Earthquake Vulnerability Assessment of Dhaka, Chittagong and Sylhet City Corporation Area

June 2009

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Comprehensive Disaster Management Programme (CDMP)
Ministry of Food and Disaster Management (MoFDM)
Government of the People's Republic of Bangladesh

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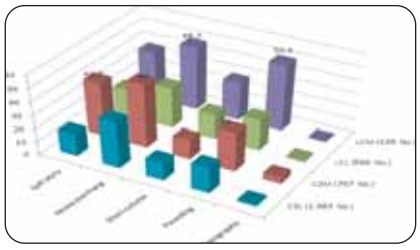

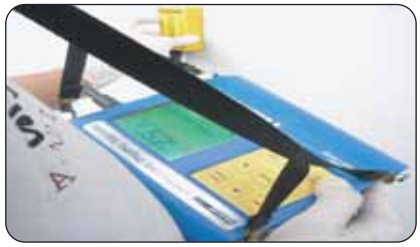

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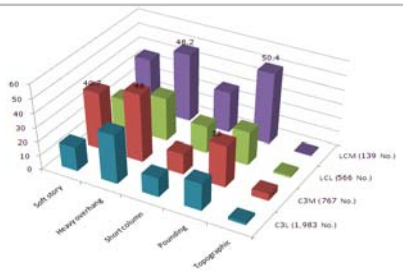
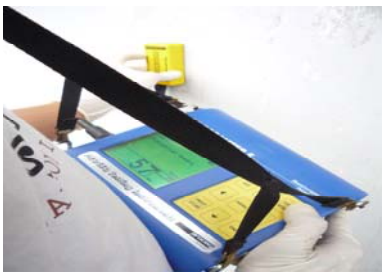
Main Report



Report On

Vulnerability Assessment of Dhaka, Chittagong and Sylhet City Corporation Area



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Executive summary

Over the past decades, urbanization in Bangladesh has been rapidly taking place without proper guidance. As a result many of the urban centers have developed haphazardly. These urban centers are fast growing and influence the economic developments of the country. It is therefore essential to have a realistic understanding on the nature, severity and consequences of likely damage/loss that a possible event of earthquake could cause. A strong earthquake affecting a major urban center like Dhaka, Chittagong, or Sylhet may result in damage and destructions of massive proportions and may have disastrous consequences for the entire nation. A strong earthquake affecting a major urban center like Dhaka, Chittagong, or Sylhet may result in damage and destructions of massive proportions and may have disastrous consequences for the entire nation.

Considering this reality, the Comprehensive Disaster management Programme (CDMP) of the Government of Bangladesh (GoB) is being implemented by the Ministry of Food and Disaster Management (MoFDM) and is supported by UNDP, DFID-B and the EC. CDMP is designed to strengthen the Bangladesh Disaster Management System and more specifically to achieve a paradigm shift from reactive response to a proactive risk reduction culture. Under Component 4a, CDMP has assigned responsibility to ADPC for implementation of Seismic Hazard and Vulnerability Mapping of Dhaka, Chittagong and Sylhet city corporation areas.

The objective of this study is to develop maps describing the seismic vulnerability characteristics of the existing building stock, essential facilities, and lifeline facilities in Dhaka, Chittagong and Sylhet city corporation areas. Three major cities in Bangladesh are considered as the study areas. These three cities are the capital city—Dhaka, the port city—Chittagong, and the fifth metropolitan city—Sylhet. In order to achieve this objective, the consulting team conducted several tasks including development of base map, development of cluster, development of general building stock database, development of lifeline and essential database and vulnerability analyses on the buildings, essential facilities, and lifelines.

The base map of Dhaka, Chittagong and Sylhet city corporation areas has been developed in a GIS database for further vulnerability assessment. Combination of topographic map, high resolution satellite images and other secondary data utilization as well as and field survey were executed to ensure the accuracy of the base maps developed.

In order to effectively analyze the building and lifeline vulnerability, the unit of municipal boundary—ward—has been subdivided into many smaller areas called '*clusters*'. Cluster development aims to get more detailed physical characteristics of the vulnerability of an area, as well as to be able to analyze and present the results in a finer and detail level.

The building inventory was developed as a tool for assessing the seismic vulnerability of existing building. The building inventory consists of data that will be used to calculate the seismic vulnerability, such as building structural type, the building occupancy class, the number of building occupants during the day and the night, the total floor area, the number of stories, the cost of the building and its contents inside, the seismic vulnerability characteristics of building and etc. This information was obtained through field surveying. The surveys were classified into 3 levels: Level-1, level-2, and level-3 surveys. The survey in each level was designed for different purposes. The level-1 survey was designed to require less information than level-2 and level-3 and therefore can be conducted in more number. In Dhaka, Chittagong and Sylhet, respectively *8,741*, *6,175*, and *3,536* buildings have been surveyed for level-1. About 10% of these buildings were selected for the level-2 survey. Level-3 survey was conducted in Dhaka, Chittagong and Sylhet respectively for 50, 30 and 30 RCC buildings. Based on the survey

results, several meaningful statistical relationships between building attributes have been derived and used for simulating the missing building attributes from the available ones.

For the lifeline inventory, the information was mainly collected from field surveying, data collecting from reliable source and identifying of quickbird images. The lifeline database mainly consists of transportation system and utility system. In the 3 cities, transportation system consists of (1) highway transportation system, (2) railway transportation system, (3) bus transportation system, and (4) ferry transportation system. While utility system consists of (1) potable water system, (2) natural gas system, (3) electricity power system, and (4) communication system, and for Dhaka (5) waste water or sewage network.

Utilizing the same methodology for lifeline inventory, essential facility inventory was developed. The essential facility inventories in this study consist of 3 categories: (1) Medical care facilities, i.e. hospital and medical clinic, (2) Emergency response facilities, i.e. police station, fire station and emergency operation center and (3) Schools.

Based on the building and lifeline inventory, vulnerability maps which shows the characteristics of the buildings, essential facilities, and lifelines that make them susceptible to the damaging effects of earthquake were developed.

From the collected database and vulnerability maps, the major findings regarding to the seismic vulnerability of building, lifeline and essential facilities can be summarized as the followings:

- The vulnerability factor which is the most common in Dhaka city is soft story (52%). The common vulnerability factor in both Chittagong and Sylhet city is heavy overhang (38% and 46%, consequently).
- Among occupancy classes in all city corporation areas, residential class is the major proportion. Their proportions are 81.3%, 81.7% and 85.2% in Dhaka, Chittagong and Sylhet, respectively.
- Among structural type of non-engineered buildings from the survey results, BF (brick in cement mortar masonry with flexible roof) is the most common type in all cities. For engineered buildings, C3 (concrete frame with masonry infill walls) is the most common class.
- From the survey results, age of buildings has been related to structural types. For example, it was found that most buildings with concrete slab-column frames (C4) are constructed less than 10 years. On the other hand, most masonry buildings with concrete floors (BC) ages more than 10 years. Also, light reinforced concrete buildings (LC) are found to be older than reinforced concrete buildings (RC).
- As expected, all residential types have an average number of occupants per floor area in the daytime less than the nighttime; nevertheless, the other occupancy classes as commercial, industrial, government and education have the number of occupants in the daytime more than the nighttime.
- By defining road blockade potential as the building density (number of building per area) dividing by the total length in each ward. In Dhaka, this value is found to be the highest in southern part of Dhaka which is the old city. The highest values are found in wards 64 and 80, respectively. In addition, the road blockade potential in Dhaka is the highest compared to the other city corporation areas. In Chittagong, the ratio is found to be the highest in ward 33, 34 and 20 which is

the old port area. In Sylhet, the highest ratio is found in ward 11, 12 and 13 which is also the old urban area of Sylhet City Corporation area.

- About 51% of highway road in Dhaka, 3% of highway road in Chittagong and 13% of highway road in Sylhet is located in the soil with very high liquefaction susceptibility. It is noted that the liquefaction susceptibility depends on only geological characteristic and does not consider the effect of earthquake hazard, yet.
- Most highway bridges in 3 city corporation areas are non-seismic design. The overlay map between liquefaction susceptibility and location of the bridge showed that there are 6 major highway bridges in Dhaka, 4 Bridges in Chittagong and 2 bridges in Sylhet which are located in moderate to very high liquefaction susceptibility area.
- Two components of railway transportation system which are railway track and railway facilities were found in 3 city corporation areas. 70% of railway track in Dhaka, 92% of railway track in Chittagong and 84% of railway track in Sylhet are located in the moderate to very high liquefaction potential areas. From interviewing and expert judgment, it was found that most structure and its facility do not have a seismic design.
- Most of potable water pipelines in 3 city corporation areas are ductile pipe. This ductile material includes galvanized iron (GI), ductile iron (DI), mild steel (MS), PVC and steel. Fewer percentage is brittle pipe which are Asbestos cement (AC), cast iron (CI) and reinforced concrete (RCC). It was found that 57% in Dhaka, 86% in Chittagong and 33% in Sylhet of potable water pipeline is in the moderate to very high liquefaction potential area.
- From survey result, waste water treatment pipeline was found to be brittle pipe. 52% of the pipe is located in very low liquefaction susceptibility area and 43% of the pipe in very high liquefaction susceptibility area.
- Most natural gas pipeline is 3 city coporation areas are arc-welded join steel pipe. 56% in Dhaka, 90% in Chittagong and 45% in Sylhet of this pipe is located in the moderate to very high liquefaction potential area.

1. Introduction

1.1. Background Information

Over the past decades, urbanization in Bangladesh has been rapidly taking place without proper guidance. As a result many of the urban centers have developed haphazardly. These urban centers are fast growing and influence the economic developments of the country. It is therefore essential to have a realistic understanding on the nature, severity and consequences of likely damage/loss that a possible event of earthquake could cause. A strong earthquake affecting a major urban center like Dhaka, Chittagong, or Sylhet may result in damage and destructions of massive proportions and may have disastrous consequences for the entire nation.

Considering this reality, the Comprehensive Disaster management Programme (CDMP) of the Government of Bangladesh (GoB) is being implemented by the Ministry of Food and Disaster Management (MoFDM) and is supported by UNDP, DFID-B and the EC. CDMP is designed to strengthen the Bangladesh Disaster Management System and more specifically to achieve a paradigm shift from reactive response to a proactive risk reduction culture. Under Component 4a, CDMP has assigned responsibility to ADPC for implementation of Seismic Hazard and Vulnerability Mapping of Dhaka, Chittagong and Sylhet city corporation areas.

This report presents the vulnerability mapping of Dhaka, Chittagong and Sylhet city corporation areas. Chapter one describes the background, study objectives, study area, and limitations of the study. Chapter two describes the procedures for base map preparation, building survey, and lifeline survey. Chapter three reports the vulnerability of existing building stock in the three cities, population density distribution during day and night, distribution of essential facilities, and other important information regarding building vulnerability. Chapter four shows the existing lifeline facilities in the three cities, which include water supply network, gas supply network, electricity network, transportation facilities etc.

1.2. Study Objective

The objective of this study is to develop maps describing the seismic vulnerability characteristics of the existing building stock, essential facilities, and lifeline facilities in Dhaka, Chittagong and Sylhet city corporation areas.

1.3. Study Areas

As explained earlier, three major cities in Bangladesh are considered as the study areas. These three cities are the capital city—Dhaka, the port city—Chittagong, and the fifth metropolitan city—Sylhet. A brief introduction for these three cities is presented as follows.

Dhaka

The Dhaka City Corporation (DCC) area considered in this study has an area of 136.4 sq. km covering 90 wards of DCC and cantonment and Zia International Airport areas. The cantonment and airport areas are defined as ward 91. The city current population is 7.2 million (projected based on 2001 census).

Dhaka is the capital city of Bangladesh located on the banks of the Buriganga River. The city is the center for political, economic and cultural life in Bangladesh. Dhaka and its surrounding metropolitan area has a total population of 11 million, spread over a total area of 815.85 sq. km., with a population density of 14,608 persons per sq. km. The city has become the 11th most populous city in the world. However, the population within the DCC area stands at approximately 7 million. This population is growing by an estimated 4.2% per annum, one of the highest rates amongst Asian cities. The continuing growth reflects an ongoing migration from rural areas to the Dhaka urban region, which accounted for 60% of the city's growth in the 1960s and 1970s.

Although Dhaka has never had any experience of earthquake disasters in the past, even then the earthquake of December 19, 2001 with a magnitude of 4.5 certainly is an indication of its earthquake source and vulnerability. In addition, micro-seismicity data also supports the existence of at least four earthquake source points in and around Dhaka. The earthquake disaster risk index has placed Dhaka among the 20 most vulnerable cities in the world. Dhaka with its population of around 11 million and enormous poorly constructed and dilapidated structures signifies extremely vulnerable conditions for massive loss of lives and property in the event of a moderately large earthquake.

Chittagong

Chittagong, the second largest city of Bangladesh, is situated within 22° 14’ and 22° 24’ 30” N Latitude and between 91° 46’ and 91° 53’ E Longitude and on the right bank of the river Karnafuli. The total area of Chittagong City is 169.4 sq. km. with a total population of 2.6 million and an average population density of 15,225 persons per sq. km.

Chittagong falls within Zone-II of the three generalized seismic zones in Bangladesh comprising the northern and eastern regions of Bangladesh with the presence of the Dauki Fault system of eastern Sylhet and the deep seated Sylhet Fault, and proximity to the highly disturbed southeastern Assam region with the Jaflong thrust, Naga thrust and Disang thrust, is a zone of high seismic risk with a basic seismic co-efficient of 0.15.

The Chittagong City Corporation (CCC) area considered in the study has a total area of 169.4 sq. km. The CCC area has 41 wards and a current population of 2.6 million (projected based on 2001 census).

Sylhet

Sylhet is the fifth divisional city of Bangladesh and is located at 24° 32′ 0″ N, 91° 52′ 0″ E, on the northern bank of the Surma River. The total area of Sylhet district is about 3,490 sq. km. The physiographic of Sylhet comprises mainly of hill soils, encompassing a few large depressions. The area of the city is 57.64 sq. km. It has a population of 369,425 with a population density of 5,488 persons per sq. km.

Sylhet region falls within the most earthquake prone zone of Bangladesh. During the last 150 years three major earthquakes (surface-wave magnitude larger than 7.5 on the Richter Scale) have occurred in this area.

The Sylhet City Corporation (SCC) area considered in this study has a total area of 27 sq. km. The SCC area has 27 wards and a current population of about 0.4 million.

1.4.Study Limitations

This study is limited to the City Cooperation areas of the three cities as defined in Section 1.3, though a significant number of areas outside the jurisdiction of City Corporation areas are densely populated and unplanned & haphazard development is taking place over there. For example, Keraniganj, one of the densely populated areas in Bangladesh with a population of more than one million, is not covered by this study despite of its adjacent location to the DCC area.

Due to existing regulations in Bangladesh, it was not possible to conduct building and lifeline surveys in certain areas in the DCC area, which include Dhaka Cantonment, Zia International Airport, Tejgaon Airport, BDR, Dhaka Central Jail, Secretarial building area, presidential place area, Prime-minister's office area, National Parliament area. These areas accommodate around 4,500 buildings and constitute about 20% of the total DCC area. Similarly, it was not possible to conduct surveys in EPZ, Bangladesh Navy, Chittagong Port, Chittagong Customs, Chittagong Jail area within the CCC area. There areas constitute about 18.3 sq. km. out of 169.4 sq. km. of the CCC area. Moreover, the lifeline information on water supply network, gas supply network, electricity supply network of CCC areas was not fully available from the respective agencies.

2. Data Collection and Database Development

This chapter presents the methodology used to develop database for vulnerability assessment under this project. List of physical features considered, projection parameters used, lifeline features collected during base map preparation are described in this chapter. Moreover, the methodology of delineation of cluster boundaries and the building survey methodology are also described here.

2.1. Base Maps

2.1.1. Base Map Development

Spatial databases have been developed for the cities of Dhaka, Chittagong and Sylhet in this study and used as base maps to assist hazard and vulnerability assessment in the respective areas. All important physical features of these three cities are considered during the database development. Based upon the availability of existing database and information of the respective cities, an appropriate methodology was developed to acquire missing information by conducting physical feature survey and attribute information collection.

For Dhaka, the base map has been developed from existing maps of *Dhaka City Corporation* and *Survey of Bangladesh*. For Chittagong, the base map of *Chittagong Development Authority* has been adopted and updated. However, no existing map was available for Sylhet. Therefore, an original comprehensive survey has been conducted to develop the base map of Sylhet city. Satellite images of the three cities were collected and utilized to ensure the accuracy of the base maps developed.

The following is the list of satellite images collected to develop the base maps of three cities.

Table 2-4 List of Satellite Images Used for Base Map Preparation

Satellite Image	Acquiring Date	Band and Resolution	Project System
Dhaka City			
Quickbird Image	22 November 2007	Pan-sharpened (4 band), 0.6m	UTM 46N WGS 84
Quickbird Image	20 December 2006	Pan-sharpened (4 band), 0.6m	UTM 46N WGS 84
Chittagong City			
Quickbird Image	15 February 2008	Pan-sharpened (4 band), 0.6m	UTM 46N WGS 84
Quickbird Image	5 December 2007	Pan-sharpened (4 band), 0.6m	UTM 46N WGS 84
Quickbird Image	4 February 2006	Pan-sharpened (4 band), 0.6m	UTM 46N WGS 84
Quickbird Image	12 February 2004	Pan-sharpened (4 band), 0.6m	UTM 46N WGS 84
Sylhet City			
Quickbird Image	4 January 2008	Pan-sharpened (4 band), 0.6m	UTM 46N WGS 84

Base Map Development for Dhaka and Chittagong

In Dhaka, base maps have been developed by a number of organizations for their respective purposes. *Dhaka City Corporation* (DCC), for example, has developed ward-level base maps showing building footprints and road layout. But there is no attribute information attached with these base maps. Moreover, the DCC ward-level base maps cover 75 out of 90 wards within its jurisdiction. RAJUK, the capital development authority, has developed base maps for its entire jurisdiction (590 sq. miles), but RAJUK does not have detail footprints of Uttara, Gulshan, Baridhara, Banani and Cantonment areas of City Corporation Boundary. Moreover,

the building use categorization developed by RAJUK lacks sufficient details required for vulnerability assessment. Survey of Bangladesh (SOB) has spot level and building footprint maps. Spot level maps of SOB were used for generating contour maps, but building footprint maps of SOB is not as informative as required.

Table 2-5 List of Base Maps Collected from Various Sources

Map	Scale	Year of Survey	Year of Publication	Published by
Topographic Map of Dhaka	1:5,000	2003-2004	2004	Survey of Bangladesh
Topographic Map of Chittagong	1:10,000	1990, 1998	1999	Bangladesh Inland Water Transport Authority
Topographic Map of Sylhet	1:15,840	1962-1963	1964	Surveyor General of Pakistan
Dhaka City Corporation Map	1:3,000	2003	2004	Dhaka City Corporation
Dhaka City Corporation Ward Map	Various, depending on ward size	2003-2005	2006	Dhaka City Corporation
Chittagong City Corporation Ward Map	Digital map	NA	2008	Chittagong Development Authority
Sylhet City Corporation Ward Map	1:9,000	NA	2004	Sylhet City Corporation

Considering the availability of base maps from various different sources, initiatives were taken to develop a comprehensive base map of Dhaka City Corporation area for vulnerability assessment by compiling base maps from various sources with satellite images and additional field survey results.

Similarly, Chittagong Development Authority (CDA) has recently developed base maps for their preparation of Master Plan for its jurisdiction. This base map of CDA was adopted in this study and updated using satellite images. Following is the method of physical feature survey and database development for Dhaka and Chittagong City Corporation areas.

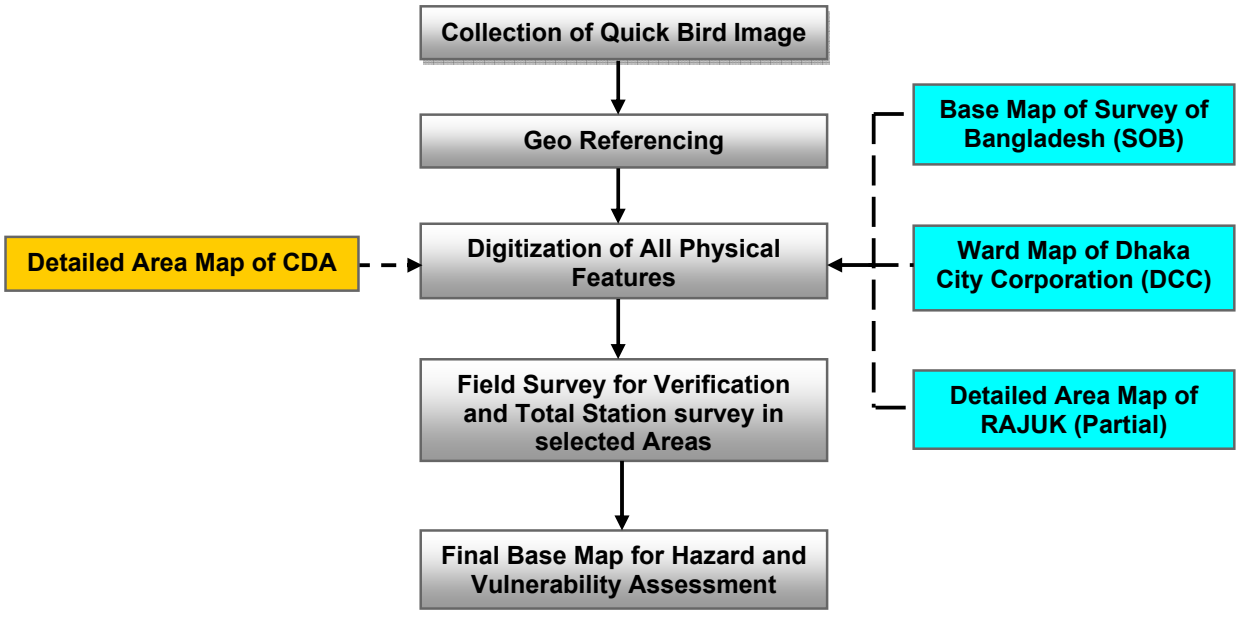
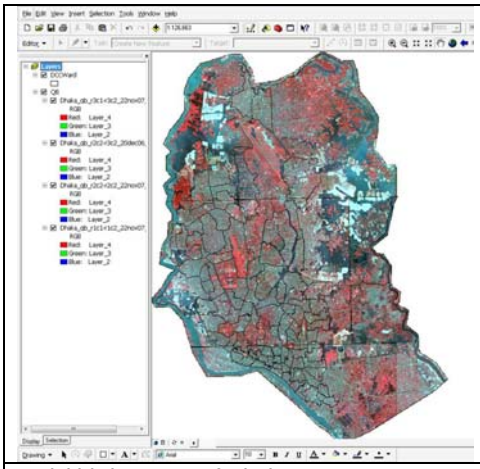


Figure 2-6 Flow-chart of Base Map Development Process

Vulnerability Assessment

For preparation of Base Map of Dhaka, Satellite (Quickbird) images of Dhaka city were collected. Ground Control Points were selected on the image at suitable locations for geo-referencing. JICA established Bench Mark at Gulshan Park was used as referencing point to do geo referencing. RTK-GPS and Total station was used for image geo-referencing. After geo-referencing of the image physical features like road alignment, building outline, water body boundary, river boundary etc. were digitized. After completion of digitization, maps were printed for field verification. During field verification a pre set list (please see table 2.3) was followed to collect attribute information against each of the digitized features. After completion of attribute information collection and feature verification, collected information were added against the each surveyed features and base map was prepared for use. Following is the detail of the steps followed during base map preparation.

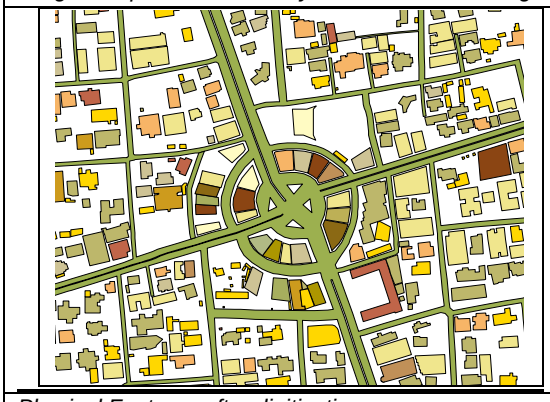


Quickbird Images of Dhaka

Geo-Referencing of Image using RTK GPS

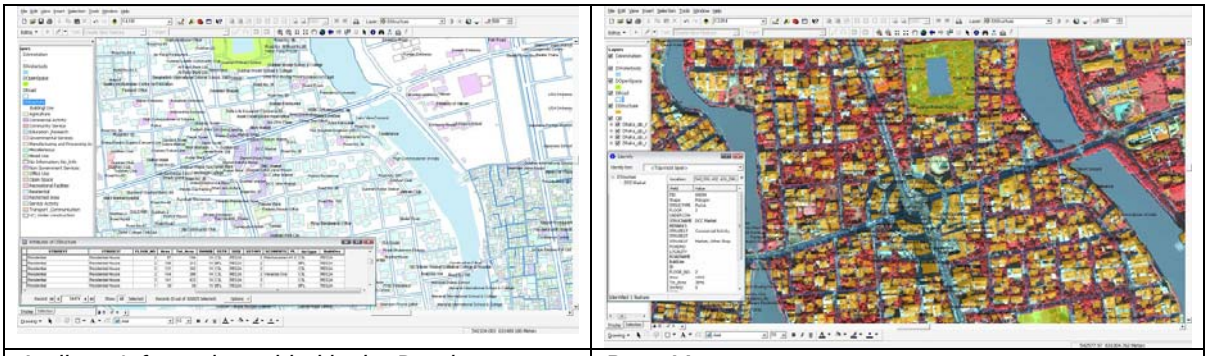
Image of a part of Dhaka City after Geo-referencing

On Screen Digitization



Physical Features after digitization

Field Verification and Attribute Informartion Collection



Attribute Information added in the Database	*Base Map*

Figure 2-7 Steps of Dhaka and Chittagong Base Map Preparation

Table 2-6 List of Physical Features and Information incorporated in the Base Map

No.	Physical Features	Attribute Information
1.	Building	Building use, land use, structure type, storey number, structure name
2.	Road	Pavement material, width, number of lane, length
3.	Railway	Type
4.	Water body	Type (river, lake, khal, dighi, pond, marshy land)
5.	Open Space	Type (eidghah, play ground, park, graveyard)

Base Map Development for Sylhet

Satellite (Quick bird) image of Sylhet city was Geo-Referenced taking 13 Ground Control Point (GCP) on the image. SOB Bench Mark (SOB-2373-Kandigaon) established by JICA was used as Reference BM for GCP Survey. RTK-GPS and Total station was used for image geo-referencing. Out of 13 locations selected for GCP Survey, 12 locations were surveyed by RTK GPS and Total Station. One was discarded for unavailability of suitable mark. Most of the GCP locations are Road Junction, Monument, Road Island, Road Crossing and its surroundings. After geo-referencing of the image physical features like road alignment, building outline, water body boundary, river boundary etc. were digitized. After completion of digitization, maps were printed for field verification. During field verification a pre set list (please see table 2.3) was followed to collect attribute information against each of the digitized features. After completion of attribute information collection and feature verification, collected information were added against the each surveyed features and base map was prepared for use. Following are the detail of the steps followed during base map preparation and list of physical feature and information incorporated in the basemap.

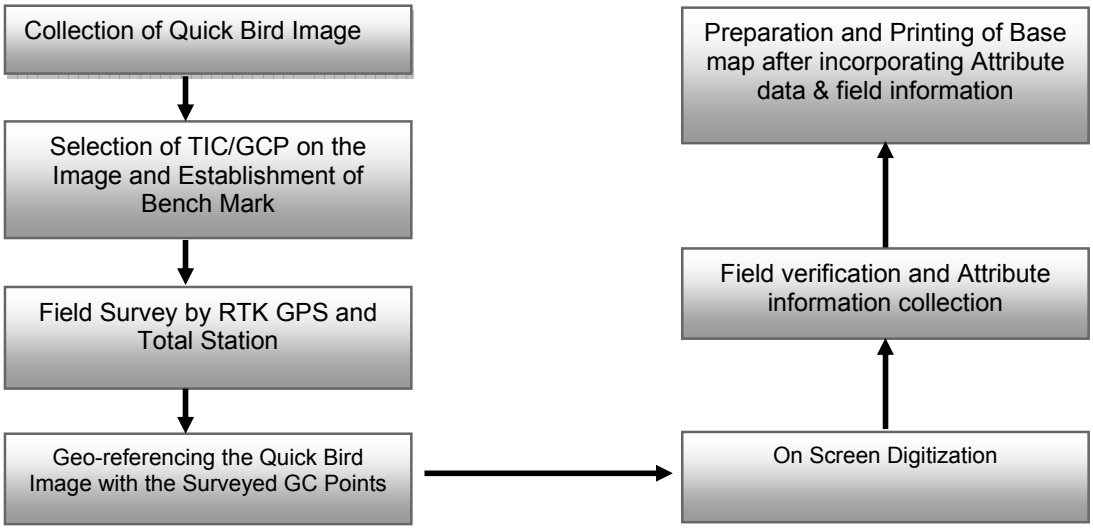
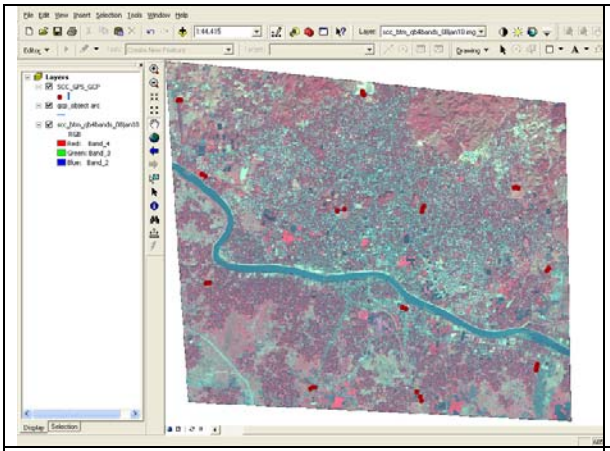


Figure 2-8 Flow-chart of Base Map Development Process



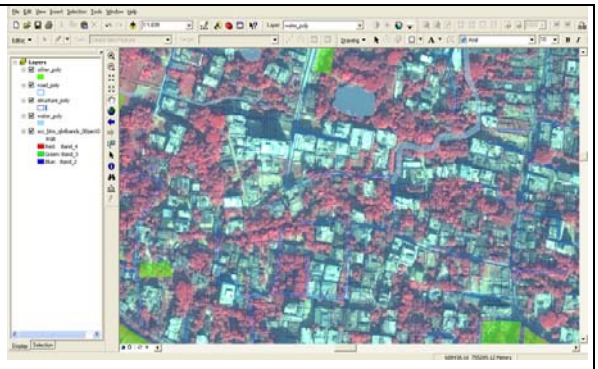
Quickbird Image of Sylhet with selected GCP points shown in red marks

JICA-SoB Benchmark-2373-Kindgaon used as a reference benchmark for GCP survey

Image of a part of Sylhet City after Geo-referencing

Geo-Referencing of Image using RTK GPS

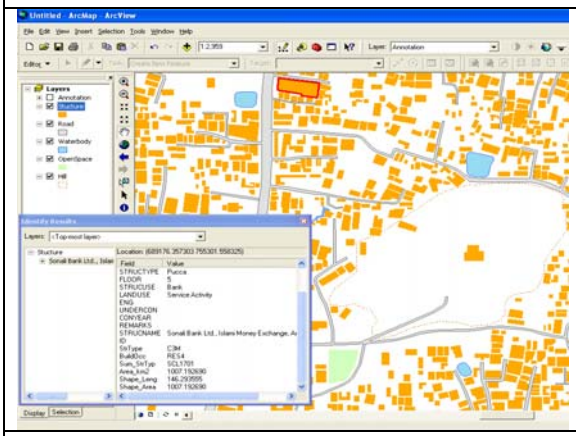
On Screen Digitization



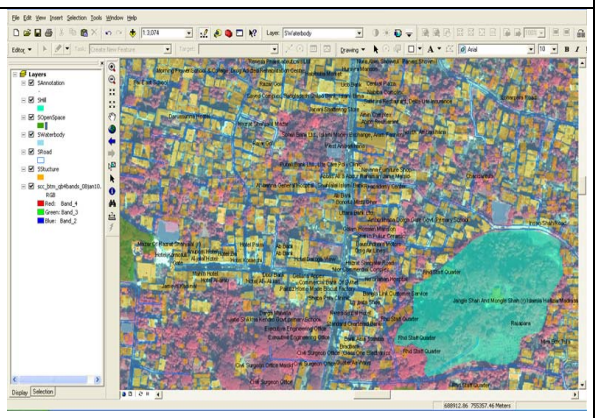
Physical Features after digitization

Field Verification and Attribute Informartion Collection

Field Verification and Attribute Informartion Collection



Attribute Information added in the Database



Base Map

Figure 2-4 Steps of Sylhet Base Map Preparation

Table 2-7 List of Physical Features and Information incorporated in the Base Map

No.	Object	Attribute	Data Source
1.	Building	Building use, land use, structure type, storey number, structure name	Topographic Map, City Planning Map, Quickbird Images, Field survey
2.	Road	Pavement material, width, number of lane, length	Topographic Map, City Planning Map, Quickbird Images, Field survey
3.	Railway	Type	Topographic Map, City Planning Map, Quickbird Images, Field survey
4.	Water body	Type (river, lake, khal, dighi, pond, marshy land)	Topographic Map, Quickbird Images, Field survey
5.	Open Space	Type (eidghah, play ground, park, graveyard)	Topographic Map, Quickbird Images, Field survey
6.	Hilly Area	Type (tilla)	Topographic Map, Quickbird Images, Field survey

No.	Object	Attribute	Data Source
7.	Locality Name	Place name, road name, water body name	Topographic Map, Field survey

All the data acquired and developed in the base map were stored and maintained in a geographic information system (GIS) database. This GIS database uses Bangladesh Transverse Mercator (BTM) projection system, which is a local projection system applied in the topographic maps of Survey of Bangladesh. Details of BTM projection system is given as follows:

- Spheroid : Everest 1830
- Scale Factor : 0.9996
- Central Meridian : 90 degree East
- Latitude of Origin : 0 degree (Equator)
- False Easting : 500,000 Meter
- False Northing : -2,000,000 Meter

2.1.2. Cluster Development

In order to effectively analyze the building and lifeline vulnerability, the unit of municipal boundary—ward—has been subdivided into many smaller areas called '*clusters*'. Cluster development aims to get more detailed physical characteristics of the vulnerability of an area, as well as to be able to analyze and present the results in a finer and detail level. In most cases, roads have been used as the cluster boundaries. Criteria and example of cluster boundary delineation are given as follows. One or more criteria are used to delineate the cluster considering the existing condition of each ward. Following the cluster delineation, field survey was carried out to check again the real condition on the ground.

- Existing ward boundary

  Administrative boundary of city corporation ward definitely becomes the boundary of cluster since the cluster is actually a subdivision of ward.

- Road network and water bodies

  The delineation can be identified by the existence of physical feature such as road network, lake, canal, and river since these physical features clearly divide an area as well as define units of building blocks or settlements in a city.

- Homogeneity in building use and structure type

  Homogeneity in building use and structure type represents the main characteristics of an area, particularly for the building. This information is embedded in GIS database in the base map. Using these criteria, we can identify the location of industrial area, residential area, commercial area, slum area, low-rise building area, high-rise building area, etc. which is very useful for the analysis.

- Restricted area

  Restricted areas, in which the physical feature survey could not be done, are delineated as separate clusters.

For the Dhaka City Corporation area, its 90 wards have been subdivided into 540 clusters. The Cantonment and Zia International Airport area is given name 'Ward 91' in the GIS database. By including this Ward 91, the total number of clusters in Dhaka is 552. While for the Chittagong City Corporation area, its 41 wards have been subdivided into 285 clusters, and the 27 wards of Sylhet City Corporation area have been subdivided into 82 clusters. Figure 2-5 shows the ward boundary of Dhaka City Corporation and an example of cluster boundary delineation (Ward 19).

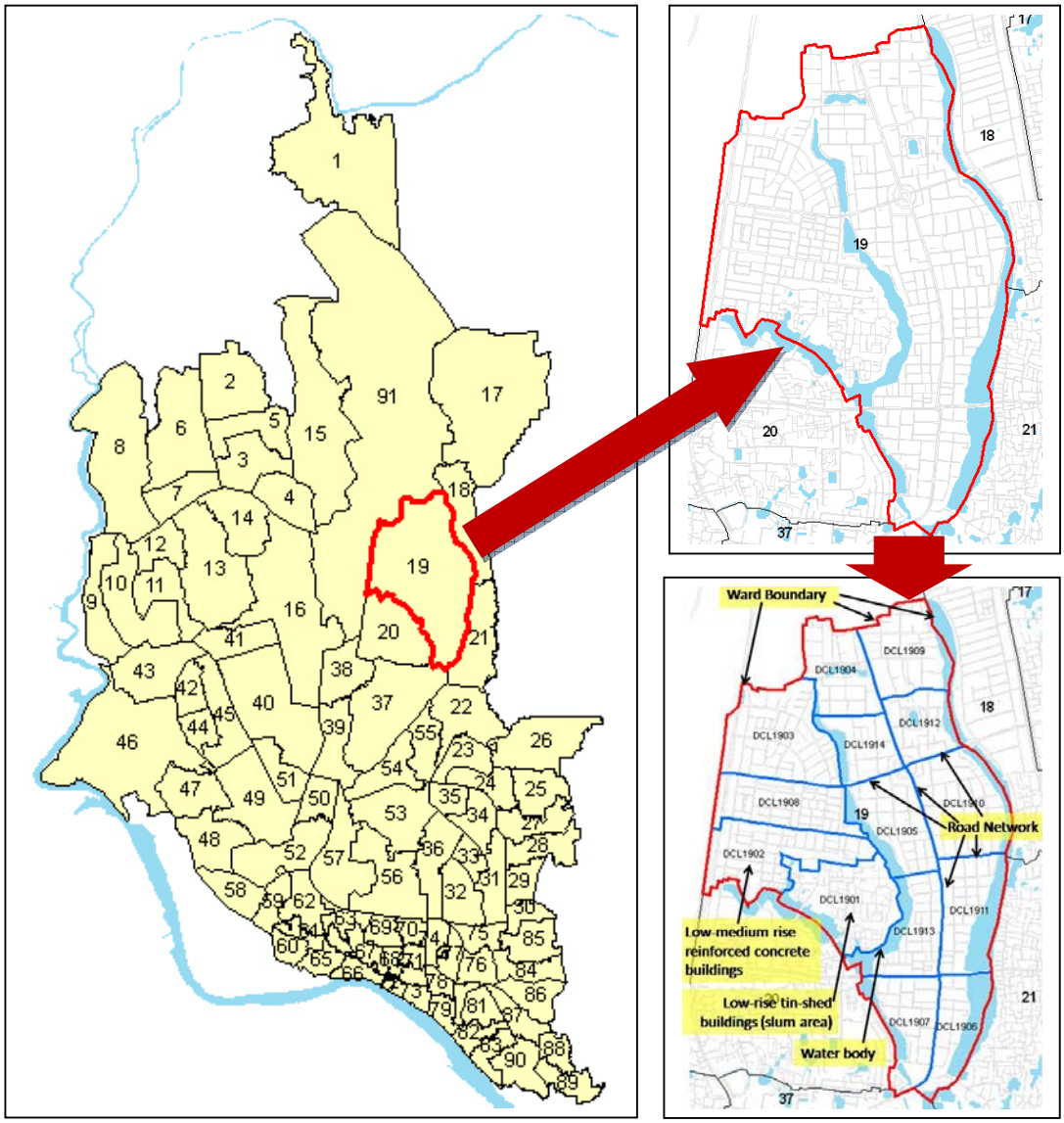


Figure 2-5 Ward Boundary of DCC (left) and Example of Cluster Delineation in Ward-19 (right) with criteria of ward boundary, road network, water bodies, and homogeneity of structure type

2.2.Building Inventory Development

To properly assess the seismic vulnerability of existing building stock, it is required to know the building structural type (Table 2-4), the building occupancy class (Table 2-5), the number of building occupants during the day and the night, the total floor area, the number of stories, the cost of the building and its contents inside, the seismic vulnerability characteristics of building,

etc. Some of the above listed information can be obtained from the existing building databases, but the rest cannot.

To acquire the missing information, it is not necessary to survey each and every building in the cities—which is impossible under the scope of budget and time frame. Instead, a series of well-designed comprehensive building surveys have been carried out in this study. The surveys were classified into 3 levels: Level-1, level-2, and level-3 surveys. The details of these survey levels are described in the following sub-sections. In Dhaka, Chittagong and Sylhet, respectively *8,741*, *6,175*, and *3,536* buildings have been surveyed for level-1. About 10% of these buildings were selected for the level-2 survey. Level-3 survey was conducted in Dhaka, Chittagong and Sylhet respectively for 50, 30 and 30 RCC buildings. Based on the survey results, several meaningful statistical relationships between building attributes have been derived and used for simulating the missing building attributes from the available ones. This process will be explained in subsequence sections. In addition, statistics from other sources have been collected to augment the field survey data. These statistics are, for example, the average construction cost per unit floor area of various building occupancy classes. Statistics on cost of building materials have been collected both from current government rate (i.e; used by Public Works Department for Government building construction) and private developers (i.e; current rate followed by REHAB, the association for Private building developer).

2.2.1. Building Surveys

As explained earlier, three level building surveys have been carried out in this study. Three different teams were utilized to conduct the survey in three cities. The survey teams were managed by Asian Disaster Prepared Center (ADPC) in Dhaka, Chittagong University of Engineering and Technology (CUET) in Chittagong and Shajalal University of Science and Technology (SUST) in Sylhet. Teams were composed with graduate structural engineers. It took about 16 weeks to complet the survey in Dhaka, 10 weeks in Chittagong and 5 weeks in sylhet/ In all three cities technical guidance and time to time supervision was done by the team from Asian Institute of Technology (AIT), National Society for Earthquake Technology (NSET) and ADPC team from Bangkok.

Level-1 Building Survey

In the level-1 building survey, side walk and questionnaire surveys were carried out. The average time required for this survey by a 2-member team was about 40-50 minutes for one building. The building attributes collected at this survey level were:

- *Number of stories*
- *Occupancy class (Table 2-6)*
- *Structural type (Table 2-5)*
- *Number of occupants during the day and the night*
- *Age of the building*
- *Presence of soft story (yes/no)*
- *Presence of heavy overhangs (yes/no).*
- *Shape of the building in plan view (rectangular, narrow rectangular, irregular)*
- *Shape of the building in elevation view (regular, setback, and narrow tall)*
- *Pounding possibility (yes/no)*

- *Building in slope land (yes/no)*
- *Visible ground settlement (yes/no)*
- *Presence of short columns (yes/no)*
- *Visible physical condition (poor/average/good)*

Table 2-8 Classification of Building Structural Types

Sl No.	Structure Type	Label	Height		Description
			Name	Stories	
1	C1	C1L	Low-Rise	1-3	Concrete moment frames are buildings with reinforced concrete columns and beams and designed by engineers. The building in this class contains no significant volume of wall that contributes to total stiffness of the building
		C1M	Mid-Rise	4-7	
		C1H	High-Rise	8+	
2	C2	C2L	Low-Rise	1-3	Concrete Shear Walls are buildings that lateral force resisting system are mainly from shear walls. The examples for shear wall are including lift core and structural wall.
		C2M	Mid-Rise	4-7	
		C2H	High-Rise	8+	
3	C3	C3L	Low-Rise	1-3	Concrete frame with masonry infill walls are buildings with reinforced concrete columns and beams and designed by engineers. The building in this class contains the significant amount of masonry in filled wall that contribute to total stiffness of the building.
		C3M	Mid-Rise	4-7	
		C3H	High-Rise	8+	
4	C4	C4L	Low-Rise	1-3	Concrete Slab-Column Frames are reinforced concrete building which its lateral force resisting system consisted of slab and column.
		C4M	Mid-Rise	4-7	
		C4H	High-Rise	8+	
5	S1	S1L	Low-Rise	1-3	Steel Moment Frame are similar to concrete moment frame however columns and beams are made of steel in stead of reinforced concrete
		S1M	Mid-Rise	4-7	
		S1H	High-Rise	8+	
6	S3	S3	Low-Rise	1	Steel truss with steel column consists of the roof truss and the steel column. Gravity load of the roof truss are transferred to ground by steel column. The weak link of this structure usually found in the connection between roof truss and steel column.
7	LC	LCL	Low-Rise	1-3	Lightly reinforced concrete frames are those reinforce concrete building that contains the minimum structural members to sustain the gravity loading. These buildings are not usually designed by engineer. The main characteristics of these building are small column sizes (usually 9-10") and heavily overhanging.
		LCM	Mid-Rise	4-7	
		S1H	High-Rise	8+	
8	BC	BCL	Low-Rise	1-3	Brick in cement mortar masonry with concrete floor are masonry buildings with concrete slab and structural masonry wall and no confined reinforced concrete column.
		BCM	Mid-Rise	4-7	
9	BF	BFL	Low-Rise	1-3	Brick in cement mortar masonry with flexible roof are similar to the one with concrete floor. However, due to lacking of rigid diaphragm that confines the masonry wall, its seismic behavior is considerer poorer.
10	STC	STC	Low-Rise	1	Steel truss with concrete column consists of the roof truss and the concrete column. Gravity load of the roof truss are transferred to ground by concrete column. The weak link of this structure usually found in the connection between roof truss and concrete column.
11	STM	STM	Low-Rise	1	Steel truss with masonry wall consists of the roof truss and the masonry wall. Gravity load of the roof truss are transferred to ground by masonry wall. The weak link of this structure usually found in the connection between roof truss and masonry wall.
12	TSL	TSL	Low-Rise	1-3	Tin shed is minimum standard structure constructed by tin shed for wall and roof.
13	BAL	BAL	Low-Rise	1-3	Bamboo refers to building which use bamboo as structural component to resist both the lateral and gravity loads.

Table 2-9 Building Occupancy Classes

Sl No.	Occupancy	Description
1	*RES1*	*These shall include any building, detached from neighboring buildings by distances required by code and having independent access which is used for private dwelling by members of a single family*
2	*RES2*	*These shall include any building in which one or more families are housed, specifically built for minimum standard accommodation of lower income families, in which the minimum requirements for hygiene and safety are maintained for example multi-storied complexes, cluster houses and rehabilitation housing or housing undertaken by private low income groups approved by the authority*
3	*RES3*	*Include any building or portion there of or group of buildings in which living quarters are provided for more than one family, living independently of each other, with independent cooking facility for each family. Flats or apartments may be located in walk up buildings, high rise buildings or in housing complexes*
4	*RES4*	*Include any building or group of buildings under single management in which sleeping and living accommodation, with or without dinning facilities but without cooking facilities for individuals is provided for hire on transient or permanent basis. Example, hotels, motels, rest house, lodging house, inns and clubs.*
5	*RES5*	*Include any building in which sleeping and living accommodations are provided for groups of unrelated persons with or without common dining facilities and with common cooking facilities under management control or with individual or group cooking facilities. Examples, mess houses, dormitories, boarding houses, hostels and students' halls of residence.*
6	*RES6*	*These are sub-standard housings*
7	*COM1*	*Include any building or portion thereof used for purpose of display and sale of merchandise, either wholesale or retail or without incidental storage and service facilities with an area not exceeding 300 sq m. Example; large shops, markets, departmental stores, super markets and hyper markets.*
8	*COM2*	*Include any building or portion thereof used for purpose of display and sale of merchandise, either wholesale or retail or without incidental storage and service facilities with an area more than 300 sq m. Example; large shops, markets, departmental stores, super markets and hyper markets.*
9	*COM3*	*These are personal and repair services shop. Examples; photocopy shop, automobile workshop etc.*
10	*COM4*	*These are professional or technical services offices*
11	*COM5*	*These are financial institutions or organizations. Examples; banks, money exchange etc.*
12	*COM6*	*Include any building or portion thereof used for purpose of providing essential medical facilities having surgery, emergency and casualty treatment areas which is equipped and designated to handle post disaster emergency and is required to remain operational after disaster.*
13	*COM7*	*Include any building or portion thereof used single management in which general and specialized medical, surgical and other treatment is provided to persons sufferings from physical limitations because of health. Example; medical office or clinic.*
14	*COM8*	*These buildings are entertainment and recreation facilities. Example: restaurants, bars, snooker club etc.*
15	*COM9*	*These buildings are theaters*
16	*COM10*	*These are mixed occupancy buildings such as residential with commercial uses.*
17	*IND1*	*Buildings are heavy industrial factories. Example: large rubber industry, plastic factory and car industry.*
18	*IND2*	*Buildings include light industry. Example; small textile & garments factory, jewelry industry.*
19	*IND3*	*Buildings include food, drugs or chemicals industries. Example; soft drink, ice cream, pharmaceuticals etc.*
20	*IND4*	*Buildings metals or minerals processing factories. Example: iron & steel industry, brick or cement factories.*
21	*IND5*	*The buildings are high technology industries. Example; computer or electrical apparatus factories.*
22	*IND6*	*These are buildings under construction.*
23	*REL1*	*These are religious buildings like mosques, churches, temples and other non-profit associations.*
24	*GOV1*	*These are government general service buildings such as government office like post office or municipal building.*
25	*GOV2*	*These are government emergency service buildings such as government office like police or fire service.*
26	*EDU1*	*These buildings are grade schools, religious schools or libraries.*
27	*EDU2*	*These are college or university buildings*

Table 2-10 Classification of surveyed buildings by the number of stories

City	Number of Buildings			Total
	1-3	4-6	7 and Above	
Dhaka	*3,494*	*4,804*	*443*	*8,741*
Chittagong	*5,090*	*1,042*	*43*	*6,175*
Sylhet	*3,285*	*246*	*5*	*3,536*
Total	***11,868***	***6,092***	***491***	***18,451***

Table 2-11 Classification of surveyed buildings by structural type

Structural Type	Number of Buildings		
	Dhaka	Chittagong	Sylhet
C1	*183*	*28*	*6*
C2	*36*	*9*	*23*
C3	*5,260*	*2,774*	*1,389*
C4	*294*	*8*	*149*
S1	*3*	*-*	*3*
S3	*16*	*9*	*3*
LC	*937*	*705*	*591*
BC	*922*	*395*	*62*
BF	*880*	*1,418*	*1,146*
STC	*6*	*8*	*-*
TSL	*139*	*155*	*85*
STM	*8*	*2*	*3*
BAL	*23*	*635*	*43*
BLL	*34*	*16*	*16*
ASM	*-*	*-*	*18*
TOTAL	***8,741***	***6,175***	***3,536***

Table 2-12 Classification of surveyed buildings by occupancy class

Occupancy	Buildings in Number		
	Dhaka	Chittagong	Sylhet
AGR1	*42*	*15*	*10*
COM1	*303*	*398*	*377*
COM2	*64*	*31*	*28*
COM3	*18*	*33*	*21*
COM4	*92*	*59*	*24*
COM5	*10*	*6*	*1*
COM6	*31*	*13*	*6*
COM7	*20*	*8*	*8*
COM8	*41*	*20*	*15*
COM9	*5*	*2*	*4*
COM10	*2,036*	*495*	*214*
EDU1	*103*	*230*	*56*
EDU2	*44*	*28*	*4*
GOV1	*76*	*38*	*18*
GOV2	*12*	*5*	*-*
IND1	*69*	*15*	*2*
IND2	*58*	*65*	*1*
IND3	*7*	*20*	*5*
IND4	*10*	*4*	*-*
IND5	*2*	*-*	*-*
IND6	*60*	*6*	*1*
REL1	*140*	*192*	*56*
RES1	*249*	*1,333*	*1,471*
RES2A	*878*	*1,119*	*155*
RES2B	*1,334*	*523*	*31*
RES2C	*41*	*43*	*9*
RES3A	*1,374*	*782*	*955*
RES3B	*1,170*	*217*	*13*
RES3C	*258*	*24*	*-*
RES3D	*17*	*-*	*-*
RES4	*14*	*5*	*20*
RES5	*54*	*47*	*11*
RES6	*108*	*371*	*20*
Total	***8,741***	***6,175***	***3,536***

Some basic information about buildings surveyed are shown in Tables 2-7, 2-8, and 2-9. Moreover, the summary of survey results in Level-1 and Level-2 are demonstrated in Table 2-10.

Table 2-13 Summary results of Level-1 and Level-2 survey in three cities

City	All buildings in database (No.)	Level-1 survey		Level-2 survey	
		No.	%	No.	%
Dhaka	*326,825*	*8,741*	*2.67*	*875*	*0.27*
Chittagong	*182,277*	*6,175*	*3.39*	*494*	*0.27*
Sylhet	*52,176*	*3,536*	*6.78*	*507*	*0.97*
Total	*561,278*	*18,452*	*3.29*	*1,876*	*0.33*

Level-2 Building Survey

About 10 percent of the level-1 surveyed buildings were chosen for the Level-2 survey on a random basis. In addition to the attributes acquired in the Level-1 survey, measurements of the building ground floor were taken. A sketch of the building plan at the ground story was made, and the dimensions of columns, concrete and masonry walls were measured, as shown by Figure 2-6. The main objective of this survey was to acquire more detailed information for more in-depth seismic vulnerability assessment of typical buildings. It took on an average about two and a half hours for a 2-member team to complete the Level-2 survey on one building.

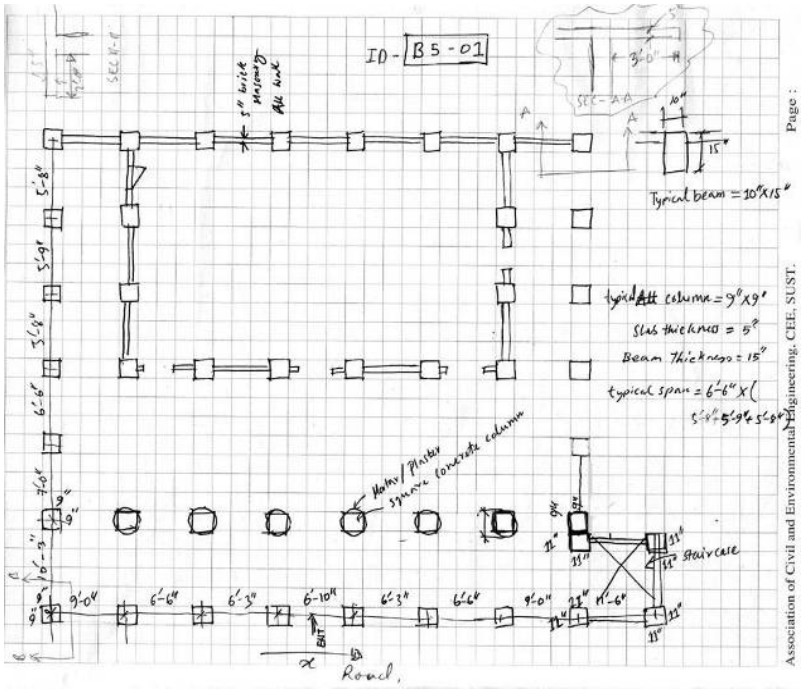


Figure 2-6 A sketch of ground-floor building plan in the level-2 survey

For concrete buildings, the building attributes acquired during the Level-2 survey are:

- *Torsional irregularity (non-rectangular shape, unsymmetrical infill, unsymmetrical shear wall)*
- *Short column (less than 25% of floor height, 25-50% of floor height, more than 50% of floor height)*
- *Diaphragm discontinuity (mezzanine floor, floor opening)*
- *Slab system (cast insitu, pre-cast)*
- *Key dimensions (plan dimensions, typical column size, no. of bays, span length, shear wall dimensions)*

For masonry buildings, the building attributes acquired during the Level-2 survey are:

- *Wall Thickness*
- *Maximum unsupported length of wall*
- *Corner separation (yes/no)*
- *Anchorage of wall to floor (yes/no)*
- *Anchorage of roof with wall (yes/no)*
- *Wall to wall anchorage (yes/no)*
- *Bracing of flexible floor/roof (yes/no)*
- *Existence of gable wall (yes/no)*
- *Horizontal band (yes/no)*
- *Vertical post (yes/no)*

Level-1 survey

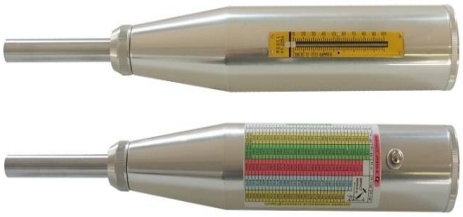
Level-2 survey

Figure 2-7 Photos of level-1 and level-2 building surveys

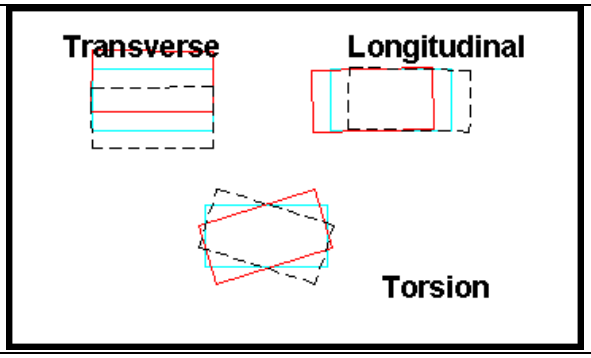
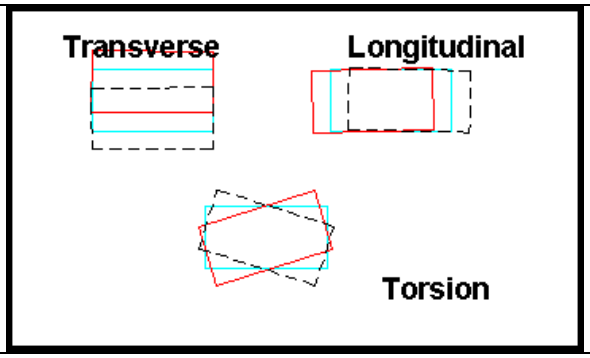
Level-3 Building Survey

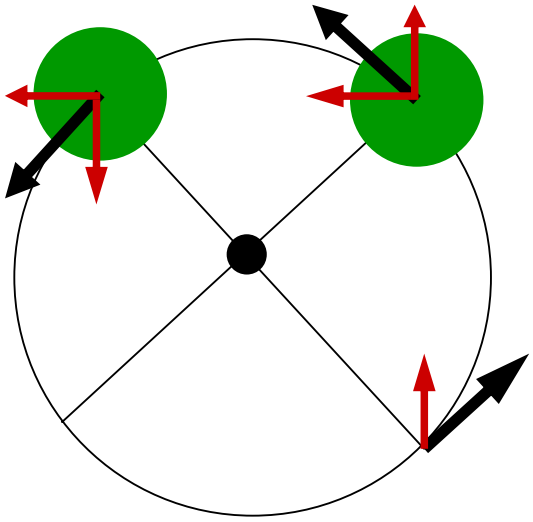
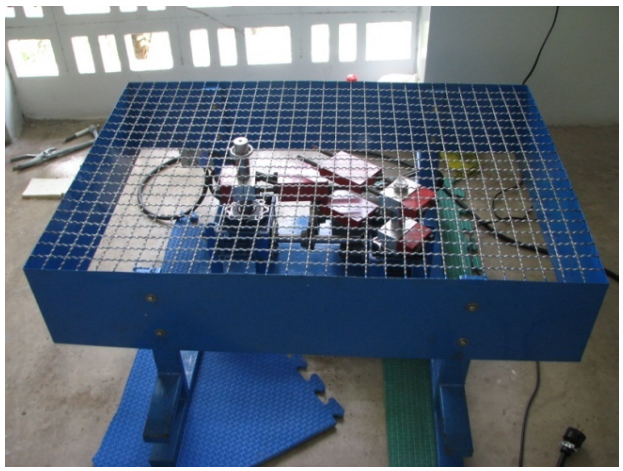
For dynamic measurement was conducted on few selected buildings in three cities. Main objective of this survey is to understand the behavior of different types of buildings during earthquake. For dynamic measurement of RCC Buildings, Micro tremor, Schmidt Hammer, Ferro Scanner, Vibration shaker were used. For masonry building Shear strength test of binding mortar of masonry walls was done using Hydraulic Jack with Deflection Meter. In Dhaka, Chittagong and Sylhet Level 3 building survey was conducted respectively for 50, 30 and 30 RCC buildings. For masonry building shear strength test, survey was conducted on 10 building each

for three cities. Following is the short description of the process and instruments used to conduct dynamic measurement of selected buildings.

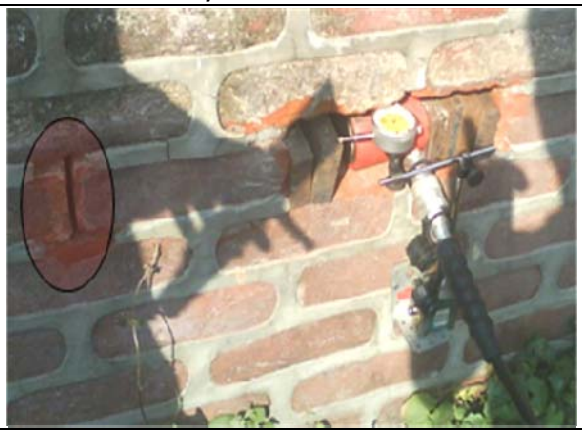
Schmidt Hammer	
The Schmidt rebound hammer is used to determine a surface hardness in order to establish the theoretical relationship between the strength of concrete and the rebound number of the hammer. During this study Schmidt Hammer was used during Level3 survey of different buildings.	
	To understand the relationship between strength of concrete, Schmidt hammer was used in all columns located at the ground floor of the surveyed building. Schmidt hammer was also used for some of the beams at ground floor. All data was recorded in separate sheets for analysis.

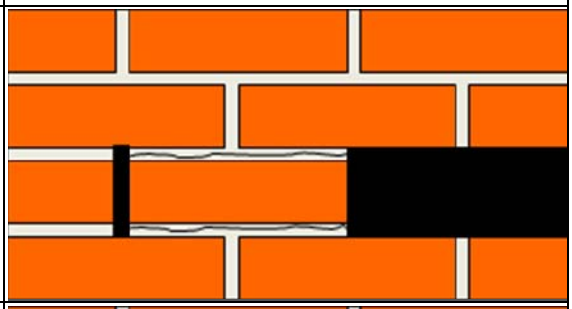
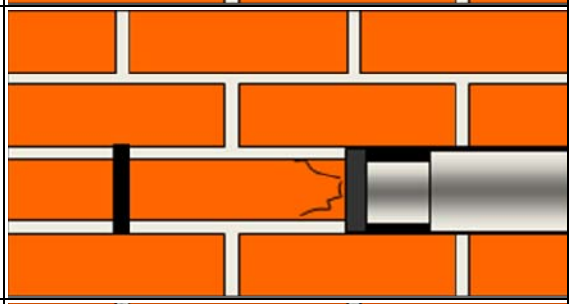
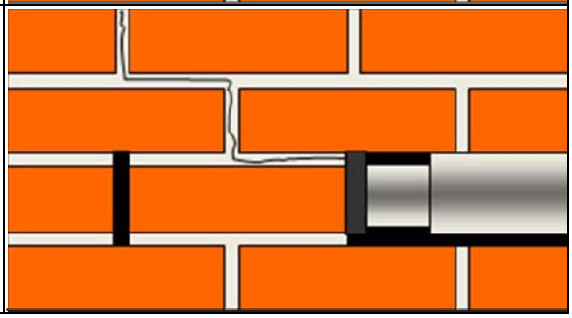
Ultrasonic device and Rebar detection instrument	
Ultrasonic device and Rebar detection instrument were used for Concrete Strength measurement of the selected buildings. Basic target of the measurement was to identify Concrete Strength measurement, Combined Ultrasonic Pulse Velocity and Hardness Measurement of the columns and bim of the selected buildings	
	
FERRO-SCANNING to determine the placement of bar in the column	

Micro Tremor	
	Measurement of ambient vibration was done using Micro Tremor at top floor of the building to determine the natural period and damping. The microtremore was set at north-south direction to determine Transverse, Longitudinal and Torsion mode. In some cases the measurement was taken for all floors depending upon the accisibility. At each case it took about 25/30 minutes to take the measurement. It took 4 to 10 hours to take overall measurement of a building depending upon the buildings height.
	
Placement of Micro Tremor on Roof	
	
Example of building with pure translation motion in two axes	Example of building with coupling translation motion in two axes

Vibration Shaker	
	
For better accuracy buildings were Excited with the use of Vibration Shaker building by force for better accuracy of ambient vibration measurement. At this case the exciter was placed at the roof of the building and operated for 30-40 minutes every time to take the measurement. An exited was specially designed and used for taking the measurement of this project.	

Shear strength test of binding mortar of masonry walls of Masonry Buildings

Working Procedure In Situ Masonry Testing	
	
Drilling for removal of Masonry unit	Removal Masonry unit
	
Hydraulic Jack & Bearing Plate	Giving pressure and measuring displacement

Prediction of causes of different failure patterns	Schematic view
• Horizontal Shear failure – Mortar strength < Masonry unit strength	
• Diagonal failure – If easier path is available to fail – If sufficient masonry layer are not available below of above the test zone	
• Masonry unit failure – Mortar strength > Masonry unit strength	

Quality assurance of Building Survey

Building survey in Dhaka, Chittagong and Sylhet were conducted by civil engineers and civil engineering students. To ensure the quality of survey data, graduate engineers and students from civil engineering department were engaged. In Dhaka, survey was conducted by ADPC's own team with the technical assistance from experts of AIT and NSET. In Chittagong and Sylhet the survey was conducted by the civil engineering students respectively from Civil engineering department of Chittagong University of Engineering and Technology (CUET) and Civil engineering department of Shajalal University of Science and Technology (SUST) with the technical assistance from ADPC, AIT and NSET.

The survey teams were trained by experts from NSET and AIT both in classroom lecture and field orientation. Each group was comprises with two members were engaged in the field survey. Teams were supervised by civil engineers who are experts in building assessment. Prescribed formats of checklist were used to do the survey. After completion of first 100 surveys the teams were called back to review the quality of survey and to share field experiences. After reviewing initial surveys the survey teams are given necessary instructions for remaining surveys. Survey teams were supervised by civil engineers and 10% of the survey sheets were randomly verified by the supervisors

2.2.2. Key Statistics derived from Survey Data

Correlation Matrix of Structural Type and Building Occupancy

As stated in the HAZUS MH-MR2 user manual, the loss estimates come from damage to both the structural system and the non-structural elements. In order to estimate losses, the structural system must be known, or inferred for all of buildings in the inventory. In the study area, the consulting team found that there is only inventory information that is available based on occupancy classes therefore we considered to infer the structural type from building occupancy class. To make a realistic inference, we construct the correlation matrix between structural type and building occupancy as shown in Table 2-11, 2-12 and 2-13.

Table 2-14 Correlation Matrix of structural type and building occupancy in Dhaka

Occ.	Engineered buildings													Non-engineered buildings											Total
	C1L	C1M	C1H	C2L	C2M	C2H	C3L	C3M	C3H	C4L	C4M	C4H	S1L	LCL	LCM	LCH	BCL	BCM	BFL	BLL	TSL	BAL	STM	STC	S3	
RES1	2						60	2		4	1			11	1		60	2	91	3	10	2				249
RES2A		1					238	79		2				81	20		153	6	256	7	31	4				878
RES2B		2		1	1		143	833	2	8	11			38	140	1	49	46	53	1	4	1				1,334
RES2C							1	18	3					3	7		1	6	2							41
RES3A	1	2			1	1	254	684	1	9	56			48	92		103	102	20							1,374
RES3B		7			3	1	15	937	31	1	95	7			21			52								1,170
RES3C			1		1	2	1	160	61		8	12			8			4								258
RES3D								3	12			2														17
RES4	1	3					2	5									1		2							14
RES5							10	21			2				5		2	3	6		5					54
RES6							1										5		38		55	9				108
COM1	7	4					20	4		1	1			20	10		30		182	2	13	2			7	303
COM2	1	9	6				8	12	2		2	1		1	8		1	1	11				1			64
COM3							4	1						1					3	1	3		2		3	18
COM4	2	2				2	25	26	2	1	1		1	5	2		12	5	5					1		92
COM5	2			1	1		1			1	1	1					2									10
COM6		1	2		2	2	2	12	2		2				1		2	2			1					31
COM7							9	3						3	1		4									20
COM8	1						12	3			2			4			7		8	2	1	1				41
COM9							1	1						1	1		1									5
COM10	11	54	13		5	5	307	875	43	5	28	8		133	215	1	141	58	116	15	2	1				2,036
IND1		3	2				10	21	6			1		2	2		1	1	13		2		2	2	1	69
IND2	1	2					5	7	1				1	4	1		3		28		1		2		2	58
IND3								4						1					2							7
IND4														1			1		4		1			1	2	10
IND5							1	1																		2
IND6	1	1				2	9	30	2	3	9	2			1											60
AGR1							5	3	1				1	5	1		3		10	1	6	2	1	2	1	42
REL1	16	10					58	14						12	5		11		11		3					140
GOV1	2	3			2	2	18	12	4		2	1		5			10	4	9	1		1				76
GOV2							5	2						1			3		1							12
EDU1		1			1		42	23						8	3		16	3	6		1					103
EDU2		1	5		1		11	12	1	1	2			2			5		3							44
Total	48	106	29	2	17	17	1,278	3,808	174	36	223	35	3	390	545	2	627	295	880	33	139	23	8	6	16	8,740

Table 2-15 Correlation Matrix of structural type and building occupancy in Chittagong

Occ.	Engineered buildings									Non-engineered buildings											Total
	C1L	C1M	C2L	C2M	C3L	C3M	C3H	C4L	C4M	LCL	LCM	BCL	BCM	BFL	BLL	TSL	BAL	STM	STC	S3	
RES1	12		1	2	475	5		2		132	3	67		438	6	29	154				1,326
RES2A	3		1		419	34	1	1		97	10	67	1	357	4	24	98				1,117
RES2B	2	1		1	130	117				56	37	35	8	112		5	18				522
RES2C		1			5	13				6	9	4	1	4							43
RES3A	1			1	327	243	2	2	1	80	20	47	8	44		3	3				782
RES3B			1		31	149	4			2	7	8	11	4							217
RES3C						12	8				1	1	2								24
RES4					2	1								1			1				5
RES5					11	4				3	1	9	1	15		1	2				47
RES6	1				3									43	4	50	269				370
COM1	3				52					32		19		219	1	23	48		1		398
COM2					4	15				3	6		1	2							31
COM3					5			1		2	1	1		13		6	4				33
COM4					18	11	3			5	1	10	1	9			1				59
COM5					4	1						1									6
COM6					7	4						2									13
COM7					3	2						3									8
COM8					5	2				1		3		5			3			1	20
COM9					2																2
COM10			1	1	164	106	2		1	87	34	14	4	68		3	10				495
IND1					3	2	1			2				5		1					14
IND2	1				14	19	1			6	1	3		11		2	1		2	4	65
IND3					5	1					1			5		1		1	3	3	20
IND4					2	1				1											4
IND6					3	1	1														5
AGR1					3									4		1	6			1	15
REL1					125	2				26		16		21			2				192
GOV1					17	4				2		9		4	1			1			38
GOV2					2							2		1							5
EDU1	3				124	13				22	6	27		25		3	6		1		230
EDU2					16	4	1				1	3		2		1					28
Total	26	2	4	5	1,981	766	24	6	2	565	139	351	38	1,412	16	153	626	2	7	9	6,134

Table 2-16 Correlation Matrix of structural type and building occupancy in Sylhet

Occ.	Engineered buildings										Non-engineered buildings											Total
	C1L	C1M	C2L	C2H	C3L	C3M	C3H	C4L	C4M	S1H	LCL	LCM	BCL	BCM	BFL	BLL	TSL	BAL	STM	S3	ASM	
RES1				5	464	2		55		1	210	1	17	4	643	11	23	18	1	1	13	1,469
RES2A					23	3		1			19		2		78	1	16	10			2	155
RES2B					3						1			1	13		9	4				31
RES2C				2	4						3											9
RES3A				13	497	64		54	14		149	15	14	3	123	1	4	2			1	954
RES3B					4	5	1		1		1				1							13
RES4		1	1		5	3					5	4			1							20
RES5					3						2		1		4		1					11
RES6															8		7	2			2	19
COM1	2				90			6			72	1	2	3	178		16	6				376
COM2					6	3		2			14	1			2							28
COM3					3			1			6		2		4		2	1		1		20
COM4					8						8		2		5	1						24
COM5					1																	1
COM6					3	2									1							6
COM7					4	1					1				2							8
COM8	1				4						2		1		7							15
COM9					2						1				1							4
COM10	1			2	86	8		8	4	2	52	4	4	1	38		4					214
IND1															2							2
IND2															1							1
IND3					1										2		1		1			5
IND6					1																	1
AGR1					1						4				5							10
REL1	1				31			1			11	1	1		5	1			1	1		54
GOV1					10	1							3		3	1						18
EDU1					33	4		1			3				14							55
EDU2					2										2							4
Total	5	1	1	22	1,289	96	1	129	19	3	564	27	49	12	1,143	16	83	43	3	3	18	3,527

From correlation matrix of Dhaka corporation area (Table2-11), it was observed that most engineered buildings is mid-rise (65.9%) and low-rise (22.1%) concrete frame with masonry infill wall (C3M and C3L) and most non-engineering buildings (30%) is low-rise masonry building with flexible roof (BFL). Moreover, most buildings are found in classes of mix occupancy building such as residential and commercial used (COM10) and flat and apartment (RES2 and RES3). The structural type and occupancy class are relatively more distributed among structural types and occupancy classes comparing to Chittagong and Sylhet corporation areas.

In Chittagong (Table2-12), low-rise (70.3%) and mid-rise (27.2%) concrete building with masonry infill wall occupies major proportion of engineered building. Most non-engineered building (42.6%) is low-rise masonry building with flexible roof (BFL). For the occupancy class, single house (RES1) and flat and apartment (RES2) are the major proportion in Chittagong.

Low-rise concrete building with masonry infill wall is majority of engineered building in Sylhet (82.3%). Same as Dhaka and Chittagong, masonry building with flexible roof (BFL) is the major proportion (58.3%) for non-engineered structure. Also, it was observed that single house (RES1) is the major occupancy class. The distribution among structural type and occupancy class is the lowest among 3 city corporation areas.

However, the above correlation matrixes which based on the building numbers are not reasonable to use in HAZUS program as well as in the other building vulnerabilities calculation. Then, the compatible matrixes in Dhaka, Chittagong and Sylhet are recently developed by computing the distribution percentage of buildings floor area as shown in Table 2-14, 2-15 and 2-16.

Table 2-14 Distribution Percentage of floor area for structural types within each building occupancy class in Dhaka

Occ.	C1L	C1M	C1H	LCL	LCM	C2H	C3L	C3M	C3H	C4L	C4M	C4H	Concrete	S3	S1L	Steel	BCL	BCM	BFL	BLL	Masonry	TSL	BAL	TS+BA	Total
RES1	5			10	2		71	5		3	4		55			0	63	5	29	3	44	88	12	1	100
RES2A				13	6		48	33					73			0	61	6	31	3	26	92	8	1	100
RES2B				1	9		7	80		1	2		94			0	27	63	9	1	6	85	15	0	100
RES2C				3	13		1	46	37				88			0	6	90	4		12			0	100
RES3A				2	6		12	69		1	8		89			0	28	70	2		11			0	100
RES3B		1			1		1	72	11		11	3	97			0		100			3			0	100
RES3C					1	4		29	52		2	10	99			0		100			1			0	100
RES3D								4	82			14	100			0					0			0	100
RES4	8	40					8	44					62			0	62		38		38			0	100
RES5					11		15	65			9		34			0	18	66	16		61	100		5	100
RES6							100						0			0	30		70		1	90	10	99	100
COM1	16	14		18	16		23	9		1	3		2	100		6	34		63	2	87	90	10	5	100
COM2	1	15	41	1	6		4	13	11		3	5	32			0	15	36	49		68			0	100
COM3				11			58	30					63	100		19			50	50	12	100		5	100
COM4	2	4		2	2	30	15	32	12	1	2		22		100	0	46	48	6		78			0	100
COM5	21						5			4	16	53	70			0	100				30			0	100
COM6		2	19		1	38	2	19	15		5		51			0	29	71			48	100		1	100
COM7				12	8		47	33					64			0	100				36			0	100
COM8	7			11			41	21			20		13			0	62		22	16	80	59	41	7	100
COM9				15	27		19	39					55			0	100				45			0	100
COM10	1	5	5	3	9		9	50	12		2		41			0	42	43	11	4	59			0	100
IND1		6	16	1	2		6	27	37			6	78	100		0	13	33	53		18	100		3	100
IND2	5	15		7	3		12	34	23				7	52	48	0	26		74		85	100		8	100
IND3				9				91					28			0			100		72			0	100
IND4				100									2	100		2	45		55		80	100		16	100
IND5							33	67					100			0					0			0	100
IND6	1	2			1	26	5	32	10	1	14	10	100			0					0			0	100
AGR1				15	5		19	23	37				6	35	65	4	43		44	13	75	81	19	15	100
REL1	19	19		6	4		35	17					35			0	77		23		59	100		6	100
GOV1	2	6		2		30	11	15	24		4	6	52			0	42	42	12	4	47		100	2	100
GOV2				8			50	42					9			0	91		9		91			0	100
EDU1		3		6	4		41	46					16			0	63	30	7		81	100		3	100
EDU2		3	53	1			9	21	8	1	5		53			0	85		15		47			0	100

Table 2-15 Distribution Percentage of floor area for structural types within each building occupancy class in Chittagong

Occ.	C1L	C1M	LCL	LCM	C3L	C3M	C3H	C4L	C4M	Concrete	S3	Steel	BCL	BCM	BFL	BLL	Masonry	TSL	BAL	TSL+BAL	Total
RES1	4		17		77	2				57		0	33		65	3	40	21	79	3	100
RES2A	1		13	2	70	12				66		0	37		60	2	24	26	74	10	100
RES2B	1		9	11	27	51				87		0	39	22	38		12	28	72	1	100
RES2C		6	9	25	10	51				90		0	52	32	16		10			0	100
RES3A			7	3	35	53				94		0	59	25	17		6	59	41	0	100
RES3B				3	8	79	10			94		0	22	75	3		6			0	100
RES3C				1		24	75			96		0	17	83			4			0	100
RES3D						100				100		0					0			0	100
RES4					49	51				92		0			100		5		100	3	100
RES5			10	6	48	36				66		0	56	16	28		33	42	58	1	100
RES6	39				61					8		0			78	22	19	21	79	73	100
COM1	7		30		63					53		0	22		77		40	41	59	7	100
COM2			5	19	9	67				95		0		80	20		5			0	100
COM3			18	17	57			8		62		0	20		80		26	68	32	12	100
COM4			5	2	24	30	39			87		0	66	16	18		13		100	0	100
COM5					66	34				89		0	100				11			0	100
COM6					46	54				91		0	100				9			0	100
COM7					42	58				77		0	100				23			0	100
COM8			8		50	42				69	100	5	66		34		23		100	3	100
COM9					100					86		0					14			0	100
COM10			13	9	31	42	4		1	88		0	31	22	46		11	30	70	1	100
IND1			8		16	22	53			96		0			100		3	100		1	100
IND2	3		7	2	20	55	14			90	100	4	47		53		6	74	26	1	100
IND3				17	59	24				71	100	18			100		9	100		2	100
IND4			16		41	43				75		0					25			0	100
IND5					100					70	100	3			100		28			0	100
IND6					20	14	66			93		0					4	19	81	3	100
AGR1					100					54	100	13			100		16		100	18	100
REL1			14		84	3				90		0	72		28		10			0	100
GOV1			6		63	31				77		0	81		11	8	23			0	100
GOV2					100					90		0	87		13		10	42	58	0	100
EDU1	3		9	5	68	15				87		0	78		22		12	100		1	100
EDU2				4	45	23	28			93		0	83		17		7			1	100

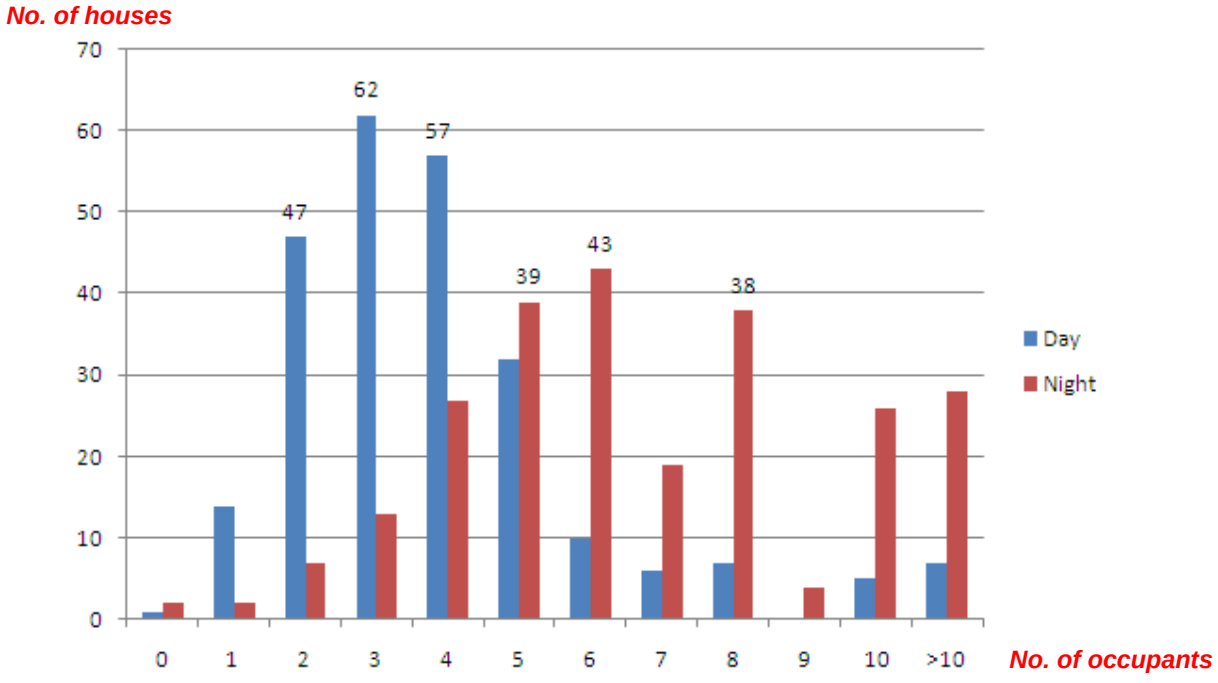
Table 2-16 Distribution Percentage of floor area for structural types within each building occupancy class in Sylhet

Occ.	C1L	LCL	LCM	C2H	C3L	C3M	C3H	C4L	C4M	C4H	Concrete	S3	S1H	Steel	BCL	BCM	BFL	BLL	Masonry	TSL	BAL	TSL+BAL	Total
RES1		10			53	33		4			43	21	79	0	2		98		52	89	11	5	100
RES2A		2			75	21		1	1		90			0	1		99		8	88	12	2	100
RES2B					22	77					96			0		2	98		2	68	32	1	100
RES2C		2		2	74	22					100			0					0			0	100
RES3A		8			49	28	2	8	4		87	100		0	27	1	72		12	98	2	0	100
RES3B		1	1		7	44	6		14	27	98			0			100		2			0	100
RES3C						32	34		34		100			0					0			0	100
RES4		3	2		20	40		35			100			0	100				0			0	100
RES5		8			85	7					53			0	39		61		45	100		2	100
RES6		27			14	5	55				9			0			99	1	59	89	11	33	100
COM1		21			53	24		2			45			0	7		92		49	97	3	6	100
COM2		36	1		22	27	4	5	4	1	96			0			100		4	100		0	100
COM3		4			53	14		28			43	100		1			100		40	84	16	16	100
COM4		7			25	18			1	49	95			0	8		90	2	5			0	100
COM5		1			25	24		7	9	32	96			0	57		43		4	100		0	100
COM6		1			75	21		3			96			0			100		2	100		2	100
COM7		2			32	65		1			96			0			100		3	100		0	100
COM8	5	15			39	41					69			0	10		90		26	100		5	100
COM9					38	62					97			0			100		3			0	100
COM10		13	1		37	28	8	8	3	2	90	94	6	0	6		94		9	100		1	100
IND1		7			4	88					13			0			100		85	100		2	100
IND2					56	44					49			0	2		98		51			0	100
IND3		11			71	19					30			0	1		99		53	100		17	100
IND6		3			11	65	16	5			99			0			100		1			0	100
AGR1		45			39	16					22			0			100		63	94	6	15	100
REL1	1	10	1		72	9		6			77			0	51		49		21	78	22	2	100
GOV1		2	3		50	44		1			88			0	13		85	1	11	100		0	100
GOV2					9	91					95			0			100		5			0	100
EDU1		8			52	27		2	1	11	84			0	7		93		16	100		1	100
EDU2		1			44	48		3	4		87			0	6		94		13			0	100

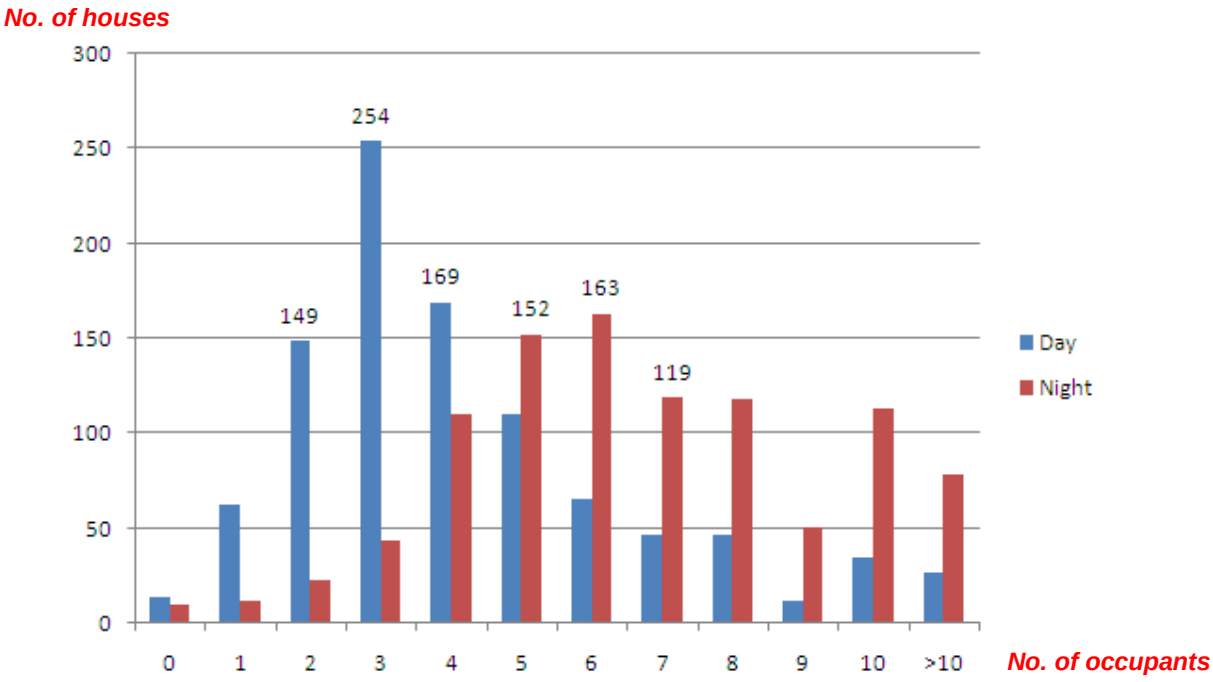
Relationships between Occupancy and Number of Building Occupants

Number of building occupants is an important parameter for earthquake loss estimation of a number of casualties, a number of refugees and etc. Due to difference in number of building occupants during day and night, it is also important to know the number of building occupants in the different period of time. Idealistically, we would prefer to use the exact number of occupants in each occupancy class however such a data is not exist in Bangladesh and it is impossible for the scope in this project to conduct such a survey for every building in the 3 city corporation areas.

