Bangladesh University of Engineering & Technology

PLAN 446: Transport Planning Studio

Project on

Traffic Impact Assessment (TIA) of South Point School and College

Level-4 Term-1

Department of Urban & Regional Planning, BUET

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Executive Summary

Group-6 was assigned by the Department of Urban and Regional Planning in Transportation Planning Studio to conduct Traffic Impact Assessment for South Point School and College. It is situated at Malibagh Chowdhury Para, Dhaka. The study identifies the existing traffic conditions and scenarios of the sites. The existing problems and issues were examined through physical survey, traffic survey and interviews with the stakeholders. After the analyzing the existing problems, interventions are proposed to mitigate the traffic impact of the school.

Reconnaissance survey was done to observe the existing condition of the site, congestion condition during school hours, footpath condition, adjacent land use, and available transport mode on the site. Later on, traffic survey was done to count the traffic volume at peak hours for fifteen minutes duration. Based on the collected traffic volume data, level of service, peak hour traffic flow, variation of different transports in different peak times, pedestrian traffic flow had been calculated for specific junctions.

The TIA included relevant stakeholders' opinions and suggestions regarding the existing issues of traffic. Based on their opinions, a pragmatic view was developed about the site and that are likely to be considered for the proposed intervention.

The TIA concludes with several mitigation measures considering the identified problems and suggestions of the stakeholders to reduce the traffic impacts of the South Point School and College. It is recommended that a more detail assessment can be done by forecasting the travel demand and using updated traffic survey method, strategic modelling and development of schemes.

CHAPTER 1: INTRODUCTION

2.1 Background

We, group-6 has been appointed by the Department of Urban and Regional Planning, BUET in Transportation Planning Studio to construct a Traffic Impact Assessment (TIA) report of South Point School and College, Malibagh, Dhaka.

Dhaka, the capital of Bangladesh is experiencing huge population growth that results as an extreme traffic problem. In 2023, Dhaka has lost 8 million working hours per day which is 3 million higher than 2017 (Ali et al., 2023). The reasons of this substantial increase are multitudinous such as inadequate infrastructure, lack of traffic management, insufficient parking facilities and existing land use and infrastructures (Khan et al., 2018)). Any type of large infrastructure generates traffic. The amount of traffic generated by infrastructures depend on its functions, location, size and the number of persons using it and the adjacent road networks (Wang and Lu, 2003). The efficiency of road networks can potentially resolve the transportation problem through suitable transportation planning and impact assessment (Sharmeen et al., 2012). Hence, these impacts of infrastructures need to be addressed by some fixed methods. Traffic Impact Assessment is one of the prominent methods for examining the impacts on roads for any infrastructures (Regidor and Teodoro, 2005). Usually, Traffic Impact Assessment (TIA) is done for school, college, hospital, industries, offices which have fixed schedule (Rahaman, 2018).

In Bangladesh, Traffic Impact Assessment is not done even for big projects because of lack of governments' intervention, budgets. As a result, particularly Dhaka is being congested more and more (Sharmeen et al., 2012). So, this study aims to do TIA for a school of Dhaka. South Point School and College was established in 2003 (SPSC, n.d.) and no such studies have been conducted regarding this school in these twenty years.

2.2 Purpose of the Study

The main purpose of Traffic Impact Assessment (TIA) of South Point School and College is to understand the impact of school on the surrounding road and the community.

This study aims to identify the existing condition of the road networks in front of the school, the daily challenges faced by the students and guardians, role or initiatives of the traffic police, school authorities and other relevant stakeholders regarding traffic management.

This study also focuses on interventions addressing the problems that could potentially change the existing traffic condition and to reduce the sufferings of pupils, guardians and the local people by promoting a positive relationship between the school authority and the community.

2.3 Scope of the Study

This report will identify the existing transport condition, adjacent land uses, opinions and suggestions of stakeholders. It will help the transport planners, city authorities and policy makers to address the existing issues and implement the possible solutions.

2.4 Limitation of the Study

The study has some limitations which are given below.

- **Forecasting model:** The study does not consider the future trip generation by any model which can help to take the interventions more precisely.
- **Level of service:** The level of service is measured by the ratio of capacity and traffic volume instead of vehicle speed due to the unavailability of the data.
- **Seasonal variation:** The traffic pattern surrounding a school can vary significantly during different time of years and it is not taken into account.
- **Unavailability of Historical Data:** The past travel pattern data is not found and considered to compare the changes with the existing one.
- **Limited area:** The study is considered only the limited vicinity of the school by not taking into account the other areas.
- **Calculation of LOS:** In calculation of LOS, volume and capacity of road were considered instead of vehicular speed.
- **Standard of PCU:** PCU for different vehicles were collected from different articles.
- **Traffic Survey:** Traffic counts were taken for 15 minutes at peak hour for four times. It may not represent the whole traffic scenario of peak hours.

CHAPTER 3: REVIEW OF PREVIOUS STUDIES AND REPORTS

3.1 Traffic Impact Assessment Guidelines

A traffic impact assessment (TIA) evaluates the effects of a specific development on both traffic and safety. In order to maintain a satisfactory Level of Service (LOS) and the safety of the roadway network in the area of the proposed development, a TIA analysis indicates the need for any changes and mitigating measures to the adjacent and neighboring roadway system. For any new development projects proposed by RAJUK in urban areas identified in the Strategic Plan and Detailed Area Plan (DAP), where the likelihood of large-scale public gathering will affect traffic flow, TIA will be made a requirement (DTCA, n.d.). a TIA study serves three purposes that is it determines the benefits and impacts of a proposed development or re – development , impact of new development on existing transportation network and mitigation strategies that should be taken to address the transportation impacts associated with the proposed development within an area (DTCA, n.d.). It also includes not only safety considerations for existing or proposed development but also modes ingress or egress between existing network and development (DTCA, n.d.). The formulation of the Traffic Impact Assessment (TIA) Guidelines (DTCA, n.d.) was directly influenced by the requirement of Section 9.7.5 of the National Land Transportation Policy (NLTP) for the integration of Land Transport and Land Use regulations in Regional Policy Statements and District Plans. The implementation of a TIA for new major real estate, institutions, shopping centers, and public gathering areas is also included in this section (DTCA, n.d.). In Bangladesh, preparation responsibility of TIA report is given to DTCA and Development Authority (DTCA, n.d.). Integration of traffic issues with preparing a Traffic Impact Assessment is directed by The RSTP (DTCA, n.d.).

The TIA Guidelines will promote a common understanding of the process aligned with the National Land Transport Policy (NLTP) and be tailored to the statutory requirements, policies and strategies (DTCA, n.d.). The TIA guidelines will also help achieve the goal of NLTP to reduce the modal share of private cars to 30% of the total mechanized trips by 2022 in Bangladesh (DTCA, n.d.). Some criteria are fixed as for studying TIA is required. For example: for new development, the number of new peak hour vehicle trips are produced more than 100, capacity issues, lack of one or more parking spaces, etc (DTCA, n.d.). As per the Global standards, a TIA study for any proposed development is usually valid for two years. A TIA

study for any proposed development is typically valid for two years according to global standards. Any development that doesn't start after two years needs to have a new TIA study done. The requirement for an updated impact analysis may result from significant changes to the study area or land use.

3.2 Previous Traffic Impact Assessment (TIA) Studies

This section discusses previous studies on traffic impact assessment for educational institutions both in global and national contexts. Here, we will represent an overview of traffic impact assessments conducted in different countries for schools and colleges, which will help to understand the methodological process practiced for TIA. Besides, previous studies conducted in Bangladesh for assessing traffic impact of educational sites will also be discussed here.

3.2.1 Global Context

Table 1: Summary of the Literature

Country	Summary	Source
United States	TIA for Booker T. Washington Elementary School This study assesses the existing traffic conditions around the site and the impacts of the additional traffic generated by the new school on the surrounding area. 1. Intersection analysis was performed to identify the impact of the proposed development.	CUUATS, 2010
United States	TIA for proposed extension of Claremont High School. 1. The study discusses existing site, road network, parking, drop off zone, public transportation. 2. Traffic counts were done at intersections for existing traffic volume. To determine the impact of the development traffic, five scenarios were considered which included existing traffic, future traffic with/without extension. 3. The study has recommended measures to improve intersection, pedestrian links, drop off zone.	JGA, 2016
Australia	Waitara Public School: Demolish of old buildings and development of new four storey building to increase from 760 students and 32 teachers to 1,000 students and 42 teachers.	GHD, 2017

	1. The study has included description of existing land use, road network characteristics, public and active transport facilities. 2. Intersection survey, manual travel model survey and online questionnaire survey were performed. 3. Proposed development includes school expansion plan, site access arrangements, parking, pick-up/drop-off. 4. A green travel plan was prepared as a travel demand measure to reduce single car travel and encourage use of public transport, walking and cycling.	
United Kingdom	St Sampson's High School: TIA for development project for construction of college buildings where number of pupils will increase from 713 to 1,500. 1. The report includes discussion of relevant policy/guidelines, existing condition of the site such as public and active transport, access of pedestrians and cycles, local highway network. 2. It gives an overview of AM and PM peak hour traffic flow at junctions, total student and staff trips, modal share, linked trips. 3. The development proposal includes access strategy for various modes, school transports, parking facilities. 4. A travel plan for students and staff was developed during the study to decrease single-occupancy car trips to and from schools in favor of more environmentally friendly means of transportation including walking, bicycling, or school/public transportation.	ARUP, 2019
Australia	Mosmon High School: TIA for the proposed redevelopment, upgradation of existing and construction of new buildings, to increase the student population from 1,116 to 1,200 by 2031. 1. The report discusses existing transport facilities and condition including road network, public and active transport, parking facilities, pick-up/drop-off facilities. 2. It shows existing traffic volume generated at intersections around school during AM and PM peak hours, level of service, delay and queue length of the intersections.	SINSW, 2021

	3. Using SIDRA modelling it has forecasted future trip generation after proposed development. 4. It has recommended some interventions, which includes access arrangements for school, pick-up/drop-off facility and parking facilities for different modes.	

3.2.2 Local Context

In Bangladesh, traffic impact assessment (TIA) is not usually performed before the development of educational institutions. There was no traffic impact assessment found for any existing school in Bangladesh. A study was conducted regarding impact of school induced traffic on urban intersection in Dhaka city (Uddin, 2018). The study was done on Wills Little Flower School. Questionnaire survey, video survey and manual counting method were done. The questionnaire survey on school students reveal that 33% of the students use non-motorized transports and 28% of them use private car/taxi to make their school commuting trips. From video survey and manual counting method Maximum length of queue had been observed during 12:30 to 12:45 which is actually due to the school induced traffic and control delay at the approach near Wills Little Flower School is 51.492 sec/veh which is greater than delay of other time of the day.

The study suggested that an effective school zoning policy including provisions for establishment of schools at a certain distance away from intersections can provide a long-term solution. Short-term solution can involve effective enforcement such as imposing case against illegal on street parking in front of school.

CHAPTER 4: METHODOLOGY

4.1 Site Selection

Traffic Impact Assessment was performed for South Point School and College. The school is located at Malibagh Chowdhury Para, Dhaka North City Corporation. The aim of the study is to analysis the impact of existing school on traffic.

4.2 Reconnaissance of the Site

On 10 August 2023, reconnaissance survey was done at 11.00AM to 1.00 PM. On that day, physical features like location of school, existing land use, road characteristics, congestion condition on the road, footpath conditions, surrounding land use were observed.

4.3 Data Collection

4.3.1 Traffic Survey

On 17 August 2023, traffic survey was done at 7.30AM to 1.30 PM. On that day, traffic counts at intersections were taken for 15 minutes duration.

4.3.2 Traffic Count at Intersections

Table 2: Location and Time of Traffic Count

Intersection	Survey Time
DIT-Chowdhury Para Road	8:00AM - 8.15 AM
Chowdhury Para-Matir Masjid Road	8: 45 AM – 9:00 AM
Chowdhury Para- Shaheed Baki Road	12:00 PM – 12:15 PM
	12:30 PM – 12: 45PM

4.3.3 Pedestrian Survey

Pedestrian survey was performed at six points on both side of Chowdhury Para road. The locations of pedestrian count were 100 feet distant from each other. At DIT– Chowdhury Para intersection, pedestrian count was performed to identify number of people using foot over bridge.

4.3.4 Interview of Stakeholders

On 24 august, 2023, interviews with different stakeholders were conducted. Around 30 people were randomly selected in the study area. Stakeholders were guardians, students, school authority, traffic police, street hawker etc.

4.3.5 Problem Identification and Proposed Intervention

Some existing issues are identified based on our surveys and stakeholders' opinion. The report has proposed some possible interventions for reducing traffic impact of school.

4.3.6 Data Processing and Analysis

4.3.6.1 Calculation of Traffic Volume of the School Area

Traffic Volume = 4*PCU*Collected number of Vehicles

Table 3: PCU for Vehicles

Mode	PCU	Mode	PCU	Mode	PCU	Mode	PCU
Bus	3	Cycle	0.5	Pickup	1	Van	2
Bike	0.75	Microbus	1.5	Rickshaw	2	CNG	0.75
Car	1	Minibus	3	Truck	3		

(Haue et al., 2017; Roksana et al., 2018; Civil Yard, 2022).

4.3.6.2 Calculation of Mode share of Car, Bike and Rickshaw

With help of conversion of vehicles into passenger car unit, mode share of car, bike and rickshaw to total traffic volume was calculated.

Mode Share of A Vehicle = (Traffic Volume of The Vehicle/Total Traffic Volume)*100%

4.3.6.3 Calculation of Peak Hour Traffic Flow

Peak hour traffic flow = (Number of vehicles)/15 minutes

This formula was used for measuring peak hour traffic flow at 8:00 AM to 8:15 AM, at 8:45 AM to 9:00 AM, at 12:00 PM to 12:15 PM and at 12:30 PM to 12:45 PM.

4.3.6.4 Calculation of Peak Hour Factor

Peak hour factor = Peak Hour Volume/(4* Peak 15 Minute Volume), (Alvarez, 2022)

4.3.6.5 Calculation of Level of Service

Level of service was calculated based on volume/capacity ratio as speed of vehicles were not collected at the time of survey.

Level of Service = Volume (pcu/hr)/Road Capacity, (Kafy et al., 2018)

Table 4: Capacity of the Roads

Road	Capacity	Road	Capacity
DIT Road	5400pcu/hr	Matir Masjid Road	800pcu/hr
Chowdhury Para Road	900pcu/hr	Shaheed Baki Road	1200pcu/hr

In the calculation of capacity of road, DIT road was supposed to arterial road, Shaheed Baki road as sub-arterial and Chowdhury para as collector/connector road(Indian Road Congress, 1990; RHD, nd; Kafy et.al., 2018).

