To Walk or Not To Walk:
A Pedestrian’s Dilemma in Male’
Beyond Shoe Prints - Elders & Disabled & Male’s Pedestrian Facilities

Clean Air Initiative Asia, in Collaboration with Environmental Protection Agency of Maldives, funded by World Health Organization (WHO)

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“Our genome is the result of several million years of selective pressure for an active, but economic organism. By making physical activity the norm and by rendering access to sedentary behavior more difficult it may become possible to bring modern Homo sapiens’ genome to express in a more appropriate environment and thus relieve the global burden of chronic non-communicable disease.”

Bengt Kayser, Faculty of medicine, University of Geneva, Switzerland
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Male’, the capital of Maldives is among the densest capitals in the world. Its main island, which is the commercial, educational, cultural and residential capital, has an area of less than 200 hectares and is home to more than a 100,000 people. Consequently, limited space, mixed land use and high-rise buildings are dominant making urban planning a tremendous challenge. Land is the most expensive commodity and therefore buildings maximize the use of their property, leaving no clearance for sidewalks. Although the island is ideal for walking because its size allows one to walk to any point in the city within 20 minutes, the Walkability Survey results found out that walking in Male’ is not a popular mode of transport.

Co-organized by the Environmental Protection Agency (EPA), the Survey was conducted in June 2010 with volunteers from Villa College and EPA staff and CAI Asia Consultant. The World Health Organization’s Regional Office provided co-funding and requested that the needs of physically disabled and the elderly be taken into account.

On a scale of 0-100% to measure the level of satisfaction, the overall average for Male’ was 56%. Out of the 100 people interviewed (including elderly, deaf and mute and other physically-disabled respondents), 37% rated the pedestrian facilities as “Okay”, followed closely by “Bad” at 36%. The major roads have a proportionate area devoted for sidewalks, whereas, in other areas, the roads are narrow and pedestrians have to compete with numerous cars and motorcycles. This gets worse during peak hours. Sidewalks are typically 4 inches above road level, made of bricks pavers, and the width varies from as much as 1.2m to less than 0.2m. There are several roads without sidewalks at all and pedestrians have to walk side by side with moving vehicles.

There is now an over-congestion of motorcycles which is estimated to be 15,000 registered for Male’ citizens only, (in ratio, about 1 out of 6 residents own a motorbike). Unrestricted importation and the unavailability of any public transport such as buses could be the main cause of such high dependency on motorbikes. The residents have to rely on their private vehicles or the taxis (that have a fixed flagged down rate of 1.5US$ to any point in the city).

There seems to be sufficient numbers of crossings, at intervals of 50 to 100 meters. On the narrow roads, it has been observed that pedestrians cross instantly instead of looking for the nearest crossing. On some crossings, the yellow paint has faded. In general, the drivers use only the allocated road and usually avoid the sidewalks. Some interviewees commented that motorists rarely gave way to pedestrians and are welcomed by honking as soon as they have to slow down or wait due to traffic. They mentioned some cases wherein some of them or their relatives have been hit by motorcycles and cars which did not stop even after the incidents. According to Indhira Gandhi Memorial Hospital (IGMH) records 155 cases of injuries to pedestrians were reported in 2009 in Male’. Of the total cases 70% of the pedestrian injuries were caused due to motorcycles, while 28% of injuries were from 4-wheelers.

A few sidewalks have shade provided by trees. There are speed bumps/humps to slow down motorists. In some intersections, there are metal railings. Sufficient numbers of streetlights are available on major roads. Not all streets have signages; therefore people rely on buildings as landmarks. The available signages are written in both Dhivehi and English but the font size is very small and signages are often difficult to locate. Among the noted obstructions are construction equipment, goods and advertisements of shops and illegal parking.
Not a single ramp for wheelchair access was found throughout the city. Therefore, the rating for disability infrastructure was considered the most unsatisfactory. For elderly and physically disabled, the uneven surface of the brick sidewalks is also not comfortable, while some elderly interviewees mentioned that they are unable to move out of homes due to fear of being hit by motorbikes. Furthermore, residential and institutional buildings do not have lifts which makes it troublesome for them to have an active lifestyle outdoors.

