

Pedestrian Walking Speed Data Analysis

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A Thesis paper is submitted to the Department of Civil Engineering, Daffodil International University in Fulfillment of the Partial Requirements for the completion of **Bachelor of Science in Civil Engineering** Degree.



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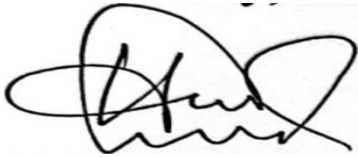
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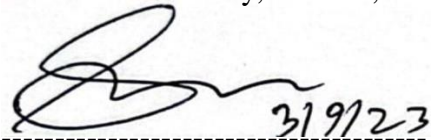
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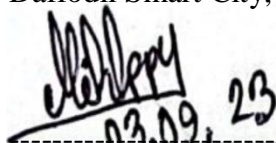
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This is to analogy with certify that the thesis book denominated “Pedestrian taking rapid walks among Dhaka city” submitted to analogy the Department of Civil Engineering Daffodil International University (DIU) in Bachelor of Science in Civil Engineering document some of the merits about the requirements documents our regulation making research policy are done by us under the custody of Kazi Obaidur Rahman, Assistant Professor, Department of Civil Engineering.

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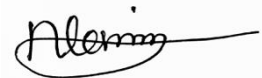
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COGNIZANCE

At the outset we express our gratitude to the great Creator for achieving the fruitful completion of our work and for giving us the strength and patience to do our work.

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ABSTRACT

Pedestrian is the most crucial factor for the roadway system in a mega city like Dhaka. As more than 17 million people are presently living in this city and all major commercial, economical, health and governmental activities are carried out here, millions of trips are generated each day. For each trip, maker has to walk on foot for a segment of the trip and in some cases for the entire trip. But there are insufficient pedestrian facilities in Dhaka and the available facilities are not properly used due to enormous deficiency. Pedestrian safety at intersections is influenced by several factors, among which behavior of pedestrians has the most direct impact. Effective management of pedestrian behavior can make the road network functional whereas failure to do so will worsen the situation. Therefore, the aim of this study is to analyze pedestrian walking speed. It continues to suggest if there is a necessity of grade separated pedestrian facility as it is an integral component of road safety and traffic management. In the survey, number of pedestrian crossing in the sidewalk directions, number of pedestrian crossing using sidewalk were collected at peak period. At selected intersections, existing walking and crossing facilities were observed and deficiencies were identified. In the surveyed intersections, percentages of illegal crossings were quite high with an average of about (66.25 m/min). About 4 hours of data collected, the necessity of grade separated facilities in these intersections has been justified as the number of crossings in each intersection was found more than 1953 pedestrian crossings per hour. From questioner data it has been found that pedestrians are unwilling to use the facilities provided and there is lack of respect towards the traffic law. So, to improve the pedestrian safety and conduct effective intersection operations, both at-grade and grade separated facilities are needed in those intersections with proper engineering, educational and enforcement measures.

RUNDOWN OF ACRONYMS

| | |
|--------------|---|
| ARI | Accident Research Institute |
| RUET | Rajshahi University of Engineering and Technology |
| BUET | Bangladesh University of Engineering and Technology |
| BRTA | Bangladesh Road Transport Authority |
| DM | Data Mining |
| GDP | Gross Domestic Product |
| MAAP | Microcomputer Accident Analysis Package |
| RTA | Road Traffic Accident |
| WHO | World Health Organization |
| GIS | Geographical Information System |
| NHTSA | National Highway Traffic Safety Administration |
| AI | Artificial Intelligence |
| PC | Personal Computer |
| RHD | Roads and Highways Department |
| LGED | Local Government Engineering Department |
| OCR | Optical character recognition |
| MS | Microsoft |

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CHAPTER 1

Introduction

1.1 Introduction

Dhaka is the capital of Bangladesh and the largest city of Bangladesh. The population is increasing as compared to other years Bangladesh has the largest population of children reading about 16 crore 51 lakh 58 thousand Dhaka is the largest city with a population of 616 people. The only reason for the increase in population and the number of people in Dhaka is that the interest of pedestrians in the suburbs of Dhaka metropolis is increasing if there is employment. Unemployed people are improving. Hearing the virtues of frequent movement or pedestrian circulation is a source of inspiration for the city of Dhaka population growth. Pedestrian holds organization. To recognize the current status of Pedestrian mode, the foot office should test walker features for different people. Valid Considerations have been given to concentrate on general behavior and qualities of pedestrian flow for Dhaka city. There was a study of different models for bystander workplaces around the world guidelines for developing an ideal model in Dhaka Metropolitan City. Various investigations are going on the pace of walking was led by numerous experts in various areas on the walking path. It has been discovered that the walking speed of humans on foot is dependent on the range of reach. Individual state of being, sexual orientation, age and various other variables. One led by Hoel (1968). Investigate the Pittsburgh Central Business District during peak and off-peak times of the demand achieved an average walking velocity of 4.80 ft/s (88 m/min). Riper (1968) indicated. A similar report and an average walking velocity were obtained on the footpath in London's Oxford Street 78.6 m/min. Nevin and Wheeler (1969) conducted an experiment among students University of Missouri, Columbia the mobile was discovered at 79 m/min. Fruin (1971) administered a test among workers in the United States and obtained an average walking speed is 81 m/min. Pollas et al. (1983) Exploring Person Development People use the stream on foot in the focal business district of Haifa, Israel The trick was a video recording device and a computerized watch instead of a cine camera used and obtained a normal walking rate of 78.8 m/min. Tanaboriboon et al.(1986) in the lead tested in Southeast Asia and achieved an average walking speed of 74 m/min. Murata (1978) introduced traffic cell rules that introduced pedestrianization to larger sections of the road In Nagano, Japan. Development of Pedestrian Arrangement Guidelines for Dhaka Metropolitan City Direct examination on nearby common qualities is required. The walk rate is an important factor for planning people in office on foot. This paper aims to build up connections between speed, flow, thickness, and space for people on foot at walkways of metropolitan area in Dhaka Metropolitan City. These results can be valuable System and planning of pedestrian network in Dhaka and can be implemented in different cities Communities of Bangladesh.

1.2 Background

This study aims to provide and epitomize area progress data in Bangladesh. Factors affecting walking speed are fully considered. Walker Stream attributes are currently under investigation as it is imperative to plan a viable and capable Walker and Street network office. Pedestrian Control Level (LOS) is rated to capture the nature of pedestrian office activity.

1.3 Objective & Study

This study has been conducted achieve the following goals:

1. To identify and understand the current pedestrian walking speed in Dhaka city.
2. To find out the problems pedestrians faced during walking.
3. To suggest the need for pedestrian walking facilities .

1.4 Scope concerning discipline

Particularly, this quest centered on signalized pedestrian passing with the goal of realizing how operational alterations could upgrade the level of service given to pedestrians. The inquiry isn't meant to be a best-exercise guide; moreover, it's meant to assist you to recognize problems and make serviceable operational recommendations. Non-signalized crossing kinds, such as zebra crossings, are typically found outside the research, as there is the youngest potential to trade their performance through operational mechanisms.

1.5 Expected Usefulness During the Research

This survey should be a major exercise in the reflection search of tourist characteristics and their offices in the big cities of Bangladesh. According to the arranger and creators, the aftermath of this test may still be useful, according to a sufficiently effective and especially tightly closed tourist office sketch. This surveillance was previously limited to people cheering on the sidewalk.

CHAPTER 2

Review of Literature

2.1 Introduction

This section contains land surveys based on previous surveys but assigned configurations for pedestrian planning. At this point, discoveries from previous overseas studies begin to protect the various issues and factors that affect the rover's speed. This is where the effect comes from. A significant number of areas or current excursion motives have been deconstructed with regard to their concussion on locomotion. Then adjust the dimensions according to the specifics of your climate and carry large amounts of weight on a regular basis. As a result, the final dialogue of the section draws each individual in. Tangles, but puts things in place because there is rest.

2.2 The Importance of Walking

The quality of human improvement, and body measurements, with individual space inclinations and connections with others, are helpful for getting person-on-foot connections. Thinking about the width of the human shoulders, body influence, and shirking of contact with others, individuals require sideways space, lengthwise, space for walking, including space for pacing for acceptable improvement and keeping away from disagreement. Individuals like to stay away from contact with others apart from where such swarming is essential. At the inadequately investigate public purpose, illogical crowding at horrible densities approaching the territory of the human body has brought about mass fatalities. Fruin (1971) presented the idea of Body Ellipses and Support Zones and contended that people on foot effort to keep a specific distance between themselves and different people on foot.

Table 2.1: Comparison of the Observed Walking Speeds in different Studies.

| City, Country | Mean Speed (m/min) | Author (s) |
|--------------------------|---------------------------|---------------------------|
| Pittsburgh, United State | 88 | Hole (1968) |
| London,England | 79 | Older (1968) |
| Columbia, United State | 79 | Navana and Wheeler (1969) |
| New York, United State | 81 | Frain (1971) |
| Paris, France | 87 | Kamini (1980) |

Table 2.2: Comparison of the Observed Walking Speeds in different Studies.

| City, Country | Mean Speed (m/min) | Authors (s) |
|-----------------------------|--------------------|---------------------------------|
| Osaka, Japan | 90 | Kamino (1980) |
| Koori-cho, Fukushima, Japan | 69.6 | Kamino (1980) |
| Osaka, Japan | 93.6 | Kamino (1980) |
| Singapore | 74 | Tanaboriboon et al. (1986) |
| Delhi, India | 72 | Gupta (1986) |
| Madras, India | 72 | Victor (1989) |
| Tiruchirapalli, India | 74 | Arasan et al (1994) |
| Haifa, Israel | 79 | Polus et al (1983) |
| Riyadh, Saudi Arabia | 65 | Koushki (1988) |
| Bangkok, Thailand | 73 | Tana Boriboon and Guyano (1991) |
| Kuwait | 71 | Koushki and Ali (1993) |
| China | 72 | Yu (1993) |
| Metro Manila, Philippines | 70.6 | Gerilla (1995) |

2.3 Walker Space Requirements

Among other things, ethnic mobility, anthropometry, and unique spatial tendencies or connectivity characteristics help establish pedestrian connectivity. Consideration of ethnic shoulder width and influence on the body. People need horizontal and vertical space to avoid contact with others. Because of the moderate growth or walking distance inhabited by a person, an individual, including step by step from a quarrel, pretends not to contact others wherever he is. A herd of this magnitude is inevitable. Poorly supervised community events have resulted in material death due to excessive swarming of corrupt densities that grow according to the ethnic group's locality. Ferin (1971) argued that when active, pedestrians stay under themselves after certain strips, while others stay on top of their feet. Affects walking speed. For aspect purposes, the US HCM (2000) Overseas set an extended body ring of 0.5 m x 0.6 m for the adjustable area, with a full house of approximately 0.3 m². The walker's oval and padded physique requirements are between the official he 2.1. It also suggests his 0.75 m² body assist zone for walking, which comes close to mimicking the area of more advanced exotic cushion

quarters by pushing, although Zupan (1975) The unnatural rearrangement is going until "Open.". Humans traveling on foot require a certain induction distance. This forward range is a rudimentary measure when it comes to setting the pace of a day's hikes, but crowds of hikers for expected performance miss the point between a certain duration and lifespan.

2.3.a Pedestrian body ellipse and buffer zone requirements:

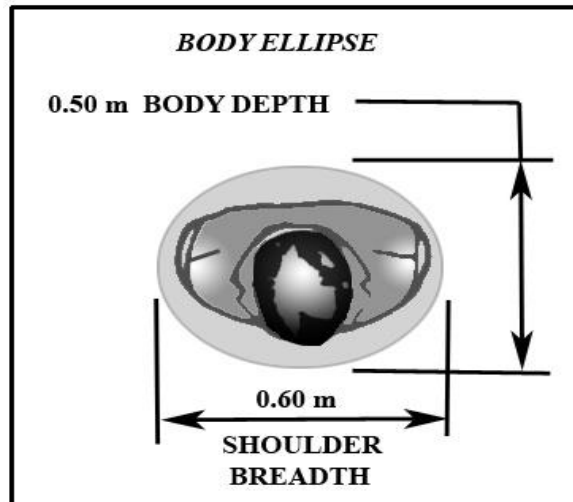


Figure 2.1: Pedestrian body ellipse.

In this figure, Schooling is required to format a simplified 50 cm x 60 cm body ellipse with a total area of 0.3 m² and 108 percent of the ellipse proposed by Fruin (1971) for the fixed area. indicates that After Fruin's ellipse, this shape (Fig. 2) performs fairly equivalently metrically. This command is close to the upper limit of the dumb quarter measurement provided by Pushkarev and Zupan (1975a) and also indicates using a body broker quarter of 0.75 m² before "artificial mixing" sets in.

2.3.b Pedistrian Zone or Forward Space

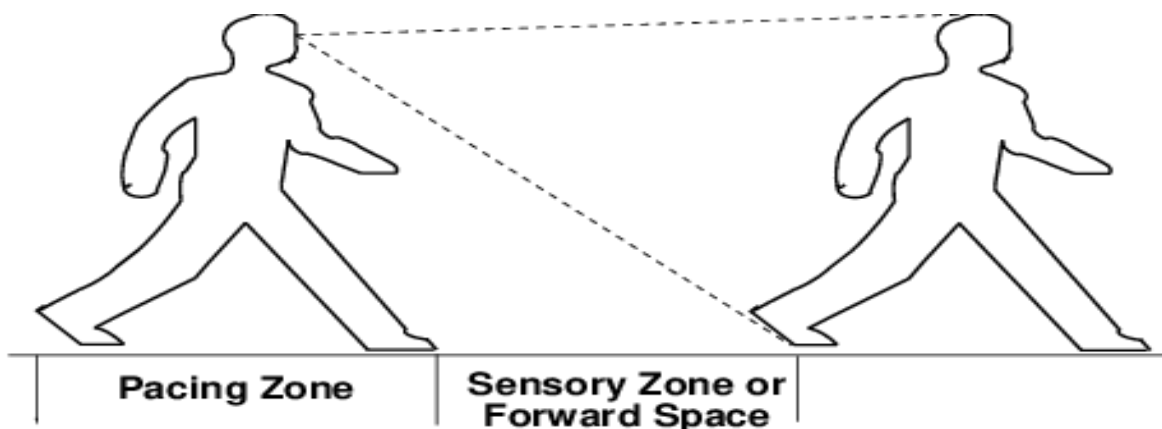


Figure 2.2: Pedestrian body Zone.

In this diagram, people are reaching out for different reasons. to observe up with the neighbor's speed, run excursions, go to school, around after a business meeting, and so on. People who pace for a diversity of reasons, including work, fitness benefits, and the pleasure of being on the go. If pedestrians want to move self-dependent, they must go through transitions properly and then move to a worthless place. It is the people's liability to provide a safe, secure and comfortable environment for all who walk. This statement describes pedestrian issues, pedestrian area surveys (data collection), characteristics, levels of dedicated service, and design criteria for pedestrian facilities. There are many problems with this.

2.3.c Human Ellipse

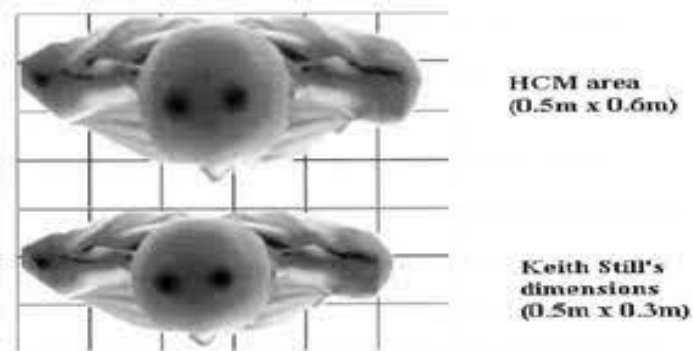


Figure 2.3: Comparison of Body Ellipses.

Everyone is out for a walk. His capability to reach his full potential is one of man's greatest capacity, and the quintessence of the stage in the constant rise of culture. Pedestrian facility placement and implementation bear a thorough understanding of pedestrian characteristics such as velocity, flow, area condition, range of inland balk, and pole drag.

