

Article

Assessing Visual Pollution: The Impact of Urban Outdoor Advertisements in Addis Ababa, Ethiopia

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Abstract: Urban visual pollution, mainly driven by outdoor advertisements, is becoming increasingly prevalent in built environments. While urban visual pollution and outdoor advertising have been thoroughly examined in the Global North, less is known about these issues in the Global South. Therefore, this study examines the prevalence and impact of outdoor advertising in Addis Ababa, Ethiopia, focusing on both its forms and the perceptions of residents and commuters. The study employed key informant interviews, field observations, and surveys. The results show a significant increase in outdoor advertisements with 78% of respondents noting a recent rise and 62% feeling overwhelmed by their abundance. Additionally, the study reveals the negative effects of outdoor advertisements on urban aesthetics, as 82% of respondents believe these advertisements diminish the visual appeal of the city. The study underscores the perception of visual pollution, particularly in densely populated areas, where advertising clutter compromises the urban environment. Key contributing factors include a lack of regulation, poorly placed outdoor advertisements, inconsistent design, excessive size and brightness, and overcrowding. This study suggests the need for improved regulatory frameworks and community engagement in outdoor advertising to enhance the visual quality of urban spaces in developing countries like Ethiopia.

Keywords: Ethiopia; regulatory frameworks; outdoor advertisements; urban aesthetics; visual pollution



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1. Introduction

The global trend of urbanization has led to unprecedented transformations in the world's landscape. While urban centers serve as hubs of innovation, culture, and economic activity, they also grapple with a significant downside pollution. The rapid growth of cities has amplified pollution challenges, putting both human health and the environment at risk [1]. Environmental pollution has long been recognized as one of the most significant threats to humanity alongside other factors influencing the quality of human life [2]. In addition to the frequently discussed forms of pollution, such as land, air, and water contamination, there are other categories of pollution that impact human well-being in both nuanced and profound ways. An illustrative example of this phenomenon is visual pollution, which constitutes a comparatively recent and non-traditional concept [3].

Visual pollution is a significant environmental and societal issue marked by disturbing and unattractive visual elements in public spaces [4]. It includes a variety of phenomena, such as cluttered signage, excessive advertising, poorly designed infrastructure, and the overuse of outdoor displays, all of which can diminish the visual quality of urban landscapes [5]. The impact of visual pollution can worsen when the pollutant is mobile, as it

tends to draw attention and diminish feelings of tranquility [6]. This creates a situation where numerous visual stimuli compete for people's focus, making it difficult for them to concentrate on their tasks [7]. Additionally, visual pollution impacts more than just aesthetics; it is intrinsically linked to the spatial arrangement of objects, significantly altering a space's character and visual harmony [7]. Studies indicate that visual pollution can diminish people's enjoyment of public areas and natural landscapes, leading to dissatisfaction and a decreased quality of life [2, 3]. Additionally, it can impair traffic safety by distracting motorists and pedestrians while also detracting from a city's overall appeal, which may adversely affect tourism and local businesses [8].

In rapidly urbanizing areas, where regulations and urban planning may struggle to adapt to keep pace with growing economic landscape, visual pollution has become a prominent issue [9]. The unregulated spread of outdoor advertising has the potential to fundamentally transform the urban experience in various developing countries, where regulatory frameworks may be inadequately enforced or established, leading to a chaotic and disordered environment [10].

Studies have identified outdoor advertisements as significant contributors to visual pollution in various countries across the world [11,12]. The colors, shapes, and fonts used in outdoor advertising can be overwhelming and distracting, often interfering with the natural beauty of landscapes and cityscapes [13–15]. This type of pollution has negatively affected ecological environments, human visual spaces, and overall emotion and well-being [2].

Outdoor advertising is frequently employed to promote products and services, effectively reaching a large and diverse audience [16]. However, unmanaged factors such as the placement, size, location, structure, and content of outdoor advertisement boards have led to significant urban visual pollution and a deterioration of the socio-physical living environment in urban centers [17]. Major cities in developing countries are losing their aesthetics appeal due to the high concentration of billboards and hoardings, their improper locations, inappropriate size, bad heights, unsuitable colors and faulty construction [18]. These advertisement structures on busy roads and urban centers are not only disturbing urban visual fabrics, deteriorating the social and physical living environment, and creating a nuisance for surrounding land uses and road users but also result in physical losses and casualties under storm conditions [17].

