**DRAFT FINAL REPORT**

# TRAFFIC AND TRANSPORT MASTER PLAN








**December 2025**

**PREPARATION OF CHATTOGRAM METROPOLITON MASTER PLAN**
**PERIOD: 2025 - 2050**

Prepared in Association with

datEx-Tiller-EGS JV

Chattogram Development Authority

Ministry of Housing and Public Works

People's Republic of Bangladesh

PREPARATION OF CHATTOGRAM METROPOLITAN MASTER PLAN

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# Traffic and Transport Master Plan

Date of Submission

December / 2025

Consultant: datEx Tiller EGS JV

# Abbreviation

| | |
|---|---|
| AH | Asian Highway |
| AI | Artificial Intelligence |
| BBIN | Bangladesh, Bhutan, India, Nepal Initiative |
| BBTOA | Bangladesh Bus-Truck Owners Association |
| BICDA | Bangladesh Inland Container Depots Association |
| BIP | Bangladesh Institute of Planners |
| BIWTA | Bangladesh Inland Water Transport Authority |
| BIWTC | Bangladesh Inland Water Transport Corporation |
| BNBC | Bangladesh National Building Code |
| BNCC | Bangladesh National Cadet Corps |
| BR | Bangladesh Railway |
| BRT | Bus Rapid Transit |
| BRTA | Bangladesh Road Transport Authority |
| BRTC | Bangladesh Road Transport Corporation |
| BSCIC | Bangladesh Small and Cottage Industries Corporation |
| BUET | Bangladesh University of Engineering and Technology |
| CAAB | Civil Aviation Authority of Bangladesh |
| CADP | Chattogram Area Development Project |
| CBD | Central Business District |
| CCC | Chattogram City Corporation |
| CCCI | Chittagong Chamber of Commerce & Industry |
| CCT | Chittagong Container Terminal |
| CDA | Chattogram Development Authority |
| CMA | Chattogram Metropolitan Area |
| CMMP | Chattogram Metropolitan Master Plan |
| CMP | Chattogram Metropolitan Police |
| CPA | Chittagong Port Authority |
| CPMFOA | Chittagong Port Marine Freight Owners Association |
| CU | Chittagong University |
| CUET | Chittagong University of Engineering and Technology |
| CWASA | Chattogram Water Supply and Sewerage Authority |
| DAP | Detailed Area Plan |
| DC | Deputy Commissioner |
| EPZ | Export Processing Zone |
| ERP | Electronic Road Pricing |
| EV | Electric Vehicle |
| IAB | Institute of Architects Bangladesh |
| IAP | Immediate Action Plan |
| IEB | Institution of Engineers, Bangladesh |
| IMMTP | Integrated Multi-Modal Transport Policy |

| | |
|---|---|
| ITS | Intelligent Transport System |
| KEPZ | Korean Export Processing Zone |
| KGTDC | Karnaphuli Gas Transmission and Distribution Company Limited |
| LGED | Local Government Engineering Department |
| LPR | License Plate Recognition |
| LTDS | Long-Term Development Strategy |
| LTDSTT | Long-Term Development Strategy for Transport & Traffic |
| MRT | Mass Rapid Transit |
| NMT | Non-Motorized Transport |
| OD | Origin-Destination |
| PCU | Passenger Car Unit |
| PDB | Power Development Board |
| PPP | Public-Private Partnership |
| PT | Public Transport |
| RFID | Radio Frequency Identification |
| RHD | Roads and Highways Department |
| ROW | Right of Way |
| SDG | Sustainable Development Goals |
| SUTMP | Sustainable Urban Transport Master Plan |
| TDM | Travel Demand Management |
| TIA | Traffic Impact Assessment |
| TOD | Transit-Oriented Development |
| VMS | Variable Message Sign |
| WASA | Water Supply and Sewerage Authority |

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# CHAPTER ONE

# INTRODUCTION

# Chapter 1: Introduction

The transport sector is a vital part of urban development, shaping economic activity, public mobility, and the overall quality of life. In Chattogram—Bangladesh's key port city and industrial hub—an efficient and well-managed transportation system is especially important. However, the city currently faces growing traffic congestion, aging infrastructure, and a lack of coordination among responsible agencies. These issues, if left unaddressed, will only become more challenging as the city continues to expand.

This Traffic and Transport Master Plan provides a structured and long-term approach to addressing Chattogram's transportation needs. The master plan is prepared as one of four sectoral plans for the Chattogram Metropolitan Master Plan (Period 2025 – 2050). It draws lessons from earlier initiatives such as the Long-Term Development Strategy for Traffic and Transport of 1995 and the Detailed Area Plan (DAP) of 2008—retaining their strengths while updating or revising aspects that no longer fit today's context. The goal is to move away from piecemeal solutions and instead focus on a well-integrated, inclusive, and realistic strategy.

Rather than simply building more roads, the master plan emphasizes better management of existing infrastructure, improved public transport, and data-driven planning. It also promotes closer collaboration between different government bodies and stakeholders, ensuring that development efforts are more aligned. By doing so, the plan aims to support a safer, smarter, and more connected Chattogram that can meet both current and future mobility demands.

## 1.1. Goal & Vision

The Transport Masterplan for Chattogram sets a long-term strategic direction to transform the city's mobility landscape. The masterplan envisions a system that can meet current needs while adapting to future growth and challenges. The following vision and goals articulate the foundational aspirations and guiding targets that shape all proposed policies and initiatives.

### Visions

To create an integrated, inclusive, safe, accessible, efficient, and resilient transportation system that enhances mobility, supports sustainable urban development, and ensures equitable access to opportunities and services for all residents of Chattogram by 2050.

### Goals

1. **Enhance Accessibility and Inclusiveness:** Ensure that transport infrastructure and services are accessible to all, including vulnerable groups such as the elderly, children, and persons with disabilities.
2. **Modernize and Expand Public Transport:** Develop a reliable, efficient, and environmentally sustainable public transport system that serves as a viable alternative to private vehicles.
3. **Improve Transport Safety and Traffic Management:** Reduce accidents and improve traffic flow through better design, enforcement, and public awareness.
4. **Promote Sustainable and Resilient Infrastructure Development**: Upgrade and expand road, rail, water, and air transport infrastructure using climate-resilient and multimodal design principles.

5. **Strengthen Institutional Capacity and Coordination:** Establish robust governance structures to support integrated planning, enforcement, and long-term transport system management.

## 1.2. Objectives

The Transport Masterplan for Chattogram is grounded in the principles of integration, inclusiveness, safety, accessibility, efficiency, and resilience. Current inadequacies in these areas hinder the seamless functioning of urban systems and pose risks to both individuals and communities.

**The Objective of the Transport Masterplan are two-fold:**

- **To foster integration, inclusiveness, safety, accessibility, efficiency, and resilience** across all aspects of the transportation system, addressing existing deficiencies and preparing for future challenges.
- **To bolster support for public transportation**, ensuring it becomes a viable, efficient, and attractive option for all users, across all segments of society.

## 1.3. Study Framework

The development of the Chattogram Transport Master Plan followed a structured and data-driven methodology to ensure a comprehensive understanding of the city's transportation dynamics. The framework consisted of the following key phases shown in Figure 1-1.

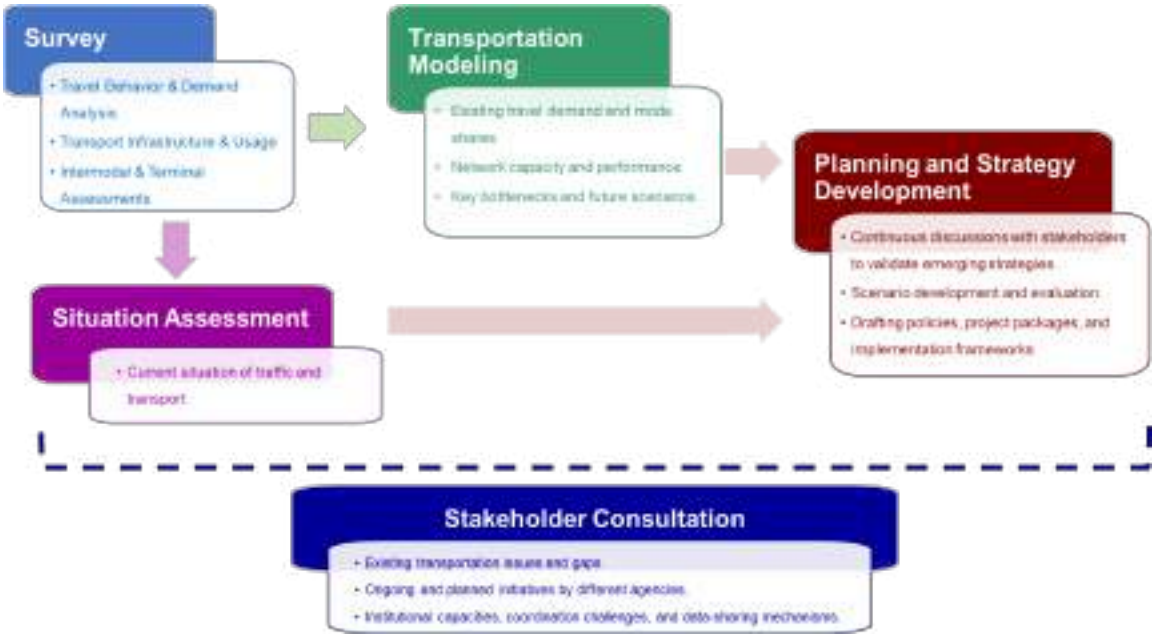



**Figure 1-1: Study Framework**

### 1.3.1. Survey

A total of twelve different types of transport surveys were conducted to collect comprehensive primary data for developing the Traffic and Transportation Master Plan (2025–2050). These included field investigations, traffic counts, user and operator feedback, and travel behavior analysis across multiple modes and transport facilities. Surveys were carried out at over 135

km of roads, 56 traffic count locations, 10,824 households, and several passenger and freight terminals. The collected data provides detailed insights into current travel patterns, traffic volumes, service quality, infrastructure conditions, and user needs. Details regarding the surveys are given in Traffic Survey and Analysis chapter.

### 1.3.2. Situation Assessment

In the process of evaluating the existing conditions, the master plan examined and analyzed the current transport infrastructure and travel patterns in Chattogram. Apart from surveys done for quantitative analysis, qualitative and observational assessments were done for various transportation modes, such as roads, public transport, railways, airways, and waterways. Pedestrian and cycling facilities, parking availability, and traffic safety measures were also evaluated. Travel behavior, including trip purposes and mode shares, was thoroughly studied. This evaluation also involved analyzing data from diverse sources, including traffic surveys, accident reports, and infrastructure documentation, to develop a comprehensive understanding of Chattogram's transportation landscape.

### 1.3.3. Transport Modelling

Traffic modeling was carried out using the PTV VISUM software to assess existing and future transport demand, evaluate network performance to support the development of the Traffic and Transportation Master Plan. The model incorporated data from all primary transport surveys, including household travel behavior, traffic volumes, trip generation, and origin-destination patterns. It was calibrated and validated using observed traffic counts and travel times to ensure reliability. The model enabled scenario analysis, identification of bottlenecks, and forecasting of future travel demand for the planning horizon up to 2050. A separate working paper detailing the methodology, assumptions, calibration process, and modeling outputs will be provided as part of this study.

### 1.3.4. Stakeholder Consultation

As part of the planning process, stakeholder consultation meetings were held with various government agencies, service providers, local authorities, and transport-related organizations to ensure an inclusive and coordinated approach. These consultations helped gather insights on current issues, ongoing projects, institutional responsibilities, and future plans. The feedback and suggestions received were carefully reviewed and incorporated into the master plan where appropriate. To streamline this process, stakeholders were mapped according to their roles and responsibilities across key transport sectors. They are grouped based on their level of influence and interest to guide engagement strategies effectively.

- **High Influence, High Interest:** Fully engage and collaborate with these stakeholders to ensure project success.
- **High Influence, Low Interest:** Keep them satisfied with key updates, but avoid overloading them with detail.
- **Low Influence, High Interest:** Keep informed and consult when needed; their input can add valuable insights.
- **Low Influence, Low Interest:** Monitor with minimal communication; engage only when necessary.

Following this, the groups can be categorized as followed.

- Category A: Involved.
- Category B: Acknowledge.
- Category C: Manage.
- Category D: Inform.

The stakeholders for the Chattogram Transport Master Plan have been mapped according to their levels of influence and interest, using the classification framework described. This mapping ensures a targeted engagement approach for each group. The stakeholder matrix below illustrates this categorization.


**Figure 1-2: Stakeholder Matrix**

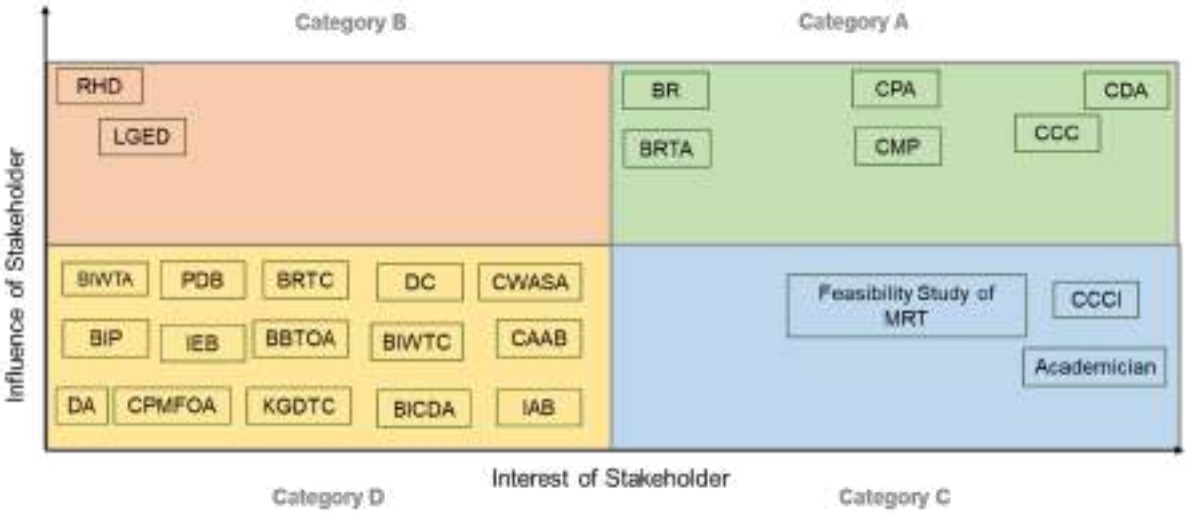



**Figure 1-3: Stakeholder Matrix for CMMP area transport system**

# CHAPTER TWO

# CURRENT URBAN STRUCTURE AND SOCIO-ECONOMIC PROFILE

# Chapter 2: Current Urban Structure and Socio-economic Profile

The planning area of the project is, as shown in Figure 2-1, Chattogram Metropolitan Area (hereinafter referred to as CMA), consisted of Chattogram City Corporation (CCC) and its adjacent regions, which is a major commercial and industrial city and financial hub area in the southeastern part of Bangladesh. The area of CMA is 1,255 Km², and the population of CMA in 2022 is 5.5 million, and is expected to reach 11.9 million by 2050. The Chattogram City Corporation with 155.4 Km², a core city of CMA, has population of 3.2 million in 2022, is the second-largest city in the country. The city is located on the banks of the Karnaphuli River between the Chittagong Hill Tracts and the Bay of Bengal.

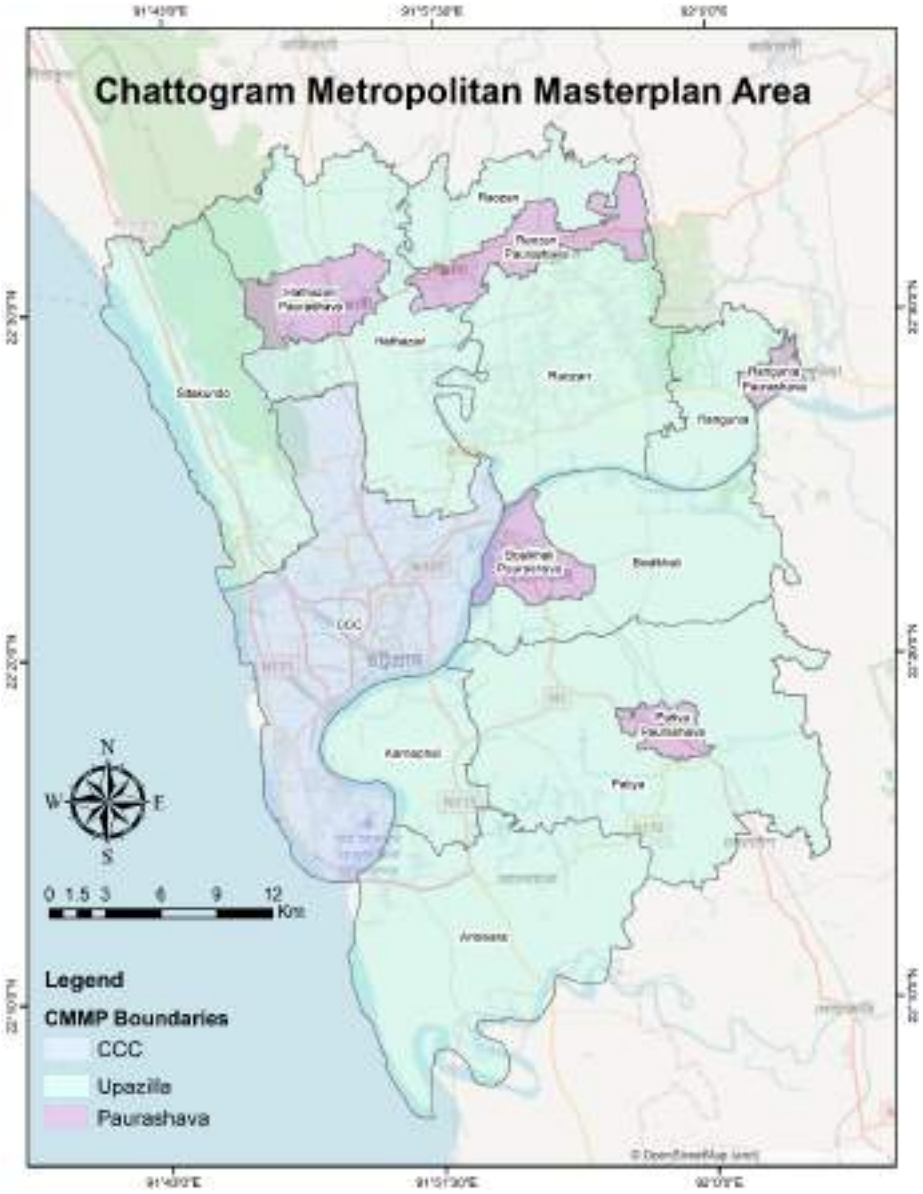
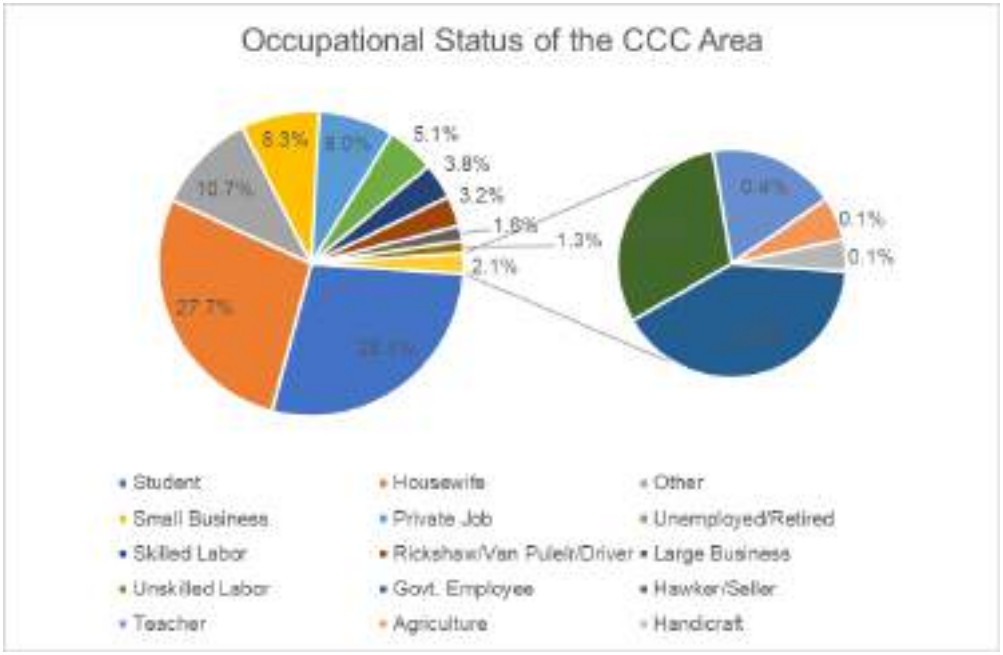



**Figure 2-1: CMMP Area**

## 2.1. Socio-Economic Conditions

Chattogram is the economic hub of Bangladesh due to its strategic coastal location along the Bay of Bengal and its role as the country's primary seaport. It handles the bulk of Bangladesh's international trade, significantly influencing the national economy and creating major employment opportunities in shipping, logistics, manufacturing (garments, shipbuilding, steel, chemicals), and port-related services. This high level of industrial and economic activity contributes to intense daily commuting flows and increased demand for efficient transport infrastructure.

Rapid urbanization, with a population exceeding 5 million in the metropolitan region, has resulted in significant pressure on the city's transport systems. Socioeconomic disparities, such as the concentration of low-income populations in informal settlements near industrial areas, result in high dependency on public and informal transport modes.



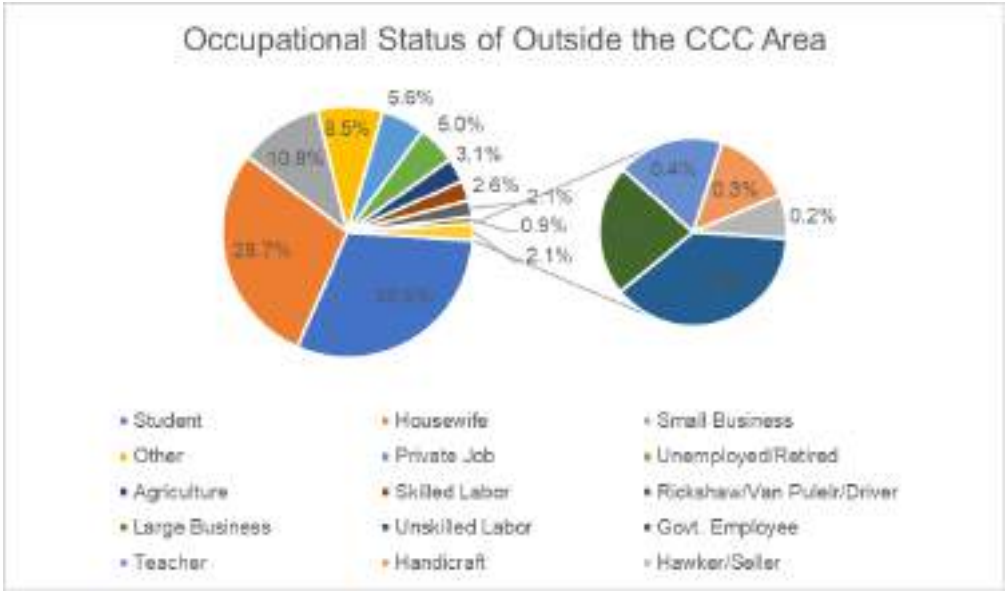




**Figure 2-2: Occupational Status**

the occupational data highlights that students make up the largest group both outside (30.5%) and inside (28.1%) the CCC area, indicating a strong need for affordable and frequent public transport for educational purposes. Small business owners and those in private jobs (combined over 19% in both areas) require reliable daily commuting options and transport systems that support economic activities like goods movement.

The presence of informal sector workers such as rickshaw/van pullers, skilled/unskilled laborers, and hawkers is more noticeable outside the CCC area, underscoring the need for non-motorized and last-mile transport solutions in suburban or rural settings. Additionally, occupations like teachers and government employees (though smaller in proportion) emphasize the importance of timely and structured transit routes.

## 2.2. Social Characteristics & Household

Chattogram households typically range between 4–5 members. High-density living and informal housing are common in low-income areas, where transport access is limited. Many residents rely on non-motorized or informal modes of transport, such as rickshaws and shared auto-rickshaws, due to affordability constraints.

A large portion of the population is engaged in informal or low-income occupations, often requiring long or irregular commutes. Women's growing participation in the workforce, especially in the garment and service sectors, underscores the need for safe, inclusive, and reliable transport systems. Increasing digital access and mobile technology adoption highlight the opportunity to integrate smart transport solutions, including ride-hailing and real-time service updates.

**Table 2-1: Social Characteristics of CMMP Area**

| Indicator | Chattogram City Corporation | Outside City Corporation (Average) |
|---|---|---|
| **Sex Composition** (% of total) | Female: 51.71%<br>Male: 48.29% | |
| **Average Household Size** | 4.23 | **4.09** (average across Upazillas and towns) |
| **Literacy Rate (Age 7+)** | 80.85% (Total)<br>Male: 82.40%<br>Female: 79.30% | 74.29% (Total)<br>Male: 75.14%<br>Female: 73.54% |

Chattogram City Corporation (CCC) has a slightly higher female population (51.71%) and a larger average household size (4.23) compared to areas outside the city. The literacy rate is notably higher in CCC (80.85%) than outside (74.29%), reflecting better educational access. These factors suggest greater demand for safe, inclusive, and well-organized public transport in the city, while outer areas may need more accessible and user-friendly systems tailored to lower literacy levels.

## 2.3. Present Population & Employment

According to the 2022 Census, Chattogram City Corporation houses over 3 million people, while the broader metropolitan area exceeds 5 million. Migration from rural areas continues to fuel rapid population growth, adding pressure on urban mobility systems.

**Table 2-2: Current and Forecasted Population and Employment of CMMP Area**

| Year | Population | | | Employment | | |
|---|---|---|---|---|---|---|
| | CCC | Upazila | Total | CCC | Upazila | Total |
| 2022 | 3,230,507 | 2,325,285 | 5,555,792 | 1,705,747 | 322,298 | 2,028,045 |
| 2030 | 3,929,674 | 3,084,274 | 7,013,948 | 2,061,157 | 467,686 | 2,528,843 |
| 2040 | 4,979,209 | 4,299,457 | 9,278,666 | 2,601,567 | 708,026 | 3,309,593 |
| 2050 | 6,263,169 | 5,702,840 | 11,966,009 | 3,272,634 | 973,939 | 4,246,573 |

The population and employment data shows rapid urban growth in the Chattogram City Corporation (CCC) area, with population projected to nearly double from 3.2 million in 2022 to 5.5 million by 2050. Employment demand is assumed to grow proportionally, especially in CCC where jobs increase from 1.7 million to 3.3 million. These trends highlight the urgent need for expanded, high-capacity urban transportation systems and improved connectivity with surrounding Upazila to support commuting and economic integration.

The labor force is concentrated in port activities, manufacturing, transport, and informal services. This economic structure generates substantial daily movement across the city, often between peripheral residential areas and industrial or commercial hubs. The reliance on informal employment results in a high demand for affordable and flexible transport modes.

Despite lower unemployment compared to rural areas, underemployment and the informal nature of much of the workforce underscore the importance of reliable and low-cost transport options. Gender disparities in formal employment indicate a need for more inclusive and gender-sensitive mobility planning.

## 2.4. Urban Development and Its Impact on Transportation

### 2.4.1. Transition into Current Urban Form

The pattern of urban growth in Chattogram has been closely tied to the location and expansion of employment hubs. Before 1995, the southern part of the city—now known as the port area—was relatively underdeveloped, with sparse population and limited economic activity. Low job availability resulted in minimal travel demand, and the modest road network was sufficient to meet local needs. Port activity was also limited, with smaller cargo volumes generating only minor freight movement through the city.

This changed significantly with the establishment of the Chattogram Export Processing Zone (CEPZ) in 1995 and the Karnaphuli Export Processing Zone (KEPZ) in 1999. These zones created over thousands of jobs, spurring rapid urbanization in surrounding areas. New residential colonies and commercial facilities emerged to support the growing workforce, dramatically increasing travel demand. However, the transport infrastructure did not evolve in step with this growth. As a result, both city and port traffic were forced to share the same limited routes, leading to persistent congestion and safety concerns.

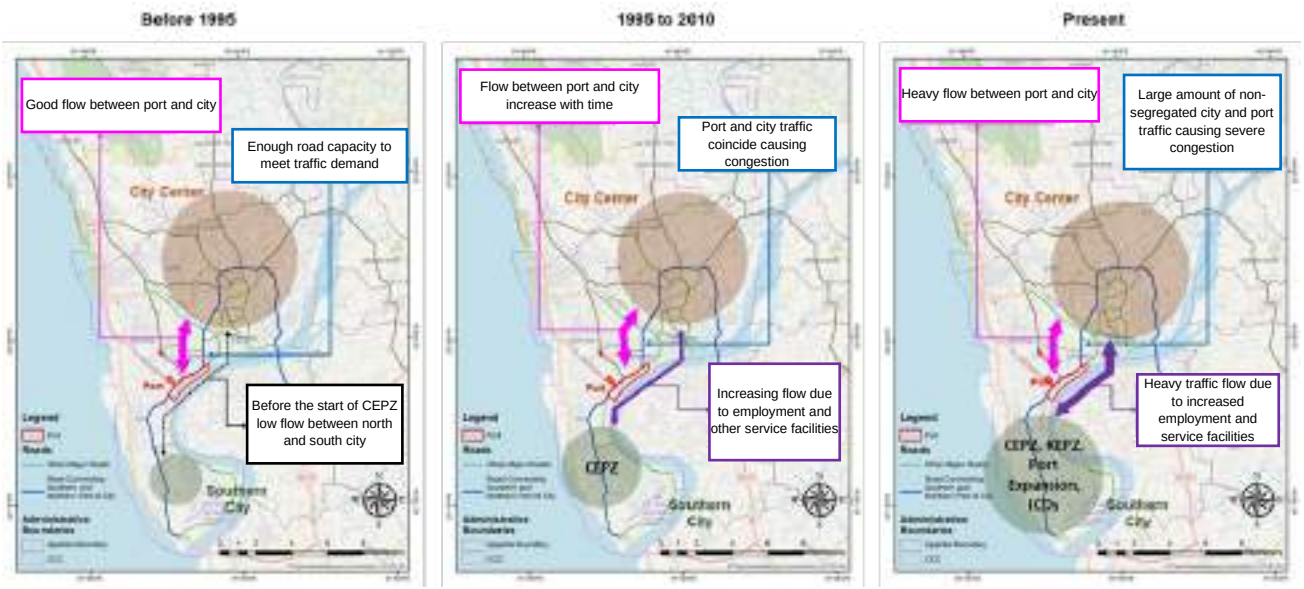



**Figure 2-3: City Traffic Scenarios**

A similar story unfolded in the city core and eastern regions. The Nasirabad and Kalurghat industrial areas drew more people and businesses, but investment in transport infrastructure lagged behind. Authorities prioritized flyovers and development in select residential areas, while critical gaps between expanding neighborhoods were left unaddressed. Today, the CCC area relies heavily on just two major thoroughfares to carry high traffic volumes, while most internal roads remain narrow and congested.

Beyond the core city, urban growth in Paurashavas follows major highways but lacks supporting local roads. Informal market encroachments near highway intersections reduce traffic flow and increase delays. In Sitakunda, industrial development has added significant freight pressure to the Dhaka-Chattogram Highway, further compounding congestion issues.

Chattogram's land use is now dominated by residential zones interspersed with commercial, industrial, and port-related areas. High-density settlements, including many informal communities, often cluster around industrial corridors, leading to complex travel behavior and an increased need for reliable last-mile connectivity. Key transport generators include:

- **Agrabad (CBD):** The city's main commercial and administrative center.
- **Chattogram Port:** A critical hub for national and regional freight movement.
- **Industrial zones (CEPZ, Nasirabad, Sitakunda):** High employee density generates peak-hour traffic surges.
- **Transport nodes and Gateways:** Including Chattogram Railway Station, Shah Amanat International Airport, and the Dhaka-Chattogram and Chattogram Cox's Bazar Highway.

Land use profile of CMMP area is shown in Figure 2-4 and Figure 2-5.

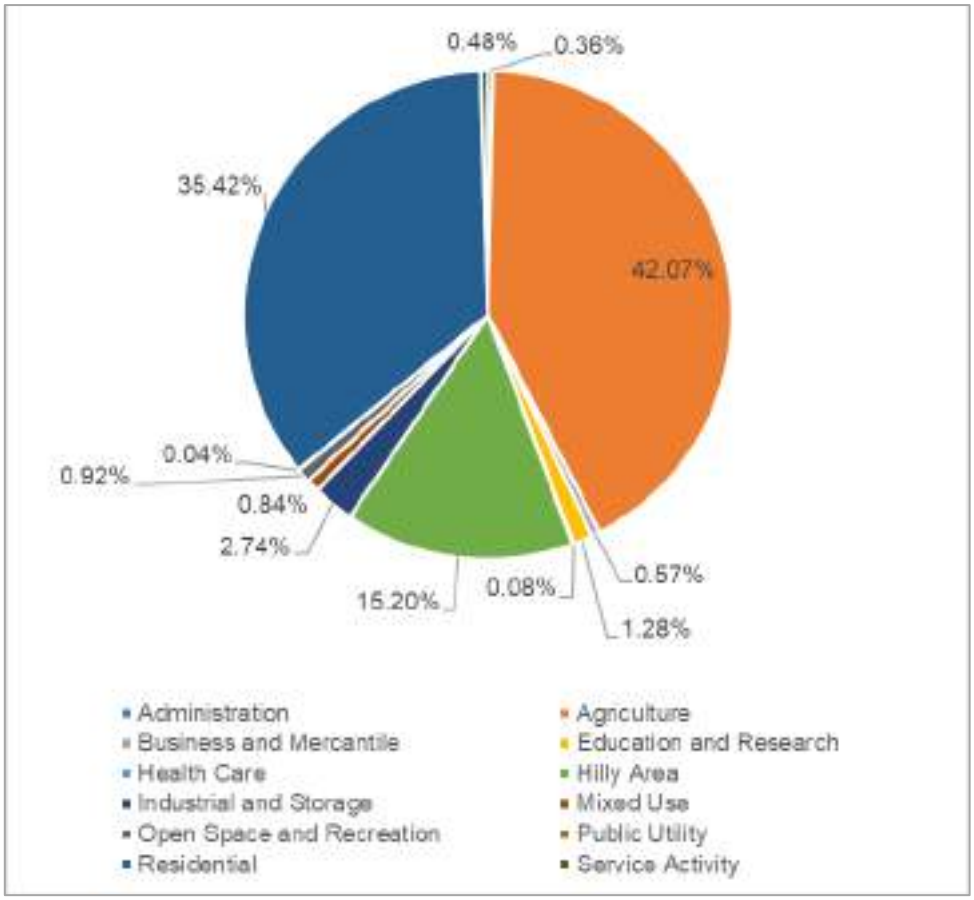



**Figure 2-4: Percentage of Land Use by Type in CMMP Area**

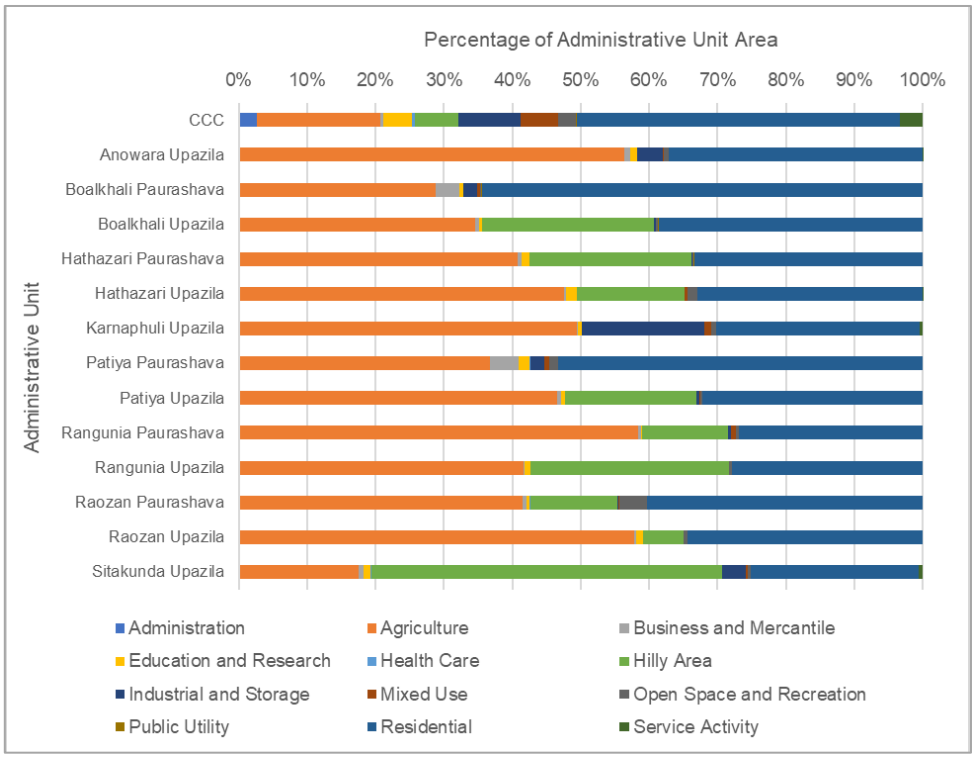



**Figure 2-5: Administrative Unit Wise Land Use Percentage by Type**

From a transportation perspective, the CMMP area's land use pattern presents both opportunities and challenges for mobility planning. With agriculture occupying the largest share (42.07%) and residential use following closely (35.42%), a significant portion of the population is dispersed across rural and semi-urban landscapes, which may lead to increased reliance on private vehicles or informal transport modes due to limited public transport access. The hilly terrain (15.20%) poses topographical constraints that affect connectivity and infrastructure development, particularly in areas like Sitakunda and Rangunia, where steep gradients complicate road expansion and increase construction and maintenance costs. The relatively low proportion of land allocated for business, mercantile, and industrial use at the CMMP level suggests that employment hubs are concentrated in specific pockets, resulting in longer commutes and directional travel demand, primarily toward urban cores such as the CCC area.

The land use distribution at the administrative unit level further illustrates the transportation implications of spatial disparity. For instance, CCC shows a high concentration of residential (47.14%), industrial and storage (9.08%), and mixed-use (5.57%) land, making it a major employment and service center that attracts daily inflows from peripheral Upazila. In contrast, areas like Anwara and Raozan are dominated by agricultural land, indicating a largely rural character with less internal travel but higher dependency on inter-Upazila movement to access jobs, education, and services. This necessitates a well-integrated regional transport network that can support efficient commuting patterns and promote modal shift from private to public transport. Additionally, land use patterns in Upazila such as Karnaphuli and Sitakunda—where industrial areas are relatively prominent—highlight the need for freight corridors and logistics infrastructure to support economic activities while minimizing congestion on passenger routes.

### 2.4.2. Future Urban Growth and Transportation Needs

Chattogram's urban growth reflects dynamic but uneven patterns driven by infrastructure development, industrial expansion, and economic opportunities. As the city core reaches saturation, growth has shifted to fringe areas like Wards 18, 3, and 6, spurred by projects such as the Bayezid Link Road and Kalurghat Bridge. These new developments have increased traffic flow in previously low-density areas, highlighting the need for improved road networks and better traffic management systems. However, unregulated development in hilly and sensitive zones poses ecological challenges and can further strain underdeveloped transport infrastructure.

The built-up area in the CMMP region expanded from 17,570 acres in 1993 to 41,605 acres in 2023. Peri-urban areas like Boalkhali, Rangunia, and Patiya are emerging as new hubs, requiring integrated planning to balance growth with sustainability. As these areas grow, new road connections and reliable public transport options will be essential to support the increased movement of people and goods while minimizing congestion and travel times.

The new Kalurghat Bridge is expected to drive development along the Karnaphuli River, benefiting Boalkhali, Anwara, and Karnaphuli Upazila, especially with EPZ expansions. This growth will bring a significant rise in both freight and commuter traffic, demanding efficient transport corridors and multimodal connectivity. CDA's Karnaphuli Residential Area has potential to alleviate city-center stress but risks ribbon development without proper internal road networks and coordinated access points.

The proposed Bay Terminal will shift port operations to coastal areas, spurring development east of the CDA Coastal Road. This change will increase heavy vehicle movement in newly

developing zones, requiring resilient road infrastructure and well-planned logistics routes to prevent bottlenecks

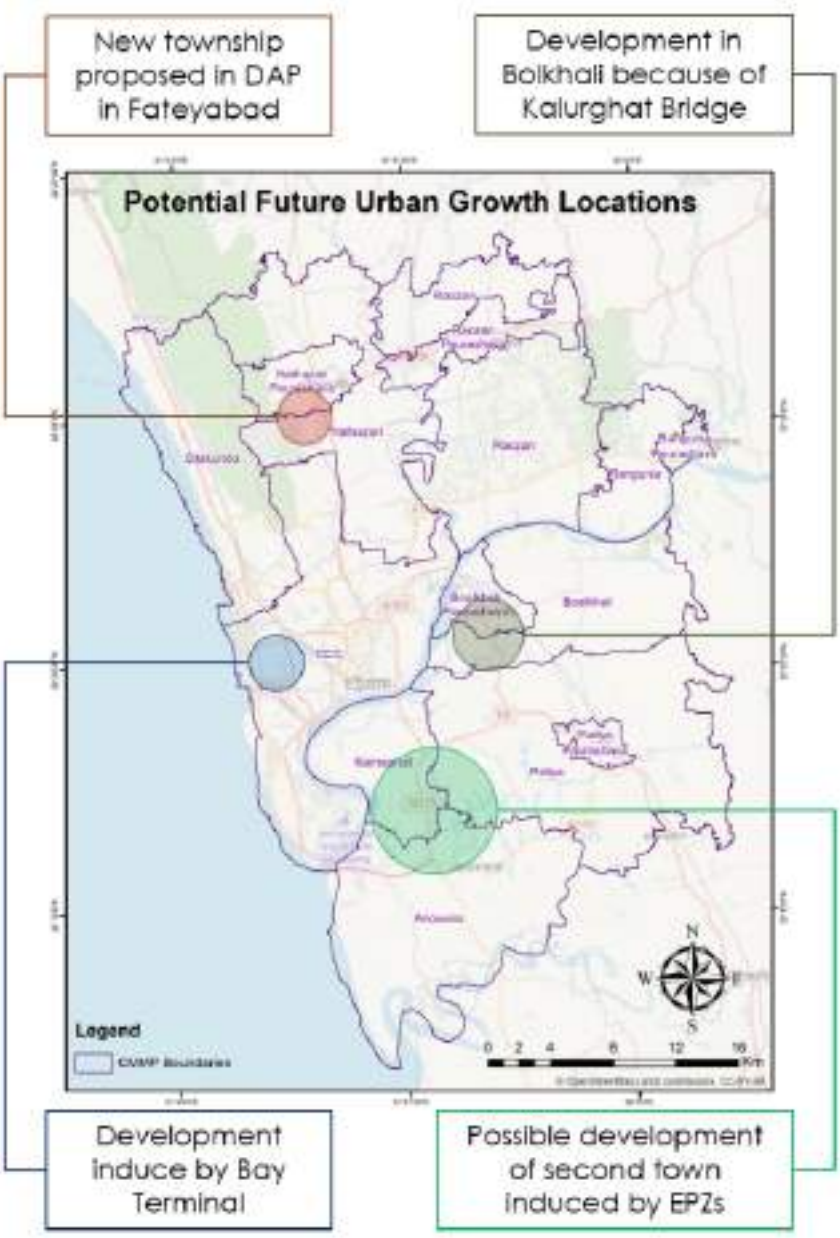



**Figure 2-6: Potential Places for Future Urban Growth**

A new township is proposed in Fatehabad in the Detail Area Plan 2008. It is envisioned as a mixed-use urban center with residential, industrial, commercial, and institutional facilities. However, the area is far away from the existing urban core, lacking adequate road connectivity and supporting infrastructure. Urban growth in Chattogram has historically been driven by proximity to large-scale economic activities (such as port operations, EPZs, and industrial clusters) which are absent in this location. Given its distance from the city and limited economic pull, major urban development in this area is unlikely to be viable before 2050. Furthermore, part of the site overlaps with reserved hill zones, with development decisions still pending. For this area to become a viable urban growth center in the long term, it must first be supported by comprehensive planning, including an action area plan, and anchored by future economic activities that can justify large-scale settlement and infrastructure investment.

Corridors that will face pressure in the future due to these developments are shown in Figure 2-7.


**Figure 2-7: Pressure on Corridors due to present and future development**

### 2.4.3. Development of the Asian and BBIN Highways

The development of the Asian Highway Network (AH) and the BBIN (Bangladesh, Bhutan, India, Nepal) transport corridor is expected to have a transformative impact on Chattogram's overall transport system and urban growth. As both initiatives position Chattogram—particularly its port—as a major regional trade gateway, the city is likely to experience increased freight traffic, international logistics operations, and cross-border connectivity. This rise in long-haul freight and passenger movement will intensify demand on existing city roads, particularly arterial routes linking the port, industrial zones, and national highways.

The Asian Highway, with its vision of uninterrupted road connectivity from Dhaka to countries such as India, Myanmar, China, and eventually to Europe, will turn Chattogram into a critical transit node in the pan-Asian transport network. This expanded accessibility is likely to attract new industrial, warehousing, and logistics developments along key corridors, reshaping land use patterns and stimulating economic zones in peri-urban and fringe areas. However, this also increases the urgency to separate through-traffic (especially freight) from local city traffic, through bypasses, ring roads, or logistics corridors.

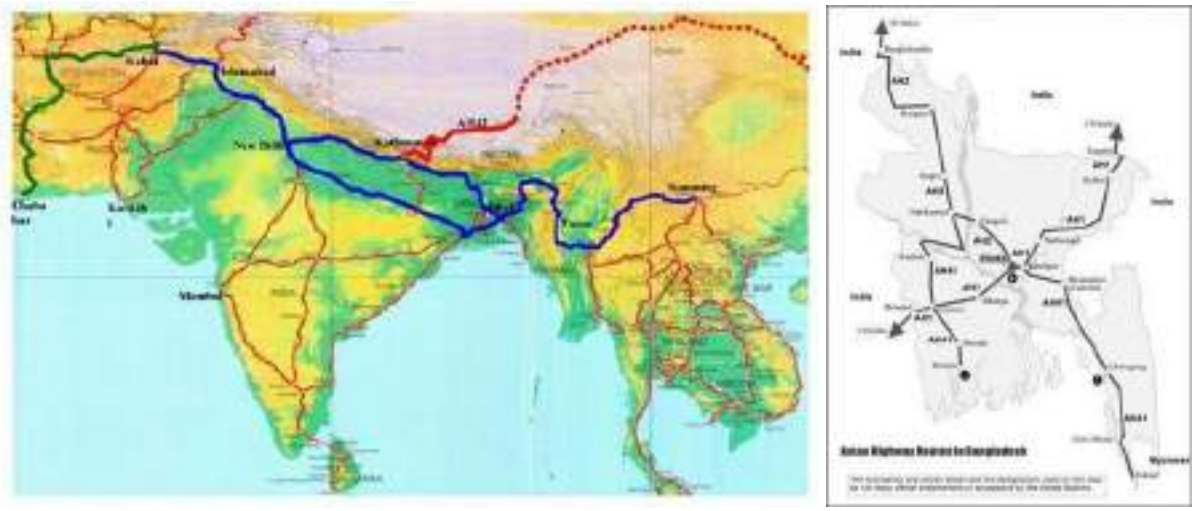


**Figure 2-8: Asian Highway**

Similarly, the BBIN initiative will enable smoother trade flows from landlocked countries like Nepal and Bhutan and India's northeastern states through Chattogram Port. The increased use of the port and surrounding infrastructure will demand higher efficiency in last-mile connectivity, port access roads, and intermodal transport systems including rail and inland waterways. It will also necessitate capacity upgrades in key transport nodes like the Dhaka–Chattogram corridor and the Kalurghat Bridge.

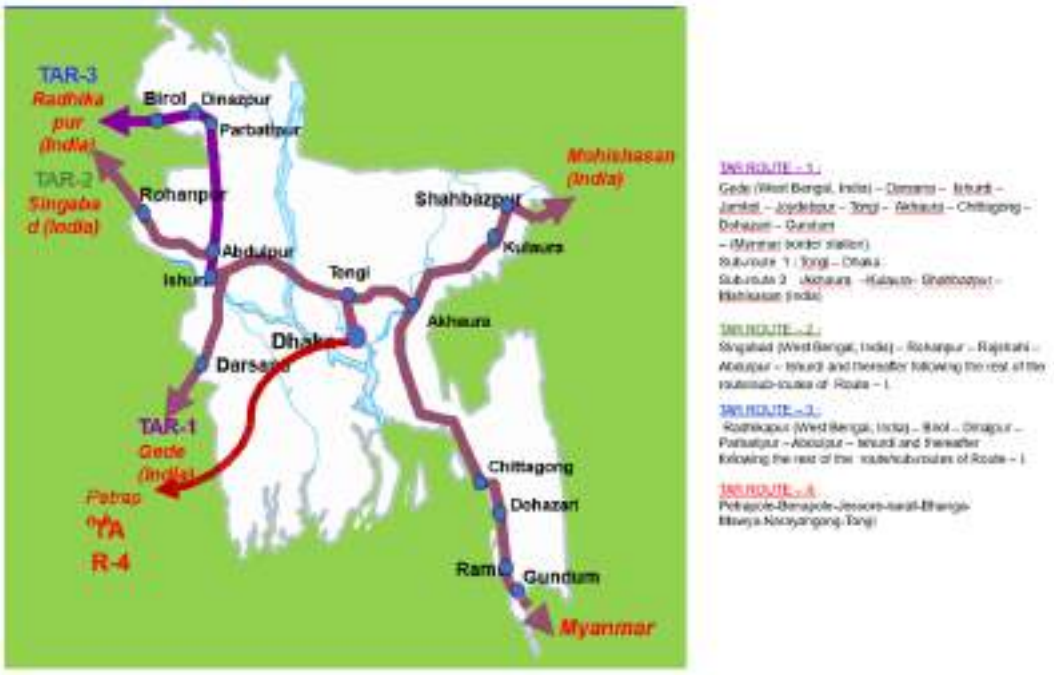



**Figure 2-9: BBIN Highway**

Urban development will increasingly follow these regional corridors, with growth likely to concentrate along transport routes serving regional and international traffic. Areas near the port, key expressways, and future freight terminals will attract more industrial and commercial developments, while residential demand may rise in satellite towns and peri-urban areas connected by these new routes. If managed strategically, this shift can help decongest the city core and promote more balanced metropolitan development. However, without integrated land use and transport planning, these trends could worsen congestion, increase conflict between local and regional traffic, and lead to unplanned urban sprawl.

# CHAPTER THREE

# TRAFFIC SURVEY AND ANALYSIS

# Chapter 3: Traffic Survey and Analysis

The transport surveys are conducted to collect primary field data which represents the current traffic and transportation situation. The transport surveys were designed to fulfill the objective and the scope of work to develop “Traffic and Transportation Master Plan” for the period 2025-2050.

A total of twelve different types of surveys were conducted in this project. Their summary description is provided in this chapter. However, details of the surveys are presented in the “Transportation Survey Report”

## 3.1. Reconnaissance Survey

A reconnaissance survey is a preliminary field investigation conducted to gather general information about an area before conducting more detailed studies. To assess the condition of the transportation system, the survey focused on:

- The existing traffic and transport situation
- The current traffic management system
- The general condition of road infrastructure
- Aspects mentioned in the Terms of Reference (ToR)
- Overview of pedestrian facilities
- Major traffic-generating centers and congestion areas

## 3.2. Parking Survey

The parking survey was carried out to collect data on parking conditions in selected high-demand areas. It analyzed the availability, usage, and demand for parking spaces to support urban planning and traffic management. The survey covered 10 key locations in the city and provided data on peak hour parking demand for various vehicle types, including private cars, CNG auto-rickshaws, motorcycles, and rickshaws.

## 3.3. Trip Generation Survey

The trip generation survey gathered data on the number of trips made to or from specific locations, such as residential, commercial, or mixed-use areas. It provided peak hour traffic demand for different vehicle types, including private cars, CNG auto-rickshaws, motorcycles, and rickshaws.

