
Design foundations for urban spaces for persons with special needs - Sociological study of the city of M'sila, Algeria

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Abstract

Caring for the mobility of the disabled is one of the most important determinants of societies' progress and development. They must therefore be integrated into their built environment, their special needs taken into account and considered as an essential and effective segment of society.

The objective of this study is to highlight this group and to provide it with the necessary care in various areas of life, on the one hand, and on the other hand to analyse the foundations and criteria for the design of urban spaces, and to overcome all obstacles and obstacles in terms of the physical and physical aspects of persons with special needs, by meeting their desires and psychological, behavioral and physical needs within the urban environment. The study relied on the descriptive analytical approach and the use of field observation as an information gathering technique, and then analyzed and interpreted to achieve the desired outcomes. We applied this study to the city of M'sila, located in the east of Algeria, with the aim of establishing a space adapted to the needs of handicaps and their social integration in their urban environment.

Key words: Urban spaces, architectural and urban design, people with special needs, disability, the city of M'sila - Algeria -

Introduction

Disability is one of the world's most important social and health topics, being one of the fastest threats that can affect humans anywhere or anytime, whether total or partial. This has led to the interest of developed and even developing countries in this segment with special needs, To be active in society and contribute to building it according to their health and physical potential physical and design impediments in the urban environment ". In a study by researcher Twitter Samir (2021) on the appropriateness of the architectural and urban vacuum for persons with special needs, it was concluded that persons with disabilities.

They face many difficulties while using urban spaces as a result of architectural barriers in the built environment. Researcher Nasreen Ali Djafar (2013) also confirmed in her study on the nautical and physical requirements of the pathways of children exposed to a mobility challenge by showing that all urban spaces in Latakia are not available for children exposed to a mobility challenge and that there is no single facility that a child with disabilities can use without having difficulties in accessing. In an Austrian study conducted in 2002 (Rana Mohamed Sobhy Awada, 2007) Its theme was on free access to public spaces without barriers aimed at creating a barrier-free environment in order to enable persons with disabilities to access all places related to their daily activities. Public transport spaces were an urgent need for many living in Austria to participate in social life. The Austrian Government has therefore set its sights on working towards achieving a world-class place in this area. rttp :

www.bn.vit.gr.at.verkchr.gesantverkehr.barrierfreiheit.rtml.

In our belief in the importance of urban spaces at all levels, this paper is designed to identify the design foundations of urban spaces that are compatible with the special needs - the mobility disabled - especially to learn the most important difficulties faced by those with a motor challenge within the external spaces in the urban environment.

Research Objective

The research aims to overcome obstacles to achieve the design foundations of urban spaces according to the needs of the disabled.

Research methodology

To achieve the objectives of the study relied on the analytical descriptive curriculum. Based on the theoretical study, which included the theoretical foundations in the design of urban spaces through the textbooks and international articles, the study also included a field aspect that relied on gathering information from the living reality, By examining the case of the City of M'sila, then analyzing the information and making conclusions and recommendations that help improve and facilitate the quality of life of people with physical disabilities.

Urban Spaces

Vacuum is the three-dimensional field in which objects and events occur and have a direction in this vacuum in order to perform a particular purpose or condition. (Ching, 1996) while the urban vacuum is every vacuum between buildings in the city, encompassing all surrounding corridors, public squares, squares, water bodies, playgrounds, private and public gardens, parking lots and roads. (Ministry of Municipal and Village Affairs, 2006).

Definition of urban spaces

The urban vacuum is part of the general vacuum that contains and interacts with people so that users feel that they are inside and the vacuum is defined by the surrounding buildings and the open vacuum. The American Ahedl defines the urban vacuum as a combination of elements or points through which geometric characteristics of three dimensions are achieved in the field of everyday experience. (Krien, 1991)

Sinclise Goldie defined it as "the vacuum produced when there is one or more barriers to one or more senses. The room envelops a vacuum, and the single wall generates a vacuum with a different personality and vacuum features that depend on the characteristics of the barriers that shape it and its interaction with the surrounding spaces. (2007Snklaiz Goldie,)

The urban vacuum can also be defined as one of the elements that affect and are influenced by the social and economic content of urban communities, which qualifies it as a social value and economic resource and can be said to be the dynamic and active component of cities and the manifestation of the interactions between the environment and man.

