Study on Estimating Traffic Volume to Identify the Level of Service in Etakhola Intersection Narsingdi

Thesis submitted to the Department of Civil Engineering, Daffodil International University in partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Civil Engineering

Submitted by

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DAFFODIL INTERNATIONAL UNIVERSITY

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DECLARATION

This is to ensure that the going with students worked on the endeavor andrecommendation **"Study on Estimating Traffic Volume to Identify the Level of Service in Etakhola Intersection, Narsingdi"**under my immediate oversight in the research centers of the Department of Civil Engineering, Faculty of Engineering, Daffodil International University, in fulfillment satisfaction of the necessities for the 4-year education in science in transformation science certification. 20th November–2024 the work was shown.

Signature of the candidate

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SUPERVISOR'S APPROVAL

The thesis **"Study on Estimating Traffic Volume to Identify the Level of Service in Etakhola Intersection, Narsingdi"** submitted by Jahangir Alam182-47-708 Has been accepted as satisfactory in partial fulfillment of the requirement for the degree of Bachelor of Science in Civil Engineering on the 20th November–2024.

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The project and thesis titled **"Study on Estimating Traffic Volume to Identify the Level of Service in Etakhola Intersection, Narsingdi"** Submitted by Jahangir Alam ID No: 182-47-708, Session: Summer 2018, has been accepted as satisfactory. This work fulfills, in part, the requirements for the degree of Bachelor of Science in Civil Engineering. Date of Acceptance: 20th November – 2024.

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ABSTRACT

In order to evaluate how traffic Situated in an industrial area and assesses the intersection's efficacy, the study examines traffic patterns and establishes the service level at the signalisedItakhola intersection. at Narsingdi, Itakola. Three distinct timeframes were used to record the traffic data using camcorders. The LOS (Level of Service) was determined using the volume limit proportion technique. An extensive information analysis reveals that the traffic at this crossing point is non-path based and diverse. Buses make up the majority of vehicles (37%), followed by cars (20%) and trucks (15%) of all traffic. When compared to other approaches, Dhaka's technique works better and displays the worst LOS (Level of Service). The research outlines the useful ramifications of these discoveries and directs the transport planners appropriately.

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CHAPTER 1

Introduction

1.1 General

The GDP of Bangladesh has been growing steadily, which has led to a significant rise in traffic volume. The tremendous diversity of Bangladeshi traffic makes it challenging to designate distinct lanes for various forms of transportation. In metropolitan settings where traffic jams, forced flow, and free flow are common throughout the transit corridor infrastructure, traffic controllers utilize control algorithms to dynamically regulate traffic. Precise measurements of traffic condition characteristics, including flow, density, and these control algorithms require speed, in both space and time. In this study, we provide a reliable vision system designed for traffic status monitoring in non-lane-based heterogeneous operations..The framework functions in an ongoing urban environment with recurring free flow, restricted flow, and obstruction in addition to functional needs including shadows, disguising, illuminating variation, obstruction, and noise. The developed framework fully makes use of pixel-based location techniques, frontline repair, and foundation renewing. It reshapes the frontal region to reduce noise and focus two images at once. After extraction, shadow districts are removed from the field of view and covered cars are identified by differentiating positive and negative paired photos. To evaluate brightness variation, the mean power esteem over the resulting edge from the deduction activity is used. Exploratory results show how our technique can measure traffic boundaries gradually with a high level of execution under current traffic conditions, as compared to competing best-in-class philosophies.93% accuracy, 91% review, and almost 100% PCC (Percent of Right Order Esteem) were produced by the computation. In Bangladesh's major cities and parkways, the increased traffic volume combined with the non-path-based heterogeneous traffic architecture results in ongoing congestion. As a result, car speeds are sharply declining, and in many Bangladeshi metropolitan districts, the peak speed is less than 10 km/h. These factors disrupt the partners' daily routines and impede the continuous and steady pace of financial development. Contrarily, a convergence is a street junction that occurs when two or more streets come together, intersect, or split at a similar level.It serves as a fundamental guide for a street network since it occurs where different directional

traffic streams connect. Convergence has a fundamental role in reducing metropolitan breakdown in a modern urban context. Street network using deliberate traffic management On the other hand, because they represent a major car traffic weak point that causes numerous effects and associated travel time delays, vehicles cooperate the least near intersections. The city experiences an increasing number of convergences. Afterwards. Analysis of traffic patterns at signalised crossings has gained popularity, especially when considering emerging nations. Over the past several years, Bangladesh has also witnessed a significant increase in rush hour traffic jams in urban areas, with the associated problems being particularly apparent in the nation's contemporary zones.Narsingdi is perhaps Bangladesh's most economically important contemporary region, and its geographical location allows it to connect the country's important region to its capital, Dhaka. The Narsingdiregion is the route of the street networks that connect Dhaka, the country's capital, to the divisions of Monohardi, Brahmanbaria, Akhaura andGazipur. These networks should pass via the Narsingdi, Itakhola Convergence (GCI).Because Narsingdi is essentially a contemporary region, with many businesses centered around Narsingdi,Traffic congestion in Itakola is a frequent issue in GCI. Consequently, the review's objective is to ascertain the traffic stream's attributes combined with the level of administration (LOS) and the GCI's coverage. The underlying causes of some of the remarkable peculiarities will also be looked into in order to collaborate with the municipal administration, traffic planners, and leaders to find a possible solution to the present problems. The study's traffic volume data will be an essential source of information for planning, organizing, and improving traffic light approaches as well as for enforcing pedestrian rules and traffic organization at signalized convergences.

1.2 Type of Intersection

Crossing points are places where at least two streets meet, cross or combine and traffic moving this way and that all met up. They come in a wide range of plans, setups, and sizes. In rush hour gridlock plans, intersection can contain upwards of six roads joining.

The three essential sorts of intersection are the three-leg or T-crossing point the four-leg between segments, and the multi-leg intersection.

1.3 Objective of this study

The main objective of this study is to:

1. Determine the traffic characteristics Itakhola Intersection Narsingdi.
2. Determine the Roadway Level of Service of Itakhola Intersection Narsingdi.
3. The volume of traffic and composition during 3 different pic time.

1.4 Outline of Thesis

Chapter 1 : Introduction, Basic idea of an intersection and type, objectives of the Study.

Chapter 2 : The accompanying portion determines what has been done beforehand

Andwhat kind of work has been used in intersection.

Chapter 3 : Study and Strategy

Chapter 4 : Result and discussion on different approach

Chapter 5 : This part critically examines the suggestions and propositions for Future work.

CHAPTER 2

Literature Review

2.1 Overview

The author should discuss their progress from book research thus far as well as what they have realized subsequently. After carefully examining this section, the per-client should be immediately persuaded that the maker's systematic evaluation would anticipate a fundamental role in enabling that discipline.