## 3.4. Origin-Destination (OD) Survey

The OD survey collected data on the starting and ending points of trips made by individuals or vehicles. Conducted at 10 strategic locations, this survey helped identify travel patterns and transportation demand. Roadside interviews were carried out by stopping both motorized and non-motorized vehicles at selected road sections. Information such as origin, destination, vehicle type, occupancy, and trip purpose were recorded. The collected data has been compiled into a database and will be used for further analysis and traffic modeling.

## 3.5. Traffic Count Survey

The traffic count survey involved measuring the number of vehicles and pedestrians passing specific points during peak hours. This data is crucial for understanding traffic volumes and congestion trends. Turning volume counts were conducted at major intersections during morning (8 AM–11 AM) and evening (6 PM–9 PM) peak periods using video cameras. The video footage was processed using AI technology to classify traffic volumes by transport mode and pedestrian activity.

## 3.6. Household Travel Survey

The household travel survey was conducted alongside a socio-economic survey. Its objective was to collect information on trip diaries of family members, including trip purposes, origins and destinations, travel modes, and trip costs. Socio-economic and demographic characteristics of the respondents were also gathered. A structured questionnaire was used to collect these data. Key findings were compiled for use in travel behavior analysis and transport modeling.

## 3.7. Water Transport Reconnaissance Survey

The survey covered 20 ghats, including six for passenger transport, five for raw materials, two each for fish, salt, and coal, and one each for stone, jute, and a private ghat. Common passenger vessels included boats and shampans, while goods were transported using lighter ships. Some small ships used for luxury tours and occasional speedboats were also observed. The survey assessed the condition of the ghats, capacity of the water transports, user load, and accessibility of both ghats and transport services.

## 3.8. Water Transport User Survey

Surveys were conducted at six passenger ghats. A questionnaire was used to understand the characteristics of the passengers and their perceptions of water transport services, including their satisfaction and service expectations.

## 3.9. Inter-city Bus Terminal Reconnaissance Survey

To assess the current condition of inter-city bus terminals, reconnaissance surveys were conducted at five locations: BRTC Bus Stand, Shuvopur Bus Stand, Kadamtali Inter-District Bus Terminal, Oxygen Bus Stand, and Bahaddarhat Bus Terminal. Field visits and discussions with terminal authorities and members of the Bus Workers' Association were carried out to better understand operational conditions and challenges.

## 3.10. Inter-city Bus User Survey

Bus users, as key stakeholders in the transport system, were surveyed to understand the current problems they face, the strengths and weaknesses of the existing bus services, and their suggestions for improvement. A total of 18 user responses were collected through structured questionnaires.

## 3.11. Public Transport User and Operator Survey

Based on data from the Bangladesh Road Transport Authority (BRTA), there are 18 permitted routes for human haulers, 21 for auto-tempos, and 17 for bus-minibuses. Surveys were

conducted on these routes. User feedback was collected regarding service performance and improvement opportunities. Operators were asked about their operational challenges and views on improvements, including opinions on fare rationalization, e-ticketing, Bus Rapid Transit (BRT), and Mass Rapid Transit (MRT). A total of 164 user interviews and 11 operator interviews were conducted.

## 3.12. Travel Time Survey

The travel time survey was conducted to measure the time required for vehicles to travel between specific locations along selected routes. This helped evaluate traffic flow conditions, identify congestion points, and assess the overall efficiency of the transport network.

Representative routes covering different road classifications were selected. The survey used the average car technique, where a standard vehicle (typically a sedan car with a Passenger Car Unit value of 1) was driven along the routes at the average traffic speed. Travel time for each segment was recorded. For each route, five runs were conducted in both directions during the AM (8–11 AM) and PM (6–9 PM) peak hours.

This is the summary of these surveys provided in Table 3-1. The locations of the surveys (excluding household trip survey) are shown in Figure 3-1

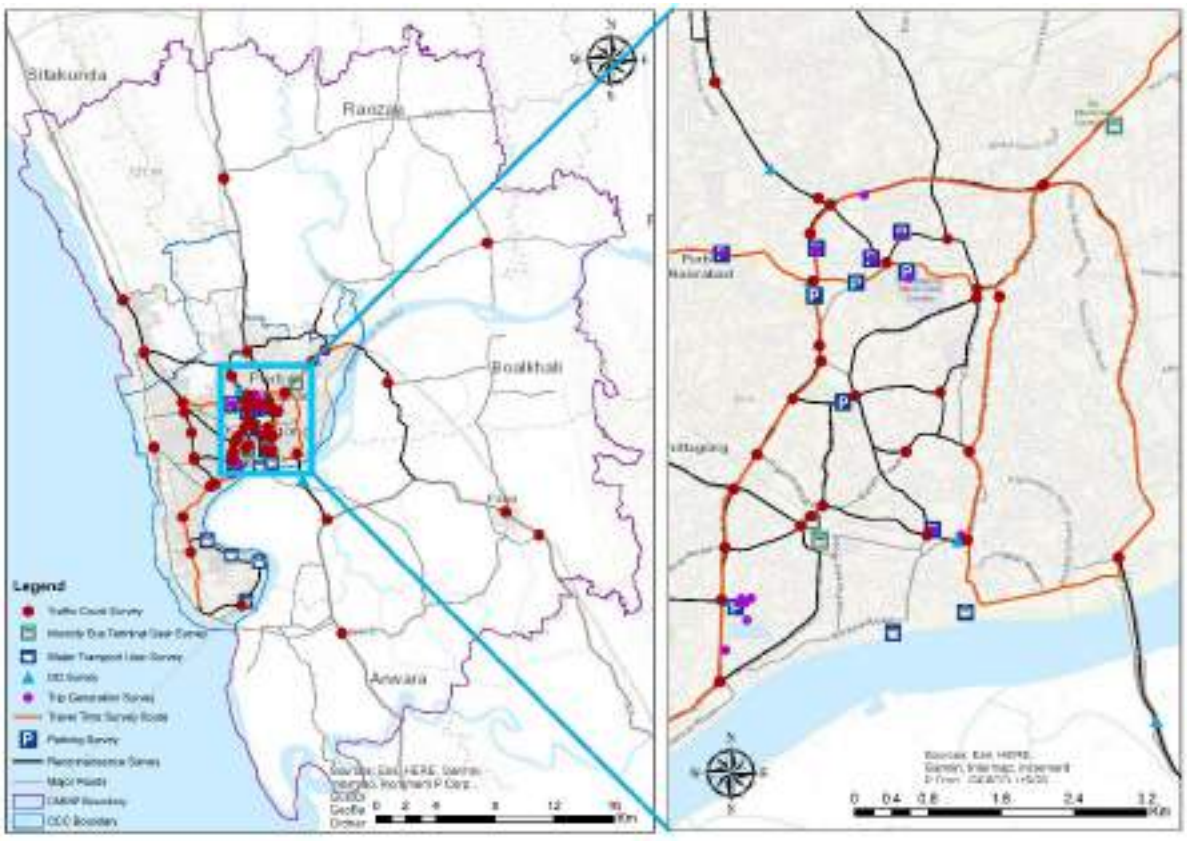



**Figure 3-1: Transportation Survey Locations**

**Table 3-1: Summary of Transportation Survey**

| Survey type | Date | Time | Description |
|---|---|---|---|
| Reconnaissance survey | 25/07/2022 - 07/08/2022 | - | 39 Roads, 70 sections (total 135 km);<br>more than 100 intersections |
| Parking survey | 02/10/2022 - 1/10/2022 | 8 AM to 10 PM | 10 locations |
| Trip generation survey | 02/10/2022 - 21/10/2022 | 8 AM - 10 PM | 13 locations for three types of land uses |
| OD survey | 28/11/2022 - 30/11/2022 | 6 AM – 10 PM | 10 locations, 6864 samples |
| Traffic Count survey | 05/12/2022 - 10/01/2023 | 8 AM – 11 AM<br>6 PM – 9 PM | 56 Locations |
| Household Travel Survey | 30/11/2022 - 06-02-2023 | | 10,824 trips samples were collected |
| Water transport reconnaissance survey | 20/12/2022 - 21/12/2022 | 10 AM – 3 PM | 20 locations |
| Water transport user survey | 02/01/2023 - 03/01/2023 | 10 AM – 5 PM | 6 locations (107 interviews) |
| Inter-city bus terminal reconnaissance survey | 05/01/2023 | 10 AM – 6 PM | 5 locations |
| Inter-city bus terminal user survey | 15/01/2023 - 26/01/2023 | - | 3 Locations, 18 interviews |
| Public transport user and operator survey | 15/01/2023- 26/01/2023 | - | 164 user interviews<br>11 operator interviews |
| Travel Time Survey | 15/02/2023- 16/03/2023 | 8 AM – 11 AM,<br>6 PM – 9 PM | 3 routes, 2 directions, 2 peak hours, 5 runs |

# CHAPTER FOUR

# EXISTING CONDITION OF TRAFFIC AND TRANSPORT

# Chapter 4: Existing Condition of Traffic and transport

A working paper titled “Existing Condition of Traffic & Transport” discussed the existing condition in more details. This chapter presents the key points of that report.

## 4.1. Current Situation of the Previous Master Plan Implementation

The Long-Term Development Strategy (LTDS) for Traffic and Transport, formulated in 1995, presented a 20-year roadmap to enhance the transportation system of the Chattogram Metropolitan Area. It aimed to guide investment and planning efforts by emphasizing affordability, economic feasibility, and consistency with government priorities. The strategy addressed the needs of the poorest communities and was closely aligned with broader spatial development goals to support the anticipated growth in passenger and freight traffic. It proposed a comprehensive approach involving the development of highways, road transport services, aviation, maritime services, and railways, alongside traffic management measures, institutional reforms, and financing mechanisms. Despite the LTDS’s detailed proposals and long-term vision, its implementation proved to be inconsistent, with many of its recommendations only partially realized or entirely neglected over time. Completed road projects include road improvement projects, new roads, bus terminals and a roundabout, which is summarized in **Table 4-1**.

**Table 4-1: Progress of Transport Projects**

| Project Type | No of Proposed Projects | Completed Projects |
|---|---|---|
| Road Improvement | 23 | 20 |
| New Links | 13 | 5 |
| Bus Terminals | 7 | Completed: 1<br>Ongoing: 1 |
| Intersection Improvement | 15 | 1 |

Public transport improvements have been limited. While newer bus models were introduced, recommendations for optimized fleets, high-quality services, and socially-oriented operations were largely ignored. Small-bus routes were partially implemented, but buses continue to operate under a conventional profit-driven model, reducing accessibility and service quality. Other proposed policies, such as market penetration strategies and government-led management, remain unfulfilled, further limiting the effectiveness of public transport. The LTDS also proposed 7 bus/truck stands but only 1 of them(Bahaddarhut) have been constructed and another is waiting to be constructed at Kulgaon. Although, other than the proposed locations CCC is planning to construct another intercity bus terminal near Shah Amanat Bridge. Inland waterway improvements, a critical component for an integrated transport network, were also neglected entirely.


**Figure 4-1: CMMP 95 Transport Projects**

Institutional arrangements proposed under the LTDS, such as creating a transport wing within CDA and multi-agency coordination committees, were never realized. This failure to establish the necessary structures has severely hindered the city's ability to execute integrated transport planning and management. Port and aviation authorities have continued to develop independently under their own master plans, with little collaboration with CDA.

The LTDS suffered from misplaced priorities, with resources diverted to high-visibility projects like flyovers instead of critical network improvements like new links and integrated transport solutions. This mismanagement has left the city with an incomplete, fragmented transportation network. To unlock the LTDS's potential, there needs to be a renewed focus on the originally proposed strategies, proper institutional reforms, and better coordination between agencies.

## 4.2. DAP Review

The review of DAP 2008 proposed roads identified several key issues that limit their feasibility and implementation. Many of the proposed roads were misaligned—some were drawn directly over existing roads without clarification, while others lacked detailed alignment altogether. In several areas, development has already taken place along the proposed alignments, making road construction practically impossible. Furthermore, one of the most significant technical flaws was the lack of proper georeferencing. The road and khal alignments were not mapped against official Mouza Dags but were instead drawn manually and later roughly matched to digitized Mouza maps from the DAP project. Since those digitized maps were themselves not properly georeferenced, translating them to the current BS Mouza base caused many features to shift or fragment, resulting in misalignment and data inconsistency.

Another structural issue arises from the way the DAP boundary was defined. It primarily concentrated around major highways and the areas directly adjacent to them. This approach left large stretches of land between highways—where connectivity is often needed—outside the planning boundary. Consequently, many proposed roads terminate abruptly or remain disconnected, reducing their practical utility. Additionally, although the CDA planning team attempts to enforce proposed alignments through buffer zones and development control, widespread unregulated construction has already occurred in many of these corridors, further complicating future infrastructure development.

## 4.3. Existing Transport Infrastructure

The portion gives a comprehensive overview of the existing transport infrastructure in Chattogram, including road networks, public transport, railways, airways, and waterways.

### 4.3.1. Road Transport Network

Chattogram has around 8,445 km of roads, including primary roads, flyovers, and an under construction elevated expressway. The city's road network connects major employment centers and the port. Outside the city, national and regional highways connect Upazila (sub-districts) and districts, but many roads are in poor condition.

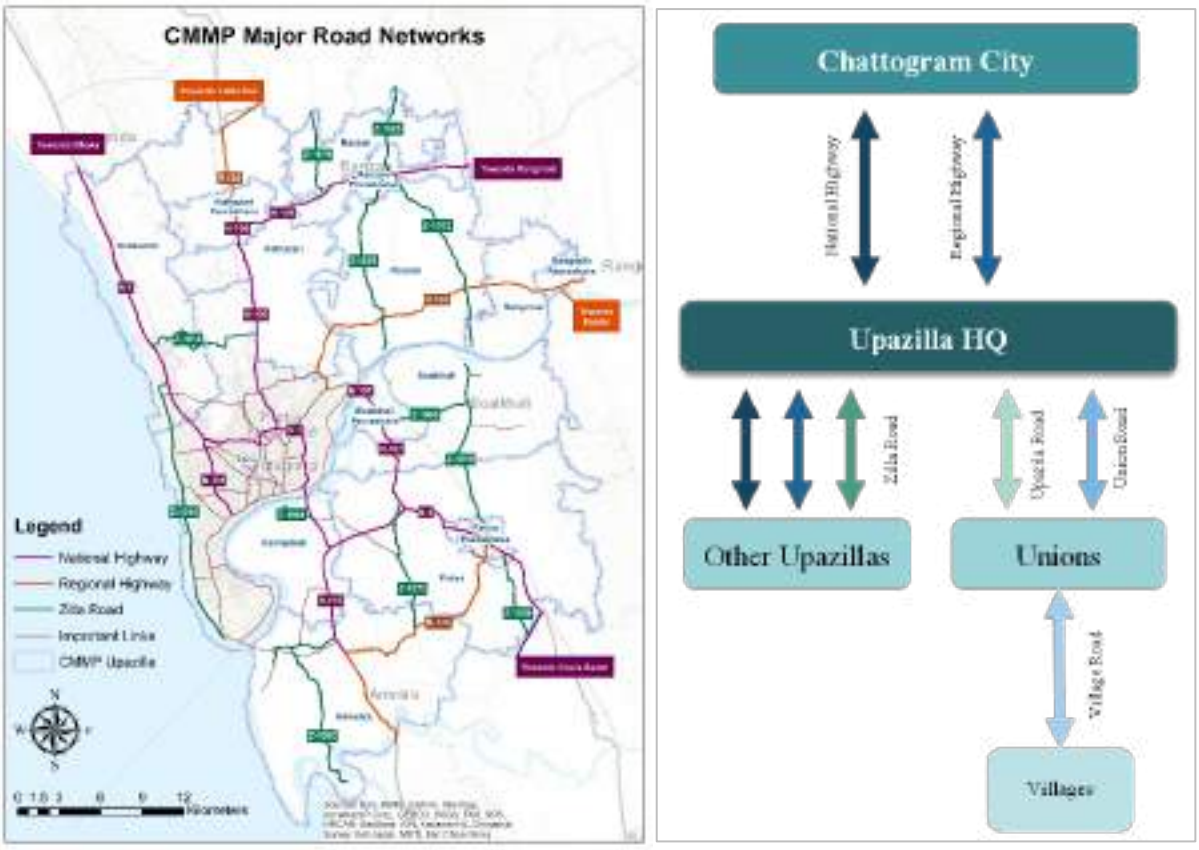



**Figure 4-2: CMMP Road Network**

### 4.3.2. Public Transport Network

Chattogram's transport system relies on a mix of formal and informal modes, both within the city and in the surrounding areas. Inside the city, buses, tempos, human haulers, CNG-rickshaws, and rickshaws are common, while areas outside the city use local buses, CNGs, easy bikes, and electric rickshaws. However, a lack of proper terminals and designated stops often causes congestion and inefficiency.

#### Key Findings from Public Transport User Survey

- **First/Last Mile Connectivity:** About 85% of respondents walk to and from public transport stops. Another 6% use rickshaws or auto-rickshaws.
- **Trip Purpose:** The majority (79%) use public transport for work. Other common reasons include education (9%) and shopping (8%).
- **MRT Perception:** A large majority (94%) believe that an MRT system would improve Chattogram's public transport network. But most of them want a similar current fare to switch.

#### Inside the City

The public transport routes for buses, minibuses, human haulers, and tempos are shown in Figure 4-3.

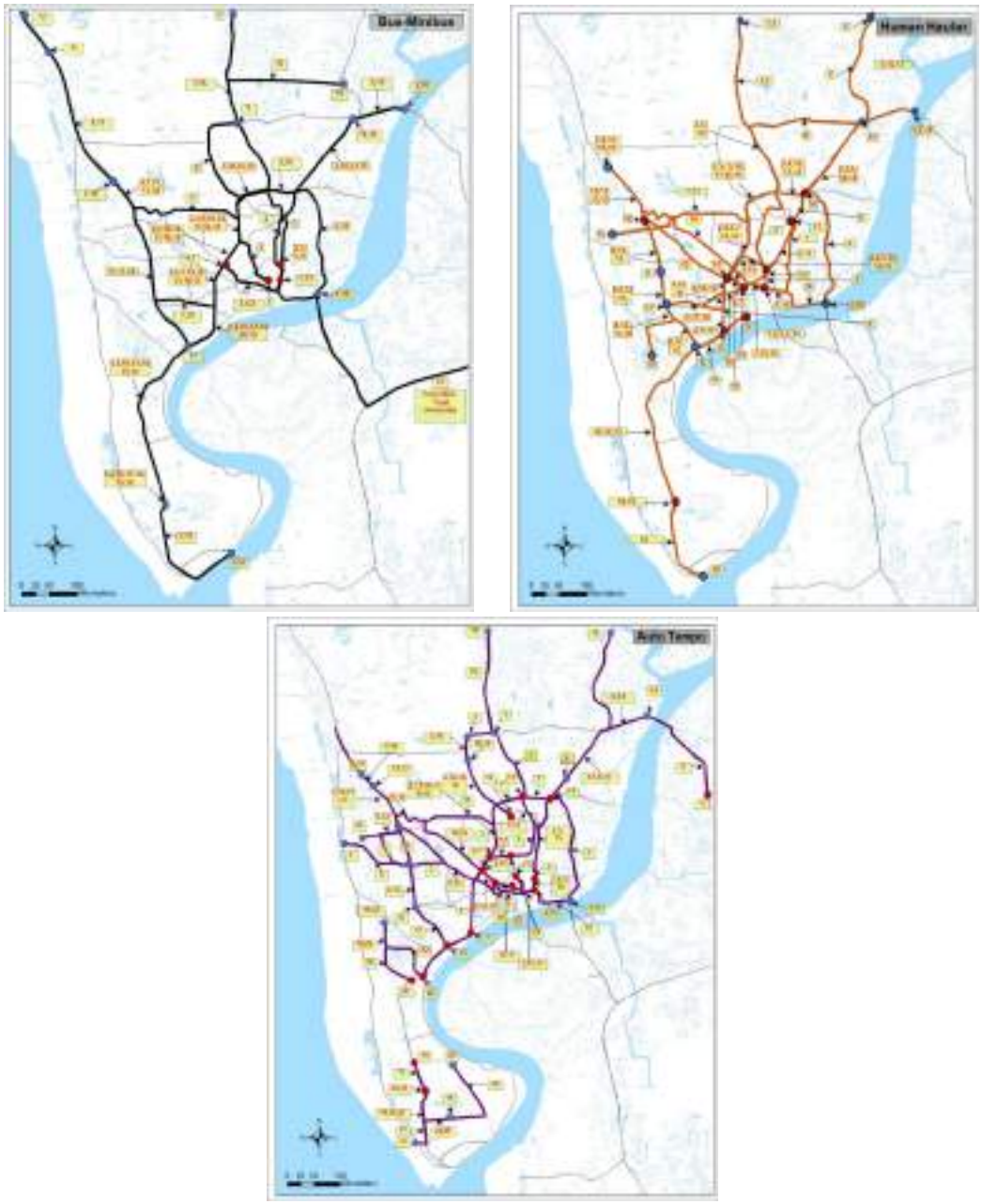


**Figure 4-3: Public Transport Routes**

Bus services are available along major corridors, and routes are mostly informal with onboard fare collection handled by conductors. Two relatively formal counter-based services (Metro Provati and Sonar Bangla) operate on fixed routes with 20 and 18 stops respectively. Metro Provati connects Kaptai Rastar Matha to Kathgor, while Sonar Bangla runs from Shah Amanat Bridge to City Gate via Agrabad Access Road. These services collect fares in advance from ticket counters at stops.

In addition to buses, tempos and human haulers operate along various distributor roads across the city. Recently, some of these have been replaced by diesel-powered three-wheelers locally known as “Mahindras.” While these modes mainly serve secondary roads, a few of them also operate on routes that overlap with bus services, contributing to route redundancy and traffic conflicts. Despite their informality, they remain a vital part of daily urban mobility for many residents.

### Outside the City

Public transport in surrounding areas includes local buses, CNGs, easy bikes, and electric rickshaws, many of which operate as shared vehicles.

- **Local Buses:** Run along highways to connect Unions and Upazila to the city. Though they have designated stops, passengers often board from random points.
- **CNG Autorickshaws:** Serve medium- to long-distance routes with flexible origin-destination points based on passenger demand.
- **Easy Bikes**: Used for short distances within villages and unions, typically along designated internal routes but also available for door-to-door service.
- **Electric Rickshaws:** Offer local travel with more structured fares and both fixed-route and flexible services.
- **Human Haulers and Tempos:** Now less common due to the rise of CNGs. Human haulers still run along routes like Sitakunda–Mirsharai, while tempos operate mostly in Hathazari Upazila.

## 4.3.3. Railway Network

The railway network in Chattogram is shown in Figure 4-4. Within the city, there is only one urban rail service that connects Chattogram University to the city center, but it runs infrequently and has limited capacity. This line also extends northward to Najirhat, a small town outside the city, while another line heads south towards Dohajari and has recently been extended to Cox's Bazar, a major tourist destination. Despite these connections, rail plays a minimal role in meeting the city's urban transport demand.

The primary function of the railway in Chattogram is to support long-distance travel, mainly connecting the city with Dhaka, Sylhet, Cox's Bazar and other districts along the route. As of 2023, there are 18 inter-city services operating daily.

In terms of regional service, five mail or express trains operate towards Sitakunda, stopping at stations such as Koibolyodham, Faujdarhat, Vatiyari, Kumira, and Barabkunda. Not all trains stop at every station, as each has a fixed schedule with specific stops.

In the northern direction, the Hathazari–Fatikchari line provides limited service. Chattogram University, located in Hathazari, operates its own dedicated shuttle train service, carrying students from the city to the university area seven times a day. This service uses two main stations within the city: Chattogram Central Station and Sholoshohor Station.

Additionally, the Najirhat Commuter service connects Chattogram to Najirhat with six daily trips from 6:45 AM to 11:30 PM. The trains stop at Jhautola, Sholoshohor, Cantonment, Fatehabad, and Hathazari along the route.


**Figure 4-4: Rail Network in Chattogram**

### 4.3.4. Airway

Shah Amanat International Airport serves domestic and international flights, with passenger numbers growing steadily. The airport currently needs more space for terminal facilities as well as cargo facilities. However, public transport connectivity to the airport is poor, requiring passengers to walk long distances to access public transport.

### 4.3.5. Waterway

Passenger water transport plays an important role in connecting parts of Chattogram with nearby Upazila and islands. Regular boat services from passenger ghats carry people to Patiya, Karnaphuli, Boalkhali, Anwara, Sandwip, and Kutubdia. Around 70,000 passengers cross the Karnaphuli River daily using these services. The locations of these passenger ghats are shown in Figure 4-5. Additionally, ship services are available for longer journeys to Saint Martin, Sandwip, and Kutubdia Island.

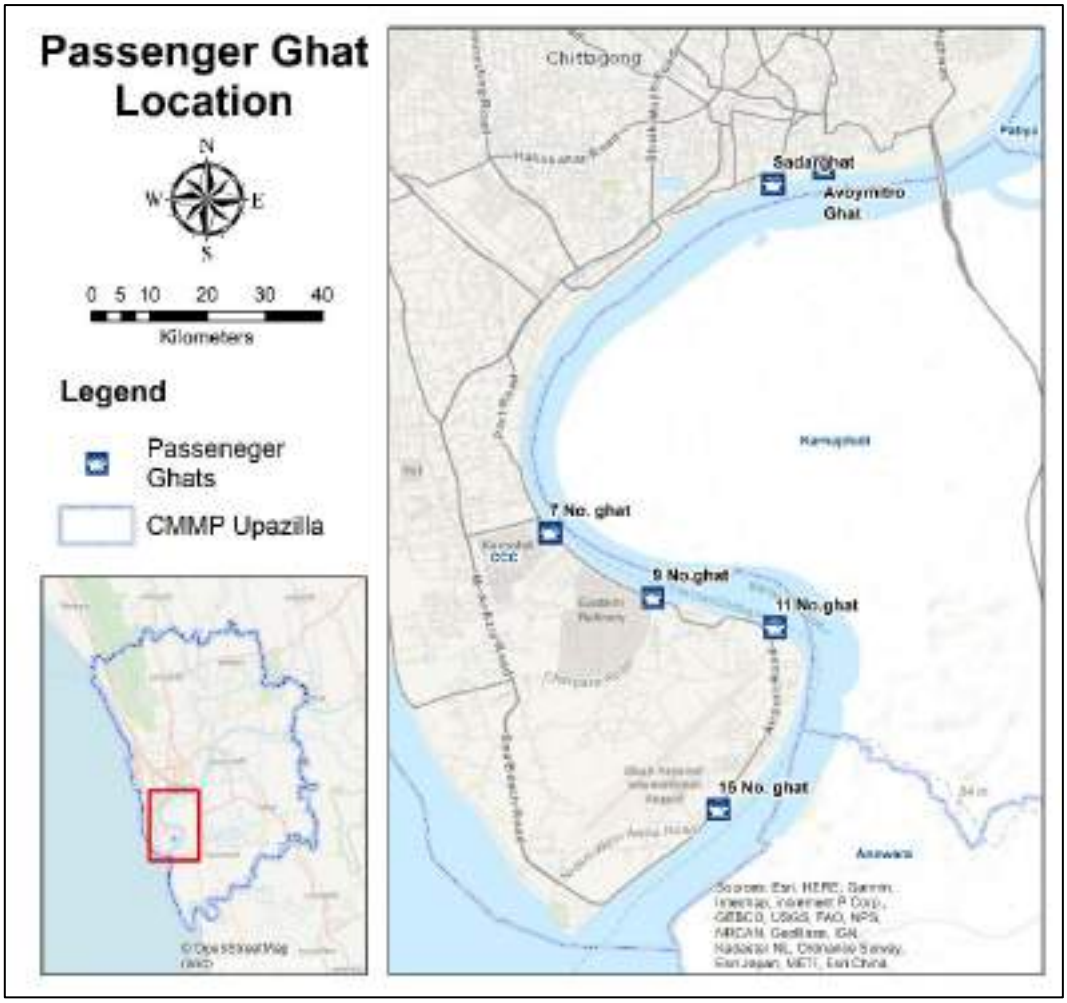



**Figure 4-5: Passenger Ghat Locations Around Chattogram City**

Main passenger vessels identified during the field survey include boats and shampans, while lighter ships are used for goods transport. Some small ships are also available for luxury river and sea tours, and speed boats are occasionally used for specific and limited purposes. The reconnaissance survey assessed the condition of passenger ghats, the capacity of water transports, passenger loads, and accessibility issues.

**Table 4-2: Passenger Movement from Ghats around Chattogram City**

| Ghat Name | Number of Boats | Trips/Day | Passengers Per Day | Fare/Trip (Tk) | Issues |
|---|---|---|---|---|---|
| Avoymitro Ghat | 250 | 7–8 | 8,000 | 5 | Toilet facility, poor infrastructure |
| Sadarghat | 190 | 7–8 | 5,000 | 15 | Inadequate infrastructure, no passenger terminal, toilet facility |
| 7 No. Ghat | 1 | 20–30 | 30 | 15 | — |
| 9 No. Ghat | 1 | 20–25 | 25 | 15 | — |
| 11 No. Ghat | 8 | 9–10 | 400 | 15 | — |
| 15 No. Ghat | 100 | 9–10 | 50,000 | 20 | — |

The key findings from the water transport user survey are as follows:

- **Socio-economics**: A significant majority (94%) of users belong to the lower-income (household income < Tk 20,000) or lower-middle-income (Tk 20,000–40,000) groups.
- **First/Last Mile Transportation**: Most passengers (61% for the first mile and 76% for the last mile) use **local CNGs**, followed by auto-rickshaws and walking.

### 4.3.6. Cycling Network

There are no dedicated cycle lanes in Chattogram, and cycling culture is not prominent. However, this study suggests that a cycling-friendly transport system could encourage more people to cycle.

### 4.3.7. Existing Key Connection Points

Chattogram is a key hub for transportation, connecting the region through roads, railways, airways, and waterways. The city's transport infrastructure plays a vital role in linking it to other parts of the country and facilitating trade, commerce, and passenger movement. Below is a detailed description of the major connection points in Chattogram:

#### Bus Terminals

Chattogram is well-connected to the rest of Bangladesh through a network of national and regional highways. The N1 (Dhaka–Chattogram Highway) is the city's primary arterial road, linking Chattogram to the capital, Dhaka to the north and further connects Cox's Bazar to the south. This corridor also connects to Bandarban via N108, while Rangamati is accessible through N106, and Khagrachari via R160.

The city has several inter-district and inter-city bus terminals, the main ones being:

- Bahadderhat Bus Terminal
- Kadamtoli Bus Terminal
- Shuvapur Bus Terminal

In addition to these, the Bangladesh Road Transport Corporation (BRTC) operates a government-owned terminal at Fatehabad, serving both city and long-distance routes. On the other hand, privately operated city buses often function from informal roadside stands rather than designated terminals. These informal terminals include areas like Dampara, Kalurghat, AK Khan and Colonel Hat, Laldighi, Shah Amanat Bridge, Boro Pol and Patenga, catering mainly to passengers bound for Dhaka or Cox's Bazar.

#### Railway Stations

Rail is an important mode of regional connectivity, though its urban transit role remains limited. Chattogram is served by two main railway stations:

**Chattogram Central Railway Station**:

Built in the late 1990s with the aim of improving multimodal connectivity, this is the city's largest station. It offers extended platforms, separate parking areas for private vehicles and CNGs, and convenient drop-off points. Located just a short walk from **New Market Circle**, it is easily accessible via various modes of transport. It is the only station that serves inter district trains.

**Sholoshahar Railway Station**

The second busiest station in the city, Sholoshahar caters to services bound for Chattogram University, Fatickchari, Hathazari, and Dohazari. However, the station lacks adequate facilities and maintenance. Strategic redevelopment of this station with enhanced amenities and improved multimodal links could benefit travelers, especially those heading toward southern Chattogram and Cox's Bazar.

Beyond these two, the CMMP area includes an additional 20 railway stations. Despite their potential, these stations remain underutilized due to a shortage of urban and city-to-Upazila services. Strengthening commuter rail options could greatly improve connectivity across the region.

### Airport

Shah Amanat International Airport is the only airport in Chattogram and the second-largest international airport in Bangladesh, after Dhaka's Hazrat Shahjalal International Airport. Located in the southern part of the city, the airport serves both domestic and international routes and is a key gateway for the southeastern region.

## 4.3.8. Parking Facilities

There are no clear guidelines or restrictions for roadside parking in Chattogram, leading to widespread on-street parking, even on busy roads during peak hours. Although parking is restricted at intersections, enforcement is poor, and drivers often ignore these rules.

On-street parking is a major cause of traffic congestion in key areas such as GEC, Muradpur, CDA Avenue, OR Nizam Road, Zakir Hossain Road, Station Road, Dhaka Trunk Road, Madarbari, Port area, and EPZ. Vehicles parked on the road reduce available road space, creating bottlenecks and slowing traffic flow. A survey of peak-hour parking demand in various locations revealed significant parking needs, particularly near shopping and healthcare facilities. For example: Agrabad CBD Area. This area has a peak parking demand of around 1,000 vehicles, including 400 cars, 95 CNGs, 355 motorcycles, and 144 rickshaws.

Detailed Parking survey findings of the parking survey are given in Table 4-3.

**Table 4-3: Peak Hour Parking Demand for the Surveyed Sites of Chattogram**

| Land Use | Name | Peak Hour Parking Demand | | | |
|---|---|---|---|---|---|
| | | Car | CNG | Motor Cycle | Rickshaw |
| Shopping | Khulshi Town Centre | 19 | 16 | 35 | 26 |
| Shopping | Sanmar Ocean City | 43 | 23 | 82 | 36 |
| Shopping | Mimi super market | 39 | 6 | 24 | 8 |
| Shopping | New Market | 65 | 8 | 84 | 55 |
| Commercial | Agrabad Commercial Area | 400 | 95 | 355 | 144 |
| Healthcare | Chevron | 21 | 4 | 49 | 4 |
| Healthcare | Chattogram Medical College Hospital | 74 | 71 | 202 | 45 |

| Land Use | Name | Peak Hour Parking Demand | | | |
|---|---|---|---|---|---|
| | | Car | CNG | Motor Cycle | Rickshaw |
| Busy Road | O.R Nizam Road | 95 | 76 | 156 | 109 |
| Busy Road | GEC Intersection Area (From Yunesco to Sanmar Ocean City) | 175 | 65 | 144 | 88 |
| Busy Road | Stadium Area | 89 | 37 | 157 | 66 |

Most parking is on-street, with cars often parked horizontally on both sides of the road, further congesting internal roads. Street vendors and pushcarts occupy roadside spaces, reducing available parking areas. With the construction of an elevated expressway and 2 flyovers, a significant portion of existing parking areas has been affected. Efficient parking management, including the development of off-street parking facilities, is urgently needed to reduce congestion and improve traffic flow.

Upazila areas lack adequate roadside parking facilities. Parking demand primarily comes from public transport vehicles, which often park near intersections while waiting for passengers, contributing to congestion. There are no off-street parking facilities in these areas, leading to unregulated parking along these roadsides.

### 4.3.9. Pedestrian Facilities

83% of roads in Chattogram city have footpaths, but 71% of these footpaths are encroached by street vendors, shops, or other obstacles. The total length of footpath in the city area is around 195 km.

**Footpath Surface Quality:**

- 34% have very good surfaces.
- 33% have good surfaces.
- 20% have average surfaces.
- 8% have poor surfaces.
- 5% have very poor surfaces.

Only 64% of major roads have continuous footpaths, while 36% lack continuity. Two major road sections in the city center lack footpaths entirely. Footpaths are often overcrowded, poorly maintained, or nonexistent, making it difficult for pedestrians to navigate safely. There are few marked pedestrian crossings, and public transport systems lack pedestrian-friendly features like level boarding or wheelchair ramps. Foot-over bridges exist at some major intersections and risky areas, but they are insufficient to address the broader pedestrian safety issues. Out of 140 km of surveyed footpaths:

- 42 km have no footpaths.
- Only 1 km have footpaths wider than 10 feet.
- 49 km have footpaths between 4 and 10 feet wide.

The remaining footpaths are less than 4 feet wide, making them unsuitable for comfortable walking. Pedestrian facilities in Upazila areas are either absent or inadequate. Where sidewalks exist, they are often obstructed by street vendors or building extensions, limiting walking space. There are no designated pedestrian crossings, forcing pedestrians to walk on the carriageway, which is dangerous. While foot-over bridges exist along the Dhaka-Chattogram Highway, they do not address pedestrian accessibility issues within Upazila areas.

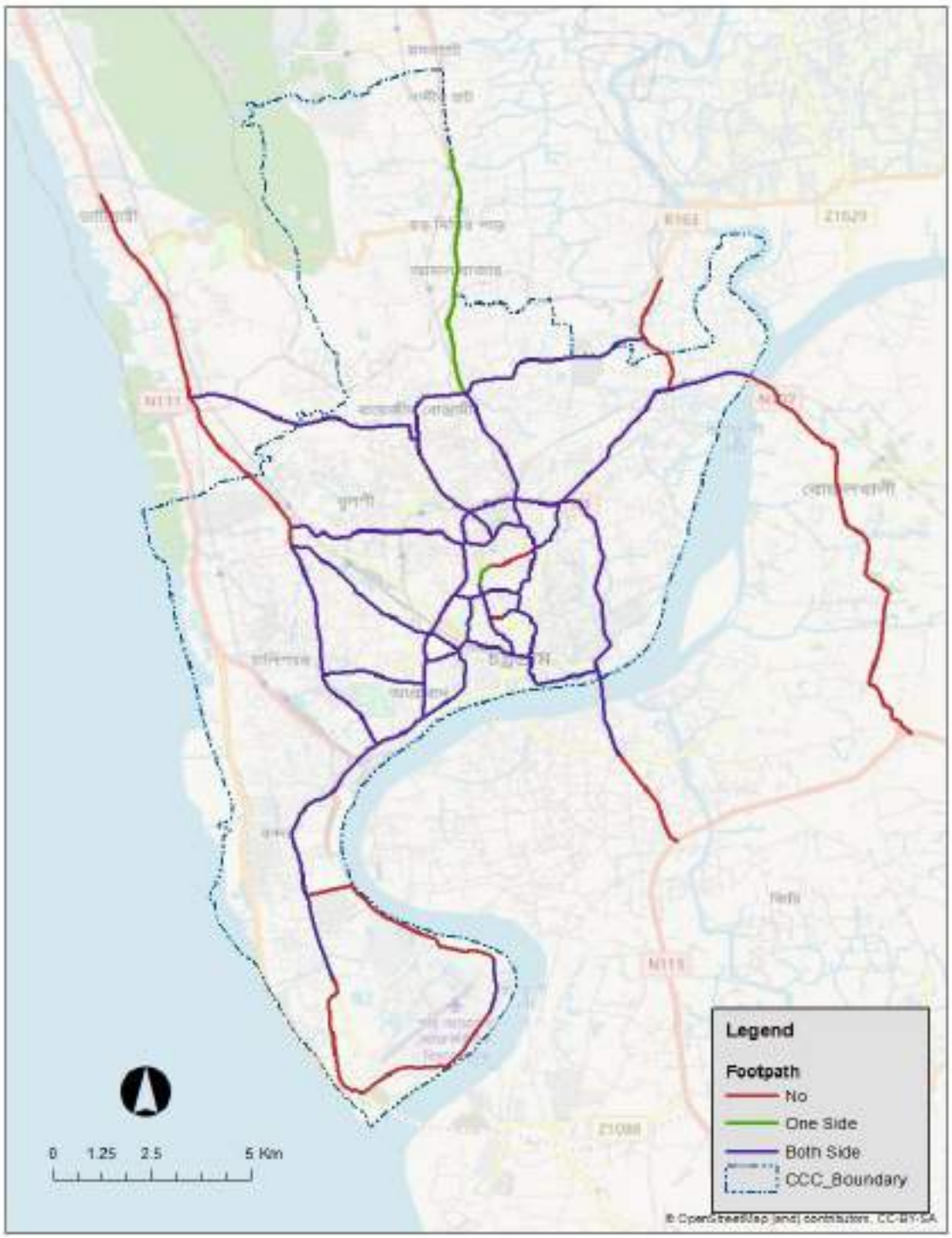



**Figure 4-6: Presence of Footpath along the Major Road Network in Chattogram**

### 4.3.10. Traffic Safety

Between 2021 and 2023, Chattogram experienced rising road safety concerns due to rapid population growth and increased vehicle ownership. A joint effort by CCC, CMP, and BIGRS analyzed road crash trends, relying on data from the Bangladesh Police's First Information Reports (FIRs), which were digitized into the MAAP5 system. Trained encoders manually reviewed reports from all 16 police stations, using tools like Epi Info and QGIS to produce maps and charts highlighting high-risk areas and vulnerable road users. While the study provides valuable insights, it faced challenges such as underreporting, inconsistent documentation, and missing data on key factors like road conditions and helmet use. This section highlights key observations made by the masterplan team on the basis of this study.[1]

Figure 4-7 shows a total of 684 crashes occurred in Chattogram city from 2017-2023 resulting in 1028 casualties. The upward trend in casualties highlights an increasing severity of road incidents over the years.

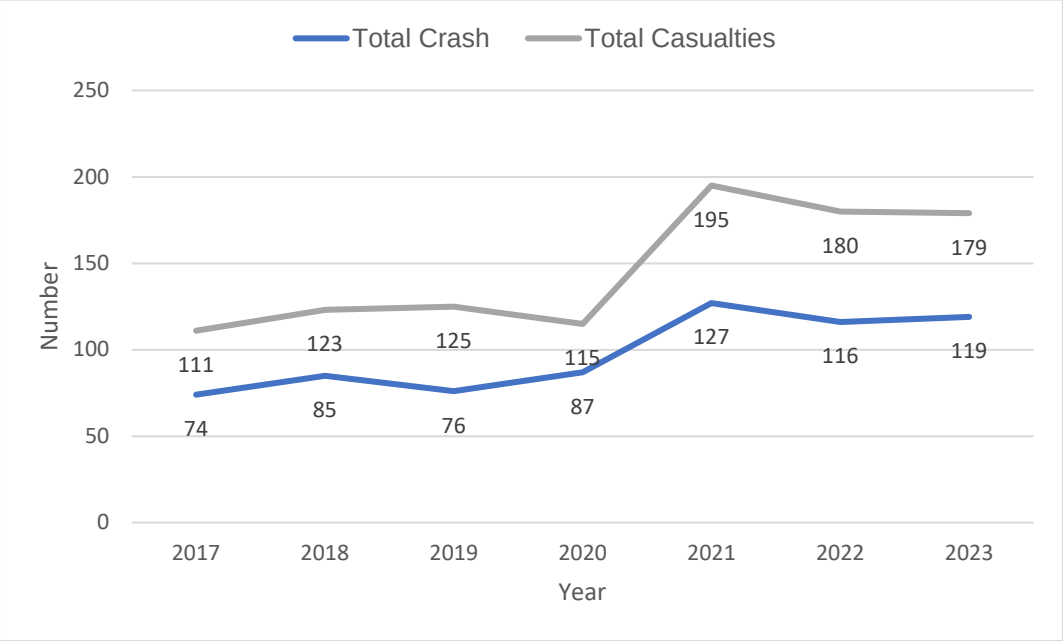



**Figure 4-7: Number of Crashes and casualties in Chattogram City, 2017-2023**

Figure 4-8 highlights that pedestrian face the highest fatalities (257) and significant injuries (104). Two/three-wheeler occupants have the highest injuries (180) and 135 fatalities. Four-wheeler occupants and NMV driver-passengers have lower casualties, with fatalities slightly exceeding injuries for NMVs. Pedestrians and two/three-wheeler users are the most vulnerable groups.

[1] Chattogram City Road Safety Report 2021-2023

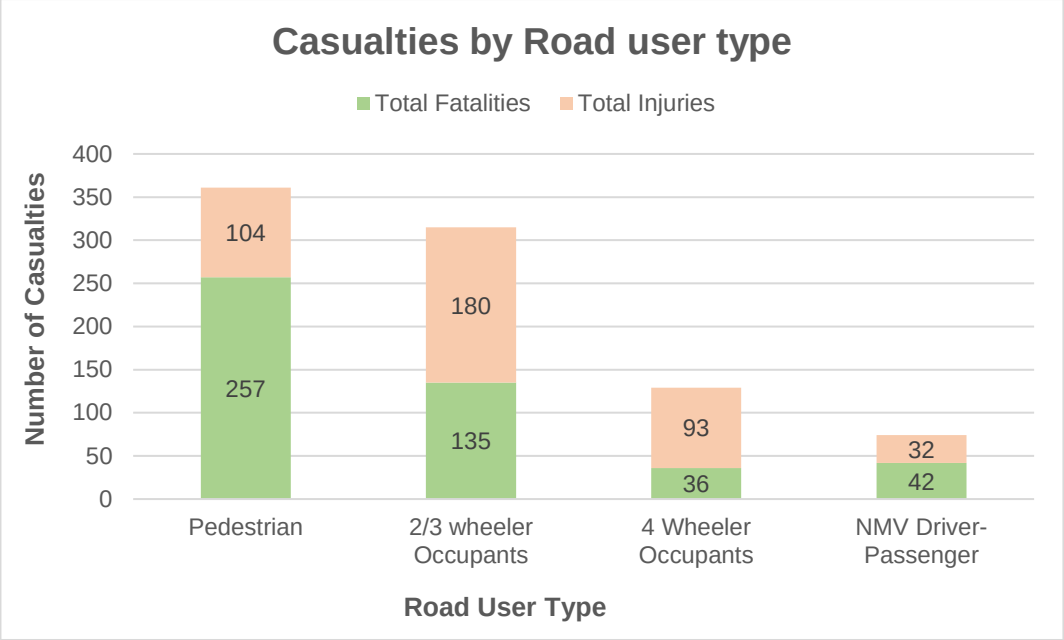
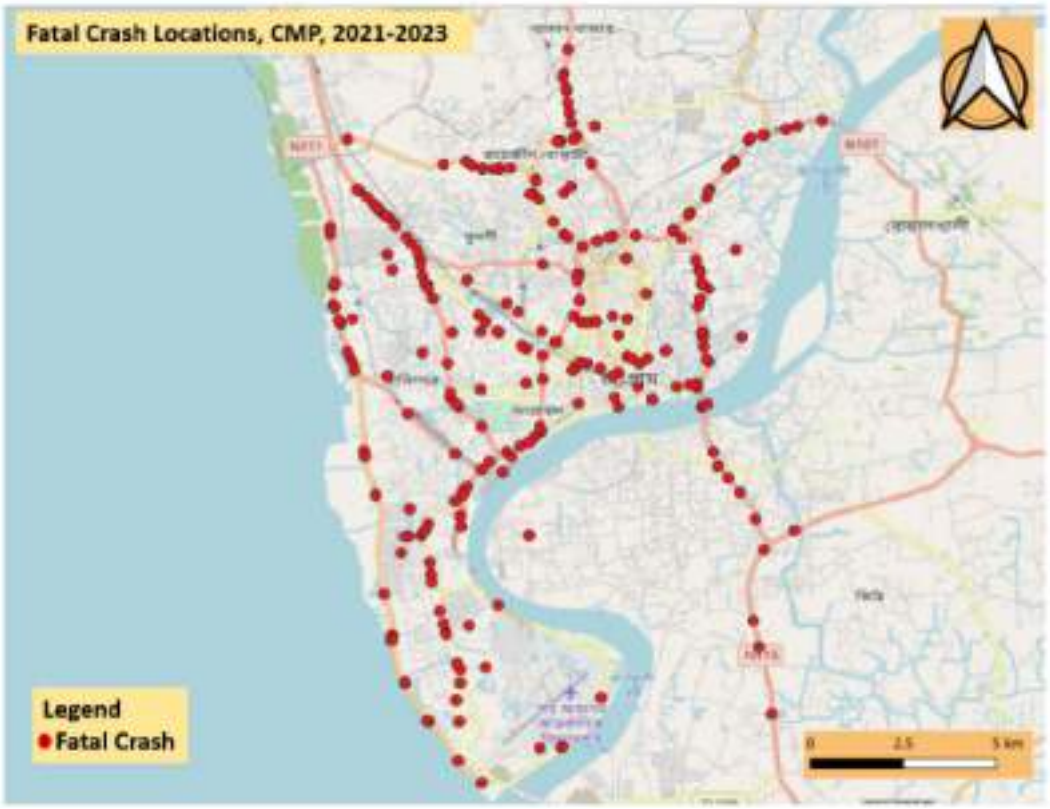



**Figure 4-8: Casualties by Road User Type**

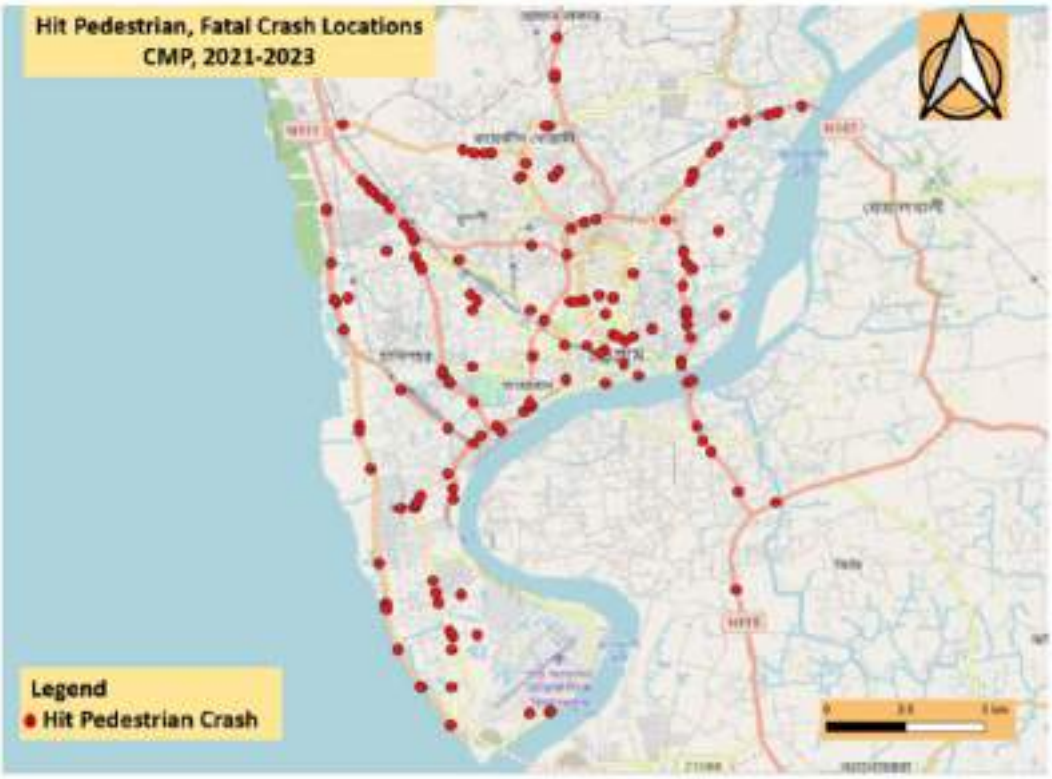
The report found, among 292 road crash deaths (2021–2023), peak time of fatalities were during **22:00–22:59** (23 deaths) and on **Fridays** (53 deaths). Evening hours (**16:00–22:59)** and weekends (Friday-Saturday) see the highest risks. This pattern suggesting increased risks possibly linked to reduced visibility, fatigue, or weekend. Further analysis indicates that from 2021-2023 crash fatalities were the highest from April to June and in December. These months coincide with Eid and year-end holidays.

This map from the Chattogram City Road Safety Report (2021–2023) shows that Hathazari Road sees frequent fatal crashes due to heavy traffic on its narrow structure, lack of walkways and crossings, and roadside temporary bazaars that increase congestion and risk.

Fatal crashes from AK Khan to Alonkar are mainly due to intercity buses stopping on the roadside, narrowing road space and creating unsafe conditions. On A.G Road, Shah Amanat Bridge, Coastal Road, and M.A. Aziz Road, heavy trucks and poor traffic management heighten crash risks, with Coastal Road further challenged by inadequate lighting. Pedestrian fatalities are linked to the lack of sidewalks, safe crossings, and proper traffic control, forcing people onto the road and increasing accident risks.




(a) Overall




(b) Crashes with Pedestrian Casualties

**Figure 4-9: Location of Fatal Crashes**

## 4.4. Travel Characteristics

### 4.4.1. Trip Purpose

The trip purposes of residents in the Chattogram Metropolitan Master Plan (CMMP) area reveal that work-related trips dominate, accounting for 47% of all trips, followed by education-related trips at 34% and shopping trips at 14%. There is a slight variation in trip purposes between the Chattogram City Corporation (CCC) area and the areas outside it. Specifically, the share of shopping trips is lower within the CCC area compared to outside it, reflecting differences in lifestyle and accessibility to commercial facilities.


