signals has been included. In addition, end targets for the indicator on pedestrian usage of sidewalks is proposed to be revised to monitor the additional locations supported through AF.

Four new intermediate indicators to capture the outputs due to piloting the non-fired brick technologies,

formulation of Clear Air Act, improvement of intersections and piloting measures for better mobility of disabled are being included. The end target of air quality monitoring stations, new sidewalks, FOBs and intersections are also being updated to capture the additional activities proposed through AF. The changes to the results framework (PDO and Intermediate Indicators) are summarized below and the revised results framework is presented in Annex 1 of the restructuring paper.

Current Indicator	Proposed Revision	Rational
PDO		
To improve air quality and safe mobility in Dhaka through the implementation of demonstration initiatives in urban transport and brick making	No Change	The PDO is still valid and achievable with the planned project interventions in the AF.
PDO Indicators		
Number of brick kilns adopting cleaner technology and decreasing (i) particulate emissions by 20% and (ii) GHG emission by 20% by end of project period	No Change	10 brick kilns have already adopted cleaner technologies and the end target 12 brick kilns is achievable within the project period.
Increase of vehicular traffic in location of interventions	No Change	The vehicular volume at the locations of interventions has increased from 217,700 to 232,000. The EOP target of 239,500 is achievable within the project period.
Pedestrian using Foot-over-Bridges in locations of interventions	No Change	The project has already achieved the target of 79 percent pedestrian usage as against the target of 75 percent.
Pedestrian using sidewalks in locations of intervention	**Revised: Description retained, but EOP target extended to December 15, 2018 to monitor additional locations supported by AF**	At the locations of interventions so far, the project has already achieved 78 percent pedestrian usage as against the target of 75 percent.
Vehicular traffic increased at selected intersections with operational traffic signals	New	The indicator is added to measure effectiveness of operationalizing traffic signals.
Intermediate Results Indicators		
At least 2 cities with updated source / emissions profiles	No Change	Indicator achieved. Profiles for Dhaka and Chittagong have been prepared and source apportionment studies for four cities (Dhaka, Chittagong, Rajshahi and Khulna) have been conducted.
Clean Air Act drafted with stakeholder consultations and recommended to GoB for adoption	New	The indicator is proposed to be added to capture the output of the activities financed by AF.
Non-fired brick manufacturing	New	The indicator is proposed to be

technologies piloted		added to capture the output of the activities financed through AF.
Continuous air monitoring stations providing air quality data in Bangladesh	**Revised: Description retained with higher EOP target to monitor additional locations supported through AF**	EOP target increased from 11 to 16, by including additional 5 stations to be established through AF.
Brick Burning Act drafted for Cabinet's approval	No Change	Indicator achieved. The act has been approved by the Parliament.
Communication campaign implemented	**Revised: Description retained, but EOP target extended to December 15, 2018 to monitor campaigns supported through AF**	EOP target revised to monitor activities supported through AF.
Vehicular Emission Standards updated	No Change	Indicator Achieved.
Complete study and implement key recommendations for better mobility of disabled people in one selected location in Dhaka	New	The indicator is added to capture the output of the activities financed by AF.
Construction of Foot-over-Bridge	**Revised: Description retained and EOP target modified**	Due to local constraints, end target has been revised from 25 to 23.
New sidewalks with surface drainage constructed	**Revised: Description retained with higher EOP to monitor additional locations supported through AF**	End target revised to 88, to include the additional sidewalks proposed to be constructed through AF.
Traffic safety campaigns	No Change	The indicator has been achieved.
Corridors of separation of MV and NMV traffic	No Change	The indicator has been achieved.
Intersections improved	**Revised: Intersections physically improved**	Indicator description clarified. Due to local constraints, the end target has been revised from 40 to 39.
Traffic Signals newly installed or fixed	**Revised: Intersections with new traffic signals installed and operational**	Indicator description clarified and the end target has been revised to 29.
Intersections with operational signals (including newly installed and existing fixed)	New	Indicator added to capture the output of both new and fixed signals.
Studies for (i) rationalization of bus route network (ii) BRT on a pilot corridor	No Change	Indicator on track to achieve end project target.
Revised DTCB Act empowering DTCB presented to the Cabinet for approval	No Change	Indicator achieved.
Revised MVO Act for reduction in emissions submitted to Cabinet	No Change	Indicator on track.

Compliance

Covenants - Additional Financing (Clean Air and Sustainable Environment Project - Additional Financing - P160014)

Source of Funds	Finance Agreement Reference	Description of Covenants	Date Due	Recurrent	Frequency	Action
				☐		

Conditions

Source Of Fund	Name	Type

Description of Condition

Risk	
Risk Category	**Rating (H, S, M, L)**
1. Political and Governance	Substantial
2. Macroeconomic	Low
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Moderate
6. Fiduciary	Substantial
7. Environment and Social	Low
8. Stakeholders	Low
9. Other	
OVERALL	Substantial

Finance

Loan Closing Date - Additional Financing (Clean Air and Sustainable Environment Project - Additional Financing - P160014)

Source of Funds	Proposed Additional Financing Loan Closing Date
International Development Association (IDA)	15-Dec-2018

Loan Closing Date(s)-Parent (Clean Air and Sustainable Environment Project-P098151)

Explanation:

Considering the continuous nature of project activities both in the parent project and AF operation, it is proposed to align the closing date of the parent project with the closing date of the proposed AF, which is December 15, 2018.

Ln/Cr/TF	Status	Original Closing Date	Current Closing Date	Proposed Closing Date	Previous Closing Date(s)
IDA-45810	Effective	31-Dec-2014	15-Dec-2016	15-Dec-2018	15-Dec-2016

Change in Disbursement Estimates (including all sources of Financing)

Explanation:

Disbursements for FY10 to FY16 are actuals for the parent project and for FY17, FY18 and FY19 estimates have been provided for the total IDA financing, including original and AF.

Expected Disbursements (in USD Million)(including all Sources of Financing)

Fiscal Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Annual	4.90	2.40	7.84	8.72	13.16	8.69	7.60	11.00	20.00	12.88
Cumulative	4.90	7.30	15.14	23.86	37.02	45.71	53.31	64.31	84.31	97.19

Allocations - Additional Financing (Clean Air and Sustainable Environment Project - Additional Financing - P160014)

Source of Fund	Currency	Category of Expenditure	Allocation	Disbursement %(Type Total)
			Proposed	Proposed
IDA	USD	Part A - Environment	17.00	100.00
IDA	USD	Part B – Transport	18.00	100.00
		Total:	35.00	

Reallocation between Disbursement Categories

Explanation:

DSCC (one of the implementing agency for Transport Component), has exhausted its allocation for Incremental Operating Cost (IOC), and has not been able to claim any operating expenditure since July, 2016. This is due to increase in prices of various items of operating expenditure and also extension of project closing date, originally from December 31, 2014 to December 15, 2016 and now to December 15, 2018. Considering the above, it is proposed to reallocate funds for the IOC from the Goods and Works category within DSCC's budget. Once the Amendment to the Financing Agreement is signed, DSCC can claim such expenditure. This will involve reallocation of SDR150,000 from Category (2) Part B.1 (a) to Category (2) Part B.1 (b). A similar re-allocation of SDR23,000 from Category (2) Part B.2 (a) to Category (2) Part B.2 (b) is also proposed for DTCA sub-component of transport component and SDR145,000 from Category (1) Part A environment component of the project, to meet IOC costs in the extended implementation period of the project.

Ln/Cr/TF	Currency	Current Category of Expenditure	Allocation		Disbursement %(Type Total)	
			Current	Proposed	Current	Proposed
IDA-45810	XDR	Goods , Wks , Serv- tr, sem , stud	10,051,720.00	9,906,720.00	100.00	100.00
IDA-45810		DISB - OPERATING COSTS	950,000.00	1,095,000.00	100.00	100.00
IDA-45810		DISB - OPERATING COSTS	250,000.00	400,000.00	100.00	100.00
IDA-45810		Goods , Wks , Serv- tr,	26,400,000.00	26,250,000.00	100.00	100.00

		sem , stud				
IDA-45810		DISB - OPERATING COSTS	112,000.00	135,000.00	100.00	100.00
IDA-45810		Goods , Wks , Serv- tr, sem , stud	4,428,000.00	4.405,000.00	100.00	100.00
IDA-45810		Designated Account	0.00	0.00	0.00	0.00
IDA-45810		Designated Account	0.00	0.00	0.00	0.00
IDA-45810		Designated Account	0.00	0.00	0.00	0.00
		Total:	42,191,720.00	42,191,720.00		

Components

Change to Components and Cost

Explanation:

The activities under the AF are essentially a continuation of the parent project, which are aimed at sustaining the initiatives supported in the parent project and enhancing some of the results. The activities proposed through AF are summarized below and a description is provided in Annex 2 of the project paper.