2.2 Literature review

The papers below were distributed throughout the course of the last several years by a group of different producers. (Kim et al., 2004; Jha et al., 2004; Lovell et al., 2004) This article uses GIS to produce convergence cost demonstrations of arrangement streamlining. The generated cost capabilities can rectify a significant flaw in previous arrangement streamlining computations that ignore the characteristics and costs of convergences. The crossing point cost display shown here determines the appropriate convergence limits for evaluating choices to move forward and earthwork costs to maintain the thruway layout, so reducing the need for duplicate cost calculations for approach segments and convergences. Overwhelming and delicate costs, such as fuel use, accidents, delay, and asphalt, are efficiently managed and organized. In Maryland, GIS data sets are used to evaluate choices for moving forward and earthwork costs at intersections. Current methods for various costs are examined and really

(Guofa Li, Dongpu Cao 2022; Weiquan Yan, Shen Li, Xingda Qu, Wenbo Chu) It has been shown that distracted driving is a major barrier to improving traffic safety. This research presents an innovative driving interruption location method in the context of a profoundly creative organization. Unlike conventional approaches, the suggested method makes use of both temporal and transient data from electroencephalography (EEG) signals as modelsources of data. Convolution techniques and gated repeated units were used to design the relationship between drivers' interruption status and EEG data in the time domain. To evaluate the practicality of the suggested approach, a driving recreation study was carried out.

(Xiaoqiu, Fan, Zhang Guoqiang, and Ji Jinzhang 2011) Because information on traffic conflicts may be obtained and evaluated quickly, traffic struggle studies have been widely used. Unavoidable studies have revealed a close relationship between traffic conflicts and auto accidents. Traffic struggle information is frequently used to fill in for auto collisions in many examinations on traffic wellbeing of crossing points because the data on car crashes is typically inadequate and the use of auto collision examination frequently requires significant stretches of information gathering. The traffic security of the expressway crossing site was evaluated in the article using traffic collisions. It is acknowledged that the primary mode of behavior has a comfortable

(Abdoul-Ahad Choupani& Jalil Shahi, 2009) Recently, flighty unsignalled U-turns along six-path divided arterials have replaced a few signalized crossing sites. Measuring the impact of U-turns on advancements through modeling was essential to evaluating the new convergence strategy. For this reason, a few models are available. Regardless, it seemed likely that these models would not be used for the wacky U-turns. Their subsequent impacts on growth speed and movement duration were demonstrated in a review project. Studies comparing the new and old models confirm that the latter are not as capable of predicting movement times and other variables as the former. There are two beneficial applications of these models concerning attainability studies and determining the optimal region of the

We provide a two-step project selection process and illustrate its advantages with an application instance as selecting an interstate renovation project necessitates screening a large number of street segments for collisions for further investigation and final venture determination. To reduce the number of planned improvement locations, the first phase of the suggested technique would use probabilities against discovering a given accident count, injury count, run-rough terrain conceded, proportions of danger, and a multi-standards pre-determination method. The final task selection is made in the next stage based on a composite productivity percentage of the evaluated benefit, risk, and cost under spending plan requirements. To demonstrate the two-step process, we

(Yiming Bie, Yihong Wang, Hongtao Li, and Shiwu Li, 2022). The likelihood of accidents can be completely reduced by improving lighting game plans at interstate crossing locations. Meanwhile, if a motorist is traveling from an unlit area into a lit area, a prudent slope illumination strategy can increase their safety by preventing sudden changes in their understudy region. The purpose of this study is to improve the brightness augmentations along the change zones and develop enlightenment progress zones for drivers as they approach the thruway convergence.

Pan, F., Xiang, Q., and Lu, J. (2008) the majority of the time, traffic conflict or auto accident investigations are used to inform security assessments for highway safety implementation. However, obtaining reliable accident or traffic conflict information is extremely difficult and time-consuming in China. This is mostly due to the lack of standard procedures and stringent requirements for traffic information by the executives. An investigation study was carried out to support a plan for the implementation of an expressway crossing point welfare evaluation with limited requirements for field crash and traffic data. To compare models, the concept of level-of-security administration was introduced and developed. Street and environmental factors, traffic patterns, and convergence geometry were all included in the level-of-wellness administration models.

In 1997, Horowitz, A. J. When the HCM94 systems are implemented into movement figures, it is discovered that less adjustments are required to enable them to function in traffic balancing jobs. You can use the two-way stop approach practically perfectly. The signalized convergence approach allows for a wider range of traffic circumstances and staging options, even though it still needs some adjustments. Because the all-way stop approach has restrictions on passable volumes and turning developments, it cannot be incorporated into movement gauges. When the HCM94 procedures are tested in rush hour jam activities, it is evident that they yield noticeably different results from the initial HCM85 tactics (the two volumes and connection delays). There are many possible harmony arrangements, but the differences between these configurations are minimal and logical.

(Haas, Robert P.; Inman, Vaughan W., 2012). When it comes to improving the capacity of rural roadways, four-lane divided highways are a more cost-effective

design option than grade-separated restricted access facilities. Four-lane split highways have significantly lower rates of sideswipe, rear-end, and head-on crashes than two-lane undivided rural roadways. However, compared to two-lane undivided highway crossings, right-angle collision rates are significantly higher at four-lane divided highway crossroads. This is mostly due to left-turns and movements from secondary roads colliding with far-side cars on the split highway. The intersection of two-lane local roads and rural four-lane divided highways presents a good opportunity to reduce right-angle collisions through the implementation of restricted crossing U-turn (RCUT). This paper compares the operations at a Maryland RCUT junction with an approximately

Lu (2008), Pan (2008), and Xiang Q. The evaluation of well-being for the purpose of implementing expressway security is often done in the context of a traffic conflict or auto accident investigation. However, in China, obtaining reliable accident or traffic conflict information may be exceedingly difficult and time-consuming. This is mostly due to the lack of a standard methodology and stringent requirements for traffic information shown on the board. An investigation study was carried out to provide an approach for evaluating the implementation of interstate convergence welfare with limited requirements for field collision and traffic data. To relate models, the concept of level-of-security administration was introduced. Street and environmental factors, traffic patterns, and convergence geometry were all taken into consideration while creating the models for level-of-wellness administration. Carefully, evaluation models in ideal conditions rely on

CHAPTER 3

Methodology

3.1: Study and Strategy

Topographically separated from Bangladesh, Narsingdi is home to several important states, non-administrative associations, and massive corporations (including apparel industry companies). Narsingdi is a local division of Dhaka located between the longitudes of 90°09′ to 92°39′ east and the scopes of 23°53′ and 24°21′ north (Fig. 1), almost exactly in the center of Bangladesh. The review crossing point, which is located 25 km from Dhaka city, is important for the shipment of goods from various manufacturing lines to Bangladesh in general and to Dhaka in particular. It plays an essential job in associating The capital and other parts of the nation are located in the North, North East, and North-West regions. Its size is 1150.14 square kilometres, and its population density is 2,320 people per km². In any case, established on January 16, 2013, Narsingdi City Company is the largest city company in Bangladesh. With 57 wards, Narsingdi City Company is regarded as one of Bangladesh's most contemporary and densely inhabited areas. GCI, on the other hand, is a signalised crossing point with four legs that is also used as a transit stand.From a social and economic perspective, it is one of the busiest and riskiest convergences located in the center of Narsingdi. Many people use this crossing point every day to get to different parts of the nation. The unique feature of this crossing point is the uneven traffic conditions and delays. Four sites were chosen to supply data for the transportation volume research after the region was thoroughly examined during the first phase of information gathering. Both the weather pattern and the asphalt's surface quality were favourable during the information-gathering times. Information for this evaluation was gathered from the Streets and Parkway Office (RHD), Narsingdi, which provides traffic data 365 days a year, 24 hours a day. Three separate time periods were used to collect the data: the morning peak hour (8 am–10 am),both during the weekday and at the conclusion of the workday, the evening peak hour (12–2 pm) and the night peak hour (4–6 pm). For this purpose, traffic data was simultaneously recorded at four separate places using four computerised camcorders for a month. To count the various types of automobiles and the number of them, all of the recordings that were taken at the lab were played slowly. It was concluded that the data acquired was adequate to conduct the important study of the review area (Fig. 2).

