

Studying and Estimating Visual Pollution in Irbid City (Centre of Irbid City—Case Study)

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Abstract: Despite the global attention towards pollution, it remains a significant global threat and challenge for both developed and developing countries. Urbanization and economic development influence different types of pollution. Visual pollution is considered a new phenomenon referring to the impact of existing and growing mainstream pollution which impairs an individual's ability to enjoy visits or views. Recently, Jordanian cities have expanded in response to urbanization and ongoing development. Irbid City has the second largest population in Jordan after the capital Amman City highest population density in Jordan. In the modern era, Irbid City dramatically increased in population and dimension. The growth of the demographic population has been significant and has led to overpopulation, rapid urbanization, and unresolved problems associated with spatial planning and infrastructures leading to different types of pollution including visual pollution. The study area focuses on the city center with the most crowded population through field visits and actual observations. The study technique is descriptive and analytical, with a focus on meticulous monitoring and a follow-up-based questionnaire which is a tool for the study, involving data collection, classification, presentation, analysis, interpretation, and exploration to identify new facts and generalizations that can help solve current issues of visual pollution. The study provides recommendations for Irbid Municipal to eliminate visual pollution, in parallel with stricter supervision from the municipality during the building process to ensure proper implementation of the new rules, adopting an integrated policy for the city with the rest of the social, political, sensory, cultural, economic, and functional aspects, so that this policy is in the short and long term.

Key words: Visual pollution, Irbid city, spatial planning, overpopulation, questionnaire, visual distortion, urban planning.

1. Introduction

Despite the global attention towards pollution, it remains a significant global threat and challenge for both developed and developing countries. Urbanization and economic development influences different types of environmental pollution such as air pollution, water pollution, and soil pollution due to the release of hazardous waste by burning fossil fuels, oil spills and industrial toxins. In modern society, polluting agents are exponentially increased due to urbanization, overpopulation and economic development leading to increased city' noise, light, and visual pollution.

Visual pollution is considered a new phenomenon and concern among the existing and growing mainstream of environmental pollution. However, visual pollution is an attractive field of study for research and spatial

planners to conceptualize, formalize, quantify, and assess it from different dimensions.

The definition of visual pollution is considered a controversial issue, and the precise definition is still an objective of discussion in scientific literature. Recently, several research studies have been published to define and quantify the visual pollution phenomenon. Visual pollution is defined as the presence of excessive and unappealing visual elements caused by the oversaturation of a landscape with anthropogenic visual information leading to detracting from its aesthetic quality and visual coherence [1]. However, visual pollution is usually dismissed as a political and economic issue due to measurement difficulties and people's tastes. Also, it is subjected to fewer regulations than more traditional environmental problems [2]. However, visual pollution is one of the

most complex and comprehensive types of pollution because it is extended to associate with natural and urban environments such as vegetation characteristics, flashing signs, lighting and street furniture, outdoor advertisements, generators and intertwined electrical wires, waste baskets, and billboards hung [3, 4].

Several studies and research described visual pollution in large and central cities as the most common settings around the world in which visual pollution occurred [3, 5]. Several approaches have been proposed to quantify visual pollution. Both quantitative and qualitative methods can be associated to assess visual pollution [6, 7]. In addition, determining factors of visual pollution varies in scientific literature. Visual pollution has been attributed to the visual impact of power transmission towers, GSM (Global System for Mobile) antenna, street furniture and garbage, intertwined cables, and traffic signs [8]. Commonly, outdoor advertising is considered as an essential contributor to visual pollution because it covers large areas of city public space, contains bright colors, attractive shapes, and fonts, and is located in some cases in elevated area [7, 9, 10]. Other factors were associated with lack of urban planning and visual quality of public spaces such as random residential

houses, buildings with non-homogeneity with surrounding infrastructure, and protruding buildings [11, 12].

2. City Location

Irbid city is located in the northern Hashemite Kingdom of Jordan. It is around 70 km to the north of Amman the capital of Jordan. It is extended to the Jordanian Syrian borders, up to the Yarmouk River. The eastern part of Irbid Governorate is considered part of Horan Plains (Ramtha), which are extended between Syria and Jordan, while the northern part of Irbid city is overlooking the Golan Plateau. On the western side, the region consists, geographically, of hills with medium heights, gradually descending to reach below sea level elevation at the Jordan Ghour (Valley). The southern parts of the Governorate extend to include Al-Mazar Al-Shamali with its high mountains of astonishing landscape, which are adjacent to Ajloun Mountains.

The location of Irbid city is strategic connecting Jordan cities with the neighboring countries and vice versa through transit station, which is making Irbid city as historical trade route hub connecting various countries as shown below.