**Figure 4-10: Key Findings of trip purpose**

### 4.4.2. Mode Share

In terms of mode share, private transport in Chattogram consists of over 30,000 registered cars and 75,000 registered motorcycles. In 2021, a total of 300,000 vehicles were registered, with cars making up 19%, motorcycles 80%, and buses just 1%. Buses are the primary mode of public transport in Chattogram, followed by tempos and human haulers. Walking is the most common mode of travel in the CMMP area, representing 60% of all trips, followed by auto rickshaws, rickshaws, and public transport. Residents within the CCC area tend to use cars and public transport more frequently compared to those outside the CCC area. Conversely, rickshaws, auto-rickshaws, and motorcycles are more commonly used outside the CCC area. Additionally, gender differences in mode usage are notable, with women in the CCC area more likely to use CNGs and rickshaws and less likely to use buses or human haulers.

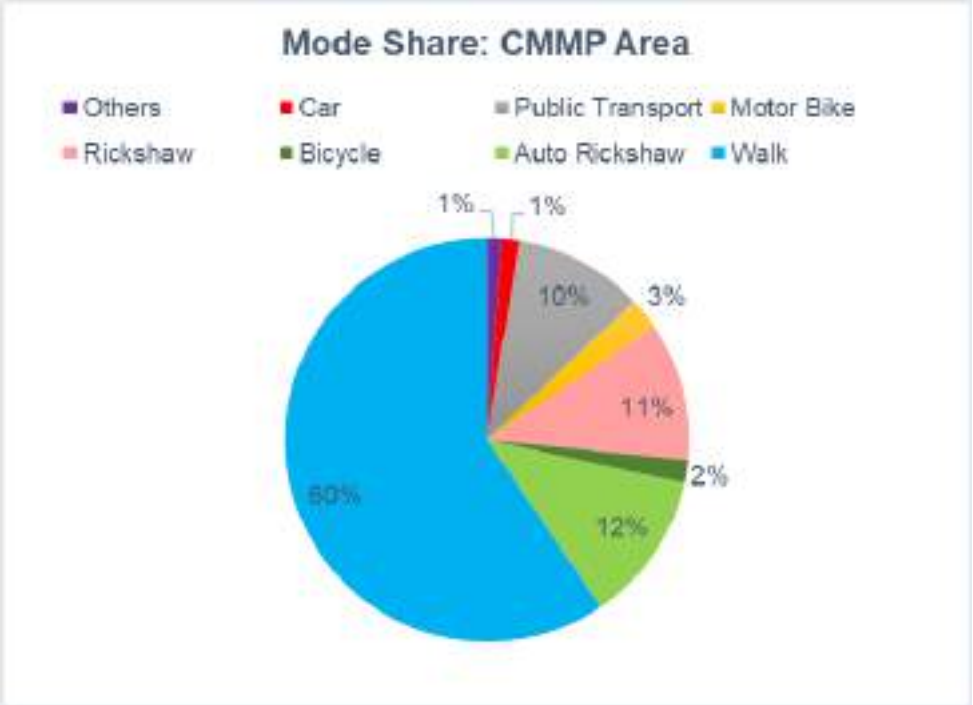



**Figure 4-11: Key Findings of mode share**

### 4.4.3. Cost of Travel

The cost of travel varies across different modes of transportation. On average, residents spend around 37 taka per trip in the CMMP area, with higher costs in the CCC area (43 taka) compared to outside the CCC area (22 taka). Car ride-sharing services like Uber are the most expensive, costing 175 taka per trip, while rickshaws and auto-rickshaws are the most affordable at 33 taka. Public transport costs an average of 37 taka per trip. Overall, travel costs are generally higher within the CCC area due to higher demand and longer distances.

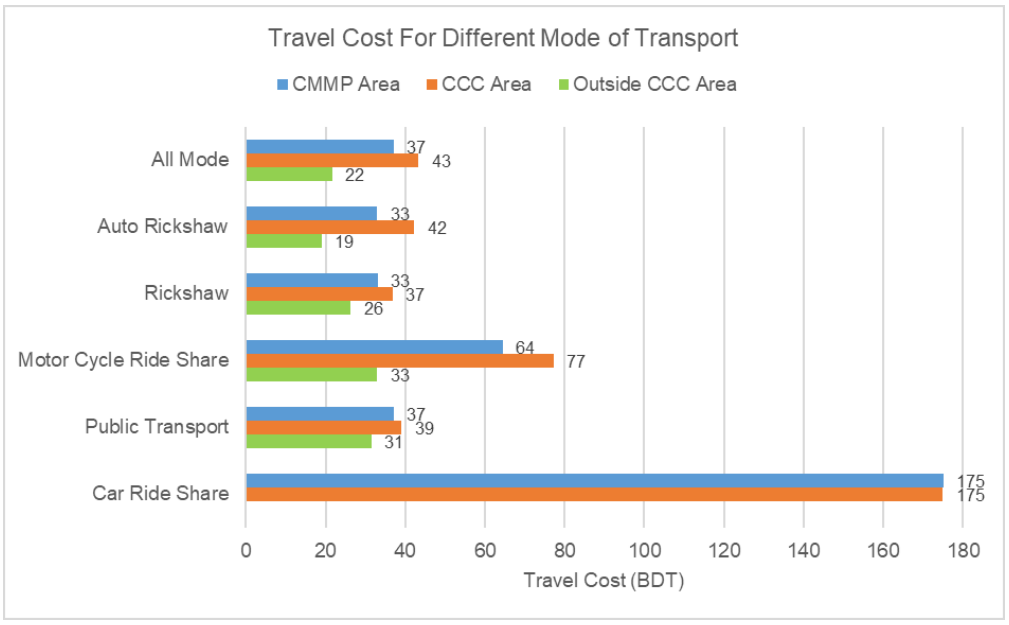



**Figure 4-12: Travel Cost of the Respondents for Different Modes**

### 4.4.4. Vehicle Ownership

Vehicle ownership in the CMMP area shows that 8.2% of households own a vehicle, with motorcycles being the most common (53.3% of households), followed by cars (29.4%). Vehicle ownership is significantly higher in the CCC area, where 92.1% of car owners and 60.1% of motorcycle owners reside, compared to 7.9% and 39.9%, respectively, outside the CCC area. Auto-rickshaw ownership, however, is lower in the CCC area (41.9%) compared to outside it (58.1%). The growth of private vehicles in Bangladesh has been steadily increasing, with a notable surge in motorcycle ownership since 2015, largely driven by the introduction of ride-sharing services like Pathao and Uber. This trend reflects the growing reliance on private and shared mobility solutions, particularly in urban areas like Chattogram.

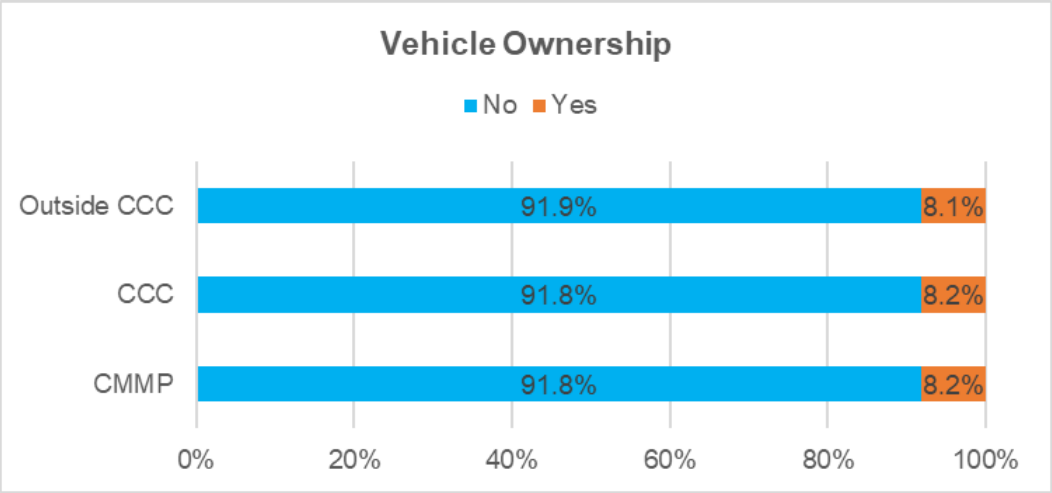



**Figure 4-13: Vehicle Ownership of the Respondents**

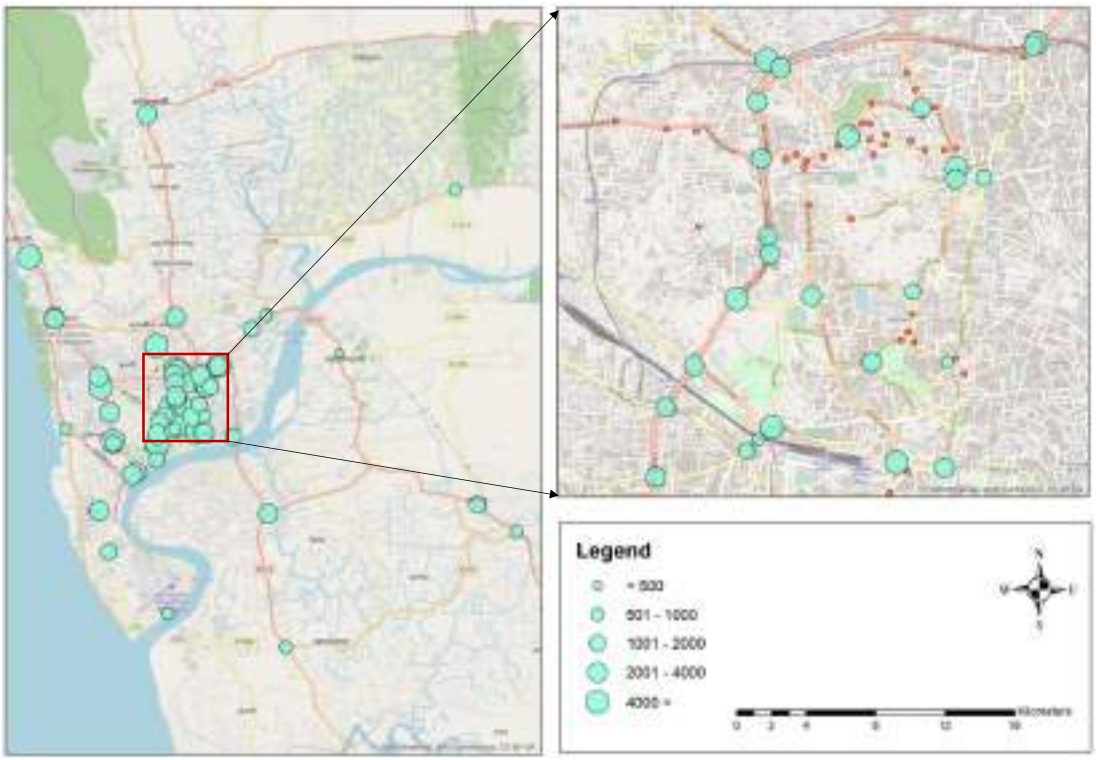
## 4.5. Traffic Flow Characteristics

### 4.5.1. Peak Hour Traffic Flow

Chattogram's peak traffic hours, as identified by a World Bank study, occur between 8 AM and 11 AM in the morning and 6 PM and 9 PM in the evening. These periods see the highest concentration of vehicles on the roads, leading to significant congestion and delays.

#### Key Road Network Flow

Analysis of the road network during peak hours reveals that only 7.4% of approaches face capacity issues in the morning peak, and 8% in the evening peak, indicating that traffic flow is not the primary cause of congestion. The busiest intersections during the morning peak include Agrabad Commercial Area, Bahadderhat, Lalkhan Bazar, Probortok, and Kadamtali. In the evening, congestion is most severe at Agrabad Commercial Area, Probortok, New Market, and Tigerpass. Pedestrian crossings are particularly heavy at intersections like Gulzar, Wali Khan Masjid, Bahaddarhat, and New Market during peak hours. Traffic flow at peak hours at major intersections are shown in Figure 4-14.




AM Peak (in PCU/hour)

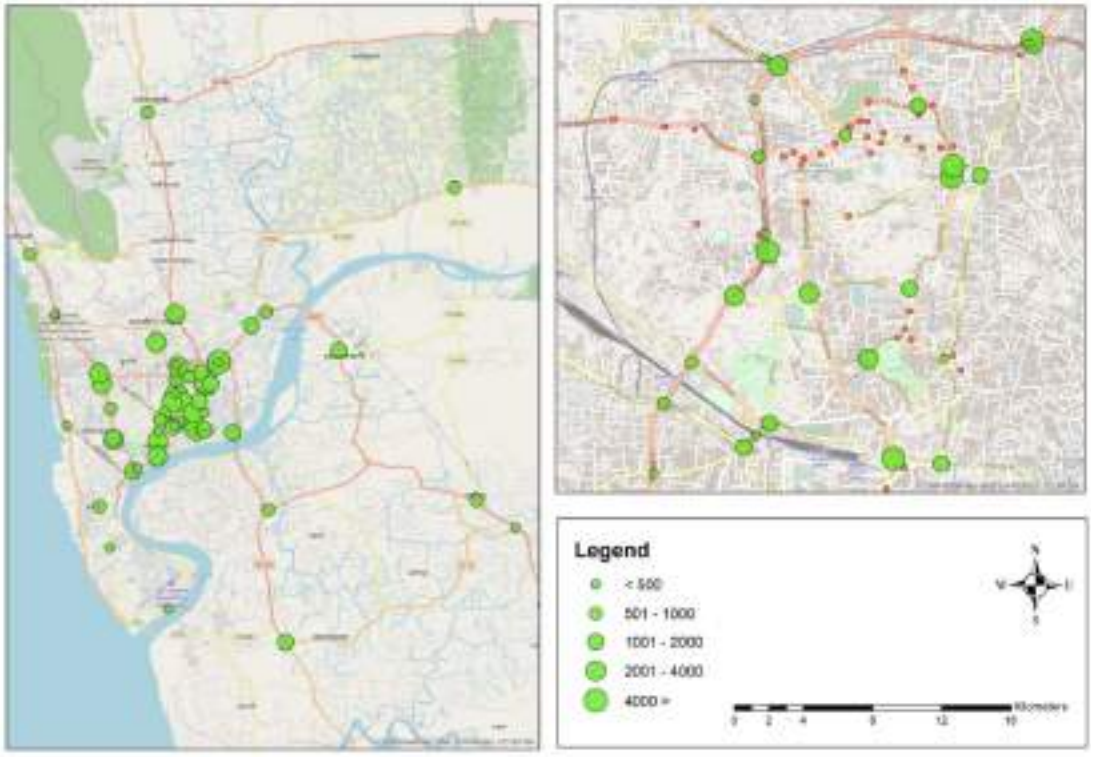

PM Peak (in PCU/hour)

**Figure 4-14: Traffic Flow (Approach Total) at Peak Hours**

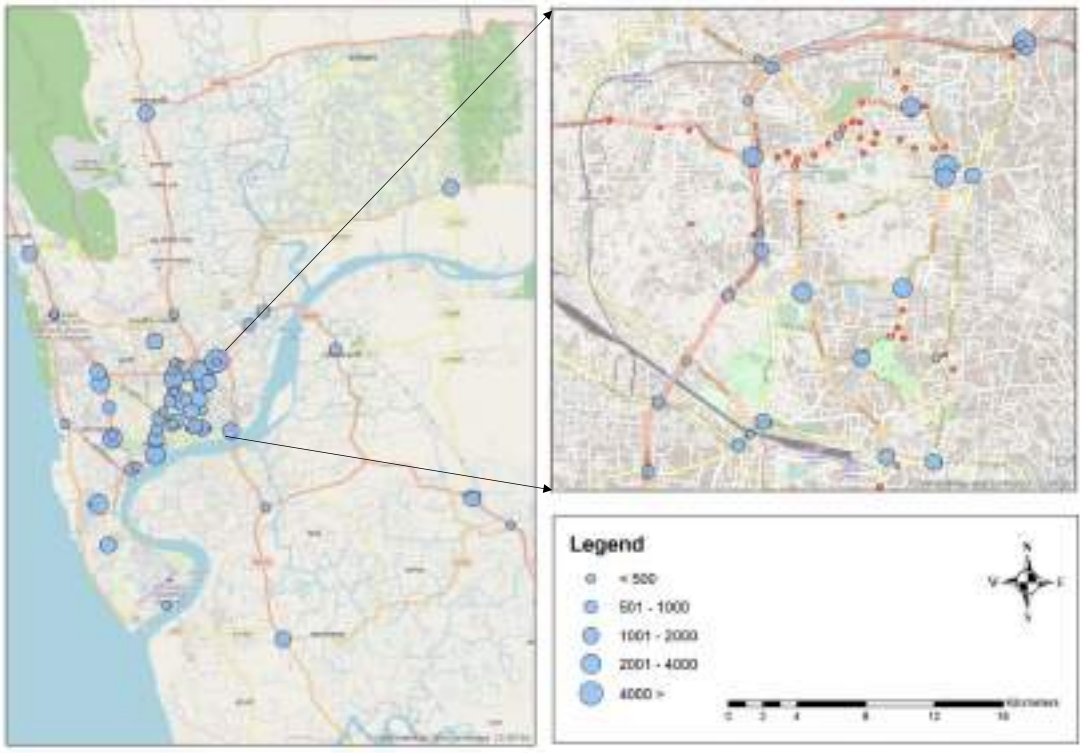
## Pedestrian Flow

Pedestrian activity is highest at intersections such as Gulzar, Wali Khan Masjid, Bahaddarhat, and Jamalkhan Circle during peak hours. Gulzar sees significant foot traffic due to its proximity to educational institutions and commercial hubs, while Bahaddarhat's bustling bazaar attracts

large numbers of pedestrians. These intersections are critical for commuters transitioning between modes of transport or traveling to work and educational institutions. Understanding these patterns is essential for improving pedestrian safety and traffic flow. Traffic flow at peak hours at major intersections are shown in Figure 4-15.




AM Peak (in pedestrian/hour)




PM Peak (in pedestrian/hour)

**Figure 4-15: Traffic Flow (Approach Total) at Peak Hours**

### School Traffic

Most schools in Chattogram lack dedicated transportation systems or adequate parking facilities, leading to severe traffic congestion, especially during school drop-off and pick-up times. Many high-end schools attract private vehicles, which often park on the streets, exacerbating congestion. This issue is particularly acute for schools with multiple shifts, where the overlap of vehicles dropping off and picking up students creates chaotic conditions.

### Port Traffic

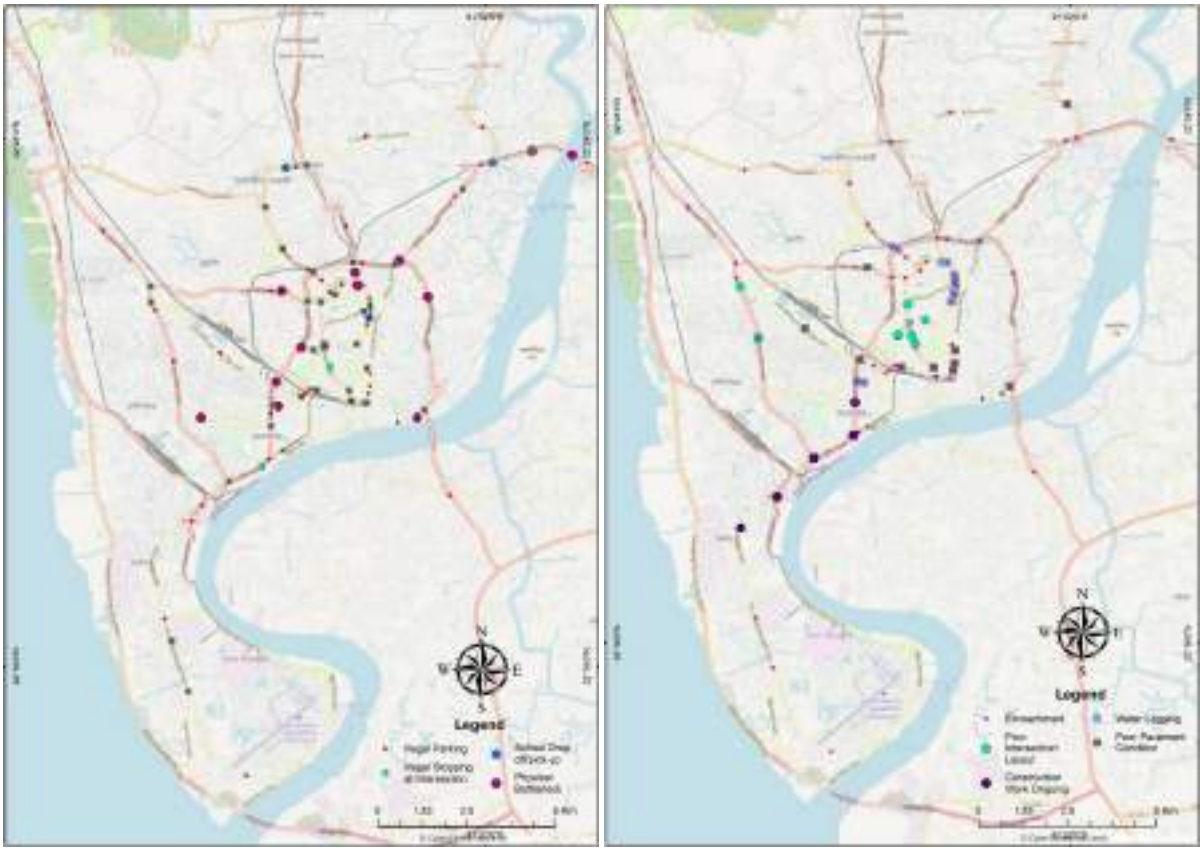
Chattogram Port handles around 10,000 vehicles daily, with traffic peaking on weekdays at 10,000 to 12,000 vehicles. The CCT 2 gate sees the highest vehicle movement, with approximately 1,500 vehicles daily. The lack of sufficient truck terminals forces drivers to park on roads, reducing road capacity and causing congestion. Stakeholders have called for the establishment of truck terminals near the port to address these issues, but proposed solutions, such as a terminal near Fouzderhat, remain unimplemented.

## 4.5.2. Network Speed

Travel time surveys reveal that average speeds during peak hours are significantly lower than road design speeds. Morning peak speeds range between 10 km/h and 30 km/h, while evening speeds drop below 10 km/h on some routes. Public transport, particularly buses, is the slowest, with speeds as low as 10.3 km/h during the afternoon peak. Private vehicles and tempos are slightly faster, but overall speeds remain far below optimal levels, negatively impacting the city's economy.

## 4.5.3. Bottleneck Analysis

Chattogram's road network faces numerous bottlenecks due to illegal parking, poor road conditions, and mismanagement. Key problem areas include Arkan Road, where a culvert and flyover pier reduce a 3-lane road to a bottleneck, and Agrabad Access Road, where a culvert causes congestion on an 8-lane road. The Dhaka-CTG Highway suffers from traffic mismanagement and illegal parking, while Bayezid Bostami Road faces space constraints due to a flyover ramp. Critical intersections like Muradpur Mor and GEC Mor experience congestion from illegal public transport and deteriorating infrastructure. Addressing these bottlenecks requires targeted interventions to improve traffic flow and infrastructure management. Figure 4-16 shows bottleneck of major roads of Chattogram in two parts: (a) The main cause of the bottleneck (b) the effect of that cause.



(a) (b)

**Figure 4-16: Existing Bottlenecks on Major Roads**

## 4.6. Traffic and Transport Issues

### 4.6.1. Traffic Congestion

Traffic congestion is a major barrier to economic development and a significant problem for Chattogram's residents. High population density, poor road networks, inadequate law enforcement, lack of effective traffic control systems, illegal parking, and reckless driving contribute to severe congestion across the city. Other key causes include illegal public transport stopping, parked vehicles at intersections, and high side-road volumes. Major intersections like Bahaddarhat, Muradpur, and Agrabad face frequent disruptions due to these issues, worsening traffic flow.

### 4.6.2. Indiscipline

Indiscipline among road users is a significant issue in Chattogram, impacting road safety and transportation efficiency. Pedestrians often cross roads informally, public transport drivers stop arbitrarily, and reckless driving behaviors are common. Factors contributing to this include a lack of awareness, poor road design, and lax enforcement of traffic rules.

#### Pedestrian Behavior

Pedestrians frequently cross roads at undesignated points, disregard traffic signals, and encroach on vehicle lanes, leading to safety risks and congestion. Poor pedestrian infrastructure, such as blocked or discontinuous footpaths, forces pedestrians to walk on roads, increasing danger and traffic disruptions.

### Public Transport Issues

Public transport faces challenges like overcrowding, sudden stops, and disregard for traffic rules. Drivers often stop at intersections or block other vehicles, creating hazardous conditions. Passengers standing on footboards or beside doors further increase safety risks.

### Car User Behavior

Reckless driving, such as speeding, dangerous overtaking, and illegal U-turns, contributes to road safety concerns. Many drivers ignore lane markings and roundabout rules, leading to chaotic traffic conditions. The lack of formal driving manuals and awareness exacerbates these issues.

## 4.6.3. Traffic Management

Chattogram lacks functioning traffic signals, with intersections managed manually by traffic police. Poor pedestrian infrastructure, lack of turning guidance, and unauthorized public transport stops worsen congestion. Freight transportation faces additional challenges due to inefficient logistics and inadequate infrastructure for large trucks.

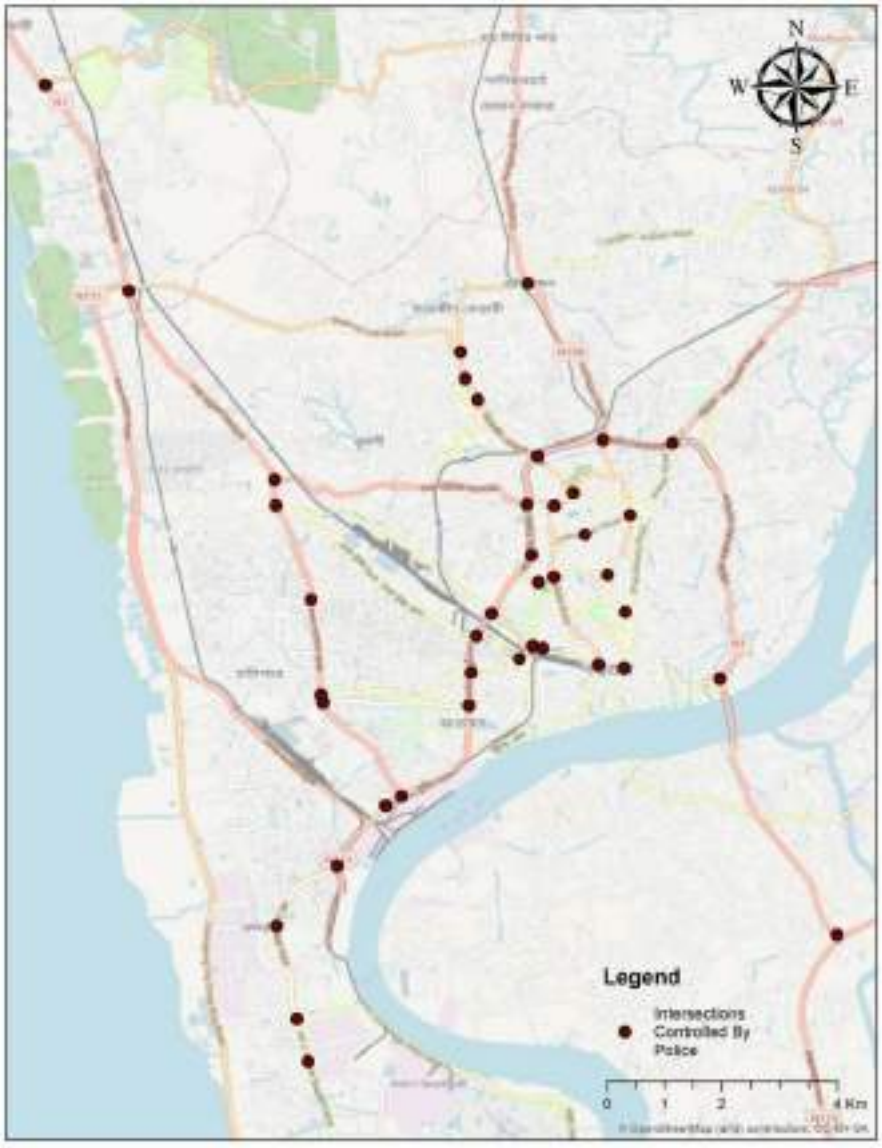



**Figure 4-17: Locations of Intersections Controlled by Traffic Police.**

Congestion significantly increases during school dismissal hours as large numbers of private vehicles, school vans, and guardians gather near school gates, often blocking lanes and disrupting traffic flow. The lack of designated pick-up zones and poor traffic control further exacerbate the problem. Three areas in Chattogram city experience prolonged traffic congestion during school dismissal hours due to the concentration of several schools in those locations.

1. Jamalkhan Circle
2. Zakir Hossain Road circle
3. Chatteswari Road Intersection beside CGS school


*Jamalkhan Circle*


*Zakir Hossen Road*


*Chatteswari Road Intersection beside CGS school*

**Figure 4-18: Location of Major Congestions during School Dismissals**

### 4.6.4. Parking Management

Parking in Chattogram is chaotic, with vehicles parked indiscriminately on roads and sidewalks. Public transport vehicles often stop at major junctions, blocking traffic flow. The lack of designated parking spaces and drop-off bays, especially near schools, shopping, bazar and commercial areas, exacerbates congestion. The scenario is similar around Pourashavas, Upazila headquarters and bazar areas.

### 4.6.5. Intersection Design

Intersections in Chattogram lack proper signage, lane markings, and pedestrian facilities, leading to accidents and traffic disruptions. Many intersections are unsignalized, and improper roundabout designs create conflict points. Proposed improvements include channelizing traffic, extending medians, and adding pedestrian crossings.

### 4.6.6. Pedestrian Safety and Walkability

Pedestrians, who account for 60% of trips, face significant safety challenges due to blocked or discontinuous footpaths, lack of safe crossings, and vehicles parked on sidewalks. Vulnerable groups, such as the elderly and children, are particularly at risk. Improving pedestrian infrastructure is essential for safety and walkability.

### 4.6.7. Lack of Enforcement

Traffic laws are poorly enforced in Chattogram, with insufficient traffic police presence and ineffective implementation of fines. Encroachment on roads and footpaths by vendors and shopkeepers further complicates traffic management.

### 4.6.8. Issue of Non-Motorized Transport

Non-motorized transport, such as rickshaws, contributes to congestion due to their slow speed and indiscipline among riders. However, rickshaws are essential for affordable and accessible transportation, especially for women. A partial ban or replacement with battery-driven rickshaws could be explored.

### 4.6.9. Railway Crossings

Railway crossings in Chattogram disrupt traffic flow, with some crossings closed for 3-4 hours daily. Proposed railway over-bridges from the 1995 master plan remain unimplemented, worsening congestion. Addressing these crossings is critical for smoother traffic flow.

### 4.6.10. Crossing the Karnaphuli River

The Kalurghat Bridge, a key connection over the Karnaphuli River, is in poor condition, forcing vehicles to rely on limited ferry services. The recent construction of the Bangabandhu Tunnel has improved connectivity, but a new road bridge at Kalurghat is urgently needed to support economic development.

### 4.6.11. Land Use and Development

Trip-intensive land uses, such as schools, hospitals, and shopping malls, are often established in congested areas without adequate parking facilities. The lack of traffic impact assessments and guidelines exacerbates congestion. Addressing land use planning is essential for reducing traffic pressure.

### 4.6.12. Accessibility and Inclusiveness

Women and vulnerable groups face challenges in accessing public transport due to safety concerns, harassment, and lack of facilities. Improving infrastructure, ensuring reserved seats, and addressing cultural barriers are necessary for inclusive transportation.


**Figure 4-19: Locations of Railway Crossings in Chattogram City**

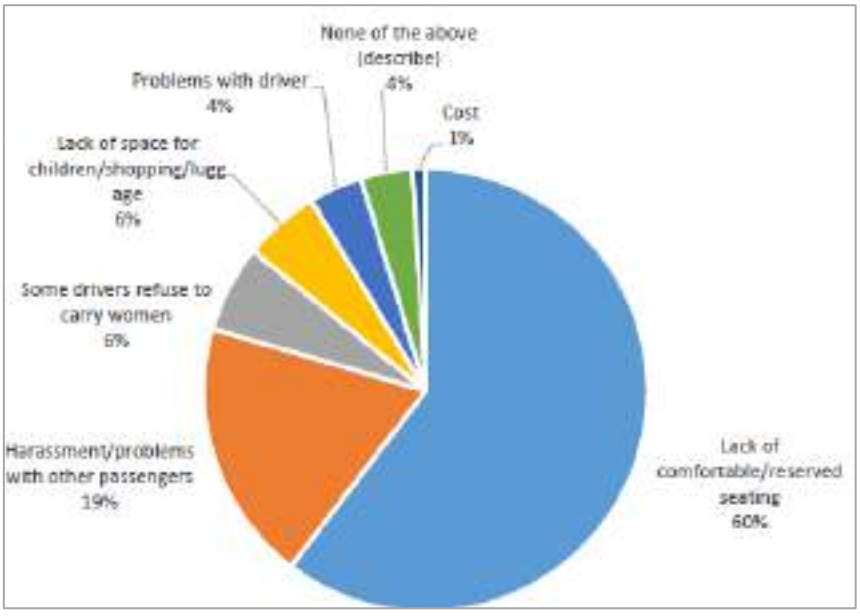



**Figure 4-20: Challenges for women in accessing public transport in Chattogram City**

### 4.6.13. Environmental Perspective

Transport is a major contributor to air pollution in Chattogram, with high levels of particulate matter and other pollutants. The increasing number of vehicles, lack of emissions standards enforcement, and poor road infrastructure worsen air quality. Addressing these issues is critical for public health and environmental sustainability.

### 4.6.14. Investment in Transport System

Recent investments in mega projects like the Bangabandhu Tunnel and Elevated Expressway have improved connectivity, but investments in public transport, traffic management, and pedestrian facilities remain inadequate. Greater focus on these areas is needed for a balanced transport system.

### 4.6.15. Organizational Coordination Issue

Multiple agencies are involved in Chattogram's transport system, but coordination is lacking. The formation of a dedicated transport coordination authority, as proposed in the 1995 master plan, remains unimplemented, hindering effective transport planning and management.

### 4.6.16. Use of ITS in Transport

Chattogram has begun adopting Intelligent Transport Systems (ITS), such as RFID devices, digital number plates, and CCTV cameras. However, further integration of ITS, including traffic lights, e-policing, and real-time public transport tracking, is needed to improve traffic management and discipline.

# CHAPTER FIVE

# TRAVEL DEMAND FORECAST

# Chapter 5: Travel Demand Forecast

This chapter outlines the expected changes in traffic demand across Chattogram based on projected population and employment growth, along with existing land use patterns. Rather than relying on complex transport models, this assessment adopts a trend-based approach using available demographic and spatial data at the ward and union levels. The objective is to identify areas where traffic volumes are likely to increase in the future and provide a basis for prioritizing infrastructure and mobility interventions.

As population and employment densities shift over time, so too will the volume and pattern of trips across the city. Understanding these dynamics is crucial for making informed decisions about future transport investments, land use zoning, and traffic management. This chapter uses the available forecasts and assumptions to highlight key growth areas, anticipate traffic pressure points, and support long-term planning efforts.

## 5.1. Population and Employment Forecast

Traffic generation and movement in any urban area are fundamentally governed by the spatial distribution and intensity of population and employment. Areas with higher population densities tend to generate more personal and service-related trips, while employment hubs act as major attractors of commuter and freight traffic. As such, future traffic conditions in Chattogram will be closely linked to how and where the city grows in terms of residents and jobs.

The population and employment forecasts used in this study cover three target years: 2030, 2040, and 2050. These projections are based on observed trends from 2011 to 2022 and incorporate separate growth rates for urban and rural areas, reflecting their differing development dynamics. The forecast was done by **Mathematical trend extrapolation**, considering a geometrical growth rate of 2.32% for CCC and Paurashava areas and 1.28% for Upazilla areas. In addition to natural demographic growth, the forecasts also account for anticipated catalytic developments that are expected to accelerate urban growth and traffic generation. Key among these are the future operations of the Bay Terminal, the Korean EPZ, and the Chinese EPZ—each of which is likely to stimulate population in-migration and create new employment opportunities in and around Chattogram. The population forecast is given in table and employment forecast is given in

Table 5-1 and Table 5-2.

**Table 5-1: Population Forecast**

| City Corporation/ Upazila | Existing Population (2022) | Projected Population (2030) | Projected Population (2040) | Projected Population (2050) |
|---|---|---|---|---|
| CCC | 3,230,507 | 3,929,674 | 4,979,209 | 6,263,169 |
| Anwara | 319,482 | 541,547 | 1,164,862 | 1,561,534 |
| Boalkhali | 258,688 | 310,832 | 391,033 | 491,926 |
| Hathazari | 427,690 | 513,900 | 646,496 | 813,304 |
| Karnaphuli | 203,705 | 373,766 | 403,320 | 705,370 |
| Patiya | 397,679 | 477,840 | 601,131 | 756,235 |
| Rangunia | 110,805 | 133,140 | 167,493 | 210,709 |
| Raozan | 371,165 | 445,981 | 561,053 | 705,815 |
| Sitakunda | 236,071 | 287,268 | 364,069 | 457,947 |
| **Total** | **5,555,792** | **7,013,949** | **9,278,667** | **11,966,009** |

**Table 5-2: Employment Forecast**

| City Corporation/ Upazila | Existing (2022) | Projected (2030) | Projected (2040) | Projected (2050) |
|---|---|---|---|---|
| CCC | 1,705,747 | 2,061,157 | 2,601,567 | 3,272,634 |
| Anwara | 32,939 | 79,579 | 189,791 | 322,637 |
| Boalkhali | 36,982 | 44,437 | 55,902 | 70,326 |
| Hathazari | 60,325 | 72,485 | 91,187 | 114,715 |
| Karnaphuli | 22,919 | 67,539 | 114,645 | 143,583 |
| Patiya | 53,104 | 63,808 | 80,271 | 100,983 |
| Rangunia | 15,946 | 19,161 | 24,105 | 30,324 |
| Raozan | 51,798 | 62,239 | 78,298 | 98,501 |
| Sitakunda | 48,285 | 58,438 | 73,827 | 92,870 |
| **Total** | **2,028,045** | **2,528,842** | **3,309,593** | **4,246,573** |

While most administrative units are expected to follow a natural growth trend in both population and employment, certain wards and unions located near large-scale employment centers are projected to experience significantly higher growth rates. Proximity to major developments such as the Bay Terminal, Korean EPZ, and Chinese EPZ will act as strong pull factors, leading to increase in-migration and land use intensification in those areas.

In addition to employment opportunities, the pace and scale of growth in different locations will also be influenced by factors such as availability of land for housing, existing utility services, and overall development readiness. Areas with better infrastructure and development potential are likely to attract more people and businesses, further amplifying traffic generation.

The influence of key employment centers on future traffic patterns—particularly in terms of where intensified travel demand is expected—is illustrated in Figure 5-1. This spatial impact underscores the need to align transportation planning with future urban growth trajectories.

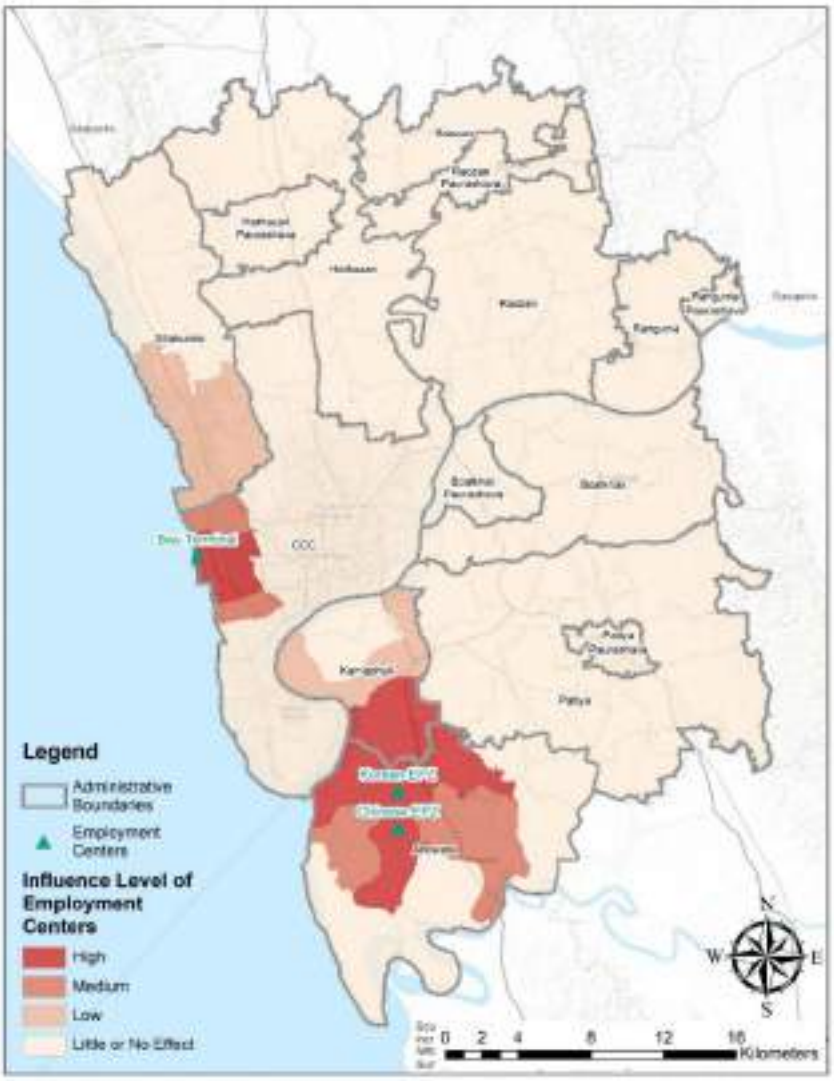



**Figure 5-1: Influence of Future Employment Centers**

## 5.2. Trip Demand Forecast

Current and the forecasted demand of trips are presented in Table 5-3 to Table 5-5. The trip demand will be almost doubled in 2050.

**Table 5-3: Daily Trip Demand Forecast**

| City Corporation/ Upazila | Existing Trip (2022) | Projected Trip (2030) | Projected Trip (2040) | Projected Trip (2050) |
|---|---|---|---|---|
| CCC | 4,903,942 | 5,954,714 | 7,537,348 | 9,481,126 |
| Anowara | 317,105 | 621,829 | 1,316,198 | 1,855,405 |
| Boalkhali | 244,221 | 293,449 | 369,164 | 464,415 |
| Hathazari | 444,570 | 534,183 | 672,012 | 845,404 |
| Karnaphuli | 183,635 | 263,382 | 309,184 | 454,542 |
| Patiya | 393,074 | 472,306 | 594,170 | 747,477 |
| Rangunia | 163,037 | 195,900 | 246,446 | 310,034 |
| Raozan | 492,092 | 591,284 | 743,846 | 935,772 |
| Sitakundo | 296,640 | 360,570 | 456,672 | 574,435 |
| **Total** | **7,438,316** | **9,287,617** | **12,245,040** | **15,668,610** |

**Table 5-4: AM Peak (8 AM to 11 AM) Trip Demand Forecast**

| City Corporation/ Upazila | Existing Trip (2022) | Projected Trip (2030) | Projected Trip (2040) | Projected Trip (2050) |
|---|---|---|---|---|
| CCC | 1,727,138 | 2,099,686 | 2,659,553 | 3,345,376 |
| Anowara | 106,992 | 211,815 | 456,907 | 642,302 |
| Boalkhali | 87,277 | 104,869 | 131,927 | 165,967 |
| Hathazari | 169,195 | 203,300 | 255,755 | 321,745 |
| Karnaphuli | 62,068 | 88,680 | 104,250 | 152,791 |
| Patiya | 161,858 | 194,484 | 244,665 | 307,793 |
| Rangunia | 35,331 | 42,452 | 53,406 | 67,185 |
| Raozan | 176,519 | 212,100 | 266,826 | 335,672 |
| Sitakundo | 125,159 | 152,311 | 193,038 | 242,815 |
| **Total** | **2,651,535** | **3,309,698** | **4,366,327** | **5,581,646** |

**Table 5-5: PM Peak (6 PM to 9 PM) Trip Demand Forecast**

| City Corporation/ Upazila | Existing Trip (2022) | Projected Trip (2030) | Projected Trip (2040) | Projected Trip (2050) |
|---|---|---|---|---|
| CCC | 818,756 | 993,810 | 1,257,663 | 1,582,003 |
| Anowara | 50,333 | 99,445 | 202,437 | 289,309 |
| Boalkhali | 30,764 | 36,966 | 46,504 | 58,502 |
| Hathazari | 49,389 | 59,833 | 74,656 | 93,918 |
| Karnaphuli | 31,651 | 43,914 | 52,194 | 74,691 |
| Patiya | 51,054 | 61,346 | 77,174 | 97,086 |
| Rangunia | 22,398 | 26,913 | 33,857 | 42,593 |
| Raozan | 47,331 | 56,872 | 71,546 | 90,006 |
| Sitakundo | 54,709 | 66,549 | 84,322 | 106,065 |
| **Total** | **1,156,385** | **1,445,647** | **1,900,352** | **2,434,174** |

## 5.3. Mode Share Forecast

Current and the forecasted mode share are presented in Table 5-6.

**Table 5-6: Mode Share Forecast**

| Mode | Existing Share (2022) | Projected Share (2030) | Projected Share (2040) | Projected Share (2050) |
|---|---|---|---|---|
| Walking | 44.0% | 46.0% | 47.0% | 48.0% |
| Bicycle | 2.7% | 3.0% | 3.2% | 3.2% |
| Rickshaw | 8.9% | 0.0% | 0.0% | 0.0% |
| Motorcycle | 7.3% | 8.0% | 9.0% | 9.5% |
| CNG/Auto Rickshaw | 13.8% | 16.6% | 12.5% | 9.0% |
| Car | 1.2% | 1.4% | 1.5% | 1.6% |
| Public transport | 21.0% | 24.0% | 26.0% | 28.0% |
| Others | 1.1% | 1.0% | 0.8% | 0.7% |
| **Total** | **100%** | **100%** | **100%** | **100%** |

## 5.4. Modeling Travel Demand

Extensive modelling exercise has been carried out to develop a suitable travel demand model. The modelling is performed from the extensive data collected and procured throughout the study. The modelling exercises includes regression analysis, choice modeling and developing a VISUM model for the CMMP area. The VISUM model comprises 142 Traffic Analysis Zones including 6 Outer zones, 120 administrative zones (CCC ward, Pourashava and Unions) and 16 special zones (employment and transport hubs). The zoning system is shown in Figure 5-2and Base Model transport network is presented in Figure 5-3. The details of the modeling exercises are documented in a forthcoming working paper titled “Working Paper on Travel Demand Modelling”.

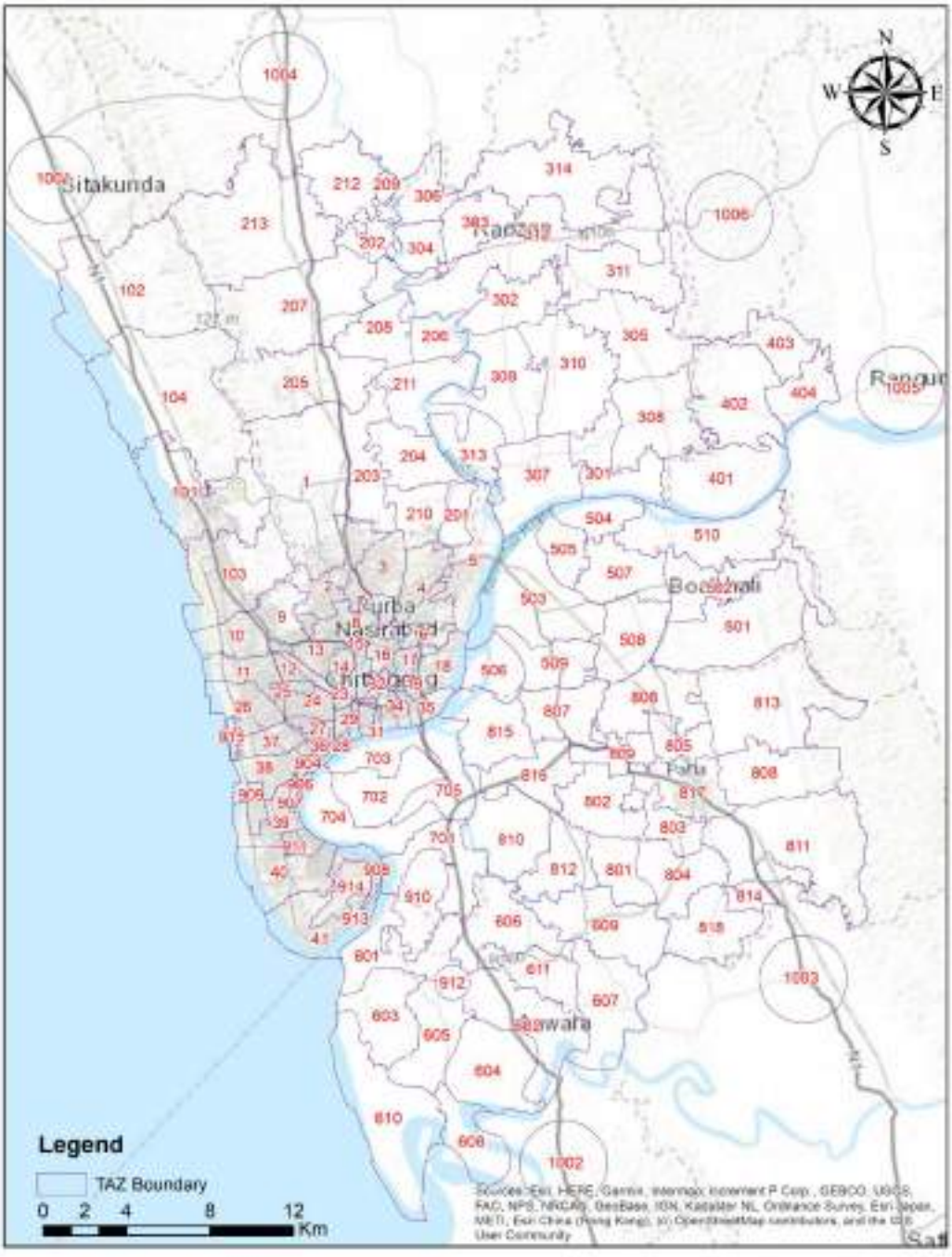



**Figure 5-2: Zoning System of the VISUM Model**


**Figure 5-3: Base Model Transport Network of the VISUM Model**

# CHAPTER SIX

# STRATEGIES AND PRINCIPLES FOR A SUSTAINABLE AND EQUITABLE TRANSPORT SYSTEM

# Chapter 6: Strategies and Principles for a Sustainable and Equitable Transport System

## 6.1. Good Practices

A visually detailed conceptual illustration showcasing sustainable urban transport strategies. The image includes six panels: 1) Transit-Oriented Development (high-density buildings near a train station with mixed-use facilities and green spaces), 2) Travel Demand Management (a congested city street with signage indicating congestion pricing and a dedicated carpool lane), 3) Integrated Transport System (seamless intermodal transit with buses, trains, and bikes connected through a digital display showing real-time schedules), 4) Vision Zero (a safe pedestrian crossing with speed bumps and clearly marked road signs indicating low speed zones), 5) Active Transport (a vibrant cycling lane with people cycling and walking paths in an urban setting), and 6) School Traffic Management (children walking safely on zebra crossings with visible safety measures around a school area). The setting has a modern urban feel with a clean and sustainable aesthetic.

### 6.1.1. Movement and Place

Movement and Place is a planning framework that helps classify roads based on their primary functions—**movement** (efficient travel of people and goods) and **place** (supporting social, commercial, and community activities). Recognizing that roads serve multiple roles, the framework balances the needs of mobility and land access across the network.

Streets are more than just transport corridors; they are dynamic public spaces where people live, interact, and carry out daily life. The Movement and Place approach, used internationally and in parts of Australia, acknowledges this dual role and helps align road design and planning with broader urban development goals.