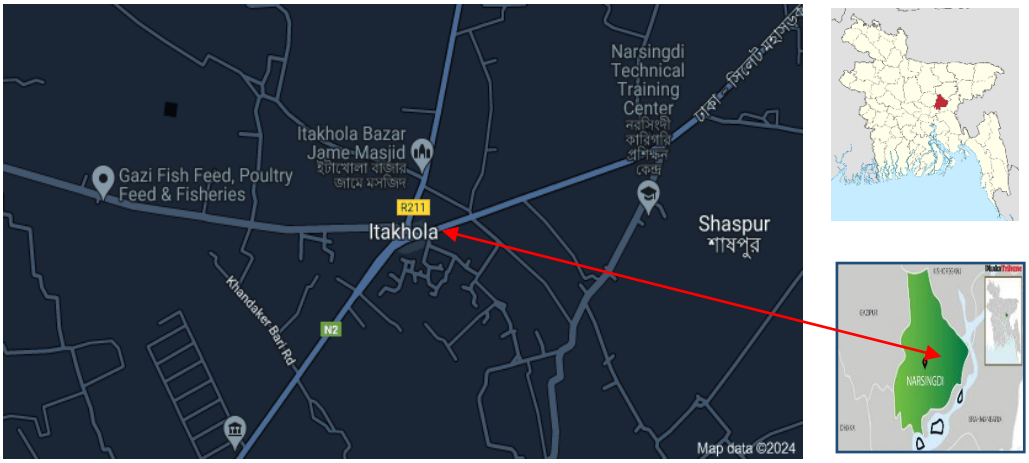


Figure 1 - A topographic image of Narsingdi City's study area

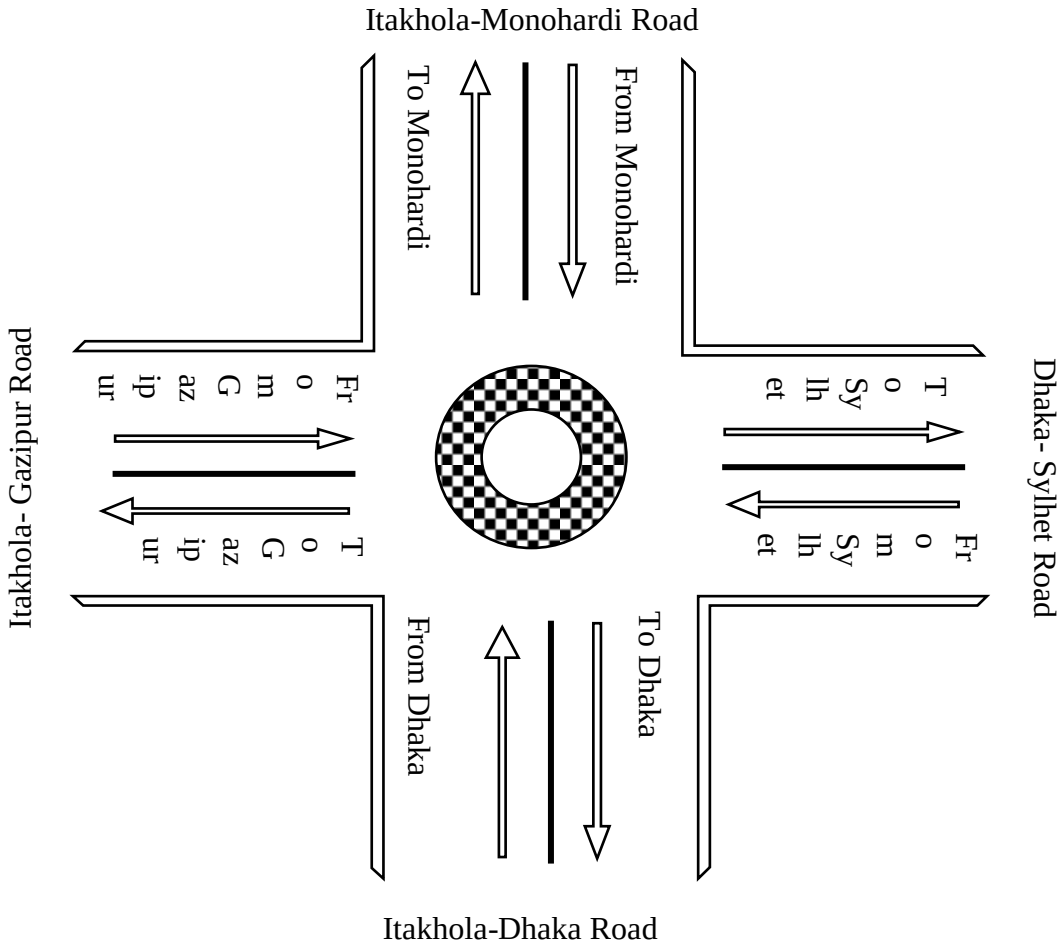


Figure 2 – Narsingdi, Itakholaintersection

3.2 Determination of Saturation Flow Rate

The immersion stream rate, which is determined using the accompanying equation, is a notable boundary to determine the LOS.

V = ca cv Cha as sb caaqaqbFCLpcqRcLQB MNC

V = modified saturation flow rate (veh/h/ln)

Ca = stream rate of base immersion (pc/h/ln)

cv = route width change factor

Cha = changing factor for heavy trucks in the stream of traffic during rush hour

as = factor of change for the approach grating

sb = change factor for the existence of a continuous path group that stops activity and ahalting path

caa = change factor for hindering impact of nearby transports that stop inside Crossing point region.

qa = change factor for region type

qbF = change factor for path usage

CLp = change factor for a route bunch's left-turn vehicle presence

cqR = change factor for the presence of a right-turning vehicle in a path grouping

cLOB = passerby change factor for left-turn gatherings

MNC = person on foot bike change factor for right turn bunch

1900 pc/h/ln was accepted as the basal immersion stream rate in accordance with HCM. Since all pathways ranged in width from 10 to 12 feet, 1.0 was chosen as the change factor for path width. It was determined that the change factor for heavy trucks in the traffic stream was 0.988. Because of the zero grades, the change factor for advancing toward grade was determined to be 1. Distinct techniques have distinct change factors for the presence of a halting path and stopping movement contiguous path bunch. A change factor of 0.95 was chosen for the region type. Given that all path bunches, contain common pathways, the change factor for path utilization was determined to be 1.0 (Table I). The change factors for the presence of a vehicle making a left turn in a path bunch were determined to be 0/9 and 0.97, respectively. Person-on-foot change factors were set at 1.0 since all significant advances were viewed as largely safe for babies.