The elderly interviewed were those referred by MANFAA (a local NGO dedicated to senior citizens), those met randomly on the sidewalk, those who live in the same building as the volunteers, and those jogging at the artificial beach. Disabled people are rarely on the street. CARE Society (an NGO for the disabled) referred 5 persons who consented to be interviewed at their homes, and Jamaluddin school’s special class for the deaf and mute also participated.

To improve walkability in the Male’ city, stringent measures in policy, infra-structure planning and regulation needs to be in place. With such an emphasis a paradigm shift can be achieved to make Male’ a walkable city in the future.
Walking is the most fundamental form of transportation and is essential for a living as it is the main connection between all activities including other sources of mobility. Studies have shown that individuals can derive immense health benefits by walking just 30 minutes each day and is one of the most popular activities for people of ages 50 and above (1). Walking as a mode of transportation creates healthier communities, vibrant economies, sustainable environments and better quality of life. For a vibrant and livable city, walking has to be encouraged. Any community which supports walking can provide social and personal interactions which are one of the most important social elements of a healthy community. Walking and walkability have major benefits in terms of health, sociability, cost savings, cleaner air, and greener public spaces as well as in the improvement of overall quality of life for city dwellers (2).

The World Health Organization (WHO) has raised concerns over the increase in sedentary behavior-related health problems and urges member countries to prioritize and promote physical activity on their public health agenda. WHO urges the member nations “to encourage and foster a favorable environment for the exercise of individual responsibility for health through the adoption of lifestyles that include a healthy diet and physical activity” and states that “strategies should be geared to changing social norms and improving community understanding and acceptance of the need to integrate physical activity into everyday life. Environments should be promoted that facilitate physical activity, and supportive infrastructure should be set up to increase access to, and use of, suitable facilities” (3). Walking is promoted to address the issue of sedentary behavior as it is cheap and effective and can provide immense health benefits. Hence adapting the built environment and social behavior to maximize walking is advocated to facilitate the health of people. Studies have shown that higher levels of walkability provides for higher levels of physical activity. (4)

Male’, the capital of Maldives, has been saturated with development for the last 50 years and has become the country’s largest population centre. Over a third of the Maldivian population resides in Male’ while an influx of expatriate workers and visiting islanders adds to this burden. Being an island of just over two square kilometers in size and being developed without much planning, Male’ has also become the most densely populated city with an average of 50 thousand people per square kilometer (3). Along with the saturated development and influx of people from different parts of Maldives, the city also is suffocating from an ever-increasing vehicle fleet, consisting mostly of four stroke motorcycles. The road system in Male’ consists of a network of 59.5 kilometers of paved road with carriage ways of different widths; the majority of them are just wide enough for a single four-wheeler to move. The vehicle fleet has grown at a rate of 18% annually according to 2007 statistics. The total numbers of vehicles registered in Male’ from January 2006 to December 2010 is 19,767 of which 86% percent are motorcycles, while 5% are cars (4). These staggering figures show that the vehicle fleet is proportionally high compared to the size of Male’ and could mean increase in pollution and impacts on pedestrians and vehicle drivers. The city which is walkable and any place is within 20 minutes walk has become a riding city within a short expanse of a few years. For a small gain in speed and convenience, a high price and high risk is posed in terms of health and quality of living in Male’. It is estimated that 37,500 motorcycles, 12,500 car/taxi return trips at an average annual cost of MRF 108 million is carried out by residents in Male’ (5).

Being shifted to a riding City also has impeded the walkability of the city especially for elders and those with special needs. Even with a large population and high pedestrian activity, especially during the school hours, the pedestrian facilities in the city are considered inadequate. This has lead to the deterioration of quality of life in general, while elders and those with special needs suffer an extra burden. It has also led to a decrease in social interaction and break down in the social structure of the traditional culture of Maldivians. The increase in vehicles further reduces space for pedestrians as more parking spaces are required and pedestrian facilities are taken for granted (5).
To make a paradigm shift, the city requires financial incentives, sound policies, and advocacy from local groups to make Male’ a walkable and walking city. The Environmental Protection Agency (EPA) wishes to take the lead in this regard and would like to begin advocacy and policy dialogue with all stakeholders to achieve this goal. EPA also wishes to congratulate the President of Maldives Mr. Mohamed Nasheed for his continued support to walking and cycling and we would like to highlight that his Excellency gives a high emphasis and preference to walking and walks often to his office from his residence. By carrying out this survey EPA would like to bring to the attention of the public, the high price we pay as a result of our selfish desires for a little convenience and speed. In a recent statement the President of the Maldives Mr. Mohamed Nasheed has acknowledged the challenges faced in Male’ due to over-congestion and the challenges ahead in improving the quality of life in Male’. The Government of Mr. Nasheed has pledged to improve living conditions of Male’ city dwellers under the “Veshi Fahi Male’” program which aims at expanding Male’ to the greater Male’ area and redeveloping Male’, with better land use plans and policies. We hope this initiative will add more value to this program and Male’ will become a walkable city in future.


