



# Study and development of passenger transport station in the center of Bani Walid city-Libya

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## ABSTRACT

*The movement of public transport in Bani Walid city has been completely stopped since 1999. In 1983-1992, the daily transport routes of Tripoli, Tarhouna, Misurata, and the public taxis which started from the passenger transport station in the center of Bani Walid city to neighboring cities. At present, the private transport sector is suffering from chaos, lack of organization and the absence of a state on the ground in many areas. The purpose of this study is to develop the passenger transport station in the city center so that the public transport sector is improved inside and outside the city. The objective of this study is to facilitate the movement of the traveler inside and to the neighboring cities. Easing congestion and congestion in the city center. The study examines the site of the study "passenger station" to transport passengers to neighboring cities and discusses through the study several questions to owners of passenger cars around the central station to leave the parking spaces that caused congestion and suffocation and confusion within the city. The study also includes a study of the bus and taxi network within the city and linking it to the central passenger station, including three bus and taxi stops in the center of the city. The research includes a design study for the central passenger station by providing a simplified design for the passenger terminal for the owners of taxis and passengers inside and outside the city.*

**Keywords:** *Passenger, Bani Walid, Transport station, Development.*

## 1. INTRODUCTION

Study and development of the passenger transport station in the center of Beni Walid, where the station was established in 1970 and started operating in that period. It started from several daily trips by public vehicles (buses) and special passenger cars (Peugeot 504) to neighboring cities (Tarhona, Tripoli, Misurata) the station was operating in an excellent manner. In 1999, the station was stopped because of a large number of private passenger cars (Mercedes). After about two years, the Hyundai buses also appeared. The owners of these private taxi cars in 1999 took places to rent in the city center. Next to the public park, which caused more or choking in winning traffic in the city center. The station is located in the center of the city opposite the petrol station and next to the Libyan Airlines building, an area of (8452 m<sup>2</sup>) surrounded by a fence and there is a building with several offices and a parachute for travelers. Because of the overcrowding in the city and the dependence of people on the means of private transport, the city needs a station to transport the traveler outside and inside the city to ease the use of private vehicles and despite the presence of a station for the traveler located in the city center and has a suitable location, but it is not used by people for years because of the use of passenger stations Private located near the public park and caused congestion in the city. Therefore, it is necessary to develop a passenger station and provide them with the comfort, safety, and entertainment of the passengers and propose to provide the station with an integrated system of buses in the city center. There are parking spaces or parking spaces within the residential areas and provide all amenities for passengers from within the region and those coming from outside. Tripoli. The station will be provided with taxis to deliver passengers from the vicinity of the city without difficulty or fatigue and can be used by residents of the region as well.



Figure 1: Bani Walid map showing the network of roads connecting it with neighboring cities

### 1.1 Study Problems

- The station is not operating and its level is 1.5 meters off the main road.
- Disadvantages in the design of the station and the lack of service facilities and health such as restaurant 'worshiper' toilets ... etc.
- The lack of paving the road next to the station and linking it in the main ways.
- There are no passengers in the station because of a large number of passenger cars (Mercedes 8 passengers) and where they took places to rent in the center of the city, resulting in congestion and congestion in traffic in the city center

### 1.2 Objectives of the study

- Attract passengers to the station and facilitate the mobility of passengers within the city and to neighboring cities
- Organizing and improving the aesthetic appearance and urban development of a passenger station in Bani Walid city.
- Attracting private passenger cars to the station so as to reduce traffic congestion in the city center.

### 1.3 Study site

The property is located within the general plan of the city of Bani Walid and the plot is characterized by the number C3 / T, and the number of air plate A51-15-56/46 and its total area is 8452 m<sup>2</sup>, Figure A shows the location of the study, and its limits:

North: S3 + S4

South: the Main road.

East: Shops + S4.

West: Street.



Figure 2: The site of the study shows the passenger station in Bani Walid

## **2. LITERATURE REVIEW**

[1] Suggests that for any urban mobility system to provide appropriate and effective solutions to its clients, it must focus on the interaction between different agents of the system acting within and across different levels of planning and control (i.e., authorities, operators, suppliers of equipment, citizens, etc.). [2] to emphasize the need for an adequate balance between the following dimensions: • Transport dimension should obtain an adequate balance between modes and means of transport so that those who give up the use of private transportation have available good quality alternatives without any social, geographical or sectorial discrimination. • Environmental dimension should establish a configuration of the urban mobility system that results in a total sum of pollution below the endurance level. • Economic dimension should offer good “value for money,” induce adaptive behavior from the users and be able to create new financial resources to support investment. • Social dimension should ensure that citizens are provided with an adequate mobility system to their needs and that no exclusion through price or any other criteria is imposed on the basis of economic or financial goals.