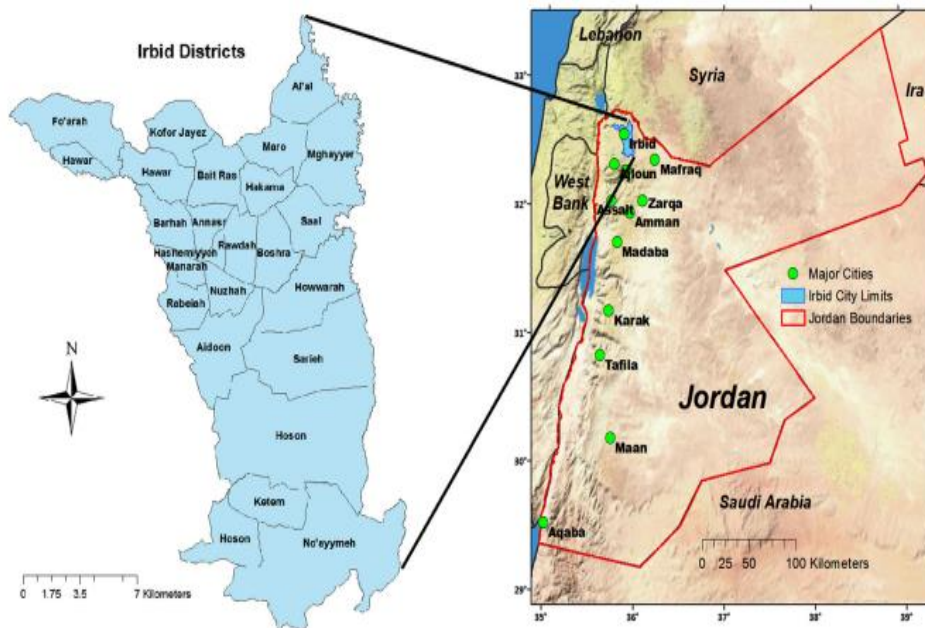


Fig. 1 Jordan map with neighbouring countries (right side) and Irbid city districts (left side) [13].

3. Area and Population City of Irbid

The Irbid Governorate has the second largest population in Jordan after Amman city with a population of around 1.7 million and the highest population density in the kingdom. Irbid Governorate consists of 23 districts and an area of about 1,570 km² [14, 15], as shown in Fig. 1.

3.1 Study Area

The study area is determined as the area most crowded with people in the city of Irbid, which is the city centre, Wasfi Al-Tal Square, Clock Square, and Al-Hashmi Street. The study noticed, through the field visit and actual observations, that the road network inside the city suffers from many problems, which cause some confusion and problems in traffic, especially in the middle. The city witnessed congestion and traffic chaos in the morning and afternoon hours.

3.2 Urban Characteristics of Irbid

Discovered graves and artifacts showed that the history of Irbid city dated to the Bronze Age. In addition, some stones and pottery found in Irbid hill were estimated to be around 3200 B.C. Accordingly, Irbid city during the Greek age was an essential trade center. During the Roman age, Irbid was known as an Arabella and played a significant role due to its agricultural wealth, soil fertility, moderate climate, and location. It was one of the ten most important cities of the Middle East (Decapolis). In the Islamic period around 636 A.C., Irbid city became a strategic center of communications and connection between the north and south parts of Islamic states [16].

In the modern era, Irbid City dramatically increased by 230 times in population and dimension between 1948 and 2017. The growth of the demographic population has been significant and leading to overpopulation, rapid urbanization, and unresolved problems associated with spatial planning and infrastructures. Unfortunately, Irbid modern transformation suffers from a lack of

spatial planning and prediction models which play an essential role in city transformation, resulting in random distribution of residential, public, and commercial buildings, environmental and visual pollution, insufficient parking area, narrow streets, and traffic congestion, improper utilization of heritage and old buildings [17].

4. Visual Pollution of Irbid City

The city of Irbid suffers from visual distortion, and the manifestations of visual distortion have been many and varied. Due to the need for progress or development at times, or for economic reasons at other times, these aspects have become prominent features and famous landmarks, without the slightest consideration for the urban character, and these aspects lacked order and consistency in their shapes, sizes, densities, locations, and methods of display. This trend has led over the years to a negative impact on the aesthetic aspects, visual harmony, and urban character of the city of Irbid, and maintaining visual harmony in the urban environment has become difficult to achieve, and far from being achieved.

The following is a presentation of the impact of these aspects on the built environment in the city of Irbid, supported by figures.

4.1 Generators and Intertwined Wires of Lighting Poles in the Streets

The large number of electrical wires, their intertwining, the lack of an underground system to connect them, their scattering in the air, and their overcrowding in one area, lead to the formation of a visually harmful appearance, and suggest fragmentation, as shown in Fig. 2.

4.2 Random Spread of Waste Baskets, and the Spread of Garbage outside Them

In addition to the uneven, unarranged, and studied appearance of the containers, the presence of garbage and throwing it outside the containers increases the visual distortion in the city, as it is customary that there



Fig. 2 Al-Hashemi street generators and electricity pole.

(Source: Researcher).



Fig. 3 Al-Al-Hashemi Street waste baskets hung on electricity poles (Source: Researcher).

is no planning for the locations of the waste containers, and people are accustomed to throwing them out of their place as shown in Fig. 3.

The conclusions that can be withdrawn are: the air infiltration rate is always larger on the refrigerator cabin when compared with the freezer one, almost double, either with the new and old seals. This occurs because the air temperature differential between inside and outside air is larger in the freezer cabin and so is the pressure differential. The consequence is that the freezer seal is much more compressed, minimizing on that way the air infiltration rate to the cabin.

4.3 Billboards Hung in the Streets Are in Conflicting Colors, as Are the Billboards That Are Spread Densely in the Centre of the City

The difference in size, the difference in the material of manufacture, the place of their suspension, and their

covering of each other, lead to a gross visual distortion of the general view of the buildings, as shown in Fig. 4.