2.1 SCOPE

The study was initiated as a result of a personal interest given to this issue by EPA staff, Mr. Ibrahim Mohamed who attended a regional workshop held in Colombo by the South Asia Cooperative Environment Program (SACEP) and UNEP on vehicular emissions. In this workshop a walkability survey for Colombo was presented by CAI-Asia consultant, Ms. Joy Bailey and Mr. Michael Co. Upon the request of Mr. Ibrahim and Dr. Maheswar Rupaketi of (United Nations Environmental Program, Regional Resource Centre for Asia and Pacific (UNEP-RRCAP), the CAI-Asia staff agreed to provide assistance to conduct a walkability survey for Male’ and hence this survey was carried out. WHO Maldives kindly contributed the funding of this survey. WHO made a special request to focus on elders and the disabled and the impediments to them in Male’s pedestrian facilities. EPA would like to thank CAI-Asia for providing the consultancy free of charge and WHO for providing the financial assistance to carry out this survey.

The survey for study was carried out by students from Villa College Maldives and we highly appreciate their cooperation and assistance and would like to thank the management of the College for supporting us.

2.2 METHODOLOGY

The surveys were conducted between, 21st -25th June of 2010, in Male’ City. The survey was carried out with the help of CAI-Asia using a toolkit developed by CAI. The survey included 3 major research components and consisted of a field walkability survey, a pedestrian interview survey and a stakeholder survey.

2.2.1 WALKABILITY RATING

The field walkability was carried out based on a perception of surveyors on the pedestrian facilities in different areas of the city, such as the commercial area, the residential area, the educational area and public transport terminals. The survey involved a physical assessment of the pedestrian facilities and rating of the walkability according to the surveyors’ perceptions.

2.2.2 PEDESTRIAN INTERVIEW SURVEY

The interview consisted of questions on the pedestrians’ perceptions on the physical aspects of various pedestrian facilities. The interviews were done during peak hours when people were walking to work and school. It also included rough estimates of pedestrians on the road.

2.2.3 STAKEHOLDER INTERVIEWS

Stakeholders were consulted and interviewed to gain an understanding of existing rules and regulations and policies as well as pedestrian injuries and fatalities. Stakeholders consulted also included NGOs working for disabled and elderly peoples’ welfare and wellbeing.
2. INTRODUCTION

2.2.4 COVERAGE AREA FOR WALKABILITY

The map given indicates the areas where field surveys were carried out.

1- Commercial Areas: The commercial areas include a strip of Majeedhee Magu in the centre of Male’ and the area near Fish Market and surrounding. These areas are considered the busiest in terms of commercial activities; since the fish market area is where loading and unloading of cargo from local boats and local supply chain for various goods occurs. The Majeedhee Magu strip is where the most shopping areas are located for Male’ residents and is considered the hub for shopping.

2- Public Transport Terminals: Public transport terminals allocated for surveys were the Villimale’ Ferry Terminal and the Hulhule/Hulhumale’ Ferry Terminal. The two areas are the major links to other nearby non connected regions of Male’, namely Villimale’ and Hulhumale’. The Hulhule/Hulhumale’ ferry terminal area is where all incoming and outgoing passengers from Male’ International Airport moves while also residents living in Hulhumale’ also use this area as the 2 terminals are adjacent. Villimale’ terminal is used by residents from Villimale’, while the area is also the ferry terminal for Thilafushi Island where more than two thousand people reside.

3- Educational Areas: The two educational areas surveyed were the Aminiyya School area and Imaadhudheen School area. Aminyya School area is the most important educational area as the area consists of a primary school, a secondary school and a higher secondary school. Similarly the Imaadhudheen School area has college faculties. These are areas where much pedestrian activities take place.

