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Deterrent to Pedestrian Used More Extensively as Travel Mode in Misurata

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Abstract: ***The issue of proper design for pedestrian traffic design is not considered a topic related to transportation only, but it is directly related to health, social, material and economic aspects and issues that negatively affect the development and development of societies. The random planning of pedestrian movement inside the city of Misurata in general caused the deterioration of traffic safety factors and the increase in traffic jams due to the unorganized movement of pedestrians, and since the number of cars inside the city is constantly increasing, the problem is constantly aggravating and there is an urgent need to make more effort to improve pedestrian movement and try Addressing non - conforming designs to increase the efficiency of the traffic performance of pedestrians and cars within the city. To achieve this end, close cooperation is required between all the authorities concerned with roads, transport and traffic safety, and the city's planning departments.***

Keywords: traffic flow, pedestrian traffic, pedestrian safety

1. Introduction

Road intersections are critical sites in any road network, as it constitutes a test for the success of managing the available road network on the one hand, and specifically for the capacity of the road system as a whole on the other. Although intersections constitute a small part of the road system in terms of geographical extent, they have a significant impact on this system. Because the capacity of intersections if it is less than the capacity of the road system as roads and streets, it will form a so - called “bottleneck”, that is, these intersections become areas of traffic jams and congestion that negatively affect the overall performance of the road network by increasing delay times and journey times, and reducing levels of traffic. Service at these intersections. Intersections are particularly important in urban areas, due to many factors, such as the large morning and evening traffic volumes associated with round trips to and from work (morning and evening rush hours) that use these intersections in relatively short times in addition to the rotation of these volumes, the problems of implementing spatial separation city intersections, and other factors (1&2).

Pedestrian Movement

The study of pedestrian movement is a basis for planning the movement network within the urban city. Planning and design includes their own considerations. The danger to pedestrians comes from interfering with the movement of vehicles, so equipment must be made that reduce risks and be safe, comfortable and easy to use.

To achieve the goal of the road, the road surface must be distributed among the users equitably. The foundations and principles of pedestrian traffic are similar to the principles of vehicular movement and the relationship between speed, traffic volume and density are similar. And pedestrian traffic service levels are completely similar to the service level for vehicular traffic, six levels (A, B, C, D, E, F). (3, 4&5)

2. Study Area

This study was carried out in five locations in the city of Misurata, which are:
(Roundabout of the High Mosque - the intersection of the traffic light, the Martyrs' Hall - the entrance to the central Misurata Hospital - the Roundabout of court complexes - the Roundabout of the road to Yidr). These sites are of great importance, traffic density and great pedestrian movement.

3. The Importance of Study

The pedestrian movement was assessed for some sensitive sites within the city of Misurata. It was found that the current situation of most of the studied intersections is bad traffic in terms of pedestrian movement, as it was found that the delay crisis for vehicles and consequently the low level of service in them to low levels. This is due to the high pedestrian traffic that is used in these sites on the one hand, and to poor coordination and poor management of the road network as a whole in the absence of comprehensive studies at the city level to organize and manage the transport sector as a whole and study everything related to it, as most studies of pedestrian movement remain Treatments for individual cases without a comprehensive strategic view to address transportation issues, and Figure (1) shows the low level of pedestrian safety in sensitive locations.

Figure 1: Shows the low level of pedestrian safety

Principles to be considered when planning the pedestrian traffic network:

1) The necessity of having a pedestrian traffic network to be planned in integration with the vehicular traffic network.
2) The pedestrian traffic network must be linked to the movement objectives of the users of the network.
3) The functional hierarchy of the pedestrian network within the transport network.
4) The link between the waiting areas and their distribution with the distribution of the pedestrian network.
5) The main areas of pedestrian movement are secondary areas for the movement of vehicles.
6) The main axis of pedestrian movement must be entirely devoted to pedestrians, separate from the movement of vehicles.
7) Separation between pedestrian movement and vehicular movement horizontally by the presence of pedestrian crossings and regulatory signals.
8) Vertical separation between pedestrian and vehicular traffic, in the presence of tunnels, overhead bridges, and stairs, whether fixed or mobile.
9) Taking into account the walking distances, which are within (500 metres), taking into account the prevailing factors in the local environment.
10) There must be protection, safety and prevention from local dangers for pedestrians.
11) Providing services and shaded places to protect against climatic factors.
12) Aesthetic aspects of the floors and elements surrounding the track.
13) Guidance on the pedestrian traffic network should be an essential element in determining the path by placing distinctive signs for each sector on the path.
14) The proportion between the size of the pedestrian and the width of the path.
15) Providing adequate lighting and keeping away from any curves or tendencies if roughness in the pavement surface.
16) Use of traffic equipment and instructions.
17) Use of control systems.
18) Achieving fluidity in pedestrian movement by balancing the speed, size and width of the path.
19) Providing sidewalks with appropriate widths in relation to the level of the road on which they are based.