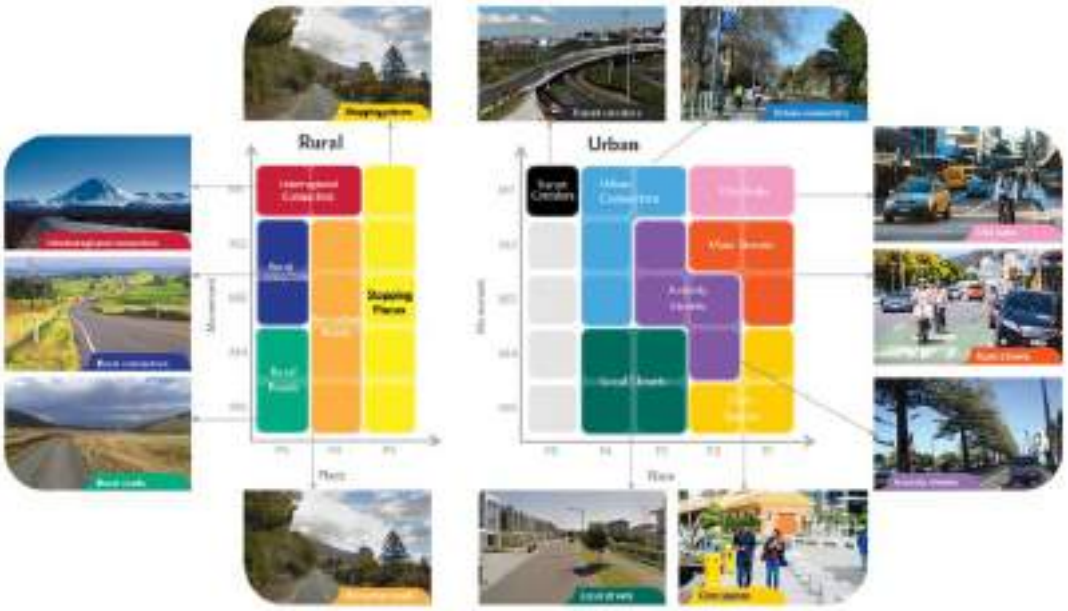



**Figure 6-1: Concept of Movement and Place[2]**

[2] https://www.nzta.govt.nz/planning-and-investment/planning/one-network-framework/overview/street-categories/

As population and land use intensity grow, pressures on roads increase. This framework promotes better planning by:

- Providing a consistent method to define movement and place roles across the network.
- Supporting the creation of higher quality, more livable urban environments by balancing transport and public space needs.

### 6.1.2. Transit Oriented Development

Transit-Oriented Development (TOD) focuses on creating walkable, bikeable, and transit-accessible neighborhoods around public transport stations. It reduces car reliance by mixing residential, commercial, and office spaces within a ¼ to ½ mile (400 to 800m) radius, solving the last-mile problem and promoting sustainability.[3]

**Figure 6-2: Concept design of BRT System[4]**

Copenhagen's 1947 Finger Plan[5], still guiding development today, embodied early TOD principles. Curitiba is a global TOD model, integrating its BRT system with high-density development, cutting car use and pollution. Hong Kong's MTR forms the city's transport backbone, with most areas within walking distance, supported by the "Rail plus Property"[6](R+P) model linking transit and residential growth. Amsterdam, known for cycling and pedestrian-friendly infrastructure, also invests heavily in public transit, making it another strong TOD example.

[3] https://www.hisour.com/data/transit-oriented-development/
[4] https://itdp.in/jharkhands-vision-2026-set-to-embrace-transit-oriented-development/
[5] https://www.sciencedirect.com/science/article/abs/pii/S0966692312000130
[6] https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/the-rail-plus-property-model

**Figure 6-3: Transition Point Between Metro and Bus in Copenhagen and Brasil[7]**

### 6.1.3. Travel Demand Management (TDM)

Travel Demand Management (TDM) uses strategies to reduce congestion by influencing travel behavior and managing road use. It aims to optimize infrastructure, improve traffic flow, and lower environmental impacts through pricing mechanisms, better public transport, carpooling, flexible work hours, and enhanced walking and cycling infrastructure.

Singapore has a leading TDM program, combining congestion pricing, parking restrictions, and car ownership quotas. Its Electronic Road Pricing (ERP) system charges vehicles on congested roads, with 19 active gantries as of July 2024[8], and works with the Certificate of Entitlement system to limit cars. ERP rates are differentiated based on traffic conditions, and adjusted to keep traffic moving at an optimal speed range of 20-30 km/h on arterial roads and 45-65 km/h on expressways[9]. London and Stockholm both use congestion pricing zones and have invested heavily in public transport and cycling infrastructure to reduce traffic.


**Figure 6-4: Singapore's ERP System[10]**

[7] What the World's First Bus Rapid Transit System Can Teach Us | Development Asia
[8] https://www.straitstimes.com/singapore/transport/just-under-one-in-four-erp-gantries-in-operation-today
[9] https://www.mot.gov.sg/what-we-do/motoring-road-network-and-infrastructure/Electronic-Road-Pricing
[10] https://www.mot.gov.sg/what-we-do/motoring-road-network-and-infrastructure/Electronic-Road-Pricing

### 6.1.4. Integrated Transport System

An integrated transport system links buses, trains, subways, trams, bicycles, and walking paths into one seamless network. It allows passengers to move smoothly between modes like cycling to a train station, taking a train to the city, and then a tram to their destination without major delays. This improves convenience, reduces travel time, encourages public transport use, and supports sustainable urban mobility.

### 6.1.5. Global Best Practices in Integrated Transport System

Switzerland exemplifies a highly integrated transport network, including trains, buses, trams, and ferries, known for its reliability and efficiency, serving both residents and tourists. Similarly, Japan's world-class system features high-speed bullet trains connecting major cities seamlessly.

**Figure 6-5: ITS Model of Australia**[11]

Australia has implemented integrated public transport systems in cities like Sydney, Melbourne, Brisbane, Perth, and Adelaide, offering unified ticketing and synchronized schedules across buses, trains, trams, and ferries. Systems such as Opal, Myki, TransLink, and Smart Rider cards enable easy transfers, reducing traffic congestion and promoting sustainable urban development. Sydney's Opal card and Metro, along with Melbourne's tram network, enhance accessibility and encourage public transport use.

### 6.1.6. Zero Vision of Traffic

Vision Zero is a philosophy aimed at eliminating traffic fatalities and serious injuries by creating a safer, more forgiving transportation system. It focuses on three key elements: engineering (redesigning roads and vehicles for safety), education (raising awareness about safe road behaviors), and enforcement (ensuring adherence to traffic laws). Vision Zero aligns with the Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health and Well-being),

[11] https://daynaa2000.wordpress.com/2015/07/05/melbourne-brompton-club-ride-to-the-melbourne-tram-museum-27-june-2015/a-melbourne-b-class-tram-route-86-turning-at-top-of-bourke-street-onto-spring-street-in-front-of-parliament-house/

SDG 11 (Sustainable Cities), and SDG 9 (Industry, Innovation, and Infrastructure), promoting safer, more innovative transport systems.

### 6.1.7. Implementing Zero Vision of Traffic Globally

Sweden aims for zero traffic fatalities by 2030, implementing measures like reduced speed limits, improved road design, and new safety technologies.

Oslo has integrated Vision Zero into its city planning, prioritizing pedestrians and cyclists through expanded zones, safer bike lanes, reduced speed limits, and traffic calming measures like speed bumps. Strict enforcement and public awareness campaigns have also played key roles in creating a safer environment.

The Netherlands and Norway also prioritize road safety, with the Netherlands focusing on cycling infrastructure and driver education, and Norway using innovative measures like center medians to separate traffic. These countries offer successful models for reducing traffic fatalities.

### 6.1.8. Active Transport

Active transport refers to modes of transportation that require physical activity, such as walking, cycling, and using other non-motorized forms of transport. This approach is increasingly being adopted worldwide as cities seek to promote healthier, more sustainable lifestyles and reduce traffic congestion and pollution. Many countries have embraced the concept of active transport by making deliberate efforts to improve infrastructure and policies to encourage walking and cycling.

Countries like the Netherlands, Bogota, Denmark, Germany, and France have made significant strides in promoting active transport. In the Netherlands, cycling is a key part of daily life, supported by an extensive network of bike lanes and cycling-friendly infrastructure. Bogota's "Ciclovía" initiative, where major roads are closed to motor vehicles on Sundays, encourages walking and cycling, a model now replicated in other cities. Copenhagen stands out with its wide, separated bike lanes, bike-sharing programs, and policies that prioritize cycling over cars. German cities like Berlin and Hamburg focus on making walking and cycling attractive alternatives to driving, with investments in pedestrian-friendly streets and cycle paths. In France, cities like Paris have expanded bike lanes, developed bike-sharing programs, and created car-free zones to encourage cycling, with over 100km of dedicated bike lanes linking Olympic venues.

**Figure 6-6: Active transport infrastructure in Netherlands**[12] [13]

### 6.1.9. School Traffic Management

School traffic management is a significant concern in many countries, especially in urban areas where schools are located in busy, high-traffic zones. Several countries have adopted effective practices to manage school traffic and ensure the safety of students, parents, and teachers.

In Australia, cities like Sydney and Melbourne focus on managing school traffic with measures such as reduced speed limits in school zones, kiss-and-ride zones for safer drop-offs, and walking school buses to reduce car use. The Netherlands promotes cycling through dedicated bike paths and training programs for students, while cities like Amsterdam prioritize cyclists near schools with smart traffic lights.

In Canada, Vancouver and Toronto have implemented drop-off zones, traffic calming, and active transport programs. The UK uses School Travel Plans and school streets, where roads are closed during drop-off times for safety.

In Japan, school traffic management involves community safety measures, including walking groups and volunteer patrols. Finland emphasizes road safety education, lower speed limits, and safe drop-off loops. In the US, cities like Portland have Safe Routes to School programs and walking school buses to improve safety.

## 6.2. Guiding Objectives – Toward a Sustainable and Equitable Transport Future

[12] https://bicycledutch.wordpress.com/2020/08/12/cycle-lanes-in-the-netherlands/
[13] https://www.24oranges.nl/2016/05/01/inventor-of-bike-sharing-explains-why-his-plan-never-caught-on-in-amsterdam/

The development of a resilient, inclusive, and efficient transportation system is vital to the future growth and livability of Chattogram. As the city continues to urbanize and expand, it must adopt a transport strategy that not only meets current demands but also anticipates future challenges—ranging from congestion and accessibility gaps to climate vulnerability and economic inefficiency.

This chapter outlines the **key guiding objectives** that will shape the direction of Chattogram's transportation planning and investment. These objectives provide the foundation for designing a multimodal transport system that is **integrated**, **inclusive**, **safe**, **efficient**, **resilient**, and **accessible** to all users. Each objective addresses a critical component of sustainable urban mobility and reflects a commitment to equitable growth, user-centered design, and environmental responsibility.

By focusing on these pillars, Chattogram aims to create a transport system that enhances the quality of life, supports economic development, ensures safety for all road users, and remains adaptable to the city's dynamic topography and climate risks.

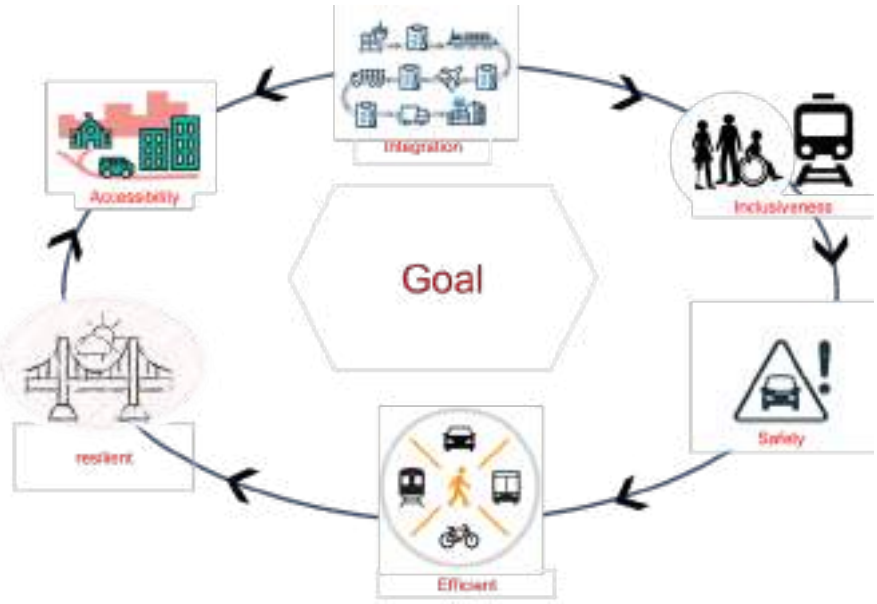



**Figure 6-7: Guiding Objectives**

### 6.2.1. Integration

Integration lies at the core of our vision for transportation strategy, encompassing a multifaceted approach aimed at enhancing connectivity and accessibility for all. We envision a comprehensive walkway network that seamlessly intertwines with existing infrastructure, providing safe and convenient pathways for pedestrians. Ample parking facilities strategically located throughout urban centers ensure ease of access while minimizing congestion and promoting sustainable modes of transport. Safe crossing facilities at key intersections prioritize pedestrian safety, fostering a pedestrian-friendly environment conducive to active lifestyles. Furthermore, our focus on intermodal connectivity facilitates seamless travel experiences, allowing commuters to transition effortlessly between different modes of transportation, ultimately enhancing efficiency and promoting sustainable mobility solutions.

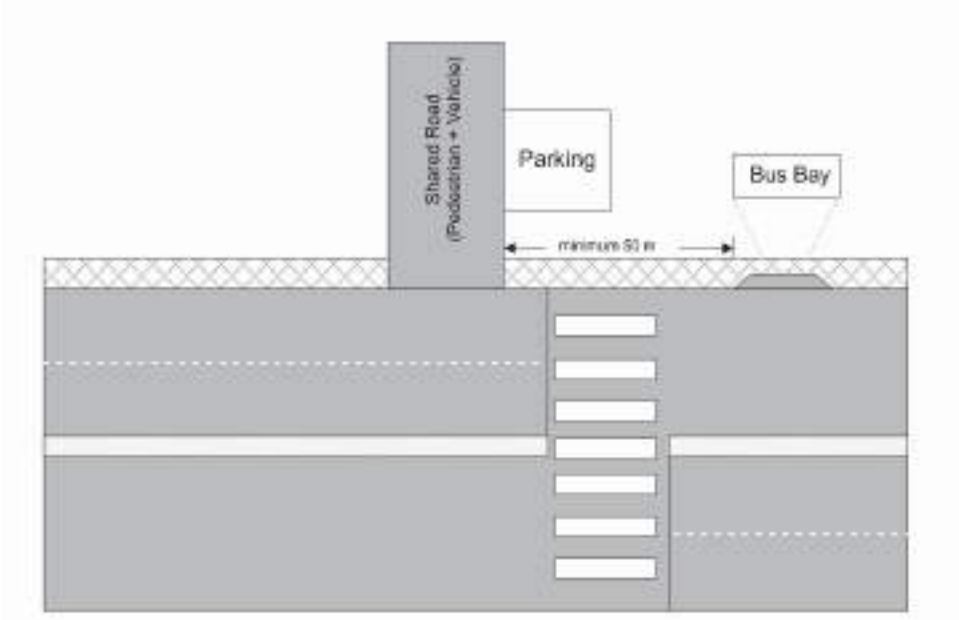



**Figure 6-8: Integration Between Different Transport Modes**

### 6.2.2. Inclusiveness

Public transportation in Chattogram suffers from a significant lack of adequate facilities for women, pregnant women, the elderly, and differently-abled individuals, exposing a major gap in inclusivity and accessibility. This deficiency not only violates the rights of these marginalized groups but also goes against the principles outlined in legislation such as the Disability Discrimination Act (DDA). The DDA mandates inclusive facilities like ramps, auditory signals, and accessible toilets, yet the reality on the ground is far from what is required. The failure to implement these essential features highlights a systemic shortfall in meeting the needs of vulnerable populations, which diminishes their ability to access public transport and participate fully in society.

**Figure 6-9: Busses Meeting the Needs of the Specially Abled**

For instance, the absence of seating areas or priority zones for pregnant women not only inconveniences them but also compromises their safety and comfort during transit. Similarly, elderly passengers are often excluded from public transport due to the lack of ramps or boarding assistance, limiting their mobility and independence. Furthermore, the design of conventional rickshaws makes them inaccessible for elderly individuals due to their height, showcasing how existing infrastructure fails to meet the needs of diverse groups. Similarly, there are few provisions for differently-abled individuals, including those who rely on

wheelchairs, exacerbating their exclusion. To address these issues, it is essential for authorities to retrofit existing infrastructure, invest in specialized vehicles, and train transportation staff to assist individuals with disabilities. Prioritizing inclusivity and accessibility in public transportation planning will ensure equal mobility for all citizens and fulfill the legal and social obligations to marginalized groups.

### 6.2.3. Safety

Safety is a fundamental guiding objective for any transportation system, as it directly impacts the well-being of road users and helps prevent accidents and fatalities. Traffic safety must be addressed through a comprehensive approach that incorporates Engineering, Education, Enforcement, and Emergency (Es) measures. These pillars work together to create a safer road environment by reducing risks, promoting responsible behaviors, and ensuring that adequate systems are in place to handle emergencies. Engineering solutions, such as enhancing intersections, installing safety barriers, and providing clear road markings, are essential to minimizing accidents and protecting both pedestrians and cyclists. Additionally, creating dedicated spaces for cyclists and pedestrians further promotes safety and encourages the use of alternative, more sustainable transportation modes.

To improve safety, it is crucial to strengthen traffic control and enforcement measures, particularly at accident-prone locations. Equipping law enforcement agencies with the necessary tools and resources ensures better management of traffic violations and higher levels of compliance. Equally important is the integration of traffic safety education into the community, particularly in schools, to instill awareness from a young age. Educating drivers through formal programs can also enhance responsible driving behavior and reduce road-related incidents. Emergency medical care is another critical component, where the establishment of accessible first-aid centers and the implementation of comprehensive traffic accident insurance systems can provide immediate relief and long-term support for accident victims. By focusing on these areas and enforcing regulations consistently, we can create a safer road environment for all, ensuring that vulnerable groups, including those with disabilities, are not excluded from safety measures.

### 6.2.4. Efficiency

The objective of efficiency in our transportation system is paramount, as the lack of effective traffic management not only hampers our economy but also squanders precious time. The Accident and Research Institute of Bangladesh University of Engineering and Technology found that daily traffic congestion causes a loss of approximately **Tk 140 crore** in working hours daily.

The inefficiencies stemming from inadequate traffic management, parking management, and public transport mismanagement impede the smooth flow of goods, services, and people, thereby hindering economic growth and productivity.

Resolving these issues calls for a concentrated effort to improve the accessibility and dependability of public transportation networks, optimize parking availability, and simplify traffic flow. We may reduce delays and increase the effectiveness of our road networks by enhancing traffic management techniques, such as installing intelligent traffic signal systems and using data-driven analytics for congestion mitigation.

Similarly, implementing smart parking solutions, such as real-time availability tracking and dynamic pricing mechanisms, can alleviate congestion and optimize the utilization of parking spaces, parking guideline thereby minimizing time wastage and enhancing overall efficiency.

Furthermore, addressing public transport mismanagement or inefficiencies in the system, such as inadequate infrastructure, unreliable schedules, and insufficient coverage, is crucial for promoting modal shift and reducing reliance on private vehicles. Investing in the expansion and modernization of public transport networks, enhancing connectivity, and improving service quality can enhance the attractiveness and efficiency of public transportation, thereby reducing traffic congestion and improving overall mobility.

### 6.2.5. Resilient

In Chattogram, the objective of resilience is of paramount importance due to its diverse and challenging geographical features. Nestled between hills and the sea, the region's mixed land use presents a complex landscape that is both beautiful and prone to environmental vulnerabilities.

The area faces a myriad of natural hazards, including cyclones, waterlogging, floods, landslides, earthquakes, and the threat of rising sea levels. These hazards pose significant risks to both human lives and critical infrastructure, including transportation networks.

One of the most pressing challenges is the vulnerability of roads to destruction caused by landslides, inundation, and the corrosive effects of saltwater. In low-lying areas, waterlogging during heavy rains can weaken road foundations, leading to structural damage and disruptions in transportation flow. Similarly, landslides triggered by heavy rainfall can result in road blockages and hazardous conditions for commuters.

Moreover, the proximity to the sea makes certain areas susceptible to saltwater intrusion, which can corrode road surfaces and undermine their integrity over time. This issue is exacerbated by sea-level rise, which increases the frequency and severity of saltwater incursions onto coastal roads.

To address these challenges, it is imperative to enhance the resilience of infrastructure, particularly roads, in Chattogram. One effective strategy is the use of reinforced concrete (RCC) in road construction, especially in areas prone to saltwater entry. RCC offers greater durability and resistance to corrosive elements, thus minimizing the risk of road damage and ensuring long-term functionality.

### 6.2.6. Accessibility

The objective of accessibility in transportation is fundamental, aiming to ensure that the transport system is available, intermodal, and economically accessible for everyone.

Firstly, availability focuses on making transportation options readily accessible to all individuals, regardless of their location or mobility needs. This includes establishing a comprehensive network of transportation services that cover urban, suburban, and rural areas, ensuring that no community is left underserved. Additionally, providing accessible infrastructure such as ramps, elevators, and tactile paving at transportation hubs ensures that individuals with disabilities can navigate the system independently.

Intermodal transport is another key aspect of accessibility, facilitating seamless transitions between different modes of transportation. By integrating various modes such as buses, trains,

ferries, and bicycles, passengers can easily switch between modes to reach their destinations efficiently. This interconnectedness not only enhances convenience but also reduces reliance on private vehicles, thereby alleviating traffic congestion and environmental impact.

Moreover, ensuring that transportation remains economically accessible for everyone is crucial for promoting social equity and inclusion. This involves keeping fares affordable, especially for low-income individuals and marginalized communities. Additionally, implementing fare subsidy programs, discounted passes, and flexible payment options, such as card systems, can further improve affordability and make transportation accessible to those facing financial constraints. By offering convenient and versatile payment methods, like card systems, passengers can easily manage their transportation expenses, thereby enhancing their access to essential mobility services. This concerted effort towards economic accessibility not only fosters social inclusion but also contributes to a more sustainable and equitable transportation system for all.

# CHAPTER SEVEN

# FORMULATION OF THE TRANSPORT MASTER PLAN

# Chapter 7: Formulation of the Transport Master Plan

## 7.1. Transportation Policies

The transportation policies outlined in this section are developed based on the guiding objectives of the Chattogram Transport Master Plan. These policies provide a strategic framework to shape investment, planning, and coordination across all transport modes. They aim to ensure inclusive access, sustainability, safety, and operational efficiency across the Chattogram Metropolitan Area, while strengthening institutional capacity and environmental compliance.

- ***TRN. 1.*** Promote inclusive and universally accessible pedestrian and NMT infrastructure throughout the city
- ***TRN. 2.*** Transition to an efficient, inclusive, and company-operated public transport system
- ***TRN. 3.*** Encourage sustainable development and upgrading of urban and regional road infrastructure
- ***TRN. 4.*** Improve safety, design quality, and operational efficiency at road junctions
- ***TRN. 5.*** Ensure the transport sector is developed to effectively complement port expansion and support efficient freight movement.
- ***TRN. 6.*** Expand and modernize rail-based services for both urban mobility and freight movement
- ***TRN. 7.*** Facilitate safe, inclusive, and efficient inland water transport
- ***TRN. 8.*** Improve air transport facilities and integrate the airport with the city's wider transport system
- ***TRN. 9.*** Implement effective traffic and parking management and digitized enforcement systems
- ***TRN. 10.*** Strengthen east-west connectivity through appropriate river crossing infrastructure
- ***TRN. 11.*** Enhance road safety through proactive education, design, and enforcement initiatives
- ***TRN. 12.*** Regulate environmental impacts and ensure vehicle roadworthiness through strict monitoring
- ***TRN. 13.*** Mandate traffic impact assessments for major land developments
- ***TRN. 14.*** Strengthen institutional arrangements for coordinated traffic and transport planning

Sector-wise plans have been developed based on these policies, outlining clear guidelines along with specific programs and projects. Priority has been given to initiatives that require immediate implementation, with those actions distinctly highlighted for prompt adoption.

## 7.2. Road Network Development Plan

***TRN. 1:*** *Promote inclusive and universally accessible pedestrian and NMT infrastructure throughout the city.*

***TRN. 3:*** *Encourage sustainable development and upgrading of urban and regional road infrastructure*

***TRN. 4:*** *Improve safety, design quality, and operational efficiency at road junctions*

***TRN. 10:*** *Strengthen east-west connectivity through appropriate river crossing infrastructure*

A strategic road network has been proposed for Chattogram to establish a well-structured and efficient transport system that supports current and future travel demand. Such a network is essential for guiding infrastructure investment, ensuring connectivity across key urban and regional areas, and improving overall mobility. The proposed network integrates both existing and new links and extends up to the level of secondary roads, categorized into primary and secondary networks based on function and hierarchy. The layout of the strategic road network is shown in Figure 7-1.

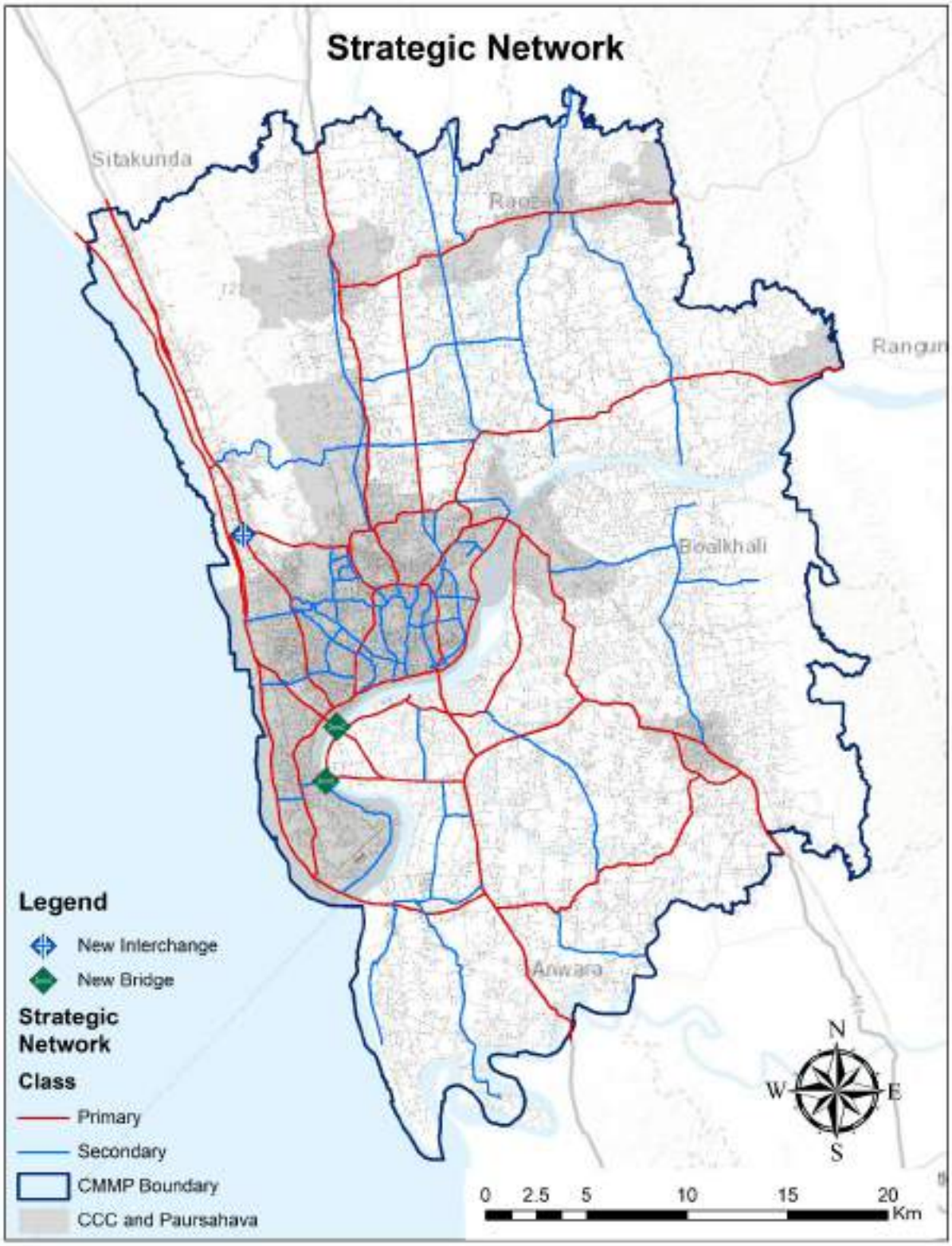



**Figure 7-1: Strategic Road Network for CMMP Area**

### 7.2.1. Road Hierarchy

A clear road hierarchy is essential for managing traffic flow, ensuring road safety, and supporting efficient urban development. It classifies roads based on their function—from high-capacity arterials for long-distance travel to local streets for property access. In Chattogram, an organized hierarchy is crucial to address growing mobility needs, guide infrastructure investment, and support integrated transport planning.

This chapter outlines the proposed road hierarchy tailored to Chattogram's urban context, providing a framework for road design, access control, and multimodal integration. The hierarchy is based on the functionality and purpose of the roads rather than width.

#### Highways

RHD (Roads and Highways Department) roads in Bangladesh are designed to facilitate regional and national connectivity by linking major cities, economic hubs, ports, and borders. These roads include national highways, regional highways, and district roads, and are crucial for long-distance travel, trade, and the movement of goods and people across the country.

- **National Highway:** Connect the capital city with district headquarters, port cities and international highways
- **Regional Highway:** Connect between district headquarters, main river/land ports, unconnected with highways
- **Zila Road:** Connect district headquarters to Upazila headquarters, or between Upazila headquarters, by main single connection with national/ regional highway, through shortest distance/route

#### Urban Road

Urban roads lie within the City Corporation area, typically developed by CDA and maintained by CCC. They form the core network supporting urban mobility, connecting neighborhoods, commercial areas, and institutions within the city.

- **Primary Distributor:** The function of primary distributors is to act as through-routes, taking traffic from Chattogram to other centers in the region or the country and avoiding the need for this through-traffic to enter the internal road network of the city.
- **Secondary Distributor**: District distributor roads link the city with primary distributor routes and connect various important activity nodes within the city.
- **Local Distributor:** Local distributor roads primarily collect and distribute traffic to and from residential areas to other parts of the road hierarchy.
- **Access Road:** Access roads provide direct access to residential areas and properties therein.

Detailed characteristics are shown in Table 7-1

**Table 7-1: Urban Road Characteristics**

| Component | Primary Distributor | Secondary Distributor | Local Distributor | Access Road |
|---|---|---|---|---|
| Design Speed (Km/h) | 60, 80 | 50 | 40 | 30 |
| Right of Way (ft) | 80-120 | 60-80 | 40-60 | At least 20 |
| Number of lanes | 4- 8 | 2- 4 | 2- 4 | 2 |
| Pedestrian Facilities | Dual Sidewalk (where needed) | Dual Sidewalk | Dual Sidewalk | Shared |
| Bus lanes | Possible | Possible | N/A | N/A |
| Rickshaw/Auto | Prohibited | Possible | Possible | Possible |

### Rural Road

LGED roads in Bangladesh primarily serve to enhance rural and peri-urban connectivity by linking villages to markets, schools, healthcare, and other essential services. These roads support local economies, promote social inclusion, and reduce poverty by improving access in underserved areas.

- **Upazila Road:** Connect Upazila headquarters with growth center(s), or between growth centers by main single connection, or growth center with higher road system (national highways, regional highways and Zila roads) with shortest distance route
- **Union Road:** Connect Union headquarters with Upazila headquarters, growth centers or local market
- **Village Road (Type A):** Connect Villages to Union headquarters.

- Local markets, farms and ghats, or with each other
  - **Village Road (Type B):** Connect roads within a village

## 7.2.2. Road Network Standards and Cross-Sections

This section shows standard road cross sections to guide future road building and upgrades in the Chattogram Metropolitan Area. These designs match the type and use of each road, and include space for all kinds of transport. Concept design and cross sections for different road widths (Right of Way) are shown in Figure 7-2 to Figure 7-6.

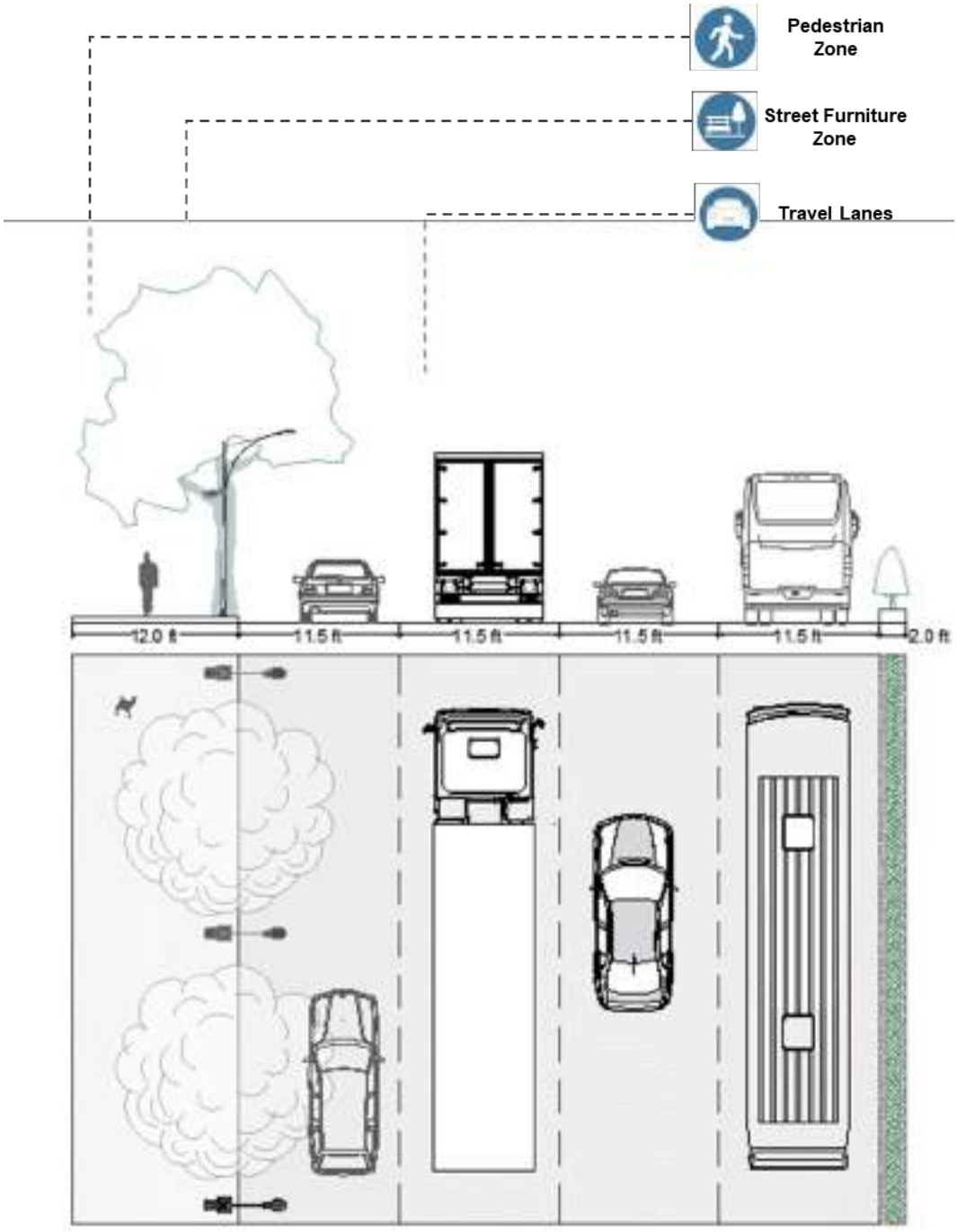



**Figure 7-2: Cross Section of a 120 ft Road with Bus Bay (edge to center of the median)**

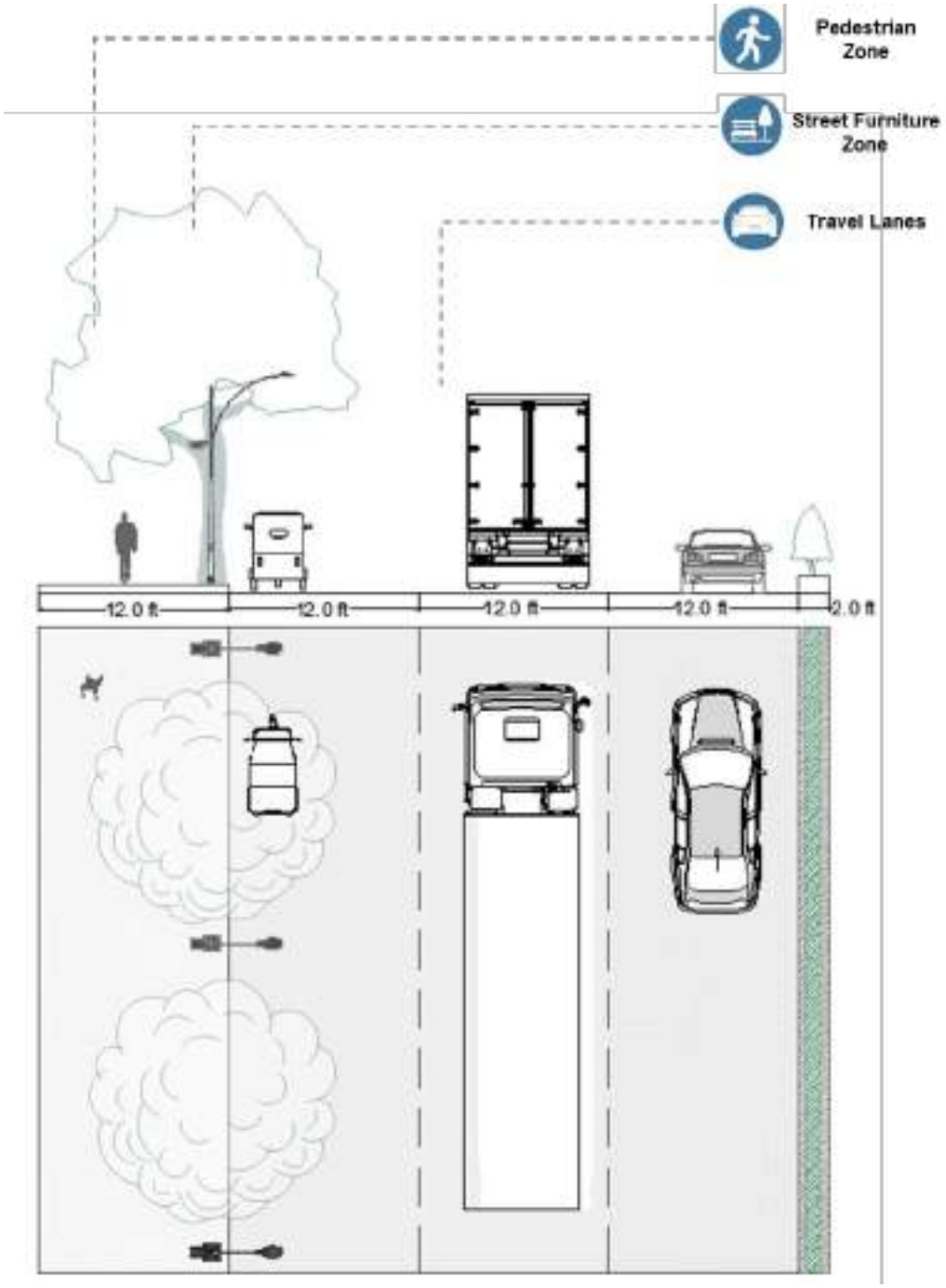



**Figure 7-3: Cross Section of 100ft Road (edge to center of the median)**

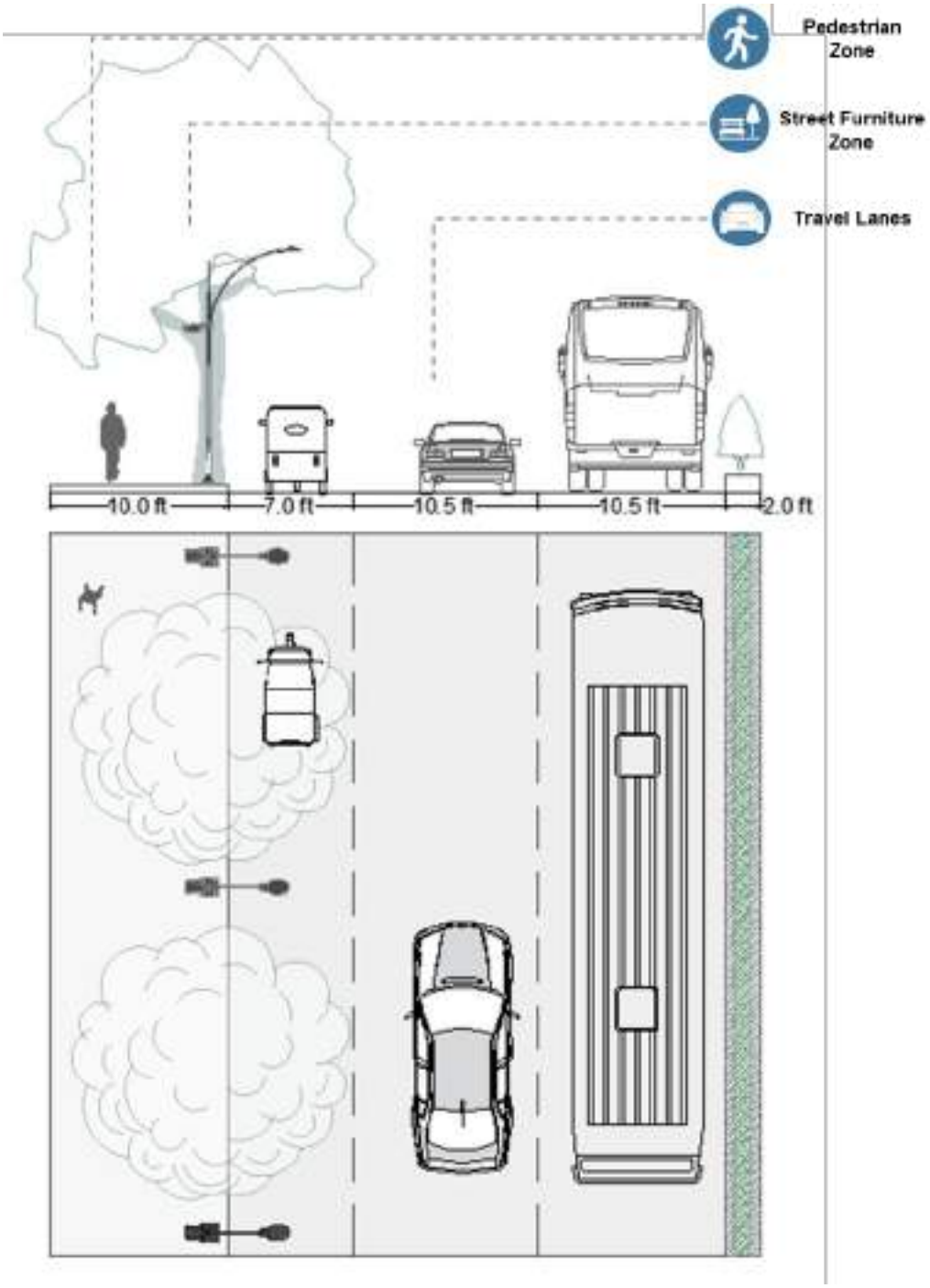



**Figure 7-4: Cross Section of an 80ft Road (edge to center of the median)**

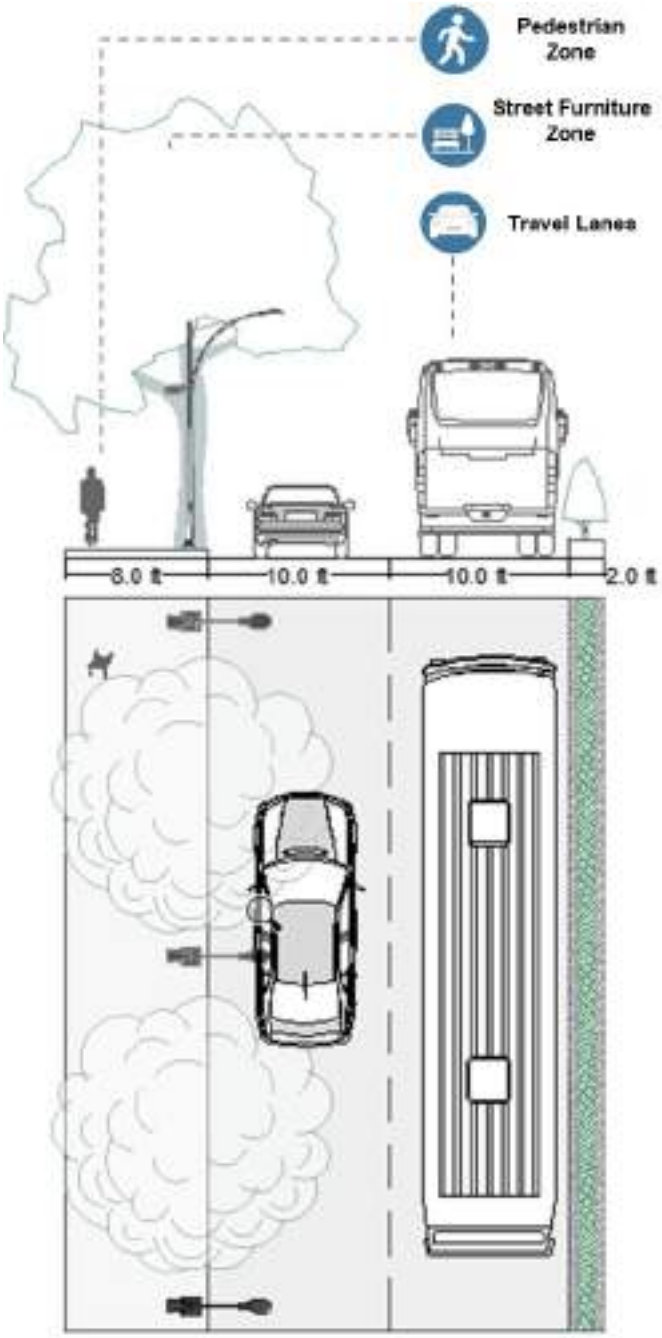



**Figure 7-5: Cross Section of a 60ft Road (edge to center of the median)**

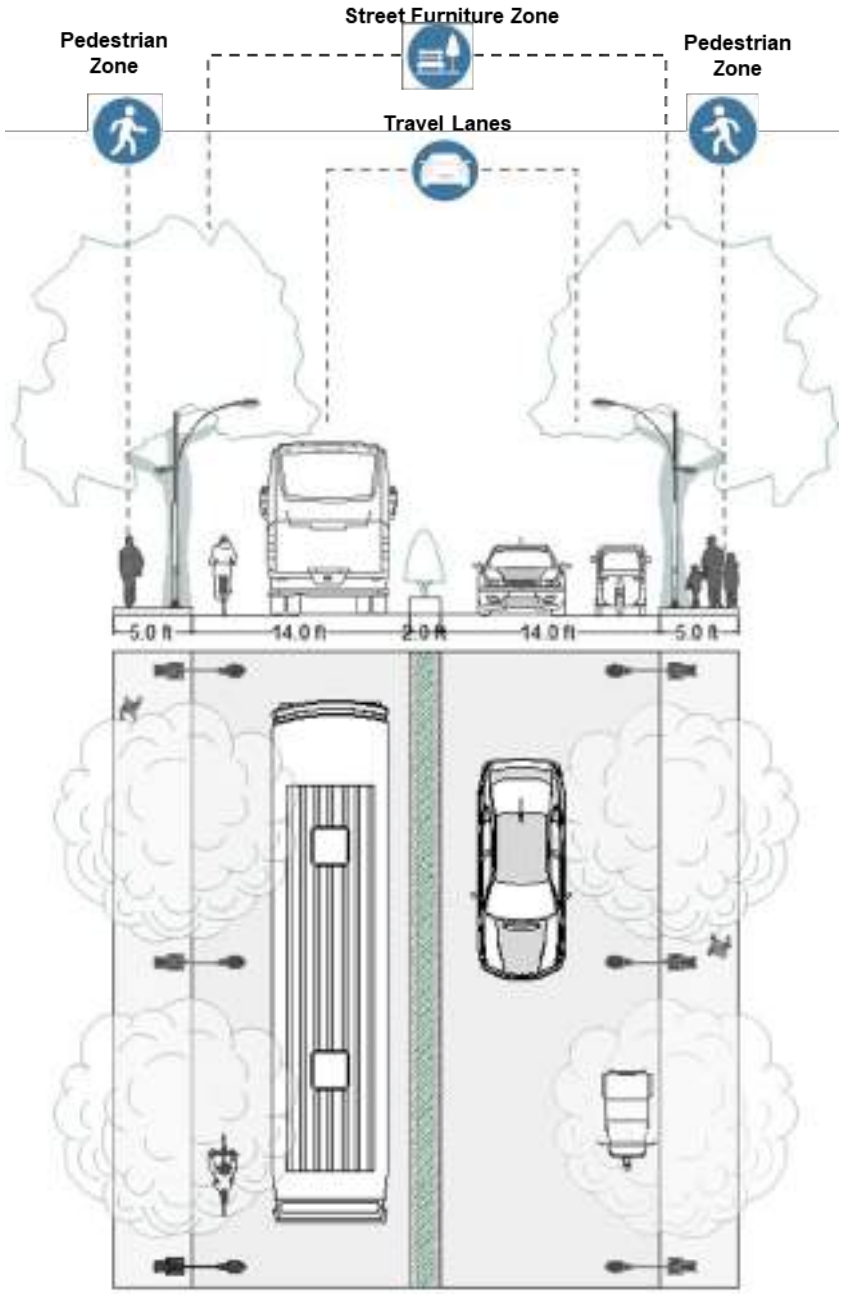



**Figure 7-6: Cross Section of 40ft Road**

### 7.2.3. Improvement of Current Strategic Road Network

Improving Chattogram's current road network is critical to enhancing mobility, connectivity, and economic growth. The existing road infrastructure is often narrow and congested, lacking the capacity to support the city's growing transport demand. As a first step, widening key arterial and sub-arterial roads is necessary to improve traffic flow and reduce bottlenecks. This will significantly enhance mobility, particularly along corridors connecting major Upazila centers and economic hubs.

The road network development plan also focuses on establishing new road links to open up underdeveloped areas and support balanced urban expansion. These new connections will link key activity centers—including the city center, Paurashavas, Upazila headquarters, and major employment zones—strengthening the region's socio-economic fabric. Additionally,

unlocking access to the eastern side of the city through improved road infrastructure is a strategic priority, as it offers immense potential for future urban development.

Wider highways and improved access roads to and from Upazila centers will ensure smoother inter-district movement and support regional integration. Furthermore, the development of new crossings over the Karnaphuli River is essential for facilitating better freight mobility between the port, industrial zones, and southern parts of the city, reducing pressure on existing bridges and creating a more resilient logistics network. Road network improvement are shown in Figure 7-7 and Figure 7-8.

During stakeholder consultations, the need for an east-west connector from Hathazari to Sitakunda, facilitating travel towards Dhaka, was raised. The nearest existing connector, Bhatiyari-Hathazari Link Road, is approximately 8 km south from Hathazari and currently experiences relatively low traffic volumes—about 350 vehicles per hour both direction (peak hour demand)—comprising 16% buses and 66% trucks, as per the Masterplan's traffic count survey. Again, the travel demand modeling for 2050 shows that this traffic will be approximately doubled (peak volume around 530 vehicles per hour direction) which is well within the capacity. Additionally, due to the absence of major employment centers in the Hathazari-Raozan area, there is limited travel demand towards Dhaka-Chattogram highway from this area. Again, this proposal will face significant environmental constraints, as it would require cutting through northern hill ranges and forests, causing substantial ecological damage. Given the low demand and high environmental cost, the construction of this connector does not appear feasible at present. However, if a significant employment hub is established in the future, the justification for the corridor may change. This can be reassessed during the next review of the Masterplan, but based on current projections, the corridor remains unjustifiable up to 2050.

As part of the transport master plan, the road proposals from the DAP 2008 were carefully reviewed. Some proposed roads were dropped due to extensive existing development along their alignment, which left no space for new road construction. In cases where new road proposals overlapped with existing roads, they were reclassified as widening projects, in line with existing alignments maintained by CDA's town planning guidelines. New roads that were found to be necessary for improving connectivity and capacity have been incorporated into the strategic road network plan, as illustrated in Figure 7-8. However, certain proposed roads in peripheral areas such as Raozan, Anwara, Karnaphuli, and Patiya require further detailed studies and local action plans to assess their feasibility and relevance. The details can be found in the *Working Paper on Review of Master Plan and Detailed Area Plan*.

