



A report on
Making Car Free Street:

Feasibility study of Razia Sultana Road and road no 3, Mohammadpur housing,
Mohammadpur, Dhaka

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Abstract

Dhaka is getting strained with numerous transportation problem. Consequently environment, living standard, security everything is getting threatened. This city is experiencing huge increase in private car ownership. It's bringing numerous problems as consequent in this densely populated city. Many cities around the world is taking initiatives to make streets car free. We are also thinking this as one of the effective tool to improve situation and rising awareness about less dependency on car. This study checks feasibility of making two from many streets in Dhaka as car free street. To find that it assessed the geographical characteristics, geometrical features, traffic and pedestrian volume, land use inventory of the selected roads and associated neighborhood. It has also checked alternative routes, network plan and car owner inventory. There was also an questionnaire survey to uphold the public opinion over this initiatives. We finally found these roads feasible to make car free. Successful implementation of this project can enhance the social and physical environment of the neighborhood. It can significantly reduce air pollution, sound pollution and temperature. It can also facilitate to strengthen social bond and to make a more cohesive and vibrant community.

2.10.1. Primary data collection				
2.10.2. Secondary data collection				
2.11. Data analysis and processing				
2.12 Presentation and preparation of final report				
Chapter Three: feasibility study of Razia Sultana Road...	7 – 14
3.1 Study area Profile				
3.1.1 Geometric feature:				
3.1.2 Landuse Inventory:				
3.1.3 Condition:				
3.1.4 Alternative Routes:				
3.2 Data collection				
3.3 Volume analysis:				
3.4 Pollution analysis:				
3.5 Alternative route analysis				
Chapter Four: feasibility study of Road no 3, Mohammadpur Housing.		14 - 34
4.1 Study area profile				
4.1.1 Location				
4.1.2 Geometric Features				
4.1.3 Existing Land Use				
4.2 Volume analysis				
4.2.1 Traffic volume				

4.2.2 Road users	
4.2.3 Schools and others users at 8.00-8.30 am	
4.2.4 Trend line of traffic variation	
4.2.5 Traffic volume at alternative route	
4.3 Pollution analysis:	
4.3.1 Sound level	
4.3.2 Air quality	
4.4 Present social activity on the road	
4.5 Present scenario of the alternative roads in the afternoon	
4.6 Sample size for questionnaire survey	
4.7 Public opinion for making the road car free	
4.8 Challenges to implement the project	
Chapter Five: Recommendation...	34 - 37
5.1 Proposed plan of the road no 3, MH Housing	
5.2 proposed policy plan for Razia Sultana road:	
5.2.1 Transport related recommendations	
5.2.2 Social activity related recommendation	
5.3 Recommended facility	
Chapter six: Conclusion...	37

Chapter one: Introduction

1.1 Background of the study

Walking mostly takes place within a transport system that must work for a range of road users. This requires effectively integrating walking needs for safety and convenience into the provision for walking along and across roads (NZ Transport Agency, 2008). Pedestrians also use routes outside road corridors as part of a continuous network. Walking is such a basic human activity that it has often been overlooked when planning for transport (DTFHA, 2002) and has been viewed as a second-class form of travel (Lumsden, L., 1999 and OFCD, 2001). Walkable neighborhoods with access to public transit, better commutes and proximity to the people and places are the key to a happier, healthier and most sustainable lifestyle. We always cherish for a neighborhood having a walkable community, a place of social gathering, a safe place where people can meet neighbors and talk, a secured environment to let children play and overall a healthy environment. But instead of these, we find no safe place or footpath for walking, unhealthy environment or pollution for vehicles, congested by private cars, no safe place to let children play, absence of place of social gathering, weak community bonding and what not specially in Dhaka city. So it has become our utmost desire to have an environment friendly safe neighborhood in our busy life.

1.2 Objective of the study

We have worked keeping twofold objective in front:

1. Feasibility study of two newly proposed roads to make car free street.
2. To give recommendation to manage the roads for making car free street.

1.3 Scope and limitation of the study

This study has an immense scope in days to come. This could help for doing further studies on selecting suitable routes to make them car free and give the neighborhood a safe place for all the inhabitants. The data shown in this report have been collected through field survey. So the data are practical and the policies and recommendations given here are also suitable for the existing roads. So the whole procedure can be followed further to select other roads for imposing the same idea. Again we have collected data of pollution of the present time. So the data of same place can be taken in future to compare the condition after making the roads car free to understand the impact. On the other hand, this study has some drawbacks like any other do. We had some constraints of

time and manpower. We have selected two roads only. The study would have been much more extensive if we could analyze more other roads.

1.4 Literature Review: International exemplary case studies for car free streets:

There are many cities around the world that are heading for making them car free cities. Madrid's main avenue, the Gran Vía, will only allow access to bikes, buses, and taxis before May 2019. It's part of a larger effort to ban all diesel cars in Madrid by 2025. But the Spanish city is not the only one getting ready to take the car-free plunge.

Oslo plans to permanently ban all cars from its city center by 2019 — six years before Norway's country-wide ban would go into effect. The Norwegian capital will invest heavily in public transportation and replace 35 miles of roads previously dominated by cars with bike lanes.

Madrid plans to ban cars from 500 acres of its city center by 2020, with urban planners redesigning 24 of the city's busiest streets for walking rather than driving. The initiative is part of the city's "sustainable mobility plan," which aims to reduce daily car usage from 29% to 23%. Drivers who ignore the new regulations will pay a fine of at least \$100. And the most polluting cars will pay more to park.

Chicago-based architects Adrian Smith and Gordon Gill designed a new residential area for the Chinese city, Chengdu. The layout makes it easier to walk than drive, with streets designed so that people can walk anywhere in 15 minutes. While Chengdu won't completely ban cars, only half the roads in the 80,000-person city will allow vehicles. The firm originally planned to make this happen by 2020, but zoning issues are delaying the deadline.

The German city, Hamburg plans to make walking and biking its dominant mode of transport. Within the next two decades, Hamburg will reduce the number of cars by only allowing pedestrians and bikers to enter certain areas. The project calls for a gruenes netz, or a "green network," of connected spaces that people can access without cars. By 2035, the network will cover 40% of Hamburg and will include parks, playgrounds, sports fields, and cemeteries.

over half of Copenhagen's population bikes to work every day, thanks to the city's effort to introduce pedestrian-only zones starting in the 1960s. The Danish capital now boasts more than 200 miles of bike lanes and has one of the lowest percentages of car ownership in Europe. The latest goal is to build a superhighway for bikes that will stretch to surrounding suburbs. The

first of 28 planned routes opened in 2014, and 11 more will be completed by the end of 2018. The city has also pledged to become completely carbon-neutral by 2025.

When Paris banned cars with even-numbered plates for a day in 2014, pollution dropped by 30%. Now, the city wants to discourage cars from driving in the city center at all. The mayor says Paris also plans to double its bike lanes and limit select streets to electric cars by 2020.

In December 2016, Athens, Greece announced it will ban diesel cars from the city center by 2025. Just like Paris, the mayor of London says the city will ban diesel cars by 2020. In April 2016, Mexico City's local government decided to prohibit a portion of cars from driving into the city center two days every work week and two Saturdays per month. It determines which cars can drive on a given day using a rotating system based on license plate numbers. Though New York City isn't planning a car ban anytime soon, it is increasing the number of pedestrian areas, along with bike share, subway, and bus options.

1.5 Assessment of nine proposed road by DNCC (region-5):

There have been a list of nine primary roads that would be made car free in Anchal 5 (Karwan Bazar) by the councilors. Those are-

Table: List of Car free roads of Anchal 5 (Karwan Bazar)

Ward no.	Name of the roads
28	Shyamoli Road No. 1
34	Dura mandir goli
33	Confidence Tower goli Katasur
32	Ikbal Road (around Stiker field)
31	South narrow road beside North Girl's school of Noorzahan road
30	Eastern part of road 9 (pisciculture housing block Kha)
29	4/1, from block F to 6/13 (mohammadpur new katcha bazar road)
27	Road behind Square Hospital of South Raza Bazar

26	Road adjacent to Abdul Hakim Community Center of South Tejtury Bazar
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But after field visit, some difficulties were found in the way of making them car free. We have tried to show the main reasons that have eliminated three of roads from feasible road's list. The rest six roads were with similar types of problems.

Shyamoli Road No. 1 (ward 28):

- Dead end road
- No through traffic
- Needs permission to entry of
- cars owned by out of community people
- Owned personal organization
- Spacious roads
- Typology: Colony



Fig: already controlled car entry



Fig: low pedestrian volume

Road behind Square Hospital of South Raza Bazar (ward 27):

- Usually cars do not enter
- Have alternative roads
- No plot access, all backyard in this road
- Children play
- Becomes muddy in the rainy season
- Changes would not made if induced car free



Fig: no plot access from front

Road adjacent to Abdul Hakim Community Center of South Tejtury Bazar (ward 26):

- Dead end road
- Road condition very poor
- No through traffic
- Owned personal organization

- No car entry, mainly space used for parking
- Length is small



Fig: Road with dead end



Fig: car parked in narrow road



Fig: bad road and drainage condition

Chapter two: Methodology

2.1. Introduction

The objectives of a survey can be fulfilled by some steps which are altogether known as methodology. To guide the whole survey efficiently, the following methods have been followed.

2.2. Fixation of the project

First of all the project was fixed that was tented to be done addressing by a suitable title.

2.3. Preparation of the objective

After fixation of the project title, two tentative objectives were selected addressing what to do throughout the whole study. After studying relevant study and focusing on the purpose of the study these objectives were fine-tuned and they were finalized.

2.4. Preparation of variables

Some variables were prepared regarding to fulfil the objectives. The variables consisted of the geometric information of the road, land use, volume of traffic, environment condition etc.

2.5. Preparation of co-ordination schema

A co-ordination schema was prepared showing the data to be collected and analyzed to carry out the related objective. Data collection method was also shown there.

2.6. Preparation of preliminary questionnaire and checklist

According to the co-ordination schema a preliminary questionnaire and a checklist were prepared. Questionnaire consisted questions on the frequency of the road users of using the road in a day, problems faced due to flow of car, road safety and security, tendency of the dwellers on making the road as car free etc. Checklist was prepared to conduct traffic volume study and road inventory.

2.7. Assessment of previously proposed roads

Afterwards, an assessment was done on nine roads suggested by the councilor of the nine wards to make them car free. They were assessed on some criteria like road width, pedestrian volume, car volume, percentage of residential land use, existence of association or committee etc.