4.4 Narrow Streets, Crowded Cars, and the Lack of Parking

There are almost no spaces designated for pedestrians, resulting from the presence of narrow streets and large numbers of cars, which reduces the spaces for individuals, violates everyone’s personal space, and gives a feeling of discomfort and security. In addition to this, there is no parking available within the general planning of the city, and the streets and sidewalks have become parking lots. This mixing has distorted the general view of the streets as shown in Fig. 5.

4.5 Random Spread of Banners

To protect themselves from the summer heat or winter rain, grocery store owners or sellers spread banners



Fig. 4 Al-Hashemi street billboards are different sizes, colors, front protrusions and some are empty without any writing (Source: Researcher).



Fig. 5 City centre visual pollution is evident in the inconsistencies in the traffic jam.



Fig. 6 The stalls in the street obstruct passers-by and cars, and there are no seats or street furnishings (Source: Researcher).

over their stores. It is very natural for the sizes, shapes, and colors of these banners to differ, and even the materials they are made of. This sharp difference in size, shape, colors, and material reflects visual pollution, as well as the image in Fig. 6 shows it.

4.6 Poor Urban Planning of Some Buildings

Whether in terms of spaces or terms of the form of their construction, high-rise buildings are built next to

significantly lower buildings, which leads to an inconsistency in the general landscape, in addition to the presence of a new building next to an old building, which leads to the creation of visual chaos as in Fig. 7.

4.7 The Lack of Sidewalks on the Roads

If sidewalks are found, they are not suitable for shop owners to seize them for the purpose of displaying their products, as shown in Fig. 8.



Fig. 7 Clock Square in the city centre (Source: Researcher).

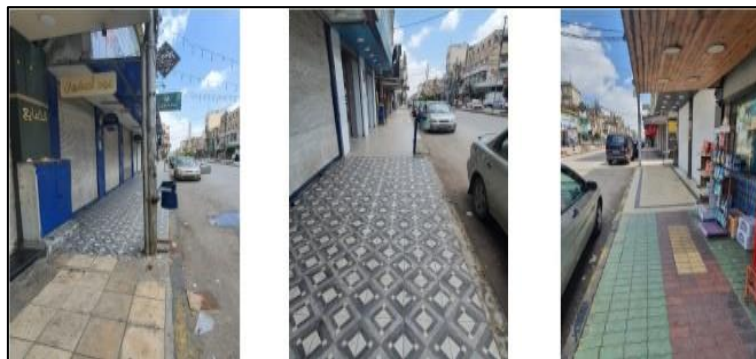


Fig. 8 Al-Al-Hashemi street sidewalk with different finishing materials and colors (Source: Researcher).

5. Methodology

The term “methodology” refers to a set of rules and procedures upon which the research method depends, and organized steps followed by the researcher in dealing with the topics he studies until he reaches a certain result. The study technique is descriptive and analytical, with a focus on meticulous monitoring and follow-up. It depicts a phenomena or occurrence in detail, both quantitatively and qualitatively, throughout the course of one or more time periods. Identifying a phenomena or occurrence in terms of content and so reaching conclusions and generalizations aids in understanding, analyzing, and shaping reality. The descriptive method involves data collection, classification, presentation, analysis, interpretation, and exploration to identify new facts and generalizations that can help solve current issues [2, 18].

5.1 Study Community and Sample

The study community consisted of public and private sector employees, students, workers, and those without

work. The study consisted of 391 individuals in the study area. The study area was determined by the city of Irbid, and the sample was chosen randomly. Tables 1-6 represent the distribution of the study sample according to its demographic variables.

5.2 Study Tool

The study developed a questionnaire which is a tool for the study, after reviewing the literature and previous studies related to the subject of the study. A total of 391 interviews were conducted with students, workers in public and private sectors, and employees in the study area. It was analyzed statistically.

5.3 Validity of the Tool

The study confirmed the validity of the tool by presenting it to several specialized and experienced arbitrators. The arbitrators indicated that some modifications had been made to the style of wording the paragraphs and questions. After making the required modifications, the arbitrators indicated the validity of the study tool.

Table 1 Distribution of the study sample according to the gender (male, female).

Gender	Frequency	Percent	Valid percent	Cumulative percent
Male	95	24.3	24.3	24.3
Female	296	75.7	75.7	100.0
Total	391	100.0	100.0	

Table 2 Distribution of the study sample according to the age.

Age	Frequency	Percent	Valid percent	Cumulative percent
20-30	124	31.7	31.7	31.7
31-40	64	16.4	16.4	48.1
41-50	203	51.9	51.9	100.0
Total	391	100.0	100.0	

Table 3 Distribution of the study sample according to the address.

Address	Frequency	Percent	Valid percent	Cumulative percent
Outside Irbid City	72	18.4	18.4	18.4
Village of Irbid City	112	28.6	28.6	47.1
Irbid City	207	52.9	52.9	100.0
Total	391	100.0	100.0	

Table 4 Distribution of the study sample according to the work.

Work	Frequency	Percent	Valid percent	Cumulative percent
Not working	72	18.4	18.4	18.4
Student	112	28.6	28.6	47.1
Private sector employee	207	52.9	52.9	100.0
Public sector employee	391	100.0	100.0	

Table 5 Distribution of the study sample according to the workplace.

Workplace	Frequency	Percent	Valid percent	Cumulative percent
Outside Irbid City	125	32.0	32.0	32.0
Villages of Irbid City	44	11.3	11.3	43.2
Irbid City	222	56.8	56.8	100.0
Total	391	100.0	100.0	

Table 6 Distribution of the study sample according to the education level.