Table 5: Level of Service

LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio
A	0.00-0.35	C	0.58-0.75	E	0.90-1.00
B	0.35-0.58	D	0.75-0.90	F	>1.00

(Kafy et al., 2018)

CHAPTER 5: EXISTING CONDITIONS OF THE SITE

5.1 Location of the Site

South Point School and College is located at Malibag Chouwdhury Para in ward no. 23 of Dhaka North City Corporation (DNCC). The location of the site is showed in Figure 01.

The school is situated in Malibag Chowdhury Para residential area. The site location is near DIT road and Chowdhury Para road intersection. There are three buildings of the school adjacent to Chowdhury Para road. The first building is located to the east side of the road and the second and third buildings are located west side of the road. Total area of the school site is 7700 square feet. Area of the three buildings are 2500 square feet, 1800 square feet and 3400 square feet respectively.

Figure 01: Location of South Point School and College

Source: Field Survey, 2023

5.2 School Profile

The following table represents the general information of South Point School and College:

Table 6: General Information of the School

Total Area	7700 sq. ft.
Number of School Shift: 2	Morning and Day
Number of Medium: 3	Bangla and English Medium. English Version
School Starting Time	**Morning Shift:** 7.30 AM-8.30 AM **Day Shift:** 11:30 AM-12:30 PM
School End Time	**Morning Shift:** 11:00 AM-12:00 PM **Day Shift:** 4:30 PM-5:30 PM
Number of Class Level: 14	Play to level 12
Total Number of Students	12,500
Total Number of Teachers	350
Total Number of Staffs	80

5.3 School Access Point

The first building of the school has two access gates, one in front of the building on Chowdhury Para road and another access gate on Matir Masjid road as showed in the Figure 02. The second and third buildings have one access gate each in front of the building on Chowdhury Para road.

Access Gate

Figure 02: Access Points of the School

5.4 Land Use of the Site

From our field survey, we have observed that the land uses around the site area are primarily mixed and residential land uses. Mixed land uses are mostly located adjacent to Chowdhury Para road. Different types of restaurants, grocery stores, clothing stores, barbershop, food stalls, repairing stores are found near the school.

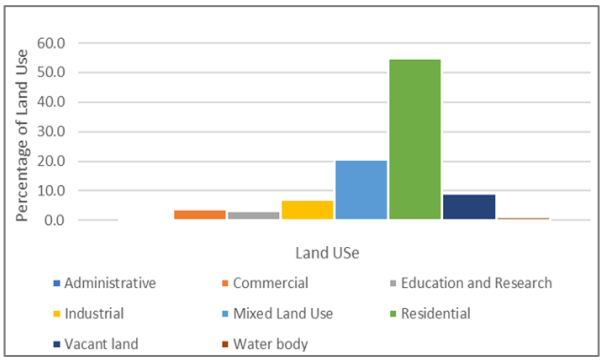
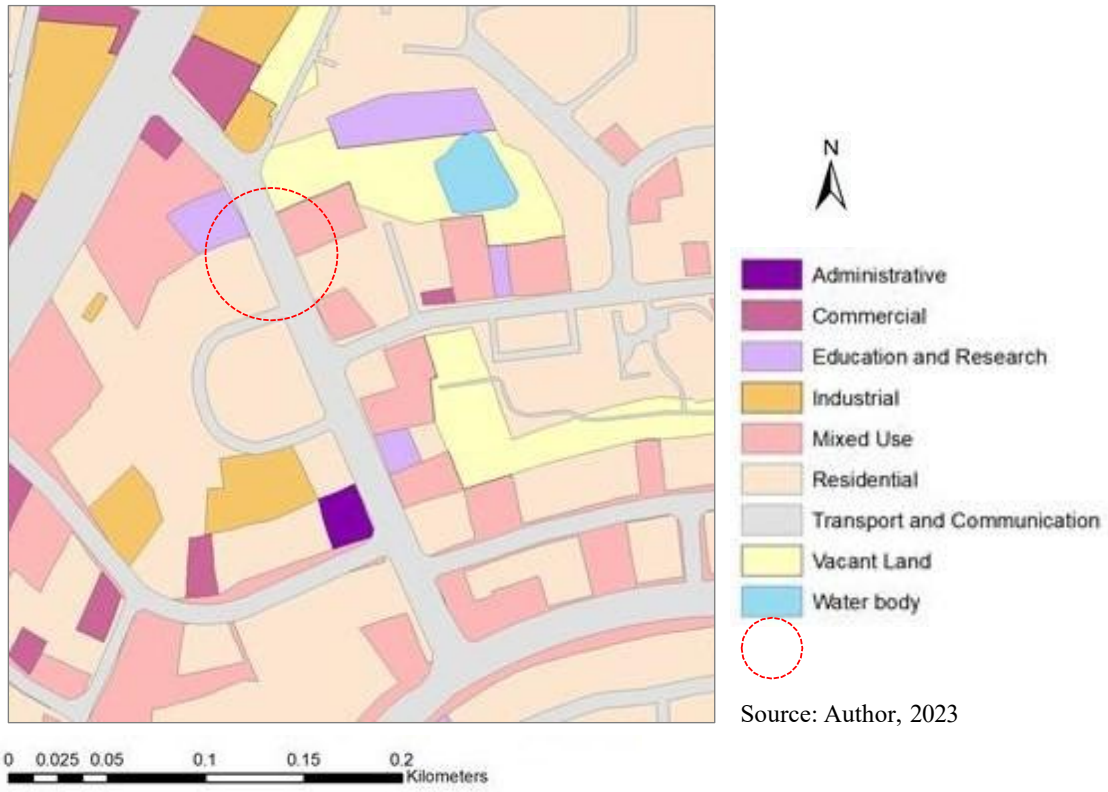
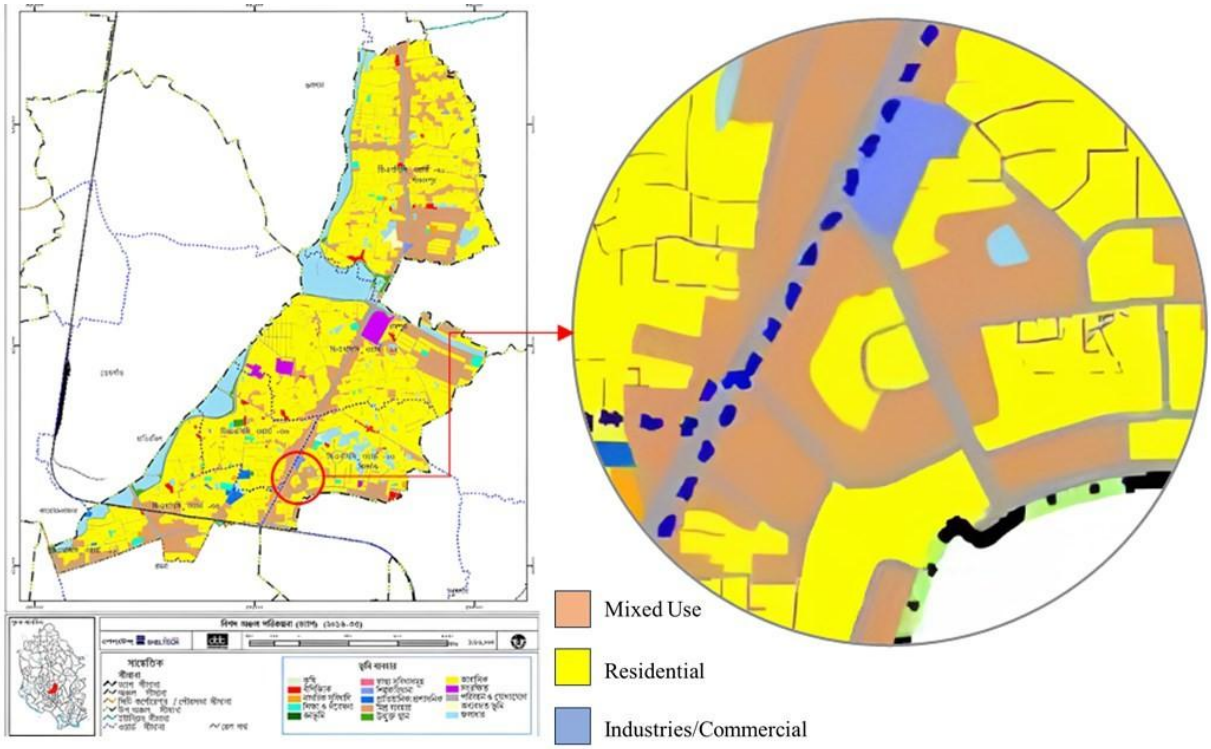


Figure 03: Percentage of Land Use at the Site



Source: Author, 2023

Figure 04: Existing Land Use of the Site



Source: Draft DAP, 2016

Figure 05: Land Use Map of the Site from Detail Area Plan

5.5 Existing Road Network

The school is served primarily by Chowdhury Para road, which is a connector road. Chowdhury Para road connects with DIT road at the north western side and at south eastern side, it connects with Shaheed Baki road. A local road called Matir Masjid connects with Chowdhury Para road at 62 meters distance from school.

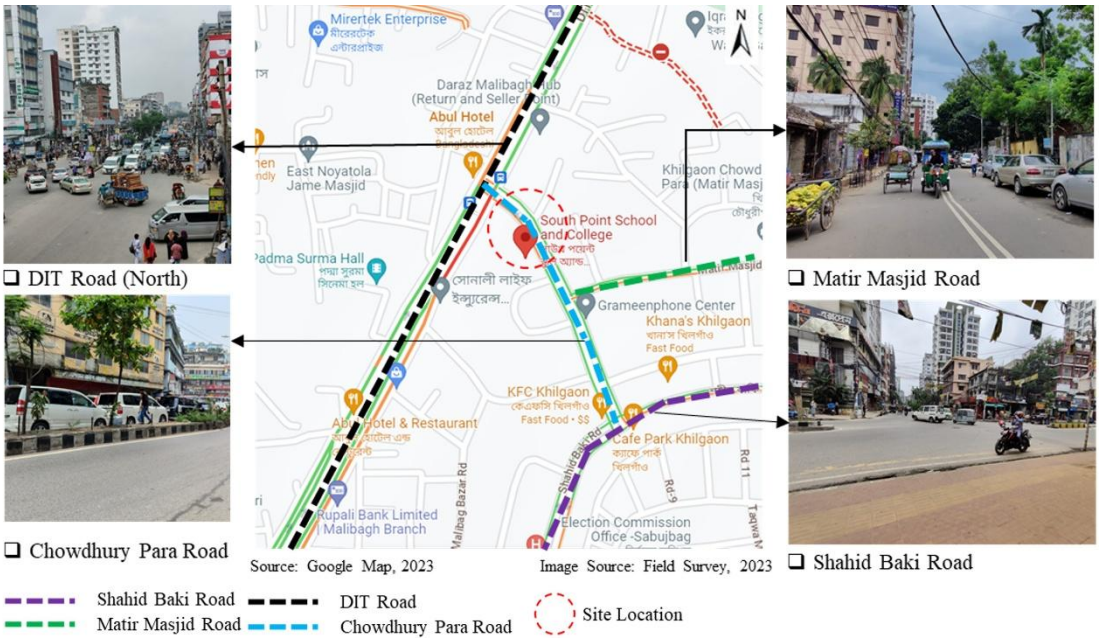


Figure 06: Road Network of the Site

5.5.1 Road Hierarchy

Near the school site, we have observed four types of road forming the existing road network.

Detail information about the characteristics of existing roads are given below

DIT Road	
Road Classification	Secondary Road
Alignment	North-South
Number of Lanes	4
Carriageway Width	90 ft.
Footpath	Exist
School Zone	Yes
Parking Controls	Restricted

Figure 07: DIT Road Source: Field Survey, 2023

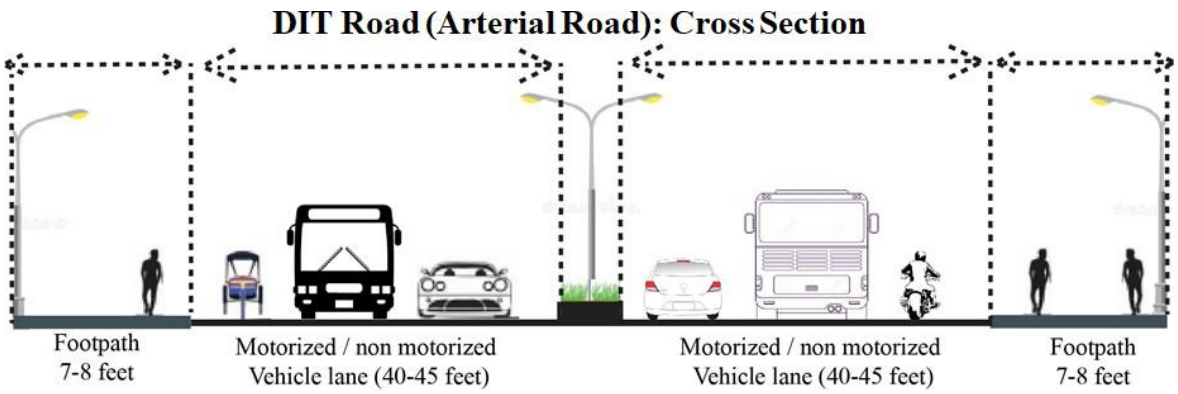


Figure 08: Cross Section of DIT Road

Chowdhury Para Road	
Road Classification	Connector Road
Alignment	North-South
Number of Lanes	2
Carriageway Width	50 feet
Footpath	Exist
School Zone	Yes
Parking Controls	Restricted

Source: Field Survey, 2023

Figure 09: Chowdhury Para Road

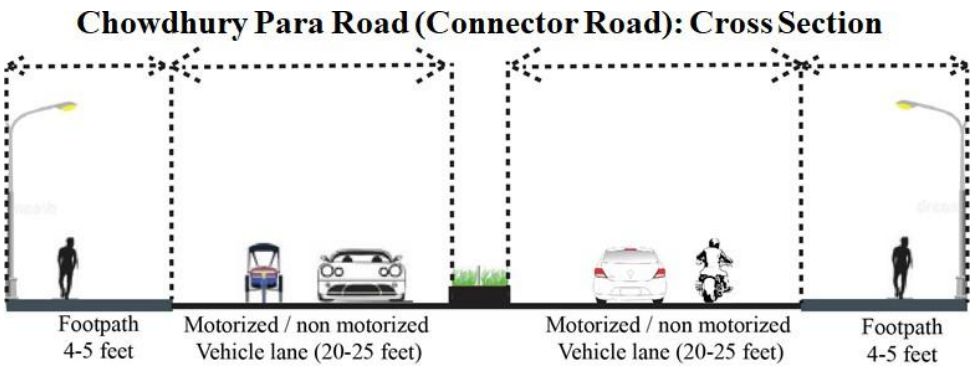


Figure 10: Cross Section of Chowdhury Para Road

Shaheed Baki Road	
Road Classification	Connector Road
Alignment	North-South
Number of Lanes	4
Carriageway Width	60 feet
Footpath	Exist
School Zone	Yes
Parking Controls	Not Restricted