2.8. Study area selection

After completion of the pilot survey the nine roads were not found feasible to conduct the study. As a result new roads were found and finally two roads were selected keeping the goals of the study. The study roads looked feasible apparently and only two roads were selected due to time and manpower constraints.

2.9. Preparation of final questionnaire

After selecting two study roads pilot survey was done on the roads too. And after completion of the pilot survey on both individual dweller, traffic and road inventory final questionnaire and checklist were prepared adding few new questionnaire suggested by the dwellers and key-informant. Few questionnaire were found unnecessary that were removed from the final questionnaire.

2.10. Field survey and data collection

After completion of the final questionnaire and checklist field survey was started to bring out the relevant information.

2.10.1. Primary data collection

Primary data were collected on the traffic volume and road inventory using the checklist and public opinion was collected using the questionnaire. Land use inventory, car owner inventory, sound level measurement, air quality measurement were also done for collecting primary data.

2.10.2. Secondary data collection

Secondary data consisted the google map of the two area, travel distance and time to cover the study road and the alternative roads etc.

2.11. Data analysis and processing

After collection of all the data they were analyzed in computer with the help of Microsoft Word and Microsoft Excel.

2.12 Presentation and preparation of final report

The report has been prepared with necessary figures combining all the analysis and major findings. Then a short power point presentation was delivered to official of concerned authority.

Chapter Three: feasibility study of Razia Sultana Road

3.1 Study area Profile

3.1.1 Geometric feature:

Two roads have been selected for our study. One of them is Razia Sultana Road and the three segments connected with it (figure 1). These Roads are located between Nur Zahan Road and Salimullah Road. The road is quite congested. Average width of the roads and footpath are around 21 feet and 3 feet respectively. Total length of the roads is around 530 meter. Drainage condition of the roads is very poor. And greenery condition is not in a satisfactory level here.

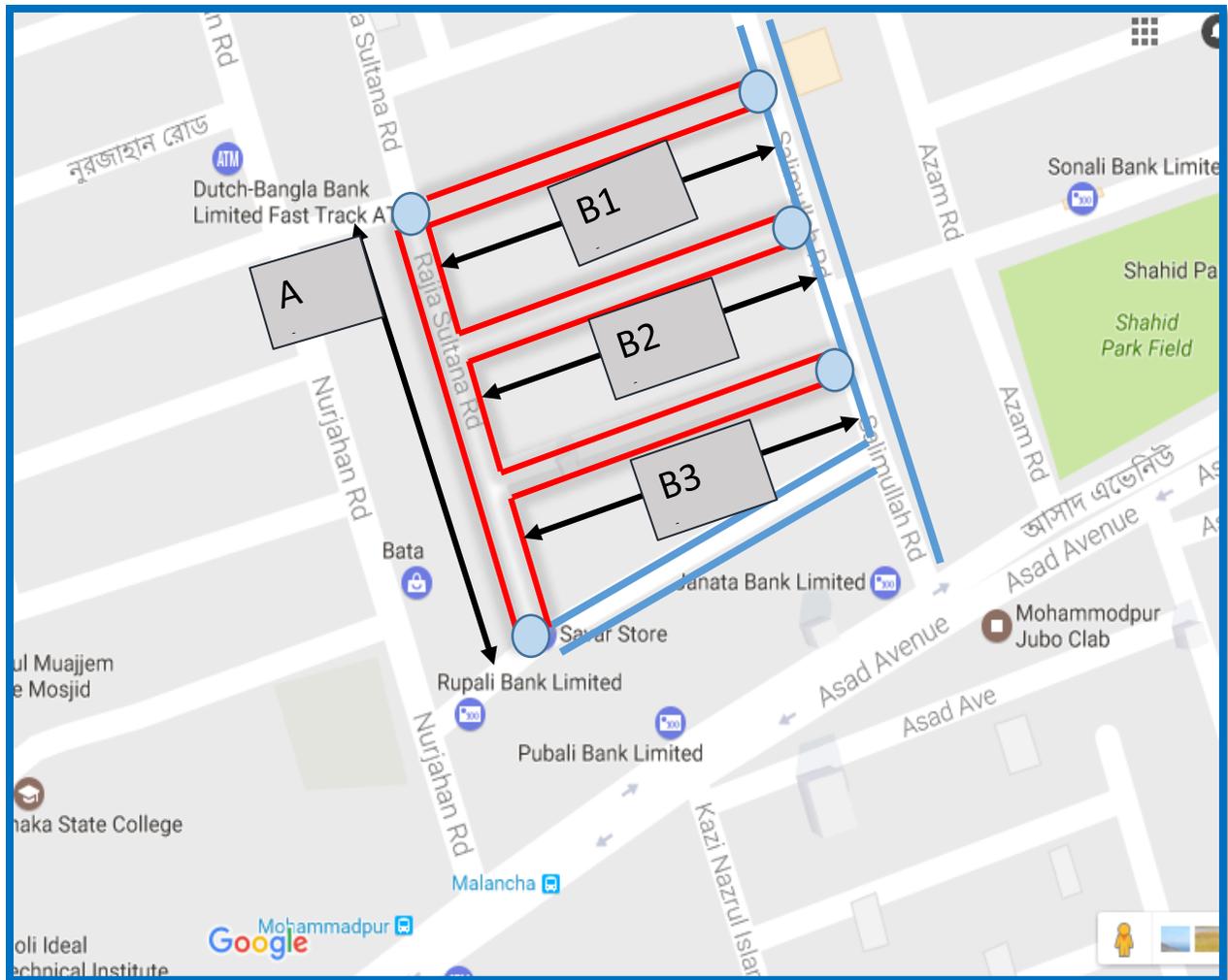


Figure: Razia Sultana Road

3.1.2 Landuse Inventory:

A survey was conducted to know the land use along the roads. Number of residential plot is 98 and 12 commercial store and total floor number is 419. So it can be said that residential plots are the dominant land use here and making car free would be highly beneficial for a residential zone. There are 12 corner shop. We found 13 street vendor after surveying three hours. There is no designated play lot. Children mainly play in the B category roads.

3.1.3 Condition:

Drainage condition is not satisfactory there. Waste management is not also satisfactory. The waste were openly exposed in roadside. But waste management in the B type road, which have mainly residential use is satisfactory. There are satisfactory amount of greenery and also opportunity to increase. In Razia sultana road there is no onsite parking opportunity. In the branch roads, there are conditional parking facility. Footpath condition also is to be developed.

3.1.4 Alternative Routes:

There is an alternative route available adjacent to the selected Razia Sultana road in order to divert the car in it. And it is Salimullah Road shown in the figure 1. The alternative route is found to be capable of holding the new added pressure of private cars diverted from the Razia Sultana road through conducting survey.

3.2 Data collection

Land use data has been collected physically using a checklist. And a volume survey was conducted to collect the volume data for different times. Volume data has been taken in different working days for the time intervals of 8:00-8:30, 8:30-9:00, 9:45-10:15, 11:00-11:30 AM and also for 12:30-1:00, 5:20-5:50 PM by manual observation.

3.3 Volume analysis:

Volumes for different times has been shown in the figure 2. Here it is seen that Number of pedestrian, car and rickshaw are comparatively very high at 12:30-1:00 PM and 5:20-5:50 PM.

Generally schools break at 12:00 PM. So pedestrian and vehicular movement is very frequent in this time. Pedestrian movement is also very high at 8:00-8:30. Most of the time it is seen that car is making an obstacle against traffic flow specially at noon and afternoon.

Table: Volume survey for different times.

time	pedestrian	no. of car	no. of rickshaw	total road user
8:00-8:30	157	16	56	236
8:30-9:00	133	18	52	205
9:45-10:15	117	29	106	279
11:00-11:30	144	32	172	440.4
12:30-1:00	195	48	248	652.5
5:20-5:50	202	44	190	568
		187	823.1	2380.9
		31.23333	137.1833	396.8166667

In the figure 3, it is found out that pedestrian movement is in the highest level at 5:20 to 5:50 PM and car is at 12:30 to 1 pm and 5:20 to 5:50 pm. Meanwhile car movement is considered as a threat in a residential zone against pedestrian in Urban Planning. So to increase the pedestrian flow, it is necessary to ban the car on the roads.

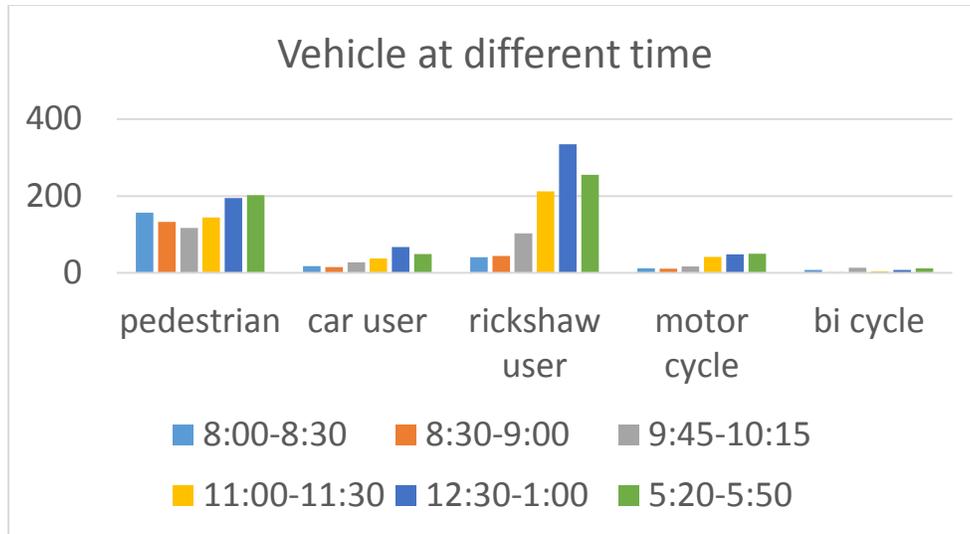


Figure : Traffic volume for individual vehicle at different times

Vehicular movement is more clearly shown in the figure 4 using trend line. Number of total road user is increasing gradually from morning to evening. An interesting findings from figure 4 is that pedestrian movement is in a satisfactory level all day long.