UK’s Midlands operator Trent Buses conducted a thorough research with a view to improving services [3] and identified customers’ top requirements as: reliability/frequency of services, friendliness of services, clean bus interiors, comfort, value for money, clean bus exteriors, easy access, reasonable fares, and easy to understand and remember timetables. The top four items stood out in importance, and value for money was revealed as an embodiment of these attributes. Thus, if bus operators failed to deliver on the four items, they were not producing value for money. The low fare was not perceived as a critical requirement. By a majority of the customers. Despite scoring high on reliability, Trent Buses fell short of expectations in the other three top values and was seen as weak in value for money. In the study, bus driver attitude and behavior were seen as problematic. Although only 10 percent of the drivers were responsible for this problem, what was far more damaging was the perception. Vehicle cleaning standards were also severely criticized. In another study, analysis of complaints received by the Rail Users Consultative Committee (RUCC) in the UK revealed that staff attitude, reliability, punctuality, and cleanliness of the trains are sources of a majority of the complaints by passengers [3].

In India, transportation systems have also been criticized for their low quality of services reflected in the growing number of standing passengers, lack of punctuality, irregularity, and substandard amenities [4]. Examined written customer complaints to Goteborg Regional Public Transport AB in Sweden (GLAB), performed personal interviews with customers who had previously complained, and found staff attitude to be the dominant issue in the written complaints. In the personal interviews, however, punctuality emerged as the major problem [5].

[6] The study dealt with the requirements of use and operation in modern passenger terminals and stressed that various research projects are based on improving passenger terminals in urban areas by leaving old curricula and switching to study Sustainable design requirements for these plants through Providing service space for station operators. Organizing internal spaces to facilitate the movement of users flexibly and avoid confusion in movement, especially at peak hours. The use of integrated design in transport stations, which is based on two basic aspects, aesthetic shape and functional efficiency. Attention to the design of traffic and entrances through the provision of vertical means of transport such as escalators and escalators in multi-storey passenger stations, and must be characterized by flexibility and ease of use and takes into consideration. Consider the transfer of persons with special needs. The use of automatic doors that help control the ventilation of the waiting space and other areas within the station. Providing passenger and service space for passengers. Passenger terminals are the most popular places for social interaction. Providing a good user experience is essential by allocating different service areas for passengers. Allocate clear areas to sell tickets and inquire about information near the station’s entrances. Securing security and safety requirements, as the security measures applied in the stations are reflected in the users’ psychology. These procedures include control of the entry and exit outlets and the allocation of control cables at the various stations [6]. The study pointed out that the stations are directed in the design and construction of modern passenger stations, which depends on the means of transport. The study pointed out that sustainable development is achieved by providing the requirements of sustainable design in modern passenger terminals, and included the following requirements: - The requirements of job design, which is achieved through communication and linking physical and optical between different areas of the station, and determine the absorptive capacity to ensure the modernization of information system and tickets, and increase the protection of passengers and provide convenience to users, there should be no obstacles in the areas of convergence[7]P - Sustainable environmental design requirements achieved through maximizing the use of natural lighting and ventilation to reduce operational costs, exploitation of roofs for rainwater harvesting, use for watering, cleaning, recycling and reuse.

- Provide security and safety requirements by controlling station entrances, providing appropriate lighting in the premises of the station, or reducing theft and violence through the use of surveillance helmets and the provision of storage areas for luggage and bags.
- Provide motor requirements, as the provision of motor flow through clarity in the axes motor, and reduce the change in the direction of movement, and reduce unnecessary changes in the appropriate axis motor [7].

## **3. ANALYSIS (Field study)**

The field study is one of the most important pillars in any project, which will be studied and analyzed in a field study to collect information and data on the study area from competent authorities such as the general plan of the city and information on the station and taking topographical images, The main points, the landuse of public and private buildings adjacent to the station and the roads leading out of the city of Bani Walid, parking spaces and buses for the transport of passengers within the civil and a location analysis in the study area (passenger station), so that he managed to develop the station and provide all the ways For the convenience of travelers outside the city to neighboring cities. The main passenger terminal in Bani Walid city center was established in 1970. It is



the backbone of passenger transport from one city to the next. In 1983 - 1992, the station flourished by transporting passengers out of the city. The buses were stopped and the Peugeot (504) to the year (1999). This year, traffic stopped at this station so that The Mercedes-Benz (8-passenger) transporter appeared more quickly than the public bus (bus) Peugeot cars were more popular than public buses. This was the reason for the dispute between the owners of public vehicles (bus - Peugeot) and owners of Mercedes (microbus) through which the owners of Mercedes (microbus) to open private partnerships to transport the passenger and became The reason for this was the closure of the main passenger transport station, as well as the problem of congestion and traffic congestion in the city center.