Table 1: Measurement of traffic performance using the V/C ratio

los	V/C ratio	Datailed Description
1	0.00-0.35	Considers optimal working conditions and is seen as a free stream. Individual clients are mostly unaffected by other people's presence in the traffic jam during rush hour.
2	0.35-0.58	Regards ideal working circumstances and is regarded as an unrestricted resource. Most clients are not impacted by other people's presence in the rush-hour traffic gridlock.
3	0.58-0.75	addresses a necessary, ongoing stream that is moving below the speed limit, requiring extra caution from the vehicles to keep safe distances. There is a discernible decline in the driver's comfort and accomodation quality.
4	0.75-0.90	Focuses on traffic activities that are heading into an unstable stream with a high passing desire and a nearly zero passing restriction, which is depicted by drivers having their mobility severely limited.
5	0.90-1.00	Focuses on unsound stream near limit. The rush hour congestion stream's aggravating factors (street conditions, accidents, etc.) usually cause LOS E to transition to LOS F fairly quickly.
6	>1.00	Describes the worst-case scenario, which includes an extremely congested stream, traffic requests that are over the limit, erratic waves, an unpleasant trip duration, higher accident openness, as well as insufficient comfort and consolation.

The following formula is used to establish each approach's limit:

c = Ps V/F ..... (2)

where c is equal to capacity (veh/h).

P is the quantity of routes (ln).

v = successful green time (s) and

s = immersion stream rate

F = duration of procedure (s)

Volume limit proportion (v/c) approach was implemented in order to determine LOS. The most often used approach for evaluating traffic conditions in metropolitan areas is probably v/c, where c is the maximum number of cars that may pass a given place

under actual traffic circumstances and v is the total number of vehicles that pass a point in an hour. v/c is an action that illustrates how an office, or a section of an office, may move and how versatile it is. It compares street supply (conveying limit) with street interest (vehicle volumes). The v/c approach is related to LOS and determining the performance level of a roadway. In places where traffic-reduction strategies should be taken into consideration, this might act as a warning to transport providers.

CHAPTER 4
DATA COLLECTION& ANALYSIS

4.1 Dhaka Approach

According to the data, the dominant vehicle in the Itakhola to Dhaka route is a vehicle as opposed to other vehicle types at the end of the week and throughout the workday, with peak values of 468 automobiles per hour in the morning and 676 automobiles per hour at night.Becausethe industry is concentrated in this region and managers use it to get home after work, the number of vehicles on the road is larger on ordinary workdays than on Fridays. Due to the fact that many plants and manufacturing lines close at the end of the week, there are fewer vehicles at the end of the week. In this manner, the second type of vehicle that controls the highest number is transportation, accounting for around 576 cars per hour during workday evenings. By the end of the week, the volume of carrying this method is even greater. The reason for this is that almost every business in this industry, especially those providing transportation for members of the working class who do not live in Narsingdi City, prefer to travel by car rather than making their own arrangements. Most people travel by transportation to Dhaka for a variety of reasons, including travel, clinical appointments, training, shopping, etc. Medium administering vehicles are trucks that are smaller than a typical truck. Because every contemporary vehicle uses this convergence in the evening to avoid massive jams, the number of smaller trucks than the average truck is not very high during peak hours, both on weekdays and weekends. The majority of the cars in the area are trucks and micro trucks, particularly at night on workdays at the end of the week. The biggest number of trucks is 280 vehicles per hour during the nighttime hours of the week; however, the most notable—and smaller-than-expected—number of trucks is 336 vehicles per hour during the daytime hours of the week. Since the majority of extreme persons who use this way use a transport and private car to go to their destination, Compared to other vehicle categories, cruisers, CNG, and NMT are less common in this strategy. The overall number of autos is at its maximum during the night peak. The most notable value of the bike is shown in Table I: Traffic execution estimation by v/c percentage.

LOS in relation to the percentage definite illustration

A. 0.00-0.35 is considered a free stream and addresses optimal working conditions.

Individual clients are mostly unaffected by other people's presence in the traffic jam during rush hour.

B. 0.35-0.58 addresses reasonable situations including free streaming, but with Some influence from external parties.

C. 0.58–0.75 deals with a required steady stream that is traveling below speed Restrictions; further care is asked of the drivers to continue using safe driving techniques. The degree of comfort and tolerance of the driver clearly decrease.

D. 0.75–0.90 focuses on traffic movements that are heading into an unstable stream

with a lot of passing interest. Additionally, the passing limit is nearly nil, which

depicts drivers as being severely limited in their range of motion.

E. 0.90-1.00 Addresses unsteady stream close to limit. LOS E frequently changes to LOS

F. very rapidly due to aggravations (street conditions, mishaps, and so on) in rush hour gridlock stream.

G. 1.00 Addresses the most horrifyingly terrible conditions, such as an extremely congested stream and traffic demand that is above capacity, characterized by erratic waves, unfavorable travel times, inadequate comfort and accommodations, and increased accident visibility, which is 296 vehicles per hour at the end of the workday evening because many people use it for family outings and other activities. People in Narsingdi City tend to use NMW, especially carts, during the nighttime hours of workdaysparticularly for training purposes and to go to the farthest point (268 cars per hour). When compared to other forms of transportation, the research indicates that CNG is the least practical.with a peak value of 121 cars per hour on weekday mornings. Indeed, but in this system, cars and transportation are the dominant types of vehicles; still, these vehicles follow the same route. Given the massive volume of traffic from other techniques into our methodology, our traffic volume in this

approach is large (Fig. 3).An analysis reveals that Dhaka's approach traffic flow exceeds its capacity in three time periods. At the conclusion of the week, all of the pathways in this method reach a level of administration of F class and work day top hour time (Table 2).This result demonstrates the least amount of administration and indicates that drivers are dissatisfied with the state of the roads as they now exist. During peak hours, the speed of cars in the Dhaka approach was very low. The reason for the large traffic volume in this methodology is that all three of the previous ways used Dhaka's strategy to accomplish their goals. However, the roadway is not wide enough to accommodate a large amount of traffic via this approach. Additionally, a huge number of cars continue to arrive and go from this location, which causes the compelling path width and restriction to decline. Similarly, the most appalling condition of