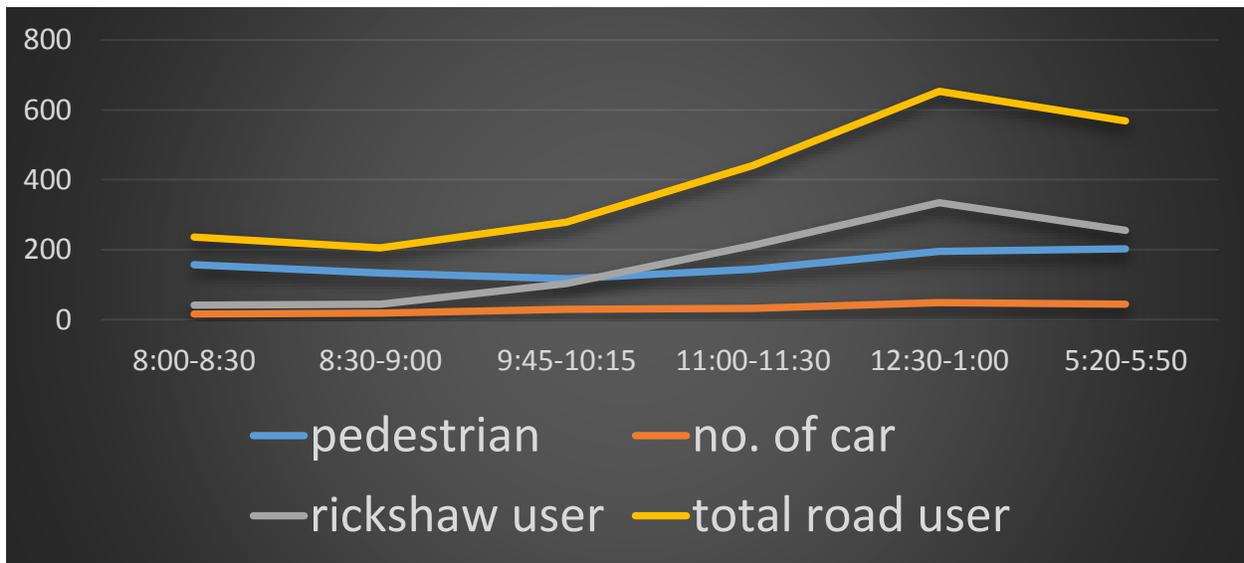


Figure : Vehicular movement for the whole day.

Meanwhile it is found out that number of car and number of car user is nearly same (figure 5). It means that most of the time only one passenger occupies a full car. It is a total wastage of space.

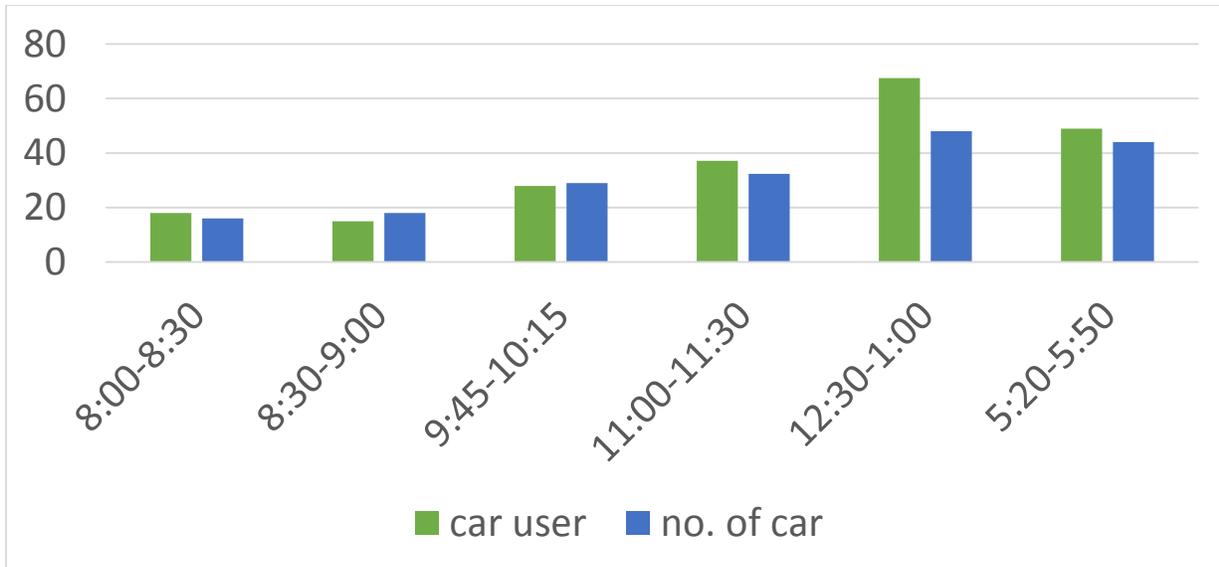


Figure : Number of car versus number of car user

Here in figure 6 the modal share (in percentage) is given. The car user occupy only 9% of share. But it is responsible for most of the congestion, air pollution, sound pollution and often time accident risk. Rickshaw and pedestrian are the most prevailing mode of transport over this road.

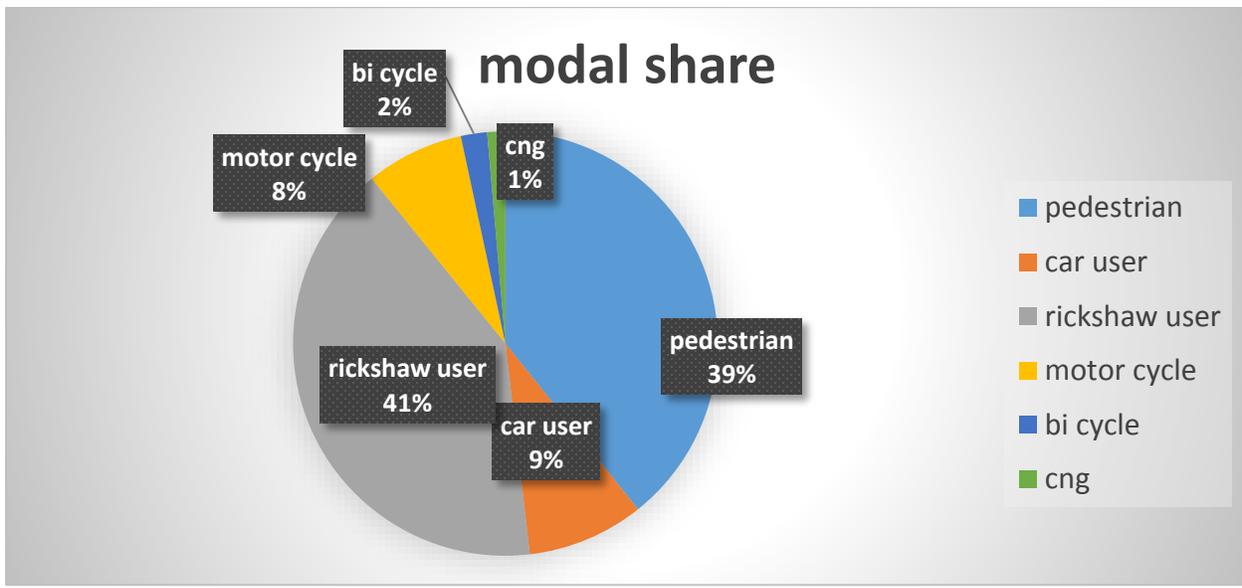


Figure : Modal Share of the road

3.4 Pollution analysis:

- **Sound level:** Main responsible source for sound pollution is transportation and chaos. Our findings are shown below.
 - Lowest sound level 56.1 dB
 - Highest sound level 107.2 dB
 - Average sound level 75.67 dB
- **Air quality:** We found severe amount of particle matter in air.

3.5 Alternative route analysis:

If the car is banned on the selected roads, it is must to have an alternative route to divert those car on that. In the figure, it is seen that Salimullah road is the alternative route to carry the car of the selected roads. As number of car in not so high on the roads, so it can be easily carried by Salimullah roads. Salimullah road has a handsome width and footpath. And volume of the vehicle is not so high in Salimullah road.

The width of Solimullah road is 31 feet. Dominant land use type is residential and commercial. The drainage condition is satisfactory. Footpath is wide, in both side with a width of 5 feet. Here is the volume analysis of this road (figure 7) As the no of car per 30 minutes is not too much than Razia Sultana Road, It can be assumed that this road can hold The pressure of Razia Sultana Road, if it is turned close.

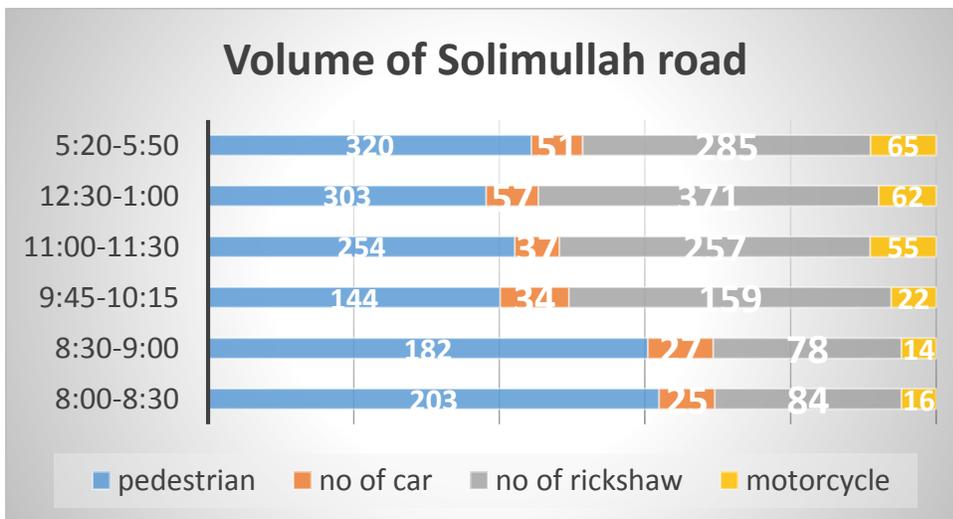


Figure : Volume study findings on Solimullah road

3.6 Conclusion

Razia Sultana road has the potential to implement this policy over it. proper implementation can enhance the social bonding over this neighborhood. Besides, it can be an exemplary case study. After a successful pilot project this car free street can be extended north wide till the Tajmohol road.

Chapter Four: Feasibility study of Road no 3, Mohammadpur Housing.

4.1 Study area profile

4.1.1 Location

The study road is Mohammadia housing road no.3 which is located in Mohammadia Housing Society. There are two entries to enter the road. One entry is from Mohammadi road and another is from Shekhertek orad no. 1. The adjacent landmarks of the study road are Shia Masjid, Japan Garden City and Dhaka Uddan.