Component 1: Environment (US$17.00 million)

a) Infrastructure development to meet growing requirements of environmental compliance and monitoring (US$12.17 million)

i. Expansion of the continuous air quality monitoring network and portable low cost monitors for wider monitoring of ambient air quality: A network of air quality monitoring stations (11 stations across eight major cities) is now fully functional. However, there are about 31 more cities to be covered in Bangladesh and the CAMS density of coverage remains minimal. Installation of additional five standard CAMS and 20 low cost CAMS are planned through the AF.

ii. Establishment of central air quality laboratory with modern facilities: Existing laboratory at DoE needs upgradation. The AF will support strengthening and modernization of equipment and facilities of central laboratory at DoE.

iii. Introduction of mobile air quality lab at divisional offices: In addition to the modernization of central air quality laboratory, eight divisional/regional laboratories of DoE will be strengthened through the AF with mobile air quality lab equipped with stack monitoring instruments (for suspended particulate matter and gaseous emissions).

iv. Completion of new office building for DoE: To help improve DoE's management capacity to deliver better results, original financing (after considering savings due to currency fluctuation) finances construction of six stories of the new building for DoE using the green building concept. Construction of remaining five stories including international conference center, and construction of wastewater treatment plant will be financed through AF.

b) Policy development and strengthening institutional capacity for environmental management (US$1.40 million)

i. Development of Clean Air Act: In order to strengthen the regulatory regime for air quality management, enactment of Clean Air Act has been envisaged by GoB in the 7th Five Year Plan (2016-20). AF will help draft this act through a wider consultative process and incorporate best practices based on a review of international experience.
ii. Enforcement of the new Brick Manufacturing Law: Dissemination of three cleaner designs (demonstrated by the parent project) for brick kilns will be continued. The AF will support preparation of a database for all the brick kilns in the country and purchase of additional mobile emission monitoring equipment of better environmental compliance monitoring and regulatory control.
iii. Establishment of mechanisms for institutional coordination for urban air quality management: Based on the collaboration across various stake holder agencies (such as MoEF, DoE, MoRTB and DSCC/DNCC, DMP), the AF will support establishment of an institutional coordination mechanism for managing urban air quality issues and related regulations/rules.
iv. Capacity Building: The AQW has been established in the DOE to serve as a focal point for air quality management related activities of the DOE. The AF will continue to support capacity building programs to address the capacity gaps in institutional knowledge through, consultancy support, training, conference and study tours and longer term academic collaboration.

c) Knowledge Management (US$2.40 million)

i. Pilot of non-fired brick (alternative building material) manufacturing technologies: Following up on the successful piloting of cleaner technologies in brick kilns in the parent project for emission and energy use reduction, the AF will support piloting two non-fired brick technologies. The technologies, if proved successful could help reduce burden on use of top soil and reduce the burden of air emissions.
ii. Communication campaign: AF will continue to promote communication campaigns to generate awareness on the impact of local and global emissions from key transport and industrial sources and 'co-benefits' of addressing these issues.

d) IOC and other project management activities for the environment component (US$1.03 million). In addition to the above, GoB will contribute US$1.39 million towards project management activities such as purchase of vehicles, fuel and lubricants, sitting allowances, etc. related to environment component.

Component 2: Transport (US$18.00 million)

a) Improvement of signal and intersection infrastructure (US$13.96 million)

i. Signal infrastructure: Deteriorated old signal infrastructure at 62 intersections will be removed and replaced to avoid frequent breakdowns of newly installed traffic signal system. A maintenance contractor will be appointed for all 92 intersections. Equipment and facility for effective maintenance will also be procured.
ii. Traffic signs, marking, lane separators: The signalized intersections will have traffic signs, road markings and lane separators so that the vehicles can be better informed on the traffic rules and road direction information, and be safely guided as they approach the intersections.
iii. Sidewalk improvement and bus stops: It is proposed to have about 18km of sidewalk improvement along with drainage and repaving where necessary so that pedestrians can enjoy a safer walking environment while approaching intersections and FOBs. About 20 bus stops will also be constructed or renovated, aiming to prevent unorderly stops of buses near and within intersections.

b) Capacity building on traffic management activities (US$1.00 million)

i. Traffic management equipment for DMP: To fill the gap in the capacity of DMP, traffic management equipment will be provided, including handheld transceivers, handheld devices that issue tickets, Variable Message Signs (VMS), portable gates, portable speaker systems, and other miscellaneous items.
ii. Capacity building and training: Domestic and international training opportunities will be provided to key staff at relevant institutions to help build staff capacity.

c) Traffic studies, awareness campaign and design, supervision and monitoring (US$1.60 million)
i. Transport and institutional development study: A study to identify technical and institutional solution options to improve the traffic management of Dhaka will be carried out.
ii. Awareness campaign: Awareness campaigns will be conducted targeted for clean and safe mobility in Dhaka.
iii. Design, Supervision and Monitoring (DSM) consultant: A civil engineering firm will be mobilized to support the Project Implementation Unit (PIU) in designing the civil work contracts, supervising construction activities, and monitoring the progress and impact of the project.

d) Piloting mobility improvement for disabled (US$1.20 million)
i. Study to identify mobility improvement needs: Challenges and difficulties of the mobility of the disabled people are studied, and an area for pilot improvement initiatives will be identified.
ii. Pilot improvement works: Following the recommendations of the study, pilot improvement work, such as sidewalks, ramps, zebra crossings, hand rails, tactile tiles, street lightings, road markings, and signs, will be implemented.

e) IOC and other project management activities for the transport component (US$0.23 million). In addition to the above GoB will contribute US$0.19 million towards project management activities such as fuel and lubricants, sitting allowances, etc. related to transport component.

Current Component Name	Proposed Component Name	Current Cost (US$M)*	Proposed Cost (US$M)	Action
Component 1: Environment (DOE)	Component 1: Environment (DOE)	16.80	33.80	Revised
Component 2A Transport (DCC)	Component 2A Transport (DCC)	40.70	58.70	Revised
Component 2B Transport (DTCB)	Component 2B Transport (DTCB)	7.00	7.00	No Change
	Total:	64.50	99.50	

* Current cost indicated in the table above is portal generated, which is different from US$62.19 million recorded in the parent project at approval. The actual costs could be lower than either of the above, due to currency fluctuation between SDR and US$. AF allocation of US$17 million for Component 1 and US$18 million for component 2A, have been added to the current cost to arrive at the proposed cost.

Other Change(s)

Implementing Agency Name	Type	Action

Change in Procurement

Explanation:

The Project will follow the Procurement Regulations, July, 2016 of The World Bank, which offers enhanced flexibility and fit-for-purpose solutions. The project will also use the Bank's new online procurement management system, Systematic Tracking of Exchanges in Procurement (STEP). The details of procurement arrangements are described in Annex 4.

Change in Implementation Schedule

Explanation:

Considering the continuous nature of the project activities and the inter-relationship of the results, the closing date of the project is proposed to be aligned with the closing date of the AF operation, which will be December 15, 2018.

IV. Appraisal Summary

Appraisal Summary

Economic and Financial Analysis

Explanation:

Similar to the parent project, AF envisages a combination of technical assistance, capacity building activities and physical investments to be carried out mainly in the city of Dhaka, while activities of environment component such as establishment of additional CAM stations focus on other cities of Bangladesh. The technical assistance and capacity building activities are not amenable to economic analysis. The analysis was, therefore, limited only to those activities where some meaningful estimates of costs and potential benefits and/or beneficiaries could be made. These include brick kiln sub-component within the environment component and traffic signaling sub-component in the transport component. This analysis in the parent project was updated using new information available and the proposed AF activities. The methodologies used for the update follow those of the original analysis. From the analyses (included in Annex 5), it is seen that the potential economic benefits are quite large.

Technical Analysis

Explanation:

Continuing the multi sectoral design of the parent project, the AF activities include interventions by the relevant stakeholder agencies critical for addressing the issues of air quality management and safe mobility. The activities also reflect the learnings of internalization and mainstreaming of sustainable environmental initiatives, gained through the parent project. Inclusion of activities to demonstrate non-fired brick manufacturing and piloting measures to address mobility needs of disabled people, reflects this learning.

For the implementation of activities to operationalize traffic signals, it is crucial to have an effective cooperation between the PIU (DSCC/DNCC) and DMP. While the coordination with DMP has not been very effective for the start of signal operation during the past couple of years, changes in the attitude and approach have been observed recently on both sides, particularly after the South-South Knowledge Exchange Program on traffic signal systems. Study tours were organized for officials (3 from DMP and 1 from MoHA participated) in July and August, 2016 to China (Wuhan and Beijing) and India (Mumbai and Delhi where 6 officials from DMP participated). DMP now awaits the remote control system, which is to be procured by DSCC from the parent project after the approval of revised DPP, to start the operation of signal system. Stakeholder meetings between DSCC/DNCC and DMP will also be organized to discuss remaining issues regarding signal operation. Similar capacity building programs aimed at learning from experience of other countries will also be undertaken through AF, to further improve the knowledge and attitude of DMP. The implementation of the parent project also identified the insufficient capacity of DMP in enforcing traffic rules. It is therefore proposed in the AF to provide DMP with enforcement equipment so that DMP becomes capable in terms of both knowledge and equipment.

For the medium to long term, GoB is contemplating to set up a unit within DMP with a mandate of managing traffic signals and traffic rule enforcement. This requires substantial support for capacity building before and after the unit is set-up, and certain period of time for the preparation of organogram and its subsequent approval process. The AF aims to provide support for this concept by paving the way towards that stage, however more in-depth support requires a larger engagement, which is beyond the scope of current project.