Figure 3: Time: 8.45 am

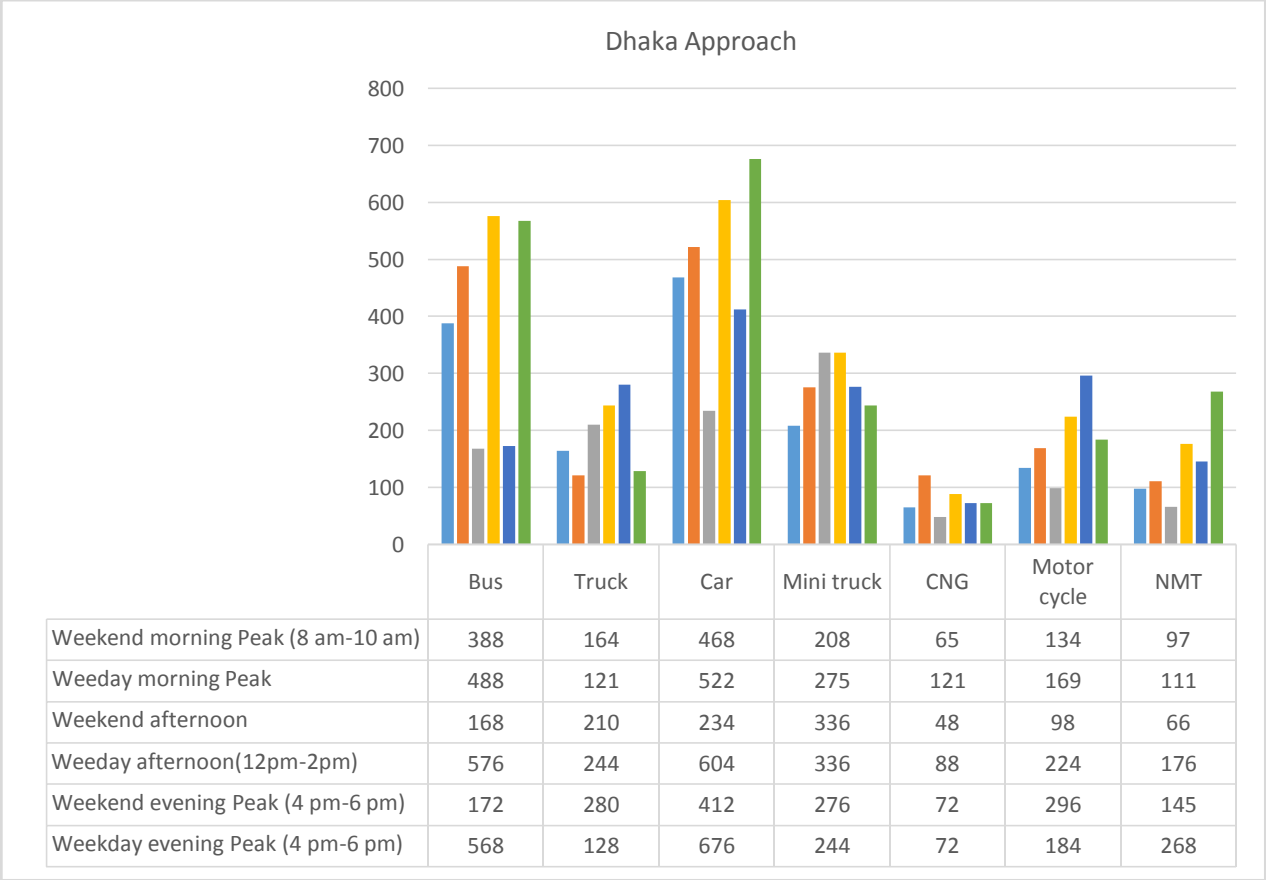
Figure 4: Time: 9.55 am

Figure 5: Time: 12.30 pm

Figure 6: Itakhola Intersection, Time:

Figure 7: Time: 1.50 pm

The reason for the formation of traffic jams is low road capacity, traffic management is not good, markets are sitting on both sides of the road, jams are created in such a situation, suddenly people move on the road, due to unfit vehicles and road jams may occur, where local vehicles Stopping there causes jam, auto rickshaws are causing heavy jam on the side of the road, we can see that in the above pictures, figure 7peak time 8:45, the jam is there, figure 4 people are moving through the road site, figure 5 signal is slightly obeyed, figure 6Itakhala intersection middle point of Narsingdi Figure 5 Road side shops plus road side rickshaws are creating traffic jam, if we can solve them then traffic can flow smoothly



	Bus	Truck	Car	Mini truck	CNG	Motor cycle	NMT
Weekend morning Peak (8 am-10 am)	388	164	468	208	65	134	97
Weeday morning Peak	488	121	522	275	121	169	111
Weekend afternoon	168	210	234	336	48	98	66
Weeday afternoon(12pm-2pm)	576	244	604	336	88	224	176
Weekend evening Peak (4 pm-6 pm)	172	280	412	276	72	296	145
Weekday evening Peak (4 pm-6 pm)	568	128	676	244	72	184	268

Figure8Modal variations of the Dhaka itakhola approach

Tables2- Malculation of level of service (los) of dhaka approach

Time	Ca	cv	cha	as	sb	caa	qa	qbF	clp	cqR	cLOB	MNC	V (veh/h/in)	F (s)	V(s)	P(in)	C(pcu/h)	V (pcu/h)	v/c	LOS
Weekend Morning	1900	1	0.988	1	0.96	0.98	0.95	1	0.9	0.97	1	1	1464	210	75	4	2092	2272	1.09	F
Weekday Morning	1900	1	0.988	1	0.96	0.98	0.95	1	0.9	0.97	1	1	1464	275	85	4	1810	2635	1.46	F
Weekend Afternoon	1900	1	0.988	1	0.96	0.98	0.95	1	0.9	0.97	1	1	1464	195	55	4	1652	1721	1.04	F
Weekday Afternoon	1900	1	0.988	1	0.96	0.98	0.95	1	0.9	0.97	1	1	1464	265	80	4	1768	3352	1.89	F
Weekend Evening	1900	1	0.988	1	0.92	0.94	0.95	1	0.9	0.97	1	1	1346	144	63	2	1178	970	0.82	C
Weekday Evening	1900	1	0.988	1	0.91	0.93	0.95	1	0.9	0.97	1	1	1276	108	35	2	827	320	0.39	B

4.2 Gazipur Approach

According to this technique, the most common vehicle on non-weekend days is the transport, which peaks at 164 vehicles per hour at the end of the week. The amount of transportation options available at different times is about equal because everyone in this area is dependent on Dhaka city, and most city dwellers will likely utilize transportation as their primary means of transportation. Additionally, during the weekday evening, the most prevalent kind of vehicle is NMT (cart, van, etc.), with an average of 196 vehicles per hour. The residents of Narsingdi city will most likely utilize NVM in the morning and at night to visit the closest locations, such as educational institutions, markets, and travel destinations.In the Gazipur method,important; nevertheless, the highest point is reached toward the conclusion of the workweek, when there are 188 vehicles/hours. Given that, city dwellers resemble those engaged in activities such as traveling, exhibiting, working, etc. On the other hand, during the late hours of non-weekend days, a single car is frequently used (172 vehicles/hour). Assuming that we compare various modes of transportation, the number of vehicles is lower since the most extreme people in this area are working-class people. The numbers of trucks, CNG, and minibuses are not very high in this method since almost a smaller portion of the business is based here. At the conclusion of the workday, the minibus and CNG level of respect are 145 and 168 vehicles/hour, respectively. Furthermore, compared to Dhaka, the truck count isn't very high; on non-weekend days, the value is 76 vehicles per hour in the evening (Fig. 8). LOS of the Gazipur approach is C class at the end of the week morning and evening busy time, and D classification at work day morning and end of the week evening busy time, LOS is Class at work day evening and night busy time, as indicated by the volume limit proportion (v/c) technique (Table 3). Investigation reveals that the vehicle's speed in the Gazipur approach is slightly greater than in the The Dhaka method. The study makes it clear that the volume of traffic is not exactly within its capability at that specific moment. However, more work has to be done to improve the existing state of affairs in order to boost vehicle speed and capabilities.