The urban vacuum is an external vacuum consisting of only two components: walls and floor. It adds that the clarity of the geometric characteristics and aesthetic values of the urban vacuum helps to understand it. It expresses an urban experience to contain and interact with people and give them a sense of containment within it. Urban spaces are one of the most important elements of urban composition of cities. They represent the main areas of human communication and the practice of various human activities.

The American dictionary states that urban vacuum is a set of points through which geometric characteristics of three dimensions are achieved in the field of everyday experience. (Krien, 1991) Urban vacuum is the place where people and activities are contained through its three dimensions, and it also has the status of evolution over time whether an urban development or a human development. (Ashihar, 1981) and urban vacuum is the space between buildings or it is the space between streets and roads that make up squares.

The current study means all public spaces, corridors, playgrounds, gardens, parking lots, streets and sidewalks.

The importance of urban spaces for the city

The importance of urban spaces is not only to help people move from one place to another, but also to the human activities within them. They are human breathing from the routine of the home and professional pressure, where they find comfort and meet with neighbors, neighbors and people in the city. (Lynch.k 1981)

The importance of urban spaces is also highlighted by the fact that it embraces the social activities of the city's inhabitants, where they meet and carry out their activities in the public space away from the environment of the house, which is limited to private activities, as it is the place where its users are allowed to engage in necessary activities or optional social activities. (Ahmed Rami, 2017) Some opinions have argued that the relationship between the characteristics of the population and the characteristics of urbanization is mutual.

That is, there is a mutual effect between the characteristics of the population and the characteristics of urbanization, and among the opinions of the researcher who proposed a model called the ecological model of social systems Asocial system ecological model of man. This model revolves around a key axis is that mutual human behavior between individuals is part of a complex ecosystem, that the physical environment and human behavior are strongly intertwined and that there is a mutual binary effect between humans and the environment. The importance of urban spaces is as follows:

- Develop and regulate people's relationship with the vacuum and the ocean so that they affect each other.
- Provide comfort for people and users of the vacuum and meet their needs and connect them to their community through design.
- Linking the vacuum with society. It is difficult to have a vacuum without social content. The opposite is true. The society also develops and forms spaces in various ways.

Classification of urban spaces

Urban spaces are classified into:

Natural spaces: They are spaces formed by natural factors without interference with human hands such as rivers and valleys. These urban spaces shape the identity of the city and distinguish it and differ it from city to city.

Urban spaces: human-made spaces such as parks, green spaces, public squares, playgrounds, gardens and trails.

Conditions for successful urban vacuum:

Five conditions have been set to be met in the urban environment to ensure its success:

Vitality: Compatibility between the nature of the place and the needs and functions of members of the community.

Sensation: Feel empty and place and connect them with time to ensure its organization.

Convenience: Fit the place, shape and capacity with users' actions.

Access: Access to everything human needs in the urban vacuum.

Control: the ability to reach the place and its activities by controlling the movement of people within the urban vacuum. (Kevin Lynch, 1990)

Motor disability and persons with special needs

Motor or physical disability is one of the fastest impairments that can affect human beings anywhere or in time. Also, many attitudes and conditions can lead to total or partial motor disability, as many developed and even developing countries are looking at this group of people with good humanity.

Attention to extraordinary individuals (persons with disabilities) in order to achieve the principle of equal opportunities for all ordinary and extraordinary persons is an important requirement; so that everyone can participate in building society according to its energy and potential.

These countries are now providing them with means of transport commensurate with their disabilities, as well as buildings that allow them to move quickly and easily. Schools, for example: There are a lot of ways to help the disabled move around, either using sloping land or private elevators. This reflects positively on them, and creates ease for this group in terms of interacting with the society in which they are located. The disabled person has become unable to find the obstacle he previously felt to transport or to move from one place to another.

The problem of persons with disabilities and their care is one of the social problems rooted in ancient and central times until it reaches the status of modern times, but of course the methods

and quality of care vary according to the political, economic, social and religious status of each age.