Visual pollution is a pervasive issue that extends beyond outdoor advertising, affecting various urban, roadway, and natural areas [2]. Advertisement posters and billboards, particularly those placed without authorization, contribute significantly to visual clutter [5]. Additionally, graffiti on buildings, walls, and public infrastructure adds to the degradation of the urban landscape. The presence of trash and litter on streets, sidewalks, and public spaces further detracts from the aesthetic appeal of cities [5]. Utility poles and overhead wires for electricity, telephone, and cable services also contribute to visual pollution by cluttering the skyline, obstructing views, and creating a chaotic environment, especially in city centers. Abandoned buildings and undeveloped plots, with their unsightly architecture, add to the visual disarray. Moreover, excessive signage and street furniture can overwhelm public spaces, further diminishing the overall visual quality of urban areas [19].

The issue of visual pollution due to unregulated outdoor advertising is a growing concern in urban areas worldwide, impacting both aesthetics and public safety [19]. For instance, Metro Manila in the Philippines, suffering from a lack of advertising regulations [20], now has an overabundance of outdoor advertisements and is gaining a reputation as 'one of the most visually unappealing cities in Southeast Asia' [21]. Similarly, 98% of citizens in West Bengal in India recognize visual pollution in their surroundings, identifying billboards as the second most significant contributor [3].

The study conducted by Bankole [22] found that uncontrolled outdoor advertisements in Nigeria cause visual disruption and obstruct important traffic signs for both motorists and pedestrians, resulting in preventable accidents. Additionally, Okosun and Jiburum [23] noted in their research on Enugu City that the persistence of time-related billboards, signage posters, and banners long after the advertised events negatively impacts the overall quality of the urban environment.

National and local authorities worldwide have attempted to address the issue of outdoor advertising in various ways. In the UK, USA, and Europe, numerous legal documents have been developed and implemented to effectively control and manage outdoor advertising [24]. In Singapore, outdoor advertising is regulated by the Building and Construction Authority, while local municipal authorities manage advertising boards in China [25]. Similarly, in both the United States and the United Kingdom, signboards and outdoor advertisements are regulated by local planning authorities and municipalities [17]. In the UK, most forms of signage fall under the town and county planning system. Currently, any display of boards without the consent of the respective planning authority incurs a fee of £2500 per offense [26]. In Japan, the regulation of outdoor advertising involves not only planning and advertising agencies but is also significantly influenced by community input, making this approach more advanced compared to practices in other countries [27]. In contrast, developing nations are still in the process of establishing regulations and policies and identifying the responsible regulatory agencies [26].

In Addis Ababa, visual pollution has become increasingly prominent. As one of the rapidly growing urban areas in Africa, the city has experienced a significant growth in commercial activities, which has been accompanied by a substantial increase in outdoor advertising [28]. These advertisements, often placed without adequate regulatory control, contribute to a disordered and visually overwhelming urban landscape [28]. There is a prevalent unethical practice in the field of outdoor advertising in Addis Ababa. Consequently, the aesthetics of the graphics and content employed in outdoor advertising fail to capture the interest of the public [29]. The rapid urban development, coupled with a growing demand for advertising space, has led to a situation where the visual appeal of Addis Ababa is at risk. The lack of coordinated urban planning and the insufficient enforcement of advertising regulations have exacerbated this issue, resulting in considerable visual clutter throughout the urban environment.

While visual pollution resulting from outdoor advertising has been extensively studied in developed countries, where urban aesthetics, public health, and environmental quality are often prioritized in policy and planning [30–33], research on this issue in developing countries, including Ethiopia, remains scarce [22,23,28,29]. As urban areas in developing countries continue to grow rapidly, the unregulated proliferation of outdoor advertisements increasingly affects visual quality and community life [34], highlighting the need for further research and context-specific policies to effectively address visual pollution.

Hence, this study examines the impact of urban outdoor advertisements on the visual quality of Addis Ababa, specifically investigating their role in contributing to visual pollution in the city. By investigating the current state of outdoor advertising and its effects on the urban environment, the study aims to highlight the broader implications of visual pollution in rapidly urbanizing areas like Addis Ababa. The study also addresses possible approaches for reducing visual pollution, using best practices from other countries.