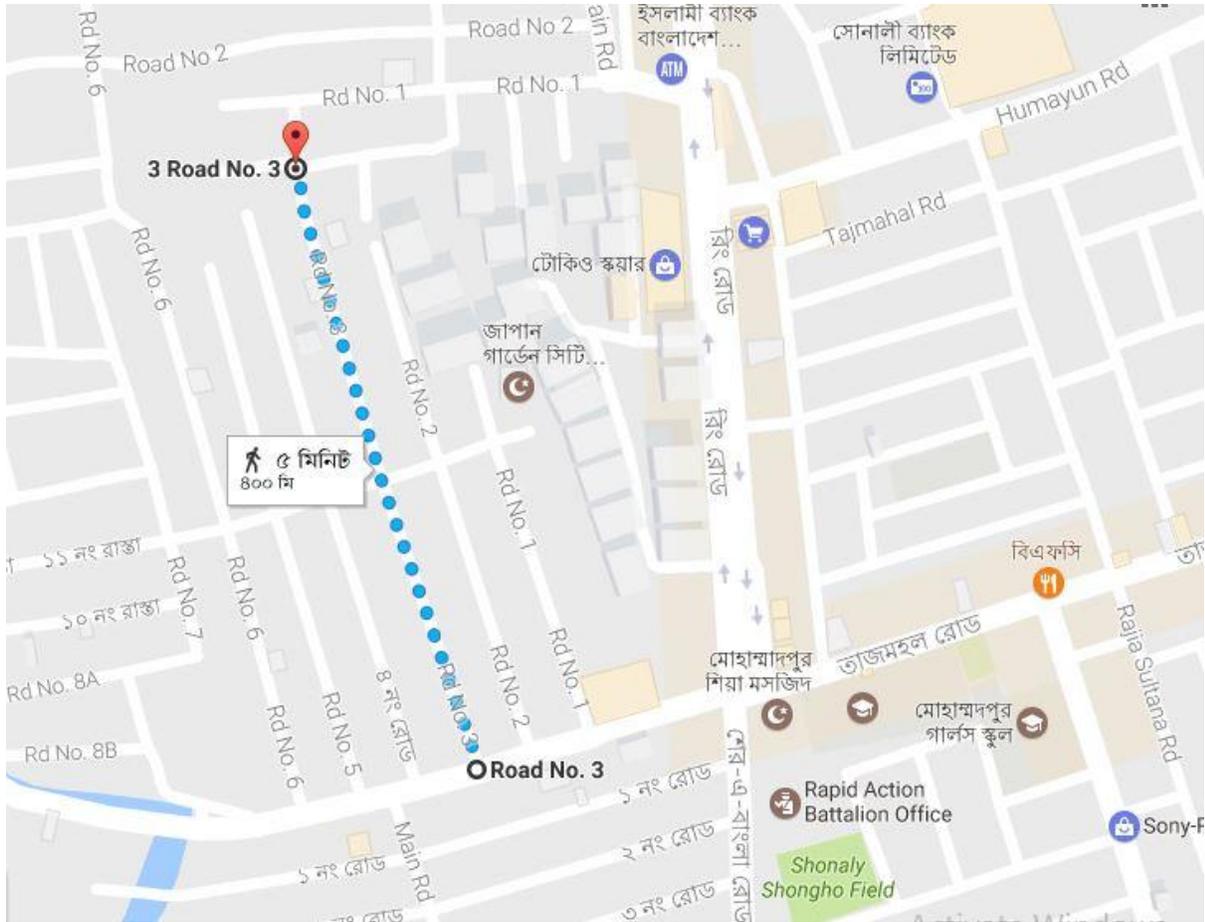


Figure: Google map view of the Mohammadia Housing society, Mohammadpur, Dhaka

4.1.2 Geometric Features

The road is 400meter long having an intersection at the middle of the road that has connected the road with adjacent roads. The intersection has divided the road into two segment. Both the segments are 200 meter long. The walking distance of the entire road is 4 minutes while the walking distance of each segment is 2 minutes.

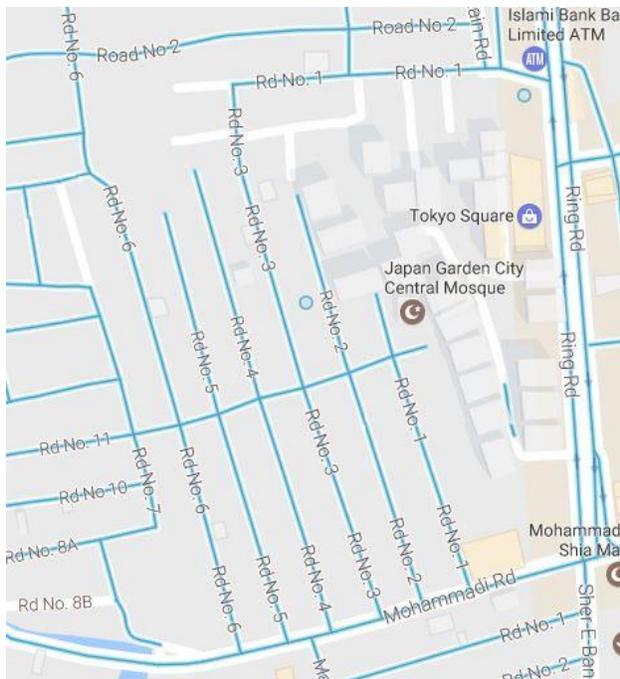


Figure: Google map view of Mohammadia housing society road no 3



Figure: Mohammadia housing society road no 3

The width of the road is 18 feet and it is uniform at every section of the road. There is no footpath and parking space on the road. The drainage condition of the road is good and during rainy season there occurs no waterlogging on the road according to the people of the area. The greenery condition of the road is good and proper measures may improve the situation more. The representing land use along the road is residential use.

4.1.3 Existing Land Use

There are 42 buildings and 3 under construction buildings along the road. Around 210 floors have been assumed at the 42 buildings while apartment numbers have been assumed 600. Assuming population size 5 at each apartment the total population size has been projected to 3000. Although the representing land use along the road is residential use, there are few others use in some buildings having all the floors or few floors of the building. Among the others use there are 2 preliminary schools and one art school, 1 grocery shop, 1 dentist's chamber, 1 saloon, 1 beauty parlor and one show room for kid's dress. At the morning there stays one food vendor selling vegetables. At different time of the study few other vendors were found who came to the road for few moments.



Fig: Grocery shop



Fig: Show room for kids dress



Fig: Beauty parlor



Fig: Food vendor



Fig: School

4.2 Volume analysis

4.2.1 Traffic volume

In the segment of the report traffic volume has been shown according to flow of traffic at different time. The total composition of all types of volume has been shown at 5 different time interval and they are 8.00am-8.30am, 10.00am-10.30am, 12.00pm-12.30pm, 5.00pm-5.30pm and 6.00pm-6.30pm. It is seen that the total composition of all types of traffic are 663, 418, 351, 477 and 457 respectively according to the study time which shows the maximum composition of traffic is in the morning and minimum is at noon.

Maximum pedestrian was found in the morning that was 350 while minimum pedestrian has been found at noon which was 134. The reason behind the maximum number of pedestrian in the morning is the existence of 3 schools on the road. It has been found an additional numbers of parents and children coming to the schools during 8.00am-8.30am who were absent at the other study time. At noon people found it less comfortable walking on the road due to sunshine.

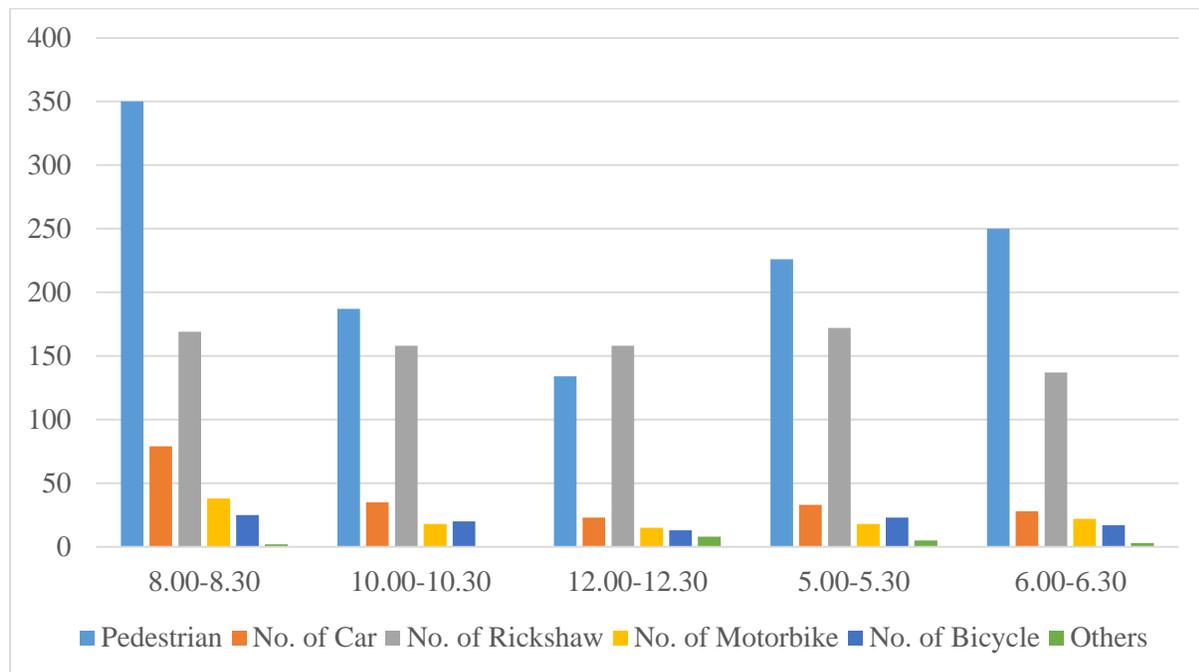


Figure: Volume of different traffic at different time

Rickshaw was found flowing roughly at constant level throughout the study time. The maximum number of rickshaw was found 5.00pm-5.30pm that is 172 while the minimum number of rickshaw was found at 6.00pm – 6.30pm.

The flow of car has been found very few at the study time. The maximum number of car was found in the morning and that is 79. The reason behind the maximum number of car in this time was also due to the additional car coming to the road to drop the school going children. It has been analyzed later at the “school users and others users at 8.00am – 8.30am” part of the report. The minimum number of car was found 23 at noon. At others study times the flow of car was found nearly at constant level ranging from 28 to 35.

The numbers of motorbike and bicycle were low with respect to the others mode. Maximum numbers of motorbike was found in the morning that is 38 while the minimum number was found

15 at 12.0pm-12.30pm. Maximum number of bicycle was found 25 at 8.00am- 8.30am and minimum number of bicycle was found 13 at 12.00pm-12.30pm. At the others study time bicycle was found flowing nearly at constant level ranging from 17 to 23.