2.4 Person by walking strolling speed on walkways

Public decide whether to walk at an alternating pace that he generally finds comfortable. Walk is the color of readiness in itself or the best color somebody uses to reach his one car or public transport and reach the end goal of the lane in terms of mode usage. African urban areas offer better itinerant modules than urban communities in Asia and Latin America. The rates of habitual walking in urban areas of Africa, Asia and Latin America are 57%, 37% and 22% respectively (Montgomery, 2006). To carry out the sheer volume of travel from international locations in Asia, Africa, and Latin America, we have to work with restricted travel agencies. A study in West Perth, Australia, found that 70% of all on-farm excursions or part of shopping trips were made on foot (Curtin University of Technology or Geografia, 2006). Due to reasons such as high street association, urban areas, planning, current workplaces or traditional foundations, people between agricultural countries, due to age, use regular exercise routines and travel goodly distances (Koushki, 1988) Foot Workplace for Best Performance, Happiness, and Assessment of Today's Workplace qualities such as morals. All (1991) in Canadian and

Asian cities created a person capable of testing the characteristics of passers-by. Seneviratne nor Moral (1985a, b) speculated that due to the obligation of Asian countries to emulate the attitudes formed by the attributes of the rangers of the region, the basic norms of order are personal. Nanoribbon or Guyana (1991) also stated that in Asian countries workplace, but nearby professionals should not immediately receive the ultimate passerby graphic standards and therefore need neighborhood planning ideas.q

2.5 Pedestrian Flow trademark

In many approaches, pedestrian swing is described in terms of known changeable such as velocity, volume, flow, and density, and thus is used similarly to vehicle swing. Other measures, particularly related to pedestrian gliding, move the flow of pedestrian site visitors through the main pedestrian flow in response to maneuvers, usually without competition or changes in walking speed. It consists of a function to switch the reverse path. Longer in assisting pedestrians at signalized and non-signalized intersections. Pedestrian movement is assumed to be diverse according to the movement of vehicles, and it can be unidirectional, bidirectional, and multidirectional. Pedestrian slaves don't usually follow a clear path, but it can be difficult to go with the flow.

2.6 Ramifications for Person by Walking Speed

At certain point in the 1960s, a large-scale survey of the Commons began. A number of studies have been conducted in recent years that attempt to determine outcomes regarding the human factors associated with passerby behavior. Various researchers (Heath, 1970; Rastogi et al., 2011; Azmi et al., 2012) investigated the effects of walking speed predictors on different sidewalks. They have a wide range of ground variations in terms of body, age, gender, appropriate health, height and weight, environmental factors, nugget size, exercise enjoyment, or odd management such as day ground. I discovered people's walking speed. to expectations. A mix of individual elements can also seriously affect a passer's pace and movement. Suggestiveness tests were performed at safe odds of 95 using the F-test (Heath, 1970) to determine if the prices reported below were significantly different Various influencing factors by testing unsupportable speculation. Judging from the diagram of workplace functions, each influences a specific effect according to the amount it can achieve (Rastogi et al., 2011). Those who run more and more regularly turn others off again according to standard motives. Tries to hold back under deterrence. Humans do not like to walk behind mysterious people and close them. Such intentions usually diverge or go a little further. As such, foot velocity depends on what makes extraordinary human capabilities unique pedestrian obstacles (Azmi et al., 2012). Walking speed is limited with age, especially after age 60, but older gray-haired adults are willing to run well into their 40s for faster distances. Because each person is different, there are many visitors who walk at a pace. A general finding of these testimonies is that women are satisfied more slowly than men, but women over 60 are more tender than their younger partners. All my research and research increased my movement speed from 98m/min to

33m/min to an ugly 80m/min. Despite various studies of ethnic factors in frequent intercourse, mainly on walking speed, there were no predictable outcomes due to the influence of sexual orientation, age, luggage handling, or other factors. This can also be caused by disagreements about comprehension goals. Another possibility is that some solutions did not transform common disturbing effects into exclusive factors, but still examined one weight. Velocities recorded by experts as normal pedestrians are a matter of infinite factors: age, gender and competitive altar have been reported consistently . Individual masses are usually the factors that have been studied in the general literature because they are specified including individual site conditions (Frain, 1971). It is generally recognized that pedestrian walking speed is strongly influenced by age and then disability, with the slowest walking speeds occurring in the elderly, adolescents, children under five years of age, or the infirm. many (Dewar, 1992). Shahrud Mohamad dan (2010) suggested that walking behavior can be estimated by minute-by-minute walking distance, walking direction, walking time, gait movement, or dirty management factors that occur very frequently in the daily frame of the foot. did. Walking drives are also appreciated with the help of resident walking. As Karim (2008) shows, Age groups have individual walking abilities, with arbitrary distances according to individual well-being. As shown by the Grab Connection conducted by Azmi then Karim (2012), discoveries involving post-walk greetings were associated with more respondents until they expected a 5–10-minute walk to reach their local workplace. shows that they love their area. According to Burton et al. (2003), actual distance traveled depends on unique actual potential, happiness, stress, unique life direction, hazards seen but added while running, purpose of hazard, and accessibility by alternative means. No significant differences in walking speed were found among hikers walking on the outskirts of town at the beginning of town when those on the route worked straight across town in the afternoon. Walking has displaced beyond roots to those who are effectively aware that the normal climate is certainly lower than those who walk with their heads down and look ahead without delay. People based in smaller communities settled at higher walking speeds than migrants from the largest community centers (Finnis then Walton, 2008). Walking speed is significantly slowed when the slope exceeds 3 degrees (ITE Technical Council Committee, 1976).

2.7. Pedestrian Speed-Density Relationships

The essential relationships of pedestrian slip velocity, density, and volume are similar and consistent with vehicle flow. Pedestrians slow down as the amount or dimension increases. As the thickness increases but the pedestrian housing decreases, the dose given to unaccompanied pedestrians for maneuver, similar to the general velocity of pedestrian flow decreases.

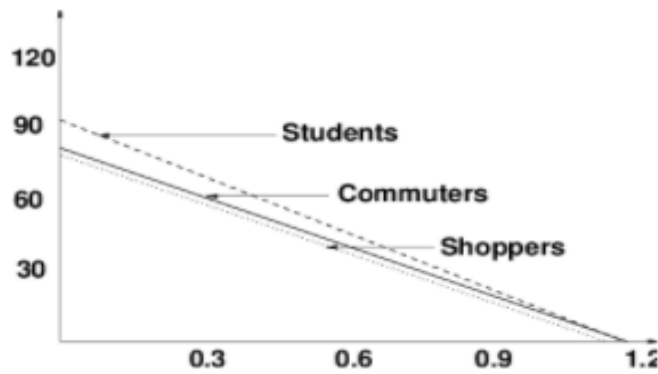


Figure 2.4: Relationship between pedestrian speed and density.

2.8 Difference between of the Speed of Bangladeshi Pedestrian with different countries

This is probably the case, as many pace tests conducted in the US and UK report walking speeds of 70–9 m/min or 88 m/min (Older, 1968; Hole, 1968). Navan then Wheeler, 1969; Frein, 1971). According to Israel, the average walking speed is between 70 and 9 m/min (Polus et al., 1983), which is higher than the average walking speed (Polus et al., 1983). Walking speed in Singapore is expected to be 74 m/min (Nanoribbon et al., 1986). Koushik then Ali (1993) saw a great many pedestrian flow characteristics there and noted that the speed of pedestrians when walking through the Kuwait City was slow in contrast to the United States. But the UK has seen something like pedestrian speed in Riyadh, Saudi Arabia. Arabian (Koushki, 1988). Morelcial. (1991) recorded pedestrian velocities in Calgary, Canada (84 m/min) and Colombo, Sri Lanka (75 m/min) as males, females, young and old, and compared them and compared them with Singapore. I compared the measured values outside of Bangkok. Encouraged by Thailand, Nanoribbons, and Guyana (1991). Pedestrian walking speed in Bangladesh (65.78 m/min) is slow in contrast to US, European and Asian countries, but faster than those in Saudi Arabia and Indonesia.

2.9 Average walking speed

The regular people walk 2.9 to 3.8 miles per clang at a fast pace. After 1.26 meters per second, 2.8 miles per hour is equivalent to 1.26 meters per second. Our walking speed congenitally slows down as we age. It may not have been considered "fast" when I was younger, but now it's a good, brisk pace. Also note that the normal gliding gait speed is slower than the fast and healthy gait speed. A 2011 study that reliably measured steps using accelerometers found that average walking speed was dependent on the age of the walker.

2.10 Individuals that utilization their cellphones while



Figure 2.5: People Use Mobile Phones while Walking.

Mobile usage increased throughout 2007, according to BD Stack's more than 255 supporters. (CTIA, 2008). The National Highway Traffic Safety Administration (NHTSA) reports that approximately 61,000 pedestrian traffic accidents increase each year (NHTSA, 2006). Most notably concerns about the potential environmental impact of the barrage. An ordinary lead bear appears. Nasar et al., then Hatfield, Murphy, and Nasar, Murphy (2008) explored the impact of PDA use on government streets across the river and the number of people on the ground talking about cells in increasing numbers. Smoke-a-look on the other side. In the past, entering the street was the basis of traffic, but now there are more busy intersections than uncrowded intersections. Loeb and Clarke (2009) also found that regular mobile phone use has a negative impact on speed and security. People who use headphones, walkers, and talk on the phone walk more cautiously than those who do not exercise (New York Pedestrian Study, 2006). Despite their best efforts, Finnis and Walton (2008) were unwilling to adjudicate this case, affecting relevant contemporary trends. B. Tune in between songs, even if the cell is on. Walking speed is important due to the low number of hikers.

2.11 Individuals by walking who strolls in Group



Figure 2.6: Group of people walking.

There is a large difference in the speed of the hikers, while the surveys have returned to a strange consistency. Rastogi et al. (2011) confirmed that the III and above group walked more slowly than the group, and that the IV and above congregation size was strongly affected. Carey (2005) found that basically human foot velocity has as much effect as foot velocity. Like garlic. (1996) Recognition that some people prefer to keep their feet on the ground rather than walking around or just walking slowly. Atrane (2001) found that a walking human remains at least as much a party to three choices in the universe as he walks separately between pairs.

2.12 Pedestrian Walking speed and health Environmentally

Walking with brisk motion can help improve overall health while maintaining many fitness benefits. improve. A brisk walk keeps your heart, lungs, and circulation healthy. It also helps reduce the risk of ongoing diseases such as heart disease, cancer, and diabetes. Walking is helpful even after the risk of disease has been reduced. Increased physical activity with walking can help maintain a healthy weight and reduce blood circulation Adds pressure and lifts mood. It also makes you far less likely to lie after holding a gun than it improves your type 2 diabetes. It also strengthens your bones and muscles. These benefits increase with similar or frequent walks. As you practice our walking with faster movements and go uphill, the benefits of walking become greater. A 2018 study found that brisk walking can help you live longer. Walking faster reduces the chance of death from all causes, including cardiovascular disease, then walking slower. The protective effect of rubber on the foot was greater in older people. Another 2018 study found that predictably courageous people, such as those who walk faster, had a lower risk of hospitalization and spent less time in hospital than those who walked slower.

Conducted over three years, doctors in this study found that faster walking speeds indicate increased mobility and help prevent disability, illness, or loss of autonomy.

2.13 Walkways, Sidewalks, and Public Spaces

All metropolitan sidewalks must meet the following basic requirements: Adequate Lane coverage, distance from four lanes, curbs, minimum width, low cross slope (2% or less), Buffering on par with private property, good visibility around corners and in driveways, shy clearance to walls and worthless buildings, clear direction of movement across boulevard furniture, continuity and well-maintained Conditions, corner ramps, and driveway flat areas. Sidewalks should also have plenty of storage space in the corners, as the expected number of pedestrians will cross between the anchors and access the green via a traffic lighted intersection.

2.14 Minimum Width of Sidewalks

Trails at require a volley backlog of 5.0 toes behind the break and a reserve of 6.0 toes on the obstacle surface. Any width less than this will not meet the minimum requirements for people and people with disabilities. Walking is a social activity. For those who connect people according to common runs, 5.0 feet area is the bare minimum. In some areas, such as schools, condominiums, some parks, and dense shopping areas, the minimum sidewalk width is 8 feet. Therefore, a person with a 4.0-foot-wide sidewalk (allowing for such an AASHTO minimum) will often push pedestrians into the lane to mimic speech. Even for a child walking along the line of competence, a 4.0-foot ceiling is no longer enough.

2.15 Levels of Service Standards on Walkways

Walking is most often the mode of transportation. Considered to be the easiest, most sustainable yet environmentally friendly transport point in the world. In addition, the metropolitan cities concerned are not only equipped according to the safe higher environment for the movement of pedestrians along sidewalks, but also ensure important facilities according to the ease of movement. 19.8% of volume trips to Dhaka are done on toes (DHUTS, 2010: 3-15). Therefore, it is important for the city authorities to check the energy environment and achieve the necessary objectives for these pedestrians to move sustainably according to the traffic regulations through Dhaka. Unfortunately, the sidewalks of Dhaka City are no longer suitable for pedestrians. Lack of facilities on the opposite bank, setting up temporary stores, parking cars, storing development materials, piles of garbage, negative sidewalk surfacing, walking on bridges, etc. challenge or interfere with the trajectory of pedestrians. Walking is the most convenient mode of transportation. It is seen as an imitation of transportation around the world, mostly sustainable and environmentally friendly at the time. For this reason, pedestrian movement is along sidewalks and essential facilities are permitted to facilitate pedestrian movement, so this is a safer and better environment for concerned city governments. Very important. 19.8% of all trips in Dhaka are made on foot (DHUTS, 2010: 3-15). This is

essential as the city mimics a safe and active environment and is geared to Dhaka's blackened transport system to provide this pedestrian with much-needed functionality. But unfortunately, the sidewalks in the big city Dhaka are not comfortable due to the movement of pedestrians. Pedestrian traffic deterioration due to lack of facilities across the river, relocation with short stalls, parking of electric vehicles, storage of building materials, piles of garbage, poor ground conditions on sidewalks, and subsequent crossing of bridges 68 Journal via Bangladesh Institute Planners, Vol. 11, 2018, Pedestrian Levels to Service (RSTP, 2015: 4-49-50, Health Bridge Foundation via Canada. To develop PLOS, it is essential to first check the status of relevant factors that influence pedestrian pride, and then determine the normal situation of PLOS. This lesson is special because no dirty research has ever been done to determine the supporter ounces of the elements that influence PLOS, mainly based on. Desire for pedestrians. This area aims to determine his PLOS for selected sections related to sidewalks in Dhaka city based on 10 factors using a multi-criteria decision-making approach, an analytical hierarchical process. In areas directed to future improvements and improvements related to urban pedestrian zones, there is a syndrome. Pedestrian Level on Service (RSTP, 2015: 4-49-50, Health Bridge Foundation via Canada. PLOS post-collection systems must first examine the status of relevant factors that influence pedestrian pleasure. Determine the position of PLOS generality. This knowledge is special because there have been no poor studies to determine the factors that influence PLOS, mainly based on pedestrian opinion. In this lesson, he tries to determine his PLOS in a selection segment related to sidewalks in Dhaka city based on 10 or more items using the analytical hierarchy process which is mainly a multi-criteria-based decision working approach. increase. It provides pointers to areas of particular importance for the future improvement and development of urban pedestrian facilities.

2.16 System

Overall performance is measured through the implementation of restructuring, so situationally relevant levels exceed key benchmarks. Pedestrian Level about Service (PLOS) is an approach to quantify the environmental quality of pedestrian spaces or to define such a scale as criteria for pedestrian service are defined across sidewalks (Parada, Nizamuddin nor Parada, 2007: 27; Papa cost even earlier, 2006: 136). With more attention being paid to the other side of green transport than active transport, this has become an important issue consistent with safe and favorable PLOS as sustainable pipeline regulation grows (Littman, 2003). To this end, this study aims to identify the PLOS associated with his four selected trail stretches in Dhaka or to suggest policy measures for his PLOS on these trail stretches. did. This instruction was based on a foundation of key facts gathered through physical surveys, questionnaire surveys, and subsequent object observations. First, a reconnaissance survey along pedestrian lines was conducted to identify the most important factors affecting PLOS. During the conduct of a reconnaissance survey, the concept of PLOS was explained in line with the progress of pedestrians and requested according to mention Selected pedestrian streets are used in Dhaka City, a factor considered important for determining pedestrian crossing services to improve

PLOS between start and way69. From the results of the reconnaissance survey, the contents of pedestrian utterances were aggregated mainly based on the number of detected pedestrians. A significant human factor was recognized from the counted data. This is almost what pedestrians consider necessary to ensure a higher environment for pedestrian traffic. A total of 240 pedestrians were interviewed, according to the collected records of relative levels of observation and other factors. According to the Grants Office, the walker asked him about the item's enjoyment level on a scale of one to five.

2.17 Walking time estimation

Every group was asked to stand round a hall mark (a stutterer on the street in the simulation task) and think about how they mimicked a 7 m high floor mark. The amount of time it took from the arrival of the researcher when the shareowner said "now" to the time when the researcher uttered the word "go". They decided that relevant markers (that is, estimated time of attendance) should be recorded and were given two estimates.

CHAPTER 3

Methodology

3.1 Introduction

This chapter create by summarizing how familiar properties are inspected. This includes a prologue that matches the conversation and approach in use today. This research idea was chosen placed entirely on a number of experts. The latest approach accompanies it, as that analysis is shared below.

3.2 Site Selection and Survey Details

The site's dedication is important for shedding light on the case that so many types of trails serve different types of visitor humor. There are many urban areas. The area above the catwalk is shown with real attributes. Destinations are sorted by region. For example, Shopping, Education, Business, Mixed, Personal, Transportation. Four of them were found to be used for shopping, commercial or educational purposes. Place self-control is exercised so much in these different neighborhoods that the sidewalks endure various "walkability" criticisms. Hiker improvements observed at each study site were bi-directional, with no expected entry or exit to intermediate trails or people associated with the base according to multiple tour objectives.