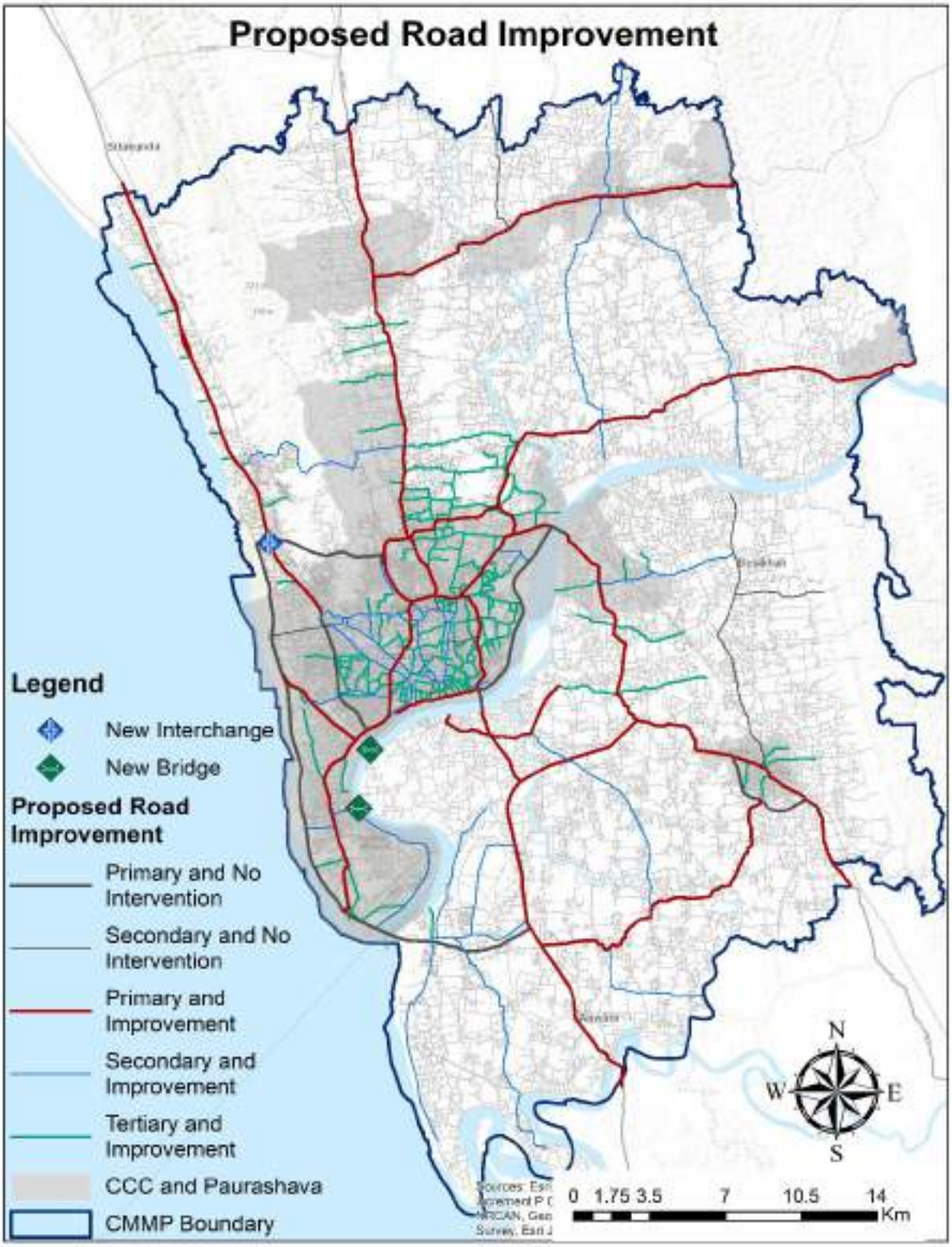



**Figure 7-7: Proposed Road Improvements for Strategic Network**

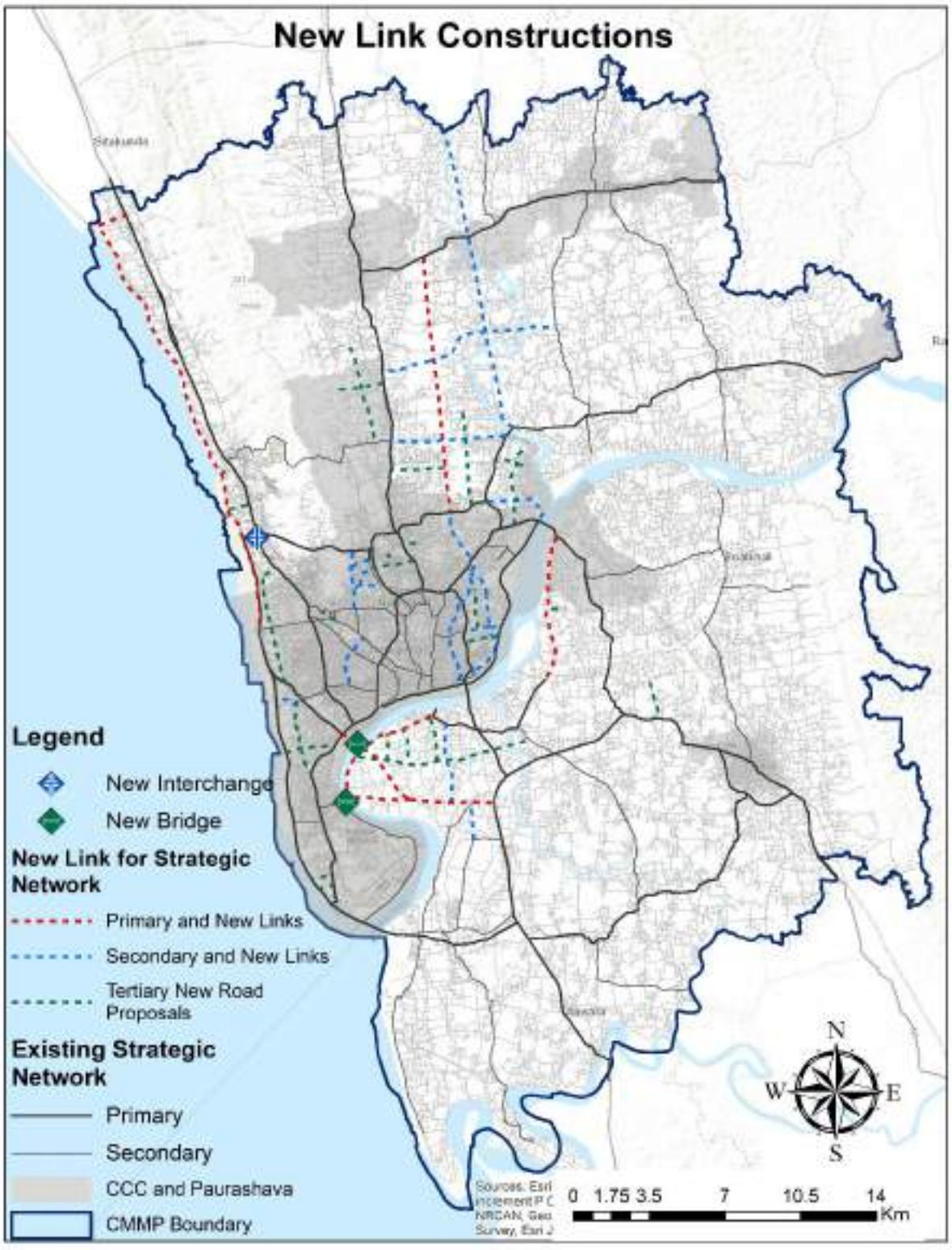



**Figure 7-8: Proposed New Links for Strategic Network**

### Guidelines for Road Network Development

- **Alignment of New Links:** Proposed new road links are indicated with tentative alignments. Final detailed alignment and design must be carried out by relevant implementing agencies (CDA, RHD, LGED), supported by a mandatory feasibility study for each connection, considering technical, environmental, and social aspects.
- **Preservation of Road Reserves:** Even where immediate full-scale construction may not be feasible, authorities must preserve the designated right-of-way (ROW) or road reserves to accommodate future expansion and utility placement. This also includes controlling unauthorized development along these corridors.
- **Standard Compliance:** All roads should be designed and developed in accordance with established standards for both carriageways (as outlined in Section 7.2.2) and pedestrian facilities (Section 7.4.1), ensuring safety, accessibility, and comfort for all users including pedestrians, cyclists, and persons with disabilities.
- **Road Improvement Projects:** Upgrading of existing roads includes both physical widening and functional improvements to optimize traffic flow and enhance safety. This must involve removal of encroachments, ensuring that the full standard width of carriageway and pedestrian paths are achieved wherever possible. Utility relocation and drainage integration should also be considered as part of improvement efforts.
    - The current government land acquisition guideline—where compensation is set at three times the mouza land price—is no longer suitable for development projects, particularly in urban areas, as actual urban land values have increased dramatically.
    - For road widening within the city, land cost will be a major challenge. This can be partially addressed by accounting for the benefits accrued to adjacent landowners, with a betterment fee introduced to help offset land acquisition costs.
    - Other mechanisms—such as the transfer of development rights and the provision of FAR incentives—can also be applied to help offset land acquisition costs.
- **Integrated Streetscape and Amenities:** All road corridors should incorporate thoughtful streetscape elements including but not limited to:
    - Adequate and energy-efficient street lighting
    - Properly located and shaded (if possible) public transport stops
    - Clearly marked road signs and lane markings
    - Traffic signals and designated pedestrian crossings at appropriate intervals
    - Landscaping elements such as trees for shade and urban cooling
    - Waste bins and seating arrangements in high pedestrian activity zones
- **Maintenance Strategy**: A long-term road maintenance plan should be established for each new development, detailing routine and periodic maintenance activities, responsible agencies, and funding mechanisms to ensure longevity and safety.

### 7.2.4. Intersection Improvement

Effective intersection design is critical for improving traffic flow, ensuring road safety, and enhancing the overall efficiency of the transport network in the Chattogram Metropolitan Area. Intersections are high-conflict zones where multiple traffic streams converge, making them particularly vulnerable to congestion, delays, and accidents. Poorly designed intersections—characterized by unclear lane markings, lack of signals, inadequate pedestrian infrastructure, and disorganized traffic movement—lead to chaotic conditions, reduced road capacity, and heightened risk for all road users. The intersection improvement program will be implemented through two key approaches: improved intersection design and improved management. Location of these intersections are shown in Figure 7-9 and are categorized on the basis of priority for improvement.

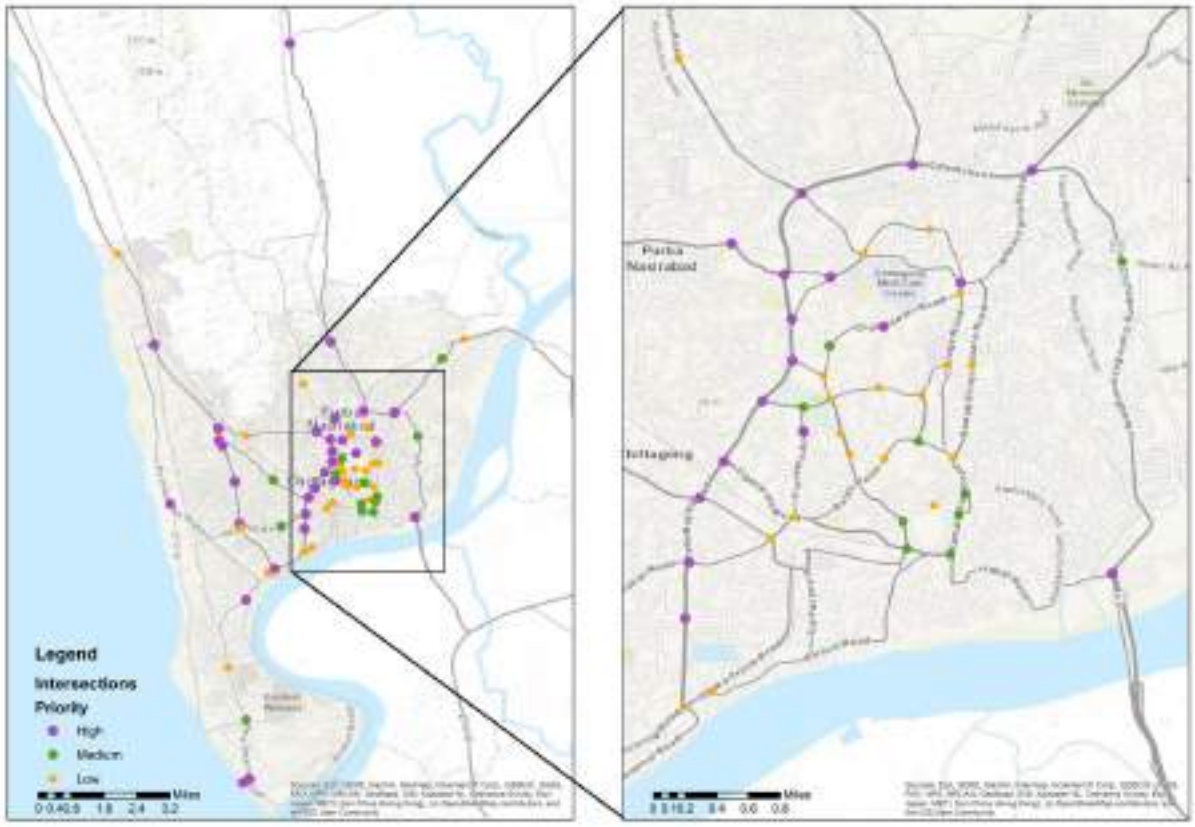



**Figure 7-9: Intersection Improvement Locations**

#### Guidelines for Intersection Design

- Channelization of turning movements shall be adopted to minimize conflict points and organize traffic flow effectively.
- Traffic signals must be installed and synchronized at all major intersections to regulate movement and enhance safety.
- Pedestrian crossings, footpaths, and refuge islands must be incorporated in intersection design to ensure safe pedestrian movement.
- Intersection footprint shall be minimized through geometric redesign to reduce the number of conflict zones and enhance vehicular flow.

- Left-in/left-out intersections must be redesigned to prevent conflicting movements and ensure safe, controlled access.
- All major intersections shall include proper road signage, lane markings, and turn indicators to guide driver behavior and improve traffic discipline.
- Intersection designs must accommodate future traffic volumes, multimodal integration, and emergency vehicle access.
- Intersection improvement projects should be guided by traffic simulation studies and safety audits.
- Obstructive structures within intersections shall be removed or redesigned to streamline traffic and improve visibility.

The master plan has prepared concept designs based on these guidelines for several major intersections, as shown in Figure 7-10.


Love Lane Intersection


Noyabazar

**Figure 7-10: Intersection Concept Designs**

## 7.3. Public Transport Plan

***TRN. 2.*** *Transition to an efficient, inclusive, and company-operated public transport system*

***TRN. 11.*** *Enhance road safety through proactive education, design, and enforcement initiatives*

***TRN. 12.*** *Regulate environmental impacts and ensure vehicle roadworthiness through strict monitoring*

### 7.3.1. Public Transport System

Investment in the public transportation system depends largely on the type of system selected whether it is a traditional bus service, a Bus Rapid Transit (BRT), or a Mass Rapid Transit (MRT) system. Each mode comes with varying levels of capital investment, operational costs, and service capacity. For such investments to be financially and operationally viable, the projected passenger demand must meet certain thresholds.

As illustrated in the Figure 7-11, traditional bus services are suitable for lower-demand corridors due to their lower capital costs. BRT systems offer a cost-effective solution for medium-demand corridors, providing higher capacity and speed through dedicated lanes. MRT systems, while requiring the highest investment, are only justifiable in high-demand corridors where they can operate efficiently and sustainably. Proper alignment between transport demand and system type is essential to ensure cost-effectiveness, long-term viability, and service quality.

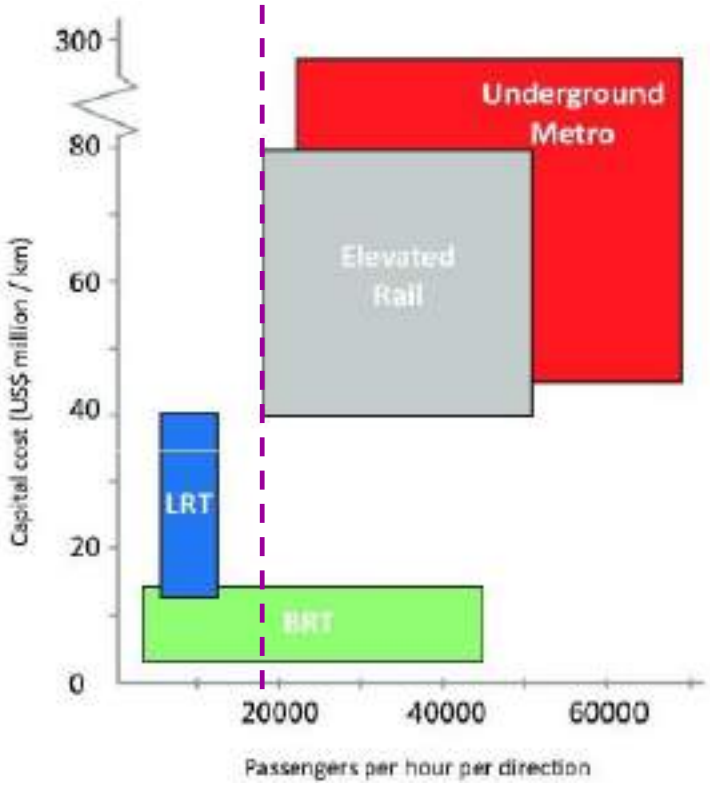



**Figure 7-11: Feasibility of Different Public Transport System**

## SUTMP Recommendations

The Strategic Urban Transport Master Plan[14] (SUTMP) for Chattogram developed by World Bank, outlines a phased approach to improving mobility through enhanced public transport, pedestrian infrastructure, and traffic management. The study concluded that projected trip volumes would not meet the threshold required to justify metro (MRT) systems, making them unfeasible due to both low demand and high cost. Instead, BRT was identified as the most appropriate mode, offering affordability, flexibility, and better alignment with local infrastructure and capacity. Three indicative BRT corridors—Green, Blue, and Red as shown in Figure 7-12, were chosen for the feasibility study, and the green one was recommended for implementation.


**Figure 7-12: BRT Routes for Feasibility Assessment[14]**

The proposed BRT system includes dedicated running lanes along CDA Avenue and Arakan Road, using one lane beneath the flyover and another from existing traffic lanes. Stations are placed mid-road between flyover pillars, with designs allowing different service types. In narrower areas, asymmetric stations are planned to retain capacity.

[14] e.Gen Consultants Ltd., & Integrated Transport Planning Ltd. (2018, November 19). *Chattogram Strategic Urban Transport Master Plan (P155253): Corridor improvements pre-feasibility study*. The World Bank.

### KOICA-DTCA Study

Another feasibility study of MRT system in Chattogram is currently being studied under a KOICA (Korea International Cooperation Agency)–funded project, implemented by the Dhaka Transport Coordination Authority (DTCA). The Masterplan team will assess the outcome of that study (if available, within the study period) and will update in the Final Report.

### CCC-Orascom-Arab Contractors MOU[15]

Chattogram City Corporation (CCC) signed a Memorandum of Understanding (MoU) on June 1, 2025, with a joint venture investor consisting of the Orascom Group and the Arab Contractors Group to construct a Monorail Network in Chattogram. Under the MoU, the investor is expected to carry out a feasibility study for the project in Chattogram, which is yet to be started. The projected construction cost is estimated at approximately Tk 25,000 crore, with an anticipated implementation period of about five years.

### Assessment of the CMMP Team regarding MRT and Monorail

Table 7-2 presents six scenarios indicating when the target ridership of MRT can be achieved. The MRT ridership threshold is considered as 18,000 passengers per hour per direction, as shown in Figure 7-11. Here, one hypothetical MRT route is considered within CCC area which will be operated for 16 hours. Current total daily trips in the CCC area are approximately 49,00,000 which will be around 1,66,00,000 in 2080. The calculation of trip numbers considers a growth rate of trips similar to the population growth rate. The scenarios have been developed based on the following two assumptions.

- **Coverage**: The percentage of total population in the CCC area that will be served by the hypothetical MRT route. Three levels, 15%, 20% and 25% are considered in this regard.
- **Mode Share**: The percentage of trips using the MRT route. For information, current mode share of all the public transport is 21% which is predicted to be increased to 28% by 2050 (see Table 5-6). Two levels, 20% and 25% are considered in this regard.

**Table 7-2: Feasibility of Ridership of the MRT System**

| Assumption Component | Scenarios | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Coverage | 15% | 15% | 20% | 20% | 25% | 25% |
| Mode share | 20% | 25% | 20% | 25% | 20% | 25% |
| **Feasible Ridership Year** | **Beyond 2080** | **Between 2070 and 2080** | **2070** | **Between 2050 and 2060** | **Between 2050 and 2060** | **Between 2040 and 2050** |

Table 7-2 shows that the earliest time the ridership of MRT can be achieved is between 2040 and 2050 under two extreme assumptions (25% population coverage and 25% mode share). However, under most likely assumptions (15% population coverage and 20% mode share), the ridership will not be achieved within 2080.

[15] Dhaka Tribune, June 1, 2025, url: https://www.dhakatribune.com/bangladesh/nation/382829/mou-signed-to-launch-country%E2%80%99s-first-monorail-in, last accessed 21.08.2025

### Assessment of the BRT

The BRT proposal outlined in the Strategic Urban Transport Master Plan (SUTMP) presents several concerns. Chattogram's traffic congestion is largely a result of inadequate traffic and parking management, affecting even corridors with spare capacity. The allocation of dedicated lanes for BRT may therefore exacerbate congestion for mixed traffic. In addition, the provision of mid-carriageway stations would require safe pedestrian crossing facilities; however, grade-separated crossings such as overpasses or underpasses may not be accessible or inclusive for all users. Again, before introducing the BRT system, a traditional bus system is more important to establish.

### Assessment of Traditional Bus System

At present, approximately 1,100 buses are operational across different routes within the city. However, many vehicles are non-standard, poorly maintained, and contribute to congestion and air pollution. The proposed modernization plan estimates that a new fleet of approximately 700 buses will be sufficient to meet projected demand once routes are restructured and operations are rationalized. This reduction reflects improved efficiency and optimized route management. The full bus fleet modernization will cost around Tk 2,500–2,900 crore (including new busses, bus terminals/depot and bus bays and stops). Another 300-500 crore will be needed for traffic and parking management (including modern traffic signals, parking buildings/lots) to make the whole system effective and safe.

### Summary

At this stage, no definitive conclusion can be drawn regarding the overall feasibility of an MRT or Monorail system, as the detailed feasibility study report is not yet available. Nevertheless, the CMMP team's preliminary assessment indicates that current ridership levels in Chattogram are insufficient to justify MRT investment. Future travel demand is also unlikely to reach the minimum threshold required for MRT viability within the master plan horizon up to 2050. Furthermore, user survey results suggest that most passengers are unwilling to pay fares significantly higher than existing public transport fares, making cost recovery uncertain. Additionally, the corridor identified as the most promising in the SUTMP (Figure 7-12) is constrained by existing flyover infrastructure, rendering an elevated metro alignment impractical. An underground alignment, while technically feasible, would pose substantial economic challenges.

In contrast, with improved traffic management measures and comprehensive reforms in public transport operations, **conventional bus systems** have the potential to provide a financially viable (at least Tk25,000 crore for Monorail system compared to Tk3,000 crore for a full fledge bus system with traffic and parking management) and effective solution for meeting Chattogram's transport demand through 2050.

## 7.3.2. Formation of Bus Company and Automated Fare Collection System

Chattogram's bus system, dominated by fragmented and unregulated individual operators, suffers from poor service quality, irregular schedules, overcrowding, and unsafe driving due to a lack of coordination and accountability. Establishing a formal bus company or consortium would streamline operations, enabling better fleet management, standardized services, and improved financial capacity for modern buses, advanced ticketing, and driver training. A centralized structure would also facilitate performance-based contracts, reduce reckless

driving by employing salaried drivers, and enhance route planning for comprehensive city coverage, ultimately improving public transport efficiency, safety, and reliability.

### Establishment of a Unified Bus Company

- **Formation of a Public-Private Partnership (PPP) Model:** The BRTA should facilitate the consolidation of existing bus operators into one or several structured company through a PPP model, ensuring both public oversight and private sector efficiency.
- **Licensing and Regulation:** The new company should operate under a formal licensing framework with clear guidelines on service quality, safety, and operational efficiency.
- **Fleet Modernization:** Incentives such as low-interest loans and subsidies should be provided for upgrading to modern, eco-friendly buses to improve service quality and reduce emissions.
- **Employment Transition and Capacity Building:** Existing bus owners and workers should be integrated into the new system through structured buyouts, training programs, and employment guarantees to ensure a smooth transition.
- **Route Optimization and Service Standards:** Implement structured route planning to reduce congestion, avoid overlaps, and ensure adequate public transport coverage across Chattogram.

### Implementation of a Digital Fare Collection System

- **Mandatory Smart Card System:** Introduce a contactless digital payment system, such as smart cards and mobile payment apps, to streamline fare collection and reduce cash handling.
- **Integration with Banking and Mobile Financial Services:** Partner with financial institutions and mobile banking platforms to facilitate easy top-ups and seamless transactions for commuters.
- **Fare Standardization and Transparency:** Implement a central fare management system to prevent overcharging, ensure uniform pricing, and provide real-time fare adjustments based on travel distance.
- **Real-Time Passenger Information System:** Develop a mobile app and digital displays at bus stops to provide real-time tracking of buses, fare details, and service schedules, improving commuter convenience.
- **Government Oversight and Data Management:** Establish a central regulatory authority to monitor fare transactions, ensure compliance with fare regulations, and use digital data for transport planning and optimization.

## 7.3.3. Bus Terminal/Depot Development and Upgradation

To achieve efficient and well-organized bus services in Chattogram, the development of new bus terminals and the upgrading of existing ones are critical. The primary goal this is to ensure smooth bus operations and better accessibility to regional routes. The current bus terminal infrastructure is inadequate to meet the growing demand for public transportation, leading to congestion, inefficiencies, and poor service quality. This section outlines the need for new bus terminals, and the provision of sufficient amenities to ensure smooth operations and better connectivity with regional routes.

### Development of New Bus Terminals in Six Upazila

- **Strategic Terminal Development:** Establish new bus terminals in Anwara, Patiya, Karnaphuli, Boalkhali, Sitakunda (Salimpur), and Raozan to improve connectivity and decentralize transport operations.
- **Intermodal Connectivity:** Design terminals to serve as interchange points between local and regional routes, ensuring seamless travel for passengers.
- **Traffic Flow Improvement:** Implement well-planned entry and exit points to prevent congestion and enhance the efficiency of bus operations.
- **Expansion of Hathazari Terminal:** Upgrade the existing Hathazari terminal by expanding parking bays, waiting areas, and boarding platforms to accommodate increasing passenger demand and bus volumes.

### Development of Bus Terminals in Chattogram City Area

- **Establishment of Key Terminals:** Construct terminals in Kalurghat, Nuton Bridge, New Market(Intermodal Hub) and Patenga, and upgrade the terminals at Kadamtoli and Bahaddarhut to improve public transport efficiency and accessibility. Ensure the new Kulgaon terminal have adequate amenities for both operators and passengers.
- Zonal Functionality:
  - Kalurghat and Nuton Bridge terminals should function as regional gateways.
  - New Market terminal should reduce congestion in commercial zones by providing adequate parking spaces and transition from one mode to another.
  - Patenga terminal should provide amenities targeted towards tourists and a resting spot for inter-district operators through the tunnel.
  - Kulgaon terminal should be expedited to accommodate urban expansion.
- **Land Use Optimization:** Ensure terminals are integrated with surrounding land use plans, providing adequate space for parking, passenger movement, and transit-oriented development.

### Provision of Essential Amenities in Bus Terminals

- **Passenger Comfort and Safety:** Equip all terminals with clean waiting areas, restrooms, and drinking water facilities to improve commuter experience.
- **Efficient Ticketing and Information Systems:** Implement digital ticketing, real-time bus schedules, and passenger information displays at all terminals.
- **Security and Accessibility:** Ensure proper lighting, surveillance systems, and dedicated facilities for women, elderly passengers, and persons with disabilities.
- **Sustainable Infrastructure:** Design terminals with eco-friendly features such as rainwater harvesting, solar lighting, and waste management systems to support environmental sustainability. It should also have water facilities, ticketing counters, and information boards. Additionally, terminals should have designated spaces for vendors, security personnel, and maintenance staff to ensure smooth.

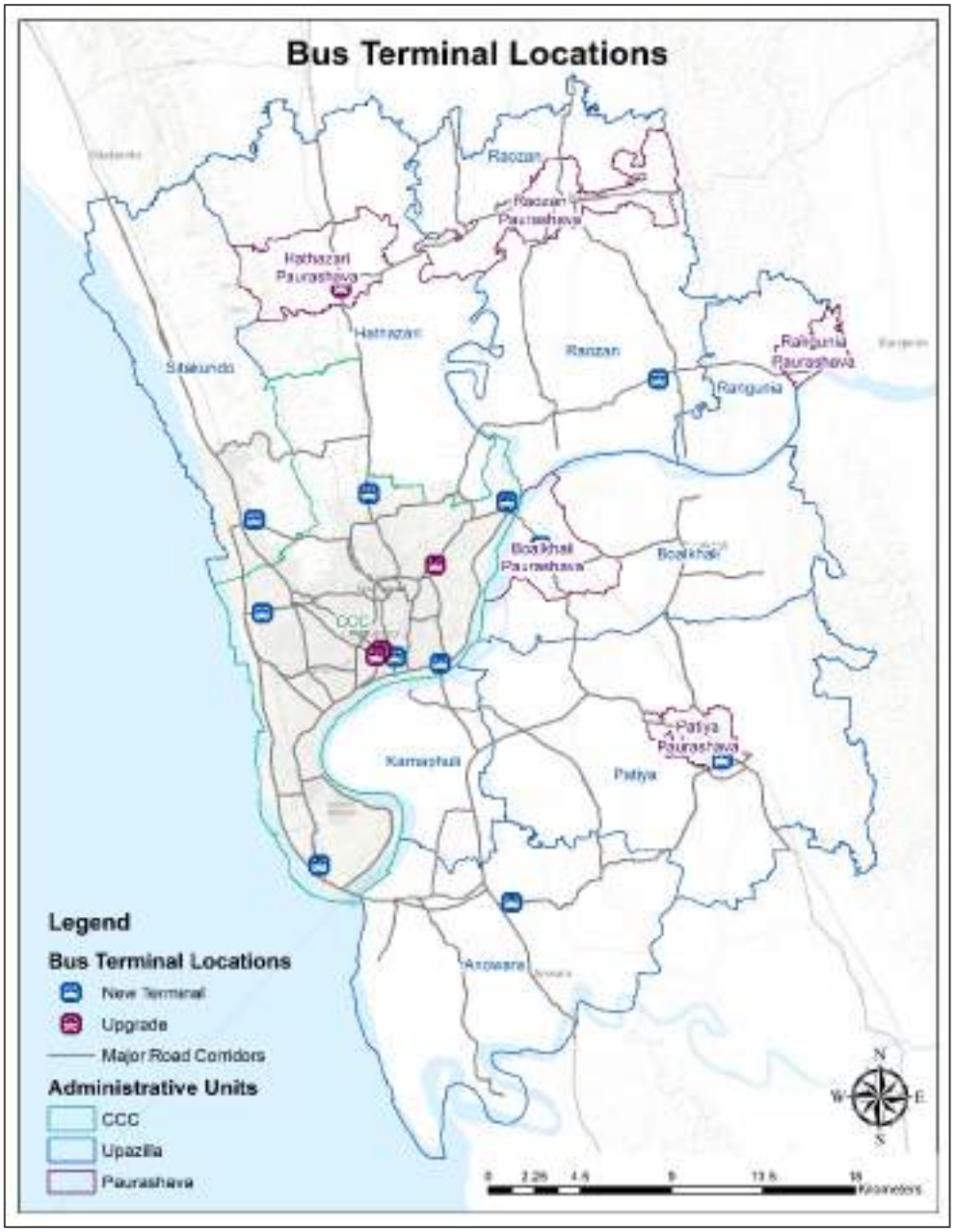



**Figure 7-13: Proposed Locations of Bus Terminals**

### 7.3.4. Public Transport Route Rationalization

Route rationalization of public transport in Chattogram is essential to create a more efficient, reliable, and well-coordinated transit system. The current unstructured routes lead to congestion, service overlaps, and inadequate coverage in key areas, causing inefficiencies and longer travel times. A structured route plan will optimize bus operations, reduce redundancy, and improve connectivity between urban centers and surrounding Upazila. Additionally, the introduction of new buses with improved capacity and service standards will enhance regional connectivity, ensuring better access to transport for suburban and rural populations.

## Plan for Urban Area

### Bus Service on Major Roads

**Table 7-3: City Bus Route Recommendation**

| Type | Route No | Proposed Route | Figure |
|---|---|---|---|
| Route Alteration Required | 5 | Route not recommended, covered by route 14 | N/A |
| | 6 | Laldighi – Newmarket - Kadamtali Mor – Trunk Road – Barik Building – Sea Beach | Figure Appendix - 5 |
| | 7 | Sagorika flyover Circle – Sagorika Mor – Boropole – Agrabad – Chowmuhani – Dhaka Trunk Road – Station Road – New market | Figure Appendix - 6 |
| | 14 | Notun Bridge – Bahaddarhat – Agrabad – Cement Crossing - Airport | Figure Appendix - 7 |
| | 18 | City Gate – Alonkar – Dewanhat – GEC - Bahaddarhat – Notun Bridge | Figure Appendix - 8 |
| New Routes | New Route | Notun Bridge – Bakalia Access Road – Telepatti – Olikha Mosque – Gani Backery – Jamalkhan – Andarkilla – Kotwali Mor – Frirngi Bazar Road – Marin's Drive Road – Notun Bridge | Figure Appendix - 9 |
| | New Route | Kalurghat – 1no Sluice Gate – Bolirhat – Notun Bridge | |
| | New Route | Patenga Sea Beach Mor – Outer Ring Road – Fouzderhat Police Box | Figure Appendix - 10 |
| | New Route (VIP) | Muradpur – 2no Gate – GEC – Flyover – Patenga (when needed) - Airport | Figure 7-27 |
| *Route No 1, 2, 3, 4, 8, 10, 11, 17 will remain unchanged | | | |

**Tempo and Human Hauler Service on Minor Roads**

**Table 7-4: Tempo Route Rationalization**

| Type | Route No | Proposed Route/Comments | Figure |
|---|---|---|---|
| Route Alteration Required | 1 | Muradpur – Chawkbazar – Lalkhan Bazar. The rest portion of this route falls on main roads covered by Bus Routes | Figure Appendix - 12 |
| | 5 | Kaptai Ratstar Matha – Bahaddarhat – Chawkbazar (Ali Khan Mor) – Gani Bakery – Jamalkhan – Cheragi Mor – DC Hill – Nandan Kanan - Amtal (Shah Amanat Market) | Figure Appendix - 13 |
| New Routes | New Route | Barik Building – Sadarghat – City College – New Market | Figure Appendix - 14Figure Appendix - 14: New Tempo Route |
| Not Recommended | 2 | Its route fully covered by Bus Route 8 | Not Applicable |
| | 4 | Its route fully covered by Tempo Route 5 | |
| | 6 | Maximum portion of this route is covered by Bus Route 17 and the rest small portion (750m) is covered by Prposed Bus Route 7. | |
| | 7 | Its route fully covered by Bus Route 18 | |
| | 10 | Its route fully covered by HH Route 15 | |
| | 11 | Its route fully covered by Bus Route 4 | |
| | 12 | Its route fully covered by HH Route 16 | |
| | 13 | Its route fully covered by Bus Route 11 | |
| | 14 | Its route fully covered by both Bus Route 1 and Tempo Route 5 | |
| | 15 | One direction is covered by Tempo route 1 and proposed 5 and other direction is covered by Bus route 1 | |
| | 17 | Its route covered by HH Route 16 with very slight difference | |
| *Route No 3, 8, 9, 16, 18/22, 19, 20, 21 will remain unchanged | | | |

**Table 7-5: Human Hauler (HH) Route Rationalization**

| Type | Route No | Proposed Route/Comments | Figure |
|---|---|---|---|
| Route Alteration Required | 9 | Existing route should extend to port link road (Need Based) | Figure Appendix - 15 |
| | 16 | Only Alongkar – Tigerpass. The rest portion is covered by Bus route 18 or HH route 15 | Figure Appendix - 16 |
| | 17 | Chawkbazar – Gani Bakery – Jamalkhan – Cheragi Mor – DC Hill – Enayet Bazar – BRTC - Tigerpass | Figure Appendix - 17 |
| Not Recommended | 8 | Route fully covered by Bus Route 17. | Not Applicable |
| | 11 | Large Route. route is covered by Bus Route 4 and 10 | |
| | 14 | Route fully covered by Bus Route 8 | |
| *Route No 6,12,15 will remain unchanged | | | |

## Plan for Regional Area

### Bus Service on National/Regional Highways

**Table 7-6: Regional Bus Route Rationalization**

| Serial No. | Route No | Proposed Route | Figure |
|---|---|---|---|
| 1 | Regional -1 | Bahaddarhat Bus Terminal – Kaptai Raster Matha - Noapara - Rangunia | Figure Appendix - 11 |
| 2 | 13 (BRTA) | Notun Bridge – Shikalbaha Crossing - Patiya Pourshava - BGC Trust (Chandanaish) | |
| 3 | Regional -2 | Chattogram Medical University – Bayezid Link Road – Southern University – Oxygen - Kuaish | |
| 4 | Regional - 3 | Notun Bridge – Shikalbaha Crossing – Chatori – Anwara Upazila Parishad | |
| 5 | Regional -4 | Chattogram University - Nazirhat | |

## 7.3.5. PT Stop Location Selection and Design Guideline

Bus stop design is a systematic procedure of planning, designing, preparing and installing the physical infrastructure for bus stops. The aim of bus stop design is to ensure consistency, safety, accessibility and efficiency of passenger and public transport to provide safe and efficient PT service and passenger satisfaction.

## Guidelines for Bus Stop Location Selection

There are some guidelines that need to follow while selecting the locations and installing the bus stops to ensure optimum utilization of bus stops. Considering local and international standards of bus stop and some local conditions, the following guidelines should be followed to locate and install bus stops in Chattogram city.

- Bus stops should be strategically placed away from intersections to minimize disruptions to traffic flow and intersection operations. The appropriate distance between a bus stop and an intersection should be determined based on the road category and local conditions. According to Chattogram Metropolitan Master Plan16, there are four types of roads in this city. Although, public transport routes are permitted only on three types of roads, and the recommended minimum distances for bus stops from intersections are: Primary Distributor ≥ 50m, Secondary Distributor ≥ 30m and Local Distributor ≥ 20m. Proper adherence to these guidelines will enhance traffic efficiency and safety in urban transport planning.
- To illustrate this Figure 7-14 is referred. The distance (x' and 'y') means the distance from the edge of the road (A) or the imaginary intersect of two roads (B) to the edge of the bus stop. The bus stop area is from the pole to the last slot as showed in Figure 7-14 in dotted line. Again in Figure 7-14, if Road A is a Primary Distributor, then the minimum distance of the bus stops on Road A should be 50m from the intersection. Furthermore, if Road B is a Secondary Distributor, then the bus stops on Road B should be minimum 30m away from the intersection.

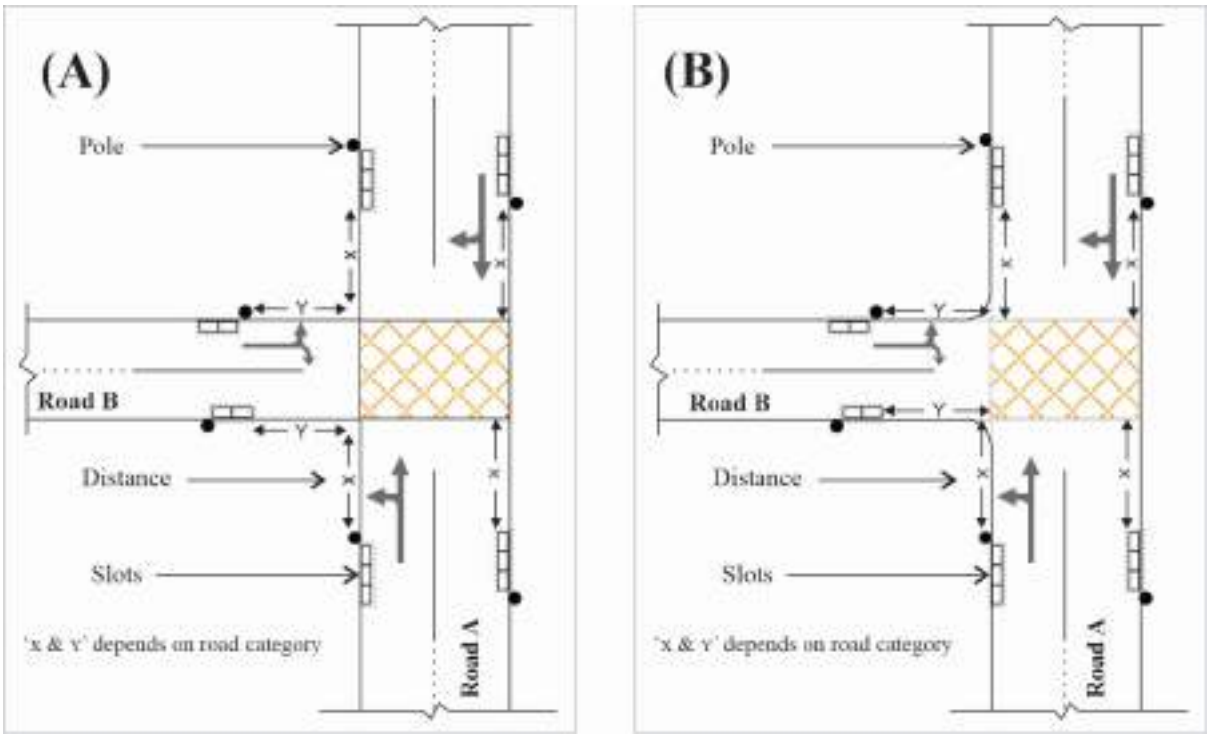



**Figure 7-14: Distance of Bus Stop from Intersection**

- The placement of bus stops should be strategically determined to optimize accessibility and traffic efficiency. Bus stops may be located on either side or both sides of an

[16] A verbal communication with the Master Plan Consultant Team.

intersection based on key factors, including the number of routes to be served, surrounding land use, the desired line of movement, footpath conditions, and road width. Proper assessment of these factors will ensure efficient public transport operations while maintaining pedestrian convenience and traffic flow.

- Figure 7-14 shows stop locations on both side (before and after) of the intersection. Bus stops can be provided at both spots if needed, however the same route bus (or tempo or human hauler) cannot stop on both locations.
- A bus stop must be designed for functionality, ensuring accessibility, safety, and convenience for all users. The location should have a properly maintained footpath with a minimum width of 5 feet, which must be continuous and at an optimum height for easy access. To support universal accessibility, a ramp should be provided from the road to the footpath for wheelchair users, and Tactile Ground Surface Indicators (TGSIs) should be installed to assist visually impaired individuals. The footpath must remain free from encroachment or obstacles, and adequate lighting should be ensured for safety. Additionally, a ticket counter may be placed near the bus stop until an electronic fare card system is introduced.

### Bus Stop Design Considerations

- An ideal bus stop should align with international best practices, ensuring accessibility, safety, and efficiency for all passengers, including women, children, and individuals with disabilities. To effectively address these requirements, the following considerations must be carefully taken into account:
- A bus stop is a ‘boarding point’
- Bus stop is not a ‘resting point’
- A bus stop is not required to include a ‘waiting area’ or ‘shade’.
- Waiting area and/or shade can be added to provide comfort and improve experience of taking the bus
- The bus stop should be sufficiently away from the intersection.
- Provision of multiple slots & information
- Provision for disabled group
- Unobstructed pedestrian flow on the footpath
- Minimum requirements of asset maintenance
- Provision of adverts to generate revenue

### PT Stop Design Standard

### Types of Bus Stops

**There are three types of designated bus stops as outlined in**

Table 7-7, with schematic designs in Figure 7-15.

**Table 7-7: Standards of Different Types of Bus Stops**

| Type | Footpath Continuity | Footpath Width | Description | Other Amenities |
|---|---|---|---|---|
| Basic | Must | At least 5 ft | Boarding area, pole | Information panel, bin |
| Regular | Must | More than 6 ft | Boarding area, pole and seating arrangements | Information panel, bin |
| Premium | Must | More than 6 ft | Boarding area, pole, seating arrangements and shed | Information panel, bin, advert panel |

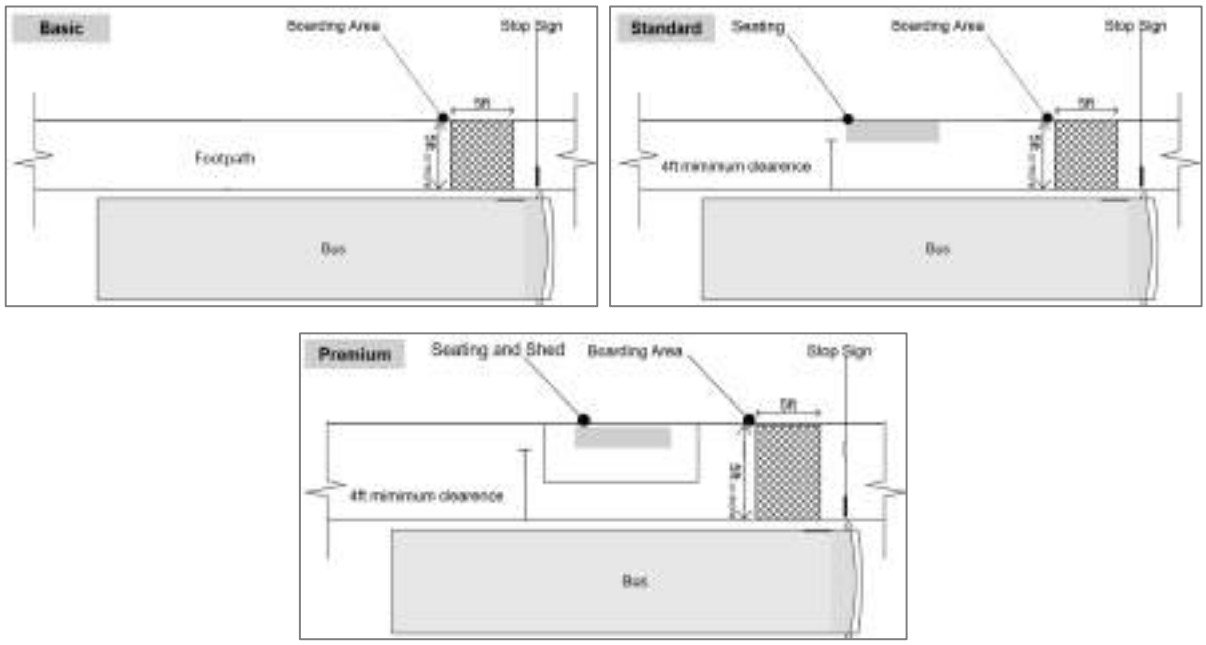



**Figure 7-15: Bus Stop Design**

## Determining Slot Demand

Slot requirement for bus stop needed to be determined by performing a PT count survey in peak hour initially. All type of PT needed to be calculated separately. Slots should be calculated separately for bus, tempo and human hauler at each point.

## Determining Slot Supply

Following points to be noted:

- Public transport (PT) vehicles must be allocated adequate space to ensure efficient operations and passenger safety. The minimum space requirements are as follows: buses must have 13-meter X 3 meter, while tempos and human haulers must each have 5-meter X 2.5 meter (see Figure 7-16 for illustration). These standards must be strictly followed to maintain orderly and effective public transport facilities.
- A minimum of one designated slot must be provided for each type of public transport (PT) operating on the road to ensure organized and efficient transit operations.

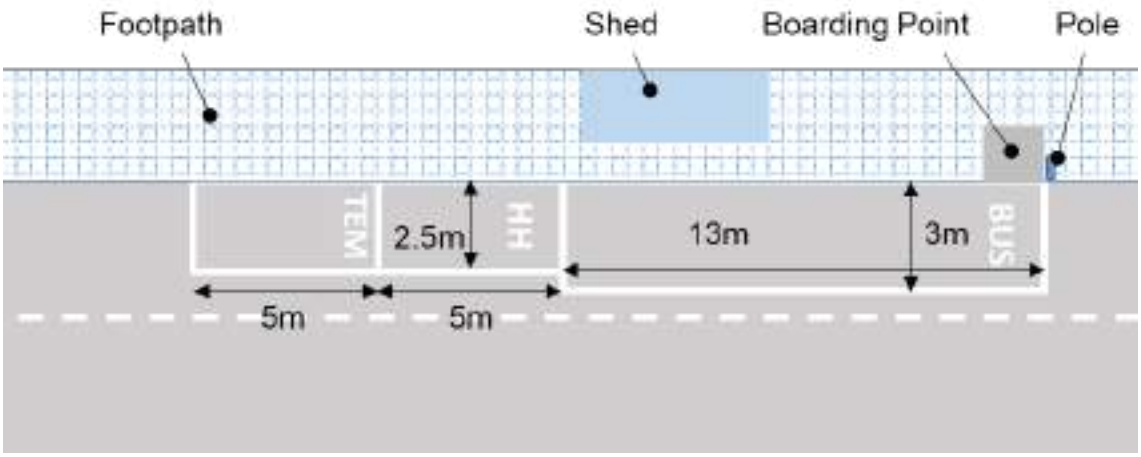



**Figure 7-16: Slot Dimensions for Different PT Modes**

## Determining Bus Stop Type

A boarding alighting survey must be conducted to assess the importance of each stop. The appropriate stop type must be selected based on the criteria outlined in Table 7-8.

**Table 7-8: Determining Bus Stop Type**

| Stop Importance | Total Passenger Activity in Peak Hour (Boarding + Alighting) | Suggested Stop Type |
|---|---|---|
| Low | < 250 | Basic / Standard |
| Medium | 250 – 1250 | Standard / Premium |
| High | 1250 > | Premium |

Again, an inventory survey is needed to check the physical condition of the site and whether the site has enough space to accommodate the requirement of the suggested type of stop.

- The boarding point must meet the following minimum requirements: a 'Bus Stop' sign must be installed at the beginning of the boarding point, a designated boarding area of at least 5 feet by 5 feet must be provided, and a minimum clearance of 4 feet must be maintained on the footpath for pedestrian movement. These standards must be strictly followed to ensure safety and accessibility. Boarding point dimensions are shown in .
- Seating arrangements must be designed ensuring durability and to prevent people from lying on them.
- A bus stop must have a bin and a shading system at the seating area. Additionally, no shops should be allowed within the bus stop premises.

A study was done for identifying PT stop location and determining design consideration according to the guidelines provided along the route from Kalurghat to Patenga, as shown in Figure 7-17. Detailed factsheet is given in Appendix- 4.


**Figure 7-17: PT Stop Locations Along Route 10 and 14**

## 7.4. Pedestrian Network Plan

***TRN 1.*** *Promote inclusive and universally accessible pedestrian and NMT infrastructure throughout the city*

Pedestrian facilities are a vital part of urban infrastructure, especially in cities like Chattogram, where walking is a primary mode of transportation for a significant portion of the population. With approximately 60% of Chattogram's residents walking to work, the quality and accessibility of pedestrian facilities are essential for their safety and well-being. Unfortunately, despite the high reliance on footpaths, nearly half of Chattogram's footpaths are in poor condition, presenting serious challenges for pedestrians. Yet nearly half of the footpaths are in poor condition. Issues such as footpaths being overtaken by hawkers, broken tiles, and obstacles make walking difficult and unsafe, especially for vulnerable groups like the elderly

and children. The lack of proper ramps and crossings for people with disabilities further complicates mobility. Foot-over bridges, though helpful, are often inaccessible due to the need for climbing, so prioritizing signalized ground-level crossings is essential. Additionally, raised speed bumps on secondary roads and wider median gaps for mid-block crossings can enhance pedestrian safety. Addressing these issues by improving footpath maintenance and implementing safer crossings will create a more accessible and safer environment for pedestrians in Chattogram. So, for creating a better future for pedestrians, some measures have been taken under the current masterplan to unlock the greatest potential.