Except the mentioned mode there were few others mode found flowing on the road. They are very few in numbers. Maximum number of others mode was found 8 at 12.00pm- 12.30pm. Ambulance, mini-truck, van, CNG and brick-breaker were the others mode.

4.2.2 Road users

The total study time was 2.5 hours studying having 30 minutes interval at 5 different times. The study time has been shown in the appendix. After studying for 2.5 hours pedestrian has been found the maximum user. 1147 pedestrian used the road which is 43.71% of all users. The second maximum users were rickshaw users. They were 910 users who are 34.68% of all users. The car users are 10.52% while the numbers of car users are 276. The numbers of motorbike users are 163 that is 6.21%, bicycle users are 98 that is 3.73% and others user are 18 that is 1.14% of all users.

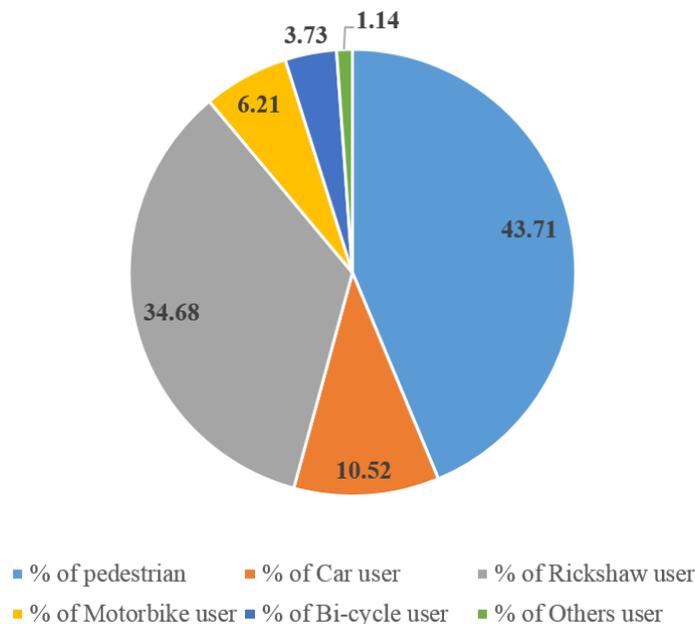


Figure: Percentage of different road users

The variation of road users with respect to 5 different study time is nearly as same as the variation of traffic. The maximum number of rickshaw users was found 213 at 5.00pm-5.30pm and the minimum number of rickshaw users was found 157 at 12.00pm-12.30pm. The numbers of

rickshaw users were 194, 163 and 183 at 8.00am-8.30am, 10.00am-10.30am and 6.00pm-6.30pm respectively. The maximum number of car users were found 123 at 8.00am-8.30am and minimum number was found 32 at 12.00pm-12.30pm. At others study times the number of car users was found ranging from 38 to 51. Maximum number of motorbike users was 56 found at 8.00am-8.30am and minimum number was found 23 at 12.00pm-12.30pm. The numbers of motorbike users were 30, 25 and 29 at 10.00am-10.30am, 5.00pm-5.30pm and 6.00pm-6.30pm respectively. The variation pedestrian and bicycle users are as same as the mode.

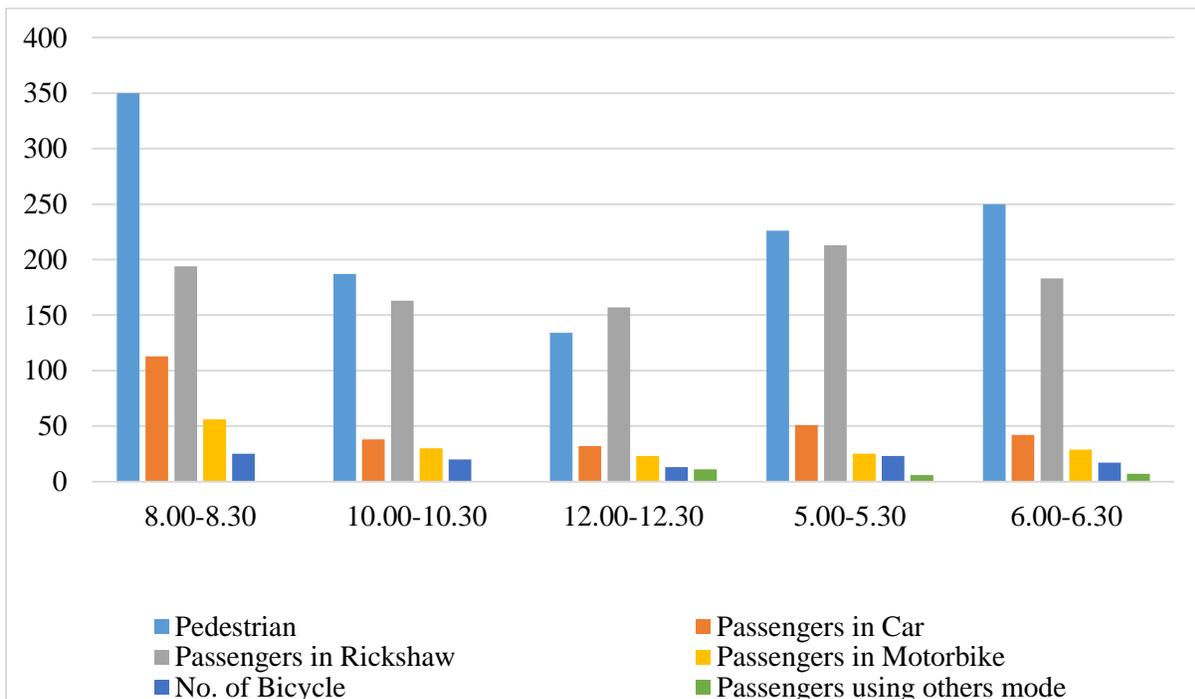


Figure: Volume of road users at different times

Analyzing the numbers of car, rickshaw and motorbike and the users respective to each traffic it has been found that the users per car, rickshaw and motorbike is 1.4, 1.1 and 1.5 respectively. The total numbers of car, rickshaw and motorbike were 198, 794 and 111 and their respective users were 276, 910 and 163 respectively.

4.2.3 Schools and others users at 8.00-8.30 am

The maximum composition of different types of traffic was found at 8.00am-8.30am. This was because of the presence of school going children and parents with others users in this time. The total numbers of users in this time was found 778 among which 323 people were the 3 schools

users and the rest 415 people were others user. The school users were 44% and others users were 56% users of all users. Among the 851 users 3 were pedestrian, 113 were car users, 194 were rickshaw users, 56 were motorbike users and res 25 were bicycle users.

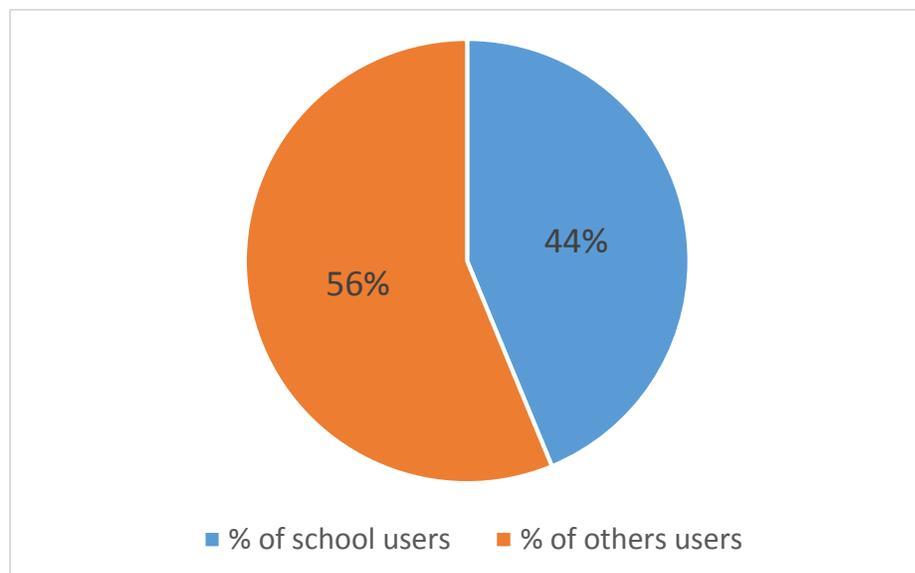


Figure: Percentage of school and others users

Among the 350 pedestrian 123 people were the school going children and their parents and rest 227 were other users. Among the 79 cars 31 cars came to drop the students of the schools and rest 48 went through the road for other purposes.

In the 31 cars coming to drop the students there were 67 users and in the 48 cars going through the road had 46 users. Among the 169 rickshaws 53 were to come to the schools by which 111 users came and rest 116 rickshaws went through the road taking 83 passengers. Among the 38 motorbike 11 motorbike came to drop the children to the schools and rest 27 went through the road. The numbers of motorbike users for coming to the schools were 22 while the others users were 34.

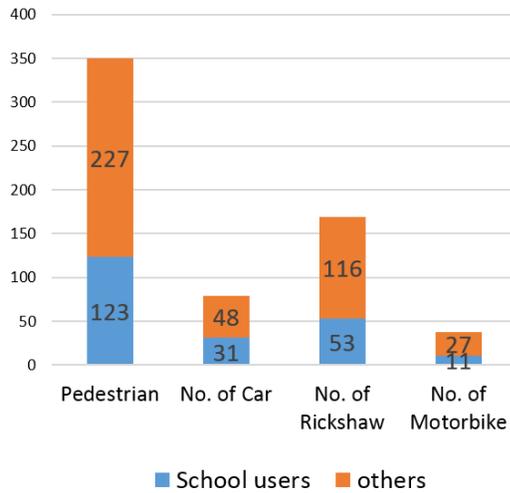


Figure: Numbers of traffic

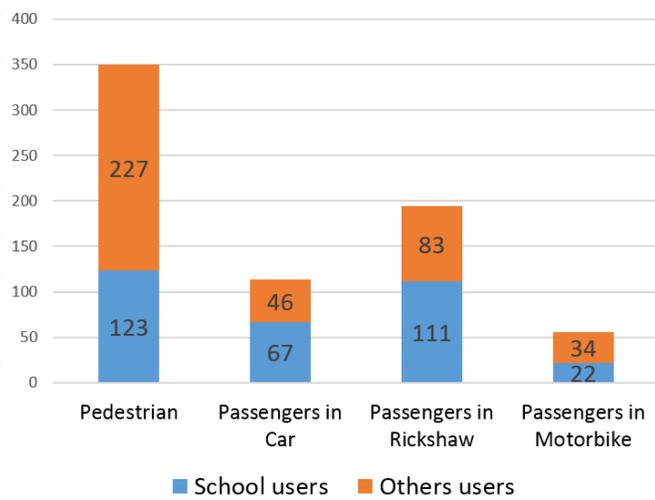


Figure: Numbers of users

4.2.4 Trend line of traffic variation

Trend line for each traffic shows the variation of traffic with respect to 5 individual time. It was found that pedestrian and rickshaw were the dominating traffics on the road. The maximum number of pedestrian was found in the morning and it started decreasing with time and the number of pedestrian became minimum at 12.00pm-12.30pm. Then the numbers of pedestrian started increasing again with time.