### 3.1 Landmarks on the study area



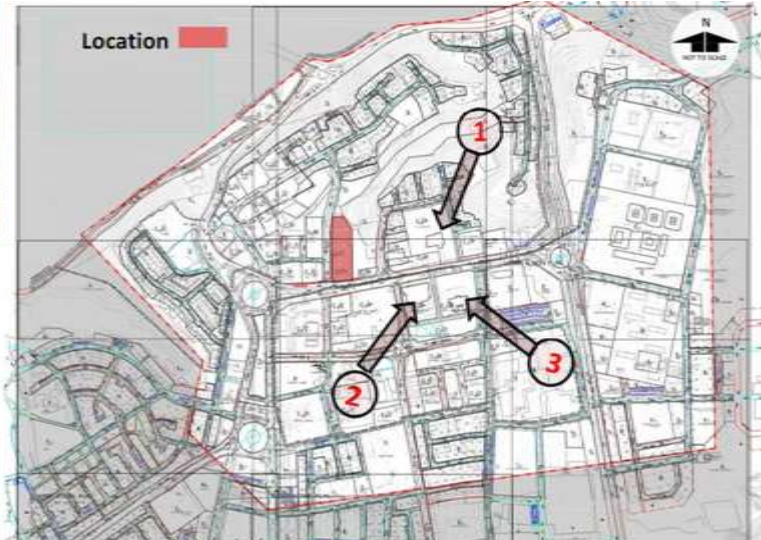
**Housing, utilities and environment building**

The building contains a number of sections, service, administrative and financial offices of public utilities and building permits for the city of Bani Walid.



**The building of the Courts Complex and the Prosecution of Bani Walid**

It contains the Beni Walid District Court and its affiliated offices, including the Court of First Instance and courtrooms.



**Administrative Complex**

The Administrative Complex was established between 1975 and 1980. It includes several administrative offices, including the Land Registry and Agricultural Branch, as well as the Tax Authority, the Education Department, the National Service Office, the Awqaf Authority Branch and other facilities of the city of Bani Walid.

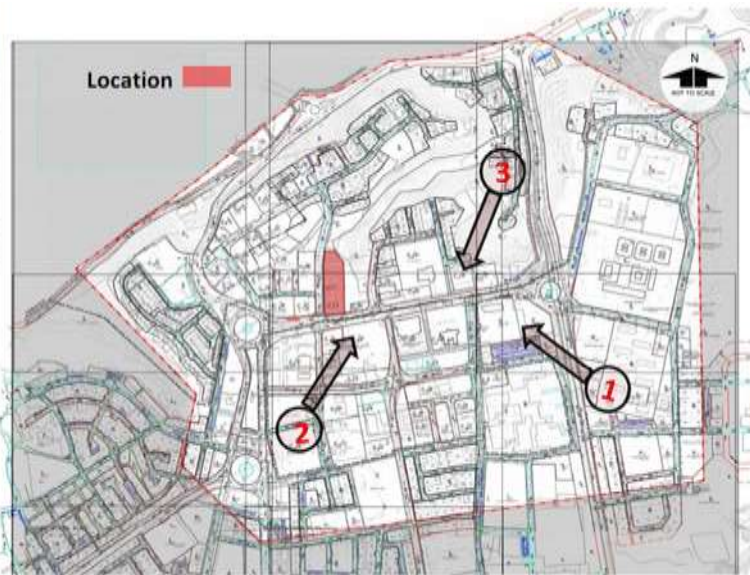






Building the economy

We consider it as an investment administrative building established between 2002 and 2002. It includes engineering offices, lawyers' offices, travel agencies, age, internet lounges, coffee shop and offices for several parties such as municipal guards, craft licensing office, road office, women's affairs office,