### 7.4.1. Footpath Improvement

Footpaths in Chattogram are essential for the population who walk to work, yet nearly half are in poor condition, presenting challenges to pedestrian safety and accessibility. Issues such as hawkers blocking footpaths, poor maintenance with broken tiles and potholes, and inadequate facilities for people with disabilities make walking hazardous, especially during the rainy season.

**A proposal includes constructing 140 kilometers of new and improved footpaths** across key areas, including

- 4 kilometers on CDA Avenue from WASA
- 2 kilometers on New Market, Station Road, and Jubilee Road
- 48.8 kilometers in central areas
- 10 kilometers along roads outside the central area

As for the newly proposed footpath by Master Plan, the design standard which is maintained here is to distribute main three elements proportionally on a footpath, Building Frontage zone: Pedestrian zone: Road Furniture zone (0.5:1.8:1). According to the proportion, the recommended width for each type of road is:

**Table 7-9: Footpath Width Calculation**

| Road Width(ft) | Minimum Footpath Width(ft) | Minimum Pedestrian zone(ft) | Minimum Road Furniture zone (ft) | Footpath Height |
|---|---|---|---|---|
| 120 | 12 | 8 | 4 | Maximum 6 inch |
| 100 | 12 | 8 | 4 | |
| 80 | 10 | 6.5 | 3.5 | |
| 60 | 8 | 4.5 | 3.5 | |
| 40 | 5 | 3 | 2 | |
| 25 | 5 (One side) | 3 | 2 | |

At the same time as maintaining the height and width, there are some other issues that should be addressed for pedestrian safety and convenience. Those are:

- Footpath discontinuity poses a significant challenge in urban areas, notably along roads like Sheikh Mujib Road and M.A. Aziz Road, where most of the stretches lack continuous footpath infrastructure. Furthermore, encroachment by hawkers further exacerbates this issue. So, take steps to connect and extend the sidewalks so people can walk easily. Make rules to stop street vendors from blocking the sidewalks and work with the local government to make sure they help fix the sidewalks.

- Assess the pedestrian flow to anticipate future needs and determine appropriate footpath widths. This can be done through pedestrian counts, observation studies, and analysis of urban development plans.
- Introduce marked pedestrian crossings at regular intervals along busy roads, especially where footpath flow is high. These crossings should be clearly visible, well-marked, and equipped with appropriate signage and signals. Implement traffic calming measures such as speed humps, raised intersections, and narrowing of road lanes near pedestrian crossings to reduce vehicle speeds and enhance safety.
- Some shops park their vans on the footpath, obstructing pedestrian walking paths and forcing pedestrians onto the road, which poses a safety risk. Therefore, it is important for large department stores to implement parking management systems for their vans to unload their goods
- Entrance of any structure or building will be at grade or at same height level with footpath.
- Footpaths should be continuous, properly wide and flat so that users don't feel discouraged from using footpaths.
- Necessary slope should be maintained to ensure proper drainage of rainwater. Also, guide tiles should be placed in such a way that visually impaired people can easily navigate sidewalks.
- Separate space for tree plantation and utility posts should be preserved at the roadsides part of the footpath.
- Necessary signs, signals and markings should be provided on footpaths. Ample and suitable space should be preserved for those markings.
- Provision of safe, quick and easy road crossings should be ensured.
- Work with local authorities to regulate street vendors ensuring designated areas for them while keeping footpaths clear for pedestrians.
- Prioritize repairing and upgrading footpaths, fixing uneven surfaces, filling gaps, and improving drainage to make walking safer and more comfortable.
- Identify areas lacking ramps and crossing footpaths and make necessary improvements to ensure access for people with disabilities.
- Coordinate with construction companies to minimize disruptions to footpaths during ongoing projects, providing alternative routes and ensuring safe passage for pedestrians.
- Quality pedestrian access to public transport terminals is required.

### 7.4.2. Provision of Safe Crossing Facilities

In Chattogram, as in many urban areas, pedestrian safety is a growing concern, particularly in densely populated and high-traffic zones. With the increasing number of vehicles on the roads, providing safe and accessible crossing facilities for pedestrians has become essential. Ensuring that people, especially vulnerable groups like the elderly, children, and people with disabilities, can cross streets safely is crucial for reducing traffic-related accidents and promoting more sustainable modes of transport, such as walking. To address this, it is

important to design and implement a variety of crossing solutions that prioritize both safety and convenience. For this instance, we must focus on-

- Foot-over bridges, though often seen as a temporary solution, tend to be expensive and not always accessible to certain groups such as the elderly or people with disabilities. Many pedestrians avoid using foot-over bridges because they don't want to climb stairs. Therefore, priority should be given to signalized crossings, which allow people to safely crossroads at ground level without the added difficulty of stairs.
- In highway corridors where the main carriageway is elevated above adjoining side roads, pedestrian underpasses can be effectively integrated to allow safe crossing without disrupting traffic. If elevation differences or site conditions make underpasses unfeasible, foot-over bridges may be considered as an alternative, ensuring pedestrian safety while maintaining uninterrupted vehicle flow.
- 

**Figure 7-18: Foot-over Bridge**

- For unsignalized crossings on secondary roads, raised speed bumps can help make pedestrian crossings safer and more convenient, as they compel drivers to slow down. Additionally, for mid-block crossings, it's important to ensure that the median gap is wide enough. A gap of at least 10-15 feet is ideal, as it allows two people to stand comfortably and ensures safety.


**Figure 7-19: Raised Speed Bumps**

## 7.5. Traffic Management Plan

***TRN 4.*** *Improve safety, design quality, and operational efficiency at road junctions*

***TRN 8.*** *Implement effective traffic and parking management and digitized enforcement systems*

***TRN 10.*** *Enhance road safety through proactive education, design, and enforcement initiatives*

Effective traffic management is essential for reducing congestion, improving road safety, and ensuring smooth transportation in Chattogram. With rapid urbanization and increasing vehicle numbers, a well-planned traffic system can minimize delays, enhance public transport efficiency, and lower accident rates. Proper signal coordination, lane discipline, and enforcement of traffic rules help in optimizing road capacity and preventing bottlenecks.

The current master plan is guided by a shift in approach from reactive mega infrastructure projects to proactive, system-wide transportation improvements. In Bangladesh, the prevailing trend has been to address urban congestion through the construction of flyovers—examples in Chattogram include the Dewanhat flyover aimed at easing freight movement along Dhaka Trunk Road, and the Bahaddarhat and Muradpur-GEC flyovers serving CDA Avenue. The Elevated Expressway was also initiated to bypass EPZ and port-related traffic. However, in international best practices, the first response to congestion is typically traffic management—improving signals, intersections, enforcement, and road use efficiency. In contrast, Chattogram's heavy investment in flyovers could have yielded greater benefits if directed toward integrated traffic management and road development. Therefore, this master plan emphasizes enhancing the overall transport system through targeted, sector-wise strategies, focusing on long-term sustainability and efficiency rather than relying on isolated mega projects. The shift in focus is exemplified in Figure 7-20.

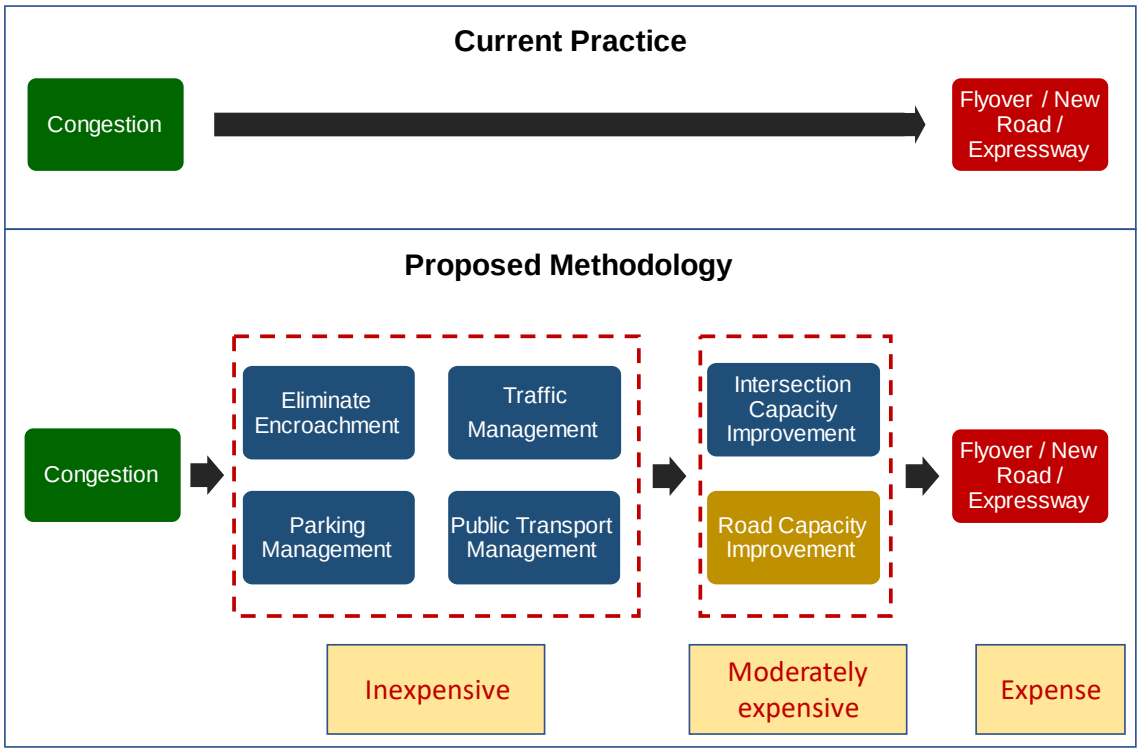



**Figure 7-20: Change in how Traffic Congestion can be Tackled**

### 7.5.1. Intersection Management

While geometric design improves the physical layout of intersections, effective management is essential to ensure these designs function as intended. Poor parking behavior, informal loading and unloading, and lack of enforcement can quickly undermine even well-designed intersections. This section focuses on the operational and regulatory aspects necessary to maintain safety, efficiency, and discipline at intersections. Given the immediate impact on traffic flow and safety, intersection management policies must be implemented immediately.

#### Guidelines for Intersection Management

Effective intersection management is critical to improving traffic flow, minimizing conflicts, and ensuring safety for all road users. The following guidelines are recommended for all primary and secondary intersections within the urban and regional road network:

- Enforce a strict no-parking or no-stopping zone extending at least **50 meters** from any intersection. This includes both sides of the road and applies to all vehicle types to prevent congestion and obstruction of sight lines.
- All local buses, CNG auto-rickshaws, and other para-transit vehicles must use **designated bus bays** for passenger loading and unloading. These bays should be located **a minimum of 50 meters** from the edge of the intersection or access roads to maintain intersection capacity and safety.
- Provide **dedicated parking areas** for local vehicles entering from access roads, ensuring they are set back **at least 50 meters** from the main highway or major arterial road. This helps reduce turning conflicts and allows for smoother vehicle transitions.


**Figure 7-21: No Stopping Zone in New Market Intersection**

- Allocate additional space near intersections—outside the immediate functional area—for future parking demand, including facilities for **motorcycles and bicycles**. This improves last-mile connectivity and encourages multi-modal use.
- **Traffic signals** must be installed at all major intersections to regulate movement and enhance vehicle and pedestrian safety. Pedestrian phase must be included in the traffic signal cycle. CCC should initiate to deploy traffic signal system and a dedicated traffic engineering team should be recruited to support and maintain this initiative. The recommendations of the signal system deployment are given in Table 7-10. The locations of the intersections are shown in Figure 7-22 A traffic control center should also be established in CCC to monitor the traffic signal operation.

**Table 7-10: Recommended Signal System Deployment Initiative**

| Phase | Activities |
|---|---|
| First Phase (2025–27) | *(A) Install Signal at **28** intersections as follows:*<br>1. Muradpur 2. 2 No. Gate 3. GEC 4. WASA 5. Lalkhan Bazar 6. Tigerpass 7. Choumohoni 8. Agrabad 9. Access Road More 10. Noya Bazar 11. Shagorika 12. Boropole 13. Shilpokola 14. Nimtola 15. Barik Building 16. Cement Crossing 17. Saltgola Crossing 18. Alonkar Circle 19. Bahaddarhat 20. A.K. Khan Circle 21. Dewanhat Circle 22. Notun Bridge 23. Custom Circle 24. Rahattar Pul 25. Katghor 26. CNB Mor 27. Patenga Sea Beach Mor 28. Kaptai Rastar Matha |
| | *(B) Establish **Traffic Control Centre** in CCC* |
| Second Phase (2027–28) | *Install Signal at **21** intersections as follows*:<br>1. Kotowali 2. New Market 3. Cheragi Pahar Square 4. Gol Pahar More 5. Bepari Para 6. Naval Ave/CRB 7. Tunnel Circle 8. Port Link Road/Coastal Road 9. Kacha Rasta 10. Shahid Lane 11. Chatteshwari Circle 12. Oxygen 13. Chawkbazar 14. Stadium Circle 15. Kalu Shah 16. Amtala Mor 17. Laldighir Par Mor 18. Laldighir Par 19. Women College Circle 20. Hathazari Circle 21. C.G.S. School |
| Third Phase (2028–30) | Install Signal at **19** intersections as follows:<br>1. Jamalkhan Circle 2. DC Hill 3. Asker Dighi 4. Kazir Dewri 5. Almas Cinema 6. Naval Ave / Nur Ahmed Road 7. Lovelane 8. Strand Road 9. Gulzar Mor 10. Andarkilla Circle 11. Panchlaish Circle 12. Gani Bakery 13. Kadamtoli Circle 14. Kadamtoli More 15. Probortok Mor 16. Bakalia Access Road Circle 17. Cinema Palace Mor 18. BMA 19. Textile Circle |
| Fouth Phase | Install signals where necessary |

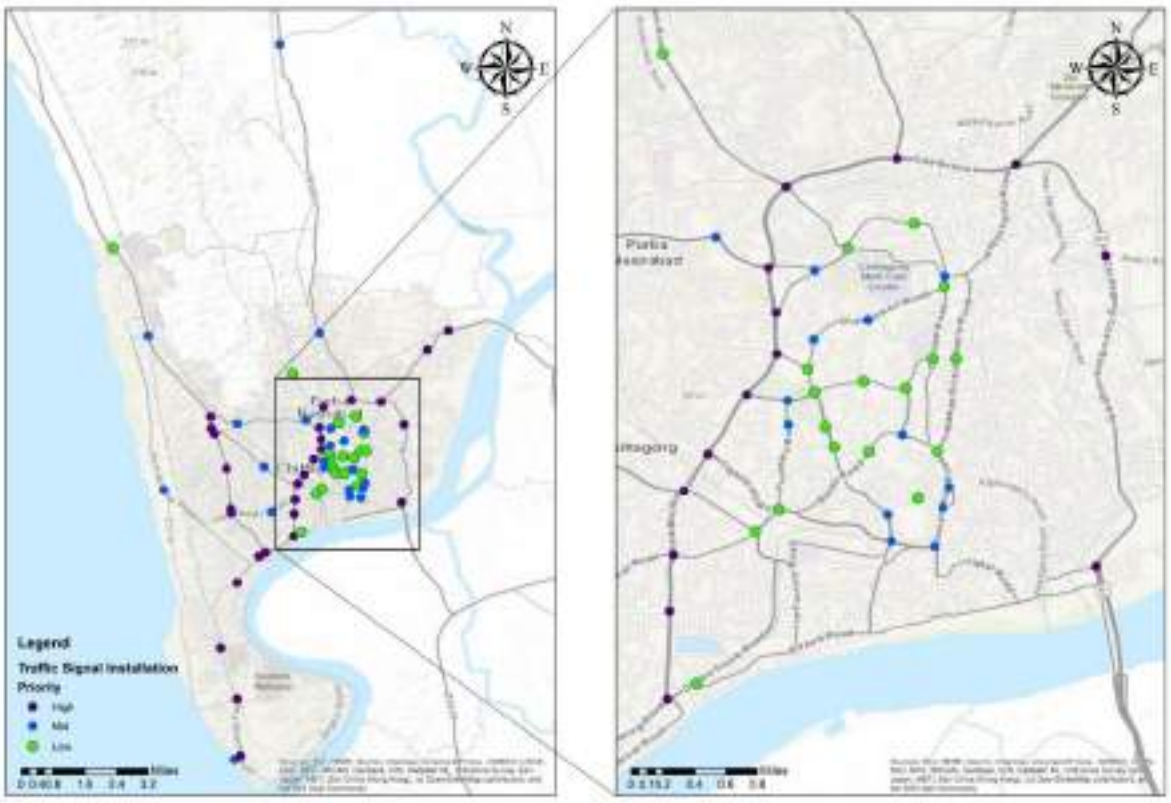



**Figure 7-22: Recommended Locations of Traffic Signal Installation**

- Ensure consistent presence of **traffic police or automated enforcement systems** intersections to monitor violations, especially in regard to stopping, red light jumping, and illegal turns. CMP should work closely with CCC's traffic control center to effectively monitor the traffic violation and ensure enforcement.
- Introduce **adaptive signal control systems** and **real-time traffic monitoring tools** to optimize intersection performance during peak hours and respond to dynamic traffic conditions. Priority wise signal installation is shown in **Error! Reference source not found.**.
- Implement dedicated **signal phases for turning movements** (especially right turns) to minimize conflict points. Where needed, provide **priority signal timing** for public transport or emergency vehicles.
- Design and manage intersections to **prevent queue spillback** onto upstream segments or adjacent intersections. This may include extending turn lanes or implementing metering at signal approaches.
- Clearly demarcate **pedestrian crossings** and provide **timed pedestrian signals**. Use fencing or channelization to prevent jaywalking and organize NMT (non-motorized transport) flow in a predictable manner.
- Limit and control **direct access to properties or commercial plots** within 50 meters of major intersections. Consolidate access points and encourage shared entryways to reduce vehicular interruptions near intersections.

Besides the general guidelines, special considerations are needed for rural areas(particularly Paurashavas and growth centers) as they face unique challenges at highway junctions and road intersections.

- Relocation of Bazars at Intersections: Informal bazaars at highway intersections in Paurashavas and growth centers cause traffic congestion and safety hazards. These markets often spill onto the roads, obstructing vehicle flow. They should be relocated to planned areas away from intersections to improve road safety and maintain organized commercial activity.
- Regulated Drop-off Zones for Para-transit Vehicles: CNGs, rickshaws, and tomtoms frequently stop at rural intersections to pick up or drop off passengers, leading to congestion and accidents. To prevent this, designated drop-off and waiting areas should be created at least 50 meters from junctions. Signage and enforcement will be needed to ensure compliance.

### 7.5.2. Regulation of Transport Modes

In the context of Chattogram's unique topography and rapidly increasing traffic demand, the presence of non-motorised and informal three-wheelers on primary roads presents a major challenge for efficient traffic flow. Non-motorised transport (NMT) three-wheelers, such as paddle rickshaws and vans, operate at significantly slower speeds and with limited acceleration capacity. This results in localized congestion, particularly along the city's steep and narrow roads where overtaking is difficult and vehicle queues form quickly behind slow-moving traffic. In addition to NMTs, para-transit vehicles like mahindras contribute to operational inefficiencies through unsafe and irregular passenger loading and unloading practices, which disrupt traffic flow and increase accident risk.

To ensure effective traffic management and streamline modal integration, it is essential to regulate and rationalize the types of vehicles permitted on different tiers of the road hierarchy. The proposed master plan provides a suitable framework for this, aiming to preserve primary roads for high-capacity public transport and essential motorised vehicles. Secondary and tertiary roads can accommodate slower or more localised travel. This differentiation will support smoother traffic operations and promote a more structured urban mobility environment.

#### Guidelines

- In line with the *Motor Vehicle Speed Limit Guidelines 2024*, an immediate and strict enforcement of the ban on all three-wheelers—including paddle rickshaws, battery-run rickshaws, CNG-powered auto-rickshaws, and mahindras—should be undertaken on expressways, national highways, and regional highways. This move is essential for ensuring safety and minimizing collision risks in fast-moving corridors.
- A phased ban should be implemented on strategic urban roads designated as part of the primary road network. This will include gradual withdrawal of NMTs and informal para-transit vehicles from these corridors. The transition period should be guided by clear timelines and communicated transparently to all stakeholders. Restrictions on three-wheelers must be coordinated with the introduction or strengthening of formal public transport services, especially on affected corridors. Increased frequency of city buses should be introduced to ensure no service vacuum is created as para-transit services are withdrawn. It is shown in Figure 7-23.
- Existing paddle rickshaws and non-motorized vans should be transitioned to electric-motor-powered vehicles. However, these vehicles must adhere to regulated standards in terms of vehicle design, weight, maximum speed, and braking systems. Bangladesh

Government recently developed standards which should be used by the authorities for enforcing these design regulations to ensure safe operation in urban areas.

- A comprehensive battery management plan must accompany the shift to electric three-wheelers. This includes proper disposal systems for used batteries, recycling programs, and public-private partnerships for battery collection. Charging infrastructure should also be planned and zoned in appropriate areas.
- Three-wheelers, especially e-rickshaws, can be permitted to operate in designated low-speed zones and residential neighborhoods. However, authority should limit the number to manage these efficiently. A comprehensive study should be undertaken preferably by CCC to establish “E-Rickshaw Zones” and number of Rickshaw permits. Integration hubs (E-Rickshaw parking) should be established near these zone boundaries to facilitate seamless transfers between modes and minimize the need for informal vehicles to encroach on restricted corridors. CCC also should take initiatives to provide permit to E-Rickshaw garage and charging stations (need coordination with PDB).


**Figure 7-23: Phased Ban of Rickshaws**

### 7.5.3. School Traffic Management

The school transportation system is a critical component of the educational infrastructure, ensuring that students can travel safely and efficiently to and from school. This report provides an overview of the key aspects of school transportation systems, including their importance, types, challenges, and potential improvements.

#### Guideline For School Bus System:

1. **Promoting and implementing smart school bus systems**, along with developing comprehensive parking management plans for schools, to ensure smoother traffic flow and safer transportation for students.
2. **Discouraging the overuse of private cars and vehicles** by students of private schools and colleges, and instead promoting the use of school-based bus services to reduce traffic congestion and environmental impact.
3. **Implement staggered schedules:** Different grades or groups of students can start and end their school days at slightly different times to reduce the number of people arriving and leaving at once.

#### School Traffic Management

- **Assigning responsibility to the Chattogram City Corporation** to address traffic congestion during school hours, in collaboration with community police and the Chattogram Metropolitan Police, to create a more organized and efficient traffic management system.
- **Encouraging extra volunteering efforts** (such as BNCC and Scouts) or community policing during school dismissal times to assist in managing traffic and ensuring student safety.
- **Encouraging the practice of admitting students to schools within their local area**, which can significantly reduce long commutes, ease traffic pressure, and foster a stronger sense of community.
- **Conducting Traffic Impact Assessments (TIA)** before approving the establishment of new private schools, ensuring that traffic infrastructure can accommodate the additional load and prevent future congestion.

### 7.5.4. Strategies for Rural Traffic Management

Effective rural traffic management is essential to ensure safe, efficient, and uninterrupted vehicular and pedestrian movement across the rural road network of Chattogram. Strategic interventions shall focus on improving intersections, regulating passenger movement, and integrating traffic management measures with overall rural infrastructure development.

- Specific areas shall be designated along highways and main rural roads for passengers to board or alight. This will prevent random stopping of vehicles on carriageways, improve traffic flow, and enhance safety for both pedestrians and drivers.
- Local CNG operated three wheelers are frequently used in rural areas and often stop on roads, blocking traffic. Providing accessible and properly located CNG stands or pick-up points near growth centers and transport nodes will regulate their movement and reduce congestion.

- Speed management devices such as humps, rumble strips, and warning signage shall be installed near schools, marketplaces, and community centers. These measures will reduce speeding, protect pedestrians, and maintain an orderly traffic environment.
- Traffic management considerations shall be incorporated into all RHD rural road development and improvement projects. This ensures sustainable traffic flow, safety, and long-term efficiency across the rural network.
- Rural intersections shall be managed with clear signage, road markings, and delineated turning areas to guide vehicles safely. Simple measures like painted center lines, marked waiting areas, and minor widening at turning points can reduce congestion and accidents without requiring major reconstruction.
- In rural areas, the goal of traffic management is to enhance road flow and capacity, particularly on arterial and collector routes linking communities and regions. Access management controls the location, design, and operation of driveways, intersections, and median openings to reduce conflicts and delays. Establishing clear access management plans, policies, and standards helps guide road development and adjacent land use. Limiting or consolidating the number and spacing of access points minimizes friction and improves traffic flow.

## 7.6. Parking Management

***TRN. 9.*** *Implement effective traffic and parking management and digitized enforcement systems*

Parking management refers to the strategic planning, regulation, and optimization of parking resources to enhance accessibility, efficiency, and sustainability in urban and transportation systems. It involves a combination of policies, technologies, and design strategies aimed at balancing parking supply and demand, reducing congestion, improving land use efficiency, and promoting alternative transportation modes. Effective parking management integrates pricing mechanisms, zoning regulations, smart parking technologies, and multimodal transport planning to create equitable, environmentally friendly, and economically viable parking solutions. It also addresses issues such as parking space allocation, enforcement, user behavior, and the integration of parking facilities with urban development goals.

### 7.6.1. Strategies of Parking Management Plan for Urban Areas

- To ensure smooth traffic flow and safety, no-parking zones should be established at major intersections and the entrances of minor intersections. These zones should extend at least 50 meters in all directions from the intersection's edge. Clear and visible signposts must be installed to inform drivers about these restrictions and prevent unauthorized parking.
- A comprehensive parking study should be conducted to assess the demand and determine the most suitable parking configurations, such as parallel, 45-degree, or 60-degree parking. Parking spaces should be planned according to vehicle types, ensuring proper segregation for different categories such as cars, motorcycles, and commercial vehicles. This helps in optimizing space utilization and preventing congestion.
- In areas where parking demand exceeds supply, off-street parking should be prioritized to reduce on-street congestion. In high-demand zones, parking restrictions

should be enforced to maintain traffic flow. If dedicated off-street parking facilities are unavailable, authorities like CCC and CDA can collaborate to lease or purchase existing parking spaces in commercial buildings, ensuring better parking management and urban mobility.

- Many buildings restrict parking to designated parking lots for residents or business owners, leaving visitors without proper parking spaces. As a result, guests often park on roadsides, creating congestion and obstructing traffic flow. The Bangladesh National Building Code (BNBC) currently lacks clear guidelines on guest parking provisions. To address this issue, BNBC regulations should include specific requirements for guest parking in new developments, ensuring adequate space allocation and reducing on-street parking pressure.

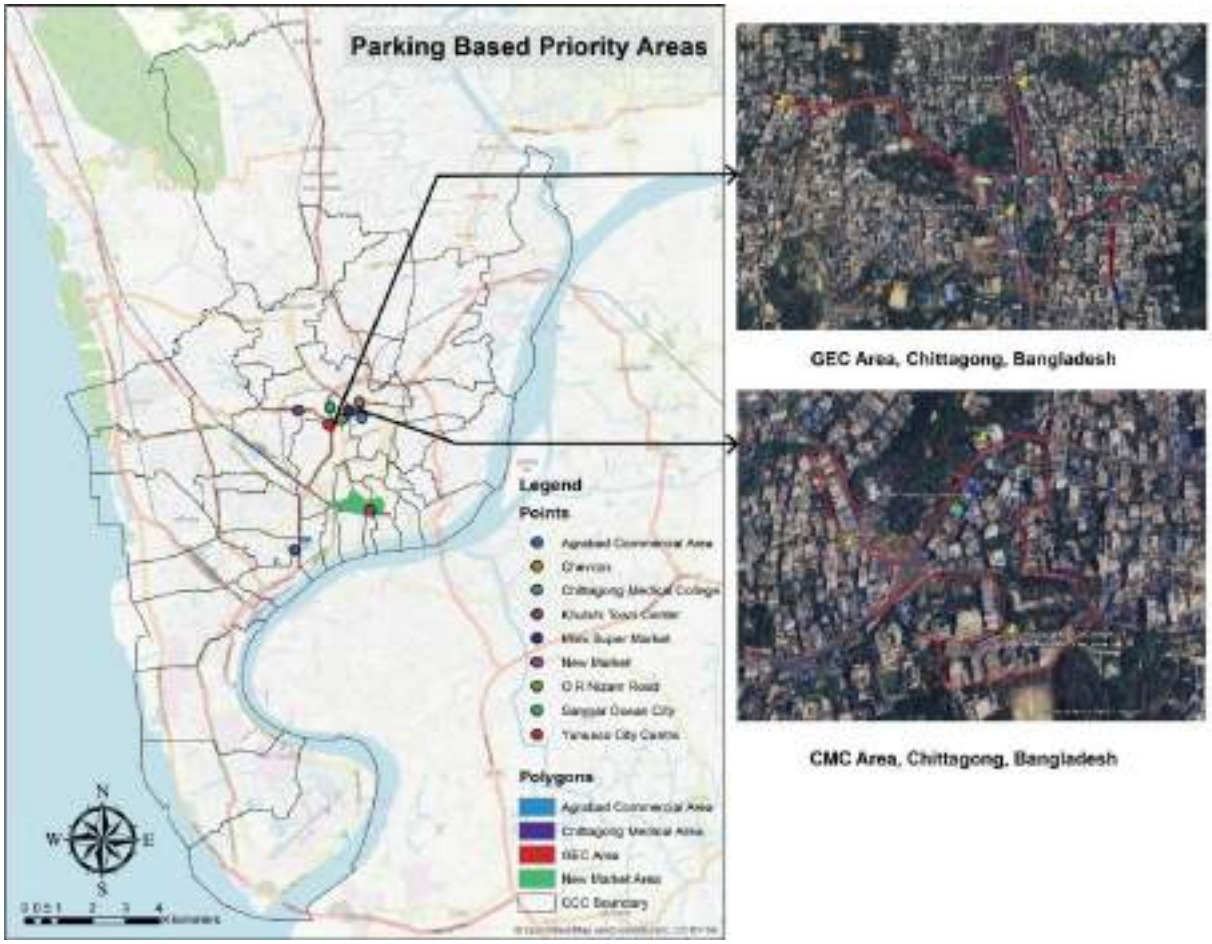



**Figure 7-24: Priority Locations for Immediate Parking Initiatives**

- To improve traffic flow and reduce congestion, no-parking zones should be enforced on main streets during peak hours. Unregulated roadside parking during high-traffic periods often causes bottlenecks, slowing down vehicles and increasing travel time. By restricting parking in critical areas at busy times of the day, urban mobility can be enhanced. These regulations should be supported with clear signage, strict enforcement, and alternative parking arrangements to minimize disruptions for commuters and businesses.
- In Paurashavas and Upazilla Growth Centers parking for CNGs, Rickshaws and Tomtoms need to be provided that will work also as a pickup and drop off point for

these vehicles. This provisions will not be provided along major highways and cannot be within 50 meters of highway-rural road junctions.

- To prevent long-term occupation of limited parking spaces, time restrictions should be introduced to formalize the duration of stay for parked vehicles. Implementing a structured time limit ensures that parking spaces remain available for multiple users throughout the day, rather than being monopolized by a few vehicles. Time-restricted parking can be enforced through signage, digital parking meters, or surveillance systems. Additionally, penalties for exceeding time limits should be introduced to encourage compliance and promote efficient parking space utilization.

*Example: Flexible Parking Strategy for Agrabad CBD*

An assessment of parking demand in the Agrabad CBD zone revealed fluctuating vehicle needs throughout the day. Mornings are characterized by heavy traffic congestion and high demand for parking, whereas the situation eases significantly after 11 PM. To address this, a **flexible parking solution** is proposed. During morning peak hours, **parking should be permitted on one side of the road**, with the **opposite side designated as a no-parking zone**. This arrangement would **reverse during the evening rush hour** to align with shifting demand patterns. Additionally, a **pay parking system** should be introduced to regulate demand and promote efficient use of space.

**Figure 7-25: Example of No Parking Zone**

*Source: Google Map Street View Image*

- Enforcing time limits on parking spaces helps regulate the duration of vehicle stays, encouraging shorter visits and reducing unnecessary occupation of limited parking spots. This strategy increases parking turnover, allowing more vehicles to access available spaces throughout the day. As a result, parking congestion is minimized, and businesses, customers, and commuters can benefit from a more efficient and fair distribution of parking resources. Proper enforcement through signage, digital meters, or monitoring systems will be essential to ensure compliance and maximize effectiveness. In Figure 7-26 "2P" on a road sign typically indicates a parking restriction. It means that parking is permitted for a maximum duration of two hours within the designated area.


**Figure 7-26: Example of Parking Restriction**

*Source: Google Map Street View Image*

### 7.6.2. Strategies for Rural Parking Management

Systematic rural parking management is integral to maintaining road safety, accessibility, and the functional efficiency of rural centers. Parking facilities shall be developed in alignment with local land-use patterns, particularly around growth centers, intersections, and transport nodes, to prevent roadside obstruction and promote orderly vehicle operation.

- Organized parking shall be developed at growth centers, bazaars, and community hubs. Properly planned parking areas will prevent roadside obstruction, improve accessibility, and support smooth vehicle movement within rural centers.
- Parking spaces should be provided adjacent to designated passenger drop-off points along highways and key rural roads. This will prevent vehicles from stopping on the carriageway, reducing congestion and improving safety.
- Parking shall not be allowed too close to intersections. Maintaining setbacks will ensure clear visibility for turning vehicles, reduce traffic conflicts, and improve overall safety at junctions.
- Parking areas shall be designed alongside community facilities such as markets, community centers, and transport terminals. This allows efficient land use, encourages accessibility, and supports rural economic and social activities.
- Where existing land is insufficient, acquisition shall be undertaken to ensure sufficient area for organized parking. Adequate space will ensure long-term functionality, proper layout, and orderly parking in rural centers. Promote formal agreements where community centers and local authorities share parking facilities to maximize utilization, especially for uses with different peak hours.

## 7.7. Intermodal Connectivity

***TRN. 2.*** *Transition to an efficient, inclusive, and company-operated public transport system*

***TRN. 8.*** *Improve air transport facilities and integrate the airport with the city's wider transport system*

Intermodal connectivity in Chattogram is crucial for enhancing the city's economic growth, improving transportation efficiency, and reducing congestion. As a major port city and the commercial hub of Bangladesh, Chattogram relies on seamless integration between road, rail, water, and air transport systems to facilitate the movement of goods and passengers. Efficient intermodal connectivity ensures smoother logistics, reduces transportation costs, and supports trade and commerce by linking the port to inland container depots (ICDs), industrial zones, and regional markets. Additionally, it promotes sustainable urban development by encouraging the use of public transport and reducing reliance on private vehicles. Strengthening intermodal connectivity in Chattogram is essential for unlocking its full economic potential and improving the quality of life for its residents.

This section presents a detailed intermodal connectivity for Chattogram, focusing on improving public transport integration at Shah Amanat International Airport, key ghats (e.g., 15 No Ghat), and New Railway Station. The intermodal connectivity emphasizes seamless transfers, efficient use of public transport (Buses, CNGs, Tempos), and the provision of parking and terminal facilities.

### 7.7.1. Connecting Shah Amanat Airport to the Inner City

Shah Amanat International Airport is a vital gateway to Chattogram, serving both domestic and international travelers. However, the current transportation infrastructure around the airport is inadequate and lacks efficient integration with public transport systems, with limited public transport options and an over-reliance on private vehicles and ride-hailing services. This results in high PT traffic demand, longer travel times, and limited accessibility for passengers relying on public transport.

To address these challenges, the proposed project introduces a dedicated airport shuttle service that connects the airport to major areas of the city such as GEC, 2no Gate and Muradpur. These shuttle buses will operate at high frequencies, ensuring 24/7 availability to align with flight schedules. The shuttle service will be designed to cater to both passengers and airport staff, providing a reliable and affordable alternative to private vehicles.

An intermodal hub can be developed near the airport terminal at the proposed park to facilitate seamless transfers between Buses, CNGs and Tempos. This hub will include designated boarding and alighting points, sheltered waiting areas, and real-time information displays. Free parking facilities will be provided for Buses, CNGs and Tempos to encourage their use for last-mile connectivity.

To reduce congestion caused by private vehicles, a multi-level car parking facility may be constructed at the airport. This facility will also house a designated stands for Buses and CNGs. The integration of these facilities will ensure efficient use of space and improve the overall flow of traffic around the airport. These measures aim to enhance the traveler experience, reduce traffic congestion, and improve accessibility for all passengers, regardless of their mode of transport.


**Figure 7-27: Proposed Route for Shuttle Bus Service for Airport**

### 7.7.2. Inland Waterways

The ghats of Chattogram, such as 15 No Ghat, play a vital role in the city's transportation network, serving as key points for water-based transport and connecting the city to surrounding regions. However, the lack of efficient public transport connectivity to these ghats creates challenges for commuters. The absence of proper parking facilities for public transport vehicles further worsens the issue, leading to chaotic traffic conditions and limited accessibility.

To improve connectivity to the ghats, the proposed plan includes the development of bus routes that link the ghats such as 15 No Ghat to major transit hubs like New Market Mor, New Railway Station, and Shah Amanat Airport or important city areas. These routes will be designed to operate at high frequencies, ensuring reliable and efficient service for commuters. These connections are shown in Figure 7-28.

An intermodal hub will be established near Airport and 15 No Ghat, integrating water transport with land-based public transport options. This hub will include designated boarding and alighting points for Buses, CNGs and Tempos as well as sheltered waiting areas for passengers. Free parking facilities will be provided for public transport vehicles, encouraging their use and reducing roadside congestion. Additionally, bike-sharing stations will be introduced near the ghats, providing commuters with convenient options for last-mile connectivity.

To address parking challenges, a multi-purpose parking facility will be constructed near the ghats. This facility will accommodate both private vehicles and public transport vehicles, ensuring efficient use of space and reducing traffic congestion. These measures aim to enhance the overall efficiency of the transportation network, improve accessibility, and provide commuters with a seamless and comfortable travel experience.


**Figure 7-28: Connectivity of Ghats with PT Routes**

### 7.7.3. Railway Station Connectivity

New Railway Station is a major rail transit hub in Chattogram, serving as a critical node for both intra-city and inter-city travel. However, the station's connectivity to other modes of transport, such as Buses, CNGs, Tempos, and rickshaws, is currently inadequate. This lack of integration creates challenges for commuters, particularly those transferring between trains and other forms of public transport. Additionally, the absence of proper parking facilities for public transport vehicles contributes to traffic congestion and reduces the overall efficiency of the transportation network.

To mitigate these issues, a dedicated intermodal hub near New Market Circle and New Railway Station should be proposed. This hub will integrate rail services with buses, CNG, Tempos, and rickshaws, providing commuters with seamless transfer options. Free parking facilities will be provided for public transport vehicles, encouraging their use and reducing

roadside congestion. The hub will also include sheltered waiting areas, ticket counters, and real-time information displays to enhance the passenger experience.

To further improve accessibility, a multi-level parking facility should be introduced near the existing parking facility of the station. This facility will accommodate both private vehicles and public transport vehicles, ensuring efficient use of space and reducing traffic congestion. No fee will be applied for public transport and CNG. These measures aim to enhance the overall efficiency of the transportation network, improve accessibility, and provide commuters with a seamless and comfortable travel experience.

**Figure 7-29: Proposed Intermodal Hub in New Railway Station**

Intermodal connectivity in Chattogram is crucial for enhancing the city's economic growth, improving transportation efficiency, and reducing congestion. As a major port city and the commercial hub of Bangladesh, Chattogram relies on seamless integration between road, rail, water, and air transport systems to facilitate the movement of goods and passengers. Efficient intermodal connectivity ensures smoother logistics, reduces transportation costs, and supports trade and commerce by linking the port to inland container depots (ICDs), industrial zones, and regional markets. Additionally, it promotes sustainable urban development by encouraging the use of public transport and reducing reliance on private vehicles. Strengthening intermodal connectivity in Chattogram is essential for unlocking its full economic potential and improving the quality of life for its residents.

## 7.8. Freight Transport Plan

***TRN. 3.*** *Encourage sustainable development and upgrading of urban and regional road infrastructure*

***TRN. 5.*** *Ensure the transport sector is developed to effectively complement port expansion and support efficient freight movement.*

A comprehensive freight transport plan for Chattogram is vital for sustaining its role as the economic and logistical hub of Bangladesh. As the country's primary port city, Chattogram

handles nearly 90% of Bangladesh's maritime trade, making efficient freight movement essential for national and international commerce. A well-structured freight transport plan would optimize the flow of goods, reduce congestion, and minimize transportation costs by integrating road, rail, and waterway networks. By improving freight logistics, Chattogram can enhance its competitiveness, support industrial growth, and ensure timely delivery of goods, ultimately contributing to the economic development of the region and the country.

Chattogram, as the primary port city of Bangladesh and the gateway to international trade, requires a robust and efficient freight transport plan to handle the growing volume of goods and reduce congestion in the city. The proposed freight transport plan focuses on creating dedicated routes and expanding existing infrastructure to streamline the movement of cargo from Chattogram Port to key industrial and commercial hubs. Proposals for freight traffic, truck terminals, and intermodal policies are presented in this chapter. Additional port-related recommendations are discussed in Section 9.2.6.

### 7.8.1. Dedicated Freight Route

A comprehensive freight transport plan is vital for supporting Chattogram’s role as the nation’s key logistics and port hub. With increasing industrial activity, port operations, and expansion of trade infrastructure, a well-structured and efficient freight movement strategy is essential to reduce congestion, improve logistics efficiency, and support economic growth. This plan aims to create a network of dedicated freight corridors, improve connectivity between ports and industrial zones, and ensure seamless movement of goods across the city and beyond.

#### Dedicated Freight Routes and Corridor Management

To segregate port-related freight traffic from general city traffic, dedicated freight corridors are proposed. These routes will prioritize port-bound vehicles but remain accessible to other traffic, except for two high-priority freight-only roads: the Port Link Road and the road parallel to the Coastal Road from Bay Terminal.

#### Integration of New Port Developments

In addition to the Bay Terminal, the Laldia Container Terminal in Patenga and the Lighterage Jetty for BSCIC in Bakalia are key emerging freight nodes. Freight from Laldia will utilize Sheikh Mujib Road to access Chattogram Port, while traffic from the BSCIC jetty will move along the new riverbank road, enhanced by the proposed expansion of Strand Road to four lanes. This route will link to the main freight corridor at Port Link Road via Customs House Circle, ensuring integrated and efficient movement from all port terminals.

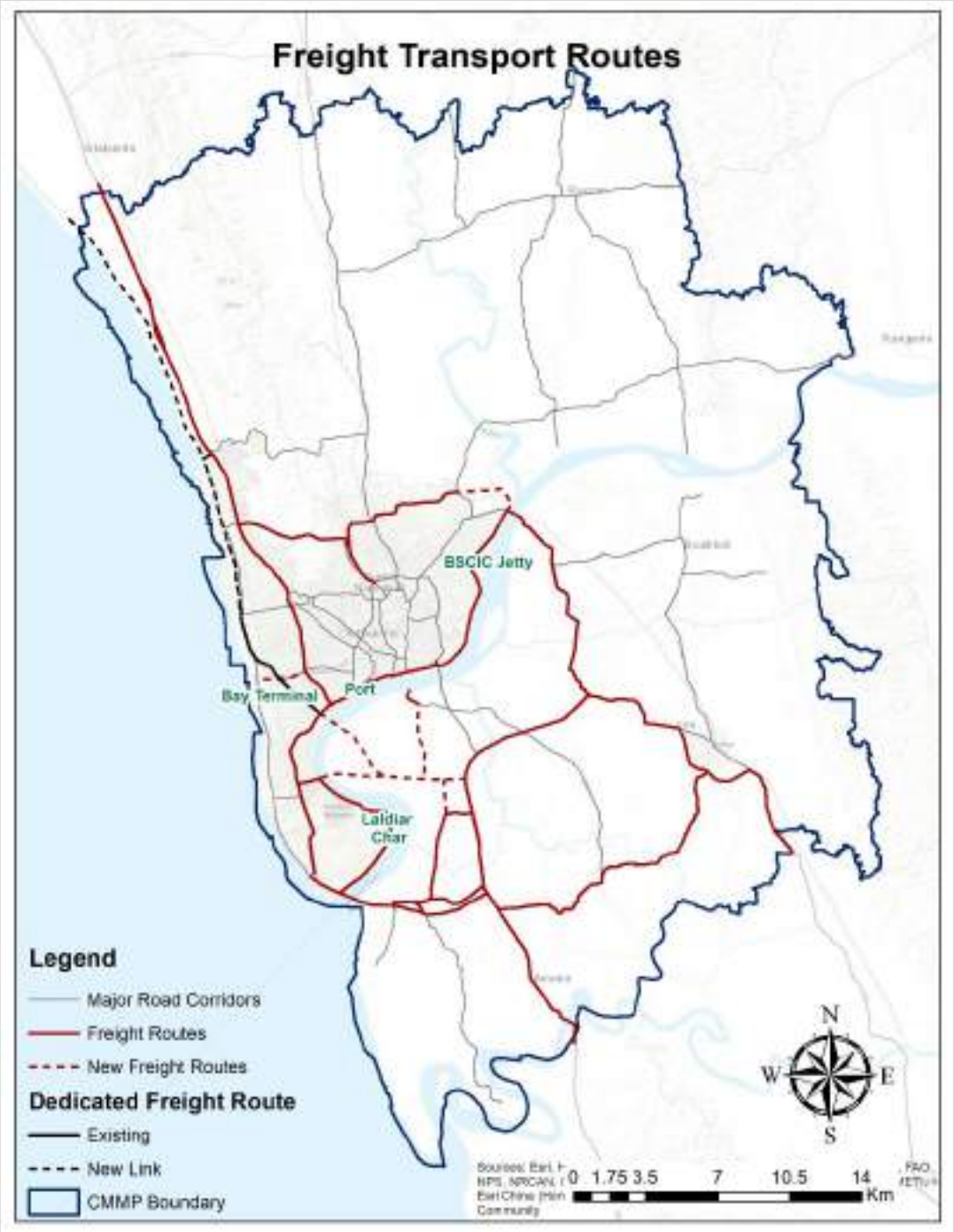



**Figure 7-30: Proposed Freight Route Network**

## Freight from Urban Industrial Zones

Freight generated from industrial zones such as Nasirabad and Kalurghat will be served by a network of strategic roads. Freight from Nasirabad can move through the Bayezid Link Road and Oxygen-Quaish Road, with a new connection planned to link directly to Kalurghat Bridge. This will facilitate both northward movement towards Dhaka and southward access via riverbank routes to the port. The new riverbank road will also provide a parallel freight corridor along the Karnaphuli River, easing pressure on inner-city roads.

### Southern Freight Movements Across Karnaphuli

Freight from the south—originating from KEPZ, Chinese EPZ in Anwara, and the future Matarbari Deep Sea Port—requires efficient crossing points over the Karnaphuli River. The Kalurghat Bridge (upon its reopening), Karnaphuli Tunnel, and proposed new river crossings will serve this demand. One of the proposed crossings will connect directly to the Port Link Road, while another will link to Sheikh Mujib Road via the Airport Road. On that future setting, the Shah Amanat Bridge and its approach roads will be restricted to freight movement to minimize congestion and safety concerns in that corridor.

To support growing freight demand from the south, particularly from Matarbari, the current N107 highway must be supplemented. The R170 route should be upgraded to function as an alternative freight corridor, relieving pressure on N107 and ensuring robust connectivity to Matarbari Port and southern economic zones.

## 7.8.2. Integrated Multimodal Policies

The implementation of Integrated Multimodal Policies is essential for optimizing freight transport in Chattogram and enhancing its role as a regional trade hub. Enacting the Integrated Multimodal Transport Policy (IMMTP) will create a seamless connection between road, rail, and waterways, enabling efficient container movement without the need for frequent unloading and reloading. This approach will significantly reduce transportation time and costs, improving overall logistics efficiency. To further support multimodal transport, the development of Inland Container Depots (ICDs) in strategic locations is crucial. These ICDs will facilitate door-to-door services, eliminating the need for stuffing and de-stuffing containers at multiple points, thereby streamlining the supply chain. Moreover, increasing the share of railway and inland water transport in freight movement will reduce dependency on road transport, alleviate congestion, and promote sustainable logistics. By prioritizing these measures, Chattogram can achieve a more efficient, cost-effective, and environmentally friendly freight transport system, strengthening its position as a key player in regional and global trade.

## 7.8.3. Truck Terminal

There are a few Truck terminals in Chattogram which can serve only a tiny portion of the demand. These creates severe health issues for the truck drivers and also create capacity constraints of the roads as drivers park their trucks on the road near port gates. The temporary locations where trucks are being parked along with the existing terminals are shown in Figure 7-31.

To cater the existing and future demand several truck terminals should be developed to accommodate approximately 10,000 trucks. Currently CPA is developing a terminal of 5000 trucks on the Bay Terminal Area which can fulfill a healthy portion of the demand. We suggest to develop few more truck terminals one on Silimpur (allocated in 2008 DAP) to accommodate 2000 trucks, one in Bhatiyari (1000 trucks) one in Anwara (1000 trucks), and one in Karnaphuli (1000 trucks). RhD also kept a location near Fakirhat for truck terminal, which will be developed with the Dhaka-Chattogram Highway Improvement Project. The locations of these suggested terminals are shown in Figure 7-32.

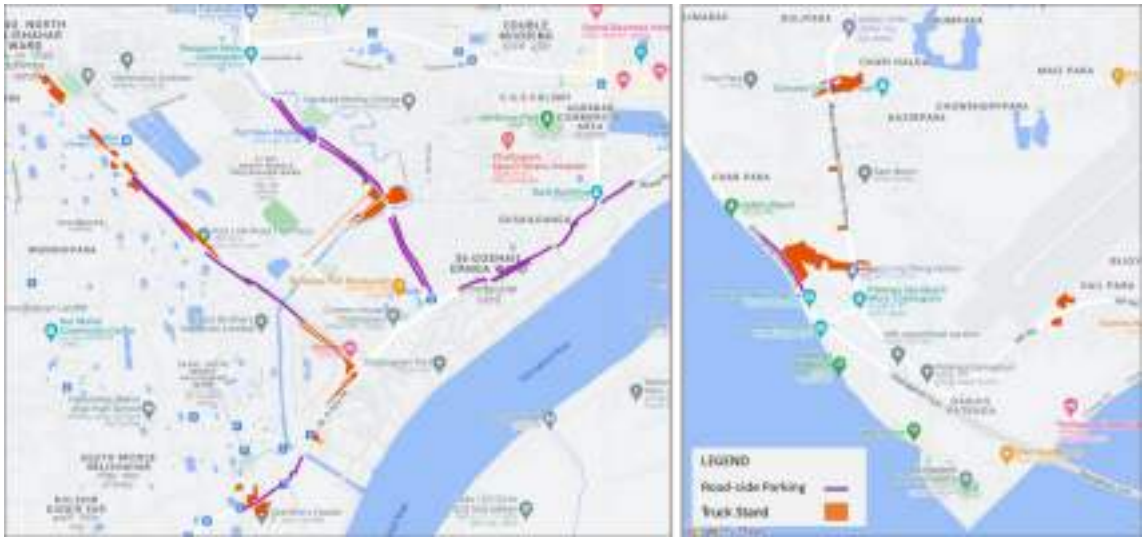



**Figure 7-31: Temporary or Roadside Truck Stands near Port Freight Route**


**Figure 7-32: Proposed Truck Terminals**

## 7.9. Traffic Impact Assessment (TIA)

***TRN. 13.*** *Mandate traffic impact assessments for major land developments*

As Chattogram continues to urbanize rapidly, certain land uses such as shopping malls, hospitals, schools, and freight terminals generate significant volumes of traffic and place pressure on surrounding roads and intersections. Traffic Impact Assessment (TIA) is an essential planning tool to ensure these developments do not negatively affect traffic flow, safety, or the overall efficiency of the transport network. It helps identify how proposed developments interact with existing infrastructure and what measures are needed to mitigate any adverse impacts.

### 7.9.1. TIA Guidelines

- The following land use clearance will require a Traffic Impact Assessment:
  - Hospitals
  - Shopping malls
  - Amusement parks
  - Large-scale residential developments (more than 50 units)
  - Mixed-use developments
  - Schools
  - Convention centers
  - Industrial facilities
  - Inland Container Depots (ICDs)
  - Freight terminals

The TIA for these uses must include:

- **Access Design Assessment:** Ensuring site access and vehicle queuing do not obstruct public roads.
- **Drop-off and Pick-up Provisions:** Properly designed areas for private vehicles, CNGs, rickshaws, and other transport modes.
- **Parking Demand Forecasting:** Estimation of parking needs for both private and intermediate transport modes.
- **Traffic Flow and Impact Analysis of the Traffic Network:** Evaluation of impacts on nearby road links and intersections using modeling and simulation tools.