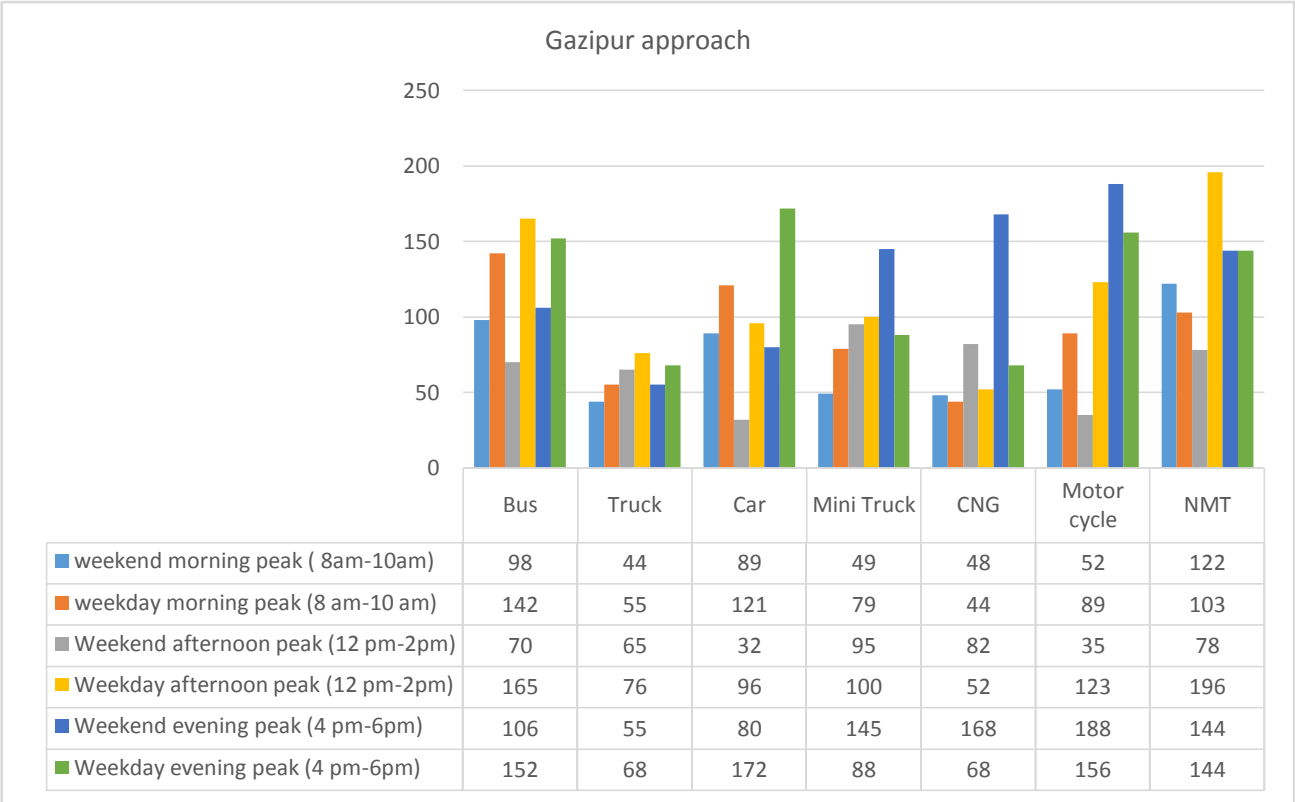


Figure 9: ItakholaTo Gazipur Approach Modal Variation:

Tables3:The Gazipur Approach's Level of LOS Calculation:

Time	Ca	cv	cha	as	sb	caa	qa	qbF	clp	cqR	cLOB	MNC	V (veh/h/in)	F(s)	V(s)	P(in)	C (pcu/h)	V (pcu/h)	V/C	LOS
Weekend Morning	1900	1	0.988	1	0.92	0.94	0.95	1	0.9	0.97	1	1	1346	135	55	2	1097	719	0.66	C
Weekday Morning	1900	1	0.988	1	0.92	0.94	0.95	1	0.9	0.97	1	1	1346	166	62	2	1005	856	0.85	D
Weekend Afternoon	1900	1	0.988	1	0.92	0.94	0.95	1	0.9	0.97	1	1	1346	120	45	2	1009	625	0.62	C
Weekday Afternoon	1900	1	0.988	1	0.92	0.94	0.95	1	0.9	0.97	1	1	1346	156	55	2	949	900	0.95	E
Weekend Evening	1900	1	0.988	1	0.92	0.94	0.95	1	0.9	0.97	1	1	1346	144	63	2	1178	970	0.82	D
Weekday Evening	1900	1	0.988	1	0.92	0.94	0.95	1	0.9	0.97	1	1	1346	180	75	2	1121	1021	0.91	E

4.3 Monohardi Approach

With a value of 521 vehicles per hour in the morning of the workday and 270 cars per hour in the evening of the week, the vehicle is the most represented vehicle in this technique at both the end of the week and the workday. The explanation for this is because the great majority of people living in Monohardi are wealthy and drive private automobiles. They like traveling to Dhaka for business, and the distance from the city is only 99 miles.For this reason, they typically leave for Dhaka in the morning and aim to go home in the evening to avoid severe traffic jams. In this strategy, transportation is the second-best mode of transportation, with a peak of 348 cars per hour on non-weekend days in the evening. Given that this methodology's predominant mode of transportation is general transportation and that Narsingdi people are from the Monohardi area are also subordinates to open vehicles. Smaller-than-usual trucks are also very large modes in this technique, with 220 vehicles per hour and 210 vehicles per hour on Friday and Saturday nights, respectively. That indicates that many firms are using that practice and that doors are open. Additionally, in order to avoid traffic jams, the car often crosses the Itakhola confluence at night and in the evening. Bikes and NMT, in any situation are not important in this strategy since people don't like using the thruway. Due to the numerous businesses, markets, and offices in the Itakhola area that close in the evening, there is an extremely high number of traffic during that time.As a result, all authorities and workers use this method to accomplish their goals, increasing the amount of rush hour traffic congestion (Fig. 9).By examining the most notable LOS given the typical v/c proportion and v/c % at the beginning of the workday, peak, and late at night.working hours The final class of the week is LOS. Busy in the morning and evening, LOS is C reach at the conclusion of the workweek. LOS is E class during the workday's evening rush hour (Table 4-1). That is what the findings indicate. The current conditions on the street are only just bearable at the end of the week. Nevertheless, throughout the working day, the volume of traffic exceeds its capacity. The current conditions of the roadway (street width, pedestrian development) should be altered to increase adaptability.