Education level	Frequency	Percent	Valid percent	Cumulative percent
Elementary	4	1.0	1.0	1.0
High School	52	13.3	13.3	73.7
Diploma	23	5.9	5.9	79.5
Bachelor	232	59.3	59.3	60.4
Postgraduate	80	20.5	20.5	100.0
Total	391	100.0	100.0	

5.4 Study Procedures

This study was conducted according to the following steps:

1. Preparing the study tool in its final form.
2. Identifying the study sample members.

3. Conducting interviews and filling out questionnaire paragraphs.

4. Collecting the completed forms from sample members, coding them, entering them into the computer, and processing them statistically using the SPSS (Statistical Package for the Social Sciences).

5. Transcribing the answers of the sample members.
6. Extracting, analyzing, and discussing the results.
7. Proposing recommendations and appropriate development mechanisms.

5.5 Study Variables

This study includes the following variables:

1. Independent variables which include:

- Gender has two levels (male, and female).
- Age has three levels (20-30 years old, 31-40 years old, and 41-50 years old).
- Address, it has three levels (outside Irbid city, villages of Irbid city, and Irbid city).
- Work has four levels (not working, student, private sector employee, and public sector employee).
- Workplace, it has three levels (outside Irbid city, villages of Irbid city, and Irbid city).
- Educational level has five levels (elementary, high school, diploma, bachelor, and postgraduate).

2. Dependent variables: It consists of responding to the questionnaire points.

5.6 Statistical Analysis

After transcribing the answers of the sample members, they were coded, and the data were entered using the computer. Then the data were processed statistically using the SPSS program, using frequencies and percentages. SPSS Statistics is a statistical software suite established by IBM for data management, advanced analytics, multivariate analysis, business intelligence, and criminal investigation. Long produced by SPSS Inc., it was developed by IBM in 2009. Versions of the software released since 2015 have the brand name IBM SPSS Statistics.

The software name originally stood for Statistical Package for the Social Sciences [19], reflecting the original market, then later changed to Statistical Product and Service Solutions [15, 20].

6. Analysis and Evaluation of Visual Distortion in the Centre of Irbid City

This section deals with an analysis and evaluation of

visual distortion in the center of the city of Irbid as a case study for the city of Irbid. Therefore, the study prepared a questionnaire, to achieve the objectives of the study, through where the degree of spread of visual distortion manifestations were measured, how they are perceived by a sample of individuals in the city of Irbid, and the proposed solutions. To improve the elements of beauty in Irbid, to confirm the facts and elements that the study emerged from the field analysis of the manifestations of visual pollution in the study area, the following is a presentation of the results of the study:

This study based on the literature presents the following fifteen elements as aesthetic visual elements which are:

- Green trees on the edges, central islands, and gardens.
- Kiosks.
- Benches for sitting.
- Water fountains
- Places to display goods.
- Signboards.
- Advertisement boards.
- Commercial signs (shop signs).
- Statues and antiques (representing the city and its symbolism).
- Lighting at night.
- Shades.
- Walls for a movie show at night.
- Floor tiling.
- Bathrooms.
- Waste baskets.

Table 7 shows the percentages for evaluating the extent of the aesthetic and visual impact of the green trees on the edges, central islands, and gardens, if available, as seen by the study sample.

Two hundred and nine (209) members of the study population, or 53.5%, believe that the green trees on the edges, central islands and gardens are available. The study attributes there is not that much difference between the two groups and the percentages are close to each other.

Table 7 Percentages for evaluating the extent of the aesthetic and visual impact of the green trees on the edges, central islands, and gardens.

Green trees on the edges, central islands and gardens	Frequency	Percent	Valid percent	Cumulative percent
Not available	182	46.5	46.5	46.5
Available	209	53.5	53.5	100.0
Total	391	100.0	100.0	

Table 8 Percentages for evaluating the extent of booths aesthetically and visually that affect the current situation in the city center of Irbid city.

Kiosks	Frequency	Percent	Valid percent	Cumulative percent
Good	112	28.6	28.6	28.6
Bad	70	17.9	17.9	46.5
Weak	153	39.1	39.1	85.7
Excellent	56	14.3	14.3	100.0
Total	391	100.0	100.0	

Table 8 illustrates the extent to which booths aesthetically and visually affect the current situation in the city center of Irbid city.

Two hundred and fifty-three (153) members of the study population, or 39.1%, believe that the extent of kiosks on the streets provides weak impact on the current situation in the city center of Irbid city aesthetically and visually. Furthermore, 112 members of the study population which presents about 28.6% see that kiosks have a good impact aesthetically and visually in the city center of Irbid city.

The difference between the sample members in the effect of kiosks as a second element in visual distortion is due to the difference in the culture of the sample members based on professional foundations, as the culture of the uneducated people is mostly attributed to personal reasons or reasons related to comfort, while the educated people realize that the kiosks, from an engineering standpoint, are exploitation of space without planning, while the uneducated among them may see it as a place that can be used to obtain needs at any time with low prices.

Table 9 shows the percentages for evaluating the

extent of the aesthetic and visual impact of the benches for sitting, if available, as seen by the study sample.