3.3 Information Collection & Methodology

This area analysis was previously conducted in Dhaka Metropolitan Municipality (DMC), Bangladesh. Four trails were selected to consume the speed tolerance of mature areas. Those at the base were physically calibrated or speed-estimated to calculate test accuracy.

Table 3.1: Details of Survey Site Locations.

| Site ID | Location of Observation Sites | Dimensions | |
|----------------|--------------------------------------|--------------------|-----------------------------|
| | | Length (ft) | Effective Width (ft) |
| NH 1 | Science Lab, Dhaka | 125 | 5 |
| NH 1 | Shabag, Dhaka | 125 | 6 |
| NH 1 | Motsho Bhaban, Dhaka | 125 | 6 |
| NH 1 | Mohakhali, Dhaka | 125 | 4 |

We have worked on four sides. We first surveyed Science lab point (next to Dhaka college and new market Bazaar area and one of South Asia's largest shopping centers). The second survey was done by Shabag, (which is in front of Dhaka University). The third survey was done near Motsho Bhaban (which is Mawlana Vaswani road, Kakrail, Dhaka). And at last, fourth we survey in Moakhali (which is situated beside the Mohakhali rail gate).

3.4 Standard Sample Size

A familiar is an individual club as a whole. A test is a subgroup or subgroup related to a population. The test size responsibility is performance in terms of perceived size selection. Test size is the right way to go as it performs fairly accurate and powerful evaluations. The set of examples is organized according to the value of the information collection, and the need for impersonation has little power.

3.5 Background

Over time, with the help of organizers, a unique classification method for men or women on foot was created and used. There are many preferences that are tested in segments. This was completed by comparing the pros and cons of each option.

3.6 Manual Data Collection Method

Many people associated with grassroots promoter (such as London Underground Limited and New York City Gathering) follow long-established collection approach after analyzing speed and density. g 5 minutes) records the bygone days of walking along previously acclaimed hiking areas. While this is used to examine walking speed, a second counter counts the total number of pedestrians learning to enter and exit the tick. Although this capacity has been used greatly in various studies, Turvey et al. (1987) and Annesley et al. (1989) studied the communication and came to have significant drawbacks as shown in the table.

Table 3.2: Advantages and Disadvantages of Manual method

| Advantages | Disadvantages |
|---|---|
| Detailed distress information can be collected. | Resource intensive |
| Simple to conduct | Potential for high variability in the data without strong training programs and quality control checks. |
| No capital expenditures required | Need a large space to be archived. |

London Underground Limited (1995) forwarded in its annual report the confidence that they suffered, including some of the impacts suffered beyond general assessment. It has been argued that the selection of such important statistics is impractical in this audit.

3.7 Survey Manually Effect

We have worked on four sides. We first surveyed Science lab point (next to Dhaka college and new market Bazaar area and one of South Asia's largest shopping centers). The second survey was done by Shabag, (which is in front of Dhaka University). The third survey was done near Motsho Bhaban (which is Mawlana Vaswani road, Kakrail, Dhaka). The fourth survey was done Mohakhali.

Table 3.3: Advantages and Disadvantages of science Lab

| Advantages | Disadvantages |
|--|--|
| Provided curbside bike lane and street parking. | Because of heavy traffic pedestrian faces too many noises problem & air pollution. |
| Sized to provide for two directions of pedestrian travel. | There are so many stalls on the footpath it causes problem for the pedestrian. |
| Street trees emphasized direction and directional change by accentuating road lines. | Pedestrian routes are not directly connected to their destination. |



Figure 3.1: Science lab footpath area

Stalls on footpaths are a major cause of pedestrians wasting their valuable time. Here we feel that these stalls need to be removed from the footpath and given specific areas.

Table 3.4: Advantages and Disadvantages of Shahbag.

| Advantages | Disadvantages |
|------------------------------|---|
| High rates of walking. | Crowded area. |
| Encourage public activities. | Difficulties in crossing the road due to heavy traffic. |
| Slower traffic speeds. | Safety problems in relation to traffic. |



Figure 3.2: Shahbag area.

In the Shahbag area we face many problems. The main problem here is that they have traffic lights but it's don't work. Most of the time traffic police maintain it manually but pedestrians don't listen to traffic police signals. It increases heavy traffic and makes the area crowded. For that reason we suggest that we need to provide Underpass or Overpass and it's gonna make a permanent solution.

Table 3.5: Advantages and Disadvantages of Motsho Bhaban.

| Advantages | Disadvantages |
|--|--|
| Encouragements of active modes. | Parked vehicles on roadsides causes problems to the pedestrian. |
| The pedestrian system provides direct and convenient connections | High atmospheric emissions. |
| Accessible to all. | Roadsides are not clear & the roadside stalls causing problems for pedestrian. |



Figure 3.3: Motsho Bhaban area.

Vehicles parked on roadsides are major causes of increased traffic jams and reduced pedestrian flow. At that moment, we need to provide a designated parking area, and the police need to take action against anyone who breaks the rules.

Table 3.6: Advantages and Disadvantages of Mohakhali

| Advantages | Disadvantages |
|--|--|
| Bike lanes and street parking are provided. | Pedestrian routes are not directly connected to their destination. |
| Walking is convenient as there are no electric poles or trees. | Difficulties in crossing the road due to heavy traffic. |
| This road is very safe to walk on because of steel guards. | Walking is a problem due to the presence of hawkers on the streets |



Figure 3.4: Mohakhali area.

The most serious problem is the retailer, trader, and hawker problem. The hawker spreads his tread on the footpath and eventually reduces the effective width of the footpath.

London Underground Limited (1995) expressed in its annual report the expectation that they would suffer, including some of the impacts suffered beyond general assessment. so many important statistics were argued to be impractical for this test.

3.8 Time-Lapse Photography

Using time-shifting with imaging techniques, we have compiled a limited set of statistics and a short true area where people are observed at every step. Data were collected using this technique at the beginning of the study of individual roots. This is because studies on geoelectric males or females were constructed according to the speed-thickness associations above for their own classification of walker development. These include Older (1968), Nevin, Wheeler (1969), O' Flaherty or Parkinson (1972). Nevertheless, while Time Through Pictures is largely composed of a series of pre-determined photographic images, Turvey is everything. (1987) suggested that its use may therefore be volatile. Moreover, loves (1994) confirmed this by performing time-shifting based on image evaluation. Washington et al. (2003) considers this technique inadequate and suggests the importance of sheer volume and perception in mimicking the promise of a more vivid investigation. Answer He acknowledged in Table 3.6.1 not only the benefits, but also the drawbacks regarding the time lost due to photography. Therefore, among views on the underlying concerns, it is concluded very strongly that the time shift away from using photographic methods is not helpful for this investigation.

Table 3.7: Advantages and Disadvantages of Time-Lapse Photography Techniques.

| Advantages | Disadvantages |
|-----------------------------------|--|
| Shorten the work of a few months. | Good quality cameras are needed to capture long-term work. |
| Combines all tasks at a fast pace | Smartphones usually require a power booster for more than a few days of use. |
| Provides long-term capture | Not very convenient for long term project, more than three days. |

3.9 Digital Video Capture

Mobile image capture involves the use of some form of video recording, including special programs designed to recognize individual people walking. It also tracks through the analysis belt and leaves instances in the frame. These opportunities are chronically recognizable in relation to walking speed. Tracking the guinea pig shows the number of walkers at walking speed in another frame, so the thickness ratio is visible. In mind, this interaction is a way of mimicking a wide variety of different ways of trying to robotize a tool and is pretty much the equivalent. Nonetheless, Damen and Hogenson (2003) published a book on imaging techniques used to perform pedestrian screening in men or women to estimate foot volume. As confirmed in Table 3.7.1, the attempt to distinguish and shape the relevant skeletons was due to the

separation of males or females from the baseline data. Therefore, due to these concerns, it was assumed that advanced image data would not be suitable for this study.

Table 3.8: Advantages and Disadvantages of Digital Image Capture.

| Advantages | Disadvantages |
|---|---|
| A digital camera can easily store thousands of pictures. | Higher initial cost |
| It is very easy to take pictures in a dark or dimly lit environment. For special mode features. | Battery consumption depletes more quickly in digital cameras |
| Digital images can be easily edited. Image editing software is easily and widely available | It is difficult if not impossible to do double or multiple exposures on a digital camera. |

3.10 Data Collection Technique

Regarding land surveys of viable alternatives, the video recording test is chosen as the most appropriate method, as the last recording of this survey was made. Video innovation has come a long way in the last decade, but this is now possible along the lines of all these types, except for the need to reduce state-of-the-art computerized recording hardware. The advantage of this strategy is that facts can be analyzed based on a longer period of time masking a wider area of pedestrians. Within a bit of reality and anticipation, secure your digital camera, do a normal walking drive on pedestrians, then notice a file on a person on foot development and continue to manage. We then use specific components to examine individual running speeds within the workplace of the affected tourists. According to recent research, video synopsis with mechanical upgrades is currently one of the most commonly used techniques based on information from Party Rover.

3.11 Data Collection Process

I used the video method to imitate all the details. Facts about passages to 4 destinations in 4 main locations between Dhaka metropolitan areas in Bangladesh. The cameras engage in elevated constant situations using attacks to gather general perspectives on selected educational areas. The estimated zone is classical. That is, full of focal points of mention. This notification will no longer remain cloudy when traffic fills the service area. Adhesive tape is used to fit the person prepared longitudinally in the sidewalk floor trap. The beneficial camouflage of each passage is constant throughout the range observed ignoring the city of Science lab. Bus station, Shahbag, Motshobhoban, Mohakhali Dhaka. These walkways were provided by merchants and their widths were estimated using outside houses provided by the merchants. A 4-hour

recording was recorded along the test section. First part about hour (4: 30-5: 30) or second part (04: 00-5: 00), third part of day (10: 30-11: 30), and part 4 in the early afternoon (12: 00-1: 00). The study simply included those people who passed the test phase, were ultimately unable to walk, and crossed the control zone. Information was gathered by approximately five hours of video recording, after which more than 2,880 people were surveyed on foot to flip-on mannequins and walk for his event. A walker's walking time is registered by dividing the distance away by the work time it took for that many people to walk. Not only walking speed but also gender, age, belongings, reasons for land use, PDA use, and party volume practices are recorded. The age of walkers is divided into her four main categories: children (under 17), adults (18-35), middle-aged (35-60) and seniors with foot problems (60+). classified as Two categories of sexual orientation are also spiritual and feminine. The area for the walking head tape marking should be chosen carefully. The risk associated with gait speed estimation increased with increasing walking distance. Shorter walking distances broaden the picture of foot pacing decisions, rendering the altimeter meaningless. The covers on the selected locations were different. The information obtained from the selected locations is sufficient, but is synthesized by calculating walking speed, density, and flow. Some prisons refer to sidewalks and other parking areas as rear parking lanes or front parking lanes, and the same applies to illegally parked vehicles. Analysis of information generated as a significant amount (25%) related to pedestrian movement is performed on the roadway. Similarly, using NPCF rather than PCF was said to enhance a great many movements on the pavement. Empirical observations revealed that pedestrians on the sidewalk were predominantly female, whereas pedestrian movement across the roadway was predominantly downhill. Females therefore have a higher affinity for the pavement than males.

3.12 Calculation of Speed, Flow, Density, and Area Module

- Pedestrian feature records are collected at selected locations by showing longitudinal sections of known extent, stuttering at the traveler's workplace, but continued human development with gait at that location. recorded automatically. A tape of the character recorded via the loot trait is later replayed, using accomplice advances to separate the recording.
- A walker is chosen to follow the pick roll, but the phase respects the time the walker imitates the pass with a 0.01 second severity. Human base-to-base gait speed was recorded as part of the measurement accepted in the selected position and then recorded as the time the man or woman used the foot to mimic the selected position.
- Rewind the tape, continue to stop the tape, and see the total number of people over the selected length of feet, just as the selected ranger was in the control zone.
- Thickness was learned once by dividing the absolute volume of pedestrians in the study area into quarters for the chosen length.
- Level of Service (LOS) was determined by the amount determined in the previous step.
- Various subtleties about the person are recorded from the information, such as age, sexual orientation, presence or absence of telephone, presence, or absence of communication.

- Repeat the halo until the videotape is fully decomposed and the desired sample size is obtained. Since this underlying land survey, with the help of a certain scientist and his Polus et al., is a method similar to that used in some previous surveys, the association has decided not to use statistical abstractions. I'm winning (1983), Turvey et al. (1987), Annesley et al. (1989), Lam or Chung (2000), Ratnayake et al. (1991) or Ladies Then Hogenson (2003).

3.13 Build up the connections between Speed, Flow, Density and Area Module

Character about basic facts is tested by calculations after video. The analysis is successful because both deployments are considered. Statistics collected from all retrieved locations are far below the typical associations between velocity, flow, altitude, and belt coefficients in Bangladesh. This relies on understanding, so the individual basic characteristics are similar across locations. From this information, a recurrence model is developed and the beyond modes are expected to remain immediately following depth such that connections are formed through this direct relationship between velocity, flow, density, and area factor. We valued the ligature between speed over performance. Pure models were either concerned with a better fit between tempo and depth ratios or aimed at a poorly small limit on the coupling coefficient.

3.14 Build up the Levels of Service Design Standards.

There were three types of processes for measuring pedestrian area by overseas sidewalk administrations. The dominant mode of conception of respect for passers-by and residents, as addressed in the accompanying philosophy of the Highway Capacity Manual (TRB, 2000). Hana et al. (2005) also considers after cessation of daily movement to determine walking rates across sidewalks. The next form is based entirely on climate quality and was once addressed by the Tour Characteristic Method (Jutkiewicz, 2000). This species has been addressed using the Australian strategy (Galling, 2001) and the Landis technique (Landis et al., 2001), considering both the traffic dynamics and the true nature of the road. Due diligence on LOS remains excellent and unparalleled, so it is common for regulations to exceed the Transportation Research Board (TRB, 2000). His HCM method in the United States relies on the addition of the pedestrian travel dimension (Ped Eminem) and sidewalk area (m²/ped) as the passerby's LOS is analyzed. Her LOS of Pedestrians counts runners ignoring a specific time frame (usually her 15 minutes), lowers pedestrian counts at any given moment, and leaves a potential stutterer on the sidewalk. determined by leaving. The following numbers are known as orbital velocities: The organizer can also look within the stream rate of the desk and determine the active walker LOS class along with A (free stream) according to F (no possible development for reason or reason). Successful passageway occlusion is determined based on assumptions of complete passageway occlusion inclusion and obstruction width. Levels that exceed the rule standards are the correct markers of comfort and opportunity to move with their homes, as they depend on the care of the realm's inhabitants, from unique strength to extraordinary wanderers, as their families see happiness. Durability.

3.15 Abuse of footpath

There is only an explanation for sidewalk cheating related to administrative districts. A unique type of motor may also control the sidewalk. Consumed the entire sidewalk area for the number of men or women walking along the main road and over the root boundary. There is an unfinished ghetto dweller near the sidewalk, and she lives there. Roads that are more ragged than shops strive to document the sidewalks here, and even development materials are on the sidewalks, and such cannot be walked on route here without difficulty. These are widespread motives for cheating in sidewalk areas.

3.16 Improvement in Pedestrian Planning

- Integration of walking as a mode of transportation.
- Positive distraction about people in non-public spaces to improve the street environment.
- Systematic application consistent with the consciousness of civilization, as Wanderers have not yet constructed trades between minds represented by using average tastes for their characteristic climates.
- Interdisciplinary post-transactional paths, including design, should be based on lies Related to constructing informative passer-by rules.
- There is business because it is built on pedestrian zone demographics.
- The needs associated with different assemblies, the types of authorities involved, shippers, engineers, organizers, etc. ultimately determine what the designer is exactly right for someone who goes a long way towards achieving a transportation plan. must be regarded as.

3.17 Outline of Methodology

The methodology presents a suitable accompanying structure to make the evaluation charts operational, as the scope and analysis of statistics and statistics are consistent with the research. Data beyond all important and useful sources were old for this study. This evaluation within the behavior type continues through the workflow using a framework of outcomes or work keys through the work of the cooking table. A field survey was conducted to understand the modern pedestrian access across from the bank through offices at major intersections in Dhaka city. Existing hikers across from the bank branch were physically collected. Due to the presence of imperfect selected convergence with high site visitor entertainment and passerby training, data on human development beyond base were collected using a manual approach using video recording. Of course, accurate crosswalk information was collected during peak night hours. Information was maintained using MS Excel. Walker's reflections on leadership concluded with a guide to awareness and video recording. From this, a problem of comprehension was recognized when pedestrians passed through the intersection. Some prominent opposite points

are electro-electrically operated according to current selective pedestrian levels with high manned and pedestrian movements. Video recordings were reviewed to gather visitor statistics, the format of information signage was also taken into consideration the selection of the lowest tier persons, and research was conducted using the well-known Webster method.