The mobility challenge to the people with disability was an area identified during the implementation of the parent project, as an aspect that received insufficient attention. The AF proposes to conduct a study through a consultative approach, to identify the needs of disabled people and piloting key recommendations.

Social Analysis

Explanation:

The social analysis is updated based on the lessons learned from the parent project and also includes gender assessment. Activities proposed in the AF operation doesn't trigger any new social safeguard policies and the Environmental and Social Management Framework (ESMF) of the parent project will be relevant for the AF. No activities involving land acquisition will be included in the sub-projects. Construction for road junctions and sidewalks, etc. may involve displacement of public land users. The magnitude, nature and scale of these impacts will not be known until specific subproject activities are selected and designed. However, as demonstrated by the parent project, the impacts are expected to be temporary and minor in nature.

Experience from the parent project regarding FoB construction shows the need for a study on the needs and priorities of disabled users of the roads, zebra-crossings, transport services and existing transport infrastructure[8]. For this purpose a sample based study will be undertaken for the improved mobility of disabled people as part of the AF activities. The scope of the study will also include consultation with disabled users and beneficiaries. Based on the findings of the study, requisite measures will be implemented.

Citizen's Engagement: It is important to understand whether the project benefits as designed are reaching the appropriate beneficiaries. The project will conduct satisfaction surveys for completed works under the parent project to gather lessons learned, and engage with potential beneficiaries (consultation workshops at relevant venues, focus groups discussions) on a sample basis to consult on their needs and priorities, challenges they are currently facing and preferred solutions. The proposed study for mobility needs assessment will be designed to combine these surveys with the gender studies/assessments described below.

Gender: A gender action plan will be prepared based on a sample study (assessment) of women users of the current available facilities and services to understand and incorporate their needs and priorities, as best possible, into the sub-project design. This will be relevant for the transport component (including FOBs) which involves a large number of female users and the environment component which involves female workers in brick making. The improvements sought in brick making will have positive gender impacts (especially from a health perspective) as there are large number of women engaged in this sector. The study will include potential beneficiaries in new areas as well as beneficiaries from the parent project to gather lessons learned and improve project design where necessary and gender outcomes. The assessment study and the action plan formulation and implementation will be monitored.

Environmental Analysis

Explanation:

[8] A complaint was received by the Grievance Redress Service of the World Bank during the implementation of the original project. The points raised in the complaint included the inaccessibility of FOBs for people with disabilities. Through the discussion with the complainant and a joint site visit with them and a group of people with disabilities, the PIU and task team have learned the unserved needs and the importance of addressing the mobility of disabled people.

Similar to the parent project, the AF activities will contribute to the substantial positive impact on the environment. The ESMF of the parent project, will be able to address the minor environmental impacts during the construction of sidewalks, signal infrastructure improvement, etc. and no new environmental safeguard policies are needed to be triggered. The overall compliance to safeguard management under parent project was satisfactory. The environmental issues are mainly generated in the construction works, such as dust, construction waste, workers health and safety, traffic congestion etc. These issues were well managed in the parent project. Some of the physical investments of the AF will have construction-related environmental issues that will impact the workers as well as the passersby and neighborhood. These impacts are minor and temporary in nature and can be mitigated through appropriate management measures. Other than these, there is no potential for large scale, significant and/or irreversible impacts.

Risk

Explanation:

The main risks for the project emerge from governance environment and fiduciary aspects. The Political and Governance risk is rated 'substantial' primarily due to the involvement of multiple implementing agencies especially for the transport component, which requires co-ordination between three agencies (DSCC/DNCC and DMP). The fiduciary risk is also rated 'substantial' due to low capacity of the implementing agencies, declaration of mis-procurement by the Bank in the parent project based on the findings of the Integrated Fiduciary Review carried out in 2013-14. The overall risk of the project, similar to the parent project, hence is rated as 'substantial,' and rating of other risks of the project, will also continue to be same for the AF.

To project proposes (i) to conduct capacity building and knowledge exchange programs through the training sub-component and regular consultation meetings between the stake holder agencies, to address political and governance risk and (ii) will follow Procurement Regulations, 2016, Systematic Tracking of Exchanges in Procurement (STEP) and suitable internal controls, governance and oversight arrangements to address fiduciary risks associated with the project.

V. World Bank Grievance Redress

20. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

The World Bank

Annex 1
Revised Results Framework

BANGLADESH: CLEAN AIR AND SUSTAINABLE ENVIRONEMNT PROJECT

Table 1 Description of Revisions

Project Name:	Clean Air and Sustainable Environment Project - Additional Financing (P160014)			Project Stage:	Additional Financing	Status:	DRAFT
Team Leader(s):	Harinath Sesha Appalarajugari	Requesting Unit:	SACBD	Created by:	Harinath Sesha Appalarajugari on 17-Aug-2016		
Product Line:	IBRD/IDA	Responsible Unit:	GEN06	Modified by:	Harinath Sesha Appalarajugari on 19-Nov-2016		
Country:	Bangladesh	Approval FY:	2017				
Region:	SOUTH ASIA	Lending Instrument:	Investment Project Financing				
Parent Project ID:	P098151	Parent Project Name:	Clean Air and Sustainable Environment Project (P098151)				

Project Development Objectives

Original Project Development Objective - Parent:

To improve air quality and safe mobility in Dhaka through the implementation of demonstration initiatives in urban transport and brick making.

Results

Core sector indicators are considered: Yes

Results reporting level: Project Level

Project Development Objective Indicators

Status	Indicator Name	Core	Unit of Measure		Baseline	Actual(Current)	End Target
No Change	Number of brick kilns adopting cleaner technology and decreasing (i) particulate emissions by 20% and (ii)	☐	Number	Value	0.00	10.00	12.00
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2016
				Comment			Emissions

	GHG emission by 20% by end of project period						measured at the individual brick kiln that adopted cleaner technologies.
No Change	Increase of vehicular traffic in location of interventions	☐	Number	Value	217700.00	232000.00	239500.00
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2016
				Comment			
No Change	Pedestrian using Foot-Over-Bridges in locations of intervention	☐	Percentage	Value	0.00	79.00	75.00
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2016
				Comment			
Revised	Pedestrian using sidewalks in locations of intervention	☐	Percentage	Value	0.00	78.00	75.00
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2018
				Comment			Indicator retained, but additional locations supported through AF will be monitored. At least four locations will be selected and average usage rate will be calculated.
Original	Pedestrian using sidewalks in locations of intervention	☐	Percentage	Value	0.00	78.00	75.00
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2016
				Comment			

New	Vehicular traffic increased at selected intersections with operational traffic signals	☐	Percentage	Value	Not Available	0.00	8.00
				Date	30-Sep-2016	30-Sep-2016	15-Dec-2018
				Comment	Base line data will be collected after intersections are selected		An 8 percent increase over base line traffic at the selected intersections. Includes locations supported through AF.

Intermediate Results Indicators

Status	Indicator Name	Core	Unit of Measure		Baseline	Actual(Current)	End Target
No Change	At least 2 cities with updated source / emissions profiles	☐	Number	Value	0.00	2.00	2.00
				Date	09-Nov-2009	31-Dec-2015	15-Dec-2016
				Comment			
New	Clean Air Act drafted with stakeholder consultations and recommended to GoB for adoption	☐	Text	Value	No	No	Yes
				Date	30-Sep-2016	30-Sep-2016	15-Dec-2018
				Comment			
New	Non-fired brick manufacturing technologies piloted	☐	Text	Value	No	No	Yes
				Date	30-Sep-2016	30-Sep-2016	15-Dec-2018
				Comment			Results of non-fired brick manufacturing technology pilot to be measured to confirm effectiveness
Revised	Continuous air monitoring		Number	Value	5.00	11.00	16.00

	stations providing air quality data in Bangladesh	☐		Date	09-Nov-2009	31-Dec-2015	15-Dec-2018
				Comment			End target has been revised by including the additional 5 stations proposed to be established through AF.
Original	Continuous air monitoring stations providing air quality data in Bangladesh	☐	Number	Value	5.00	11.00	11.00
				Date	09-Nov-2009	31-Dec-2015	31-Dec-2016
				Comment			
No Change	Brick Burning Act drafted for Cabinet's approval	☐	Text	Value	None	Act approved by Parliament on Nov 20, 2013	Brick Burning Act submitted to Cabinet
				Date		31-Dec-2015	31-Dec-2014
				Comment			Indicator achieved
Revised	Communication campaign implemented	☐	Text	Value	None	Completed	Campaign continued
				Date		31-Dec-2015	15-Dec-2018
				Comment			End Target continued through AF.
Original	Communication campaign implemented	☐	Text	Value	None	Completed	Campaign continued
				Date		31-Dec-2015	31-Dec-2016
				Comment			
No Change	Vehicular Emission Standards		Text	Value	None	Included in ECR	Vehicle