Source: Field Survey, 2023

Figure 11: Shaheed Baki Road

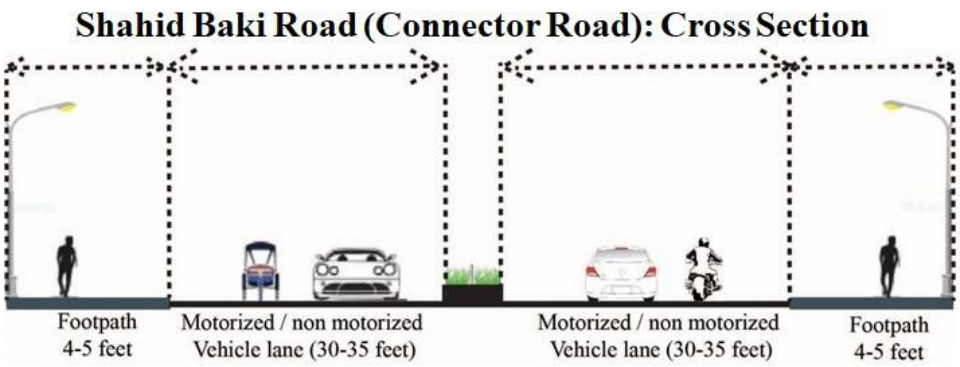


Figure 12: Cross Section of Shaheed Baki Road

Matir Masjid Road	
Road Classification	Local Road
Alignment	North-South
Number of Lanes	2
Carriageway Width	25 feet
Footpath	Exist
School Zone	Yes
Parking Controls	Restricted

Source: Field Survey, 2023

Figure 13: Matir Masjid Road Road

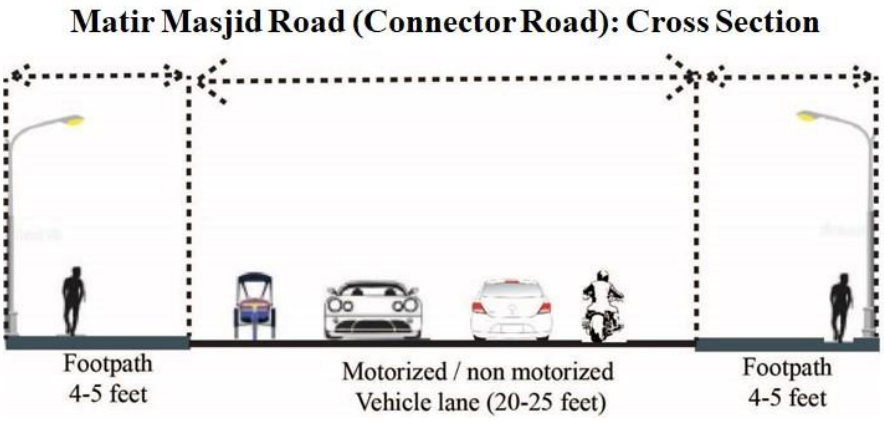


Figure 13: Cross Section of Matir Masjid Road

5.5.2 Intersections at the Site

We have observed two intersections located near the school site. DIT road-Chowdhury Para road intersection is located at north side and 80 meters distant from the site. Location of the other intersection (Chowdhury Para road-Shaheed Baki road) is at south side and it is 215 meters away from the site. Both of the intersections are manullay controlled by the traffic police. At first intersection, traffic police remains present all the time. However, at intersection 02 traffic police is only seen during peak hours. Besides, two junctions have been found at the

site. At junction 1, local road namely Matir Masjid connects with Chowdhury Para road. This junction is at 70 meters distance from school. At junction 2, another local road connects with Chowdhury Para road, which is 176 meters away from school. The location of intersections and junctions are presented in Figure 14.

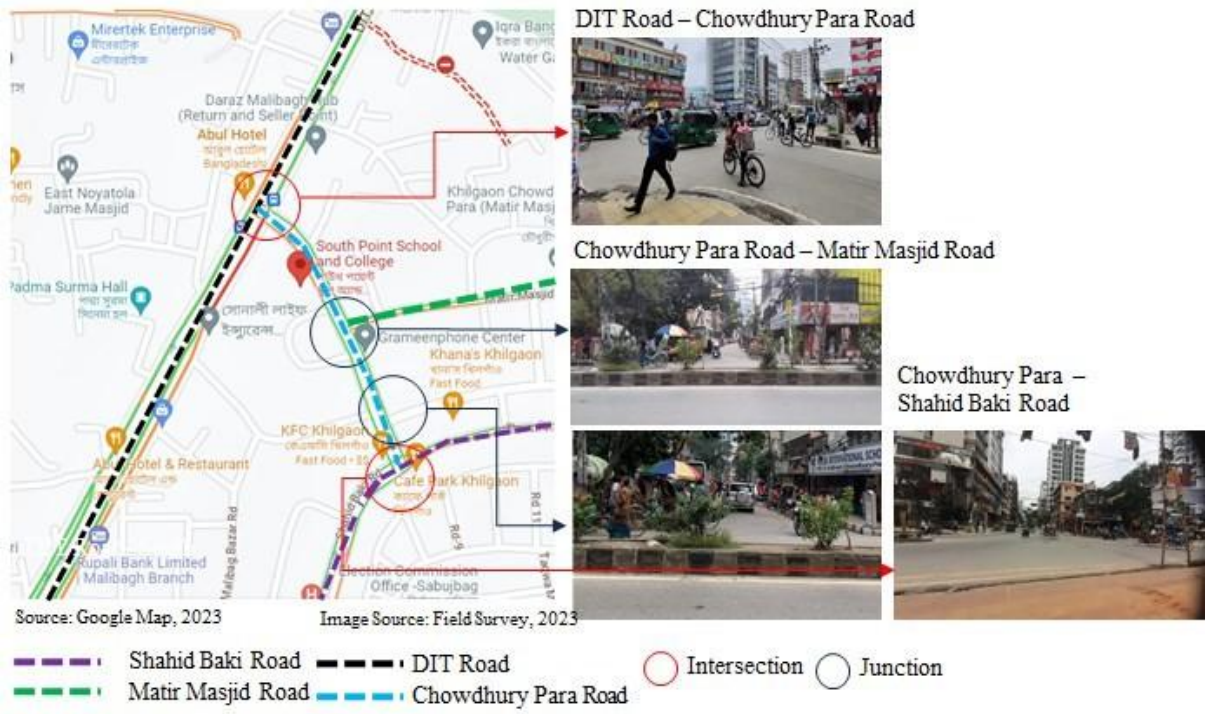


Figure 14: Location of the Intersections and Junctions at the Site

Table 7: Characteristics of the Existing Intersection at the Site

Intersection	Attributes	Junction	Attributes
DIT road-Chowdhury Para road	1. 80m distant from school 2. Unsignalized 3. Manual traffic control-24/7 hours 4. Footover bridge for pedestrians	Chowdhury Para- Matir Masjid	1. 70 m distant from school 2. Unsignalized 3. No traffic control 4. No pedestrian crossings
Chowdhury Para road-Shaheed Baki road	1. 215m distant from school 2. Unsignalized 3. Manual traffic control at peak hours 4. Three Zebra crossings for pedestrians	Chowdhury Para-Local Road	1. 176 m from school 2. Unsignalized 3. No traffic control 4. No pedestrian crossings

5.5.3 Access to Public Transit

There are total three access points of public bus is near DIT road intersection, which is at 80 meters distance from the school site. Bus access points are situated within the walking distance of the school site. But, there is no designated bus stoppage for public buses. As a result, buses stop right at the intersection which creates congestion and conflict with other mode. The location of the access points of public bus is showed in the following Figure10.

Figure 15: Access Points of Public Bus

5.5.4 Pedestrian Pathway

The existing roads surrounding the school site have footpath for pedestrians. Except local access roads, all the roads have footpath on both sides. Figure 16 represents the existing pedestrian network around the site.

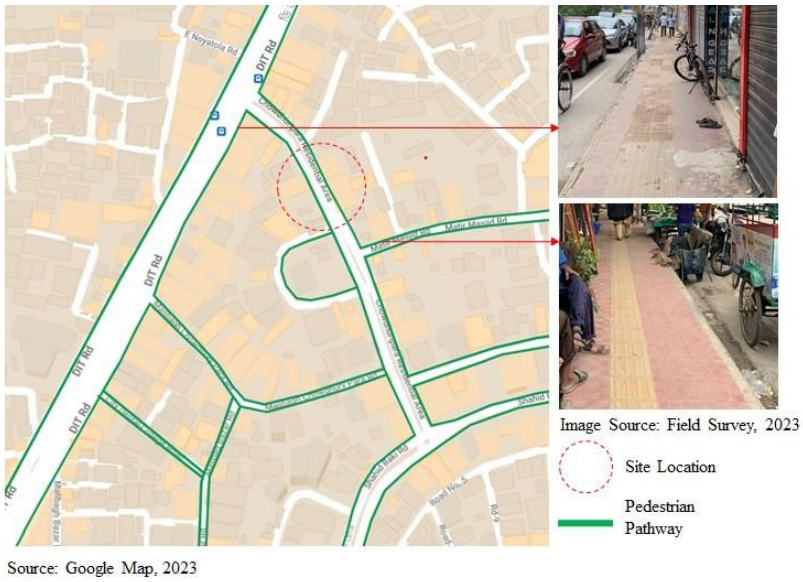


Figure 16: Pedestrian Pathway

5.5.5 Pedestrian Crossings

DIT Road: There is one grade-separated pedestrian crossing near DIT-Chowdhury Para road intersection.

Chowdhury Para Road: There are total three at-graded pedestrian crossings provided on this road. One of the pedestrian crossings is located in front of school and it has zebra marking. School guards assist the schoolchildren while crossing the road. The other two crossings on this road do not have any marking.

Shaheed Baki Road: There is one at-graded pedestrian crossing near Shaheed Baki-Chowdhury Intersection.

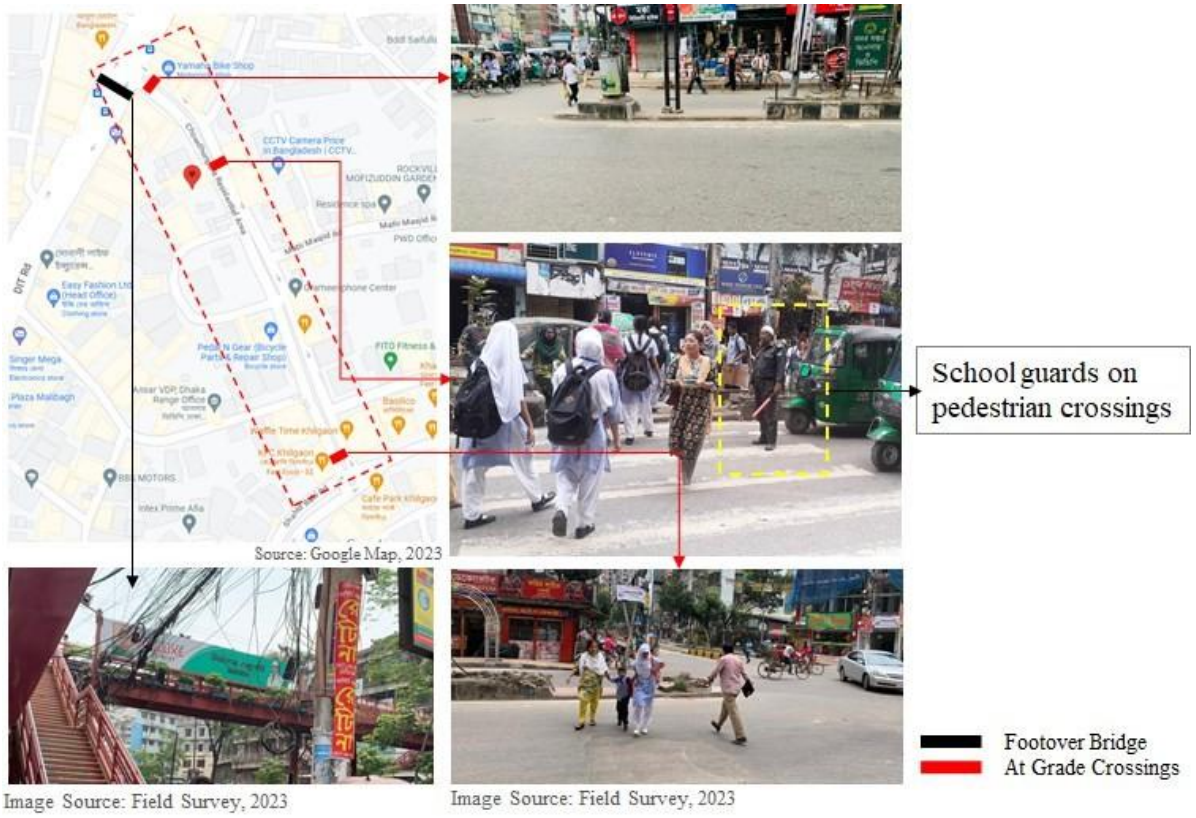


Figure 17: Pedestrian Crossings

5.6 Parking Facility

There is no parking provision at the school site for private cars, school van. Parking is restricted on Chowdhury Para road, DIT road. School buildings have parking facility on ground floor but it is only allowed for school officials. Vehicles are illegally parked on Chowdhury Para road, Matir Masjid road near school site.

5.7 Existing Pick-up and Drop-off Activity

There is no designated place for pick-up/drop-off at the school site. Private cars, rickshaw, school vans drop the students in front of the school buildings.

5.8 On-street Commercial Activities

Street vendors are always seen on the adjacent roads at the school site doing on-street commercial activities. Number of street vendors is higher on Chowdhury Para road. They sell street foods, cloths, household products, plants etc. Sometimes, vendors occupy footpath.