A disabled human being, like any other human being, has a unique personality and a distinct set of qualities, and the world's care and attention to this group increases from day to day, but this is achieved. According to the socio-economic and recreational status of States in which such situations exist, which has not been achieved on the ground in many States so far, further exacerbating their problems.

Definition of motor disability

There are several definitions of motor disability, including:

Motor disability means "cases of individuals suffering from some dysfunction of their motor capacity or activity so that such dysfunction affects the manifestations of their mental, social and emotional development requiring special education". (Al-Russan, 2010).

It is a condition of neurological, bone or muscular impairment or is a chronic condition requiring therapeutic, pedagogical and study intervention. (Al-Azza, 2000)

It is a non-sensory disorder or dysfunction that prevents an individual from using their body naturally to perform motor functions. (Abu al-Naja and Badran, 2003)

Definition of a person with a mobility disability

Is a person who has a physical impediment that prevents him from performing his motor functions naturally as a result of an illness or injury that has resulted in muscle atrophy, loss of motor or sensory ability or both in the lower and upper limbs sometimes or in a motor imbalance or amputation of limbs and that person needs medical, psychological, social, educational and vocational programmes to help him or her achieve his or her life goals and live with the greatest autonomy. (Awamla, 2003).

Causes of motor disability

The causes of motor disability can be traced back to two main factors:

- * Genetic birth defects: They cause congenital motor impairment, the latter of which the child is born with.
- * Factors acquired from the environment: occurring during or after childbirth, or at one of the age stages of an individual's development such as traffic accidents.

The main causes of motor disability include:

Insufficient oxygen Anosmia from the child's brain at the antenatal stage or during or after the birth, which causes damage to the child's brain so that this damage affects the neurological centers of the movement.

Genetic factors that are related to chromosomal dysfunction are either recessive or prevalent from parents to children so that the dysfunction creates a physical disability in the newborn child.

The mother's blood differs from that of the child. Pregnant mothers are exposed to infectious diseases such as German measles, syphilis and other diseases affecting the pregnant woman's health. (Said Hussein Al-Azza, 2000)

Serious traffic accidents and serious injuries resulting there from.

Categories of persons with motor disabilities

The mobility of the disabled can be divided into four categories:

Persons with formative disorders: They are intended to interrupt the growth of their limbs or affect their functions and performance capabilities.

Polio sufferers: They are infected in their nervous system, paralyzing some parts of the body, especially the upper and lower limbs.

Sufferers of cerebral paralysis: a neurological disorder that occurs from its point of view due to the disorders affecting certain brain regions, often accompanied by mental retardation although many sufferers may have normal intelligence and may be able to take care of themselves to reach the level of economic sufficiency.

Persons with mobility disabilities due to accidents, wars, natural disasters and work injuries: These may suffer from the loss of one or more limbs and lack of the ability to move an organ or group of body organs optional, due to the injured organ's inability to move, the loss of some tissue, the difficulties that circulation may face, or for any other reason.

Historical Profile of Motor Disability

There is no doubt that the history of disability in general, and motor disability, is linked to the earliest period of time, and goes back to the date of mankind's origin. Given the causes of disability, there are many factors that cause motor disability, the most important of which are: Lack of health awareness, lack of medical progress, and it is common knowledge that primitive societies experienced a healthy fumble and relied on primitive means of treatment for many illnesses and diseases.

Consequently, motor disability had arisen in conjunction with mankind's genesis, like many diseases, and the disabled had been treated with a kind of humiliation and contempt. In ancient times, in many nations, the disabled had suffered persecution, contempt and neglect, leaving them to die of hunger.

In the Islamic era, care for persons with disabilities has led to a variety of forms of care for persons with disabilities within the framework of Islam's social solidarity policies.

But what is noticeable here is that care services for motor disability and rehabilitation are relatively modern, for example, polio was the most common cause of motor disability in the 1940s, it was almost eliminated in some countries of the world in general. (1966), cerebral palsy was known by ancient Egyptians and was distinguished from polio. Some medical books on cerebral palsy appeared a year ago. (1479 m), but the British orthopedic surgeon William Till gave the first description of cerebral palsy clinics in a year. The disease has been called Latte's Disease for many years. (Abaid, 2012)

With the modern Renaissance and the accompanying reformist revolutions, movements of interest in the disabled emerged, as rapid developments in social philosophy, learning theories and technology journals led to an ongoing revolution and made work in the field of special education as exciting as it was difficult in the last years of the eighteenth century and the beginning of the nineteenth century, Post-American and French revolutions used effective procedures and methods to train and educate children with sensory disabilities in the United States of America and France, followed by mental and motor disability.