The results of Table 9 indicate that most of the sample members are dissatisfied with the current situation of benches for sitting areas in the city center. The study explains this result as the fact that individuals are more concerned with what is on the ground, and what they see and feel daily, so the lack of seating results from the lack of sufficient space in the center of the city, and it cannot be denied or ignored that the number of seats is very small compared to the number of people and visitors to the city center.

Table 10 provides the percentages used to assess the aesthetic and visual impact of water fountains, if present, as seen by the study sample.

The result in Table 10 illustrates that 96.9% of the members of the sample agree that there is no water fountain in the center of the city of Irbid. This highlights the importance of this element in this area. Table 11 shows the percentages utilized for evaluating the scope of the artistic and painterly influence of the places to display goods.

Table 9 Percentages for evaluating the extent of the aesthetic and visual impact of the benches for sitting.

Benches for sitting	Frequency	Percent	Valid percent	Cumulative percent
Not available	331	84.7	84.7	84.7
Available	60	15.3	15.3	100.0
Total	391	100.0	100.0	

Table 10 Percentages for evaluating the extent of the aesthetic and visual impact of the water fountains.

Water fountains	Frequency	Percent	Valid percent	Cumulative percent
Not available	379	96.9	96.9	96.9
Available	12	3.1	3.1	100.0
Total	391	100.0	100.0	

Table 11 Percentages for evaluating the extent of the aesthetic and visual impact of the places of goods.

Places of goods	Frequency	Percent	Valid percent	Cumulative percent
Not available	245	62.7	62.7	62.7
Available	146	37.3	37.3	100.0
Total	391	100.0	100.0	

Sixty-two point seven percent (62.7%) of the members of the sample find that the places of goods do not exist and impact the aesthetic and visual appearance of the center of the city of Irbid. The study explains this result based on this question by saying that the primary problem of the sample members is the merchandise stalls, because the stalls take up a lot of space, especially the space on the floor. As these stalls increase, the spaces begin to diminish, and the space allocated for individuals and passers-by becomes less and less, and this causes great inconvenience, and a bad feeling for them, and it needs to be organized, and the responsibility for organizing it falls on the planning bodies such as the municipality, which is responsible for providing an alternative and properly prepared place where the services they need are available, in addition to the crowding or annoying noises that result from the presence of the stalls.

Table 12 represents the availability percentage of the signboards as seen by the members of the sample.

Table 12 shows that 68% of the members of the sample can see obviously the signboards everywhere in the center of the city of Irbid. However, while the matter of visual pollution, as this phenomenon is frequently designated, has been extensively discussed, there is yet no unblemished conclusion as to how best to control commercial signage and whether several urban contexts and people from different experiences and cultures have worldwide or diverse preferences.

Table 13 illustrates how advertisement signboards affect the aesthetic and visual appearance of the center of the city of Irbid.

It can be seen from Table 13 that there are differences in opinions between the members of the sample. However, it is also worth noting that commercial signs, regardless of their differences, represent one of the most important elements that make up public streets. They are classified as large-scale public means that move each person’s purchasing power according to his need and create growth in economic life. As a result of the great importance that commercial signs have received and their increasing spread, recently, we have noticed that our cities have become experiencing what is known as commercial sign fever as a result of competition between shop owners and companies that invade the markets daily, which has led to the sacrifice of the ethics required in the design of these signs, and in the locations of their deployment, which has caused visual chaos in street architecture in particular. It was reflected in the cityscape in general.

Commercial signs that are placed for long periods can be described as an organized communication aimed at promoting a product or service. In 1997, the Signtronix company in the United States of America conducted a survey on a group of commercial signs that were recently placed, that is, within 30-40 days, and it was taken, a random sample of customers and asking them about how they learned about these products or companies. The result of the study indicated that the signs that were placed during the last period were the ones that introduced these companies. It was concluded that commercial signs should perform at least three main functions [21], until it achieves its desired purpose which are:

Table 12 Percentages for evaluating the extent of the aesthetic and visual impact of the signboards.

Sign boards	Frequency	Percent	Valid percent	Cumulative percent
Not available	125	32.0	32.0	32.0
Available	266	68.0	68.0	100.0
Total	391	100.0	100.0	

Table 13 Percentages for evaluating the extent of the aesthetic and visual impact of the advertisement's signboards.

Advertisements signboards	Frequency	Percent	Valid percent	Cumulative percent
Good	112	28.6	28.6	28.6
Bad	70	17.9	17.9	46.5
Weak	153	39.1	39.1	85.7
Excellent	56	14.3	14.3	100.0
Total	391	100.0	100.0	

1. Consolidating information about the entity that owns the sign in the mind of the recipient, whether it addresses him or not.

2. Attract the largest number of new customers.

3. Increase the percentage of sales of entities operating these stores.

Table 14 provides the percentages used to assess the aesthetic and visual impact of commercial signs (shop signs) as seen by the study sample.

Table 14 shows clear difference between the opinions of the members of the sample. This might be due to the different backgrounds of the members.

Table 15 provides the percentages used to assess the aesthetic and visual impact of statues and antiques (representing the city and its symbolism), as seen by the study sample.

The results of Table 15 indicate that there is agreement

among the various members participating in the sample, at a rate of 78.8%, that the presence of statues and antiques in the city center may increase the aesthetic appearance of the city center and affect the city's economy.