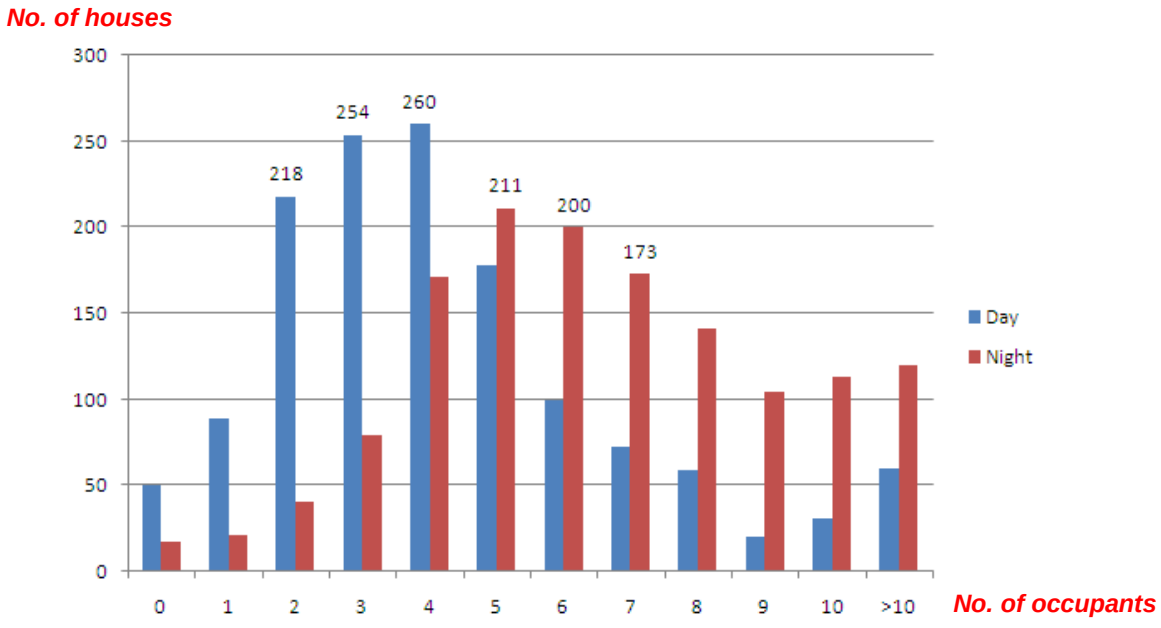
Because data of occupancy class is available in building stock of the study areas, we can alternatively approximate the number of building occupant if we know the relationship between number of building occupants and occupancy class. In this study, we used the approximating method developed in ATC-13 to estimate the number of building occupants. In this method, a number of occupants in each building occupancy classes are calculated using an average number of occupants per floor area times the building floor area. This average number was computed using weight arithmetic mean (see equation 2-1). It is important to note that this approximating method can be used to estimate the number of building occupant in most occupancy class however there is only exceptional occupancy class in RES1 type which represents the single house. Statistic analysis result showed that, for this occupancy class, the ratio between the number of occupants in both daytime and nighttime cannot be related to the building floor area. To solve this problem, we estimated the number of occupants in RES1 type using the ratio between a number of the occupants in each single house and number of occupants in this occupancy class from sample buildings instead.



Graph 2-13 Frequency of the Number of Occupants in Single House at Day and Night in Dhaka



Graph 2-14 Frequency of the Number of Occupants in Single House at Day and Night in Chittagong



Graph 2-15 Frequency of the Number of Occupants in Single House at Day and Night in Sylhet

The data in Graph 2-1 to 2-3 indicate that the number of occupants of RES1 in a day was mostly 3-4 people, while there were 5-6 people at night. Thus, the number of occupants of RES1 type (single house) at night was larger than the day time.

A relation between weight arithmetic mean and variation of the number of occupants per floor area during a day and night time can be found as the following:

Weight Arithmetic Mean $$\overline{\mathrm{X}} = \frac{1}{\mathrm{N}} \sum_{\mathrm{i}=1}^{\mathrm{N}} \frac{\mathrm{X_i A_i}}{\overline{\mathrm{A}}} \qquad (2\text{-}1)$$

Variation $$\sigma^2 = \frac{1}{N-1} \sum_{i=1}^{N} \frac{\left(X_i - \overline{X}\right)^2 A_i}{\overline{A}} \qquad (2\text{-}2)$$

Where; X_i is Number of Occupants per Using Area of Building i

A_i is Using Area of Building i

N is Number of Building

$$\overline{A} = \frac{1}{N} \sum_{i=1}^{N} A_i$$

When; $\frac{A_i}{\overline{A}}$ is a weight factor for the data X_i in weight arithmetic mean

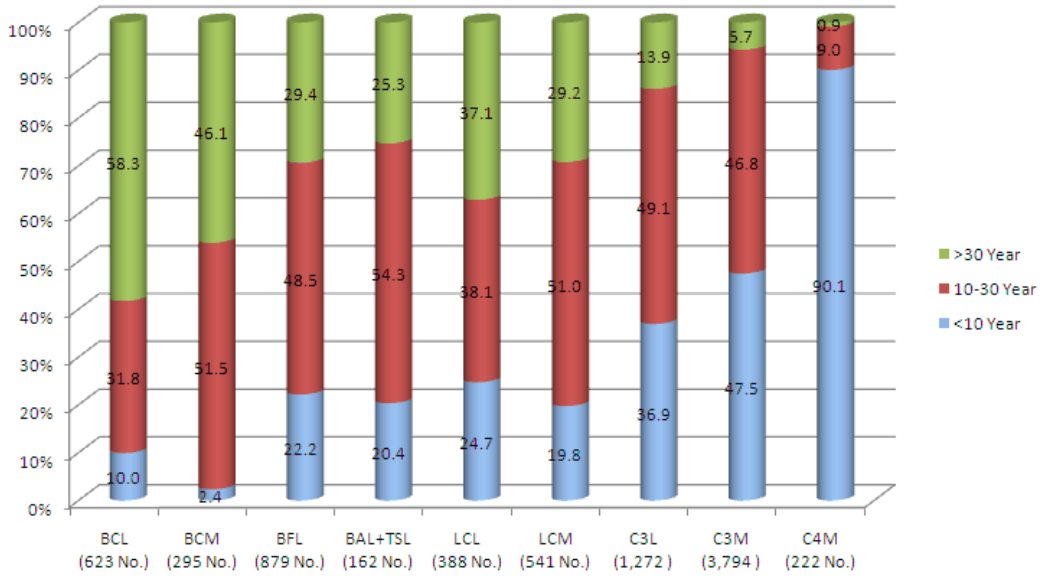
From the equation 2-1 and 2-2, the comparison between weight arithmetic mean of the number of occupants per floor area and ATC-13 report is appeared in Table 2-17.

Table 2-17 The average number of occupants per building floor area in each occupancy classes

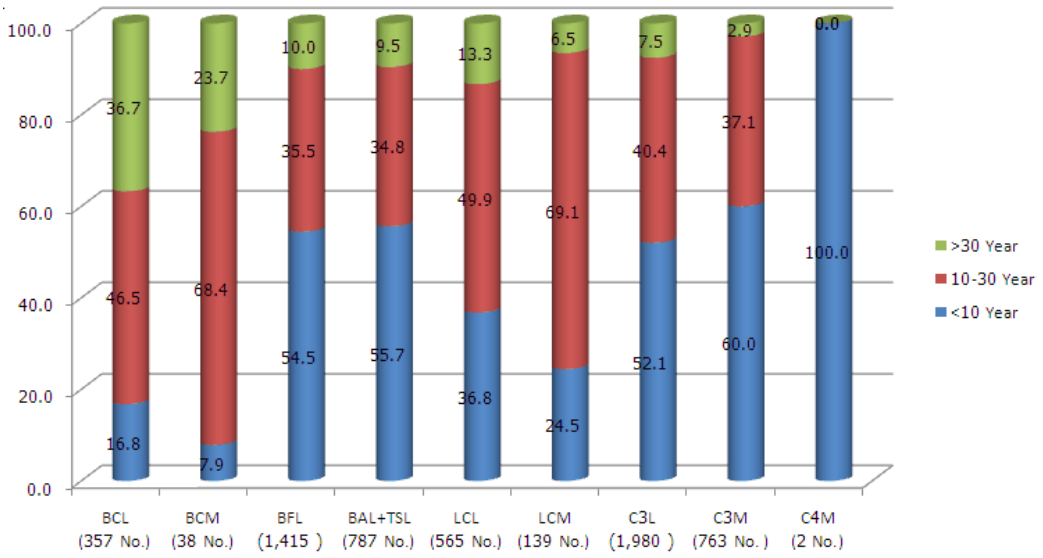
No.	Occupancy	Population per 100 sq.m										
		X ± σ Dhaka			X ± σ Chittagong			X ± σ Sylhet			ATC-13	
		Total	Day	Night	Total	Day	Night	Total	Day	Night	Day	Night
1	RES1	248	Graph 2-1		993	Graph 2-2		1,392	Graph 2-3		1.29	3.33
2	RES2A	788	10.82 ± 5.00	23.64 ± 1.17	1,017	6.54 ± 6.23	12.28 ± 1.43	130	5.88 ± 6.47	10.26 ± 11.57		
3	RES2B	1,257	10.14 ± 5.38	21.33 ± 1.14	484	11.49 ± 9.88	22.48 ± 1.28	27	10.04 ± 10.92	22.90 ± 23.06		
4	RES2C	39	6.01 ± 4.90	11.77 ± 8.78	40	26.74 ± 18.71	54.42 ± 1.21	8	2.63 ± 1.47	4.02 ± 2.92		
5	RES3A	1,317	2.37 ± 1.53	4.71 ± 3.03	737	8.41 ± 7.22	14.90 ± 1.30	896	2.65 ± 2.62	4.37 ± 3.59	2.15	3.23
6	RES3B	1,138	2.27 ± 1.69	4.45 ± 3.25	213	11.43 ± 8.41	20.47 ± 1.22	13	3.40 ± 2.62	5.61 ± 3.59	2.15	3.23
7	RES3C	245	1.83 ± 1.40	3.48 ± 2.22	23	15.83 ± 12.63	27.62 ± 1.29				2.15	3.23
8	RES3D	16	1.64 ± 1.70	3.28 ± 2.73							2.15	3.23
9	RES4	14	2.31 ± 1.79	3.56 ± 2.55	4	15.37 ± 16.03	29.86 ± 1.57	20	3.64 ± 3.30	6.13 ± 5.82	0.65	2.69
10	RES5	48	8.18 ± 7.03	12.61 ± 9.56	45	5.81 ± 5.40	19.14 ± 1.45	10	3.59 ± 4.18	5.79 ± 5.48	2.15	3.23
11	RES6	103	11.12 ± 9.74	22.20 ± 18.01	269	6.72 ± 6.64	14.16 ± 1.37	18	22.25 ± 21.05	45.13 ± 35.75		
12	COM1	259	11.16 ± 11.03	1.64 ± 5.10	339	7.89 ± 9.42	1.73 ± 0.62	332	7.18 ± 7.11	1.07 ± 3.32	10.76	0
13	COM2	58	9.92 ± 8.10	0.50 ± 1.34	24	85.69 ± 70.42	43.97 ± 1.72	24	5.21 ± 5.66	0.64 ± 1.08	10.76	0
14	COM3	17	3.87 ± 3.47	0.74 ± 1.29	31	6.36 ± 6.42	1.93 ± 1.80	17	11.13 ± 11.02	1.71 ± 1.76	4.31	0.11
15	COM4	81	5.02 ± 4.70	0.44 ± 1.46	43	7.59 ± 10.30	0.57 ± 2.57	18	5.02 ± 5.43	0.69 ± 1.12	4.31	0
16	COM5	9	12.10 ± 4.01	0.20 ± 0.18	4	11.31 ± 9.38	1.04 ± 1.94				4.31	0
17	COM6	28	12.44 ± 12.31	7.80 ± 8.20	11	18.49 ± 25.94	12.40 ± 1.98	6	23.63 ± 9.38	20.53 ± 6.94	5.38	2.15
18	COM7	19	5.94 ± 5.80	0.88 ± 1.18	6	14.62 ± 14.79	2.94 ± 1.55	8	3.78 ± 4.69	1.83 ± 0.69	5.38	2.15
19	COM8	35	5.10 ± 7.40	0.33 ± 1.60	15	27.16 ± 24.89	18.20 ± 1.72	10	43.01 ± 27.56	1.35 ± 1.33	6.46	0
20	COM9	5	4.69 ± 1.90	1.61 ± 1.58	2	24.31 ± 17.01	19.35 ± 1.59	4	36.30 ± 29.86	3.02 ± 4.00	6.46	0
21	COM10	1,865	6.24 ± 6.86	3.30 ± 4.26	422	16.28 ± 15.29	12.85 ± 1.41	184	5.59 ± 5.71	4.18 ± 4.66	10.76	0
22	IND1	69	15.50 ± 15.16	0.92 ± 3.32	12	19.91 ± 20.96	3.37 ± 2.19	6	3.45 ± 5.50	2.53 ± 5.03	3.23	0.32
23	IND2	53	8.46 ± 10.16	1.59 ± 2.81	50	18.58 ± 23.93	2.07 ± 2.55				5.38	0.32
24	IND3	15	9.35 ± 9.38	1.52 ± 3.11	15	1.50 ± 2.74	0.28 ± 2.51				2.69	0.32
25	IND4				4	5.52 ± 10.99	0.80 ± 1.80				1.29	0.11
26	IND5										3.23	0.32
27	IND6	50	1.05 ± 1.40	0.67 ± 1.64	4	26.44 ± 31.55	2.95 ± 1.86				4.31	0.11
28	AGR1	36	2.07 ± 2.99	0.81 ± 2.66	10	3.33 ± 3.70	0.47 ± 1.60	4	7.01 ± 11.03	0.13 ± 0.21	1.08	0
29	REL1	122	16.64 ± 14.75	2.55 ± 4.76	106	36.83 ± 28.82	15.36 ± 1.94	45	44.06 ± 38.57	1.12 ± 6.87	69.97	0
30	GOV1	73	2.82 ± 3.56	0.25 ± 0.70	30	5.42 ± 8.58	0.72 ± 6.51	15	9.31 ± 9.21	3.60 ± 4.67	4.31	0
31	GOV2	10	5.48 ± 3.04	2.95 ± 6.64	4	8.89 ± 9.50	11.67 ± 1.55				3.23	0.43
32	EDU1	84	41.81 ± 24.58	0.37 ± 1.28	100	45.19 ± 53.88	3.15 ± 3.88	37	30.95 ± 23.99	4.24 ± 5.64	21.53	0
33	EDU2	38	20.88 ± 14.97	0.65 ± 1.84	15	42.46 ± 36.67	0.28 ± 1.66	4	22.86 ± 9.15	0.02 ± 0.02	21.53	0
Total		***8,139***			***5,072***			***3,228***				

Relationships between Structural Type and Building Age

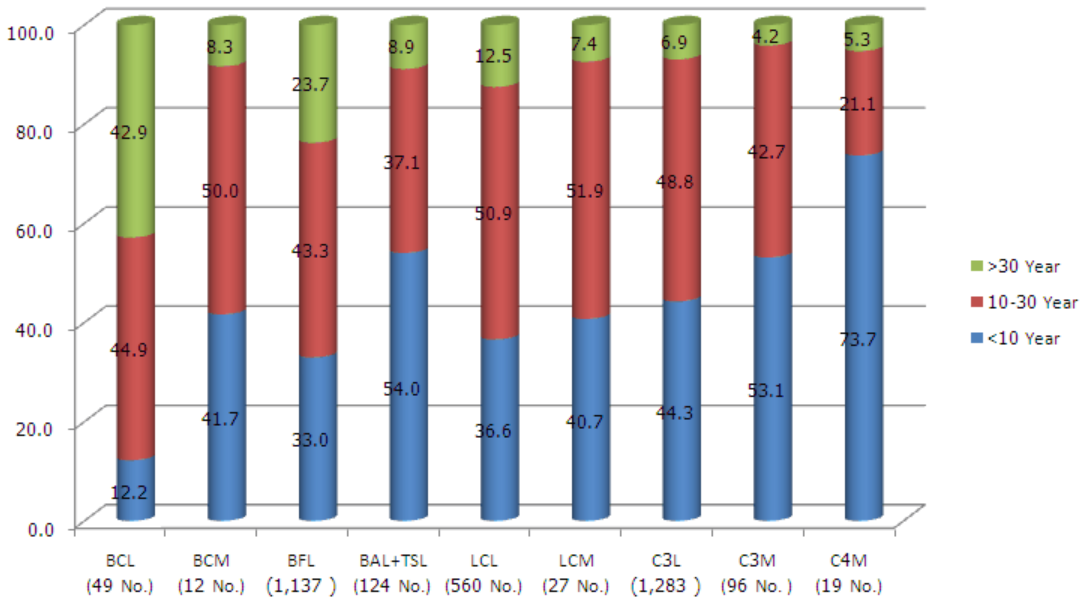
In the local construction practice, the popularity in application of each structural type is varied by era. For example, most of concrete slab-column frames (C4) were built during the last decade while masonry buildings with concrete floor (BC) were constructed more than 30 years ago. Relationships between structural type and building age for the three cities are demonstrated in Graph 2-4 to 2-6.



Graph 2-16 Relationships between Structural Type and Building Age for Dhaka



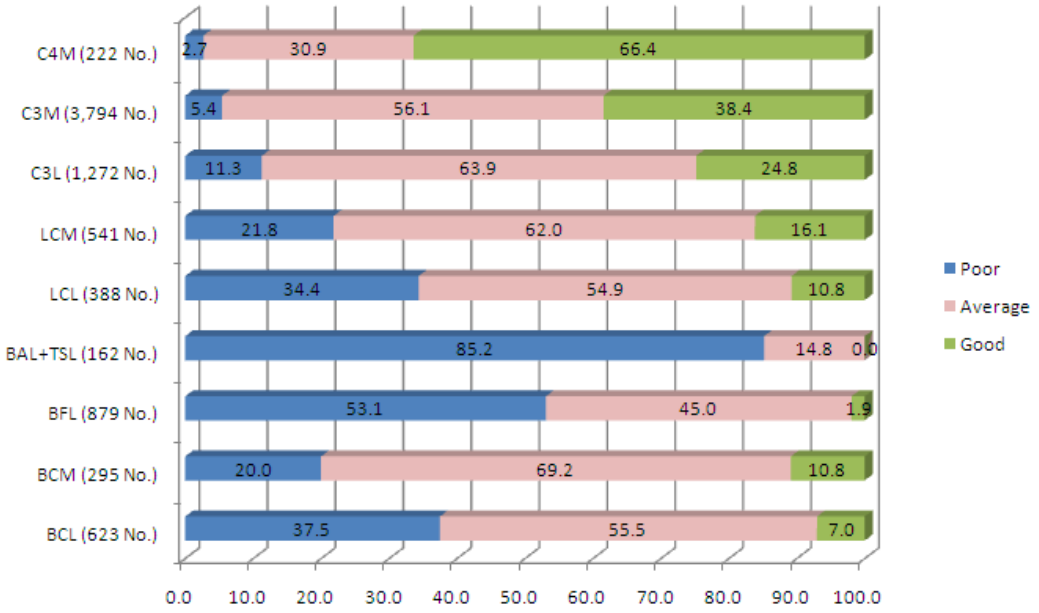
Graph 2-17 Relationships between Structural Type and Building Age for Chittagong



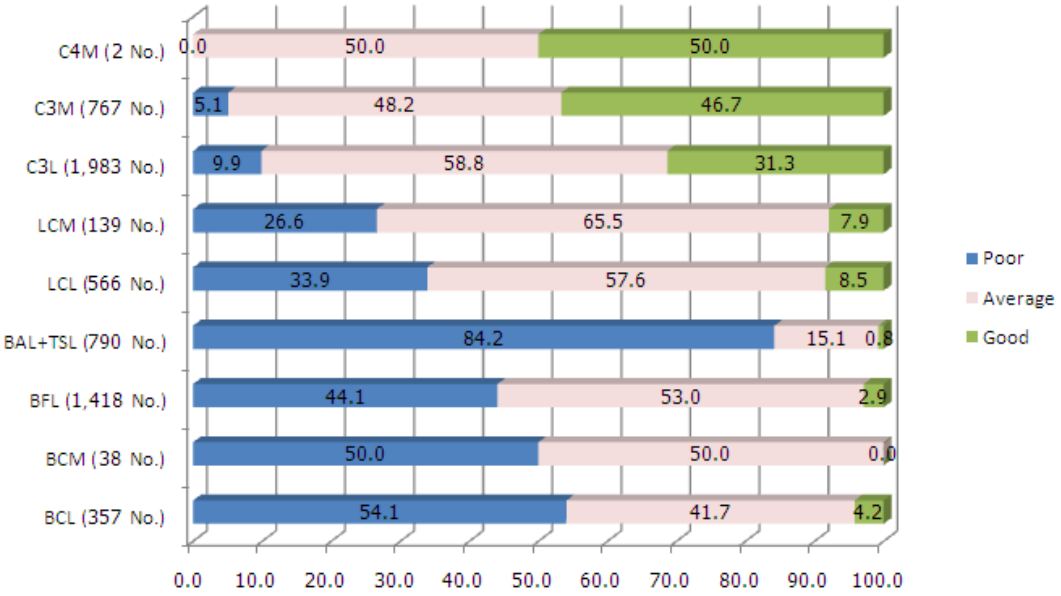
Graph 2-18 Relationships between Structural Type and Building Age for Sylhet

Relationships between Structural Type and Apparent Building Quality

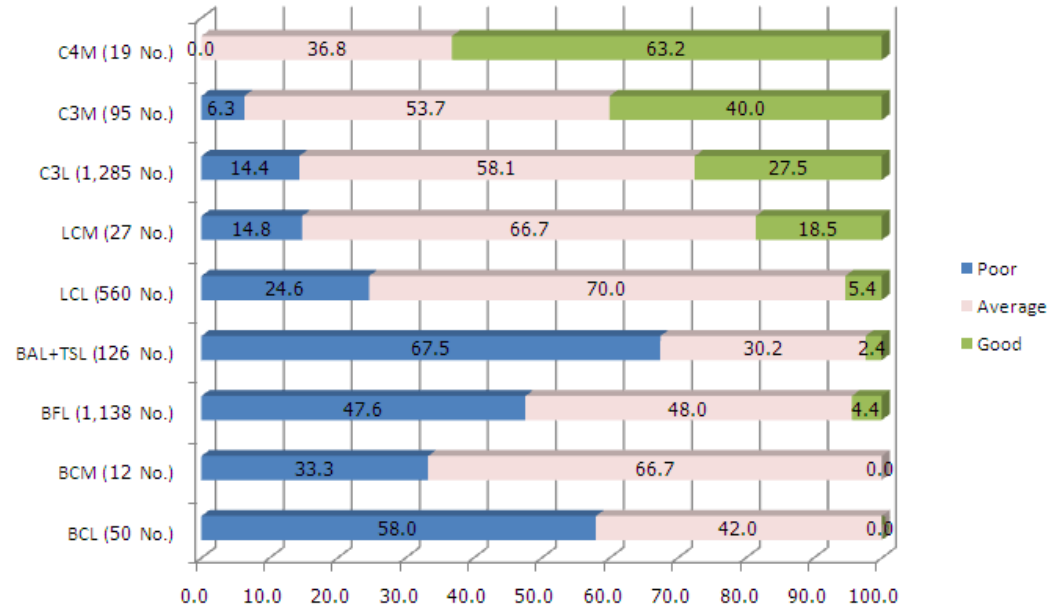
According to Turkish method [Turkish method, 2005], the level of building damage during earthquakes depends on the apparent building quality which is, in turn, related to the quality of construction materials, workmanships and building maintenance. Well-trained observers can classify a building's quality as roughly good, moderate, or poor. From the survey results, relationships between apparent building quality and structural type in the three cities are illustrated in Graph 2-7 to 2-9.



Graph 2-19 ***Relationships between Structural Type and Apparent Building Quality for Dhaka***



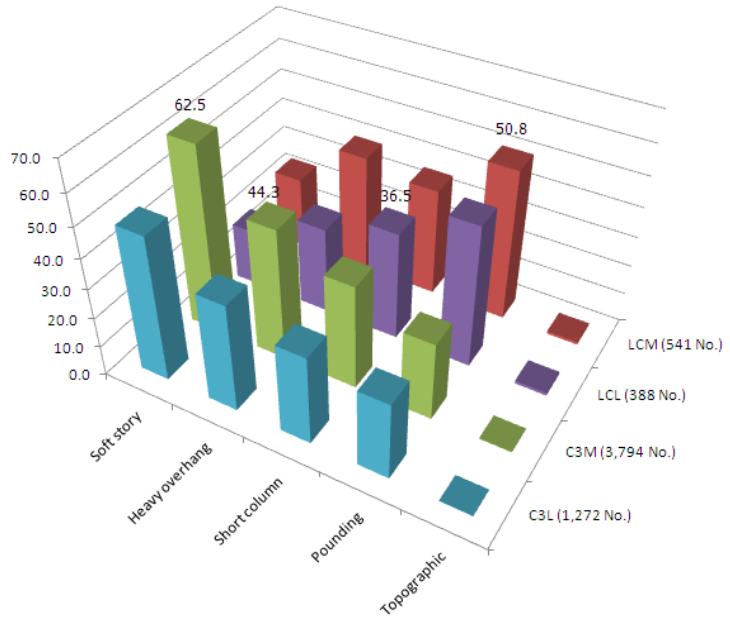
Graph 2-20 ***Relationships between Structural Type and Apparent Building Quality for Chittagong***



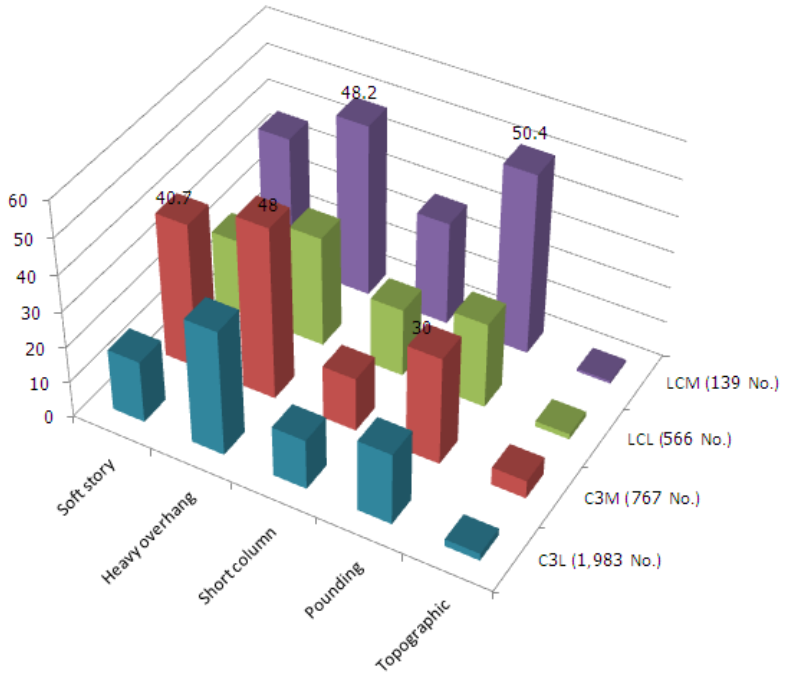
Graph 2-21 ***Relationships between Structural Type and Apparent Building Quality for Sylhet***

Relationships between Structural Type and Vulnerability factors

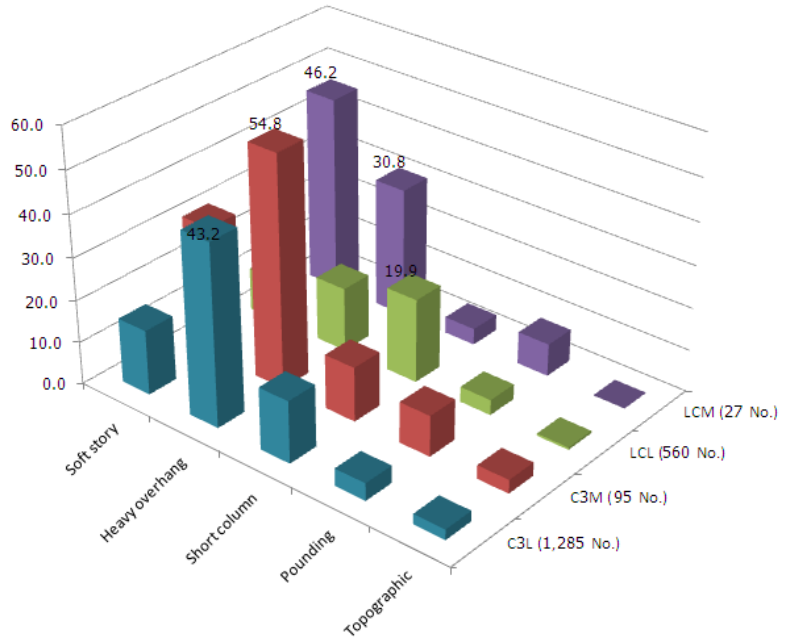
For concrete buildings, 5 significant vulnerability factors are observed including (1) soft story, (2) heavy overhang, (3) short column, (4) pounding possibility between adjacent buildings, and (5) topographic effects (buildings constructed on slope ground). Relationships between structural type and the presence of the above vulnerability factors are shown in Graph 2-10 to 2-12. Note that such relationships for structural types contributing major portion of the building population are only shown here.



Graph 2-22 Relationships between Structural Type and Presence of Vulnerability Factors for Dhaka



Graph 2-23 Relationships between Structural Type and Presence of Vulnerability Factors for Chittagong



Graph 2-24 Relationships between Structural Type and Presence of Vulnerability Factors for Sylhet

Soft Story

Among the surveyed buildings in Dhaka, about 53% were found with soft story. Soft story is commonly present in the recently constructed buildings where ground floor is used as a car park. Presence of soft story in Chittagong and Sylhet is, respectively, 24% and 15% which is comparatively less than in Dhaka.

Figure 2-8 Ground floor being Used as Car Park: One of the Typical Buildings in Dhaka

Heavy Overhang

Among the surveyed buildings under this project, about 41% of buildings in Dhaka were found with heavy overhangs. These buildings were found in both old and new city areas. Significant

portion of buildings with heavy overhangs were also found in Chittagong and Sylhet, i.e. 38% and 36%, respectively.

Figure 2-9 Typical Heavy Overhangs found in the old part of Dhaka City

Short Columns

Earthquake damage in short columns is pretty common. For an example, it was observed after the August 17th, 1999 earthquake in Turkey (Mw=7.4) that a large number of buildings were damaged due to the presence of short columns. During this study, the presence of short columns was found in 34%, 15%, and 16% of buildings in Dhaka, Chittagong, and Sylhet, respectively. There might be a substantial short column effect in the three cities as well, if a major earthquake event occurs.

Damage of short column (17 August 1999 in Adapazarı-Turkey)

Presence of Short Colum in the building in Dhaka

Figure 2-10 Short Column

Replacement Cost and Content Cost

Initially, it was planned to obtain the replacement cost from the field survey. However, it was quite difficult to get such information. As a consequence, it was decided to collect the replacement cost from local real estate companies and building contractor associations. The data was obtained in the form of construction cost per unit floor area for various building occupancy classes. The name of identities who supplied the data is listed as follows;

- *Apartment design & Development Ltd. (Dhaka: Source1)*
- *Trimline Consultants Ltd. (Dhaka: Source2)*
- *Dalan Kotha Ltd. (Dhaka: Source3)*

Replacement cost can be calculated by using the below equation:

Replacement cost = Construction cost per floor are x Building floor area

Table 2-18 The average cost per floor area from 3 sources of Dhaka compares with US cost (x0.2)

No.	Occupancy	TK. per Sq-ft				US. Dollars per Sq-ft.	
		Source1	Source2	Source3	Average	Average	USx0.2
1	**Residential Buildings**						
1.1	Single Family Dwelling (House)	*1,250*	*900*	*1,200*	*1,117*	*16.4*	*14.0*
1.2	Minimum Standard Housing	*1,100*	*1,100*	*950*	*1,050*	*15.4*	-
1.3	Multi Family Dwelling	*1,250*	*1,200*	*1,200*	*1,217*	*17.9*	*22.6*
	(Apartment/Condominium/Flat)						
1.4	Hotel/Motel	*1,250*	*1,700*	*1,200*	*1,383*	*20.3*	*20.1*
1.5	Institutional Dormitory	*1,200*	*1,200*	*1,200*	*1,200*	*17.6*	*22.1*
1.6	Sub-Standard Housing	-	-	-	-	-	-
	(Bamboo/Thin-shed)						
2	**Commercial Buildings**						
2.1	Small Shops (Street-side Shops)	*1,200*	*1,100*	*950*	*1,083*	*15.9*	*15.1*
2.2	Large Shops and Markets	*1,350*	*1,800*	*1,300*	*1,483*	*21.8*	*16.0*
	(Shopping Malls, Complex)						
2.3	Office Buildings	*1,250*	*2,400*	*1,350*	*1,667*	*24.5*	*19.3*
2.4	Banks	*1,250*	*2,400*	*1,350*	*1,667*	*24.5*	*30.8*
2.5	Hospitals	*1,450*	*2,000*	*1,550*	*1,667*	*24.5*	*27.0*
2.6	Mixed occupancy (COM10)	*1,500*	*2,300*	*1,450*	*1,750*	*25.7*	-
3	**Industrial Buildings**	*1,050*	*1,100*	*1,050*	*1,067*	*15.7*	*15.2*
4	**Mosque/Non-Profit Buildings**	*1,350*	*1,200*	*950*	*1,167*	*17.2*	*22.8*
5	**Government Buildings**						
5.1	General Services	*1,105*	*1,200*	*1,105*	*1,137*	*16.7*	*22.3*
	(Government office, Post office)						
5.2	Emergency Response	*1,205*	*1,200*	*1,205*	*1,203*	*17.7*	*23.5*
	(Police station, Fire station)						
6	**Education Buildings**						
6.1	Grade Schools	*1,200*	*1,200*	*1,200*	*1,200*	*17.6*	*19.8*
	(High school, Religious school)						
6.2	Colleges/Universities	*1,400*	*1,400*	*1,400*	*1,400*	*20.6*	*21.9*

The easiest and most effective method to evaluate the content cost is to calculate it as a fraction of the building replacement cost, *CV*, as shown in the equation below.

Content Cost = CV x Replacement cost

Due to some difficulties in obtaining the appropriate value of *CV* for Bangladesh, the standard values provided by HAZUS was adopted in this project. It is also important to note that CV is not a constant but depends on occupancy class. The adopted values of CV for each occupancy class are listed in Table 2-19.

Table 2-19 Content Value (CV) of Content Cost, separated by Building Occupancy

No.	Label	Occupancy Class	Contents Value (%)
		Residential	
1	RES1	Single Family Dwelling	*50*
2	RES2	Mobile Home	*50*
3	RES3	Multi Family Dwelling	*50*
4	RES4	Temporary Lodging	*50*
5	RES5	Institutional Dormitory	*50*
6	RES6	Nursing Home	*50*
		Commercial	
7	COM1	Retail Trade	*100*
8	COM2	Wholesale Trade	*100*
9	COM3	Personal and Repair Services	*100*
10	COM4	Professional/Technical/ Business Services	*100*
11	COM5	Banks	*100*
12	COM6	Hospital	*150*
13	COM7	Medical Office/Clinic	*150*
14	COM8	Entertainment & Recreation	*100*
15	COM9	Theaters	*100*
16	COM10	Parking	*50*
		Industrial	
17	IND1	Heavy	*150*
18	IND2	Light	*150*
19	IND3	Food/Drugs/Chemicals	*150*
20	IND4	Metals/Minerals Processing	*150*
21	IND5	High Technology	*150*
22	IND6	Construction	*100*
		Agriculture	
23	AGR1	Agriculture	*100*
		Religion/Non/Profit	
24	REL1	Church/Membership Organization	*100*
		Government	
25	GOV1	General Services	*100*
26	GOV2	Emergency Response	*150*
		Education	
27	EDU1	Schools/Libraries	*100*
28	EDU2	Colleges/Universities	*150*

2.2.3. General Building Stock

The general building stock, a GIS database required for the development the building vulnerability maps, was developed from the available GIS databases in Bangladesh. The statistics obtained from the survey work was incorporated into the developed general building stock to fulfill the HAZUS requirements. Data contained in the general building stock includes building numbers, building density, occupancy classes, structural types, age of buildings, building qualities, number of occupants and vulnerability factors. These data are divided into both ward level (shown in this report) and cluster level (demonstrated in the annex). Table 2-20 to 2-22 give the ward-wise distribution of building numbers and building density in the three cities. Others are shown in the next chapter (topic 3.1 to 3.5).

Table 2-20 Number of the Buildings of Dhaka in Ward level

Ward	Area (Km^2)	Building Number (No.)	Building Density(No./Km^2)	Ward	Area (Km^2)	Building Number (No.)	Building Density(No./Km^2)
1	5.599	8,182	1,461	41	0.979	1,426	1,457
2	1.884	6,114	3,245	42	0.606	2,621	4,325
3	1.314	4,695	3,573	43	1.689	5,263	3,116
4	1.124	2,181	1,940	44	0.552	2,163	3,918
5	1.190	5,981	5,026	45	1.341	2,360	1,760
6	2.796	10,452	3,738	46	5.441	6,794	1,249
7	0.972	2,786	2,866	47	1.281	3,910	3,052
8	4.153	6,380	1,536	48	1.355	4,981	3,676
9	1.439	3,796	2,638	49	2.251	2,729	1,212
10	2.127	5,878	2,764	50	0.666	2,778	4,171
11	1.191	3,101	2,604	51	0.823	2,281	2,772
12	0.840	3,373	4,015	52	1.693	1,632	964
13	3.022	12,114	4,009	53	1.829	1,861	1,017
14	1.478	5,307	3,591	54	1.066	3,314	3,109
15	4.601	13,141	2,856	55	0.829	3,228	3,894
16	4.588	7,953	1,733	56	2.095	1,444	689
17	6.199	12,376	1,996	57	1.829	1,353	740
18	1.403	3,529	2,515	58	0.898	4,692	5,225
19	5.279	7,323	1,387	59	0.585	2,318	3,962
20	1.853	4,467	2,411	60	0.422	3,427	8,121
21	1.597	6,482	4,059	61	0.313	1,694	5,412
22	1.571	6,140	3,908	62	0.899	1,629	1,812
23	0.771	2,563	3,324	63	0.471	1,189	2,524
24	0.805	2,742	3,406	64	0.204	1,266	6,206
25	0.986	4,608	4,673	65	0.478	3,210	6,715
26	1.972	5,294	2,685	66	0.384	1,444	3,760
27	0.890	3,730	4,191	67	0.448	1,339	2,989
28	0.942	3,632	3,856	68	0.266	1,563	5,876
29	0.588	3,057	5,199	69	0.443	2,864	6,465
30	0.435	2,351	5,405	70	0.340	1,659	4,879
31	0.931	1,864	2,002	71	0.253	1,557	6,154
32	1.016	1,561	1,536	72	0.205	1,062	5,180
33	0.433	404	933	73	0.369	839	2,274
34	0.780	2,097	2,688	74	0.405	2,334	5,763
35	0.497	2,014	4,052	75	0.542	2,071	3,821
36	1.285	1,785	1,389	76	0.545	3,083	5,657
37	3.081	3,901	1,266	77	0.420	2,360	5,619
38	1.101	2,889	2,624	78	0.292	1,588	5,438
39	1.162	2,609	2,245	79	0.371	2,440	6,577
40	3.440	3,075	894	80	0.245	1,681	6,861

Table 2-20 Number of the Buildings of Dhaka in Ward Level (Con't)

Ward	Area (Km^2)	Building Number (No.)	Building Density(No./Km^2)
81	0.543	3,300	6,077
82	0.434	2,572	5,926
83	0.546	3,088	5,656
84	0.716	3,785	5,286
85	0.907	4,412	4,864
86	0.834	3,658	4,386
87	0.644	4,530	7,034
88	0.459	2,855	6,220
89	0.669	4,386	6,556
90	0.753	4,865	6,461
Total	119.96	326,825	2,725

Table 2-21 Number of the Buildings of Chittagong in Ward level

Ward	Area (Km^2)	Building Number (No.)	Building Density(No./Km^2)
1	23.64	5,800	245
2	14.60	9,181	629
3	4.15	4,783	1,154
4	9.85	11,024	1,119
5	6.84	5,868	858
6	2.71	6,529	2,412
7	4.00	8,298	2,072
8	6.24	10,807	1,731
9	6.27	8,088	1,291
10	5.48	4,290	783
11	5.41	5,526	1,021
12	2.43	5,313	2,191
13	3.33	5,971	1,793
14	1.21	2,951	2,429
15	1.73	2,636	1,525
16	2.37	4,517	1,909
17	1.99	4,212	2,119
18	4.24	5,076	1,198
19	0.84	2,839	3,374
20	0.40	1,409	3,552
21	0.78	2,094	2,694
22	0.80	2,004	2,520
23	0.58	2,185	3,796
24	2.66	7,517	2,827
25	2.04	4,709	2,303
26	6.12	3,526	576
27	1.51	3,031	2,004
28	1.09	3,172	2,922
29	0.66	2,541	3,876
30	0.83	2,940	3,539
31	0.64	1,281	2,000
32	0.86	1,573	1,824
33	0.48	2,077	4,315
34	0.58	2,040	3,493
35	1.59	1,999	1,255
36	1.53	2,363	1,545
37	3.71	2,211	596
38	4.77	5,716	1,198
39	8.51	4,558	536
40	10.44	5,685	545
41	11.47	3,937	343
Total	169.36	182,277	1,076

Table 2-22 Number of the Buildings of Sylhet in Ward level

Ward	Area (Km^2)	Building Number (No.)	Building Density(No./Km^2)
1	0.52	1,368	2,644
2	0.58	978	1,693
3	1.30	1,337	1,027
4	0.90	1,226	1,355
5	0.65	2,068	3,172
6	0.60	1,366	2,288
7	1.85	3,242	1,751
8	2.18	3,558	1,630
9	1.57	2,801	1,789
10	1.16	2,593	2,239
11	0.51	1,785	3,534
12	0.42	1,594	3,758
13	0.59	1,635	2,792
14	0.84	1,766	2,093
15	0.68	1,215	1,778
16	0.70	1,334	1,893
17	0.94	1,924	2,039
18	0.86	1,915	2,239
19	0.76	1,987	2,608
20	1.11	1,986	1,795
21	0.42	2,363	5,598
22	0.46	1,490	3,218
23	1.00	849	845
24	1.06	2,455	2,315
25	1.94	2,118	1,093
26	1.34	2,584	1,924
27	2.01	2,639	1,312
Total	26.96	52,176	1,935

2.3.Lifeline and Essential Facilities

This section discusses the process of data collection and database development for lifeline and essential facilitiy. The lifeline include transportation system and utility system. While essential facility include medical care facilities, emergency response facilities, and schools.

For earthquake vulnerability assessment all lifeline facilities and essential facilities have been incorporated with the base map. Exposed lifeline features have been surveyed. However, underground installations records have been collected from respective organizations and incorporated in the main map.

2.3.1. Lifeline

The lifeline information that have been collected and incorporated here with this report includes transportation system and utility system. In the 3 cities, transportation system consists of (i) highway transportation system, (ii) railway transportation system, (iii) bus transportation system, and (iv) ferry transportation system. While utility system consists of (i) potable water system, (ii) natural gas system, (iii) electricity power system, and (iv) communication system, and for Dhaka (v) waste water or sewage network. Acquiring the lifeline data , the previously developed base map was always used as a reference. Following are the details on the sources and type of information have been collected and incorporated for this project in Dhaka, Chittagong and Sylhet.

2.3.1.1. Highway Transportation System

Highway transportation system consists of the road network and highway bridge. They were identified and digitized from Quickbird Images and field surveyed for verification and acquiring relevant detail information. Based on the road width and number of lane, the road is classified into minor or local road (number of lane = 1, width <4 meter), urban road (number of lane =2, width 4-9 meter), and major road (number of lane >=4, width >= 10 meter). However, vulnerability assessment and loss estimation analyses of highway transportation system will only take into account highway road, which is urban road and major road. For the highway bridge, only the main highway bridges were surveyed, with span length more than 10 meters. Following is the summary of road network and highway bridges surveyed in 3 city corporation areas.

Table 2-23 Total Road Length (in km) and Number of Highway Bridge in Dhaka, Chittagong, and Sylhet

No.	Component	Dhaka	Chittagong	Sylhet
	Road Network			
1.	Major road	*240.49*	*115.88*	*40.39*
2.	Urban road	*1,022.82*	*505.16*	*108.40*
3.	Local road	*1,097.73*	*893.57*	*264.22*
	Total Length (km)	*2361.04*	*1514.61*	*264.22*
4.	Highway Bridge	*10*	*4*	*2*

Source: Base map, Quickbird Images, and field survey, 2008.
Note: The road network also covers some areas in the periphery of city corporation areas. In the vulnerability and risk assessment, only the road within city corporation area is considered.

Table 2-24 Surveyed Highway Bridge in Dhaka, Chittagong, and Sylhet

No.	City Corporation	Bridge Name
1.	Dhaka	Amin Bazar, Burigangga 1, Burigangga 2, Kamrangichar 1, Kamrangichar 2, Kamrangichar 3, Khilgaon Flyover, Mohakhali Flyover, Tongi 1, Tongi 2.
2.	Chittagong	Shah Amanat, Dewan Hut, Kalurghat Karnaphuli, Chittagong Port
3.	Sylhet	Keenan, Shahjalal

Source: Field survey, 2008

Figure 2-11 Surveyed Highway Bridges in Dhaka (upper top), Chittagong (bottom-left) and Sylhet (bottom-right) City Corporation Areas.

2.3.1.2. Railway Transportation System

Railway transportation system consists of railway track, railway station facilities and railway bridge. Railway bridge is not available within city corporation area of Dhaka and Sylhet. While in Chittagong, the railway bridge also functions as a highway bridge for its main function, and therefore is classified into highway bridge. Railway station facilities include dispatch facility (platform), maintenance facility (workshop), fuel facility, and urban station (main station building). These components were identified and digitized from Quickbird Images and field surveyed for verification and acquiring relevant detail information. In Dhaka, four railway station locations were surveyed (Kamalapur, Tejgaon, Cantonment, and Airport Railway Station). Two locations were surveyed in Chittagong and one in Sylhet. Following is the summary of data acquisition of railway transportation system in 3 cities.

Table 2-25 Railway Track Length and Number of Railway Facility in Dhaka, Chittagong, and Sylhet

No.	Component	Dhaka	Chittagong	Sylhet
	Railway Track			
1.	Railway Track	*62.13 km*	*95.60 km*	*6.70 km*
	Railway Facility			
2.	Dispatch Facility	*7*	*6*	*2*
3.	Maintenance Facility	*3*	*1*	*4*
4.	Fuel Facility	-	-	-
5.	Urban Station	*9*	*8*	*1*
	Total Facilities	*19*	*15*	*7*

Source: Base map, Quickbird Images, and field survey, 2008

Figure 2-12 Railway Transportation System Facility

2.3.1.3. Bus Transportation System

Bus transportation system focuses on bus station facilities that include dispatch facility, maintenance facility, fuel facility, and urban station. There is no specific fuel facility that is located within the bus station and under management of bus station authority. Fuel facility or filing station is mostly operated by private enterprise located outside or around bus station. All facilities were identified and digitized from Quickbird Images and building foot-print of the base map, as well as field surveyed for verification and collecting relevant detail information. Three bus stations locations were surveyed in Dhaka (Saidabad, Mohakhali, and Gabtoli bus stations), and one station in each of Chittagong and Sylhet cities. Following is the summary of data acquisition of bus transportation system in 3 cities.

Table 2-26 Number of Bus Transportation Facility in Dhaka, Chittagong, and Sylhet

No.	Component	Dhaka	Chittagong	Sylhet
1.	Dispatch Facility	*13*	*5*	*2*
2.	Maintenance Facility	*4*	*2*	-
3.	Fuel Facility	-	-	-
4.	Urban Station	*8*	*3*	-
	Total Facilities	*25*	*10*	*2*

Source: Base map, Quickbird Images, and field survey, 2008

Figure 2-13 Bus Transportation System Facility

2.3.1.4. Inland Water (Ferry) Transportation System

Inland water (ferry) transportation system consists of dispatch facility, maintenance facility, fuel facility, and passanger terminal (main terminal building) of the launch terminal or port. This launch terminal is only available in Dhaka city, Sadarghat Launch Terminal. Facilities of this terminal were identified and digitized from Quickbird Images and building foot-print of the base map, as well as field surveyed for verification and collecting relevant detail information. Following is the summary of the surveyed launch terminal in Dhaka city.

Table 2-27 Facility of Launch Terminal of Dhaka City

No.	Component	Dhaka
1.	Dispatch Facility	*5*
2.	Maintenance Facility	-
3.	Fuel Facility	-
4.	Passenger Terminal	*3*
	Total Facilities	*8*

Source: Base map, Quickbird Images, and field survey, 2008

Ferry Transportation System Components of Dhaka

Figure 2-14 Ferry Transportation System Facility

2.3.1.5. Potable Water System

Installation and distribution of water supply in Dhaka and Chittagong city is managed and monitored respectively by Dhaka Water Supply and Sewerage Authority (DWASA) and Chittagong Water Supply and Sewerage Authority (CWASA). However, Sylhet City Corporation (SCC) is responsible for water supply in Sylhet city. DWASA developed water supply network map for the city in 2008. The water supply system includes installation of pipe lines, switch valve, deep tube well, pump house, over head tanks, and water treatment plant. After collection of digital water supply network map from DWASA, it has been incorporated with the GIS database. Water supply network has been collected as hard copy from SCC and was digitized & geo-referenced to adjust with the base map. Similar approach was followed to incorporate the water supply map of Chittagong after collecting from CWASA.

Table 2-28 Components of Potable Water System in Dhaka City Corporation Area

No.	Component	Material	Length (km) or quantity
1.	Pipe diameter 75mm	PVC	*1.18*
2.	Pipe diameter 100mm	AC	*0.90*
		CI	*0.88*
		MS	*0.06*
		PVC	*418.28*
3.	Pipe diameter 150mm	AC	*3.70*
		CI	*11.31*
		Ductile Iron	*0.12*
		MS	*0.60*
		PVC	*526.58*
4.	Pipe diameter 200mm	AC	*3.10*
		CI	*4.20*
		MS	*0.08*
		PVC	*272.75*
5.	Pipe diameter 225mm	CI	*0.13*
		PVC	*8.00*
6.	Pipe diameter 250mm	AC	*0.39*
		PVC	*18.38*
7.	Pipe diameter 300mm	AC	*5.92*
		CI	*5.39*
		DI	*5.93*
		Ductile Iron	*0.60*
		PVC	*192.96*
8.	Pipe diameter 350mm	Ductile Iron	*2.91*
9.	Pipe diameter 400mm	Ductile Iron	*3.14*
10.	Pipe diameter 450mm	AC	*3.77*
		DI	*3.91*
		Ductile Iron	*51.24*
11.	Pipe diameter 600mm	Ductile Iron	*3.14*
12.	Pipe diameter 1000mm	Ductile Iron	*4.98*
13.	Pipe diameter 1200mm	Ductile Iron	*2.95*
14.	Pipe diameter 1400mm	Ductile Iron	*6.76*
15.	Pipe diameter 1800mm	Ductile Iron	*0.77*
TOTAL			*1,565.01*
16.	Deep Tube Well	NA	*368*
17.	Overhead Tank	NA	*36*
18.	Pump House	NA	*342*
19.	Valve	NA	-
20.	Water Treatment Plant	NA	*2*

Source: Dhaka Water Supply and Sewerage Authority (DWASA), 2008.
Note: The pipeline network also covers some areas in the periphery of DCC area. In the risk assessment analyses, only the pipeline within DCC area is considered.

Table 2-29 Components of Potable Water System in Chittagong City Corporation Area

No.	Component	Material	Length (km) or quantity
1.	Pipe diameter 2in	NA	*6.68*
2.	Pipe diameter 4in	AC	*0.35*
		PVC	*3.12*
		NA	*293.92*
3.	Pipe diameter 6in	AC	*4.68*
		DI	*5.42*
		PVC	*5.73*
		NA	*54.24*
4.	Pipe diameter 8in	AC	*25.19*
		DI	*1.28*
		PVC	*2.92*
		NA	*47.71*
5.	Pipe diameter 12in	AC	*17.28*
		DI	*14.69*
		PVC	*0.43*
		NA	*12.74*
6.	Pipe diameter 18in	AC	*12.83*
		DI	*8.66*
		NA	*7.84*
7.	Pipe diameter 24in	AC	*11.31*
		DI	*4.93*
		NA	*4.16*
8.	Pipe diameter 36in	DI	*11.58*
9.	Pipe diameter 48in	NA	*1.47*
TOTAL			*559.16*
10.	Deep Tube Well	NA	-
11.	Overhead Tank	NA	*1*
12.	Pump House	NA	*21*
13.	Valve	NA	-
14.	Water Treatment Plant	NA	*2*

Source: Chittagong Water Supply Authority (CWASA), 2008.
Note: The pipeline network also covers some areas in the periphery of CCC area. In the risk assessment analyses, only the pipeline within CCC area is considered.

Table 2-30 Components of Potable Water System Sylhet City Corporation Area

No.	Component	Material	Length (km) or quantity
1.	Pipe diameter 50mm	PVC	*0.68*
2.	Pipe diameter 75mm	PVC	*9.01*
3.	Pipe diameter 100mm	AC	*0.56*
		CI	*0.17*
		GI	*2.99*
		PVC	*43.67*
4.	Pipe diameter 114mm	PVC	*0.14*
5.	Pipe diameter 150mm	AC	*4.61*
		CI	*0.65*
		GI	*0.10*
		PVC	*41.71*
6.	Pipe diameter 200mm	AC	*14.33*
		CI	*1.22*
		GI	*0.95*
		PVC	*5.09*
7.	Pipe diameter 250mm	AC	*1.80*
8.	Pipe diameter 300mm	AC	*2.06*
		DI	*1.19*
		PVC	*0.24*
TOTAL			*131.17*
9.	Deep Tube Well	NA	*5*
10.	Overhead Tank	NA	*9*
11.	Pump House	NA	*4*
12.	Valve	NA	-
13.	Water Treatment Plant	NA	-

Source: Sylhet City Corporation, 2008. *Note: The pipeline network also covers a few areas in the periphery of SCC area. In the risk assessment analyses, only the pipeline within SCC area is considered.*

2.3.1.6. Waste Water System

Waste Water System only exists in Dhaka City Corporation area. At the moment of data acquisition, the data was collected from DWASA in PDF map format, followed by digitization and attribute entry process. Following is the components of waste water system.

Table 2-31 Components of Waste Water System in Dhaka City Corporation Area

No.	Component	Length (km) or quantity
1.	Pipe diameter 100mm	*25.17*
2.	Pipe diameter 150mm	*40.77*
3.	Pipe diameter 200mm	*263.98*
4.	Pipe diameter 225mm	*14.51*
5.	Pipe diameter 250mm	*14.74*
6.	Pipe diameter 300mm	*128.95*
7.	Pipe diameter 400mm	*43.91*
8.	Pipe diameter 450mm	*78.42*
9.	Pipe diameter 600mm	*27.97*
10.	Pipe diameter 900mm	*11.48*
11.	Pipe diameter 1050mm	*2.83*
12.	Pipe diameter 1200mm	*14.90*
13.	Pipe diameter 1350mm	*49.55*
14.	Pipe diameter 1524mm	*2.02*
TOTAL		*719.2*
15.	Waste Water Treatment Plants	-
16.	Lift Stations	*13*
17.	Cleanout	*573*
18.	Pit	*170*
19.	Septic Tank	*349*

Source: Dhaka Water Supply and Sewerage Authority (DWASA), 2008.
Note: The pipeline network also covers some areas in the periphery of DCC area. Referring to HAZUS inventory, only the pipeline and lift stations within DCC area are considered for vulnerability and risk assessment.

2.3.1.7. Natural Gas System

Installation and distribution of Gas supply in Dhaka, Chittagong and Sylhet city is managed and monitored respectively by Titas Gas Transmission and Distribution Company, Bakhrabad Gas Company Limited and Jalalabad Gas Transmission and Distribution Limited. None of these organizations currently has digital network maps. In order to develop a comprehensive vulnerability map, information were collected from respective organizations and incorporated in the GIS database.

Table 2-32 Components of Natural Gas System of Dhaka City Corporation Area

No.	Component	Material	Length (km) or quantity
1.	Pipe diameter 0.5mm	Steel	*0.76*
2.	Pipe diameter 0.75mm	Steel	*98.66*
3.	Pipe diameter 1mm	Steel	*448.60*
4.	Pipe diameter 1.25mm	Steel	*2.31*
5.	Pipe diameter 1.5mm	Steel	*2.04*
6.	Pipe diameter 2mm	Steel	*503.36*
7.	Pipe diameter 3mm	Steel	*98.45*
8.	Pipe diameter 4mm	Steel	*86.78*
9.	Pipe diameter 6mm	Steel	*45.66*
10.	Pipe diameter 8mm	Steel	*95.48*
11.	Pipe diameter 10mm	Steel	*3.42*
12.	Pipe diameter 12mm	Steel	*34.51*
13.	Pipe diameter 14mm	Steel	*0.04*
TOTAL			*1,420.07*
14.	DRS	NA	*7*
15.	Valve	NA	*2344*

Source: Titas Gas Transmission and Distribution Company Ltd., 2008.
Note: The pipeline network also covers some areas in the periphery of DCC area. Referring to HAZUS inventory, only the pipeline and DRS within DCC area are considered for vulnerability and risk assessment.

Table 2-33 Components of Natural Gas System of Chittagong City Corporation Area

No.	Component	Material	Length (km) or quantity
1.	Pipe diameter 60mm	Steel	*146.1914*
2.	Pipe diameter 150mm	Steel	*60.4926*
3.	Pipe diameter 360mm	Steel	*20.4002*
TOTAL			*227.0842*
4.	DRS	NA	*22*
5.	Valve	NA	-

Source: Bakrabad Gas Transmission and Distribution Company Ltd., 2008.
Note: The pipeline network also covers some areas in the periphery of CCC area. Referring to HAZUS inventory, only the pipeline and DRS within CCC area are considered for vulnerability and risk assessment.

Table 2-34 Components of Natural Gas System of Sylhet City Corporation Area

No.	Component	Material	Length (km) or quantity
1.	Pipe diameter 20mm	Steel	*1.80*
2.	Pipe diameter 25mm	Steel	*39.42*
3.	Pipe diameter 50mm	Steel	*37.55*
4.	Pipe diameter 75mm	Steel	*28.13*
5.	Pipe diameter 100mm	Steel	*11.06*
6.	Pipe diameter 150mm	Steel	*24.43*
7.	Pipe diameter 200mm	Steel	*5.13*
TOTAL			*147.52*
8.	DRS	NA	*1*
9.	Valve	NA	*98*

Source: Jalalabad Gas Transmission and Distribution System Ltd., 2008.
Note: The pipeline network also covers some areas in the periphery of SCC area. Referring to HAZUS inventory, only the pipeline and DRS within SCC area are considered for vulnerability and risk assessment.

2.3.1.8. Electric Power System

Electricity installation and distribution in Dhaka, Chittagong and Sylhet city is taken care by Dhaka Electricity Supply Authority (DESA), Power Development Board, Chittagong and Power Development Board in Sylhet respectively. While electric power transmission system is taken care by Power Grid Distribution Company. Maps on electricity supply network were developed based on primary survey and incorporating maps from respective organizations. All electricity poles of the respective cities were identified in the maps. Other installations that are identified

in the map include location of electric substation and electric transformer. Number of components of electric power system in the 3 cities is shown as follows.

Table 2-35 Number of Components of Electric Power System in Dhaka, Chittagong and Sylhet City Corporation Areas

No.	Component	Dhaka	Chittagong	Sylhet
1.	Electric Pole	*52,765*	*26,703*	*9,040*
2.	Electric Transformer	*2045*	*1,702*	-
3.	Electric Substation	*5*	*2*	*1*
4.	Electric underground cable	-	-	*Length: 3.38 km*

Source: DESA, Power Development Board, Power Grid Distribution Company, 2008.
Note: Referring to HAZUS inventory system, underground cable is not included in the vulnerability and risk assessment.

2.3.1.9. Communication system

Telecommunication is gradually being improved in Bangladesh over last one decade especially after introduction of mobile networks. Now a day mobile is widely used in these three cities as well as other parts of the country. Telecommunication maps have been developed based on primary survey and incorporating information from respective organizations. In Dhaka and Chittagong all telephone poles were surveys and locations of Telephone exchange, government stations have been identified. It was not possible to conduct survey of mobile towers since these are not located in any specific building. However, all mobile towers, telephone poles, telephone exchange, government radio stations were surveyed in Sylhet. Moreover, underground cable map of telephone of Sylhet city was collected and incorporated into communication system map of Sylhet city. Number of components of electric power system in the 3 cities is shown as follows.

Table 2-36 Number of Components of Communication System in Dhaka, Chittagong and Sylhet City Corporation Areas

No.	Component	Dhaka	Chittagong	Sylhet
1.	Telephone pole	*19,029*	-	*1,879*
2.	Telephone box	*576*	-	*18*
3.	Telephone exchange	*6*	*3*	*3*
4.	Radio station/transmitter	*18*	*1*	*2*
5.	TV station/transmitter	*5*	*1*	*2*
6.	Underground telephone cable	-	-	*Length: 26.71 km*

Source: Quickbird Images, BTCL, ADPC field survey, 2008.
Note: Referring to HAZUS inventory system, telephone pole, telephone box, and underground telephone cable are not included in the vulnerability and risk assessment.

2.3.2. Essential Facilities

Essential facilities are those facilities that provide services to the community and should be functional after an earthquake. Without key emergency services, such as police and fire service, response activities can be disorganized and ineffective. Hospitals also serve as important focal points for community response. In these cases, not only must these facilities remain open but the roadways that lead to these facilities must also be functional. Facilities fall within essential facility category are only the dedicated building for the above mentioned functions. If a building contain essential facility function along with other non-relevant function, then the building is not considered to be an essential facility. In these facilities, structure type were identified and incorporated in the GIS database.

In 3 cities, essential facilities are identified from the primary survey based on building foot print that was developed for the base map and GIS database. Total number of every essential facility is presented in the following table.

Table 2-37 Number of Essential Facility in Dhaka, Chittagong and Sylhet City Corporation Areas

No.	Essential Facility	Dhaka	Chittagong	Sylhet
	Medical Care			
1.	Large Hospital	*75*	*45*	*7*
2.	Medium Hospital	*59*	*15*	*6*
3.	Small Hospital	*98*	*36*	*7*
4.	Medical Clinic	*368*	*66*	*67*
	Emergency Response			
5.	Police Station	*10*	*11*	*6*
6.	Fire Station	*62*	*12*	*2*
7.	Emergency Operation Center	*1*	*1*	*-*
	Schools			
8.	Grade School	*2,026*	*906*	*162*
9.	College/University	*711*	*127*	*49*

Source: Quickbird Images, ADPC field survey, 2008.
Note: Offices of relevant agencies to emergency response have been incorporated in the risk assessment analysis under Emergency Operation Center class to prepare a contingency planning analysis. These agencies include: Meteorological Department, Road and Highway Department, Public Health Department, Prime Minister Office, Secretariat Office, etc.

3. Building Vulnerability

A vulnerability map shows the degree of loss to a given element at risk resulting from the occurrence of the specified earthquakes. In this project, vulnerability maps are divided into 2 categories: (1) Building Vulnerability maps and (2) Lifeline Vulnerability maps.

Based on the developed database for the general building stock, vulnerability maps showing the ward-wise distribution of the following vulnerability factors are created; occupancy class, structural type, building age, visible physical condition, and population at risk.

In addition to the above, the maps showing vulnerability of concrete buildings (only for C3L, C3M, LCL and LCM structural type) in the three cities are developed. The statistics obtained from the field survey including presence of soft story, presence of heavy overhang, apparent building quality, presence of short columns, pounding possibility between adjacent buildings, and topographic effects are used in the development of these maps following the level 1 Turkish method.

3.1. Occupancy Class and Essential facility

Occupancy class is an important factor determining economic loss, since the building value is primarily a function of building use (i.e., hospitals are more valuable than most commercial buildings, primarily because of their expensive nonstructural systems and contents, not because of their structural systems). Occupancy class also relates to the number of occupants, for example, a lot of people (workers) work for industrial buildings in the daytime while a few people stay in residential buildings in this time.

In the three cities, 27 occupancy classes are grouped into residential, commercial, industrial and essential facilities. The details are shown in Table 3-1 to 3-3

Table 3-17 A Number of Grouped Occupancy Classes in Dhaka

Ward	Residential	Commercial	Industrial	Essential Facilities			Other	Total
				Medical Care	Emergency Response	School		
1	6,397	898	591	44	6	140	106	8,182
2	5,314	657	63	5	5	41	29	6,114
3	3,890	614	65	4	29	41	52	4,695
4	1,917	192	19	2	2	15	34	2,181
5	5,195	639	65	5	0	51	26	5,981
6	9,313	742	249	15	7	56	70	10,452
7	2,382	288	22	3	0	36	55	2,786
8	5,635	556	47	11	2	49	80	6,380
9	3,353	373	18	1	1	16	34	3,796
10	5,105	593	80	7	3	24	66	5,878
11	2,731	251	33	0	1	21	64	3,101
12	2,846	410	55	7	1	25	29	3,373
13	11,039	819	122	6	7	56	65	12,114
14	4,501	633	105	4	1	27	36	5,307
15	11,942	1,015	42	5	3	45	89	13,141
16	6,993	758	64	3	2	53	80	7,953
17	10,445	1,521	251	5	1	78	75	12,376
18	2,788	595	54	2	36	23	31	3,529
19	6,009	1,108	44	44	5	77	36	7,323
20	3,640	639	72	77	4	19	16	4,467
21	5,213	1,047	134	7	3	37	41	6,482
22	5,356	624	99	5	1	22	33	6,140

Table 3-1 A Number of Grouped Occupancy Classes in Dhaka (Con't)

Ward	Residential	Commercial	Industrial	Essential Facilities			Other	Total
				Medical Care	Emergency Response	School		
23	2,090	384	47	4	0	16	22	2,563
24	2,176	455	44	3	1	34	29	2,742
25	3,999	548	25	0	0	13	23	4,608
26	4,548	599	93	2	0	18	34	5,294
27	3,058	577	25	3	0	19	48	3,730
28	3,087	425	41	2	0	25	52	3,632
29	2,479	502	24	3	1	12	36	3,057
30	2,262	71	7	0	0	2	9	2,351
31	1,431	351	20	2	4	8	48	1,864
32	615	854	36	4	3	4	45	1,561
33	325	35	0	2	0	19	23	404
34	1,627	397	15	11	0	15	32	2,097
35	1,723	242	14	2	1	12	20	2,014
36	1,224	437	51	5	3	19	46	1,785
37	2,221	759	548	5	5	27	336	3,901
38	2,296	505	18	7	2	13	48	2,889
39	2,005	497	27	4	4	25	47	2,609
40	2,529	334	21	23	3	18	147	3,075
41	1,143	214	5	7	2	4	51	1,426
42	2,140	413	25	4	0	27	12	2,621
43	4,686	459	63	3	2	28	22	5,263
44	1,757	367	8	2	3	9	17	2,163
45	1,785	449	23	27	3	40	33	2,360
46	5,976	626	103	4	6	30	49	6,794
47	3,326	510	26	3	0	14	31	3,910
48	3,877	645	367	5	2	26	59	4,981
49	1,995	514	48	45	3	82	42	2,729
50	2,363	357	28	10	0	10	10	2,778
51	1,894	298	28	9	1	17	34	2,281
52	1,129	425	26	5	1	12	34	1,632
53	1,265	433	14	27	1	27	94	1,861
54	2,801	433	3	4	0	16	57	3,314
55	2,857	306	18	2	1	21	23	3,228
56	643	574	21	22	7	8	169	1,444
57	855	302	4	28	5	8	151	1,353
58	4,161	410	48	3	2	18	50	4,692
59	1,877	353	47	1	9	13	18	2,318
60	2,902	474	10	2	0	11	28	3,427
61	1,332	262	52	1	0	19	28	1,694
62	1,305	201	22	3	1	22	75	1,629
63	863	221	46	2	0	7	50	1,189
64	732	453	48	3	0	5	25	1,266
65	1,948	738	256	2	1	6	259	3,210
66	423	674	158	18	1	9	161	1,444
67	747	495	24	6	4	15	48	1,339
68	872	639	15	2	0	13	22	1,563
69	1,931	766	96	8	1	19	43	2,864
70	857	712	36	1	0	12	41	1,659
71	848	664	13	0	1	8	23	1,557

Table 3-1 A Number of Grouped Occupancy Classes in Dhaka (Con't)

Ward	Residential	Commercial	Industrial	Essential Facilities			Other	Total
				Medical Care	Emergency Response	School		
72	599	411	14	0	0	10	28	1,062
73	213	542	21	2	7	22	32	839
74	1,495	750	26	0	0	31	32	2,334
75	1,628	352	26	3	7	12	43	2,071
76	2,398	548	31	4	1	26	75	3,083
77	1,770	495	25	6	1	13	50	2,360
78	1,156	355	8	4	0	23	42	1,588
79	1,819	493	69	4	0	12	43	2,440
80	1,299	338	15	2	0	3	24	1,681
81	2,637	470	112	4	0	24	53	3,300
82	2,095	330	63	0	9	18	57	2,572
83	2,406	444	165	2	1	17	53	3,088
84	2,908	642	160	3	5	11	56	3,785
85	3,690	512	104	4	3	38	61	4,412
86	2,764	756	78	6	2	15	37	3,658
87	3,720	628	94	5	0	21	62	4,530
88	2,410	353	51	0	0	13	28	2,855
89	3,802	441	73	8	0	23	39	4,386
90	3,979	578	213	3	5	15	72	4,865
Total	265,777	46,769	6,379	663	245	2,154	4,838	326,825

Table 3-18 A Number of Grouped Occupancy Classes in Chittagong

Ward	Residential	Commercial	Industrial	Essential Facilities			Other	Total
				Medical Care	Emergency Response	School		
1	4,968	544	48	0	2	49	189	5,800
2	7,309	1,248	478	6	0	90	50	9,181
3	3,883	797	31	4	0	44	24	4,783
4	8,892	1,703	277	4	0	67	81	11,024
5	5,036	715	38	3	0	54	22	5,868
6	5,223	1,238	18	8	1	26	15	6,529
7	6,473	1,542	165	4	0	73	41	8,298
8	9,060	1,282	308	0	3	77	77	10,807
9	7,162	796	44	1	1	27	57	8,088
10	3,546	564	128	8	1	26	17	4,290
11	4,932	524	35	0	0	31	4	5,526
12	4,193	1,029	30	1	0	30	30	5,313
13	5,229	563	13	22	1	56	87	5,971
14	2,561	365	3	0	0	18	4	2,951
15	2,220	336	10	1	0	36	33	2,636
16	3,442	937	13	10	2	73	40	4,517
17	3,681	470	4	0	0	54	3	4,212
18	4,335	624	19	2	0	19	77	5,076
19	2,220	575	16	0	0	14	14	2,839
20	1,270	131	0	0	0	3	5	1,409
21	1,817	256	7	0	0	12	2	2,094
22	1,539	446	7	1	0	10	1	2,004
23	1,789	366	21	0	0	8	1	2,185
24	6,414	994	35	4	26	40	4	7,517
25	4,087	557	14	22	0	22	7	4,709
26	3,102	371	3	2	0	42	6	3,526

Table 3-2 A Number of Grouped Occupancy Classes in Chittagong (Con't)

Ward	Residential	Commercial	Industrial	Essential Facilities			Other	Total
				Medical Care	Emergency Response	School		
27	2,417	556	8	5	0	33	12	3,031
28	2,516	562	39	0	0	15	40	3,172
29	2,148	322	23	2	1	7	38	2,541
30	2,271	463	87	2	1	33	83	2,940
31	780	462	14	1	1	8	15	1,281
32	993	515	2	2	2	22	37	1,573
33	1,242	781	24	0	0	6	24	2,077
34	888	1,141	4	0	0	2	5	2,040
35	693	1,221	73	0	0	6	6	1,999
36	1,848	492	8	0	0	6	9	2,363
37	1,990	185	1	0	6	13	16	2,211
38	5,052	612	10	1	0	12	29	5,716
39	3,276	1,194	17	3	4	30	34	4,558
40	4,895	740	5	0	0	21	24	5,685
41	3,669	243	0	0	0	6	19	3,937
Total	149,061	28,462	2,080	119	52	1,221	1,282	182,277

Table 3-19 A Number of Grouped Occupancy Classes in Sylhet

Ward	Residential	Commercial	Industrial	Essential Facilities			Other	Total
				Medical Care	Emergency Response	School		
1	1,176	164	2	15	0	7	4	1,368
2	798	143	0	15	0	14	8	978
3	1,073	197	2	37	0	16	12	1,337
4	1,036	140	4	8	0	27	11	1,226
5	1,888	125	1	0	2	12	40	2,068
6	1,198	155	5	0	0	2	6	1,366
7	3,076	132	4	0	0	2	28	3,242
8	3,266	249	3	0	0	9	31	3,558
9	2,429	283	21	4	0	20	44	2,801
10	2,255	260	36	1	0	18	23	2,593
11	1,610	146	6	8	0	11	4	1,785
12	1,331	156	77	0	0	18	12	1,594
13	1,197	387	6	2	12	12	19	1,635
14	1,030	598	13	1	1	43	80	1,766
15	914	247	4	4	0	21	25	1,215
16	1,135	151	11	2	0	23	12	1,334
17	1,639	260	2	5	1	7	10	1,924
18	1,797	89	5	3	0	10	11	1,915
19	1,845	106	5	9	0	16	6	1,987
20	1,798	120	8	0	0	11	49	1,986
21	2,139	205	2	0	0	7	10	2,363
22	1,339	108	5	1	1	11	25	1,490
23	659	158	6	1	0	12	13	849
24	2,218	187	10	0	0	21	19	2,455
25	1,764	303	6	0	0	13	32	2,118
26	1,712	739	45	2	1	29	56	2,584
27	2,121	276	160	2	4	22	54	2,639
Total	44,443	6,085	449	120	22	414	644	52,176

3.2. Structural Type

Structural type or model building type is the key factor in assessing overall building performance, loss of function, and casualties.

There are mainly 5 structural types in Bangladesh; reinforced concrete building (RC), lightly reinforced concrete building (LC), brick in cement mortar with concrete floor (BC), brick in cement mortar with flexible roof (BF) and thin shed (TSL). The number of different structural types in each ward is given in Table 3-4 to 3-6.