4- Residential Areas: The residential areas selected were the Sinamamle Flat area in Galolhu ward and the East Maafannu area covering the East end of Majeedhee Magu. These areas mostly consist of public flats and private homes and are the major residential areas in Male’.

5- Institutional Area: The institutional Area chosen was near the Ghaazee and Huravee Buildings where most of the public offices are located.

The survey covered almost 1 km of the commercial strip and 1.1 sq km of area which is almost 50% of the whole of Male’ city.

INTERVIEW SURVEY

The pedestrian Interviews were mostly concentrated on the elderly and the disabled and the interview survey consisted of 100 participants. This included 50 elderly, 15 disabled and 35 others. Interviews with disabled were conducted by visiting Care Society Maldives and Jamaaludheen School, both providing care for disabled children. For disabled elders’ interviews were conducted by visiting the MANFAA Centre for the disabled and elderly. Based on information provided from MANFAA Centre some elderly people were also visited at their own residence. The remaining 35 interviews were carried out on different stretches surveyed in the city.

Stakeholder interviews included interviews with key officials from the following

1 - Male Municipality - now, Male’ City Council
2 - Ministry of Transport and Communications
3 - Ministry of Housing and Environment
4 - Maldives Police Service (Traffic Police)
5 - MANFAA (NGO for elderly)
6 - CARE Society (NGO for physically disabled)
7 - Ministry of Health and Family
This map indicates the areas where the field surveys were carried out.
3.1 FIELD WALKABILITY SURVEY

In the city of Male’, streets are generally small and often lack foot paths and designated parking spaces for vehicles. A considerable amount of constructions is also seen and foot paths are blocked by building sites and often the pavers on footpaths are dislodged and damaged on these sites. Hence safe and healthy walking areas and unsafe walking areas are also found while, not even a single road had ramps or special facilities for disabled people.

3.1.1 WALKING PATH MODAL CONFLICTS

Conflicts with pedestrians are seen, especially with motorists. It was observed that some motorists use pavements and interfere with people walking on pavements. Similarly in small streets with no foot paths, pedestrians are often unable to move due to motorists hogging up the space or other vehicles impeding the movement of pedestrians. Pedestrians are expected to give way to vehicles and are honked at by motorists, and elders and children are often neglected by motorists. Motorists are also seen raising their speed hastily, producing unnecessary noise and using their horns at will, often giving sudden shocks to pedestrians. There are no bicycle tracks on any roads and is a huge challenge due to lack of space on roads.

All the roads were accessible to motorists, though a few streets are barred from four-wheel vehicles and hence there were no streets exclusively for pedestrians to move freely, without encountering traffic flow.

The results showed that the worst pedestrian facilities were available for the commercial area and scoring was 50 out of 100. The institutional area is considered to have the most adequate facilities for pedestrians and scored 80. The average score for all areas was 68. Hence pedestrian facilities are considered sufficient by respondents.

3.1.2 FOOT PATH AVAILABILITY

Availability of foot paths is a major constraint in many small streets of Male’ as there is lack of space to create more spacious walking paths. Even in major roads the pavements are generally too narrow making it impossible for more than two people to walk side by side comfortably and freely. Moreover the conditions of foot paths were alarmingly inadequate for pedestrians, especially elderly and the disabled. In commercial areas, foot paths were used as a temporary storage area for goods, by shop owners and often all space near the shops are filled with goods. Similarly in construction sites most of the footpath is inaccessible due to barriers laid and ongoing construction work hogging the walking path space. Some walking paths are also used as vehicle parking due to small size of streets. It was also found that after completion of construction the damage caused to foot path from the construction is not repaired and maintained making the pavement uneven and difficult for wheel chairs or prams. In many areas it was also found that the motorcycles are parked like a wall adjacent to the pavements causing discomfort and impeding free movement from one side of the road to the other side. Hence the pavements and footpaths in Male’ city need to be made more accessible. The residential area scored the least and was 47, followed by commercial area with a score of 49. The institutional scored highest rating and was 64.
3.1.3 **AVAILABILITY OF CROSSINGS AND CROSSING SAFETY**

Signalized crossings with traffic lights and zebra crossings were available for pedestrians in most of the bigger streets and are considered adequate. However the traffic lights are mostly non functional making it risky for pedestrians. Even though Zebra crossings are available, vehicles seem to neglect pedestrians and pedestrians are always compromised. However the speed limit is very low for Male’ city by law and also speeding is difficult due to small size of roads and congestion in most streets. As a result people can cross safely from non designated areas for crossing and jay walking is commonly seen from pedestrians. Skywalks or sky crossings are not seen in the roads and may be due to lack of space in roads.