	updated	☐					Emission Standards approved.
				Date		31-Jan-2016	31-Dec-2014
				Comment			
New	Complete study and implement key recommendations for better mobility of disabled people in one selected location in Dhaka	☐	Text	Value	No	No	Yes
				Date	30-Sep-2016	30-Sep-2016	15-Dec-2018
				Comment			
Revised	Construction of Foot-Over-Bridge	☐	Text	Value	0	21	23
				Date	09-Nov-2009	31-Mar-2016	15-Dec-2016
				Comment			Due to local constraints, two locations have been dropped.
Original	Construction of Foot Over Bridge	☐	Text	Value	0	21	25
				Date	09-Nov-2009	31-Mar-2016	15-Dec-2016
				Comment			
Revised	New sidewalks with surface drainage constructed	☐	Kilometers	Value	0.00	65.00	88.00
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2018
				Comment			End target has been revised by including additional sidewalks proposed to be constructed through AF.
Original	New sidewalks with surface		Kilometers	Value	0.00	65.00	70.00

	drainage constructed	☐		Date	09-Nov-2009	31-Jan-2016	08-Dec-2016
				Comment			
No Change	Traffic safety campaigns	☐	Number	Value	0.00	3.00	3.00
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2016
				Comment			Target achieved
No Change	Corridors of separation of MV and NMV traffic	☐	Number	Value	0.00	2.00	2.00
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2016
				Comment			Target Achieved
Revised	Intersections physically improved	☐	Number	Value	0	35	39
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2016
				Comment			Indicator modified to clarify the difference from other indicators on traffic signals. Due to local constraints, one location has been dropped.
Original	Intersections improved	☐	Number	Value	0	35	40
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2016
				Comment			
Revised	Intersections with new traffic signals installed and operational	☐	Number	Value	0.00	0.00	29
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2018
				Comment			Indicator and target modified

							to capture the output on new signals
Original	Traffic signals installed or fixed	☐	Number	Value	0	62	39
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2016
				Comment			
New	Intersections with operational signals (including newly installed and existing fixed)	☐	Number	Value	0.00	0.00	91
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2018
				Comment			Indicator added to capture the output on both new and fixed signals.
No Change	Studies for (i) rationalization of bus route network (ii) BRT on a pilot corridor	☐	Number	Value	0.00	1.00	2.00
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2016
				Comment			
No Change	Revised DTCB Act empowering DTCB presented to the Cabinet for approval	☐	Text	Value	Revision initiated	Passed by Parliament and Published in the Gazette	Passed by Parliament and Published in the Gazette
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2016
				Comment			Indicator achieved
No Change	Revised MVO Act for reduction in emissions submitted to Cabinet	☐	Text	Value	None	BRTA Act under review by Ministry of Law	Presented to Cabinet for approval
				Date	09-Nov-2009	31-Jan-2016	15-Dec-2016
				Comment			

Table 2: Revised Results Framework with Cumulative Targets

Project Development Objective (PDO):
To improve air quality and safe mobility in Dhaka through the implementation of demonstration initiatives in urban transport and brick making

PDO Level Indicators*	Core	UoM	Baseline	Status, September, 2016	FY 2016 -17	FY 2017 -18	FY 2018 -19	Frequency	Data sources and methodology	Responsibility for data collection	Description / comments
PDO Indicator: Number of brick kilns adopting cleaner technology and decreasing (i) particulate emissions by 20% and (ii) GHG emission by 20% by end of project period	☐	Number	0	10	12	EOP Target achieved	EOP Target achieved	Yearly	Contracts DoE-S8, S9/S9a/S9b	DoE	EOP Target – 12 Review of Results from the contracts and the results
PDO Indicator: Increase of vehicular traffic in location of interventions	☐	Number	217700	232000	239500	EOP Target achieved	EOP Target achieved	Once	DSM consultant	DSCC	EOP Target – 239500
PDO Indicator: Pedestrian using Foot-Over-Bridges in locations of intervention	☐	Percentage	0	79.00	75.00	EOP Target achieved	EOP Target achieved	Yearly	DSM consultant	DSCC	EOP Target – 75 Current results (79 percent) exceed target.
PDO Indicator: Pedestrian using sidewalks in locations of intervention	☐	Percentage	0	78.00	75.00	75.00	75.00	Yearly	DSM consultant	DSCC	EOP Target – 75 Current results (78 percent) exceed target
PDO Indicator: Vehicular traffic increased at selected intersections with operational traffic signals	☐	Percentage	Not Available	0.00	0.00	0.00	8.00	Yearly	DSM consultant	DSCC	EOP Target – 8 % Baseline data will be collected after selecting intersections
Intermediate results											
IR Indicator: At least 2 cities with updated source / emissions profiles	☐	Number	0	2	2	EOP Target achieved	EOP Target achieved	Half-Yearly	DoE – S13	DoE	EOP Target 2 cities Outputs of studies. Indicator achieved
IR Indicator: Clean Air Act drafted with stakeholder consultations and recommended to GoB for adoption	☐	Yes /No	No	No	No	No	Yes	Yearly	Progress report from the implementation agency	DoE	Experts will draft the act and will be submitted to MoEF and Cabinet for approval
IR Indicator: Non-fired brick manufacturing technologies piloted	☐	Yes /No	No	No	No	Yes	Yes	Yearly	Progress reports	DoE	Agency will be hired to pilot technologies
IR Indicator: Continuous air monitoring stations providing air quality data in Bangladesh	☐	Number	5	11	11	13	16	Monthly	Monthly reports on air quality analysis	DoE	EOP Target – 16
IR Indicator: Brick Burning Act drafted for Cabinet's approval	☐	Yes/ No	No	Yes	Yes	EOP Target achieved	EOP Target achieved	Yearly	Progress Reports	DoE	Indicator achieved

IR Indicator: Communication campaign implemented	☐	Yes /No	No	Yes	Yes	Yes	Yes	Yearly	DoE – S12 and new contract during AF	DoE	Campaigns during AF will be monitored.
IR Indicator: Vehicular Emission Standards updated	☐	Yes/ No	0	Yes	Yes	Yes	Yes	Yearly	DoE – S4, S5	DoE	Indicator Achieved
IR Indicator: Complete study and implement key recommendations for better mobility of disabled people in one selected area in Dhaka	☐	Yes/ No	No	No	No	Yes	Yes	Annual	Progress report on study and pilot implementation	DSCC	
IR Indicator: Construction of Foot Over Bridge	☐	Num ber	0	21	23	EOP Target achieved	EOP Target achieved	Yearly	DCC-W6 /W7A/W7B	DSCC/DNCC	Revised EOP Target - 23.
IR Indicator: New sidewalks with surface drainage constructed	☐	km	0	65	70	78	88	Yearly	DCC:W1,W2A W2B1,W2B2, W3A,W3B,W4 AFW4,AF W 5, FW6,AFW7	DSCC/DNCC	Revised EOP Target–88 End target revised to include sidewalks proposed in AF
IR Indicator: Traffic safety campaigns	☐	Num ber	0	3	3	Target achieved	Target achieved	Yearly	DCC – S1	DSCC/DNCC	EOP Target – 3 Indicator achieved
IR Indicator: Corridors of separation of MV and NMV traffic	☐	Num ber	0	2	2	EOP Target achieved	EOP Target achieved	Yearly	DCC – W5	DSCC/DNCC	EOP Target – 2 Indicator achieved
IR Indicator: Intersections physically improved	☐	Num ber	0	39	39	EOP Target achieved	EOP Target achieved	Yearly	DCC – W8A/W8B	DSCC/DNCC	Revised EOP Target – 39
IR Indicator: Intersections with new traffic signals installed and operational	☐	Num ber	0	0	0	29	EOP Target achieved	Yearly	DCC – G2	DSCC/DNCC	EOP Target - 29
IR Indicator: Intersections with operational signals (including newly installed and existing fixed)	☐	Num ber	0	0	0	50	91	Yearly	DCC-AFW1	DSCC/DNCC	EOP Target – 91 Indicator added to capture output on both new and fixed signals.
IR Indicator: Studies for (i) rationalization of bus route network (ii) BRT on a pilot corridor	☐	Num ber	0	1	2	EOP Target achieved	EOP Target achieved	Yearly	DTCA – S1/ S2/ S3	DTCA	EOP Target – 2 Completion of Studies
IR Indicator: Revised DTCB Act empowering DTCB presented to the Cabinet for approval	☐	Yes/ No	No	Yes	Yes	Yes	Yes	Yearly		DTCA	Indicator achieved
IR Indicator: Revised MVO Act for reduction in emissions submitted to Cabinet	☐	Yes/ No	No	Yes	Yes	Yes	Yes	Yearly	DTCA – S5A	DTCA	Indicator achieved

Annex 2 Description of Additional Financing Activities

1. The proposed AF would help cover the financing gap and finance the costs of associated activities for augmenting and sustaining air quality management initiatives in Bangladesh, testing models for improving traffic management system in Dhaka and designing follow-on air quality and traffic management programs to scale up support to country's sustainable urbanization and growth.

2. The project is a step towards integrating environmental and transport concerns and priorities. Similar to the parent project, the AF will have two components: the environment component to be implemented by the Department of Environment (DOE) under the Ministry of Environment and Forests (MoEF), and the transport component to be implemented by Dhaka South City Corporation (DSCC)/Dhaka North City Corporation (DNCC) under the Ministry of Local Government, Rural Development and Cooperatives (MoLGRDC).

3. The AF would require about 24 months to implement the proposed activities. The key activities, as detailed below are a continuation/extension of programs / activities of the parent project.