Table 3.9: Age category limit

| Category | Age |
|-----------------|------------|
| Young | 15 - 35 |
| Middle | 35 - 60 |
| Old | 60 up |
| Children | Under 15 |

CHAPTER 4

Data Analysis

4.1 Introduction

The simple performance of walking has a performance effect on the vehicle frame. It is important because it supports community and economic connectivity through city life. Walking allows community to touch humans from one point to another, but also allows humans to access areas from below where vehicular expansion would be unthinkable. State-of-the-art US HCM uses speed as a percentage of intrinsic validity (MOE). In particular, the scrutiny chapter of the US-HCM paper (part 11, TRB, 2000) uses large normal cruising speeds, or MOEs. Zegley et al. (1994) previous land surveys of UK industrial samples or other items in Europe revealed that velocity was used as much as MOE. Velocity is also being used as the feasibility of expanding into existing walk-in offices is being tested or a modified plan to the current infrastructure is sought. The instructions behind this section are to investigate and analyze the speed of the lower Bangladeshi foot and distinguish between those circumstances at this altitude that affect overall walking speed.

4.2 Concentrate on the Profile of the Area

1. Science lab is the most important road in Dhaka city. So, we choose this area because.
2. As it's connected to all the important roads. So, all type of vehicle's which can be intercity or outer city found easily.
3. This road is connected with Dhanmondi Lake and Newmarket which is most important for people to spent leisure time.
4. There are so many schools, college and university in this area which make this road busier.
5. There are few reckoned shopping mall in this area which makes it important for collecting data.
7. Huge amount of pedestrian moves from Shahbag to Dhaka University for working purposes, study purpose.
8. As we collected data form Motsho Bhaban. Which is beside the National Parliament. VIP movement is frequent in that area.
9. Mohakhali is most important and busy road because a stadium is situated beside this road.

4.2.a Science Lab Dhaka

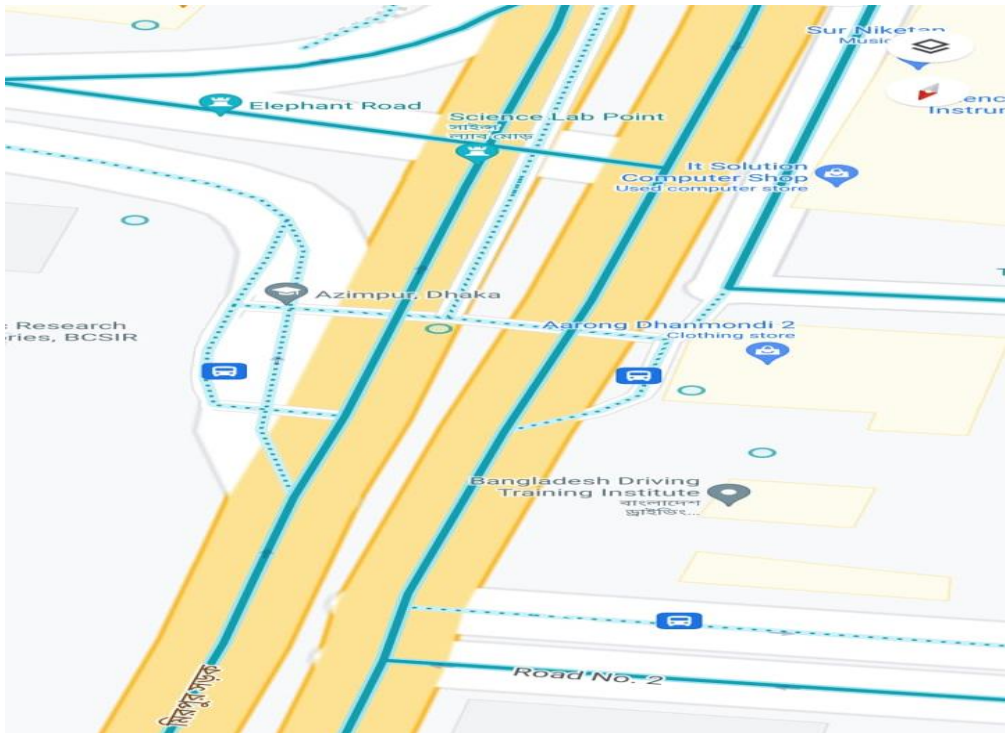


Figure 4.1: Science Lab area in Map.

We can see on the map that there are different types of local roads where there are lots of sidewalk, for that walking extra pavement is very difficult the footpath should be clean and free of stink.

4.2.b Shabag, Dhaka

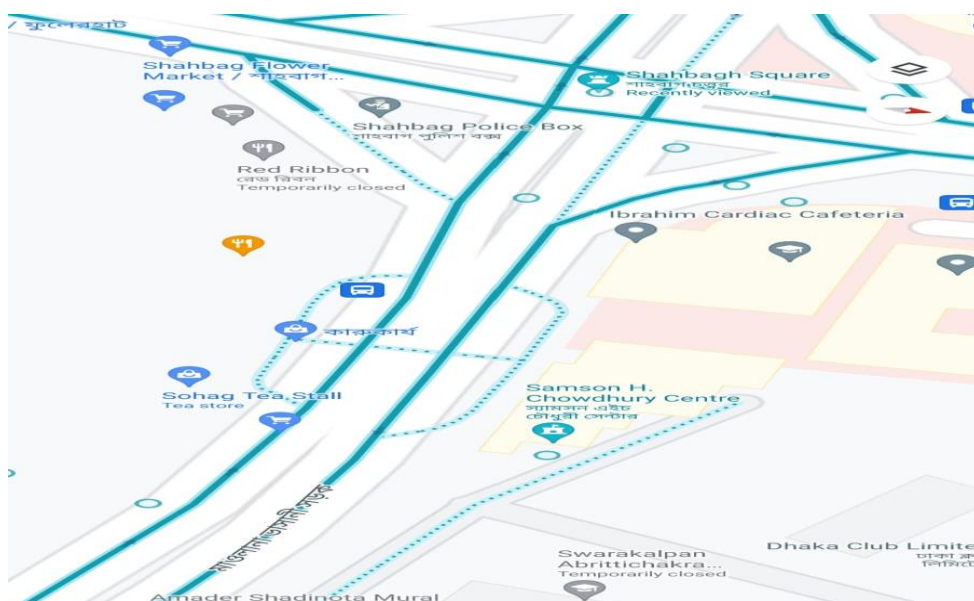


Figure 4.2: Shabag area in Map

Shabag is located at Maulana Bhashani Road, Dhaka. Besides this Dhaka University, lots of flower shop can be seen on the side of the road, as a result, it is very difficult to walk on the road. For this, first of all we have to clean the dirt on the side of the road, and we need to keep an eye on the road so that we can walk properly.

4.2.c Motsho Bhaban, Dhaka

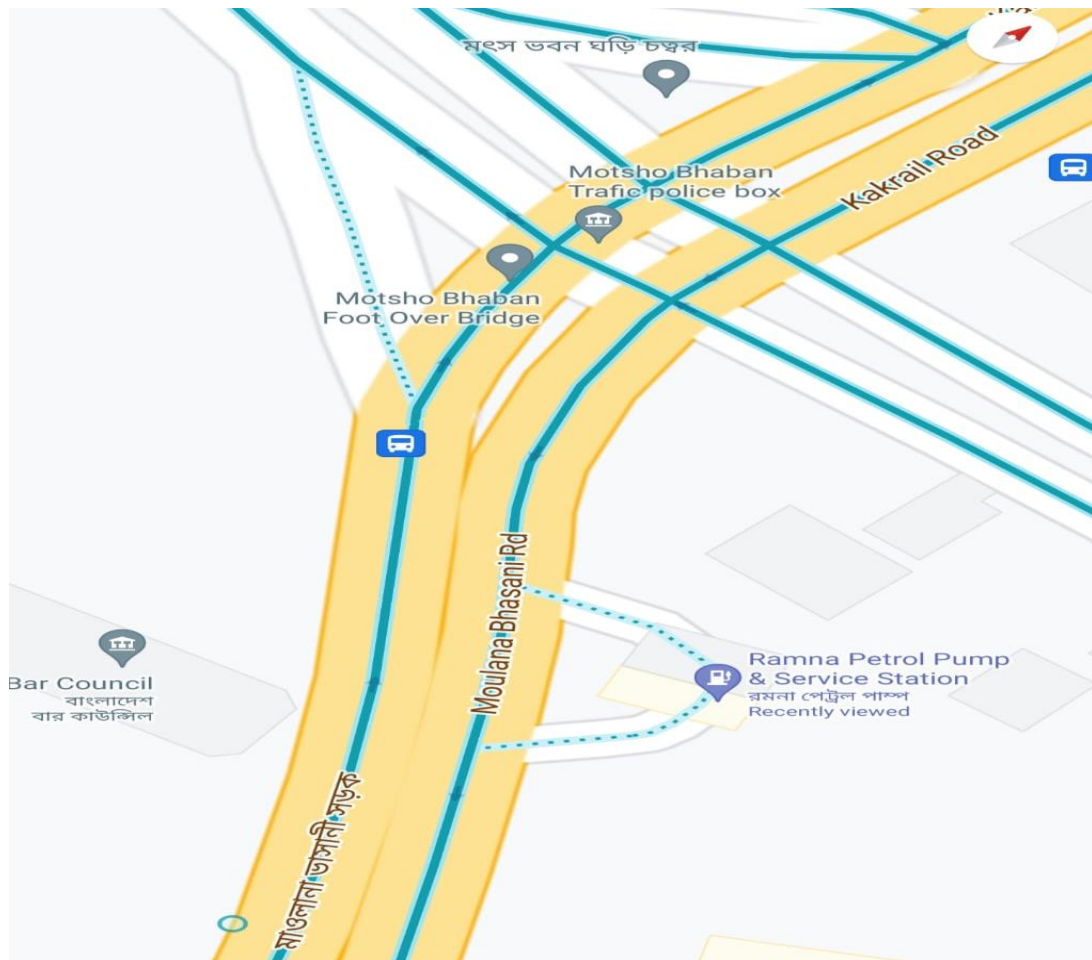


Figure 4.3: Motsho Bhaban area in Map

Various types of people live along the front of Motsho Bhaban road and to make a living, they run small shops along the road, as a result, emulation suffers from difficulty in walking on the road. So, we have to look at these things.

4.2.d Mohakhali, Dhaka

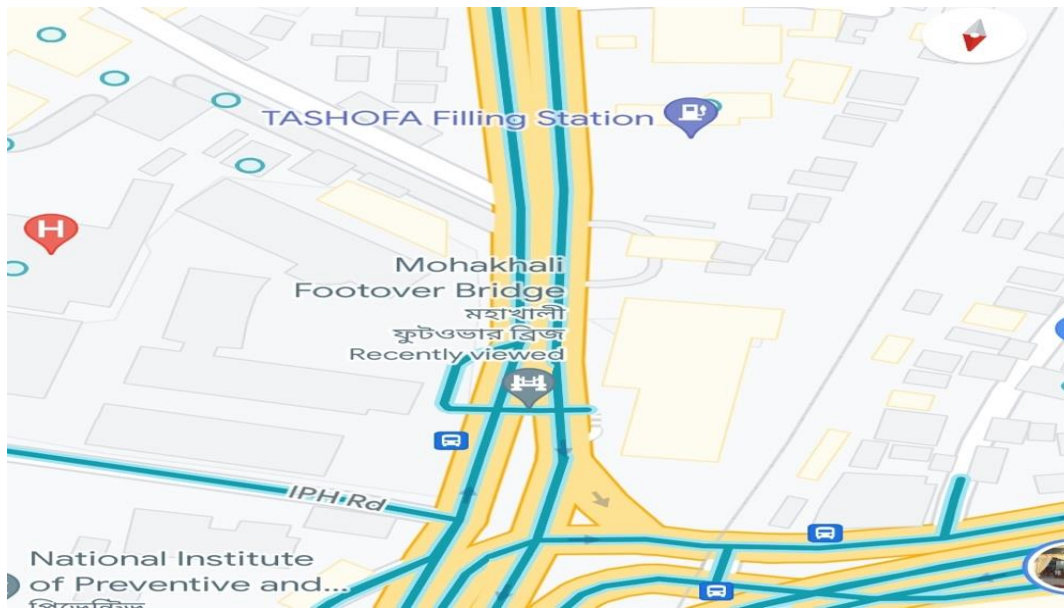


Figure 4.4: Mohakhali area in Map

Mohakhali road is located at Bangladesh collage of physicians and surgeons (BCPS). Lots of street shop can be seen on the side of the road like shoe shop t-shirt etc. That's why it's very difficult to walk on the road properly. We should have to clean the Dirt on the side of the road, and we need to keep an eye on the road so that we can walk properly.

4.3 Standard Sample Size

The commune is the whole affair concerned with the individuals. Tests are a subdivision and then subgroups of the population. Make sure the test size is about content selection rather than perception. The test altar is the most convincing approach because it does enough real and synthetic assessments. The size is settled on the price of the type of information and the need to support an appropriate cramped effort.

4.4 The person on foot Flow Characteristic in Walkways

As mentioned earlier, there are four highly rated places in Metropolitan Dhaka. Science Laboratory, Dhaka, 125 feet long and 4 feet wide. Shahbag is 125 feet long but only 5 feet wide, while Motsho Bhaban is 125 feet long but only 6 feet wide, Mohakhali is 125 Feet long and 4 Feet wide. The accuracy that surrounds individual place arrive in the amount of individual area. Walking speeds noticed as a consequence of different walkers, hospitals, e-commerce malls and children's park offices in the aisles were accomplished alien of the video study but were prepare.

Table 4.1: People on foot Walking Speeds on Walkways for Science Lab

| Characteristics | | | | | | |
|-----------------|-----------------|-------------|------------|-------------------|--------|--------|
| Class | Pedestrian Type | Sample Size | Mean Speed | Standar deviation | Range | |
| | | | | | Low | High |
| Overall | Combined | 590 | 83.16 | 2.8 | 76.125 | 84.75 |
| | Female | 86 | 81.1 | 3.06 | 75.64 | 81.75 |
| | Male | 504 | 85.22 | 2.8 | 76.61 | 87.75 |
| Young | Combined | 319 | 83.95 | 2.42 | 80.915 | 85.755 |
| | Female | 29 | 82.98 | 2.18 | 80.41 | 84.73 |
| | Male | 233 | 84.91 | 2.1 | 81.42 | 86.78 |
| Middle | Combined | 208 | 81.76 | 2.31 | 78.885 | 83.26 |
| | Female | 27 | 80.18 | 1.65 | 76.28 | 81.74 |
| | Male | 181 | 83.34 | 1.61 | 81.49 | 84.78 |
| Old | Combined | 93 | 74.2 | 2.82 | 72.48 | 75.985 |
| | Female | 21 | 72.14 | 1.43 | 71.53 | 73.69 |
| | Male | 72 | 76.27 | 1.48 | 73.43 | 78.28 |
| Children | Combined | 27 | 72.68 | 2.75 | 71.34 | 73.695 |
| | Female | 9 | 71.12 | 3.22 | 70.35 | 73.24 |
| | Male | 18 | 73.24 | 2.17 | 72.33 | 74.15 |

Difference in walking speed in Science Lab Bus Stop area

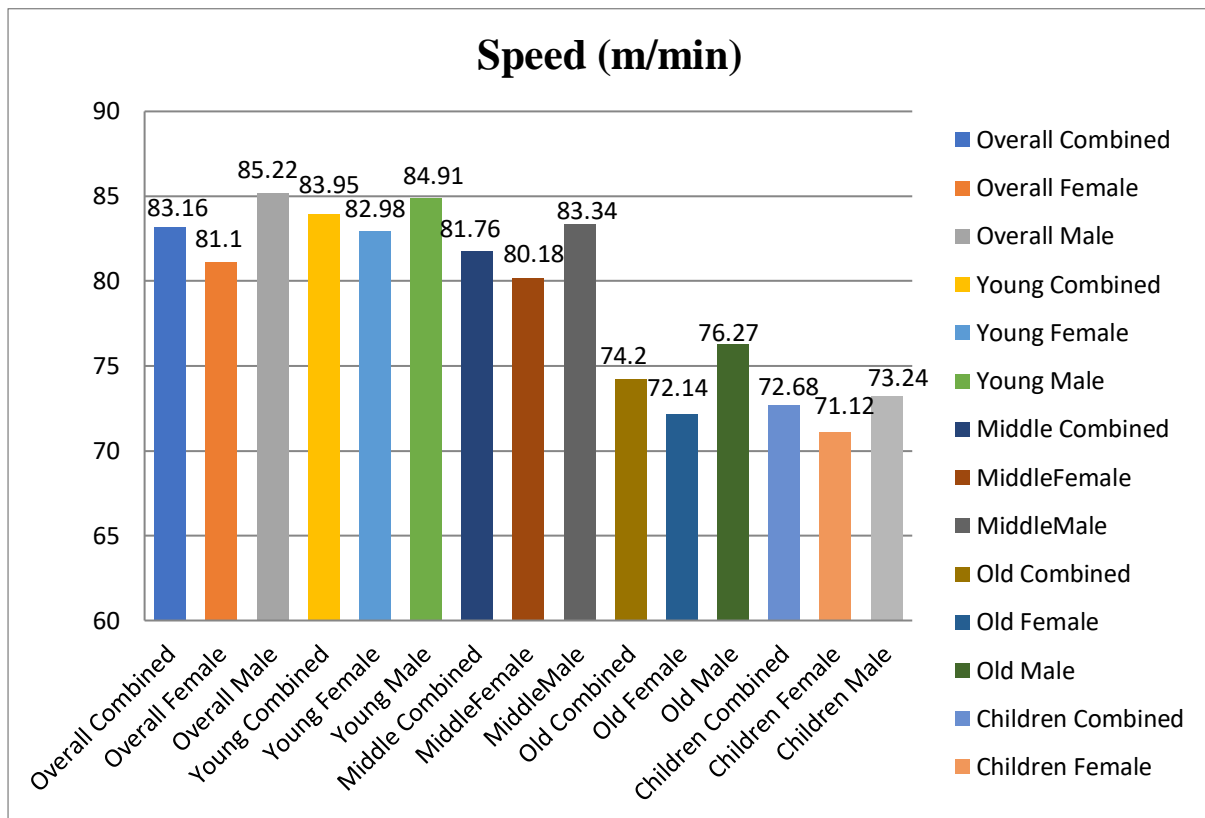


Figure 4.5: Walking speed area of Science Lab Bus Stop.