Postal and Telecommunication Building

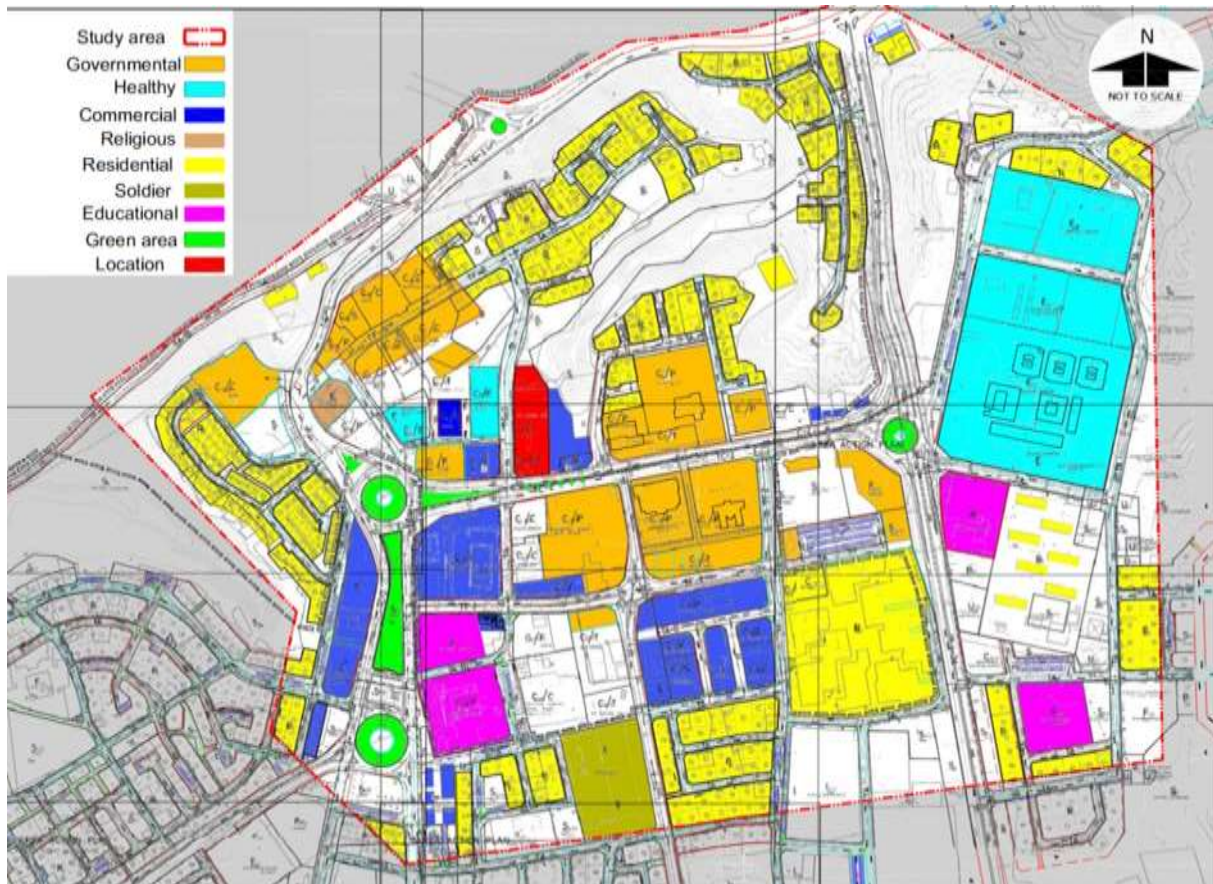
The building includes land and rural telephone exchanges and provides maintenance services for the communications networks in Bani Walid city.

Bani Walid Security Directorate Building

Located in the city center, the building contains the registration office, automatic vehicles, the driving license office, the prison, the communications office and the parking lot.