Component 1: Environment (US$17.00 million)

4. **Infrastructure development to meet growing requirements of environmental compliance and monitoring (US$12.17 million)**

a. **Expansion of the continuous air quality monitoring network and portable low cost monitors for wider monitoring of ambient air quality:** The environment component of the project significantly contributed to building the capacity of the DoE in air quality management. A network of air quality monitoring stations (11 stations across 8 major cities) is now fully functional. The AQW in DoE is managing some activities related to the data quality, data analysis and report generation. The daily AQI based on the air quality data is being published in DoE website for last three years. There are about 31 other cities in the country with population in excess of one hundred thousand where monitoring of air quality is essential. The CAMS density of coverage is also minimal currently even in the large cities; with only three CAMS in the capital city of Dhaka with a population of more than 15 million. Under the AF, installation of five standard CAMS (United States Federal Reference Method -USFRM compliant) and twenty low cost CAMS is envisaged.
b. **Establishment of central air quality laboratory with modern facilities:** The central laboratory capacity at DoE will be strengthened through additional equipment and modernizing facilities. Currently only a rudimentary laboratory exists to support the CAMS operations, maintenance, and central server and data management activities. In addition, it also serves for storage of equipment and spares for CAMS and enforcement related activities. The central laboratory capacity will be strengthened and sufficient space will be made available in the new building for the purpose.
c. **Introduction of mobile air quality lab at divisional offices:** In addition to the modernization of central air quality laboratory, eight divisional/regional laboratories of DoE will be strengthened through purchasing mobile air quality lab equipped with stack monitoring instruments (for suspended particulate matter and gaseous emission).
d. **Completion of new office building for DOE:** The DoE is expanding its organizational capacities and activities on regulatory and policy reforms, enforcement, monitoring and quality control. The parent project supported design and construction of a new building using the ‘green building concept’ to accommodate additional staff, centralized reference laboratories, research and development facilities and training centers. The building is designed as 11 stories with a ground floor and two basements. The parent project supports construction up to seven stories. The proposed AF will support the completion of the building and help improve DoE’s management capacity to

deliver better results. An international conference center and a wastewater treatment plant to treat wastewater from the building, will also be built through the AF.

5. **Policy development and strengthening institutional capacity for environmental management (US$1.40 million)**

a. **Development of Clean Air Act:** In order to strengthen the regulatory regime for air quality management in Bangladesh, enactment of Clean Air Act has been envisaged by GoB in the 7th Five Year Plan (2016-20). AF will help draft the act through a wider consultative process and incorporate best practices based on a review of international experience.
b. **Enforcement of the new Brick Manufacturing Law:** With the new Brick Manufacturing Law and Rules prepared in the parent project (i.e. which is drafted and is in the final stage of adoption); DOE is poised for better enforcement of brick kiln emission compliance. The dissemination of three cleaner designs for brick kilns will be continued with technical assistance of the project. Twelve energy efficient and cleaner brick making technologies have been piloted in different parts of the country and it is hoped that with more regulatory pressure larger number of kilns will adopt the technologies. The AF will support preparation of a database for all the brick kilns in the country and purchase of additional mobile emission monitoring equipment for better environmental compliance monitoring and regulatory control.
c. **Establishment of mechanisms for institutional coordination for urban air quality management**: Based on the collaboration across various stake holder agencies (such as MoEF, DoE, MoRTB and DSCC/DNCC, DMP), the AF will support establishment of an Institutional Coordination Mechanism for managing urban air quality issues to manage new regulations/rules.
d. **Capacity building of the AQW, DOE:** An AQW was established through the parent project, in the DOE with financial support from GoB revenue budget. This AQW is the focal point for air quality management related activities in the Bangladesh. The parent project supported AQW in training skilled technical personnel, who are required to effectively address air pollution issues. In order to empower the AQW staff technically, the project will continue to support a strong capacity building program to address the capacity gaps in institutional knowledge through: (i) consultant support; (ii) addressing human resource gaps through training, (iii) exposure visits, conference participation etc.; and (iv) building sound institutional knowledge through longer term academic collaboration. The AF will support, academic and technical cooperation, advanced studies and to develop local designs for air pollution control (APC) systems with Bangladesh Atomic Energy Commission (BAEC) and Bangladesh University of Engineering and Technology (BUET) respectively. The receptor modeling (also referred to as *source apportionment*) will be pursued in collaboration with BAEC, which will be used to assess strategies that will focus on the sources with the greatest contributions to the problem, in order to prioritize cost-effective measures for AQM. The collaboration with BUET will be focused on low cost APC system for polluting industries, so that local industries can afford these (e.g., small capacity highly polluting steel mills and foundries). Establishment of mechanisms for institutional coordination for urban air quality management: Based on the collaboration across various stake holder agencies (such as MoEF, DoE, MoRTB and DSCC/DNCC, DMP), the AF will support establishment of an Institutional Coordination Mechanism for managing urban air quality issues to manage new regulations/rules.

6. **Knowledge Management (US$2.40 million)**

a. **Piloting of non-fired brick (alternative building material) manufacturing technologies:** This is an extension of the earlier brick initiative in the parent project for emission and energy use reduction. The piloting of non-fired brick technology is aimed at elimination of (i) direct PM and GHG emission, (ii) top soil use, and (iii) minimizing land required for production facilities. Two technologies will be pursued in this approach. The Autoclaved Aerated Concrete (AAC) /Aerated

Concrete Brick (ACB) is a light and porous building material. It has light weight, high insulation, fire resistance and other advantages. It can be used in both common and industrial buildings. The other technology is for calcium-silicate bricks which are also called sand-lime brick; and uses lime as binding material for the silicate materials. The raw materials for calcium-silicate bricks include lime mixed in an appropriate proportion with sand. Waste material can be added in the mixture which is an added advantage. The materials are mixed and left until the lime is completely hydrated; the mixture is then pressed into molds and cured in an autoclave for three to fourteen hours to speed up the chemical hardening. This work will be pursued in collaboration with House Building Research Institute (HBRI) as the institute has unencumbered land in its compound in Mirpur, Dhaka for the proposed activities.

b. **Communications campaign:** This is an ongoing program in the parent project, which will be continued using all available media channels in English and Bangla to highlight the impacts of local and global emissions from key transport and industrial sources, and the "co-benefits" of addressing the same. It will contain targeted messages for different stakeholders, such as messages among workers in the transport and brick industry. Social marketing tools will be used to address socio-cultural issues. The media campaign will also serve as the tool for GoB to reach out to different stakeholders and include them in the efforts to achieve the project's development objectives.

About US$ 1.03 million has been allocated and project management activities of environment component. In addition to the above GoB will contribute US$1.39 million towards project management activities such as purchase of vehicles, fuel and lubricants, sitting allowances, etc. related to environment component.

Component 2: Transport (US$18.00 million)

7. **Improvement of signal and intersection infrastructure (US$13.96 million):** In order to make the traffic signal system operational and provide safer environment for pedestrians, following activities will be implemented through the AF.

a. **Signal infrastructure.** To avoid frequent breakdowns of newly installed traffic signal system, deteriorated old signal infrastructure, which was outside the scope of parent project, will be removed and replaced. Through the parent project, the traffic signal equipment at 62 intersections were repaired and the traffic signal system was installed at 29 new intersections. While these new equipment works fine, the repair work at 62 intersections was planned to utilize some of the old equipment that was still functional at the time the parent project was prepared in 2008 to 2009. Due to unexpected deterioration of underground and aboveground cables, signal aspects, and other equipment, which was caused by vandalism and lack of sufficient maintenance, the whole system has become unstable and prone to frequent breakdowns. The AF will undertake the repair work for the 62 intersections and remove unused old infrastructure, such as cables, poles, signal aspects, and foundations. The contract for the improvement work will also include a few years (3 to 5 years, to be determined through market analysis) of maintenance for the all signal system at 91 intersections so that the working condition of the system can be kept even after the project closes in 2018.
b. **Warehouse.** A warehouse will be constructed on DSCC's land to store repair parts and equipment for traffic signal and traffic management safely. Equipment like signal aspects, controller boxes, solar panels, inverters, batteries, and poles have been imported, and the extras have to be kept at a safe and secure location so that the repair work can be done promptly in times of breakdowns.
c. **Hydraulic ladder**. A truck-mounted hydraulic ladder will be procured for the maintenance of traffic signals. It has a hydraulic boom with a bucket on top so that a technician in that bucket can check, clean, and have a quick repair on traffic signal lights, countdown timers, and solar panels, as a part of the regular maintenance. The truck shall have a tank to carry water to the sites and to clean the equipment from the bucket.

d. **Traffic signs, road markings, and lane separators.** The 91 signalized intersections will have traffic signs, road markings and lane separators so that the vehicles can be better informed on the traffic rules and road direction information, and be safely guided as they approach the intersections.
e. **Sidewalks.** It is proposed to have about 18km of sidewalk improvement along with drainage and repaving where necessary so that pedestrians can enjoy a safer walking environment while approaching intersections and FOBs. While the parent project had a scope of improving sidewalks for about 70km of road sections in downtown Dhaka, road sections to be included in the AF will be more on main trunk corridors where the volume and speed of road traffic is higher, compared with the mix of trunk and neighborhood roads in the parent project. Maintenance contractor will be appointed for the entire sidewalks improved under the project.
f. **Bus stops.** Infrastructure for bus stops, such as curbs, benches, sheds, signs, and lightings, will be constructed or renovated aiming to prevent unorderly stops of buses near and within intersections.