In terms of scoring residential areas had the lowest for availability of crossings and may be due to smaller streets. Institutional areas and commercial areas are scored with 75 and had the highest scores for crossings. The average for availability of crossings for the whole city was 59.

3.1.4 **MOTORIST BEHAVIOR**

Motorcyclists’ behavior is seen as a public nuisance by pedestrians and pedestrians are greeted with honking continuously, while those on bicycles are felt as an obstacle by motorcyclists’. Honking by motorists is a common scene even with good traffic flow. Just for a little convenience and speed motorists honk at their will and speed hastily. Consequently, the elderly people felt psychologically and physically threatened due to this uncontrolled behavior of motorists. Motorcyclists’ often neglect traffic signals and sometimes ride on pavements to make their way through or for short cuts. This impedes pedestrians’ movements and pedestrians’ are at a constant fear of being hit by motorists. According to Traffic Police, more policing is done during peak hours and heavy fines are being imposed on traffic violators. This may help to curb the worsening conditions in future. Motorists were also the leading cause of pedestrian injuries according to reports from IGMH. Of all the leading causes of pedestrian injuries, 70% accounted for motorcycle accidents, while 28% were caused by four-wheelers. In addition the only one case of pedestrian death due to traffic accidents reported in 2009 was also caused by a collision with a motor bike.

Commercial area is considered the most intimidating for pedestrians by motorists and had a score of 48. Residential area had the highest score and was 70. Thus in most suitable areas for walking such as institutional area also, motorcyclists’ behavior is considered a nuisance by pedestrians.
**3.1.5 Amenities**

Amenities to facilitate pedestrian movement include street shading from street greenery, benches, sign boards, waste bins and protective railings for pedestrians. In Male’ few streets are planted with trees and some are shaded and cooled from big old trees. However there are no special facilities for elderly to take a rest on the roads, while the railings were only in few areas with traffic lights. There are no waste bins on the streets and hence street littering is common.

The scores for amenities were quite low and lowest were for commercial area with a score of 38. The highest score was for public transport terminals and may have been due to the availability of few places to take rest and availability of more space in the areas. However the vehicle encroachment in to walking space is seen in the Villimale’ ferry terminal parking area due to large number of motorcycles parked. The average score for amenities was 50, for the whole city.

**3.1.6 Disability Infrastructure**

Pavements accessible to disabled people through wheel chair and pram is not seen and there are no ramps on any street. There are no kerb ramps to the pavements, while most pavements are too narrow for wheel chairs. According to the survey the least score was for the availability of disability infrastructure with an average score of 20. Compounded with the unavailability of any such infrastructure is the motorist behaviors which makes it impossible for a disabled person to move alone in the streets of Male’.

**3.1.7 Obstructions**

Public transport area is considered with the least obstructions for walking according to scores and had a score of 63, while on average it was 54. Obstructions are common on many areas especially in commercial area. Most of the obstructions are temporary and most common form obstructions were from construction sites using the foot paths to store their materials and equipments. Often the whole street may be closed during construction causing nuisance not only to pedestrians but to all road users. Also many small retail shops and cafes as well as tea shops are seen using the foot path to keep their goods, blocking the movement of pedestrians’. In addition many vehicle repair and maintenance workshops keep the damaged vehicles on foot paths and their activities such as painting and washing often creates discomfort to pedestrians.

**3.1.8 Security From Crimes**

In Male’ city security from crime is seen to vary greatly, and public transport terminal areas are seen most safe from crimes with a score of 90, while walking and residential areas are considered least safe with a score of 40. Commercial area scored 55, while institutional area scored 88 and average score for security from crime was 68. It seems areas where people are crowded are safer, such as the public transport terminals. The very lower score for residential area shows the increasing crime rate and is the general consensus of the public.
3.1.9 RESULTS OF PEDESTRIAN FIELD SURVEY

The walkability index results show that Male’s overall walkability index was 56 out of 100. The residential area and commercial area scored the least and was 48 and 49 respectively. The institutional area scored the highest and was 64, while the public transport terminal scored 62. Please refer the graphs given below for summary results.