2. Materials and Methods

2.1. Study Area

Addis Ababa, the capital city of Ethiopia, has been selected as the case study site. It is located at 9°0′19.4436″ North and 38°45′48.9996″ East in the central region of the country.

The city's elevation ranges from 3200 m above sea level at the highest peak of Entoto to 2048 m above sea level in the lower southern part of the Akaki plains [35]. This altitude makes Addis Ababa one of the highest capital cities in the world [35]. Covering a total land area of 540 square kilometers, the city is surrounded by a mountainous landscape. Although there are no large rivers flowing through or near Addis Ababa, its small rivers and streams have significantly influenced the city's layout. As one of the fastest-growing cities in Africa, Addis Ababa serves as Ethiopia's primary urban center with an estimated population of around 5.7 million. This population accounts for roughly 25% of the country's total urban population and is more than ten times the size of Adama, which is the second-largest city [36,37]. The city's physical environment, which combines modern and historic architecture, has been influenced by the proliferation of outdoor advertisement. This has led to visual pollution, as billboards, banners, posters, and digital signs are extensively placed along high-traffic roads, public spaces, and commercial centers (Figure 1).

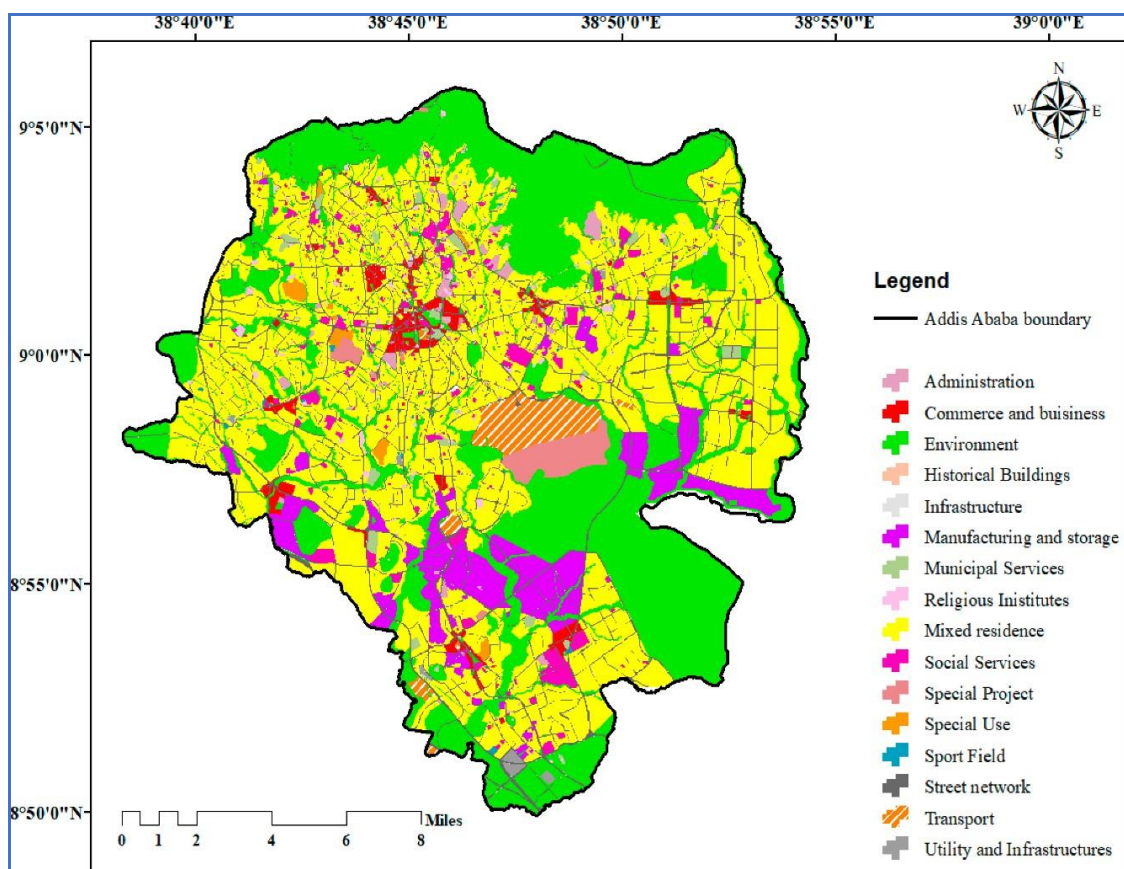


Figure 1. Map of the study area.