Map Source: Google Map, 2023
Image Source: Field Survey, 2023

Figure 18: On-Street Commercial Activities at the School Site

5.9 Safety, Mobility and Accessibility Issue

Safety Issues at the Site

1. Majority of the exiting footpath have broken edges creating difficulty for pedestrians.
2. At DIT-Chowdhury Para Intersection, people do not use foot over bridge to cross main road most of the time.
3. Sometimes rickshaw, motorbikes uses wrong side on Chowdhury Para road creating conflicts in front of school.

Mobility Issue: Existing footpath in front of the school buildings are narrow and have poor condition. Pedestrians face difficulty as heavy pedestrian flow and queuing occurs during school hours.

Accessibility Issue: There is no ramp provided on footpath for disable people.

Figure 19: Broken Footpath

Figure 20: No Ramp on Footpath

CHAPTER 6: TRAFFIC SURVEY AND IMPACT IDENTIFICATION

6.1 Traffic Volume during Peak Hours

Traffic Volume at 8:00AM – 9:00AM

At 8:00AM – 8:15AM, DIT North to DIT South, traffic volume is 2314 pcu/hr. DIT South to DIT North, traffic volume is 2116 pcu/hr. It is observed that traffic volume of 1042 pcu/hr are entering the Chowdhry para road from DIT road north and south portion. Traffic volume at Chowdhry para road that is in front of school building 1 is 1261 pcu/hr. Besides, 146 pcu/hr of traffic volume turn to Matir Masjid Road and 899 pcu/hr enter to the Chowdhry para road. number of vehicles leave the Chowdhry para road to Shaheed Baki Road. Moreover, 1677 pcu/hr leave Chowdhry para road to DIT road (both north and south direction) and the road is in front of school building 2 & 3. From Shaheed Baki Road, total 705 pcu/hr enter to the Chowdhry para road. The number of pass through vehicles volume both Shaheed Baki road (North to South) and (South to North) is 112 pcu/hr and 364 pcu/hr respectively.

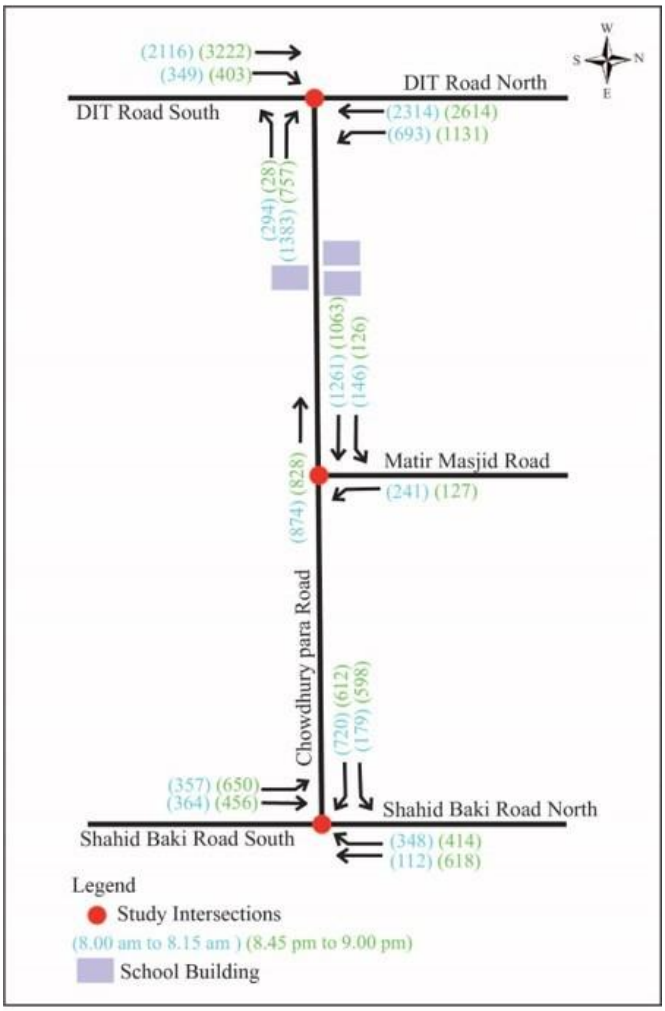


Figure 21: Traffic Volume of School Area (at 8:00AM-9:00AM)

At 8:45AM – 9:00AM, The traffic volume of pass through vehicles for DIT road North to DIT road South is 3222 pcu/hr and DIT South to DIT North is 2116 pcu/hr. It is observed that total traffic volume of 1534 pcu/hr are entering the Chowdhry para road from DIT road north and south portion. In total number of vehicles at Chowdhry para road that is in front of school building 1 is 1063 pcu/hr. Besides, 126 pcu/hr vehicles turn to Matir Masjid road and 127

pcu/hr of traffic volume enter to the Chowdhry para road. 1210 pcu/hr of traffic volume leave the Chowdhry para road to Shaheed Baki road. Moreover, 785 pcu/hr of traffic volume leave Chowdhry para road to DIT road (north and south direction) and the road is in front of school building 2 & 3. From Shaheed Baki road, total traffic volume of 1064 pcu/hr enter to the Chowdhry para road. The traffic volume of pass through vehicles both Shaheed Baki road (North to South) and (South to North) is 618 pcu/hr and 456 pcu/hr respectively

Traffic Volume at 12:00 PM – 1:00PM

At 12:00PM – 12:15PM, DIT North to DIT South, the traffic volume of pass through vehicles number is 2446 pcu/hr. DIT South to DIT North, traffic volume of pass through vehicles number is 2815 pcu/hr. It is observed that total 1472 pcu/hr number of vehicles are entering the Chowdhry para road from DIT road north and south portion. In total, the number of vehicles at Chowdhry para road that is in front of school building 1 is 1432 pcu/hr. Besides, 249 pcu/hr vehicles turn to Matir Masjid Road and 294 pcu/hr of traffic volume of vehicles enter to the Chowdhry para road. 1133 pcu/hr number of vehicles leave the Chowdhry para road to Shaheed Baki road. Moreover, 621 pcu/hr of traffic volume of vehicles leave Chowdhry para road to DIT road (north and south direction) and the road is in front of school building 2 & 3. From Shaheed Baki Road, total 600 pcu/hr volume of vehicles enter to the Chowdhry para road. The number of pass-through vehicles both Shaheed Baki Road (North to South) and (South to North) is 494 pcu/hr and 362 pcu/hr respectively.

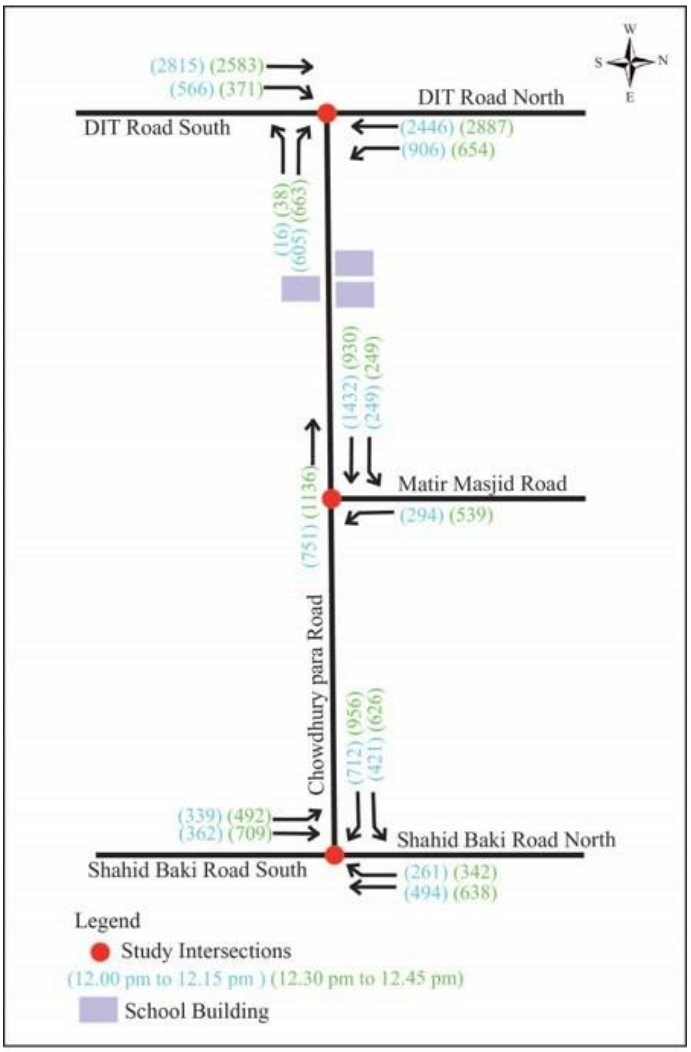


Figure 22: Traffic Volume of School Area (at 12:00PM-1:00PM)

At 12:30PM – 12:45PM, the number of pass through vehicles for DIT road North to DIT road South is 2887 pcu/hr and DIT South to DIT North is 2583 pcu/hr. It is observed that total 1025 pcu/hr traffic volume of vehicles are entering the Chowdhry para road from DIT road north and south portion. In total, the number of vehicles at Chowdhry para road that is in front of school building 1 is 930 pcu/hr. Besides, 249 pcu/hr of vehicles turn to Matir Masjid road and 539 pcu/hr of vehicles enter to the Chowdhry para road. 1582 pcu/hr of vehicles leave the Chowdhry para road to Shaheed Baki road. Moreover, 745 pcu/hr of vehicles leave Chowdhry para road to DIT road (north and south direction) and the road is in front of school building 2 & 3. From Shaheed Baki Road, total 834 pcu/hr of vehicles enter to the Chowdhry para road. The number of pass-through vehicles both Shaheed Baki Road (North to South) and (South to North) is 638 pcu/hr and 709 pcu/hr respectively.

6.2 Peak Hour Traffic Flow

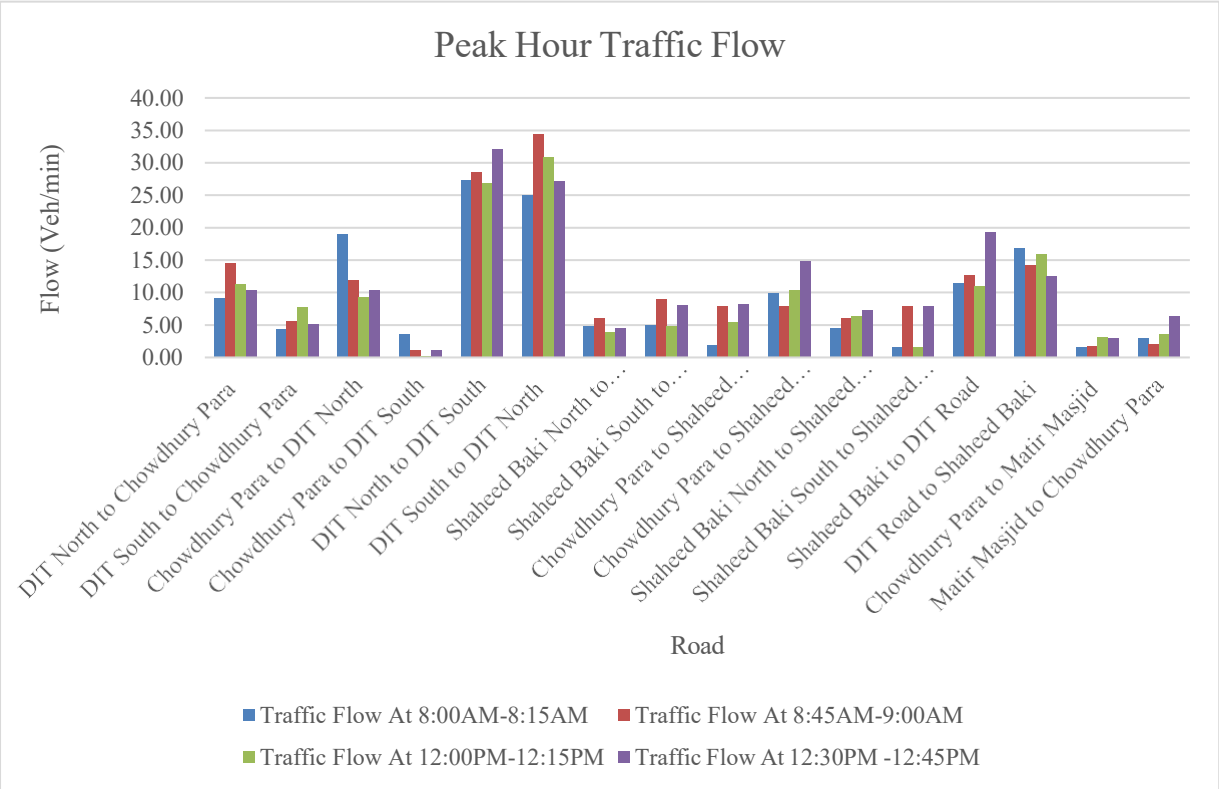


Figure 23: Peak Hour Traffic Flow at 8:00 AM-9:00AM and 12:00PM-1:00PM

Peak hour traffic flow is calculated for four roads with all directions for traffic coming. It is considered for four times data collection period. From the graph, DIT Road in both directions (North to South or vice versa), peak hour traffic flow is highest (about 35 veh/min) against two times peak hour (at 8:00AM-9:00AM and 12:00PM-1:00PM) among all roads. Of all, for road of Chowdhury para to DIT South direction (which is in front of school 2 and 3), traffic flow is lowest (<5 Veh/min) at peak hours. The reason for this phenomenon may be, the road directing

DIT South from Chowdhury para is severe congested for signal and it was observed during data collection, for 15 minutes survey time, traffic flow was almost stopped for 10 minutes. Again, rest of the roads traffic flow is in 20 veh/min.

6.3 Variation in Vehicle Number at Chowdhury Para Road

In this case, based on the traffic volume (at 12:30 PM-12:45PM), others time variation of peak hour traffic volume is measured. The reason for taking (at 12:30 PM-12:45PM) is at that time, school morning shift ends and day shift starts and this variation counts for only Chowdhury para road (school access road), it is thought that traffic at that time only for school-goers. At that time, it is observed that, based on noon peak time, vehicle number is increased 139 %, 50% and 44% for Chowdhury Para to DIT (at 8:00AM-8:15AM), DIT to Chowdhury Para Road (at 8:45AM-9:00AM) and (at 12:00PM-12:15PM) respectively. The increase in vehicle number road (Chowdhury Para to DIT) at morning have reason as the time for both office-goers and school-goers. But based on noon peak time, vehicle number is decreased 76% at Matir Masjid to Chowdhury Para road.