* Web diagram showing walkability results for Male’ City

* Bar graph showing the average walkability index for different areas
According to the graph given below, pedestrian counts for various areas surveyed and length of the streets surveyed for each area, pedestrian count was highest for commercial area. The length of streets surveyed was highest for residential area and was 0.9km. It shows that pedestrian count was above 100 for all areas, except public transport terminal with 90. The less number of people on public transport terminal may be due to rapid turnover of people from the terminals to their destination as few people will remain in waiting at a given time. The results showed that the commercial area had a count of 404 on a stretch of 0.74km. Please note that the length corresponds to both sides of the streets observed during surveys.

3.2 STAKEHOLDERS INTERVIEWS

3.2.1 PEDESTRIAN INTERVIEWS

The pedestrian interviews conducted were concentrated on elders and parents of disabled children as well as pedestrians on the road. A total of 100 interviews were carried out.

3.2.2 TRAVEL BEHAVIOR

As for the current travel and walking behavior of respondents, people spend very less time on traveling to main destination such as work place or school. This is not surprising as Male’ is a very small city and hence can reach anywhere within 20 minutes by walking. Hence average travel time for main destination is less than 15 minutes for 48% of respondents and for 42% it is between 15 to 30 minutes. Only 5% spend more than an hour of traveling one way to their main destination and may be the people who travel from Hulhumale’ Island which is about 35 minute ferry ride from Male’. Majority of people travel only less than a kilometre one way for their main destination and consists of 70% of respondents. About 20% travels 1.1 to 3 km daily on their way to work and could be people traveling from Villimale’ to Male.
To find out whether people had choice of their travelling mode we asked them about vehicle ownership. It was found that most people used their own vehicles as there is no public transport system available.

As shown by the graph majority of the respondents, who represent 77% of interviewees, owned a motorcycle. Those who own bicycles are the least and are just 8%, while 27% had no vehicles of their own. It is also interesting to find that more people own cars than bicycles, showing the less than desirable nature of using bicycles. The results clearly indicate the paradigm shift from bicycle usage to motorcycle in the city as the bicycle ownership is considerably low.

### 3.3 PEDESTRIAN PREFERENCES

The interviewees’ responses on existing pedestrian facilities in Male’ city and on aspects to be improved were also found out from the survey. Additionally they were also asked on which modes of transport they may shift in the future. As shown in the graph below only 3% of respondents felt the pedestrian facilities in the city are “best” and 10% felt facilities are good. As can be seen from results 37% people felt the pedestrian facilities were alright by implying the facilities are “ok”. However 40% of people felt the facilities are not adequate and while 14% considered it worst 36% considered it bad. Hence 47% of respondents find pedestrians’ facilities generally adequate. However for 50% of interviewees the pedestrian facilities in Male’ is inadequate.
The interviewees were also asked about the facilities which need most improvements, and they ranked the aspects from least desired (6) to most desired (1). For most people the biggest improvement desired were for disability access and improved street lighting along with wider, clean sidewalks. Most people believed that easy access for people with special needs to be improved most as there are no kerb side ramps for wheel chair access, on any streets. Most people ranked the least for improving crossing points, suggesting adequacy of crossings available. Many also demanded for reducing and slowing the traffic. Please refer the graph below which shows ranking for various aspects on improving pedestrian facilities.

On the participant’s willingness with regard to distance desired to walk to cross roads, 39% were willing to walk to 100 feet to cross road followed by 200 feet. A very low percentage of people preferred walking above 300 feet and was about 14% while only 2% said they are willing to walk 500 feet to reach a crossing point. About 13% are unaware on how much they are willing to walk to cross roads. Since majority of people are only willing to walk less than 200 feet to cross road, pedestrian facilities need to be designed with considerable numbers of crossings and could be a challenge for a small city like Male'. Currently also in larger streets there are crossing points every 200 feet or so.
With regard to shifting their current mode of transport most participants are not willing to change their
current patterns of transport and are represented by 46%. About 24% also are willing to shift to buses a
public transport mode. There are plans to introduce buses in Male city as a convenient public transport
mode, according to Ministry of Transport. The shifting for bicycles was the least and only 7% are willing to
shift to bicycles. While 14% wishes to use motorcycles about 9% would like to shift to cars. Hence about
one fourth of participants are thinking of shifting to motorized transport and roughly same number would
also like to switch to buses. The reasons for not shifting by a large percentage may be due to lack of choice
to own vehicles.