2.2. Type and Sources of Data

To achieve the intended objective of the study, both primary and secondary data sources were utilized:

A. Primary Data

- **Field Observations:** Conducted to visually document outdoor advertisements, their density, and their impact on urban aesthetics.
- **Questionnaire Survey:** Captured quantitative data regarding the perceptions of visual pollution caused by outdoor advertisements.
- **Key Informant Interviews:** Provided in-depth insights from stakeholders, including urban planners, advertising companies, and business owners.

Each data collection technique (Table 1) was selected for its unique contribution to addressing the research questions. Field observations provided a direct, on-site understanding of how outdoor advertisements are integrated into the urban landscape, offering a spatial dimension that complements survey and interview data [38]. The survey allowed for the collection of large-scale, quantifiable data on survey respondents' perceptions, enabling the identification of patterns across different sub-cities. Key informant interviews offered deeper insights into the regulatory and societal challenges associated with outdoor advertising. These interviews helped address the research questions related to the root causes of visual pollution and potential solutions, which could not be easily captured through surveys alone [39]. Together, these methods align with a mixed method design, enhancing the study's reliability and providing a more comprehensive understanding of the impact of outdoor advertisements on urban aesthetics. This approach effectively addresses the research questions from multiple perspectives, improving both the depth and breadth of the analysis.

Table 1. Key information on data collection methods.

Data Collection Method	Objective	Time Period	Field Observations	Survey	Key Informant Interviews	Sequences Followed
Field Observations	To identify the spatial distribution and characteristics of outdoor advertisements.	3 weeks	Five CBDs in selected sub-cities	N/A	N/A	Conducted first to map visual pollution areas
Questionnaire Survey	To gather survey respondents' perceptions of visual pollution caused by outdoor advertisements.	3 weeks	N/A	400 respondents (proportional to population)	N/A	Conducted after field observations
Key Informant Interviews	To obtain expert opinions on the causes and solutions for visual pollution from outdoor advertisements.	2 weeks	N/A	N/A	15 experts	Conducted last to validate other findings

B. Secondary Data

Secondary data were gathered from a range of publicly accessible sources, including government regulations, legal documents, and urban development policies, to contextualize the findings of this research within the broader framework of urban planning and advertising regulations. Specific sources consulted include the following:

- **Government Regulations and Policies:** Relevant documents from the Ethiopian Ministry of Urban and Infrastructure Development and Addis Ababa City Administration, particularly focusing on urban zoning laws, outdoor advertising regulations, and urban development master plans.
- **Academic Articles and Research Papers:** Peer-reviewed journals, conference proceedings, and scholarly articles related to urban development, visual pollution, and outdoor advertising impacts in both local and international contexts. These sources were accessed through academic databases such as Google Scholar, JSTOR, and ResearchGate.

The data from these sources are publicly accessible and provide critical background information on urban development, advertising laws, and visual pollution, which helped frame the analysis of the impact of outdoor advertisements in Addis Ababa.

2.3. Sampling Technique and Sample Size

The study employed purposive sampling techniques to select four sub-cities (the second administrative stratum of the city) as case study sites from a total of 11 sub-cities in Addis Ababa city including Addis Ketema, Arada, Lideta, and Yeka (Figure 2). These sub-cities were chosen based on their high concentration of visual pollution caused by outdoor advertisements, dense commercial activity, and their relevance as prominent centers of urban aesthetics degradation. These criteria were based on the premise that areas with higher concentrations of outdoor advertising would provide more pertinent data regarding the research focus on visual pollution and its effects on urban aesthetics.