Table 3-20 Main Structural Types of Dhaka

Ward	Structure (No. of buildings)					Total
	Concrete		Masonry		TSL + BAL + Other	
	RC	LC	BC	BF		
1	5,078	547	1,169	421	978	8,193
2	3,178	586	999	464	892	6,119
3	2,208	400	781	419	887	4,695
4	901	147	295	131	711	2,185
5	2,517	455	849	460	1,715	5,996
6	4,389	764	1,304	719	3,290	10,466
7	1,693	245	511	184	155	2,788
8	2,794	468	908	385	1,832	6,387
9	1,486	281	510	270	1,256	3,803
10	2,628	479	889	465	1,426	5,887
11	1,802	264	461	189	387	3,103
12	1,680	284	560	279	569	3,372
13	6,931	1,114	1,855	729	1,477	12,106
14	2,998	496	895	446	474	5,309
15	3,783	820	1,450	973	6,103	13,129
16	4,358	727	1,253	571	1,043	7,952
17	6,461	1,131	2,114	1,133	1,540	12,379
18	2,020	299	694	274	238	3,525
19	2,921	327	1,096	319	2,652	7,315
20	2,109	360	719	338	936	4,462
21	3,412	570	1,098	632	765	6,477
22	2,854	530	870	496	1,393	6,143
23	1,167	208	446	234	511	2,566
24	1,364	233	516	203	423	2,739
25	2,141	404	805	350	905	4,605
26	1,638	316	638	390	2,312	5,294
27	1,752	326	643	308	705	3,734
28	1,531	293	555	338	912	3,629
29	1,493	280	523	296	466	3,058
30	1,205	233	332	145	434	2,349
31	563	86	371	174	51	1,245
32	1,006	182	499	246	241	2,174
33	237	31	64	21	47	400
34	1,633	257	512	246	239	2,887
35	1,083	182	346	203	278	2,092
36	1,147	204	337	174	151	2,013
37	1,431	196	684	372	417	3,100
38	819	112	406	411	836	2,584
39	1,465	212	505	232	194	2,608

40	1,875	226	516	127	326	3,070

Table 3-4 Main Structural Types of Dhaka (Con't)

Ward	Structure (No. of buildings)					Total
	Concrete		Masonry		TSL + BAL + Other	
	RC	LC	BC	BF		
41	707	103	219	118	283	1,430
42	1,341	201	422	159	497	2,620
43	2,594	376	643	252	1,397	5,262
44	1,397	207	405	117	36	2,162
45	1,469	191	485	164	56	2,365
46	2,912	470	837	402	2,168	6,789
47	1,927	284	554	221	921	3,907
48	2,713	392	799	496	578	4,978
49	1,843	175	513	141	59	2,731
50	1,753	218	388	154	265	2,778
51	1,483	178	348	103	170	2,282
52	959	113	323	158	79	1,632
53	1,056	137	438	164	62	1,857
54	1,739	300	580	268	425	3,312
55	1,354	259	433	242	942	3,230
56	586	88	419	245	107	1,445
57	677	78	353	105	138	1,351
58	2,647	434	704	295	616	4,696
59	1,381	220	416	191	107	2,315
60	1,484	243	494	210	998	3,429
61	1,034	162	326	138	34	1,694
62	1,061	144	293	96	38	1,632
63	623	111	267	136	51	1,188
64	635	111	333	165	22	1,266
65	1,403	232	665	465	447	3,212
66	449	75	450	359	113	1,446
67	610	114	360	204	49	1,337
68	759	139	438	198	28	1,562
69	1,442	266	668	370	117	2,863
70	799	137	481	207	34	1,658
71	718	133	421	239	45	1,556
72	511	94	306	121	26	1,058
73	298	43	303	170	21	835
74	1,188	211	563	305	64	2,331
75	1,131	178	369	188	199	2,065
76	1,512	309	615	371	275	3,082
77	1,363	228	448	247	72	2,358
78	839	163	347	192	47	1,588
79	1,231	250	526	324	113	2,444
80	853	175	359	195	95	1,677
81	1,487	299	589	360	566	3,301
82	1,242	252	519	308	255	2,576
83	1,417	263	541	390	481	3,092
84	1,596	320	665	480	725	3,786
85	2,051	371	732	359	894	4,407
86	1,742	345	714	439	422	3,662
87	1,738	363	725	486	1,218	4,530
88	1,344	292	498	296	428	2,858

89	2,215	486	784	465	439	4,389

Table 3-4 Main Structural Types of Dhaka (Con't)

Ward	Structure (No. of buildings)					Total
	Concrete		Masonry		TSL + BAL + Other	
	RC	LC	BC	BF		
90	1,860	394	748	580	1,281	4,863
Total	158,924	26,602	54,804	27,825	58,670	326,825

Table 3-21 Main Structural Types of Chittagong

Ward	Structure (No. of buildings)					Total
	Concrete		Masonry		TSL + BAL + Other	
	RC	LC	BC	BF		
1	3,162	525	784	832	512	5,815
2	5,089	733	1,551	1,111	712	9,196
3	2,583	401	763	523	515	4,785
4	5,733	886	1,541	1,423	1,460	11,043
5	2,573	384	815	883	1,222	5,877
6	3,533	476	1,358	742	430	6,539
7	4,382	628	1,339	1,013	952	8,314
8	5,868	737	1,727	1,146	1,351	10,829
9	3,683	578	1,035	1,178	1,627	8,101
10	2,137	330	556	576	696	4,295
11	3,082	305	1,352	529	273	5,541
12	2,681	342	984	618	695	5,320
13	3,372	531	831	753	492	5,979
14	1,649	238	524	357	186	2,954
15	1,739	272	274	223	133	2,641
16	2,537	431	578	553	427	4,526
17	2,390	274	873	392	289	4,218
18	2,696	467	718	738	467	5,086
19	1,540	303	257	423	319	2,842
20	1,031	156	113	80	30	1,410
21	1,363	165	375	143	49	2,095
22	1,126	142	449	213	76	2,006
23	1,286	164	458	196	83	2,187
24	5,181	708	994	449	191	7,523
25	2,317	334	507	555	1,002	4,715
26	1,932	219	744	369	268	3,532
27	1,893	288	388	321	147	3,037
28	1,775	219	674	337	167	3,172
29	1,412	162	567	253	150	2,544
30	1,677	260	471	355	181	2,944
31	714	156	148	188	80	1,286
32	1,072	199	115	147	43	1,576
33	1,156	264	189	335	136	2,080
34	1,119	286	170	321	146	2,042
35	926	255	171	407	245	2,004
36	1,447	240	303	271	105	2,366
37	1,253	203	309	284	170	2,219
38	2,970	532	674	796	448	5,420
39	2,544	481	601	634	308	4,568
40	3,404	544	744	641	366	5,699
41	2,161	423	377	619	371	3,951

Total	*100,188*	*15,241*	*27,401*	*21,927*	*17,520*	*182,277*

Table 3-22 Main Structural Types of Sylhet

Ward	Structure (No. of buildings)					Total
	Concrete		Masonry		TSL + BAL + Other	
	RC	LC	BC	BF		
1	*838*	*62*	*45*	*370*	*38*	*1,353*
2	*475*	*22*	*32*	*403*	*44*	*976*
3	*734*	*42*	*37*	*470*	*64*	*1,347*
4	*772*	*56*	*39*	*325*	*39*	*1,231*
5	*981*	*32*	*58*	*885*	*118*	*2,074*
6	*667*	*26*	*37*	*568*	*73*	*1,371*
7	*1,691*	*77*	*103*	*1,234*	*142*	*3,247*
8	*1,570*	*52*	*113*	*1,642*	*186*	*3,563*
9	*1,373*	*60*	*77*	*1,124*	*155*	*2,789*
10	*1,526*	*118*	*80*	*756*	*120*	*2,600*
11	*808*	*36*	*53*	*775*	*114*	*1,786*
12	*712*	*43*	*43*	*668*	*124*	*1,590*
13	*763*	*55*	*49*	*663*	*80*	*1,610*
14	*845*	*106*	*45*	*673*	*100*	*1,769*
15	*620*	*43*	*33*	*454*	*58*	*1,208*
16	*660*	*30*	*38*	*543*	*62*	*1,333*
17	*973*	*48*	*53*	*761*	*85*	*1,920*
18	*915*	*27*	*56*	*822*	*97*	*1,917*
19	*907*	*35*	*58*	*868*	*127*	*1,995*
20	*978*	*42*	*64*	*812*	*93*	*1,989*
21	*1,092*	*43*	*71*	*1,033*	*124*	*2,363*
22	*985*	*75*	*50*	*349*	*34*	*1,493*
23	*364*	*27*	*23*	*371*	*70*	*855*
24	*1,031*	*46*	*68*	*1,117*	*197*	*2,459*
25	*933*	*51*	*67*	*946*	*116*	*2,113*
26	*1,161*	*100*	*72*	*1,083*	*157*	*2,573*
27	*1,035*	*51*	*71*	*1,259*	*236*	*2,652*
Total	*25,409*	*1,405*	*1,535*	*20,974*	*2,853*	*52,176*

3.3. Buildings Age and Visible Physical Condition

In this project, building age is divided into three categories as follows; (1) less than 10 years, (2) 10-30 years, and (3) more than 30 years. Visible physical condition of building is classified into good condition, average condition or poor condition. The ward-wise distribution of building age and visible physical condition for the three cities are given in table 3-7 to 3-9.

Table 3-23 Buildings Age and Visible Physical Condition of Dhaka

Ward	Building Age			Total	Visible Physical			Total
	< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
1	1,685	2,874	3,634	8,193	3,874	2,476	1,843	8,193
2	1,584	1,706	2,829	6,119	2,471	2,197	1,451	6,119
3	1,115	1,285	2,295	4,695	1,846	1,680	1,169	4,695
4	438	578	1,169	2,185	806	728	651	2,185
5	1,282	1,562	3,152	5,996	2,243	2,053	1,700	5,996
6	2,159	2,722	5,585	10,466	3,938	3,469	3,059	10,466
7	678	923	1,187	2,788	1,332	910	546	2,788
8	1,339	1,736	3,312	6,387	2,445	2,125	1,817	6,387
9	815	936	2,052	3,803	1,326	1,326	1,151	3,803
10	1,355	1,552	2,980	5,887	2,220	2,082	1,585	5,887
11	721	979	1,403	3,103	1,426	976	701	3,103
12	788	971	1,613	3,372	1,403	1,163	806	3,372
13	2,982	3,677	5,447	12,106	5,381	3,984	2,741	12,106
14	1,334	1,614	2,361	5,309	2,367	1,817	1,125	5,309
15	2,498	2,784	7,847	13,129	3,885	4,647	4,597	13,129
16	1,956	2,366	3,630	7,952	3,462	2,683	1,807	7,952
17	3,155	3,492	5,732	12,379	5,036	4,494	2,849	12,379
18	851	1,140	1,534	3,525	1,592	1,210	723	3,525
19	1,178	2,162	3,975	7,315	2,809	2,275	2,231	7,315
20	1,040	1,250	2,172	4,462	1,721	1,590	1,151	4,462
21	1,552	1,900	3,025	6,477	2,786	2,228	1,463	6,477
22	1,449	1,643	3,051	6,143	2,388	2,156	1,599	6,143
23	598	714	1,254	2,566	1,000	935	631	2,566
24	649	828	1,262	2,739	1,137	977	625	2,739
25	1,143	1,254	2,208	4,605	1,742	1,717	1,146	4,605
26	972	1,227	3,095	5,294	1,670	1,843	1,781	5,294
27	906	1,037	1,791	3,734	1,458	1,357	919	3,734
28	831	932	1,866	3,629	1,329	1,324	976	3,629
29	768	847	1,443	3,058	1,224	1,117	717	3,058
30	628	614	1,107	2,349	898	851	600	2,349
31	265	422	558	1,245	536	480	229	1,245
32	538	633	1,003	2,174	843	855	476	2,174
33	86	140	174	400	199	120	81	400
34	685	922	1,280	2,887	1,350	942	595	2,887
35	487	637	968	2,092	928	708	456	2,092
36	544	598	871	2,013	876	723	414	2,013
37	611	1,011	1,478	3,100	1,341	1,095	664	3,100
38	383	693	1,508	2,584	1,014	855	715	2,584
39	593	855	1,160	2,608	1,223	859	526	2,608
40	646	1,084	1,340	3,070	1,508	906	656	3,070
41	290	436	704	1,430	625	453	352	1,430

Table 3-7 Buildings Age and Visible Physical Condition of Dhaka (Con't)

Ward	Building Age			Total	Visible Physical			Total
	< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
42	556	811	1,253	2,620	1,149	826	645	2,620
43	1,051	1,553	2,658	5,262	2,242	1,572	1,448	5,262
44	552	749	861	2,162	1,073	689	400	2,162
45	543	845	977	2,365	1,170	761	434	2,365
46	1,359	1,826	3,604	6,789	2,579	2,198	2,012	6,789
47	785	1,174	1,948	3,907	1,684	1,188	1,035	3,907
48	1,042	1,588	2,348	4,978	2,388	1,525	1,065	4,978
49	568	1,055	1,108	2,731	1,419	797	515	2,731
50	581	967	1,230	2,778	1,437	750	591	2,778
51	487	818	977	2,282	1,182	624	476	2,282
52	330	585	717	1,632	830	494	308	1,632
53	424	659	774	1,857	852	668	337	1,857
54	822	984	1,506	3,312	1,409	1,169	734	3,312
55	723	825	1,682	3,230	1,188	1,126	916	3,230
56	306	458	681	1,445	557	604	284	1,445
57	278	476	597	1,351	584	490	277	1,351
58	1,142	1,412	2,142	4,696	2,093	1,512	1,091	4,696
59	567	749	999	2,315	1,109	750	456	2,315
60	693	950	1,786	3,429	1,342	1,107	980	3,429
61	427	561	706	1,694	821	556	317	1,694
62	392	575	665	1,632	826	498	308	1,632
63	317	359	512	1,188	501	460	227	1,188
64	308	413	545	1,266	562	482	222	1,266
65	686	942	1,584	3,212	1,341	1,144	727	3,212
66	252	446	748	1,446	601	581	264	1,446
67	329	409	599	1,337	554	538	245	1,337
68	399	500	663	1,562	664	620	278	1,562
69	747	857	1,259	2,863	1,205	1,118	540	2,863
70	408	546	704	1,658	706	656	296	1,658
71	381	480	695	1,556	661	615	280	1,556
72	271	340	447	1,058	441	424	193	1,058
73	164	279	392	835	349	350	136	835
74	620	701	1,010	2,331	972	916	443	2,331
75	479	649	937	2,065	939	688	438	2,065
76	857	819	1,406	3,082	1,186	1,231	665	3,082
77	616	734	1,008	2,358	1,079	826	453	2,358
78	444	461	683	1,588	660	624	304	1,588
79	691	669	1,084	2,444	971	987	486	2,444
80	478	460	739	1,677	659	674	344	1,677
81	831	863	1,607	3,301	1,240	1,260	801	3,301
82	706	683	1,187	2,576	975	1,043	558	2,576
83	736	833	1,523	3,092	1,229	1,144	719	3,092
84	905	968	1,913	3,786	1,409	1,439	938	3,786
85	1,063	1,189	2,155	4,407	1,647	1,620	1,140	4,407
86	963	990	1,709	3,662	1,415	1,427	820	3,662
87	1,051	1,085	2,394	4,530	1,538	1,724	1,268	4,530
88	820	688	1,350	2,858	988	1,162	708	2,858
89	1,328	1,072	1,989	4,389	1,565	1,809	1,015	4,389
90	1,137	1,132	2,594	4,863	1,654	1,858	1,351	4,863
Total	75,192	93,923	157,710	326,825	133,303	113,710	79,812	326,825

Table 3-24 Buildings Age and Visible Physical Condition of Chittagong

Ward	Building Age			Total	Visible Physical Condition			Total
	< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
1	2,809	2,301	690	5,800	1,647	2,891	1,262	5,800
2	4,486	3,573	1,122	9,181	2,524	4,420	2,237	9,181
3	2,346	1,862	575	4,783	1,383	2,242	1,158	4,783
4	5,434	4,283	1,308	11,024	3,396	5,164	2,465	11,024
5	2,885	2,243	740	5,868	2,176	2,592	1,101	5,868
6	3,149	2,528	852	6,529	1,824	3,085	1,620	6,529
7	4,099	3,200	999	8,298	2,474	3,860	1,964	8,298
8	5,379	4,153	1,275	10,807	3,196	4,959	2,652	10,807
9	3,976	3,118	994	8,088	2,915	3,631	1,543	8,088
10	2,123	1,658	510	4,290	1,400	1,974	916	4,290
11	2,666	2,113	747	5,526	1,489	2,577	1,460	5,526
12	2,610	2,027	675	5,313	1,672	2,393	1,248	5,313
13	2,899	2,371	701	5,971	1,638	2,951	1,382	5,971
14	1,423	1,159	369	2,951	799	1,438	714	2,951
15	1,316	1,064	256	2,636	574	1,339	724	2,636
16	2,222	1,788	506	4,517	1,248	2,202	1,068	4,517
17	2,052	1,625	535	4,212	1,133	1,974	1,105	4,212
18	2,446	2,014	615	5,076	1,484	2,505	1,088	5,076
19	1,392	1,139	308	2,839	822	1,411	606	2,839
20	714	576	119	1,409	245	734	430	1,409
21	1,036	822	236	2,094	449	1,025	621	2,094
22	969	773	262	2,004	520	953	531	2,004
23	1,061	849	275	2,185	540	1,049	596	2,185
24	3,770	3,005	743	7,517	1,470	3,773	2,274	7,517
25	2,366	1,814	529	4,709	1,629	2,081	999	4,709
26	1,709	1,357	460	3,526	991	1,647	888	3,526
27	1,518	1,197	316	3,031	705	1,505	821	3,031
28	1,537	1,219	416	3,172	843	1,504	825	3,172
29	1,227	976	338	2,541	688	1,193	659	2,541
30	1,433	1,155	351	2,940	768	1,448	724	2,940
31	624	518	139	1,281	339	652	289	1,281
32	791	645	137	1,573	308	825	441	1,573
33	1,011	845	221	2,077	549	1,073	455	2,077
34	1,002	830	208	2,040	540	1,041	459	2,040
35	982	796	221	1,999	638	989	372	1,999
36	1,164	945	254	2,363	559	1,192	612	2,363
37	1,073	883	255	2,211	602	1,102	507	2,211
38	2,611	2,166	939	5,716	1,523	2,722	1,471	5,716
39	2,215	1,824	520	4,558	1,224	2,285	1,049	4,558
40	2,791	2,272	623	5,685	1,430	2,842	1,413	5,685
41	1,897	1,600	440	3,937	1,127	2,019	790	3,937
Total	89,212	71,285	21,780	182,277	51,478	87,262	43,537	182,277

Table 3-25 Buildings Age and Visible Physical Condition of Sylhet

Ward	Building Age			Total	Visible Physical Condition			Total
	< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
1	583	604	166	1,353	329	715	309	1,353
2	401	425	150	976	294	493	189	976
3	563	591	193	1,347	372	690	285	1,347
4	531	547	153	1,231	295	648	288	1,231
5	857	909	308	2,074	645	1,047	382	2,074
6	567	603	201	1,371	417	696	258	1,371
7	1,363	1,426	458	3,247	932	1,662	653	3,247
8	1,460	1,556	547	3,563	1,145	1,789	629	3,563
9	1,157	1,226	406	2,789	843	1,416	530	2,789
10	1,112	1,163	325	2,600	671	1,367	562	2,600
11	735	781	270	1,786	567	898	321	1,786
12	653	700	237	1,590	511	800	279	1,590
13	663	709	238	1,610	491	822	297	1,610
14	728	786	255	1,769	525	913	331	1,769
15	503	534	171	1,208	351	622	235	1,208
16	553	586	194	1,333	396	680	257	1,333
17	799	846	275	1,920	564	983	373	1,920
18	793	839	285	1,917	591	968	358	1,917
19	822	874	299	1,995	635	1,002	358	1,995
20	827	873	289	1,989	596	1,012	381	1,989
21	975	1,034	354	2,363	739	1,193	431	2,363
22	650	667	176	1,493	336	795	362	1,493
23	348	374	133	855	280	428	147	855
24	1,004	1,078	377	2,459	823	1,226	410	2,459
25	865	924	324	2,113	677	1,064	372	2,113
26	1,052	1,132	389	2,573	808	1,305	460	2,573
27	1,071	1,158	423	2,652	920	1,309	423	2,652
Total	21,635	22,945	7,596	52,176	15,753	26,543	9,880	52,176

3.4. Population (Daytime, Nighttime)

Table 3-10 to 3-12 show population (computed by using a weight arithmetic mean of the number of occupants per floor area) and population density during Daytime and Nighttime in each ward as well as Table 3-13 demonstrates a comparison between the calculated population and population of city corporations from the statistical pocket book of Bangladesh 2008.

Table 3-26 A Number of Occupants in Dhaka

Ward	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
		Daytime	Nighttime	Daytime	Nighttime
1	5.599	219,941	217,075	39,282	38,770
2	1.884	105,138	141,585	55,806	75,152
3	1.314	87,073	100,002	66,265	76,105
4	1.124	35,952	40,696	31,986	36,207
5	1.190	85,885	113,017	72,173	94,972
6	2.796	165,973	214,039	59,361	76,552
7	0.972	54,893	61,586	56,474	63,360
8	4.153	90,962	117,468	21,903	28,285
9	1.439	48,639	66,416	33,801	46,154
10	2.127	87,184	115,980	40,989	54,528
11	1.191	60,268	73,876	50,603	62,028
12	0.840	67,121	76,614	79,907	91,208
13	3.022	184,489	275,790	61,049	91,261
14	1.478	104,976	131,977	71,026	89,295
15	4.601	141,028	214,930	30,652	46,714
16	4.588	149,498	196,701	32,585	42,873
17	6.199	189,112	253,020	30,507	40,816
18	1.403	60,867	73,343	43,383	52,276
19	5.279	166,819	139,036	31,601	26,338
20	1.853	99,014	107,361	53,434	57,939
21	1.597	99,603	126,237	62,369	79,046
22	1.571	121,176	164,727	77,133	104,855
23	0.771	53,873	64,862	69,874	84,127
24	0.805	70,244	79,817	87,259	99,152
25	0.986	79,013	113,867	80,135	115,484
26	1.972	68,606	97,731	34,790	49,559
27	0.890	76,220	97,787	85,640	109,873
28	0.942	65,422	84,426	69,450	89,624
29	0.588	68,670	81,562	116,786	138,711
30	0.435	33,549	55,104	77,125	126,677
31	0.931	44,600	45,359	47,905	48,721
32	1.016	68,184	32,008	67,110	31,504
33	0.433	20,037	17,268	46,274	39,879
34	0.780	58,120	69,176	74,513	88,687
35	0.497	47,108	63,185	94,786	127,134
36	1.285	66,760	57,931	51,953	45,083
37	3.081	98,549	57,637	31,986	18,707
38	1.101	60,424	75,325	54,881	68,415
39	1.162	67,879	58,562	58,415	50,398
40	3.440	88,767	76,136	25,804	22,133
41	0.979	31,126	32,197	31,793	32,888
42	0.606	50,168	59,765	82,786	98,622
43	1.689	88,126	118,615	52,176	70,228
44	0.552	47,678	62,503	86,373	113,230

Table 3-10 A Number of Occupants in Dhaka (Con't)

Ward	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
		Daytime	Nighttime	Daytime	Nighttime
45	1.341	68,645	61,664	51,190	45,983
46	5.441	105,495	144,782	19,389	26,610
47	1.281	57,097	76,447	44,572	59,678
48	1.355	99,189	108,441	73,202	80,030
49	2.251	103,391	73,114	45,931	32,480
50	0.666	50,374	64,598	75,637	96,994
51	0.823	51,431	55,954	62,492	67,988
52	1.693	55,358	40,286	32,698	23,796
53	1.829	73,893	54,802	40,401	29,963
54	1.066	75,293	92,712	70,631	86,972
55	0.829	68,472	82,559	82,596	99,588
56	2.095	57,968	27,305	27,669	13,033
57	1.829	69,208	40,238	37,839	22,000
58	0.898	67,211	96,617	74,846	107,591
59	0.585	41,724	53,247	71,323	91,020
60	0.422	49,844	60,352	118,114	143,015
61	0.313	34,787	39,288	111,140	125,522
62	0.899	47,105	44,003	52,397	48,946
63	0.471	31,878	34,577	67,681	73,413
64	0.204	35,176	32,786	172,433	160,716
65	0.478	58,079	56,489	121,505	118,179
66	0.384	47,081	25,701	122,608	66,929
67	0.448	37,737	30,828	84,235	68,812
68	0.266	44,445	38,516	167,088	144,796
69	0.443	68,894	70,429	155,516	158,982
70	0.340	51,450	38,250	151,324	112,501
71	0.253	39,879	35,636	157,626	140,852
72	0.205	30,883	25,460	150,650	124,197
73	0.369	55,975	13,532	151,695	36,671
74	0.405	76,059	53,182	187,800	131,313
75	0.542	43,933	48,566	81,056	89,605
76	0.545	60,436	71,430	110,892	131,064
77	0.420	57,362	59,537	136,577	141,754
78	0.292	45,943	41,833	157,339	143,264
79	0.371	63,411	57,334	170,919	154,540
80	0.245	33,376	40,121	136,230	163,759
81	0.543	62,569	73,472	115,229	135,307
82	0.434	45,761	56,733	105,441	130,722
83	0.546	55,283	65,253	101,250	119,510
84	0.716	68,205	80,233	95,259	112,057
85	0.907	67,353	86,314	74,259	95,164
86	0.834	78,567	84,568	94,205	101,401
87	0.644	65,553	86,769	101,790	134,735
88	0.459	39,421	55,987	85,885	121,976
89	0.669	63,372	91,473	94,727	136,731
90	0.753	74,183	85,946	98,517	114,138
Total	120	6,457,483	7,279,663	53,812	60,664

Table 3-27 A Number of Occupants in Chittagong

Ward	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
		Daytime	Nighttime	Daytime	Nighttime
1	23.64	54,872	61,734	2,321	2,612
2	14.60	115,829	109,556	7,931	7,502
3	4.15	59,459	71,403	14,342	17,222
4	9.85	127,890	131,215	12,984	13,321
5	6.84	49,903	62,707	7,293	9,164
6	2.71	69,457	84,567	25,654	31,236
7	4.00	104,897	108,044	26,192	26,977
8	6.24	131,473	145,948	21,061	23,379
9	6.27	75,480	98,272	12,044	15,681
10	5.48	56,765	53,549	10,356	9,769
11	5.41	53,033	73,468	9,803	13,580
12	2.43	53,207	67,199	21,940	27,710
13	3.33	60,004	71,385	18,019	21,437
14	1.21	25,988	35,553	21,392	29,265
15	1.73	33,758	40,284	19,532	23,308
16	2.37	79,831	65,585	33,743	27,721
17	1.99	44,002	58,058	22,140	29,212
18	4.24	45,148	54,769	10,656	12,926
19	0.84	24,601	31,244	29,238	37,133
20	0.40	14,559	23,773	36,702	59,929
21	0.78	22,794	32,959	29,327	42,407
22	0.80	21,112	26,817	26,546	33,720
23	0.58	23,928	30,482	41,570	52,955
24	2.66	96,966	128,613	36,466	48,368
25	2.04	44,668	62,725	21,844	30,674
26	6.12	35,061	45,955	5,730	7,510
27	1.51	40,219	52,678	26,591	34,829
28	1.09	36,073	40,149	33,232	36,987
29	0.66	26,599	33,674	40,573	51,365
30	0.83	35,519	36,305	42,751	43,698
31	0.64	19,372	16,587	30,249	25,901
32	0.86	24,297	24,687	28,173	28,625
33	0.48	24,848	24,559	51,627	51,027
34	0.58	26,077	24,066	44,654	41,210
35	1.59	25,185	17,296	15,809	10,857
36	1.53	24,162	31,984	15,794	20,907
37	3.71	23,104	28,239	6,227	7,610
38	4.77	44,019	60,041	9,223	12,580
39	8.51	48,713	53,179	5,727	6,252
40	10.44	52,689	74,094	5,049	7,100
41	11.47	26,130	39,200	2,279	3,419
Total	169.36	2,001,691	2,332,599	11,819	13,773

Table 3-28 A Number of Occupants in Sylhet

Ward	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
		Daytime	Nighttime	Daytime	Nighttime
1	0.52	8,980	9,276	17,356	17,929
2	0.58	7,350	6,624	12,722	11,466
3	1.30	12,075	10,950	9,276	8,412
4	0.90	10,016	9,958	11,072	11,008
5	0.65	15,232	17,263	23,365	26,481
6	0.60	7,977	10,750	13,360	18,005
7	1.85	17,845	23,371	9,636	12,620
8	2.18	19,470	24,201	8,921	11,089
9	1.57	19,148	22,349	12,233	14,278
10	1.16	16,753	20,367	14,468	17,588
11	0.51	11,623	14,963	23,012	29,624
12	0.42	11,628	14,836	27,411	34,974
13	0.59	10,495	10,149	17,919	17,328
14	0.84	15,654	12,009	18,552	14,232
15	0.68	11,068	9,009	16,199	13,185
16	0.70	9,326	9,643	13,230	13,680
17	0.94	12,299	14,484	13,037	15,353
18	0.86	10,829	14,411	12,660	16,847
19	0.76	13,177	17,593	17,296	23,093
20	1.11	13,576	13,339	12,270	12,056
21	0.42	13,078	17,384	30,983	41,183
22	0.46	9,710	9,576	20,968	20,678
23	1.00	7,106	7,847	7,075	7,813
24	1.06	17,545	24,293	16,547	22,910
25	1.94	13,140	14,053	6,779	7,250
26	1.34	19,717	17,621	14,679	13,118
27	2.01	22,262	25,459	11,069	12,659
Total	26.96	357,079	401,776	13,242	14,900

Table 3-29 A Comparison between the calculated population and the statistical pocket book 2008 population in Dhaka, Chittagong and Sylhet City Corporations

City	Calculated Population		Statistical Pocket Book 2008		
	Daytime	Nighttime	2006	2007	2008 (Estimated)
Dhaka	6,457,483	7,279,663	6,475,252	6,732,968	7,000,940
Chittagong	2,001,691	2,332,599	2,438,403	2,532,421	2,579,107
Sylhet	357,079	401,776	394,119	427,265	463,198
Total	8,816,253	10,014,038	9,307,774	9,692,654	10,043,245

3.5. Vulnerability factors

According to the Turkish method level 1, there are five significant vulnerability factors including soft first story, heavy overhang, short columns, pounding effects and topographic effects. The number of buildings with the presence of the foregoing vulnerability factors is shown in Table 3-14 to 3-16. It is also noted that a number of the concrete buildings in each ward are accumulated by using C3L, C3M, LCL and LCM structural types.

The definitions of vulnerability factors are described in the following:

Presence of soft story

Soft first story buildings are one of the most vulnerable structures during severe earthquakes. A soft story in a building happens when the ground story has less stiffness and strength compared to the other stories. Normally, this situation can be resulted from the building that locates along the side of the main street because the first story is used for a commercial space that has opening between the frame members for customer circulation. Besides, further irregularity can be caused by having taller clearances and different axis systems. Hence, the soft story buildings exhibit a less safe behavior than the similar regular structures during moderate and severe earthquake.

Presence of heavy overhangs

Heavy overhanging floors in multistory buildings lead to irregularity in stiffness and mass distributions. From the view point of earthquake engineering, these irregular plan shapes are undesirable because they cause an inappropriate dynamic behavior when subjected to horizontal earthquake ground motion. For example, torsional moment in buildings can be increased during earthquakes due to non-symmetric distribution of mass and stiffness.

Presence of short columns

Short columns can be created by the arrangement of infill walls or other non-structural, architectural members. Sometimes, the infill walls are shorter than the columns and windows may be opened at the top of the periphery shear walls at the basement of the structures. In such cases, the column length becomes shorter and stiffer. Due to the increase in stiffness, the columns share more flexural moment and this causes the increase in shear forces. Therefore, these columns usually sustain heavy damage during strong earthquake.

Pounding between adjacent buildings

Damage due to pounding can be observed after almost every earthquake events. Different vibration periods and non-synchronized vibration amplitudes cause the close buildings to knock together. Buildings subjected to pounding receive heavier damage on higher stories.

Topographic effects

Topographic amplification may also increase ground motion intensity on hilltops during earthquake. For example, buildings located on steep slopes (more than 30 degrees) usually have discontinues foundations that can distort the ground distribution evenly to the structural components above. Therefore, this factor should be taken into account in the seismic risk assessment.

Table 3-30 Vulnerability Factors in Dhaka

Ward	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building
1	2,625	1,984	1,635	1,378	14	4,749
2	1,837	1,433	1,210	1,079	11	3,596
3	1,263	985	831	740	8	2,469
4	508	393	330	290	3	975
5	1,450	1,129	952	847	9	2,825
6	2,530	1,964	1,652	1,460	15	4,887
7	962	737	613	530	5	1,798
8	1,599	1,239	1,039	915	10	3,071
9	856	670	567	508	5	1,691
10	1,513	1,180	996	888	9	2,964
11	1,020	782	651	563	6	1,908
12	962	746	626	552	6	1,851
13	4,001	3,086	2,581	2,256	23	7,601
14	1,719	1,330	1,114	979	10	3,288
15	2,206	1,747	1,495	1,369	15	4,507
16	2,523	1,951	1,635	1,436	15	4,824
17	3,667	2,854	2,406	2,139	23	7,154
18	1,119	861	719	625	6	2,114
19	1,529	1,158	955	808	8	2,781
20	1,173	913	769	682	7	2,281
21	1,935	1,499	1,258	1,108	12	3,718
22	1,673	1,305	1,100	980	10	3,268
23	672	523	441	392	4	1,310
24	783	608	510	450	5	1,506
25	1,249	976	825	739	8	2,462
26	928	729	618	558	6	1,849
27	1,013	791	668	596	6	1,985
28	888	695	588	528	6	1,756
29	863	674	570	509	5	1,694
30	710	556	471	422	4	1,404
31	287	223	186	164	2	548
32	550	431	365	328	3	1,089
33	137	104	86	73	1	249
34	935	720	601	523	5	1,763
35	633	490	410	359	4	1,206
36	666	518	436	386	4	1,291
37	749	575	478	414	4	1,401
38	433	332	276	239	2	810
39	814	624	519	449	5	1,521
40	1,024	776	640	542	5	1,856
41	396	304	253	218	2	739
42	757	581	484	419	4	1,416
43	1,470	1,126	936	806	8	2,734
44	793	608	506	437	5	1,480
45	801	610	505	432	4	1,473
46	1,642	1,269	1,063	932	10	3,134
47	1,091	837	696	601	6	2,034
48	1,534	1,175	976	840	9	2,846
49	931	699	573	477	5	1,654
50	979	743	612	518	5	1,772
51	813	616	507	428	4	1,468

Table 3-14 Vulnerability Factors in Dhaka (Con't)

Ward	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building
52	504	382	315	266	3	911
53	548	419	348	300	3	1,019
54	1,008	782	657	580	6	1,942
55	795	622	525	470	5	1,562
56	276	215	182	163	2	542
57	334	255	211	180	2	616
58	1,527	1,179	986	863	9	2,902
59	793	611	510	444	5	1,496
60	840	650	544	477	5	1,602
61	589	454	379	330	3	1,111
62	592	452	375	321	3	1,092
63	350	273	231	206	2	686
64	352	274	231	205	2	681
65	772	599	503	444	5	1,485
66	223	175	147	132	1	435
67	335	263	223	200	2	663
68	418	327	276	247	3	820
69	817	639	540	483	5	1,606
70	426	333	280	250	3	830
71	398	312	264	236	3	783
72	279	219	185	166	2	549
73	126	99	84	75	1	247
74	643	503	425	381	4	1,267
75	640	493	412	359	4	1,210
76	877	691	589	534	6	1,767
77	773	599	502	442	5	1,483
78	481	378	320	288	3	955
79	699	551	470	427	5	1,408
80	492	388	330	300	3	990
81	858	675	574	519	6	1,718
82	719	566	482	438	5	1,449
83	815	636	538	481	5	1,604
84	918	722	614	556	6	1,840
85	1,154	901	762	682	7	2,273
86	989	779	662	599	6	1,981
87	998	789	674	615	7	2,027
88	775	615	527	484	5	1,593
89	1,282	1,018	872	802	9	2,636
90	1,063	842	720	659	7	2,171
Total	89,689	69,541	58,400	51,517	541	172,722

Table 3-31 Vulnerability Factors in Chittagong

Ward	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building
1	755	1,261	520	786	81	3,411
2	1,261	1,973	788	1,242	137	5,125
3	674	1,027	409	656	73	2,620
4	1,450	2,271	911	1,431	157	5,915
5	583	963	394	601	63	2,583
6	843	1,313	524	831	91	3,390
7	1,110	1,698	672	1,074	121	4,354
8	1,539	2,295	890	1,452	170	5,768
9	870	1,426	584	894	93	3,808
10	536	846	340	533	58	2,209
11	704	1,084	423	681	78	2,763
12	663	1,003	393	635	73	2,547
13	852	1,366	552	856	92	3,604
14	402	639	257	401	44	1,674
15	524	769	298	490	58	1,920
16	678	1,051	422	667	73	2,720
17	596	899	349	568	66	2,267
18	644	1,073	444	671	69	2,903
19	425	671	273	423	46	1,767
20	339	478	181	305	38	1,162
21	388	557	212	354	43	1,364
22	274	416	163	263	30	1,058
23	328	493	193	313	36	1,243
24	1,597	2,263	858	1,447	178	5,502
25	640	958	374	607	70	2,419
26	459	709	278	446	50	1,816
27	532	789	308	501	58	1,985
28	417	649	257	409	45	1,673
29	331	512	202	324	36	1,312
30	422	664	267	419	46	1,732
31	196	308	127	197	21	811
32	348	500	194	321	38	1,240
33	327	515	212	328	35	1,362
34	340	516	212	333	36	1,337
35	255	408	173	260	27	1,101
36	414	619	244	393	45	1,572
37	319	511	207	321	34	1,350
38	724	1,210	502	756	77	3,279
39	672	1,062	433	672	72	2,796
40	933	1,431	568	904	102	3,679
41	539	917	384	571	57	2,510
Total	25,903	40,114	15,996	25,337	2,818	103,651

Table 3-32 Vulnerability Factors in Sylhet

Ward	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building
1	166	360	114	49	21	792
2	100	213	64	30	12	453
3	148	318	98	44	18	688
4	154	332	105	46	19	728
5	208	445	133	61	26	942
6	140	301	90	41	17	640
7	351	746	225	104	43	1,590
8	340	716	210	101	41	1,500
9	286	614	186	84	35	1,312
10	301	649	207	89	37	1,433
11	170	359	108	51	21	762
12	147	313	96	44	18	675
13	163	347	108	48	20	753
14	181	379	125	54	22	855
15	130	281	88	38	16	613
16	140	297	89	42	17	631
17	207	444	135	61	26	952
18	195	415	123	58	24	874
19	192	407	121	57	24	860
20	205	435	131	61	25	925
21	233	494	147	69	29	1,044
22	190	413	132	56	24	914
23	76	161	50	23	9	350
24	219	464	139	65	27	984
25	201	425	129	60	25	908
26	245	520	164	73	30	1,142
27	220	465	140	65	27	989
Total	5,308	11,313	3,457	1,574	653	24,309

3.6. Vulnerability Scoring and Mapping in Ward Level

Review of Turkish Scoring Method (Level 1)

The 1999 earthquakes caused huge damage and economic losses in Turkey. The city of Duzce, hit by the second earthquake (7.2Mw), suffered widespread damage to many concrete buildings. After the events, a co-operation between the government of Turkey and JICA, Japan, has been established to record the damage level of 477 concrete buildings in Turkey. The data was then used to develop a scoring method for the determination of building damage. The following factors are taken into account:

- Earthquake area (Zone I, Zone II, and Zone III)
- Number of storey of building (1-7 stories)
- Soft storey (Yes or No)
- Heavy overhang (Yes or No)
- Apparent building quality (Good, Moderate, or Poor)
- Short columns (Yes or No)
- Pounding effect (Yes or No)
- Topography effect (Yes or No)

From the factors above, the research team had set up an equation and a risking value for calculating performance score (PS) of damaged concrete building as equation 3-1 below.

$$PS = (\text{Initial Score}) - \sum(\text{Vulnerability Parameter}) \times (\text{Vulnerability Score}) \qquad (3\text{-}1)$$

Table 3-33 Initial Scores and Vulnerability Scores of 1-7 Storey-Concrete Building

Story #	Zone I 60<PGV<80	Zone II 40<PGV<60	Zone III 20<PGV<40	Soft Story	Heavy Overhang	Apparent Quality	Short Column	Pounding	Topographic Effects
1, 2	90	125	160	0	-5	-5	-5	0	0
3	90	125	160	-10	-10	-10	-5	-2	0
4	80	100	130	-15	-10	-10	-5	-3	-2
5	80	90	115	-15	-15	-15	-5	-3	-2
6, 7	70	80	95	-20	-15	-15	-5	-3	-2

Initial Score **Vulnerability Score**

Vulnerability Parameters

Soft story	: No (0); Yes (1)
Heavy overhangs	: No (0); Yes (1)
Apparent quality	: Good (0); Moderate (1); Poor (2)
Short columns	: No (0); Yes (1)
Pounding effect	: No (0); Yes (1)
Topography effect	: No (0); Yes (1)

Table 3-34 Definition of Each Damage Levels of Structure of Concrete Buildings

Damage State	Structural Elements	Non-Structural Elements	Score
None	No visual sign of damage	No visual sign of damage	≥100
Light	Hairline inclined or flexural cracks	Hairline cracks in wall. Flaking of plaster	80-100
Moderate	Concrete spalling	Cracking in walls and joints between panels. Flaking of large pieces of plaster	50-80
Severe	Local structural failure	Wide and through cracks in walls	0-50
Collapse	Local or total collapse	Crushing of walls or out-of-plane toppling of walls	

Table 3-18 defines damage levels as none, light, moderate, severe, and collapse. None refers to no damage to building structure. However, its risking score is equal or greater than 100. For light level and moderate level, they are slightly damage and average damage to building structure that can mark in range of 80-100 and 50-80, respectively. Finally, severe and collapse levels, failure damage and totally damage to building structure, are in the same score range as 0-50.

Vulnerability Maps of Concrete Buildings

In the development of vulnerability maps for concrete buildings, there are mainly 4 steps as:

- Select a representative group of concrete building types which have a story number less than 8. In this project, C3L, C3M, LCL and LCM type are focused because they contribute a major portion in the building stock.
- Calculate a performance score (PS) of an individual building by using the initial score from Zone II (Initial score = 125). Then, find a vulnerability value which is equal to PS divided by 125. If this calculated value is low, the vulnerability of the building is high.
- Average the vulnerability values in each ward by using a combination arithmetic mean.
- Define a range of vulnerability levels in three cities (very high, high, medium, low and very low) and develop the vulnerability maps of concrete buildings.

Table 3-35 Ward Vulnerability Values from 6,010 Concrete Buildings in Dhaka

Ward	Number of Buildings	Vulnerability Value	Ward	Number of Buildings	Vulnerability Value
1	*231*	*0.718*	12	*79*	*0.872*
2	*88*	*0.752*	13	*183*	*0.847*
3	*91*	*0.745*	14	*126*	*0.830*
4	*64*	*0.820*	15	*10*	*0.901*
5	*54*	*0.724*	16	*175*	*0.874*
6	*51*	*0.768*	17	*40*	*0.948*
7	*50*	*0.811*	18	*60*	*0.773*
8	*20*	*0.807*	19	*140*	*0.649*
9	*26*	*0.841*	20	*51*	*0.793*
10	*77*	*0.854*	21	*27*	*0.895*
11	*96*	*0.634*	22	*113*	*0.879*

Table 3-19 Ward Vulnerability Values from 6,010 Concrete Buildings in Dhaka (Con't)

Ward	Number of Buildings	Vulnerability Value	Ward	Number of Buildings	Vulnerability Value
23	53	0.766	57	43	0.784
24	101	0.724	58	98	0.802
25	58	0.921	59	113	0.733
26	24	0.903	60	76	0.791
27	104	0.875	61	93	0.766
28	24	0.874	62	40	0.774
29	88	0.801	63	39	0.835
30	16	0.873	64	40	0.706
31	19	0.672	65	106	0.737
32	18	0.703	66	61	0.667
33	12	0.901	67	25	0.747
34	42	0.806	68	28	0.563
35	101	0.694	69	27	0.762
36	110	0.785	70	22	0.699
37	100	0.764	71	27	0.664
38	130	0.779	72	53	0.767
39	107	0.714	73	16	0.681
40	212	0.740	74	50	0.750
41	70	0.756	75	16	0.829
42	96	0.750	76	29	0.822
43	111	0.740	77	29	0.685
44	66	0.786	78	19	0.697
45	71	0.736	79	23	0.675
46	192	0.626	80	17	0.764
47	114	0.830	81	25	0.742
48	78	0.802	82	6	0.664
49	155	0.744	83	46	0.782
50	79	0.731	84	47	0.886
51	69	0.746	85	13	0.861
52	60	0.668	86	46	0.815
53	69	0.726	87	98	0.674
54	60	0.766	88	12	0.930
55	13	0.764	89	61	0.824
56	45	0.669	90	47	0.823

Table 3-36 Ward Vulnerability Values from 2,951 Concrete Buildings in Chittagong

Ward	Number of Buildings	Vulnerability Value	Ward	Number of Buildings	Vulnerability Value
1	60	0.931	22	15	0.709
2	159	0.922	23	37	0.792
3	101	0.940	24	107	0.865
4	190	0.849	25	82	0.848
5	113	0.932	26	96	0.892
6	97	0.905	27	58	0.877
7	83	0.882	28	14	0.760
8	113	0.864	29	4	0.683
9	65	0.899	30	26	0.795
10	98	0.913	31	16	0.635
11	144	0.916	32	8	0.937
12	121	0.854	33	17	0.823
13	44	0.876	34	13	0.871
14	20	0.900	35	38	0.734
15	34	0.853	36	36	0.896
16	86	0.884	37	56	0.920
17	40	0.792	38	261	0.873
18	42	0.901	39	193	0.823
19	27	0.751	40	106	0.909
20	5	0.703	41	92	0.935
21	34	0.871			

Table 3-37 Ward Vulnerability Values from 1,885 Concrete Buildings in Sylhet

Ward	Number of Buildings	Vulnerability Value	Ward	Number of Buildings	Vulnerability Value
1	55	0.914	15	64	0.895
2	46	0.894	16	53	0.893
3	62	0.903	17	69	0.905
4	65	0.882	18	49	0.903
5	61	0.918	19	60	0.963
6	65	0.891	20	95	0.916
7	124	0.941	21	107	0.926
8	109	0.893	22	67	0.945
9	106	0.911	23	39	0.906
10	58	0.923	24	91	0.918
11	46	0.905	25	73	0.934
12	35	0.935	26	113	0.916
13	42	0.905	27	87	0.956
14	44	0.888			

4. Lifeline Vulnerability

Referring to UN-ISDR Terminology on Disaster Risk Reduction (2009), vulnerability is the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. In this context, vulnerability can be defined as the characteristics and circumstances of lifeline systems that are susceptible due to the earthquake. Lifelines are considered critical systems because of their importance in facilitating rapid and effective response and recovery. Delayed response can lead to exacerbated conditions, such as fire following damage. This is why it is critical, for example, that water systems be designed to survive even the largest earthquakes. Post-earthquake recovery process will also be hampered if certain lifeline systems have not been operational. The lifeline systems include transportation system and utility system.

4.1.Transportation System

Vulnerability mapping of transportation system include (i) highway transportation system, (ii) railway transportation system, (iii) bus transportation system and (iv) ferry transportation system. This subchapter discusses about vulnerability characteristics of those systems.

Soil classification is also incorporated in describing the vulnerability of the system. In three cities there are 3 types of soil: (i) Class E: soft soils, (ii) Class D: stiff soils, and (iii) Class C: very dense soil and soft rock. This information is derived from shear wave velocity measurement within 0-30m depth (Vs 30) that was presented in the seismic hazard mapping report. This report was submitted by Oyo International Corporation (OIC) – Asian Disaster Preparedness Center (ADPC) to CDMP earlier as a part of this project.

Vulnerability maps of every transportation system are compiled and presented in the Map Catalog submitted along with this report.

4.1.1. Highway Transportation System

Vulnerability is defined as the characteristics of highway segments and highway bridges that make them susceptible to the damaging effect of an earthquake. It can be identified from the physical structural characteristics (for road and bridge), the road blockade potential, and the soil liquefaction susceptibility on which the highway and bridge are located. As mentioned before, existing road network is classified into major road (HRD1, number of lane <=4), urban road (HRD2, number of lane =2-3), and local or minor road (number of lane =1). In the vulnerability and risk assessment, only major road and urban road are considered as components of highway transportation system.

Physical characteristics of highway segment are observed from the road length, pavement material and road width (represented in major and urban road). Considering the high density of high-rise buildings and possibility of road blockade by building damage or collapse, the road blockade potential also represents the vulnerability of an area. More roads will provide more alternatives of route for evacuation, and response and relief efforts after the earthquake. The more roads exist in an area reflects the less vulnerability of that area. It is necessary to define the road blockade potential in every ward to be able to benchmark different vulnerability level

of different wards. Road blockade potential is defined as building density (building number/sq.km) divided by total road length in every cluster (km).

Road vulnerability characteristics in every ward of city corporation areas and in every class of soil liquefaction susceptibility are presented in the following tables.

Table 4-1 Highway Vulnerability Characteristics in Every Ward of Dhaka City Corporation Area

Dhaka Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)					Total Length (km)
			Very Low	Low	Moderate	High	Very High	
1	Major Road	Bituminous	3.92		2.84		5.82	12.58
	Urban Road	Bituminous	36.00		29.63		36.64	102.27
		Brick			2.14		2.04	4.18
		Total	39.92		34.61		44.49	119.03
2	Major Road	Bituminous	1.28		0.02		0.36	1.66
	Urban Road	Bituminous	7.89	1.72	2.61		15.89	28.11
		Brick	0.41				0.67	1.07
		Total	9.57	1.72	2.63		16.92	30.85
3	Major Road	Bituminous	1.15		0.06		1.01	2.22
	Urban Road	Bituminous	4.35		0.09		6.29	10.73
		Total	5.50		0.15		7.29	12.95
4	Major Road	Bituminous					0.56	0.56
	Urban Road	Bituminous					9.88	9.88
		Total					10.44	10.44
5	Major Road	Bituminous	0.52		0.36		0.91	1.79
	Urban Road	Bituminous	4.15		1.10		7.39	12.64
		Total	4.66		1.47		8.31	14.44
6	Major Road	Bituminous	2.47	0.01			3.20	5.69
	Urban Road	Bituminous	16.50	0.51			15.97	32.98
		Brick					0.61	0.61
		Total	18.97	0.52			19.78	39.27
7	Major Road	Bituminous	1.55				0.20	1.75
	Urban Road	Bituminous	11.30				2.34	13.63
		Brick	0.09				0.02	0.11
		Total	12.93				2.56	15.49
8	Major Road	Bituminous	1.36		3.04		1.35	5.74
	Urban Road	Bituminous	9.46		2.06		4.52	16.04
		Brick	0.26				0.31	0.57
		Total	11.08		5.09		6.18	22.35
9	Major Road	Bituminous			0.45		0.97	1.42
		Brick					1.13	1.13
	Urban Road	Bituminous			0.44		0.90	1.34
		Brick					0.15	0.15
		Total			0.89		3.15	4.04
10	Major Road	Bituminous					3.96	3.96
	Urban Road	Bituminous					7.22	7.22
		Brick			0.15		0.35	0.50
		Total			0.15		11.53	11.68
11	Major Road	Bituminous					1.16	1.16
	Urban Road	Bituminous					5.98	5.98
		Total					7.14	7.14
12	Major Road	Bituminous	0.57				1.05	1.62

Dhaka Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)					Total Length (km)
			Very Low	Low	Moderate	High	Very High	
	Urban Road	Bituminous	0.54				4.19	4.73
		Brick					0.24	0.24
		Total	1.10				5.48	6.59
13	Major Road	Bituminous	0.32					0.32
	Urban Road	Bituminous	0.90				3.63	4.53
		Brick	0.10				0.09	0.19
		Total	1.32				3.71	5.04
14	Major Road	Bituminous	0.02				2.35	2.37
	Urban Road	Bituminous	0.51				4.24	4.75
		Brick	0.10				0.00	0.10
		Total	0.63				6.59	7.22
15	Urban Road	Bituminous	0.00		0.27		6.74	7.01
		Brick					0.14	0.14
		Total	0.00		0.27		6.88	7.15
16	Major Road	Bituminous	2.55				4.42	6.97
	Urban Road	Bituminous	0.81				8.89	9.70
		Brick					0.06	0.06
		Total	3.36				13.36	16.72
17	Major Road	Bituminous	1.10		1.96		0.43	3.48
	Urban Road	Bituminous	6.59		13.55		41.74	61.88
		Brick			0.56		1.71	2.27
		Total	7.69		16.06		43.88	67.63
18	Major Road	Bituminous	1.00		1.43		0.39	2.83
	Urban Road	Bituminous	5.96		7.14		1.66	14.75
		Total	6.96		8.57		2.05	17.58
19	Major Road	Bituminous	7.38		1.18		2.34	10.91
	Urban Road	Bituminous	44.55		6.31		12.99	63.85
		Brick			0.57			0.57
		Total	51.93		8.06		15.34	75.33
20	Major Road	Bituminous	2.49		0.14		0.81	3.45
	Urban Road	Bituminous	11.11		0.17		2.42	13.70
		Brick	0.39		1.26		2.11	3.75
		Total	14.00		1.58		5.33	20.90
21	Major Road	Bituminous	2.05		0.24		0.66	2.95
	Urban Road	Bituminous	4.84		1.04		1.73	7.61
		Total	6.89		1.28		2.39	10.56
22	Major Road	Bituminous			0.02		1.64	1.66
	Urban Road	Bituminous					8.63	8.63
		Brick					0.69	0.69
		Total			0.02		10.96	10.98
23	Major Road	Bituminous					1.69	1.69
	Urban Road	Bituminous					7.66	7.66
		Brick					0.07	0.07
		Total					9.42	9.42
24	Major Road	Bituminous					3.07	3.07
	Urban Road	Bituminous					17.19	17.19
		Brick					0.40	0.40
		Total					20.67	20.67
25	Major Road	Bituminous					0.03	0.03
	Urban Road	Bituminous					3.93	3.93
		Brick					3.02	3.02
		Total					6.98	6.98

Dhaka Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)					Total Length (km)
			Very Low	Low	Moderate	High	Very High	
26	Urban Road	Bituminous			0.05		12.68	12.73
		Brick					6.71	6.71
		Total			0.05		19.40	19.45
27	Major Road	Bituminous					2.90	2.90
	Urban Road	Bituminous					9.47	9.47
		Brick					0.16	0.16
		Total					12.53	12.53
28	Major Road	Bituminous					0.80	0.80
	Urban Road	Bituminous					4.54	4.54
		Brick					0.19	0.19
		Total					5.53	5.53
29	Major Road	Bituminous					0.22	0.22
	Urban Road	Bituminous					4.29	4.29
		Total					4.50	4.50
30	Major Road	Bituminous	0.24				0.75	0.99
	Urban Road	Bituminous	0.12				1.02	1.15
		Total	0.36				1.78	2.14
31	Major Road	Bituminous	0.27				3.66	3.92
	Urban Road	Bituminous	0.38				3.48	3.87
		Total	0.65				7.14	7.79
32	Major Road	Bituminous	3.26				2.16	5.42
	Urban Road	Bituminous	3.19				2.88	6.07
		Total	6.45				5.03	11.49
33	Major Road	Bituminous	0.49				2.03	2.52
	Urban Road	Bituminous	0.03				2.18	2.21
		Total	0.53				4.20	4.73
34	Major Road	Bituminous					2.21	2.21
	Urban Road	Bituminous					3.99	3.99
		Total					6.20	6.20
35	Major Road	Bituminous					0.48	0.48
	Urban Road	Bituminous					0.87	0.87
		Total					1.35	1.35
36	Major Road	Bituminous	4.50				2.69	7.20
	Urban Road	Bituminous	5.57				5.36	10.93
		Total	10.07				8.06	18.13
37	Major Road	Bituminous	1.91		0.24		2.42	4.57
	Urban Road	Bituminous	13.77		0.06		7.17	21.00
		Brick			0.21		0.90	1.11
		Total	15.68		0.51		10.50	26.68
38	Major Road	Bituminous	0.92				0.63	1.56
	Urban Road	Bituminous	3.71				7.12	10.83
		Brick	0.17					0.17
		Total	4.81				7.75	12.56
39	Major Road	Bituminous	2.31				1.59	3.90
	Urban Road	Bituminous	7.01				1.88	8.90
		Total	9.33				3.47	12.80
40	Major Road	Bituminous	3.87				3.84	7.71
	Urban Road	Bituminous	16.29				9.39	25.68
		Brick					0.01	0.01
		Total	20.16				13.24	33.40
	Major Road	Bituminous					3.67	3.67

Dhaka Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)					Total Length (km)
			Very Low	Low	Moderate	High	Very High	
41								
	Urban Road	Bituminous					5.22	5.22
		Brick					0.28	0.28
		Total					9.17	9.17
42	Major Road	Bituminous					2.32	2.32
	Urban Road	Bituminous					14.22	14.22
		Total					16.54	16.54
43	Major Road	Bituminous			0.01		0.91	0.93
		Brick			0.01		0.11	0.12
	Urban Road	Bituminous					15.58	15.58
		Brick					0.76	0.76
		Total			0.02		17.37	17.39
44	Major Road	Bituminous	0.72				0.29	1.01
	Urban Road	Bituminous	6.18				5.58	11.77
		Total	6.90				5.87	12.77
45	Major Road	Bituminous	1.75				0.85	2.61
	Urban Road	Bituminous	11.58				8.72	20.30
		Total	13.33				9.57	22.90
46	Major Road	Bituminous	0.44		0.07		3.15	3.67
		Brick			0.13		0.19	0.32
	Urban Road	Bituminous	2.39		1.44		20.84	24.68
		Brick			0.07		2.60	2.67
		Total	2.84		1.72		26.78	31.33
47	Major Road	Bituminous	0.46		0.72			1.18
	Urban Road	Bituminous	3.73		0.49			4.22
		Total	4.19		1.21			5.40
48	Major Road	Bituminous	0.73			0.13	0.35	1.22
	Urban Road	Bituminous	5.94				3.42	9.37
		Brick	0.02					0.02
		Total	6.69			0.13	3.78	10.60
49	Major Road	Bituminous	2.66				1.67	4.33
	Urban Road	Bituminous	10.07		0.76		13.03	23.86
		Total	12.72		0.76		14.70	28.18
50	Major Road	Bituminous	0.69				1.00	1.69
	Urban Road	Bituminous	0.82				4.48	5.30
		Total	1.51				5.48	6.99
51	Major Road	Bituminous	0.57				1.90	2.47
	Urban Road	Bituminous	2.45		0.75		6.27	9.47
		Total	3.02		0.75		8.17	11.94
52	Major Road	Bituminous	3.88				0.07	3.95
	Urban Road	Bituminous	10.85				2.22	13.06
		Total	14.73				2.29	17.02
53	Major Road	Bituminous	7.49				1.74	9.23
	Urban Road	Bituminous	8.93				2.59	11.52
		Total	16.42				4.33	20.75
54	Major Road	Bituminous	0.51				1.26	1.77
	Urban Road	Bituminous	1.24				5.16	6.40
		Total	1.75				6.42	8.17
55	Major Road	Bituminous					0.29	0.29
	Urban Road	Bituminous					4.36	4.36
		Brick			0.01		0.09	0.10
		Total			0.01		4.74	4.76

Dhaka Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)					Total Length (km)
			Very Low	Low	Moderate	High	Very High	
56	Major Road	Bituminous	9.29				1.85	11.14
	Urban Road	Bituminous	8.57				2.64	11.21
		Brick	0.54					0.54
		Total	18.40				4.49	22.89
57	Major Road	Bituminous	8.55				0.73	9.28
	Urban Road	Bituminous	12.25				0.60	12.85
		Brick	0.80					0.80
		Total	21.60				1.33	22.93
58	Major Road	Bituminous	1.13			0.23	0.28	1.65
	Urban Road	Bituminous	3.00			0.00	0.04	3.04
		Total	4.13			0.23	0.33	4.69
59	Major Road	Bituminous	0.53			0.06	0.04	0.63
	Urban Road	Bituminous	2.27				0.06	2.32
		Total	2.80			0.06	0.10	2.95
60	Major Road	Bituminous				1.00		1.00
	Urban Road	Bituminous	1.22			2.33		3.56
		Brick				0.07		0.07
		Total	1.22			3.41		4.63
61	Major Road	Bituminous	0.09					0.09
	Urban Road	Bituminous	2.30			0.11		2.41
		Total	2.39			0.11		2.50
62	Major Road	Bituminous	2.10					2.10
	Urban Road	Bituminous	5.65				1.43	7.08
		Total	7.75				1.43	9.19
63	Major Road	Bituminous	0.87					0.87
	Urban Road	Bituminous	4.49					4.49
		Total	5.35					5.35
64	Major Road	Bituminous	0.01					0.01
	Urban Road	Bituminous	2.31					2.31
		Total	2.32					2.32
65	Major Road	Bituminous	0.42			0.73	0.16	1.30
	Urban Road	Bituminous	1.17			1.96		3.13
		Brick				0.11		0.11
		Total	1.58			2.80	0.16	4.54
66	Major Road	Bituminous	1.34			0.32	0.00	1.66
	Urban Road	Bituminous	3.63			0.68		4.32
		Total	4.97			1.00	0.00	5.97
67	Major Road	Bituminous	0.14					0.14
	Urban Road	Bituminous	4.03					4.03
		Total	4.17					4.17
68	Major Road	Bituminous	0.64					0.64
	Urban Road	Bituminous	2.06					2.06
		Total	2.70					2.70
69	Major Road	Bituminous	0.12					0.12
	Urban Road	Bituminous	3.81					3.81
		Total	3.93					3.93
70	Major Road	Bituminous	1.88					1.88
	Urban Road	Bituminous	1.50					1.50
		Total	3.38					3.38
71	Major Road	Bituminous	0.77					0.77
	Urban Road	Bituminous	2.26					2.26
		Total	3.04					3.04

Dhaka Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)					Total Length (km)
			Very Low	Low	Moderate	High	Very High	
72	Major Road	Bituminous	0.42					0.42
	Urban Road	Bituminous	0.57					0.57
		Total	0.99					0.99
73	Major Road	Bituminous	1.88				0.12	2.00
	Urban Road	Bituminous	2.58				0.01	2.59
		Brick	0.07					0.07
		Total	4.53				0.13	4.66
74	Major Road	Bituminous	0.76					0.76
	Urban Road	Bituminous	2.60					2.60
		Total	3.36					3.36
75	Major Road	Bituminous	2.05				0.04	2.09
	Urban Road	Bituminous	3.19				1.13	4.33
		Total	5.24				1.18	6.42
76	Major Road	Bituminous	1.68					1.68
	Urban Road	Bituminous	2.83				0.31	3.14
		Total	4.51				0.31	4.82
77	Major Road	Bituminous	0.32					0.32
	Urban Road	Bituminous	5.80					5.80
		Total	6.12					6.12
78	Major Road	Bituminous	0.55					0.55
	Urban Road	Bituminous	1.43					1.43
		Total	1.98					1.98
79	Major Road	Bituminous	0.83				0.10	0.93
	Urban Road	Bituminous	1.17				0.24	1.42
		Total	2.00				0.35	2.35
80	Major Road	Bituminous	0.69					0.69
	Urban Road	Bituminous	1.01					1.01
		Total	1.70					1.70
81	Major Road	Bituminous	1.32		0.05			1.36
	Urban Road	Bituminous	4.22		0.08			4.30
		Total	5.54		0.12			5.66
82	Major Road	Bituminous	0.57					0.57
	Urban Road	Bituminous	2.92		0.36			3.28
		Total	3.49		0.36			3.85
83	Major Road	Bituminous	0.25		0.57			0.82
	Urban Road	Bituminous	0.77		4.60		0.04	5.41
		Brick			0.06			0.06
		Total	1.02		5.23		0.04	6.29
84	Major Road	Bituminous	0.26				1.01	1.28
	Urban Road	Bituminous	0.24				2.61	2.86
		Total	0.51				3.63	4.13
85	Major Road	Bituminous	0.01				1.06	1.07
	Urban Road	Bituminous	0.02				7.35	7.37
		Total	0.03				8.41	8.44
86	Major Road	Bituminous	0.95		0.13		3.31	4.40
	Urban Road	Bituminous	0.22		0.20		3.63	4.05
		Total	1.17		0.33		6.94	8.45
87	Major Road	Bituminous	1.24		1.01			2.25
	Urban Road	Bituminous	0.99		2.61			3.60
		Total	2.23		3.62			5.85
	Major Road	Bituminous			0.16			0.16

Dhaka Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)					Total Length (km)
			Very Low	Low	Moderate	High	Very High	
88								
	Urban Road	Bituminous			*0.83*			*0.83*
		Total			*0.99*			*0.99*
89	Major Road	Bituminous			*0.23*			*0.23*
	Urban Road	Bituminous			*4.84*			*4.84*
		Total			*5.07*			*5.07*
90	Major Road	Bituminous			*3.04*			*3.04*
	Urban Road	Bituminous			*6.33*			*6.33*
		Brick			*0.23*			*0.23*
		Total			*9.59*			*9.59*
91 (Cantonment & ZIA)	Major Road	Bituminous	*6.82*		*0.85*		*8.77*	*16.43*
	Urban Road	Bituminous	*26.99*		*6.09*		*51.10*	*84.18*
		Total	*33.81*		*6.94*		*59.86*	*100.61*
Grand Total			*516.63*	*2.24*	*118.12*	*7.75*	*625.42*	***1,270.16***

Table 4-2 Highway Vulnerability Characteristics in Every Ward of Chittagong City Corporation Area

Chittagong Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)					Total Length (km)
			None	Low	Moderate	High	Very High	
1	Major Road	Bituminous			*5.65*			*5.65*
	Urban Road	Bituminous	*9.32*		*10.18*			*19.51*
		Brick	*1.55*		*2.83*			*4.38*
		Earthen	*3.41*		*1.39*			*4.80*
		Total	*14.28*		*20.05*			*34.33*
2	Major Road	Bituminous	*0.75*		*2.64*	*1.62*		*5.02*
	Urban Road	Bituminous	*14.29*		*10.26*	*4.56*		*29.11*
		Brick	*1.82*		*0.87*	*0.04*		*2.73*
		Earthen	*1.92*		*2.51*	*0.04*		*4.47*
		Total	*18.79*		*16.28*	*6.27*		*41.33*
3	Major Road	Bituminous			*0.37*			*0.37*
	Urban Road	Bituminous			*7.97*			*7.97*
		Brick			*5.87*			*5.87*
		Earthen			*1.06*			*1.06*
		Total			*15.28*			*15.28*
4	Major Road	Bituminous			*4.13*		*0.72*	*4.85*
	Urban Road	Bituminous			*13.59*	*3.97*	*0.10*	*17.66*
		Brick			*4.76*	*0.12*	*0.00*	*4.89*
		Earthen			*0.15*			*0.15*
		Total			*22.64*	*4.09*	*0.82*	*27.55*
5	Major Road	Bituminous			*1.97*		*0.61*	*2.58*
	Urban Road	Bituminous			*6.84*	*1.05*	*0.66*	*8.55*
		Brick			*2.11*		*0.16*	*2.28*
		Total			*10.91*	*1.05*	*1.44*	*13.40*
6	Major Road	Bituminous			*1.37*			*1.37*
		Brick			*0.03*			*0.03*
		Earthen			*0.03*			*0.03*
	Urban Road	Bituminous			*6.64*			*6.64*
		Brick			*0.54*			*0.54*
		Earthen			*0.12*			*0.12*
		Total			*8.74*			*8.74*
7	Major Road	Bituminous	*0.03*		*4.20*			*4.22*

Chittagong Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)					Total Length (km)
			None	Low	Moderate	High	Very High	
	Urban Road	Bituminous	4.12		8.67			12.79
		Brick	0.74		1.30			2.04
		Earthen	0.10		0.15			0.25
		Total	4.99		14.32			19.31
8	Major Road	Bituminous	1.51		1.53	2.00		5.05
		Earthen			0.01			0.01
	Urban Road	Bituminous	9.46		6.85	3.52		19.84
		Brick	1.88		0.63	1.40		3.91
		Earthen	2.23		0.05			2.29
		Total	15.09		9.08	6.93		31.09
9	Major Road	Bituminous	0.20	0.30	0.83	0.47		1.79
	Urban Road	Bituminous	5.56	0.62	2.61	0.89		9.69
		Brick	0.09		0.02			0.11
		Earthen	0.09		0.08			0.17
		Total	5.95	0.92	3.53	1.36		11.75
10	Major Road	Bituminous			2.84	0.98		3.82
	Urban Road	Bituminous		0.28	3.47	5.98		9.73
		Brick			0.63	0.91		1.55
		Earthen			1.78	0.29		2.06
		Total		0.28	8.71	8.17		17.16
11	Major Road	Bituminous			2.01	1.65		3.66
	Urban Road	Bituminous			6.94	11.18		18.12
		Brick			0.64	0.62		1.26
		Earthen			1.99	0.83		2.83
		Total			11.58	14.28		25.86
12	Major Road	Bituminous			1.97	1.79		3.76
	Urban Road	Bituminous			4.84	1.91		6.75
		Brick			0.08	0.07		0.14
		Total			6.89	3.76		10.65
13	Major Road	Bituminous	3.13	0.06	2.10			5.28
	Urban Road	Bituminous	5.07		2.84			7.91
		Brick	1.64					1.64
		Total	9.84	0.06	4.94			14.83
14	Major Road	Bituminous	1.12		0.51			1.63
		Brick			0.02			0.02
	Urban Road	Bituminous	1.69		0.58			2.27
		Brick	0.19					0.19
		Total	3.00		1.11			4.11
15	Major Road	Bituminous	2.62	0.78	2.35			5.74
		Brick			0.00			0.00
	Urban Road	Bituminous	3.30	0.07	4.40			7.77
		Brick	0.04					0.04
		Total	5.95	0.85	6.75			13.55
16	Major Road	Bituminous	2.15		2.20			4.35
		Earthen			0.02			0.02
	Urban Road	Bituminous	4.78		8.09			12.87
		Brick	0.15		0.08			0.23
		Total	7.08		10.40			17.47
17	Major Road	Bituminous			1.01			1.01
	Urban Road	Bituminous			5.89			5.89
		Brick			0.72			0.72
		Earthen			0.06			0.06
		Total			7.68			7.68

Chittagong Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)					Total Length (km)
			None	Low	Moderate	High	Very High	
18	Major Road	Bituminous			1.56			1.56
	Urban Road	Bituminous			6.44	0.64		7.08
		Brick			1.24	1.02		2.26
		Total			9.25	1.67		10.91
19	Urban Road	Bituminous	0.06		3.31			3.36
		Brick			0.32			0.32
		Total	0.06		3.63			3.68
20	Urban Road	Bituminous	1.11		1.31			2.42
		Total	1.11		1.31			2.42
21	Major Road	Bituminous	0.96		1.76			2.72
	Urban Road	Bituminous	0.56		2.01			2.56
		Brick			0.04			0.04
		Total	1.51		3.81			5.32
22	Major Road	Bituminous	0.31		1.38			1.69
	Urban Road	Bituminous	1.26		2.69			3.95
		Total	1.57		4.07			5.64
23	Major Road	Bituminous	0.01		1.17	0.05		1.23
	Urban Road	Bituminous			1.55	0.16		1.71
		Brick			0.07			0.07
		Total	0.01		2.78	0.21		3.00
24	Major Road	Bituminous			0.91	2.90		3.82
	Urban Road	Bituminous			0.43	10.52		10.94
		Earthen			0.02	0.12		0.14
		Total			1.36	13.54		14.90
25	Major Road	Bituminous			0.03	1.64		1.67
	Urban Road	Bituminous			0.69	6.18		6.87
		Brick			0.04	0.19		0.23
		Total			0.76	8.01		8.77
26	Major Road	Bituminous			2.89	0.21		3.10
	Urban Road	Bituminous			14.86	9.11		23.97
		Brick			0.59			0.59
		Earthen			1.87			1.87
		Total			20.21	9.32		29.53
27	Major Road	Bituminous			0.07	0.69		0.76
	Urban Road	Bituminous			2.50	9.65		12.15
		Total			2.57	10.34		12.91
28	Major Road	Bituminous			0.99	1.06	0.31	2.35
	Urban Road	Bituminous			2.66	3.45	0.50	6.62
		Total			3.65	4.51	0.82	8.97
29	Major Road	Bituminous	0.13		1.49			1.63
	Urban Road	Bituminous			2.79	0.87	0.18	3.84
		Total	0.13		4.28	0.87	0.18	5.46
30	Major Road	Bituminous			0.16		0.36	0.51
	Urban Road	Bituminous			2.48	1.36	1.96	5.81
		Brick					0.24	0.24
		Total			2.64	1.36	2.56	6.55
31	Major Road	Bituminous	0.24		1.74		0.30	2.28
	Urban Road	Bituminous	0.06		2.02		1.27	3.35
		Total	0.30		3.76		1.57	5.63
32	Major Road	Bituminous	0.29		2.58			2.87
	Urban Road	Bituminous	1.12		4.34			5.45
		Total	1.41		6.92			8.32

Chittagong Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)					Total Length (km)
			None	Low	Moderate	High	Very High	
33	Major Road	Bituminous			0.23			0.23
	Urban Road	Bituminous			3.85		1.07	4.92
		Brick			0.33			0.33
		Total			4.40		1.07	5.47
34	Urban Road	Bituminous	0.84		3.64			4.48
		Brick			0.16			0.16
		Total	0.84		3.80			4.64
35	Major Road	Bituminous			0.25	0.86		1.11
	Urban Road	Bituminous	0.87		4.51	0.21		5.59
		Brick			0.29	0.10		0.39
		Total	0.87		5.05	1.17		7.10
36	Major Road	Bituminous			0.86	0.44	1.21	2.51
	Urban Road	Bituminous			3.37	2.40	1.51	7.28
		Total			4.23	2.84	2.72	9.79
37	Major Road	Bituminous			2.09	1.08		3.18
	Urban Road	Bituminous			10.13	12.59		22.72
		Brick			0.24			0.24
		Total			12.46	13.67		26.13
38	Major Road	Bituminous			1.84	0.15	0.71	2.70
	Urban Road	Bituminous			16.25	1.10	0.61	17.96
		Brick			1.97	0.16		2.13
		Total			20.05	1.42	1.32	22.79
39	Major Road	Bituminous			3.50	0.29		3.80
	Urban Road	Bituminous			20.62	16.57		37.19
		Brick			1.55	0.23		1.79
		Total			25.68	17.10		42.77
40	Major Road	Bituminous			5.02	0.37	0.26	5.65
	Urban Road	Bituminous			24.35	0.00	3.89	28.24
		Brick			0.25			0.25
		Total			29.63	0.37	4.15	34.15
41	Major Road	Bituminous			10.19	0.07		10.25
	Urban Road	Bituminous			29.77		0.67	30.44
Total					39.95	0.07	0.67	40.69
Grand Total			92.77	2.11	395.11	132.34	17.33	**639.66**

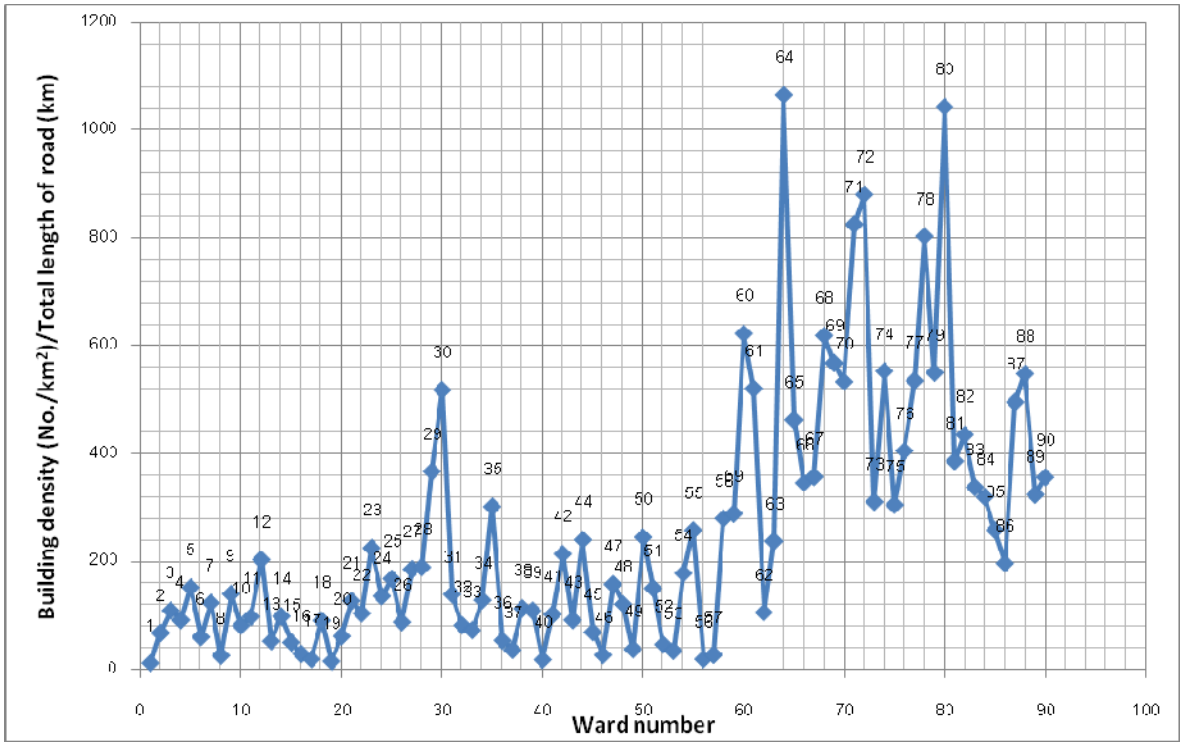
Table 4-3 Highway Vulnerability Characteristics in Every Ward of Sylhet City Corporation Area

Sylhet Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)				Total Length (km)
			None	Moderate	High	Very High	
1	Major Road	Bituminous	1.70	0.25			1.96
	Urban Road	Bituminous	2.71	0.00			2.71
		Total	4.41	0.25			4.67
2	Major Road	Bituminous	1.22				1.22
	Urban Road	Bituminous	1.08				1.08
		Total	2.30				2.30
3	Major Road	Bituminous	1.07	1.17			2.24
	Urban Road	Bituminous	1.30	1.08			2.37
		Total	2.36	2.24			4.61
4	Major Road	Bituminous	0.38	0.36			0.74
	Urban Road	Bituminous	3.49	0.26			3.75
		Total	3.87	0.62			4.50
5	Major Road	Bituminous	0.72	0.20			0.92
	Urban Road	Bituminous	0.90	0.51			1.41

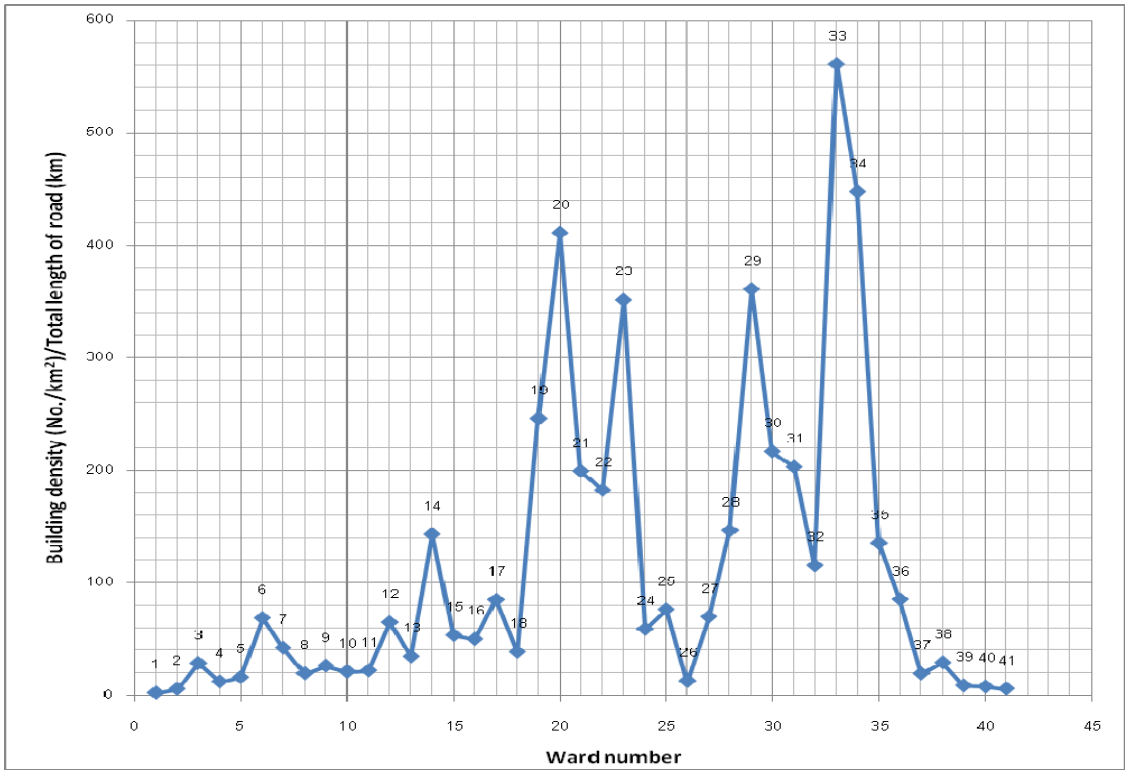
Sylhet Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km) None	Moderate	High	Very High	Total Length (km)
		Total	1.62	0.71			2.33
6	Major Road	Bituminous	0.34	0.43			0.77
	Urban Road	Bituminous	1.20	0.29			1.49
		Total	1.54	0.72			2.26
7	Major Road	Bituminous	0.55	0.00			0.55
	Urban Road	Bituminous	3.32	2.13			5.45
		Brick	0.04				0.04
		Total	3.91	2.13			6.04
8	Major Road	Bituminous	0.54	0.19			0.73
	Urban Road	Bituminous	3.79	1.24			5.03
		Total	4.33	1.43			5.76
9	Major Road	Bituminous	1.10	1.59			2.69
	Urban Road	Bituminous	0.87	1.99			2.86
		Brick	0.29	0.36			0.66
		Total	2.26	3.94			6.21
10	Major Road	Bituminous		0.10			0.10
	Urban Road	Bituminous	0.11	6.69	0.74		7.53
		Total	0.11	6.78	0.74		7.62
11	Major Road	Bituminous	0.77	0.04			0.81
	Urban Road	Bituminous	2.52	0.19			2.71
		Total	3.29	0.22			3.52
12	Major Road	Bituminous	0.22				0.22
	Urban Road	Bituminous	2.79	0.65			3.43
		Brick	0.00				0.00
		Total	3.00	0.65			3.65
13	Major Road	Bituminous	1.18				1.18
	Urban Road	Bituminous	2.56				2.56
		Brick	0.07				0.07
		Total	3.80				3.80
14	Major Road	Bituminous	0.98	0.04		0.33	1.35
	Urban Road	Bituminous	1.12	1.08		2.80	5.01
		Brick		0.03		0.03	0.06
		Total	2.10	1.14		3.16	6.41
15	Major Road	Bituminous	2.49	0.35		0.10	2.95
	Urban Road	Bituminous	3.02	0.40		0.05	3.47
		Total	5.51	0.76		0.15	6.42
16	Major Road	Bituminous	1.52				1.52
	Urban Road	Bituminous	2.57				2.57
		Total	4.09				4.09
17	Major Road	Bituminous	3.58	0.12			3.70
	Urban Road	Bituminous	2.51				2.51
		Total	6.09	0.12			6.21
18	Major Road	Bituminous	0.94	0.16			1.10
	Urban Road	Bituminous	3.97	0.58			4.56
		Total	4.92	0.74			5.66
19	Major Road	Bituminous	0.65	0.25			0.90
	Urban Road	Bituminous	3.97	1.69			5.66
		Total	4.62	1.94			6.56
20	Major Road	Bituminous	1.16	0.37			1.53
	Urban Road	Bituminous	3.83	0.91			4.74
		Total	4.99	1.28			6.27
	Major Road	Bituminous	1.36				1.36

Sylhet Ward	Road Class	Pavement Material	Liquefaction Susceptibility (length in km)				Total Length (km)
			None	Moderate	High	Very High	
21							
	Urban Road	Bituminous	*1.81*	*0.04*		*0.13*	*1.98*
		Brick	*0.06*			*0.01*	*0.07*
		Total	*3.23*	*0.04*		*0.15*	*3.41*
22	Urban Road	Bituminous	*0.37*	*2.05*		*9.41*	*11.83*
		Brick		*0.50*		*0.94*	*1.44*
		Total	*0.37*	*2.55*		*10.35*	*13.27*
23	Major Road	Bituminous		*0.66*	*0.15*		*0.81*
	Urban Road	Bituminous		*3.22*	*0.21*	*0.22*	*3.66*
		Brick		*0.14*		*0.01*	*0.14*
		Total		*4.03*	*0.36*	*0.23*	*4.61*
24	Urban Road	Bituminous	*0.29*	*3.85*		*0.03*	*4.18*
		Brick		*0.06*			*0.06*
		Total	*0.29*	*3.92*		*0.03*	*4.24*
25	Major Road	Bituminous		*2.01*			*2.01*
	Urban Road	Bituminous		*2.13*			*2.13*
		Total		*4.14*			*4.14*
26	Major Road	Bituminous		*3.77*	*0.13*	*2.15*	*6.04*
	Urban Road	Bituminous	*0.00*	*3.58*		*0.75*	*4.34*
		Brick		*0.25*		*0.64*	*0.89*
		Total	*0.00*	*7.60*	*0.13*	*3.54*	*11.27*
27	Major Road	Bituminous		*2.67*		*0.34*	*3.01*
	Urban Road	Bituminous		*4.82*		*1.04*	*5.86*
		Brick		*0.12*			*0.12*
		Total		*7.60*		*1.38*	*8.98*
Grand Total			*73.04*	*55.56*	*1.23*	*18.98*	***148.80***

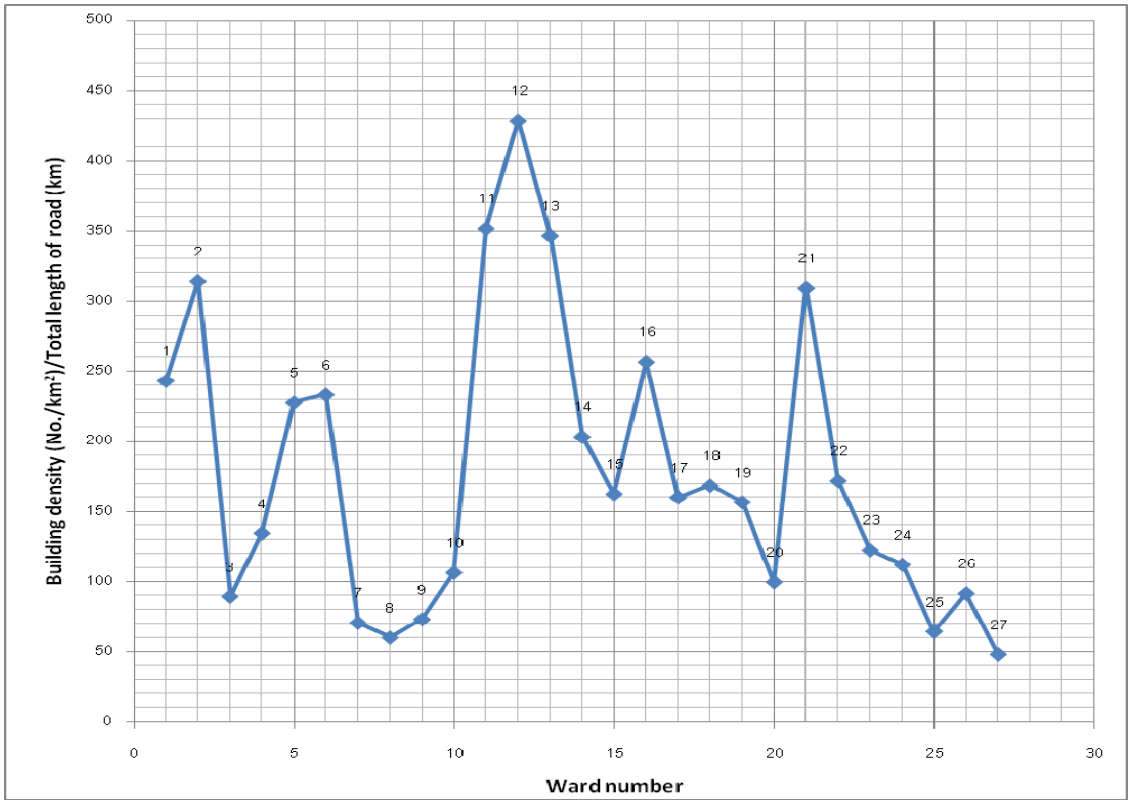
Road blockade potential in every ward of the three city corporation areas is presented in the following graphs.