* Graph showing willingness to walk to cross street

* Graph showing exposure to air pollution

With regard to their perceptions on exposure to air pollution while on the roads and
78% felt that highest exposure is during walking. About 14% also felt that they are exposed to pollution
while riding motorcycles. Only 1% felt they get exposed to pollution while riding a taxi or car. Hence the
general consensus is that pollution is a concern for pedestrians. Exposure to pollution while riding a
bicycle was not stated by any respondent, indicating, none of the respondents use bicycle as a medium of
transport.
3.3.1 **Socioeconomic Profile of Participants**

The socio-economic profile of participants showed that of the total of 99 participants who undertook the survey, 54% were male and 45% were females and is shown by the graph below. About 53% of participants were of ages 60 and above as the survey mainly focused on elders and disabled and also 13% were below 15 years. While majority of participants (45%) refused to disclose the income levels, 24% had a household income of more than US$ 5 thousand. In most households, more than one member earns and on average, each household may have 4-5 people earning an income.

![Graph showing the socio-economic profile of participants.](image)

### 3.4 Stakeholder Interviews

Key stakeholders interviewed during the survey are: Male Municipality, Ministry of Transport, Ministry of Housing & Environment, Maldives Police Service (Traffic Police), MANFAA (NGO for elderly), CARE Society (NGO for physically disabled) and Ministry of Health.

All stakeholders agreed that the pedestrian facilities in the city are inadequate and space as a major constraint for improving the pedestrian facilities. It was found that only few roads have proportionate designated areas for sidewalks while, most are narrow increasing the congestion and impeding walking. Most sidewalks are typically 4 inches above road level, made of brick pavers and have a width varying from 1.2 meters to less than 0.2 meters. Several streets also lack sidewalks and pedestrians have to walk side by side with vehicles.

Major impediments identified by the stakeholders were lack of funding and lack of inter-sectoral cooperation in improving pedestrian facilities. Specific regulations are also lacking in the areas of jay walking, road side vendors, encroachment in to public spaces and road side advertisements. It was also found that the accessibility to roads for disabled and especially the blind people is highly undesirable and inadequate and needs lot of improvements.
4. CONCLUSIONS & RECOMMENDATIONS

According to the findings from this survey pedestrian facility in Male’ city is considered undesirable and was on an average score of 55. The limited space in Male has lead to the design of narrow foot paths and hogging up of walking space for keeping goods and also for parking. Motorists’ behaviour is considered an intimidating factor for pedestrians and is in need of urgent attention for the safety of pedestrians. Safety of crossings and availability of facilities for disabled people is considered lacking in almost all streets.

Despite the fact that walking and cycling are effective and has been practiced in the past, priority has been now given to motorists and motorised land transport. There is also a lack of planning for making the city a more walkable and pedestrian friendly city, while a proper and affordable public transport system is lacking. Such an environment leads to more sedentary behaviour, especially in elderly and young children, resulting in chronic health problems which may pose an enormous health burden on the individual and on society. Promoting cycling and walking should be made a high priority of the public health Agenda.

Some critical steps which can be taken towards improving walkability in Male’ city are:

1 - a land transport strategy for the city needs to be established with more emphasis on walkability especially under the “Veshi-Fahi Male’” Program;

2 - a working group of experts from transport and environment sectors needs to be formulated to advise the council on matters of making the Male’ city more liveable and walkable;

3 - more leisure structures such as green public spaces and empty spaces need to be created in public health infra structures to encourage walking in elderly and disabled;

4 - also roads which are compact and small with higher residential populations and difficulty to access by vehicles, need to be fully restricted for motor vehicles;

5 - capping of Vehicle registration for Male’ and restrictions of importations of vehicles need to be sought with concerned government authorities;

6 - public awareness programs and campaigns needs to be carried out especially for school students of different ages on importance of walking;

7 - taxing of motorists through check points at key focused areas of the city and imposing a fee for all vehicle owners who do not own a private vehicle parking space at their residences can also be done to discourage use of motorised transport; and

8 - an efficient and convenient public transport accessible to people of all ages and abilities is also an important step towards making Male’ a more walkable city.
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