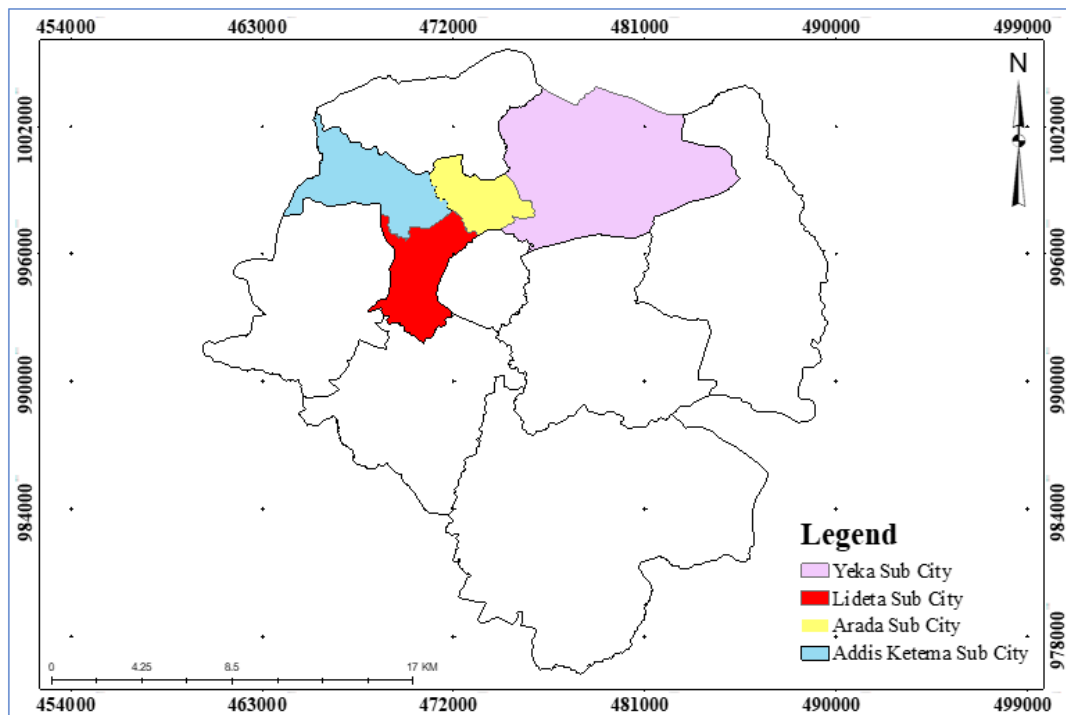


Figure 2. Selected sub-cities.

Five prominent central business districts (CBDs) within the selected sub-cities were identified for field observations, including Megenagna, Merkato, Autobis Tera, Mexico, and Piassa. These locations were chosen due to their high concentration of outdoor advertisements along high-traffic roads, intersections, public spaces, and commercial centers. Additionally, these areas were selected because they represent diverse typologies of urban spaces, allowing for a comprehensive analysis of the impact of outdoor advertisements on various aspects of urban aesthetics.

The unit of analysis for the survey is the individual resident who has lived in the selected sub-cities for at least five years to observe the impact of outdoor advertisements. Households were used as the selection unit for determining the proportional representation of each sub-city, but the actual survey was conducted with individuals. For the survey, the sample size of the respondents was determined using a formula (Equation (1)) developed by Yamane [40].

$$n = \frac{N}{1 + N(\alpha)^2} \quad (1)$$

where n = sample size of the study population,

N = number of population,

α = the margin of error, and

1 = constant.

Thus, actual sample size will be calculated as follows:

$$n = \frac{260179}{1 + 260179(0.05)^2}$$

$$n = \frac{260179}{651.45}$$

$$n = 400$$

Out of 260,179 households, 400 sample informants were selected for the surveys. In order to increase the accuracy of the research results, the study was conducted at a 95% confidence level with a margin of error of 5%. A proportional to size allocation method was used to obtain a representative sample size for each sub-city. In this method, subjects are selected in proportion to their representation in the population [41]. This means that the sample per sub-city was determined by the percentage contribution of households by each sub-city to the total number of households (260,179) in the four sub-cities (Table 2).

Table 2. Sample size for the households.