Graph 4-1 Road Blockade Potential in Every Ward of Dhaka City Corporation Area



Graph 4-2 Road Blockade Potential in Every Ward of Chittagong City Corporation Area



Graph 4-3 Road Blockade Potential in Every Ward of Sylhet City Corporation Area

Physical characteristics of highway bridge are identified from structural design parameters and soil liquefaction susceptibility. Parameters represent bridge vulnerability include: (i) construction year (age), (ii)total length, (iii) maximum span length, (iv) structural type, (v) material type, (vi) pier type, (vii) abutment and bearing type, and (viii) span continuity. For the soil factor, the higher liquefaction susceptibility reflects more vulnerability of the bridge stands on it. Vulnerability characteristics of highway bridge in 3 cities are presented in the following tables.

Table 4-4 Vulnerability Characteristics of Highway Bridge in Dhaka City Corporation Area

Bridge Name	Constr. Year	Total Length (m)	Max.Span Length (m)	Structural Type	Material Type	Pier Type	Abutment & Bearing Type	Span Continuity	Soil Liquefaction susceptibility
Amin Bazar	1993	164	41	Stringer/Multi-beam or Girder	Concrete	Pier walls	Monolithic, rubber bearing	Discontinuous	Moderate
Burigangga 1	1989	540	40	Box Beam or Girders & Stringer/Multi-beam or Girder	Concrete	Multiple column bents	Monolithic, high rocker bearing	Continuous & simply supprted	Very High
Burigangga 2	2001	661	35	Stringer/Multi-beam or Girder	Concrete	Pier walls	Monolithic, steel bearing	Simply supprted	High
Kamrangichar 1	1985	55	11	Girder and Floor beam system	Concrete	Multiple column	Monolithic, steel bearing	Simply supprted	High
Kamrangichar 2	2003	33	11	Girder and Floor beam system	Concrete	Multiple column	Monolithic, steel bearing	Simply supprted	Very Low
Kamrangichar 3	1993	110	34	Truss-Thru	Steel	Multiple column	Monolithic, high	Continuous	High

Bridge Name	Constr. Year	Total Length (m)	Max.Span Length (m)	Structural Type	Material Type	Pier Type	Abutment & Bearing Type	Span Continuity	Soil Liquefaction susceptibility
						bents	rocker bearing		
Khilgaon Flyover	2005	1,145	84	Box beam or Girder & Stringer/Multi-beam or Girder	Concrete continuous & Pre-stressed concrete	Pier walls& multiple column bents	Monolithic, steel bearing	Continuous & simply supported	Very Low
Mohakhali Flyover	2004	546	42	Segmental Box Girder	Pre-stressed concrete	single column bents	Monolithic, steel bearing	Continuous	Very High
Tongi 1	1965	52	26	Stringer/Multi-beam or Girder	Concrete	Pier walls	Monolithic, steel bearing	Continuous	Very Low
Tongi 2	1985	63	29	Stringer/Multi-beam or Girder	Concrete	Pier walls	Monolithic, steel bearing	Simply supprted	Very Low

Table 4-5 Vulnerability Characteristics of Highway Bridge in Chittagong City Corporation Area

Bridge Name	Constr. Year	Total Length (m)	Max.Span Length (m)	Structural Type	Material Type	Pier Type	Abutment & Bearing Type	Span Continuity	Soil Liquefaction susceptibility
Shah Amanat	1987	750	135	Truss-Thru	Truss & Timber	Multiple column bents	Monolithic, steel bearing	Continuous	Moderate
Dewan Hut	1978	225	17.4	Girder and Floor beam system	Concrete continuous	Multiple column bents	Monolithic, steel bearing	Simply supported	Moderate
Kalurghat Karnaphuli	1931	560.4	42	Truss-Deck	Steel	Pier walls & Multiple column bents	Monolithic, steel bearing	Discontinuous	Moderate
Chittagong Port	1965	39.6	15	Girder and Floor beam system	Concrete	Pier walls	Monolithic, steel bearing	Continuous	Moderate

Table 4-6 Vulnerability Characteristics of Highway Bridge in Sylhet City Corporation Area

Bridge Name	Constr. Year	Total Length (m)	Max.Span Length (m)	Structural Type	Material Type	Pier Type	Abutment & Bearing Type	Span Continuity	Soil Liquefaction susceptibility
Keenan	1936	364	80	Truss-Deck & Truss-Thru	Steel	Multiple column bents	Non-monolithic, high rocker bearings	Discontinuous	Moderate
Shahjalal	1985	304.5	43.5	Stringer/Multi-beam or Girder	Concrete	Pier walls	Monolithic, steel bearing	Simply supported	High

4.1.2. Railway Transportation System

In railway transportation system, vulnerability is defined as the characteristics of railway segments and railway station facilities that make them susceptible to the damaging effect of an earthquake. It is identified from the railway track, structural type of railway facilities, and their position relevant to soil liquefaction susceptibility. The following table shows the total railway track length in every class of soil liquefaction susceptibility in 3 cities.

Table 4-7 Railway Track Vulnerability in Wards of Dhaka, Chittagong, and Sylhet City Corporation Areas

City Corporation	Ward	Liguefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
Dhaka	17			1.01	3.00		0.60	4.61
	19			1.52			1.31	2.83
	20			1.52			1.19	2.71
	31			0.01			20.24	20.25
	34						2.06	2.06
	35						1.66	1.66
	37			2.76			0.76	3.51
	38			0.47			0.93	1.40
	39			6.74			0.71	7.45
	53			0.51			0.97	1.49
	54			0.81			1.00	1.80
	75			0.24			0.31	0.55
	76			0.55				0.55
	81			0.51	0.16			0.67
	82				0.19			0.19
	83				0.44			0.44
	84			0.08			0.15	0.22
	85						0.05	0.05
	87			0.17				0.17
	90				1.96			1.96
	91			1.63	0.08		5.84	7.55
Total				18.53	5.82		37.78	**62.13**
Chittagong	1				7.14			7.14
	2	0.64			2.10			2.73
	4				2.50	0.35	0.09	2.94
	5				1.77	0.19		1.97
	7	0.69			5.33			6.02
	8	2.66			0.77		1.00	4.43
	9	0.19		0.31	2.80			3.31
	10	0.18		0.31	3.04			3.52
Chittagong	11				1.38			1.38
	12	0.08			5.09			5.17
	13	0.31			8.49			8.80
	15	0.24		0.45	0.97			1.66
	23	0.28		0.37	1.85			2.50
	26				3.13			3.13
	28				1.30	0.32	1.53	3.15
	29	0.61			2.09			2.70
	31	0.30			3.46			3.76
	36				0.06	0.71	0.82	1.59
	37				14.08		0.03	14.11
	38				3.56	0.60	0.29	4.44
	39				4.09		2.22	6.32
	40				2.49	0.09	0.31	2.89
	41				1.88		0.04	1.92
Total		6.17		1.44	79.39	2.27	6.33	**95.60**
Sylhet	25				3.12		0.05	3.17
	26				1.42		0.92	2.34
	27				1.19			1.19
Total					5.73		0.97	**6.70**

City Corporation	Ward	Liguefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
Grand Total		*6.17*	*0.00*	*19.97*	*90.94*	*2.27*	*45.09*	***164.43***

According to HAZUS inventory system, railway station facilities comprises (i) dispatch facility (RDF), (ii) maintenance facility (RMF), (iii) fuel facility (RFF), (iv) and urban station (RST). From the field observation, it is identified that the fuel facility (oil tank) is located on the on-rail oil wagon rather than in a building. In this system, the vulnerability is defined from the structural type of the components. Most of the facilities (particularly maintenance and fuel facility) are not planned and prepared with the seismic design, proper equipment anchorage, and backup power system. In 3 cities, the main structural type of railway station facilities is low-rise reinforced concrete with infill walls (C3L), steel truss with steel column (S3), and low-rise brick cement mortar masonry with concrete floor (BCL). Main structural type in every city is given in the following table. Details of characteristics of every structural type have been discussed in the previous subchapter 2.2.

Table 4-8 Railway Transportation System Components in Different Wards of 3 Cities

Ward		Dispatch Facility	Maintenance Facility	Urban Station	Total
Dhaka	*31*	*5*	*3*	*4*	*12*
	39	*1*	*-*	*3*	*4*
	91	*1*	*-*	*2*	*3*
	Total	*7*	*3*	*9*	*19*
Chittagong	*31*	*6*	*1*	*8*	*15*
	Total	*6*	*1*	*8*	*15*
Sylhet	*25*	*-*	*4*	*-*	*4*
	26	*2*	*-*	*1*	*3*
	Total	*2*	*4*	*1*	*7*

Table 4-9 Main Structural Type of Railway Transportation Components in 3 Cities

Structural Type	Dhaka		Chittagong		Sylhet	
	No	Percentage of total facility number	No	Percentage of total facility number	No	Percentage of total facility number
C3L	*10*	*52.63*	*1*	*6.67*	*2*	*28.57*
S3	*2*	*10.53*	*6*	*40*	*1*	*14.29*
BCL	*3*	*15.79*	*2*	*13.33*	*2*	*28.57*
Total Number of Facility	*19*	-	*15*	-	*7*	-

4.1.3. Bus Transportation System

The vulnerability is defined as the characteristics of bus station facilities that make them susceptible to the damaging effect of an earthquake. In bus transportation system, vulnerability is identified from structural type of bus station facilities and their position relevant to soil liquefaction susceptibility. According to Hazus, bus transportation system components facilities include (i) dispatch facility (BDF), (ii) maintenance facility (BMF), (iii) fuel facility (BFF), (iv) and urban station (BPT). From the field survey, it is found that most of the facilities are not planned and prepared with the seismic design, equipment anchorage, and backup power system. The fuel facility or filling station, which is operated and managed under bus station

authority, does not exist in the 3 cities. Most of the filling stations are located around or outside the bus station, and operated by private management. In the three city corporation areas, the main structural type of bus station facilities is low-rise reinforced concrete with infill walls (C3L), low-rise steel truss with steel column (S3), and low-rise steel truss with concrete column (STC) as shown in the following table. Main structural type in every city is given in the following table. Details of characteristics of every structural type have been discussed in the previous subchapter 2.2.

Table 4-10 Bus Transportation System Components in Different Wards of 3 Cities

Ward		Dispatch Facility	Maintenance Facility	Urban Station	Total
Dhaka	9	5	-	2	7
	10	-	-	-	1
	37	2	1	3	6
	84	6	3	3	12
	Total	13	4	8	25
Chittagong	4	5	2	3	10
	Total	5	2	3	10
Sylhet	26	2	-	-	2
	Total	2			2

***Table 4-11* Main Structural Type of Bus Transportation Components in 3 Cities**

Structural Type	Dhaka		Chittagong		Sylhet	
	No	Percentage of total facility number	No	Percentage of total facility number	No	Percentage of total facility number
C3L	22	84.62	7	63.64	-	-
STC	-	-	1	9.09	2	100
S3	2	7.69	-	-	-	-
Total Number of Facility	25	-	10	-	2	-

4.1.4. Ferry Transportation System

In ferry transportation system, vulnerability is defined at the characteristics of launch terminal facilities that make them susceptible to the damaging effect of an earthquake. The launch terminal only exists in Dhaka, which is Sadarghat Launch Terminal. Its facilities are classified as (i) waterfront structures such as wharf, piers, and seawalls (FWS), (ii) dispatch facility (FDF), (iii) fuel facility (FFF), maintenance facility (FMF), and passenger terminal (FPT). There are only dispatch facility (floating structure) and passenger terminal in Sadarghat Launch Terminal. These facilities are not prepared with seismic design and proper anchorage equipment. In this system, the vulnerability is identified from the building structural type and soil liquefaction susceptibility (for on-the-ground building only). Main structural type is steel truss with steel column for floating dispatch facility (S3) and low-rise reinforced concrete with infill walls (C3L) for passenger terminal. Details of characteristics of every structural type have been discussed in the previous subchapter 2.2.

Table 4-12 Ferry Transportation System Components in Ward 73 Dhaka City Corporation

Facility	Dhaka
Dispatch Facility (FDF)	5
Maintenance Facility (FMF)	-
Passenger Terminal (FPT)	3
Total Number of Facility	8

Table 4-13 **Main Structural Type of Ferry Transportation Components in Dhaka City Corporation**

Structural Type	Dhaka		Remarks
	No	Percentage of total facility number	
S3	*4*	*50*	Floating structure
C3L	*2*	*25*	
BFL	*1*	*12.5*	
Total Building Number	*8*	-	

4.2. Utility System

Vulnerability mapping of utility system include (i) potable water system, (ii) waste water system, (iii) natural gas system, (iv) electric power system, and (v) communication system. This subchapter discusses about vulnerability characteristics of those systems.

Soil characteristics particularly liquefaction susceptibility information is also incorporated in describing the vulnerability of the system. Liquefaction susceptibility is classified into six classes: none, very low, low, moderate, high, and very high. It derives from seismic hazard mapping data and report that was submitted by Oyo International Corporation (OIC) – Asian Disaster Preparedness Center (ADPC) to CDMP earlier as a part of this project.

Vulnerability maps of every utility system are compiled and presented in the Map Catalog submitted along with this report.

4.2.1. Potable Water System

Vulnerability is assessed from the characteristics of potable water pipeline and distribution facilities that make them susceptible to the damaging effect of an earthquake. In potable water system, vulnerability is identified from the pipe ductility type, distribution facility type, and soil liquefaction susceptibility on which the pipe and facility lie on. From the field survey, it is found that most of distribution facilities are not prepared with the seismic design, proper anchorage, and backup power system. Based on material type, the pipe is classified into brittle (PWP1) and ductile (PWP2). Brittle pipe material includes asbestos cement (AC), cast iron (CI), and reinforced concrete (RCC), while ductile pipe material includes galvanized iron (GI), ductile iron (DI), mild steel (MS), PVC, and steel. Brittle pipe is more vulnerable than ductile one. Potable water facility include well, pumping plant, above ground tank, and water treatment plant. Pipeline as well as distribution facilities located on higher liquefaction susceptibility soil are more vulnerable than those on lower liquefaction susceptibility level. The following tables show the pipeline length and number of facilities in different liquefaction susceptibility soils, as well as spatial distribution of potable water system components in every ward of 3 city corporation areas.

Table 4-14 Vulnerability Characteristics of Potable Water Pipeline in Every Ward of Dhaka City Corporation Area

Dhaka Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
1	Brittle Pipe		*12.20*		*4.28*		*6.76*	*23.24*
	Ductile Pipe		*7.79*		*9.41*		*12.56*	*29.76*
Total			*19.99*		*13.69*		*19.32*	*53.00*
2	Ductile Pipe		*5.65*	*1.04*	*0.27*		*9.80*	*16.77*

Dhaka Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
Total			5.65	1.04	0.27		9.80	16.77
3	Ductile Pipe		4.22		0.19		7.64	12.05
Total			4.22		0.19		7.64	12.05
4	Ductile Pipe						5.90	5.90
Total							5.90	5.90
5	Ductile Pipe		3.41		1.48		9.87	14.76
Total			3.41		1.48		9.87	14.76
6	Brittle Pipe		0.87				0.08	0.94
	Ductile Pipe		16.29	0.42			15.72	32.42
Total			17.15	0.42			15.79	33.36
7	Ductile Pipe		10.66				1.54	12.20
Total			10.66				1.54	12.20
8	Ductile Pipe		5.62				1.84	7.46
Total			5.62				1.84	7.46
9	Ductile Pipe				0.87		3.69	4.56
Total					0.87		3.69	4.56
10	Brittle Pipe						0.28	0.28
	Ductile Pipe						11.95	11.95
Total							12.23	12.23
11	Ductile Pipe						8.99	8.99
Total							8.99	8.99
12	Ductile Pipe		1.20				8.95	10.14
Total			1.20				8.95	10.14
13	Ductile Pipe		1.47				28.43	29.89
Total			1.47				28.43	29.89
14	Ductile Pipe		0.85				18.61	19.46
Total			0.85				18.61	19.46
15	Ductile Pipe		0.08	1.08	1.26		10.46	12.87
Total			0.08	1.08	1.26		10.46	12.87
16	Ductile Pipe		0.64				17.01	17.66
Total			0.64				17.01	17.66
17	Ductile Pipe		7.95		9.02		8.85	25.82
Total			7.95		9.02		8.85	25.82
18	Ductile Pipe		6.57		7.69		2.13	16.40
Total			6.57		7.69		2.13	16.40
19	Ductile Pipe		37.74		4.57		11.10	53.41
Total			37.74		4.57		11.10	53.41
20	Ductile Pipe		12.57		1.63		4.70	18.90
Total			12.57		1.63		4.70	18.90
21	Ductile Pipe		11.67		2.51		2.69	16.87
Total			11.67		2.51		2.69	16.87
22	Ductile Pipe				0.27		14.29	14.55
Total					0.27		14.29	14.55
23	Ductile Pipe						11.03	11.03
Total							11.03	11.03
24	Ductile Pipe						15.73	15.73
Total							15.73	15.73
25	Ductile Pipe						14.42	14.42
Total							14.42	14.42
26	Ductile Pipe				0.04		15.66	15.70
Total					0.04		15.66	15.70
27	Ductile Pipe						10.65	10.65

Dhaka Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
Total							*10.65*	*10.65*
28	Ductile Pipe						*8.26*	*8.26*
Total							*8.26*	*8.26*
29	Ductile Pipe						*9.56*	*9.56*
Total							*9.56*	*9.56*
30	Ductile Pipe		*0.99*				*6.77*	*7.76*
Total			*0.99*				*6.77*	*7.76*
31	Ductile Pipe		*0.11*				*5.75*	*5.86*
Total			*0.11*				*5.75*	*5.86*
32	Ductile Pipe		*4.74*				*7.80*	*12.54*
Total			*4.74*				*7.80*	*12.54*
33	Ductile Pipe		*0.93*				*3.53*	*4.46*
Total			*0.93*				*3.53*	*4.46*
34	Ductile Pipe						*9.25*	*9.25*
Total							*9.25*	*9.25*
35	Ductile Pipe		*0.32*				*6.03*	*6.35*
Total			*0.32*				*6.03*	*6.35*
36	Ductile Pipe		*9.05*				*8.64*	*17.69*
Total			*9.05*				*8.64*	*17.69*
37	Ductile Pipe		*17.54*		*0.39*		*10.00*	*27.93*
Total			*17.54*		*0.39*		*10.00*	*27.93*
38	Ductile Pipe		*4.11*				*7.00*	*11.11*
Total			*4.11*				*7.00*	*11.11*
39	Brittle Pipe		*0.61*				*0.24*	*0.85*
	Ductile Pipe		*9.46*				*5.07*	*14.52*
Total			*10.07*				*5.30*	*15.37*
40	Brittle Pipe		*2.81*				*2.10*	*4.91*
	Ductile Pipe		*11.52*				*12.19*	*23.71*
Total			*14.33*				*14.28*	*28.61*
41	Brittle Pipe						*0.01*	*0.01*
	Ductile Pipe						*6.23*	*6.23*
Total							*6.24*	*6.24*
42	Brittle Pipe						*0.27*	*0.27*
	Ductile Pipe						*13.39*	*13.39*
Total							*13.65*	*13.65*
43	Brittle Pipe						*0.52*	*0.52*
	Ductile Pipe						*13.79*	*13.79*
Total							*14.32*	*14.32*
44	Brittle Pipe		*0.22*				*0.04*	*0.26*
	Ductile Pipe		*7.15*				*4.54*	*11.69*
Total			*7.36*				*4.58*	*11.94*
45	Brittle Pipe		*1.48*				*0.53*	*2.02*
	Ductile Pipe		*12.97*				*9.46*	*22.43*
Total			*14.46*				*9.99*	*24.45*
46	Brittle Pipe		*0.74*					*0.74*
	Ductile Pipe		*3.55*				*16.11*	*19.66*
Total			*4.29*				*16.11*	*20.39*
47	Brittle Pipe		*0.07*					*0.07*
	Ductile Pipe		*8.68*		*0.21*			*8.89*
Total			*8.74*		*0.21*			*8.95*
48	Ductile Pipe		*9.00*				*3.63*	*12.64*

Dhaka Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
Total			9.00				3.63	12.64
49	Brittle Pipe		1.12				1.03	2.15
	Ductile Pipe		16.98		1.27		17.70	35.96
Total			18.10		1.27		18.74	38.11
50	Brittle Pipe		0.13				0.26	0.40
	Ductile Pipe		2.45				8.47	10.91
Total			2.58				8.73	11.31
51	Brittle Pipe		0.01				0.33	0.34
	Ductile Pipe		2.95		0.85		8.90	12.70
Total			2.96		0.85		9.23	13.04
52	Brittle Pipe		0.40					0.40
	Ductile Pipe		12.29				0.13	12.42
Total			12.69				0.13	12.82
53	Ductile Pipe		17.44				6.44	23.88
Total			17.44				6.44	23.88
54	Ductile Pipe		1.76				9.84	11.60
Total			1.76				9.84	11.60
55	Ductile Pipe				0.01		6.23	6.23
Total					0.01		6.23	6.23
56	Ductile Pipe		13.33				3.88	17.21
Total			13.33				3.88	17.21
57	Brittle Pipe		0.01					0.01
	Ductile Pipe		8.60				1.98	10.58
Total			8.61				1.98	10.59
58	Ductile Pipe		5.73			0.04	0.60	6.37
Total			5.73			0.04	0.60	6.37
59	Ductile Pipe		5.22					5.22
Total			5.22					5.22
60	Ductile Pipe		2.21			2.46		4.67
Total			2.21			2.46		4.67
61	Ductile Pipe		4.95			0.07		5.03
Total			4.95			0.07		5.03
62	Ductile Pipe		12.51				0.79	13.30
Total			12.51				0.79	13.30
63	Ductile Pipe		6.72					6.72
Total			6.72					6.72
64	Ductile Pipe		3.67					3.67
Total			3.67					3.67
65	Ductile Pipe		2.69			3.90		6.59
Total			2.69			3.90		6.59
66	Ductile Pipe		3.15					3.15
Total			3.15					3.15
67	Ductile Pipe		3.53					3.53
Total			3.53					3.53
68	Ductile Pipe		3.12					3.12
Total			3.12					3.12
69	Ductile Pipe		5.88					5.88
Total			5.88					5.88
70	Ductile Pipe		3.60					3.60
Total			3.60					3.60
71	Ductile Pipe		6.70					6.70

Dhaka Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
Total			6.70					6.70
72	Ductile Pipe		3.90					3.90
Total			3.90					3.90
73	Brittle Pipe		0.18					0.18
	Ductile Pipe		5.05				0.09	5.13
Total			5.23				0.09	5.31
74	Ductile Pipe		7.90					7.90
Total			7.90					7.90
75	Ductile Pipe		9.53				1.81	11.34
Total			9.53				1.81	11.34
76	Ductile Pipe		8.26				0.57	8.83
Total			8.26				0.57	8.83
77	Brittle Pipe		0.17					0.17
	Ductile Pipe		7.73					7.73
Total			7.90					7.90
78	Ductile Pipe		5.69					5.69
Total			5.69					5.69
79	Ductile Pipe		8.07				0.31	8.38
Total			8.07				0.31	8.38
80	Ductile Pipe		1.78					1.78
Total			1.78					1.78
81	Ductile Pipe		4.99					4.99
Total			4.99					4.99
82	Ductile Pipe		5.68		0.21			5.89
Total			5.68		0.21			5.89
83	Ductile Pipe		2.49		2.15			4.64
Total			2.49		2.15			4.64
84	Ductile Pipe		1.58		0.13		8.50	10.22
Total			1.58		0.13		8.50	10.22
85	Ductile Pipe		0.03				10.29	10.31
Total			0.03				10.29	10.31
86	Ductile Pipe		1.56		0.94		8.40	10.89
Total			1.56		0.94		8.40	10.89
87	Ductile Pipe		3.19		3.94			7.13
Total			3.19		3.94			7.13
88	Ductile Pipe				5.05			5.05
Total					5.05			5.05
89	Ductile Pipe				8.22			8.22
Total					8.22			8.22
90	Ductile Pipe				4.50			4.50
Total					4.50			4.50
91	Brittle Pipe		0.06				0.03	0.09
	Ductile Pipe		8.23		0.97		10.40	19.60
Total			8.29		0.97		10.43	19.69
	Grand Total	0	486.72	2.54	72.34	6.48	569.00	**1,137.08**

Table 4-15 Potable Water Facilities on Soil Liquefaction Susceptibility in Dhaka City Corporation Area

Component	Liquefaction Susceptibility (number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Well	0	154	0	21	3	190	368

Component	Liquefaction Susceptibility (number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Pumping Plant	*0*	*137*	*0*	*21*	*3*	*181*	*342*
Above Ground Tank	*0*	*24*	*2*	*0*	*0*	*10*	*36*
Water Treatment Plant	*0*	*0*	*0*	*0*	*1*	*1*	*1*
Total Number	*0*	*315*	*2*	*42*	*7*	*382*	*748*

Table 4-16 Vulnerability Characteristics of Potable Water Pipeline in Every Ward of Chittagong City Corporation Area

Chittagong Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
2	Brittle Pipe	*0.09*			*2.90*		*2.47*	*5.45*
	Ductile Pipe	*6.58*			*2.07*		*2.88*	*11.53*
Total		*6.67*			*4.96*		*5.35*	*16.98*
3	Ductile Pipe				*9.03*			*9.03*
Total					*9.03*			*9.03*
4	Brittle Pipe				*5.32*	*0.61*		*5.93*
	Ductile Pipe				*29.22*	*0.84*	*4.02*	*34.09*
Total					*34.55*	*1.45*	*4.02*	*40.02*
5	Brittle Pipe				*1.01*	*0.63*		*1.64*
	Ductile Pipe				*5.44*	*0.50*	*0.50*	*6.43*
Total					*6.45*	*1.13*	*0.50*	*8.07*
6	Brittle Pipe				*1.05*			*1.05*
	Ductile Pipe				*13.72*		*0.19*	*13.92*
Total					*14.77*		*0.19*	*14.97*
7	Brittle Pipe	*0.89*			*3.33*			*4.22*
	Ductile Pipe	*3.86*			*19.38*			*23.24*
Total		*4.75*			*22.71*			*27.46*
8	Brittle Pipe	*1.47*			*0.40*		*2.35*	*4.23*
	Ductile Pipe	*20.62*			*14.72*		*7.08*	*42.42*
Total		*22.09*			*15.12*		*9.43*	*46.65*
9	Brittle Pipe	*0.54*		*0.16*	*0.18*			*0.87*
	Ductile Pipe	*7.98*		*0.46*	*1.49*			*9.92*
Total		*8.51*		*0.61*	*1.66*			*10.79*
10	Ductile Pipe			*0.71*	*5.57*		*5.72*	*12.00*
Total				*0.71*	*5.57*		*5.72*	*12.00*
11	Brittle Pipe						*1.11*	*1.11*
	Ductile Pipe				*4.98*		*15.05*	*20.03*
Total					*4.98*		*16.17*	*21.14*
12	Brittle Pipe				*0.13*		*0.29*	*0.41*
	Ductile Pipe				*5.95*		*10.79*	*16.75*
Total					*6.08*		*11.08*	*17.16*
13	Ductile Pipe	*2.35*		*0.04*	*0.91*			*3.31*
Total		*2.35*		*0.04*	*0.91*			*3.31*
14	Brittle Pipe	*0.52*						*0.52*
	Ductile Pipe	*5.68*			*3.58*			*9.25*
Total		*6.19*			*3.58*			*9.77*
15	Brittle Pipe	*1.14*			*2.52*			*3.66*
	Ductile Pipe	*3.88*			*4.89*			*8.76*
Total		*5.01*			*7.41*			*12.42*
16	Brittle Pipe	*1.94*			*3.15*			*5.09*
	Ductile Pipe	*4.35*			*11.68*			*16.04*
Total		*6.29*			*14.83*			*21.13*

Chittagong Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
17	Ductile Pipe				8.46			8.46
Total					8.46			8.46
18	Ductile Pipe				4.31			4.31
Total					4.31			4.31
19	Ductile Pipe	0.17			7.39			7.56
Total		0.17			7.39			7.56
20	Brittle Pipe	0.34			0.62			0.96
	Ductile Pipe	1.12			4.48			5.60
Total		1.46			5.09			6.55
21	Brittle Pipe	0.36			1.95			2.32
	Ductile Pipe	1.84			7.30			9.15
Total		2.21			9.26			11.46
22	Brittle Pipe	0.41			2.65			3.06
	Ductile Pipe	1.88			5.20			7.08
Total		2.29			7.85			10.14
23	Ductile Pipe				5.10		1.49	6.59
Total					5.10		1.49	6.59
24	Brittle Pipe				0.15		1.12	1.27
	Ductile Pipe				2.07		29.67	31.74
Total					2.23		30.78	33.01
25	Brittle Pipe				0.06		1.04	1.10
	Ductile Pipe				0.63		21.24	21.87
Total					0.69		22.28	22.97
26	Ductile Pipe				5.89		10.92	16.81
Total					5.89		10.92	16.81
27	Brittle Pipe				0.30		0.17	0.47
	Ductile Pipe				6.61		19.26	25.87
Total					6.91		19.43	26.34
28	Brittle Pipe				2.36	0.07	2.47	4.90
	Ductile Pipe				5.21	0.82	5.85	11.87
Total					7.57	0.88	8.32	16.77
29	Brittle Pipe				1.14		0.62	1.76
	Ductile Pipe	0.14			8.81	0.10	0.27	9.32
Total		0.14			9.95	0.10	0.89	11.08
30	Brittle Pipe				1.59	1.44	0.40	3.43
	Ductile Pipe				4.18	3.85	0.51	8.54
Total					5.77	5.29	0.91	11.97
31	Brittle Pipe	0.07			2.28			2.35
	Ductile Pipe	0.13			3.06	3.11		6.31
Total		0.20			5.34	3.11		8.65
32	Brittle Pipe	0.58			4.02			4.60
	Ductile Pipe	1.88			6.32			8.20
Total		2.46			10.34			12.79
33	Brittle Pipe				0.42			0.42
	Ductile Pipe				6.14	1.30		7.44
Total					6.56	1.30		7.86
34	Ductile Pipe	2.29			5.27			7.57
Total		2.29			5.27			7.57
35	Ductile Pipe	1.03			5.37		0.07	6.47
Total		1.03			5.37		0.07	6.47

Chittagong Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
36	Brittle Pipe				*0.37*	*0.95*	*0.40*	*1.72*
	Ductile Pipe				*6.31*	*2.11*	*0.65*	*9.08*
Total					*6.69*	*3.06*	*1.05*	*10.80*
37	Ductile Pipe				*0.56*		*0.36*	*0.92*
Total					*0.56*		*0.36*	*0.92*
38	Brittle Pipe				*2.17*	*0.52*	*0.12*	*2.81*
	Ductile Pipe				*0.08*			*0.08*
Total					*2.25*	*0.52*	*0.12*	*2.88*
39	Brittle Pipe				*1.21*		*1.31*	*2.52*
	Ductile Pipe				*4.94*		*10.80*	*15.74*
Total					*6.15*		*12.11*	*18.26*
40	Brittle Pipe				*1.75*		*0.31*	*2.06*
	Ductile Pipe				*3.60*			*3.60*
Total					*5.35*		*0.31*	*5.66*
41	Brittle Pipe				*1.66*		*0.09*	*1.75*
	Ductile Pipe				*3.53*			*3.53*
Total					*5.19*		*0.09*	*5.28*
Grand Total		*74.12*	*0*	*1.36*	*298.15*	*16.84*	*161.58*	***552.05***

Note: There is no potable water pipeline in Ward 1.

Table 4-17 Potable Water Facilities on Soil Liquefaction Susceptibility in Chittagong City Corporation Area

Component	Liquefaction Susceptibility (number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Well	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Pumping Plant	*8*	*0*	*0*	*7*	*1*	*5*	*21*
Above Ground Tank	*0*	*0*	*0*	*1*	*0*	*0*	*1*
Water Treatment Plant	*0*	*0*	*0*	*2*	*0*	*0*	*2*
Total Number	*8*	*0*	*0*	*10*	*1*	*5*	*24*

Table 4-18 Vulnerability Characteristics of Potable Water Pipeline in Every Ward of Sylhet City Corporation Area

Sylhet Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
1	Brittle Pipe	*1.11*			*0.16*			*1.27*
	Ductile Pipe	*4.07*			*0.12*			*4.19*
Total		*5.18*			*0.28*			*5.46*
2	Brittle Pipe	*1.29*						*1.29*
	Ductile Pipe	*3.15*						*3.15*
Total		*4.43*						*4.43*
3	Brittle Pipe	*0.55*			*0.56*			*1.11*
	Ductile Pipe	*2.27*			*1.73*			*4.01*
Total		*2.82*			*2.30*			*5.12*
4	Brittle Pipe	*0.63*						*0.63*
	Ductile Pipe	*4.01*			*0.48*			*4.49*
Total		*4.64*			*0.48*			*5.12*
5	Brittle Pipe	*1.25*						*1.25*
	Ductile Pipe	*2.07*			*2.16*			*4.22*
Total		*3.32*			*2.16*			*5.48*
6	Ductile Pipe	*0.79*			*0.40*			*1.19*

Sylhet Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
Total		0.79			0.40			1.19
7	Brittle Pipe	0.41						0.41
	Ductile Pipe	4.20			1.43			5.62
Total		4.61			1.43			6.03
8	Brittle Pipe	0.74			0.02			0.76
	Ductile Pipe	2.87			1.51			4.38
Total		3.61			1.53			5.14
9	Brittle Pipe	0.35			0.89			1.23
	Ductile Pipe	1.51			2.21			3.72
Total		1.86			3.10			4.95
10	Ductile Pipe				7.10	0.37		7.46
Total					7.10	0.37		7.46
11	Brittle Pipe	0.00						0.00
	Ductile Pipe	4.66			0.79			5.45
Total		4.66			0.79			5.45
12	Brittle Pipe	0.14			0.22			0.36
	Ductile Pipe	3.36			0.77			4.13
Total		3.49			0.99			4.49
13	Brittle Pipe	2.66						2.66
	Ductile Pipe	2.82						2.82
Total		5.47						5.47
14	Brittle Pipe	0.48						0.48
	Ductile Pipe	1.01			1.23		1.69	3.92
Total		1.48			1.23		1.69	4.40
15	Brittle Pipe	1.42					0.25	1.67
	Ductile Pipe	4.05			0.48		0.05	4.57
Total		5.48			0.48		0.30	6.25
16	Brittle Pipe	2.46						2.46
	Ductile Pipe	3.30						3.30
Total		5.75						5.75
17	Brittle Pipe	1.87						1.87
	Ductile Pipe	5.02			0.16			5.18
Total		6.89			0.16			7.05
18	Ductile Pipe	5.63			0.26			5.89
Total		5.63			0.26			5.89
19	Brittle Pipe	0.17			0.79			0.95
	Ductile Pipe	3.50			1.90			5.40
Total		3.67			2.69			6.35
20	Brittle Pipe	2.41			0.88			3.28
	Ductile Pipe	2.84			0.51			3.35
Total		5.25			1.38			6.63
21	Brittle Pipe	1.40					0.20	1.60
	Ductile Pipe	6.18			0.14		0.07	6.38
Total		7.58			0.14		0.27	7.98
22	Brittle Pipe				0.04		2.08	2.12
	Ductile Pipe	0.16			0.68		4.47	5.31
Total		0.16			0.72		6.55	7.43
23	Ductile Pipe				2.41	0.16	0.19	2.76
Total					2.41	0.16	0.19	2.76
24	Ductile Pipe	1.17			3.44		0.03	4.63
Total		1.17			3.44		0.03	4.63

Sylhet Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
Grand Total		*87.94*	*0*	*0*	*33.45*	*0.53*	*9.02*	***130.94***

Note: There is no potable water pipeline in Ward 25, 26, and 27.

Table 4-19 Potable Water Facilities on Soil Liquefaction Susceptibility in Sylhet City Corporation Area

Component	Liquefaction Susceptibility (length in km or number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Well	*2*	*0*	*0*	*3*	*0*	*0*	*5*
Pumping Plant	*2*	*0*	*0*	*2*	*0*	*0*	*4*
Above Ground Tank	*6*	*0*	*0*	*3*	*0*	*0*	*9*
Water Treatment Plant	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Total Number	*10*	*0*	*0*	*8*	*0*	*0*	*18*

4.2.2. Waste Water System

Waste Water System only exists in some parts of Dhaka City Corporation area. Its vulnerability is assessed from the characteristics of waste water pipeline and waste water facilities that make them susceptible to the damaging effect of an earthquake. In waste water system, vulnerability is identified from the pipe ductility, facility type, and soil liquefaction susceptibility on which the pipes and facilities lie on. At the moment of data acquisition (in DWASA), there is no information on pipe material type. From the field survey, it can be identified that almost all pipeline are brittle. Waste water system facilities comprise waste water treatment plant (WWTP) and lift station. In Dhaka, WWTP is located outside the city corporation area, while existing lift station is considered to be small lift station (WLSS) with reference of HAZUS inventory.

Pipeline and facilities located on higher liquefaction susceptibility soil is more vulnerable than those on lower or none liquefaction susceptibility. The following tables show the pipeline length and number of facilities in different liquefaction susceptibility soils and spatial distribution of waste water components in Dhaka City Corporation Area.

Table 4-20 Vulnerability Characteristics of Waste Water Pipeline in Every Ward of Dhaka City Corporation Area

Dhaka Ward	Component	Liquefaction Susceptibility (length in km)						Tota Length (km)
		None	Very Low	Low	Moderate	High	Very High	
2	Brittle Pipe		*9.02*	*2.69*	*2.36*		*17.24*	*31.31*
Total			*9.02*	*2.69*	*2.36*		*17.24*	*31.31*
3	Brittle Pipe		*2.72*				*1.79*	*4.50*
Total			*2.72*				*1.79*	*4.50*
4	Brittle Pipe						*3.03*	*3.03*
Total							*3.03*	*3.03*
5	Brittle Pipe		*0.97*		*0.73*		*2.48*	*4.18*
Total			*0.97*		*0.73*		*2.48*	*4.18*
6	Brittle Pipe		*1.78*				*2.51*	*4.29*
Total			*1.78*				*2.51*	*4.29*
7	Brittle Pipe		*1.78*				*1.60*	*3.39*
Total			*1.78*				*1.60*	*3.39*
8	Brittle Pipe		*2.05*				*0.08*	*2.13*
Total			*2.05*				*0.08*	*2.13*

Dhaka Ward	Component	Liquefaction Susceptibility (length in km)						Tota Length (km)
		None	Very Low	Low	Moderate	High	Very High	
16	Brittle Pipe		0.32				0.74	1.06
Total			0.32				0.74	1.06
18	Brittle Pipe				0.07		0.00	0.08
Total					0.07		0.00	0.08
19	Brittle Pipe		41.30		5.16		11.33	57.79
Total			41.30		5.16		11.33	57.79
20	Brittle Pipe		1.18		0.14			1.33
Total			1.18		0.14			1.33
22	Brittle Pipe						8.68	8.68
Total							8.68	8.68
23	Brittle Pipe						6.79	6.79
Total							6.79	6.79
24	Brittle Pipe						14.65	14.65
Total							14.65	14.65
25	Brittle Pipe						6.75	6.75
Total							6.75	6.75
26	Brittle Pipe						1.63	1.63
Total							1.63	1.63
27	Brittle Pipe						7.41	7.41
Total							7.41	7.41
28	Brittle Pipe						3.10	3.10
Total							3.10	3.10
29	Brittle Pipe						4.02	4.02
Total							4.02	4.02
30	Brittle Pipe		0.04				0.67	0.71
Total			0.04				0.67	0.71
31	Brittle Pipe		0.25				1.21	1.46
Total			0.25				1.21	1.46
32	Brittle Pipe		3.51				3.65	7.17
Total			3.51				3.65	7.17
33	Brittle Pipe		0.41				1.30	1.71
Total			0.41				1.30	1.71
34	Brittle Pipe						4.49	4.49
Total							4.49	4.49
35	Brittle Pipe						1.09	1.09
Total							1.09	1.09
36	Brittle Pipe		4.04				5.18	9.22
Total			4.04				5.18	9.22
37	Brittle Pipe		12.09		0.95		5.00	18.04
Total			12.09		0.95		5.00	18.04
38	Brittle Pipe		0.25				0.73	0.98
Total			0.25				0.73	0.98
39	Brittle Pipe		1.55				0.65	2.20
Total			1.55				0.65	2.20
40	Brittle Pipe		0.33				1.98	2.31
Total			0.33				1.98	2.31
41	Brittle Pipe						0.05	0.05
Total							0.05	0.05
42	Brittle Pipe						0.89	0.89
Total							0.89	0.89
44	Brittle Pipe		3.25				1.87	5.12
Total			3.25				1.87	5.12

Dhaka Ward	Component	Liquefaction Susceptibility (length in km)						Tota Length (km)
		None	Very Low	Low	Moderate	High	Very High	
45	Brittle Pipe		8.33				7.08	15.41
Total			8.33				7.08	15.41
48	Brittle Pipe		0.01					0.01
Total			0.01					0.01
49	Brittle Pipe		8.91		0.68		11.49	21.08
Total			8.91		0.68		11.49	21.08
51	Brittle Pipe		0.80		0.70		3.30	4.79
Total			0.80		0.70		3.30	4.79
52	Brittle Pipe		2.68				2.01	4.69
Total			2.68				2.01	4.69
53	Brittle Pipe		11.82				3.38	15.20
Total			11.82				3.38	15.20
54	Brittle Pipe		1.03				4.54	5.57
Total			1.03				4.54	5.57
55	Brittle Pipe				0.09		4.16	4.24
Total					0.09		4.16	4.24
56	Brittle Pipe		3.74				2.48	6.22
Total			3.74				2.48	6.22
57	Brittle Pipe		4.76					4.76
Total			4.76					4.76
58	Brittle Pipe		7.18				0.16	7.34
Total			7.18				0.16	7.34
59	Brittle Pipe		3.51					3.51
Total			3.51					3.51
60	Brittle Pipe		0.89					0.89
Total			0.89					0.89
61	Brittle Pipe		2.13			0.01		2.14
Total			2.13			0.01		2.14
62	Brittle Pipe		1.33					1.33
Total			1.33					1.33
63	Brittle Pipe		2.95					2.95
Total			2.95					2.95
64	Brittle Pipe		3.13					3.13
Total			3.13					3.13
65	Brittle Pipe		1.51			0.13		1.64
Total			1.51			0.13		1.64
66	Brittle Pipe		2.33			0.21		2.54
Total			2.33			0.21		2.54
67	Brittle Pipe		2.90					2.90
Total			2.90					2.90
68	Brittle Pipe		1.43					1.43
Total			1.43					1.43
69	Brittle Pipe		5.27					5.27
Total			5.27					5.27
70	Brittle Pipe		2.42					2.42
Total			2.42					2.42
71	Brittle Pipe		2.37					2.37
Total			2.37					2.37
72	Brittle Pipe		1.47					1.47
Total			1.47					1.47

Dhaka Ward	Component	Liquefaction Susceptibility (length in km)						Tota Length (km)
		None	Very Low	Low	Moderate	High	Very High	
73	Brittle Pipe		*2.43*					*2.43*
Total			*2.43*					*2.43*
74	Brittle Pipe		*4.11*					*4.11*
Total			*4.11*					*4.11*
75	Brittle Pipe		*3.09*				*1.22*	*4.31*
Total			*3.09*				*1.22*	*4.31*
76	Brittle Pipe		*2.65*				*0.48*	*3.14*
Total			*2.65*				*0.48*	*3.14*
77	Brittle Pipe		*3.70*					*3.70*
Total			*3.70*					*3.70*
78	Brittle Pipe		*1.86*					*1.86*
Total			*1.86*					*1.86*
79	Brittle Pipe		*3.57*				*0.13*	*3.70*
Total			*3.57*				*0.13*	*3.70*
80	Brittle Pipe		*1.25*					*1.25*
Total			*1.25*					*1.25*
81	Brittle Pipe		*5.72*		*0.09*			*5.81*
Total			*5.72*		*0.09*			*5.81*
82	Brittle Pipe		*2.76*		*0.02*			*2.77*
Total			*2.76*		*0.02*			*2.77*
83	Brittle Pipe		*3.08*		*2.44*			*5.52*
Total			*3.08*		*2.44*			*5.52*
84	Brittle Pipe		*0.23*				*0.53*	*0.76*
Total			*0.23*				*0.53*	*0.76*
85	Brittle Pipe		*0.09*				*1.01*	*1.09*
Total			*0.09*				*1.01*	*1.09*
86	Brittle Pipe		*0.10*				*0.37*	*0.46*
Total			*0.10*				*0.37*	*0.46*
87	Brittle Pipe		*0.45*		*0.48*			*0.93*
Total			*0.45*		*0.48*			*0.93*
89	Brittle Pipe				*0.45*			*0.45*
Total					*0.45*			*0.45*
90	Brittle Pipe				*2.11*			*2.11*
Total					*2.11*			*2.11*
91	Brittle Pipe		*3.40*				*6.89*	*10.29*
Total			*3.40*				*6.89*	*10.29*
Grand Total		*0*	*208.24*	*2.69*	*16.46*	*0.35*	*171.87*	***399.60***

Note: At the moment of data acquisition, DWASA waste water pipeline is only available in these wards.

Table 4-21 Waste Water Facilities on Soil Liquefaction susceptibility in Dhaka City Corporation Area

Component	Liquefaction Susceptibility (number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Lift Station	*0*	*4*	*1*	*0*	*0*	*8*	*13*
Total	*0*	*4*	*1*	*0*	*0*	*8*	*13*

4.2.3. Natural Gas System

For vulnerability assessment, natural Gas System consists of pipelines (NGP1/NGP2) and compressor stations (NGC). Both are vulnerable to damage during earthquake. Failure of natural gas system may cause another disaster of fire. The vulnerability is assessed from the

characteristics of pipeline joints and distribution facilities that make them susceptible to the damaging effect of an earthquake. The gas pipeline is welded steel pipe, and the critical part is located at the joint. According to HAZUS inventory system, gas pipeline is divided into gas-welded joint (NGP1) and arc-welded joint (NGP2). From data acquisition, it is identified that gas pipelines in the 3 cities are with arc-welded joints. System vulnerability is identified from the pipe type and compressor station location relation to the soil liquefaction susceptibility on which they lie on. Pipeline and compressor stations located on higher liquefaction susceptibility soil is more vulnerable than those on low or none liquefaction susceptibility. The following tables show the pipeline length and number of facilities in different liquefaction susceptibility soils and spatial distribution of natural gas components in 3 city corporation areas.

Table 4-22 Vulnerability Characteristics of Natural Gas Pipeline in Every Ward of Dhaka City Corporation Area

Dhaka Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
1	Arc-welded Joint Steel Pipe		41.17		25.18		39.99	106.33
2	Arc-welded Joint Steel Pipe		4.63	1.02	1.59		5.83	13.06
3	Arc-welded Joint Steel Pipe		4.03		0.15		5.10	9.29
4	Arc-welded Joint Steel Pipe						3.05	3.05
5	Arc-welded Joint Steel Pipe		2.75		1.85		4.55	9.15
6	Arc-welded Joint Steel Pipe		7.55	0.40			9.04	16.99
7	Arc-welded Joint Steel Pipe		8.41				1.45	9.86
8	Arc-welded Joint Steel Pipe		4.51				1.69	6.20
10	Arc-welded Joint Steel Pipe						5.62	5.62
11	Arc-welded Joint Steel Pipe						7.49	7.49
12	Arc-welded Joint Steel Pipe		0.52				6.34	6.86
13	Arc-welded Joint Steel Pipe		0.19				18.65	18.84
14	Arc-welded Joint Steel Pipe		0.44				16.88	17.32
15	Arc-welded Joint Steel Pipe			0.36	0.54		9.51	10.42
16	Arc-welded Joint Steel Pipe		1.67				15.20	16.87
17	Arc-welded Joint Steel Pipe		7.77		14.08		8.12	29.96
18	Arc-welded Joint Steel Pipe		6.24		7.61		2.50	16.36
19	Arc-welded Joint Steel Pipe		43.67		4.09		11.18	58.94
20	Arc-welded Joint Steel Pipe		5.52		0.18		1.51	7.21
21	Arc-welded Joint Steel Pipe		10.62		4.27		2.97	17.86
22	Arc-welded Joint Steel Pipe				0.44		15.69	16.14
23	Arc-welded Joint Steel Pipe						5.93	5.93
24	Arc-welded Joint Steel Pipe						5.90	5.90
25	Arc-welded Joint Steel Pipe						4.31	4.31
26	Arc-welded Joint Steel Pipe						7.46	7.46
27	Arc-welded Joint Steel Pipe						7.28	7.28
28	Arc-welded Joint Steel Pipe						4.00	4.00
29	Arc-welded Joint Steel Pipe						4.27	4.27
30	Arc-welded Joint Steel Pipe						0.07	0.07
31	Arc-welded Joint Steel Pipe		0.10				3.88	3.98
32	Arc-welded Joint Steel Pipe		2.62				5.57	8.19
33	Arc-welded Joint Steel Pipe		0.36				3.63	4.00
34	Arc-welded Joint Steel Pipe						4.50	4.50
35	Arc-welded Joint Steel Pipe						2.23	2.23
36	Arc-welded Joint Steel Pipe		5.35				6.45	11.80
37	Arc-welded Joint Steel Pipe		12.21		0.72		8.47	21.40
38	Arc-welded Joint Steel Pipe		3.09				3.19	6.28

Dhaka Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
39	Arc-welded Joint Steel Pipe		4.91				2.25	7.15
40	Arc-welded Joint Steel Pipe		9.11				5.58	14.69
41	Arc-welded Joint Steel Pipe						2.85	2.85
42	Arc-welded Joint Steel Pipe						5.11	5.11
43	Arc-welded Joint Steel Pipe						6.98	6.98
44	Arc-welded Joint Steel Pipe		4.02				4.18	8.20
45	Arc-welded Joint Steel Pipe		16.58				8.02	24.60
46	Arc-welded Joint Steel Pipe		2.39				9.09	11.48
47	Arc-welded Joint Steel Pipe		2.36					2.36
48	Arc-welded Joint Steel Pipe		4.80				2.73	7.53
49	Arc-welded Joint Steel Pipe		16.07		0.65		16.24	32.96
50	Arc-welded Joint Steel Pipe		0.90				4.81	5.71
51	Arc-welded Joint Steel Pipe		0.79		0.29		3.52	4.60
52	Arc-welded Joint Steel Pipe		6.58					6.58
53	Arc-welded Joint Steel Pipe		13.79				3.97	17.76
54	Arc-welded Joint Steel Pipe		1.55				4.71	6.26
55	Arc-welded Joint Steel Pipe						3.41	3.41
56	Arc-welded Joint Steel Pipe		3.92				1.79	5.70
57	Arc-welded Joint Steel Pipe		5.49				0.36	5.85
58	Arc-welded Joint Steel Pipe		4.38				0.13	4.51
59	Arc-welded Joint Steel Pipe		5.73				0.14	5.87
60	Arc-welded Joint Steel Pipe		0.98			0.23		1.21
61	Arc-welded Joint Steel Pipe		3.12					3.12
62	Arc-welded Joint Steel Pipe		6.51				0.72	7.23
63	Arc-welded Joint Steel Pipe		3.22					3.22
64	Arc-welded Joint Steel Pipe		2.67					2.67
65	Arc-welded Joint Steel Pipe		2.40					2.40
66	Arc-welded Joint Steel Pipe		3.04					3.04
67	Arc-welded Joint Steel Pipe		3.18					3.18
68	Arc-welded Joint Steel Pipe		3.33					3.33
69	Arc-welded Joint Steel Pipe		3.04					3.04
70	Arc-welded Joint Steel Pipe		5.09					5.09
71	Arc-welded Joint Steel Pipe		4.78					4.78
72	Arc-welded Joint Steel Pipe		2.26					2.26
73	Arc-welded Joint Steel Pipe		5.75				0.11	5.87
74	Arc-welded Joint Steel Pipe		2.77					2.77
75	Arc-welded Joint Steel Pipe		3.29				0.57	3.86
76	Arc-welded Joint Steel Pipe		5.28				0.22	5.50
77	Arc-welded Joint Steel Pipe		2.52					2.52
78	Arc-welded Joint Steel Pipe		3.33					3.33
79	Arc-welded Joint Steel Pipe		5.34				0.42	5.75
80	Arc-welded Joint Steel Pipe		3.22					3.22
81	Arc-welded Joint Steel Pipe		2.48					2.48
82	Arc-welded Joint Steel Pipe		3.00		0.14			3.14
83	Arc-welded Joint Steel Pipe		1.47		1.69			3.16
84	Arc-welded Joint Steel Pipe		0.54		0.00		3.21	3.76
85	Arc-welded Joint Steel Pipe						1.12	1.12
86	Arc-welded Joint Steel Pipe		1.39		0.60		3.37	5.36
87	Arc-welded Joint Steel Pipe		0.69		2.01			2.70
88	Arc-welded Joint Steel Pipe				3.36			3.36
89	Arc-welded Joint Steel Pipe				8.14			8.14
90	Arc-welded Joint Steel Pipe				5.80			5.80

Dhaka Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
91	Arc-welded Joint Steel Pipe		*10.21*		*1.21*		*23.94*	*35.36*
Grand Total		*0*	*371.68*	*1.78*	*84.58*	*0.23*	*389.09*	***847.36***

Table 4-23 Vulnerability Characteristics of Natural Gas Pipeline in Every Ward of Chittagong City Corporation Area

Chittagong Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
1	Arc-welded Joint Steel Pipe				*5.66*			*5.66*
2	Arc-welded Joint Steel Pipe	*2.02*			*3.55*		*4.07*	*9.64*
3	Arc-welded Joint Steel Pipe				*1.10*			*1.10*
4	Arc-welded Joint Steel Pipe				*10.23*	*1.30*	*0.65*	*12.18*
5	Arc-welded Joint Steel Pipe				*1.85*	*0.92*	*0.56*	*3.33*
6	Arc-welded Joint Steel Pipe				*2.46*			*2.46*
7	Arc-welded Joint Steel Pipe	*0.02*			*8.15*			*8.17*
8	Arc-welded Joint Steel Pipe	*1.38*			*2.18*		*3.88*	*7.45*
9	Arc-welded Joint Steel Pipe	*0.37*		*0.30*	*1.45*		*0.95*	*3.08*
10	Arc-welded Joint Steel Pipe				*2.53*		*1.04*	*3.57*
11	Arc-welded Joint Steel Pipe				*4.31*		*4.95*	*9.26*
12	Arc-welded Joint Steel Pipe				*2.34*		*2.35*	*4.69*
13	Arc-welded Joint Steel Pipe	*4.91*		*0.04*	*3.73*			*8.68*
14	Arc-welded Joint Steel Pipe	*2.11*			*0.90*			*3.01*
15	Arc-welded Joint Steel Pipe	*3.55*		*0.89*	*3.71*			*8.15*
16	Arc-welded Joint Steel Pipe	*2.24*			*5.48*			*7.72*
17	Arc-welded Joint Steel Pipe				*2.99*			*2.99*
18	Arc-welded Joint Steel Pipe				*2.85*			*2.85*
19	Arc-welded Joint Steel Pipe				*0.83*			*0.83*
20	Arc-welded Joint Steel Pipe	*0.74*			*1.41*			*2.14*
21	Arc-welded Joint Steel Pipe	*0.17*			*0.76*			*0.92*
22	Arc-welded Joint Steel Pipe	*0.14*			*0.91*			*1.05*
23	Arc-welded Joint Steel Pipe				*3.80*		*1.04*	*4.84*
24	Arc-welded Joint Steel Pipe				*1.21*		*8.14*	*9.35*
25	Arc-welded Joint Steel Pipe				*0.10*		*6.40*	*6.50*
26	Arc-welded Joint Steel Pipe				*9.16*		*2.10*	*11.26*
27	Arc-welded Joint Steel Pipe				*0.41*		*4.88*	*5.29*
28	Arc-welded Joint Steel Pipe				*3.80*	*0.75*	*4.11*	*8.66*
29	Arc-welded Joint Steel Pipe				*3.64*	*0.04*	*0.74*	*4.41*
30	Arc-welded Joint Steel Pipe				*1.36*	*1.48*	*0.90*	*3.74*
31	Arc-welded Joint Steel Pipe				*0.73*	*0.85*		*1.58*
32	Arc-welded Joint Steel Pipe	*1.27*			*4.17*			*5.45*
33	Arc-welded Joint Steel Pipe				*1.59*	*0.47*		*2.06*
34	Arc-welded Joint Steel Pipe	*0.48*			*2.04*			*2.52*
35	Arc-welded Joint Steel Pipe	*0.53*			*2.90*			*3.43*
36	Arc-welded Joint Steel Pipe				*1.76*	*2.79*	*0.90*	*5.45*
37	Arc-welded Joint Steel Pipe				*4.86*		*1.45*	*6.31*
38	Arc-welded Joint Steel Pipe				*6.88*	*1.07*	*0.58*	*8.52*
39	Arc-welded Joint Steel Pipe				*7.05*		*2.09*	*9.14*
40	Arc-welded Joint Steel Pipe				*8.00*	*2.09*		*10.10*
41	Arc-welded Joint Steel Pipe				*2.13*	*0.70*		*2.84*
Grand Total		*19.94*	*0*	*1.23*	*134.98*	*12.47*	*51.76*	***220.38***

Table 4-24 Vulnerability Characteristics of Natural Gas Pipeline in Every Ward of Sylhet City Corporation Area

Sylhet Ward	Component	Liquefaction Susceptibility (length in km)						Total Length (km)
		None	Very Low	Low	Moderate	High	Very High	
1	Arc-welded Joint Steel Pipe	4.14			0.17			4.31
2	Arc-welded Joint Steel Pipe	3.18						3.18
3	Arc-welded Joint Steel Pipe	2.19			1.55			3.73
4	Arc-welded Joint Steel Pipe	3.99			0.84			4.83
5	Arc-welded Joint Steel Pipe	2.85			2.63			5.48
6	Arc-welded Joint Steel Pipe	0.90			1.10			2.00
7	Arc-welded Joint Steel Pipe	6.57			1.86			8.43
8	Arc-welded Joint Steel Pipe	4.57			3.01			7.58
9	Arc-welded Joint Steel Pipe	3.86			6.57	0.13		10.56
10	Arc-welded Joint Steel Pipe	0.10			5.95	0.64		6.68
11	Arc-welded Joint Steel Pipe	3.16			0.71			3.88
12	Arc-welded Joint Steel Pipe	3.82			0.87			4.69
13	Arc-welded Joint Steel Pipe	4.20						4.20
14	Arc-welded Joint Steel Pipe	0.63			0.76		1.69	3.08
15	Arc-welded Joint Steel Pipe	5.21			1.12		0.30	6.62
16	Arc-welded Joint Steel Pipe	3.00						3.00
17	Arc-welded Joint Steel Pipe	5.68			0.08			5.76
18	Arc-welded Joint Steel Pipe	4.27			0.39			4.66
19	Arc-welded Joint Steel Pipe	2.93			2.35			5.27
20	Arc-welded Joint Steel Pipe	5.28			1.97			7.25
21	Arc-welded Joint Steel Pipe	7.59			0.04		0.12	7.74
22	Arc-welded Joint Steel Pipe				0.53		2.18	2.71
23	Arc-welded Joint Steel Pipe				3.43	0.25	0.06	3.75
24	Arc-welded Joint Steel Pipe	0.46			3.62		0.03	4.11
25	Arc-welded Joint Steel Pipe				5.68			5.68
26	Arc-welded Joint Steel Pipe				4.07		2.85	6.92
27	Arc-welded Joint Steel Pipe				6.12		1.63	7.75
Grand Total		78.57	0	0	55.42	1.03	8.86	***143.87***

Table 4-25 Natural Gas Facilities on Soil Liquefaction susceptibility in Dhaka, Chittagong, and Sylhet City Corporation Areas

City Corporation and Component	Liquefaction Susceptibility (number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Dhaka							
Compression Station (DRS)	0	2	0	2	0	3	7
Total	0	2	0	2	0	3	7
Chittagong							
Compression Station (DRS)	3	0	0	8	4	7	22
Total	3	0	0	8	4	7	22
Sylhet							
Compression Station (DRS)	1	0	0	0	0	0	1
Total	1	0	0	0	0	0	1

Table 4-26 Natural Gas Pipe Length and Number of Facilities on Soil Liquefaction susceptibility in Chittagong City Corporation Area

Component	Liquefaction Susceptibility (length in km or number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Pipeline							
Arc-welded Joint Steel Pipe	22.98	0.00	0.85	116.50	9.31	77.44	227.08

Total	*22.98*	*0.00*	*0.85*	*116.50*	*9.31*	*77.44*	*227.08*
Facility							
Compression Station (DRS)	*3*	*0*	*0*	*8*	*4*	*7*	*22*
Total	*3*	*0*	*0*	*8*	*4*	*7*	*22*

4.2.4. Electric Power System

The vulnerability electric power system is assessed from the characteristics of electric power components which are power generation facilities, transmission substation, and distribution circuit that make them susceptible to the damaging effect of an earthquake. From the field survey, it is known that there is no power generation plant located in the study area of the 3 cities. The existing components include low voltage substation (ESSL), and electric pole and transformer as distribution circuits (EDC). In electric power system, vulnerability is identified from the location and spatial distribution of those components and soil liquefaction susceptibility on which the components stand. Number of component in different liquefaction susceptibility soils and spatial distribution of electric power components are given in the next tables.

Table 4-27 Number of Electric Power System Facilities on Soil Liquefaction susceptibility in Dhaka City Corporation Area

Component	Liquefaction Susceptibility (number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Electric Substation	*0*	*0*	*0*	*1*	*1*	*3*	*5*
Distribution Circuit (electric pole & transformer)	*0*	*20,792*	*105*	*4,708*	*532*	*28,673*	*54,810*
Total	*0*	*20,792*	*105*	*4,709*	*533*	*28,676*	*54,815*

Table 4-28 Number of Electric Power System Facilities on Soil Liquefaction susceptibility in Chittagong City Corporation Area

Component	Liquefaction Susceptibility (number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Electric Substation	*1*	*0*	*0*	*1*	*0*	*0*	*2*
Distribution Circuit (electric pole & transformer)	*3,600*	*0*	*81*	*18,245*	*602*	*5,817*	*28,405*
Total	*3,601*	*0*	*81*	*18,246*	*602*	*5,817*	*28,407*

Table 4-29 Number of Electric Power System Facilities on Soil Liquefaction susceptibility in Sylhet City Corporation Area

Component	Liquefaction Susceptibility (number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Electric Substation	*1*	*0*	*0*	*0*	*0*	*0*	*1*
Distribution Circuit (electric pole &transformer)	*4,579*	*0*	*0*	*3,579*	*45*	*853*	*9,056*
Total	*4,580*	*0*	*0*	*3,579*	*45*	*853*	*9,057*

Table 4-30 Spatial Distribution of Electric Power System Facilities in Each Ward of Dhaka City Corporation Area

Dhaka Ward	Electric Substation	Distribution Circuit (electric pole & transformer)	Total
1	*1*	*3,109*	*3,110*
2		*921*	*921*
3		*713*	*713*

Dhaka Ward	Electric Substation	Distribution Circuit (electric pole & transformer)	Total
4		*493*	*493*
5		*613*	*613*
6	*1*	*1,754*	*1,755*
7		*597*	*597*
8		*819*	*819*
9		*344*	*344*
10	*1*	*728*	*729*
11		*505*	*505*
12		*657*	*657*
13		*1,630*	*1,630*
14		*955*	*955*
15		*1,125*	*1,125*
16		*1,360*	*1,360*
17		*1,930*	*1930*
18		*750*	*750*
19		*2,108*	*2,108*
20		*695*	*695*
21		*889*	*889*
22	*1*	*958*	*959*
23		*491*	*491*
24		*555*	*555*
25		*649*	*649*
26		*658*	*658*
27		*565*	*565*
28		*516*	*516*
29		*325*	*325*
30		*194*	*194*
31		*283*	*283*
32		*538*	*538*
33		*215*	*215*
34		*559*	*559*
35		*356*	*356*
36		*580*	*580*
37		*1,087*	*1,087*
38		*386*	*386*
39		*567*	*567*
40		*814*	*814*
41		*366*	*366*
42		*423*	*423*
43		*773*	*773*
44		*424*	*424*
45		*798*	*798*
46		*907*	*907*
47		*434*	*434*
48		*820*	*820*
49		*1,515*	*1,515*
50		*529*	*529*
51		*579*	*579*
52		*588*	*588*
53		*737*	*737*
54		*586*	*586*
55		*351*	*351*

Dhaka Ward	Electric Substation	Distribution Circuit (electric pole & transformer)	Total
56		*426*	*426*
57		*404*	*404*
58	*1*	*513*	*514*
59		*343*	*343*
60		*314*	*314*
61		*256*	*256*
62		*519*	*519*
63		*224*	*224*
64		*175*	*175*
65		*486*	*486*
66		*299*	*299*
67		*288*	*288*
68		*229*	*229*
69		*440*	*440*
70		*274*	*274*
71		*213*	*213*
72		*131*	*131*
73		*286*	*286*
74		*371*	*371*
75		*355*	*355*
76		*315*	*315*
77		*329*	*329*
78		*201*	*201*
79		*202*	*202*
80		*218*	*218*
81		*353*	*353*
82		*300*	*300*
83		*406*	*406*
84		*326*	*326*
85		*357*	*357*
86		*485*	*485*
87		*331*	*331*
88		*283*	*283*
89		*398*	*398*
90		*516*	*516*
91		*424*	*424*
Total	*5*	*54,810*	*54,815*

Table 4-31 Spatial Distribution of Electric Power System Facilities in Each Ward of Chittagong City Corporation Area

Chittagong Ward	Electric Substation	Distribution Circuit (electric pole & transformer)	Total
1		*862*	*862*
2	*1*	*1,195*	*1,196*
3		*675*	*675*
4		*1,976*	*1,976*
5		*850*	*850*
6		*805*	*805*
7		*1,003*	*1,003*
8		*1,719*	*1,719*
9	*1*	*697*	*698*
10		*694*	*694*

Chittagong Ward	Electric Substation	Distribution Circuit (electric pole & transformer)	Total
11		*818*	*818*
12		*770*	*770*
13		*850*	*850*
14		*293*	*293*
15		*597*	*597*
16		*944*	*944*
17		*626*	*626*
18		*829*	*829*
19		*423*	*423*
20		*195*	*195*
21		*296*	*296*
22		*374*	*374*
23		*371*	*371*
24		*1,376*	*1,376*
25		*883*	*883*
26		*446*	*446*
27		*772*	*772*
28		*634*	*634*
29		*448*	*448*
30		*460*	*460*
31		*316*	*316*
32		*391*	*391*
33		*325*	*325*
34		*383*	*383*
35		*458*	*458*
36		*278*	*278*
37		*265*	*265*
38		*502*	*502*
39		*362*	*362*
40		*1,139*	*1,139*
41		*1,105*	*1,105*
Total	*2*	*28,405*	*28,407*

Table 4-32 Spatial Distribution of Electric Power System Facilities in Each Ward of Sylhet City Corporation Area

Sylhet Ward	Electric Substation	Distribution Circuit (electric pole & transformer)	Total
1		*294*	*294*
2		*137*	*137*
3		*293*	*293*
4		*271*	*271*
5		*346*	*346*
6		*246*	*246*
7		*553*	*553*
8		*512*	*512*
9		*580*	*580*
10		*387*	*387*
11		*211*	*211*
12		*234*	*234*
13		*225*	*225*
14		*259*	*259*
15		*229*	*229*

Sylhet Ward	Electric Substation	Distribution Circuit (electric pole & transformer)	Total
16		*174*	*174*
17	*1*	*276*	*277*
18		*311*	*311*
19		*353*	*353*
20		*382*	*382*
21		*341*	*341*
22		*613*	*613*
23		*171*	*171*
24		*320*	*320*
25		*296*	*296*
26		*489*	*489*
27		*553*	*553*
Total	*1*	*9,056*	*9,057*

4.2.5. Communication System

The communication system consists of telephone central office (telephone exchange) and communication stations or transmitters (TV, radio, weather stations). Field survey was conducted to get the location of telephone exchange office (CCO), TV station (CBT), and radio station (CBR). Vulnerability is identified from the location and spatial distribution of those components and soil liquefaction susceptibility on which the components located. Number of components in different liquefaction susceptibility soils and in different wards of the three citiy corporation areas is given in the next tables.

Table 4-33 Number of Communication System Facilities on Soil Liquefaction susceptibility in Dhaka City Corporation Area

Component	Liquefaction Susceptibility (number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Central Office (Telephone Exchange)	-	*4*	-	-	-	*2*	*6*
TV Station or Transmitter	-	*4*	-	-	-	*1*	*5*
Radio Station or Transmitter	-	*7*	-	*3*	-	*8*	*18*
Total	-	*15*	-	*3*	-	*11*	*29*

Table 4-34 Number of Communication System Facilities on Soil Liquefaction susceptibility in Chittagong City Corporation Area

Component	Liquefaction Susceptibility (number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Central Office (Telephone Exchange)	-	-	-	-	*2*	*1*	*3*
TV Station or Transmitter	-	-	-	-	*1*	-	*1*
Radio Station or Transmitter	-	-	-	-	*1*	-	*1*
Total	-	-	-	-	*4*	*1*	*5*

Table 4-35 Number of Facilities System Facilities on Soil Liquefaction susceptibility in Sylhet City Corporation Area

Component	Liquefaction Susceptibility (number of facility)						Total
	None	Very Low	Low	Moderate	High	Very High	
Central Office (Telephone Exchange)	*2*	-	-	*1*	-	-	*3*
TV Station or	*2*	-	-	-	-	-	*2*

Transmitter							
Radio Station or Transmitter	-	-	-	*2*	-	-	*2*
Total	*4*	-	-	*3*	-	-	*7*

Table 4-36 Spatial Distribution of Communication System Facilities in Dhaka City Corporation Area

Dhaka Ward	Central Office (Telephone Exchange)	TV Station or Transmitter	Radio Station or Transmitter	Total
6	-	-	*2*	*2*
10	-	-	*1*	*1*
16	-	-	*1*	*1*
19	-	*1*	-	*1*
20	-	-	*1*	*1*
24	*1*	-	-	*1*
39	-	*3*	-	*3*
41	-	-	*1*	*1*
43	-	-	*1*	*1*
46	-	-	*2*	*2*
47	-	-	*3*	*3*
50	-	*1*	-	*1*
53	*2*	-	-	*2*
54	-	-	*1*	*1*
57	-	-	*1*	*1*
58	-	-	*1*	*1*
67	*1*	-	-	*1*
69	*1*	-	-	*1*
74	*1*	-	-	*1*
90	-	-	*3*	*3*
Total	*6*	*5*	*18*	*29*

Table 4-37 Spatial Distribution of Communication System Facilities in Chittagong City Corporation Area

Chittagong Ward	Central Office (Telephone Exchange)	TV Station or Transmitter	Radio Station or Transmitter	Total
13		*1*		*1*
2	*1*			*1*
32	*1*			*1*
4			*1*	*1*
8	*1*			*1*
Total	*3*	*1*	*1*	*5*

Table 4-38 Spatial Distribution of Communication System Facilities in Sylhet City Corporation Area

Sylhet Ward	Central Office (Telephone Exchange)	TV Station or Transmitter	Radio Station or Transmitter	Total
14	*1*			*1*
17		*2*		*2*
20	*1*			*1*
21			*1*	*1*
27	*1*			*1*
1			*1*	*1*
Total	*3*	*2*	*2*	*7*

5. Conclusion

Based on the developed database for the general building stock, vulnerability maps are created. Each map shows the ward-wise distribution of the following vulnerability factors including occupancy class, structural type, building age, visible physical condition, and population at risk. Moreover, the maps showing vulnerability of concrete buildings in the three cities are developed by using the statistics obtained from the field survey including presence of soft story, presence of heavy overhang, apparent building quality, presence of short columns, pounding possibility between adjacent buildings, and topographic effects. The significant findings from the building vulnerability assessment are concluded as followings:

- Among occupancy classes in all city corporation areas, residential class is the major proportion. Their proportions are 81.3%, 81.7% and 85.2% in Dhaka, Chittagong and Sylhet, respectively.
- Among structural type of non-engineered buildings from the survey results, BF (brick in cement mortar masonry with flexible roof) is the most common type in all cities. For engineered buildings, C3 (concrete frame with masonry infill walls) is the most common class.
- From the survey results, age of buildings has been related to structural types. For example, it was found that most buildings with concrete slab-column frames (C4) are constructed less than 10 years. On the other hand, most masonry buildings with concrete floors (BC) ages more than 10 years. Also, light reinforced concrete buildings (LC) are found to be older than reinforced concrete buildings (RC).
- As expected, all residential types have an average number of occupants per floor area in the daytime less than the nighttime; nevertheless, the other occupancy classes as commercial, industrial, government and education have the number of occupants in the daytime more than the nighttime.
- The vulnerability factor which is the most common in Dhaka city is soft story (52%). The common vulnerability factor in both Chittagong and Sylhet city is heavy overhang (38% and 46%, consequently).

For Lifeline inventory, the database including transportation including highway, railway, bus and ferry and utility systems including portable water, waste water, natural gas, electric power and communication systems in the 3 city corporation areas were developed. This information was collected based on field surveying, data collecting from reliable sources and identifying of quickbird image. From the collected data and developed vulnerability map, the major findings are summarized as followings:

- By defining road blockade potential as the building density (number of building per area) dividing by the total length in each ward. In Dhaka, this value is found to be the highest in southern part of Dhaka which is the old city. The highest values are found in wards 64 and 80, respectively. In addition, the road blockade potential in Dhaka is the highest compared to the other city corporation areas. In Chittagong, the ratio is found to be the highest in ward 33, 34 and 20 which is the old port area. In Sylhet, the highest ratio is found in ward 11, 12 and 13 which is also the old urban area of Sylhet City Corporation area.

- About 51% of highway road in Dhaka, 3% of highway road in Chittagong and 13% of highway road in Sylhet is located in the soil with very high liquefaction susceptibility. It is noted that the liquefaction susceptibility depends on only geological characteristic and does not consider the effect of earthquake hazard, yet.
- Most highway bridges in 3 city corporation areas are non-seismic design. The overlay map between liquefaction susceptibility and location of the bridge showed that there are 6 major highway bridges in Dhaka, 4 Bridges in Chittagong and 2 bridges in Sylhet which are located in moderate to very high liquefaction susceptibility area.
- Two components of railway transportation system which are railway track and railway facilities were found in 3 city corporation areas. 70% of railway track in Dhaka, 92% of railway track in Chittagong and 84% of railway track in Sylhet are located in the moderate to very high liquefaction potential areas. From interviewing and expert judgment, it was found that most structure and its facility do not have a seismic design.
- Most of potable water pipelines in 3 city corporation areas are ductile pipe. This ductile material includes galvanized iron (GI), ductile iron (DI), mild steel (MS), PVC and steel. Fewer percentage is brittle pipe which are Asbestos cement (AC), cast iron (CI) and reinforced concrete (RCC). It was found that 57% in Dhaka, 86% in Chittagong and 33% in Sylhet of potable water pipeline is in the moderate to very high liquefaction potential area.
- From survey result, waste water treatment pipeline was found to be brittle pipe. 52% of the pipe is located in very low liquefaction susceptibility area and 43% of the pipe in very high liquefaction susceptibility area.
- Most natural gas pipeline is 3 city coporation areas are arc-welded join steel pipe. 56% in Dhaka, 90% in Chittagong and 45% in Sylhet of this pipe is located in the moderate to very high liquefaction potential area.