In Ref. [22], author pointed out the importance of lighting in the process of perceiving the vocabulary of the street at night, in addition to its ability to shed light on certain parts of the signs that the designer deems important in attracting the viewer's attention, as appropriately distributed lighting works to perceiving the texts written on the signs, so the designer must pay attention to the issue of shadows that result from night lighting, which may affect the viewer's perception if they are indirect due to the shadows that result from them. Table 16 provides the percentages used to assess the aesthetic and visual impact of lighting at night as seen by the study sample.

Table 14 Percentages used to assess the aesthetic and visual impact of commercial signs (shop signs).

Commercial signs	Frequency	Percent	Valid percent	Cumulative percent
Good	118	30.2	30.2	30.2
Bad	75	19.2	19.2	49.4
Weak	127	32.5	32.5	81.8
Excellent	71	18.2	18.2	100.0
Total	391	100.0	100.0	

Table 15 Percentages for evaluating the extent of the aesthetic and visual impact of the statues and antiques

Statues and antiques	Frequency	Percent	Valid percent	Cumulative percent
Not available	308	78.8	78.8	78.8
Available	83	21.2	21.2	100.0
Total	391	100.0	100.0	

Table 16 Percentages for evaluating the extent of the aesthetic and visual impact of the lighting at night.

Lighting at night	Frequency	Percent	Valid percent	Cumulative percent
Not available	79	20.2	20.2	20.2
Available	312	79.8	79.8	100.0
Total	391	100.0	100.0	

Table 17 Percentages for evaluating the extent of the aesthetic and visual impact of the shades.

Shades	Frequency	Percent	Valid percent	Cumulative percent
Not available	311	79.5	79.5	79.5
Available	80	20.5	20.5	100.0
Total	391	100.0	100.0	

Seventy-nine point eight percent (79.8%) of the members of the sample see that lighting at night does not exist. This study believes that this gives a bad impression to the municipality of Irbid.

Table 17 shows the importance of one of the elements that affect visual pollution in the center of the city of Irbid as seen by the members of the sample.

Seventy-nine point five percent (79.5%) of the members of the sample believe that shades do not exist in the center of the city of Irbid. The study assumes that shades play an important role in the general view of the city and passers-by benefit from it as rest stations.

Everyone loves going to the cinema. Observing the latest films on the big screen makes for a perfect appointment, a fun family outing, and a comfortable method to spend an afternoon with friends. This study finds that having walls for a movie show at night can provide a touch of luxury to residents, offer complete and comfort watching, watch sporting events on a big screen, provide ideal family entertainment. Table 18 below shows the percentages used to assess the

aesthetic and visual impact of walls for a movie show as seen by the study sample.

Despite its importance (i.e. walls for a movie show) in developing and adding beauty to the city, 93.9% of the members of the sample believe that this element does not exist in the center of the city of Irbid.

There is another element that applies beauty to the center of a city which is floor tiling. Furthermore, tile floors should be durable, practical, and convenient. Plus, when installed correctly, they can last for decades. Floor tiles come in a wide array of colors, styles, sizes, and shapes. They can also be made from several materials, including ceramic, porcelain, marble, cement, slate, and travertine.

Table 19 below shows the percentages used to assess the aesthetic and visual impact of floor tiling as seen by the study sample.

The previous table shows that 252 of the members of the sample say that floor tiling does not exist in the center of the city of Irbid. However, this element is the responsibility of Irbid Municipality.

Table 18 Percentages used to assess the aesthetic and visual impact of walls for a movie show.

Walls for a movie show	Frequency	Percent	Valid percent	Cumulative percent
Not available	367	93.9	93.9	93.9
Available	24	6.1	6.1	100.0
Total	391	100.0	100.0	

Table 19 Percentages used to assess the aesthetic and visual impact of floor tiling.

Walls for A Movie Show	Frequency	Percent	Valid percent	Cumulative percent
Not available	252	64.5	64.5	64.5
Available	139	35.5	35.5	100.0
Total	391	100.0	100.0	

Table 20 Percentages used to assess the aesthetic and visual impact of bathrooms.

Bathrooms	Frequency	Percent	Valid percent	Cumulative percent
Not available	359	91.8	91.8	91.8
Available	32	8.2	8.2	100.0
Total	391	100.0	100.0	

Table 21 Percentages used to assess the aesthetic and visual impact of wastebaskets.

Water baskets	Frequency	Percent	Valid percent	Cumulative percent
Not available	219	56.0	56.0	56.0
Available	172	44.0	44.0	100.0
Total	391	100.0	100.0	

Irbid's huge and dense population requires accessible, clean, and safe public bathrooms. Public bathrooms, like housing, are a fundamental necessity, a human right, a public health concern, and an essential component of urban infrastructure. Table 20 below shows the percentages used to assess the aesthetic and visual impact of floor bathrooms as seen by the study sample.

The results of Table 20 indicate that most of the sample members do not see the bathrooms in the center of the city of Irbid. The agreement of the answers and the shared vision of specialists and the public gives clear evidence of the aesthetic and visual importance of public bathrooms, which is one of the almost missing elements in the city of Irbid.

Table 21 shows the percentages used to assess the aesthetic and visual impact of waste baskets as seen by the study sample.

Fifty-six percent (56%) of the members of the sample show that wastebaskets do not exist in the center of the city of Irbid. To this study, this affects the aesthetic and visual sight badly.

7. Description of the Results of the Study

Table 22 shows the frequencies, minimum, maximum, arithmetic mean, and standard deviation of the respondents' answers according to the study tool items.