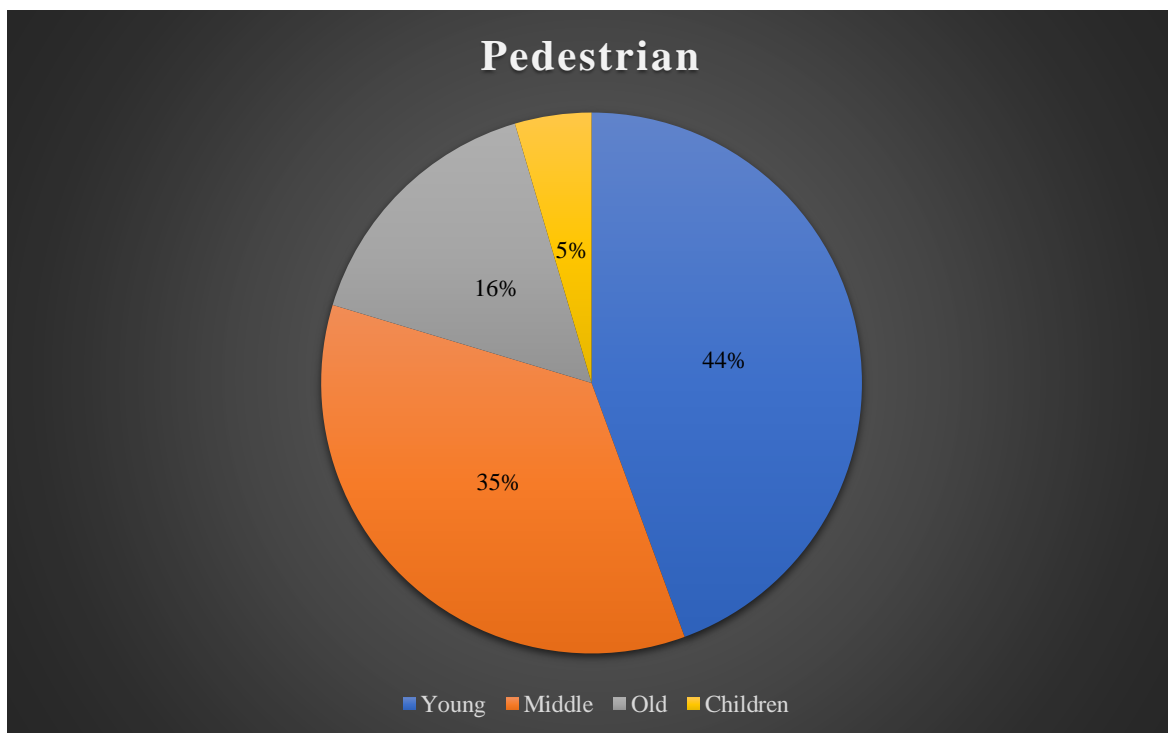


Figure 4.6: Pedestrian Percent

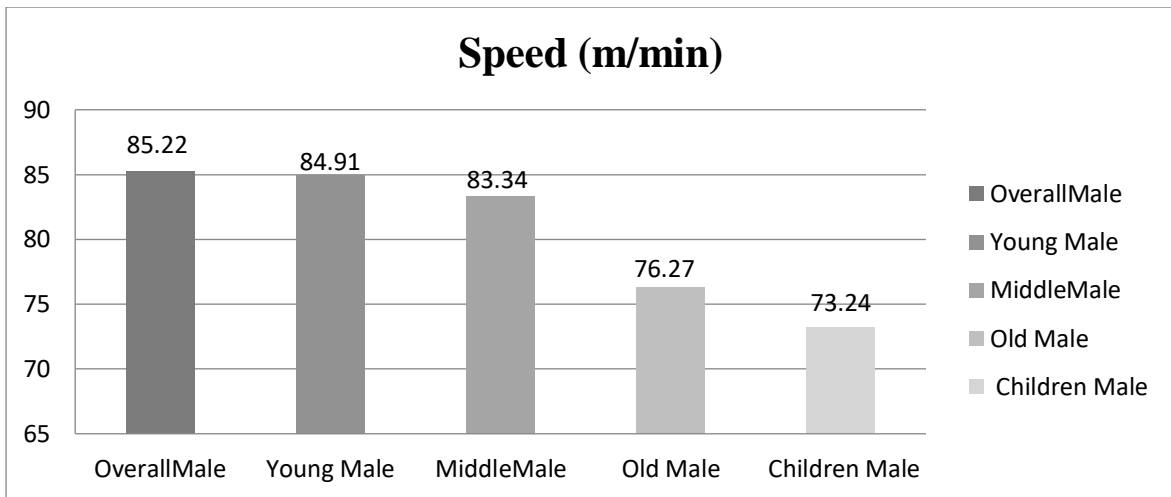


Figure 4.7: Walking Speed male

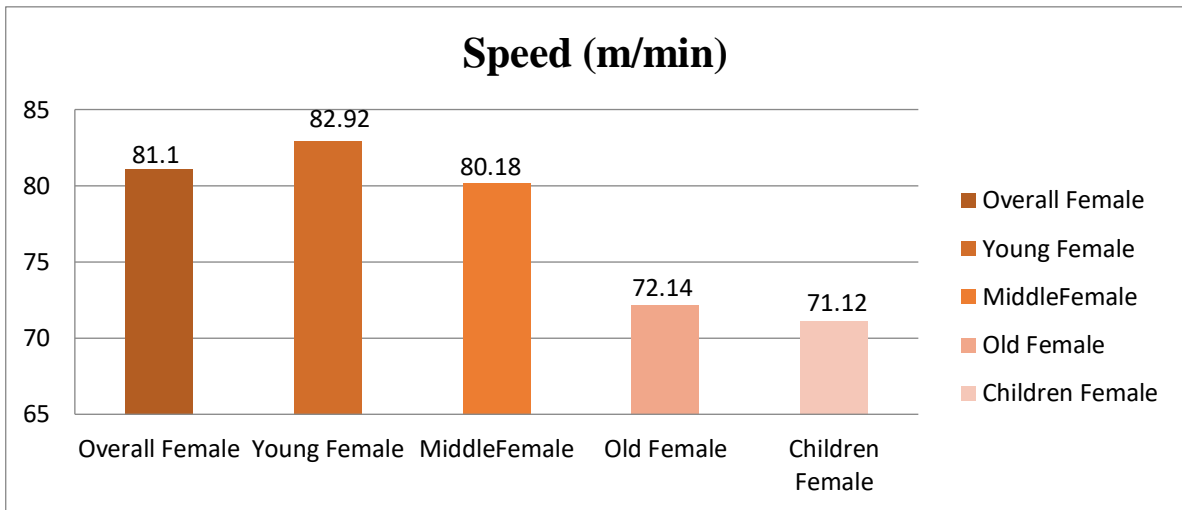


Figure 4.8: Walking Speed Female

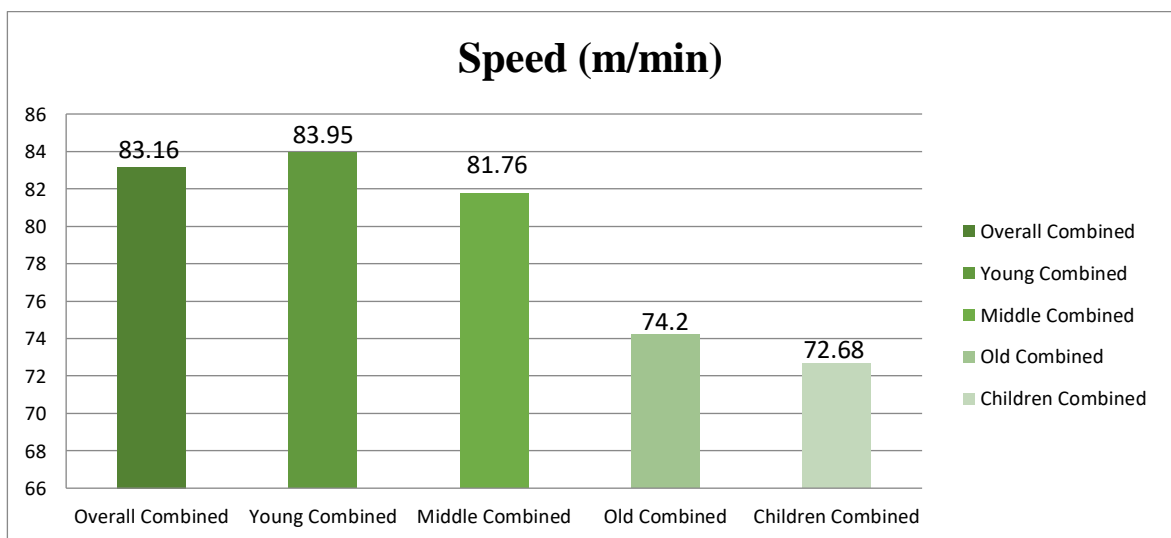


Figure 4.9: Walking Speed Combined

Table 4.2: People on foot walking Speed on walkways Motsho Bhaban

| Characteristics | | | | | | |
|-----------------|-----------------|-------------|------------|-------------------|--------|-------|
| Class | Pedestrian Type | Sample Size | Mean speed | Standar deviation | Range | |
| | | | | | High | low |
| Overall | Combined | 461 | 87.17 | 2.36 | 88.51 | 75.98 |
| | Female | 57 | 86.31 | 2.79 | 87.26 | 74.83 |
| | Male | 404 | 88.02 | 2.36 | 89.76 | 77.12 |
| Young | Combined | 222 | 88.3 | 2.267 | 89.025 | 80.80 |
| | Female | 26 | 87.26 | 1.39 | 88.29 | 80.31 |
| | Male | 196 | 89.34 | 2.14 | 89.76 | 81.28 |
| Middle Age | Combined | 199 | 87.11 | 2.26 | 86.135 | 79.05 |
| | Female | 16 | 86.2 | 0.99 | 84.21 | 78.67 |
| | Male | 183 | 88.02 | 2.32 | 88.06 | 79.43 |
| Old | Combined | 29 | 82.59 | 2.44 | 81.78 | 75.46 |
| | Female | 9 | 82.05 | 2.02 | 81.02 | 74.83 |
| | Male | 20 | 83.13 | 2.06 | 82.54 | 76.08 |
| Children | Combined | 9 | 78.615 | 2.31 | 75.615 | 71.68 |
| | Female | 6 | 78.02 | 0.98 | 75.22 | 71.22 |
| | Male | 3 | 79.21 | 0.65 | 76.01 | 72.13 |