Sub-City	Number of Households	Sample Size Used
Addis Ketema	67,159	103
Arada	55,638	85
Lideta	53,057	82
Yeka	84,324	130
Total	260,179	400

The sample respondents (400) for the survey were selected purposively from four sub-cities, based on their familiarity with the area, as well as their long-term residence and employment in the respective locations. Purposive sampling was used to ensure that respondents had sufficient knowledge and experience regarding the visual pollution caused by outdoor advertisements in their respective sub-cities. This was because participants needed to have direct familiarity with the problem. However, it is important to note that this purposive sampling method may introduce some level of bias and may limit representatives, as it assumes that respondents have adequate exposure to and knowledge about the environmental impact of outdoor advertising. To mitigate this potential bias and representativeness issues, the following steps were taken:

- **Diverse Demographic Representation:** Efforts were made to ensure diversity in the sample, including various age groups, genders, and occupations, to capture a broad range of perspectives on visual pollution.
- **Cross-Sectoral Sampling:** Respondents were selected from different types of urban spaces (residential, commercial, and mixed-use areas) to capture varying perceptions of visual pollution. This diversity in spatial context allowed for a more comprehensive understanding of how outdoor advertising affects different segments of the population.

The criteria for selecting the purposive sample were based on several key factors to ensure respondents had relevant experience and knowledge of the subject matter. These criteria aimed to minimize bias by including individuals who were not only familiar with outdoor advertising but also had a range of viewpoints:

- Long-Term Residency: Participants were required to have lived in the sub-city for at least five years to ensure they had sufficient knowledge of the area's environmental context.
- Exposure to Visual Pollution: Respondents had to be regularly exposed to outdoor advertisements, which was confirmed through their self-reporting of daily interactions with advertisements in their neighborhood.
- Familiarity with Urban Aesthetics: Long-term residents were selected, as they had the opportunity to observe the gradual changes in the urban landscape due to increasing outdoor advertising, providing them with insights into how the aesthetic qualities of the area may have been impacted over time.

The survey questionnaire consisted of a combination of close-ended and open-ended questions to gather comprehensive data. The close-ended questions focused on capturing quantitative data regarding perceptions of visual pollution, while the open-ended questions provided respondents with the opportunity to share suggestions for mitigating visual pollution. This approach ensured a balance between structured data collection and the inclusion of diverse perspectives.

The survey instrument was pre-tested on a sample of 30 respondents to identify ambiguities and refine questions for clarity and relevance. Feedback was incorporated before final implementation. Surveys were conducted face-to-face by trained enumerators who adhered to ethical protocols, including informed consent and confidentiality. These questions focused on the following areas:

- Awareness of outdoor advertisements;
- Perception of visual pollution;
- Types of outdoor advertisements;
- Predominance of outdoor advertisements;
- Areas with the highest concentration of outdoor advertisements;
- Factors contributing to visual pollution from outdoor advertisements;
- Impacts of outdoor advertisements.

Semi-structured interviews were conducted with 15 purposively selected key informants, including experts from the city and sub-city administration, experts from advertising companies and business owners. The key informants were selected based on the following criteria:

- Experts involved in managing and overseeing urban development and advertising regulations;
- Those with experience and knowledge of issues related to visual pollution and outdoor advertising;
- Business owners directly impacted by or involved in advertising practices;
- Individuals interested in contributing to the research.

The semi-structured interview guide included questions designed to gather insights on the respondents' perceptions of the causes of visual pollution from outdoor advertisements in the study area as well as their suggested solutions to mitigate these issues. The flexible structure of the interviews allowed for an in-depth exploration of their views while ensuring consistency across interviews. The interviews were conducted face-to-face in a variety of locations based on the convenience and availability of the key informants. In-person interviews were chosen to allow for a more personal interaction and a deeper understanding of the informants' perspectives, ensuring that non-verbal signs could also be captured. Each interview took approximately 30–40 min per person. Detailed notes were taken during each interview to capture the responses and ensure accuracy in documenting the key points discussed.

The level of education, area of expertise, and work experience of the interviewed key informant (KI) is summarized in Table 3.

Table 3. Level of education, area of expertise, institutions and work experience of interviewed key informant.