The trend line of rickshaw shows the flowing of rickshaw nearly at constant level. A small amount of rickshaw increased at 5.00pm-5.30pm from the average level.

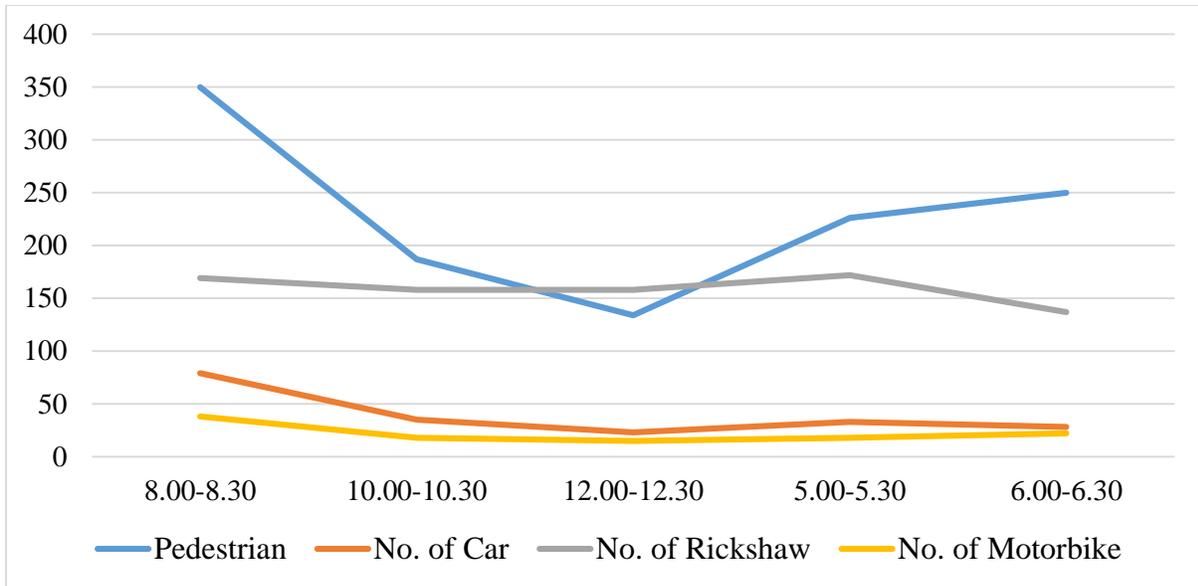


Figure: Trend line of different traffic

The flow of others mode were found too small and nearly at constant level. Among them maximum flow of car, motorbike and cycle were found in the morning and all of them were found decreasing till 12.00pm-12.30pm. Then a very small amount of car was found increased at 5.00pm-5.30pm which decreased by a very few numbers later.

4.2.5 Traffic volume at alternative route

Primary data collection on alternative route has been done only at 5.00pm-5.30pm as the study route will be proposed completely restricted for all types of traffic in the afternoon for the purpose of children's playing, cycling, walking for elders and so on. There were 4 alternative roads named Mohammadia housing society road no 2, 4, 5 and 6. They are described below in details.

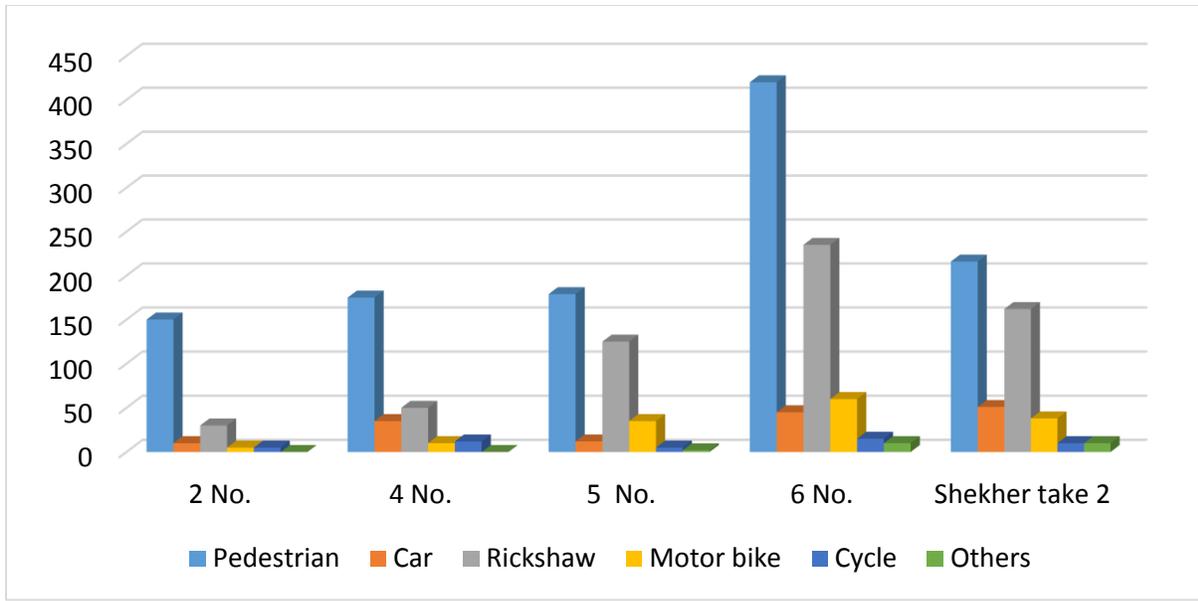


Figure: Traffic volume at alternative roads

1. Mohammadia housing society road no 2

The road is 350 meter long having an intersection at 200 meter from the entry. It is a dead end road. The traffic volume was minimum among the four alternative roads. The maximum users of the road was pedestrian and their number was 150. There were 30 rickshaws, 10 cars, 5 motor bikes and 5 cycles using the roads within the study time.

2. Mohammadia housing society road no 4

The road is 400 meter long having an intersection at 200 meter from the entry. It is also a dead end road. The traffic volume was more than the road no 2 but less than others two alternative roads. The maximum users of the road was also pedestrian and their number was 175. The numbers of car was comparatively more than the road no 2,3 and 5. There were 35 cars, 50 rickshaws, 10 motor bikes and 12 cycles using the roads within the study time. 5 cars were found parked for the study time.

3. Mohammadia housing society road no 5

The road is 350 meter long having an intersection at 200 meter from the entry. It is also a dead end road. The composition of all types of traffic volume was less than the road no 6 but more than the two others alternative roads. The maximum users of the road was pedestrian and their number was 179. The numbers of rickshaw was much more in this

road than the road no 2 and 4. There were 125 rickshaws, 12 cars, 35 motor bikes and 5 cycles using the roads within the study time.

4. Mohammadia housing society road no 6

It is the longest and busiest road among the Mohammadia housing society roads. It is 500 meter long having an intersection at 200 meter from the entry. It has started from the Mohammadi road and finished at Shekhertek road no 2. It is busiest roads due to presence of many floors used for commercial purpose and the numbers of food vendors are so much in this road. The maximum users of the road was pedestrian. There is a mosque at the intersection of the road that induced an additional numbers of pedestrian. At the study time 420 pedestrians were found on the road. The numbers of rickshaw was also high and that was 235. During study time 45 cars, 60 motorbikes 15 bicycles and 10 others vehicles were found. Among the others vehicle cargo van, mini truck, CNG, pushcart and truck were few of them.

5. Shekhertek road no 2

The road is 600 meter long starting from the Shekhertek main road and finished nearly at Nobodoy housing limited. This is too busy a road among all the roads in Shekhertek. The total number of pedestrian was found 216, 126 rickshaws, 38 motor bikes, 10 cycles and 10 others traffic. In this road flow of car is quite more than the others alternative roads. The total number of car found during the study time was 51.

4.3 Pollution analysis:

4.3.1 Sound level

The sound source of the road was mostly vehicular sound. The average sound level was found 71decibel. The maximum sound level was found 105 decibel which was found when a car made o horn. The minimum sound level was 67 decibel that was found when there was no vehicle on the road.

4.3.2 Air quality

A limitation of our study was to measure the air quality of the existing road in details. Presence of different particle size was measured using particle counter instruments. The main pollutants were

coming from the vehicular smoke. Air quality was measured at two times. Firstly it was measured at 12.00pm and secondly it was measured at 6.00pm. At both time the instrument showed red signal that refers the air quality of the road is too bad and harmful for health. Presence and amount of different air pollutants were not calculated in details due to limitation of the instrument and experts.

4.4 Present social activity on the road

The road was found not so much busy throughout the study. There were very little volume of traffic almost every time. In spite of the road not being busy, no social activity was found on the road at the study time except few boys playing in the afternoon for roughly 1 hour. Around 12-14 boys were playing cricket with temporary playing structure and two kids were found playing badminton. Due to flow of traffic the children had to stop their playing again and again. Even their playing equipment was found being damaged due to flow of rickshaw at the study time. In the afternoon 5-6 guards were found gossiping. In the evening only two women were found walking for physical fitness.



Fig: Children playing badminton

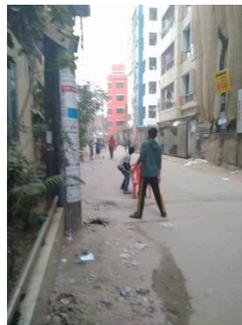


Fig: Children playing cricket



Figure: Stopping of playing due to flow of traffic



Figure: Damage of the badminton feather



Figure: Stopping of playing due to traffic flow

Present scenario of the road in the afternoon

In the afternoon it was found the road having low volume. The air condition of the road looked apparently good but the air quality measuring instrument showed the air quality of the road is bad. No social activity was found in the road except playing few children while at the same time few cyclists and more children were found playing at the adjacent three roads. The main reason for choosing the others road for cycling and playing was the roads being dead end.