Difference in walking speed in Motsho Bhaban

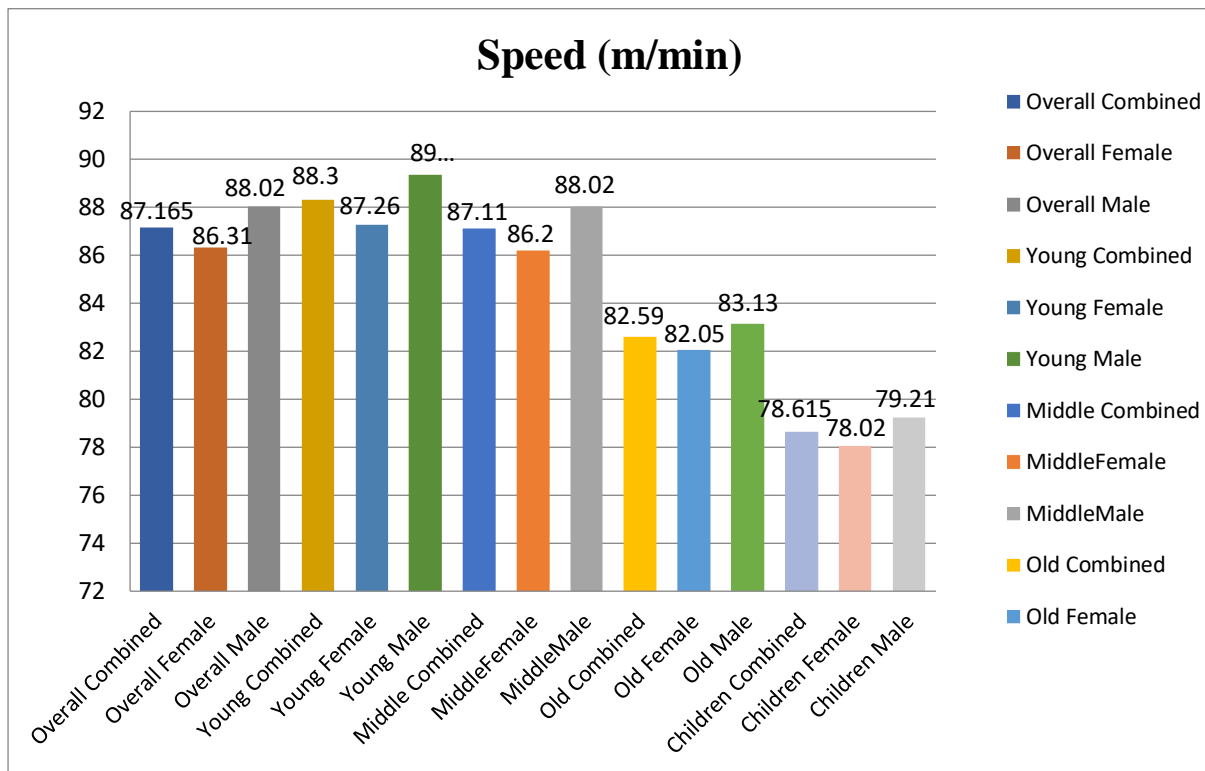


Figure 4.10: Walking speed area of Motsho Bhaban

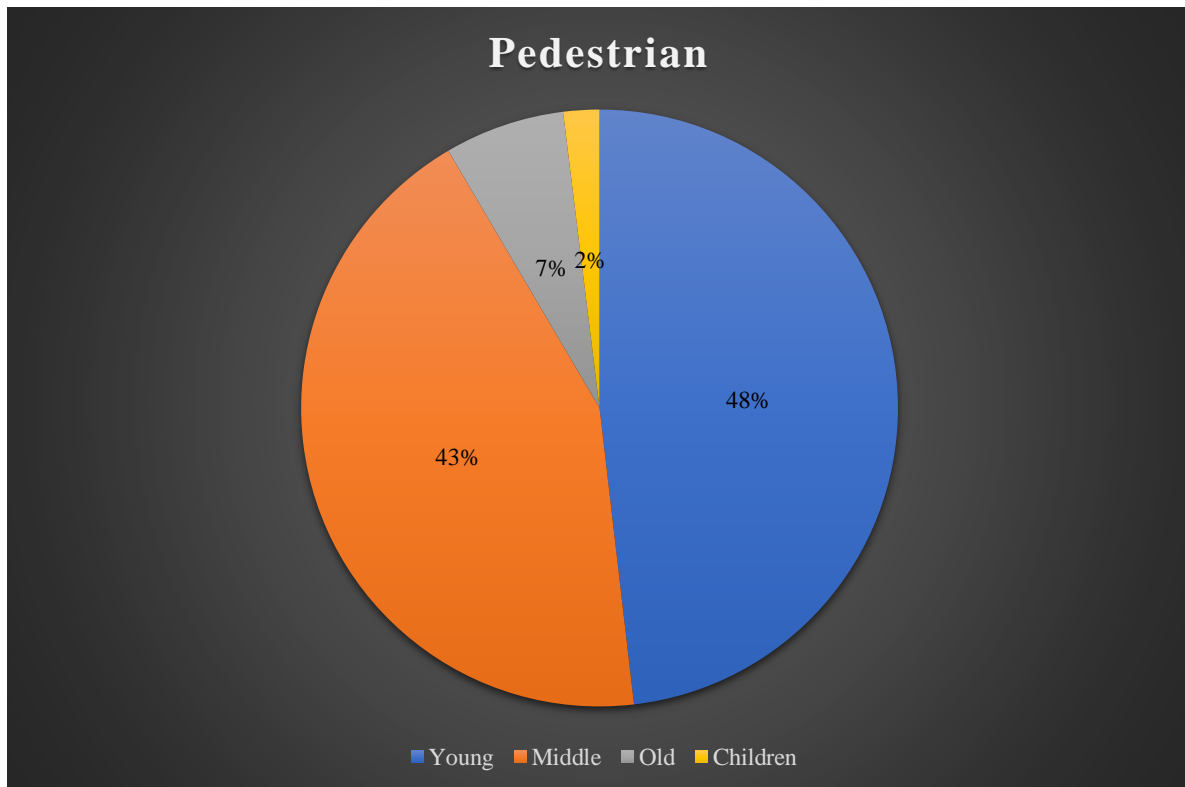


Figure 4.11: Pedestrian Percent

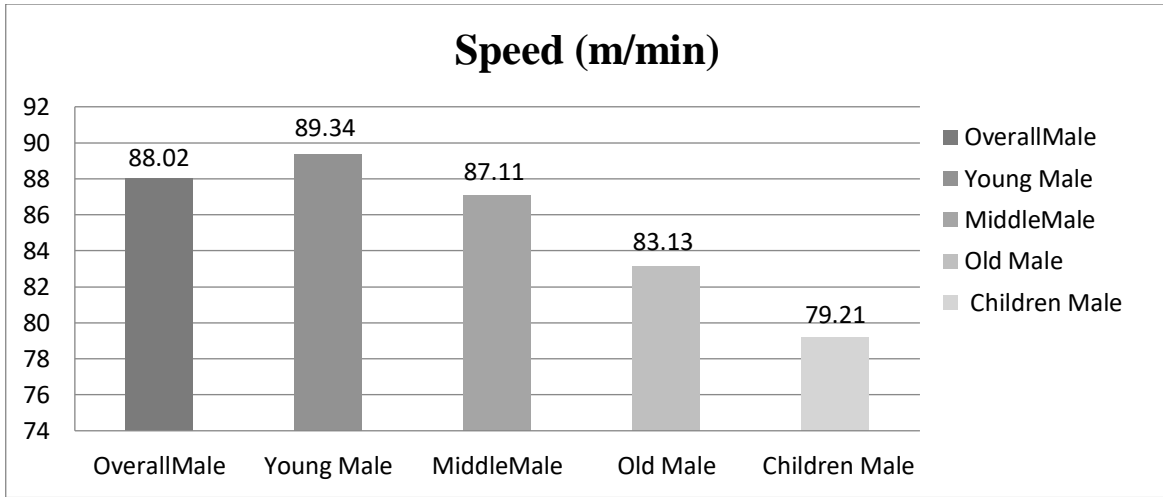


Figure 4.12: Walking Speed Male

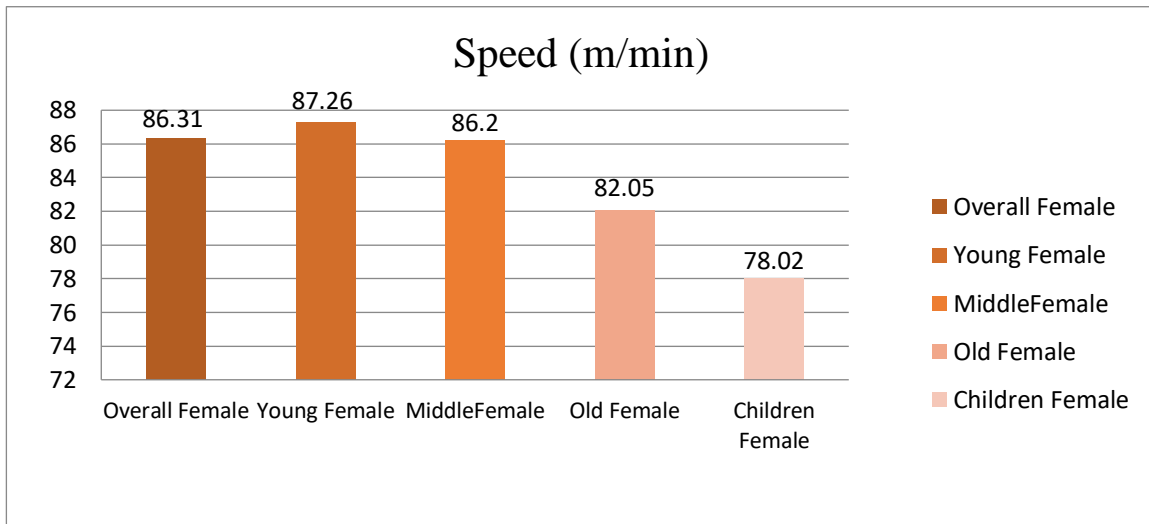


Figure 4.13: Walking Speed Female

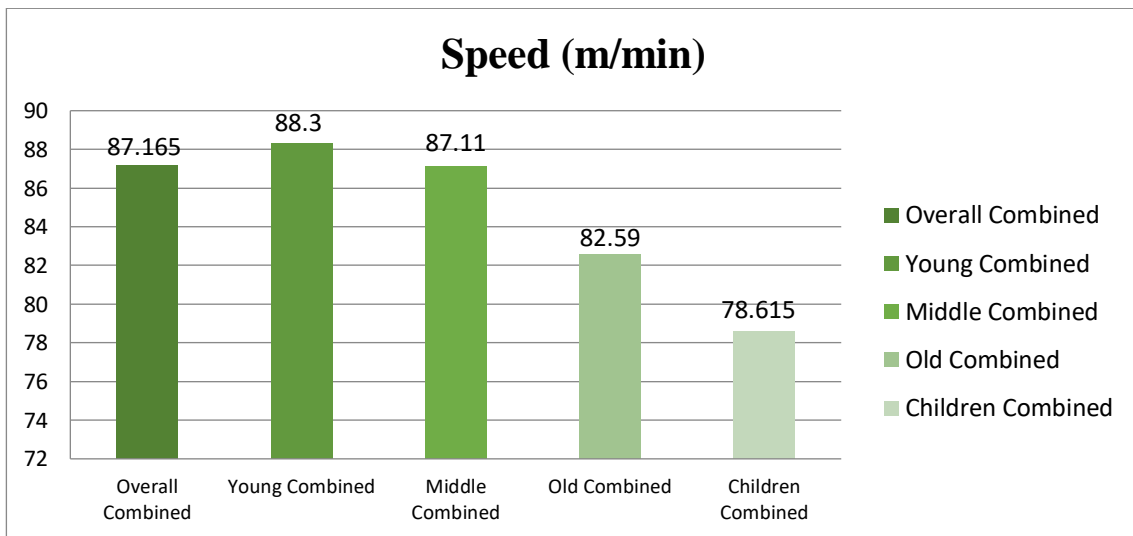


Figure 4.14: Walking Speed Combined

Table 4.3: People on foot Walking Speeds on Walkways for Shahbag

| Characteristics | | | | | | |
|-----------------|------------------|-------------|------------|-------------------|-------|--------|
| | Pedestrian Types | Sample Size | Mean speed | Standar deviation | Range | |
| | | | | | High | low |
| Overall | Combined | 489 | 86.46 | 2.41 | 88.56 | 77.345 |
| | Female | 89 | 85.63 | 3.17 | 87.74 | 76.13 |
| | Male | 400 | 87.28 | 2.2 | 89.38 | 78.56 |
| Young | Combined | 212 | 87.6 | 2.31 | 88.56 | 84.785 |
| | Female | 39 | 86.31 | 2.27 | 87.74 | 84.56 |
| | Male | 173 | 88.89 | 2.51 | 89.38 | 85.01 |
| Middle Age | Combined | 194 | 85.69 | 2.02 | 86.18 | 82.19 |
| | Female | 27 | 84.65 | 2.06 | 85.23 | 81.47 |
| | Male | 167 | 86.72 | 2.51 | 87.13 | 82.91 |
| Old | Combined | 66 | 82.03 | 1.98 | 82.62 | 79.88 |
| | Female | 13 | 81.32 | 1.56 | 82.41 | 79.12 |
| | Male | 53 | 82.73 | 2.33 | 82.83 | 80.64 |
| Children | Combined | 17 | 78.36 | 1.99 | 78.88 | 76.79 |
| | Female | 10 | 77.31 | 1.55 | 77.87 | 76.23 |
| | Male | 7 | 79.41 | 1.61 | 79.89 | 77.35 |