8. **Capacity building on traffic management activities (US$1.00 million):** To fill the gap in the capacity of DMP, traffic management equipment will be provided to DMP, and trainings will be organized for traffic management and enforcement in Dhaka. Details of the activities are provided in the following:

a. **Traffic Management equipment for DMP**. The traffic management equipment, which the PIU at DSCC will procure for DMP, will include handheld transceivers, handheld devices that issue tickets, VMS, portable gates, portable speaker systems, and other miscellaneous items like raincoat, reflecting vest, traffic cones, and flash light. These equipment will only be used by the traffic unit within DMP for traffic management and enforcement purposes.
b. **Capacity building training**. Domestic and international training opportunities will be given to key staff at relevant institutions to help build staff capacity.

9. **Traffic studies, awareness campaign, and design, supervision and Monitoring (US$1.60 million):** To support improvement activities, following consultancies and services will be procured:
a. **Transport and institutional development study.** The consultant will propose technical and institutional options that can improve the traffic management of Dhaka.
b. **Awareness campaign**. An awareness campaign for clean and safe mobility to help improve the traffic discipline of drivers, motorcycle riders, and pedestrians in Dhaka. Activities will include media advertisement and promotional leaflets and products.
c. **Design, Supervision and Monitoring (DSM) consultant.** A civil engineering firm will be mobilized to support the PIU in designing the civil work contracts, supervising construction activities, and monitoring the progress and impact of the project.

10. **Piloting mobility improvement for disabled (US$1.20 million):** This activity will be undertaken in the following two stages:
a. **Study to identify mobility improvement needs.** Through the consultation with the Civil Society Organizations and target groups, challenges and difficulties of the mobility of the disabled people will be studied, and an area for pilot improvement initiatives will be identified. That area should have a higher mobility demand for the disabled, such as an area with hospitals, physical therapy centers, and special needs schools.
b. **Pilot improvement work.** Following the recommendations of the study, pilot improvement work, such as on sidewalks, ramps, zebra crossings, hand rails, tactile tiles, street lightings, road markings, and signs, will be implemented. Minor modifications will also be made to selected FOB sites constructed under the parent project. A post implementation survey will be conducted to monitor the impact as well as to collect the feedbacks and lessons.

About US$0.23 million has been allocated for IOC and other project management activities of transport component in AF. In addition to the above GoB will contribute US$0.19 million towards project management activities such as fuel and lubricants, sitting allowances, etc. related to transport component.

Annex 3 Revised Project Costs

Table 1: Total Project Cost

Component	Financing (in US$)		Total Financing
	Current Financing (at approval)*	Additional Financing	
Component 1: Environment	16,232,000.00	17,000,000.00	33,232,000.00
Component 2: Transport			
A. DSCC / DNCC	39,299,000.00	18,000,000.00	57,299,000.00
B. DTCA	6,673,000.00	0.00	6,673,000.00
Total – Component Costs	**62,204,000.00**	**35,000,000.00**	**97,204,000.00**
GoB Contribution	**9,050,000.00**	**1,582,201.00**	**10,632,201.00**
Grand Total – Project Cost	**71,254,000.00**	**36,582,201.00**	**107,836,201.00**

* Current financing at approval above, is different from the cost (US$64.50 million) in the project portal The actual costs could be lower than either of the above, due to currency fluctuation between SDR and US$. AF allocation of US$17 million for Component 1 and US$18 million for component 2A, have been added to the current cost to arrive at total financing.

Table 2: Estimated Costs: Additional Financing

Component	Estimated Cost (in US$)
Component 1: Environment	
a. Infrastructure for Environmental compliance Monitoring	12,169,600.00
b. Policy Development and Strengthening Institutional Capacity	1,400,000.00
c. Knowledge Management	2,400,000.00
d. Incremental Operating Costs	1,030,400.00
Total – Component 1: Environment	**17,000,000.00**
Component 2: Transport	
a. Improvement of Signal and Intersection Infrastructure	13,966,445.00
b. Capacity Building on Traffic Management	1,000,000.00
c. Traffic Studies and Awareness Campaigns	1,600,000.00
d. Piloting Mobility Improvement for Disabled	1,200,000.00
e. Incremental Operating Costs	233,555.00
Total- Component 2: Transport	**18,000,000.00**
GoB Contribution	
Component 1: Environment	1,391,910.00
Component 2: Transport	190,290.00
Total – GoB Contribution	**1,582,200.00**
Grand Total – Additional Financing	**36,582,200.00**

Annex 4 Procurement and Financial Management Arrangements

A. Procurement Arrangements

1. All goods, works, non-consulting services and consulting services required for the Project and to be financed out of the proceeds of the Financing shall be procured in accordance with the requirements set forth or referred to in the World Bank's "Procurement Regulations for Borrowers under Investment Project Financing", dated July 1, 2016.

2. Procurement under this AF of the project will largely involve goods, works, consulting services and a few non-consulting services. Out of 24 goods contracts, 18 works contracts and 18 consulting services contracts under the AF, only 8 contracts (2 goods contracts and 6 works contracts) are priced at US$ 1 million or more.

3. *Procurement Responsibility:* Each of the two PIUs will process all procurements for their respective implementing agencies – DOE and DSCC. DSCC will also conduct the procurement activities for DNCC and DMP.

4. *Procurement Risks.* The fiduciary assessment carried out for the agencies indicates "substantial" risk in procurement operations and contract management. The main drivers to the risks are associated to capacity constraint of the agencies especially with regards to identifying irregular bidding practices undertaken by the bidders and delay in performing procurement contract management related activities.

5. *Managing Procurement Risks:* In order to minimize the procurement associated risks, the following measures have been agreed upon with the implementing agencies. Part of these measures are already in place, while the remaining measures as discussed below will be implemented under the AF of the Project:

(i) *Project Procurement Strategy for Development (PPSD) and Procurement Plan: A PPSD* is developed by the Implementing Agencies, in agreement with the Bank, taking into account the volume of items to be procured, prevailing market conditions, activity level risks etc. The PPSD spelled out the appropriate procurement strategy for this project. PPSD is a live document and it is to be updated at least annually. As an output of the PPSD exercise, initial Procurement Plans for both the implementing agencies have been prepared. For each contract to be financed under the project, the different selection methods for procurement, market approach, the need for pre-qualification, contracting arrangement, estimated costs, prior review requirements and time frame were also agreed between the implementing agencies and the Bank in the Procurement Plan;

(ii) *Introducing STEP System:* Systematic Tracking of Exchanges in Procurement (STEP) is introduced to prepare and manage procurement plan and procurement transactions under the project. The procurement plan will be updated semi-annually (or as required) using STEP system;

(iii) *Bid/Proposal Evaluation Committee*: All implementing agencies shall ensure that the bid/proposal evaluation committees are formed in a manner acceptable to the Bank, and Bank's no objection shall be required on the formation, as well as alteration in the composition or membership, of the bid/proposal evaluation committees. Procurement consultant(s) of the project will be mandatory member(s) of the bid/proposal evaluation committee;

(iv) Electronic Government Procurement (e-GP): Request for Bids (Open-National) contracts under the AF will incrementally use the e-GP system of the country;

6. Selection Methods for Procurement of Goods, Works and Non-consultancy services: Except as otherwise agreed in the Procurement Plan, goods, works and non-consulting services may be procured on the basis of Request for Bids (Open-International) procurement method. As allowed under the World Bank's "Procurement Regulations July 1, 2016", other selection methods, market approach, and contract arrangement as agreed in the Procurement Plan on a case to case basis can also be used. Request for Bids (Open-National) [i.e. National Competitive Tender (NCT)], if allowed in the Procurement Plan, will be carried out under the Bank's Procurement Regulations following procedures for Open Tendering Method (OTM) of the People's Republic of Bangladesh (Public Procurement Act 2006 - PPA, 1st amendment to PPA (2009) and The Public Procurement Rules 2008, as amended in August 2009) using standard/model bidding documents satisfactory to the Bank. For the purpose of Request for Bids (Open-National) the following shall apply:

- Post bidding negotiations shall not be allowed with the lowest evaluated or any other bidder;
- Bids should be submitted and opened in public in one location immediately after the deadline for submission;
- Lottery in award of contracts shall not be allowed;
- Bidders' qualification/experience requirement shall be mandatory;
- Bids shall not be invited or rejected on the basis of percentage above or below the estimated cost.

7. *Selection Methods of Procurement of Consultants' Services:* The Procurement Plan will specify the selection method, market approach (International/National, Open/Limited/Direct) and contract modality for each of the selection of consultant following the World Bank's "Procurement Regulations July 1, 2016".

8. *Use of Standard Procurement Documents:* For all procurements under the project, the Bank's Standard Procurement Documents shall be used. In case of unavailability of a particular procurement document, the implementing agencies shall use model tender documents (MTD) agreed with the Bank.

9. *Prior Review Thresholds:* The Procurement Plan shall set forth those contracts which shall be subject to the Bank's prior review. All other contracts shall be subject to Post Review by the Bank.