Table 8: Variation in Peak Hour Traffic volume at Chowdhury Para Road based on (12:30-12:45) PM

Road	**8:00AM -8:15AM**	**8:45AM -9:00AM**	**12:00PM -12:15PM**	**12:30PM -12:45PM**
DIT to Chowdhury Para Road	1042	1534	1472	1025
	2%	**50%**	**44%**	0%
Chowdhury Para to DIT	1677	785	1472	701
	139%	12%	-11%	0%
Shaheed Baki to Chowdhury Para Road	705	1064	600	834
	-15%	28%	-28%	0%
Chowdhury Para to Shaheed Baki Road	899	1210	1133	1572
	-43%	-23%	-28%	0%
Chowdhury Para to Matir Masjid Road	146	126	249	249
	-41%	**-49%**	0%	0%
Matir Masjid Road to Chowdhury Para Road	241	127	294	539
	-55%	**-76%**	**-45%**	0%

6.4 Peak Hour Factor of Roads

For all the roads (including its directions), peak hour factor is calculated. Peak hour factor is highest (close to .9) for DIT North to DIT South road and DIT South to DIT North road. The number of PHF on these road means that there is no variation of the traffic flow through out

the hour. For Chowdhury Para to DIT South directing road, the peak hour factor is 0.3 which means on the road, traffic flow has a variation at the time of peak hour and it has a peak during the peak 15-minute period. For all the rest of roads, peak hour factor is in (0.55 to 0.79).

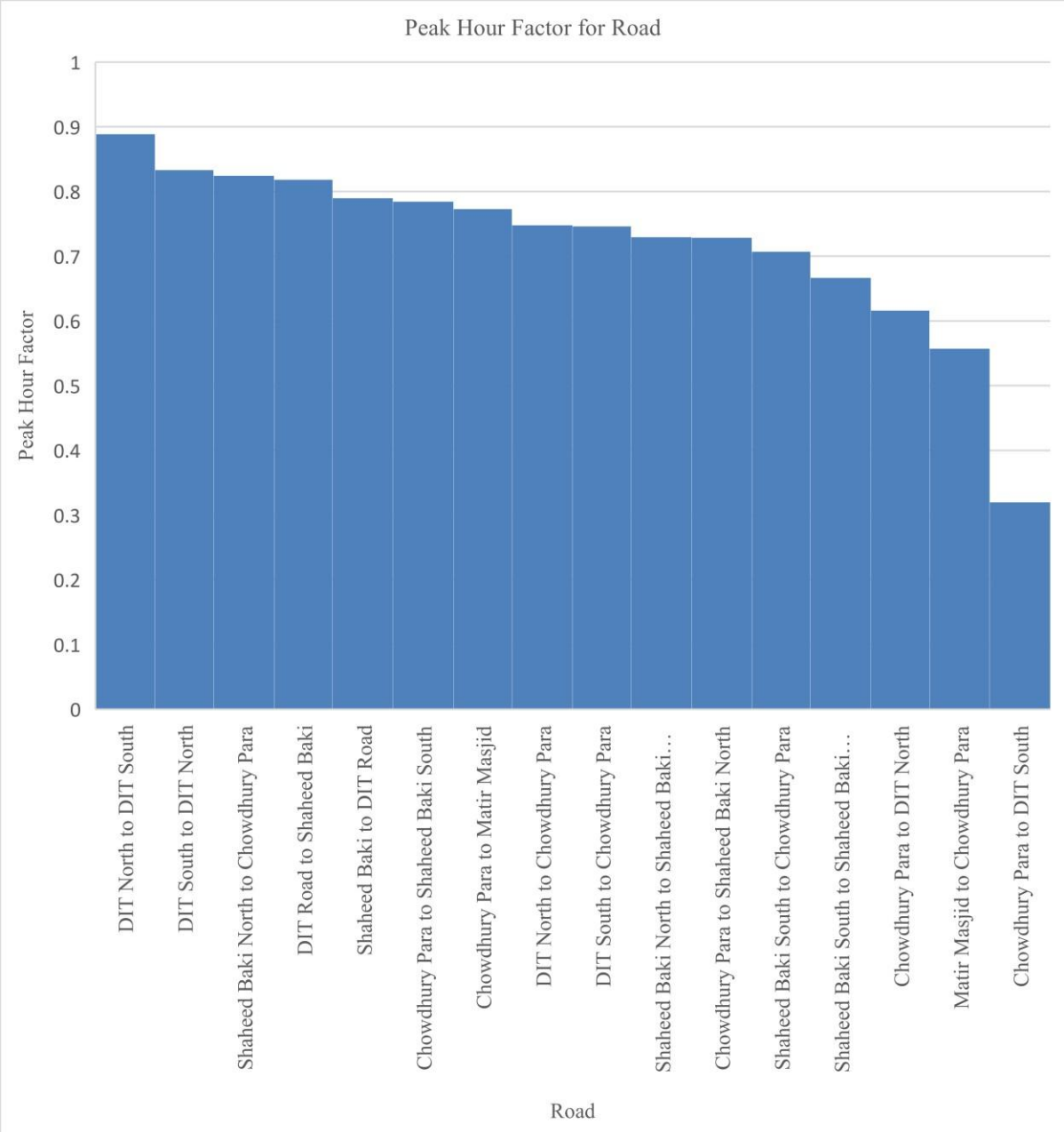
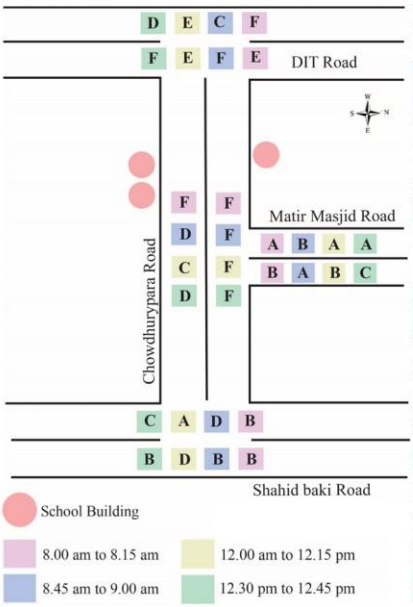


Figure 24: Peak Hour Factor of Roads in School Area

6.5 Level of Service of Roads

It is seen that level of service of Chowdhury Para road (right lane) is F for four times survey. Similarly, for DIT North to DIT South road, LOS is either E or F. Both road indicate the worst conditions, bad travel times, low comfort and convenience and a strongly congested flow (Kafy

et al., 2018). Comparatively, Matir Masjid road and Shaheed Baki road have lower LOS (ranging A to D at different times).



Road name	At 8:00AM-8:15AM	At 8:45AM-9:00AM	At 12:00PM-12:15PM	At 12:30PM-12:45PM
Chowdhury para (Right lane)	F	F	F	F
Chowdhury Para (left lane)	F	D	C	D
DIT South to DIT North	F	C	E	D
DIT North to DIT South	E	F	E	F
Shaheed Baki North to Shaheed Baki South	B	B	D	B
Shaheed Baki South to Shaheed Baki North	B	D	A	C
Shaheed Baki to DIT Road	E	E	D	F
Chowdhury Para to Matir Masjid	A	B	A	A
Matir Masjid to Chowdhury Para	B	A	B	C

Source: Field Survey, 2023

Figure 25: Level of Service of Roads

6.6 Mode Share of Car, Bike and Rickshaw at Chowdhury Para Road

As the access road for school is Chowdhury Para Road and it is observed that high presence of car, bike ad rickshaw in traffic volume. So, it is tried to find out modal share of these vehicles based on total mode. For this calculation, two lane and two direction of Chowdhury Para Road are considered at four times of survey. It is seen that Car, bike and rickshaw are more than 50% in total number of mode. It is observed that mode share is comparatively less in morning peak rather than noon peak. The highest more share (86%) is found for vehicles incoming to Chowdhury para Road from DIT Road at 12:00PM- 12:15PM and lowest (50%) is found for vehicles Leaving to DIT Road from Chowdhury Para Road at 8:00AM -8:15AM**.**

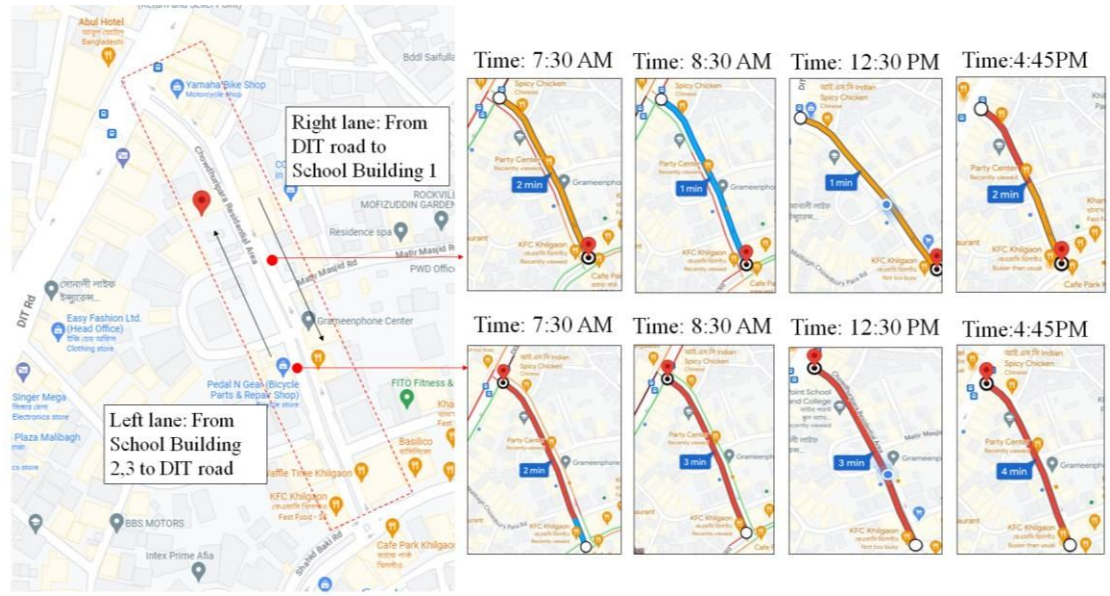
Table 9: Mode Share of Car, Bike, Rickshaw at Chowdhury Para Road

Location	**Mode**	**8:00AM-8:15AM**		**8:45AM-9.00AM**		**12:00PM-12:15PM**		**12:30PM-12:45PM**	
Incoming to Chowdhury para Road from DIT Road	Bike	21%	**67%**	22%	**78%**	33%	**86%**	21%	**78%**
	Car	30%		50%		41%		40%	
	Rickshaw	16%		6%		12%		17%	
Leaving to DIT Road from	Bike	12%	**50%**	10%	**81%**	18%	**74%**	18%	**72%**
	Car	20%		44%		31%		35%	

Chowdhury Para Road	Rickshaw	28%		27%		25%		19%	
Incoming to Chowdhury Para Road from Shaheed Baki Road	Bike	1%	**58%**	24%	**66%**	21%	**85%**	25%	**69%**
	Car	50%		30%		35%		25%	
	Rickshaw	7%		12%		19%		19%	
Leaving to Shaheed Baki Road from Chowdhury Para Road	Bike	8%	**69%**	10%	**66%**	17%	**70%**	24%	**72%**
	Car	39%		31%		29%		28%	
	Rickshaw	22%		25%		24%		20%	

(Source: Author, 2023)

6.7 Congestion Condition at Peak Hours



Source: Google Map, 2023

Figure 26: Congestion Condition at Peak Hours

Figure 26 represents congestion condition of school area at school peak periods. For all the peak period, congestion color is red (traffic at stand still or slow moving) at left lane (from school building 2 and 3 to DIT road) and right lane (from DIT road to school building 1), the condition is either blue (no delay) or orange (moderate traffic) (Poudel, 2022)

6.8 Congestion Points

There is found three intersections at the school area. At DIT-Chowdhury Para Intersection and Chowdhury Para-Matir Masjid intersection, there are severe congestion. But low congestion is found at Chowdhury Para-Shaheed Baki Road intersection.

Figure 27: Congestion Points

6.9 Conflict Points

There are several conflict points found on school area. The reasons for finding conflict area are street hawkers at road shoulders, drop-off and pick-up of car, wrong direction vehicle movements.

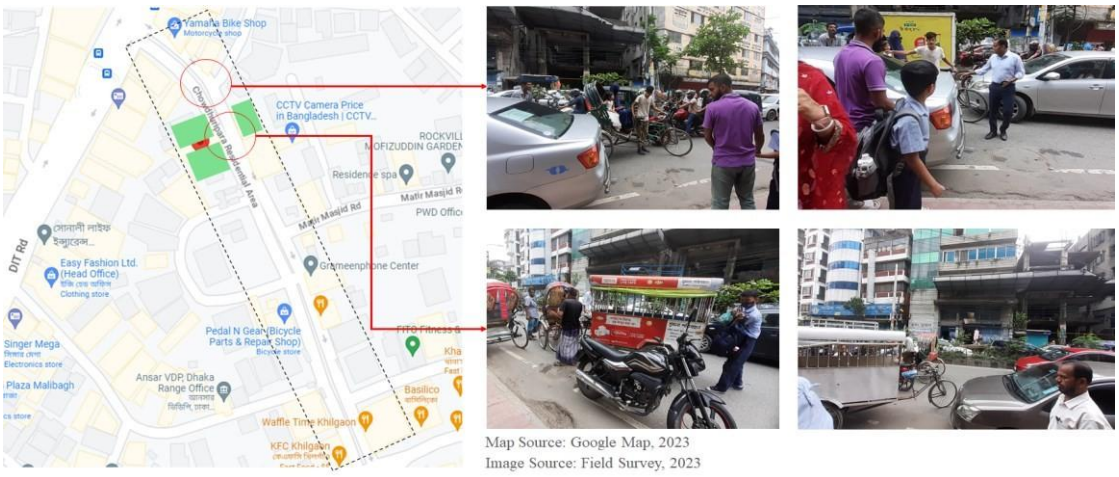


Figure 28: Conflict Points

6.10 Mode Preference by Students for Daily Commuting

It is seen from the graph that the majority of the students come to school by walking, followed by rickshaw and car. The count stayed for 15 minutes. As the two lane of the roads is very congested, many rickshaw-pullers, car drivers drop off their passengers aloof from the access of school gate. This may be a reason for getting higher percentage for walking.