Difference in Walking speed in Shahbag

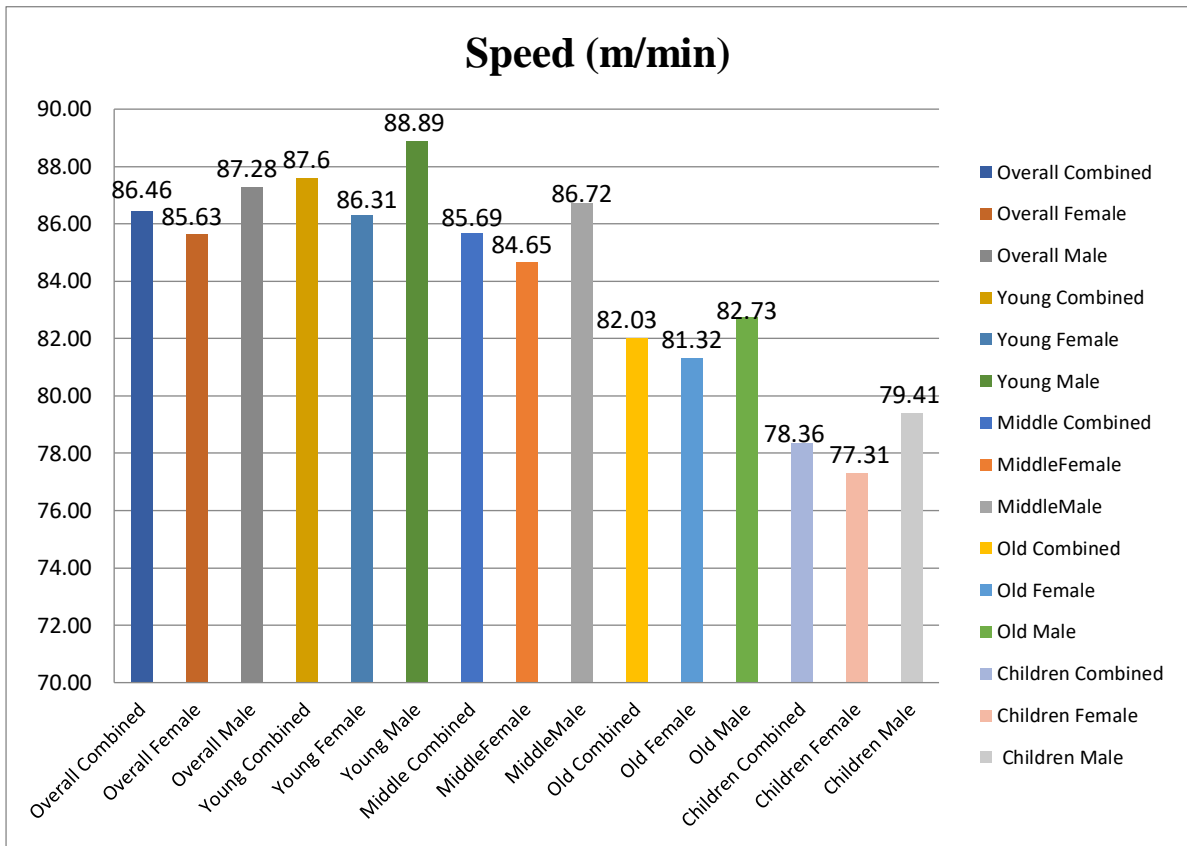


Figure 4.15: Walking Speed area on Shahbag

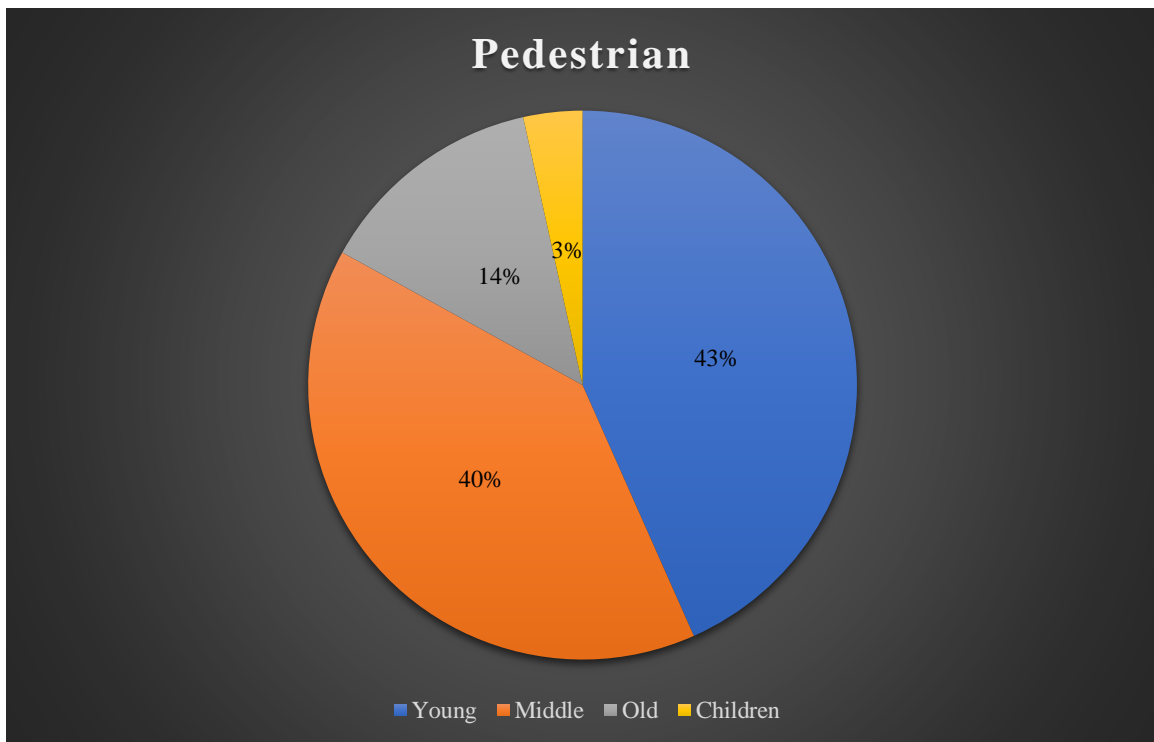


Figure 4.16: Pedestrian Percent

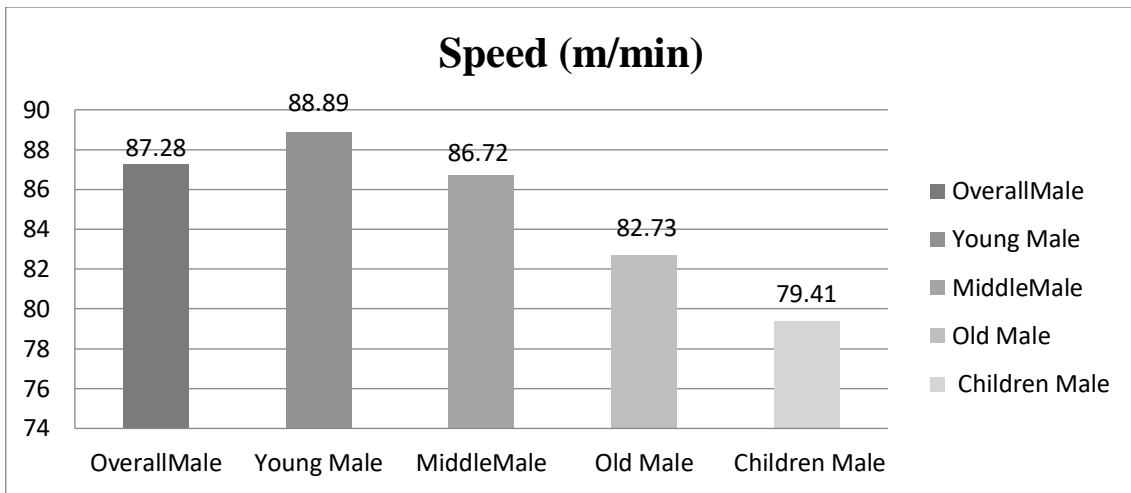


Figure 4.17: Walking Speed Male

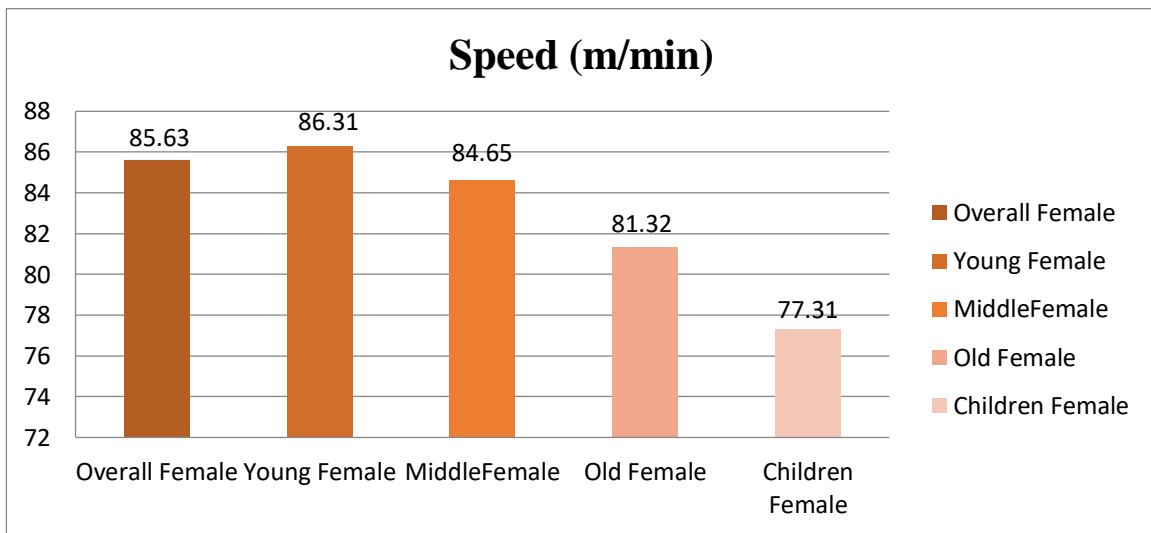


Figure 4.18: Walking Speed Female

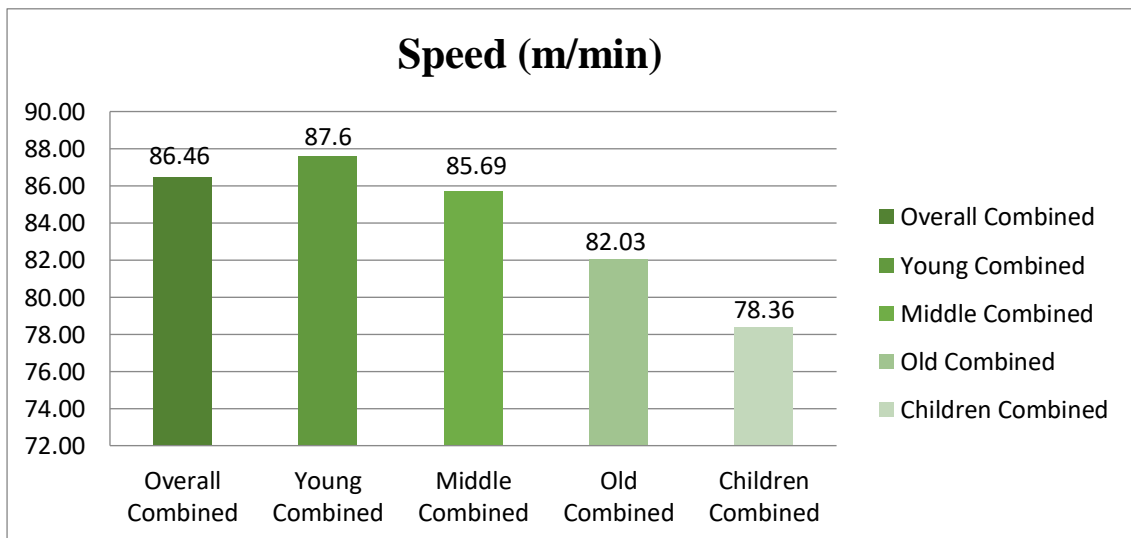


Figure 4.19: Walking Speed Combined

Table 4.4: People on foot Walking Speeds on Walkways for Mohakhali

| Characteristics | | | | | | |
|-----------------|-----------------|-------------|------------|-------------------|--------|-------|
| Class | Pedestrian Type | Sample Size | Mean Speed | Standar deviation | Range | |
| | | | | | High | Low |
| Overall | Combined | 544 | 77.05 | 3.09 | 78.51 | 68.12 |
| | Female | 137 | 76.03 | 3.56 | 77.89 | 67.1 |
| | Male | 407 | 78.07 | 2.92 | 79.12 | 69.13 |
| Young | Combined | 257 | 77.87 | 3.04 | 78.51 | 72.91 |
| | Female | 69 | 77.03 | 2.76 | 77.89 | 72.23 |
| | Male | 188 | 78.71 | 2.58 | 79.12 | 73.59 |
| Middle | Combined | 202 | 76.67 | 2.91 | 77.64 | 71.62 |
| | Female | 47 | 76.01 | 3.12 | 76.96 | 71.12 |
| | Male | 155 | 77.32 | 2.54 | 78.32 | 72.11 |
| Old | Combined | 57 | 72.895 | 3.16 | 73.995 | 68.12 |
| | Female | 12 | 71.37 | 2.52 | 73.21 | 67.1 |
| | Male | 45 | 74.42 | 2.56 | 74.78 | 69.13 |
| Children | Combined | 28 | 70.57 | 2.99 | 72.325 | 68.70 |
| | Female | 9 | 70.13 | 2.85 | 71.79 | 67.1 |
| | Male | 19 | 71.01 | 2.64 | 72.86 | 70.29 |

Difference in Walking speed in Mohakhali

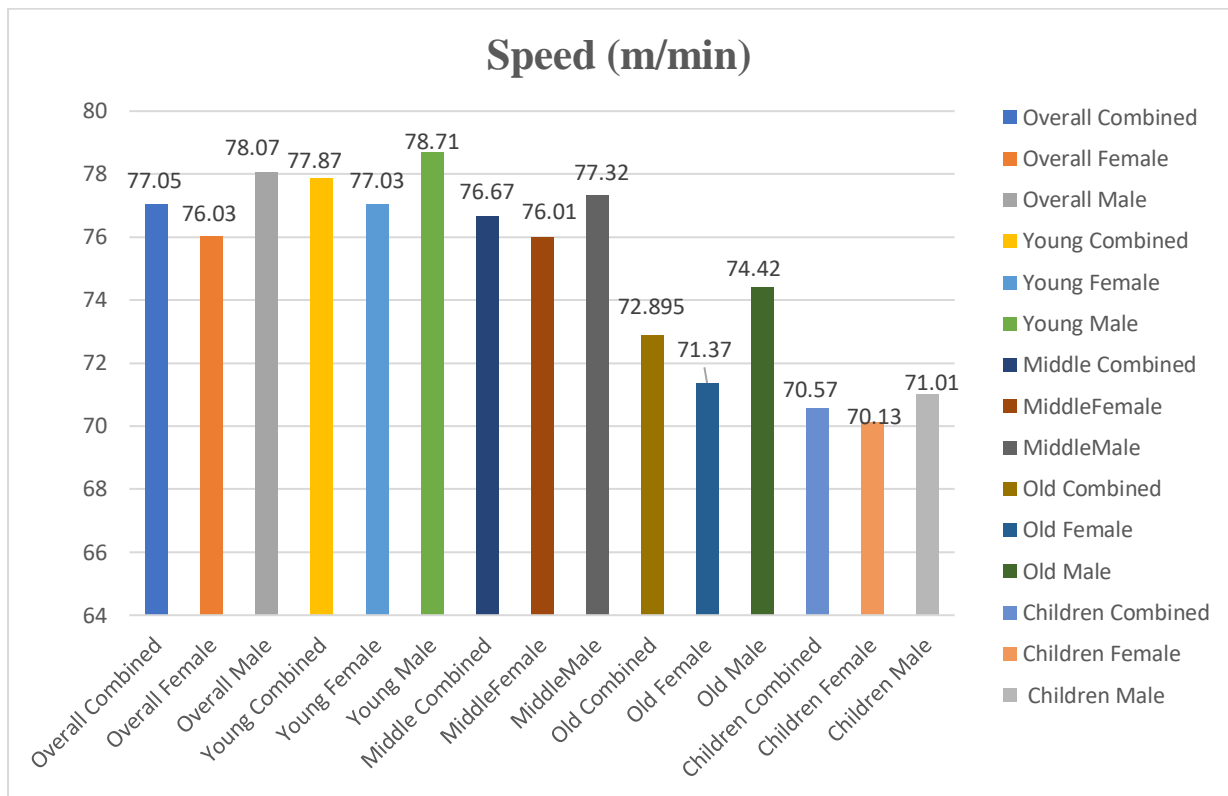


Figure 4.20: Walking Speed area on Mohakhali

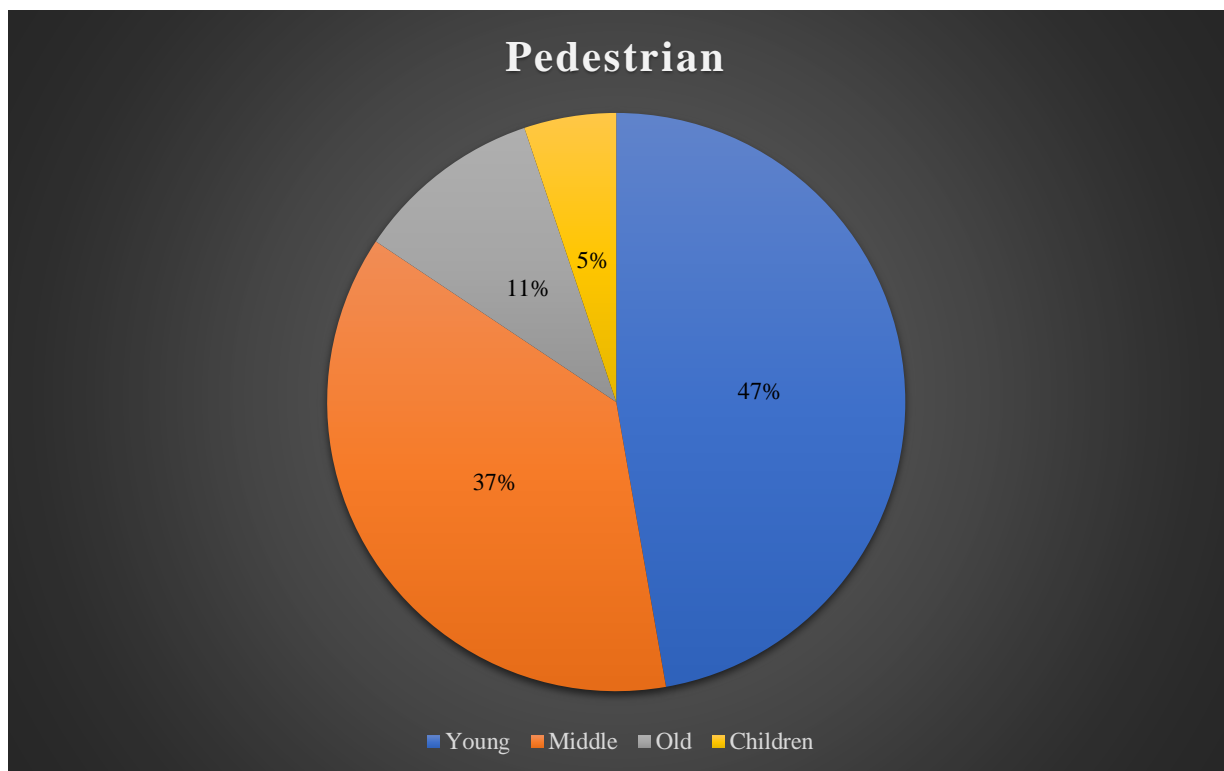


Figure 4.21: Pedestrian Percent

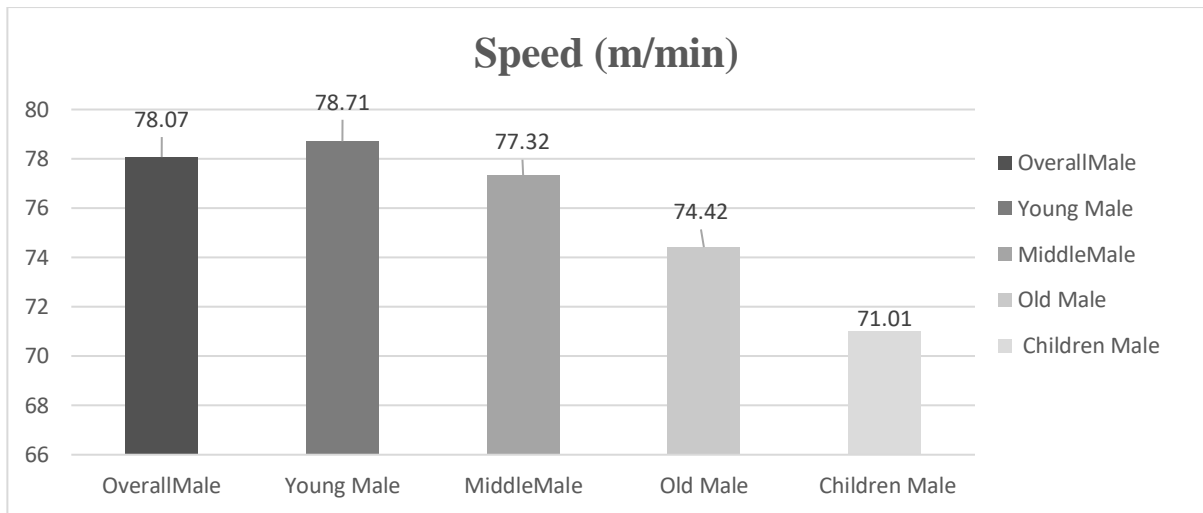


Figure 4.22: Walking Speed Male

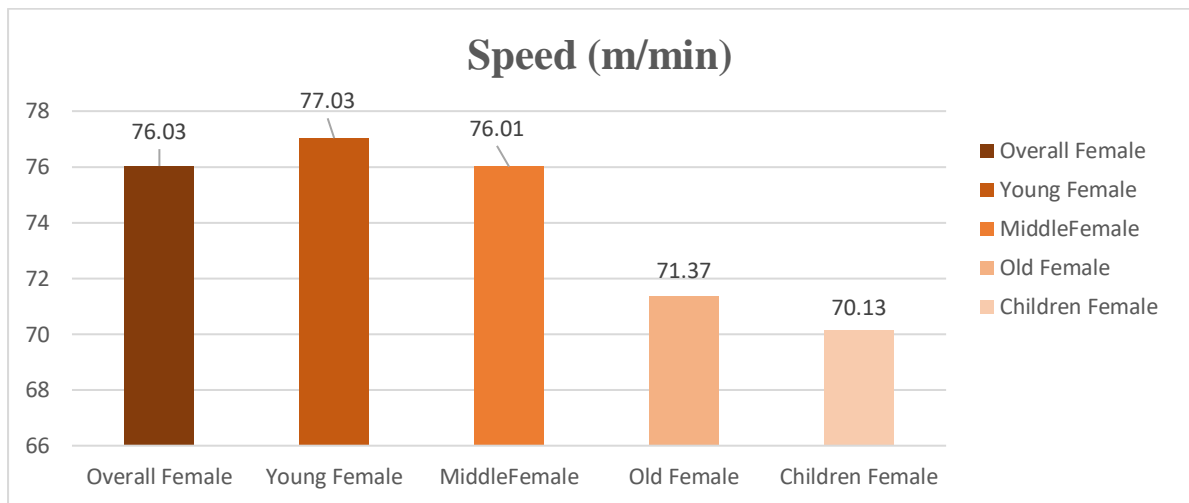


Figure 4.23: Walking Speed Female

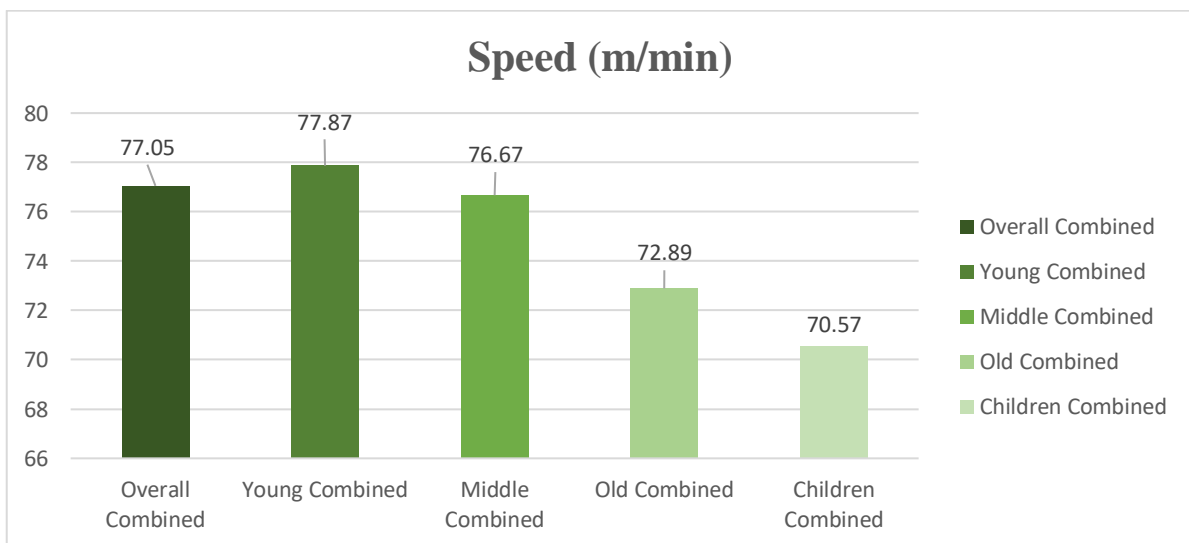


Figure 4.24: Walking Speed Combined

4.5 Comparison of the Speed of Science Lab, Motsho Bhaban, Shahbag, Mohakhali Dhaka Pedestrian with other Countries.

This correlates with speed studies conducted in the United States and later in the United Kingdom, who found walking speeds to be 79 m/min instead of 88 m/min (Alter, 1968; Hoel, 1968; Navin, Wheeler, 1969; Miss, 1971). However, agnate to Israel, forth a modest migration speed of 79 m/min (Polus et al., 1983), then across Singapore at altitudes above 74 m/min, according to Israel, Asia Ranger cross-mobility movement is generally lower than that of the Caucasian. minutes (Tanaboriboon et al., 1986). Koushki or Ali (1993) considered pedestrian walking speeds in Kuwait City to be slower than those in the United States and Great Britain, but were adopted as travel speeds in Riyadh, Saudi Arabia (Koushki, 1988). morals. (1991) processed pedestrian velocities associated with sidewalks in Calgary, Canada (84 m/min) and Colombo, Sri Lanka (75 m/min). A tie published in Tanaboriboon or Guyano (1991). Nazir Sial. (2012) found that the ground speed of a Bangladeshi man between the capital Dhaka was 69.49 m/min. The findings suggest that Bangladesh's immigration is leisurely than Western countries but equipotential to some Asian organization and Europe. From our data series, the mediocre low pace is 82.8 per minute/meters, which turned out to be greater than the optimal bad measure of the big city Dhaka.