B. Financial Management (FM) Arrangements:

10. *Financial Management Assessment:* The overall financial management capacity of the project assessed to be moderately satisfactory and the overall FM risk of the project still remains 'substantial', mainly because, among others: (i) absence of comprehensive accounting system in DSCC and DOE at the agency level, instead manual system of book keeping and reporting is carried out that bears risks of inaccurate financial reporting (ii) Inability to operationalize computerized accounting system to generate Financial Management Report (FMR) automatically, though the 'off the shelf' system was funded by the Bank through the previous operation; (iii) absence of internal audit function in the Implementation Agencies; and (iv) Decentralized project operation with multiple accounting centers. The AF credit will continue to follow same financial management arrangements agreed for the parent project with the action plan as detailed below.

11. *Financial Management Team*: All Implementing Agencies (IAs) have required financial management staff and it is agreed that the existing financial management consultants/staffs will also support

AF activities. In case of staff turnover, project will ensure timely replacement so that FM activities continue to function without any interruption.

12. *Planning and Budgeting*: Similar to the arrangements of the parent project, IA's shall maintain a budget for the entire term of the additional financing. Detailed budget for each fiscal year will also be produced to provide basis for FM activities of the project. The annual budget will be prepared on the basis of the procurement plan and any other relevant annual work/implementation plans. The budget will be monitored periodically to ensure actual expenditure in line with the budget, and to provide input for necessary revisions. The existing capacity of the agency is found reasonably adequate to prepare and submit said budgets.

13. *Internal Control*:

a. *Filing and Record Keeping:* IA's will preserve all financial records including all procurement related supporting and other documents in accordance with provisions of the Government Rules, Public Procurement Act 2006 and The World Bank policies. These records will be made readily available on request for audit, investigation or review by the government and the World Bank or its appointed agency. All project-related documents (whether financial or others) will be filed separately in organized manner to facilitate internal and external audits, as well as reviews by the Bank/ its appointed agency.
b. *Accounting System: (i)* Computerized Accounting System (installed in DoE) feature's will be enhanced so that it can facilitate the generation of FMR automatically (without manual intervention) (ii) The existing books of accounts arrangement of DSCC and DTCA will be enhanced and improved so that it can accommodate the maintenance and preservation of complete financial records thus provide the base of preparation of reliable FMR.
c. *Assets and Payments:* All project payments as to be made by IA's, will be signed/approved by the respective Project Director (PD) and mandatorily made through banking channel (Cheque/Other Bank Transfer) except for petty cash expenses following the petty cash policy of GoB. Comprehensive database/register of assets will be maintained by all IA's thus provide the base for the audit trail, reporting of assets and safeguard of same. The taxes and duties for the AF are expected to be below 15 percent of total Bank financing.
d. *Internal Audit:* At least one internal audit will be carried out by a Chartered Accountants (private audit) firm one year before the close of the credit. The ToR for the internal audit will be prepared by IA's and share to the Bank for its review and concurrence.
e. *Cost under Co financing:* As per the latest Country Financing Parameters (CFP) for Bangladesh, certain cost category items which are operating in nature (such as fuels, sitting allowances, honoraria, cash per-diem, etc.) are not eligible for IDA financing. These costs will be paid out of co-financing by GoB/IA. Adequate provisioning under GoB head is provided in the DPP for this purpose.

14. *Governance and Oversight Arrangements*:

a. *Annual external audit*: Foreign Aided Project Audit Directorate (FAPAD) of C&AG, Bangladesh will continue to carry out the annual external audit. The audit report will be submitted to the Bank by December 31, every year. There is no overdue audit for the implementing ministry. However it is noted that the follow up on FAPAD audit objections under original financing was less than optimal and needs to improve.

b. *Refund of ineligible expenditure due to mis-procurement under parent project:* The refunds related to mis-procurement in the parent project, due from GoB since 2014/15, were also

credited to IDA account. While one of the refunds (USD 2,354.90), was credited October 4, 2016, the second refund of BDT 733,500 was credited to IDA account on October 18, 2016.

15. *Financial Management Considerations in the Fiduciary Assessment*

a. *Supervision of FM Activities*: The PD will be responsible for the overall financial management of the project and will also provide overall guidance/directions on a day to day basis to the Financial Management Specialist/Accounts Staff of the project.
b. *Accounting and Reporting*: The implementing agencies will maintain necessary books of accounts along with vouchers, etc. separately for additional financing. The accounting policies and procedures of the project will be governed in line with GOB procedures and Bank guidelines. Separate FMR (for additional financing) will be prepared on a quarterly basis along with a designated account reconciliation statement and other necessary reports as agreed for Original financing. FMRs shall be submitted to the Bank within 45 days from the end of each quarter.

16. *Disbursements:*

a. *Basis of Disbursements*: It was agreed that the project will continue the transaction based disbursements.
b. *Flow of Funds from Designated Account (DA)*: IDA Funds will be disbursed to separate Designated Accounts (DA's) which IA's shall open and maintained in an existing commercial bank in accordance with the approved government procedures relating to establishment and governance of DA. Although PD will be the authorized signatory to operate the Designated Account (DA of the project), it is recommended that the project proposes additional authorized signatory though ERD so that fund withdrawn is not delayed in case the lone signatory is not available.

Annex 5: Economic and Financial Analysis

Similar to the parent project, the AF activities are also a combination of technical assistance, capacity building activities and physical investments that will be carried out mainly in the city of Dhaka, with some investments in the environment component for other cities. The technical assistance and capacity building activities are not amenable to economic analysis. The analysis was, therefore, limited only to those activities where some meaningful estimates of the costs and potential benefits and/or beneficiaries could be made. These include the brick sub-component within the environment component and the traffic signaling in the transport component. This analysis is to update the original analysis prepared for the parent project using new information available and the proposed AF activities. The methodologies used for the update follow those of the original analysis. From the analyses, it is seen that the potential economic benefits are quite large.

Component 1: Environment

In the case of the brick sub-component of the DOE component, four new designs for brick kilns with lower emission and better fuel efficiency have been developed in the project. Technical assistance were extended to entrepreneurs for implementation of these designs at their own cost. One of the designs for conversion of Fixed Chimney Kiln (FCK) to Zigzag was found to be popular among entrepreneurs, due to low investment cost of about BDT four million only. Seven kilns of this design were piloted in two phases for three and four units respectively.

In order to evaluate cost-benefits of the new design Zigzag kilns, baseline data for 5 FCKs were also measured along with 4 converted Zigzag kilns in the 2nd phase. The measured and calculated data is given in the table below for comparison. The average emission levels from the new kilns were found to be about 96% lower and fuel use reduction obtained was about 47%.

Table 1.1: Comparison between FCK and Zigzag kiln design in CASE Project

Parameters	FCK (Avg. for 5 kilns)	Zigzag (Avg for 4 kilns)
1. Yearly Production (million)	4	4
*2. Coal used/ 100,000/bricks (tons)	20.1	10.6
3. Coal Used per year (tons)	805	422
4. Coal Saved per year (tons)/kiln	0	383
*5. Average Carbon content of coal %	69.9	69.9
*6. Average CO2 emission reduced (tons/Year)/kiln	0	1,405
*7. PM emission (mg/m^3)	1100	65
8. Health Cost saving per kiln/ year (BDT million)	-	7.7
9. Cost of coal saved in BDT Million/year (@BDT 7000/ton)	-	2.7
10. Payback period in years	-	1.5

*Measured values in CASE Project (*IHERE, Hanoi University of Science and Technology, 2016)*

With these measured values, the cost benefits have been estimated which are also included in the table. During the last two seasons (2015-16) coal supply was abundant and the price was stable at about BDT 7,000/ton and this value has been used to calculate the numbers in the table. However, the coal prices are rather uncertain from year to year and may fluctuate by as much as 50% usually on the higher side. In an

earlier World Bank study (2011)[9], the economic costs associated with poor air quality in DMA (Dhaka Metropolitan Area) due to a single FCK was estimated as BDT 8.2 million per year and cost saving per year per kiln has been found to be BDT 7.7 million for the converted kilns. The cost saving will be lower for less crowded rural areas. As a pilot, only seven kilns have been converted so far, but provision has been kept in the AF phase of the project for the continuation of the dissemination of the cleaner and more energy efficient brick kiln designs. The real benefits of the technologies can be obtained, when applied to large brick kiln clusters near major urban areas; where kilns' cluster develop due to high demand for bricks and health costs are high due to proximity of large population.

The payback period has been calculated to be 1.5 years using recent coal prices. Given the attractive payback period, it is expected that with technical assistance from the project, the conversion of the FCKs to Zigzag will sustain. Due to regulatory pressure many entrepreneurs have converted their FCKs to Zigzags of improper designs and without the emission control measures (i.e., gravity settlement chamber and scrubber). It is expected that with a combination of regulatory pressure (i.e., enforcement of lower new emission standards for brick kilns) and incentive in the form of technical assistance for retrofitting of improperly converted Zigzag kilns, there will be sustained incentive at the entrepreneur level to upgrade these kilns because of the modest cost of such retrofit. Provisions have been kept in the project to purchase mobile equipment for emission measurements from brick kilns for enforcement purpose.

From the coal savings the GHG benefit per kiln has been estimated as 1,405 tons per year. In the AF, two non-fired brick technologies are to be piloted and these will have little direct GHG emission. So, for equivalent production volume of bricks, the GHG benefits will be more than twice the value for the brick kilns.