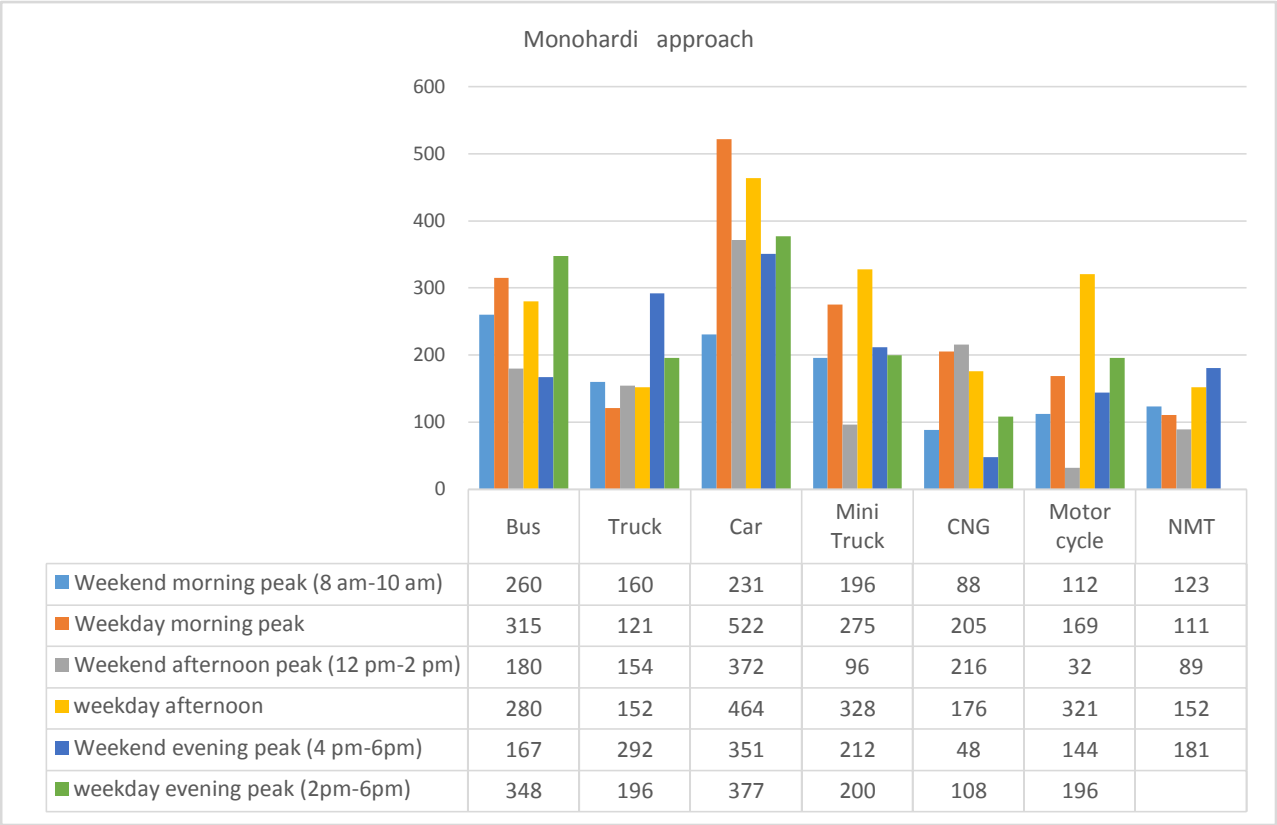


Figure 10: Modal Variation OfItakhola To Monohardi Approach

Tables4:Calculation Of Level Of Service LOS Of Monohardi Approach

Time	Ca	cv	cha	as	sb	caa	qa	qbF	clp	cqR	cLOB	MNC	V (veh/h/in)	F(s)	V(s)	P(in)	C (pcu/h)	V (pcu/h)	V/C	LOS
Weekend Morning	1900	1	0.988	1	0.94	0.96	0.95	1	0.9	0.97	1	1	1404	190	70	4	2070	1720	0.83	D
Weekday Morning	1900	1	0.988	1	0.94	0.96	0.95	1	0.9	0.97	1	1	1404	234	90	4	2161	2280	1.05	F
Weekend Afternoon	1900	1	0.988	1	0.94	0.96	0.95	1	0.9	0.97	1	1	1404	166	65	4	2200	1579	0.72	B
Weekday afternoon	1900	1	0.988	1	0.94	0.96	0.95	1	0.9	0.97	1	1	1404	195	85	4	2449	2349	0.96	C
Weekend evening	1900	1	0.988	1	0.94	0.96	0.95	1	0.9	0.97	1	1	1404	175	78	4	2504	1966	0.78	B
Weekday evening	1900	1	0.988	1	0.94	0.96	0.95	1	0.9	0.97	1	1	1404	245	85	4	1949	2302	1.18	F

4.4 Sylhet Approach

According to the analysis, the most significant number of vehicles (carts, vans, and so on) in the Sylhet route during peak workday evening hours is 220 cars each hour. This suggests that NMT is preferred by the local population, which has a relatively low number of cars each hour—123—to get to their preferred locations in the early hours of the day. Bicycles are the second most common means of transportation in this area, with 148 vehicles per hour during the working evening. People in the area like using engine cycles for transportation. Based on the synopsis At work in the morning, the number of automobiles, trucks, minibuses, CNG, and transport vehicles is enormous: 81 vehicles per hour, 56 vehicles per hour, 65 vehicles per hour, 48 vehicles per hour, and 45 vehicles per hour separately. The reason for this is because a great lot of businesses and plants are located in this route, and a great deal of people use it to get to work, which causes heavy traffic on this route throughout the early hours of the day and in the evening. It has an even higher volume at the conclusion of the week. At workday evening, the second most common vehicle is an engine cycle that averages 148 vehicles per hour. Transport, truck, and CNG vehicles are among the medium-impacted vehicles, and the impact on their power is greatest in the early morning. Small trucks and cars have lower prevailing rates; they are charged at 5% and 6% respectively. An minimal amount of traffic analysis to various approaches is included in this approach (Fig. 10). Analysis reveals that the traffic volume in the Sylhet approach is not precisely within its capacity at that particular moment. According to Table 5, LOS is a class that meets during workday morning, workday evening, and end of week evening busy times. LOS is also a B class that meets during workday evening and end of week evening busy times. This outcome indicates that drivers are satisfied with the state of the roads and that the administration is operating at the highest level.