The table indicates that the items of the study tool achieved an arithmetic mean of 4.41 of the total scale area, with a standard deviation of 0.727. This indicates that the sample trends are positive for all items of the study tool because their arithmetic averages are greater than the average of the measurement tool.

It was shown from the results in Table 22 that the third statement, which states the following: "Paying attention to the aesthetic appearance of the center of the city of Irbid and working to develop it serves to preserve the environment and to reduce environmental pollution" ranked first with an arithmetic mean of 4.47 and a standard deviation of 0.800. On the one hand, the first statement, which states, "Paying attention to the aesthetic appearance of the center of the city of Irbid and working to develop it serves aesthetic appearance of the city center only" received the lowest arithmetic average, which amounted to 4.20 and a standard deviation of 0.994.

Table 23 shows the frequencies, minimum, maximum, arithmetic mean, and standard deviation of the respondents' answers according to the study tool items.

The table specifies that the items of the study tool attained an arithmetic mean of 2.44 of the total scale area, with a standard deviation of 0.451. This signifies that the sample trends are positive for all items of the study tool because their arithmetic averages are greater than the average of the measurement tool.

It was shown from the results in Table 23 that problem number 13, which states the following: "Potholes in the streets serve as a problem and a difficulty facing Irbid city center from a planning and aesthetic standpoint" ranked first with an arithmetic mean of 2.69 and a standard deviation of 0.582. On the one hand, the tenth problem, which states, "Unpleasant odors serve as a problem and a difficulty facing Irbid city center from a planning and aesthetic standpoint" received the lowest arithmetic average, which amounted to 2.20 and a standard deviation of 0.715.

Table 22 Do you think that paying attention to the aesthetic appearance of the center of the city of Irbid and working to develop it affects.

Seq	Statement	N	Min	Max	Mean	Std. deviation
1	The aesthetic appearance of the city center only	391	2	5	4.20	0.994
2	Economic growth of the city	391	2	5	4.37	0.816
3	Preserving the environment and reducing environmental pollution	391	2	5	4.47	0.800
4	Providing psychological comfort for people	391	2	5	4.46	0.873
5	Tourism movement in the city	391	2	5	4.55	0.811
6	Overall index	391	2	5	4.41	0.727

Table 23 Energy saved per refrigerator and per year and the reduction of CO₂ emissions to the environment.

Seq	Problem	N	Min	Max	Mean	Std. deviation
1	Narrow streets	391	1	3	2.48	0.659
2	Traffic jam	391	1	3	2.60	0.636
3	Pedestrian congestion	391	1	3	2.37	0.646
4	Goods stalls	391	1	3	2.60	0.636
5	Diversity in shapes and colors of banners	391	1	3	2.36	0.715
6	Too many ads	391	1	3	2.25	0.757
7	Random cadres	391	1	3	2.27	0.767
8	Electrical wiring extensions	391	1	3	2.45	0.673
9	Electrical generators	391	1	3	2.22	0.721
10	Unpleasant odors	391	1	3	2.20	0.715
11	Scattering of waste	391	1	3	2.33	0.781
12	Sunken manhole covers in the road	391	1	3	2.44	0.688
13	Potholes in the streets	391	1	3	2.69	0.565
14	Random buildings	391	1	3	2.50	0.611
15	Car noise	391	1	3	2.52	0.628
16	Contradiction in architectural styles	391	1	3	2.56	0.608
17	Not enough areas for queuing	391	1	3	2.69	0.582
18	Overall index	391	1	3	2.44	0.451

Table 24 Impression when visiting the downtown area of Irbid City.

Seq	Impression	N	Min	Max	Mean	Std. deviation
1	Easy to navigate	391	2	5	2.87	0.844
2	Ease of identifying destinations	391	2	5	3.25	0.856
3	Clear vision	391	2	5	3.15	0.832
4	Ease of reading signs and ads	391	2	5	3.24	0.913
5	Easy shopping	391	2	5	3.25	0.869
6	Feeling safe	391	2	5	3.69	0.900
7	Parking	391	2	5	2.50	0.671
8	The noise	391	2	5	2.74	0.941
9	Sanitation	391	2	5	2.89	0.816
10	Lack of public facilities	391	2	5	2.44	0.791
11	Overall index	391			3.00	0.598

Table 24 shows the frequencies, minimum, maximum, arithmetic mean, and standard deviation of the respondents' answers according to the study tool items.

The above table specifies that the items of the study

tool accomplished an arithmetic mean of 3.00 of the total scale area, with a standard deviation of 0.598. This signifies that the sample trends are positive for all items of the study tool due to the reason that their arithmetic

averages are greater than the average of the measurement tool.

It was shown from the results in Table 24 that impression number 6, which states the following: “Feeling safe as an impression when visiting the downtown area of Irbid city” ranked first with an arithmetic mean of 3.69 and a standard deviation of 0.900. On the one hand, the tenth impression, which states, “Lack of public facilities as an impression when visiting the downtown area of Irbid city” received the lowest arithmetic average, which amounted to 2.44 and a standard deviation of 0.791.

Table 25 shows the frequencies of yes and no answers and the valid percentages of yes and no answers of the respondents’ answers according to the study tool items.