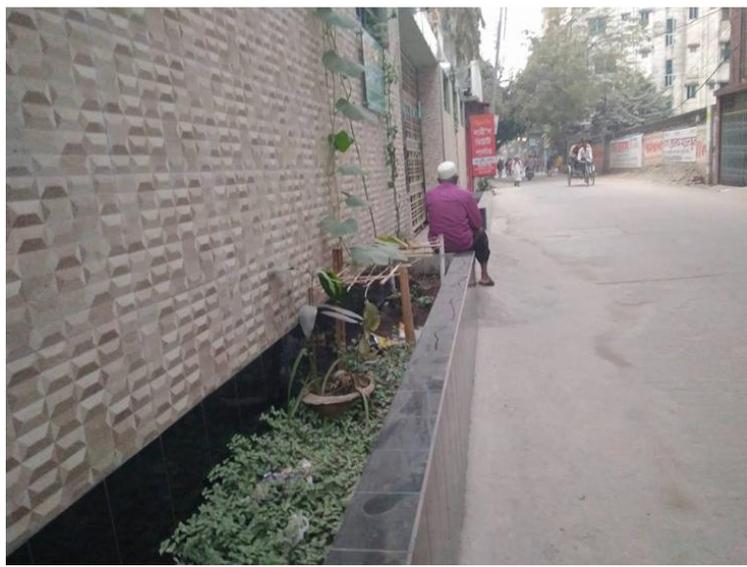


Figure: Present scenario of the road in the afternoon

4.5 Present scenario of the alternative roads in the afternoon

The present scenario of the alternative roads were quite good. The adjacent road no.2, road no. 4 and road no. 5 were dead end roads. As a result there were many children playing and cycling on the roads. 22 children were found playing cricket dividing four team on road no. 2. 6 children were playing cricket and 8 children were playing football on the road no. 4 in the afternoon. 6 children were found bicycling on road no.5. The road no. 6 and Shekhertek road no. 2 were two major connecting road of Mohammadia Housing Society and Shekhertek that were more busy than the other alternative roads. But traffic were not so much which were flowing without creation of any congestion on the road during the survey time. All the roads are affordable to get the pressure of additional traffic of the study road easily.



Figure: Children playing on road no. 2



Figure: Children bicycling on road no. 5



Figure: Children playing on road no. 5

4.6 Sample size for questionnaire survey

There were 42 buildings along the road. It was quite difficult to go to meet all dwellers due to time and manpower constraints. So to carry out the public opinion questionnaire survey was done on 25 dwellers among which 10 people had car and rest 15 people having no car. Among the 10 car owners 5 people were house owner 5 people were living in rented flat. Among 15 people who had no car 4 shopkeepers, 2 street vendors, 1 children, 3 guards and 3 mothers of school going children and 2 women using the road only for walking purpose in the evening.

4.7 Public opinion for making the road car free

Questionnaire survey was done to carry out the public opinion on making the road car free. Questions were set according to carry out their opinion on the disturbance on their walking due to flow of car, sound and air pollution, safety and security concern, purpose of use of the road, creation of public space, participation on making the road car free and supporting both socially and economically.

After completion of the household survey it was found that there were 56 cars. The major activity of the cars were dropping the children to the schools, going to office, going to shopping market and visiting the relatives etc. Most of the cars set out of the building within 8.00am-10.00am and come back to the building within 6.00pm-10.00pm. But the entry and exit is not confined within the time. Many users use their cars whenever they need. Almost all of them are interested the road to be car free. But they are in a doubt whether they will be able to follow the regulation in the afternoon when restriction of all types of mode will run. Again few of them were worried about how through traffic users of the road would reach Adabor if the road is declared as car free.

Few dwellers are anxious about the noise and public gathering due to creation of public space. As there is no active club or committee many of them are in confusion whether the project will run well or not.

4.8 Challenges to implement the project

To implement the project there are few constraints that are needed to overcome. They are described in details below.

1. Connectivity system and travel time

The main purpose of cars of outsiders coming from Mohammadia road are to use the road to reach adjacent road no.6 or to reach Shekhertek main road. The cars who use the road only to reach road no 6 can easily reach there using adjacent two alternative roads that are road no 4 and road no 5. Rather they can easily use 6 no roads directly coming from Mohammadia road.

A new proposal is needed for those cars who enter into the road from Mohammadia road to reach Shekhetek main road. Here, the car has to cover 800 meter to reach the Shekhertek main road and it takes 4 minutes to reach there. If restriction is imposed on these cars, they

have one alternative way to reach there from Mohammadia road. Firstly the car need to enter the Shekher take road no 2 using Mohammadia housing society road no 6. Then the car can easily reach to the Shekhertek main road using Shekher take road no 2 or Shekhertek road no 3. If the car uses Shekhertek road no 2 it needs to cover 1000 meter and it needs to cover 1050 meter if it uses Shekhertek road no 3. Here the car takes 5 minutes to reach the Shekhertek main road just one minute more than the time required if it uses the study road.

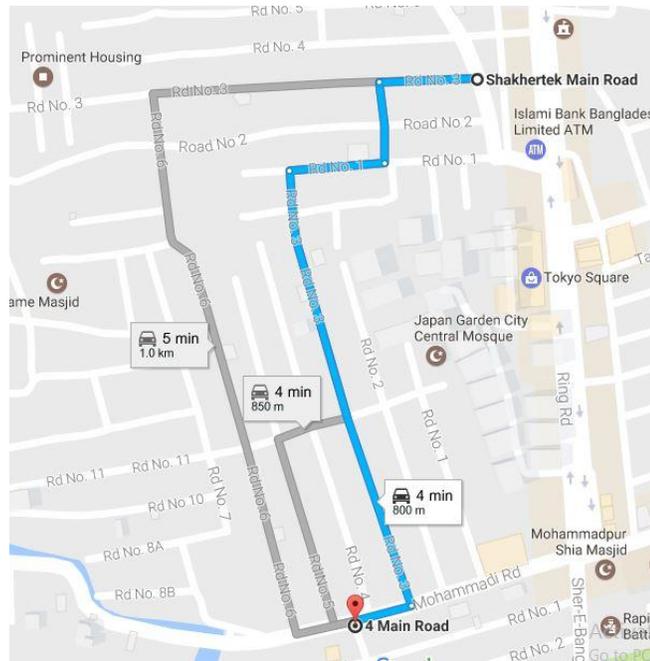


Figure: Alternative road comparison with study road

Few cars use the study road to come to the intersection of Mohammadia housing society road no 6 where Baitul Wahab Jame Masjid is located from Shekhertek main road. For them the alternative road is as same as mentioned before. Here the car needs to cover 650 meter that takes the car 3 minutes is it uses the study road. But if the car use alternative road it needs to cover 700-750 meter which take 4 minutes that is only one minute more than the previous time.

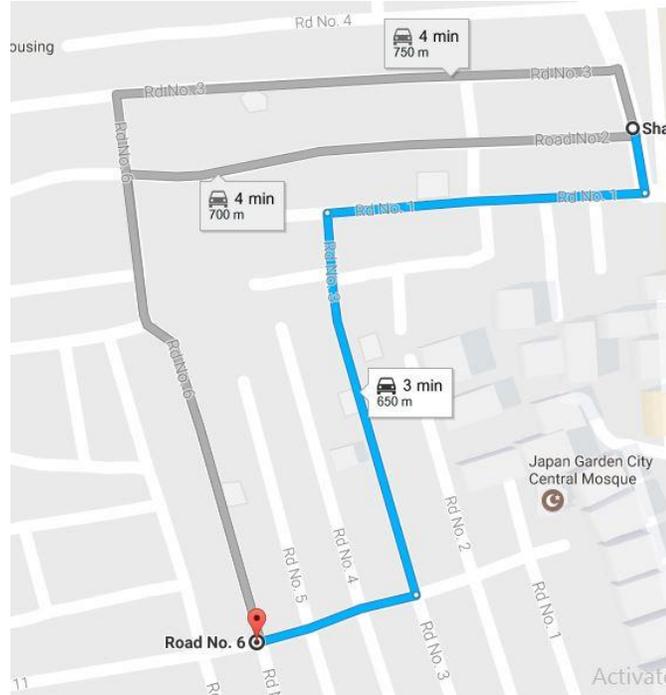


Figure: Alternative road comparison with study road

2. Modal split among others road

To understand the future modal split if restriction on car is made, per minute volume of traffic on the roads has been calculated. Here only car, rickshaw, motor bike and cycle have been calculated. The total traffic mode was seen 1.7 per minute in road no 2 among which 1 was rickshaw that refers per minute 1 rickshaw goes through the road. For road no 4 the total number of traffic was found 3.9 per minute among which 1.72 were rickshaws, 1.2 were cars and rest was motorbike and cycle. Total number of traffic volume was found 5.9 per minute in road no 5. Among them 4.2 were rickshaws, 1.2 were motorbike. Car per minute was only .4 in this road. The total traffic volume was found nearly 12 per minute in road no 6. Among them rickshaws were 7.8, car 1.5, motor bike 2 and cycle was .5.

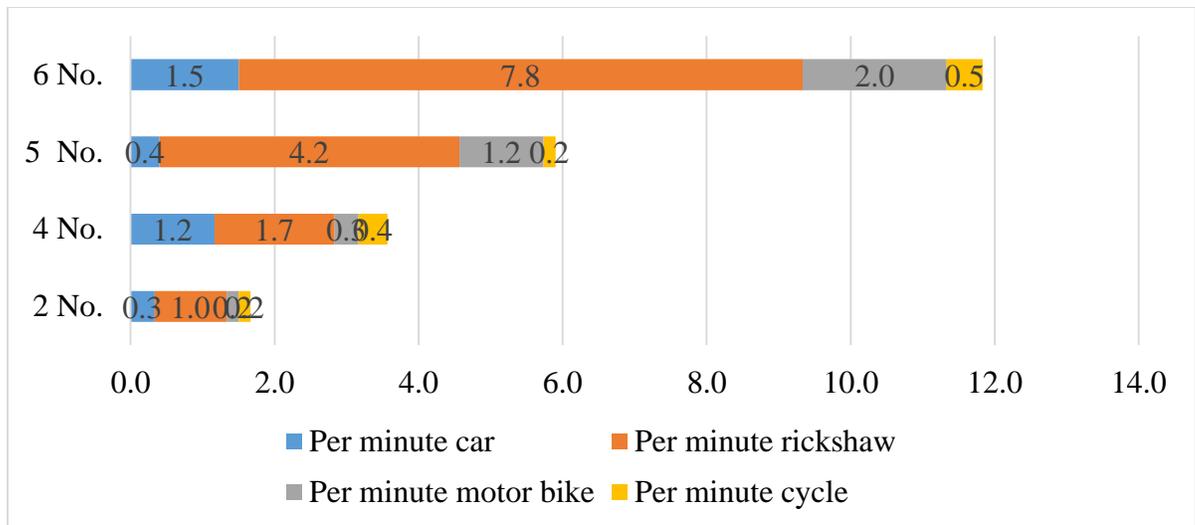


Figure: Existing traffic per minute on the alternative roads

In this segment modal split has been calculated at the time 5.00pm-5.30pm when the study road would be proposed to be restricted for the entry of all types of roads both for the dwellers along the road and outsiders. At others time only car will be restricted. As the number of car was found so low it has been assumed the alternative roads can easily afford the additional entry of cars easily. So special concern has been shown in the afternoon.