Appendix A: Report Occupancy Class and BNBC 2006 Occupancy

Table A-38 Modified HAZUS Building Occupancy Classes for Bangladesh

Label	Bangladesh National Building Code type	Modified Occupancy Class Definition HAZUS	Example Description
		Residential	
RES1	A1	Single Family Dwelling	House
RES2	A4	Minimum Standard Housing RES2A < 25 occupants RES2B 25-100 occupants RES2C 100+ occupants	
RES3	A2	Multi Family Dwelling RES3A < 10 units RES3B 10-19 units RES3C 20-49 units RES3D 50+ unit	Apartment/Condominium
RES4	A5	Temporary Lodging	Hotel/Motel
RES5	A3	Institutional Dormitory	Group Housing (military, student), Jails
RES6	*	Sub-Standard Housing	Slum, Tin-Shed
		Commercial	
COM1	F2	Small Shops and Markets	Street-Side Shops
COM2	F3	Large Shops and Markets	Shopping Malls, Complex
COM3	F4	Personal and Repair Services	Automobile workshop, Car wash
COM4	F1	Professional/Technical Services	Office
COM5	F1	Banks	
COM6	D2	Hospitals	
COM7	D1	Medical Office/Clinic	
COM8	E5	Entertainment and Recreation	Restaurant, Snooker club
COM9	E1,E2	Theaters	
COM10	MIXED	Mixed Occupancy	Residential – Commercial
		Industrial	
IND1	G2	Heavy	Large rubber industry, Plastic factory, Car industry
IND2	G1	Light	Small textile & garments factory
IND3	G2	Food/Drugs/Chemicals	
IND4	G2	Metals/Minerals Processing	
IND5	G1	High Technology	Computer/electrical apparatus
IND6	G1	Construction	Under construction building
		Agriculture	
AGR1	H1,H2	Agriculture	Farm house, Ware house
		Religion/Non-Profit	
REL1	E3,E4	Mosque/Non-Profit	
		Government	
GOV1	F1	General Services	Government office, Post office
GOV2	F5	Emergency Response	Police station, Fire station
		Education	
EDU1	B1	Grade Schools	High school, Religious school, Library
EDU2	B1	Colleges/Universities	

Table A-39 BNBC 2006 Occupancy Classes

Table 3.1.1

Summary of Occupancy Classification
(Details in Sec 2.1. Details of Occupancy A4 in Appendix A)

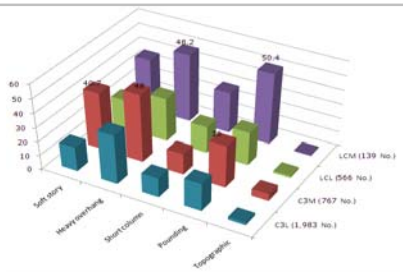
Occupancy type	Sub-division	Nature of use or occupancy
A : Residential	A1	Detached single family dwelling
	A2	Flats or apartments
	A3	Mess, boarding houses, dormitories and hostels
	A4	Minimum standard housing
	A5	Hotels and lodging houses
B : Educational	B1	Educational facilities
	B2	Preschool facilities
C : Institutional	C1	Institutions for care of children
	C2	Custodial institutions for physically capable
	C3	Custodial institutions for physically incapable or handicapped
	C4	penal and mental institutions
D : Health Care	D1	Normal medical facilities
	D2	Emergency medical facilities
E : Assembly	E1	Large assembly with fixed seats
	E2	Small assembly with fixed seats
	E3	Large assembly without fixed seats
	E4	Small assembly without fixed seats
	E5	Sports facilities
F : Business and Mercantile	F1	Offices
	F2	Small shops and markets
	F3	large shops and markets
	F4	Garages and petrol stations
	F5	Essential services
G : Industrial	G1	Low hazard industries
	G2	Moderate hazard industries
H : Storage	H1	Low fire risk storage
	H2	Moderate fire risk storage
J : Hazardous	J1	Explosion hazard building
	J2	Chemical, biological or radiation hazard building
K : Miscellaneous	K1	Private garages and special structures
	K2	Fences, tanks and towers

Appendix B: A field survey of content values in residential buildings

ID	Location	Occupancy class	Structural type	Floor Area (Sq.ft)	Number of storey	Number of Apartment per storey	Content Value (Tk)	Number of Units	Content Value per Sq.ft
1	Mohammadi Housing Ltd.	RES3B	C3M	1,115	6	2	600,000	12	538
2	DOHS, Baridhara	RES3B	C3M	800	6	3	440,000	18	550
3	Nikunjo	RES3B	C3M	1,000	6	2	500,000	12	500
4	Kakrail	RES3B	C3M	750	6	2	500,000	12	667
5	8, Circuit house road	RES3C	C3H	1,650	12	4	600,000	48	364
6	Kaderabad Housing	RES3B	C3M	750	6	2	200,000	12	267
7	15/28, Baily Square, Baily road	RES3D	C3M	450	6	10	200,000	60	444
8	Rupnagar, Mirpur	RES3B	C3M	1,200	6	2	1,000,000	12	833
9	Dhanmondi	RES3B	C3M	1,900	6	3	775,000	18	408
								Avg. Content value per Sq.ft.	508
								Avg. Replacement cost per Sq.ft	1,559
								CV factor	0.32

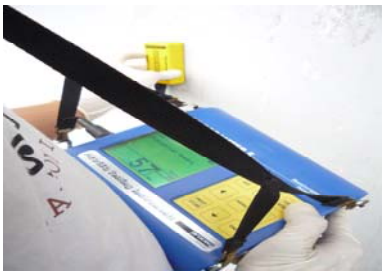
Comprehensive Disaster Management Programme (CDMP)
Ministry of Food and Disaster Management
Government of the People's Republic of Bangladesh

Annex



Vulnerability Assessment of Dhaka, Chittagong and Sylhet City Corporation Area

(General building stock in cluster level)



Annex

Dhaka City Corporation Area

Table 40 Number of Buildings of Dhaka in Cluster level

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
1	DCL0101	0.548	1,089	1,987
	DCL0102	0.632	652	1,032
	DCL0103	0.253	312	1,233
	DCL0104	0.440	729	1,657
	DCL0105	0.275	567	2,062
	DCL0106	0.432	594	1,375
	DCL0107	0.364	600	1,648
	DCL0108	0.403	523	1,298
	DCL0109	0.294	253	861
	DCL0110	0.508	724	1,425
	DCL0111	0.555	894	1,611
	DCL0112	0.372	476	1,280
	DCL0113	0.523	769	1,470
Total		5.599	8,182	1,461
2	DCL0201	0.155	466	3,006
	DCL0202	0.602	507	842
	DCL0203	0.158	839	5,310
	DCL0204	0.227	1,103	4,859
	DCL0205	0.129	831	6,442
	DCL0206	0.157	275	1,752
	DCL0207	0.152	34	224
	DCL0208	0.187	1,398	7,476
	DCL0209	0.117	661	5,650
Total		1.884	6,114	3,245
3	DCL0301	0.293	1,276	4,355
	DCL0302	0.293	883	3,014
	DCL0303	0.299	1,112	3,719
	DCL0304	0.204	995	4,877
	DCL0305	0.225	429	1,907
Total		1.314	4,695	3,573
4	DCL0401	0.123	489	3,976
	DCL0402	0.251	7	28
	DCL0403	0.176	694	3,943
	DCL0404	0.324	254	784
	DCL0405	0.118	252	2,136
	DCL0406	0.132	485	3,674
Total		1.124	2,181	1,940
5	DCL0501	0.181	1,113	6,149
	DCL0502	0.115	256	2,226
	DCL0503	0.072	386	5,361
	DCL0504	0.083	448	5,398
	DCL0505	0.071	415	5,845
	DCL0506	0.044	513	11,659
	DCL0507	0.090	563	6,256
	DCL0508	0.102	572	5,608
	DCL0509	0.084	466	5,548
	DCL0510	0.215	640	2,977
	DCL0511	0.133	609	4,579
Total		1.190	5,981	5,026
6	DCL0601	0.487	1,321	2,713
	DCL0602	0.284	2,016	7,099
	DCL0603	0.101	175	1,733
	DCL0604	0.078	188	2,410
	DCL0605	0.098	816	8,327
	DCL0606	0.238	892	3,748
	DCL0607	0.249	643	2,582
	DCL0608	0.122	750	6,148
	DCL0609	0.362	869	2,401
	DCL0610	0.461	1,646	3,570
	DCL0611	0.167	427	2,557
	DCL0612	0.050	707	14,140
	DCL0613	0.099	2	20
Total		2.796	10,452	3,738
7	DCL0701	0.174	536	3,080
	DCL0702	0.102	15	147
	DCL0703	0.204	774	3,794

}

Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	DCL0704	0.058	312	5,379
	DCL0705	0.126	281	2,230
	DCL0706	0.114	439	3,851
	DCL0707	0.092	53	576
	DCL0708	0.039	100	2,564
	DCL0709	0.063	276	4,381
Total		0.972	2,786	2,866
8	DCL0801	0.937	130	139
	DCL0802	0.129	374	2,899
	DCL0803	0.185	1,307	7,065
	DCL0804	0.181	716	3,956
	DCL0805	0.260	935	3,596
	DCL0806	0.305	1,380	4,525
	DCL0807	0.321	520	1,620
	DCL0808	0.177	875	4,944
	DCL0809	1.658	143	86
Total		4.153	6,380	1,536
9	DCL0901	0.201	309	1,537
	DCL0902	0.663	575	867
	DCL0903	0.116	658	5,672
	DCL0904	0.141	654	4,638
	DCL0905	0.158	897	5,677
	DCL0906	0.160	703	4,394
Total		1.439	3,796	2,638
10	DCL1001	0.264	1,602	6,068
	DCL1002	0.394	777	1,972
	DCL1003	0.454	332	731
	DCL1004	0.135	685	5,074
	DCL1005	0.142	386	2,718
	DCL1006	0.220	934	4,245
	DCL1007	0.254	782	3,079
	DCL1008	0.264	380	1,439
Total		2.127	5,878	2,764
11	DCL1101	0.390	1,142	2,928
	DCL1102	0.361	633	1,753
	DCL1103	0.309	1,144	3,702
	DCL1104	0.131	182	1,389
Total		1.191	3,101	2,604
12	DCL1201	0.162	505	3,117
	DCL1202	0.080	418	5,225
	DCL1203	0.198	1,234	6,232
	DCL1204	0.121	286	2,364
	DCL1205	0.170	716	4,212
	DCL1206	0.109	214	1,963
Total		0.840	3,373	4,015
13	DCL1301	0.375	1,181	3,149
	DCL1302	0.236	923	3,911
	DCL1303	0.395	1,562	3,954
	DCL1304	0.338	1,287	3,808
	DCL1305	0.392	1,603	4,089
	DCL1306	0.288	1,206	4,188
	DCL1307	0.288	1,607	5,580
	DCL1308	0.234	962	4,111
	DCL1309	0.221	842	3,810
	DCL1310	0.255	941	3,690
Total		3.022	12,114	4,009
14	DCL1401	0.322	1,180	3,665
	DCL1402	0.206	828	4,019
	DCL1403	0.133	350	2,632
	DCL1404	0.252	941	3,734
	DCL1405	0.268	769	2,869
	DCL1406	0.297	1,239	4,172
Total		1.478	5,307	3,591
15	DCL1501	0.624	742	1,189
	DCL1502	0.719	1,100	1,530
	DCL1503	0.420	884	2,105
	DCL1504	0.395	903	2,286
	DCL1505	0.304	994	3,270
	DCL1506	0.313	1,094	3,495
	DCL1507	0.454	2,655	5,848

}

Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	DCL1508	0.459	1,496	3,259
	DCL1509	0.520	1,156	2,223
	DCL1510	0.393	2,117	5,387
Total		4.601	13,141	2,856
16	DCL1601	2.548	5	2
	DCL1602	0.280	1,217	4,346
	DCL1603	0.298	1,505	5,050
	DCL1604	0.344	807	2,346
	DCL1605	0.341	1,284	3,765
	DCL1606	0.362	1,697	4,688
	DCL1607	0.278	1,228	4,417
	DCL1608	0.137	210	1,533
Total		4.588	7,953	1,733
17	DCL1701	0.628	1,330	2,118
	DCL1702	0.367	938	2,556
	DCL1703	0.265	1,198	4,521
	DCL1704	0.198	682	3,444
	DCL1705	0.448	1,596	3,563
	DCL1706	0.843	2	2
	DCL1707	0.571	281	492
	DCL1708	0.396	1,221	3,083
	DCL1709	0.640	1,020	1,594
	DCL1710	0.497	1,105	2,223
	DCL1711	0.608	1,565	2,574
	DCL1712	0.306	888	2,902
	DCL1713	0.432	550	1,273
Total		6.199	12,376	1,996
18	DCL1801	0.425	596	1,402
	DCL1802	0.420	170	405
	DCL1803	0.116	626	5,397
	DCL1804	0.189	958	5,069
	DCL1805	0.069	275	3,986
	DCL1806	0.184	904	4,913
Total		1.403	3,529	2,515
19	DCL1901	0.467	2,808	6,013
	DCL1902	0.466	678	1,455
	DCL1903	0.531	592	1,115
	DCL1904	0.333	253	760
	DCL1905	0.375	339	904
	DCL1906	0.297	149	502
	DCL1907	0.347	277	798
	DCL1908	0.368	600	1,630
	DCL1909	0.379	314	828
	DCL1910	0.491	381	776
	DCL1911	0.398	293	736
	DCL1912	0.244	164	672
	DCL1913	0.343	300	875
	DCL1914	0.240	175	729
Total		5.279	7,323	1,387
20	DCL2001	0.359	1,059	2,950
	DCL2002	0.364	429	1,179
	DCL2003	0.379	1,689	4,456
	DCL2004	0.402	1,011	2,515
	DCL2005	0.349	279	799
Total		1.853	4,467	2,411
21	DCL2101	0.374	1,601	4,281
	DCL2102	0.185	931	5,032
	DCL2103	0.240	1,082	4,508
	DCL2104	0.265	1,276	4,815
	DCL2105	0.286	1,570	5,490
	DCL2106	0.247	22	89
Total		1.597	6,482	4,059
22	DCL2201	0.258	1,165	4,516
	DCL2202	0.320	1,291	4,034
	DCL2203	0.377	1,292	3,427
	DCL2204	0.369	1,521	4,122
	DCL2205	0.247	871	3,526
Total		1.571	6,140	3,908
23	DCL2301	0.290	974	3,359
	DCL2302	0.154	447	2,903

}

Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	DCL2303	0.130	385	2,962
	DCL2304	0.197	757	3,843
Total		0.771	2,563	3,324
24	DCL2401	0.229	594	2,594
	DCL2402	0.164	669	4,079
	DCL2403	0.215	973	4,526
	DCL2404	0.197	506	2,569
Total		0.805	2,742	3,406
25	DCL2501	0.205	969	4,727
	DCL2502	0.157	297	1,892
	DCL2503	0.113	776	6,867
	DCL2504	0.171	764	4,468
	DCL2505	0.229	1,293	5,646
	DCL2506	0.111	509	4,586
Total		0.986	4,608	4,673
26	DCL2601	0.293	613	2,092
	DCL2602	0.276	417	1,511
	DCL2603	0.447	379	848
	DCL2604	0.278	1,068	3,842
	DCL2605	0.271	1,076	3,970
	DCL2606	0.407	1,741	4,278
Total		1.972	5,294	2,685
27	DCL2701	0.307	1,134	3,694
	DCL2702	0.202	890	4,406
	DCL2703	0.222	1,144	5,153
	DCL2704	0.159	562	3,535
Total		0.890	3,730	4,191
28	DCL2801	0.234	889	3,799
	DCL2802	0.191	758	3,969
	DCL2803	0.194	769	3,964
	DCL2804	0.182	680	3,736
	DCL2805	0.141	536	3,801
Total		0.942	3,632	3,856
29	DCL2901	0.141	563	3,993
	DCL2902	0.153	639	4,176
	DCL2903	0.140	953	6,807
	DCL2904	0.076	375	4,934
	DCL2905	0.078	527	6,756
Total		0.588	3,057	5,199
30	DCL3001	0.092	730	7,935
	DCL3002	0.124	507	4,089
	DCL3003	0.082	311	3,793
	DCL3004	0.137	803	5,861
Total		0.435	2,351	5,405
31	DCL3101	0.574	143	249
	DCL3102	0.155	688	4,439
	DCL3103	0.106	320	3,019
	DCL3104	0.096	713	7,427
Total		0.931	1,864	2,002
32	DCL3201	0.298	312	1,047
	DCL3202	0.191	210	1,099
	DCL3203	0.255	1	4
	DCL3204	0.097	268	2,763
	DCL3205	0.175	770	4,400
Total		1.016	1,561	1,536
33	DCL3301	0.149	184	1,235
	DCL3302	0.095	74	779
	DCL3303	0.099	85	859
	DCL3304	0.090	61	678
Total		0.433	404	933
34	DCL3401	0.254	348	1,370
	DCL3402	0.155	543	3,503
	DCL3403	0.235	917	3,902
	DCL3404	0.136	289	2,125
Total		0.780	2,097	2,688
35	DCL3501	0.147	748	5,088
	DCL3502	0.111	513	4,622
	DCL3503	0.119	318	2,672
	DCL3504	0.120	435	3,625
Total		0.497	2,014	4,052

}

Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
36	DCL3601	0.430	832	1,935
	DCL3602	0.309	62	201
	DCL3603	0.412	890	2,160
	DCL3604	0.134	1	7
Total		1.285	1,785	1,389
37	DCL3701	0.486	656	1,350
	DCL3702	0.264	7	27
	DCL3703	0.440	498	1,132
	DCL3704	0.258	157	609
	DCL3705	0.480	1,463	3,048
	DCL3706	0.419	433	1,033
	DCL3707	0.296	245	828
	DCL3708	0.438	442	1,009
Total		3.081	3,901	1,266
38	DCL3801	0.235	678	2,885
	DCL3802	0.347	1	3
	DCL3803	0.294	1,170	3,980
	DCL3804	0.225	1,040	4,622
Total		1.101	2,889	2,624
39	DCL3901	0.333	648	1,946
	DCL3902	0.329	1,144	3,477
	DCL3903	0.246	233	947
	DCL3904	0.254	584	2,299
Total		1.162	2,609	2,245
40	DCL4001	1.533	52	34
	DCL4002	0.298	633	2,124
	DCL4003	0.501	153	305
	DCL4004	0.324	951	2,935
	DCL4005	0.399	305	764
	DCL4006	0.253	841	3,324
	DCL4007	0.132	140	1,061
Total		3.440	3,075	894
41	DCL4101	0.249	711	2,855
	DCL4102	0.280	219	782
	DCL4103	0.226	91	403

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	DCL4104	0.224	405	1,808
Total		0.979	1,426	1,457
42	DCL4201	0.124	722	5,823
	DCL4202	0.217	835	3,848
	DCL4203	0.116	476	4,103
	DCL4204	0.149	588	3,946
Total		0.606	2,621	4,325
43	DCL4301	0.343	1,251	3,647
	DCL4302	0.357	1,225	3,431
	DCL4303	0.206	527	2,558
	DCL4304	0.252	925	3,671
	DCL4305	0.296	860	2,905
	DCL4306	0.132	278	2,106
	DCL4307	0.103	197	1,913
Total		1.689	5,263	3,116
44	DCL4401	0.125	449	3,592
	DCL4402	0.151	588	3,894
	DCL4403	0.099	463	4,677
	DCL4404	0.084	313	3,726
	DCL4405	0.093	350	3,763
Total		0.552	2,163	3,918
45	DCL4501	0.341	562	1,648
	DCL4502	0.059	284	4,814
	DCL4503	0.083	241	2,904
	DCL4504	0.209	453	2,167
	DCL4505	0.223	55	247
	DCL4506	0.214	332	1,551
	DCL4507	0.212	433	2,042
Total		1.341	2,360	1,760
46	DCL4601	2.330	238	102
	DCL4602	0.285	933	3,274
	DCL4603	0.274	828	3,022
	DCL4604	0.245	981	4,004
	DCL4605	0.365	1,622	4,444
	DCL4606	0.426	1,621	3,805

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Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	DCL4607	1.516	571	377
Total		5.441	6,794	1,249
47	DCL4701	0.252	823	3,266
	DCL4702	0.138	1,008	7,304
	DCL4703	0.127	486	3,827
	DCL4704	0.054	295	5,463
	DCL4705	0.109	615	5,642
	DCL4706	0.319	25	78
	DCL4707	0.127	504	3,969
	DCL4708	0.155	154	994
Total		1.281	3,910	3,052
48	DCL4801	0.215	1,358	6,316
	DCL4802	0.285	504	1,768
	DCL4803	0.108	424	3,926
	DCL4804	0.122	628	5,148
	DCL4805	0.181	587	3,243
	DCL4806	0.113	610	5,398
	DCL4807	0.157	51	325
	DCL4808	0.174	819	4,707
Total		1.355	4,981	3,676
49	DCL4901	0.467	482	1,032
	DCL4902	0.370	335	905
	DCL4903	0.268	249	929
	DCL4904	0.354	869	2,455
	DCL4905	0.392	427	1,089
	DCL4906	0.400	367	918
Total		2.251	2,729	1,212
50	DCL5001	0.160	821	5,131
	DCL5002	0.183	576	3,148
	DCL5003	0.135	590	4,370
	DCL5004	0.188	791	4,207
Total		0.666	2,778	4,171
51	DCL5101	0.160	456	2,850
	DCL5102	0.167	477	2,856
	DCL5103	0.153	473	3,092

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	DCL5104	0.124	510	4,113
	DCL5105	0.219	365	1,667
Total		0.823	2,281	2,772
52	DCL5201	0.646	43	67
	DCL5202	0.224	354	1,580
	DCL5203	0.271	515	1,900
	DCL5204	0.341	189	554
	DCL5205	0.086	200	2,326
	DCL5206	0.125	331	2,648
Total		1.693	1,632	964
53	DCL5301	0.196	265	1,352
	DCL5302	0.202	310	1,535
	DCL5303	0.564	5	9
	DCL5304	0.301	399	1,326
	DCL5305	0.238	280	1,176
	DCL5306	0.246	409	1,663
	DCL5307	0.082	193	2,354
Total		1.829	1,861	1,017
54	DCL5401	0.236	1,179	4,996
	DCL5402	0.370	703	1,900
	DCL5403	0.159	497	3,126
	DCL5404	0.301	935	3,106
Total		1.066	3,314	3,109
55	DCL5501	0.114	317	2,781
	DCL5502	0.133	618	4,647
	DCL5503	0.221	574	2,597
	DCL5504	0.122	629	5,156
	DCL5505	0.101	378	3,743
	DCL5506	0.138	712	5,159
Total		0.829	3,228	3,894
56	DCL5601	0.539	304	564
	DCL5602	0.539	83	154
	DCL5603	0.220	357	1,623
	DCL5604	0.378	176	466
	DCL5605	0.419	524	1,251

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Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
Total		2.095	1,444	689
57	DCL5701	0.378	121	320
	DCL5702	0.244	150	615
	DCL5703	0.435	658	1,513
	DCL5704	0.411	197	479
	DCL5705	0.361	227	629
Total		1.829	1,353	740
58	DCL5801	0.117	718	6,137
	DCL5802	0.054	228	4,222
	DCL5803	0.058	508	8,759
	DCL5804	0.184	721	3,918
	DCL5805	0.080	645	8,063
	DCL5806	0.093	486	5,226
	DCL5807	0.129	804	6,233
	DCL5808	0.105	582	5,543
	DCL5809	0.078	0	0
Total		0.898	4,692	5,225
59	DCL5901	0.050	278	5,560
	DCL5902	0.057	433	7,596
	DCL5903	0.159	608	3,824
	DCL5904	0.048	371	7,729
	DCL5905	0.090	622	6,911
	DCL5906	0.096	6	63
	DCL5907	0.085	0	0
Total		0.585	2,318	3,962
60	DCL6001	0.053	442	8,340
	DCL6002	0.068	448	6,588
	DCL6003	0.104	654	6,288
	DCL6004	0.061	471	7,721
	DCL6005	0.057	489	8,579
	DCL6006	0.079	923	11,684
Total		0.422	3,427	8,121
61	DCL6101	0.051	405	7,941
	DCL6102	0.111	281	2,532
	DCL6103	0.031	206	6,645
	DCL6104	0.030	129	4,300
	DCL6105	0.040	232	5,800
	DCL6106	0.050	441	8,820
Total		0.313	1,694	5,412
62	DCL6201	0.159	653	4,107
	DCL6202	0.307	192	625
	DCL6203	0.094	410	4,362
	DCL6204	0.193	231	1,197
	DCL6205	0.146	143	979
Total		0.899	1,629	1,812
63	DCL6301	0.122	49	402
	DCL6302	0.138	649	4,703
	DCL6303	0.111	302	2,721
	DCL6304	0.089	189	2,124
	DCL6305	0.011	0	0
Total		0.471	1,189	2,524
64	DCL6401	0.036	229	6,361
	DCL6402	0.070	443	6,329
	DCL6403	0.043	244	5,674
	DCL6404	0.026	171	6,577
	DCL6405	0.029	179	6,172
Total		0.204	1,266	6,206
65	DCL6501	0.069	489	7,087
	DCL6502	0.114	468	4,105
	DCL6503	0.120	707	5,892
	DCL6504	0.111	1,071	9,649
	DCL6505	0.064	475	7,422
Total		0.478	3,210	6,715
66	DCL6601	0.081	286	3,531
	DCL6602	0.111	268	2,414
	DCL6603	0.065	324	4,985
	DCL6604	0.074	267	3,608
	DCL6605	0.053	299	5,642
Total		0.384	1,444	3,760
67	DCL6701	0.117	0	0

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Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	DCL6702	0.105	315	3,000
	DCL6703	0.108	523	4,843
	DCL6704	0.084	478	5,690
	DCL6705	0.014	23	1,643
	DCL6706	0.020	0	0
Total		0.448	1,339	2,989
68	DCL6801	0.051	195	3,824
	DCL6802	0.044	188	4,273
	DCL6803	0.066	338	5,121
	DCL6804	0.044	432	9,818
	DCL6805	0.053	410	7,736
	DCL6806	0.008	0	0
Total		0.266	1,563	5,876
69	DCL6901	0.122	734	6,016
	DCL6902	0.079	490	6,203
	DCL6903	0.133	971	7,301
	DCL6904	0.109	669	6,138
Total		0.443	2,864	6,465
70	DCL7001	0.082	514	6,268
	DCL7002	0.058	309	5,328
	DCL7003	0.085	163	1,918
	DCL7004	0.115	673	5,852
Total		0.340	1,659	4,879
71	DCL7101	0.054	337	6,241
	DCL7102	0.044	306	6,955
	DCL7103	0.044	163	3,705
	DCL7104	0.067	491	7,328
	DCL7105	0.044	260	5,909
Total		0.253	1,557	6,154
72	DCL7201	0.047	358	7,617
	DCL7202	0.036	155	4,306
	DCL7203	0.038	294	7,737
	DCL7204	0.043	196	4,558
	DCL7205	0.041	59	1,439
Total		0.205	1,062	5,180

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
73	DCL7301	0.103	208	2,019
	DCL7302	0.116	302	2,603
	DCL7303	0.076	153	2,013
	DCL7304	0.074	176	2,378
Total		0.369	839	2,274
74	DCL7401	0.015	72	4,800
	DCL7402	0.100	671	6,710
	DCL7403	0.049	312	6,367
	DCL7404	0.075	550	7,333
	DCL7405	0.084	301	3,583
	DCL7406	0.082	428	5,220
Total		0.405	2,334	5,763
75	DCL7501	0.125	454	3,632
	DCL7502	0.079	511	6,468
	DCL7503	0.133	261	1,962
	DCL7504	0.115	331	2,878
	DCL7505	0.090	514	5,711
Total		0.542	2,071	3,821
76	DCL7601	0.250	1,380	5,520
	DCL7602	0.071	240	3,380
	DCL7603	0.156	907	5,814
	DCL7604	0.068	556	8,176
Total		0.545	3,083	5,657
77	DCL7701	0.124	987	7,960
	DCL7702	0.080	227	2,838
	DCL7703	0.145	587	4,048
	DCL7704	0.071	559	7,873
Total		0.420	2,360	5,619
78	DCL7801	0.045	253	5,622
	DCL7802	0.073	424	5,808
	DCL7803	0.045	411	9,133
	DCL7804	0.052	67	1,288
	DCL7805	0.035	191	5,457
	DCL7806	0.042	242	5,762
Total		0.292	1,588	5,438

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Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
79	DCL7901	0.098	758	7,735
	DCL7902	0.043	313	7,279
	DCL7903	0.068	451	6,632
	DCL7904	0.073	506	6,932
	DCL7905	0.089	412	4,629
Total		0.371	2,440	6,577
80	DCL8001	0.060	401	6,683
	DCL8002	0.067	466	6,955
	DCL8003	0.064	417	6,516
	DCL8004	0.054	397	7,352
Total		0.245	1,681	6,861
81	DCL8101	0.155	909	5,865
	DCL8102	0.086	620	7,209
	DCL8103	0.097	669	6,897
	DCL8104	0.078	364	4,667
	DCL8105	0.127	738	5,811
Total		0.543	3,300	6,077
82	DCL8201	0.084	655	7,798
	DCL8202	0.049	314	6,408
	DCL8203	0.067	342	5,104
	DCL8204	0.085	448	5,271
	DCL8205	0.100	429	4,290
	DCL8206	0.049	384	7,837
Total		0.434	2,572	5,926
83	DCL8301	0.176	1,191	6,767
	DCL8302	0.112	325	2,902
	DCL8303	0.126	909	7,214
	DCL8304	0.132	663	5,023
Total		0.546	3,088	5,656
84	DCL8401	0.175	916	5,234
	DCL8402	0.063	498	7,905
	DCL8403	0.174	916	5,264
	DCL8404	0.138	1,071	7,761
	DCL8405	0.166	384	2,313
Total		0.716	3,785	5,286

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
85	DCL8501	0.261	85	326
	DCL8502	0.128	969	7,570
	DCL8503	0.211	908	4,303
	DCL8504	0.150	1,180	7,867
	DCL8505	0.157	1,270	8,089
Total		0.907	4,412	4,864
86	DCL8601	0.143	351	2,455
	DCL8602	0.127	701	5,520
	DCL8603	0.141	173	1,227
	DCL8604	0.142	394	2,775
	DCL8605	0.099	784	7,919
	DCL8606	0.182	1,255	6,896
Total		0.834	3,658	4,386
87	DCL8701	0.143	613	4,287
	DCL8702	0.140	1,221	8,721
	DCL8703	0.062	372	6,000
	DCL8704	0.158	1,395	8,829
	DCL8705	0.141	929	6,589
Total		0.644	4,530	7,034
88	DCL8801	0.075	594	7,920
	DCL8802	0.084	539	6,417
	DCL8803	0.101	837	8,287
	DCL8804	0.133	460	3,459
	DCL8805	0.066	425	6,439
Total		0.459	2,855	6,220
89	DCL8901	0.196	905	4,617
	DCL8902	0.120	1,006	8,383
	DCL8903	0.128	890	6,953
	DCL8904	0.150	1,259	8,393
	DCL8905	0.075	326	4,347
Total		0.669	4,386	6,556
90	DCL9001	0.114	962	8,439
	DCL9002	0.191	1,211	6,340
	DCL9003	0.065	298	4,585
	DCL9004	0.095	738	7,768

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Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	DCL9005	0.045	3	67
	DCL9006	0.192	1,399	7,286
	DCL9007	0.051	254	4,980
Total		0.753	4,865	6,461
Summary		119.96	326,825	2,724

Table 41 Grouped Occupancy Classes of Dhaka in Cluster level

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
1	DCL0101	918	59	92	0	0	8	12	1,089
	DCL0102	523	19	88	2	0	12	8	652
	DCL0103	196	26	85	0	0	4	1	312
	DCL0104	542	81	87	1	0	2	16	729
	DCL0105	439	77	28	2	0	11	10	567
	DCL0106	497	48	22	7	0	6	14	594
	DCL0107	477	86	14	7	0	17	0	600
	DCL0108	380	74	32	9	1	16	11	523
	DCL0109	184	42	9	5	5	9	0	253
	DCL0110	574	117	19	5	0	4	5	724
	DCL0111	693	135	23	6	0	24	13	894
	DCL0112	354	52	48	0	0	13	9	476
	DCL0113	620	82	44	0	0	14	9	769
Total		6,397	898	591	44	6	140	106	8,182
2	DCL0201	419	28	18	1	0	0	0	466
	DCL0202	438	58	6	2	0	1	2	507
	DCL0203	765	56	2	1	0	10	5	839
	DCL0204	994	89	10	0	5	2	3	1,103
	DCL0205	679	137	2	0	0	9	4	831
	DCL0206	195	53	11	1	0	8	7	275
	DCL0207	29	5	0	0	0	0	0	34
	DCL0208	1,192	182	7	0	0	9	8	1,398
	DCL0209	603	49	7	0	0	2	0	661
Total		5,314	657	63	5	5	41	29	6,114
3	DCL0301	995	214	29	2	0	12	24	1,276
	DCL0302	688	159	7	2	1	13	13	883
	DCL0303	1,027	57	11	0	0	11	6	1,112
	DCL0304	797	147	13	0	28	4	6	995
	DCL0305	383	37	5	0	0	1	3	429
Total		3,890	614	65	4	29	41	52	4,695
4	DCL0401	425	46	8	1	0	2	7	489
	DCL0402	6	0	0	0	0	0	1	7
	DCL0403	608	67	1	0	0	7	11	694
	DCL0404	219	23	2	0	2	0	8	254
	DCL0405	228	15	0	1	0	3	5	252
	DCL0406	431	41	8	0	0	3	2	485
Total		1,917	192	19	2	2	15	34	2,181
5	DCL0501	918	171	2	4	0	17	1	1,113
	DCL0502	168	73	6	0	0	7	2	256
	DCL0503	349	35	0	0	0	0	2	386
	DCL0504	358	71	14	0	0	2	3	448
	DCL0505	362	47	3	1	0	1	1	415
	DCL0506	468	39	2	0	0	2	2	513
	DCL0507	481	64	10	0	0	5	3	563
	DCL0508	522	30	15	0	0	3	2	572
	DCL0509	422	36	4	0	0	2	2	466
	DCL0510	578	47	9	0	0	2	4	640
	DCL0511	569	26	0	0	0	10	4	609
Total		5,195	639	65	5	0	51	26	5,981
6	DCL0601	1,115	88	87	1	2	4	24	1,321
	DCL0602	1,825	162	2	1	1	12	13	2,016
	DCL0603	47	49	75	1	1	0	2	175
	DCL0604	154	20	4	0	0	7	3	188
	DCL0605	747	65	0	1	0	1	2	816
	DCL0606	777	91	11	1	1	3	8	892
	DCL0607	554	72	11	1	0	4	1	643
	DCL0608	727	15	0	0	0	3	5	750
	DCL0609	758	69	29	1	0	7	5	869
	DCL0610	1,567	51	7	0	0	11	10	1,646
	DCL0611	335	59	22	8	2	4	0	427

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Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	DCL0612	705	1	1	0	0	0	0	707
	DCL0613	2	0	0	0	0	0	0	2
Total		9,313	742	249	15	7	56	70	10,452
7	DCL0701	492	33	0	0	0	3	8	536
	DCL0702	6	7	0	0	0	0	2	15
	DCL0703	674	78	5	2	0	5	10	774
	DCL0704	287	18	0	0	0	2	5	312
	DCL0705	256	18	1	1	0	4	1	281
	DCL0706	365	60	3	0	0	5	6	439
	DCL0707	15	12	0	0	0	7	19	53
	DCL0708	46	30	12	0	0	8	4	100
	DCL0709	241	32	1	0	0	2	0	276
Total		2,382	288	22	3	0	36	55	2,786
8	DCL0801	109	12	2	0	1	0	6	130
	DCL0802	280	73	7	3	0	12	0	374
	DCL0803	1,184	100	8	0	0	8	7	1,307
	DCL0804	594	100	3	5	0	10	4	716
	DCL0805	878	38	12	0	0	2	5	935
	DCL0806	1,262	103	3	1	0	8	3	1,380
	DCL0807	443	27	3	2	0	0	45	520
	DCL0808	749	103	9	0	0	6	8	875
	DCL0809	136	0	0	0	1	3	3	143
Total		5,635	556	47	11	2	49	80	6,380
9	DCL0901	286	17	0	1	0	0	5	309
	DCL0902	520	51	2	0	0	0	2	575
	DCL0903	558	89	2	0	0	2	7	658
	DCL0904	597	33	5	0	0	6	13	654
	DCL0905	822	61	8	0	0	3	3	897
	DCL0906	570	122	1	0	1	5	4	703
Total		3,353	373	18	1	1	16	34	3,796
10	DCL1001	1,470	109	7	2	0	7	7	1,602
	DCL1002	745	13	4	2	0	0	13	777
	DCL1003	285	36	1	0	1	0	9	332
	DCL1004	585	68	20	0	0	6	6	685

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	DCL1005	310	55	14	2	0	3	2	386
	DCL1006	784	132	9	1	0	5	3	934
	DCL1007	656	100	4	0	0	3	19	782
	DCL1008	270	80	21	0	2	0	7	380
Total		5,105	593	80	7	3	24	66	5,878
11	DCL1101	1,040	78	3	0	1	5	15	1,142
	DCL1102	538	46	19	0	0	3	27	633
	DCL1103	991	121	11	0	0	7	14	1,144
	DCL1104	162	6	0	0	0	6	8	182
Total		2,731	251	33	0	1	21	64	3,101
12	DCL1201	352	131	10	1	0	7	4	505
	DCL1202	366	33	8	0	0	3	8	418
	DCL1203	1,126	83	13	1	0	8	3	1,234
	DCL1204	182	81	11	5	0	2	5	286
	DCL1205	635	65	12	0	1	1	2	716
	DCL1206	185	17	1	0	0	4	7	214
Total		2,846	410	55	7	1	25	29	3,373
13	DCL1301	980	121	37	3	6	12	22	1,181
	DCL1302	849	57	5	2	0	5	5	923
	DCL1303	1,436	99	8	0	1	14	4	1,562
	DCL1304	1,164	105	8	0	0	5	5	1,287
	DCL1305	1,443	139	15	0	0	1	5	1,603
	DCL1306	1,128	61	7	0	0	5	5	1,206
	DCL1307	1,473	105	16	0	0	5	8	1,607
	DCL1308	894	46	11	0	0	5	6	962
	DCL1309	785	49	4	1	0	1	2	842
	DCL1310	887	37	11	0	0	3	3	941
Total		11,039	819	122	6	7	56	65	12,114
14	DCL1401	1,033	104	30	2	0	4	7	1,180
	DCL1402	719	94	11	0	0	2	2	828
	DCL1403	222	112	5	0	0	3	8	350
	DCL1404	827	78	20	1	0	10	5	941
	DCL1405	580	144	30	1	1	3	10	769
	DCL1406	1,120	101	9	0	0	5	4	1,239

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Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
Total		4,501	633	105	4	1	27	36	5,307
15	DCL1501	696	39	1	0	0	1	5	742
	DCL1502	985	85	11	0	0	5	14	1,100
	DCL1503	767	107	5	1	0	0	4	884
	DCL1504	827	65	4	0	0	3	4	903
	DCL1505	926	61	2	1	1	1	2	994
	DCL1506	1,017	70	4	0	0	2	1	1,094
	DCL1507	2,407	206	3	2	0	10	27	2,655
	DCL1508	1,337	133	9	1	0	9	7	1,496
	DCL1509	1,004	134	3	0	0	5	10	1,156
	DCL1510	1,976	115	0	0	2	9	15	2,117
Total		11,942	1,015	42	5	3	45	89	13,141
16	DCL1601	0	4	0	0	0	0	1	5
	DCL1602	1,092	99	1	0	0	13	12	1,217
	DCL1603	1,342	139	5	1	1	5	12	1,505
	DCL1604	625	137	5	0	1	13	26	807
	DCL1605	1,100	144	19	1	0	9	11	1,284
	DCL1606	1,531	124	24	0	0	7	11	1,697
	DCL1607	1,142	73	8	0	0	1	4	1,228
	DCL1608	161	38	2	1	0	5	3	210
Total		6,993	758	64	3	2	53	80	7,953
17	DCL1701	1,167	126	20	1	0	4	12	1,330
	DCL1702	694	199	27	0	0	11	7	938
	DCL1703	981	195	9	0	0	3	10	1,198
	DCL1704	555	100	13	0	0	5	9	682
	DCL1705	1,295	258	25	1	0	11	6	1,596
	DCL1706	2	0	0	0	0	0	0	2
	DCL1707	214	10	53	0	0	3	1	281
	DCL1708	1,052	121	35	0	0	7	6	1,221
	DCL1709	849	118	38	3	1	8	3	1,020
	DCL1710	996	96	7	0	0	1	5	1,105
	DCL1711	1,365	159	9	0	0	19	13	1,565
	DCL1712	818	57	6	0	0	4	3	888
	DCL1713	457	82	9	0	0	2	0	550

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
Total		10,445	1,521	251	5	1	78	75	12,376
18	DCL1801	474	88	17	2	2	3	10	596
	DCL1802	98	21	10	0	34	5	2	170
	DCL1803	514	97	5	0	0	6	4	626
	DCL1804	795	148	7	0	0	1	7	958
	DCL1805	160	99	10	0	0	2	4	275
	DCL1806	747	142	5	0	0	6	4	904
Total		2,788	595	54	2	36	23	31	3,529
19	DCL1901	2,655	144	0	0	0	2	7	2,808
	DCL1902	497	149	6	7	0	12	7	678
	DCL1903	467	93	3	7	0	7	15	592
	DCL1904	225	23	2	1	0	3	0	253
	DCL1905	285	39	6	2	4	0	3	339
	DCL1906	103	41	2	0	0	1	2	149
	DCL1907	206	56	5	0	0	2	8	277
	DCL1908	308	271	2	21	0	7	0	600
	DCL1909	235	64	3	2	0	12	0	314
	DCL1910	293	67	6	3	1	9	2	381
	DCL1911	224	59	4	0	0	6	0	293
	DCL1912	126	26	1	0	0	9	2	164
	DCL1913	256	38	2	0	0	2	2	300
	DCL1914	129	38	2	1	0	5	0	175
Total		6,009	1,108	44	44	5	77	36	7,323
20	DCL2001	749	264	21	38	2	4	0	1,059
	DCL2002	352	42	21	22	1	1	0	429
	DCL2003	1,559	99	5	5	1	8	12	1,689
	DCL2004	830	145	12	10	0	5	9	1,011
	DCL2005	150	89	13	2	0	1	24	279
Total		3,640	639	72	77	4	19	16	4,467
21	DCL2101	1,293	264	19	2	0	1	22	1,601
	DCL2102	734	159	20	1	3	10	4	931
	DCL2103	839	196	32	1	0	12	2	1,082
	DCL2104	995	239	28	3	0	8	3	1,276
	DCL2105	1,343	176	35	0	0	6	10	1,570

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Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	DCL2106	9	13	0	0	0	0	0	22
Total		5,213	1,047	134	7	3	37	41	6,482
22	DCL2201	1,012	119	18	3	1	4	8	1,165
	DCL2202	1,148	112	17	1	0	7	6	1,291
	DCL2203	1,111	140	34	1	0	1	5	1,292
	DCL2204	1,260	216	24	0	0	10	11	1,521
	DCL2205	825	37	6	0	0	0	3	871
Total		5,356	624	99	5	1	22	33	6,140
23	DCL2301	822	128	16	1	0	5	2	974
	DCL2302	325	101	8	2	0	6	5	447
	DCL2303	244	116	13	0	0	2	10	385
	DCL2304	699	39	10	1	0	3	5	757
Total		2,090	384	47	4	0	16	22	2,563
24	DCL2401	465	89	16	2	1	11	10	594
	DCL2402	497	152	5	1	0	9	5	669
	DCL2403	818	131	18	0	0	0	6	973
	DCL2404	396	83	5	0	0	14	8	506
Total		2,176	455	44	3	1	34	29	2,742
25	DCL2501	817	132	6	0	0	5	9	969
	DCL2502	255	35	5	0	0	0	2	297
	DCL2503	679	91	0	0	0	2	4	776
	DCL2504	627	123	7	0	0	4	3	764
	DCL2505	1,172	112	5	0	0	1	3	1,293
	DCL2506	449	55	2	0	0	1	2	509
Total		3,999	548	25	0	0	13	23	4,608
26	DCL2601	577	27	3	0	0	1	5	613
	DCL2602	329	43	40	0	0	2	3	417
	DCL2603	300	56	18	0	0	2	3	379
	DCL2604	909	129	16	0	0	3	11	1,068
	DCL2605	922	135	5	1	0	6	7	1,076
	DCL2606	1,511	209	11	1	0	4	5	1,741
Total		4,548	599	93	2	0	18	34	5,294
27	DCL2701	845	248	11	2	0	5	23	1,134
	DCL2702	739	141	2	0	0	3	5	890

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	DCL2703	987	133	6	0	0	5	13	1,144
	DCL2704	487	55	6	1	0	6	7	562
Total		3,058	577	25	3	0	19	48	3,730
28	DCL2801	759	110	8	0	0	1	11	889
	DCL2802	598	127	13	2	0	5	13	758
	DCL2803	674	72	12	0	0	8	3	769
	DCL2804	614	52	6	0	0	3	5	680
	DCL2805	442	64	2	0	0	8	20	536
Total		3,087	425	41	2	0	25	52	3,632
29	DCL2901	478	74	4	0	0	3	4	563
	DCL2902	395	215	10	3	1	1	14	639
	DCL2903	861	78	6	0	0	7	1	953
	DCL2904	336	32	0	0	0	1	6	375
	DCL2905	409	103	4	0	0	0	11	527
Total		2,479	502	24	3	1	12	36	3,057
30	DCL3001	699	21	5	0	0	1	4	730
	DCL3002	484	21	0	0	0	0	2	507
	DCL3003	295	14	1	0	0	0	1	311
	DCL3004	784	15	1	0	0	1	2	803
Total		2,262	71	7	0	0	2	9	2,351
31	DCL3101	59	58	0	0	4	2	20	143
	DCL3102	585	85	4	0	0	2	12	688
	DCL3103	204	95	11	2	0	2	6	320
	DCL3104	583	113	5	0	0	2	10	713
Total		1,431	351	20	2	4	8	48	1,864
32	DCL3201	55	236	9	0	3	0	9	312
	DCL3202	94	104	1	0	0	0	11	210
	DCL3203	0	1	0	0	0	0	0	1
	DCL3204	137	106	7	2	0	1	15	268
	DCL3205	329	407	19	2	0	3	10	770
Total		615	854	36	4	3	4	45	1,561
33	DCL3301	152	9	0	1	0	10	12	184
	DCL3302	54	10	0	0	0	4	6	74
	DCL3303	68	9	0	1	0	4	3	85

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Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	DCL3304	51	7	0	0	0	1	2	61
Total		325	35	0	2	0	19	23	404
34	DCL3401	239	85	2	6	0	5	11	348
	DCL3402	455	70	6	2	0	1	9	543
	DCL3403	756	147	6	1	0	5	2	917
	DCL3404	177	95	1	2	0	4	10	289
Total		1,627	397	15	11	0	15	32	2,097
35	DCL3501	661	73	7	0	0	3	4	748
	DCL3502	471	35	3	1	0	3	0	513
	DCL3503	240	69	3	1	1	2	2	318
	DCL3504	351	65	1	0	0	4	14	435
Total		1,723	242	14	2	1	12	20	2,014
36	DCL3601	659	122	21	1	2	8	19	832
	DCL3602	23	27	2	0	1	0	9	62
	DCL3603	542	287	28	4	0	11	18	890
	DCL3604	0	1	0	0	0	0	0	1
Total		1,224	437	51	5	3	19	46	1,785
37	DCL3701	351	155	85	4	1	7	53	656
	DCL3702	5	1	0	0	0	0	1	7
	DCL3703	197	153	42	0	1	1	104	498
	DCL3704	72	36	11	0	0	4	34	157
	DCL3705	1,235	161	50	0	0	6	11	1,463
	DCL3706	105	91	192	0	0	1	44	433
	DCL3707	97	61	61	0	3	0	23	245
	DCL3708	159	101	107	1	0	8	66	442
Total		2,221	759	548	5	5	27	336	3,901
38	DCL3801	530	117	3	1	1	0	26	678
	DCL3802	1	0	0	0	0	0	0	1
	DCL3803	987	150	8	2	1	5	17	1,170
	DCL3804	778	238	7	4	0	8	5	1,040
Total		2,296	505	18	7	2	13	48	2,889
39	DCL3901	484	123	7	2	0	14	18	648
	DCL3902	996	126	5	2	4	6	5	1,144
	DCL3903	61	157	10	0	0	2	3	233
	DCL3904	464	91	5	0	0	3	21	584
Total		2,005	497	27	4	4	25	47	2,609
40	DCL4001	40	4	0	0	0	0	8	52
	DCL4002	538	77	6	1	0	5	6	633
	DCL4003	125	17	0	0	1	3	7	153
	DCL4004	818	116	10	1	0	1	5	951
	DCL4005	172	33	0	17	0	2	81	305
	DCL4006	744	67	5	0	0	7	18	841
	DCL4007	92	20	0	4	2	0	22	140
Total		2,529	334	21	23	3	18	147	3,075
41	DCL4101	631	65	3	4	1	0	7	711
	DCL4102	88	108	0	2	0	2	19	219
	DCL4103	52	20	0	0	1	2	16	91
	DCL4104	372	21	2	1	0	0	9	405
Total		1,143	214	5	7	2	4	51	1,426
42	DCL4201	633	77	2	0	0	5	5	722
	DCL4202	666	143	10	1	0	12	3	835
	DCL4203	345	115	3	0	0	8	5	476
	DCL4204	496	78	10	3	0	2	0	588
Total		2,140	413	25	4	0	27	12	2,621
43	DCL4301	1,133	100	4	0	0	10	4	1,251
	DCL4302	1,064	136	15	1	1	3	5	1,225
	DCL4303	423	79	13	2	1	6	3	527
	DCL4304	842	67	15	0	0	0	1	925
	DCL4305	790	51	9	0	0	5	5	860
	DCL4306	254	13	5	0	0	3	3	278
	DCL4307	180	13	2	0	0	1	1	197
Total		4,686	459	63	3	2	28	22	5,263
44	DCL4401	377	55	2	0	1	6	8	449
	DCL4402	497	87	1	0	2	0	1	588
	DCL4403	368	90	3	1	0	0	1	463
	DCL4404	245	62	1	1	0	0	4	313
	DCL4405	270	73	1	0	0	3	3	350
Total		1,757	367	8	2	3	9	17	2,163

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Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
45	DCL4501	443	85	7	7	0	15	5	562
	DCL4502	217	64	0	1	0	1	1	284
	DCL4503	207	29	3	0	0	0	2	241
	DCL4504	323	120	4	12	1	3	0	453
	DCL4505	23	15	0	0	0	1	16	55
	DCL4506	212	79	6	4	2	15	14	332
	DCL4507	360	57	3	3	0	5	5	433
Total		1,785	449	23	27	3	40	33	2,360
46	DCL4601	214	20	0	1	1	0	2	238
	DCL4602	845	56	16	0	0	8	8	933
	DCL4603	766	48	5	0	0	4	5	828
	DCL4604	832	116	17	0	3	2	11	981
	DCL4605	1,341	237	24	1	1	3	15	1,622
	DCL4606	1,560	39	8	2	0	10	2	1,621
	DCL4607	418	110	33	0	1	3	6	571
Total		5,976	626	103	4	6	30	49	6,794
47	DCL4701	729	82	4	1	0	0	7	823
	DCL4702	915	84	2	0	0	4	3	1,008
	DCL4703	388	81	7	0	0	1	9	486
	DCL4704	249	41	2	1	0	2	0	295
	DCL4705	482	119	6	1	0	1	6	615
	DCL4706	16	8	0	0	0	0	1	25
	DCL4707	447	45	5	0	0	5	2	504
	DCL4708	100	50	0	0	0	1	3	154
Total		3,326	510	26	3	0	14	31	3,910
48	DCL4801	1,116	225	9	2	0	2	4	1,358
	DCL4802	101	85	301	0	0	0	17	504
	DCL4803	355	59	2	0	0	2	6	424
	DCL4804	568	48	6	0	0	1	5	628
	DCL4805	500	67	6	0	0	4	10	587
	DCL4806	520	76	0	0	0	6	8	610
	DCL4807	36	6	5	2	0	0	2	51
	DCL4808	681	79	38	1	2	11	7	819
Total		3,877	645	367	5	2	26	59	4,981

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
49	DCL4901	330	81	6	6	0	44	15	482
	DCL4902	231	87	4	9	0	7	0	335
	DCL4903	170	49	8	4	1	8	9	249
	DCL4904	674	148	12	4	0	10	21	869
	DCL4905	316	78	12	19	1	7	0	427
	DCL4906	274	71	6	3	1	6	6	367
Total		1,995	514	48	45	3	82	42	2,729
50	DCL5001	726	80	9	1	0	1	4	821
	DCL5002	511	53	6	3	0	0	3	576
	DCL5003	511	67	2	0	0	7	3	590
	DCL5004	615	157	11	6	0	2	0	791
Total		2,363	357	28	10	0	10	10	2,778
51	DCL5101	377	68	2	5	0	3	1	456
	DCL5102	399	64	8	0	0	4	2	477
	DCL5103	411	44	9	3	0	2	4	473
	DCL5104	414	83	5	0	0	3	5	510
	DCL5105	293	39	4	1	1	5	22	365
Total		1,894	298	28	9	1	17	34	2,281
52	DCL5201	41	2	0	0	0	0	0	43
	DCL5202	303	36	7	0	0	0	8	354
	DCL5203	227	267	10	0	1	2	8	515
	DCL5204	142	19	2	0	0	8	18	189
	DCL5205	151	46	1	2	0	2	0	200
	DCL5206	265	55	6	3	0	0	2	331
Total		1,129	425	26	5	1	12	34	1,632
53	DCL5301	212	39	3	2	0	2	7	265
	DCL5302	211	73	2	13	0	5	6	310
	DCL5303	1	0	0	0	0	0	4	5
	DCL5304	219	119	5	0	0	10	46	399
	DCL5305	183	68	1	11	1	4	12	280
	DCL5306	289	92	3	1	0	6	18	409
	DCL5307	150	42	0	0	0	0	1	193
Total		1,265	433	14	27	1	27	94	1,861
54	DCL5401	1,064	94	0	0	0	2	19	1,179

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Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	DCL5402	561	106	2	1	0	7	26	703
	DCL5403	380	107	0	3	0	5	2	497
	DCL5404	796	126	1	0	0	2	10	935
Total		2,801	433	3	4	0	16	57	3,314
55	DCL5501	253	42	5	0	1	7	9	317
	DCL5502	524	85	0	2	0	6	1	618
	DCL5503	531	35	3	0	0	1	4	574
	DCL5504	523	89	6	0	0	6	5	629
	DCL5505	342	32	2	0	0	0	2	378
	DCL5506	684	23	2	0	0	1	2	712
Total		2,857	306	18	2	1	21	23	3,228
56	DCL5601	166	88	0	3	5	0	42	304
	DCL5602	56	17	0	0	0	0	10	83
	DCL5603	152	151	19	2	0	6	27	357
	DCL5604	81	31	0	0	1	2	61	176
	DCL5605	188	287	2	17	1	0	29	524
Total		643	574	21	22	7	8	169	1,444
57	DCL5701	48	18	0	2	0	0	53	121
	DCL5702	118	16	0	0	0	0	16	150
	DCL5703	404	207	3	25	3	2	14	658
	DCL5704	126	33	1	0	2	6	29	197
	DCL5705	159	28	0	1	0	0	39	227
Total		855	302	4	28	5	8	151	1,353
58	DCL5801	655	50	3	1	0	0	9	718
	DCL5802	195	28	2	0	0	2	1	228
	DCL5803	456	39	8	0	0	1	4	508
	DCL5804	628	74	9	1	0	1	8	721
	DCL5805	580	41	14	0	0	2	8	645
	DCL5806	424	44	3	0	0	5	10	486
	DCL5807	738	56	3	1	1	3	2	804
	DCL5808	485	78	6	0	1	4	8	582
	DCL5809	0	0	0	0	0	0	0	0
Total		4,161	410	48	3	2	18	50	4,692
59	DCL5901	153	108	16	1	0	0	0	278

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	DCL5902	379	39	13	0	0	0	2	433
	DCL5903	515	67	8	0	9	3	6	608
	DCL5904	325	37	2	0	0	3	4	371
	DCL5905	501	100	8	0	0	7	6	622
	DCL5906	4	2	0	0	0	0	0	6
	DCL5907	0	0	0	0	0	0	0	0
Total		1,877	353	47	1	9	13	18	2,318
60	DCL6001	361	74	0	0	0	1	6	442
	DCL6002	358	78	1	0	0	6	5	448
	DCL6003	495	148	5	2	0	1	3	654
	DCL6004	425	36	2	0	0	1	7	471
	DCL6005	444	44	0	0	0	0	1	489
	DCL6006	819	94	2	0	0	2	6	923
Total		2,902	474	10	2	0	11	28	3,427
61	DCL6101	326	65	1	1	0	9	3	405
	DCL6102	171	59	37	0	0	1	13	281
	DCL6103	174	25	6	0	0	1	0	206
	DCL6104	97	25	1	0	0	1	5	129
	DCL6105	194	29	1	0	0	4	4	232
	DCL6106	370	59	6	0	0	3	3	441
Total		1,332	262	52	1	0	19	28	1,694
62	DCL6201	538	85	15	1	0	2	12	653
	DCL6202	150	11	2	0	1	2	26	192
	DCL6203	336	53	2	2	0	6	11	410
	DCL6204	164	39	3	0	0	4	21	231
	DCL6205	117	13	0	0	0	8	5	143
Total		1,305	201	22	3	1	22	75	1,629
63	DCL6301	38	4	0	0	0	0	7	49
	DCL6302	454	159	12	2	0	7	15	649
	DCL6303	217	40	27	0	0	0	18	302
	DCL6304	154	18	7	0	0	0	10	189
	DCL6305	0	0	0	0	0	0	0	0
Total		863	221	46	2	0	7	50	1,189
64	DCL6401	170	50	8	0	0	0	1	229

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Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	DCL6402	154	266	6	0	0	1	16	443
	DCL6403	129	84	25	3	0	1	2	244
	DCL6404	128	40	2	0	0	0	1	171
	DCL6405	151	13	7	0	0	3	5	179
Total		732	453	48	3	0	5	25	1,266
65	DCL6501	226	133	27	1	0	0	102	489
	DCL6502	189	186	58	1	0	4	30	468
	DCL6503	433	172	28	0	1	1	72	707
	DCL6504	868	155	32	0	0	0	16	1,071
	DCL6505	232	92	111	0	0	1	39	475
Total		1,948	738	256	2	1	6	259	3,210
66	DCL6601	73	77	105	0	0	0	31	286
	DCL6602	95	149	1	17	0	1	5	268
	DCL6603	82	200	12	0	1	0	29	324
	DCL6604	56	106	33	1	0	3	68	267
	DCL6605	117	142	7	0	0	5	28	299
Total		423	674	158	18	1	9	161	1,444
67	DCL6701	0	0	0	0	0	0	0	0
	DCL6702	188	83	13	5	0	10	16	315
	DCL6703	233	269	0	1	2	3	15	523
	DCL6704	308	140	11	0	2	2	15	478
	DCL6705	18	3	0	0	0	0	2	23
	DCL6706	0	0	0	0	0	0	0	0
Total		747	495	24	6	4	15	48	1,339
68	DCL6801	118	68	0	1	0	3	5	195
	DCL6802	69	108	7	1	0	2	1	188
	DCL6803	112	216	3	0	0	2	5	338
	DCL6804	287	140	0	0	0	0	5	432
	DCL6805	286	107	5	0	0	6	6	410
	DCL6806	0	0	0	0	0	0	0	0
Total		872	639	15	2	0	13	22	1,563
69	DCL6901	514	177	29	6	1	2	5	734
	DCL6902	313	146	14	0	0	7	10	490
	DCL6903	719	212	22	0	0	4	14	971
	DCL6904	385	231	31	2	0	6	14	669
Total		1,931	766	96	8	1	19	43	2,864
70	DCL7001	294	194	15	1	0	4	6	514
	DCL7002	140	155	5	0	0	4	5	309
	DCL7003	20	117	6	0	0	1	19	163
	DCL7004	403	246	10	0	0	3	11	673
Total		857	712	36	1	0	12	41	1,659
71	DCL7101	168	160	1	0	0	1	7	337
	DCL7102	177	120	1	0	0	4	4	306
	DCL7103	41	111	11	0	0	0	0	163
	DCL7104	271	208	0	0	1	1	10	491
	DCL7105	191	65	0	0	0	2	2	260
Total		848	664	13	0	1	8	23	1,557
72	DCL7201	237	113	2	0	0	2	4	358
	DCL7202	79	69	2	0	0	2	3	155
	DCL7203	182	107	0	0	0	1	4	294
	DCL7204	90	87	8	0	0	5	6	196
	DCL7205	11	35	2	0	0	0	11	59
Total		599	411	14	0	0	10	28	1,062
73	DCL7301	56	129	11	1	5	3	3	208
	DCL7302	80	175	7	1	2	17	20	302
	DCL7303	47	97	2	0	0	2	5	153
	DCL7304	30	141	1	0	0	0	4	176
Total		213	542	21	2	7	22	32	839
74	DCL7401	51	16	0	0	0	2	3	72
	DCL7402	524	116	14	0	0	5	12	671
	DCL7403	180	126	0	0	0	3	3	312
	DCL7404	395	137	4	0	0	8	6	550
	DCL7405	89	197	4	0	0	8	3	301
	DCL7406	256	158	4	0	0	5	5	428
Total		1,495	750	26	0	0	31	32	2,334
75	DCL7501	362	76	4	1	0	3	8	454
	DCL7502	407	91	6	0	0	2	5	511
	DCL7503	153	77	3	0	7	1	20	261

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Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	DCL7504	262	52	6	2	0	4	5	331
	DCL7505	444	56	7	0	0	2	5	514
Total		1,628	352	26	3	7	12	43	2,071
76	DCL7601	1,120	205	7	1	1	18	28	1,380
	DCL7602	203	31	2	0	0	1	3	240
	DCL7603	665	189	16	2	0	2	33	907
	DCL7604	410	123	6	1	0	5	11	556
Total		2,398	548	31	4	1	26	75	3,083
77	DCL7701	820	142	5	2	0	4	14	987
	DCL7702	173	44	3	0	0	3	4	227
	DCL7703	443	107	5	4	1	2	25	587
	DCL7704	334	202	12	0	0	4	7	559
Total		1,770	495	25	6	1	13	50	2,360
78	DCL7801	202	39	3	0	0	3	6	253
	DCL7802	283	127	2	4	0	2	6	424
	DCL7803	314	89	0	0	0	0	8	411
	DCL7804	25	15	0	0	0	14	13	67
	DCL7805	161	22	1	0	0	1	6	191
	DCL7806	171	63	2	0	0	3	3	242
Total		1,156	355	8	4	0	23	42	1,588
79	DCL7901	631	114	2	1	0	1	9	758
	DCL7902	258	47	6	0	0	0	2	313
	DCL7903	357	76	9	1	0	2	6	451
	DCL7904	403	84	1	0	0	8	10	506
	DCL7905	170	172	51	2	0	1	16	412
Total		1,819	493	69	4	0	12	43	2,440
80	DCL8001	245	136	11	1	0	1	7	401
	DCL8002	408	50	3	1	0	1	3	466
	DCL8003	330	78	1	0	0	1	7	417
	DCL8004	316	74	0	0	0	0	7	397
Total		1,299	338	15	2	0	3	24	1,681
81	DCL8101	758	83	37	0	0	4	27	909
	DCL8102	422	160	31	0	0	0	7	620
	DCL8103	556	93	9	0	0	2	9	669

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	DCL8104	280	54	9	0	0	14	7	364
	DCL8105	621	80	26	4	0	4	3	738
Total		2,637	470	112	4	0	24	53	3,300
82	DCL8201	573	61	11	0	0	2	8	655
	DCL8202	245	61	1	0	0	2	5	314
	DCL8203	281	46	6	0	1	5	3	342
	DCL8204	324	65	26	0	1	4	28	448
	DCL8205	350	56	6	0	7	1	9	429
	DCL8206	322	41	13	0	0	4	4	384
Total		2,095	330	63	0	9	18	57	2,572
83	DCL8301	1,011	137	33	1	0	6	3	1,191
	DCL8302	205	65	20	0	0	3	32	325
	DCL8303	687	128	83	1	0	3	7	909
	DCL8304	503	114	29	0	1	5	11	663
Total		2,406	444	165	2	1	17	53	3,088
84	DCL8401	739	129	33	1	0	7	7	916
	DCL8402	408	76	6	0	3	0	5	498
	DCL8403	739	141	10	1	2	0	23	916
	DCL8404	700	254	105	1	0	0	11	1,071
	DCL8405	322	42	6	0	0	4	10	384
Total		2,908	642	160	3	5	11	56	3,785
85	DCL8501	63	21	1	0	0	0	0	85
	DCL8502	828	122	1	2	1	8	7	969
	DCL8503	773	38	83	1	1	4	8	908
	DCL8504	943	175	12	1	1	18	30	1,180
	DCL8505	1,083	156	7	0	0	8	16	1,270
Total		3,690	512	104	4	3	38	61	4,412
86	DCL8601	228	101	15	0	1	3	3	351
	DCL8602	535	147	6	1	0	7	5	701
	DCL8603	69	73	24	0	1	0	6	173
	DCL8604	336	48	1	0	0	1	8	394
	DCL8605	606	151	20	2	0	1	4	784
	DCL8606	990	236	12	3	0	3	11	1,255
Total		2,764	756	78	6	2	15	37	3,658

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Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
87	DCL8701	496	67	20	1	0	6	23	613
	DCL8702	1,006	186	13	4	0	5	7	1,221
	DCL8703	303	58	4	0	0	0	7	372
	DCL8704	1,121	232	21	0	0	9	12	1,395
	DCL8705	794	85	36	0	0	1	13	929
Total		3,720	628	94	5	0	21	62	4,530
88	DCL8801	524	58	3	0	0	3	6	594
	DCL8802	477	50	6	0	0	5	1	539
	DCL8803	706	108	15	0	0	3	5	837
	DCL8804	326	104	20	0	0	0	10	460
	DCL8805	377	33	7	0	0	2	6	425
Total		2,410	353	51	0	0	13	28	2,855
89	DCL8901	820	55	12	1	0	8	9	905
	DCL8902	892	94	8	0	0	3	9	1,006
	DCL8903	809	65	5	0	0	5	6	890
	DCL8904	1,102	113	32	6	0	5	1	1,259
	DCL8905	179	114	16	1	0	2	14	326
Total		3,802	441	73	8	0	23	39	4,386
90	DCL9001	784	143	13	0	0	4	18	962
	DCL9002	1,100	78	21	1	0	3	8	1,211
	DCL9003	118	110	55	0	1	0	14	298
	DCL9004	572	88	70	0	0	1	7	738
	DCL9005	0	0	1	0	0	0	2	3
	DCL9006	1,280	73	29	0	0	2	15	1,399
	DCL9007	125	86	24	2	4	5	8	254
Total		3,979	578	213	3	5	15	72	4,865
Summary		265,777	46,769	6,379	663	245	2,154	4,838	326,825

Table 42 Main Structural Types of Dhaka in Cluster level

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
1	DCL0101	738	83	131	37	101	1,090
	DCL0102	230	18	42	17	346	653
	DCL0103	182	14	28	14	73	311
	DCL0104	446	41	85	38	120	730
	DCL0105	368	39	86	29	46	568
	DCL0106	381	45	84	24	63	597
	DCL0107	400	49	112	30	10	601
	DCL0108	346	38	98	31	10	523
	DCL0109	160	19	56	15	4	254
	DCL0110	478	56	123	46	23	726
	DCL0111	582	66	159	62	27	896
	DCL0112	274	28	64	32	78	476
	DCL0113	493	51	101	46	77	768
Total		5,078	547	1,169	421	978	8,193
2	DCL0201	297	47	61	25	34	464
	DCL0202	86	16	46	33	325	506
	DCL0203	441	88	139	65	106	839
	DCL0204	553	106	172	79	194	1,104
	DCL0205	431	82	156	89	73	831
	DCL0206	151	24	55	25	24	279
	DCL0207	9	2	4	3	18	36
	DCL0208	785	150	264	109	91	1,399
	DCL0209	425	71	102	36	27	661
Total		3,178	586	999	464	892	6,119
3	DCL0301	507	87	206	126	351	1,277
	DCL0302	489	80	165	96	52	882
	DCL0303	554	109	167	77	205	1,112
	DCL0304	491	93	199	96	116	995
	DCL0305	167	31	44	24	163	429
Total		2,208	400	781	419	887	4,695
4	DCL0401	269	41	77	30	72	489
	DCL0402	2	0	1	0	4	7
	DCL0403	359	60	112	47	117	695
	DCL0404	53	8	23	10	161	255
	DCL0405	38	6	20	9	181	254

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
	DCL0406	180	32	62	35	176	485
Total		901	147	295	131	711	2,185
5	DCL0501	322	60	154	86	494	1,116
	DCL0502	141	21	57	31	10	260
	DCL0503	232	40	62	26	28	388
	DCL0504	184	33	72	45	115	449
	DCL0505	247	45	72	35	18	417
	DCL0506	116	23	43	36	295	513
	DCL0507	301	56	95	58	54	564
	DCL0508	326	56	82	43	67	574
	DCL0509	199	38	64	31	134	466
	DCL0510	273	50	84	45	188	640
	DCL0511	176	33	64	24	312	609
Total		2,517	455	849	460	1,715	5,996
6	DCL0601	402	67	141	108	605	1,323
	DCL0602	831	155	264	131	635	2,016
	DCL0603	49	8	40	67	11	175
	DCL0604	118	19	35	14	4	190
	DCL0605	514	95	142	58	9	818
	DCL0606	554	95	154	68	22	893
	DCL0607	352	60	106	54	73	645
	DCL0608	243	46	67	30	365	751
	DCL0609	488	82	131	72	96	869
	DCL0610	579	95	141	66	767	1,648
	DCL0611	252	41	79	44	12	428
	DCL0612	7	1	4	7	689	708
	DCL0613	0	0	0	0	2	2
Total		4,389	764	1,304	719	3,290	10,466
7	DCL0701	321	46	84	27	60	538
	DCL0702	7	2	4	1	1	15
	DCL0703	491	72	141	53	17	774
	DCL0704	197	31	56	16	12	312
	DCL0705	182	25	48	12	13	280
	DCL0706	274	38	85	31	12	440

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
	DCL0707	21	2	18	4	9	54
	DCL0708	29	4	27	20	21	101
	DCL0709	171	25	48	20	10	274
Total		1693	245	511	184	155	2788
8	DCL0801	53	9	19	14	35	130
	DCL0802	223	34	82	29	8	376
	DCL0803	782	133	224	81	88	1,308
	DCL0804	400	65	134	55	63	717
	DCL0805	273	45	80	37	501	936
	DCL0806	531	90	167	72	521	1,381
	DCL0807	145	25	60	36	255	521
	DCL0808	333	57	125	55	304	874
	DCL0809	54	10	17	6	57	144
Total		2,794	468	908	385	1,832	6,387
9	DCL0901	57	10	22	9	212	310
	DCL0902	24	3	32	18	500	577
	DCL0903	351	68	120	71	50	660
	DCL0904	296	55	90	42	170	653
	DCL0905	385	74	119	61	260	899
	DCL0906	373	71	127	69	64	704
Total		1,486	281	510	270	1,256	3,803
10	DCL1001	788	148	248	107	313	1,604
	DCL1002	129	22	40	20	568	779
	DCL1003	137	26	49	24	98	334
	DCL1004	346	63	116	62	98	685
	DCL1005	159	26	57	37	108	387
	DCL1006	520	97	178	92	48	935
	DCL1007	387	69	130	72	123	781
	DCL1008	162	28	71	51	70	382
Total		2,628	479	889	465	1426	5,887
11	DCL1101	676	104	171	66	126	1,143
	DCL1102	358	45	84	32	114	633
	DCL1103	651	100	181	85	127	1144
	DCL1104	117	15	25	6	20	183

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
Total		1,802	264	461	189	387	3,103
12	DCL1201	212	33	106	55	99	505
	DCL1202	230	39	68	33	47	417
	DCL1203	644	116	193	88	194	1,235
	DCL1204	122	18	57	34	53	284
	DCL1205	394	67	113	56	88	718
	DCL1206	78	11	23	13	88	213
Total		1,680	284	560	279	569	3,372
13	DCL1301	620	95	199	83	182	1,179
	DCL1302	540	88	145	52	96	921
	DCL1303	885	146	243	96	191	,1561
	DCL1304	743	123	207	90	123	1,286
	DCL1305	925	145	247	96	190	1,603
	DCL1306	744	120	183	77	82	1,206
	DCL1307	893	147	245	96	225	1,606
	DCL1308	586	93	146	50	87	962
	DCL1309	464	73	116	43	146	842
	DCL1310	531	84	124	46	155	940
Total		6,931	1,114	1,855	729	1,477	12,106
14	DCL1401	682	114	191	94	99	1,180
	DCL1402	468	79	132	64	85	828
	DCL1403	171	26	81	43	29	350
	DCL1404	543	89	148	71	93	944
	DCL1405	408	65	146	85	66	770
	DCL1406	726	123	197	89	102	1,237
Total		2,998	496	895	446	474	5,309
15	DCL1501	344	78	114	64	141	741
	DCL1502	424	94	153	109	318	1,098
	DCL1503	385	84	136	96	183	884
	DCL1504	460	98	148	77	119	902
	DCL1505	483	106	156	86	163	994
	DCL1506	194	42	82	57	719	1,094
	DCL1507	254	53	165	147	2033	2,652
	DCL1508	707	151	243	138	254	1,493

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
	DCL1509	466	101	177	125	285	1,154
	DCL1510	66	13	76	74	1,888	2,117
Total		3,783	820	1,450	973	6,103	13,129
16	DCL1601	0	0	2	1	0	3
	DCL1602	717	121	197	87	94	1,216
	DCL1603	766	133	230	106	272	1,507
	DCL1604	399	62	147	67	130	805
	DCL1605	687	112	203	92	188	1,282
	DCL1606	969	161	257	118	193	1,698
	DCL1607	712	124	187	79	128	1,230
	DCL1608	108	14	30	21	38	211
Total		4,358	727	1,253	571	1,043	7,952
17	DCL1701	730	121	212	106	161	1,330
	DCL1702	412	76	169	115	167	939
	DCL1703	624	120	242	140	72	1,198
	DCL1704	331	64	132	79	76	682
	DCL1705	738	145	304	183	227	1,597
	DCL1706	1	0	0	0	0	1
	DCL1707	224	16	22	1	18	281
	DCL1708	597	132	225	119	148	1,221
	DCL1709	583	69	129	41	199	1,021
	DCL1710	538	110	193	108	157	1,106
	DCL1711	886	147	265	127	140	1,565
	DCL1712	519	86	137	55	92	889
	DCL1713	278	45	84	59	83	549
Total		6,461	1,131	2,114	1,133	1,540	12,379
18	DCL1801	404	38	101	32	19	594
	DCL1802	94	7	58	8	2	169
	DCL1803	367	61	120	55	23	626
	DCL1804	540	92	181	80	65	958
	DCL1805	137	20	68	29	21	275
	DCL1806	478	81	166	70	108	903
Total		2,020	299	694	274	238	3,525
19	DCL1901	124	18	91	68	2,507	2,808

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
	DCL1902	388	45	155	35	54	677
	DCL1903	381	44	128	27	10	590
	DCL1904	176	20	46	9	1	252
	DCL1905	220	25	61	16	14	336
	DCL1906	89	10	36	9	6	150
	DCL1907	171	18	60	16	10	275
	DCL1908	322	36	185	49	7	599
	DCL1909	184	21	78	14	18	315
	DCL1910	243	26	74	25	15	383
	DCL1911	195	20	56	18	3	292
	DCL1912	110	11	40	12	1	174
	DCL1913	107	12	37	7	1	164
	DCL1914	211	21	49	14	5	300
Total		2,921	327	1,096	319	2,652	7,315
20	DCL2001	575	101	218	112	51	1,057
	DCL2002	276	37	64	21	31	429
	DCL2003	566	106	177	88	750	1,687
	DCL2004	550	96	187	80	97	1010
	DCL2005	142	20	73	37	7	279
Total		2,109	360	719	338	936	4,462
21	DCL2101	704	119	237	171	366	1,597
	DCL2102	513	86	176	88	70	933
	DCL2103	571	96	199	117	99	1,082
	DCL2104	700	113	233	114	116	1,276
	DCL2105	920	156	250	136	107	,569
	DCL2106	4	0	3	6	7	20
Total		3,412	570	1,098	632	765	6,477
22	DCL2201	551	106	177	97	234	1,165
	DCL2202	513	94	158	85	440	1,290
	DCL2203	565	104	181	101	342	,293
	DCL2204	717	133	236	157	279	1,522
	DCL2205	508	93	118	56	98	873
Total		2,854	530	870	496	1,393	6,143
23	DCL2301	458	83	164	89	181	975

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
	DCL2302	219	37	95	47	50	448
	DCL2303	192	32	91	51	19	385
	DCL2304	298	56	96	47	261	758
Total		1,167	208	446	234	511	2,566
24	DCL2401	320	55	120	47	50	592
	DCL2402	352	57	141	49	70	669
	DCL2403	426	76	155	70	246	973
	DCL2404	266	45	100	37	57	505
Total		1,364	233	516	203	423	2,739
25	DCL2501	430	79	171	77	213	970
	DCL2502	167	29	52	23	25	296
	DCL2503	370	72	144	57	132	775
	DCL2504	394	74	156	68	70	762
	DCL2505	515	103	196	85	393	1,292
	DCL2506	265	47	86	40	72	510
Total		2,141	404	805	350	905	4,605
26	DCL2601	138	28	48	26	373	613
	DCL2602	249	33	52	23	60	417
	DCL2603	183	30	55	30	81	379
	DCL2604	285	60	134	89	500	1,068
	DCL2605	314	67	145	85	464	1,075
	DCL2606	469	98	204	137	834	1,742
Total		1,638	316	638	390	2312	5,294
27	DCL2701	600	107	238	110	82	1,137
	DCL2702	383	74	149	72	211	889
	DCL2703	468	92	168	91	328	1,147
	DCL2704	301	53	88	35	84	561
Total		1,752	326	643	308	705	3,734
28	DCL2801	298	63	128	84	316	889
	DCL2802	361	62	127	85	120	755
	DCL2803	407	74	125	57	108	771
	DCL2804	303	59	96	55	167	680
	DCL2805	162	35	79	57	201	534
Total		1,531	293	555	338	912	3,629

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
29	DCL2901	247	47	87	47	137	565
	DCL2902	297	52	140	94	56	639
	DCL2903	496	97	146	72	140	951
	DCL2904	216	39	56	26	39	376
	DCL2905	237	45	94	57	94	527
Total		1,493	280	523	296	466	3,058
30	DCL3001	382	74	106	47	120	729
	DCL3002	245	48	72	29	115	509
	DCL3003	164	33	49	22	41	309
	DCL3004	414	78	105	47	158	802
Total		1,205	233	332	145	434	2,349
31	DCL3101	77	11	63	31	27	209
	DCL3102	0	0	0	0	0	0
	DCL3103	138	20	70	33	6	267
	DCL3104	348	55	238	110	18	769
Total		563	86	371	174	51	1,245
32	DCL3201	58	8	45	17	16	144
	DCL3202	335	66	112	65	109	687
	DCL3203	155	24	67	40	31	317
	DCL3204	351	73	135	78	77	714
	DCL3205	107	11	140	46	8	312
Total		1,006	182	499	246	241	2,174
33	DCL3301	88	13	27	11	43	182
	DCL3302	53	5	11	3	1	73
	DCL3303	51	8	18	4	3	84
	DCL3304	45	5	8	3	0	61
Total		237	31	64	21	47	400
34	DCL3401	399	62	126	63	28	678
	DCL3402	0	0	0	0	0	0
	DCL3403	655	104	181	83	146	1,169
	DCL3404	579	91	205	100	65	1,040
Total		1,633	257	512	246	239	2,887
35	DCL3501	126	19	46	33	122	346
	DCL3502	327	54	87	41	33	542
	DCL3503	512	90	158	70	86	916
	DCL3504	118	19	55	59	37	288
Total		1,083	182	346	203	278	2,092
36	DCL3601	450	80	120	53	44	747
	DCL3602	281	55	80	36	61	513
	DCL3603	186	28	59	36	10	319
	DCL3604	230	41	78	49	36	434
Total		1,147	204	337	174	151	2,013
37	DCL3701	528	75	136	56	35	830
	DCL3702	31	4	21	5	2	63
	DCL3703	490	69	223	87	21	890
	DCL3704	0	0	0	0	0	0
	DCL3705	205	27	142	97	183	654
	DCL3706	2	0	1	0	3	6
	DCL3707	106	13	114	108	157	498
	DCL3708	69	8	47	19	16	159
Total		1,431	196	684	372	417	3,100
38	DCL3801	450	67	161	86	700	1,464
	DCL3802	113	15	96	155	55	434
	DCL3803	91	9	50	68	27	245
	DCL3804	165	21	99	102	54	441
Total		819	112	406	411	836	2,584
39	DCL3901	348	48	131	58	64	649
	DCL3902	713	107	191	74	58	1,143
	DCL3903	75	9	73	59	17	233
	DCL3904	329	48	110	41	55	583
Total		1,465	212	505	232	194	2,608
40	DCL4001	33	4	9	2	1	49
	DCL4002	426	52	110	27	17	632
	DCL4003	93	13	32	9	5	152
	DCL4004	654	80	152	35	29	950
	DCL4005	111	8	64	15	107	305
	DCL4006	520	65	123	31	102	841
	DCL4007	38	4	26	8	65	141

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
Total		1,875	226	516	127	326	3,070
41	DCL4101	446	66	102	40	58	712
	DCL4102	64	8	55	53	40	220
	DCL4103	40	5	24	6	17	92
	DCL4104	157	24	38	19	168	406
Total		707	103	219	118	283	1,430
42	DCL4201	219	34	75	39	355	722
	DCL4202	536	79	161	45	13	834
	DCL4203	265	41	101	38	32	477
	DCL4204	321	47	85	37	97	587
Total		1,341	201	422	159	497	2,620
43	DCL4301	434	72	132	60	552	1250
	DCL4302	698	109	187	74	157	1225
	DCL4303	349	41	81	29	26	526
	DCL4304	582	76	111	35	120	924
	DCL4305	245	40	76	34	464	859
	DCL4306	152	20	31	10	66	279
	DCL4307	134	18	25	10	12	199
Total		2,594	376	643	252	1,397	5,262
44	DCL4401	292	44	85	24	4	449
	DCL4402	373	56	100	32	26	587
	DCL4403	308	44	86	22	3	463
	DCL4404	200	30	63	20	2	315
	DCL4405	224	33	71	19	1	348
Total		1,397	207	405	117	36	2,162
45	DCL4501	363	44	109	28	18	562
	DCL4502	157	25	57	33	13	285
	DCL4503	168	21	39	10	3	241
	DCL4504	276	37	101	36	6	456
	DCL4505	24	2	15	9	4	54
	DCL4506	193	24	83	25	7	332
	DCL4507	288	38	81	23	5	435
Total		1,469	191	485	164	56	2,365
46	DCL4601	28	5	18	9	178	238
	DCL4602	377	66	105	61	321	930
	DCL4603	487	67	95	30	147	826
	DCL4604	519	72	132	56	202	981
	DCL4605	863	145	269	126	219	1,622
	DCL4606	441	81	124	59	917	1,622
	DCL4607	197	34	94	61	184	570
Total		2,912	470	837	402	2,168	6,789
47	DCL4701	211	32	75	36	469	823
	DCL4702	523	80	130	44	230	1,007
	DCL4703	272	38	79	35	62	486
	DCL4704	167	25	47	18	37	294
	DCL4705	356	55	116	46	44	617
	DCL4706	2	0	5	3	13	23
	DCL4707	348	47	74	23	12	504
	DCL4708	48	7	28	16	54	153
Total		1,927	284	554	221	921	3,907
48	DCL4801	681	102	206	102	266	1,357
	DCL4802	113	14	114	223	40	504
	DCL4803	286	38	68	23	9	424
	DCL4804	426	63	89	33	17	628
	DCL4805	391	54	91	26	26	588
	DCL4806	387	56	100	32	33	608
	DCL4807	29	3	8	2	7	49
	DCL4808	400	62	123	55	180	820
Total		2,713	392	799	496	578	4,978
49	DCL4901	315	26	107	25	7	480
	DCL4902	219	20	70	18	8	335
	DCL4903	166	15	51	11	7	250
	DCL4904	585	63	147	51	24	870
	DCL4905	301	28	75	18	6	428
	DCL4906	257	23	63	18	7	368
Total		1,843	175	513	141	59	2,731
50	DCL5001	528	66	103	41	82	820
	DCL5002	405	48	78	23	23	577

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
	DCL5003	393	49	89	24	35	590
	DCL5004	427	55	118	66	125	791
Total		1,753	218	388	154	265	2,778
51	DCL5101	304	36	76	22	18	456
	DCL5102	335	40	71	20	10	476
	DCL5103	289	34	60	15	77	475
	DCL5104	316	41	82	30	41	510
	DCL5105	239	27	59	16	24	365
Total		1,483	178	348	103	170	2,282
52	DCL5201	31	4	5	1	0	41
	DCL5202	245	29	51	17	14	356
	DCL5203	235	26	129	100	26	516
	DCL5204	103	13	46	10	16	188
	DCL5205	130	16	41	7	5	199
	DCL5206	215	25	51	23	18	332
Total		959	113	323	158	79	1,632
53	DCL5301	174	22	50	17	3	266
	DCL5302	176	23	77	25	8	309
	DCL5303	2	0	2	0	0	4
	DCL5304	194	24	112	46	22	398
	DCL5305	157	21	69	25	8	280
	DCL5306	243	31	92	32	10	408
	DCL5307	110	16	36	19	11	192
Total		1,056	137	438	164	62	1,857
54	DCL5401	609	113	185	88	183	1,178
	DCL5402	374	58	132	49	89	702
	DCL5403	276	46	100	53	21	496
	DCL5404	480	83	163	78	132	936
Total		1,739	300	580	268	425	3,312
55	DCL5501	127	26	53	32	78	316
	DCL5502	318	60	105	53	81	617
	DCL5503	186	36	59	31	263	575
	DCL5504	333	62	103	65	68	631
	DCL5505	169	30	46	26	107	378

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
	DCL5506	221	45	67	35	345	713
Total		1,354	259	433	242	942	3,230
56	DCL5601	136	22	81	43	23	305
	DCL5602	39	8	23	7	6	83
	DCL5603	167	21	116	43	11	358
	DCL5604	82	13	56	16	8	175
	DCL5605	162	24	143	136	59	524
Total		586	88	419	245	107	1,445
57	DCL5701	56	5	34	10	15	120
	DCL5702	100	12	53	13	49	227
	DCL5703	89	10	32	8	11	150
	DCL5704	340	41	165	58	54	658
	DCL5705	92	10	69	16	9	196
Total		677	78	353	105	138	1,351
58	DCL5801	386	64	99	39	130	718
	DCL5802	127	21	36	15	29	228
	DCL5803	322	53	80	36	19	510
	DCL5804	354	58	101	50	159	722
	DCL5805	317	52	83	39	154	645
	DCL5806	311	50	83	32	9	485
	DCL5807	525	86	125	41	28	805
	DCL5808	305	50	97	43	87	582
	DCL5809	0	0	0	0	1	1
Total		2,647	434	704	295	616	4,696
59	DCL5901	105	17	60	61	33	276
	DCL5902	251	42	67	27	46	433
	DCL5903	395	59	104	37	12	607
	DCL5904	240	39	64	20	9	372
	DCL5905	387	63	119	45	7	621
	DCL5906	3	0	2	1	0	6
	DCL5907	0	0	0	0	0	0
Total		1,381	220	416	191	107	2,315
60	DCL6001	248	40	78	28	47	441
	DCL6002	225	36	77	34	76	448

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
	DCL6003	267	43	112	60	170	652
	DCL6004	221	37	62	25	127	472
	DCL6005	166	28	52	20	225	491
	DCL6006	357	59	113	43	353	925
Total		1,484	243	494	210	998	3,429
61	DCL6101	252	41	83	24	4	404
	DCL6102	140	22	61	47	12	282
	DCL6103	134	20	34	15	5	208
	DCL6104	80	12	25	8	3	128
	DCL6105	151	22	42	14	3	232
	DCL6106	277	45	81	30	7	440
Total		1,034	162	326	138	34	1,694
62	DCL6201	421	61	111	44	18	655
	DCL6202	126	15	37	9	5	192
	DCL6203	268	38	77	22	5	410
	DCL6204	149	18	41	15	8	231
	DCL6205	97	12	27	6	2	144
Total		1,061	144	293	96	38	1,632
63	DCL6301	17	2	23	5	2	49
	DCL6302	324	61	149	80	35	649
	DCL6303	173	28	61	33	6	301
	DCL6304	109	20	34	18	8	189
	DCL6305	0	0	0	0	0	0
Total		623	111	267	136	51	1,188
64	DCL6401	128	24	50	23	3	228
	DCL6402	190	30	149	68	8	445
	DCL6403	114	19	64	39	6	242
	DCL6404	96	18	37	19	3	173
	DCL6405	107	20	33	16	2	178
Total		635	111	333	165	22	1,266
65	DCL6501	133	21	98	93	144	489
	DCL6502	147	23	128	92	81	471
	DCL6503	361	58	154	94	42	709
	DCL6504	602	107	197	97	66	1069
	DCL6505	160	23	88	89	114	474
Total		1,403	232	665	465	447	3,212
66	DCL6601	57	11	75	98	45	286
	DCL6602	109	16	91	40	12	268
	DCL6603	107	17	109	79	14	326
	DCL6604	58	10	81	88	29	266
	DCL6605	118	21	94	54	13	300
Total		449	75	450	359	113	1,446
67	DCL6701	0	0	0	0	0	0
	DCL6702	144	26	78	49	16	313
	DCL6703	211	39	161	93	18	522
	DCL6704	242	46	115	60	15	478
	DCL6705	13	3	6	2	0	24
	DCL6706	0	0	0	0	0	0
Total		610	114	360	204	49	1,337
68	DCL6801	94	17	52	24	7	194
	DCL6802	75	13	62	35	3	188
	DCL6803	136	23	117	55	8	339
	DCL6804	234	44	108	41	5	432
	DCL6805	220	42	99	43	5	409
	DCL6806	0	0	0	0	0	0
Total		759	139	438	198	28	1,562
69	DCL6901	384	71	173	87	19	734
	DCL6902	243	43	121	65	18	490
	DCL6903	507	96	203	115	49	970
	DCL6904	308	56	171	103	31	669
Total		1,442	266	668	370	117	2,863
70	DCL7001	250	44	141	65	12	512
	DCL7002	145	25	94	37	9	310
	DCL7003	55	6	56	40	5	162
	DCL7004	349	62	190	65	8	674
Total		799	137	481	207	34	1,658
71	DCL7101	147	29	99	53	10	338
	DCL7102	154	26	81	39	5	305