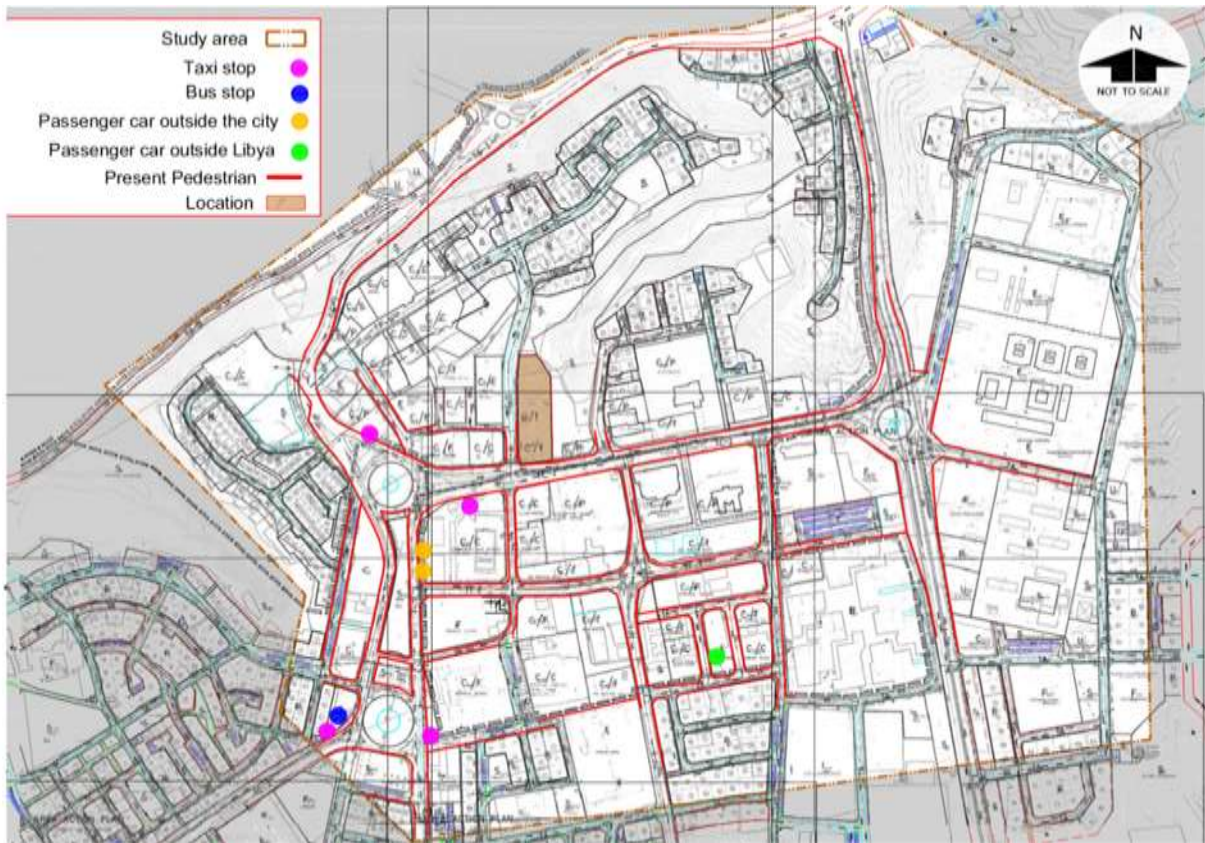


### 3.2 Function buildings on the study area

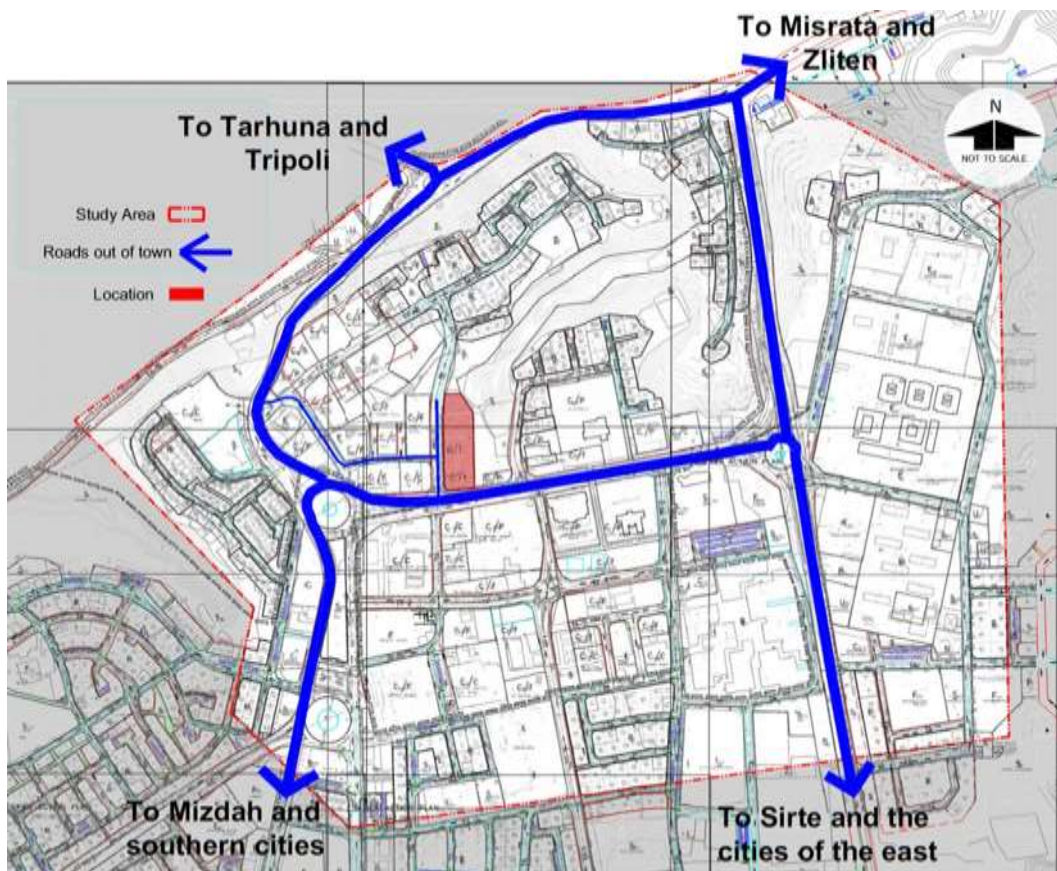




### 3.3 Present sidewalk on study area



### 3.4 Road network leading outside the city of Bani Walid





### 3.5 Analysis of station location

#### 3.5.1 Location of the station from the inside



##### Station defects

1. The station design is not integrated.
2. Lack of commuter amenities within the station.
3. Station level is about 1.5 meters below the main road
4. There are no dedicated parking spaces for buses and private cars.