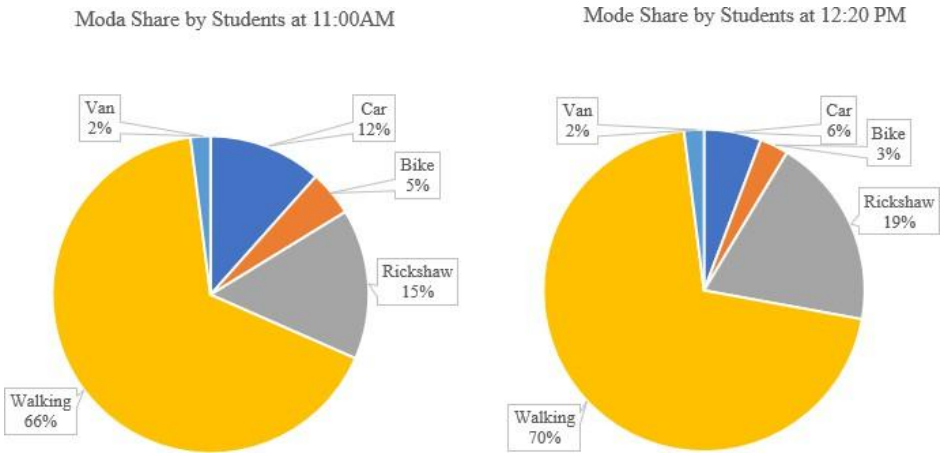


Figure 28: Mode Preference by Students

6.11 Pedestrian Volume during Peak Hours

From the pedestrian survey, it is found that in front of the school building 1, the number of pedestrians is highest among all locations. The number of pedestrians increases at noon peak time rather than morning peak time. At noon peak time, pedestrian flow increases in front of school building 1. Again, the lowest number of pedestrian is seen aloof from the school access footpath area location at 5 and 6.

Table 10: Pedestrian Count

Location	8:15AM-8:20 AM	9:00AM-9:05 AM	12:20PM-12:25 PM	12:45PM-12:50 PM
School to DIT Road (1)	26	33	56	47
DIT Road to School (2)	33	19	36	45
In front of school building 1 (3)	42	135	106	147
In front of school building two & three (4)	52	80	83	59
DIT Road to Matir Masjid Road (5)	11	55	50	31
Shaheed Baki Road to DIT Road (6)	19	17	40	26

Data Source: Field Survey, 2023

Map Source: Google Map, 2023

Figure 29: Location of Pedestrian Counts

6.12 Number of Foot over Bridge Users

Despite the presence of a footover bridge at the DIT intersection, it is found that the number of people who use road use for crossing are 3.14 times greater than footover bridge users. This is the result of five minutes time of survey and it is taken at 12.43 PM to 12.48 PM

Table 11 Number of People Using Foot over Bridge and Road for Crossing

Using Foot over bridge	Using road
27	85

CHAPTER 7: STAKEHOLDER ANALYSIS

7.1 Identification and selection of Stakeholder

Stakeholder analysis has become a popular method for management and development during the last decade. It has become prevalent among researchers who acknowledge stakeholders (Individuals, groups, organizations) for their potential to impact the actions (Mason and Mitrof 1981; Crosby 1992). It is an efficient tool or approach to analyze the decision making and implementation processes (Brugha and Varvasovszky, 2000).

For identifying the stakeholders, few steps have been followed.

1. It is crucial to understand the past and present context for determining the interaction process with stakeholders. The level of analysis also resolves to what extent analyzing the stakeholders. All stakeholders can be reached individually in local level analysis (Brugha and Varvasovszky, 2000). For this study, local level analysis is considered.
2. Stakeholders are those who can influence the implementation and decision-making processes (Brugha and Varvasovszky, 2000). For the purpose of this study, students, guardians, school authorities, traffic polices and street vendors of Chowdhury para road are considered as stakeholders.

7.2 Data Collection and Data Analysis

Constructing checklists, questionnaires for interviewing the stakeholders is an efficient way to collect the primary data sources. Through focus group discussion is also an approach for collecting the information from stakeholders (Varvasovszky, 1998).The outputs can be represented by matrices, charts, tables, maps for presenting data (Montgomery, 1996).

7.3 Stakeholder Profile

Table 12: Stakeholder Profile

Stakeholders	Involvement in the issue	Interest in the issue	Influence power
Guardians of the students	Primary reason of traffic generation of those three intersections	High	High
Students		Medium	Medium
School authority	Manage 12000 students who directly impact the roads creating huge traffic flow in Chowdhurypara Road and DIT intersection.	Low	High
Traffic police	Deals with the vehicles generated at the DIT Road, Chowdhurypara Road, Matirmashjid Road and Shahid Baki Road.	High	High

Street vendors	Sells products because of the high demand which generate by the students and guardians of the school.	Low	Low

7.4 Opinions and Suggested Interventions of the Stakeholders

Table 13: Stakeholders' Opinions about Different Issues

Transport Mode Issue		
Stakeholders	**Problems and opinions**	**Suggested Intervention**
Guardians	* Few vans are provided by private agencies but don't maintain the school timing properly. * Concerned about the safety of van. * Cost of school van is relatively high. * Difficulty to avail CNG, rickshaw in the morning. * Don't feel safe at the time of pickup and drop off in moving bus.	* Provision of School Bus by school authority with safety and security. * Need a bus stoppage
Students	* Bikers ride on the footpath during congestion hampering the safety and pedestrian flow.	* Blockage on footpaths
School Authority	* Do not concern about the students' transport mode. The reason of uninterest is that they need to invest and open a transportation department to regulate the school bus.	* No intervention needed regarding school bus and satisfied with the present system.
Vendors	* Reside in adjacent location and don't have to use transport.	-
Traffic police	* Mixed responses about rickshaw. Traffic Police In-charge thinks that rickshaw decreases the speed and eventually reducing severe accident. Another, Traffic Police think oppositely, he contemplates that restricting rickshaws on the DIT intersection will be a solution to improve the efficiency of the intersection.	* No specific suggestions regarding any mode.

Ingress and Egress of school		
Stakeholders	**Problems and opinions**	**Suggested Intervention**
Guardians	* One gate is used for both ingress and egress for Building 1, so gates become congested that eventually block the footpath and road.	* The gates for ingress and egress should be separated.
School Authority	* Doesn't think any problem regarding one access gate.	* No intervention needed
Parking Issue		
Stakeholders	**Problems and opinions**	**Suggested Intervention**
Guardians	* Not allowed to park in front of school more than one minute. * No parking provision for guardians in the building. * Bike users park their bike away from school and feel unsafe about their mode.	* Better parking provision provided by school.
School Authority	* Guardians try to park their cars and rickshaws more time in front of school.	* After completion of the ongoing construction of building one, it will provide parking provision.
Traffic police	* Car users park their cars randomly in the roads. * Bus stops at the middle of the road for loading and unloading of passengers. * Under the Road Transport Act, 2018 illegal parking is penalized by video recording. Some influential and political people stop this fine system.	* Need digital fine system via video recording of illegal parking. * Every commercial and larger building need to provide the parking facilities

Road Crossing		
Stakeholders	**Problems and opinions**	**Suggested Intervention**
Guardians	* No foot over bridge at Chowdhury para road. * Sometimes guards get missing for helping the school children for road crossing.	* Need a foot over bridge at Chowdhury para road.
School Authority	*Guardians and students don't use the foot over bridge at the DIT intersection	* Social awareness program can be done from their school.
Traffic police	* Almost every one specifically the educated ones risk their lives to cross the intersection by not using the foot over bridge. * Most of the students and guardians don't use the foot over bridge.	* Fine can be imposed to use the foot over bridge.
Footpath		
Stakeholders	**Problems and opinions**	**Suggested Intervention**
Guardians	*Footpaths are broken. *Vendors occupied the footpaths mostly.	* Condition of footpath need to be improved.
Students	* Bikers use to ride on the footpath during the congestion of Chowdhury para road.	* Blockage should be constructed thus the bikers could not ride on the footpath.
Traffic Police	* Vendors are evicted by police but they use to come again and again due to good business potential of Chowdhury Para Road.	* Evicted vendors permanently.

Congestion		
Stakeholders	**Causes and opinions**	**Suggested Intervention**
Traffic police	* High volume of vehicular flow compares to road capacity. * 7.30 am to 9.30 am and 11.00 am to 1.00 pm are considered peak hour because of the school. * Higher trips generated at the DIT intersection due to location of the school. * Manhole is broken for few days. They inform city corporation but they are not responding quickly. As a result, vehicular speed gets slow at the intersection. * For better traffic flow, The Chowdhury para road is stopped by traffic police higher time but when the traffic police open signal for the Chowdhurypara Road the guards of the South Point School and College interrupt the flow for crossing of the students at that time. * The location of starting and ending of Mouchak flyover is not suitable. * During rainy season, waterlogging also hinders the vehicular flow. * Provision of bus bay or separating the lane also creates congestion previously. * Lack off use of foot over bridge decrease the vehicular flow.	* Need to move the school buildings from two sides of Chowdhury Para Road to one side. * Chowdhury para road could be turned into one way road. * The road capacity must be increased by extending the road width both sides. * At the time of drop off from rickshaw in front of school, one must keep the changes. * The relevant authorities must be compatibly work for road maintenance. * No disturbance must be ensured from the school guard.

CHAPTER 8: PROBLEM IDENTIFICATION AND PROPOSED INTERVENTION

Some major problems at the school site have been identified based on field survey and stakeholders' opinions. Possible solutions and interventions for the existing problems are discussed in this chapter.

8.1 Drop-off/Pick-up Point for Vehicles

Problem: There is no designated drop-off/pick-up point at site. As a result, private cars, rickshaws, school vans drop students in front of school on Chowdhury Para road during school start time. It creates severe congestion and conflicts during school hours at the site.

Proposed Intervention: Two separate drop-off/pick-up points have been proposed for motorized and non-motorized vehicles as shown in the picture.

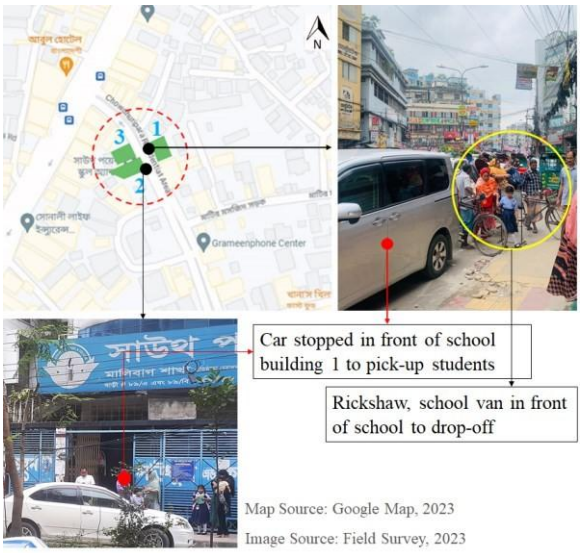
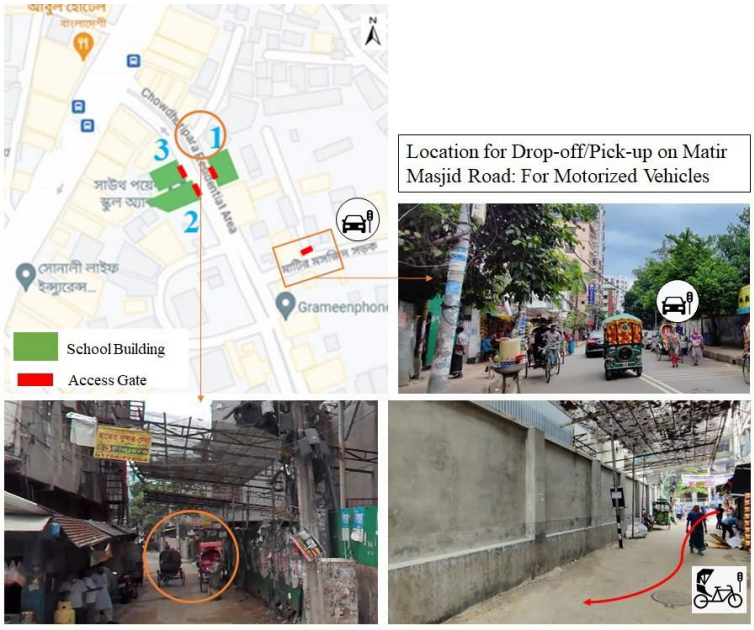


Figure 30: Drop-off/Pick-up in front of School



Map Source: Google Map, 2023 Image Source: Field Survey, 2023

Figure 31 : Proposed Location of Drop-off/Pick-up Points

1. **For motorized vehicles (private cars and bike)**, drop-off location is proposed on Matir Masjid road in front of the access gate 02 of school building 01.

2. School gate should constructed on Matir Masjid Road

3. Guards should be assigned at drop-off/pick-up Point

1. **For non-motorized vehicles (rickshaw)**, drop-off location is proposed beside school building 01 on a local road.

8.2 Access Arrangements

Problem: There is two gates in school building 01 but only one gate is opened for ingress and egress through school building 01. As a result, overcrowding occurs during school start/end time infront of the building. On contrary, school building no. 2 and 3 have two separate points for ingress and egress.

Proposed Intervention: Two separate gates in building 01 are proposed for ingress and agress during school start/end time. School guards should be assigned separately for each gate.

Figure 32: Proposed Ingress and Agress Points for School Building 01

8.3 Parking Facility

Problem: There is no on-site parking facility for the vehicles at the school premises. Though car parking is restricted Chowdhury para road, illegal parking is observed most of the time. Private cars, bikes, school vans are parked on the adjacent roads, Chowdhury Para and Matir Masjid road. Road capacity is reduced due to on street parking in front of school. Heavy congestion occurs during school hours at the site.

Proposed Intervention:

1. On-street parking should be strictly prohibited on Chowdhury Para Road. Penalty option for illegal parking should be introduced.

2. Parking provision on Matir Masjid road is proposed with parking charge for private cars and bikes.
3. Guards should be assigned at parking site on Matir Masjid road.
4. School van should parking inside school premises.