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
	DCL7103	44	8	50	52	10	164
	DCL7104	241	43	131	64	10	489
	DCL7105	132	27	60	31	10	260
Total		718	133	421	239	45	1,556
72	DCL7201	181	36	95	38	6	356
	DCL7202	74	13	49	15	3	154
	DCL7203	154	28	79	29	4	294
	DCL7204	87	15	59	27	7	195
	DCL7205	15	2	24	12	6	59
Total		511	94	306	121	26	1,058
73	DCL7301	76	11	76	43	4	210
	DCL7302	110	16	113	52	9	300
	DCL7303	53	8	50	35	6	152
	DCL7304	59	8	64	40	2	173
Total		298	43	303	170	21	835
74	DCL7401	40	7	13	8	2	70
	DCL7402	373	68	139	65	26	671
	DCL7403	153	25	81	45	7	311
	DCL7404	296	57	119	64	12	548
	DCL7405	108	15	95	75	9	302
	DCL7406	218	39	116	48	8	429
Total		1,188	211	563	305	64	2,331
75	DCL7501	238	34	71	35	74	452
	DCL7502	288	47	90	50	37	512
	DCL7503	126	19	66	36	13	260
	DCL7504	198	31	63	29	7	328
	DCL7505	281	47	79	38	68	513
Total		1,131	178	369	188	199	2,065
76	DCL7601	738	148	277	142	76	1,381
	DCL7602	121	25	39	28	26	239
	DCL7603	419	87	190	128	82	906
	DCL7604	234	49	109	73	91	556
Total		1,512	309	615	371	275	3,082
77	DCL7701	611	105	170	83	20	989

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
	DCL7702	140	20	41	19	5	225
	DCL7703	331	56	113	58	28	586
	DCL7704	281	47	124	87	19	558
Total		1,363	228	448	247	72	2,358
78	DCL7801	142	28	51	27	6	254
	DCL7802	221	41	104	51	8	425
	DCL7803	217	43	82	57	12	411
	DCL7804	23	4	27	10	2	66
	DCL7805	111	22	36	17	5	191
	DCL7806	125	25	47	30	14	241
Total		839	163	347	192	47	1,588
79	DCL7901	400	83	146	82	47	758
	DCL7902	174	36	63	34	8	315
	DCL7903	240	49	93	53	16	451
	DCL7904	268	55	108	55	19	505
	DCL7905	149	27	116	100	23	415
Total		1,231	250	526	324	113	2,444
80	DCL8001	171	34	100	64	30	399
	DCL8002	239	51	83	48	46	467
	DCL8003	227	46	90	43	9	415
	DCL8004	216	44	86	40	10	396
Total		853	175	359	195	95	1,677
81	DCL8101	368	74	135	101	233	911
	DCL8102	282	56	138	85	57	618
	DCL8103	353	73	129	71	41	667
	DCL8104	198	38	78	40	13	367
	DCL8105	286	58	109	63	222	738
Total		1,487	299	589	360	566	3,301
82	DCL8201	348	73	131	72	33	657
	DCL8202	159	32	67	44	11	313
	DCL8203	179	32	64	33	35	343
	DCL8204	181	38	96	71	62	448
	DCL8205	199	41	88	46	55	429
	DCL8206	176	36	73	42	59	386

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+BAL +Other	
Total		1,242	252	519	308	255	2,576
83	DCL8301	528	100	179	112	273	1,192
	DCL8302	140	20	54	46	66	326
	DCL8303	446	88	184	148	43	909
	DCL8304	303	55	124	84	99	665
Total		1,417	263	541	390	481	3,092
84	DCL8401	455	86	159	99	118	917
	DCL8402	243	51	98	55	54	501
	DCL8403	319	65	143	91	298	916
	DCL8404	442	89	210	194	135	1070
	DCL8405	137	29	55	41	120	382
Total		1,596	320	665	480	725	3,786
85	DCL8501	29	5	16	11	25	86
	DCL8502	514	97	185	86	85	967
	DCL8503	298	41	74	30	463	906
	DCL8504	590	111	236	112	130	1,179
	DCL8505	620	117	221	120	191	1,269
Total		2,051	371	732	359	894	4,407
86	DCL8601	176	32	76	46	21	351
	DCL8602	365	71	145	80	40	701
	DCL8603	51	8	39	41	34	173
	DCL8604	186	41	69	45	54	395
	DCL8605	370	75	150	96	96	787
	DCL8606	594	118	235	131	177	1,255
Total		1,742	345	714	439	422	3,662
87	DCL8701	291	56	103	59	104	613
	DCL8702	428	92	197	130	375	1,222
	DCL8703	176	37	69	48	42	372
	DCL8704	536	113	239	156	350	1,394
	DCL8705	307	65	117	93	347	929
Total		1,738	363	725	486	1,218	4,530
88	DCL8801	271	60	100	57	108	596
	DCL8802	279	62	102	52	46	541
	DCL8803	402	88	152	85	110	837
	DCL8804	184	37	70	61	108	460
	DCL8805	208	45	74	41	56	424
Total		1,344	292	498	296	428	2,858
89	DCL8901	471	104	159	84	89	907
	DCL8902	546	122	190	109	38	1,005
	DCL8903	493	109	167	87	36	892
	DCL8904	583	128	211	130	207	1,259
	DCL8905	122	23	57	55	69	326
Total		2,215	486	784	465	439	4,389
90	DCL9001	322	68	145	103	325	963
	DCL9002	645	142	210	128	85	1,210
	DCL9003	84	14	62	86	52	298
	DCL9004	316	66	125	110	121	738
	DCL9005	0	0	1	1	0	2
	DCL9006	405	87	144	97	666	1,399
	DCL9007	88	17	61	55	32	253
Total		1,860	394	748	580	1,281	4,863
Summary		158,924	26,602	54,804	27,825	58,670	326,825

Table 43 Buildings Age and Visible Physical Condition of Dhaka in Cluster level

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
1	DCL0101	237	391	462	1,090	537	314	239	1,090
	DCL0102	82	178	393	653	205	199	249	653
	DCL0103	53	106	152	311	118	102	91	311
	DCL0104	140	253	337	730	331	219	180	730
	DCL0105	119	207	242	568	286	165	117	568
	DCL0106	131	207	259	597	288	177	132	597
	DCL0107	140	218	243	601	299	187	115	601
	DCL0108	115	195	213	523	257	168	98	523
	DCL0109	56	95	103	254	127	82	45	254
	DCL0110	168	260	298	726	366	223	137	726
	DCL0111	199	326	371	896	456	275	165	896
	DCL0112	89	163	224	476	216	146	114	476

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Annex

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	DCL0113	156	275	337	768	388	219	161	768
Total		1,685	2,874	3,634	8,193	3,874	2,476	1,843	8,193
2	DCL0201	120	149	195	464	220	148	96	464
	DCL0202	62	105	339	506	137	165	204	506
	DCL0203	237	220	382	839	322	318	199	839
	DCL0204	289	293	522	1,104	426	402	276	1,104
	DCL0205	218	235	378	831	347	308	176	831
	DCL0206	66	89	124	279	125	96	58	279
	DCL0207	6	8	22	36	12	12	12	36
	DCL0208	400	400	599	1,399	575	526	298	1,399
	DCL0209	186	207	268	661	307	222	132	661
Total		1,584	1,706	2,829	6,119	2,471	2,197	1,451	6,119
3	DCL0301	254	345	678	1,277	486	441	350	1,277
	DCL0302	221	271	390	882	397	311	174	882
	DCL0303	295	287	530	1,112	418	409	285	1,112
	DCL0304	253	281	461	995	399	375	221	995
	DCL0305	92	101	236	429	146	144	139	429
Total		1,115	1,285	2,295	4,695	1,846	1,680	1,169	4,695
4	DCL0401	117	148	224	489	209	164	116	489
	DCL0402	1	2	4	7	2	3	2	7
	DCL0403	169	197	329	695	282	241	172	695
	DCL0404	31	58	166	255	73	80	102	255
	DCL0405	27	52	175	254	66	78	110	254
	DCL0406	93	121	271	485	174	162	149	485
Total		438	578	1,169	2,185	806	728	651	2,185
5	DCL0501	189	267	660	1,116	361	380	375	1,116
	DCL0502	58	87	115	260	123	89	48	260
	DCL0503	105	116	167	388	173	133	82	388
	DCL0504	93	120	236	449	175	155	119	449
	DCL0505	117	123	177	417	182	150	85	417
	DCL0506	73	107	333	513	151	165	197	513
	DCL0507	148	158	258	564	236	205	123	564
	DCL0508	148	166	260	574	250	194	130	574
	DCL0509	106	117	243	466	170	162	134	466

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	DCL0510	141	163	336	640	237	219	184	640
	DCL0511	104	138	367	609	185	201	223	609
Total		1,282	1,562	3,152	5,996	2,243	2,053	1,700	5,996
6	DCL0601	215	315	793	1,323	446	431	446	1,323
	DCL0602	436	507	1,073	2,016	727	689	600	2,016
	DCL0603	23	48	104	175	84	66	25	175
	DCL0604	51	60	79	190	87	66	37	190
	DCL0605	245	242	331	818	362	296	160	818
	DCL0606	246	278	369	893	409	311	173	893
	DCL0607	160	191	294	645	284	220	141	645
	DCL0608	138	168	445	751	235	246	270	751
	DCL0609	215	259	395	869	391	289	189	869
	DCL0610	283	404	961	1,648	573	506	569	1,648
	DCL0611	109	136	183	428	201	149	78	428
	DCL0612	38	114	556	708	139	199	370	708
	DCL0613	0	0	2	2	0	1	1	2
Total		2,159	2,722	5,585	10,466	3,938	3,469	3,059	10,466
7	DCL0701	128	172	238	538	250	169	119	538
	DCL0702	4	4	7	15	6	6	3	15
	DCL0703	195	260	319	774	379	252	143	774
	DCL0704	83	100	129	312	146	105	61	312
	DCL0705	70	95	115	280	139	87	54	280
	DCL0706	105	152	183	440	218	142	80	440
	DCL0707	11	19	24	54	17	24	13	54
	DCL0708	15	30	56	101	41	38	22	101
	DCL0709	67	91	116	274	136	87	51	274
Total		678	923	1,187	2,788	1,332	910	546	2,788
8	DCL0801	27	33	70	130	50	45	35	130
	DCL0802	93	128	155	376	178	129	69	376
	DCL0803	353	396	559	1,308	579	452	277	1,308
	DCL0804	177	223	317	717	320	246	151	717
	DCL0805	145	216	575	936	294	293	349	936
	DCL0806	266	351	764	1,381	494	450	437	1,381
	DCL0807	81	124	316	521	166	170	185	521

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Annex

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	DCL0808	169	229	476	874	314	293	267	874
	DCL0809	28	36	80	144	50	47	47	144
Total		1,339	1,736	3,312	6,387	2,445	2,125	1,817	6,387
9	DCL0901	39	64	207	310	81	97	132	310
	DCL0902	39	106	432	577	126	173	278	577
	DCL0903	182	181	297	660	269	249	142	660
	DCL0904	155	167	331	653	241	230	182	653
	DCL0905	205	225	469	899	325	313	261	899
	DCL0906	195	193	316	704	284	264	156	704
Total		815	936	2,052	3,803	1,326	1,326	1,151	3,803
10	DCL1001	407	427	770	1,604	613	578	413	1,604
	DCL1002	86	157	536	779	203	235	341	779
	DCL1003	75	84	175	334	116	120	98	334
	DCL1004	174	189	322	685	277	249	159	685
	DCL1005	80	103	204	387	146	134	107	387
	DCL1006	262	267	406	935	392	352	191	935
	DCL1007	192	217	372	781	317	278	186	781
	DCL1008	79	108	195	382	156	136	90	382
Total		1,355	1,552	2,980	5,887	2,220	2,082	1,585	5,887
11	DCL1101	282	353	508	1,143	520	368	255	1,143
	DCL1102	130	207	296	633	292	188	153	633
	DCL1103	269	355	520	1,144	522	369	253	1,144
	DCL1104	40	64	79	183	92	51	40	183
Total		721	979	1,403	3,103	1,426	976	701	3,103
12	DCL1201	99	153	253	505	210	175	120	505
	DCL1202	107	121	189	417	177	147	93	417
	DCL1203	314	342	579	1,235	502	435	298	1,235
	DCL1204	56	86	142	284	119	99	66	284
	DCL1205	178	212	328	718	314	243	161	718
	DCL1206	34	57	122	213	81	64	68	213
Total		788	971	1,613	3,372	1,403	1,163	806	3,372
13	DCL1301	265	363	551	1,179	511	394	274	1,179
	DCL1302	233	282	406	921	415	303	203	921
	DCL1303	389	467	705	1,561	687	520	354	1,561

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	DCL1304	327	388	571	1,286	574	433	279	1,286
	DCL1305	389	497	717	1,603	725	519	359	1,603
	DCL1306	312	375	519	1,206	562	393	251	1,206
	DCL1307	398	474	734	1,606	689	539	378	1,606
	DCL1308	246	300	416	962	440	314	208	962
	DCL1309	199	250	393	842	367	268	207	842
	DCL1310	224	281	435	940	411	301	228	940
Total		2,982	3,677	5,447	12,106	5,381	3,984	2,741	12,106
14	DCL1401	301	358	521	1,180	530	401	249	1,180
	DCL1402	213	245	370	828	360	285	183	828
	DCL1403	76	113	161	350	157	124	69	350
	DCL1404	237	287	420	944	423	317	204	944
	DCL1405	181	239	350	770	346	267	157	770
	DCL1406	326	372	539	1,237	551	423	263	1,237
Total		1,334	1,614	2,361	5,309	2,367	1,817	1,125	5,309
15	DCL1501	212	170	359	741	250	296	195	741
	DCL1502	267	243	588	1,098	355	421	322	1,098
	DCL1503	236	204	444	884	303	347	234	884
	DCL1504	264	225	413	902	330	356	216	902
	DCL1505	287	238	469	994	350	393	251	994
	DCL1506	149	212	733	1,094	282	357	455	1,094
	DCL1507	252	491	1,909	2,652	636	826	1,190	2,652
	DCL1508	411	367	715	1,493	534	584	375	1,493
	DCL1509	285	268	601	1,154	394	444	316	1,154
	DCL1510	135	366	1,616	2,117	451	623	1,043	2,117
Total		2,498	2,784	7,847	13,129	3,885	4,647	4,597	13,129
16	DCL1601	0	1	2	3	1	2	0	3
	DCL1602	316	372	528	1,216	555	409	252	1,216
	DCL1603	361	427	719	1,507	621	514	372	1,507
	DCL1604	181	244	380	805	340	278	187	805
	DCL1605	306	383	593	1,282	554	430	298	1,282
	DCL1606	426	510	762	1,698	757	565	376	1,698
	DCL1607	324	363	543	1,230	538	420	272	1,230
	DCL1608	42	66	103	211	96	65	50	211

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Annex

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
Total		1,956	2,366	3,630	7,952	3,462	2,683	1,807	7,952
17	DCL1701	326	391	613	1,330	580	447	303	1,330
	DCL1702	227	243	469	939	343	360	236	939
	DCL1703	332	333	533	1,198	485	470	243	1,198
	DCL1704	182	183	317	682	261	269	152	682
	DCL1705	414	417	766	1,597	596	626	375	1,597
	DCL1706	0	1	0	1	1	0	0	1
	DCL1707	55	112	114	281	143	71	67	281
	DCL1708	364	299	558	1,221	426	505	290	1,221
	DCL1709	204	340	477	1,021	471	297	253	1,021
	DCL1710	309	278	519	1,106	403	439	264	1,106
	DCL1711	391	472	702	1,565	698	530	337	1,565
	DCL1712	228	266	395	889	391	298	200	889
	DCL1713	123	157	269	549	238	182	129	549
Total		3,155	3,492	5,732	12,379	5,036	4,494	2,849	12,379
18	DCL1801	121	225	248	594	314	166	114	594
	DCL1802	29	71	69	169	77	65	27	169
	DCL1803	164	195	267	626	285	219	122	626
	DCL1804	250	291	417	958	418	341	199	958
	DCL1805	63	90	122	275	118	101	56	275
	DCL1806	224	268	411	903	380	318	205	903
Total		851	1,140	1,534	3,525	1,592	1,210	723	3,525
19	DCL1901	179	499	2,130	2,808	613	807	1,388	2,808
	DCL1902	144	246	287	677	322	222	133	677
	DCL1903	136	219	235	590	294	190	106	590
	DCL1904	60	93	99	252	132	74	46	252
	DCL1905	76	121	139	336	167	104	65	336
	DCL1906	33	55	62	150	70	51	29	150
	DCL1907	60	101	114	275	133	90	52	275
	DCL1908	125	226	248	599	274	218	107	599
	DCL1909	68	117	130	315	148	107	60	315
	DCL1910	85	138	160	383	188	121	74	383
	DCL1911	65	108	119	292	148	89	55	292
	DCL1912	39	66	69	174	84	59	31	174
	DCL1913	38	61	65	164	81	53	30	164
	DCL1914	70	112	118	300	155	90	55	300
Total		1,178	2,162	3,975	7,315	2,809	2,275	2,231	7,315
20	DCL2001	291	313	453	1,057	434	408	215	1,057
	DCL2002	104	149	176	429	198	143	88	429
	DCL2003	318	392	977	1,687	544	564	579	1,687
	DCL2004	263	303	444	1,010	425	368	217	1,010
	DCL2005	64	93	122	279	120	107	52	279
Total		1,040	1,250	2,172	4,462	1,721	1,590	1,151	4,462
21	DCL2101	335	433	829	1,597	643	537	417	1,597
	DCL2102	231	284	418	933	409	327	197	933
	DCL2103	261	322	499	1,082	472	379	231	1,082
	DCL2104	309	392	575	1,276	563	437	276	1,276
	DCL2105	414	464	691	1,569	691	541	337	1,569
	DCL2106	2	5	13	20	8	7	5	20
Total		1,552	1,900	3,025	6,477	2,786	2,228	1,463	6,477
22	DCL2201	293	306	566	1,165	442	428	295	1,165
	DCL2202	268	327	695	1,290	461	440	389	1,290
	DCL2203	290	341	662	1,293	486	452	355	1,293
	DCL2204	360	416	746	1,522	619	536	367	1,522
	DCL2205	238	253	382	873	380	300	193	873
Total		1,449	1,643	3,051	6,143	2,388	2,156	1,599	6,143
23	DCL2301	234	270	471	975	385	355	235	975
	DCL2302	107	136	205	448	187	167	94	448
	DCL2303	94	120	171	385	167	146	72	385
	DCL2304	163	188	407	758	261	267	230	758
Total		598	714	1,254	2,566	1,000	935	631	2,566
24	DCL2401	152	183	257	592	249	221	122	592
	DCL2402	157	219	293	669	300	233	136	669
	DCL2403	217	267	489	973	369	344	260	973
	DCL2404	123	159	223	505	219	179	107	505
Total		649	828	1,262	2,739	1,137	977	625	2,739
25	DCL2501	227	267	476	970	368	356	246	970
	DCL2502	77	91	128	296	130	106	60	296

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Annex

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	DCL2503	203	210	362	775	291	297	187	775
	DCL2504	205	221	336	762	309	293	160	762
	DCL2505	302	317	673	1,292	433	481	378	1,292
	DCL2506	129	148	233	510	211	184	115	510
Total		1,143	1,254	2,208	4,605	1,742	1,717	1,146	4,605
26	DCL2601	93	126	394	613	167	202	244	613
	DCL2602	90	140	187	417	190	131	96	417
	DCL2603	83	110	186	379	154	128	97	379
	DCL2604	191	233	644	1,068	316	381	371	1,068
	DCL2605	207	239	629	1,075	325	389	361	1,075
	DCL2606	308	379	1,055	1,742	518	612	612	1,742
Total		972	1,227	3,095	5,294	1,670	1,843	1,781	5,294
27	DCL2701	296	345	496	1,137	480	425	232	1,137
	DCL2702	210	235	444	889	328	326	235	889
	DCL2703	259	291	597	1,147	412	412	323	1,147
	DCL2704	141	166	254	561	238	194	129	561
Total		906	1,037	1,791	3,734	1,458	1,357	919	3,734
28	DCL2801	188	203	498	889	282	331	276	889
	DCL2802	174	216	365	755	316	268	171	755
	DCL2803	198	222	351	771	317	277	177	771
	DCL2804	164	172	344	680	248	248	184	680
	DCL2805	107	119	308	534	166	200	168	534
Total		831	932	1,866	3,629	1,329	1,324	976	3,629
29	DCL2901	132	148	285	565	210	203	152	565
	DCL2902	152	187	300	639	265	243	131	639
	DCL2903	260	255	436	951	375	350	226	951
	DCL2904	98	113	165	376	169	127	80	376
	DCL2905	126	144	257	527	205	194	128	527
Total		768	847	1,443	3,058	1,224	1,117	717	3,058
30	DCL3001	200	191	338	729	279	268	182	729
	DCL3002	131	131	247	509	187	184	138	509
	DCL3003	87	81	141	309	120	115	74	309
	DCL3004	210	211	381	802	312	284	206	802
Total		628	614	1,107	2,349	898	851	600	2,349

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
31	DCL3101	38	64	107	209	75	84	50	209
	DCL3102	0	0	0	0	0	0	0	0
	DCL3103	60	92	115	267	123	98	46	267
	DCL3104	167	266	336	769	338	298	133	769
Total		265	422	558	1,245	536	480	229	1,245
32	DCL3201	34	45	65	144	50	63	31	144
	DCL3202	178	184	325	687	268	256	163	687
	DCL3203	72	99	146	317	139	114	64	317
	DCL3204	199	187	328	714	271	282	161	714
	DCL3205	55	118	139	312	115	140	57	312
Total		538	633	1,003	2,174	843	855	476	2,174
33	DCL3301	37	57	88	182	79	57	46	182
	DCL3302	16	29	28	73	43	19	11	73
	DCL3303	20	30	34	84	40	29	15	84
	DCL3304	13	24	24	61	37	15	9	61
Total		86	140	174	400	199	120	81	400
34	DCL3401	165	223	290	678	327	222	129	678
	DCL3402	0	0	0	0	0	0	0	0
	DCL3403	276	361	532	1,169	532	375	262	1,169
	DCL3404	244	338	458	1,040	491	345	204	1,040
Total		685	922	1,280	2,887	1,350	942	595	2,887
35	DCL3501	63	91	192	346	126	114	106	346
	DCL3502	140	175	227	542	255	181	106	542
	DCL3503	233	285	398	916	414	315	187	916
	DCL3504	51	86	151	288	133	98	57	288
Total		487	637	968	2,092	928	708	456	2,092
36	DCL3601	209	225	313	747	330	265	152	747
	DCL3602	148	139	226	513	203	192	118	513
	DCL3603	75	107	137	319	156	107	56	319
	DCL3604	112	127	195	434	187	159	88	434
Total		544	598	871	2,013	876	723	414	2,013
37	DCL3701	198	289	343	830	410	262	158	830
	DCL3702	14	22	27	63	22	27	14	63
	DCL3703	204	316	370	890	414	321	155	890

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Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	DCL3704	0	0	0	0	0	0	0	0
	DCL3705	101	191	362	654	252	235	167	654
	DCL3706	1	2	3	6	2	2	2	6
	DCL3707	61	137	300	498	176	186	136	498
	DCL3708	32	54	73	159	65	62	32	159
Total		611	1,011	1,478	3,100	1,341	1,095	664	3,100
38	DCL3801	213	371	880	1,464	514	444	506	1,464
	DCL3802	58	116	260	434	197	162	75	434
	DCL3803	35	74	136	245	115	85	45	245
	DCL3804	77	132	232	441	188	164	89	441
Total		383	693	1,508	2,584	1,014	855	715	2,584
39	DCL3901	140	214	295	649	300	216	133	649
	DCL3902	284	376	483	1,143	554	363	226	1,143
	DCL3903	37	73	123	233	99	90	44	233
	DCL3904	132	192	259	583	270	190	123	583
Total		593	855	1,160	2,608	1,223	859	526	2,608
40	DCL4001	12	18	19	49	24	16	9	49
	DCL4002	142	234	256	632	337	179	116	632
	DCL4003	34	53	65	152	76	48	28	152
	DCL4004	213	353	384	950	514	259	177	950
	DCL4005	50	93	162	305	92	120	93	305
	DCL4006	176	293	372	841	423	233	185	841
	DCL4007	19	40	82	141	42	51	48	141
Total		646	1,084	1,340	3,070	1,508	906	656	3,070
41	DCL4101	172	233	307	712	349	215	148	712
	DCL4102	29	66	125	220	91	81	48	220
	DCL4103	19	31	42	92	34	36	22	92
	DCL4104	70	106	230	406	151	121	134	406
Total		290	436	704	1,430	625	453	352	1,430
42	DCL4201	108	177	437	722	245	221	256	722
	DCL4202	207	294	333	834	420	262	152	834
	DCL4203	113	157	207	477	219	161	97	477
	DCL4204	128	183	276	587	265	182	140	587
Total		556	811	1,253	2,620	1,149	826	645	2,620

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
43	DCL4301	214	311	725	1,250	435	390	425	1,250
	DCL4302	289	381	555	1,225	559	386	280	1,225
	DCL4303	114	193	219	526	280	146	100	526
	DCL4304	203	312	409	924	463	254	207	924
	DCL4305	128	201	530	859	276	262	321	859
	DCL4306	56	87	136	279	126	79	74	279
	DCL4307	47	68	84	199	103	55	41	199
Total		1,051	1,553	2,658	5,262	2,242	1,572	1,448	5,262
44	DCL4401	116	155	178	449	223	144	82	449
	DCL4402	149	197	241	587	287	185	115	587
	DCL4403	118	165	180	463	235	145	83	463
	DCL4404	81	109	125	315	153	104	58	315
	DCL4405	88	123	137	348	175	111	62	348
Total		552	749	861	2,162	1,073	689	400	2,162
45	DCL4501	127	207	228	562	284	174	104	562
	DCL4502	66	90	129	285	134	95	56	285
	DCL4503	55	90	96	241	133	65	43	241
	DCL4504	105	162	189	456	221	152	83	456
	DCL4505	11	18	25	54	21	23	10	54
	DCL4506	75	121	136	332	155	117	60	332
	DCL4507	104	157	174	435	222	135	78	435
Total		543	845	977	2,365	1,170	761	434	2,365
46	DCL4601	23	48	167	238	58	74	106	238
	DCL4602	188	232	510	930	336	306	288	930
	DCL4603	185	264	377	826	377	246	203	826
	DCL4604	206	303	472	981	433	301	247	981
	DCL4605	396	479	747	1,622	691	555	376	1,622
	DCL4606	255	353	1,014	1,622	483	513	626	1,622
	DCL4607	106	147	317	570	201	203	166	570
Total		1,359	1,826	3,604	6,789	2,579	2,198	2,012	6,789
47	DCL4701	110	193	520	823	260	249	314	823
	DCL4702	214	300	493	1,007	438	302	267	1,007
	DCL4703	103	159	224	486	229	148	109	486
	DCL4704	67	94	133	294	137	90	67	294

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Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	DCL4705	145	202	270	617	290	198	129	617
	DCL4706	2	5	16	23	7	8	8	23
	DCL4707	121	179	204	504	266	143	95	504
	DCL4708	23	42	88	153	57	50	46	153
Total		785	1,174	1,948	3,907	1,684	1,188	1,035	3,907
48	DCL4801	277	412	668	1,357	603	418	336	1,357
	DCL4802	49	134	321	504	248	189	67	504
	DCL4803	99	153	172	424	227	119	78	424
	DCL4804	155	214	259	628	327	179	122	628
	DCL4805	137	209	242	588	307	165	116	588
	DCL4806	144	208	256	608	306	181	121	608
	DCL4807	11	16	22	49	22	16	11	49
	DCL4808	170	242	408	820	348	258	214	820
Total		1,042	1,588	2,348	4,978	2,388	1,525	1,065	4,978
49	DCL4901	97	190	193	480	250	146	84	480
	DCL4902	69	132	134	335	169	104	62	335
	DCL4903	51	98	101	250	125	76	49	250
	DCL4904	181	326	363	870	467	238	165	870
	DCL4905	92	167	169	428	221	125	82	428
	DCL4906	78	142	148	368	187	108	73	368
Total		568	1,055	1,108	2,731	1,419	797	515	2,731
50	DCL5001	174	283	363	820	426	217	177	820
	DCL5002	127	213	237	577	313	151	113	577
	DCL5003	129	213	248	590	316	157	117	590
	DCL5004	151	258	382	791	382	225	184	791
Total		581	967	1,230	2,778	1,437	750	591	2,778
51	DCL5101	99	168	189	456	240	127	89	456
	DCL5102	109	176	191	476	258	127	91	476
	DCL5103	93	164	218	475	235	126	114	475
	DCL5104	107	178	225	510	262	141	107	510
	DCL5105	79	132	154	365	187	103	75	365
Total		487	818	977	2,282	1,182	624	476	2,282
52	DCL5201	11	14	16	41	23	11	7	41
	DCL5202	77	131	148	356	189	97	70	356

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	DCL5203	88	177	251	516	251	174	91	516
	DCL5204	39	68	81	188	90	61	37	188
	DCL5205	44	76	79	199	103	58	38	199
	DCL5206	71	119	142	332	174	93	65	332
Total		330	585	717	1,632	830	494	308	1,632
53	DCL5301	62	98	106	266	135	85	46	266
	DCL5302	72	111	126	309	139	115	55	309
	DCL5303	-	3	1	4	2	2	-	4
	DCL5304	84	140	174	398	169	154	75	398
	DCL5305	67	97	116	280	121	107	52	280
	DCL5306	94	147	167	408	193	142	73	408
	DCL5307	45	63	84	192	93	63	36	192
Total		424	659	774	1,857	852	668	337	1,857
54	DCL5401	304	327	547	1,178	476	421	281	1,178
	DCL5402	165	224	313	702	306	244	152	702
	DCL5403	126	157	213	496	226	178	92	496
	DCL5404	227	276	433	936	401	326	209	936
Total		822	984	1,506	3,312	1,409	1,169	734	3,312
55	DCL5501	74	79	163	316	112	118	86	316
	DCL5502	163	174	280	617	253	226	138	617
	DCL5503	106	134	335	575	188	190	197	575
	DCL5504	163	180	288	631	268	226	137	631
	DCL5505	83	101	194	378	149	125	104	378
	DCL5506	134	157	422	713	218	241	254	713
Total		723	825	1,682	3,230	1,188	1,126	916	3,230
56	DCL5601	73	94	138	305	113	129	63	305
	DCL5602	21	25	37	83	30	35	18	83
	DCL5603	76	132	150	358	148	147	63	358
	DCL5604	43	60	72	175	60	79	36	175
	DCL5605	93	147	284	524	206	214	104	524
Total		306	458	681	1,445	557	604	284	1,445
57	DCL5701	24	42	54	120	42	51	27	120
	DCL5702	43	74	110	227	89	81	57	227
	DCL5703	33	54	63	150	73	47	30	150

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Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	DCL5704	138	233	287	658	292	236	130	658
	DCL5705	40	73	83	196	88	75	33	196
Total		278	476	597	1,351	584	490	277	1,351
58	DCL5801	170	209	339	718	307	230	181	718
	DCL5802	56	68	104	228	101	74	53	228
	DCL5803	135	160	215	510	242	165	103	510
	DCL5804	158	206	358	722	302	231	189	722
	DCL5805	140	182	323	645	269	203	173	645
	DCL5806	129	157	199	485	234	158	93	485
	DCL5807	219	256	330	805	384	259	162	805
	DCL5808	135	174	273	582	254	191	137	582
	DCL5809	0	0	1	1	0	1	0	1
Total		1,142	1,412	2,142	4,696	2,093	1,512	1,091	4,696
59	DCL5901	47	81	148	276	124	97	55	276
	DCL5902	108	132	193	433	195	140	98	433
	DCL5903	151	207	249	607	308	186	113	607
	DCL5904	99	122	151	372	179	120	73	372
	DCL5905	161	204	256	621	300	204	117	621
	DCL5906	1	3	2	6	3	3	0	6
	DCL5907	0	0	0	0	0	0	0	0
Total		567	749	999	2,315	1,109	750	456	2,315
60	DCL6001	108	138	195	441	198	145	98	441
	DCL6002	101	134	213	448	192	148	108	448
	DCL6003	126	185	341	652	261	216	175	652
	DCL6004	102	130	240	472	186	153	133	472
	DCL6005	83	122	286	491	168	153	170	491
	DCL6006	173	241	511	925	337	292	296	925
Total		693	950	1,786	3,429	1,342	1,107	980	3,429
61	DCL6101	107	136	161	404	193	136	75	404
	DCL6102	59	90	133	282	134	97	51	282
	DCL6103	53	69	86	208	105	64	39	208
	DCL6104	32	44	52	128	63	41	24	128
	DCL6105	60	78	94	232	114	74	44	232
	DCL6106	116	144	180	440	212	144	84	440

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
Total		427	561	706	1,694	821	556	317	1,694
62	DCL6201	160	223	272	655	328	201	126	655
	DCL6202	45	71	76	192	97	60	35	192
	DCL6203	100	145	165	410	209	125	76	410
	DCL6204	54	82	95	231	116	70	45	231
	DCL6205	33	54	57	144	76	42	26	144
Total		392	575	665	1,632	826	498	308	1,632
63	DCL6301	10	18	21	49	23	20	6	49
	DCL6302	173	190	286	649	264	257	128	649
	DCL6303	81	95	125	301	133	113	55	301
	DCL6304	53	56	80	189	81	70	38	189
	DCL6305	0	0	0	0	0	0	0	0
Total		317	359	512	1,188	501	460	227	1,188
64	DCL6401	62	71	95	228	102	85	41	228
	DCL6402	93	156	196	445	197	173	75	445
	DCL6403	56	78	108	242	108	94	40	242
	DCL6404	47	53	73	173	75	65	33	173
	DCL6405	50	55	73	178	80	65	33	178
Total		308	413	545	1,266	562	482	222	1,266
65	DCL6501	80	129	280	489	178	174	137	489
	DCL6502	76	143	252	471	194	174	103	471
	DCL6503	165	223	321	709	317	249	143	709
	DCL6504	285	316	468	1,069	467	378	224	1,069
	DCL6505	80	131	263	474	185	169	120	474
Total		686	942	1,584	3,212	1,341	1,144	727	3,212
66	DCL6601	36	76	174	286	121	111	54	286
	DCL6602	57	93	118	268	108	112	48	268
	DCL6603	57	104	165	326	137	131	58	326
	DCL6604	37	77	152	266	110	107	49	266
	DCL6605	65	96	139	300	125	120	55	300
Total		252	446	748	1,446	601	581	264	1,446
67	DCL6701	0	0	0	0	0	0	0	0
	DCL6702	77	94	142	313	130	125	58	313
	DCL6703	118	163	241	522	215	214	93	522

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Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	DCL6704	126	145	207	478	200	188	90	478
	DCL6705	8	7	9	24	9	11	4	24
	DCL6706	0	0	0	0	0	0	0	0
Total		329	409	599	1,337	554	538	245	1,337
68	DCL6801	49	62	83	194	83	76	35	194
	DCL6802	42	61	85	188	80	77	31	188
	DCL6803	73	114	152	339	142	138	59	339
	DCL6804	119	138	175	432	186	167	79	432
	DCL6805	116	125	168	409	173	162	74	409
	DCL6806	0	0	0	0	0	0	0	0
Total		399	500	663	1,562	664	620	278	1,562
69	DCL6901	194	226	314	734	315	286	133	734
	DCL6902	124	150	216	490	206	193	91	490
	DCL6903	269	276	425	970	399	378	193	970
	DCL6904	160	205	304	669	285	261	123	669
Total		747	857	1,259	2,863	1,205	1,118	540	2,863
70	DCL7001	127	165	220	512	223	199	90	512
	DCL7002	76	102	132	310	129	123	58	310
	DCL7003	29	55	78	162	67	67	28	162
	DCL7004	176	224	274	674	287	267	120	674
Total		408	546	704	1,658	706	656	296	1,658
71	DCL7101	84	102	152	338	135	141	62	338
	DCL7102	75	101	129	305	138	115	52	305
	DCL7103	25	48	91	164	72	65	27	164
	DCL7104	124	155	210	489	211	190	88	489
	DCL7105	73	74	113	260	105	104	51	260
Total		381	480	695	1,556	661	615	280	1,556
72	DCL7201	101	107	148	356	143	146	67	356
	DCL7202	39	52	63	154	64	63	27	154
	DCL7203	79	95	120	294	127	114	53	294
	DCL7204	43	65	87	195	85	75	35	195
	DCL7205	9	21	29	59	22	26	11	59
Total		271	340	447	1,058	441	424	193	1,058
73	DCL7301	39	72	99	210	90	87	33	210

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	DCL7302	61	103	136	300	122	128	50	300
	DCL7303	30	47	75	152	63	63	26	152
	DCL7304	34	57	82	173	74	72	27	173
Total		164	279	392	835	349	350	136	835
74	DCL7401	21	19	30	70	28	28	14	70
	DCL7402	188	200	283	671	283	256	132	671
	DCL7403	79	96	136	311	131	122	58	311
	DCL7404	159	156	233	548	225	216	107	548
	DCL7405	59	94	149	302	125	124	53	302
	DCL7406	114	136	179	429	180	170	79	429
Total		620	701	1,010	2,331	972	916	443	2,331
75	DCL7501	96	142	214	452	206	142	104	452
	DCL7502	122	160	230	512	237	169	106	512
	DCL7503	56	85	119	260	115	96	49	260
	DCL7504	82	108	138	328	154	113	61	328
	DCL7505	123	154	236	513	227	168	118	513
Total		479	649	937	2,065	939	688	438	2,065
76	DCL7601	409	377	595	1,381	544	552	285	1,381
	DCL7602	65	62	112	239	96	90	53	239
	DCL7603	244	238	424	906	343	369	194	906
	DCL7604	139	142	275	556	203	220	133	556
Total		857	819	1,406	3,082	1,186	1,231	665	3,082
77	DCL7701	276	304	409	989	456	341	192	989
	DCL7702	54	79	92	225	112	73	40	225
	DCL7703	149	184	253	586	263	207	116	586
	DCL7704	137	167	254	558	248	205	105	558
Total		616	734	1,008	2,358	1,079	826	453	2,358
78	DCL7801	72	74	108	254	109	96	49	254
	DCL7802	114	131	180	425	179	169	77	425
	DCL7803	116	115	180	411	172	161	78	411
	DCL7804	14	23	29	66	25	30	11	66
	DCL7805	58	54	79	191	80	73	38	191
	DCL7806	70	64	107	241	95	95	51	241
Total		444	461	683	1,588	660	624	304	1,588

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Annex

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
79	DCL7901	226	201	331	758	294	304	160	758
	DCL7902	96	86	133	315	126	126	63	315
	DCL7903	132	125	194	451	182	180	89	451
	DCL7904	150	139	216	505	200	205	100	505
	DCL7905	87	118	210	415	169	172	74	415
Total		691	669	1,084	2,444	971	987	486	2,444
80	DCL8001	100	111	188	399	155	163	81	399
	DCL8002	135	121	211	467	178	185	104	467
	DCL8003	124	117	174	415	167	167	81	415
	DCL8004	119	111	166	396	159	159	78	396
Total		478	460	739	1,677	659	674	344	1,677
81	DCL8101	206	226	479	911	330	334	247	911
	DCL8102	158	172	288	618	244	244	130	618
	DCL8103	196	180	291	667	263	265	139	667
	DCL8104	101	108	158	367	155	142	70	367
	DCL8105	170	177	391	738	248	275	215	738
Total		831	863	1,607	3,301	1,240	1,260	801	3,301
82	DCL8201	200	171	286	657	249	273	135	657
	DCL8202	89	85	139	313	124	129	60	313
	DCL8203	89	100	154	343	141	128	74	343
	DCL8204	110	114	224	448	165	183	100	448
	DCL8205	117	112	200	429	154	176	99	429
	DCL8206	101	101	184	386	142	154	90	386
Total		706	683	1,187	2,576	975	1,043	558	2,576
83	DCL8301	284	304	604	1,192	441	433	318	1,192
	DCL8302	64	94	168	326	134	113	79	326
	DCL8303	237	248	424	909	380	357	172	909
	DCL8304	151	187	327	665	274	241	150	665
Total		2,148	2,199	3,897	8,244	3,179	3,230	1,835	3,092
84	DCL8401	231	256	430	917	375	336	206	917
	DCL8402	142	129	230	501	184	202	115	501
	DCL8403	198	218	500	916	299	344	273	916
	DCL8404	253	275	542	1,070	421	416	233	1,070
	DCL8405	81	90	211	382	130	141	111	382

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
Total		905	968	1,913	3,786	1,409	1,439	938	3,786
85	DCL8501	16	23	47	86	31	32	23	86
	DCL8502	266	272	429	967	391	367	209	967
	DCL8503	147	219	540	906	261	303	342	906
	DCL8504	314	328	537	1,179	462	451	266	1,179
	DCL8505	320	347	602	1,269	502	467	300	1,269
Total		1,063	1,189	2,155	4,407	1,647	1,620	1,140	4,407
86	DCL8601	90	104	157	351	148	133	70	351
	DCL8602	192	203	306	701	291	271	139	701
	DCL8603	31	45	97	173	64	69	40	173
	DCL8604	112	95	188	395	141	158	96	395
	DCL8605	206	209	372	787	300	308	179	787
	DCL8606	332	334	589	1,255	471	488	296	1,255
Total		963	990	1,709	3,662	1,415	1,427	820	3,662
87	DCL8701	156	164	293	613	228	233	152	613
	DCL8702	268	286	668	1,222	403	463	356	1,222
	DCL8703	103	94	175	372	139	149	84	372
	DCL8704	329	337	728	1,394	478	536	380	1,394
	DCL8705	195	204	530	929	290	343	296	929
Total		1,051	1,085	2,394	4,530	1,538	1,724	1,268	4,530
88	DCL8801	168	140	288	596	202	240	154	596
	DCL8802	169	134	238	541	192	227	122	541
	DCL8803	243	206	388	837	294	342	201	837
	DCL8804	114	106	240	460	153	179	128	460
	DCL8805	126	102	196	424	147	174	103	424
Total		820	688	1,350	2,858	988	1,162	708	2,858
89	DCL8901	282	221	404	907	321	374	212	907
	DCL8902	325	249	431	1,005	368	424	213	1,005
	DCL8903	293	223	376	892	328	376	188	892
	DCL8904	353	301	605	1,259	436	508	315	1,259
	DCL8905	75	78	173	326	112	127	87	326
Total		1,328	1,072	1,989	4,389	1,565	1,809	1,015	4,389
90	DCL9001	203	221	539	963	311	360	292	963
	DCL9002	381	295	534	1,210	445	498	267	1,210

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Annex

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	DCL9003	50	74	174	298	119	114	65	298
	DCL9004	182	182	374	738	278	286	174	738
	DCL9005	0	1	1	2	1	1	0	2
	DCL9006	268	293	838	1,399	404	496	499	1,399
	DCL9007	53	66	134	253	96	103	54	253
Total		1,137	1,132	2,594	4,863	1,654	1,858	1,351	4,863
Summery		75,192	93,923	157,710	326,825	133,303	113,710	79,812	326,825

Table 44 Number of occupants of Dhaka in Cluster level

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
1	DCL0101	0.548	22,054	30,574	40,244	55,792
	DCL0102	0.632	10,096	10,600	15,975	16,773
	DCL0103	0.253	4,678	5,125	18,492	20,257
	DCL0104	0.44	16,309	18,818	37,067	42,769
	DCL0105	0.275	19,066	17,353	69,332	63,100
	DCL0106	0.432	17,391	16,729	40,256	38,724
	DCL0107	0.364	21,353	16,700	58,662	45,878
	DCL0108	0.403	20,669	14,411	51,288	35,760
	DCL0109	0.294	10,195	6,954	34,677	23,655
	DCL0110	0.508	20,049	20,408	39,466	40,173
	DCL0111	0.555	28,637	25,232	51,598	45,463
	DCL0112	0.372	10,719	11,336	28,815	30,474
	DCL0113	0.523	18,725	22,835	35,803	43,661
Total		5.599	219,941	217,075	39,282	38,770
2	DCL0201	0.155	9,935	15,450	64,097	99,676
	DCL0202	0.602	5,000	6,611	8,306	10,981
	DCL0203	0.158	12,906	16,995	81,684	107,560
	DCL0204	0.227	17,540	23,868	77,270	105,143
	DCL0205	0.129	14,186	18,699	109,970	144,950
	DCL0206	0.157	9,159	7,671	58,337	48,860
	DCL0207	0.152	336	527	2,213	3,467
	DCL0208	0.187	23,233	31,770	124,243	169,892
	DCL0209	0.117	12,842	19,997	109,758	170,911
Total		1.884	105,138	141,585	55,806	75,152
3	DCL0301	0.293	23,421	25,264	79,937	86,226
	DCL0302	0.293	25,142	22,541	85,810	76,932
	DCL0303	0.299	16,539	22,922	55,313	76,662
	DCL0304	0.204	16,690	21,163	81,813	103,739
	DCL0305	0.225	5,280	8,112	23,469	36,053
Total		1.314	87,073	100,002	66,265	76,105
4	DCL0401	0.123	8,338	10,727	67,788	87,214
	DCL0402	0.251	126	110	503	438
	DCL0403	0.176	13,557	13,658	77,026	77,605
	DCL0404	0.324	3,853	3,793	11,893	11,706
	DCL0405	0.118	4,118	4,142	34,902	35,105
	DCL0406	0.132	5,959	8,265	45,145	62,616
Total		1.124	35,952	40,696	31,986	36,207
5	DCL0501	0.181	15,717	16,608	86,835	91,755
	DCL0502	0.115	7,323	6,439	63,674	55,988
	DCL0503	0.072	6,082	9,609	84,466	133,461
	DCL0504	0.083	7,056	8,580	85,006	103,376
	DCL0505	0.071	6,153	9,489	86,668	133,653
	DCL0506	0.044	4,497	7,000	102,214	159,080
	DCL0507	0.09	8,272	11,426	91,915	126,954
	DCL0508	0.102	9,346	13,865	91,628	135,930
	DCL0509	0.084	5,521	8,352	65,723	99,433
	DCL0510	0.215	8,093	12,051	37,643	56,052
	DCL0511	0.133	7,825	9,598	58,837	72,163
Total		1.19	85,885	113,017	72,173	94,972
6	DCL0601	0.487	21,529	22,607	44,207	46,421
	DCL0602	0.284	25,956	36,868	91,393	129,816
	DCL0603	0.101	7,429	3,018	73,554	29,881
	DCL0604	0.078	5,467	4,985	70,093	63,905
	DCL0605	0.098	12,467	19,532	127,213	199,311
	DCL0606	0.238	15,675	22,702	65,860	95,384

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	DCL0607	0.249	13,759	16,334	55,258	65,598
	DCL0608	0.122	7,750	12,097	63,528	99,154
	DCL0609	0.362	17,909	22,796	49,474	62,972
	DCL0610	0.461	24,147	34,157	52,380	74,094
	DCL0611	0.167	10,164	11,623	60,860	69,596
	DCL0612	0.05	3,705	7,288	74,092	145,769
	DCL0613	0.099	16	33	166	331
Total		2.796	165,973	214,039	59,361	76,552
7	DCL0701	0.174	8,360	11,742	48,047	67,485
	DCL0702	0.102	1,181	452	11,582	4,427
	DCL0703	0.204	12,951	17,811	63,487	87,310
	DCL0704	0.058	4,508	6,392	77,723	110,203
	DCL0705	0.126	5,425	6,582	43,052	52,236
	DCL0706	0.114	8,282	10,546	72,650	92,510
	DCL0707	0.092	5,572	540	60,563	5,866
	DCL0708	0.039	4,416	1,271	113,241	32,593
	DCL0709	0.063	4,197	6,250	66,627	99,206
Total		0.972	54,893	61,586	56,474	63,360
8	DCL0801	0.937	1,533	2,080	1,636	2,220
	DCL0802	0.129	10,378	9,389	80,446	72,782
	DCL0803	0.185	19,069	27,878	103,076	150,694
	DCL0804	0.181	16,237	16,149	89,709	89,223
	DCL0805	0.26	8,760	14,257	33,692	54,836
	DCL0806	0.305	16,255	23,634	53,293	77,490
	DCL0807	0.321	5,989	7,619	18,659	23,735
	DCL0808	0.177	10,861	14,152	61,362	79,954
	DCL0809	1.658	1,880	2,308	1,134	1,392
Total		4.153	90,962	117,468	21,903	28,285
9	DCL0901	0.201	3,041	4,410	15,127	21,939
	DCL0902	0.663	4,982	5,686	7,514	8,576
	DCL0903	0.116	8,738	12,962	75,331	111,738
	DCL0904	0.141	10,900	12,608	77,304	89,419
	DCL0905	0.158	10,877	17,025	68,844	107,756
	DCL0906	0.16	10,102	13,725	63,136	85,783

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
Total		1.439	48,639	66,416	33,801	46,154
10	DCL1001	0.264	21,011	32,335	79,586	122,482
	DCL1002	0.394	8,031	11,583	20,383	29,397
	DCL1003	0.454	4,351	5,729	9,584	12,619
	DCL1004	0.135	11,401	14,070	84,455	104,220
	DCL1005	0.142	7,187	8,006	50,609	56,384
	DCL1006	0.22	14,763	19,625	67,104	89,202
	DCL1007	0.254	12,696	16,834	49,986	66,274
	DCL1008	0.264	7,744	7,799	29,334	29,542
Total		2.127	87,184	115,980	40,989	54,528
11	DCL1101	0.39	19,595	25,520	50,243	65,435
	DCL1102	0.361	14,926	16,854	41,346	46,686
	DCL1103	0.309	19,882	25,804	64,344	83,509
	DCL1104	0.131	5,865	5,698	44,770	43,495
Total		1.191	60,268	73,876	50,603	62,028
12	DCL1201	0.162	14,197	12,548	87,634	77,459
	DCL1202	0.08	7,950	9,203	99,380	115,043
	DCL1203	0.198	18,351	25,787	92,681	130,235
	DCL1204	0.121	9,891	6,653	81,745	54,979
	DCL1205	0.17	11,926	17,449	70,151	102,638
	DCL1206	0.109	4,807	4,975	44,098	45,643
Total		0.84	67,121	76,614	79,907	91,208
13	DCL1301	0.375	23,233	26,495	61,956	70,655
	DCL1302	0.236	14,227	21,605	60,284	91,549
	DCL1303	0.395	22,939	34,185	58,074	86,545
	DCL1304	0.338	19,384	27,925	57,348	82,619
	DCL1305	0.392	24,363	38,237	62,151	97,543
	DCL1306	0.288	17,985	29,163	62,448	101,260
	DCL1307	0.288	21,079	33,799	73,191	117,359
	DCL1308	0.234	15,193	23,081	64,926	98,637
	DCL1309	0.221	12,741	19,941	57,654	90,230
	DCL1310	0.255	13,344	21,357	52,328	83,752
Total		3.022	184,489	275,790	61,049	91,261
14	DCL1401	0.322	23,754	30,286	73,771	94,056

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	DCL1402	0.206	13,757	19,467	66,783	94,502
	DCL1403	0.133	10,247	8,085	77,041	60,787
	DCL1404	0.252	18,992	24,436	75,365	96,967
	DCL1405	0.268	17,352	18,796	64,746	70,136
	DCL1406	0.297	20,874	30,907	70,283	104,066
Total		1.478	104,976	131,977	71,026	89,295
15	DCL1501	0.624	8,380	14,441	13,429	23,142
	DCL1502	0.719	12,274	18,971	17,071	26,385
	DCL1503	0.42	10,301	16,542	24,527	39,386
	DCL1504	0.395	12,910	20,533	32,684	51,983
	DCL1505	0.304	12,442	21,217	40,927	69,793
	DCL1506	0.313	10,046	15,408	32,096	49,228
	DCL1507	0.454	24,433	32,918	53,817	72,506
	DCL1508	0.459	20,851	31,379	45,427	68,363
	DCL1509	0.52	14,041	21,457	27,003	41,264
	DCL1510	0.393	15,349	22,064	39,056	56,144
Total		4.601	141,028	214,930	30,652	46,714
16	DCL1601	2.548	531	39	208	15
	DCL1602	0.28	22,748	32,039	81,244	114,426
	DCL1603	0.298	23,858	33,668	80,061	112,981
	DCL1604	0.344	20,475	18,765	59,519	54,549
	DCL1605	0.341	27,335	31,344	80,160	91,919
	DCL1606	0.362	29,915	43,973	82,637	121,474
	DCL1607	0.278	18,628	30,485	67,008	109,658
	DCL1608	0.137	6,008	6,386	43,857	46,617
Total		4.588	149,498	196,701	32,585	42,873
17	DCL1701	0.628	18,018	25,699	28,691	40,922
	DCL1702	0.367	16,720	16,576	45,560	45,166
	DCL1703	0.265	18,439	26,733	69,580	100,881
	DCL1704	0.198	10,909	13,536	55,096	68,362
	DCL1705	0.448	24,806	30,342	55,370	67,727
	DCL1706	0.843	20	41	24	48
	DCL1707	0.571	4,194	5,654	7,345	9,902
	DCL1708	0.396	18,486	24,855	46,681	62,764
	DCL1709	0.64	22,824	29,474	35,663	46,053
	DCL1710	0.497	12,976	21,393	26,109	43,045
	DCL1711	0.608	23,591	30,688	38,801	50,473
	DCL1712	0.306	11,279	17,790	36,859	58,138
	DCL1713	0.432	6,850	10,240	15,857	23,704
Total		6.199	189,112	253,020	30,507	40,816
18	DCL1801	0.425	12,500	12,616	29,411	29,684
	DCL1802	0.42	3,907	2,917	9,302	6,945
	DCL1803	0.116	10,740	14,157	92,590	122,044
	DCL1804	0.189	13,830	20,147	73,173	106,600
	DCL1805	0.069	5,807	5,186	84,162	75,153
	DCL1806	0.184	14,083	18,320	76,536	99,567
Total		1.403	60,867	73,343	43,383	52,276
19	DCL1901	0.467	17,975	29,847	38,491	63,911
	DCL1902	0.466	19,391	15,761	41,612	33,823
	DCL1903	0.531	18,331	14,745	34,521	27,768
	DCL1904	0.333	5,412	6,593	16,251	19,798
	DCL1905	0.375	9,152	8,488	24,405	22,634
	DCL1906	0.297	4,339	3,095	14,610	10,423
	DCL1907	0.347	10,230	6,589	29,480	18,990
	DCL1908	0.368	26,554	12,777	72,159	34,719
	DCL1909	0.379	9,018	6,862	23,795	18,107
	DCL1910	0.491	13,898	9,550	28,306	19,451
	DCL1911	0.398	10,231	7,518	25,706	18,890
	DCL1912	0.244	7,163	3,721	29,355	15,249
	DCL1913	0.343	8,856	9,124	25,818	26,602
	DCL1914	0.24	6,269	4,365	26,120	18,188
Total		5.279	166,819	139,036	31,601	26,338
20	DCL2001	0.359	28,464	26,815	79,287	74,693
	DCL2002	0.364	14,558	17,318	39,994	47,576
	DCL2003	0.379	21,876	30,635	57,719	80,830
	DCL2004	0.402	22,077	26,089	54,917	64,897
	DCL2005	0.349	12,040	6,506	34,498	18,641
Total		1.853	99,014	107,361	53,434	57,939

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
21	DCL2101	0.374	21,294	28,600	56,935	76,472
	DCL2102	0.185	16,508	18,717	89,231	101,171
	DCL2103	0.24	18,127	20,675	75,530	86,146
	DCL2104	0.265	22,641	26,487	85,439	99,951
	DCL2105	0.286	20,726	31,603	72,468	110,499
	DCL2106	0.247	307	155	1,243	626
Total		1.597	99,603	126,237	62,369	79,046
22	DCL2201	0.258	23,218	30,017	89,991	116,345
	DCL2202	0.32	22,699	31,120	70,935	97,249
	DCL2203	0.377	23,879	32,335	63,339	85,769
	DCL2204	0.369	32,653	41,448	88,490	112,326
	DCL2205	0.247	18,728	29,807	75,821	120,676
Total		1.571	121,176	164,727	77,133	104,855
23	DCL2301	0.29	19,197	25,399	66,195	87,584
	DCL2302	0.154	11,448	12,029	74,338	78,109
	DCL2303	0.13	11,586	10,072	89,121	77,475
	DCL2304	0.197	11,642	17,362	59,098	88,130
Total		0.771	53,873	64,862	69,874	84,127
24	DCL2401	0.229	18,294	17,779	79,887	77,637
	DCL2402	0.164	19,177	21,706	116,933	132,356
	DCL2403	0.215	17,936	24,342	83,424	113,221
	DCL2404	0.197	14,836	15,989	75,312	81,164
Total		0.805	70,244	79,817	87,259	99,152
25	DCL2501	0.205	17,896	23,917	87,299	116,669
	DCL2502	0.157	6,558	9,550	41,770	60,826
	DCL2503	0.113	13,005	18,902	115,087	167,276
	DCL2504	0.171	15,248	20,218	89,171	118,232
	DCL2505	0.229	16,628	26,710	72,613	116,636
	DCL2506	0.111	9,678	14,571	87,188	131,269
Total		0.986	79,013	113,867	80,135	115,484
26	DCL2601	0.293	6,956	10,159	23,740	34,673
	DCL2602	0.276	10,322	14,042	37,399	50,877
	DCL2603	0.447	8,099	10,764	18,118	24,080
	DCL2604	0.278	11,761	16,649	42,305	59,890
	DCL2605	0.271	12,617	17,679	46,558	65,235
	DCL2606	0.407	18,851	28,438	46,318	69,873
Total		1.972	68,606	97,731	34,790	49,559
27	DCL2701	0.307	25,275	31,641	82,330	103,066
	DCL2702	0.202	16,233	21,348	80,359	105,681
	DCL2703	0.222	20,318	26,842	91,521	120,911
	DCL2704	0.159	14,394	17,956	90,529	112,931
Total		0.89	76,220	97,787	85,640	109,873
28	DCL2801	0.234	10,090	15,382	43,119	65,734
	DCL2802	0.191	20,614	21,397	107,927	112,028
	DCL2803	0.194	16,415	22,721	84,614	117,120
	DCL2804	0.182	10,773	16,516	59,194	90,745
	DCL2805	0.141	7,529	8,410	53,399	59,642
Total		0.942	65,422	84,426	69,450	89,624
29	DCL2901	0.141	10,179	13,739	72,189	97,441
	DCL2902	0.153	19,718	15,204	128,875	99,373
	DCL2903	0.14	20,181	26,437	144,150	188,835
	DCL2904	0.076	9,144	13,304	120,313	175,052
	DCL2905	0.078	9,449	12,878	121,136	165,104
Total		0.588	68,670	81,562	116,786	138,711
30	DCL3001	0.092	9,851	16,788	107,080	182,477
	DCL3002	0.124	6,621	11,160	53,392	89,999
	DCL3003	0.082	4,829	7,328	58,886	89,367
	DCL3004	0.137	12,249	19,829	89,407	144,734
Total		0.435	33,549	55,104	77,125	126,677
31	DCL3101	0.574	7,103	2,205	12,375	3,842
	DCL3102	0.155	12,984	17,840	83,766	115,097
	DCL3103	0.106	11,967	8,873	112,896	83,712
	DCL3104	0.096	12,546	16,440	130,683	171,254
Total		0.931	44,600	45,359	47,905	48,721
32	DCL3201	0.298	18,669	3,673	62,647	12,324
	DCL3202	0.191	11,906	3,102	62,333	16,240
	DCL3203	0.255	144	8	565	31
	DCL3204	0.097	14,725	7,519	151,804	77,517

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	DCL3205	0.175	22,741	17,706	129,947	101,179
Total		1.016	68,184	32,008	67,110	31,504
33	DCL3301	0.149	7,005	6,395	47,014	42,920
	DCL3302	0.095	5,297	3,749	55,763	39,468
	DCL3303	0.099	4,065	3,751	41,056	37,893
	DCL3304	0.09	3,669	3,372	40,772	37,465
Total		0.433	20,037	17,268	46,274	39,879
34	DCL3401	0.254	10,724	8,557	42,221	33,690
	DCL3402	0.155	16,561	20,810	106,844	134,260
	DCL3403	0.235	22,930	31,512	97,574	134,093
	DCL3404	0.136	7,905	8,297	58,127	61,005
Total		0.78	58,120	69,176	74,513	88,687
35	DCL3501	0.147	16,816	24,911	114,396	169,462
	DCL3502	0.111	9,551	14,465	86,045	130,313
	DCL3503	0.119	9,857	11,443	82,833	96,157
	DCL3504	0.12	10,884	12,367	90,701	103,058
Total		0.497	47,108	63,185	94,786	127,134
36	DCL3601	0.43	30,850	30,939	71,744	71,950
	DCL3602	0.309	3,744	1,238	12,116	4,008
	DCL3603	0.412	32,022	25,746	77,724	62,491
	DCL3604	0.134	144	8	1,075	60
Total		1.285	66,760	57,931	51,953	45,083
37	DCL3701	0.486	18,455	9,340	37,973	19,217
	DCL3702	0.264	49	77	184	291
	DCL3703	0.44	12,240	4,984	27,817	11,327
	DCL3704	0.258	10,589	3,732	41,043	14,465
	DCL3705	0.48	19,061	23,402	39,711	48,753
	DCL3706	0.419	15,912	5,509	37,977	13,147
	DCL3707	0.296	7,952	4,653	26,865	15,719
	DCL3708	0.438	14,291	5,942	32,628	13,567
Total		3.081	98,549	57,637	31,986	18,707
38	DCL3801	0.235	14,250	18,623	60,638	79,249
	DCL3802	0.347	11	23	33	65
	DCL3803	0.294	22,202	29,574	75,518	100,592
	DCL3804	0.225	23,961	27,105	106,492	120,466
Total		1.101	60,424	75,325	54,881	68,415
39	DCL3901	0.333	21,192	14,871	63,640	44,656
	DCL3902	0.329	21,674	27,732	65,878	84,291
	DCL3903	0.246	10,141	2,918	41,223	11,861
	DCL3904	0.254	14,872	13,042	58,550	51,346
Total		1.162	67,879	58,562	58,415	50,398
40	DCL4001	1.533	795	855	519	558
	DCL4002	0.298	13,963	16,969	46,856	56,942
	DCL4003	0.501	4,293	3,345	8,569	6,677
	DCL4004	0.324	18,655	25,540	57,578	78,827
	DCL4005	0.399	28,614	5,959	71,715	14,934
	DCL4006	0.253	15,806	21,350	62,473	84,389
	DCL4007	0.132	6,640	2,118	50,305	16,045
Total		3.44	88,767	76,136	25,804	22,133
41	DCL4101	0.249	14,683	19,680	58,969	79,035
	DCL4102	0.28	6,896	3,161	24,629	11,289
	DCL4103	0.226	4,513	1,455	19,969	6,436
	DCL4104	0.224	5,033	7,902	22,469	35,276
Total		0.979	31,126	32,197	31,793	32,888
42	DCL4201	0.124	9,543	12,269	76,960	98,942
	DCL4202	0.217	19,461	23,105	89,683	106,476
	DCL4203	0.116	11,167	10,390	96,267	89,572
	DCL4204	0.149	9,997	14,001	67,093	93,965
Total		0.606	50,168	59,765	82,786	98,622
43	DCL4301	0.343	13,959	19,754	40,696	57,591
	DCL4302	0.357	21,204	27,851	59,395	78,013
	DCL4303	0.206	15,566	17,694	75,563	85,895
	DCL4304	0.252	17,463	27,096	69,297	107,525
	DCL4305	0.296	10,693	12,973	36,126	43,829
	DCL4306	0.132	5,364	7,379	40,635	55,902
	DCL4307	0.103	3,877	5,867	37,642	56,965
Total		1.689	88,126	118,615	52,176	70,228
44	DCL4401	0.125	11,534	13,497	92,276	107,978

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	DCL4402	0.151	10,909	16,622	72,246	110,079
	DCL4403	0.099	9,729	13,865	98,275	140,054
	DCL4404	0.084	6,687	8,433	79,602	100,389
	DCL4405	0.093	8,819	10,086	94,823	108,448
Total		0.552	47,678	62,503	86,373	113,230
45	DCL4501	0.341	17,392	17,159	51,002	50,321
	DCL4502	0.059	3,833	5,089	64,970	86,249
	DCL4503	0.083	5,693	7,515	68,587	90,540
	DCL4504	0.209	13,432	11,720	64,267	56,076
	DCL4505	0.223	4,949	606	22,192	2,718
	DCL4506	0.214	12,252	7,602	57,251	35,524
	DCL4507	0.212	11,096	11,973	52,338	56,475
Total		1.341	68,645	61,664	51,190	45,983
46	DCL4601	2.33	2,281	2,881	979	1,237
	DCL4602	0.285	10,627	15,127	37,287	53,077
	DCL4603	0.274	18,584	27,988	67,825	102,147
	DCL4604	0.245	19,526	26,992	79,699	110,171
	DCL4605	0.365	28,919	37,892	79,229	103,813
	DCL4606	0.426	16,727	25,498	39,266	59,853
	DCL4607	1.516	8,831	8,405	5,825	5,544
Total		5.441	105,495	144,782	19,389	26,610
47	DCL4701	0.252	7,568	11,587	30,031	45,978
	DCL4702	0.138	12,955	19,729	93,879	142,963
	DCL4703	0.127	8,782	10,539	69,147	82,985
	DCL4704	0.054	4,613	6,112	85,426	113,176
	DCL4705	0.109	9,720	12,179	89,178	111,729
	DCL4706	0.319	419	231	1,313	725
	DCL4707	0.127	10,281	13,842	80,952	108,993
	DCL4708	0.155	2,760	2,230	17,803	14,385
Total		1.281	57,097	76,447	44,572	59,678
48	DCL4801	0.215	18,313	26,456	85,176	123,050
	DCL4802	0.285	21,966	6,837	77,075	23,991
	DCL4803	0.108	9,058	12,246	83,875	113,392
	DCL4804	0.122	10,489	15,982	85,976	131,003

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	DCL4805	0.181	12,397	16,294	68,492	90,024
	DCL4806	0.113	11,190	14,825	99,024	131,191
	DCL4807	0.157	2,138	1,271	13,620	8,099
	DCL4808	0.174	13,637	14,529	78,371	83,500
Total		1.355	99,189	108,441	73,202	80,030
49	DCL4901	0.467	24,479	13,204	52,418	28,274
	DCL4902	0.37	12,497	9,749	33,777	26,349
	DCL4903	0.268	11,463	6,637	42,773	24,767
	DCL4904	0.354	23,224	19,304	65,605	54,531
	DCL4905	0.392	17,679	12,488	45,100	31,858
	DCL4906	0.4	14,048	11,731	35,119	29,326
Total		2.251	103,391	73,114	45,931	32,480
50	DCL5001	0.16	12,845	18,773	80,279	117,333
	DCL5002	0.183	10,634	15,537	58,109	84,901
	DCL5003	0.135	11,528	13,988	85,391	103,611
	DCL5004	0.188	15,368	16,300	81,743	86,702
Total		0.666	50,374	64,598	75,637	96,994
51	DCL5101	0.16	12,483	13,005	78,019	81,283
	DCL5102	0.167	9,496	12,075	56,862	72,308
	DCL5103	0.153	8,624	11,391	56,368	74,448
	DCL5104	0.124	9,870	10,416	79,593	84,002
	DCL5105	0.219	10,958	9,066	50,038	41,399
Total		0.823	51,431	55,954	62,492	67,988
52	DCL5201	0.646	578	864	895	1,337
	DCL5202	0.224	7,198	9,592	32,133	42,824
	DCL5203	0.271	25,587	9,812	94,418	36,207
	DCL5204	0.341	9,610	6,061	28,180	17,775
	DCL5205	0.086	5,304	5,515	61,670	64,127
	DCL5206	0.125	7,082	8,442	56,656	67,532
Total		1.693	55,358	40,286	32,698	23,796
53	DCL5301	0.196	9,451	9,754	48,217	49,767
	DCL5302	0.202	12,655	9,762	62,648	48,326
	DCL5303	0.564	186	75	330	132
	DCL5304	0.301	15,689	8,841	52,124	29,371

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	DCL5305	0.238	13,745	8,258	57,753	34,700
	DCL5306	0.246	17,395	12,775	70,711	51,931
	DCL5307	0.082	4,773	5,337	58,202	65,084
Total		1.829	73,893	54,802	40,401	29,963
54	DCL5401	0.236	19,432	29,605	82,338	125,447
	DCL5402	0.37	22,562	21,672	60,977	58,572
	DCL5403	0.159	14,083	14,304	88,573	89,963
	DCL5404	0.301	19,216	27,131	63,841	90,135
Total		1.066	75,293	92,712	70,631	86,972
55	DCL5501	0.114	7,605	6,722	66,709	58,962
	DCL5502	0.133	17,303	18,090	130,097	136,014
	DCL5503	0.221	8,247	12,802	37,315	57,926
	DCL5504	0.122	17,675	18,929	144,880	155,153
	DCL5505	0.101	7,980	10,982	79,006	108,731
	DCL5506	0.138	9,663	15,035	70,018	108,949
Total		0.829	68,472	82,559	82,596	99,588
56	DCL5601	0.539	9,954	4,724	18,467	8,764
	DCL5602	0.539	2,655	1,450	4,927	2,690
	DCL5603	0.22	12,993	8,577	59,057	38,987
	DCL5604	0.378	8,265	2,611	21,864	6,908
	DCL5605	0.419	24,101	9,943	57,520	23,731
Total		2.095	57,968	27,305	27,669	13,033
57	DCL5701	0.378	9,758	2,252	25,815	5,957
	DCL5702	0.244	7,410	5,661	30,370	23,203
	DCL5703	0.435	22,595	16,213	51,942	37,271
	DCL5704	0.411	15,730	9,049	38,273	22,018
	DCL5705	0.361	13,714	7,063	37,990	19,564
Total		1.829	69,208	40,238	37,839	22,000
58	DCL5801	0.117	8,938	14,381	76,390	122,917
	DCL5802	0.054	3,827	4,813	70,867	89,133
	DCL5803	0.058	7,046	11,005	121,485	189,741
	DCL5804	0.184	9,104	13,571	49,476	73,758
	DCL5805	0.08	8,797	12,516	109,962	156,456
	DCL5806	0.093	8,809	10,897	94,715	117,177
	DCL5807	0.129	11,327	18,175	87,810	140,891
	DCL5808	0.105	9,364	11,257	89,184	107,206
	DCL5809	0.078	0	0	0	0
Total		0.898	67,211	96,617	74,846	107,591
59	DCL5901	0.05	5,021	4,341	100,419	86,828
	DCL5902	0.057	6,663	9,205	116,901	161,496
	DCL5903	0.159	12,281	16,818	77,237	105,772
	DCL5904	0.048	6,354	8,804	132,378	183,409
	DCL5905	0.09	11,165	13,981	124,057	155,341
	DCL5906	0.096	239	98	2,493	1,023
	DCL5907	0.085	0	0	0	0
Total		0.585	41,724	53,247	71,323	91,020
60	DCL6001	0.053	7,776	9,269	146,717	174,886
	DCL6002	0.068	8,908	8,528	130,999	125,412
	DCL6003	0.104	10,985	11,234	105,624	108,021
	DCL6004	0.061	5,331	8,232	87,400	134,950
	DCL6005	0.057	4,655	7,694	81,660	134,984
	DCL6006	0.079	12,189	15,395	154,292	194,875
Total		0.422	49,844	60,352	118,114	143,015
61	DCL6101	0.051	8,430	9,249	165,286	181,361
	DCL6102	0.111	6,494	5,746	58,508	51,768
	DCL6103	0.031	4,038	5,460	130,266	176,134
	DCL6104	0.03	3,230	3,133	107,682	104,440
	DCL6105	0.04	5,269	5,788	131,714	144,707
	DCL6106	0.05	7,325	9,911	146,509	198,223
Total		0.313	34,787	39,288	111,140	125,522
62	DCL6201	0.159	12,190	15,540	76,665	97,737
	DCL6202	0.307	10,535	6,616	34,315	21,549
	DCL6203	0.094	10,205	11,253	108,564	119,715
	DCL6204	0.193	8,835	6,252	45,777	32,394
	DCL6205	0.146	5,340	4,342	36,578	29,739
Total		0.899	47,105	44,003	52,397	48,946
63	DCL6301	0.122	4,827	4,950	39,567	40,577
	DCL6302	0.138	14,820	14,990	107,394	108,626

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	DCL6303	0.111	7,970	9,027	71,804	81,327
	DCL6304	0.089	4,260	5,609	47,866	63,028
	DCL6305	0.011	0	0	0	0
Total		0.471	31,878	34,577	67,681	73,413
64	DCL6401	0.036	5,121	6,573	142,253	182,594
	DCL6402	0.07	15,205	9,738	217,216	139,113
	DCL6403	0.043	6,726	6,272	156,426	145,855
	DCL6404	0.026	3,365	4,667	129,429	179,490
	DCL6405	0.029	4,759	5,536	164,095	190,906
Total		0.204	35,176	32,786	172,433	160,716
65	DCL6501	0.069	7,246	6,206	105,019	89,949
	DCL6502	0.114	11,414	7,374	100,123	64,688
	DCL6503	0.12	13,920	14,777	116,001	123,144
	DCL6504	0.111	14,564	20,886	131,208	188,160
	DCL6505	0.064	10,935	7,246	170,858	113,212
Total		0.478	58,079	56,489	121,505	118,179
66	DCL6601	0.081	8,850	4,081	109,264	50,384
	DCL6602	0.111	11,161	7,322	100,554	65,962
	DCL6603	0.065	11,533	5,119	177,438	78,753
	DCL6604	0.074	7,376	3,272	99,682	44,212
	DCL6605	0.053	8,160	5,907	153,955	111,456
Total		0.384	47,081	25,701	122,608	66,929
67	DCL6701	0.117	0	0	0	0
	DCL6702	0.105	10,883	8,106	103,648	77,200
	DCL6703	0.108	14,734	10,193	136,423	94,377
	DCL6704	0.084	11,682	12,102	139,068	144,066
	DCL6705	0.014	439	428	31,340	30,540
	DCL6706	0.02	0	0	0	0
Total		0.448	37,737	30,828	84,235	68,812
68	DCL6801	0.051	5,372	5,128	105,329	100,557
	DCL6802	0.044	6,997	3,618	159,028	82,231
	DCL6803	0.066	10,864	6,390	164,608	96,816
	DCL6804	0.044	10,367	12,231	235,610	277,970
	DCL6805	0.053	10,845	11,149	204,630	210,351
	DCL6806	0.008	0	0	0	0
Total		0.266	44,445	38,516	167,088	144,796
69	DCL6901	0.122	17,946	19,805	147,097	162,334
	DCL6902	0.079	14,009	11,524	177,324	145,869
	DCL6903	0.133	20,531	23,677	154,371	178,023
	DCL6904	0.109	16,408	15,424	150,531	141,500
Total		0.443	68,894	70,429	155,516	158,982
70	DCL7001	0.082	15,631	12,677	190,622	154,603
	DCL7002	0.058	9,007	6,641	155,286	114,492
	DCL7003	0.085	10,185	2,035	119,819	23,938
	DCL7004	0.115	16,628	16,897	144,589	146,934
Total		0.34	51,450	38,250	151,324	112,501
71	DCL7101	0.054	7,308	6,333	135,338	117,281
	DCL7102	0.044	8,745	8,520	198,747	193,639
	DCL7103	0.044	4,330	2,216	98,402	50,374
	DCL7104	0.067	13,825	12,220	206,349	182,382
	DCL7105	0.044	5,671	6,346	128,891	144,235
Total		0.253	39,879	35,636	157,626	140,852
72	DCL7201	0.047	7,896	8,421	167,992	179,175
	DCL7202	0.036	4,439	3,685	123,319	102,356
	DCL7203	0.038	7,757	7,859	204,141	206,815
	DCL7204	0.043	8,271	4,978	192,341	115,777
	DCL7205	0.041	2,520	517	61,466	12,606
Total		0.205	30,883	25,460	150,650	124,197
73	DCL7301	0.103	11,939	3,777	115,911	36,670
	DCL7302	0.116	20,852	5,194	179,763	44,779
	DCL7303	0.076	10,532	2,138	138,584	28,126
	DCL7304	0.074	12,652	2,423	170,967	32,742
Total		0.369	55,975	13,532	151,695	36,671
74	DCL7401	0.015	2,203	1,928	146,867	128,516
	DCL7402	0.1	15,184	17,777	151,835	177,771
	DCL7403	0.049	11,517	7,256	235,036	148,090
	DCL7404	0.075	14,933	12,394	199,106	165,252
	DCL7405	0.084	18,413	4,021	219,203	47,864

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	DCL7406	0.082	13,810	9,806	168,410	119,589
Total		0.405	76,059	53,182	187,800	131,313
75	DCL7501	0.125	9,241	11,556	73,924	92,446
	DCL7502	0.079	8,652	11,913	109,516	150,799
	DCL7503	0.133	9,256	5,067	69,596	38,099
	DCL7504	0.115	8,753	8,431	76,111	73,315
	DCL7505	0.09	8,031	11,599	89,236	128,876
Total		0.542	43,933	48,566	81,056	89,605
76	DCL7601	0.25	29,395	35,170	117,581	140,681
	DCL7602	0.071	4,241	6,294	59,731	88,655
	DCL7603	0.156	16,867	19,037	108,122	122,032
	DCL7604	0.068	9,933	10,928	146,072	160,707
Total		0.545	60,436	71,430	110,892	131,064
77	DCL7701	0.124	21,123	25,838	170,347	208,371
	DCL7702	0.08	6,087	7,393	76,089	92,417
	DCL7703	0.145	12,815	15,311	88,377	105,591
	DCL7704	0.071	17,337	10,995	244,190	154,855
Total		0.42	57,362	59,537	136,577	141,754
78	DCL7801	0.045	6,634	7,283	147,424	161,847
	DCL7802	0.073	14,055	11,455	192,535	156,914
	DCL7803	0.045	8,514	10,622	189,194	236,042
	DCL7804	0.052	6,901	1,424	132,703	27,387
	DCL7805	0.035	4,953	5,627	141,516	160,784
	DCL7806	0.042	4,887	5,422	116,350	129,089
Total		0.292	45,943	41,833	157,339	143,264
79	DCL7901	0.098	17,449	18,480	178,048	188,568
	DCL7902	0.043	5,812	7,894	135,152	183,582
	DCL7903	0.068	9,349	11,574	137,481	170,210
	DCL7904	0.073	11,933	12,539	163,471	171,769
	DCL7905	0.089	18,869	6,847	212,007	76,933
Total		0.371	63,411	57,334	170,919	154,540
80	DCL8001	0.06	10,118	7,667	168,628	127,777
	DCL8002	0.067	7,831	11,409	116,882	170,277
	DCL8003	0.064	8,231	10,848	128,612	169,505
	DCL8004	0.054	7,196	10,198	133,266	188,843
Total		0.245	33,376	40,121	136,230	163,759
81	DCL8101	0.155	14,771	19,561	95,295	126,197
	DCL8102	0.086	12,373	13,148	143,868	152,889
	DCL8103	0.097	12,706	16,263	130,986	167,662
	DCL8104	0.078	10,349	9,759	132,681	125,114
	DCL8105	0.127	12,371	14,741	97,412	116,067
Total		0.543	62,569	73,472	115,229	135,307
82	DCL8201	0.084	10,202	14,940	121,455	177,863
	DCL8202	0.049	6,293	7,025	128,429	143,365
	DCL8203	0.067	7,604	9,545	113,499	142,457
	DCL8204	0.085	8,060	8,125	94,819	95,592
	DCL8205	0.1	6,855	8,846	68,546	88,456
	DCL8206	0.049	6,747	8,252	137,702	168,417
Total		0.434	45,761	56,733	105,441	130,722
83	DCL8301	0.176	16,980	23,811	96,475	135,288
	DCL8302	0.112	8,177	7,315	73,006	65,311
	DCL8303	0.126	16,879	19,070	133,964	151,347
	DCL8304	0.132	13,247	15,057	100,356	114,071
Total		0.546	55,283	65,253	101,250	119,510
84	DCL8401	0.175	19,444	24,389	111,109	139,367
	DCL8402	0.063	7,622	10,865	120,983	172,468
	DCL8403	0.174	13,209	16,253	75,912	93,410
	DCL8404	0.138	21,624	21,242	156,696	153,928
	DCL8405	0.166	6,307	7,483	37,991	45,077
Total		0.716	68,205	80,233	95,259	112,057
85	DCL8501	0.261	1,111	1,253	4,258	4,803
	DCL8502	0.128	16,282	21,073	127,205	164,632
	DCL8503	0.211	9,569	12,993	45,351	61,576
	DCL8504	0.15	22,057	24,518	147,044	163,451
	DCL8505	0.157	18,334	26,477	116,777	168,643
Total		0.907	67,353	86,314	74,259	95,164
86	DCL8601	0.143	10,058	8,879	70,335	62,090
	DCL8602	0.127	17,966	18,882	141,466	148,681

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	DCL8603	0.141	5,346	1,977	37,914	14,018
	DCL8604	0.142	5,606	8,246	39,482	58,073
	DCL8605	0.099	14,157	17,835	143,000	180,148
	DCL8606	0.182	25,434	28,749	139,745	157,964
Total		0.834	78,567	84,568	94,205	101,401
87	DCL8701	0.143	11,202	14,200	78,335	99,301
	DCL8702	0.14	17,124	22,550	122,314	161,071
	DCL8703	0.062	5,226	7,945	84,291	128,137
	DCL8704	0.158	20,908	26,687	132,332	168,904
	DCL8705	0.141	11,092	15,388	78,670	109,135
Total		0.644	65,553	86,769	101,790	134,735
88	DCL8801	0.075	7,767	11,733	103,554	156,437
	DCL8802	0.084	8,045	11,529	95,774	137,246
	DCL8803	0.101	11,640	16,854	115,246	166,869
	DCL8804	0.133	6,361	7,228	47,829	54,343
	DCL8805	0.066	5,609	8,644	84,980	130,970
Total		0.459	39,421	55,987	85,885	121,976
89	DCL8901	0.196	13,048	19,395	66,572	98,955
	DCL8902	0.12	13,488	21,574	112,397	179,786
	DCL8903	0.128	12,912	20,261	100,874	158,292
	DCL8904	0.15	18,321	25,925	122,141	172,830
	DCL8905	0.075	5,603	4,317	74,712	57,563
Total		0.669	63,372	91,473	94,727	136,731
90	DCL9001	0.114	12,297	15,778	107,869	138,407
	DCL9002	0.191	17,754	26,205	92,955	137,199
	DCL9003	0.065	8,941	3,589	137,547	55,223
	DCL9004	0.095	13,160	14,708	138,528	154,825
	DCL9005	0.045	211	41	4,685	915
	DCL9006	0.192	13,776	21,998	71,752	114,573
	DCL9007	0.051	8,044	3,626	157,720	71,088
Total		0.753	74,183	85,946	98,517	114,138
Summary		119.963	6,457,488	7,279,666	53,829	60,683