##### Features of the station

1. Station space is good.
2. Station location is convenient.
3. There are shops near the station.



#### 3.5.2 Main Street in front of the station



- No traffic lights.
  - There is no pedestrian crossing area that makes the street dangerous and difficult to cross pedestrians.
  - The street is two roads and the view of the warm is not within the specifications.
  - Street area is not possible for parking.
  - Lack of trees on the street.
- The street is very important connecting the roads that lead out of the city

### 3.5.3 The street adjacent to the station



- The street is unpaved.
- The street is crowded with citizens parking.
- One street is not good road to prevent traffic congestion.
- The intersection at the beginning of the street is dangerous and causes accidents without the presence of traffic signals .. Etc.

## 4. DESIGN PROPOSAL

The project of developing the main passenger terminal in Beni Walid is a potential physical transformation in the city to meet the traveler's needs in designing the station and accomplishing these goals. The urban development and the station are well organized in the traffic distribution of the station and in a harmonious manner of buses, pedestrians, comfort, and security. The plan of transportation of travelers in a simple way in the design of the station has provided traffic buses, information section, and waiting room for the traveler, children's lounge, adequate seats, good lighting and purpose of these items to increase the comfort and security of the traveler.

### 4.1 Proposal to design a passenger transport station

4.1.1 A model of the proposal for the development of passenger transport station, (Figure a), and proposal to clarify the station entrances and, exits (Figure b)