No.	Institutions	Level of Education	Area of Expertise	Work Experience
KI-1	Addis Ababa City Administration Plan and Development Commission	MSc	Urban Planning and Design	Policy development on urban planning, including regulations for outdoor advertisements
KI-2	Addis Ababa City Administration Urban Beauty and Green Development Office	MSc	Environmental Protection and Management	Management of environmental quality, including visual pollution from urban advertisements
KI-3	Bole Sub-City Administration	BSc	Urban Development and Zoning	Implementation and enforcement of zoning regulations for outdoor advertisements
KI-4	Addis Ketema Sub-City Administration	BSc	Urban Development and Zoning	Enforcement of urban regulations, including controlling visual pollution from advertisements
KI-5	Ermias Advertising Agency	BSc	Advertising Strategy and Outdoor Media	Managing the placement, design, and distribution of outdoor advertisements
KI-6	Admass Advertising PLC	BSc	Outdoor Advertising Design and Planning	Expertise in designing and planning outdoor advertisements
KI-7	Addis Ababa City's Construction Licensing and Control Authority	MSc	Construction Permits and Oversight	Expertise in issuing construction permits, monitoring compliance, and addressing cases of unauthorized construction or alleged illegal demolitions
KI-8	Addis Ababa City Administration Tourism Bureau	MSc	Tourism Marketing and Advertising	Overseeing tourism-related advertising policies and public relations, including ensuring outdoor ads align with tourism promotion and urban aesthetics
KI-9	KS Electronics Print and Advertising PLC	BSc	Media and Outdoor Advertising	Managing billboard placements and outdoor media
KI-10	Zawa Printing and Advertising Agency	BSc	Advertising Design and Public Safety	Expertise in designing outdoor advertisements
KI-11	Addis Ababa University	PhD	Urban Landscape Design	Research in urban landscape and the impact of outdoor advertisements on city aesthetics
KI-12	Private Business Owner	Primary School	Business	Business owner
KI-13	Ministry of Urban Development and Housing	MSc	Urban Policy and Regulation	Involved in drafting policies on visual pollution and the regulation of outdoor advertisements in the context of urban development
KI-14	Private Business Owner	BSc	Business Management	Business owner
KI-15	Ethiopian Advertising Association	BSc	Advertising and Public Communication	Knowledge of advertising standards and practices, including the regulations related to outdoor advertisements and their impact on visual pollution

For this study, outdoor advertising is defined as any form of advertising displayed in public spaces or on external surfaces of buildings and structures, visible to pedestrians, drivers, and other individuals in the urban environment. This includes, but is not limited to, billboards, posters, digital screens, transit advertisements, and other large-scale visual communications intended to promote products, services, or ideas [13,14,17,18]. This study adapted criteria from similar research to assess the impact of outdoor advertisements on urban visual quality, focusing on visual clutter, compatibility with architectural and landscape design, advertisement density, and light pollution caused by digital signage. These criteria were refined from studies conducted by Wakil et al. [10], Abu Hasna and Ajeeb [30], Bankole [22], and Nowghabi and Talebzadeh [42].

These criteria were measured using both quantitative data (survey responses) and qualitative insights (interviews with key informants) to capture a comprehensive understanding of the impact of outdoor advertising. Respondents' perceptions were central to the evaluation, as they provide subjective but valuable data on how visual pollution is experienced by urban dwellers.

2.4. Spatial Mapping of Outdoor Advertisements

This study utilized spatial analysis to map outdoor advertisements in the central business districts (CBDs) of the sub-cities. GIS tools were employed to create maps highlighting areas with high concentrations of outdoor advertisements. These maps helped identify locations with the densest outdoor advertising and allowed for an assessment of their impact on the aesthetic and environmental quality of urban spaces. The mapping process revealed clusters of advertisements contributing to visual pollution and demonstrated how the density of outdoor advertising is associated with the decline in urban aesthetics.

2.5. Data Analysis Techniques

For data analysis, the study employs both quantitative and qualitative techniques. Quantitative analysis includes descriptive statistics of advertisement characteristics and statistical analysis of survey responses. Additionally, spatial analysis was conducted using the mapped data to show areas with high concentrations of outdoor advertisements. A theoretical proposition strategy recommended by Yin [38] was used to qualitative data obtained from the key informant interviews and field observations through a checklist. Based on this strategy, the responses were categorized under themes such as the current status of outdoor advertisements in the study area, impact of outdoor advertisements on urban aesthetics, and appropriate strategies for sustainable outdoor advertising. For further discussion, the data obtained from key informant interviews were supported by personal observations and document review.