Table 45 Vulnerability factors of Dhaka in Cluster level

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
1	DCL0101	390	295	243	205	2	706
	DCL0102	99	75	61	51	0	178
	DCL0103	75	56	46	39	0	135
	DCL0104	218	164	134	112	1	390
	DCL0105	194	146	120	101	1	348
	DCL0106	204	155	128	108	1	372
	DCL0107	214	163	135	115	1	392
	DCL0108	177	134	110	93	1	321
	DCL0109	86	65	54	46	0	156
	DCL0110	256	194	160	136	1	467
	DCL0111	311	235	194	164	2	564
	DCL0112	138	104	86	72	1	249
	DCL0113	263	198	163	136	1	471
Total		2,625	1,984	1,635	1,378	14	324
2	DCL0201	172	132	110	96	1	95
	DCL0202	48	37	32	29	0	513
	DCL0203	257	202	171	155	2	634
	DCL0204	321	251	213	191	2	494
	DCL0205	251	196	166	149	2	160
	DCL0206	84	65	54	48	0	11
	DCL0207	6	4	4	3	0	894
	DCL0208	453	354	300	269	3	471
	DCL0209	246	191	160	140	1	552
Total		1,837	1,433	1,210	1,079	11	3,824
3	DCL0301	286	222	187	165	2	526
	DCL0302	274	212	178	157	2	641
	DCL0303	322	253	215	193	2	558
	DCL0304	283	221	187	168	2	192
	DCL0305	98	76	64	58	1	285
Total		1,263	985	831	740	8	2,202
4	DCL0401	150	116	97	84	1	2
	DCL0402	1	1	1	1	0	390
	DCL0403	202	157	132	116	1	55
	DCL0404	29	22	19	16	0	40

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
	DCL0405	21	16	14	12	0	203
	DCL0406	105	81	68	61	1	358
Total		508	393	330	290	3	1,048
5	DCL0501	182	142	120	108	1	145
	DCL0502	77	59	50	43	0	259
	DCL0503	134	104	88	77	1	205
	DCL0504	106	82	69	61	1	277
	DCL0505	142	111	93	83	1	135
	DCL0506	68	53	45	41	0	342
	DCL0507	174	136	115	103	1	364
	DCL0508	189	147	123	109	1	229
	DCL0509	116	91	77	69	1	310
	DCL0510	159	124	104	93	1	201
	DCL0511	102	80	67	60	1	434
Total		1,450	1,129	952	847	9	2,901
6	DCL0601	225	174	147	129	1	946
	DCL0602	482	377	318	284	3	47
	DCL0603	24	19	16	14	0	126
	DCL0604	66	51	43	38	0	584
	DCL0605	299	233	197	175	2	614
	DCL0606	319	248	208	183	2	390
	DCL0607	203	157	132	116	1	279
	DCL0608	142	111	94	84	1	542
	DCL0609	284	219	184	161	2	643
	DCL0610	338	261	218	191	2	274
	DCL0611	144	111	93	81	1	8
	DCL0612	4	3	3	2	0	0
	DCL0613	0	0	0	0	0	341
Total		2,530	1,964	1,652	1,460	15	4,794
7	DCL0701	183	140	116	100	1	9
	DCL0702	4	4	3	3	0	524
	DCL0703	280	215	179	154	2	215
	DCL0704	113	87	73	64	1	192
	DCL0705	104	79	66	56	1	287
	DCL0706	155	118	98	84	1	16

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
	DCL0707	8	6	5	5	0	29
	DCL0708	15	12	10	9	0	185
	DCL0709	99	76	63	54	1	60
Total		962	737	613	530	5	1,517
8	DCL0801	31	24	20	18	0	236
	DCL0802	125	96	80	70	1	868
	DCL0803	451	350	294	259	3	434
	DCL0804	228	176	147	129	1	298
	DCL0805	155	120	101	89	1	589
	DCL0806	306	237	199	176	2	159
	DCL0807	82	64	54	48	1	365
	DCL0808	189	147	123	109	1	62
	DCL0809	32	25	21	19	0	62
Total		1,599	1,239	1,039	915	10	3,073
9	DCL0901	32	25	21	19	0	21
	DCL0902	11	8	7	6	0	403
	DCL0903	203	159	135	121	1	337
	DCL0904	171	134	113	101	1	442
	DCL0905	224	175	148	133	1	426
	DCL0906	215	169	143	128	1	900
Total		856	670	567	508	5	2,529
10	DCL1001	457	357	302	270	3	142
	DCL1002	74	57	48	42	0	155
	DCL1003	78	61	52	47	0	391
	DCL1004	200	156	131	117	1	173
	DCL1005	90	69	58	51	1	591
	DCL1006	300	235	198	177	2	436
	DCL1007	224	174	147	130	1	176
	DCL1008	91	71	59	53	1	728
Total		1,513	1,180	996	888	9	2,792
11	DCL1101	386	297	248	215	2	360
	DCL1102	197	150	124	105	1	698
	DCL1103	370	285	238	207	2	122
	DCL1104	67	51	42	36	0	221
Total		1,020	782	651	563	6	1,401

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
12	DCL1201	117	90	75	66	1	254
	DCL1202	131	102	86	76	1	729
	DCL1203	374	291	246	218	2	124
	DCL1204	66	51	42	37	0	439
	DCL1205	229	177	149	131	1	84
	DCL1206	45	35	29	25	0	661
Total		962	746	626	552	6	2,291
13	DCL1301	350	269	225	196	2	597
	DCL1302	314	242	203	177	2	981
	DCL1303	514	397	333	292	3	822
	DCL1304	430	333	279	244	3	1007
	DCL1305	533	410	343	298	3	822
	DCL1306	433	334	279	244	3	983
	DCL1307	514	397	333	292	3	641
	DCL1308	338	261	218	190	2	508
	DCL1309	269	207	173	150	2	579
	DCL1310	306	236	197	172	2	753
Total		4,001	3,086	2,581	2,256	23	7,693
14	DCL1401	393	304	255	224	2	517
	DCL1402	269	208	175	154	2	176
	DCL1403	93	72	60	52	1	596
	DCL1404	312	241	202	177	2	436
	DCL1405	229	177	148	130	1	810
	DCL1406	422	327	274	241	3	418
Total		1,719	1,330	1,114	979	10	2,953
15	DCL1501	203	161	138	127	1	509
	DCL1502	247	196	168	155	2	461
	DCL1503	225	178	153	140	2	548
	DCL1504	270	213	182	166	2	581
	DCL1505	284	225	193	177	2	229
	DCL1506	112	89	76	70	1	293
	DCL1507	144	114	97	89	1	840
	DCL1508	413	327	279	255	3	557
	DCL1509	273	216	185	169	2	71
	DCL1510	35	28	24	22	0	0

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
Total		2,206	1,747	1,495	1,369	15	4,089
16	DCL1601	0	0	0	0	0	805
	DCL1602	422	326	273	240	3	857
	DCL1603	444	345	290	256	3	424
	DCL1604	223	172	144	126	1	748
	DCL1605	392	303	254	222	2	1,076
	DCL1606	564	436	365	320	3	802
	DCL1607	417	323	271	239	3	112
	DCL1608	61	46	38	33	0	803
Total		2,523	1,951	1,635	1,436	15	5,627
17	DCL1701	419	324	272	239	2	457
	DCL1702	229	179	152	137	1	719
	DCL1703	362	284	240	216	2	378
	DCL1704	189	148	126	114	1	847
	DCL1705	422	332	282	255	3	1
	DCL1706	1	0	0	0	0	181
	DCL1707	104	77	63	51	0	707
	DCL1708	343	272	234	215	2	577
	DCL1709	318	241	199	168	2	633
	DCL1710	313	247	210	191	2	976
	DCL1711	510	395	331	290	3	571
	DCL1712	298	231	193	170	2	304
	DCL1713	160	123	103	90	1	375
Total		3,667	2,854	2,406	2,139	23	6,726
18	DCL1801	212	159	130	108	1	82
	DCL1802	46	35	28	23	0	403
	DCL1803	210	163	136	120	1	594
	DCL1804	308	239	201	177	2	137
	DCL1805	72	56	46	41	0	523
	DCL1806	271	210	177	156	2	125
Total		1,119	861	719	625	6	1,864
19	DCL1901	67	51	43	37	0	377
	DCL1902	207	157	130	110	1	372
	DCL1903	204	155	128	108	1	175
	DCL1904	97	73	60	51	1	214

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
	DCL1905	118	89	73	62	1	84
	DCL1906	46	35	29	24	0	158
	DCL1907	87	66	54	46	0	289
	DCL1908	158	120	99	84	1	178
	DCL1909	98	74	61	52	1	227
	DCL1910	125	95	78	66	1	182
	DCL1911	101	76	63	53	1	101
	DCL1912	56	42	35	29	0	102
	DCL1913	56	42	35	30	0	197
	DCL1914	110	83	68	57	1	624
Total		1,529	1,158	955	808	8	3,280
20	DCL2001	317	248	209	187	2	272
	DCL2002	146	112	93	80	1	644
	DCL2003	327	256	216	193	2	606
	DCL2004	312	243	204	181	2	135
	DCL2005	71	55	46	40	0	776
Total		1,173	913	769	682	7	2,433
21	DCL2101	404	313	263	231	2	556
	DCL2102	289	224	188	166	2	621
	DCL2103	323	250	210	185	2	749
	DCL2104	392	303	254	223	2	1,012
	DCL2105	525	407	342	302	3	4
	DCL2106	2	2	1	1	0	635
Total		1,935	1,499	1,258	1,108	12	3,577
22	DCL2201	321	251	213	191	2	582
	DCL2202	298	232	196	175	2	638
	DCL2203	326	255	215	192	2	825
	DCL2204	423	330	278	247	3	588
	DCL2205	304	236	199	176	2	522
Total		1,673	1,305	1,100	980	10	3,155
23	DCL2301	267	208	176	156	2	240
	DCL2302	124	96	81	72	1	206
	DCL2303	107	83	70	62	1	342
	DCL2304	174	136	115	103	1	352
Total		672	523	441	392	4	1,140

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
24	DCL2401	182	141	119	105	1	384
	DCL2402	203	157	131	114	1	476
	DCL2403	245	191	160	143	2	294
	DCL2404	154	119	100	88	1	490
Total		783	608	510	450	5	1,644
25	DCL2501	250	195	165	147	2	189
	DCL2502	98	76	64	56	1	430
	DCL2503	216	170	144	129	1	452
	DCL2504	230	180	152	136	1	600
	DCL2505	299	235	200	181	2	301
	DCL2506	155	121	101	90	1	160
Total		1,249	976	825	739	8	2,132
26	DCL2601	80	63	53	48	1	248
	DCL2602	134	103	85	73	1	197
	DCL2603	103	80	67	59	1	330
	DCL2604	162	128	109	100	1	368
	DCL2605	180	143	122	112	1	546
	DCL2606	269	213	182	166	2	663
Total		928	729	618	558	6	2,352
27	DCL2701	340	265	224	199	2	439
	DCL2702	222	174	147	132	1	542
	DCL2703	274	215	182	163	2	341
	DCL2704	177	138	115	102	1	349
Total		1,013	791	668	596	6	1671
28	DCL2801	171	135	116	106	1	401
	DCL2802	208	161	136	120	1	462
	DCL2803	237	185	156	138	1	352
	DCL2804	177	139	118	106	1	192
	DCL2805	94	74	64	58	1	282
Total		888	695	588	528	6	1,689
29	DCL2901	143	112	95	85	1	316
	DCL2902	161	126	106	95	1	577
	DCL2903	292	228	193	174	2	249
	DCL2904	130	101	84	74	1	270
	DCL2905	137	107	91	81	1	445

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
Total		863	674	570	509	5	1,857
30	DCL3001	225	176	149	134	1	285
	DCL3002	144	113	95	86	1	194
	DCL3003	97	77	65	58	1	480
	DCL3004	245	191	161	144	2	66
Total		710	556	471	422	4	1,025
31	DCL3101	33	26	22	20	0	0
	DCL3102	0	0	0	0	0	133
	DCL3103	71	55	45	40	0	349
	DCL3104	183	142	119	105	1	53
Total		287	223	186	164	2	535
32	DCL3201	27	21	18	16	0	389
	DCL3202	196	154	130	117	1	162
	DCL3203	85	66	55	48	1	410
	DCL3204	203	160	137	124	1	75
	DCL3205	39	30	25	22	0	96
Total		550	431	365	328	3	1,132
33	DCL3301	52	40	33	28	0	52
	DCL3302	30	22	18	15	0	55
	DCL3303	29	23	19	16	0	46
	DCL3304	26	20	16	13	0	429
Total		137	104	86	73	1	582
34	DCL3401	228	176	146	127	1	0
	DCL3402	0	0	0	0	0	713
	DCL3403	378	291	243	212	2	621
	DCL3404	330	254	212	184	2	132
Total		935	720	601	523	5	1,466
35	DCL3501	69	53	45	39	0	362
	DCL3502	191	147	123	108	1	581
	DCL3503	304	235	197	174	2	131
	DCL3504	70	54	45	39	0	507
Total		633	490	410	359	4	1,581
36	DCL3601	262	204	171	152	2	327
	DCL3602	165	129	110	98	1	197
	DCL3603	105	81	67	58	1	260
	DCL3604	134	104	88	78	1	542
Total		666	518	436	386	4	1,326
37	DCL3701	292	224	186	160	2	25
	DCL3702	13	10	8	7	0	488
	DCL3703	261	200	167	144	1	0
	DCL3704	0	0	0	0	0	195
	DCL3705	104	80	66	58	1	2
	DCL3706	1	1	1	1	0	87
	DCL3707	46	35	30	26	0	62
	DCL3708	33	25	21	18	0	471
Total		749	575	478	414	4	1330
38	DCL3801	252	194	161	139	1	108
	DCL3802	57	44	37	32	0	79
	DCL3803	44	33	27	23	0	152
	DCL3804	80	62	52	45	0	355
Total		433	332	276	239	2	694
39	DCL3901	191	146	121	105	1	764
	DCL3902	408	313	261	226	2	60
	DCL3903	32	24	20	18	0	342
	DCL3904	183	141	117	101	1	33
Total		814	624	519	449	5	1,199
40	DCL4001	18	14	11	10	0	430
	DCL4002	238	180	148	125	1	98
	DCL4003	53	41	34	29	0	661
	DCL4004	366	277	228	193	2	75
	DCL4005	41	31	25	22	0	530
	DCL4006	293	222	183	155	2	29
	DCL4007	16	12	10	9	0	477
Total		1024	776	640	542	5	2,300
41	DCL4101	256	196	163	141	1	57
	DCL4102	31	23	20	17	0	36
	DCL4103	19	15	12	11	0	169
	DCL4104	90	69	58	50	1	233
Total		396	304	253	218	2	495
42	DCL4201	124	95	79	69	1	567

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
	DCL4202	305	234	194	168	2	278
	DCL4203	147	114	95	83	1	338
	DCL4204	181	139	116	100	1	475
Total		757	581	484	419	4	1,658
43	DCL4301	249	192	161	141	1	749
	DCL4302	398	306	255	222	2	345
	DCL4303	192	145	119	100	1	603
	DCL4304	331	251	208	176	2	266
	DCL4305	140	108	90	79	1	156
	DCL4306	85	65	54	46	0	140
	DCL4307	76	58	48	41	0	312
Total		1,470	1,126	936	806	8	2,571
44	DCL4401	167	128	107	92	1	400
	DCL4402	214	164	137	118	1	323
	DCL4403	174	133	111	95	1	209
	DCL4404	111	86	71	62	1	236
	DCL4405	127	97	81	70	1	359
Total		793	608	506	437	5	1,527
45	DCL4501	197	150	124	105	1	169
	DCL4502	89	69	58	50	1	172
	DCL4503	95	72	59	50	1	273
	DCL4504	147	113	94	80	1	20
	DCL4505	11	8	7	6	0	186
	DCL4506	101	77	64	55	1	294
	DCL4507	160	122	101	86	1	31
Total		801	610	505	432	4	1,145
46	DCL4601	16	12	10	9	0	418
	DCL4602	215	167	141	125	1	499
	DCL4603	270	206	171	147	2	539
	DCL4604	291	222	184	159	2	940
	DCL4605	489	379	318	280	3	498
	DCL4606	254	198	168	149	2	209
	DCL4607	107	83	70	63	1	223
Total		1,642	1,269	1,063	932	10	3,326
47	DCL4701	118	91	76	66	1	564

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
	DCL4702	301	231	193	167	2	281
	DCL4703	152	116	96	83	1	178
	DCL4704	95	73	61	53	1	377
	DCL4705	201	154	129	112	1	2
	DCL4706	1	1	1	1	0	361
	DCL4707	197	150	124	106	1	48
	DCL4708	26	20	16	14	0	724
Total		1,091	837	696	601	6	2,535
48	DCL4801	388	298	248	214	2	98
	DCL4802	52	40	34	29	0	297
	DCL4803	163	124	102	87	1	458
	DCL4804	247	189	157	135	1	408
	DCL4805	223	170	140	120	1	410
	DCL4806	222	169	141	121	1	27
	DCL4807	15	11	9	8	0	424
	DCL4808	225	173	145	126	1	279
Total		1,534	1,175	976	840	9	2,401
49	DCL4901	159	118	97	80	1	190
	DCL4902	107	80	66	55	1	143
	DCL4903	81	60	50	41	0	557
	DCL4904	312	235	193	161	2	266
	DCL4905	150	112	92	77	1	219
	DCL4906	123	93	76	63	1	538
Total		931	699	573	477	5	1,913
50	DCL5001	297	225	186	157	2	401
	DCL5002	223	169	139	117	1	401
	DCL5003	222	168	139	117	1	432
	DCL5004	237	181	149	127	1	296
Total		979	743	612	518	5	1,530
51	DCL5101	164	124	102	86	1	333
	DCL5102	184	140	115	97	1	284
	DCL5103	158	119	98	83	1	322
	DCL5104	177	135	111	94	1	233
	DCL5105	129	98	80	68	1	33
Total		813	616	507	428	4	1,205

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
52	DCL5201	18	14	11	10	0	240
	DCL5202	133	101	83	70	1	200
	DCL5203	111	84	69	59	1	102
	DCL5204	56	43	35	30	0	126
	DCL5205	70	53	44	37	0	210
	DCL5206	116	88	73	61	1	171
Total		504	382	315	266	3	1,049
53	DCL5301	93	71	59	50	1	170
	DCL5302	91	70	58	50	1	1
	DCL5303	1	0	0	0	0	178
	DCL5304	95	73	61	52	1	149
	DCL5305	79	61	51	44	0	233
	DCL5306	126	96	80	69	1	117
	DCL5307	63	48	40	34	0	699
Total		548	419	348	300	3	1,547
54	DCL5401	358	279	235	210	2	398
	DCL5402	210	162	135	118	1	304
	DCL5403	159	123	103	91	1	541
	DCL5404	281	218	183	161	2	147
Total		1,008	782	657	580	6	1,390
55	DCL5501	73	58	49	45	0	364
	DCL5502	186	145	122	109	1	218
	DCL5503	111	87	73	66	1	379
	DCL5504	194	152	128	114	1	194
	DCL5505	101	78	66	58	1	260
	DCL5506	130	102	87	79	1	131
Total		795	622	525	470	5	1,546
56	DCL5601	65	51	44	39	0	42
	DCL5602	21	16	14	13	0	143
	DCL5603	76	58	49	42	0	75
	DCL5604	38	30	25	23	0	151
	DCL5605	76	60	50	45	0	41
Total		276	215	182	163	2	452
57	DCL5701	22	17	14	12	0	91
	DCL5702	49	38	31	27	0	86
	DCL5703	48	36	30	25	0	314
	DCL5704	170	130	107	92	1	84
	DCL5705	46	35	29	24	0	424
Total		334	255	211	180	2	999
58	DCL5801	222	172	144	126	1	139
	DCL5802	73	56	47	41	0	354
	DCL5803	186	144	120	105	1	388
	DCL5804	204	158	132	115	1	348
	DCL5805	183	141	118	104	1	340
	DCL5806	180	138	116	101	1	577
	DCL5807	304	234	196	172	2	332
	DCL5808	175	135	113	99	1	0
	DCL5809	0	0	0	0	0	111
Total		1,527	1,179	986	863	9	2,589
59	DCL5901	58	45	38	33	0	274
	DCL5902	144	111	93	82	1	425
	DCL5903	228	175	145	126	1	262
	DCL5904	138	107	89	78	1	421
	DCL5905	222	172	143	125	1	3
	DCL5906	2	1	1	1	0	0
	DCL5907	0	0	0	0	0	268
Total		793	611	510	444	5	1,653
60	DCL6001	141	109	91	80	1	241
	DCL6002	127	98	82	72	1	284
	DCL6003	149	115	97	85	1	242
	DCL6004	126	98	82	72	1	181
	DCL6005	95	73	61	54	1	386
	DCL6006	202	156	131	115	1	274
Total		840	650	544	477	5	1,608
61	DCL6101	144	112	93	82	1	147
	DCL6102	78	60	50	44	0	144
	DCL6103	77	59	49	43	0	85
	DCL6104	45	35	29	25	0	159
	DCL6105	85	65	54	47	0	302
	DCL6106	159	123	103	90	1	441

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
Total		589	454	379	330	3	1,278
62	DCL6201	237	182	151	130	1	124
	DCL6202	68	52	43	36	0	280
	DCL6203	151	116	96	83	1	148
	DCL6204	81	62	51	43	0	99
	DCL6205	55	41	34	29	0	16
Total		592	452	375	321	3	667
63	DCL6301	9	7	5	5	0	364
	DCL6302	184	144	122	110	1	183
	DCL6303	95	74	62	55	1	123
	DCL6304	63	49	41	37	0	0
	DCL6305	0	0	0	0	0	145
Total		350	273	231	206	2	815
64	DCL6401	74	58	49	44	0	184
	DCL6402	97	75	63	55	1	121
	DCL6403	63	49	41	36	0	108
	DCL6404	55	43	36	33	0	123
	DCL6405	63	49	42	37	0	138
Total		352	274	231	205	2	674
65	DCL6501	72	55	47	41	0	144
	DCL6502	76	59	49	43	0	384
	DCL6503	202	156	130	114	1	669
	DCL6504	345	268	226	200	2	150
	DCL6505	78	61	51	45	0	57
Total		772	599	503	444	5	1,404
66	DCL6601	29	23	19	18	0	100
	DCL6602	52	40	34	30	0	98
	DCL6603	51	40	33	30	0	57
	DCL6604	29	23	19	17	0	123
	DCL6605	63	49	42	37	0	0
Total		223	175	147	132	1	378
67	DCL6701	0	0	0	0	0	158
	DCL6702	80	63	53	47	1	221
	DCL6703	111	88	74	67	1	269
	DCL6704	136	107	90	81	1	15

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
	DCL6705	7	6	5	5	0	0
	DCL6706	0	0	0	0	0	104
Total		335	263	223	200	2	767
68	DCL6801	53	42	35	31	0	75
	DCL6802	38	30	25	23	0	133
	DCL6803	68	53	45	40	0	260
	DCL6804	133	104	88	78	1	248
	DCL6805	126	98	83	75	1	0
	DCL6806	0	0	0	0	0	429
Total		418	327	276	247	3	1,145
69	DCL6901	219	171	144	129	1	262
	DCL6902	134	104	88	79	1	577
	DCL6903	291	228	193	174	2	338
	DCL6904	173	135	114	102	1	268
Total		817	639	540	483	5	1,445
70	DCL7001	138	108	91	81	1	150
	DCL7002	77	60	51	45	0	38
	DCL7003	20	15	13	11	0	374
	DCL7004	192	150	126	113	1	160
Total		426	333	280	250	3	722
71	DCL7101	80	63	54	49	1	167
	DCL7102	87	68	57	50	1	44
	DCL7103	22	18	15	13	0	260
	DCL7104	133	104	88	78	1	152
	DCL7105	76	60	51	46	0	204
Total		398	312	264	236	3	827
72	DCL7201	102	80	68	62	1	77
	DCL7202	39	31	26	23	0	168
	DCL7203	86	67	57	51	1	89
	DCL7204	46	36	30	27	0	11
	DCL7205	6	4	4	3	0	65
Total		279	219	185	166	2	410
73	DCL7301	34	26	22	20	0	94
	DCL7302	48	38	32	28	0	44
	DCL7303	22	17	15	13	0	44

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
	DCL7304	23	18	15	13	0	44
Total		126	99	84	75	1	226
74	DCL7401	22	17	15	13	0	414
	DCL7402	211	165	139	124	1	155
	DCL7403	79	62	52	46	0	334
	DCL7404	168	132	112	101	1	88
	DCL7405	45	35	30	27	0	232
	DCL7406	118	92	78	70	1	251
Total		643	503	425	381	4	1,474
75	DCL7501	135	103	86	74	1	313
	DCL7502	165	127	107	93	1	127
	DCL7503	67	52	43	38	0	209
	DCL7504	110	85	71	62	1	310
	DCL7505	163	126	105	92	1	861
Total		640	493	412	359	4	1,820
76	DCL7601	429	338	287	260	3	145
	DCL7602	73	57	49	44	0	488
	DCL7603	241	190	162	148	2	273
	DCL7604	135	106	91	83	1	679
Total		877	691	589	534	6	1,585
77	DCL7701	353	274	230	203	2	146
	DCL7702	79	60	50	43	0	360
	DCL7703	188	145	122	108	1	298
	DCL7704	154	120	101	89	1	164
Total		773	599	502	442	5	968
78	DCL7801	83	65	55	50	1	241
	DCL7802	122	96	81	73	1	252
	DCL7803	127	99	84	76	1	23
	DCL7804	12	9	8	7	0	129
	DCL7805	65	51	43	39	0	146
	DCL7806	73	57	49	44	0	465
Total		481	378	320	288	3	1,256
79	DCL7901	230	182	155	141	2	203
	DCL7902	101	80	68	62	1	280
	DCL7903	140	110	94	85	1	313

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
	DCL7904	156	123	104	95	1	147
	DCL7905	73	58	49	45	0	190
Total		699	551	470	427	5	1,133
80	DCL8001	94	74	63	58	1	285
	DCL8002	141	111	95	86	1	264
	DCL8003	132	104	88	80	1	251
	DCL8004	125	99	84	76	1	428
Total		492	388	330	300	3	1,228
81	DCL8101	214	169	143	129	1	320
	DCL8102	160	126	107	97	1	413
	DCL8103	205	162	138	125	1	227
	DCL8104	115	90	76	68	1	330
	DCL8105	163	129	110	100	1	412
Total		858	675	574	519	6	1,702
82	DCL8201	203	160	137	125	1	186
	DCL8202	92	73	62	56	1	202
	DCL8203	104	81	68	60	1	212
	DCL8204	104	82	70	64	1	232
	DCL8205	114	90	77	70	1	205
	DCL8206	102	80	68	62	1	603
Total		719	566	482	438	5	1,640
83	DCL8301	304	238	202	181	2	145
	DCL8302	77	59	49	43	0	515
	DCL8303	258	203	172	155	2	341
	DCL8304	175	136	115	102	1	519
Total		815	636	538	481	5	1,520
84	DCL8401	264	207	175	156	2	284
	DCL8402	140	110	94	86	1	368
	DCL8403	181	143	122	111	1	507
	DCL8404	252	199	169	153	2	162
	DCL8405	80	63	54	49	1	32
Total		918	722	614	556	6	1,353
85	DCL8501	16	13	11	10	0	587
	DCL8502	297	233	197	176	2	278
	DCL8503	143	111	93	82	1	667

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
	DCL8504	337	264	223	201	2	709
	DCL8505	360	281	238	213	2	194
Total		1,154	901	762	682	7	2,435
86	DCL8601	99	77	65	58	1	417
	DCL8602	211	165	140	126	1	48
	DCL8603	24	19	16	14	0	223
	DCL8604	109	86	74	68	1	424
	DCL8605	211	166	141	128	1	675
	DCL8606	336	265	225	204	2	328
Total		989	779	662	599	6	2,115
87	DCL8701	165	129	110	99	1	502
	DCL8702	246	195	167	153	2	208
	DCL8703	102	81	69	63	1	631
	DCL8704	311	246	210	191	2	358
	DCL8705	175	139	119	109	1	325
Total		998	789	674	615	7	2,024
88	DCL8801	158	125	107	99	1	334
	DCL8802	162	129	111	102	1	477
	DCL8803	232	184	158	145	2	210
	DCL8804	103	81	69	63	1	247
	DCL8805	120	95	82	75	1	563
Total		775	615	527	484	5	1,831
89	DCL8901	274	217	186	171	2	655
	DCL8902	318	253	217	200	2	593
	DCL8903	289	229	196	180	2	692
	DCL8904	336	267	229	211	2	133
	DCL8905	65	51	44	40	0	375
Total		1,282	1,018	872	802	9	2,448
90	DCL9001	184	146	124	114	1	775
	DCL9002	378	300	257	236	3	83
	DCL9003	41	33	28	25	0	368
	DCL9004	182	144	122	112	1	0
	DCL9005	0	0	0	0	0	477
	DCL9006	233	184	158	145	2	93
	DCL9007	46	36	31	28	0	375

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete Building (No.)
Total		1,063	842	720	659	7	2,171
Summary		89,689	69,541	58,400	51,517	541	172,722

Chittagong City Corporation Area

Table 46 Number of Buildings of Chittagong in Cluster level

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
1	CCL0101	0.83	1,002	1,201
	CCL0102	0.69	297	429
	CCL0103	2.68	0	0
	CCL0104	0.96	461	482
	CCL0105	1.67	847	507
	CCL0106	1.62	1,237	762
	CCL0107	2.22	811	365
	CCL0108	0.67	19	29
	CCL0109	0.50	0	0
	CCL0110	1.07	106	99
	CCL0111	0.74	432	587
	CCL0112	1.04	131	126
	CCL0113	1.65	0	0
	CCL0114	0.67	77	114
	CCL0115	0.38	105	278
	CCL0116	0.77	15	19
	CCL0117	1.20	172	144
	CCL0118	1.58	57	36
	CCL0119	1.19	19	16
	CCL0120	1.49	12	8
Total		23.64	5,800	245
2	CCL0201	7.38	606	82
	CCL0202	0.72	511	709
	CCL0203	0.67	875	1,310
	CCL0204	0.68	929	1,370
	CCL0205	0.72	313	435
	CCL0206	0.77	1,320	1,712

}

Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	CCL0207	0.45	557	1,226
	CCL0208	0.33	191	583
	CCL0209	0.27	189	688
	CCL0210	0.56	914	1,632
	CCL0211	0.64	1,136	1,765
	CCL0212	0.36	509	1,407
	CCL0213	0.68	875	1,282
	CCL0214	0.37	256	701
Total		14.60	9,181	629
3	CCL0301	0.77	846	1,105
	CCL0302	0.53	353	667
	CCL0303	0.99	850	863
	CCL0304	0.55	1,047	1,921
	CCL0305	0.77	1,270	1,641
	CCL0306	0.55	417	763
Total		4.15	4,783	1,154
4	CCL0401	0.96	1,274	1,330
	CCL0402	0.47	648	1,392
	CCL0405	0.70	857	1,221
	CCL0406	0.52	874	1,697
	CCL0407	0.70	1,017	1,459
	CCL0408	0.99	1,025	1,038
	CCL0409	0.54	759	1,396
	CCL0410	0.76	580	766
	CCL0411	0.64	7	11
	CCL0412	0.93	794	856
	CCL0413	0.80	376	468
	CCL0414	0.65	332	510
	CCL0415	0.46	657	1,416
	CCL0416	0.74	1,824	2,469
Total		9.85	11,024	1,119
5	CCL0501	1.63	343	211
	CCL0502	0.35	253	718
	CCL0503	0.51	850	1,677
	CCL0504	0.55	663	1,195

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	CCL0505	0.73	1,097	1,494
	CCL0506	0.40	501	1,237
	CCL0507	0.35	382	1,106
	CCL0508	0.35	287	813
	CCL0509	0.54	395	726
	CCL0510	0.28	247	884
	CCL0511	0.26	200	783
	CCL0512	0.20	68	340
	CCL0513	0.24	202	829
	CCL0514	0.16	120	735
	CCL0516	0.11	122	1,099
	CCL0517	0.17	138	829
Total		6.84	5,868	858
6	CCL0601	0.48	1,856	3,897
	CCL0602	0.40	1,325	3,342
	CCL0603	0.33	801	2,425
	CCL0604	0.53	935	1,779
	CCL0605	0.49	904	1,834
	CCL0606	0.49	708	1,457
Total		2.71	6,529	2,412
7	CCL0701	0.46	1,075	2,317
	CCL0702	0.66	1,200	1,805
	CCL0703	0.69	1,729	2,518
	CCL0704	0.24	544	2,232
	CCL0705	0.60	1,399	2,316
	CCL0706	0.52	975	1,875
	CCL0707	0.38	27	70
	CCL0708	0.44	1,349	3,073
Total		4.00	8,298	2,072
8	CCL0801	0.45	1,563	3,483
	CCL0802	0.44	692	1,579
	CCL0803	0.40	1,264	3,134
	CCL0804	0.49	710	1,446
	CCL0805	0.81	1,627	2,002
	CCL0806	0.54	482	900

}

Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	CCL0807	0.67	810	1,204
	CCL0808	0.49	485	983
	CCL0809	0.58	741	1,269
	CCL0810	0.69	607	879
	CCL0811	0.67	1,826	2,715
Total		6.24	10,807	1,731
9	CCL0901	0.62	330	533
	CCL0902	0.74	205	278
	CCL0903	0.53	472	896
	CCL0904	0.76	30	40
	CCL0905	0.54	1,661	3,058
	CCL0906	0.51	947	1,863
	CCL0907	0.47	1,484	3,160
	CCL0908	0.37	1,053	2,874
	CCL0909	0.78	891	1,146
	CCL0910	0.47	194	409
	CCL0911	0.49	821	1,685
Total		6.27	8,088	1,291
10	CCL1001	0.86	724	838
	CCL1002	0.96	10	10
	CCL1003	0.50	0	0
	CCL1004	0.68	207	304
	CCL1005	0.46	127	279
	CCL1006	0.69	615	892
	CCL1007	0.56	725	1,293
	CCL1008	0.32	1,053	3,284
	CCL1009	0.45	829	1,846
Total		5.48	4,290	783
11	CCL1101	0.57	8	14
	CCL1102	0.67	20	30
	CCL1103	0.57	79	139
	CCL1104	0.68	407	596
	CCL1105	0.53	706	1,338
	CCL1106	0.77	780	1,015
	CCL1107	0.50	892	1,793

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	CCL1108	0.61	1,400	2,287
	CCL1109	0.52	1,234	2,365
Total		5.41	5,526	1,021
12	CCL1201	0.54	1,761	3,238
	CCL1202	0.53	1,329	2,524
	CCL1203	0.59	984	1,676
	CCL1204	0.38	1,196	3,189
	CCL1205	0.39	43	109
Total		2.43	5,313	2,191
13	CCL1301	0.60	887	1,474
	CCL1302	0.41	1,358	3,330
	CCL1303	0.44	659	1,484
	CCL1304	0.67	1,163	1,738
	CCL1305	0.61	1,201	1,979
	CCL1306	0.33	207	625
	CCL1307	0.27	496	1,842
Total		3.33	5,971	1,793
14	CCL1401	0.60	1,213	2,017
	CCL1402	0.61	1,738	2,833
Total		1.21	2,951	2,429
15	CCL1501	0.53	974	1,846
	CCL1502	0.52	1,196	2,287
	CCL1503	0.68	466	687
Total		1.73	2,636	1,525
16	CCL1601	0.45	970	2,173
	CCL1602	0.43	527	1,228
	CCL1603	0.35	869	2,505
	CCL1604	0.34	1,223	3,641
	CCL1605	0.53	480	911
	CCL1606	0.28	448	1,597
Total		2.37	4,517	1,909
17	CCL1701	0.18	207	1,176
	CCL1702	0.38	586	1,542
	CCL1703	0.32	374	1,176
	CCL1704	0.35	876	2,497

}

Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	CCL1705	0.38	1,288	3,350
	CCL1706	0.38	881	2,332
Total		1.99	4,212	2,119
18	CCL1801	0.49	392	807
	CCL1802	0.37	18	49
	CCL1803	0.57	1,542	2,697
	CCL1804	0.19	0	0
	CCL1805	0.53	642	1,206
	CCL1806	0.42	693	1,633
	CCL1807	0.35	133	378
	CCL1808	0.31	205	667
	CCL1809	0.66	1,451	2,196
	CCL1810	0.34	0	0
Total		4.24	5,076	1,198
19	CCL1901	0.43	1,466	3,414
	CCL1902	0.41	1,373	3,333
Total		0.84	2,839	3,374
20	CCL2001	0.18	696	3,923
	CCL2002	0.22	713	3,252
Total		0.40	1,409	3,552
21	CCL2101	0.31	676	2,182
	CCL2102	0.47	1,418	3,034
Total		0.78	2,094	2,694
22	CCL2201	0.40	1,405	3,533
	CCL2202	0.40	599	1,506
Total		0.80	2,004	2,520
23	CCL2301	0.34	1,553	4,623
	CCL2302	0.24	632	2,637
Total		0.58	2,185	3,796
24	CCL2401	0.46	1,058	2,300
	CCL2402	0.38	988	2,587
	CCL2403	0.32	810	2,522
	CCL2404	0.56	1,582	2,840
	CCL2405	0.28	801	2,883
	CCL2406	0.32	1,114	3,493
	CCL2407	0.34	1,164	3,402
Total		2.66	7,517	2,827
25	CCL2501	0.55	1,442	2,598
	CCL2502	0.47	998	2,104
	CCL2503	0.58	920	1,573
	CCL2504	0.43	1,349	3,134
Total		2.04	4,709	2,303
26	CCL2601	0.40	697	1,751
	CCL2602	0.44	79	180
	CCL2603	0.63	271	429
	CCL2604	0.61	273	449
	CCL2605	0.48	478	1,000
	CCL2606	0.56	54	97
	CCL2607	0.23	359	1,560
	CCL2608	0.33	1,253	3,848
	CCL2609	1.71	4	2
	CCL2610	0.74	58	78
Total		6.12	3,526	576
27	CCL2701	0.29	202	685
	CCL2702	0.26	252	981
	CCL2703	0.30	642	2,166
	CCL2704	0.23	589	2,614
	CCL2705	0.22	687	3,071
	CCL2706	0.22	659	3,060
Total		1.51	3,031	2,004
28	CCL2801	0.50	911	1,814
	CCL2802	0.32	985	3,049
	CCL2803	0.26	1,276	4,903
Total		1.09	3,172	2,922
29	CCL2901	0.20	576	2,836
	CCL2902	0.26	1,312	5,013
	CCL2903	0.19	653	3,423
Total		0.66	2,541	3,876
30	CCL3001	0.12	168	1,427
	CCL3002	0.32	1,281	4,039

}

Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	CCL3003	0.40	1,491	3,766
Total		0.83	2,940	3,539
31	CCL3101	0.23	526	2,263
	CCL3102	0.24	375	1,587
	CCL3103	0.17	380	2,214
Total		0.64	1,281	2,000
32	CCL3201	0.43	593	1,365
	CCL3202	0.43	980	2,290
Total		0.86	1,573	1,824
33	CCL3301	0.21	693	3,240
	CCL3302	0.27	1,384	5,176
Total		0.48	2,077	4,315
34	CCL3401	0.28	1,035	3,694
	CCL3402	0.30	1,005	3,309
Total		0.58	2,040	3,493
35	CCL3501	0.26	913	3,538
	CCL3502	0.30	542	1,809
	CCL3503	0.58	538	927
	CCL3504	0.46	6	13
Total		1.59	1,999	1,255
36	CCL3601	0.55	35	64
	CCL3602	0.63	1,895	3,007
	CCL3603	0.35	433	1,228
Total		1.53	2,363	1,545
37	CCL3701	0.38	85	226
	CCL3702	0.39	38	97
	CCL3703	0.30	417	1,370
	CCL3704	0.23	34	150
	CCL3705	0.33	36	109
	CCL3706	0.35	590	1,706
	CCL3707	0.38	614	1,599
	CCL3708	0.45	336	749
	CCL3709	0.27	0	0
	CCL3710	0.42	14	33
	CCL3711	0.21	47	223

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
Total		3.71	2,211	596
38	CCL3801	1.04	302	289
	CCL3803	0.53	1,207	2,283
	CCL3804	0.64	1,188	1,843
	CCL3805	0.53	953	1,787
	CCL3806	0.36	778	2,146
	CCL3807	0.43	711	1,638
	CCL3808	0.24	391	1,649
	CCL3809	0.99	186	188
Total		4.77	5,716	1,198
39	CCL3901	0.56	70	126
	CCL3902	0.51	304	594
	CCL3903	0.23	651	2,842
	CCL3904	0.27	602	2,197
	CCL3905	0.41	562	1,386
	CCL3906	0.25	340	1,355
	CCL3907	0.30	196	654
	CCL3908	0.46	988	2,136
	CCL3910	0.36	424	1,189
	CCL3911	0.37	1	3
	CCL3912	0.37	80	217
	CCL3913	0.80	0	0
	CCL3914	0.33	82	246
	CCL3915	0.43	162	375
	CCL3916	1.87	75	40
	CCL3917	0.99	21	21
Total		8.51	4,558	536
40	CCL4001	0.70	1,125	1,611
	CCL4002	0.30	398	1,342
	CCL4003	0.34	305	891
	CCL4004	0.21	317	1,488
	CCL4005	0.52	531	1,024
	CCL4006	0.63	315	498
	CCL4007	0.50	70	141
	CCL4008	0.33	221	665

}

Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	CCL4009	0.61	380	627
	CCL4010	0.55	33	60
	CCL4011	0.51	202	394
	CCL4012	0.21	520	2,422
	CCL4013	0.32	781	2,405
	CCL4014	4.69	487	104
Total		10.44	5,685	545
41	CCL4101	0.53	515	966
	CCL4102	0.75	922	1,228
	CCL4103	0.63	591	940
	CCL4104	0.75	266	352
	CCL4105	0.51	6	12
	CCL4106	0.77	106	137
	CCL4107	0.81	509	632
	CCL4108	0.69	649	945
	CCL4109	0.55	292	530
	CCL4110	5.47	81	15
Total		11.47	3,937	343
Summary		169.36	182,277	1,076

Table 47 Grouped Occupancy Classes of Chittagong in Cluster level

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
1	CCL0101	880	95	0	0	0	14	13	1,002
	CCL0102	243	32	11	0	0	1	10	297
	CCL0103	0	0	0	0	0	0	0	0
	CCL0104	364	72	0	0	0	6	19	461
	CCL0105	695	102	16	0	0	4	30	847
	CCL0106	1,079	112	17	0	0	9	20	1,237
	CCL0107	674	78	4	0	0	11	44	811
	CCL0108	19	0	0	0	0	0	0	19
	CCL0109	0	0	0	0	0	0	0	0
	CCL0110	72	15	0	0	0	1	18	106
	CCL0111	424	6	0	0	0	1	1	432
	CCL0112	125	5	0	0	0	1	0	131
	CCL0113	0	0	0	0	0	0	0	0
	CCL0114	61	2	0	0	0	0	14	77
	CCL0115	94	9	0	0	0	0	2	105
	CCL0116	12	0	0	0	0	0	3	15
	CCL0117	144	13	0	0	2	1	12	172
	CCL0118	53	2	0	0	0	0	2	57
	CCL0119	19	0	0	0	0	0	0	19
	CCL0120	10	1	0	0	0	0	1	12
Total		4,968	544	48	0	2	49	189	5,800
2	CCL0201	592	11	0	0	0	2	1	606
	CCL0202	416	36	57	0	0	2	0	511
	CCL0203	649	92	109	0	0	16	9	875
	CCL0204	751	127	25	0	0	22	4	929
	CCL0205	151	36	114	0	0	9	3	313
	CCL0206	936	261	106	0	0	11	6	1,320
	CCL0207	476	74	0	0	0	2	5	557
	CCL0208	154	30	4	0	0	2	1	191
	CCL0209	152	22	10	0	0	0	5	189
	CCL0210	697	207	3	4	0	3	0	914
	CCL0211	958	127	34	0	0	10	7	1,136
	CCL0212	448	53	1	0	0	3	4	509
	CCL0213	717	143	13	0	0	0	2	875
	CCL0214	212	29	2	2	0	8	3	256
Total		7,309	1,248	478	6	0	90	50	9,181
3	CCL0301	773	50	0	0	0	8	15	846
	CCL0302	308	27	0	0	0	14	4	353
	CCL0303	758	82	0	0	0	10	0	850
	CCL0304	697	329	17	1	0	1	2	1,047
	CCL0305	943	301	13	3	0	9	1	1,270
	CCL0306	404	8	1	0	0	2	2	417
Total		3,883	797	31	4	0	44	24	4,783
4	CCL0401	1,077	185	0	0	0	7	5	1,274
	CCL0402	554	88	0	0	0	1	5	648

}

Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	CCL0405	784	58	0	0	0	10	5	857
	CCL0406	604	216	48	0	0	2	4	874
	CCL0407	762	227	2	2	0	14	10	1,017
	CCL0408	796	162	55	0	0	7	5	1,025
	CCL0409	577	156	15	1	0	2	8	759
	CCL0410	387	62	125	0	0	1	5	580
	CCL0411	7	0	0	0	0	0	0	7
	CCL0412	722	43	10	0	0	4	15	794
	CCL0413	324	38	9	0	0	2	3	376
	CCL0414	299	16	2	1	0	4	10	332
	CCL0415	530	117	4	0	0	2	4	657
	CCL0416	1,469	335	7	0	0	11	2	1,824
Total		8,892	1,703	277	4	0	67	81	11,024
5	CCL0501	300	33	7	0	0	1	2	343
	CCL0502	176	75	1	0	0	0	1	253
	CCL0503	699	130	11	0	0	10	0	850
	CCL0504	535	118	9	0	0	0	1	663
	CCL0505	976	114	1	0	0	6	0	1,097
	CCL0506	407	71	3	2	0	17	1	501
	CCL0507	345	35	0	0	0	0	2	382
	CCL0508	251	27	4	1	0	4	0	287
	CCL0509	349	33	2	0	0	6	5	395
	CCL0510	221	20	0	0	0	3	3	247
	CCL0511	192	6	0	0	0	0	2	200
	CCL0512	63	4	0	0	0	0	1	68
	CCL0513	178	18	0	0	0	6	0	202
	CCL0514	103	17	0	0	0	0	0	120
	CCL0516	114	7	0	0	0	0	1	122
	CCL0517	127	7	0	0	0	1	3	138
Total		5,036	715	38	3	0	54	22	5,868
6	CCL0601	1,401	448	3	0	1	3	0	1,856
	CCL0602	918	393	8	1	0	5	0	1,325
	CCL0603	695	95	7	0	0	4	0	801
	CCL0604	815	112	0	7	0	1	0	935

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	CCL0605	761	124	0	0	0	9	10	904
	CCL0606	633	66	0	0	0	4	5	708
Total		5,223	1,238	18	8	1	26	15	6,529
7	CCL0701	894	155	13	0	0	9	4	1,075
	CCL0702	820	316	61	3	0	0	0	1,200
	CCL0703	1,313	356	26	0	0	28	6	1,729
	CCL0704	396	132	9	0	0	5	2	544
	CCL0705	1,142	218	7	1	0	24	7	1,399
	CCL0706	777	145	38	0	0	1	14	975
	CCL0707	25	0	0	0	0	1	1	27
	CCL0708	1,106	220	11	0	0	5	7	1,349
Total		6,473	1,542	165	4	0	73	41	8,298
8	CCL0801	1,312	236	3	0	0	12	0	1,563
	CCL0802	611	73	0	0	0	3	5	692
	CCL0803	1,085	162	4	0	0	4	9	1,264
	CCL0804	465	118	124	0	0	1	2	710
	CCL0805	1,432	163	0	0	0	16	16	1,627
	CCL0806	304	95	74	0	0	9	0	482
	CCL0807	606	125	32	0	3	18	26	810
	CCL0808	387	73	12	0	0	3	10	485
	CCL0809	687	44	7	0	0	0	3	741
	CCL0810	575	31	0	0	0	1	0	607
	CCL0811	1,596	162	52	0	0	10	6	1,826
Total		9,060	1,282	308	0	3	77	77	10,807
9	CCL0901	318	8	0	0	0	2	2	330
	CCL0902	193	3	0	0	0	6	3	205
	CCL0903	460	12	0	0	0	0	0	472
	CCL0904	30	0	0	0	0	0	0	30
	CCL0905	1,307	325	13	0	1	2	13	1,661
	CCL0906	870	73	0	0	0	3	1	947
	CCL0907	1,328	116	30	0	0	0	10	1,484
	CCL0908	910	126	0	0	0	0	17	1,053
	CCL0909	833	37	0	1	0	13	7	891
	CCL0910	191	2	0	0	0	0	1	194

}

Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	CCL0911	722	94	1	0	0	1	3	821
Total		7,162	796	44	1	1	27	57	8,088
10	CCL1001	658	53	3	0	0	9	1	724
	CCL1002	10	0	0	0	0	0	0	10
	CCL1003	0	0	0	0	0	0	0	0
	CCL1004	190	7	7	0	0	1	2	207
	CCL1005	29	31	66	0	1	0	0	127
	CCL1006	448	111	48	0	0	6	2	615
	CCL1007	632	82	0	0	0	4	7	725
	CCL1008	842	198	2	1	0	5	5	1,053
	CCL1009	737	82	2	7	0	1	0	829
Total		3,546	564	128	8	1	26	17	4,290
11	CCL1101	8	0	0	0	0	0	0	8
	CCL1102	20	0	0	0	0	0	0	20
	CCL1103	66	13	0	0	0	0	0	79
	CCL1104	380	26	0	0	0	0	1	407
	CCL1105	621	74	3	0	0	6	2	706
	CCL1106	709	56	11	0	0	3	1	780
	CCL1107	753	133	1	0	0	5	0	892
	CCL1108	1,270	106	20	0	0	4	0	1,400
	CCL1109	1,105	116	0	0	0	13	0	1,234
Total		4,932	524	35	0	0	31	4	5,526
12	CCL1201	1,466	280	8	0	0	3	4	1,761
	CCL1202	1,155	157	9	0	0	5	3	1,329
	CCL1203	580	370	6	0	0	13	15	984
	CCL1204	983	200	3	1	0	9	0	1,196
	CCL1205	9	22	4	0	0	0	8	43
Total		4,193	1,029	30	1	0	30	30	5,313
13	CCL1301	743	90	1	19	0	18	16	887
	CCL1302	1,174	167	1	3	0	7	6	1,358
	CCL1303	589	52	0	0	0	3	15	659
	CCL1304	1,118	34	0	0	1	6	4	1,163
	CCL1305	995	173	1	0	0	13	19	1,201
	CCL1306	153	20	7	0	0	0	27	207

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	CCL1307	457	27	3	0	0	9	0	496
Total		5,229	563	13	22	1	56	87	5,971
14	CCL1401	1,027	178	1	0	0	7	0	1,213
	CCL1402	1,534	187	2	0	0	11	4	1,738
Total		2,561	365	3	0	0	18	4	2,951
15	CCL1501	796	161	8	1	0	5	3	974
	CCL1502	1,000	155	2	0	0	17	22	1,196
	CCL1503	424	20	0	0	0	14	8	466
Total		2,220	336	10	1	0	36	33	2,636
16	CCL1601	813	135	6	2	1	9	4	970
	CCL1602	322	179	2	0	0	12	12	527
	CCL1603	686	138	3	0	0	20	22	869
	CCL1604	875	333	2	0	0	12	1	1,223
	CCL1605	386	80	0	1	0	12	1	480
	CCL1606	360	72	0	7	1	8	0	448
Total		3,442	937	13	10	2	73	40	4,517
17	CCL1701	163	44	0	0	0	0	0	207
	CCL1702	476	104	1	0	0	3	2	586
	CCL1703	328	40	2	0	0	4	0	374
	CCL1704	756	86	0	0	0	33	1	876
	CCL1705	1,163	112	1	0	0	12	0	1,288
	CCL1706	795	84	0	0	0	2	0	881
Total		3,681	470	4	0	0	54	3	4,212
18	CCL1801	316	64	4	0	0	1	7	392
	CCL1802	18	0	0	0	0	0	0	18
	CCL1803	1,281	241	0	0	0	6	14	1,542
	CCL1804	0	0	0	0	0	0	0	0
	CCL1805	578	57	2	0	0	0	5	642
	CCL1806	616	69	1	0	0	3	4	693
	CCL1807	102	26	2	0	0	1	2	133
	CCL1808	160	43	2	0	0	0	0	205
	CCL1809	1,264	124	8	2	0	8	45	1,451
	CCL1810	0	0	0	0	0	0	0	0
Total		4,335	624	19	2	0	19	77	5,076

}

Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
19	CCL1901	1,048	383	14	0	0	11	10	1,466
	CCL1902	1,172	192	2	0	0	3	4	1,373
Total		2,220	575	16	0	0	14	14	2,839
20	CCL2001	585	103	0	0	0	3	5	696
	CCL2002	685	28	0	0	0	0	0	713
Total		1,270	131	0	0	0	3	5	1,409
21	CCL2101	605	64	0	0	0	7	0	676
	CCL2102	1,212	192	7	0	0	5	2	1,418
Total		1,817	256	7	0	0	12	2	2,094
22	CCL2201	1,096	294	6	0	0	9	0	1,405
	CCL2202	443	152	1	1	0	1	1	599
Total		1,539	446	7	1	0	10	1	2,004
23	CCL2301	1,293	248	4	0	0	8	0	1,553
	CCL2302	496	118	17	0	0	0	1	632
Total		1,789	366	21	0	0	8	1	2,185
24	CCL2401	873	148	3	0	26	6	2	1,058
	CCL2402	888	95	1	0	0	4	0	988
	CCL2403	720	79	1	3	0	7	0	810
	CCL2404	1,361	201	12	0	0	8	0	1,582
	CCL2405	681	111	1	0	0	7	1	801
	CCL2406	938	169	2	1	0	4	0	1,114
	CCL2407	953	191	15	0	0	4	1	1,164
Total		6,414	994	35	4	26	40	4	7,517
25	CCL2501	1,279	145	10	1	0	4	3	1,442
	CCL2502	874	116	0	3	0	5	0	998
	CCL2503	812	90	2	1	0	11	4	920
	CCL2504	1,122	206	2	17	0	2	0	1,349
Total		4,087	557	14	22	0	22	7	4,709
26	CCL2601	629	46	0	0	0	22	0	697
	CCL2602	29	48	0	0	0	1	1	79
	CCL2603	231	35	3	0	0	0	2	271
	CCL2604	187	80	0	0	0	5	1	273
	CCL2605	411	63	0	2	0	2	0	478
	CCL2606	51	2	0	0	0	1	0	54
	CCL2607	320	38	0	0	0	0	1	359
	CCL2608	1,194	48	0	0	0	11	0	1,253
	CCL2609	2	2	0	0	0	0	0	4
	CCL2610	48	9	0	0	0	0	1	58
Total		3,102	371	3	2	0	42	6	3,526
27	CCL2701	122	71	0	1	0	2	6	202
	CCL2702	158	88	0	4	0	2	0	252
	CCL2703	536	90	0	0	0	14	2	642
	CCL2704	500	78	1	0	0	7	3	589
	CCL2705	588	87	4	0	0	7	1	687
	CCL2706	513	142	3	0	0	1	0	659
Total		2,417	556	8	5	0	33	12	3,031
28	CCL2801	587	252	28	0	0	5	39	911
	CCL2802	821	149	9	0	0	5	1	985
	CCL2803	1,108	161	2	0	0	5	0	1,276
Total		2,516	562	39	0	0	15	40	3,172
29	CCL2901	414	106	18	1	1	0	36	576
	CCL2902	1,168	135	1	1	0	5	2	1,312
	CCL2903	566	81	4	0	0	2	0	653
Total		2,148	322	23	2	1	7	38	2,541
30	CCL3001	32	49	56	0	0	0	31	168
	CCL3002	1,019	191	19	2	1	9	40	1,281
	CCL3003	1,220	223	12	0	0	24	12	1,491
Total		2,271	463	87	2	1	33	83	2,940
31	CCL3101	420	89	3	1	1	2	10	526
	CCL3102	273	90	5	0	0	2	5	375
	CCL3103	87	283	6	0	0	4	0	380
Total		780	462	14	1	1	8	15	1,281
32	CCL3201	211	335	0	0	2	17	28	593
	CCL3202	782	180	2	2	0	5	9	980
Total		993	515	2	2	2	22	37	1,573
33	CCL3301	167	496	19	0	0	1	10	693
	CCL3302	1,075	285	5	0	0	5	14	1,384
Total		1,242	781	24	0	0	6	24	2,077

}

Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
34	CCL3401	362	672	0	0	0	0	1	1,035
	CCL3402	526	469	4	0	0	2	4	1,005
Total		888	1,141	4	0	0	2	5	2,040
35	CCL3501	233	668	5	0	0	1	6	913
	CCL3502	168	337	32	0	0	5	0	542
	CCL3503	286	216	36	0	0	0	0	538
	CCL3504	6	0	0	0	0	0	0	6
Total		693	1,221	73	0	0	6	6	1,999
36	CCL3601	13	22	0	0	0	0	0	35
	CCL3602	1,473	401	7	0	0	6	8	1,895
	CCL3603	362	69	1	0	0	0	1	433
Total		1,848	492	8	0	0	6	9	2,363
37	CCL3701	54	20	1	0	3	3	4	85
	CCL3702	24	10	0	0	3	0	1	38
	CCL3703	411	6	0	0	0	0	0	417
	CCL3704	28	5	0	0	0	1	0	34
	CCL3705	24	12	0	0	0	0	0	36
	CCL3706	570	13	0	0	0	4	3	590
	CCL3707	523	84	0	0	0	4	3	614
	CCL3708	319	12	0	0	0	1	4	336
	CCL3709	0	0	0	0	0	0	0	0
	CCL3710	13	1	0	0	0	0	0	14
	CCL3711	24	22	0	0	0	0	1	47
Total		1,990	185	1	0	6	13	16	2,211
38	CCL3801	282	18	0	0	0	1	1	302
	CCL3803	1,167	29	0	0	0	2	9	1,207
	CCL3804	1,118	60	5	0	0	1	4	1,188
	CCL3805	731	204	2	0	0	8	8	953
	CCL3806	738	35	0	0	0	0	5	778
	CCL3807	586	124	0	1	0	0	0	711
	CCL3808	284	103	3	0	0	0	1	391
	CCL3809	146	39	0	0	0	0	1	186
Total		5,052	612	10	1	0	12	29	5,716
39	CCL3901	68	0	0	0	0	1	1	70

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	CCL3902	263	37	0	0	0	0	4	304
	CCL3903	387	262	0	0	0	0	2	651
	CCL3904	498	101	1	0	0	2	0	602
	CCL3905	376	179	1	0	0	6	0	562
	CCL3906	176	149	0	1	4	4	6	340
	CCL3907	105	79	4	2	0	6	0	196
	CCL3908	762	209	1	0	0	6	10	988
	CCL3910	265	146	6	0	0	2	5	424
	CCL3911	1	0	0	0	0	0	0	1
	CCL3912	72	8	0	0	0	0	0	80
	CCL3913	0	0	0	0	0	0	0	0
	CCL3914	82	0	0	0	0	0	0	82
	CCL3915	159	1	0	0	0	1	1	162
	CCL3916	43	22	4	0	0	2	4	75
	CCL3917	19	1	0	0	0	0	1	21
Total		3,276	1,194	17	3	4	30	34	4,558
40	CCL4001	1,038	82	0	0	0	3	2	1,125
	CCL4002	351	43	0	0	0	1	3	398
	CCL4003	277	26	0	0	0	2	0	305
	CCL4004	270	41	5	0	0	0	1	317
	CCL4005	419	108	0	0	0	4	0	531
	CCL4006	307	7	0	0	0	0	1	315
	CCL4007	58	11	0	0	0	0	1	70
	CCL4008	219	2	0	0	0	0	0	221
	CCL4009	338	41	0	0	0	1	0	380
	CCL4010	33	0	0	0	0	0	0	33
	CCL4011	185	8	0	0	0	3	6	202
	CCL4012	417	102	0	0	0	1	0	520
	CCL4013	635	141	0	0	0	3	2	781
	CCL4014	348	128	0	0	0	3	8	487
Total		4,895	740	5	0	0	21	24	5,685
41	CCL4101	491	22	0	0	0	0	2	515
	CCL4102	880	37	0	0	0	0	5	922
	CCL4103	552	32	0	0	0	3	4	591

}

Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
	CCL4104	238	27	0	0	0	0	1	266
	CCL4105	5	1	0	0	0	0	0	6
	CCL4106	81	24	0	0	0	0	1	106
	CCL4107	482	24	0	0	0	1	2	509
	CCL4108	591	53	0	0	0	2	3	649
	CCL4109	279	13	0	0	0	0	0	292
	CCL4110	70	10	0	0	0	0	1	81
Total		3,669	243	0	0	0	6	19	3,937
Summary		149,061	28,462	2,080	119	52	1,221	1,282	182,277

Table 48 Main Structural Types of Chittagong in Cluster level

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+other	
1	CCL0101	551	113	88	158	93	1,003
	CCL0102	166	32	24	47	29	298
	CCL0103	0	0	0	0	0	0
	CCL0104	248	46	57	72	40	463
	CCL0105	446	54	163	103	82	848
	CCL0106	673	77	281	139	67	1237
	CCL0107	445	85	74	127	81	812
	CCL0108	11	2	2	4	2	21
	CCL0109	0	0	0	0	0	0
	CCL0110	57	10	8	18	13	106
	CCL0111	239	46	38	67	43	433
	CCL0112	74	14	11	21	12	132
	CCL0113	0	0	0	0	0	0
	CCL0114	42	7	6	12	11	78
	CCL0115	57	12	9	18	10	106
	CCL0116	8	1	1	3	2	15
	CCL0117	94	17	14	28	19	172
	CCL0118	33	6	5	9	5	58
	CCL0119	11	2	2	4	2	21
	CCL0120	7	1	1	2	1	12
Total		3,162	525	784	832	512	5,815
2	CCL0201	333	64	53	93	62	605
	CCL0202	247	22	105	60	78	512
	CCL0203	459	73	84	118	142	876
	CCL0204	524	95	88	127	94	928
	CCL0205	181	30	25	47	31	314
	CCL0206	762	126	199	158	76	1,321
	CCL0207	304	36	127	64	27	558
	CCL0208	105	12	46	21	8	192
	CCL0209	97	10	44	22	18	191
	CCL0210	506	73	186	107	45	917
	CCL0211	654	80	232	118	53	1,137
	CCL0212	285	33	114	53	25	510
	CCL0213	482	58	201	96	40	877
	CCL0214	150	21	47	27	13	258
Total		5,089	733	1,551	1,111	712	9196
3	CCL0301	454	62	149	105	76	846
	CCL0302	191	20	82	38	23	354
	CCL0303	350	31	170	106	194	851
	CCL0304	622	117	157	98	52	1,046
	CCL0305	735	146	112	132	145	1,270
	CCL0306	231	25	93	44	25	418
Total		2,583	401	763	523	515	4,785
4	CCL0401	715	104	163	125	169	1,276
	CCL0402	353	53	118	85	41	650
	CCL0405	472	54	196	92	46	860
	CCL0406	456	67	159	111	81	874
	CCL0407	537	77	215	135	56	1,020
	CCL0408	581	86	176	123	61	1,027
	CCL0409	380	69	92	117	102	760
	CCL0410	334	58	43	82	64	581
	CCL0411	4	1	1	2	1	9
	CCL0412	433	83	69	124	85	794
	CCL0413	206	31	63	49	26	375

}

Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+other	
	CCL0414	184	26	58	41	24	333
	CCL0415	364	55	117	83	40	659
	CCL0416	714	122	71	254	664	1,825
Total		5,733	886	1,541	1,423	1,460	11,043
5	CCL0501	188	38	30	54	34	344
	CCL0502	109	24	24	47	50	254
	CCL0503	351	64	76	140	219	850
	CCL0504	196	31	61	119	257	664
	CCL0505	555	111	98	181	152	1,097
	CCL0506	189	31	52	80	148	500
	CCL0507	69	9	15	71	217	381
	CCL0508	113	10	51	39	75	288
	CCL0509	210	15	113	37	21	396
	CCL0510	132	9	75	23	8	247
	CCL0511	109	6	61	17	7	200
	CCL0512	36	2	20	7	3	68
	CCL0513	110	8	58	19	7	202
	CCL0514	64	7	30	15	6	122
	CCL0516	66	5	36	12	5	124
	CCL0517	76	14	15	22	13	140
Total		2,573	384	815	883	1,222	5,877
6	CCL0601	981	154	326	222	175	1,858
	CCL0602	706	116	247	167	90	1,326
	CCL0603	448	45	195	75	39	802
	CCL0604	520	50	242	89	37	938
	CCL0605	490	70	174	117	55	906
	CCL0606	388	41	174	72	34	709
Total		3,533	476	1,358	742	430	6,539
7	CCL0701	436	65	71	153	353	1,078
	CCL0702	667	117	177	163	77	1,201
	CCL0703	935	142	321	226	106	1,730
	CCL0704	339	51	85	52	18	545
	CCL0705	731	102	212	160	197	1,402
	CCL0706	555	61	222	100	40	978

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+other	
	CCL0707	15	3	2	6	3	29
	CCL0708	704	87	249	153	158	1,351
Total		4,382	628	1,339	1,013	952	8,314
8	CCL0801	900	97	368	147	54	1,566
	CCL0802	495	68	77	40	14	694
	CCL0803	807	120	142	110	89	1,268
	CCL0804	369	55	110	103	75	712
	CCL0805	1,090	148	224	110	57	1,629
	CCL0806	215	33	71	74	90	483
	CCL0807	455	48	172	80	57	812
	CCL0808	246	27	88	53	73	487
	CCL0809	314	26	145	90	167	742
	CCL0810	323	32	146	67	41	609
	CCL0811	654	83	184	272	634	1,827
Total		5,868	737	1727	1,146	1351	10,829
9	CCL0901	161	31	25	54	60	331
	CCL0902	89	22	13	30	52	206
	CCL0903	183	20	69	68	134	474
	CCL0904	14	2	2	6	7	31
	CCL0905	887	103	414	185	73	1,662
	CCL0906	278	38	77	159	396	948
	CCL0907	764	136	157	216	213	1,486
	CCL0908	487	88	108	164	207	1,054
	CCL0909	461	88	75	139	130	893
	CCL0910	108	21	17	30	19	195
	CCL0911	251	29	78	127	336	821
Total		3,683	578	1,035	1,178	1,627	8,101
10	CCL1001	355	36	159	85	89	724
	CCL1002	2	0	1	2	4	9
	CCL1003	0	0	0	0	0	0
	CCL1004	114	16	38	26	15	209
	CCL1005	72	11	6	15	23	127
	CCL1006	252	41	56	96	172	617
	CCL1007	425	82	58	102	59	726

}

Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+other	
	CCL1008	515	96	80	148	215	1,054
	CCL1009	402	48	158	102	119	829
Total		2,137	330	556	576	696	4,295
11	5	0	2	2	1	10	5
	11	2	2	4	2	21	11
	41	9	7	15	8	80	41
	233	21	98	35	21	408	233
	370	33	189	71	44	707	370
	424	59	145	99	53	780	424
	487	44	246	85	33	895	487
	763	51	422	115	53	1,404	763
	748	86	241	103	58	1,236	748
Total	3,082	305	1,352	529	273	5,541	3,082
12	967	92	480	162	62	1,763	967
	649	90	116	148	327	1,330	649
	506	82	211	145	41	985	506
	537	74	173	154	261	1,199	537
	22	4	4	9	4	43	22
Total	2,681	342	984	618	695	5,320	2,681
13	467	52	172	100	97	888	467
	735	144	141	217	123	1,360	735
	390	68	72	79	50	659	390
	696	97	181	118	72	1,164	696
	706	136	101	170	89	1,202	706
	98	11	32	26	42	209	98
	280	23	132	43	19	497	280
Total	3,372	531	831	753	492	5,979	3,372
14	656	133	118	191	116	1,214	656
	993	105	406	166	70	1,740	993
Total	1,649	238	524	357	186	2,954	1,649
15	643	110	82	90	51	976	643
	834	138	85	91	50	1,198	834
	262	24	107	42	32	467	262
Total	1,739	272	274	223	133	2,641	1,739

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+other	
16	541	88	146	127	69	971	541
	334	66	46	49	33	528	334
	CCL1603	419	81	57	129	186	872
	CCL1604	678	102	226	147	71	1,224
	CCL1605	269	50	47	63	52	481
	CCL1606	296	44	56	38	16	450
Total		2,537	431	578	553	427	4,526
17	CCL1701	106	12	54	25	10	207
	CCL1702	315	33	150	62	26	586
	CCL1703	218	22	90	33	13	376
	CCL1704	520	54	208	69	28	879
	CCL1705	665	71	257	129	166	1,288
	CCL1706	566	82	114	74	46	882
Total		2,390	274	873	392	289	4,218
18	CCL1801	211	45	33	65	39	393
	CCL1802	9	2	2	4	2	19
	CCL1803	830	178	138	258	141	1,545
	CCL1804	0	0	0	0	0	0
	CCL1805	337	49	110	86	60	642
	CCL1806	333	27	178	75	82	695
	CCL1807	67	12	19	20	17	135
	CCL1808	109	12	54	23	7	205
	CCL1809	800	142	184	207	119	1,452
	CCL1810	0	0	0	0	0	0
Total		2,696	467	718	738	467	5,086
19	CCL1901	678	154	120	268	247	1,467
	CCL1902	862	149	137	155	72	1,375
Total		1,540	303	257	423	319	2,842
20	CCL2001	480	83	50	59	25	697
	CCL2002	551	73	63	21	5	713
Total		1,031	156	113	80	30	1,410
21	CCL2101	533	79	37	22	6	677
	CCL2102	830	86	338	121	43	1,418
Total		1,363	165	375	143	49	2,095

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+other	
22	CCL2201	820	106	292	137	51	1,406
	CCL2202	306	36	157	76	25	306
Total		1,126	142	449	213	76	1,126
23	CCL2301	922	98	378	116	40	922
	CCL2302	364	66	80	80	43	364
Total		1,286	164	458	196	83	1,286
24	CCL2401	637	89	163	102	69	637
	CCL2402	574	60	223	85	48	574
	CCL2403	496	49	185	57	22	496
	CCL2404	1,110	146	225	77	24	1,110
	CCL2405	629	97	43	28	5	629
	CCL2406	850	130	76	47	11	850
	CCL2407	885	137	79	53	12	885
Total		5,181	708	994	449	191	5,181
25	CCL2501	487	72	61	208	615	487
	CCL2502	649	79	170	69	34	649
	CCL2503	463	83	60	125	190	463
	CCL2504	718	100	216	153	163	718
Total		2,317	334	507	555	1,002	2,317
26	CCL2601	408	42	157	60	32	408
	CCL2602	42	10	8	16	4	42
	CCL2603	139	20	31	30	51	139
	CCL2604	135	28	28	48	35	135
	CCL2605	260	43	73	66	37	260
	CCL2606	29	2	14	5	3	29
	CCL2607	193	19	86	36	25	193
	CCL2608	694	48	341	96	76	694
	CCL2609	1	0	1	2	0	1
	CCL2610	31	7	5	10	5	31
Total		1,932	219	744	369	268	1,932
27	CCL2701	141	20	17	18	6	141
	CCL2702	149	31	22	39	14	149
	CCL2703	455	58	51	53	26	455
	CCL2704	396	56	75	45	18	396

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+other	
	CCL2705	392	64	104	84	43	687
	CCL2706	360	59	119	82	40	660
Total		1,893	288	388	321	147	3,037
28	CCL2801	489	100	86	145	90	910
	CCL2802	576	58	232	82	37	985
	CCL2803	710	61	356	110	40	1,277
Total		1,775	219	674	337	167	3,172
29	CCL2901	300	52	66	82	78	578
	CCL2902	734	73	334	119	52	1,312
	CCL2903	378	37	167	52	20	654
Total		1,412	162	567	253	150	2,544
30	CCL3001	100	17	9	30	13	169
	CCL3002	722	108	211	155	87	1,283
	CCL3003	855	135	251	170	81	1,492
Total		1,677	260	471	355	181	2,944
31	CCL3101	305	60	58	69	35	527
	CCL3102	204	37	58	53	25	377
	CCL3103	205	59	32	66	20	382
Total		714	156	148	188	80	1286
32	CCL3201	340	80	56	90	28	594
	CCL3202	732	119	59	57	15	982
Total		1,072	199	115	147	43	1576
33	CCL3301	357	101	57	138	41	694
	CCL3302	799	163	132	197	95	1,386
Total		1,156	264	189	335	136	2,080
34	CCL3401	605	154	87	135	56	1,037
	CCL3402	514	132	83	186	90	1,005
Total		1,119	286	170	321	146	2,042
35	CCL3501	463	132	74	183	63	915
	CCL3502	192	61	40	128	121	542
	CCL3503	268	61	56	94	60	539
	CCL3504	3	1	1	2	1	8
Total		926	255	171	407	245	2,004
36	CCL3601	20	5	3	7	2	37

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+other	
	CCL3602	1,190	206	201	215	83	1,895
	CCL3603	237	29	99	49	20	434
Total		1,447	240	303	271	105	2,366
37	CCL3701	57	10	9	7	3	86
	CCL3702	21	3	8	6	2	40
	CCL3703	229	12	133	31	13	418
	CCL3704	22	3	5	3	1	34
	CCL3705	17	2	7	7	4	37
	CCL3706	326	64	52	91	58	591
	CCL3707	353	64	62	81	55	615
	CCL3708	186	36	30	53	33	338
	CCL3709	0	0	0	0	0	0
	CCL3710	7	1	1	3	1	13
	CCL3711	35	8	2	2	0	47
Total		1,253	203	309	284	170	2,219
38	CCL3801	0	0	0	1	0	1
	CCL3803	668	125	120	181	115	1,209
	CCL3804	651	106	173	164	96	1,190
	CCL3805	529	87	140	132	65	953
	CCL3806	427	83	72	121	75	778
	CCL3807	381	76	83	112	59	711
	CCL3808	210	44	45	64	29	392
	CCL3809	104	11	41	21	9	186
Total		2,970	532	674	796	448	5,420
39	CCL3901	40	7	7	10	6	70
	CCL3902	167	26	45	39	29	306
	CCL3903	414	82	74	59	24	653
	CCL3904	329	38	144	67	26	604
	CCL3905	307	68	47	88	54	564
	CCL3906	187	38	48	51	17	341
	CCL3907	111	24	22	28	11	196
	CCL3908	535	105	124	148	74	986
	CCL3910	219	49	48	77	32	425
	CCL3911	0	0	0	1	0	1

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL+other	
	CCL3912	42	8	12	12	6	80
	CCL3913	0	0	0	0	0	0
	CCL3914	45	9	7	14	8	83
	CCL3915	90	17	14	25	16	162
	CCL3916	42	8	8	13	5	76
	CCL3917	16	2	1	2	0	21
Total		2,544	481	601	634	308	4,568
40	CCL4001	714	126	87	127	71	1,125
	CCL4002	265	35	59	28	11	398
	CCL4003	167	12	90	26	10	305
	CCL4004	175	15	91	27	10	318
	CCL4005	292	32	138	50	19	531
	CCL4006	173	33	30	49	31	316
	CCL4007	37	8	6	13	7	71
	CCL4008	121	23	20	35	22	221
	CCL4009	212	28	57	38	47	382
	CCL4010	8	1	1	7	17	34
	CCL4011	138	17	22	13	15	205
	CCL4012	356	62	41	45	18	522
	CCL4013	489	94	59	95	46	783
	CCL4014	257	58	43	88	42	488
Total		3,404	544	744	641	366	5,699
41	CCL4101	282	56	46	83	51	518
	CCL4102	506	100	82	144	90	922
	CCL4103	323	64	53	95	57	592
	CCL4104	143	30	24	46	26	269
	CCL4105	3	1	1	2	1	8
	CCL4106	54	13	9	21	10	107
	CCL4107	279	55	45	80	50	509
	CCL4108	368	63	84	86	49	650
	CCL4109	159	32	26	47	29	293
	CCL4110	44	9	7	15	8	83
Total		2,161	423	377	619	371	3,951
Summary		100,188	15,241	27,401	21,927	17,520	182,277

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Annex

Table 49 Buildings Age and Visible Physical Condition of Chittagong in Cluster level

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
1	CCL0101	482	408	112	1,002	284	516	202	1,002
	CCL0102	145	120	32	297	83	152	62	297
	CCL0103	0	0	0	0	0	0	0	0
	CCL0104	223	184	53	461	131	233	96	461
	CCL0105	413	324	110	847	250	395	202	847
	CCL0106	592	475	170	1,237	342	585	310	1,237
	CCL0107	393	326	92	811	230	416	165	811
	CCL0108	10	8	0	19	6	11	2	19
	CCL0109	0	0	0	0	0	0	0	0
	CCL0110	52	42	12	106	30	54	22	106
	CCL0111	208	176	48	432	124	222	86	432
	CCL0112	64	54	14	131	37	68	26	131
	CCL0113	0	0	0	0	0	0	0	0
	CCL0114	39	31	8	77	22	40	15	77
	CCL0115	51	43	11	105	31	55	20	105
	CCL0116	8	6	2	15	5	8	3	15
	CCL0117	84	69	19	172	49	89	35	172
	CCL0118	28	24	5	57	16	30	11	57
	CCL0119	10	8	0	19	6	11	2	19
	CCL0120	6	5	1	12	3	6	3	12
Total		2,809	2,301	690	5,800	1,647	2,891	1,262	5,800
2	CCL0201	291	245	69	606	174	310	123	606
	CCL0202	254	190	68	511	170	220	121	511
	CCL0203	443	336	96	875	273	408	194	875
	CCL0204	455	371	102	929	257	463	209	929
	CCL0205	162	120	31	313	82	153	78	313
	CCL0206	647	519	154	1,320	332	655	333	1,320
	CCL0207	267	215	75	557	152	265	140	557
	CCL0208	92	73	25	191	51	91	49	191
	CCL0209	92	72	25	189	58	87	45	189
	CCL0210	441	357	116	914	245	441	228	914
	CCL0211	551	440	145	1,136	293	546	297	1,136
	CCL0212	245	197	68	509	136	242	131	509
	CCL0213	421	337	117	875	235	415	225	875
	CCL0214	124	101	30	256	66	126	64	256
Total		4,486	3,573	1,122	9,181	2,524	4,420	2,237	9,181
3	CCL0301	407	330	109	846	245	406	195	846
	CCL0302	169	135	48	353	100	165	88	353
	CCL0303	418	314	118	850	332	346	171	850
	CCL0304	513	417	118	1,047	251	515	282	1,047
	CCL0305	639	505	126	1,270	339	612	319	1,270
	CCL0306	200	161	56	417	115	198	104	417
Total		2,346	1,862	575	4,783	1,383	2,242	1,158	4,783
4	CCL0401	635	498	140	1,274	368	595	311	1,274
	CCL0402	311	255	82	648	180	317	151	648
	CCL0405	410	332	115	857	236	408	213	857
	CCL0406	433	330	111	874	256	402	216	874
	CCL0407	486	395	135	1,017	288	489	240	1,017
	CCL0408	500	400	125	1,025	269	501	255	1,025
	CCL0409	372	298	90	759	241	362	156	759
	CCL0410	294	226	60	580	157	288	136	580
	CCL0411	4	4	(1)	7	3	5	(0)	7
	CCL0412	384	320	90	794	230	403	160	794
	CCL0413	181	147	48	376	104	184	89	376
	CCL0414	160	131	42	332	92	163	77	332
	CCL0415	318	258	81	657	179	321	158	657
	CCL0416	945	688	191	1,824	794	726	304	1,824
Total		5,434	4,283	1,308	11,024	3,396	5,164	2,465	11,024
5	CCL0501	167	139	37	343	98	175	69	343
	CCL0502	125	99	29	253	93	117	43	253
	CCL0503	422	326	102	850	336	372	142	850
	CCL0504	336	244	83	663	325	252	86	663
	CCL0505	531	439	127	1,097	348	542	207	1,097
	CCL0506	249	189	63	501	212	208	81	501
	CCL0507	198	135	49	382	228	122	32	382

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Annex

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	CCL0508	143	106	38	287	118	115	54	287
	CCL0509	190	148	57	395	112	178	104	395
	CCL0510	117	93	38	247	68	112	67	247
	CCL0511	95	74	30	200	54	90	56	200
	CCL0512	32	25	10	68	19	31	18	68
	CCL0513	96	76	30	202	55	92	55	202
	CCL0514	58	46	15	120	34	57	28	120
	CCL0516	59	46	16	122	34	56	31	122
	CCL0517	67	56	14	138	40	71	27	138
Total		2,885	2,243	740	5,868	2,176	2,592	1,101	5,868
6	CCL0601	902	721	233	1,856	543	872	442	1,856
	CCL0602	639	519	167	1,325	371	634	320	1,325
	CCL0603	388	305	108	801	214	372	216	801
	CCL0604	448	358	129	935	250	436	248	935
	CCL0605	433	354	117	904	252	439	212	904
	CCL0606	338	272	98	708	194	332	182	708
Total		3,149	2,528	852	6,529	1,824	3,085	1,620	6,529
7	CCL0701	555	404	116	1,075	452	436	187	1,075
	CCL0702	596	464	140	1,200	319	583	299	1,200
	CCL0703	834	674	221	1,729	477	837	415	1,729
	CCL0704	269	216	59	544	123	270	151	544
	CCL0705	692	541	166	1,399	434	641	324	1,399
	CCL0706	475	373	127	975	252	462	261	975
	CCL0707	14	12	1	27	8	15	4	27
	CCL0708	664	516	169	1,349	409	615	325	1,349
Total		4,099	3,200	999	8,298	2,474	3,860	1,964	8,298
8	CCL0801	757	601	205	1,563	398	738	426	1,563
	CCL0802	352	279	62	692	126	352	213	692
	CCL0803	634	505	125	1,264	296	628	341	1,264
	CCL0804	354	272	84	710	210	334	166	710
	CCL0805	812	648	167	1,627	340	811	476	1,627
	CCL0806	241	181	60	482	169	213	100	482
	CCL0807	400	307	103	810	220	375	215	810
	CCL0808	243	182	60	485	156	212	117	485