The results of Table 25 indicate that most of the sample members believe that preserving the aesthetic elements in the city center of Irbid begins with re-studying urban transportation of the town, providing ground floor parking, designing virtual facades that express an architectural style that mimics the history of the region, providing public spaces for social interaction between individuals and converting some streets to pedestrians only, consequently.

The study attributes this correct result to the fact that these factors help and work towards the success of programs to preserve aesthetic elements, especially in the center of the city of Irbid, which is considered a

historical, archaeological, and tourist landmark that must be preserved and its elements, and continuous restoration of these elements must be done while preserving their components.

Table 26 shows the frequencies of yes and no answers and the valid percentages of yes and no answers of the respondents’ answers according to the study tool items.

The results of Table 26 indicate that most of the sample members believe that Irbid Municipality and relevant institutions play significant roles in preserving the aesthetic elements in the city center of Irbid beginning with placing waste baskets, placing information boards, removing hanging power cords, finding parking, lightening streets, restoration of old buildings gain the high priorities, consequently.

The study attributes this result to the fact that municipalities often direct their plans towards infrastructure such as water, electricity, and sewage, and consider attention to the visual and aesthetic elements a secondary matter, or the low culture of municipal officials regarding aesthetic elements and their cultural dimensions, or even marketing them and benefiting from them economically. It can be ignored that municipal budgets are limited, and it is assumed that they include projects for visual and aesthetic appeal.

Table 27 shows the frequencies of yes and no answers and the valid percentages of yes and no answers of the respondents’ answers according to the study tool items.

Table 25 Opinions of solutions and ways to solve the aesthetic appearance problems when visiting the downtown area of Irbid City.

Seq	Solutions and ways	No	Yes	Percentage of No	Percentage of Yes
1	Redesigning the city center	59	332	15.1	84.9
2	Changing the features of storefronts	69	322	17.6	82.4
3	Standardizing the billboards	47	344	12.0	88.0
4	Increasing the planting of ornamental trees	47	344	12.0	88.0
5	Reliance on public transportation	63	328	16.1	83.9
6	Providing ground-floor parking	24	367	6.1	93.9
7	Converting some streets to pedestrians only	36	355	9.2	90.8
8	Designing virtual facades that express an architectural style that mimics the history of the region	28	363	7.2	92.8
9	Providing public spaces for social interaction between individuals	28	363	7.2	92.8
10	Re-studying urban transportation within the city center	16	375	4.1	95.9

Table 26 Role of Irbid Municipality and relevant institutions to solve the aesthetic appearance problems when visiting the downtown area of Irbid City.

Seq	Role of the Irbid municipality and relevant institutions	No	Yes	Percentage of No	Percentage of Yes
1	Redesigning the city center	36	355	9.2	90.8
2	Finding parking	15	376	3.8	96.2
3	Placing information boards	11	380	2.8	97.2
4	Placing waste baskets	7	384	1.8	98.2
5	Standardizing the style of billboards	28	363	7.2	92.8
6	Closing the area to vehicle traffic	102	289	26.1	73.
7	Removal of stalls	90	301	23.0	77.0
8	Removing kiosks	165	226	42.2	57.8
9	Removing hanging power cords	12	376	3.8	96.2
10	Street lighting	15	376	3.8	96.2
11	Restoration of old buildings	15	376	3.8	96.2
12	Determining a building pattern and system for each street	59	332	15.1	84.9

Table 27 Elements of old city of Irbid to solve the aesthetic appearance problems.

Seq	Element	No	Yes	Percentage of No	Percentage of Yes
1	Laws issued by Irbid Municipality regarding construction within the boundaries of the old city	23	368	5.9	94.1
2	Restoring and reviving the old city buildings	15	376	3.8	96.2
3	Maintaining the cleanliness of the town and its streets	11	380	2.8	97.2
4	Increasing public awareness of the aesthetic importance of the city center	11	380	2.8	97.2
5	Working to implement tourism projects to revive the old city	8	383	2.0	98.0

The results of the previous table indicate that there is a very large role assigned to the municipality of Irbid in issuing laws regarding construction within the boundaries of the old city, restoring and reviving the old city buildings, maintaining the cleanliness of the town and its streets, increasing public awareness of the aesthetic importance of the city center, working to implement tourism projects to revive the old city.

8. Conclusion

Visual pollution is a sort of pollution that is just as hazardous as other prevalent types of pollution. To avoid visual pollution, individuals must first organize and harmonize their immediate environment, followed by their district and neighborhood. Local governments and organizations, such as the Ministry of Municipal and Rural Affairs and municipal councils, also play a role in ensuring this.

From the above discussion, it is indicated that visual pollution that impairs a person's purview to enjoy a

pleasant environment is creating a hazardous condition in a civic society. Among the different sources people perceive potholes in the streets, not enough areas for queuing, traffic jams, and goods stalls are the greatest source of visual pollution. Each brings several other associated hazards to society. The mitigation efforts may be either localized in certain belts or have not reached a level where the citizens can perceive the change.

The study provides some recommendations for Irbid Municipal to eliminate visual pollution such as delivering new information for building codes to guide architects and designers with precise instructions that preserve reliability and synchronization of color, material, shape, and height to avoid mismatching designs on the same street; also, providing stricter supervision from the municipality during the building process to ensure proper implementation of the new rules; furthermore, adopting an integrated policy for the city of Irbid with the rest of the social, political, sensory,

cultural, economic, and functional aspects, so that this policy is in the short and long term.

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