From the previous Principles, it becomes clear to us that the study of pedestrian movement is very important to determine the form and cycle of movement in it, and it must be taken into account the massive movement resulting from public transport stations and intersections in the streets of the city center at different hours of the day and its daily, weekly and monthly change. These studies are used to determine the width of the necessary sidewalks For pedestrian traffic, it is also used to locate pedestrian protection fences and locate pedestrian crossing signals in streets and intersections. With high density, it may be necessary to separate pedestrian traffic from traffic in tunnels or overhead bridges, or to limit some streets to pedestrian movement only.

4. The Method of Work

This research was conducted in two stages, the first stage is to diagnose the current situation of some of the rotation islands and intersections in the city and to read the structure and traffic of these streets, and the second stage is to compare these sites with the foundations and principles that must be provided for pedestrians and to develop solutions to them in the form of appropriate proposals, and a number of sites were selected in the city Misurata is crowded with pedestrians, in which pedestrians cause obstruction to vehicles of all kinds.

The Roundabout of the High Mosque

This Roundabout is located in the center of the city of Misurata, and works to collect traffic flowing from shops, buildings, Sidi Abu Alim street, the investment market and banks near the Roundabout and witnesses heavy traffic, especially at peak times, and there are problems on this Roundabout, which poses a danger to pedestrians and one of the most important problems:

- There are no guiding signs that show pedestrians where to cross.
- Unavailability of lanes or lines for pedestrians.
- Parking on the sidewalk, which impedes the movement of pedestrians.
- There is no safety for pedestrians on the sidewalk.
- There is no insurance for traffic control means and light and sound guidance signs at traffic lights and pedestrians' passage to assist pedestrians of special categories while crossing.

Figure 2: shows the current situation on the Roundabout of the High Mosque

Design Proposal

It was proposed to put pedestrian lanes for the roads adjacent to the Roundabout and to put warning traffic signals for vehicle drivers, as well as a traffic signal that regulates the precedence of pedestrians, and the following figure shows

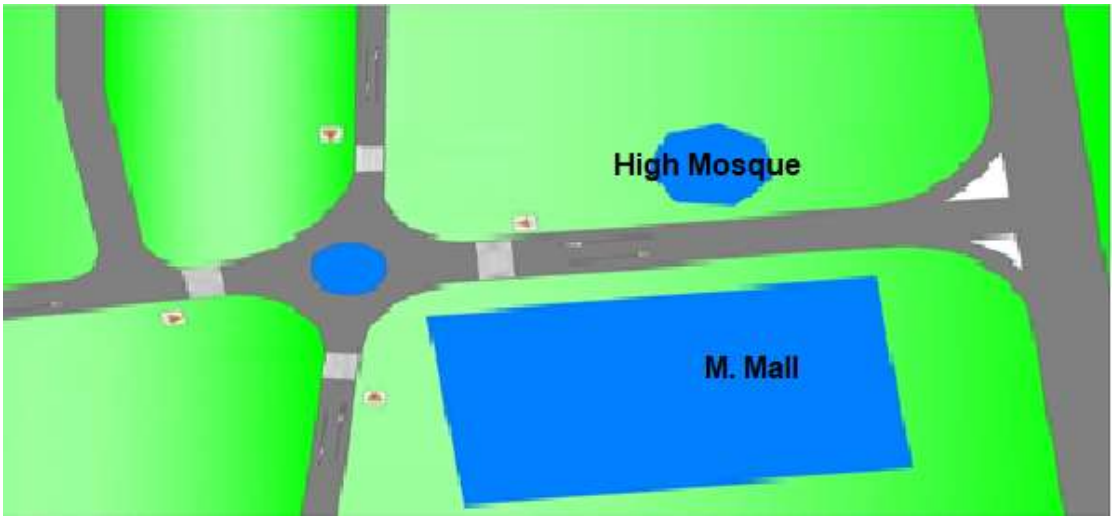

Figure 3: Shows the design proposal for the Roundabout of the High Mosque

Roundabout of the Courts Complex

This Roundabout is located in the center of the city of Misurata. This Roundabout is characterized by the presence of several different roads, including ways to enter the Roundabout and some to exit from it. There are several government departments and some shops near the Roundabout, and there are problems on this Roundabout, which poses a danger to pedestrians, and the most important problems are:

- Parking on the sidewalk and next to the Roundabout, which impedes the movement of pedestrians and causes congestion of traffic.
- There is no safety for pedestrians due to the lack of lanes and sidewalks for pedestrians.
- There is no protection fence for pedestrians to protect them from crossing the sidewalk and crossing to the other side of the street.
- Not taking into account the appropriate tendencies that include draining water from the surface of the sidewalks to the level of the road or the surrounding roads.

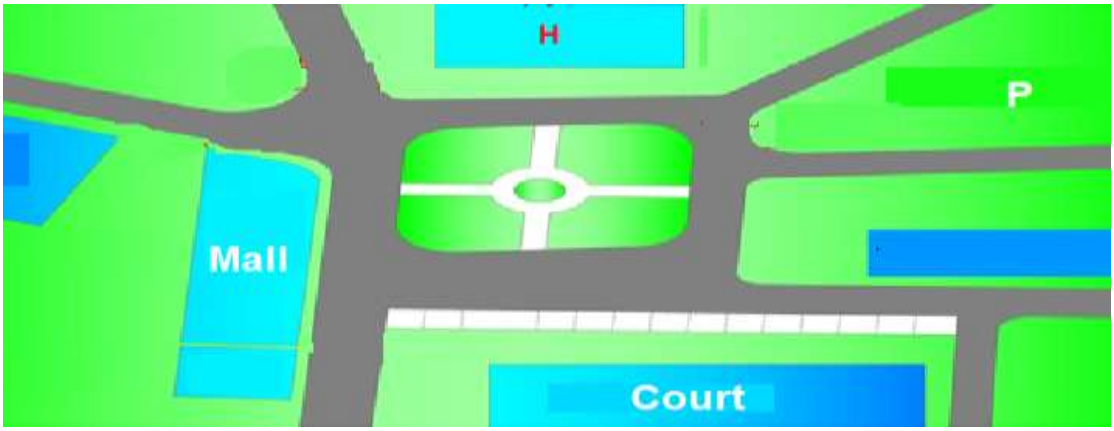

Figure 4: Shows the current situation for the Roundabout of the Courts Complex

Figure 5: Shows the current status of the movement of vehicles and pedestrians in the Roundabout of the Courts Complex

Intersection of Martyrs' Hall

This intersection leads to the city center. It is one of the vital intersections of the city extending from the city center and witnessing a large traffic movement, especially during the cycle times. Among its most important disadvantages:

- The absence of explanatory signs at the intersection.
- The absence of special lanes for pedestrians.
- The absence of traffic signals that regulate the movement of pedestrians with the traffic of vehicles.
- There is no insurance, traffic control means, and clear signs with good reflectivity, and they must be of high height so that pedestrians do not collide with them.
- The lack of guiding signs that show pedestrians the places to cross.

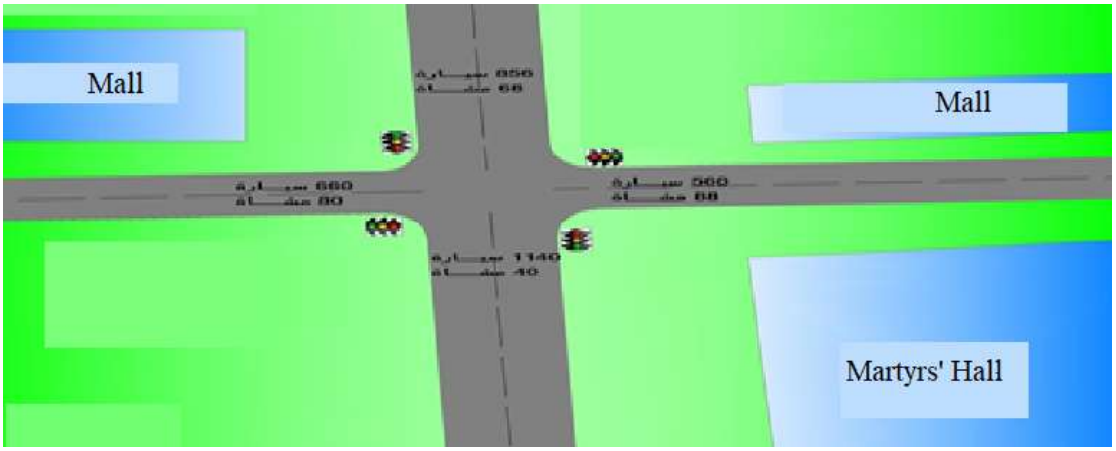

Figure 6: Shows the current situation for the intersection, Martyrs' Hall

Suggested mode 1

A regulatory traffic signal shall be placed between the movement of pedestrians and vehicles and the necessity of placing pedestrian paths as shown in the following form