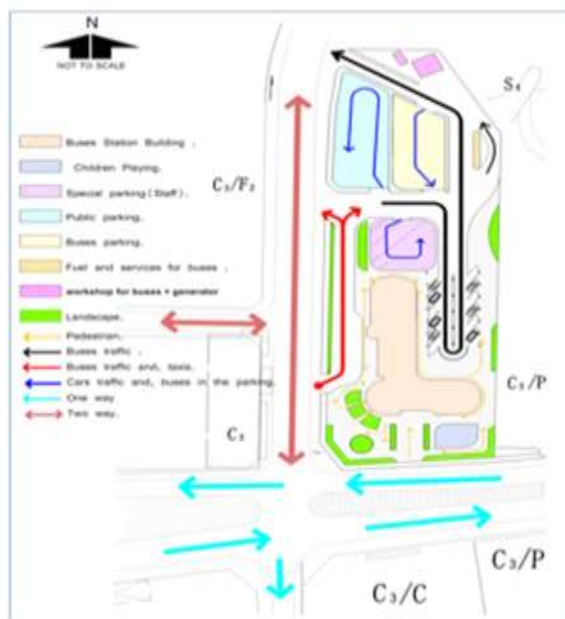


Figure a

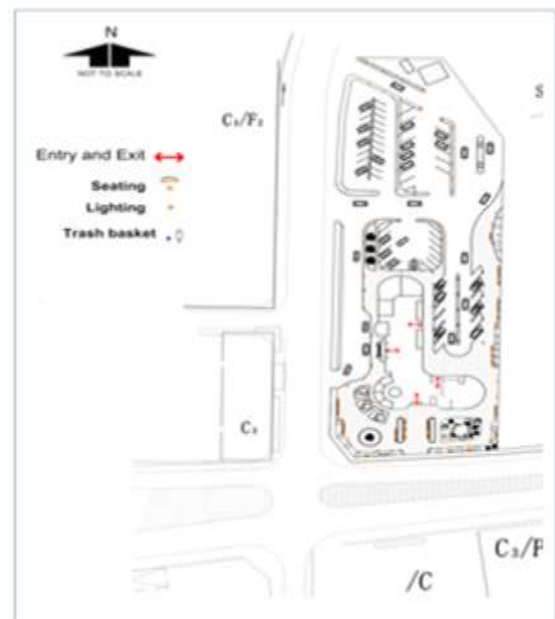
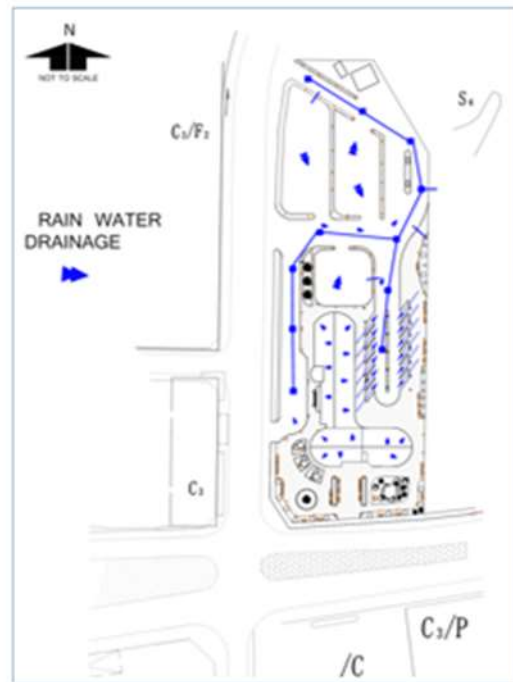
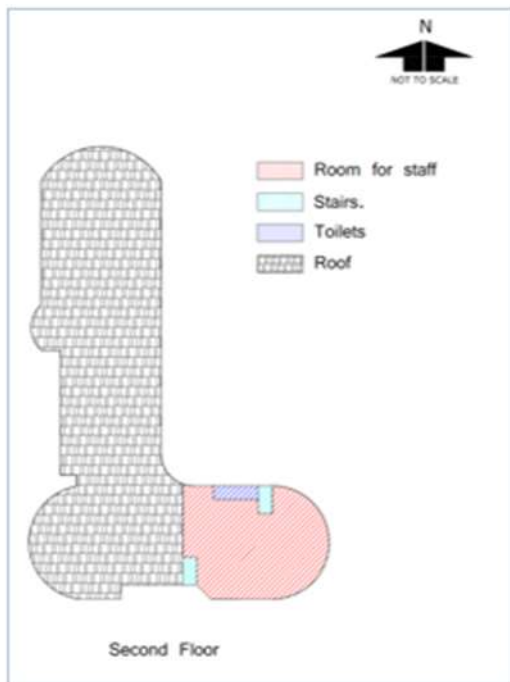
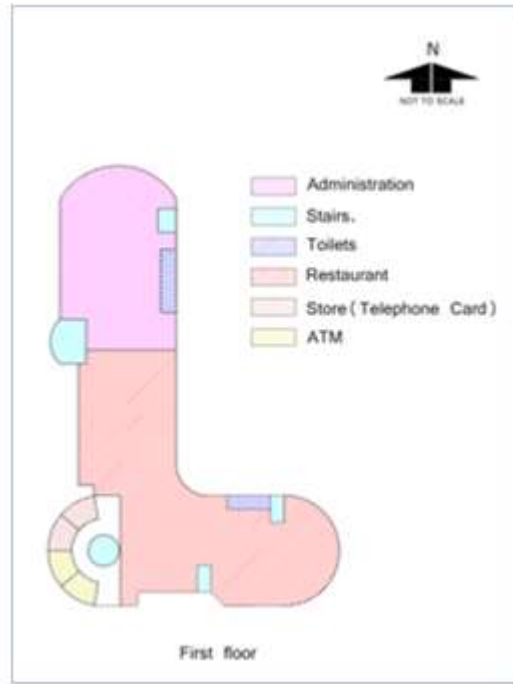
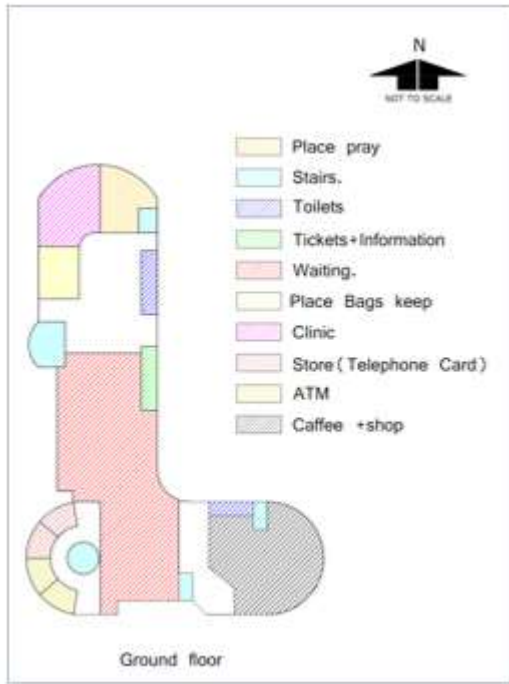