To have a clear idea on the diversion of the traffics to others roads, total number of traffic entering to and exiting from the roads has been collected at 5.00pm-5.30pm. It was found that 3 cars, 51 rickshaws, 22 motor bikes and 6 others mode entered into the road. 6 cars, 49 rickshaws, 5 motor bikes, 3 cycles and 12 others traffic exited the road. So it is a big challenge to divert these 157 vehicles to others roads without making traffic congestion on these roads within 30 minutes that means nearly 5.23 vehicles are needed to divert to 4 alternative roads per minute. The study road would be proposed be blocked by all entries in this time. So road no 2 would no more be the alternative road as it needs to cross study road to reach the road no 2. So now the alternative roads are only road no 4,5 and 6.

It has been assumed that the road no 6 would share the 40% and the road no 4 and 5 would share 30% each of the total traffic of the study road. So the new total volume in road no 4 is 4.6 per minute among which 1.5 are cars, 2.8 are rickshaws .5 is motor bike and .6 is cycle. The new total volume in road no 5 is 7.9 per minute among which .7 is cars, 2.8 are rickshaws, 1.3 are motor bike and .4 is cycle. The new total volume in road no 6 is 14.3 per minute among which 1.9 are cars, 10.1 are rickshaws, 2.2 are motor bike and .8 is cycle.

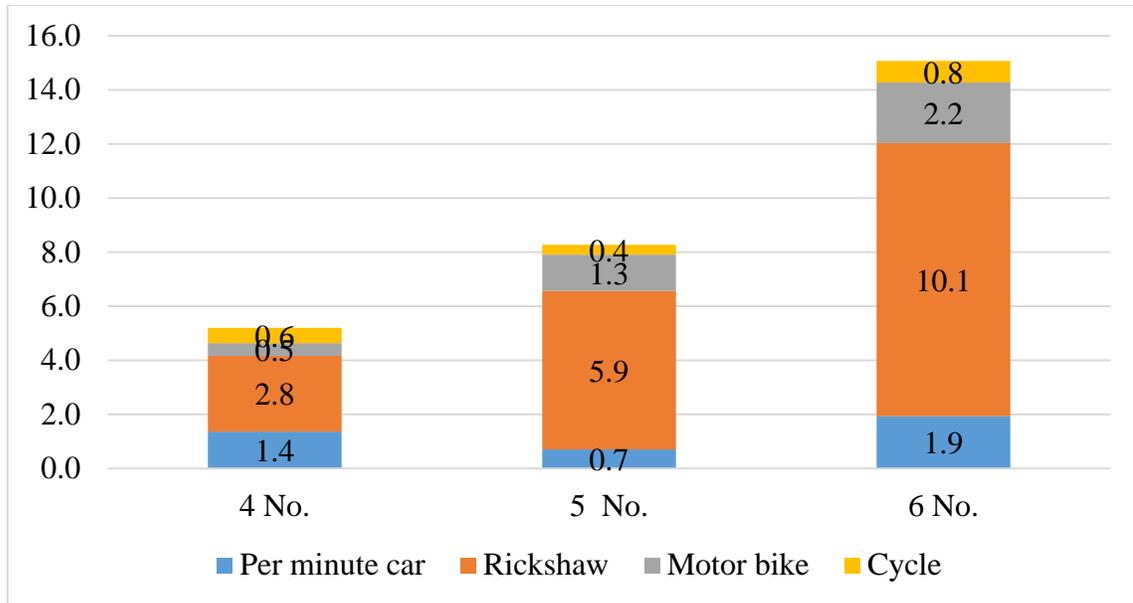


Figure: Projected future traffic per minute on the alternative roads

3. People gathering and noise

Few existing dwellers became anxious of the noise and public gathering due to conversion of the road to public space. It would be maintained by the local people. Establishment of a strong committee may regulate the situation well.

4. Management

Management of the proposed activity is so important to run the project well. Among various management activity checking the cars of the owners, guest and outsiders is the first one. In the afternoon few temporary playing equipment, sitting arrangements, environment friendly temporary landscaping elements etc would be provided that require proper maintenance. 3 guards would be proposed for the entire road among them two guards would stay at the two entry of the road and rest one would stay at the intersection.

5. Economic support

The most important factor to run the project is the economic support. The initial investment for providing facilities such as sitting arrangement, playing equipment, landscaping element etc. would be provided by the city corporation. But a monthly amount is needed for the maintenance of the project. Salary of the three guards are the major cost needed monthly. To accommodate the monthly expenditure public participation is a must. There are 600 apartments along the road. If each dweller of the apartment donates Tk. 50 per month, total amount will Tk. 30,000 which is sufficient enough to maintain the project very

well. The house owner would collect the donation with the rent of the apartment and submit it at the central committee.

4.9 Conclusion

This road is an important road. So it might face much more challenge in implementation of this initiative. But there is alternative roads. Therefore, successful implementation and continuation of it can help changing mind set by establishing this example. This example will help to replicate this project in other busy roads of Dhaka.

Chapter Five: Recommendation

5.1 Proposed plan of the road no 3, MH Housing

The proposed plan has been recommended keeping in mind the use of the road at different times by different aged group people. For children three portions of the road has been proposed for playing. Each of them are 50 meter long where 16 children can play in each portion. The space has been proposed mostly for cricket and football. 150 meter carpeting would be provided by the city corporation for the three portions as the children do not be injured at the time of playing. A portion of 20 meter has been proposed for play lot where few temporary playing equipment like see-saw, marry-go-round, sandbox etc would be provided. It is proposed for 20 babies. As the mothers of the baby can sit well, well designed and environment friendly sitting arrangement has been proposed. The capacity of the sitting arrangement would be 4. But there may be different types of seats. Few food vendors have been suggested to conduct their business in the road. The vendors must be committed to sell the quality food with relevant price.

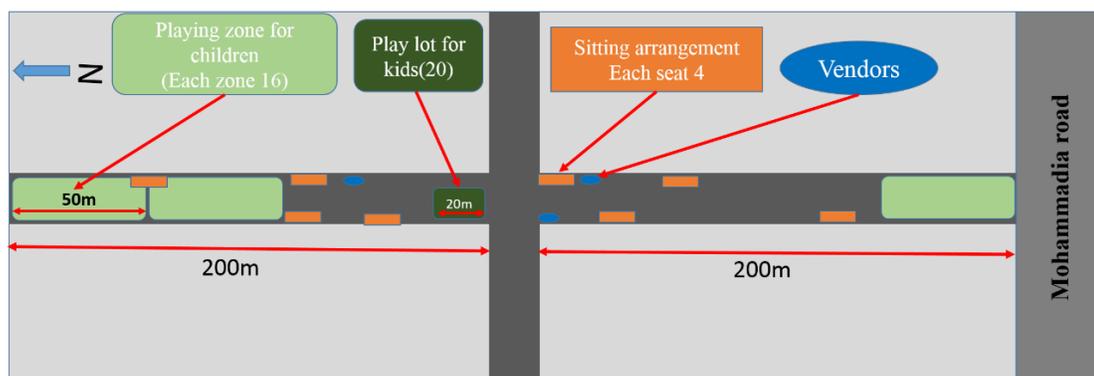


Figure: Plan view of the proposed road

5.2 proposed policy plan for Razia Sultana road:

5.2.1 Transport related recommendations:

External car is a threat for the community people. So external Car will be prohibited to enter into these road for the purpose of shopping, passing the road or any other use. And these banned cars on the roads will use Salimullah road as an alternative route. Guests' car will be given entry into the roads and will be parked on the roadside of B roads (Figure 1). Pressure on the B roads is very low. So if car is also banned, a few number of guest cars can easily be parked on the roadside. Car with aged people, infant, sick, handicapped people will get relaxation from this rule. The car of internal house owner (marked by sticker) will be regulated by speed and time. The afternoon period spanning from 3 pm to 6 pm (seasonally varied) will be free from internal car movement. And rickshaw will be allowed to move only through road A in the afternoon. Ambulance and fire brigade will get highest privilege to enter.

5.2.2 Social activity:

Footpath will be redesigned to assist the handicapped people. The B roads will be used as play lot for the children in afternoon. Sittings, shades, small food cart will be provided to facilitate social inclusion and coherence. Greenery will be provided and urban agriculture will be encouraged to sequester carbon emission. The urban infrastructure will be provided to facilitate children activity, walking, bicycle users Controlled vending will be offered. It will also help employment and to lessen car trip.

5.3 Recommended facility

- Sitting arrangement for pedestrian
- For parents of the children
- For the people using the road for walking purpose only in the morning and evening



Fig: Coloring road surface and manmade landscaping



Fig: Play lot for kids



Fig: Steps for sitting and mini pool



Fig: Sitting arrangement



Fig: Artificial grass bed carpeting



Fig: Aesthetic coloring of adjacent building

- Attracts people to use the road for walking
- Create public space
- Aesthetically pleasant
- Increase social attraction

Recommendation and policy

- External Car will be prohibited to enter into these road for the purpose of shopping, passing the road or any other use.
- Guest's car will be allowed to enter into these road with few criteria.
- Car with aged people, infant, sick, handicapped people will get relaxation from this rule.
- The car of internal house owner (marked by sticker) will be regulated by speed and time.
- Ambulance and fire brigade will get highest privilege to enter
- Sittings, shades, small food cart will be provided to facilitate social inclusion and coherence.
- greenery will be provided and urban agriculture will be encouraged to sequester carbon emission
- The urban infrastructure will be provided to facilitate children activity, walking, bicycle users
- Controlled vending will be offered. It will also help employment and to lessen car trip.

Chapter six: Conclusion

Making street car free might make some conflicts with car owners. But here there should be public forum or platform through which this kind of conflict can be resolved. Its necessary to make people realize that the city is not too big yet to traverse by a car a only option. For prevailing transportation problems of Dhaka city, promoting more public transportation is still the major prescription. This movement will get force when each community will act like a repelling factor for car use. Successful implementation of this project can promise to children of making their childhood more colorful and active. Different stakeholder should come to a united point to make this happen. Nobody will lose in this win-win solution.