Component 2: Transport

The activities in this component for the AF are selected to bridge the financing gaps for (a) operationalizing the traffic signals and (b) addressing the mobility needs of people with disabilities. Interventions for traffic signal operation include, traffic signal infrastructure, related sidewalk and road improvement, and capacity building and studies. Interventions for mobility improvement of the disabled include a study to better understand the needs and prepare recommendations, and a pilot improvement at a selected location.

The analysis is, therefore, limited to evaluate the impact of traffic signal operation since any meaningful estimate of costs and potential benefits cannot be expected for other activities, such as capacity building and pilot mobility improvement for the disabled. The methodologies used for the evaluation is the same as was used for the parent project, which is the cost recovery period analysis.

Direct benefits of traffic signal operation is the reduction of the stoppage delay at intersections, measured in two ways, the idle fuel consumption saving and time value saving. Indirect benefits will include the reduction in air pollution, accidents, vehicle operating cost other than the idle fuel consumption, cost of deploying police personnel, etc.

Reduction in idle running fuel: Daily traffic in Dhaka consists of person trips made in different travel modes, such as CNG bus, and car. Travel patterns are different in each of the modes in terms of number of trips, average occupancy in one vehicle, and average trip length. Assuming a signal delay reduction by about 120 seconds at one signalized intersection, a total saving of about Tk780,000 per day is estimated for

9 World-Bank (2011) Introducing Energy-efficient Clean Technologies in the Brick Sector of Bangladesh. ESMAP Publication Series, Report No. 60155-BD, The World Bank, Washington DC; and Croitoru L, Sarraf M (2012) Benefits and costs of the informal sector: the case of brick kilns in Bangladesh. Journal of Environmental Protection 3(6):476–484. doi:10.4236/jep.2012.36058.

the 12million person trips made within DNCC and DSCC jurisdictions in 2014. This translates into an annual saving of Tk245 million (US$ 3.1 million), assuming a half delay reduction on weekend days.

Table 2.1: Evaluation of Idle Running Fuel Saving

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Mode	Number of person trips	Average Occupancy	Average Fuel Consumption during idle running	Fuel Cost	Number of vehicle trips	Average trip length	Number of intersection with signals per trip	Existing average delay at signal	Expected average delay at signal	Signal delay reduction per trip	Idle fuel cost saving by signal delay reduction per vehicle trip	Idle fuel cost saving by signal delay reduction per mode
					(1)/(2)		(6)/12.86km			(7)*((8)-(9))	(3)*(4)*(10)/3600	(5)*(11)
(unit)	(person trips/day)	(person /vehicle)	(l, m^3/hr)	(Tk/l, m^3)	(vehicle-trips/day)	(km/trip)	(signals /trip)	(sec /signal)	(sec /signal)	(sec/trip)	(Tk/vehicle-trip)	(Tk/day)
Rickshaw	4,832,834	2.29	0.00	0.0	2,110,408	3.6	0.3	190.0	62.8	35.6	0.00	0
CNG	1,042,303	4.07	0.37	35.0	256,094	8.7	0.7	190.0	62.8	86.0	0.31	78,370
Bus,Pub	4,644,567	38.62	1.00	65.0	120,263	9.7	0.8	190.0	62.8	95.9	1.73	208,292
Motorcycle	384,169	1.70	0.35	85.0	225,982	7.4	0.6	190.0	62.8	73.2	0.60	136,662
Car&Taxi	952,197	2.77	0.50	85.0	343,754	8.7	0.7	190.0	62.8	86.0	1.02	349,148
Truck	15,361	2.75	1.00	65.0	5,586	9.7	0.8	190.0	62.8	95.9	1.73	9,674
(Total)	11,871,431				3,062,086							782,147

Reduction in passenger time wasted in traffic: Using the same assumption in the signal delay reduction, the saving in the passenger time value now being wasted while waiting at intersections is estimated. Total time saving per day of about 13.6million minutes, which corresponds to about 10.5 hours per person annually for the 7million population within DNCC and DSCC. Financially, the saving is equivalent to Tk 31 million per day and Tk9.6 billion per year (US$ 122 million).

Table 2.2: Evaluation of Passenger Time Value Saving

	(1)	(2)	(6)	(7)	(8)	(9)	(10)	(13)	(14)	(15)	(16)
Mode	Number of person trips	Average Occupancy	Average trip length	Number of intersection with signals per trip	Existing average delay at signal	Expected average delay at signal	Signal delay reduction per trip	Average Passenger Occupancy	Value of Passenger Time	Total travel time reduction per mode	Time value saving by signal delay reduction
				(6)/12.86km			(7)*((8)-(9))			(1)*(10)	(14)*(15)
(unit)	(person trips/day)	(person /vehicle)	(km/trip)	(signals /trip)	(sec /signal)	(sec /signal)	(sec/trip)	(person /vehicle)	(Tk/min /person)	(Person-min/day)	(Tk/day)
Rickshaw	4,832,834	2.29	3.6	0.3	190.0	62.8	35.6	1.29	1.7	2,867,547	4,874,829
CNG	1,042,303	4.07	8.7	0.7	190.0	62.8	86.0	3.07	1.7	1,494,581	2,540,787
Bus,Pub	4,644,567	38.62	9.7	0.8	190.0	62.8	95.9	36.62	1.8	7,425,455	13,365,819
Motorcycle	384,169	1.70	7.4	0.6	190.0	62.8	73.2	1.70	3.0	468,555	1,405,665
Car&Taxi	952,197	2.77	8.7	0.7	190.0	62.8	86.0	1.77	6.3	1,365,376	8,601,869
Truck	15,361	2.75	9.7	0.8	190.0	62.8	95.9	0.00	0.0	24,558	0
(Total)	11,871,431									13,646,071	30,788,969

GHG emissions reduction from the reduction in idle running fuel. Based on the calculation in Table 2.1, GHG emissions reduction potential is calculated as shown in Table 2.3, using GHG coefficient from US EIA. For simplification purpose, natural growth of traffic demand nor induced traffic demand due to the reduction in signal delay is not considered. It is estimated to yield GHG emissions reduction of 8,200 t-CO_2 per year.

Mode	(1) Number of person trips	(2) Average Occupancy	(3) Average Fuel Consumption during idle running	(5) Number of vehicle trips	(6) Average trip length	(7) Number of intersection with signals per trip	(8) Existing average delay at signal	(9) Expected average delay at signal	(10) Signal delay reduction per trip	(11) Idle fuel cost saving by signal delay reduction per vehicle trip	(17) GHG emission coefficient	(18) GHG emission reduction
				(1)/(2)		(6)/12.86km			(7)*((8)-(9))	(3)*(5)*(10)/3600		(11)*365*(17)/1000
(unit)	(person trips/day)	(person /vehicle)	(l, m^3/hr)	(vehicle-trips/day)	(km/trip)	(signals /trip)	(sec /signal)	(sec /signal)	(sec/trip)	(l/day)	(CO_2-kg /1,000l, m^3)	(CO_2-kg /yr)
Rickshaw	4,832,834	2.29	0.00	2,110,408	3.6	0.3	190.0	62.8	35.6	0.0	0	0
CNG	1,042,303	4.07	0.37	256,094	8.7	0.7	190.0	62.8	86.0	2,239.1	1,927	1,349,923
Bus,Pub	4,644,567	38.62	1.00	120,263	9.7	0.8	190.0	62.8	95.9	3,204.5	2,655	2,661,768
Motorcycle	384,169	1.70	0.35	225,982	7.4	0.6	190.0	62.8	73.2	1,607.8	2,269	1,141,324
Car&Taxi	952,197	2.77	0.50	343,754	8.7	0.7	190.0	62.8	86.0	4,107.6	2,269	2,915,895
Truck	15,361	2.75	1.00	5,586	9.7	0.8	190.0	62.8	95.9	148.8	2,655	123,627
(Total)	11,871,431			3,062,086								8,192,536

Data source:
(1) JICA and DTCA. The Project on the Revision and Updating of the Strategic Transport Plan for Dhaka, Draft Final Report. Table 10.3 and Table 10.6. November 2015.
(2) Ibid., Table 3.6
(3) Project Appraisal Document of the parent project, p.88 Table II
(originally from www.pcra.org/English/transport/CRRIstudy.htm; (CRRI RUCS 1982 and Indian Institute of Petroleum, 1996). Unit is m^3 for CNG, liter for everything else. Fuel consumption for CNG (0.37 m^3/hr) is converted assuming 1m^3 CNG is equivalent to 1.23 liter of petrol, according to Navana CNG, a CNG conversion company in Bangladesh (http://www.navanacng.com/faq.php).
(4) Bangladesh Petroleum Corporation (http://www.bpc.gov.bd/contactus.php?id=39)
(6) Ibid. 1, p. 10-9
(7) Total length of road network in Dhaka is 1,286km, according to Ibid. 1, Table 12.21 (originally from Road Maintenance Management System of RHD). 100 intersections are being signalized by DCC.
(8) DSCC, Traffic Signal Synchronization Study (DCC-S10), Draft Final Report. December 2014.
(9) Ibid.
(14) Ibid. 1, Table 13.2
(17) US EPA