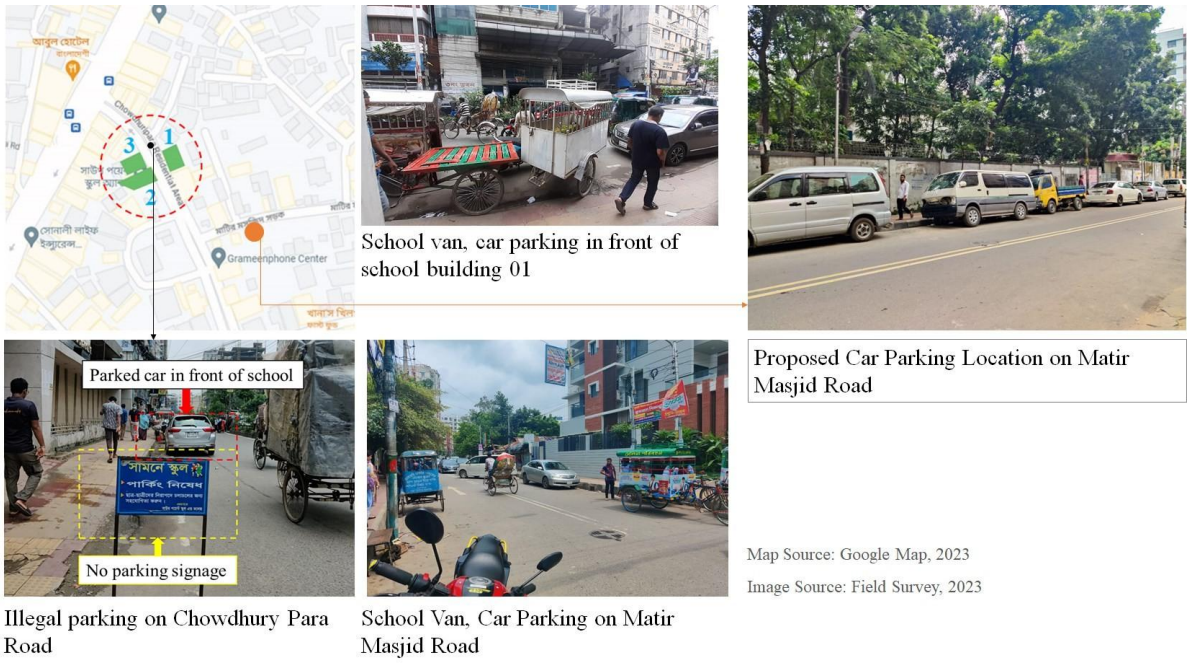


Figure 33: Parking Facilities

8.4 Pedestrian Facility

Problem: Footpaths have broken edges and there is no provision of ramp. Foothpath in front of the school building is only 4 feet and unable to support heavy pedestrian flow.

Proposed Intervention:

1. Regular maintenance of footpath should be ensured. Broken edges of footpath should be repaired immediately.
2. Existing footpath in front of school building should be widened.
3. Ramp should be provided on footpath.

8.5 Relocation of Street Vendors

Problem: Street vendors on Chowdhury Para road occupy road and congestion occurs duing school time. Students intake unhygienic street foods from the street, which can create health problems.

Proposed Intervention:

1. Vendors should be strictly prohibited on Chowdhury Para road.
2. All the vendors will be relocated on Matir Masjid road.
3. Provision of school canteen inside school buildings for students.

Figure 34: Location for Street Vendors

8.6 Provision of Bus Stoppage

Problem: There is no bus stoppage at DIT-Chowdhury Para road intersection. As a result, public buses stop in the middle of the road, which is a major safety issue for the passengers and students.

Proposed Intervention: A bus stoppage should be provided near the intersection.

8.7 Geometric Design of Intersection

Problem: The existing design of DIT-Chowdhury Para road intersection do not follow any standards of an intersection design. There is no corner widening, channelization, lane marking.

It is not signalized, traffic is manually control. Though there is a footover bridge, most of the people do not use it to cross main road. This is a major safety issue for the pedestrians.

Figure 35: DIT-Chowdhury Para Road Intersection

Proposed Intervention:

1. Geometric design of the intersection should be improved according to the Geometric Design Standards of RHD, 2000
2. Corner widening, channelization for disciplined L turn should be provided
3. Provision of at graded pedestrian crossing at the intersection
4. Provide digital traffic signals at the intersection.

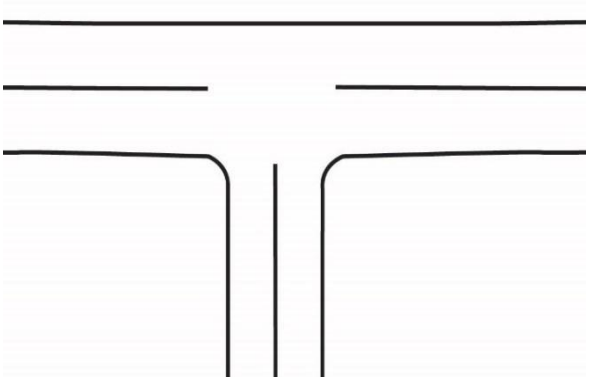


Figure 36: Existing Geometric Design

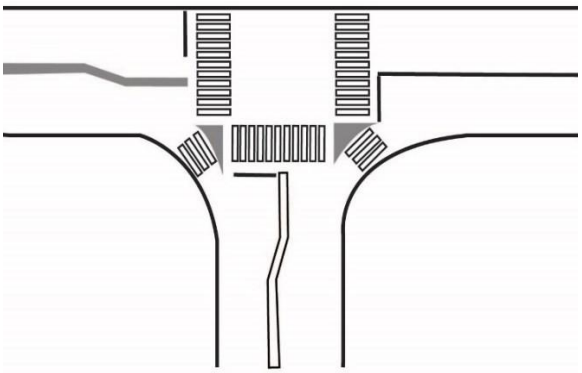


Figure 37: Proposed Geometric Design

8.8 Provision of School Bus

Problem: School authority does not provide any school bus for the students. Some private agencies provide school van and micro bus service with high cost. They do not maintain proper school timing.

Proposed Intervention

1. School bus provision for the school authority.
2. A mobile app can introduced for school buses. The app would include all the information about the school buses, arrival time, departure time, share location of the school bus.

8.9 Car Sharing

Proposed Intervention:

1. A database might be created to help parents find nearby parents to encourage carpooling.
2. Advertising the cost savings of car sharing on notice boards.
3. Car sharing app can be provided for the parents, staffs and teachers.

- **Short Term and Long Term Measures**

The proposed interventions are divided into short term and long term measures according to the implementation time. Benefitted stakeholders and responsible stakeholders are indentifies for the proposed measure which are presented on the following tables.

Table 14: Short Term Measures

Short Term Measures	**Benefitted Stakeholders**	**Responsible Stakeholders**
Drop-off/Pick-up Point for Car/Bike on Matir Masjid Road	Guardians, Students	School Authority
Construct School Gate on Matir Masjid Road	Guardians, Students	School Authority
Setting up a canteen in school building 1	Guardians, Students	School Authority
Proposed Access Arrangement for Building1	Guardians, Students, Local Residents	School Authority
Strictly prohibit on street parking on Chowdhury Para Road. Give penalty for illegal parking	Guardians, Students, Local Residents	DNCC
School van parking inside school premises	Guardians, Students	School Authority
Footpath widening in front of school building 01, Regular maintenance of footpath, Provide ramp for disable people	Guardians, Students, Local Residents	DNCC
Provide bus stoppage near DIT road-Chowdhury Para road intersection	Guardians, Students, Vehicle Users	DNCC
Promoting Walking Programme	Students	School Authority
Car-sharing	Guardians, Students, Vehicle Users	Guardians, School Authority

Table 15: Long Term Measures

Long Term Measure	Benefitted Stakeholders	Responsible Stakeholders
Change in Geometric Design of Intersection of DIT Road	Guardians, Students, Vehicle Users	DNCC
Relocation of School (if possible)	Local residents	School Authority
Integrated Bicycle lane and NMT network	Guardians, Students	DNCC
School Bus	Guardians, Students	School Authority

8.10 Future Development at the Site

According to the Draft Detail Area Plan (2016-2035), there will be a MRT station on DIT road. The school would be within 250 meters buffer of the station. The existing residential - mixed land uses will be converted to mixed land use (residential-commercial). The solely residential land uses will be coverted to mixed land use.

Problem: Location of the school should not be within 250 meters buffer of a MRT station.

Proposed Intervention: Relocation of the school to a suitable location.

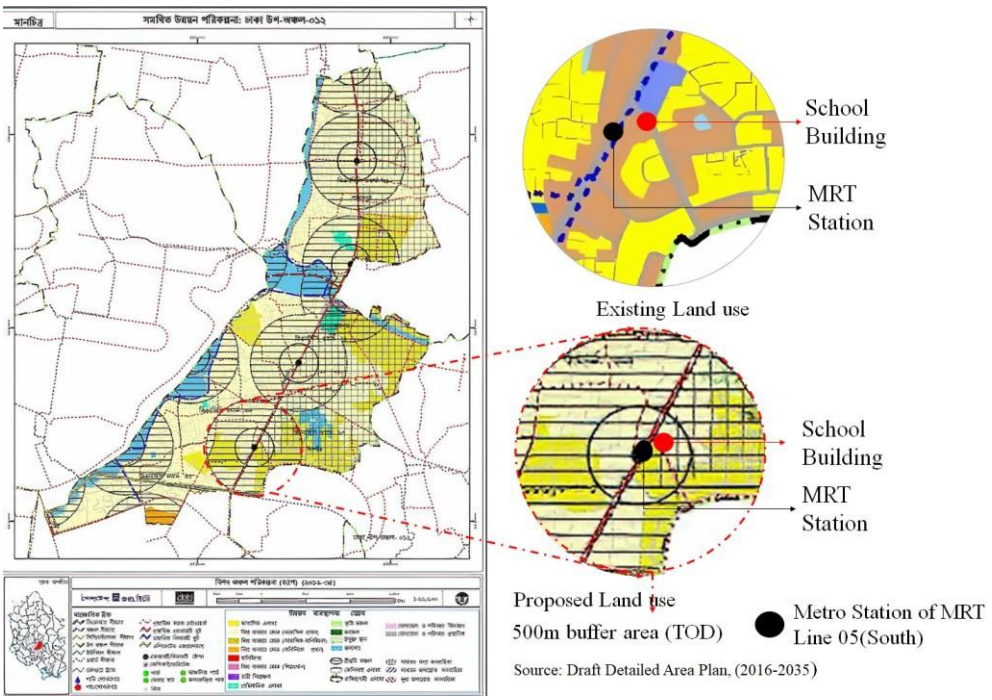


Figure 38: Proposed Development

CHAPTER 9: SUMMARY AND CONCLUSION

Traffic impact assessment is very important for identifying the impact of new developments or re-development on a specific area. The study aims to determine the impact and take intervention to relief the stakeholders from the existing condition of the study area. For the study, data collection is going through three process like physical survey, traffic count survey and interview of stakeholders. Our study area is South Point School and College, Malibagh, Dhaka which has 12000 students. The school is accessed by Chowdhury para road which is a collector road joined by an arterial road. The school has Bangla and English version and medium. The school has staggered time for class ending. Most of the land use of the study area is residential and mixed-residential. There are four roads surrounding the area. One arterial road is DIT road, one sub-arterial road is Shaheed Baki road and two collector roads are Chowdhury Para road and Matir Masjid road. In school access road and arterial road-collector road intersection, there is seen high level of congestion of motorized traffic. For school access roads, it is said that the road is fully occupied by car, bike and rickshaw. Besides, drop-off/pick-up activity, broken footpath, street hawkers' business, idling position of school van on road, illegal parking makes problem of pedestrian movement, reducing carriage way of vehicles, creating conflict with vehicles and human. Level of service of Chowdhury para road and DIT road is almost always F which means slow traffic, no movement of vehicles on the road. For creating issues like these on existing situation, the study recommends some interventions that may be helpful for reducing impact of the land use on transportation network. It is recommended that creation of channelization, corner widening for L turn of vehicles movement, provision of traffic signal, and pedestrian crossing can be solution of issues like manual traffic signaling, not using foot over bridge for road crossing. Provision of bus-stoppage at DIT road can reduce haphazard stopping of bus at the middle of road and unsafe ingress and egress of public transport users. Provision of drop-off and pick-up points at Matir Masjid road for cars and for rickshaws on local roads beside school can be a solution of severe congestion of roads, conflict points etc. Moreover, prohibition of on-street parking, and penalties for illegal parking can reduce the congestion. At last it can be said that interventions can be a solution to lessen the impact of existing condition and in future when new development will be occurred due to new demand, the impact of integration of land use and transportation will be required new traffic impact assessment for the study area.