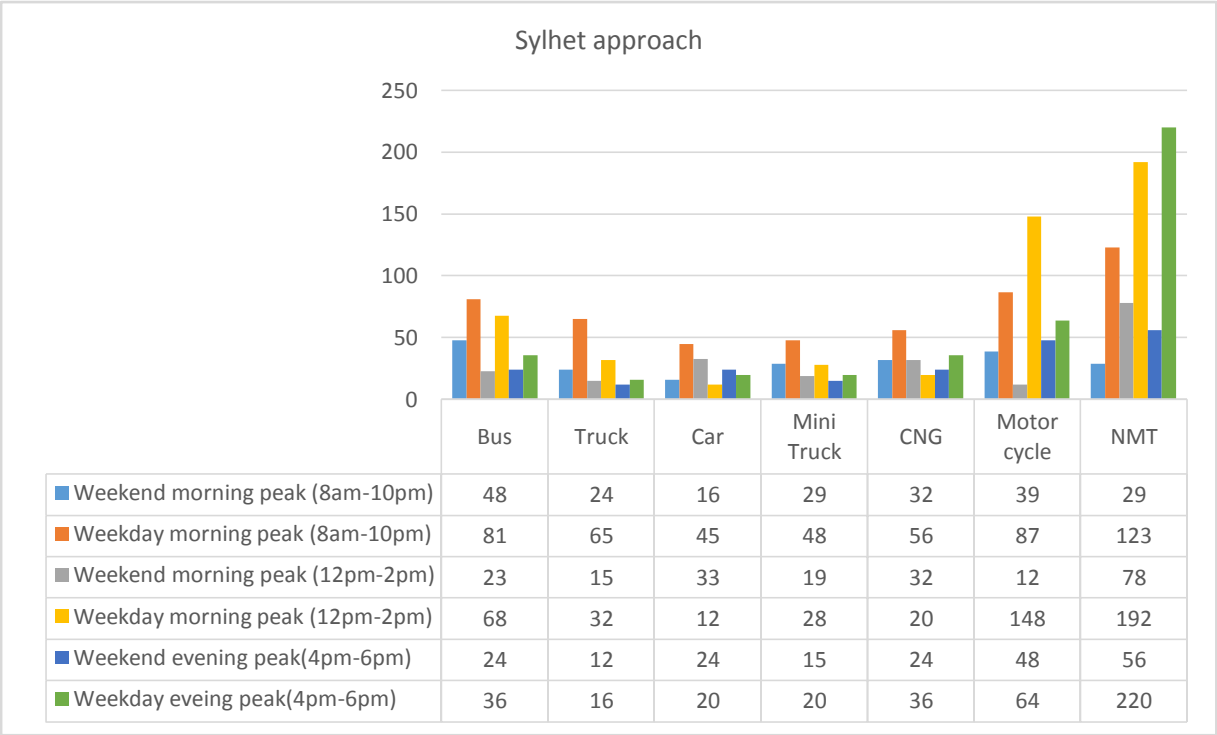


Figure 11: ItakholaTo Sylhet Approach Modal Variation

Tables: Sylhet Approach Level of Service Calculation

Time	Ca	cv	cha	as	sb	caa	qa	qbF	clp	cqR	cLOB	MNC	V (veh/h/in)	F(s)	V(s)	P(in)	C(pcu/h)	V (pcu/h)	V/C	LOS
Weekend morning	1900	1	0.988	1	0.91	0.93	0.95	1	0.9	0.97	1	1	1276	110	40	2	928	292	0.31	A
Weekday Morning	1900	1	0.988	1	0.91	0.93	0.95	1	0.9	0.97	1	1	1276	132	54	2	1044	622	0.60	B
Weekend afternoon	1900	1	0.988	1	0.91	0.93	0.95	1	0.9	0.97	1	1	1276	95	38	2	1021	230	0.23	A
Weekday Afternoon	1900	1	0.988	1	0.91	0.93	0.95	1	0.9	0.97	1	1	1276	125	42	2	858	483	0.56	C
Weekend afternoon	1900	1	0.988	1	0.91	0.93	0.95	1	0.9	0.97	1	1	1276	108	35	2	827	320	0.39	A
Weekday evening	1900	1	0.988	1	0.91	0.93	0.95	1	0.9	0.97	1	1	1276	140	60	2	1094	366	0.33	A

4.5 Total Vehicle Composition

Transport is shown to have the highest extreme rate, with a total of37%. It indicates that a greater percentage of individuals go to their location by car. When considering various forms of transportation, transportation is the most affordable and easily available option in our nation. Therefore, in order to go to their destinations, members of the working and lower classes need transportation. One may argue that the majority of middle-class and lower class people reside in Narsingdi urban neighborhoods, which contributes to the mode's increased notoriety. Nevertheless, the more dedicated route may be the most practical choice for this kind of transportation, and it will lessen traffic congestion.Twenty percent of vehicles are trucks in the second category. Near the Itakhola crossing point, Gazipur, and the Dhaka Sylhet highway are several plants and enterprises. The Itakhola crossing point is used by all enterprises to pass through raw materials and manufactured goods. That explains why there are more trucks at the Itakhola crossing point. Furthermore, 14% of the aggregate vehicle is smaller than a typical truck, meaning that trucks and minitrucks occupy 34% of the total, necessitating further work with on-street spaces, particularly with regard to truck and small-scale truck specific pathways.Furthermore, the observation that 15% of the vehicles passed via the Itakhola confluence suggests a moderate concentration of better class residents in the area. Level of CNG, Engine cycle, and NMT are less common, accounting for 4%, 4%, and 6% of all crossing points, respectively. This suggests that people use those modes less frequently than other modes.

CHAPTER 5
CONCLUSION AND RECOMMENDATION

5.1 Conclusions

Finding the LOS and analysing the traffic patterns at a significant and important signalised crossroads are the goals of this study. Furthermorethe information investigation's findings demonstrate that there is no route discipline and that traffic at GCI is quite varied. Furthermore, the emphasis here is on conveying that there is far more traffic than this bridge can handle. On non-weekend days, it is particularly high in the morning and at night. There is a little less traffic on the weekends than there is during the workday. LOS assured that LOS is considered F class in three different periods in Dhaka, including at the end of the weekend workday. At a crossing point, LOS F indicates that traffic is forced to move as well, but at an abnormally slow speed. The LOS of Dhaka's approach is incredibly low because all traffic from the other three methods used it to accomplish their goals. Analysis shows that drivers are satisfied with the current state of the roads in the Sylhet approach, and the degree of administration is A, B, and C class. The findings of this study indicate that 37% of the vehicles at the NarsingdiItakhola crossing point are moved. Even still, At this crossroads, traffic congestion is a frequent issue. and the assistance nature of transportation in this area isn't satisfactory.Still, a great deal of people use this mode of transportation to go where they are going. This is because the financial situation makes it unfeasible for these large numbers of people to switch to other forms of transportation. A field investigation also reveals that a moderate amount of financially independent people reside in the vicinity of this location. Transport organizers and chiefs may find the evaluation useful in understanding the basic vehicle creation conditions in Narsingdi city and, as a result, in taking initiatives to improve the status of GCI and develop further improvement plans.

• Data collecting has revealed that itakholatodhaka, is extremely congested and has increased traffic patterns.

• Itakhola to sylhetapproach is better than other’s approach.

• All approach the roadway condition is very bad.

5.2 Recommendation

• A dedicated route for transportation may be persuasive in increasing this street'sutility.

• The strong width of the highway must be expanded. There should be no interference with this. To get to their goal, vehicles from many places used this confluence. Grade partitions could be an excellent option for developing outer-to-outer circulation withoutupsetting convergence execution.

• The local administration should implement a ground-breaking plan for Narsingdi City in order to address the existing status of this chosen confluence.

• The local government should create a master plan for Narssingdi City in order to enhance the current state of this particular crossroads.

Future research might take into account the characteristics of other road users and examine the link between trip features, mode choice behaviors, and demographic factors, even though the current study focuses on the vehicular characteristics of this significant industrial zone.

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