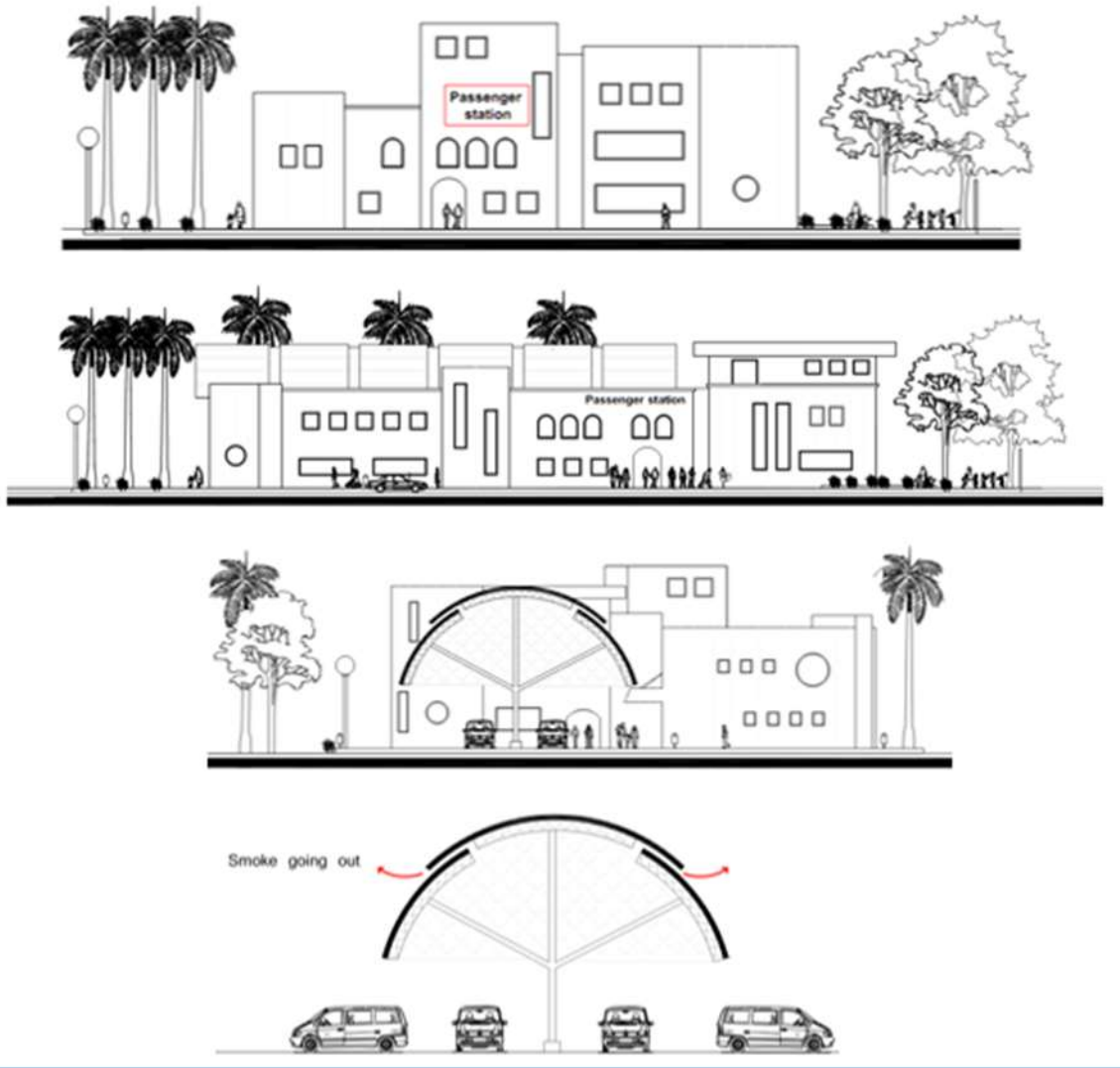
Figure b



4.1.2 Proposal for ground floor, first floor, second floor and, rain water drainage.



4.1.3 Proposed station facades and 3D





## 5. CONCLUSION

The station is designed to keep pace with modern designs with attractive and beautiful appearance and provide comfort for travelers. The station provided entertainment facilities, waiting for hall, restaurants, shops, cash machine, chapel, bathrooms, workers rooms, gas station, bus, and car parking. The station was adopted in the design of the station on a bus type Mercedes transport 8 passengers. Through the study we recommend the following points:

1) Adopting the current study at the applied level by investing the vocabulary of the theoretical framework for research and benefiting from it in the design of projects of current and future local transport stations.  
2) Taking into consideration the treatment and rehabilitation of all existing garages in accordance with the requirements of the design of passenger stations, and taking advantage of the Arab and international experiences in the field of the development of transport stations, taking into consideration the specificity of the local side in these projects in terms of cultural identity and weather conditions and land uses Per site.

3) To make the bus station more attractive to passengers, the following facilities should be available:

- A suitable speed to ensure that passengers are not delayed.
- Pay attention to maintenance, renovation, and cleaning of buses.
- Provide bus drivers of the appropriate age categories to maintain the safety of passengers and have sufficient experience.
- Provision of minibuses.

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