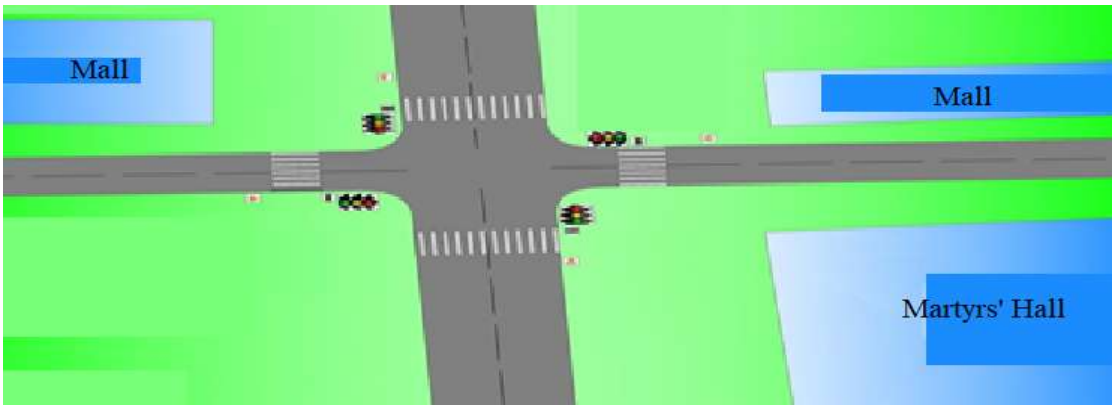

Figure 7: Shows the design proposal 1 for the intersection, Martyrs' Hall

Suggested 2

We suggest making a bridge (upper corridor), as it is considered one of the design methods for pedestrian crossings that helps separate pedestrians from vehicular movement at different levels, as shown in the attached figure. And the Considerations for the bridge are:

- The external shape of the bridge must be in harmony with the facility adjacent to the bridge.
- The safety factor of the neighboring facilities, services and public utilities and the traffic during construction and after the construction of the bridge must be taken into consideration.

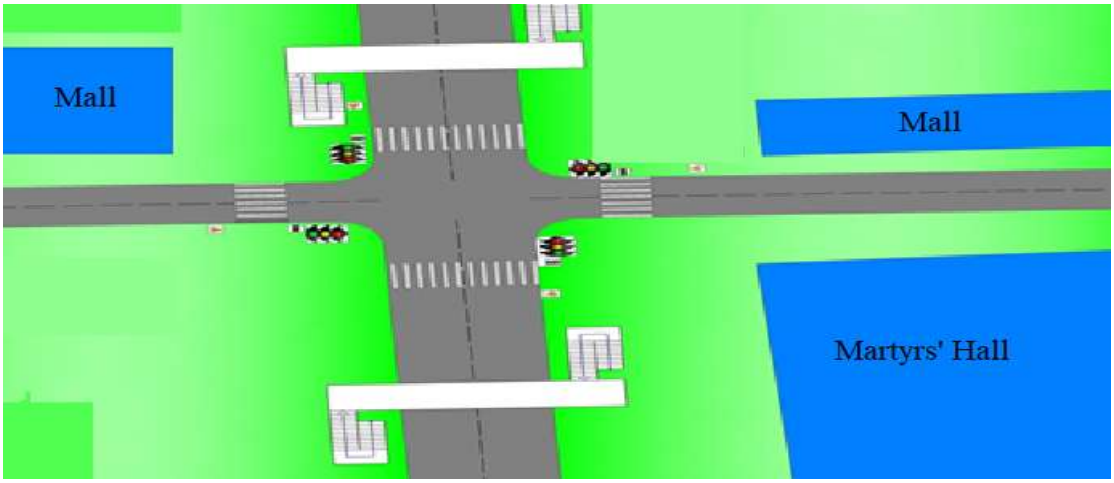

Figure 8: Shows the design proposal 2 for the intersection, Martyrs' Hall

Roundabout of the Yidr Road

This Roundabout is located north of the city of Misurata, and is considered distinctive for the city of Misurata because of the abundance of shops, including vegetables, meat and bakeries challenge the Roundabout, and witnessing very heavy traffic, especially at peak times, and there are problems on this Roundabout, which poses a danger to pedestrians, including problems:

- The absence of any pedestrian lines on the Roundabout.
- Parking some cars in places other than those designated for them.
- There are no traffic signs showing the movement of pedestrians.
- Not taking into account the difference in the dimensions of the sidewalks and the elements they contain, according to the expected pedestrian movement.
- The lack of continuity of the sidewalk and the road as a whole, and the suitability of the sidewalk to the buildings around it.

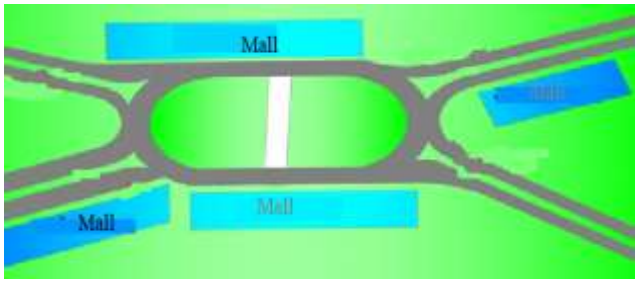

Figure 9: Shows the current situation for the Roundabout of the Yidr Road

5. Suggestions

We suggest constructing underpasses (crossing tunnels). One of the characteristics of a good design for crossings is that the width of the pedestrian corridors at the crossings is usually (2.5 m), and it increases in areas where the number of pedestrians increases, such as commercial areas and markets.

Procedures to be followed when designing the lower crossings:

1) It should be sufficiently lit and clearly visible to pedestrians without any obstruction.
2) The exit of the lower crossing must be clear to pedestrians from the time they enter the crossing until they leave it.
3) The height of the lower crossing must not be less than (3 m).
4) The drainage of rain water as well as the effect of ground water must be taken into consideration.
5) Adequate ventilation must be provided for the lower crossings

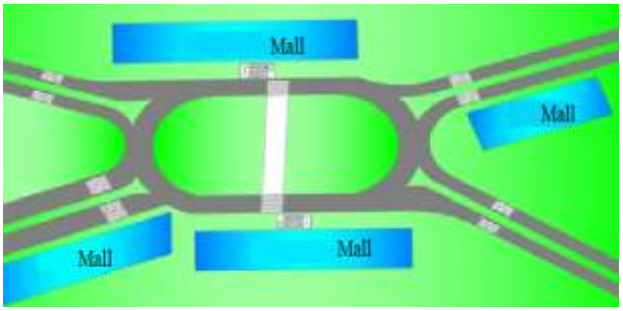

Figure 10: Shows the design proposal for the Roundabout of the Yidr Road

6. Conclusions

From these conclusions, we conclude the following:

1) The first target site ((Roundabout of the High Mosque) The service levels for pedestrians were very poor due to the parking of vehicles on the sidewalks and the absence of special lines or any signposts for pedestrian crossing.
2) The second target site (the intersection of the traffic light, the Martyrs' Hall) The intersection does not contain clear signs for pedestrians, such as raising the surface of the crossing from the road surface, using a layer of paint in the form of lines that show the crossing.
3) The third target location (Roundabout of the Courts Complex) recorded the highest percentage of traffic violations for vehicles by not succeeding in their designated places, which caused obstruction to pedestrian movement.
4) Strictness in preventing the use of sidewalks as parking spaces for vehicles, and parking spaces for street vendors, newspaper vendors, and areas as lanes designated for pedestrians.
5) Completing the necessary designs for the various pedestrian crossings in order to achieve the greatest

degree of smoothness for the movement of vehicles and pedestrians .

6) Carrying out periodic, renewed statistics for the increasing number of pedestrians, and the goal of developing the traffic system in a way that ensures its continued absorption of the various traffic streams of vehicles and pedestrians for the continuous development in the city.
7) Determining, planning and painting pedestrian sites in the colors shown in the guide, and maintaining them constantly.
8) Emphasis on providing the requirements of the disabled in the sidewalks, such as ramps, paving materials and others.
9) Amending the car parks in accordance with this guide and the technical requirements for car parks, with the provision of car parks for the disabled.

Coordination with the Traffic Department in the event of a need to modify any sites related to the means of traffic control (light instructions, traffic signs and directional signs).

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