### 7.9.2. TIA Implementation Framework for CDA

To manage TIAs effectively and ensure consistency in review, the following steps are recommended:

- Prepare a Comprehensive TIA Guideline in collaboration with a third-party transportation expert group.
- Develop the Following Technical Manuals:

- **Trip Generation and Distribution Manual:**

  Defining typical trip generation rates for key land uses across different time periods and locations. To develop the Trip Generation and Distribution Manual, local traffic surveys must be conducted at key land uses like hospitals, shopping malls, residential complexes, and schools to establish accurate trip generation rates. These should be disaggregated by time of day and by mode—such as car, CNG, rickshaw, and pedestrian trips. Socio-economic data should also be used to interpret travel behavior and trip purposes specific to Chattogram.

  Land use categories need to be clearly defined and standardized. For each, local trip generation rates should be derived per appropriate unit (e.g., per 100 sqm of floor area or per bed). Origin-destination (OD) data and transport model outputs should be used to determine distribution patterns and develop zone-based trip assignment rules, supported by GIS mapping.

- **Parking Manual**

  Offering methodologies to estimate vehicle parking demand, accounting for local travel modes and land use context. For the Parking Manual, parking demand surveys are essential across different urban areas to understand how current parking needs align with actual land use intensity. Data must include both on-site and overflow parking, and differentiate between visitor and long-term parking needs. Parking standards should be calculated for each land use type with modal breakdowns.

  The manual should also include requirements for rickshaws, motorcycles, and CNGs, especially in mixed-use and high-density areas. Design standards should be outlined to ensure safe entry, drop-off, and circulation areas. Future parking needs must be projected based on expected growth and local development trends, ensuring the manual supports adaptive and inclusive planning.

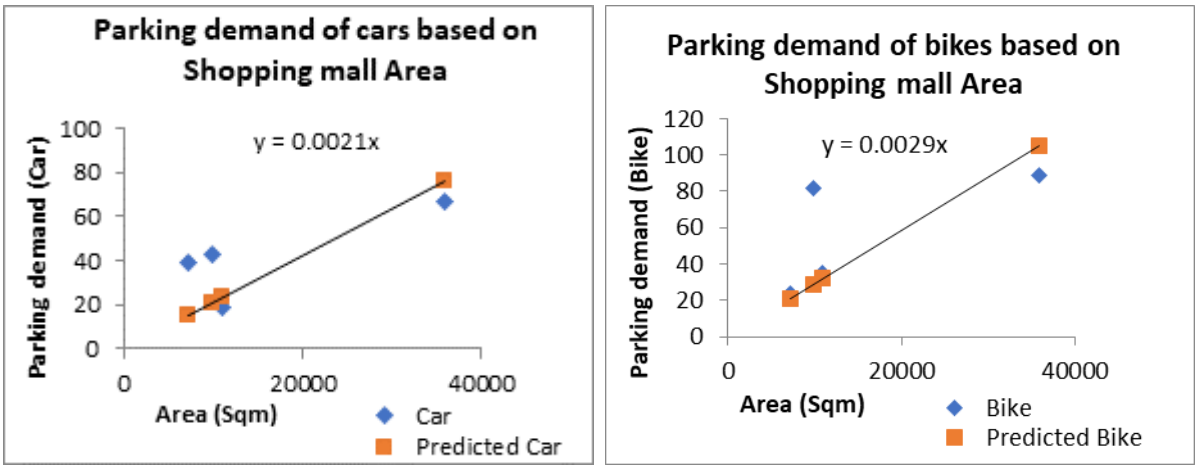
- Entities eligible to conduct Traffic Impact Assessments (TIA) must be transportation consultancy firms or professionals with demonstrated expertise in traffic engineering, modeling, and urban transport planning. To be enlisted with CDA, they must submit proof of relevant project experience, technical qualifications, and modeling capabilities, including the use of microsimulation tools. CDA should maintain a roster of pre-qualified consultants, updated periodically, and require registered firms to follow standardized methodologies and submit validated reports as per TIA guidelines.

### 7.9.3. Parking Demand Assessment for the Parking Manual (an Example)

The masterplan team conducted a parking demand survey across 10 key locations in Chattogram, including commercial areas like Agrabad, shopping centers such as Khulshi Town Centre and New Market, healthcare facilities like Chevron and Chattogram Medical College Hospital, and high-activity corridors like O.R. Nizam Road and GEC Intersection. The survey was carried out from 8 a.m. to 10 p.m., capturing data on four vehicle types—cars, motorcycles, CNGs, and rickshaws—to understand existing parking conditions, particularly peak hour demand.

To explore a method for determining future parking demand in shopping mall areas, a simple linear regression model was developed using survey data from five shopping centers. The model correlated total building floor area (in sqm) with the number of parked private cars and motorcycles during peak hours. This approach excluded CNGs and rickshaws since they

typically operate as on-road vehicles rather than occupying fixed parking spots. The models are shown in Figure 7-33.




(a) (b)

**Figure 7-33: Parking Demand Assessment for (a) Cars and (b) Bikes in Shopping Malls**

By using the gross floor area of the shopping mall as the X variable the equation will return the number of parking slots required for meeting the demand.

## 7.10. Use of ITS (Intelligent Transport Systems) in Road Transportation System

***TRN. 9.*** *Implement effective traffic and parking management and digitized enforcement systems*

***TRN. 11.*** *Enhance road safety through proactive education, design, and enforcement initiatives*

Intelligent Transportation Systems (ITS) are advanced technologies applied to transportation infrastructure and vehicles to improve safety, efficiency, and sustainability in road systems. ITS integrates communication, control, and information processing to address traffic challenges.

**Implementation of ITS in Chattogram City: A Two-Phase Approach**

In Chattogram City, the implementation of Intelligent Transportation Systems (ITS) should be carried out in two major phases to ensure a smooth transition and maximize its effectiveness.

### 7.10.1. Phase 1: Priority Phase (First 10 Years)

The initial 10 years will serve as the priority phase, focusing on familiarizing the public with the ITS system, promoting disciplined road usage, and enhancing vehicle mobility. During this period, ITS will be utilized to improve traffic management, modernize signal systems, enforce traffic rules, and establish comprehensive traffic control. Key suggestions for this phase include:

- **Upgraded Traffic Signal Systems**: Implement advanced traffic signal systems at major intersections to optimize traffic flow and reduce congestion.
- **Speed Cameras:** Install speed cameras to detect and deter over-speeding vehicles, ensuring safer road conditions.

- **Lane Change Detectors**: Use lane-changing detectors to identify and penalize vehicles violating lane discipline.
- **Wrong-Way Detection Cameras:** Deploy cameras to detect and alert vehicles moving in the wrong direction, preventing potential accidents.
- **Restricted Vehicle Detection**: Implement systems to identify and manage vehicles operating in restricted zones or during prohibited times.

This phase will lay the foundation for a more organized and efficient transportation system, preparing the city for the next stage of ITS integration.

### 7.10.2. Phase 2: Advanced Integration and Expansion (Next 10 Years)

The second phase will focus on upgrading and expanding the ITS system to incorporate advanced technologies, improve connectivity, and further enhance the efficiency, safety, and sustainability of Chattogram City's transportation network. Initiatives for this phase include:

- **Predictive Analytics:** Use historical and real-time data to predict traffic patterns, accidents, and congestion hotspots, enabling proactive management.
- **Variable Message Signs (VMS):** Utilize VMS to provide real-time updates to commuters, including public transport locations, accident alerts, and road blockage information.
- **Smart Parking Solutions:** Implement sensor-based parking systems to guide drivers to available parking spots, reducing congestion and emissions.

## 7.11. Transportation and Environment

***TRN. 12.*** *Regulate environmental impacts and ensure vehicle roadworthiness through strict monitoring*

Chattogram, Bangladesh's second-largest city, is facing mounting environmental challenges due to rapid urbanization and a heavily congested, fossil fuel-dependent transport system. The mix of private vehicles, freight trucks, and informal modes—many of which are old and poorly maintained—contributes significantly to air pollution. Inefficient traffic flow and lack of emission controls further worsen air quality, threatening public health and environmental sustainability. Incorporating environmental considerations into transportation planning is vital for sustainable urban development in fast-growing cities like Chattogram. As Bangladesh's commercial and maritime hub, Chattogram experiences high transport demand driven by port activities, industry, and population growth resulting in severe air pollution.

### Guidelines for Environmental Management

- **Regular Vehicle Fitness Inspections**: Vehicles should undergo mandatory fitness checks annually, covering emissions, brakes, suspension, and general safety. Inspections will be conducted using digital diagnostic tools for accuracy and transparency. The results will be stored in a centralized digital system, accessible by regulatory authorities to ensure compliance. Non-compliant vehicles will face fines or temporary suspension of their operating license until they meet required standards.
- **Mobile Courts for Emissions Enforcement:** Mobile courts should be equipped with portable emission testing devices and deployed in high-traffic or pollution-prone areas. These units will allow authorities to perform instant emissions tests and issue penalties for non-compliance. The system should be integrated with a centralized database for efficient

tracking of violations. Public education campaigns should precede enforcement actions to raise awareness about emissions standards and their health impact.

- **ITS Devices for Emissions Detection and Penalty Automation:** Intelligent Transport Systems (ITS) should be used to monitor emissions, with black smoke detection cameras installed at key locations throughout the city. These systems will automatically identify vehicles exceeding emissions limits and link the violations to vehicle registrations using license plate recognition (LPR) technology. Penalties will be automatically issued based on the severity of the violation. Real-time pollution data should be made available to the public via mobile apps or government websites to promote transparency and accountability.
- **Encourage Electric Vehicle (EV):** Electric vehicles (EVs) present a promising future to cleaner air by eliminating fuel emissions. While EV technology is increasingly safe and reliable, the environmental impact of conventional batteries heavy, costly, and difficult to dispose of requires careful consideration. To promote responsible EV adoption, Chattogram's policies should prioritize safer, more efficient battery technologies and establish robust systems for battery recycling and disposal. Enforcing safety standards for EV use and charging, alongside public awareness campaigns on battery handling and maintenance, is crucial. A successful EV transition in Chattogram must address the entire lifecycle of conventional batteries, not just emissions.

# CHAPTER EIGHT

# RAILWAY DEVELOPMENT

# Chapter 8: Railway Development

***TRN. 6.*** Expand and modernize rail-based services for both urban mobility and freight movement

## 8.1. Regional Rail Services

The city-to-Upazila rail service in Chattogram is crucial for improving regional connectivity, reducing traffic congestion, and providing a faster, more reliable commuting option. With the city's growing population and increasing dependence on road transport, an efficient rail system will offer a sustainable alternative, easing pressure on highways and lowering travel costs for daily commuters. By ensuring structured scheduling, streamlined ticketing, and regular fare enforcement, the service will enhance public transport efficiency and accessibility. This rail network will not only support economic activities by improving workforce mobility but also contribute to a cleaner environment by reducing vehicular emissions. Investing in this system will create a more balanced and resilient urban transport network for the future.

- **Establish Rail Connectivity:** Develop a commuter rail service linking Chattogram city with Sitakunda, Hathazari, and Patiya Upazila to provide a faster and more efficient alternative to road transport, reducing congestion and travel time.
- **Optimize Train Scheduling:** Ensure well-structured train schedules with morning services directed towards the city to accommodate home-to-work commuters and evening services returning to the Upazila. Additional mid-day and off-peak services can be introduced based on demand.
- **Implement a Structured Ticketing System:** Introduce a standardized fare system with digital ticketing options, such as smart cards and mobile payment solutions, to streamline fare collection and enhance passenger convenience. Also, deploy ticket inspectors to conduct routine fare checks on trains to minimize fare evasion and ensure compliance with ticketing regulations.

## 8.2. Potential Urban Rail Service

The urban rail system in Chattogram is crucial for enhancing connectivity, reducing traffic congestion, and promoting sustainable urban mobility. By linking key areas such as Sholoshohor, Kalurghat, Akbar Shah, Pahartoli, and Patenga, the system will offer a reliable, high-capacity transport option that alleviates pressure on road networks. Utilizing existing railway infrastructure and converting port lines will provide cost-effective solutions while improving accessibility to commercial, industrial, and residential zones. The urban rail will also contribute to environmental sustainability by reducing reliance on cars and buses, lowering emissions, and supporting cleaner transportation. Ultimately, this system will enhance economic efficiency, improve quality of life, and promote a more sustainable and integrated public transport network in Chattogram.


Figure 8-1: Proposed Railway Network

- **Utilize Existing Railway Network**: Leverage the existing railway infrastructure to establish an urban rail service connecting key areas of Chattogram, including Sholoshohor, Kalurghat, Akbar Shah, and Pahartoli. This will optimize resources and reduce the need for extensive new infrastructure investments.
- **Conversion of Port Lines for Urban Rail:** Convert the existing port railway lines into an urban rail system extending towards Patenga. This will enhance connectivity to the coastal and industrial zones, supporting economic growth and providing better access to these crucial areas.
- **Structured and Punctual Service:** Ensure that the urban rail system operates on a well-coordinated and punctual schedule, particularly during peak hours to cater to

commuter demand. The service should prioritize frequent, high-capacity trains during rush hours to accommodate large volumes of passengers.

- **Integration with Other Transport Modes:** Integrate the urban rail service with other modes of public transport, including buses and ferries, to create a seamless travel experience. Stations should be strategically located to facilitate smooth transfers between different transport systems.
- **Accessible Ticketing System:** Implement a unified, digital ticketing system for the urban rail, allowing for easy payment and fare collection across different transport modes. This should include options for smart cards, mobile apps, and automated ticket vending machines.
- **Safety and Comfort:** Ensure that the urban railway provides a safe, secure, and comfortable environment for passengers, with appropriate security measures, well-maintained stations, and clean trains.

## 8.3. Rail Station Development

Structural improvements in railway stations refer to the physical upgrades and modernization efforts to enhance passenger convenience, safety, and operational efficiency. These improvements are essential to accommodate the growing number of travelers, ensure smooth train operations, and create a more sustainable transport system. One of the key reasons for structural upgrades is to improve passenger comfort and experience. Investing in structural improvements at railway stations is vital for creating a modern, safe, and efficient transport system. These upgrades not only enhance passenger experience but also contribute to sustainable urban mobility and economic development. Here a list is given of the railway stations in the city corporation area of Chattogram:

- Chattogram Railway Station
- Pahartali Railway Station
- Kaibollo Dham Railway Station
- Jhautala Railway Station
- Chattogram Cantonment Railway Station
- Sholoshohor Railway station

Here are some effective strategies for structural improvement at each railway station in urban Chattogram:

- **Chattogram Railway Station (Main Station)**
  - **Expansion & Modernization**: Increase platform capacity and improve waiting areas.
  - Multi-Modal Connectivity: Integrate bus and taxi stands for smooth passenger transition.
  - **Digital Infrastructure**: Install digital ticketing kiosks and automated gates.
  - **Structural Reinforcement:** Upgrade roofs and platforms to withstand heavy foot traffic.
- **Pahartali Railway Station**
  - **Platform Extension:** Increase platform length to accommodate longer trains.

- **Drainage System:** Improve water drainage to prevent flooding during monsoons.
- **Security Enhancement**: Install surveillance cameras and increase lighting.
- **Passenger Amenities:** Add more seating, shades, and drinking water facilities.

- **Kaibollo Dham Railway Station**
  - **Shelter & Shade Improvement:** Install better roofing for protection from sun and rain.
  - **Platform Height Adjustment:** Modify platform height for easier train boarding.
- Safety Measures: Implement proper fencing and pedestrian pathways.
- **Jhautala Railway Station**
  - **Pedestrian Bridges:** Construct foot over bridges for safe crossing between platforms.
- **Signage & Navigation**: Install clear signboards in Bengali and English.
  - **Accessibility**: Improve footpaths and Platforms.
- **Chattogram Cantonment Railway Station**
  - **Military & Civilian Coordination:** Establish a designated zone for military and civilian passengers.
  - **Checkpoints & Security:** Implement scanning systems at entry points.
  - **Parking Lot Expansion:** Improve vehicle parking to reduce congestion.
- **Sholoshohor Railway Station**
  - **Retail & Commercial Spaces:** Develop small shops for passenger convenience.
  - **Modern Ticketing System:** Introduce smart card-based ticketing.
  - **Green Spaces**: Add landscaped areas with seating for commuters.
  - **Structural Repairs:** Fix cracked platforms, damaged tracks, and weak roofing.

To effectively implement the proposed structural improvements, the following policies should be introduced:

- Infrastructure Development & Modernization Policy
  - Encourage private sector investments in station upgrades.
  - Set clear construction and maintenance standards for platforms, roofs, and waiting areas.
  - Streamline procedures for acquiring land for station expansion while ensuring fair compensation.
  - Promote digital ticketing, automated gates, and smart surveillance integration.
- Passenger Safety & Security Policy
  - Implement mandatory CCTV monitoring, baggage scanning, and emergency response systems at all stations.
  - Strengthen law enforcement presence and introduce railway police patrols.

- Mandate the installation of proper lighting and security cameras at all stations.
- Ensure the construction of pedestrian overpasses and proper fencing around tracks.

- Accessibility & Passenger Service Policy
  - Mandate the installation of ramps, tactile paving, and accessible toilets.
  - Require stations to provide adequate seating, shades, drinking water, and restroom facilities.
  - Improve connectivity with bus, taxi, and ride-sharing services for seamless passenger movement.
- Revenue Generation & Commercialization Policy
  - Allow small businesses, food stalls, and service kiosks to operate within stations.
  - Utilize digital and physical advertising spaces for additional revenue.
  - Implement digital fare collection to reduce ticket fraud and improve efficiency.
- Emergency Response & Disaster Management Policy
  - Ensure every station has fire extinguishers, medical emergency points, and evacuation plans.
  - Upgrade drainage systems to prevent waterlogging during monsoons.
  - Implement a real-time reporting system for accidents or security threats.
- Governance & Implementation Policy
  - Establish a governing body to oversee station improvements, funding, and policy enforcement.
  - Conduct routine assessments to ensure structural safety and service quality.
  - Create a grievance redressal system to address passenger concerns.

## 8.4. Railway Over-bridge Construction

A Railway Over Bridge is a structure built to carry a roadway or pathway over a railway track, eliminating the need for level crossings where vehicles and pedestrians have to wait for passing trains. These bridges are essential in urban planning, particularly in cities with heavy rail and road traffic, as they help improve traffic flow, safety, and connectivity. Railway Over Bridges are usually constructed using reinforced concrete or steel structures, designed to accommodate vehicular load, pedestrian movement, and sometimes even bicycle lanes. They serve as a permanent solution to congestion and accidents at railway crossings by allowing uninterrupted traffic movement while trains pass underneath. We recommended some precise locations for the railway over bridge, which are depicted in Figure 8-2.

Dewanhat over bridge is the oldest (more than 50 years old) railway crossing in Chattogram, currently at the end of its life cycle. This bridge will need repair or replacement in the near future. Recently Bangladesh Railway published a gazette of the height clearance which is 8.5 meter, way above the current height, might pose an engineering challenge for a new construction. This clearance issue should be considered by Bangladesh Railway when this bridge needs a replacement.

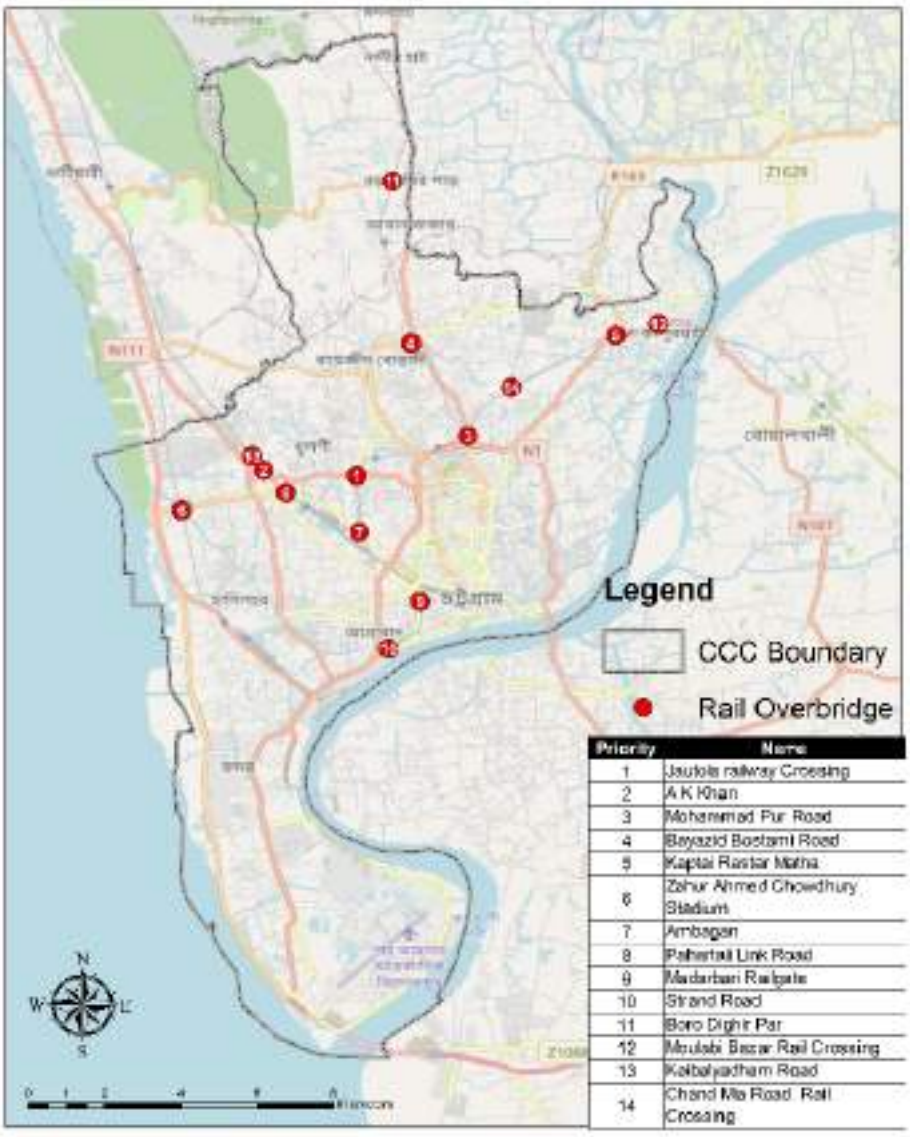



**Figure 8-2: Proposed Rail Over Bridges**

# CHAPTER NINE

# AVIATION AND MARITIME

# Chapter 9: Aviation and Maritime

## 9.1. Airport Development

The Chattogram Airport Development Project (CADP) was the last major development initiative finished in the 2000. The aim was to modernize the outdated and insufficient facilities of Shah Amanat International Airport and transform it into a functional international gateway. As Bangladesh's second largest city and main seaport, Chattogram needed improved aviation infrastructure to support its growing economic activities and rising domestic and international travel demand. The project enhances safety and operational standards, improve international connectivity, support regional economic development, attract foreign investment and tourism, and serve as an alternative to Hazrat Shahjalal International Airport. It increases resilience against natural disasters.

A new three-storied passenger terminal was constructed, equipped with modern processing systems, boarding bridges, and passenger amenities. Additional infrastructure included a cargo terminal, extended and strengthened runway, modern control tower, utility buildings, parking facilities, and upgraded navigation and communication systems. Designed to accommodate wide-body aircraft, the airport now has the capacity to handle up to 600,000 passengers and 5,700 metric tons of cargo annually. Completed on time and within budget, the project upgraded Shah Amanat International Airport to regional standards. Additionally, a key ongoing project is the Strengthening of the Existing Runway & Taxiway at Shah Amanat International Airport, Chattogram, aimed at further enhancing the airport's capacity and operational safety.[17]

A new Master Plan of the Shah Amanat International Airport is currently underway. This plan aims to improve the terminal facilities as well as cargo facilities for the current and future passenger and cargo. To facilitate the current and traffic movements a shuttle bus service is proposed in Figure 7-27 (section 7.7.1).

## 9.2. Chattogram Port Development

***TRN. 5.*** *Ensure the transport sector is developed to effectively complement port expansion and support efficient freight movement.*

The ongoing and planned expansion projects of Chattogram Port, including the **Bay Terminal**, **Laldia Bulk Terminal**, and **Kalurghat Jetty**, are poised to significantly enhance the port's capacity and generate substantial increases in both freight and passenger transport demand.

### 9.2.1. Bay Terminal

The Bay Terminal project represents a transformative expansion initiative for Chattogram Port. Due to current tidal limitations and river navigation constraints, larger vessels (exceeding 187 meters in length) are unable to access the port. Upon completion, the Bay Terminal will allow for the berthing of ships up to 260 meters in length and 12 meters in draught, enabling round-the-clock operations independent of tidal conditions.

The terminal will consist of four berths, each approximately 1.25 kilometers long, along with a truck terminal capable of accommodating up to 5,000 trucks. Once operational, the terminal

[17] caab.gov.bd/devlpmnts/cadp.html

is expected to **increase the port's container handling capacity by six times**. Nationally, container handling across all ports—including Chattogram, Mongla, Payra, and Matarbari—is projected to reach **17 million TEUs annually by 2030**. This will result in a sharp rise in **truck and container movements**, requiring robust road and logistical support systems.

The development of the Bay Terminal is anticipated to generate approximately **10,000 new employment opportunities**, leading to increased daily commuter trips between residential areas and the terminal zone. This necessitates the planning and provision of adequate housing, commercial, educational, and recreational facilities in the vicinity to reduce pressure on the broader urban transport network and ensure a balanced work-life environment for employees.


**Figure 9-1: Location of Proposed Bay Terminal**

### 9.2.2. Laldia Bulk Terminal

The proposed Laldia Bulk Terminal, as outlined in the CPA Master Plan, will be developed through a Public-Private Partnership (PPP). Featuring a 1,000-meter jetty dedicated to bulk cargo handling, this facility is expected to contribute significantly to **bulk freight transport**, generating heavy vehicle traffic within the port access road network and reinforcing the need for efficient traffic management and infrastructure planning.


**Figure 9-2: Location of Proposed Laldia Bulk Terminal**

### 9.2.3. Kalurghat Jetty

A new jetty south of the Maritime University is proposed to support freight movement from the Kalurghat Industrial Area. This initiative aims to **shift a portion of cargo transport from road to water**, thereby reducing congestion on port access roads. However, it will still lead to increased local freight handling requirements at the water-land interface.


**Figure 9-3: Location of Proposed Kalurghat Jetty**

### 9.2.4. Development Pressure on the Southern Bank of Karnaphuli

The completion of the **Bangabandhu Sheikh Mujib Tunnel** beneath the Karnaphuli River has opened up direct connectivity between Chattogram's central urban core and the southern regions, including Anwara, Bandarban, and Cox's Bazar. The strategic location of the tunnel, only 2 km from Shah Amanat International Airport, has already begun to attract industrial investment on the southern bank.

As new Export Processing Zones (EPZs) and industrial estates are established in the Anwara region, there will be a **notable increase in import-export activity**, which in turn will heighten the demand for port services and logistics traffic. Improvements to the Banshkhali–Cox's Bazar corridor are critical to ensuring seamless freight and passenger movement along this emerging economic axis.

### 9.2.5. Matarbari Port

The development of Matarbari Port as Bangladesh's first deep sea port is expected to significantly reshape the transport dynamics of Chattogram. Designed to handle large vessels of up to 8,000 TEUs, Matarbari will alleviate pressure on Chattogram Port by diverting a portion of container and bulk cargo traffic. While this may reduce some freight congestion within Chattogram's core port areas, it will simultaneously generate **new transport demand** across the corridor linking Matarbari with Chattogram and beyond, requiring strategic upgrades to **regional highways, logistics hubs, and rail infrastructure** to support efficient cargo movement between the two ports and inland destinations.

### 9.2.6. Recommendations for Improved Port Traffic

The following recommendations will be helpful to ensure smooth port management and also for improvement of the overall scenario of this port-city Chattogram. The location of these recommendations are illustrated in Figure 9-4.


| SL | Suggestion |
|---|---|
| 1 | New Connection between Airport Road and Feeder Road through Karnaphuli EPZ |
| 2 | Widening the existing connecting road of port with M.A Aziz road |
| 3 | Traffic Signal at the entrance of overflow yard on M A Aziz Road |
| 4 | Proposed Truck Terminal for 5000 Truck (Currently implemented by CPA) |
| 5 | New freight only link between Saltgola and Port Link Road |
| 6 | Widening the existing Port Link road and CPAR gate connecting road from 2 lane to 6 lane |
| 7 | Connecting Port Connecting Road with Coastal road at Boropole Intersection |
| 8 | New Freight Road from Bay Terminal to Dhaka-Chattogram Highway |
| 9 | Widening Strand Road (4-lane) and creating Truck parking area at both side |
| 10 | Flyover from Karnaphully Marine Drive to Barek Building |
| 11 | Traffic Signals on M A Aziz Road and Mooring Road at port gates (Gate 2, 3, 4 and CCT-2) |
| 12 | Intersection re-design at NCT Gate 2 and a U-turn 500 m down the road to the south |

**Figure 9-4: Recommendations for the Improvement of Port Traffic**

## 9.3. Inland Water Transport System

***TRN. 7.*** Facilitate safe, inclusive, and efficient inland water transport

***TRN. 10.*** Strengthen east-west connectivity through appropriate river crossing infrastructure

A water bus is a form of public transportation that operates on waterways, such as rivers, canals, or lakes. It serves as an efficient and sustainable mode of transit in cities with extensive water networks. Water buses are a necessary and innovative solution for modern urban transportation. Water bus can be used for tourism purpose or passenger passing.

### 9.3.1. Ferry / Boat Service route

Here is the proposed route map for water bus operation

- Route 1: Bangla Bazar Ghat- Issanagar sadarghat- Avaymitraghat- Naval Ghat
- Route 2: Dovashnagar Ghat -Bangla Bazar Ghat- Sadarghat Sampan Ghat-Fishery Ghat -Naval Ghat
- Route 4: Bothside of riverbank from Kalurghat Bridge to Shah Amanat Bridge
- Route 5: 15 No Ghat – Avaymitra Ghat

**Initiating River Cruise on Karnaphuli River**

The Karnaphuli River, a vital waterway for Chattogram, offers immense potential for river cruising. With its scenic beauty, historical significance, and diverse ecosystem, the river can

be transformed into a major tourist attraction. River cruises can provide visitors with a unique perspective of the city, showcasing its skyline, waterfront activities, and historical landmarks.

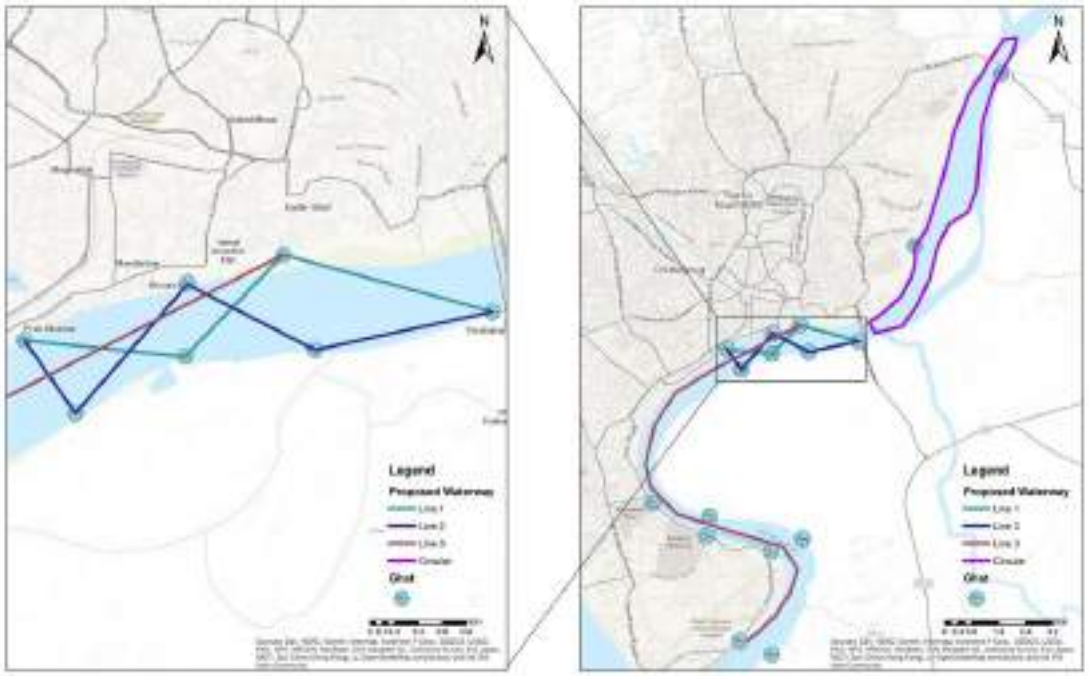



**Figure 9-5: Proposed Inland Waterway Routes**

### 9.3.2. Terminal Facilities

To make functional, safe, and welcoming for all users, and for upgradation of ghat the following amenities should be provided:

- Basic Development: Regular maintenance, parking management for passengers' vehicles, shelter or shade for passengers during sunny or rainy weather, well-constructed seat for passengers as well as special sitting arrangement for older person or physically challenged people.
- **Sanitation:** Clean & well-maintained toilets, dustbin & proper waste management system should be developed.
- **Safety & Security**: Non slippery steps or ramp for ghat , adequate lighting for night, safety life jackets , barriers for children etc.
- **Other:** Information board for waiting passengers, stationaries , recreational facilities like boating service, riverside seating etc.

# CHAPTER TEN

# IMPLEMENTATION PROGRAM

# Chapter 10: Implementation Program

***TRN. 14.*** *Strengthen institutional arrangements for coordinated traffic and transport planning*

## 10.1. Implementation Program, Phasing and Authorities

This chapter outlines the roles and responsibilities of various authorities in the effective implementation of the Chattogram Metropolitan Master Plan, which serves as a comprehensive framework for all urban development initiatives.

The CMMP Master Plan is designed to guide the long-term growth and development of the region, ensuring that all stakeholders government agencies, local authorities, and private entities work towards a common goal. Each institution has a clear mandate within the framework, and their collective efforts are crucial for the successful realization of the plan's objectives. The master plan covers all aspects of urban planning, including transport, infrastructure, and land use, and its implementation requires close cooperation among relevant authorities.

To achieve the desired outcomes, it is essential that all parties take ownership of their responsibilities, ensuring that projects are carried out efficiently and in alignment with the broader vision of the master plan. Regular communication, coordination, and accountability between institutions will facilitate the seamless execution of initiatives. By adhering to the plan, Chattogram will be able to tackle challenges such as traffic congestion, infrastructure deficits, and urban development.

### 10.1.1. The Need for Institutional Strengthening

Typically, a multitude of agencies oversee different transport modes and infrastructure requirements, resulting in overlapping responsibilities and lack of clarity in roles. These issues complicate the management and coordination of urban transport services. Additionally, a shortage of adequately trained personnel has been a major barrier to the development of the sector over the past decade.

In Chattogram, the consequences of such institutional limitations are visible in multiple forms. Methods for evaluating transport programs and projects are often outdated or lack adequate support, particularly in terms of economic appraisal. Project justifications tend to rely on engineering judgments rather than comprehensive analysis. Furthermore, decision making is frequently influenced by shifting political priorities.

For example, planning the location and scale of bus, rail, and other terminals should be informed by access, existing trip patterns, and forecast demand. However, decisions are often based on site availability alone. Urban planning integration is also limited for instance, the placement of electricity poles should be done with foresight, allowing the Chattogram Development Authority (CDA) to improve primary and secondary routes without incurring substantial service diversion costs.

Organizational coordination among key agencies such as CDA, Chattogram City Corporation (CCC), and the Bangladesh Road Transport Authority (BRTA) needs improvement. The 1995 Master Plan (IAP, 1993; LTDSTT, 1995) proposed the following institutional setup to address these issues:

1. Formation of a Chattogram Traffic Committee, with a Traffic Group located in CCC;
2. Expansion of the role of the Chattogram Metropolitan Transport Committee through the establishment of a Public Transport Group, located in either CCC or BRTA;
3. Formation of a permanent Strategic Transport Planning Unit within CDA;
4. Formation of an IAP Implementation Unit and a Project Implementation Unit within both CDA and CCC.

As of now, items 1, 2, and 3 have not yet been implemented. Addressing these institutional gaps is essential to ensure coordinated, efficient, and forward-looking urban transport development in Chattogram.

### 10.1.2. Related Institutions

The development and successful implementation of the Transport Master Plan for Chattogram require close coordination among a wide range of Institutions. These include government agencies, local authorities, regulatory bodies, transport operators, utility service providers, professional organizations, academic institutions, and private sector representatives. Each Institution plays a critical role in shaping the region's transport future through planning, policy, investment, operations, and community engagement. Key Institutions include:

#### Government & Regulatory Authorities

- **Chattogram Development Authority (CDA):** Leads urban planning and coordinates land use and infrastructure development aligned with the transport master plan.
- **Chattogram City Corporation (CCC):** Maintains and develops city roads, street infrastructure, and local transport-related amenities.
- **Chattogram Metropolitan Police (CMP):** Manages traffic enforcement, road safety, and congestion control across the metropolitan area.
- **Bangladesh Road Transport Authority (BRTA):** Regulates vehicle registration, driver licensing, and sets safety standards for road transport.
- **Bangladesh Inland Water Transport Authority (BIWTA):** Regulates and plans inland waterway routes and terminals to support integrated and multimodal transport connectivity.
- **Bangladesh Railways (BR):** Develops and operates railway connectivity to improve freight and passenger mobility in the region.
- **Chattogram Port Authority (CPA):** Facilitates port access and logistics planning, coordinating with freight routes and port infrastructure.
- **Local Government Engineering Department (LGED):** Constructs and maintains rural and peri-urban roads connecting to the city transport network.
- **Roads and Highways Department (RHD):** Designs and maintains national highways and arterial roads feeding into the city's road network.
- **Civil Aviation Authority of Bangladesh (CAAB):** Coordinates airport infrastructure with road and rail access to enhance intermodal connectivity.
- **District Commissioner (DC), Chattogram:** Oversees administrative coordination among departments for land acquisition and project implementation.

### Service & Utility Providers

- **Chattogram Water Supply & Sewerage Authority (CWASA):** Coordinates utility relocation and infrastructure planning to ensure water and sewerage lines do not conflict with transport development.
- **Karnaphuli Gas Transmission & Distribution Company (KGTDC):** Aligns gas pipeline planning and maintenance with road construction and transport corridor development to avoid service disruptions.
- **Power Development Board (PDB):** Installs and maintains electric poles and lines, which influence road infrastructure and footpath design due to pole placement and utility alignment.

### Academic & Professional Institutions

- **Academicians (CUET, BUET, CU, etc.):** Provide academic expertise and informed opinions during consultations and stakeholder meetings.
- **Bangladesh Institute of Planners (BIP):** Offer professional planning perspectives and recommendations in stakeholder engagements.
- **Institute of Engineers Bangladesh (IEB):** Share engineering viewpoints and technical feedback during planning discussions.
- **Institute of Architects Bangladesh (IAB):** Contribute architectural insights and urban design considerations in advisory roles.

### Private Sector & Industry Associations

- **Chattogram Chamber of Commerce & Industry (CCCI):** Represents business interests and provides input on how transportation planning can support trade, commerce, and industrial growth.
- **Chattogram Prime Mover and Flatbed Owner's Association (CPMFOA):** Offers operational insights on freight movement needs and challenges related to container transport.
- **Bangladesh Inland Container Depots Association (BICDA):** Shares logistics requirements and depot connectivity concerns to ensure efficient freight handling.
- **Bangladesh Bus-Truck Owner's Association (BBTOA):** Represents the interests of road freight and passenger transport operators, highlighting key issues and infrastructure needs.

### Transport Operators & Authorities

- **Bangladesh Inland Water Transport Corporation (BIWTC):** Operates water transport services, contributing to planning by identifying route needs and operational improvements.
- **Bangladesh Road Transport Corporation (BRTC):** Provides public bus services and supports network planning by indicating demand and route optimization needs.
- **Driver's Associations (Bus, Truck) (DA):** Represent on-the-ground operational feedback from drivers regarding road conditions, safety, and infrastructure bottlenecks.

### Project-Specific Initiatives

**Transport Master Plan and Preliminary Feasibility Study for Urban Metro-Rail Transit Construction of Chattogram Metropolitan Area (CMA) Project:** Provides foundational data, strategic direction, and feasibility insights for introducing metro-rail transit as a core component of Chattogram's future transport infrastructure.

## 10.1.3. Division of Responsibilities

A brief summary of the current responsibilities of two of the principal transport authorities CDA and CCC follows before setting out the proposals for new implementation arrangements within the Investment Programmed.

### Road Network Development

Road development in the Chattogram Metropolitan Area (CMA) involves coordinated responsibilities among key government institutions to ensure a well-connected, safe, and sustainable transport network.

The **Chattogram City Corporation (CCC)** handles the upgrading, maintenance, and widening of existing city roads, along with improvements to urban transport facilities like drainage, street lighting, and bus bays.

The **Chattogram Development Authority (CDA)** plans and implements major urban roads, including new corridors and alternative routes, ensuring integration with public and multimodal transport.

The **Local Government Engineering Department (LGED)** develops rural and peri-urban roads, especially at the Upazila level, enhancing connectivity between urban and outlying areas.

The **Roads and Highways Department (RHD)** is responsible for national and regional highways, including key expansions like the Dhaka-Chattogram Expressway, Chattogram-Cox's Bazar corridor, and freight routes linked to the port and Bay Terminal.

Utility facility providers such as the **Power Development Board (PDB), Karnaphuli Gas Distribution Company Ltd. (KGDCL)** and **Chattogram Water and Sanitation Authority (CWASA)** are also stakeholders in these type of development as utility lines follow major corridors and co-ordination with them requires to ensure excavating roads at short intervals.

### Public Transport Plan

Improving public transport in the Chattogram Metropolitan Area (CMA) is essential to address growing travel demand, reduce congestion, and ensure equitable mobility. A shift from informal, unregulated systems to structured, company-based operations is key to instating discipline, enhancing service quality, and ensuring long-term sustainability. This transformation requires coordinated efforts from key institutions, each with defined responsibilities.

The **Chattogram City Corporation (CCC)** is responsible for developing and upgrading public transport infrastructure, including city and intercity bus terminals, bus stops, shelters, bays, and proper road markings. CCC also supports the implementation of automated fare collection systems to ensure cashless and transparent transactions.

The **Chattogram Development Authority (CDA)**, as the primary road developer in the city, can incorporate public transport infrastructure during road design and construction. CDA is also interested in developing bus terminals.

The **Bangladesh Road Transport Authority (BRTA)** leads in establishing company based public bus operations and rationalizing routes for improved efficiency. BRTA also ensures operator training and regulatory oversight while collaborating on the deployment of automated fare systems and smart enforcement tools.

The **Chattogram Metropolitan Police (CMP)** supports public transport reform through traffic regulation and enforcement, particularly by adopting Intelligent Transport Systems (ITS) to enhance law enforcement and operational monitoring.

The **Bangladesh Road Transport Corporation (BRTC)** is tasked with procuring buses to meet specific transport needs, such as school services, tourist travel, and group tours, supporting a more inclusive and responsive transit network.

### Pedestrian Network Plan

Enhancing pedestrian infrastructure in the Chattogram Metropolitan Area (CMA) is crucial to ensure safe, inclusive, and accessible urban mobility particularly for the elderly, children, and persons with disabilities. A people-centered approach to transport planning emphasizes walkability, pedestrian safety, and improved urban design, especially in areas with high foot traffic such as tourist zones and commercial centers.

The **Chattogram City Corporation (CCC)** is primarily responsible for the improvement and expansion of pedestrian infrastructure. This includes upgrading existing footpaths, constructing new walkways, and developing safe, designated crossing zones. CCC also leads the installation of traffic signals with dedicated pedestrian phases and mid-block crossings to facilitate safer movement across roads.

The **Chattogram Metropolitan Police (CMP)** collaborates with CCC to install and manage traffic signal systems at intersections, ensuring effective traffic flow and pedestrian safety.

The **Bangladesh Road Transport Authority (BRTA)**, in coordination with NGOs and media partners, plays a key role in promoting pedestrian safety through public awareness and behavioral change campaigns. These efforts should start at the school level to build a culture of road safety from an early age.

### Traffic Management Plan

Effective traffic management is essential for improving mobility, safety, and efficiency across the Chattogram Metropolitan Area (CMA). To address growing congestion and coordination challenges, a comprehensive and integrated traffic management approach must be implemented with active involvement from key institutions.

The **Chattogram City Corporation (CCC)** is responsible for installing traffic signals at major intersections and corridors, implementing road markings, signage, and leading the establishment of a dedicated traffic management wing. CCC will also lead intersection improvement projects across the inner city, from Kalurghat to Patenga, and along the Port Connecting Road. Roundabout designs are discouraged, and intersections should be planned by qualified traffic engineers using appropriate modeling tools (e.g., VISSIM, SIDRA). CCC is also expected to form and lead a Traffic Management Committee headed by the Mayor to ensure coordination among departments for plan implementation.

The **Chattogram Metropolitan Police (CMP)** plays a crucial role in enforcing traffic laws, managing intersection flow, and operating Intelligent Transport Systems (ITS) for real-time monitoring and violation control.

The **Bangladesh Road Transport Authority (BRTA)** supports the digitalization of traffic systems, including signal control integration, and contributes to planning traffic regulation strategies such as school zone management and port traffic co-ordination.

**CCC** is responsible for crash investigation, road safety improvements like humps, signage, and signals. **BRTA** handles driver training and awareness, while **BRTA** and **CMP** implement ITS-based traffic violation enforcement. **CDA** is responsible for developing technical guidelines and tools for traffic planning in CMA, including a Traffic Impact Assessment Manual, Trip Generation and Parking Manual, and microsimulation models to support data-driven decision-making.

### Parking Management

The **Chattogram Development Authority (CDA)** and **Chattogram City Corporation (CCC)** are jointly responsible for implementing the proposed parking management plan. This includes developing a comprehensive parking strategy based on guidelines from the Transport Master Plan. Both agencies will also manage parking facilities for various types of vehicles, such as cars, motorcycles, CNGs, rickshaws, auto-rickshaws, and service vehicles.

CCC will focus on the immediate implementation of parking management measures as outlined in the Transport Master Plan to alleviate congestion and improve the organization of parking spaces.

### Railway Station Connectivity

To improve connectivity and alleviate traffic congestion, the **Chattogram City Corporation (CCC)** will construct railway over-bridges at key railway crossings across the city, ensuring smoother traffic flow.

The **Bangladesh Railway (BR)** will expand the railway network by building new tracks, upgrading stations, and connecting key areas, including the future Bay Terminal. BR will also procure locomotives and coaches to support the introduction of city service trains and increase freight train operations.

### Inland Waterways

To promote safe and inclusive river-based transport, **BIWTA** and **CCC** will develop proper terminal-style infrastructure at key river ghats, ensuring amenities for all users, including women, children, the elderly, and differently abled individuals. They will also construct safe landing points across the river network and assess the feasibility of waterbus services and organized river cruises.