In the twentieth century, there was a general sense in the medical community of the inadequacy and effectiveness of traditional medical treatment methods, and there was a perception of the need for attention to pedagogical methods as well as surgical procedures. The General Law (142/94) of 1975, known as Education for All Children with Disabilities, adopted by the United Nations, was one of the most important laws calling for the care, education and employment of persons with disabilities, and the United Nations called for it to be general. (1981) International General for Persons with Disabilities, with a view to drawing the attention of the world's peoples and States to the problem of persons with disabilities, which is numbered (450) million persons with disabilities, through which they aimed to help, care, training and counseling persons with disabilities "(Abaid, 2012)

Delayed attention and care for motor disability is due to a lack of technological and medical progress commensurate with the nature, treatment and burden of disability, but with reference to visual and mental disability, it depends mainly on self-effort and the desire for rehabilitation away from advanced medical devices. In addition, attention to the educational

aspect of surgical medicine has contributed to the development of attention and care for the disabled.

Measures to be taken in the design of physical spaces for persons with physical disabilities

Persons with special needs (persons with motor disabilities) face many difficulties in different urban spaces as a result of architectural barriers in the urban environment as they are unable to participate in social life without assistance. Architectural design is primarily responsible for designing these spaces. When designing an urban vacuum, account must be taken of human standards in its different movements and the function of the place it will use. The type of disability must also be taken into account in their various movements, their daily effectiveness and the age, gender and size of the disabled in the design process. During the design, 90 depends on the proportion of people with lengths ranging from 165 cm to 186cm, and according to this form, the human length rate can be considered at 175 cm. This problem can be solved through the implementation and application of standards and design bases without neglecting the needs of this category, including:

Architectural design of entrances for persons with special needs

These spaces represent the transitional space of the building's internal vacuum. In order to remove obstacles and facilitate the movement of persons with and without disabilities within these types of spaces, it is necessary to provide two main tracks, one for vehicle traffic and the other for pedestrian traffic, which are directly linked to the buildings' entrances, and to provide them with signs and signals on the main entrances, reception spaces and parking spaces to provide security, safety and comfort for the movement of persons with and without disabilities.

The entrance is the first place where a healthy individual is or is disabled. The bases and criteria for this urban vacuum can be established to facilitate its use by persons with motor disabilities. The following must be observed:

- Preparation of building entrances to facilitate the movement of entry and exit for the disabled (photo 1).
- Customize doors in entrances to buildings for the mobility disabled that open once a specific button is pressed.

- Door openings in entrances are wide to facilitate their use.
- Take into account the simple position at the end of each slope.
- The need to provide special facilities for wheelchairs at the entrances to buildings. (Al-Mu 'ayyeeh, Dawood Mohammed, Building and Open Space Installations, Department of Ministry of Teachers' Colleges, Ministry of Knowledge).
- The net door is not less than 90cm in width (100cm in width). A sufficient vacuum must be available before the door for movement and to open and close the door at least 120cm * 150cm.



Photo 1: The building's entrances are based on the principles and criteria for designing entrances for the disabled.

Source: <https://urs-ufa.ru/ar/norms-of-ramps-for-disabled-people>

Architectural road design for persons with disabilities

The main objective of designing methods that are consistent with special needs is to keep moving without hindrance and without relying on the help of others. Among these criteria are:

Type of floor used

Flooring should not be the slippery type that leads to the fall.

The quality of the flooring, or the method of fixing it should not constitute some kind of impediment.

The spacing between units should not be overgrown to the degree that hinders the stick or wheelchair, or make the foot tumble while walking. (Mufaq Mahmoud, 2014)

Instead of using gravel in its natural form, gravel can be used with cement and poured on site in order not to obstruct the wheelchair and not slide pedestrians, and units of wood can be

placed over the sandy floor if any. If the flooring has openings to leak water into the sewage, the diameter or width of the openings must not exceed 2 cm so that the wheelchair or stick wheels are not crammed into the disabled. (Photo 2)



Photo 2: It shows the quality of flooring suitable for the mobility disabled.