From my neighborhood, we ran a rundown of the motives behind the reduced pedestrian speed. The pattern can also remain as follows:

- As the aureole cosmopolitan is raging encompassing the world, the thickness of pedestrians is less than that of normal pedestrians in science laboratory.
- In my region, position we assemble the case, the sufficient direction width is no weightier a count of the opening point by the end point. Normally, the best trail coverage is 4 feet, but for us, trail coverage is no longer the same in a particular location.
- Of course, from one hundred to thirty toes, in this place, there is a basic twin configuration on the bridge and the electric stacker, that's why the pedestrian can't easily walk, because he has You may not want to control your walking pace anymore.
- In Bangladesh it's mostly 8:00 to 10:00h & 5:00 to 7:00 pm is ceiling time. But we did collect demography at some point in the morning, but the lunch time until the wait is the reason why the pedestrian density is low.
- In my area, there used to be a shopping mall adjacent to the road, the integration of the mall has reduced the coverage of the road which could be the cause of the slowdown below pedestrian speed.

4.6 Difference in walking speed between Science Lab, Shahbag, Motsho Bhaban, Mohakhali

Science Lab, Shahbag, Motsho Bhaban, Mohakhali rest of the world. Following the simulation of a previous KUET lecture, we noticed the final results of walking speeds for other cities in

the country. In this study, we collected our profile by video recording via smartphone. While acquiring the documents in our possession, we encountered a crisp problem at Science Lab, Shahbag, Motsho Bhaban area, as it is closer to the court site and suitable for conservation secret of that place, we can only congregate a gong based on certainty or afterward we have a descending management structure. But it was once valuable adequate based on data collection. In the previous cultivation on KUET, we are tenacious that these carry-on stats accrued along with a special place in our US, but the results were well deserved. They argue that our country's defined normal low speed is 65.78 (m/min), which is generally slightly lower than Science Lab, Shahbag, Motsho Bhaban, Mohakhali Area. By manipulative the begin data, we get the base mini speed of Motsho Bhaban, Science Lab, Shahbag, Mohakhali Location of 87.17 (m/min), 86.46 (m/min), 83.16 (m/min), 77.05 (m/min) where the measurement recycled to be 125 feet and the offset was 6 feet, 6 feet, 5 feet and 4 feet. which is categorically close to world walking speed. The difference occurs in Science Lab, Shahbag, Motsho Bhaban and Mohakhali road outside the middle ternary due to part of the reason.

Those are may additionally keep paint as many follows:

- Width remains consistent throughout the aisle.
- We didn't have an avenue dealership on a computational scale before, so it should make it easier for people to move around.
- Daylight used to be a big deal for capricious portals, as it's no longer anyone's crest time.
- The area is convenient to the Parliament, so clearly the continuity route is basic since it is a footpath.
- Since it's close to a working domicile acknowledged as the old tannin center because of the updated car in the parking lot, we were in half slow gesture the whole time.

4.7 Pedestrian crashes at Intersection in Dhaka

The purpose of this guide is to identify the factors that contribute to the figure of pedestrian-person accidents at intersections in prosperous countries. This culture also helps extend skills across disciplines, as significantly less research has been done in an increasing national context, as opposed to an advanced global setting. Road environments and users' behavior varies so much that beyond known risk circumstance from progressive global area may also produce exceptional outcomes in the evolving US situation.

In extension, this discipline also uncovered many fundamentals of recent concern in the biography, such as the standard control of website inspector and the actualization of anti-abuse devices, speed breakers, cosmic panels, etc. Many of these initiations are either very unique depending on the prosperous country or currently absent from most funding countries.

4.8 Walking Speed Under Different Influences

Table 4.5: Walking speed different influences

| Category | Scinence Laboratory | Shahbag | Mothsho Bhubon | Mohakhali | Range | |
|-------------------|---------------------|---------|----------------|-----------|-------------|------------|
| Gender | | | | | High | Low |
| Male | 504 | 400 | 404 | 407 | 86.5 | 75.36 |
| Female | 86 | 89 | 57 | 137 | 83.66 | 73.42 |
| Age | | | | | | |
| Younger | 262 | 212 | 222 | 257 | 85.46 | 79.85 |
| Middle age | 208 | 194 | 200 | 202 | 83.3 | 77.93 |
| Older | 93 | 66 | 30 | 57 | 78.59 | 73.98 |
| Children | 27 | 17 | 9 | 28 | 75.12 | 72.12 |

The doses of many human walks associated with the footpath foundations of the four exceeding places in Dhaka's civil community are 64.77 m/min, 26.57 m/min and 28.99 m/min respectively. In urban areas of Dhaka, the basic men walk quick than the basic women. This is because men at the bottom can go faster than girls under the worst of circumstances. The average walking and walking speed are more or less pronounced at 77.05 (m/min) at Mohakhali, but 86.46 (m/min) at Shahbag and 87.17 (m/min) for Motsho bhobon as well. Rooted young people are the lackadaisical to move ever in civil compass. The number of young communities in terms of ground speed is lower than relatively reluctant passers-by at the entrance of Mohakhali, Shahbag, Mothsho Bhubon, and higher in Longevity Science Laboratory, Dhaka metropolitan area. The average walking pace for children, young, moderately active or stronger hikers is almost astonishing at Science Lab, Shahbag, Mothsho Bhubon, Mohakhali. Then, there are more people who walk fast than people who walk poorly. Since the foot population Science Lab is almost declining, they compete with young people to walk at high speed and then approximately backwards. At all three of his locations in Dhaka city, many walking exercises are performed in relation to a humbler group of retable walkers who have larger competition sizes around their feet. An excellent backdrop is noted under the portal of the Mothsho Bhubon, where many foot movements meet across the altar, three walkers less than his six feet. Pedestrians other than carrying luggage walk at a faster speed than those at the base, regardless of all three of his points marked in Dhaka's urban areas. People inside the base who use smartphones on foot walk faster than others who walk a third of Dhaka's civil community.

4.9 How would we be able to speed up common strolling

- Captain in relation to full, the regular diameter relative to the pavement must be preserved omnipresent.
- If the hawkers wear scraps on the side of the footpath, the speed of the passerby walking will expansion.
- No one is allowed to stopover later parking on the footpath.
- There are no magnetic poles located in every trail. After that, people's appetite for walking speed no longer manifests, as a choice as a consequence walking speed objective increase.
- Appropriate precautions should be taken to establish that no one is illegally occupying the sidewalk. Then the rhythm of wandering on the footpath became more and more yearning.

4.10 Comparison speed the four-survey study

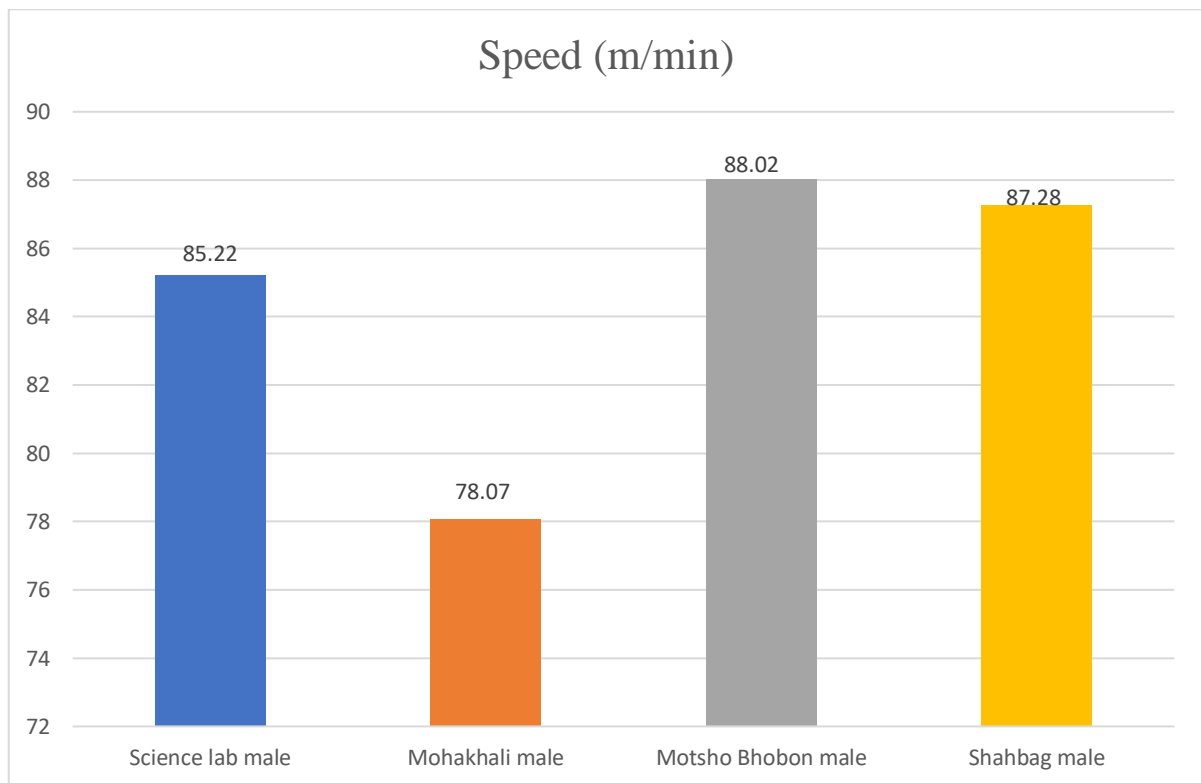


Figure 4.25: Walking Speed of male

In this figure we find the speed of male. We get the high walking speed for the respect of Motsho Bhubon 88.02 m/min and in the other site we get the low walking speed 78.07 m/min from the Mohakhali.

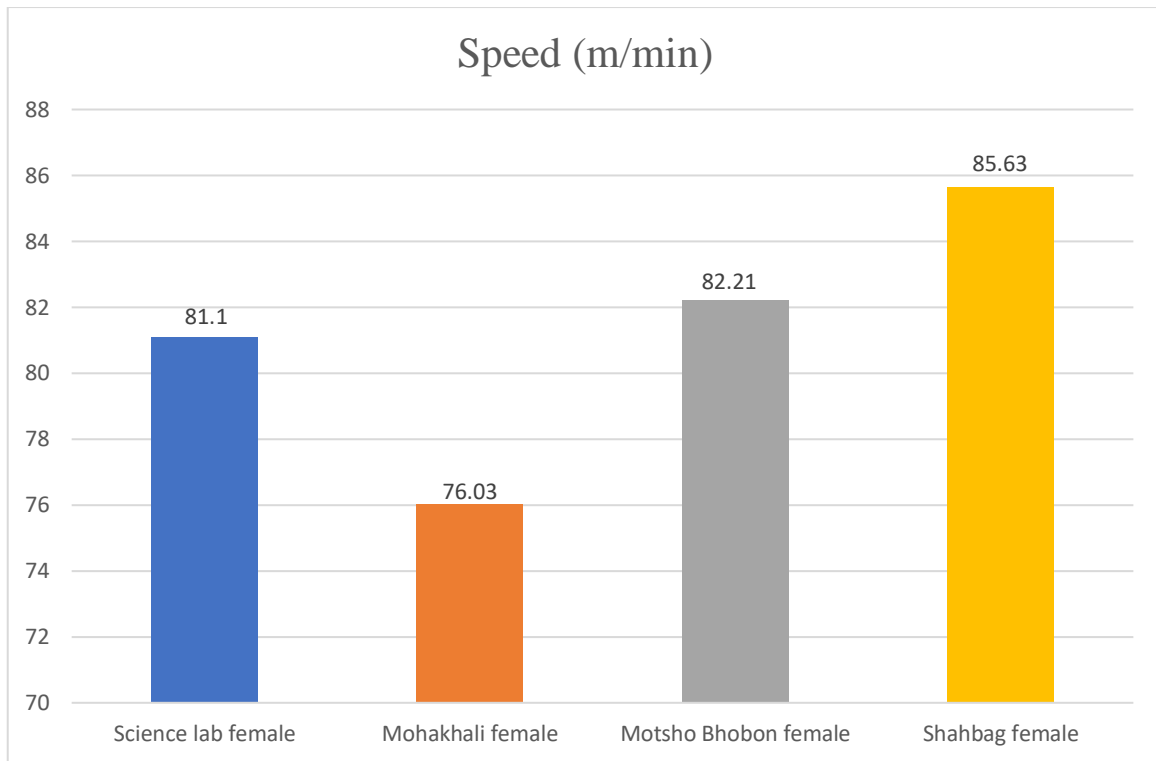


Figure 4.26: Walking Speed of female

The high speed of female walking speed come from the science lab site and the low walking speed come from the Mohakhali, because Mohakhali footpath is too narrow and unregistered footpath shop, for this reason the low velocity of walking speed 76.03 m/min comes from the Mohakhali.

CHAPTER 5

Conclusions & Recommendations

5.1 Introduction

This part summarizes the tests that arose on that principle, and the main results continue to work and suggest. This proportion will be considered along with developments and assumptions regarding future research. Below is an overview of our efforts for this exploration.

5.2 Conclusion & Recommendations

1. The average speed of pedestrians in the areas (Science lab) is 83.16 m/min. At low speeds in all other parts of the city (Science lab). This is no longer acceptable. But our country turned out to be slower than the United States, Europeans, Saudi Arabia and Indonesia. longevity.

2. A lower velocity of 77.05 m/min is reached from Environment 4 (Mohakhali) and then 83.16 m/min from Area 2 (Science lab). These records are higher than previous searches for typical average speeds in the Dhaka metropolitan area. durability.

3. In the connection area, the average walking speed of male walkers (88.02 m/min) is higher than that of female walkers (86.31 m/min), and in other places, the basic slow walking speed of descending pedestrians (70.57 m/min) is a minute. Male pedestrians walk faster than Female pedestrians in all four locations.

4. Male Pedestrians walk faster than female pedestrians in all types of land-use descents. The maximum walking speed for female pedestrians is set for shopping areas (86.31m/min) and lower areas (70.57m/min). The full difference between descending speed and running speed occurs in mixed terrain use (15.74 m/min).

5. In the 'Mohakhali' area, the young soul rides at a low speed of 73.59 m/min and the young lady rides at a low speed of 72.23 m/min, whereas in Science lab the young lady measures (80.41 m/min), so it consists only of the area of " Mohakhali ".

6. The maximum walking speed for center defenders (male and female) at "Motsho Bhaban & Shahabag" bus station is 89.76 m/min and 87.26 m/min. However, another area "Science lab", the highest walking speed for young or elderly people is 89.38 m/min, while it is 87.74 m/min.

7. We also shown those difference in Bar Chart as like Male vs female.

8. For a well-maintained pedestrian flow, hawkers should be removed from the foot overbridged and the footpath.

9. All crossings need a median island with a median barrier to ensure safe pedestrian crossings.
10. Turn restrictions and separation barriers; parking or waiting places for public transportation vehicles (buses, rickshaws, auto-rickshaws, taxis, and others).
11. Considering the high density of pedestrian traffic all over the city, it should be provided to ensure safe pedestrian crossing.

5.3 Proposals for Further Investigations

The speed-flow-thickness model was originally developed for circulating pedestrian puffs in a large civil community in Bangladesh. This model represents a specific urban area in Bangladesh. Based on further investigation, it is possible that the bi-directional replication model is also left full due to the Walker flow. For future investigations, the change in walking speed of pedestrians due to the reduction in sidewalk width.

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