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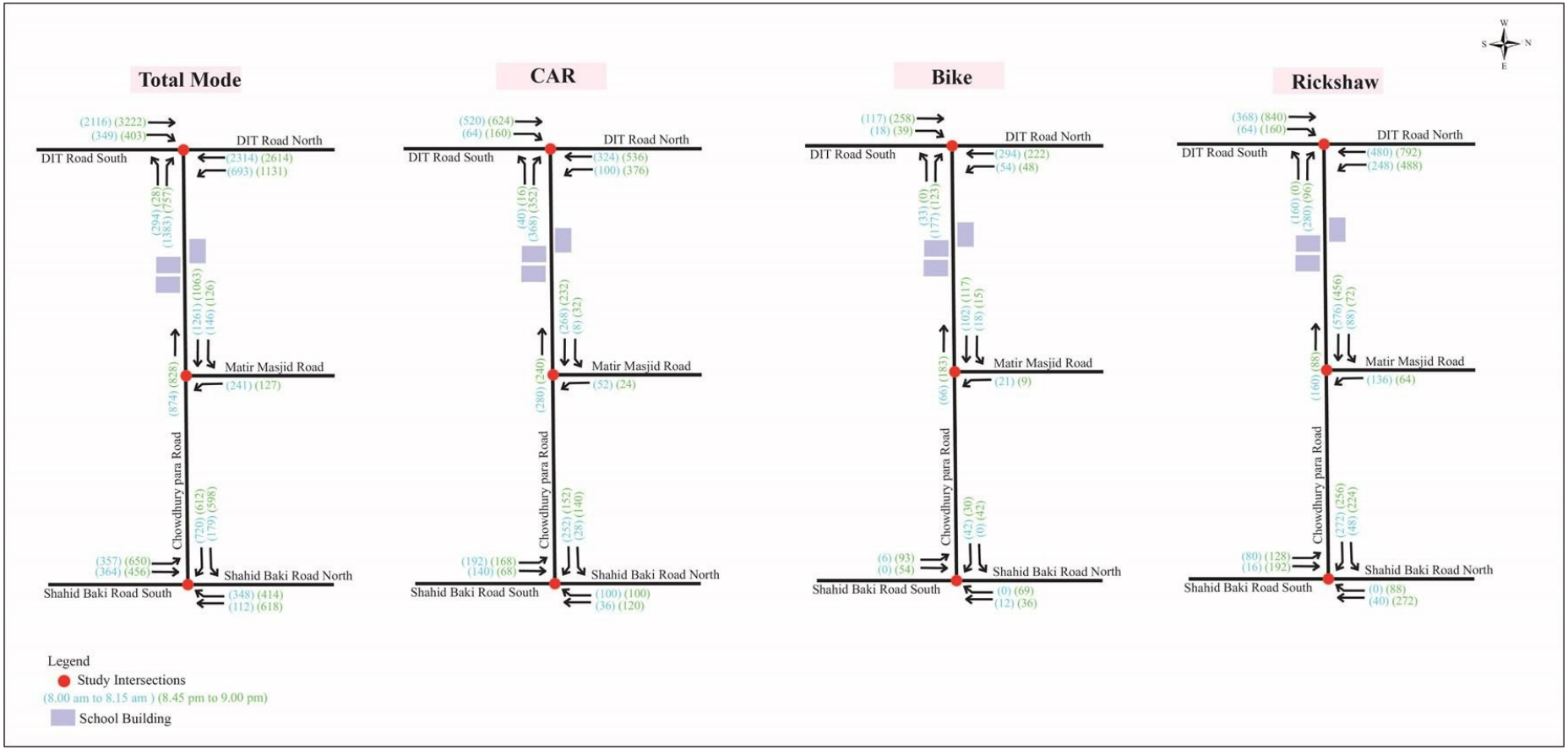
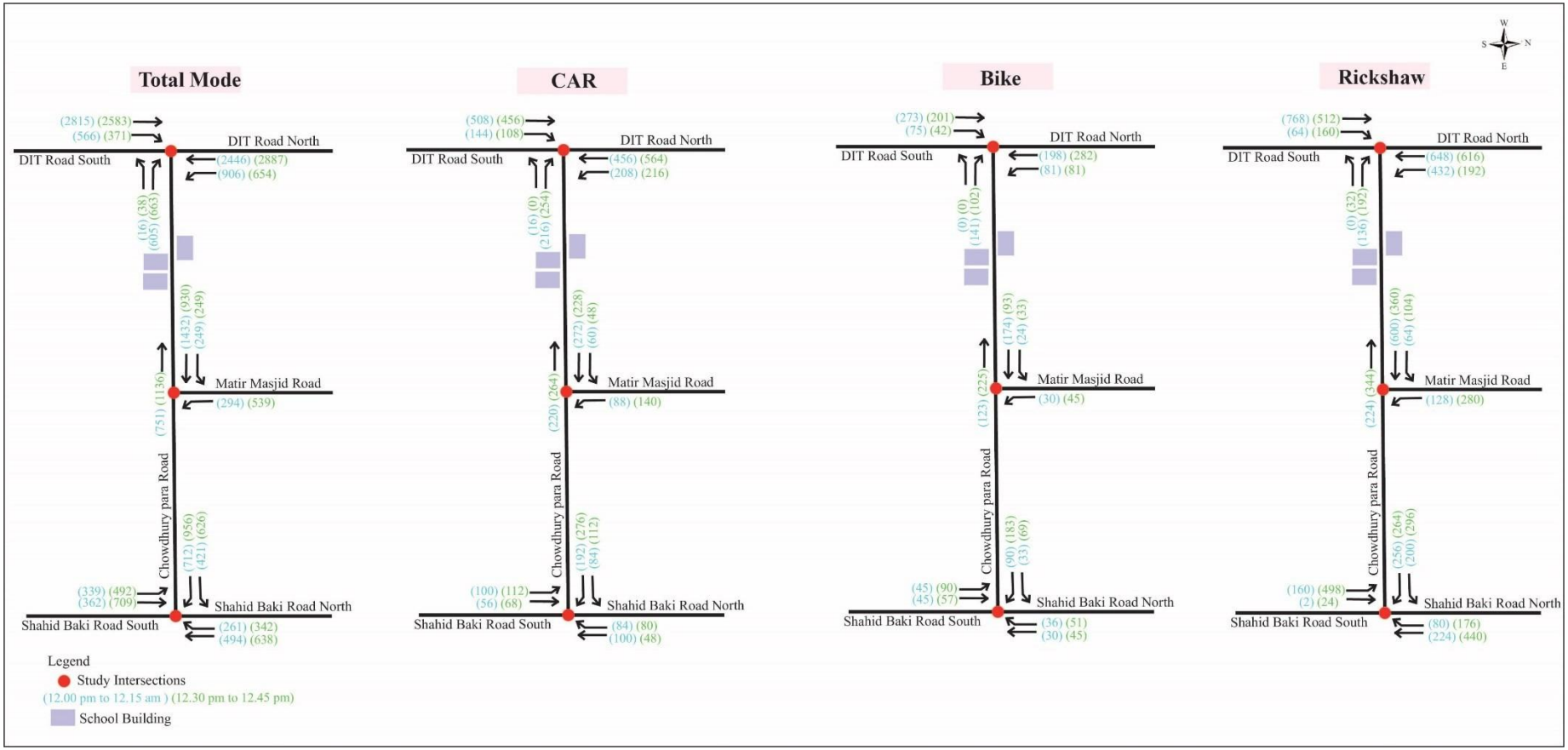
APPENDICES


Total Mode
CAR
Bike
Rickshaw
DIT Road North
DIT Road South
Matir Masjid Road
Chowdhury para Road
Shahid Baki Road North
Shahid Baki Road South
Legend
Study Intersections
(8.00 am to 8.15 am) (8.45 pm to 9.00 pm)
School Building


Total Mode
CAR
Bike
Rickshaw
DIT Road North
DIT Road South
Matir Masjid Road
Chowdhury para Road
Shahid Baki Road North
Shahid Baki Road South
(2815) (2583)
(566) (371)
(2446) (2887)
(906) (654)
(16) (38)
(605) (663)
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(160) (498)
(2) (24)
(80) (176)
(224) (440)
Legend
Study Intersections
(12.00 pm to 12.15 am) (12.30 pm to 12.45 pm)
School Building

1. Traffic Count at DIT-Chowdhury Para Intersection:

Peak Hour: 8:00AM to 9:00 AM

Direction	**Time**	Bus	Bike	Car	CNG	Cycle	Microbus	Minibus	Pickup	Rickshaw	Truck	Van	Total
DIT North to Chowdhury Para Road	8:00-8:15	1	18	25	23	6	17	2	8	31	0	5	136
	8:45-9:00	2	16	94	15	3	10	0	13	61	0	4	218
DIT South to Chowdhury Para Road	8:00-8:15	0	6	16	13	4	2	0	0	25	0	1	67
	8:45-9:00	0	13	40	0	10	0	2	0	20	0	0	85
Chowdhury Para to DIT North Road	8:00-8:15	8	59	92	24	11	40	6	8	35	0	3	286
	8:45-9:00	4	41	88	10	11	5	2	6	12	0	1	180

Direction	Time	Bus	Bike	Car	CNG	Cycle	Microbus	Minibus	Pickup	Rickshaw	Truck	Van	Total
Chowdhury Para to DIT South Road	8:00-8:15	0	11	10	3	2	8	0	0	20	0	0	54
	8:45-9:00	1	0	4	0	0	0	0	0	0	0	0	5
DIT North to DIT South Road	8:00-8:15	60	98	81	46	10	25	5	18	60	0	7	410
	8:45-9:00	73	74	134	20	7	11	0	8	99	0	2	428
DIT South to DIT North Road	8:00-8:15	41	39	130	47	2	59	6	1	46	1	4	376
	8:45-9:00	98	86	156	24	11	15	4	11	105	0	6	516

2. Traffic Count at DIT-Chowdhury Para Intersection:

Peak Hour: 12:00 PM to 12:45 AM

Direction	Time	Bus	Bike	Car	CNG	Cycle	Microbus	Minibus	Pickup	Rickshaw	Truck	Van	Total
DIT North to Chowdhury Para Road	12:00-12:15 PM	3	27	52	11	4	8	0	5	54	0	5	169
	12:30-12:45 PM	0	27	54	33	13	0	0	2	24	0	4	157
DIT South to Chowdhury Para Road	12:00-12:15 PM	0	25	36	5	9	17	5	2	18	0	0	117
	12:30-12:45 PM	0	14	27	7	4	0	0	2	21	0	2	77
Chowdhury Para to DIT North Road	12:00-12:15 PM	3	47	54	8	4	0	2	3	17	0	1	139
	12:30-12:45 PM	0	34	66	21	7	0	0	3	24	0	2	157
Chowdhury Para to DIT South Road	12:00-12:15 PM	0	0	4	0	0	0	0	0	0	0	0	4

Direction	Time	Bus	Bike	Car	CNG	Cycle	Microbus	Minibus	Pickup	Rickshaw	Truck	Van	Total
	12:30-12:45 PM	0	0	0	2	0	0	0	0	4	0	0	6
DIT North to DIT South Road	12:00-12:15 PM	76	66	114	24	21	11	0	7	81	0	3	403
	12:30-12:45 PM	87	94	141	31	16	0	9	17	77	0	10	482
DIT South to DIT North Road	12:00-12:15 PM	84	91	127	20	18	3	4	16	96	0	4	463
	12:30-12:45 PM	94	67	114	34	12	0	5	11	64	0	7	408

3. Traffic Count at Chowdhury Para-Shaheed Baki Intersection:

Peak Hour: 8:00AM to 9:00 AM

Direction	**Time**	Bus	Bike	Car	CNG	Cycle	Microbus	Minibus	Pickup	Rickshaw	Truck	Van	Total
Shaheed Baki North to Chowdhury Para Road	8:00-8:15	2	0	25	10	2	3	0	19	0	0	12	73
	8:45-9:00	1	23	25	7	2	12	0	10	11	0	1	92
Shaheed Baki South to Chowdhury Para Road	8:00-8:15	1	2	48	3	5	0	3	1	10	0	1	74
	8:45-9:00	5	31	42	11	3	15	2	8	16	0	2	135
Chowdhury Para to Shaheed Baki North Road	8:00-8:15	0	0	7	1	4	2	1	1	6	0	8	30
	8:45-9:00	0	14	35	8	9	15	0	7	28	0	4	120
Chowdhury Para to Shaheed	8:00-8:15	0	14	63	20	4	5	1	5	34	0	3	149

Direction	Time	Bus	Bike	Car	CNG	Cycle	Microbus	Minibus	Pickup	Rickshaw	Truck	Van	Total
Baki South Road	8:45-9:00	2	10	38	10	8	8	1	7	32	0	2	118
Shaheed Baki North to Shaheed Baki South Road	8:00-8:15	1	4	9	4	0	0	0	0	5	0	0	23
	8:45-9:00	0	12	30	20	3	10	2	4	34	0	3	118
Shaheed Baki South to Shaheed Baki North Road	8:00-8:15	0	0	35	4	2	0	0	4	2	0	22	69
	8:45-9:00	0	18	17	14	4	6	1	3	24	0	4	91

4. Traffic Count at Chowdhury Para-Shaheed Baki Intersection:

Off Peak Hour: 12:00PM to 12:45PM

Direction	**Time**	Bus	Bike	Car	CNG	Cycle	Microbus	Minibus	Pickup	Rickshaw	Truck	Van	Total
Shaheed Baki North to Chowdhury Para Road	12:00-12:15 PM	0	12	21	5	2	1	0	5	10	0	2	58
	12:30-12:45 PM	0	17	20	5	2	0	0	2	22	0	1	69
Shaheed Baki South to Chowdhury Para Road	12:00-12:15 PM	1	15	25	8	1	2	0	4	15	0	1	72
	12:30-12:45 PM	0	30	28	30	4	2	0	9	15	0	3	121
Chowdhury Para to Shaheed Baki North Road	12:00-12:15 PM	0	11	21	12	5	5	0	1	25	0	3	83
	12:30-12:45 PM	0	23	28	9	11	2	0	4	37	0	9	123
Chowdhury Para to Shaheed	12:00-12:15 PM	0	30	48	26	4	10	0	5	32	0	1	156

Direction	Time	Bus	Bike	Car	CNG	Cycle	Microbus	Minibus	Pickup	Rickshaw	Truck	Van	Total
Baki South Road	12:30-12:45 PM	0	61	69	31	5	9	0	9	33	0	5	222
Shaheed Baki North to Shaheed Baki South Road	12:00-12:15 PM	0	10	25	16	2	8	1	3	28	0	2	95
	12:30-12:45 PM	0	15	12	9	12	1	0	0	55	0	6	110
Shaheed Baki South to Shaheed Baki North Road	12:00-12:15 PM	0	15	14	11	3	5	0	2	20	0	3	73
	12:30-12:45 PM	0	19	17	6	11	0	0	0	61	0	7	121

5. Traffic Count at Chowdhury Para – Matir Masjid Road:

Peak Hour: 8:00AM to 9:00 AM

Direction	**Time**	Bus	Bike	Car	CNG	Cycle	Microbus	Minibus	Pickup	Rickshaw	Truck	Van	Total
Shaheed Baki to DIT Road	8:00-8:15	4	22	70	16	2	22	9	7	20	0	0	172
	8:45-9:00	3	61	60	17	7	18	4	7	11	2	1	191
DIT Road to Shaheed Baki	8:00-8:15	1	34	67	37	13	19	0	7	72	0	3	253
	8:45-9:00	1	39	58	20	11	20	1	8	57	0	0	215
DIT Road to Matir Masjid Road	8:00-8:15	0	6	2	0	0	4	0	0	11	0	1	24
	8:45-9:00	0	5	8	1	2	0	0	0	9	0	0	25
Matir Masjid to Shaheed Baki Road	8:00-8:15	0	7	13	4	1	3	0	0	17	0	0	45

Direction	Time	Bus	Bike	Car	CNG	Cycle	Microbus	Minibus	Pickup	Rickshaw	Truck	Van	Total
	8:45-9:00	0	3	6	0	0	1	0	0	8	0	3	21

6. Traffic Count at Chowdhury Para – Matir Masjid Road:

Peak Hour: 12:00PM to 12:45 PM

Direction	Time	Bus	Bike	Car	CNG	Cycle	Microbus	Minibus	Pickup	Rickshaw	Truck	Van	Total
Shaheed Baki to DIT Road	12:00-12:15 PM	1	41	55	18	3	8	0	8	28	0	4	166
	12:30-12:45 PM	0	13	18	12	1	2	0	8	9	0	2	65
DIT Road to Shaheed Baki	12:00-12:15 PM	2	20	8	5	1	3	0	6	8	0	2	55

Direction	**Time**	Bus	Bike	Car	CNG	Cycle	Microbus	Minibus	Pickup	Rickshaw	Truck	Van	Total
	12:30-12:45 PM	0	0	12	2	8	15	0	2	8	0	2	49
DIT Road to Matir Masjid Road	12:00-12:15 PM	0	8	15	5	0	5	0	0	8	0	7	48
	12:30-12:45 PM	0	11	12	2	0	3	0	0	13	0	5	46
Matir Masjid to Shaheed Baki Road	12:00-12:15 PM	0	10	22	0	0	4	0	0	16	0	3	55
	12:30-12:45 PM	0	15	35	0	0	7	0	0	35	0	4	96