Source: <https://m.akhbarelyom.com/news/newdetails/3139681/1>

Architectural design of slopes for people with special needs

The slope for persons with special needs is preferred to be equal to or less than 5% and there are some exceptional cases where the slope may exceed 5%.

A slope may reach 8% if the slope length is equal to or less than 2 meters.

The slope may also reach 10% if it serves an equal or less than 50cm longitudinal distance.

If the slope exceeds 4, there must be a horizontal surface 140 cm wide each longitudinal distance not exceeding 10 meters. (Mufaq Mahmoud, 2014)



Photo 3: Shows the slope's good inclination for the mobility disabled

Source: <https://spama.com/Sbase-Ramp-Aluminum-Foldable>



Photo 4: Illustrates the slope needed for the mobility disabled

Source: <https://spama.com/Sbase-Ramp-Aluminum-Foldable>

Architectural design of sidewalks

The sidewalk is critical as an urban component in cities and villages and is a complementary part of roads and streets where it regulates pedestrian traffic and provides them with the necessary protection against the dangers of vehicles and forms the important link between the road and the buildings overlooking it.

For the design of the sidewalks, the unimpeded design defines many important design foundations to be considered, the most important of which is the need to use floors made of materials that bear the operating and anti-slip conditions, as well as the design of the sidewalks to be level and steady tilt, and the absence of any highlights in them (such as manhole rooms). The slopes leading to the streets from the sidewalks are painted from their open sides, not less than 0.075 m in the absence of drapes, and 0.05 m in the case of drapes. It is taken into account when

To provide sidewalks with seating for persons with disabilities and persons with disabilities together not less than 0.70 m of space and no more than 0.05 m of seat, no more than 0.50 m of seat and no more than 0.20 m of seat and no more than 0.20 m of handrails, and to take into account the situation of flower tubs, plants and trees so as not to hinder the movement of persons with disabilities.

In order for the pavement to be prepared for the movement of the disabled, it is necessary:

- Its design is simple and free of complexity;
- Be barrier-free and have a coarse surface to avoid slipping,
- To encourage walking and feeling safe,
- Gradual transition from downtown sidewalks and main roads to sidewalks in residential neighborhoods within the scope of individual property,

- Avoiding the extreme slope tendency at junctions so as not to hinder the movement of pedestrians or persons with disabilities (Mufaq Mahmood Moussa, 2014);

Requirements of those exposed to a motor challenge in spaces and urban spaces

Creating an unimpeded environment requires designing buildings with spaces and components that respect the deficiencies and disabilities of persons with disabilities and provide them with their functional and psychological needs to be able to carry out various daily activities efficiently and easily.

Vacuum requirements in street space

The street is that space of space that has a number of corridors or trails and runs between two lines of urban blocks and these corridors are divided into footpaths and vehicle corridors. Its main function is to work on connecting different actors.

Street trails are designed according to mobile transportation as well as pedestrian needs, but technological advances in transport have left cities with major problems.

Its streets are represented in congestion and pollution, and accessibility from one place to another has become a major problem especially for people with special needs. In order to allow them to participate in public life on an equal basis with others, the following must be taken into account:

Trails: Trails must be designed to allow free and comfortable movement, taking into account the provision of their own paths on the sides of the streets, to be able to walk them with their helpful tools, as well as providing them with security and safety as they move from one place to another. These paths are suitable for auxiliary devices, to make them easy to pass on both sides of the street back and forth. (Najat Hassan)

Parking: Car parks are allocated to the disabled category so as to allow them to ride and be sufficient to rotate the wheelchair and be safe from wind and rain, and the width required to park a disabled person and use a wheelchair must be between 3-3.60 meters and the length of the stand is not less than 5.10 meters.

1. Positions should not be more than 60 m and 30 m away from the entrances to the buildings if they include slopes and should be close to lifts in multi-turn positions.
2. Attitude surfaces must not be sand and stones (disjointed materials) that impede the disabled's movement and have a tendency of not more than 2%.