### Airways

**CAAB** is responsible for expanding airport infrastructure and terminal facilities, while **CAAB** and **BRTA** ensure intermodal connectivity with city transport services

## 10.1.4. Institutional Rearrangement Proposal

To improve the coordination and efficiency in managing traffic and transport planning in the Chattogram Metropolitan Area, the following institutional restructuring is proposed:

- **Chair:** City Mayor
- **Member Secretary:** CMP Additional Commissioner (Traffic)
- Members:
  - CCC Traffic Department (Head)
  - CCC Planning (1)
  - CDA Transport Planning (1)
  - CDA Planning (1)
  - BRTA (1)
  - Port Authority (1)
  - BR (1)
  - BIWTA (1)
  - RHD (1)
  - WASA (1)
  - KGDCL (1)
  - PDB (1)

## 10.2. Investment Programs

This chapter presents a set of prioritized transport infrastructure programs aimed at improving mobility, safety, and connectivity across the Chattogram Metropolitan Area. The projects span urban and peri-urban zones, addressing gaps in pedestrian facilities, public transport, road and railway networks, waterways, airport access, and traffic management. Each initiative is designed to support integrated, inclusive, and sustainable growth across the CMA, with defined roles for implementing agencies to ensure coordinated delivery.

| **Program:** Construction of New Links (Figure 10-1) | | | | |
|---|---|---|---|---|
| **Sl. No.** | **Project Description** | **Priority** | **Phase** | **Agency** |
| NL 1 | Construct a 100 ft wide Boropol to Coastal Road Connector (2.4 Km) | High | Mid | CDA |
| NL 2 | Construct a 120 ft wide Kalurghat to Kulgoan Connector Road (6.9 Km) | High | Mid | CDA |
| NL 3 | Construct a 120 ft wide NS-1 Road Corridor (2.69 Km) | High | Mid | CDA |
| NL 4 | Construct a 160 ft wide North–South 2 Corridor (2.48 Km) | High | Mid | CDA |
| NL 5 | Construct a 160 ft wide NS-2 Road Extension (2.17 Km) | High | MId | CDA |
| NL 6 | Construct a 170 ft wide Barai Para Khal-cum-Road (2.19 Km) | High | Mid | LGED |
| NL 7 | Construct a 60 ft wide Dhaka Trunk Road to Agrabad Access Road Connector (1.80 Km) | High | Mid | CDA |
| NL 8 | Construct a 60 ft wide NS-1 to Techno Cider Int'l School Road Connector – 1 (0.92 Km) | High | MId | CDA |
| NL 9 | Construct a 60 ft wide NS-1 to Techno Cider Int'l School Road Connector – 2 (1 Km) | High | MId | CDA |
| NL 10 | Construct a 60 ft wide NS-1 to Techno Cider Int'l School Road Connector – 3 (1.23 Km) | High | MId | CDA |
| NL 11 | Construct a 60 ft wide Quaish–Kalurghat Road (Extension of Oxygen–Quaish Road, 3.38 Km) | High | Mid | CDA |

| **Program:** Construction of New Links (Figure 10-1) | | | | |
|---|---|---|---|---|
| **Sl. No.** | **Project Description** | **Priority** | **Phase** | **Agency** |
| NL 12 | Construct an 80 ft wide Bakalia Internal Road – 1 (0.59 Km) | High | Mid | CDA |
| NL 13 | Construct a 100 ft wide Bay Terminal–Bhatiary Freight Road (May extend upto Bashbaria, 21.7 Km) | Mid | Mid | CPA / RHD |
| NL 14 | Construct a 120 ft wide Airport Road to Char Lakkhya Connector (3.18 Km) | Mid | Mid | CDA |
| NL 15 | Construct a 120 ft wide Char Lakkhya–N-115 Connector (3.93 Km) | Mid | Mid | RHD |
| NL 16 | Construct a 120 ft wide Port Link Road–Char Lakkhya Connector (4.52 Km) | Mid | Mid | CPA |
| NL 17 | Construct a 60 ft wide Bakalia Access Road Extension (1.15 Km) | Mid | Mid | CDA |
| NL 18 | Construct a 60 ft wide Hathazari East–West Connector Road (8.75 Km) | Mid | Mid | RHD |
| NL 19 | Construct a 60 ft wide KEPZ–Char Lakkhya Road Connector (1.7 Km) | Mid | Mid | CDA |
| NL 20 | Construct a 60 ft wide Rahattarpul to Chaktai Connector (4.27 Km) | Mid | Mid | CDA |
| NL 21 | Construct a 70 ft wide Ambagan to Dhaka Trunk Road Connector (0.8 Km) | High | Mid | CDA |
| NL 22 | Construct a 80 ft embankment cum road from Dangarchar to Noyahut (6.5 Km) | Mid | Mid | CDA |
| NL 23 | Construct an 80 ft wide Hathazari Road North–South Parallel 1(11.93 Km) | Mid | Mid | RHD, CDA |
| NL 24 | Construct an 80 ft wide North–South Connector parallel to Shah Amanat Bridge Approach Road – 1 (5.41 Km) | Mid | Mid | CDA |
| NL 25 | Construct a 160 ft wide Oxygen-Quaish Road to Janalihat (1.6 Km) | Low | Mid | CDA |
| NL 26 | Construct a 60 ft wide Bayezid Link Road to Kaptai Road Connector (5.37 Km) | Low | Mid | CDA |
| NL 27 | Construct a 60 ft wide Hathazari Road North–South Parallel 2 (14.17 Km) | Low | Mid | RHD |
| NL 28 | Construct a 60 ft wide Oxygen-Mirer hut at/above grade (Following Railline, 14 Km) | Low | Mid | RHD |
| NL 29 | Construct a 60 ft wide Z-1804 to Char Lakkhya Connector (3.71 Km) | Low | Mid | RHD |
| Total Length of New Roads: 140.6 Km<br>*For new links the lengths are approximate as detailed alignments may vary. | | | | |

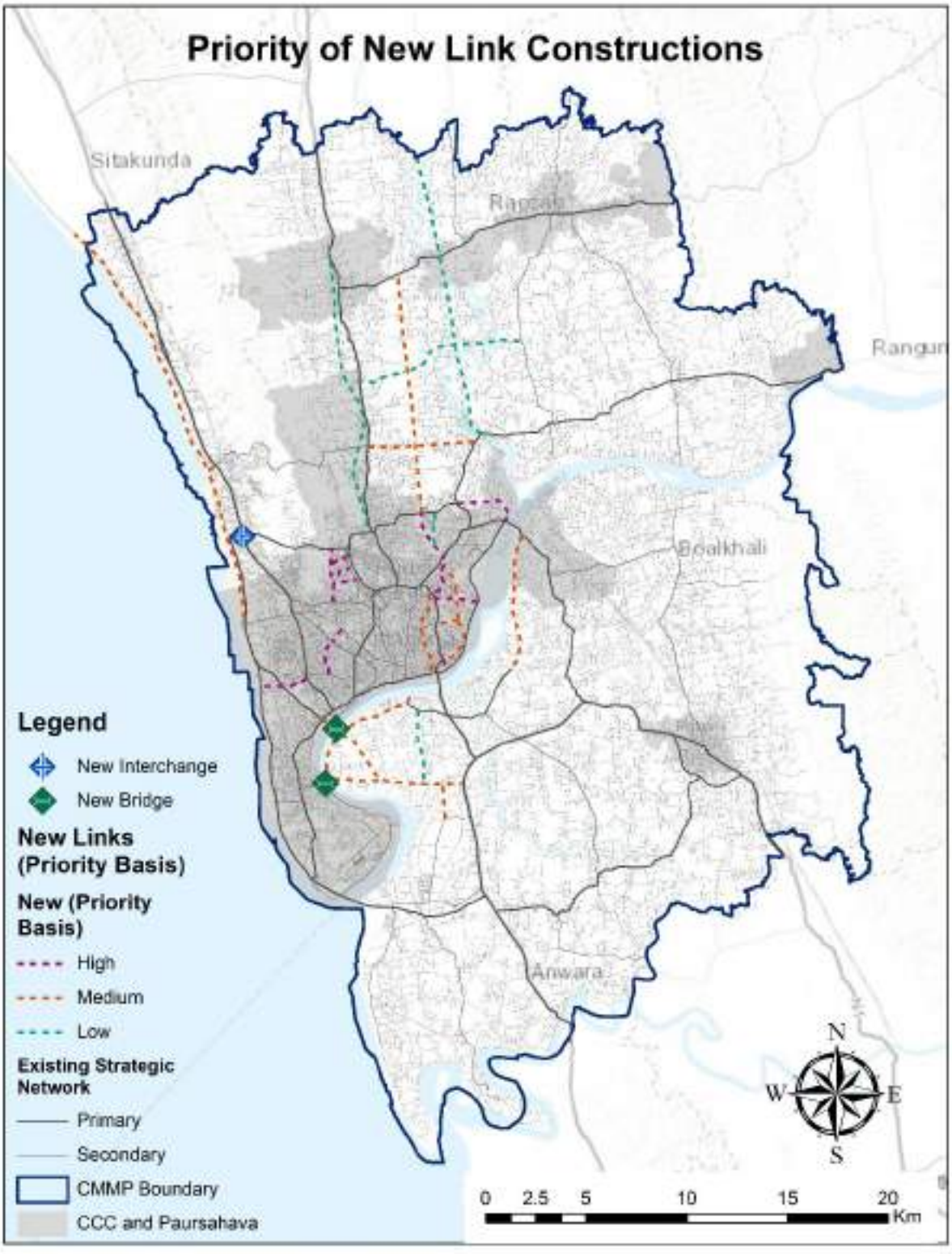



**Figure 10-1: Priority of New Link Construction**

| **Program:** Road Improvement (Figure 10-2) | | | | |
|---|---|---|---|---|
| **No.** | **Project Description** | **Priority** | **Phase** | **Agency** |
| RI 1 | Improve the 24.24-Km N-1 Road from Shah Amanat Bridge to Kharana with a proposed widening to 120ft. | High | Mid | RHD |
| RI 2 | Improve the 1.68-Km Mariner's Drive Road with a proposed widening to 100ft. | High | Mid | CDA |
| RI 3 | Improve the 0.79-Km Mariner’s Drive to Strand Road Connector with a proposed widening to 100ft. | High | Mid | CDA |
| RI 4 | Improve the 1.80-Km Strand Road with a proposed widening to 100ft. | High | Mid | CDA |
| RI 5 | Improve the 20.32-Km N-1 Road from Kumira to Bayezid Link Road with a proposed widening to 120ft. | High | Mid | RHD,CDA |
| RI 6 | Improve the 10.30-Km Arkan Road with a proposed widening to 120ft. | High | Mid | CDA |
| RI 7 | Improve the 4.61-Km Port Link Road with a proposed widening to 100ft. | High | Mid | CPA |
| RI 8 | Improve the 4.47-Km N-1 Road from AK Khan to GEC with a proposed widening to 80ft. | High | Mid | RHD |
| RI 9 | Improve the 1.39-Km Halishahar Road with a proposed widening to 100ft. | High | Mid | CDA |
| RI 10 | Improve the 5.49-Km KEPZ Internal Road with a proposed widening to 60ft. | High | Mid | CDA |
| RI 11 | Improve the 0.43-Km Agrabad Access Road from Hazirapara Goli to Agrabad Circle with a proposed widening to 100ft. | High | Mid | CDA |
| RI 12 | Improve the 0.54-Km Bakalia Stadium Road with a proposed widening to 80ft. | High | Mid | CDA |
| RI 13 | Improve the 1.20-Km Pahartali College Road with a proposed widening to 120ft. | High | Mid | CDA |
| RI 14 | Improve the 7.09-Km N-115 Road with a proposed widening to 120ft. | Mid | Mid | RHD |

| **Program:** Road Improvement (Figure 10-2) | | | | |
|---|---|---|---|---|
| **No.** | **Project Description** | **Priority** | **Phase** | **Agency** |
| RI 15 | Improve the 1.67-Km Bayezid Bostami Road with a proposed widening to 120ft. | Mid | Mid | CDA |
| RI 16 | Improve the 0.20-Km Bayezid Link Road to Bayezid Bostami Road Connector 2 with a proposed widening to 70ft. | Mid | Mid | CDA |
| RI 17 | Improve the 24.69-Km R-163 Road with a proposed widening to 120ft. | Mid | Mid | RHD |
| RI 18 | Improve the 7.96-Km R-170 Road from Anowara to Toilerdwip Bridge with a proposed widening to 120ft. | Mid | Mid | RHD |
| RI 19 | Improve the 30.81-Km N-106 Road with a proposed widening to 120ft. | Mid | Mid | RHD |
| RI 20 | Improve the 5.08-Km Patiya Bypass Road with a proposed widening to 120ft. | Mid | Mid | RHD |
| RI 21 | Improve the 15.70-Km R-170 Road from Anowara to Patiya Bypass with a proposed widening to 60ft. | Mid | Mid | RHD |
| RI 22 | Improve the 4.52-Km Moijjartek to Kolagaon Tek Road with a proposed widening to 120ft. | Mid | Mid | CDA |
| RI 23 | Improve the 0.93-Km N-115 Road with a proposed widening to 120ft. | Mid | Mid | RHD |
| RI 24 | Improve the 7.28-Km R-160 Road with a proposed widening to 120ft. | Mid | Mid | RHD |
| RI 25 | Improve the 3.30-Km Ambagan Road with a proposed widening to 100ft. | Mid | Mid | CDA |
| RI 26 | Improve the 3.14-Km Road from Shantir Haat to Budhpara Bazar with a proposed widening to 80ft. | Mid | Mid | CDA |
| RI 27 | Improve the 5.67-Km Z-1070 Road from Budhpara Bazar to Khashkhama with a proposed widening to 80ft. | Mid | Mid | RHD |
| RI 28 | Improve the 8.22-Km CUFL Road with a proposed widening to 60ft. | Mid | Mid | RHD |

| **Program:** Road Improvement (Figure 10-2) | | | | |
|---|---|---|---|---|
| **No.** | **Project Description** | **Priority** | **Phase** | **Agency** |
| RI 29 | Improve the 2.22-Km Road from Kalapur to Shantir Haat with a proposed widening to 80ft. | Mid | Mid | CDA |
| RI 30 | Improve the 0.30-Km Chaktai Road with a proposed widening to 60ft. | Mid | Mid | CDA |
| RI 31 | Improve the 6.1-Km Chondonaish Road with a proposed widening to 60ft. | Mid | Mid | RHD |
| RI 32 | Improve the 12.41-Km Z-1629 Road with a proposed widening to 60ft. | Low | Mid | RHD |
| RI 33 | Improve the 12.93-Km Z-1088 Road with a proposed widening to 60ft. | Low | Mid | RHD |
| RI 34 | Improve the 2.56-Km Z-1804 Road with a proposed widening to 80ft. | Low | Mid | RHD |
| RI 35 | Improve the 1.36-Km Techno Cider International School Road with a proposed widening to 80ft. | Low | Mid | CDA |
| RI 36 | Improve the 0.16-Km Ruby Gate Road with a proposed widening to 60ft. | Low | Mid | CDA |
| RI 37 | Improve the 0.13-Km Polytechnic Road with a proposed widening to 60ft. | Low | Mid | CDA |
| RI 38 | Improve the 1.98-Km BFIDC Road with a proposed widening to 60ft. | Low | Mid | CDA |
| Total Length of Roads to be Improved: 244.97 Km | | | | |

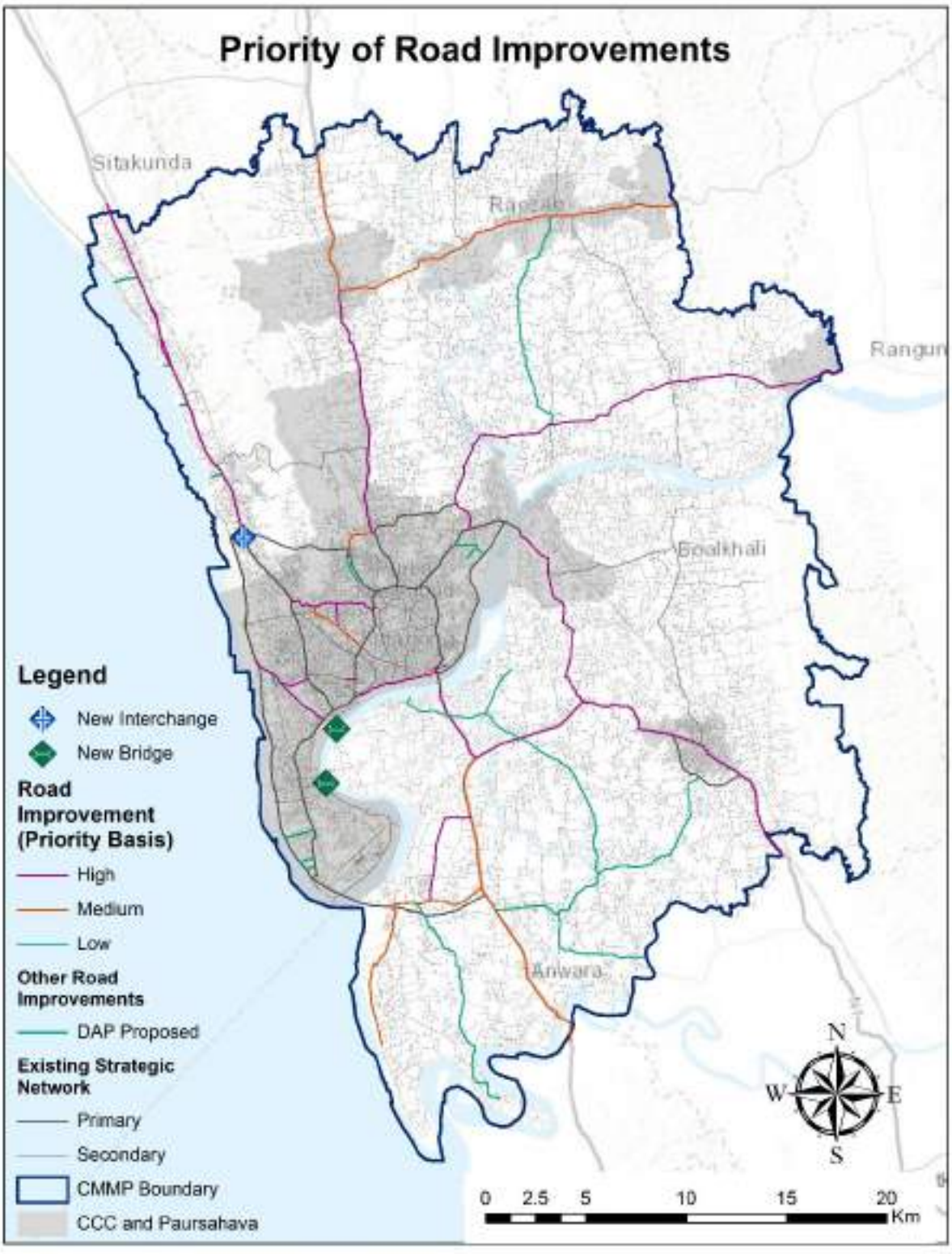



**Figure 10-2; Priority of Road Improvement**

| **Program:** Public Transport Improvement | | | | |
|---|---|---|---|---|
| **SL** | **Project Description** | **Priority** | **Phase** | **Agency** |
| PT01 | Chattogram Urban Transit Company Establishment | High | Short | BRTA, CCC and CMP |
| PT 02 | Establish new bus terminals in Anwara, Patiya, Karnaphuli, Boalkhali, Sitakunda (Salimpur), and Raozan to improve connectivity and decentralize transport operations. | High | Short | BRTA, CCC, CDA |
| PT 03 | Upgrade the existing Hathazari terminal by expanding | High | Short | CCC |
| PT 04 | Chattogram City and Intercity Bus Terminal Construction | High | Short | CCC |
| PT 05 | Kalurghat, Nuton Bridge, New Market, Patenga, and Kulgaon to improve public transport efficiency and accessibility. | High | Short | BRTA and CMP |
| PT 06 | Chattogram Intelligent Law Enforcement System Implementation | High | Short | BRTC |
| PT 07 | School, Tourist, and Group Transport Bus Procurement | | | BRTA, |
| PT 08 | Chattogram Public Transport Route Rationalization and Optimization | High | Short | BRTA, CCC and CMP |

| **Program:** Pedestrian Facility Improvement | | | | |
|---|---|---|---|---|
| **SL** | **Project Description** | **Priority** | **Phase** | **Agency** |
| P01 | **Constructing 140 kilometers of new and improved footpaths:** CDA Avenue from WASA (4km); New Market, Station Road, and Jubilee Road (2km); in central areas 48.8(km); along roads outside the central area 10(km) | High | Short | CCC |
| P02 | Develop designated and safe crossing zones | High | Short | CCC |
| P03 | Install signal system with pedestrian phase at intersections | High | Short | CCC |

| **Program:** Traffic Management | | | | |
|---|---|---|---|---|
| **SL** | **Project Description** | **Priority** | **Phase** | **Agency** |
| TM01 | Installation of traffic signals from Kaptai Raster Matha to Patenga | High | Short | CCC, CMP BRTA |
| TM02 | Installation of traffic signals on the major intersections of Chattogram City | High | Mid | CCC, CMP BRTA |
| TM03 | Installation of ITS devices for traffic violation control in Chattogram Metropolitan Area | High | Mid | CCC, CMP BRTA |
| TM04 | Installation of traffic sign and road marking for efficient traffic Management | High | Short | CCC |

| **Program:** Railway Infrastructure Development | | | | |
|---|---|---|---|---|
| **SL** | **Project Description** | **Priority** | **Phase** | **Agency** |
| RAL 01 | Construction of railway over-bridges at key railway crossings on AK Khan, Khulshi and Bibirhat | High | Short | CCC |
| RAL 02 | Construction of railway over-bridges at railway crossings on Pahartoli thana, Jhaotola and Oxygen | High | Short | CCC |
| RAL 03 | Construction 8.19km double line from Sholashahar Railway Station to Janali Hat | High | Short | BR |
| RAL 04 | Construction 36.6km double line from Sholashahar Railway Station to Hathazari | High | Short | BR |
| RAL 05 | Improve stations for city service train service | High | Short | BR |
| RAL 06 | Construct new stations for city service train service | High | Short | BR |
| RAL 07 | Purchase locomotives and coaches to roll-out Chattogram city service trains | | | BR |
| RAL 08 | Construction of new train tracks to connect Bay Terminal | High | Short | BR |
| RAL 09 | Procure locomotives and wagons to operate to and from the Bay Terminal | High | Short | BR |

| **Program:** Waterway Infrastructure Development | | | | |
|---|---|---|---|---|
| **SL** | **Project Description** | **Priority** | **Phase** | **Agency** |
| WT01 | Construction of proper terminal facilities at Ghat-15 and its corresponding ghat. | High | Short | BIWTA, CCC |
| WT02 | Construction of proper terminal facilities at Avoymitra Ghat and Sadarghat. | High | Short | BIWTA, CCC |
| WT03 | Construct safe landing facilities at different ghats along the river Karnaphuli | | | BIWTA, CCC, Upazila Parishad |
| WT04 | Construction of proper terminal facilities at Banglabazar ghat. | High | Short | BIWTA, CCC |
| WT05 | Construction of proper terminal facilities at Bakalia to operate river cruise and connection to Char Bakalia. | High | Short | BIWTA, CCC |
| WT06 | Feasibility Study to operate waterbus along the river Karnaphuli | High | Short | BIWTA, CCC |

| **Program:** Airport Transportation System | | | | |
|---|---|---|---|---|
| **SL** | **Project Description** | **Priority** | **Phase** | **Agency** |
| A01 | Shuttle bus service from City to Airport | High | Short | CAAB, BRTA |

| **Study Programs** | | | | |
|---|---|---|---|---|
| **SL** | **Project Description** | **Priority** | **Phase** | **Agency** |
| SP 01 | Develop a Trip Generation and Distribution Manual for TIA | High | Short | CDA |
| SP 02 | Develop a Parking Manual for TIA | High | Short | CDA |
| SP 03 | Conduct a Study on PT Stop Requirements according to Masterplan Guidelines | High | Short | CDA |

# APPENDIX

# *Appendix- 1.* Stakeholder Involvement

| Category A | | | | |
|---|---|---|---|---|
| **Stakeholder** | **Influence** | **Interest** | **Reason** | **Type** |
| Chattogram Development Authority (CDA) | High | High | Client and overall coordination of implementation | Category A |
| Chattogram City Corporation (CCC) | High | High | Authority managing the city and responsible for planning and implementation, providing service, and development control. | Category A |
| Chattogram Metropolitan Police (CMP) | High | High | Traffic Management | Category A |
| Bangladesh Road Transport Authority (BRTA) | High | High | Authorities responsible for road | Category A |
| Bangladesh Railways (BR) | High | High | Authorities responsible for Rail | Category A |
| Chattogram Port Authority (CPA) | High | High | CPA in the master plan ensures seamless integration between port operations and transport infrastructure. | Category A |

| Category B | | | | |
|---|---|---|---|---|
| **Stakeholder** | **Influence** | **Interest** | **Reason** | **Type** |
| Local Government Engineering Department (LGED) | High | Low | Master Plan will need integration with LGED projects planned and under implementation in and around the site. | Category B |
| Roads and Highway Department (RHD) | High | Low | Authorities responsible for road | Category B |

| Category C | | | | |
|---|---|---|---|---|
| **Stakeholder** | **Influence** | **Interest** | **Reason** | **Type** |
| Chattogram Chamber Of Commerce & Industry (CCCI) | Low | High | Integration of Industry owners' feedback on the Master Plan | Category C |
| Transport Master Plan and Preliminary Feasibility Study for Urban Metro-Rail Transit Construction of Chattogram Metropolitan Area (CMA) Project | Low | High | For integration into the Master Plan | Category C |
| Academician (CUET, BUET, CU etc) | Low | High | | Category C |

| Category D | | | | |
|---|---|---|---|---|
| **Stakeholder** | **Influence** | **Interest** | **Reason** | **Type** |
| Bangladesh Institute of Planners (BIP) | Low | Low | For technical review of the deliverables | Category D |
| Institute of Engineers (IEB) | Low | Low | | Category D |
| Institute of Architects (IAB) | Low | Low | | Category D |
| Chattogram Water Supply & Sewerage Authority (CWASA) | Low | Low | To inform about the utility requirements for the proposed projects. | Category D |
| Karnaphuli Gas Transmission & Distribution Company (KGTDC) | Low | Low | | Category D |
| Power Development Board (PDB) | Low | Low | | Category D |
| District Commissioner (DC) | Low | Low | | Category D |
| Civil Aviation Authority of Bangladesh (CAAB) | Low | Low | | Category D |
| Bangladesh Inland Water Transport Corporation (BIWTC) | Low | Low | Inform and getting feedback about the proposed Mass Transit Network. Getting suggestions on multimodal integrations. | Category D |
| Bangladesh Road Transport Corporation (BRTC) | Low | Low | | Category D |
| Chattogram Prime Mover and Flatbed Owner's Association (CPMFOA) | Low | Low | Integration of owners' and operators' feedback on the Master Plan | Category D |
| Bangladesh Inland Container Depots Association (BICDA) | Low | Low | | Category D |
| Bangladesh Bus-Truck Owner's Association (BBTOA) | Low | Low | | Category D |
| Bangladesh Inland Water Transport Authority (BIWTA) | Low | Low | | Category D |
| Driver's Association (Bus,Truck) (DA) | Low | Low | Inform and getting feedback | Category B |

# *Appendix- 2.* Intersection Concept Designs

**Figure Appendix - 1: Concept Design of Neval Avenue- Nur Ahmed Road Intersection**

**Figure Appendix - 2: Concept Design of CRB- Neval Avenue Intersection**

**Figure Appendix - 3: Concept Design of Lovelane Intersection**

**Figure Appendix - 4: Concept Design of Noyabazar Intersection**

# *Appendix- 3.* Proposed Bus Routes


**Figure Appendix - 5: City Bus Route 6**


**Figure Appendix - 6: City Bus Route 7**


**Figure Appendix - 7: City Bus Route 14**


**Figure Appendix - 8: City Bus Route 18**

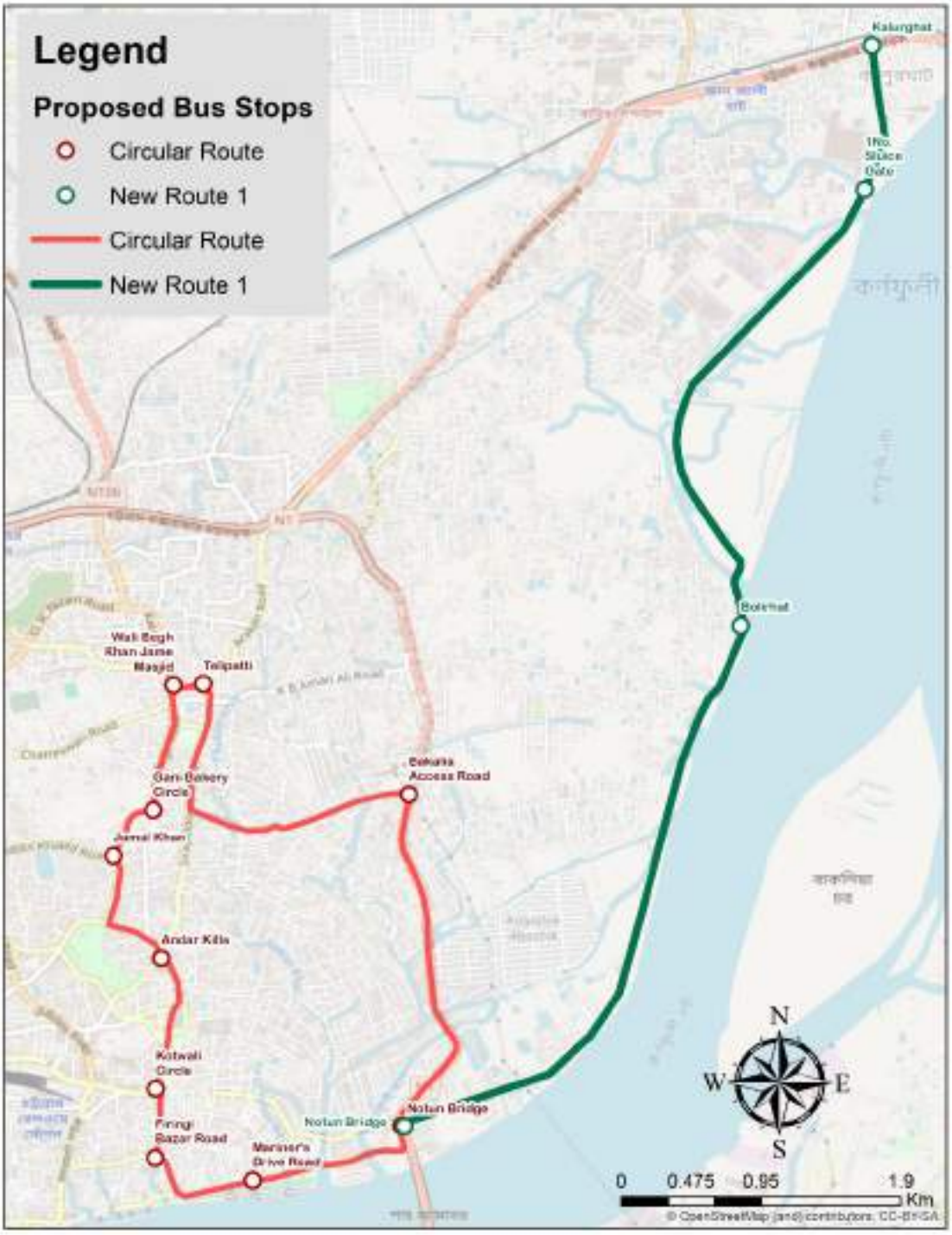



**Figure Appendix - 9: New Bus Route No 1 and Circular Route**


**Figure Appendix - 10: New Bus Route No 2**


**Figure Appendix - 11: New Regional Bus Routes**

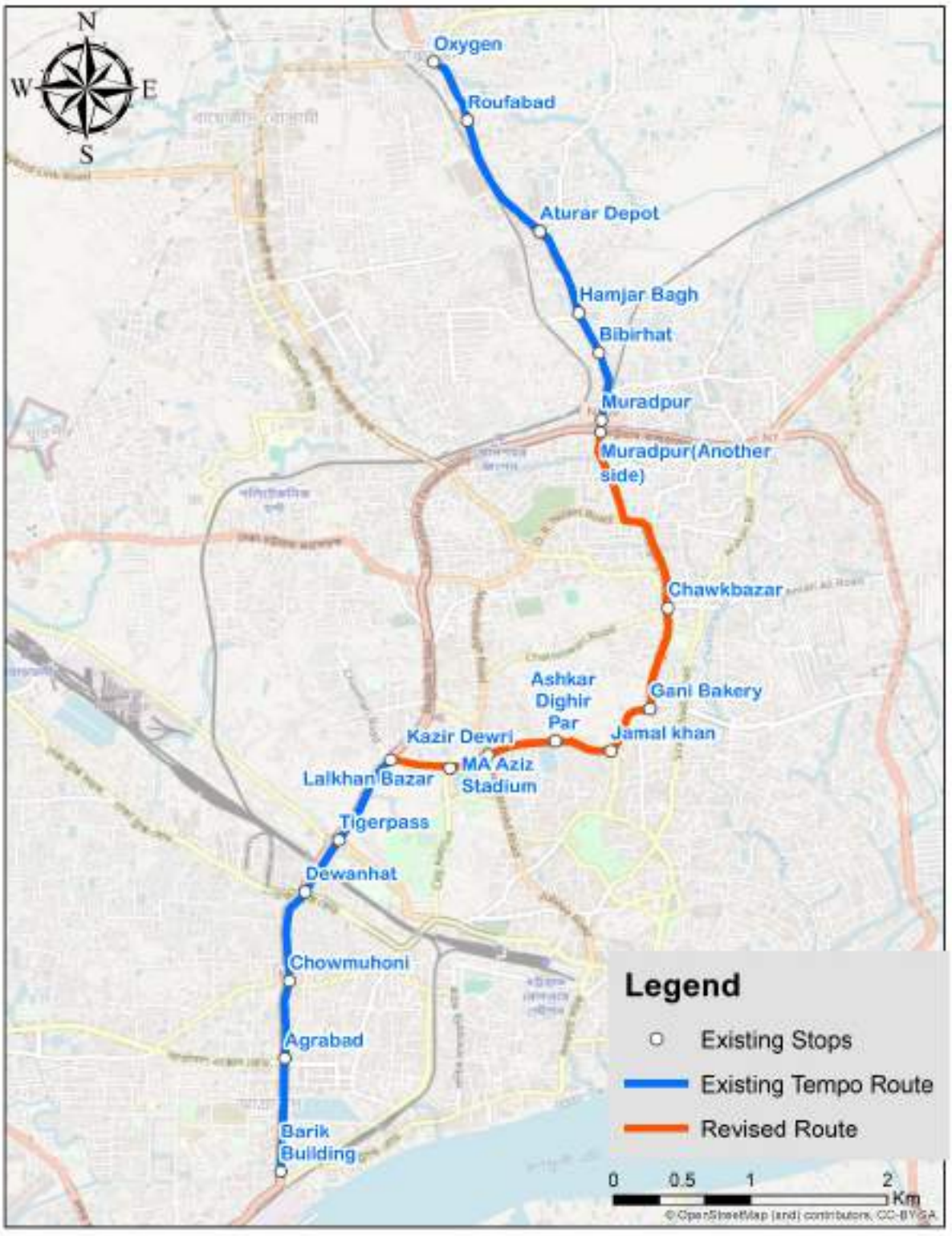



**Figure Appendix - 12: Tempo Route No 1**


**Figure Appendix - 13: Tempo Route No 5**

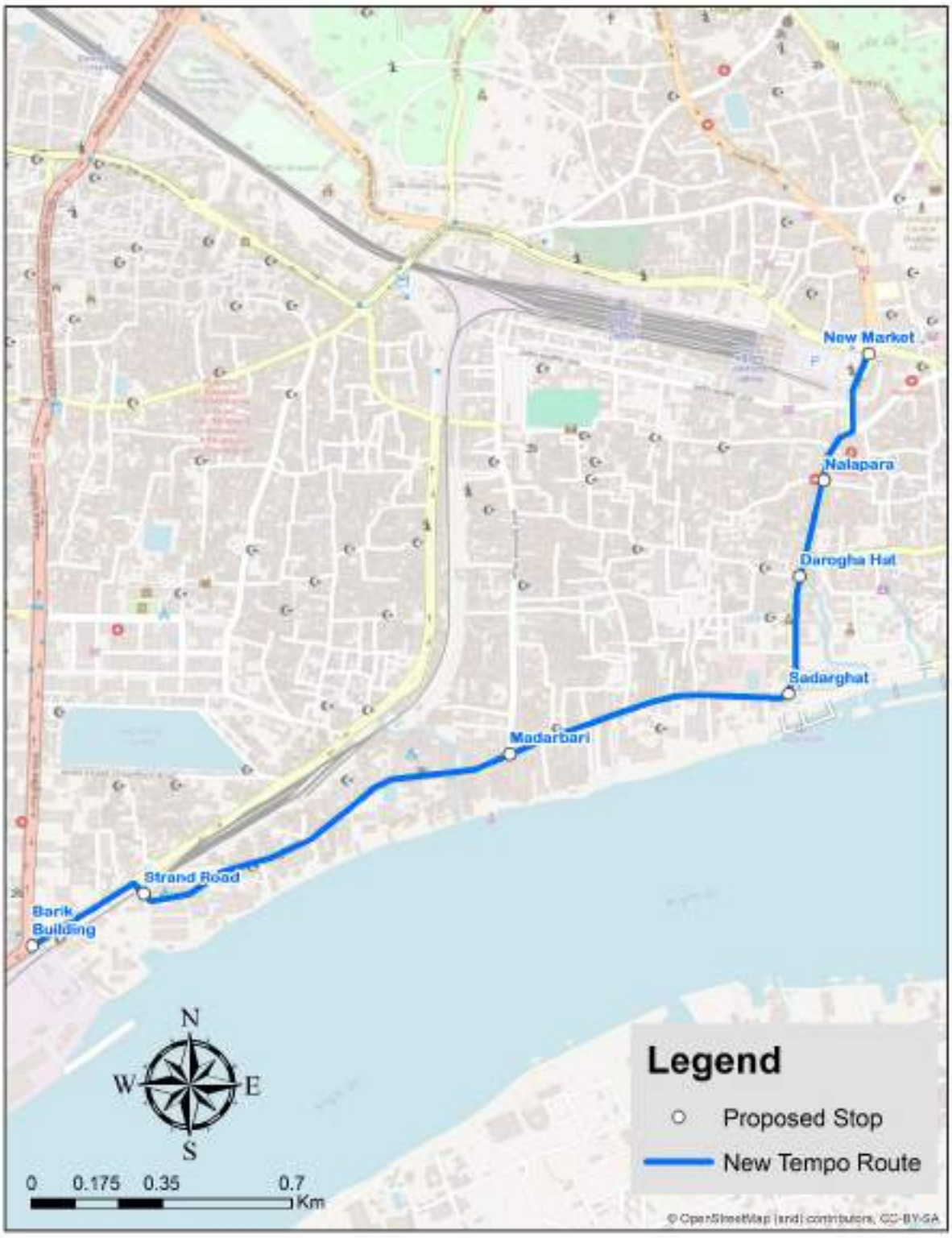



**Figure Appendix - 14: New Tempo Route**


**Figure Appendix - 15: Human Hauler Route No 9**

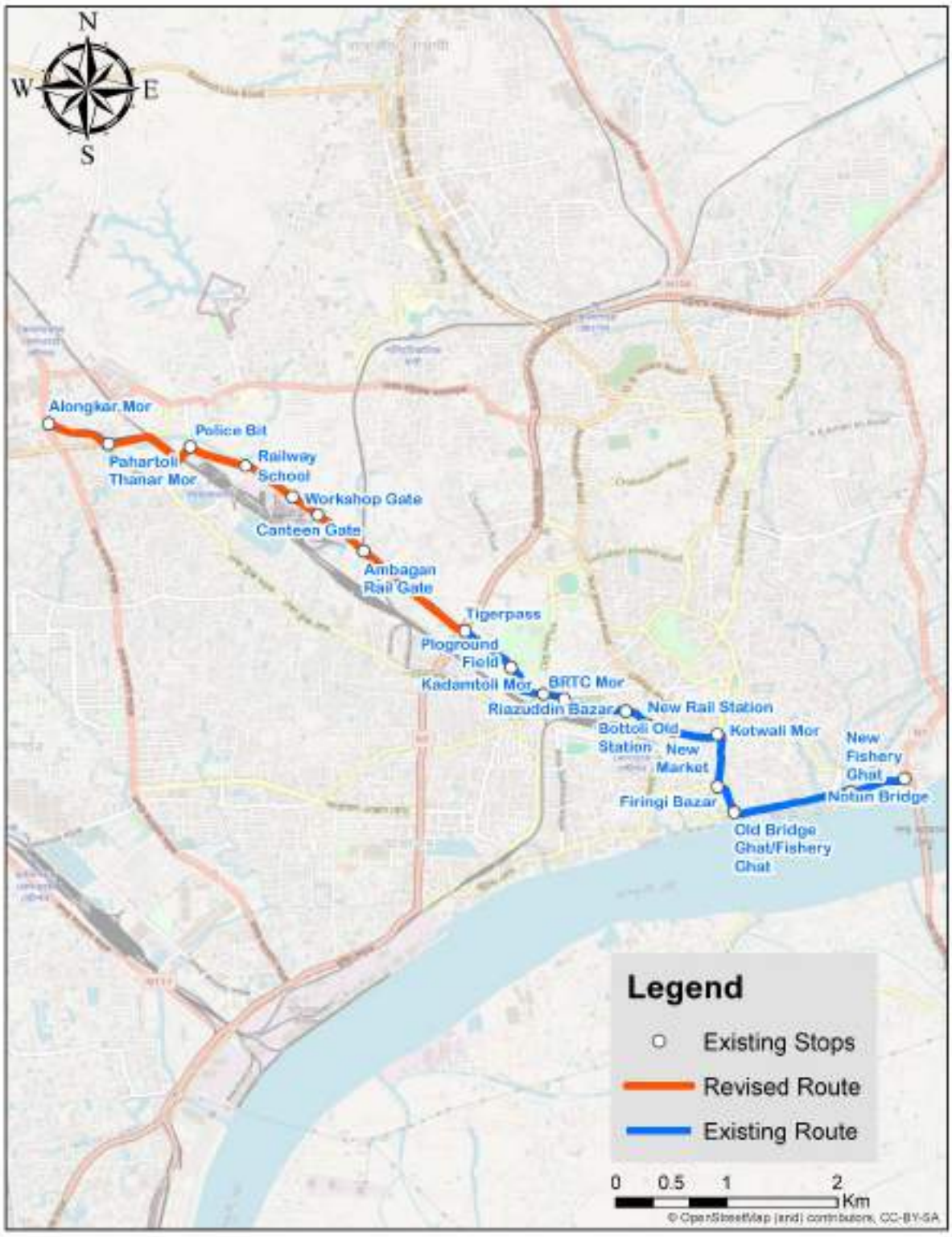



**Figure Appendix - 16: Human Hauler Route No 16**


**Figure Appendix - 17: Human Hauler Route No 17**

# *Appendix- 4.* PT Stop Locations and Design Considerations

## Kalurghat (Towards Patenga)

1. Footpath availability: No
2. Footpath space availability: Yes
3. Footpath width: Not applicable
4. Footpath Connectivity: Not available
5. Footpath encroachment: Not applicable
6. Obstacles on footpath: Not applicable
7. Distance from intersection: 50 m
8. Road width: 11 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 1 | 0 |
| Mini | 1 | 1 | 0 |

16. Required Space: 44/18 m
17. Availability of space: Enough

**Critical observations:** No footpath available

## Kalurghat (Towards Kalurghat)

1. Footpath availability: No
2. Footpath space availability: Yes
3. Footpath width: Not applicable
4. Footpath Connectivity: Not available
5. Footpath encroachment: Not applicable
6. Obstacles on footpath: Not applicable
7. Distance from intersection: 40 m
8. Road width: 11 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 1 | 0 |
| Mini | 1 | 1 | 0 |

16. Required Space: 44/18 m
17. Availability of space: Enough

**Critical observations:** No footpath available

## Kaptai Rastar Matha (Towards Patenga )

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 5 m (approx.)
4. Footpath Connectivity: No
5. Footpath encroachment: No
6. Obstacles on footpath: No
7. Distance from intersection: 50 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 4 | 2 | 0 |
| Mini | 2 | 1 | 0 |

16. Required Space: 62/31 m
17. Availability of space: 40 m

**Critical observations**:

## Kaptai Rastar Matha (Towards Kalurghat)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 3.5 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 20 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

16. Required Space: 11/28 m
17. Availability of space: 15 m

**Critical observations**:

# Bahaddarhat (Towards Patenga)

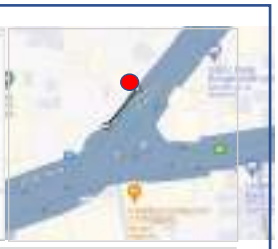
1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.5 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 35 m
8. Road width: 14 (approx.)
9. Number of lanes: 3
10. Existing boarding availability: Yes
11. Conditions of boarding area: Pole
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 3 | 0 |
| Mini | 2 | 1 | 0 |

16. Required Space: 54/31 m
17. Availability of space: 55 m

**Critical observations:** Boarding point only for Tempo

# Bahaddarhat (Towards Kalurghat)



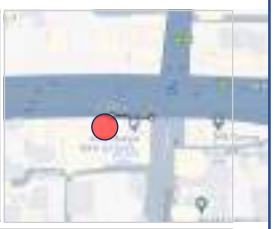
1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.75 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 35 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 2 | 0 |
| Mini | 1 | 1 | 0 |

16. Required Space: 36/18 m
17. Availability of space: Enough

**Critical Observations:**

## Muradpur (Towards Patenga)



1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 5.5 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 30 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: Yes
11. Conditions of boarding area: Shelter with seats, surface is not adjusted with road and footpath, not user friendly for disabled persons.
12. Availability of seats: Yes
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:
16. Required Space: 62/31 m
17. Availability of space: 50 m (approx.)

| Slots | B | T | H |
|---|---|---|---|
| Max | 4 | 1 | 1 |
| Mini | 2 | 1 | 0 |

**Critical Observations:** Pole and shelter are located at different locations. Stopping at shelter location is prohibited by traffic dept.

## Muradpur (Towards Kalurghat)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.25 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: No
6. Obstacles on footpath: Yes
7. Distance from intersection: 50 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:
16. Required Space: 49/18 m
17. Availability of space: 40 m (approx.)

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 1 | 1 |
| Mini | 1 | 1 | 0 |

**Critical Observations:**

## 2no Gate (Towards Patenga)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 2.5 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: No
6. Obstacles on footpath: No
7. Distance from intersection: 25, 50 & 90 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: Yes
11. Conditions of boarding area: Moderately good condition, but its lacks of proper signage and its corner shop is attracting non passengers.
12. Availability of seats: Yes
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:
16. Required Space: 75/36 m
17. Availability of space: 66 m (approx.) (Double)

| Slots | B | T | H |
|---|---|---|---|
| Max | 5 | 1 | 1 |
| Mini | 2 | 1 | 1 |

**Critical Observations:**

## 2no Gate (Towards Kalurghat )

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.75 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 50 m
8. Road width: 11 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:
16. Required Space: 49/31 m
17. Availability of space: Enough

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 2 | 0 |
| Mini | 2 | 1 | 0 |

**Critical Observations:** Proposed point is being used as a dumping site. Dumping site starts from 35m and it is around 40 m long.

## GEC (Towards Patenga)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 3 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 50 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: Yes
11. Conditions of boarding area: Not user friendly, not clearly defined
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 1 | 1 |
| Mini | 1 | 1 | 1 |

16. Required Space: 49/23 m
17. Availability of space: Enough

**Critical Observations:**

## GEC (Towards Kalurghat)

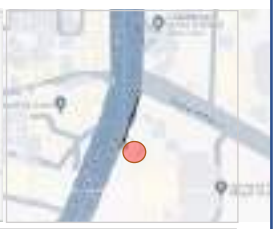
1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 5 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: No
6. Obstacles on footpath: Yes
7. Distance from intersection: 50 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 1 | 1 |
| Mini | 2 | 1 | 1 |

16. Required Space: 49/36 m
17. Availability of space: Enough

**Critical Observations:** There is a boarding facility with shade and seats in front of GEC Convention hall which is located on a wrong point.

# WASA (Towards Patenga )



1. Footpath availability: No
2. Footpath space availability: Yes
3. Footpath width: Not applicable
4. Footpath Connectivity: No
5. Footpath encroachment: Not applicable
6. Obstacles on footpath: No
7. Distance from intersection: 55 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 1 | 0 |
| Mini | 2 | 1 | 0 |

16. Required Space: 44/31 m
17. Availability of space: Enough

**Critical Observations:**

# WASA (Towards Kalurghat )

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 5 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: No
6. Obstacles on footpath: Yes
7. Distance from intersection: 50 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 1 | 0 |
| Mini | 1 | 1 | 0 |

16. Required Space: 31/18 m
17. Availability of space: Enough

**Critical Observations:**

## Lalkhan Bazar (Towards Patenga)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 2 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 40 m
8. Road width: 10 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not available.
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 1 | 1 |
| Mini | 1 | 1 | 1 |

16. Required Space: 36/23 m
17. Availability of space: Enough

**Critical Observations:**

## Lalkhan Bazar (Towards Kalurghat)


1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 2 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 40 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: Yes
11. Conditions of boarding area: Pole Sign damaged, obstructed by electric poles, not user friendly
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 1 | 1 |
| Mini | 1 | 1 | 1 |

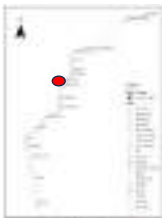
16. Required Space: 36/23 m
17. Availability of space: 35 m

**Critical Observations:** Existing boarding point is located at 90 m distance from intersection.

## Tigerpass (Towards Patenga)

Proposed point falls on the bridge. No option without using this point. Further discussion and finalization is needed.

## Tigerpass (Towards Kalurghat)



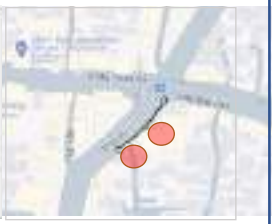
1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 3.5 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: No
6. Obstacles on footpath: No
7. Distance from intersection: 60 m
8. Road width: 8 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility : No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 1 | 1 |
| Mini | 1 | 1 | 1 |

16. Required Space: 36/23 m
17. Availability of space: Enough

**Critical Observations:**

## Dewanhat (Towards Patenga)



1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 2 m (approx.)
4. Footpath Connectivity: No
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 30 & 75 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not Applicable
12. Availability of seats: No
13. Availability of street lights: No
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 1 | 1 |
| Mini | 2 | 1 | 1 |

16. Required Space: 49/36 m
17. Availability of space: 40 m

**Critical Observations:**

## Dewanhat (Towards Kalurghat)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 2 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 90 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: Yes
11. Conditions of boarding area: Located on a wrong place, Not identifiable and accessible, used for other purpose
12. Availability of seats: Yes
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 1 | 1 |
| Mini | 2 | 1 | 1 |

16. Required Space: 49/36 m
17. Availability of space: 35 m

**Critical Observations:** Need discussion & finalization

# AGRABAD (Towards Patenga)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.5 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: No
6. Obstacles on footpath: No
7. Distance from intersection: 55 m
8. Road width: 7.5 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not Applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 4 | 2 | 1 |
| Mini | 2 | 1 | 1 |

16. Required Space: 67/36 m
17. Availability of space: 55 m (approx.)

**Critical Observations:** Uneven & broken footpath

# AGRABAD (Towards Kalurghat )

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 2 m (approx.)
4. Footpath Connectivity: Not available
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 55 m
8. Road width: 10 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: Yes
11. Conditions of boarding area: Slightly broken, not well paved, not user friendly
12. Availability of seats: Yes (broken)
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 1 | 2 |
| Mini | 1 | 1 | 1 |

16. Required Space: 54/23 m
17. Availability of space: Enough

**Critical Observations:** There is a drain behind the footpath and tree canopy can be utilized

## Barek Building (Towards Patenga)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 2 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: No
6. Obstacles on footpath: No
7. Distance from intersection: 50 m
8. Road width: 8 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 0 | 0 |
| Mini | 2 | 0 | 0 |

16. Required Space: 39/26 m
17. Availability of space: Enough

**Critical Observations:**

## Barek Building (Towards Kalurghat)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 2.5 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: No
6. Obstacles on footpath: Yes
7. Distance from intersection: 3 5 m
8. Road width: 18 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 1 | 0 |
| Mini | 1 | 1 | 0 |

16. Required Space: 31/18 m
17. Availability of space: 30 m (Double Lane)

**Critical Observations:** Slabs of drain is broken, No slabs on some points

## Customs Circle (Towards Patenga)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 3 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: No
6. Obstacles on footpath: No
7. Distance from intersection: 55 m
8. Road width: 5 m (approx.)
9. Number of lanes: 2
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 0 | 1 |
| Mini | 1 | 0 | 1 |

16. Required Space: 44/18 m
17. Availability of space: 35 m (approx.)

**Critical Observations:** Proposed location not visible from intersection.

## Customs Circle (Towards Kalurghat)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.5 m (approx.)
4. Footpath Connectivity: No
5. Footpath encroachment: No
6. Obstacles on footpath: No
7. Distance from intersection: 55 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: Yes
11. Conditions of boarding area: Moderately broken, no signs, broken pavement and seats.
12. Availability of seats: Yes
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 0 | 1 |
| Mini | 1 | 0 | 1 |

16. Required Space: 44/18 m
17. Availability of space: Enough

**Critical Observations:** Existing boarding shade located almost on the circle. Tree canopy can be utilized.

## Saltgola (Towards Patenga)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 3 m (approx.)
4. Footpath Connectivity: No
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 55 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 0 | 1 |
| Mini | 2 | 0 | 1 |

16. Required Space: 44/31 m
17. Availability of space: Enough

**Critical Observations:**

## Saltgola (Towards Kalurghat)

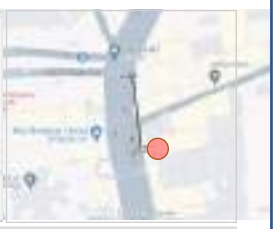
1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.25 m (approx.)
4. Footpath Connectivity: No
5. Footpath encroachment: No
6. Obstacles on footpath: No
7. Distance from intersection: 65 m
8. Road width: 7 m (approx.)
9. Number of lanes: 2
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 0 | 1 |
| Mini | 1 | 0 | 1 |

16. Required Space: 44/18 m
17. Availability of space: 35 m (approx.)

**Critical Observations:**

# EPZ (Towards Patenga )



1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.25 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: No
7. Distance from intersection: 55 m
8. Road width: 10 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 0 | 1 |
| Mini | 1 | 0 | 1 |

16. Required Space: 31/18 m
17. Availability of space: Enough

**Critical Observations:** Height of footpath is too high

# EPZ (Towards Kalurghat)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 3 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 55 m
8. Road width: 10 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 0 | 2 |
| Mini | 1 | 0 | 1 |

16. Required Space: 36/18 m
17. Availability of space: Enough

**Critical Observations:**

## Bandartila (Towards Patenga)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.25 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: No
7. Distance from intersection: 50 m
8. Road width: 10 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 0 | 1 |
| Mini | 1 | 0 | 1 |

16. Required Space: 31/18 m
17. Availability of space: Enough

**Critical Observations:** Height of footpath is too high

## Bandartila (Towards Kalurghat)

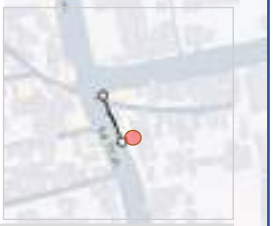
1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.25 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 50 m
8. Road width: 10 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 0 | 1 |
| Mini | 1 | 0 | 1 |

16. Required Space: 31/18 m
17. Availability of space: Enough

**Critical Observations:** Height of footpath is too high

## Cement Crossing (Towards Patenga)



1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.75 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 50 m
8. Road width: 11 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 0 | 1 |
| Mini | 1 | 0 | 1 |

16. Required Space: 31/18 m
17. Availability of space: Enough

**Critical Observations:** Height of footpath is too high, broken and uneven

## Cement Crossing (Towards Kalurghat )

1. Footpath availability: No
2. Footpath space availability: Yes
3. Footpath width: Not applicable
4. Footpath Connectivity: No
5. Footpath encroachment: Not applicable
6. Obstacles on footpath: Not applicable
7. Distance from intersection: 50 m
8. Road width: 8 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 0 | 1 |
| Mini | 1 | 0 | 0 |

16. Required Space: 31/13 m
17. Availability of space: Enough

**Critical Observations:** Footpath is under construction.

## Kathghar (Towards Patenga)

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.25 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: Yes
6. Obstacles on footpath: Yes
7. Distance from intersection: 50 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: No
11. Conditions of boarding area: Not applicable
12. Availability of seats: No
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 2 | 0 | 1 |
| Mini | 1 | 0 | 1 |

16. Required Space: 31/18 m
17. Availability of space: Enough

**Critical Observations:** Bazar starts from 20m from the circle. Land office is located within this 20m. Proposed point is fully occupied by bazar.

## Kathghar (Towards Kalurghat )

1. Footpath availability: Yes
2. Footpath space availability: Yes
3. Footpath width: 1.75 m (approx.)
4. Footpath Connectivity: Yes
5. Footpath encroachment: No
6. Obstacles on footpath: No
7. Distance from intersection: 50 m
8. Road width: 9 m (approx.)
9. Number of lanes: 3
10. Existing boarding availability: Yes
11. Conditions of boarding area: Broken and not usable
12. Availability of seats: Yes
13. Availability of street lights: Yes
14. Wheel chair accessibility: No
15. Required Slots:

| Slots | B | T | H |
|---|---|---|---|
| Max | 3 | 0 | 0 |
| Mini | 2 | 0 | 0 |

16. Required Space: 39/26 m
17. Availability of space: Enough

**Critical Observations:** Existing boarding shade is located at 40m from the circle without any traffic signs