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	CCL0809	366	274	102	741	285	303	152	741
	CCL0810	291	232	84	607	175	282	149	607
	CCL0811	929	673	224	1,826	820	711	295	1,826
Total		5,379	4,153	1,275	10,807	3,196	4,959	2,652	10,807
9	CCL0901	161	132	37	330	113	159	58	330
	CCL0902	100	83	22	205	79	93	33	205
	CCL0903	235	176	61	472	199	192	81	472
	CCL0904	16	12	2	30	11	15	4	30
	CCL0905	794	634	233	1,661	458	776	427	1,661
	CCL0906	481	348	118	947	475	352	120	947
	CCL0907	726	586	172	1,484	465	717	301	1,484
	CCL0908	516	412	125	1,053	373	486	194	1,053
	CCL0909	433	358	100	891	281	441	169	891
	CCL0910	94	79	21	194	55	100	38	194
	CCL0911	419	299	104	821	405	300	116	821
Total		3,976	3,118	994	8,088	2,915	3,631	1,543	8,088
10	CCL1001	350	274	101	724	234	323	167	724
	CCL1002	5	3	2	10	5	3	2	10
	CCL1003	0	0	0	0	0	0	0	0
	CCL1004	100	82	25	207	58	102	47	207
	CCL1005	71	44	11	127	34	56	37	127
	CCL1006	314	230	70	615	247	259	109	615
	CCL1007	354	296	76	725	189	375	161	725
	CCL1008	527	413	113	1,053	360	483	210	1,053
	CCL1009	402	316	111	829	274	372	183	829
Total		2,123	1,658	510	4,290	1,400	1,974	916	4,290
11	CCL1101	5	4	(1)	8	3	5	0	8
	CCL1102	10	8	1	20	6	11	3	20
	CCL1103	39	32	8	79	24	41	14	79
	CCL1104	197	155	54	407	108	189	110	407
	CCL1105	338	267	102	706	204	321	181	706
	CCL1106	374	304	102	780	218	378	184	780
	CCL1107	428	338	126	892	242	411	240	892
	CCL1108	670	523	206	1,400	383	630	387	1,400

}

Annex

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	CCL1109	604	481	149	1,234	302	592	340	1,234
Total		2,666	2,113	747	5,526	1,489	2,577	1,460	5,526
12	CCL1201	844	667	250	1,761	470	812	479	1,761
	CCL1202	679	508	142	1,329	474	571	284	1,329
	CCL1203	471	381	132	984	276	474	235	984
	CCL1204	595	454	147	1,196	440	514	242	1,196
	CCL1205	22	16	5	43	12	22	9	43
Total		2,610	2,027	675	5,313	1,672	2,393	1,248	5,313
13	CCL1301	430	341	117	887	268	411	208	887
	CCL1302	653	548	156	1,358	389	693	276	1,358
	CCL1303	322	265	72	659	169	332	158	659
	CCL1304	566	461	136	1,163	294	574	295	1,163
	CCL1305	586	489	127	1,201	311	621	269	1,201
	CCL1306	104	79	25	207	74	91	42	207
	CCL1307	238	188	69	496	131	230	135	496
Total		2,899	2,371	701	5,971	1,638	2,951	1,382	5,971
14	CCL1401	586	490	137	1,213	348	616	248	1,213
	CCL1402	838	669	232	1,738	451	821	465	1,738
Total		1,423	1,159	369	2,951	799	1,438	714	2,951
15	CCL1501	488	396	90	974	211	500	263	974
	CCL1502	603	489	104	1,196	235	623	339	1,196
	CCL1503	225	178	62	466	128	216	122	466
Total		1,316	1,064	256	2,636	574	1,339	724	2,636
16	CCL1601	469	384	117	970	265	480	225	970
	CCL1602	262	215	50	527	119	269	139	527
	CCL1603	436	342	92	869	304	402	163	869
	CCL1604	596	475	152	1,223	328	587	309	1,223
	CCL1605	236	192	52	480	135	238	107	480
	CCL1606	223	180	44	448	96	227	124	448
Total		7,701	6,233	1,757	15,691	3,994	7,755	3,942	15,691
17	CCL1701	98	79	30	207	59	96	51	207
	CCL1702	280	223	83	586	161	271	154	586
	CCL1703	182	144	48	374	95	177	102	374
	CCL1704	424	338	114	876	217	415	243	876
	CCL1705	630	489	169	1,288	401	575	313	1,288
	CCL1706	437	352	92	881	200	439	242	881
Total		2,052	1,625	535	4,212	1,133	1,974	1,105	4,212
18	CCL1801	190	159	43	392	113	202	78	392
	CCL1802	9	8	1	18	6	10	2	18
	CCL1803	742	628	172	1,542	443	794	305	1,542
	CCL1804	0	0	0	0	0	0	0	0
	CCL1805	309	250	83	642	190	308	144	642
	CCL1806	335	259	100	693	227	301	165	693
	CCL1807	66	53	15	133	43	64	27	133
	CCL1808	98	78	29	205	56	95	54	205
	CCL1809	697	581	173	1,451	407	732	313	1,451
	CCL1810	0	0	0	0	0	0	0	0
Total		2,446	2,014	615	5,076	1,484	2,505	1,088	5,076
19	CCL1901	715	582	169	1,466	502	706	258	1,466
	CCL1902	677	557	139	1,373	320	705	348	1,373
Total		1,392	1,139	308	2,839	822	1,411	606	2,839
20	CCL2001	349	286	61	696	137	365	194	696
	CCL2002	364	290	58	713	108	369	236	713
Total		714	576	119	1,409	245	734	430	1,409
21	CCL2101	349	279	48	676	97	357	222	676
	CCL2102	687	543	188	1,418	352	668	399	1,418
Total		1,036	822	236	2,094	449	1,025	621	2,094
22	CCL2201	683	545	176	1,405	349	674	382	1,405
	CCL2202	286	228	86	599	171	279	149	599
Total		969	773	262	2,004	520	953	531	2,004
23	CCL2301	752	596	204	1,553	377	730	446	1,553
	CCL2302	308	253	71	632	164	318	150	632
Total		1,061	849	275	2,185	540	1,049	596	2,185
24	CCL2401	520	418	120	1,058	266	517	275	1,058
	CCL2402	480	380	128	988	255	464	269	988
	CCL2403	394	312	104	810	190	383	237	810
	CCL2404	794	630	157	1,582	294	791	497	1,582
	CCL2405	413	331	57	801	114	424	263	801

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Annex

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	CCL2406	570	457	87	1,114	171	583	360	1,114
	CCL2407	598	477	89	1,164	180	610	373	1,164
Total		3,770	3,005	743	7,517	1,470	3,773	2,274	7,517
25	CCL2501	748	534	159	1,442	694	538	209	1,442
	CCL2502	496	393	109	998	219	488	291	998
	CCL2503	460	363	97	920	311	427	182	920
	CCL2504	661	524	164	1,349	404	627	317	1,349
Total		2,366	1,814	529	4,709	1,629	2,081	999	4,709
26	CCL2601	338	269	90	697	179	330	188	697
	CCL2602	39	32	8	79	22	41	16	79
	CCL2603	136	104	31	271	89	121	61	271
	CCL2604	133	109	31	273	86	135	52	273
	CCL2605	230	190	58	478	135	236	107	478
	CCL2606	26	20	8	54	15	24	15	54
	CCL2607	173	136	50	359	102	165	93	359
	CCL2608	605	471	177	1,253	346	562	344	1,253
	CCL2609	2	2	1	4	2	2	0	4
	CCL2610	28	24	6	58	16	30	12	58
Total		1,709	1,357	460	3,526	991	1,647	888	3,526
27	CCL2701	110	75	17	202	37	97	68	202
	CCL2702	125	104	23	252	64	132	57	252
	CCL2703	337	252	53	642	122	320	200	642
	CCL2704	297	234	58	589	121	295	173	589
	CCL2705	332	273	82	687	181	341	166	687
	CCL2706	316	260	83	659	181	321	157	659
Total		1,518	1,197	316	3,031	705	1,505	821	3,031
28	CCL2801	447	361	102	911	258	456	197	911
	CCL2802	479	376	131	985	248	462	276	985
	CCL2803	611	482	183	1,276	337	586	353	1,276
Total		1,537	1,219	416	3,172	843	1,504	825	3,172
29	CCL2901	284	225	67	576	176	278	122	576
	CCL2902	628	501	183	1,312	347	612	354	1,312
	CCL2903	315	249	88	653	165	304	184	653
Total		1,227	976	338	2,541	688	1,193	659	2,541

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
30	CCL3001	89	64	15	168	39	87	42	168
	CCL3002	624	502	156	1,281	342	628	311	1,281
	CCL3003	721	589	181	1,491	386	734	371	1,491
Total		1,433	1,155	351	2,940	768	1,448	724	2,940
31	CCL3101	255	213	57	526	136	269	122	526
	CCL3102	182	149	44	375	104	186	85	375
	CCL3103	186	156	38	380	100	198	83	380
Total		624	518	139	1,281	339	652	289	1,281
32	CCL3201	290	242	61	593	147	308	138	593
	CCL3202	501	403	76	980	160	517	303	980
Total		791	645	137	1,573	308	825	441	1,573
33	CCL3301	339	281	73	693	189	361	143	693
	CCL3302	673	564	147	1,384	359	713	312	1,384
Total		1,011	845	221	2,077	549	1,073	455	2,077
34	CCL3401	513	423	99	1,035	249	530	256	1,035
	CCL3402	489	407	109	1,005	291	511	202	1,005
Total		1,002	830	208	2,040	540	1,041	459	2,040
35	CCL3501	446	371	96	913	257	471	185	913
	CCL3502	268	210	64	542	214	250	78	542
	CCL3503	264	213	61	538	163	265	110	538
	CCL3504	4	3	(1)	6	3	4	(1)	6
Total		982	796	221	1,999	638	989	372	1,999
36	CCL3601	19	14	2	35	10	19	7	35
	CCL3602	937	764	194	1,895	432	968	495	1,895
	CCL3603	208	167	58	433	118	205	110	433
Total		1,164	945	254	2,363	559	1,192	612	2,363
37	CCL3701	42	35	8	85	18	44	23	85
	CCL3702	19	16	3	38	11	19	7	38
	CCL3703	199	156	63	417	113	187	117	417
	CCL3704	17	13	4	34	7	17	10	34
	CCL3705	18	14	4	36	12	17	7	36
	CCL3706	284	240	66	590	169	303	118	590
	CCL3707	301	247	66	614	165	309	139	614
	CCL3708	163	137	36	336	97	174	66	336

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Annex

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	CCL3709	0	0	0	0	0	0	0	0
	CCL3710	6	5	2	14	4	7	4	14
	CCL3711	24	20	3	47	7	25	15	47
Total		1,073	883	255	2,211	602	1,102	507	2,211
38	CCL3801	1	0	301	302	0	1	301	302
	CCL3803	581	489	137	1,207	344	616	247	1,207
	CCL3804	571	473	145	1,188	336	591	261	1,188
	CCL3805	464	375	115	953	259	471	223	953
	CCL3806	374	315	89	778	222	398	157	778
	CCL3807	342	286	83	711	202	360	149	711
	CCL3808	189	158	45	391	110	199	83	391
	CCL3809	92	70	24	186	49	87	50	186
Total		2,611	2,166	939	5,716	1,523	2,722	1,471	5,716
39	CCL3901	34	28	8	70	19	36	15	70
	CCL3902	149	120	35	304	87	148	69	304
	CCL3903	323	264	64	651	142	331	177	651
	CCL3904	289	231	81	602	164	284	154	602
	CCL3905	275	228	58	562	158	285	119	562
	CCL3906	165	136	39	340	90	172	78	340
	CCL3907	96	79	21	196	50	100	46	196
	CCL3908	474	396	119	988	275	497	216	988
	CCL3910	204	171	49	424	123	216	85	424
	CCL3911	1	0	0	1	0	1	0	1
	CCL3912	38	32	10	80	23	40	17	80
	CCL3913	0	0	0	0	0	0	0	0
	CCL3914	40	34	9	82	24	43	15	82
	CCL3915	78	66	18	162	46	83	33	162
	CCL3916	38	30	7	75	20	38	17	75
	CCL3917	11	9	2	21	3	11	7	21
Total		2,215	1,824	520	4,558	1,224	2,285	1,049	4,558
40	CCL4001	554	459	112	1,125	263	583	279	1,125
	CCL4002	198	158	42	398	83	199	116	398
	CCL4003	145	114	45	305	82	139	84	305
	CCL4004	153	119	45	317	84	145	88	317
	CCL4005	254	203	74	531	141	247	143	531
	CCL4006	152	128	35	315	91	162	63	315
	CCL4007	34	29	7	70	21	37	13	70
	CCL4008	106	90	26	221	64	113	44	221
	CCL4009	189	148	42	380	110	177	93	380
	CCL4010	18	12	3	33	19	12	2	33
	CCL4011	106	80	17	202	45	99	59	202
	CCL4012	262	213	45	520	104	271	145	520
	CCL4013	386	320	75	781	183	407	190	781
	CCL4014	235	198	54	487	141	252	94	487
Total		2,791	2,272	623	5,685	1,430	2,842	1,413	5,685
41	CCL4101	248	210	56	515	149	266	100	515
	CCL4102	443	375	105	922	264	473	185	922
	CCL4103	284	240	67	591	170	304	117	591
	CCL4104	129	109	28	266	79	138	49	266
	CCL4105	3	3	0	6	3	3	0	6
	CCL4106	51	43	12	106	32	55	19	106
	CCL4107	245	207	58	509	146	261	102	509
	CCL4108	314	260	75	649	176	326	147	649
	CCL4109	141	119	32	292	85	150	57	292
	CCL4110	40	33	8	81	24	42	14	81
Total		1,897	1,600	440	3,937	1,127	2,019	790	3,937
Summary		89,212	71,284	21,781	182,277	51,478	87,561	43,538	182,277

Table 50 Number of occupants of Chittagong in Cluster level

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
1	CCL0101	0.83	9,552	10,486	11,446	12,565
	CCL0102	0.69	3,418	2,987	4,932	4,311
	CCL0103	2.68	0	0	0	0
	CCL0104	0.96	4,572	4,706	4,778	4,918
	CCL0105	1.67	9,185	9,940	5,493	5,944
	CCL0106	1.62	12,743	14,851	7,850	9,149

}

Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	CCL0107	2.22	7,417	7,799	3,338	3,510
	CCL0108	0.67	111	191	167	287
	CCL0109	0.50	0	0	0	0
	CCL0110	1.07	988	865	925	809
	CCL0111	0.74	2,690	4,297	3,654	5,837
	CCL0112	1.04	904	1,338	868	1,284
	CCL0113	1.65	0	0	0	0
	CCL0114	0.67	567	676	840	1,002
	CCL0115	0.38	690	986	1,829	2,615
	CCL0116	0.77	97	124	125	161
	CCL0117	1.20	1,223	1,589	1,024	1,329
	CCL0118	1.58	461	584	292	369
	CCL0119	1.19	111	191	94	160
	CCL0120	1.49	142	126	95	85
Total		23.64	54,872	61,734	2,321	2,612
2	CCL0201	7.38	3,837	6,040	520	819
	CCL0202	0.72	6,933	6,293	9,619	8,730
	CCL0203	0.67	16,502	9,936	24,707	14,876
	CCL0204	0.68	10,812	10,427	15,944	15,377
	CCL0205	0.72	10,283	3,230	14,303	4,493
	CCL0206	0.77	18,260	15,860	23,679	20,566
	CCL0207	0.45	4,881	6,792	10,745	14,952
	CCL0208	0.33	1,871	2,354	5,711	7,184
	CCL0209	0.27	2,099	2,280	7,639	8,298
	CCL0210	0.56	9,288	11,322	16,588	20,219
	CCL0211	0.64	13,491	14,362	20,961	22,316
	CCL0212	0.36	4,910	6,497	13,569	17,954
	CCL0213	0.68	8,734	10,912	12,802	15,995
	CCL0214	0.37	3,927	3,251	10,750	8,900
Total		14.60	115,829	109,556	7,931	7,502
3	CCL0301	0.77	7,244	9,782	9,459	12,773
	CCL0302	0.53	4,219	4,354	7,970	8,225
	CCL0303	0.99	7,430	10,289	7,540	10,441
	CCL0304	0.55	15,272	16,897	28,016	30,998
	CCL0305	0.77	21,913	24,857	28,314	32,118
	CCL0306	0.55	3,382	5,224	6,190	9,563
Total		4.15	59,459	71,403	14,342	17,222
4	CCL0401	0.96	12,926	17,929	13,494	18,717
	CCL0402	0.47	5,246	7,346	11,269	15,780
	CCL0405	0.70	7,917	10,652	11,283	15,180
	CCL0406	0.52	17,729	11,051	34,418	21,454
	CCL0407	0.70	11,442	11,590	16,416	16,629
	CCL0408	0.99	12,809	11,976	12,966	12,123
	CCL0409	0.54	7,814	7,954	14,372	14,629
	CCL0410	0.76	14,277	5,419	18,855	7,156
	CCL0411	0.64	41	70	64	110
	CCL0412	0.93	6,511	7,823	7,022	8,437
	CCL0413	0.80	3,835	4,181	4,771	5,202
	CCL0414	0.65	3,350	3,989	5,143	6,124
	CCL0415	0.46	6,064	7,748	13,070	16,700
	CCL0416	0.74	17,928	23,484	24,267	31,789
Total		9.85	127,890	131,215	12,984	13,321
5	CCL0501	1.63	3,019	3,415	1,855	2,098
	CCL0502	0.35	2,027	2,429	5,750	6,890
	CCL0503	0.51	7,623	8,458	15,040	16,688
	CCL0504	0.55	4,896	6,515	8,826	11,745
	CCL0505	0.73	7,479	10,436	10,186	14,214
	CCL0506	0.40	5,265	5,137	13,001	12,684
	CCL0507	0.35	2,250	3,832	6,513	11,091
	CCL0508	0.35	2,855	3,348	8,088	9,484
	CCL0509	0.54	4,414	5,168	8,111	9,496
	CCL0510	0.28	2,455	3,259	8,788	11,664
	CCL0511	0.26	1,771	2,775	6,937	10,872
	CCL0512	0.20	607	910	3,034	4,545
	CCL0513	0.24	2,256	2,613	9,258	10,724
	CCL0514	0.16	962	1,430	5,890	8,752
	CCL0516	0.11	1,017	1,613	9,165	14,534
	CCL0517	0.17	1,006	1,369	6,041	8,224

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
Total		6.84	49,903	62,707	7,293	9,164
6	CCL0601	0.48	19,627	23,218	41,208	48,748
	CCL0602	0.40	17,402	18,189	43,896	45,879
	CCL0603	0.33	8,445	10,900	25,570	33,002
	CCL0604	0.53	8,938	12,680	17,005	24,124
	CCL0605	0.49	8,381	10,429	17,004	21,160
	CCL0606	0.49	6,663	9,152	13,714	18,834
Total		2.71	69,457	84,567	25,654	31,236
7	CCL0701	0.46	11,388	13,297	24,542	28,656
	CCL0702	0.66	23,601	17,106	35,509	25,737
	CCL0703	0.69	19,300	19,852	28,113	28,916
	CCL0704	0.24	10,231	9,321	41,984	38,249
	CCL0705	0.60	15,276	18,143	25,290	30,036
	CCL0706	0.52	11,711	12,552	22,524	24,140
	CCL0707	0.38	256	259	669	676
	CCL0708	0.44	13,133	17,514	29,919	39,898
Total		4.00	104,897	108,044	26,192	26,977
8	CCL0801	0.45	15,443	21,431	34,409	47,752
	CCL0802	0.44	9,053	12,975	20,663	29,615
	CCL0803	0.40	13,156	18,754	32,620	46,498
	CCL0804	0.49	12,294	7,728	25,039	15,740
	CCL0805	0.81	20,355	26,321	25,051	32,394
	CCL0806	0.54	8,021	4,748	14,979	8,867
	CCL0807	0.67	16,709	10,095	24,830	15,001
	CCL0808	0.49	7,900	6,552	16,019	13,284
	CCL0809	0.58	6,306	9,244	10,800	15,831
	CCL0810	0.69	4,717	7,536	6,829	10,909
	CCL0811	0.67	17,519	20,564	26,048	30,576
Total		6.24	131,473	145,948	21,061	23,379
9	CCL0901	0.62	2,270	3,348	3,663	5,404
	CCL0902	0.74	4,526	7,615	6,130	10,313
	CCL0903	0.53	3,059	5,409	5,806	10,266
	CCL0904	0.76	168	302	222	400
	CCL0905	0.54	18,962	21,513	34,912	39,609
	CCL0906	0.51	6,106	9,952	12,011	19,576
	CCL0907	0.47	13,065	16,076	27,819	34,230
	CCL0908	0.37	13,134	13,650	35,851	37,257
	CCL0909	0.78	6,853	8,948	8,813	11,508
	CCL0910	0.47	1,193	1,944	2,518	4,102
	CCL0911	0.49	6,143	9,515	12,605	19,523
Total		6.27	75,480	98,272	12,044	15,681
10	CCL1001	0.86	6,576	8,661	7,613	10,026
	CCL1002	0.96	56	106	58	110
	CCL1003	0.50	0	0	0	0
	CCL1004	0.68	1,653	2,302	2,424	3,375
	CCL1005	0.46	8,975	2,094	19,685	4,592
	CCL1006	0.69	10,112	6,468	14,659	9,377
	CCL1007	0.56	8,937	9,449	15,938	16,852
	CCL1008	0.32	13,632	14,652	42,519	45,703
	CCL1009	0.45	6,825	9,818	15,196	21,860
Total		5.48	56,765	53,549	10,356	9,769
11	CCL1101	0.57	57	97	101	172
	CCL1102	0.67	117	201	176	301
	CCL1103	0.57	489	688	861	1,211
	CCL1104	0.68	3,578	5,624	5,241	8,236
	CCL1105	0.53	6,673	8,974	12,650	17,012
	CCL1106	0.77	6,829	8,878	8,890	11,558
	CCL1107	0.50	8,633	12,017	17,350	24,151
	CCL1108	0.61	14,423	19,230	23,561	31,415
	CCL1109	0.52	12,233	17,759	23,449	34,041
Total		5.41	53,033	73,468	9,803	13,580
12	CCL1201	0.54	17,492	23,733	32,167	43,645
	CCL1202	0.53	12,897	18,399	24,497	34,948
	CCL1203	0.59	10,947	10,181	18,650	17,344
	CCL1204	0.38	11,126	14,650	29,664	39,057
	CCL1205	0.39	745	236	1,896	602
Total		2.43	53,207	67,199	21,940	27,710
13	CCL1301	0.60	11,416	11,376	18,970	18,903

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	CCL1302	0.41	10,495	13,250	25,737	32,494
	CCL1303	0.44	9,336	9,184	21,022	20,681
	CCL1304	0.67	9,951	15,637	14,874	23,372
	CCL1305	0.61	10,742	13,077	17,704	21,551
	CCL1306	0.33	2,407	2,125	7,266	6,415
	CCL1307	0.27	5,657	6,736	21,013	25,020
Total		3.33	60,004	71,385	18,019	21,437
14	CCL1401	0.60	9,580	12,235	15,932	20,348
	CCL1402	0.61	16,408	23,318	26,742	38,004
Total		1.21	25,988	35,553	21,392	29,265
15	CCL1501	0.53	12,744	15,203	24,155	28,817
	CCL1502	0.52	15,459	18,696	29,563	35,753
	CCL1503	0.68	5,554	6,385	8,195	9,420
Total		1.73	33,758	40,284	19,532	23,308
16	CCL1601	0.45	9,913	11,388	22,205	25,509
	CCL1602	0.43	19,723	12,328	45,954	28,723
	CCL1603	0.35	21,002	12,522	60,536	36,092
	CCL1604	0.34	14,816	15,367	44,106	45,747
	CCL1605	0.53	7,593	6,551	14,411	12,432
	CCL1606	0.28	6,784	7,430	24,187	26,488
Total		2.37	79,831	65,585	33,743	27,721
17	CCL1701	0.18	1,934	2,539	10,983	14,419
	CCL1702	0.38	5,919	7,584	15,570	19,952
	CCL1703	0.32	3,818	5,239	12,005	16,470
	CCL1704	0.35	11,437	12,351	32,602	35,206
	CCL1705	0.38	12,799	17,378	33,285	45,196
	CCL1706	0.38	8,096	12,967	21,426	34,318
Total		1.99	44,002	58,058	22,140	29,212
18	CCL1801	0.49	3,175	3,779	6,533	7,777
	CCL1802	0.37	105	181	286	490
	CCL1803	0.57	12,446	14,748	21,766	25,793
	CCL1804	0.19	0	0	0	0
	CCL1805	0.53	5,252	7,222	9,864	13,565
	CCL1806	0.42	6,079	8,772	14,322	20,668
	CCL1807	0.35	1,566	1,486	4,451	4,224
	CCL1808	0.31	2,890	2,989	9,403	9,724
	CCL1809	0.66	13,636	15,592	20,635	23,595
	CCL1810	0.34	0	0	0	0
Total		4.24	45,148	54,769	10,656	12,926
19	CCL1901	0.43	12,651	13,231	29,458	30,811
	CCL1902	0.41	11,950	18,012	29,009	43,725
Total		0.84	24,601	31,244	29,238	37,133
20	CCL2001	0.18	7,256	10,696	40,894	60,280
	CCL2002	0.22	7,303	13,077	33,309	59,645
Total		0.40	14,559	23,773	36,702	59,929
21	CCL2101	0.31	8,147	12,605	26,295	40,685
	CCL2102	0.47	14,647	20,354	31,338	43,548
Total		0.78	22,794	32,959	29,327	42,407
22	CCL2201	0.40	15,658	19,985	39,375	50,258
	CCL2202	0.40	5,454	6,832	13,717	17,181
Total		0.80	21,112	26,817	26,546	33,720
23	CCL2301	0.34	17,067	22,931	50,806	68,261
	CCL2302	0.24	6,861	7,550	28,624	31,502
Total		0.58	23,928	30,482	41,570	52,955
24	CCL2401	0.46	12,165	15,511	26,447	33,723
	CCL2402	0.38	9,313	13,933	24,386	36,483
	CCL2403	0.32	12,941	14,512	40,296	45,186
	CCL2404	0.56	24,420	29,100	43,833	52,234
	CCL2405	0.28	9,973	14,790	35,895	53,230
	CCL2406	0.32	13,314	20,124	41,746	63,098
	CCL2407	0.34	14,840	20,643	43,373	60,334
Total		2.66	96,966	128,613	36,466	48,368
25	CCL2501	0.55	12,287	17,854	22,140	32,169
	CCL2502	0.47	10,331	15,744	21,777	33,187
	CCL2503	0.58	8,955	11,303	15,308	19,322
	CCL2504	0.43	13,095	17,824	30,416	41,402
Total		2.04	44,668	62,725	21,844	30,674
26	CCL2601	0.40	8,025	9,398	20,161	23,610

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	CCL2602	0.44	1,090	703	2,478	1,597
	CCL2603	0.63	3,124	3,642	4,948	5,767
	CCL2604	0.61	3,160	2,903	5,199	4,775
	CCL2605	0.48	3,756	5,258	7,854	10,996
	CCL2606	0.56	552	801	991	1,436
	CCL2607	0.23	3,125	4,742	13,580	20,607
	CCL2608	0.33	11,770	17,924	36,144	55,042
	CCL2609	1.71	30	28	18	17
	CCL2610	0.74	428	557	579	753
Total		6.12	35,061	45,955	5,730	7,510
27	CCL2701	0.29	5,262	6,163	17,850	20,908
	CCL2702	0.26	2,571	2,915	10,008	11,347
	CCL2703	0.30	11,738	16,728	39,594	56,427
	CCL2704	0.23	7,350	10,358	32,626	45,976
	CCL2705	0.22	6,851	8,718	30,627	38,970
	CCL2706	0.22	6,447	7,797	29,932	36,201
Total		1.51	40,219	52,678	26,591	34,829
28	CCL2801	0.50	11,626	9,016	23,152	17,953
	CCL2802	0.32	12,181	13,663	37,706	42,293
	CCL2803	0.26	12,266	17,470	47,132	67,132
Total		1.09	36,073	40,149	33,232	36,987
29	CCL2901	0.20	6,863	6,190	33,795	30,479
	CCL2902	0.26	12,860	17,982	49,133	68,703
	CCL2903	0.19	6,875	9,502	36,045	49,814
Total		0.66	26,599	33,674	40,573	51,365
30	CCL3001	0.12	3,931	1,187	33,391	10,083
	CCL3002	0.32	13,739	14,968	43,321	47,196
	CCL3003	0.40	17,849	20,150	45,077	50,890
Total		0.83	35,519	36,305	42,751	43,698
31	CCL3101	0.23	6,286	7,280	27,045	31,324
	CCL3102	0.24	5,799	4,759	24,532	20,135
	CCL3103	0.17	7,287	4,547	42,463	26,497
Total		0.64	19,372	16,587	30,249	25,901
32	CCL3201	0.43	12,150	8,040	27,961	18,503
	CCL3202	0.43	12,147	16,647	28,388	38,904
Total		0.86	24,297	24,687	28,173	28,625
33	CCL3301	0.21	9,403	6,406	43,957	29,945
	CCL3302	0.27	15,444	18,153	57,764	67,895
Total		0.48	24,848	24,559	51,627	51,027
34	CCL3401	0.28	15,665	14,263	55,902	50,900
	CCL3402	0.30	10,412	9,803	34,277	32,271
Total		0.58	26,077	24,066	44,654	41,210
35	CCL3501	0.26	12,209	9,155	47,316	35,479
	CCL3502	0.30	5,811	3,157	19,396	10,536
	CCL3503	0.58	7,130	4,925	12,287	8,487
	CCL3504	0.46	35	60	77	132
Total		1.59	25,185	17,296	15,809	10,857
36	CCL3601	0.55	382	245	698	448
	CCL3602	0.63	19,881	26,253	31,552	41,664
	CCL3603	0.35	3,899	5,487	11,062	15,565
Total		1.53	24,162	31,984	15,794	20,907
37	CCL3701	0.38	1,391	1,268	3,691	3,365
	CCL3702	0.39	441	538	1,124	1,371
	CCL3703	0.30	3,522	5,937	11,568	19,501
	CCL3704	0.23	444	536	1,962	2,370
	CCL3705	0.33	283	352	861	1,071
	CCL3706	0.35	4,031	5,866	11,657	16,961
	CCL3707	0.38	5,271	7,201	13,727	18,752
	CCL3708	0.45	2,320	3,346	5,168	7,454
	CCL3709	0.27	0	0	0	0
	CCL3710	0.42	84	132	199	314
	CCL3711	0.21	5,317	3,063	25,280	14,563
Total		3.71	23,104	28,239	6,227	7,610
38	CCL3801	1.04	2,009	2,976	1,924	2,849
	CCL3803	0.53	8,054	12,355	15,237	23,374
	CCL3804	0.64	8,722	13,013	13,528	20,183
	CCL3805	0.53	9,490	10,259	17,800	19,241
	CCL3806	0.36	5,010	7,818	13,820	21,567

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	CCL3807	0.43	5,244	7,338	12,079	16,902
	CCL3808	0.24	3,628	4,139	15,301	17,456
	CCL3809	0.99	1,862	2,144	1,884	2,169
Total		4.77	44,019	60,041	9,223	12,580
39	CCL3901	0.56	572	735	1,028	1,321
	CCL3902	0.51	2,590	3,725	5,059	7,274
	CCL3903	0.23	9,155	9,945	39,961	43,410
	CCL3904	0.27	5,481	7,528	20,003	27,475
	CCL3905	0.41	5,757	6,013	14,198	14,831
	CCL3906	0.25	4,442	3,970	17,704	15,823
	CCL3907	0.30	3,031	2,250	10,110	7,505
	CCL3908	0.46	9,245	10,646	19,991	23,021
	CCL3910	0.36	4,319	3,812	12,108	10,687
	CCL3911	0.37	6	10	16	27
	CCL3912	0.37	555	868	1,504	2,351
	CCL3913	0.80	0	0	0	0
	CCL3914	0.33	480	823	1,442	2,471
	CCL3915	0.43	1,099	1,628	2,546	3,771
	CCL3916	1.87	1,743	848	934	455
	CCL3917	0.99	239	377	242	381
Total		8.51	48,713	53,179	5,727	6,252
40	CCL4001	0.70	9,134	14,471	13,083	20,727
	CCL4002	0.30	4,119	6,177	13,887	20,824
	CCL4003	0.34	2,940	4,202	8,589	12,277
	CCL4004	0.21	3,811	4,435	17,891	20,819
	CCL4005	0.52	5,799	7,171	11,186	13,833
	CCL4006	0.63	1,935	3,157	3,060	4,992
	CCL4007	0.50	486	628	978	1,263
	CCL4008	0.33	1,303	2,210	3,918	6,646
	CCL4009	0.61	3,322	5,209	5,483	8,599
	CCL4010	0.55	174	344	316	622
	CCL4011	0.51	2,984	4,121	5,814	8,028
	CCL4012	0.21	5,381	7,833	25,059	36,480
	CCL4013	0.32	7,107	9,820	21,881	30,233
	CCL4014	4.69	4,194	4,318	893	920
Total		10.44	52,689	74,094	5,049	7,100
41	CCL4101	0.53	3,167	5,018	5,939	9,410
	CCL4102	0.75	5,796	9,077	7,721	12,092
	CCL4103	0.63	4,026	5,718	6,400	9,092
	CCL4104	0.75	1,666	2,465	2,208	3,267
	CCL4105	0.51	37	52	73	102
	CCL4106	0.77	724	884	938	1,146
	CCL4107	0.81	3,268	4,974	4,058	6,177
	CCL4108	0.69	5,105	7,419	7,432	10,800
	CCL4109	0.55	1,754	2,843	3,186	5,164
	CCL4110	5.47	589	749	108	137
Total		11.47	26,130	39,200	2,279	3,419
Summary		169.36	2,001,691	2,332,599	11,819	13,773

Table 51 Vulnerability factors of Chittagong in Cluster level

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building (No.)
1	CCL0101	140	237	99	148	15	648
	CCL0102	42	71	29	44	5	192
	CCL0103	0	0	0	0	0	0
	CCL0104	60	101	42	63	6	276
	CCL0105	101	162	65	101	11	423
	CCL0106	146	236	95	147	16	622
	CCL0107	110	188	78	117	12	515
	CCL0108	3	5	2	3	0	13
	CCL0109	0	0	0	0	0	0
	CCL0110	14	24	10	15	1	65
	CCL0111	59	102	42	63	6	279
	CCL0112	19	32	13	20	2	86
	CCL0113	0	0	0	0	0	0
	CCL0114	10	17	7	11	1	48
	CCL0115	14	24	10	15	1	67
	CCL0116	2	3	1	2	0	9

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building (No.)
	CCL0117	23	40	17	24	2	109
	CCL0118	8	14	6	9	1	38
	CCL0119	3	5	2	3	0	13
	CCL0120	2	3	1	2	0	8
Total		755	1,261	520	786	81	3,411
2	CCL0201	83	142	59	88	9	389
	CCL0202	56	85	33	53	6	213
	CCL0203	118	185	74	116	13	483
	CCL0204	142	225	91	141	15	592
	CCL0205	50	75	30	47	6	192
	CCL0206	202	311	124	198	22	800
	CCL0207	68	109	43	68	7	284
	CCL0208	24	37	15	24	3	96
	CCL0209	21	33	13	21	2	85
	CCL0210	123	192	77	121	13	496
	CCL0211	159	245	96	154	17	629
	CCL0212	65	103	41	65	7	267
	CCL0213	111	174	69	109	12	448
	CCL0214	37	58	23	37	4	151
Total		1,261	1,973	788	1,242	137	5,125
3	CCL0301	104	171	69	106	11	456
	CCL0302	42	67	26	42	5	174
	CCL0303	72	113	45	71	8	293
	CCL0304	181	266	106	173	19	665
	CCL0305	226	328	130	213	24	816
	CCL0306	51	82	33	51	6	216
Total		674	1,027	409	656	73	2,620
4	CCL0401	202	299	116	190	22	748
	CCL0402	83	135	55	84	9	358
	CCL0405	105	168	67	105	11	441
	CCL0406	104	163	66	103	11	426
	CCL0407	121	196	80	123	13	520
	CCL0408	145	226	91	143	16	589
	CCL0409	94	153	63	96	10	409
	CCL0410	89	139	56	87	10	365

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building (No.)
	CCL0411	1	2	1	1	0	5
	CCL0412	108	183	77	114	11	502
	CCL0413	48	79	32	50	5	211
	CCL0414	42	70	29	44	5	188
	CCL0415	90	142	57	89	10	370
	CCL0416	218	315	122	202	24	783
Total		1,450	2,271	911	1,431	157	5,915
5	CCL0501	48	80	34	50	5	219
	CCL0502	28	45	19	29	3	123
	CCL0503	85	140	58	88	9	380
	CCL0504	42	70	29	43	5	189
	CCL0505	137	234	98	146	15	642
	CCL0506	43	72	30	45	5	194
	CCL0507	13	22	9	14	1	62
	CCL0508	23	37	15	23	3	96
	CCL0509	42	66	26	41	5	170
	CCL0510	26	41	16	26	3	106
	CCL0511	22	34	13	21	2	86
	CCL0512	7	11	4	7	1	29
	CCL0513	22	35	14	22	2	90
	CCL0514	13	22	9	13	1	57
	CCL0516	14	21	8	13	1	54
	CCL0517	18	31	13	20	2	86
Total		583	963	394	601	63	2,583
6	CCL0601	246	380	153	243	26	981
	CCL0602	181	277	111	177	19	712
	CCL0603	102	157	61	99	11	398
	CCL0604	117	180	70	113	13	460
	CCL0605	112	183	75	115	12	488
	CCL0606	85	135	54	85	9	351
Total		843	1,313	524	831	91	3,390
7	CCL0701	123	181	70	115	14	455
	CCL0702	162	256	104	162	17	673
	CCL0703	224	356	144	224	24	936
	CCL0704	98	143	55	91	11	354

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building (No.)
	CCL0705	191	289	114	183	21	735
	CCL0706	132	201	78	126	15	510
	CCL0707	4	7	3	4	0	18
	CCL0708	176	266	104	168	19	673
Total		1,110	1,698	672	1,074	121	4,354
8	CCL0801	220	330	127	208	24	828
	CCL0802	157	221	83	141	18	533
	CCL0803	243	353	136	225	27	875
	CCL0804	93	143	57	90	10	368
	CCL0805	325	468	179	298	36	1,149
	CCL0806	52	81	32	51	6	209
	CCL0807	105	161	63	101	12	409
	CCL0808	59	88	34	56	6	221
	CCL0809	65	103	40	64	7	265
	CCL0810	69	111	44	69	8	290
	CCL0811	151	238	95	149	16	621
Total		1,539	2,295	890	1,452	170	5,768
9	CCL0901	40	68	29	42	4	187
	CCL0902	26	41	17	27	3	106
	CCL0903	39	64	26	40	4	169
	CCL0904	3	5	2	3	0	15
	CCL0905	195	306	122	193	21	793
	CCL0906	60	100	41	62	6	269
	CCL0907	188	313	129	196	20	844
	CCL0908	120	199	82	125	13	536
	CCL0909	115	195	81	121	12	533
	CCL0910	27	46	19	29	3	126
	CCL0911	57	89	35	56	6	230
Total		870	1,426	584	894	93	3,808
10	CCL1001	75	120	48	75	8	316
	CCL1002	0	1	0	0	0	2
	CCL1003	0	0	0	0	0	0
	CCL1004	26	43	18	27	3	115
	CCL1005	19	27	11	18	2	67
	CCL1006	62	97	39	61	7	254

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building (No.)
	CCL1007	118	188	77	119	13	498
	CCL1008	146	224	90	143	16	578
	CCL1009	90	145	58	90	10	379
Total		536	846	340	533	58	2,209
11	CCL1101	1	2	1	1	0	4
	CCL1102	3	5	2	3	0	13
	CCL1103	10	18	7	11	1	49
	CCL1104	54	82	32	52	6	208
	CCL1105	78	122	48	77	9	314
	CCL1106	97	159	65	99	10	424
	CCL1107	107	163	63	103	12	414
	CCL1108	157	241	93	151	17	608
	CCL1109	197	292	112	185	22	729
Total		704	1,084	423	681	78	2,763
12	CCL1201	215	328	128	207	24	830
	CCL1202	192	276	106	176	21	680
	CCL1203	117	186	75	117	13	489
	CCL1204	134	205	81	130	15	525
	CCL1205	5	8	3	5	1	23
Total		663	1,003	393	635	73	2,547
13	CCL1301	105	169	67	105	12	445
	CCL1302	182	308	129	192	19	844
	CCL1303	106	166	67	105	11	433
	CCL1304	182	282	112	177	20	726
	CCL1305	194	310	126	195	21	822
	CCL1306	22	36	14	22	2	93
	CCL1307	61	95	37	59	7	241
Total		852	1,366	552	856	92	3,604
14	CCL1401	167	279	117	175	18	759
	CCL1402	235	360	140	226	26	915
Total		402	639	257	401	44	1,674
15	CCL1501	199	292	114	186	22	729
	CCL1502	265	384	148	245	29	953
	CCL1503	60	93	36	58	7	238
Total		1,329	2,047	812	1,292	145	1,920

}

Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building (No.)
16	CCL1601	133	215	88	135	14	572
	CCL1602	105	154	61	99	11	384
	CCL1603	112	179	73	114	12	473
	CCL1604	168	259	104	164	18	669
	CCL1605	73	115	47	73	8	302
	CCL1606	88	129	50	82	10	320
Total		678	1,051	422	667	73	2,720
17	CCL1701	22	36	14	22	2	93
	CCL1702	70	108	43	68	8	277
	CCL1703	52	79	30	50	6	198
	CCL1704	126	190	74	120	14	478
	CCL1705	158	242	94	152	17	614
	CCL1706	167	244	94	155	18	607
Total		596	899	349	568	66	2,267
18	CCL1801	54	91	38	57	6	249
	CCL1802	2	4	2	2	0	11
	CCL1803	211	357	150	223	22	979
	CCL1804	0	0	0	0	0	0
	CCL1805	77	127	52	79	8	341
	CCL1806	67	106	42	66	7	273
	CCL1807	16	26	11	17	2	70
	CCL1808	24	37	15	24	3	95
	CCL1809	193	325	135	202	21	885
	CCL1810	0	0	0	0	0	0
Total		644	1,073	444	671	69	2,903
19	CCL1901	172	289	122	181	18	793
	CCL1902	253	382	151	242	28	974
Total		425	671	273	423	46	1,767
20	CCL2001	154	223	86	142	17	554
	CCL2002	185	255	95	163	21	608
Total		339	478	181	305	38	1,162
21	CCL2101	184	254	95	163	21	607
	CCL2102	204	303	117	192	23	757
Total		388	557	212	354	43	1,364
22	CCL2201	210	314	123	200	23	791
	CCL2202	64	102	41	64	7	267
Total		274	416	163	263	30	1,058
23	CCL2301	231	340	131	216	25	843
	CCL2302	97	153	62	97	10	400
Total		328	493	193	313	36	1,243
24	CCL2401	172	260	102	164	19	659
	CCL2402	142	213	82	134	16	533
	CCL2403	129	188	71	119	14	461
	CCL2404	344	482	182	309	38	1,163
	CCL2405	219	302	113	194	25	721
	CCL2406	291	402	151	258	32	963
	CCL2407	302	417	157	268	34	1,002
Total		1,597	2,263	858	1,447	178	5,502
25	CCL2501	139	205	79	130	15	512
	CCL2502	188	269	102	171	21	657
	CCL2503	129	202	81	127	14	526
	CCL2504	184	282	112	178	20	724
Total		640	958	374	607	70	2,419
26	CCL2601	98	149	58	94	11	379
	CCL2602	12	18	7	11	1	48
	CCL2603	39	57	22	36	4	144
	CCL2604	34	57	24	36	4	155
	CCL2605	64	104	42	65	7	276
	CCL2606	6	10	4	6	1	25
	CCL2607	44	67	26	42	5	172
	CCL2608	155	232	88	146	17	579
	CCL2609	0	0	0	0	0	1
	CCL2610	8	13	6	8	1	37
Total		459	709	278	446	50	1,816
27	CCL2701	38	54	21	35	4	133
	CCL2702	44	67	27	43	5	174
	CCL2703	143	198	74	126	16	476
	CCL2704	118	169	65	108	13	417
	CCL2705	101	159	64	100	11	416
	CCL2706	89	141	57	89	9	369

}

Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building (No.)
Total		532	789	308	501	58	1,985
28	CCL2801	126	206	85	129	13	553
	CCL2802	135	205	80	129	15	519
	CCL2803	157	238	92	150	17	601
Total		417	649	257	409	45	1,673
29	CCL2901	74	121	50	76	8	323
	CCL2902	166	257	100	162	18	654
	CCL2903	90	135	52	86	10	335
Total		331	512	202	324	36	1,312
30	CCL3001	27	42	17	26	3	109
	CCL3002	175	280	113	176	19	738
	CCL3003	220	342	137	217	24	885
Total		422	664	267	419	46	1,732
31	CCL3101	84	132	54	84	9	346
	CCL3102	51	81	33	51	5	216
	CCL3103	62	95	40	62	6	249
Total		196	308	127	197	21	811
32	CCL3201	100	153	63	98	11	399
	CCL3202	248	347	132	222	28	841
Total		348	500	194	321	38	1,240
33	CCL3301	104	163	68	104	11	434
	CCL3302	224	353	144	224	24	928
Total		327	515	212	328	35	1,362
34	CCL3401	195	285	115	186	21	720
	CCL3402	145	231	96	147	15	617
Total		340	516	212	333	36	1,337
35	CCL3501	134	211	89	135	14	563
	CCL3502	49	82	36	53	5	231
	CCL3503	71	113	47	72	7	303
	CCL3504	1	1	1	1	0	4
Total		255	408	173	260	27	1,101
36	CCL3601	6	8	3	5	1	22
	CCL3602	354	526	206	334	39	1,329
	CCL3603	55	85	34	54	6	221
Total		414	619	244	393	45	1,572

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building (No.)
37	CCL3701	17	26	10	17	2	64
	CCL3702	5	8	3	5	1	21
	CCL3703	46	71	27	44	5	178
	CCL3704	7	9	4	6	1	23
	CCL3705	3	6	2	3	0	15
	CCL3706	81	139	58	87	9	382
	CCL3707	97	152	62	96	11	399
	CCL3708	46	79	33	49	5	217
	CCL3709	0	0	0	0	0	0
	CCL3710	2	3	1	2	0	8
	CCL3711	14	19	7	13	2	43
Total		319	511	207	321	34	1,350
38	CCL3801	0	0	0	0	0	0
	CCL3803	165	280	117	175	17	768
	CCL3804	154	258	106	161	17	698
	CCL3805	126	207	85	129	14	553
	CCL3806	106	181	76	113	11	497
	CCL3807	96	159	66	100	10	432
	CCL3808	55	89	37	56	6	239
	CCL3809	22	35	14	22	2	92
Total		724	1,210	502	756	77	3,279
39	CCL3901	10	16	7	10	1	45
	CCL3902	43	68	27	43	5	176
	CCL3903	127	186	74	120	14	465
	CCL3904	75	117	46	73	8	301
	CCL3905	86	136	56	87	9	361
	CCL3906	49	78	32	49	5	205
	CCL3907	31	48	20	31	3	126
	CCL3908	135	222	92	140	14	599
	CCL3910	55	92	39	58	6	251
	CCL3911	0	0	0	0	0	0
	CCL3912	10	17	7	11	1	46
	CCL3913	0	0	0	0	0	0
	CCL3914	11	19	8	12	1	53
	CCL3915	22	38	16	24	2	105

}

Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building (No.)
	CCL3916	10	17	7	10	1	45
	CCL3917	5	8	3	5	1	18
Total		672	1,062	433	672	72	2,796
40	CCL4001	210	321	128	203	23	827
	CCL4002	78	112	43	71	9	277
	CCL4003	35	54	21	34	4	136
	CCL4004	37	57	22	36	4	144
	CCL4005	66	102	40	64	7	259
	CCL4006	43	73	31	46	5	201
	CCL4007	9	16	7	10	1	44
	CCL4008	30	51	21	32	3	141
	CCL4009	58	86	33	55	6	216
	CCL4010	2	3	1	2	0	8
	CCL4011	40	58	22	37	5	141
	CCL4012	114	165	64	105	13	408
	CCL4013	146	222	89	141	16	572
	CCL4014	65	111	47	69	7	305
Total		933	1,431	568	904	102	3,679
41	CCL4101	70	120	51	75	7	331
	CCL4102	126	216	91	134	13	593
	CCL4103	80	137	58	85	8	378
	CCL4104	36	61	26	38	4	169
	CCL4105	1	1	1	1	0	4
	CCL4106	13	23	10	15	1	65
	CCL4107	69	119	50	74	7	327
	CCL4108	93	152	62	95	10	404
	CCL4109	40	68	29	42	4	187
	CCL4110	11	19	8	12	1	52
Total		539	917	384	571	57	2,510
Summary		25,903	40,114	15,996	25,337	2,818	103,651

Sylhet City Corporation Area

Table 52 Number of Buildings of Sylhet in Cluster level

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
1	SCL0101	0.34	757	2,242
	SCL0102	0.18	611	3,398
Total		0.52	1,368	2,644
2	SCL0201	0.29	584	2,031
	SCL0202	0.29	394	1,358
Total		0.58	978	1,693
3	SCL0301	0.43	702	1,636
	SCL0302	0.32	367	1,163
	SCL0303	0.28	1	4
	SCL0304	0.28	267	952
Total		1.30	1,337	1,027
4	SCL0401	0.53	721	1,367
	SCL0402	0.38	505	1,339
Total		0.90	1,226	1,355
5	SCL0501	0.30	1,006	3,340
	SCL0502	0.35	1,062	3,028
Total		0.65	2,068	3,172
6	SCL0601	0.30	889	2,936
	SCL0602	0.29	477	1,621
Total		0.60	1,366	2,288
7	SCL0701	0.35	763	2,163
	SCL0702	0.25	731	2,971
	SCL0703	0.49	569	1,161
	SCL0704	0.47	623	1,334
	SCL0705	0.30	556	1,877
Total		1.85	3,242	1,751
8	SCL0801	0.32	763	2,352
	SCL0802	0.47	684	1,460
	SCL0803	0.43	608	1,407
	SCL0804	0.45	679	1,507
	SCL0805	0.51	824	1,626
Total		2.18	3,558	1,630
9	SCL0901	0.50	1,013	2,025

}

Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	SCL0902	0.42	373	882
	SCL0903	0.32	1,030	3,197
	SCL0904	0.32	385	1,203
Total		1.57	2,801	1,789
10	SCL1001	0.31	443	1,412
	SCL1002	0.29	1,167	4,046
	SCL1003	0.27	712	2,596
	SCL1004	0.28	271	962
Total		1.16	2,593	2,239
11	SCL1101	0.24	1,046	4,379
	SCL1102	0.27	739	2,776
Total		0.51	1,785	3,534
12	SCL1201	0.20	620	3,033
	SCL1202	0.22	974	4,432
Total		0.42	1,594	3,758
13	SCL1301	0.18	702	3,797
	SCL1302	0.40	933	2,328
Total		0.59	1,635	2,792
14	SCL1401	0.27	532	1,974
	SCL1402	0.28	809	2,851
	SCL1403	0.29	425	1,462
Total		0.84	1,766	2,093
15	SCL1501	0.22	813	3,643
	SCL1502	0.12	396	3,200
	SCL1503	0.34	6	18
Total		0.68	1,215	1,778
16	SCL1601	0.29	552	1,933
	SCL1602	0.42	782	1,865
Total		0.70	1,334	1,893
17	SCL1701	0.42	1,376	3,290
	SCL1702	0.53	548	1,043
Total		0.94	1,924	2,039
18	SCL1801	0.50	1,208	2,395
	SCL1802	0.35	707	2,015
Total		0.86	1,915	2,239

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
19	SCL1901	0.29	775	2,629
	SCL1902	0.29	624	2,166
	SCL1903	0.18	588	3,284
Total		0.76	1,987	2,608
20	SCL2001	0.25	441	1,748
	SCL2002	0.31	39	127
	SCL2003	0.29	775	2,714
	SCL2004	0.26	731	2,791
Total		1.11	1,986	1,795
21	SCL2101	0.25	1,244	4,982
	SCL2103	0.17	1,119	6,489
Total		0.42	2,363	5,598
22	SCL2201	0.15	672	4,632
	SCL2202	0.32	818	2,572
Total		0.46	1,490	3,218
23	SCL2301	0.47	522	1,105
	SCL2302	0.53	327	614
Total		1.00	849	845
24	SCL2401	0.49	424	863
	SCL2402	0.34	711	2,098
	SCL2403	0.14	774	5,569
	SCL2404	0.09	546	5,996
Total		1.06	2,455	2,315
25	SCL2501	0.39	788	2,023
	SCL2502	0.55	341	621
	SCL2503	0.49	401	823
	SCL2504	0.51	588	1,148
Total		1.94	2,118	1,093
26	SCL2601	0.30	906	3,000
	SCL2602	0.43	589	1,368
	SCL2603	0.45	687	1,529
	SCL2604	0.16	402	2,490
Total		1.34	2,584	1,924
27	SCL2701	0.22	412	1,886
	SCL2702	0.36	283	776

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Annex

Ward	Cluster	Area (Km^2)	Building Number (No.)	Building Density (No./Km^2)
	SCL2703	0.31	463	1,497
	SCL2704	0.30	493	1,618
	SCL2705	0.30	645	2,180
	SCL2706	0.52	343	662
Total		2.01	2,639	1,312
Summary		26.96	52,176	1,935

Table 53 Grouped Occupancy Classes of Sylhet in Cluster level

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
1	SCL0101	677	66	0	12	0	2	0	757
	SCL0102	499	98	2	3	0	5	4	611
Total		1,176	164	2	15	0	7	4	1,368
2	SCL0201	486	81	0	1	0	8	8	584
	SCL0202	312	62	0	14	0	6	0	394
Total		798	143	0	15	0	14	8	978
3	SCL0301	630	55	0	2	0	5	10	702
	SCL0302	228	102	1	35	0	1	0	367
	SCL0303	1	0	0	0	0	0	0	1
	SCL0304	214	40	1	0	0	10	2	267
Total		1,073	197	2	37	0	16	12	1,337
4	SCL0401	628	71	3	0	0	10	9	721
	SCL0402	408	69	1	8	0	17	2	505
Total		1,036	140	4	8	0	27	11	1,226
5	SCL0501	924	63	0	0	0	7	12	1,006
	SCL0502	964	62	1	0	2	5	28	1,062
Total		1,888	125	1	0	2	12	40	2,068
6	SCL0601	800	80	3	0	0	2	4	889
	SCL0602	398	75	2	0	0	0	2	477
Total		1,198	155	5	0	0	2	6	1,366
7	SCL0701	745	12	1	0	0	1	4	763
	SCL0702	675	47	0	0	0	1	8	731
	SCL0703	538	24	1	0	0	0	6	569
	SCL0704	599	16	1	0	0	0	7	623
	SCL0705	519	33	1	0	0	0	3	556
Total		3,076	132	4	0	0	2	28	3,242
8	SCL0801	701	57	0	0	0	2	3	763
	SCL0802	612	63	0	0	0	3	6	684
	SCL0803	572	30	0	0	0	3	3	608
	SCL0804	595	64	3	0	0	1	16	679
	SCL0805	786	35	0	0	0	0	3	824
Total		3,266	249	3	0	0	9	31	3,558
9	SCL0901	826	143	8	1	0	13	22	1,013
	SCL0902	343	26	1	0	0	0	3	373
	SCL0903	927	75	11	3	0	4	10	1,030
	SCL0904	333	39	1	0	0	3	9	385
Total		2,429	283	21	4	0	20	44	2,801
10	SCL1001	379	43	6	1	0	5	9	443
	SCL1002	1,022	121	13	0	0	5	6	1,167
	SCL1003	616	73	12	0	0	6	5	712
	SCL1004	238	23	5	0	0	2	3	271
Total		2,255	260	36	1	0	18	23	2,593
11	SCL1101	926	102	2	5	0	7	4	1,046
	SCL1102	684	44	4	3	0	4	0	739
Total		1,610	146	6	8	0	11	4	1,785
12	SCL1201	520	50	39	0	0	5	6	620
	SCL1202	811	106	38	0	0	13	6	974
Total		1,331	156	77	0	0	18	12	1,594
13	SCL1301	385	276	2	1	12	7	19	702
	SCL1302	812	111	4	1	0	5	0	933
Total		1,197	387	6	2	12	12	19	1,635
14	SCL1401	80	400	1	0	1	21	29	532
	SCL1402	662	125	9	1	0	3	9	809
	SCL1403	288	73	3	0	0	19	42	425
Total		1,030	598	13	1	1	43	80	1,766
15	SCL1501	658	112	3	2	0	18	20	813
	SCL1502	256	129	1	2	0	3	5	396
	SCL1503	0	6	0	0	0	0	0	6

}

Annex

Ward	Cluster	Residential	Commercial	Industrial	Essential Facilities			Other	Total
					Medical Care	Emergency Response	School		
Total		914	247	4	4	0	21	25	1,215
16	SCL1601	453	72	5	1	0	12	9	552
	SCL1602	682	79	6	1	0	11	3	782
Total		1,135	151	11	2	0	23	12	1,334
17	SCL1701	1,151	207	2	5	1	3	7	1,376
	SCL1702	488	53	0	0	0	4	3	548
Total		1,639	260	2	5	1	7	10	1,924
18	SCL1801	1,147	44	0	3	0	7	7	1,208
	SCL1802	650	45	5	0	0	3	4	707
Total		1,797	89	5	3	0	10	11	1,915
19	SCL1901	721	41	2	1	0	5	5	775
	SCL1902	588	24	1	5	0	5	1	624
	SCL1903	536	41	2	3	0	6	0	588
Total		1,845	106	5	9	0	16	6	1,987
20	SCL2001	407	25	4	0	0	0	5	441
	SCL2002	8	0	0	0	0	0	31	39
	SCL2003	714	46	2	0	0	8	5	775
	SCL2004	669	49	2	0	0	3	8	731
Total		1,798	120	8	0	0	11	49	1,986
21	SCL2101	1,144	94	1	0	0	3	2	1,244
	SCL2103	995	111	1	0	0	4	8	1,119
Total		2,139	205	2	0	0	7	10	2,363
22	SCL2201	587	69	4	0	0	2	10	672
	SCL2202	752	39	1	1	1	9	15	818
Total		1,339	108	5	1	1	11	25	1,490
23	SCL2301	401	95	4	1	0	10	11	522
	SCL2302	258	63	2	0	0	2	2	327
Total		659	158	6	1	0	12	13	849
24	SCL2401	388	26	3	0	0	5	2	424
	SCL2402	621	65	5	0	0	13	7	711
	SCL2403	696	70	2	0	0	1	5	774
	SCL2404	513	26	0	0	0	2	5	546
Total		2,218	187	10	0	0	21	19	2,455
25	SCL2501	653	117	3	0	0	7	8	788
	SCL2502	296	37	1	0	0	3	4	341
	SCL2503	305	86	0	0	0	1	9	401
	SCL2504	510	63	2	0	0	2	11	588
Total		1,764	303	6	0	0	13	32	2,118
26	SCL2601	633	247	9	1	1	6	9	906
	SCL2602	479	97	6	0	0	2	5	589
	SCL2603	359	256	24	1	0	21	26	687
	SCL2604	241	139	6	0	0	0	16	402
Total		1,712	739	45	2	1	29	56	2,584
27	SCL2701	356	39	6	0	0	4	7	412
	SCL2702	85	51	130	2	4	0	11	283
	SCL2703	398	41	8	0	0	2	14	463
	SCL2704	428	39	9	0	0	7	10	493
	SCL2705	590	41	1	0	0	2	11	645
	SCL2706	263	66	6	0	0	7	1	343
Total		2,121	276	160	2	4	22	54	2,639
Summary		44,443	6,085	449	120	22	414	644	52,176

Table 54 Main Structural Types of Sylhet in Cluster level

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL + Other	
1	SCL0101	508	39	26	171	16	760
	SCL0102	330	23	19	199	22	593
Total		838	62	45	370	38	1,353
2	SCL0201	281	13	19	244	27	584
	SCL0202	194	9	13	159	17	392
Total		475	22	32	403	44	976
3	SCL0301	403	26	21	222	33	705
	SCL0302	194	8	9	140	18	369
	SCL0303	2	0	0	3	1	6
	SCL0304	135	8	7	105	12	267
Total		734	42	37	470	64	1,347
4	SCL0401	492	43	26	149	14	724

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL + Other	
	SCL0402	280	13	13	176	25	507
Total		772	56	39	325	39	1,231
5	SCL0501	471	16	27	430	67	1,011
	SCL0502	510	16	31	455	51	1,063
Total		981	32	58	885	118	2,074
6	SCL0601	422	14	25	385	46	892
	SCL0602	245	12	12	183	27	479
Total		667	26	37	568	73	1,371
7	SCL0701	358	10	24	336	36	764
	SCL0702	485	38	26	168	17	734
	SCL0703	275	9	18	241	26	569
	SCL0704	321	13	20	244	26	624
	SCL0705	252	7	15	245	37	556
Total		1,691	77	103	1,234	142	3,247
8	SCL0801	335	11	24	354	38	762
	SCL0802	300	11	22	317	35	685
	SCL0803	276	9	19	275	30	609
	SCL0804	300	12	22	306	40	680
	SCL0805	359	9	26	390	43	827
Total		1,570	52	113	1,642	186	3,563
9	SCL0901	498	22	28	415	50	1,013
	SCL0902	175	6	11	159	20	371
	SCL0903	488	19	26	420	68	1,021
	SCL0904	212	13	12	130	17	384
Total		1,373	60	77	1,124	155	2,789
10	SCL1001	233	13	14	164	21	445
	SCL1002	739	63	37	287	43	1,169
	SCL1003	435	37	21	183	38	714
	SCL1004	119	5	8	122	18	272
Total		1,526	118	80	756	120	2,600
11	SCL1101	483	22	32	451	60	1,048
	SCL1102	325	14	21	324	54	738
Total		808	36	53	775	114	1,786
12	SCL1201	296	18	17	247	44	622
	SCL1202	416	25	26	421	80	968
Total		712	43	43	668	124	1,590
13	SCL1301	314	34	21	286	40	695
	SCL1302	449	21	28	377	40	915
Total		763	55	49	663	80	1,610
14	SCL1401	272	69	12	159	21	533
	SCL1402	358	23	21	349	59	810
	SCL1403	215	14	12	165	20	426
Total		845	106	45	673	100	1,769
15	SCL1501	435	24	22	300	38	819
	SCL1502	181	18	11	153	19	382
	SCL1503	4	1	0	1	1	7
Total		620	43	33	454	58	1,208
16	SCL1601	274	16	16	218	25	549
	SCL1602	386	14	22	325	37	784
Total		660	30	38	543	62	1,333
17	SCL1701	714	36	36	526	59	1,371
	SCL1702	259	12	17	235	26	549
Total		973	48	53	761	85	1,920
18	SCL1801	551	17	38	541	63	1,210
	SCL1802	364	10	18	281	34	707
Total		915	27	56	822	97	1,917
19	SCL1901	339	13	23	352	52	779
	SCL1902	269	11	18	279	49	626
	SCL1903	299	11	17	237	26	590
Total		907	35	58	868	127	1,995
20	SCL2001	210	10	14	183	25	442
	SCL2002	30	0	1	8	1	40
	SCL2003	381	16	25	319	35	776
	SCL2004	357	16	24	302	32	731
Total		978	42	64	812	93	1,989
21	SCL2101	580	18	37	550	60	1,245
	SCL2103	512	25	34	483	64	1,118
Total		1,092	43	71	1,033	124	2,363

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Annex

Ward	Cluster	Structure (No. of buildings)					Total
		RC	LC	BC	BF	TSL + Other	
22	SCL2201	415	30	22	187	18	672
	SCL2202	570	45	28	162	16	821
Total		985	75	50	349	34	1,493
23	SCL2301	222	16	14	229	46	527
	SCL2302	142	11	9	142	24	328
Total		364	27	23	371	70	855
24	SCL2401	183	6	13	198	26	426
	SCL2402	318	13	23	324	35	713
	SCL2403	268	20	16	361	109	774
	SCL2404	262	7	16	234	27	546
Total		1,031	46	68	1,117	197	2,459
25	SCL2501	347	18	25	358	44	792
	SCL2502	156	8	11	147	20	342
	SCL2503	176	13	13	179	20	401
	SCL2504	254	12	18	262	32	578
Total		933	51	67	946	116	2,113
26	SCL2601	409	34	25	385	51	904
	SCL2602	267	17	18	248	38	588
	SCL2603	291	31	19	299	44	684
	SCL2604	194	18	10	151	24	397
Total		1,161	100	72	1,083	157	2,573
27	SCL2701	150	10	10	193	50	413
	SCL2702	110	8	5	136	26	285
	SCL2703	203	7	15	213	26	464
	SCL2704	158	10	10	245	73	496
	SCL2705	264	8	20	312	44	648
	SCL2706	150	8	11	160	17	346
Total		1,035	51	71	1,259	236	2,652
Summary		25,409	1,405	1,535	20,974	2,853	52,176

Table 55 Buildings Age and Visible Physical Condition of Sylhet in Cluster level

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
1	SCL0101	333	341	86	760	169	407	184	760
	SCL0102	250	263	80	593	160	308	125	593
Total		583	604	166	1,353	328	716	309	1,353
2	SCL0201	241	255	88	584	177	296	111	584
	SCL0202	160	170	62	392	117	197	78	392
Total		401	425	150	976	294	493	189	976
3	SCL0301	301	313	91	705	187	367	151	705
	SCL0302	151	159	59	369	105	184	79	369
	SCL0303	2	3	1	6	2	3	1	6
	SCL0304	109	116	42	267	78	135	54	267
Total		563	591	193	1,347	373	689	285	1,347
4	SCL0401	318	325	81	724	156	390	178	724
	SCL0402	213	222	72	507	139	258	110	507
Total		531	547	153	1,231	295	648	288	1,231
5	SCL0501	418	444	149	1,011	319	509	183	1,011
	SCL0502	439	465	159	1,063	326	537	199	1,063
Total		857	909	308	2,074	645	1,047	382	2,074
6	SCL0601	368	391	133	892	276	451	165	892
	SCL0602	199	212	68	479	141	245	93	479
Total		567	603	201	1,371	417	696	258	1,371
7	SCL0701	316	333	115	764	237	385	143	764
	SCL0702	321	329	84	734	165	394	175	734
	SCL0703	235	248	86	569	172	287	110	569
	SCL0704	261	274	89	624	181	319	124	624
	SCL0705	230	242	84	556	177	278	101	556
Total		1,363	1,426	458	3,247	933	1,662	653	3,247
8	SCL0801	312	333	117	762	245	383	134	762
	SCL0802	280	299	106	685	221	344	121	685
	SCL0803	251	266	92	609	192	306	110	609
	SCL0804	278	298	104	680	219	342	119	680
	SCL0805	339	360	128	827	268	413	145	827
Total		1,460	1,556	547	3,563	1,145	1,788	630	3,563
9	SCL0901	419	444	150	1,013	305	514	194	1,013
	SCL0902	153	162	56	371	115	187	69	371

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Annex

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	SCL0903	423	450	148	1,021	317	517	188	1,021
	SCL0904	162	170	52	384	106	199	79	384
Total		1,157	1,226	406	2,789	842	1,416	531	2,789
10	SCL1001	186	197	62	445	127	229	89	445
	SCL1002	507	526	136	1,169	278	624	268	1,169
	SCL1003	308	321	85	714	178	378	158	714
	SCL1004	111	119	42	272	88	137	47	272
Total		1,112	1,163	325	2,600	671	1,367	561	2,600
11	SCL1101	431	458	159	1,048	328	528	192	1,048
	SCL1102	304	323	111	738	239	369	129	738
Total		735	781	270	1,786	567	897	321	1,786
12	SCL1201	258	275	89	622	192	316	114	622
	SCL1202	395	425	148	968	319	484	165	968
Total		653	700	237	1,590	511	800	279	1,590
13	SCL1301	284	307	104	695	217	355	123	695
	SCL1302	379	402	134	915	274	467	174	915
Total		663	709	238	1,610	490	822	298	1,610
14	SCL1401	219	241	73	533	141	286	106	533
	SCL1402	332	357	121	810	260	409	141	810
	SCL1403	177	188	61	426	124	218	84	426
Total		728	786	255	1,769	525	913	331	1,769
15	SCL1501	343	362	114	819	234	422	163	819
	SCL1502	157	169	56	382	115	197	71	382
	SCL1503	3	3	1	7	2	4	1	7
Total		503	534	171	1,208	350	622	236	1,208
16	SCL1601	228	241	80	549	161	280	108	549
	SCL1602	325	345	114	784	235	399	149	784
Total		553	586	194	1,333	397	679	257	1,333
17	SCL1701	572	606	193	1,371	395	705	271	1,371
	SCL1702	227	240	82	549	169	278	102	549
Total		799	846	275	1,920	564	983	373	1,920
18	SCL1801	498	528	184	1,210	382	608	220	1,210
	SCL1802	295	311	101	707	209	361	138	707
Total		793	839	285	1,917	591	969	358	1,917

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
19	SCL1901	319	341	119	779	254	390	136	779
	SCL1902	257	274	95	626	207	312	107	626
	SCL1903	246	259	85	590	174	301	115	590
Total		822	874	299	1,995	634	1,002	359	1,995
20	SCL2001	183	194	65	442	136	224	82	442
	SCL2002	18	18	4	40	8	21	11	40
	SCL2003	322	340	114	776	233	395	149	776
	SCL2004	304	321	106	731	219	372	139	731
Total		827	873	289	1,989	596	1,012	381	1,989
21	SCL2101	514	544	187	1,245	388	628	229	1,245
	SCL2103	461	490	167	1,118	351	565	202	1,118
Total		975	1,034	354	2,363	739	1,193	432	2,363
22	SCL2201	288	298	86	672	163	353	156	672
	SCL2202	362	369	90	821	173	442	206	821
Total		650	667	176	1,493	336	795	362	1,493
23	SCL2301	214	230	83	527	174	261	91	527
	SCL2302	134	144	50	328	106	165	56	328
Total		348	374	133	855	281	427	148	855
24	SCL2401	174	186	66	426	139	213	74	426
	SCL2402	291	312	110	713	227	359	127	713
	SCL2403	312	341	121	774	289	378	107	774
	SCL2404	227	239	80	546	168	276	102	546
Total		1,004	1,078	377	2,459	822	1,226	410	2,459
25	SCL2501	323	345	124	792	255	397	140	792
	SCL2502	141	150	51	342	108	173	61	342
	SCL2503	164	176	61	401	128	203	70	401
	SCL2504	237	253	88	578	186	291	101	578
Total		865	924	324	2,113	676	1,064	373	2,113
26	SCL2601	369	397	138	904	282	458	164	904
	SCL2602	241	258	89	588	186	297	105	588
	SCL2603	277	301	106	684	222	346	116	684
	SCL2604	165	176	56	397	118	204	75	397
Total		1,052	1,132	389	2,573	807	1,306	460	2,573
27	SCL2701	166	181	66	413	150	202	61	413

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Annex

Ward	Cluster	Building Age			Total	Visible Physical Condition			Total
		< 10 year	10 - 30 year	> 30 year		Poor	Average	Good	
	SCL2702	114	124	47	285	99	140	46	285
	SCL2703	190	203	71	464	150	233	81	464
	SCL2704	198	217	81	496	191	239	66	496
	SCL2705	263	282	103	648	219	321	108	648
	SCL2706	140	151	55	346	111	174	61	346
Total		1,071	1,158	423	2,652	920	1,310	422	2,652
Summary		21,635	22,945	7,596	52,176	15,753	26,543	9,880	52,176

Table 56 Number of occupants of Sylhet in Cluster level

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
1	SCL0101	0.34	4,168	4,900	12,346	14,514
	SCL0102	0.18	4,812	4,377	26,762	24,343
Total		0.52	8,980	9,276	17,356	17,929
2	SCL0201	0.29	3,828	3,615	13,311	12,569
	SCL0202	0.29	3,522	3,009	12,138	10,373
Total		0.58	7,350	6,624	12,722	11,466
3	SCL0301	0.43	5,015	5,696	11,688	13,276
	SCL0302	0.32	4,891	3,390	15,504	10,747
	SCL0303	0.28	26	41	93	149
	SCL0304	0.28	2,144	1,822	7,644	6,498
Total		1.30	12,075	10,950	9,276	8,412
4	SCL0401	0.53	4,454	4,200	8,444	7,963
	SCL0402	0.38	5,562	5,758	14,747	15,266
Total		0.90	10,016	9,958	11,072	11,008
5	SCL0501	0.30	7,205	9,411	23,920	31,246
	SCL0502	0.35	8,027	7,852	22,888	22,388
Total		0.65	15,232	17,263	23,365	26,481
6	SCL0601	0.30	5,022	6,700	16,583	22,125
	SCL0602	0.29	2,955	4,050	10,043	13,764
Total		0.60	7,977	10,750	13,360	18,005
7	SCL0701	0.35	3,754	5,120	10,642	14,514
	SCL0702	0.25	4,003	4,537	16,271	18,441
	SCL0703	0.49	3,009	3,745	6,140	7,642
	SCL0704	0.47	3,411	4,252	7,305	9,107
	SCL0705	0.30	3,668	5,717	12,382	19,300
Total		1.85	17,845	23,371	9,636	12,620
8	SCL0801	0.32	3,806	5,016	11,731	15,463
	SCL0802	0.47	3,722	4,348	7,944	9,281
	SCL0803	0.43	3,144	4,124	7,272	9,541
	SCL0804	0.45	4,819	5,033	10,695	11,171
	SCL0805	0.51	3,980	5,679	7,855	11,209
Total		2.18	19,470	24,201	8,921	11,089
9	SCL0901	0.50	7,169	7,101	14,328	14,192
	SCL0902	0.42	1,962	2,789	4,641	6,598
	SCL0903	0.32	7,227	9,646	22,430	29,935
	SCL0904	0.32	2,790	2,813	8,720	8,791
Total		1.57	19,148	22,349	12,233	14,278
10	SCL1001	0.31	3,184	3,161	10,151	10,078
	SCL1002	0.29	6,875	8,741	23,834	30,302
	SCL1003	0.27	4,973	6,407	18,130	23,358
	SCL1004	0.28	1,721	2,058	6,113	7,308
Total		1.16	16,753	20,367	14,468	17,588
11	SCL1101	0.24	6,756	8,034	28,283	33,631
	SCL1102	0.27	4,867	6,929	18,282	26,029
Total		0.51	11,623	14,963	23,012	29,624
12	SCL1201	0.20	4,319	5,549	21,125	27,141
	SCL1202	0.22	7,309	9,287	33,259	42,260
Total		0.42	11,628	14,836	27,411	34,974
13	SCL1301	0.18	5,259	4,092	28,447	22,133
	SCL1302	0.40	5,235	6,057	13,063	15,112
Total		0.59	10,495	10,149	17,919	17,328
14	SCL1401	0.27	5,903	1,794	21,906	6,659
	SCL1402	0.28	5,606	7,276	19,758	25,643
	SCL1403	0.29	4,145	2,938	14,265	10,111
Total		0.84	15,654	12,009	18,552	14,232
15	SCL1501	0.22	7,736	6,573	34,662	29,454

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Annex

Ward	Cluster	Area (Km^2)	Population (No.)		Population Density (No./Km^2)	
			Daytime	Nighttime	Daytime	Nighttime
	SCL1502	0.12	2,956	2,427	23,885	19,610
	SCL1503	0.34	377	9	1,120	26
Total		0.68	11,068	9,009	16,199	13,185
16	SCL1601	0.29	4,174	3,508	14,614	12,285
	SCL1602	0.42	5,152	6,134	12,288	14,629
Total		0.70	9,326	9,643	13,230	13,680
17	SCL1701	0.42	9,193	10,913	21,983	26,096
	SCL1702	0.53	3,106	3,571	5,914	6,799
Total		0.94	12,299	14,484	13,037	15,353
18	SCL1801	0.50	6,535	8,614	12,955	17,077
	SCL1802	0.35	4,294	5,796	12,237	16,517
Total		0.86	10,829	14,411	12,660	16,847
19	SCL1901	0.29	4,986	6,748	16,915	22,894
	SCL1902	0.29	4,661	6,408	16,183	22,246
	SCL1903	0.18	3,530	4,438	19,713	24,784
Total		0.76	13,177	17,593	17,296	23,093
20	SCL2001	0.25	2,593	3,313	10,278	13,134
	SCL2002	0.31	2,429	59	7,919	193
	SCL2003	0.29	4,386	5,194	15,360	18,191
	SCL2004	0.26	4,168	4,772	15,916	18,223
Total		1.11	13,576	13,339	12,270	12,056
21	SCL2101	0.25	6,522	8,994	26,123	36,022
	SCL2103	0.17	6,556	8,391	38,018	48,655
Total		0.42	13,078	17,384	30,983	41,183
22	SCL2201	0.15	4,166	4,169	28,720	28,738
	SCL2202	0.32	5,543	5,407	17,431	17,001
Total		0.46	9,710	9,576	20,968	20,678
23	SCL2301	0.47	5,024	5,146	10,639	10,899
	SCL2302	0.53	2,082	2,700	3,912	5,074
Total		1.00	7,106	7,847	7,075	7,813
24	SCL2401	0.49	2,531	3,238	5,150	6,590
	SCL2402	0.34	4,462	4,531	13,167	13,371
	SCL2403	0.14	7,326	12,273	52,716	88,316
	SCL2404	0.09	3,226	4,250	35,431	46,674
Total		1.06	17,545	24,293	16,547	22,910
25	SCL2501	0.39	4,856	5,242	12,466	13,456
	SCL2502	0.55	2,132	2,496	3,880	4,543
	SCL2503	0.49	2,559	2,237	5,251	4,590
	SCL2504	0.51	3,593	4,078	7,016	7,964
Total		1.94	13,140	14,053	6,779	7,250
26	SCL2601	0.30	6,172	6,166	20,436	20,415
	SCL2602	0.43	3,882	4,565	9,019	10,606
	SCL2603	0.45	6,161	3,991	13,713	8,882
	SCL2604	0.16	3,501	2,899	21,688	17,955
Total		1.34	19,717	17,621	14,679	13,118
27	SCL2701	0.22	4,146	5,450	18,982	24,955
	SCL2702	0.36	3,342	1,962	9,159	5,378
	SCL2703	0.31	3,236	3,020	10,462	9,762
	SCL2704	0.30	5,154	7,751	16,920	25,443
	SCL2705	0.30	4,190	5,201	14,162	17,579
	SCL2706	0.52	2,194	2,075	4,234	4,005
Total		2.01	22,262	25,459	11,069	12,659
Summary		26.96	357,079	401,776	13,242	14,900

Table 57 Vulnerability factors of Sylhet in Cluster level

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building (No.)
1	SCL0101	98	214	69	29	12	475
	SCL0102	68	146	45	20	8	317
Total		166	360	114	49	21	792
2	SCL0201	60	126	38	18	7	269
	SCL0202	40	86	26	12	5	184
Total		100	213	64	30	12	453
3	SCL0301	79	171	54	24	10	374
	SCL0302	40	86	26	12	5	182
	SCL0303	0	1	0	0	0	2
	SCL0304	28	60	19	8	3	130
Total		148	318	98	44	18	688

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building (No.)
4	SCL0401	94	207	67	28	12	463
	SCL0402	59	125	37	18	7	265
Total		154	332	105	46	19	728
5	SCL0501	99	212	63	29	12	450
	SCL0502	109	233	69	32	13	492
Total		208	445	133	61	26	942
6	SCL0601	90	192	57	27	11	405
	SCL0602	50	109	33	15	6	235
Total		140	301	90	41	17	640
7	SCL0701	76	161	47	23	9	336
	SCL0702	93	204	66	28	12	454
	SCL0703	58	122	36	17	7	257
	SCL0704	67	142	43	20	8	302
	SCL0705	56	116	34	17	7	241
Total		351	746	225	104	43	1,590
8	SCL0801	73	154	45	22	9	322
	SCL0802	65	137	40	19	8	288
	SCL0803	59	125	37	18	7	261
	SCL0804	65	136	41	19	8	288
	SCL0805	78	164	48	23	10	341
Total		340	716	210	101	41	1,500
9	SCL0901	105	225	68	31	13	480
	SCL0902	37	79	23	11	5	167
	SCL0903	101	217	65	30	13	463
	SCL0904	43	93	29	13	5	202
Total		286	614	186	84	35	1,312
10	SCL1001	48	103	32	14	6	222
	SCL1002	143	311	100	42	18	693
	SCL1003	83	181	59	25	10	404
	SCL1004	26	54	16	8	3	114
Total		301	649	207	89	37	1,433
11	SCL1101	102	215	64	30	12	456
	SCL1102	68	144	43	20	8	306
Total		170	359	108	51	21	762
12	SCL1201	61	129	40	18	7	278
	SCL1202	86	184	57	26	11	397
Total		147	313	96	44	18	675
13	SCL1301	69	145	47	20	8	323
	SCL1302	95	202	61	28	12	430
Total		163	347	108	48	20	753
14	SCL1401	59	122	46	18	7	301
	SCL1402	75	160	49	22	9	344
	SCL1403	46	98	30	14	6	210
Total		181	379	125	54	22	855
15	SCL1501	91	197	61	27	11	428
	SCL1502	38	81	26	11	5	180
	SCL1503	1	2	1	0	0	5
Total		130	281	88	38	16	613
16	SCL1601	58	122	37	17	7	261
	SCL1602	82	175	52	24	10	370
Total		140	297	89	42	17	631
17	SCL1701	152	326	100	45	19	701
	SCL1702	55	118	36	16	7	251
Total		207	444	135	61	26	952
18	SCL1801	118	249	73	35	14	521
	SCL1802	76	166	50	23	10	353
Total		195	415	123	58	24	874
19	SCL1901	72	152	45	21	9	320
	SCL1902	56	120	36	17	7	253
	SCL1903	63	135	40	19	8	287
Total		192	407	121	57	24	860
20	SCL2001	44	93	28	13	5	199
	SCL2002	7	14	4	2	1	28
	SCL2003	80	169	51	24	10	360
	SCL2004	75	159	48	22	9	338
Total		205	435	131	61	25	925
21	SCL2101	125	265	78	37	15	556
	SCL2103	108	229	69	32	13	488
Total		233	494	147	69	29	1,044
22	SCL2201	81	176	56	24	10	386

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Annex

Ward	Cluster	Soft Story	Heavy overhang	Short Column	Pounding	Topographic	Concrete building (No.)
	SCL2202	109	237	76	32	14	528
Total		190	413	132	56	24	914
23	SCL2301	46	98	30	14	6	212
	SCL2302	30	63	20	9	4	138
Total		76	161	50	23	9	350
24	SCL2401	40	83	24	12	5	174
	SCL2402	69	145	43	20	8	306
	SCL2403	54	116	37	16	7	254
	SCL2404	56	119	35	17	7	250
Total		219	464	139	65	27	984
25	SCL2501	74	157	48	22	9	336
	SCL2502	33	70	21	10	4	150
	SCL2503	39	81	25	11	5	176
	SCL2504	55	116	35	16	7	246
Total		201	425	129	60	25	908
26	SCL2601	88	184	58	26	11	402
	SCL2602	55	118	37	16	7	256
	SCL2603	62	132	43	18	8	296
	SCL2604	40	85	27	12	5	188
Total		245	520	164	73	30	1,142
27	SCL2701	31	66	20	9	4	142
	SCL2702	23	50	16	7	3	109
	SCL2703	44	93	27	13	5	194
	SCL2704	32	68	21	10	4	147
	SCL2705	57	120	35	17	7	251
	SCL2706	32	68	21	10	4	146
Total		220	465	140	65	27	989
Summary		5,308	11,313	3,457	1,574	653	24,309

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Technical assistance: adpc Asian Disaster Preparedness Center