3. Prefers concrete, asphalt or tiles (Photo 5).
4. Placement of globally applicable traffic signals on the ground or plates on columns (as shown in photo 5 and 6).



Photo 5: Special parking spaces for disabled

Source: https://www.khyoot.com/2021/09/blog-post_871.html



Photo 6: Signs showing disabled car parks

Source: <https://shop08004.irfankanat.com/category?name>

Field study

The case study is characterized by the city of M'sila

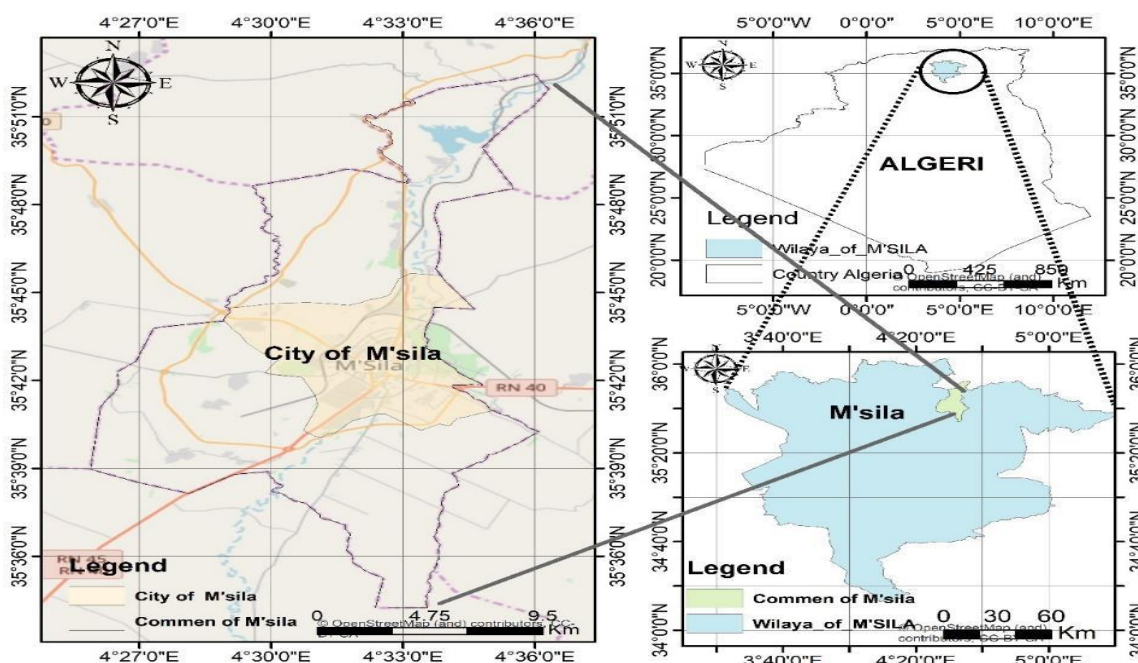
Presentation of the case study (City of M'sila)

The city of M'sila is located on the northwest side of the shatt al-Hodna basin, where it is bordered on the northern side by the al-Hodna mountain range, and on the southern side by shatt al-Hodna as shown in (figure 1), an intersection point for both national route 40, national route 45 and waterway (cane al-Qsob), which is one of the most important reasons why the city of M'sila. The city's area is estimated at 233 km², with approximately 170990

inhabitants at the 2014 census (Feloussia, 2022), or 733 km². (M'sila Municipality Interests, 2015)

The city of M'sila is located in the northern part of Algeria, whose geographical coordinates N 4°32'49"E 7°42'35", (Dahimi, et al, 2022. P.173), limited in the north by the semi-urban agglomeration of Buchemisa, in the south by agricultural lands, to the east by the municipality of Elmetarfa and to the west by the power station Draa El Hadja.

the land use plan for the new urban residential area (NURA 01), which is a model for this study in the M'sila.



Map 1: Location of the town of M'sila

Source: Dahimi.S, et al, 2022

Problems faced by persons with disabilities within their urban environment

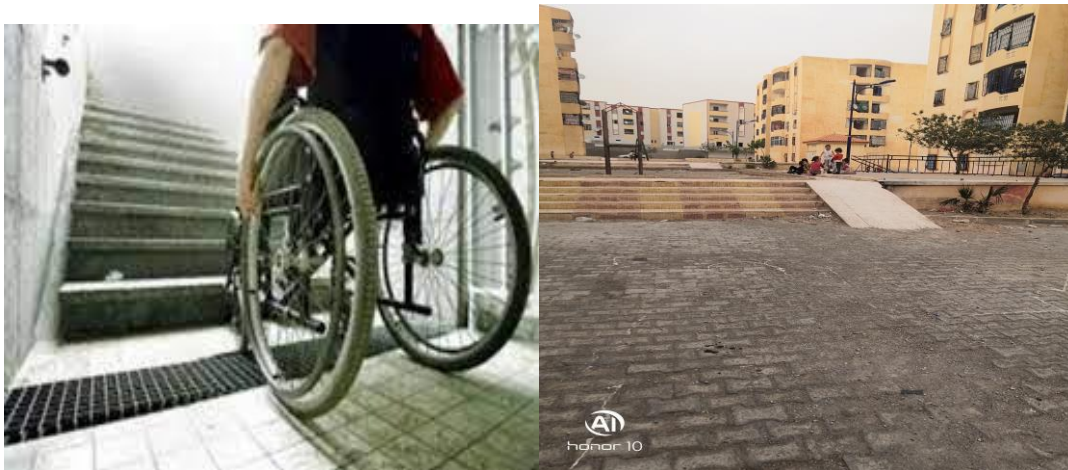
Although the Algerian state has stressed in its laws the need to ensure the right of easy access of the group of disabled people in all places, the reality is frustrated, discouraged and hindered. During our field study and the application of a group sample of disabled people in the city of M'sila in 2022, the result was the problem of accessibility in relation to administrative facilities, institutions. All these problems have damaged their social life.

Through field observation, we find that the most important problems in the urban environment of the city of M'sila, of which the handicapped suffer, are recorded as follows:

- Failure to implement design requirements, standards and foundations despite the existence of laws and decrees.
- The absence of spaces for crossing pedestrian disabled persons, which poses a risk to them.
- Lack of sidewalks for persons with disabilities, resulting in the movement of pedestrians mixing with the vehicle's path.
- The height of the pavement is difficult for the disabled when landing and ascending.
- Severe decline makes the movement of the disabled difficult.
- Building entrances are not equipped to allow the disabled to move easily.
- Design of buildings' entrances without regard to the disabled group, which constitutes an obstacle to their mobility.



Source: <https://tanja24.com/news23023.html> Source: <https://www.noonpost.com/content/35118>



Photos 7, 8, 9, 10: show the problems of the mobility disabled
Source: <https://fr.dreamstime.com/photo-stock-utilisant-rampe> Source: Authors, 2022

Conclusion

The urban vacuum is regarded as the place where objects, persons and activities are contained through its three dimensions. It is also characterized as evolution over time by an age or human development (human evolution here means behavior, activities, movement and

everything related to human behavior). The urban vacuum takes the final form of the relationship between man and the things he realizes.

External spaces are part of the environment in which man lives and understands them, so man's perception and interpretation of these spaces is linked to instinctive and acquired factors and is influenced by his social and cultural environment.

Since these urban spaces are an integral part of the urban composition of the city, design experts and technicians must take into account the principles and criteria adopted to organize and prepare them in an architectural manner to ensure the security, safety and satisfaction of its users, and to achieve equality between all elements of urban society, especially the group with special needs (this category of society that requires special attention during the design of these urban spaces).

Through this analytical study of this subject, it is worth making recommendations and proposals that help to organize well and rationalize urban spaces for persons with special needs, including:

- Encouraging further research and creativity on the design of urban spaces suitable for persons with disabilities;
- Highlighting the group of persons with disabilities, meeting their needs and providing urban space commensurate with their disability;
- Review of the foundations and criteria for designing urban spaces for persons with special needs;
- Attention to psychological studies in urbanization in order to improve the quality of urban spaces in order to achieve communication between individuals and the surrounding urban environment;
- Design green spaces in a way that makes them accessible and permeable by the disabled;
- Attention to night lighting and diversification in the shapes and colors of lighting units, which increases the pomp and beauty of the place and facilitates mobility and mobility for persons with special needs.

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