2.6. Addressing Methodological Limitations

The study identified several potential limitations that could enhance the reliability of its findings. One limitation was the sample size, which comprised 400 respondents and 15 key informants. While these samples provided valuable insights, they may not fully represent all perspectives in Addis Ababa. To improve robustness, triangulation was employed. Another limitation was the potential for response bias and particularly social desirability bias during interviews. This issue was addressed by ensuring respondent anonymity and encouraging honest feedback. Concerns about the accuracy of observations also arose due to possible observational bias. To mitigate this, multiple site visits were conducted at different times to obtain a more comprehensive view. Additionally, purposive sampling was used to select respondents knowledgeable about visual pollution from outdoor advertisements. Although this approach could introduce bias, efforts were made to ensure diversity in demographics (such as age, gender, and occupation) and urban

spaces (including residential, commercial, and mixed-use areas) to capture a wide range of perspectives.

3. Results and Discussion

3.1. Background of the Respondent

This study collected demographic information from the respondents to better understand the composition of the sample and provide context for interpreting the survey data. The main demographic variables included age, sex, education, and occupation (Table 4).

Table 4. Descriptive statistics of survey respondents (source: survey data, 2024).

Variable	Category	Frequency (%)
Age	18–25	21%
	26–35	30%
	36–45	25%
	46–60	10%
	60+	14%
Sex	Male	57.5%
	Female	42.5%
Education	Illiterate	3.5%
	Read and Write only	2%
	Elementary (1–8)	14.5%
	Secondary (9–12)	28.5%
	Tertiary (Above 12)	42.5%
	Postgraduate	9%
Occupation	Employed	42.5%
	Self-employed	50%
	Unemployed	7.5%

3.2. Current Status of Outdoor Advertisements in the Study Area

3.2.1. Types and Extent of Outdoor Advertisements

The information gathered from key informant interviews and field visits to the case study site indicates that outdoor advertising is primarily composed of posters on building facades, billboards, and LED screens. As shown in Figure 3, most advertisements are located on building facades.



Figure 3. Poster on building facade (source: field survey, 2024).

Likewise, field observations indicate that old paper posters attached to walls and poles are a common form of advertisement (Figure 4). A study conducted by Nowghabi and Talebzadeh [42] using field observations and community surveys found that deteriorating posters contribute to urban neglect and visual disorder. Additionally, a study conducted by Dubi et al. [28] using observation and public opinion surveys indicated that the absence of maintenance and oversight for old paper posters not only reduces the aesthetic appeal of the urban landscape but also highlights challenges in advertising regulation and enforcement. However, some studies offer contrasting viewpoints. For example, García Carrizo [13] argues that when properly regulated, outdoor advertisements can enhance the urban experience by introducing creative visual elements that contribute to the unique identity of the city. This perspective suggests that outdoor advertisements have the potential to be a positive force in urban spaces provided that their implementation and maintenance are effectively managed.



Figure 4. Paper posters on wall and poles (source: field survey, 2024).

Large billboard structures are commonly found in the case study site, and they are often located at commercial centers, roundabouts, and high-traffic areas such as alongside busy roads. Companies in sectors such as telecommunications, banking, and real estate primarily use these billboards for high-visibility campaigns (Figure 5). Based on the information obtained from the key informants, the strategic placement ensures that these advertisements capture the attention of both pedestrians and motorists, making them an effective tool for large-scale advertising in the area. These findings are consistent with a study conducted by Bankole [22], which emphasizes the importance of high-traffic zones for billboard placement in Lagos, Nigeria, as businesses aim to boost brand visibility and marketing effectiveness.



Figure 5. Billboards for outdoor advertisement (source: field survey, 2024).

In the study area, LED display screens have increasingly become a trend, especially in high-traffic locations such as shopping centers, transport hubs, and other public gathering spots (Figure 6). Information gathered from key informant interviews shows that these modern advertising formats are strategically placed to capture the attention of both motorists and pedestrians. One key informant revealed:

“... unlike traditional signage, digital screens offer more dynamic and engaging content, allowing advertisers to showcase multiple messages or visuals in a rotating manner. This capability makes them a preferred choice for businesses aiming to attract a broader audience in busy urban settings.” (Key informant interview, 2024)

The view reflected by the key informant indicates that the shift toward digital advertising aligns with global trends, as businesses increasingly seek flexible and impactful ways to reach diverse audiences. Kumar and Gupta [43] revealed that digital billboards provide an engaging alternative to static formats, enabling advertisers to tailor messages more effectively to specific audiences.

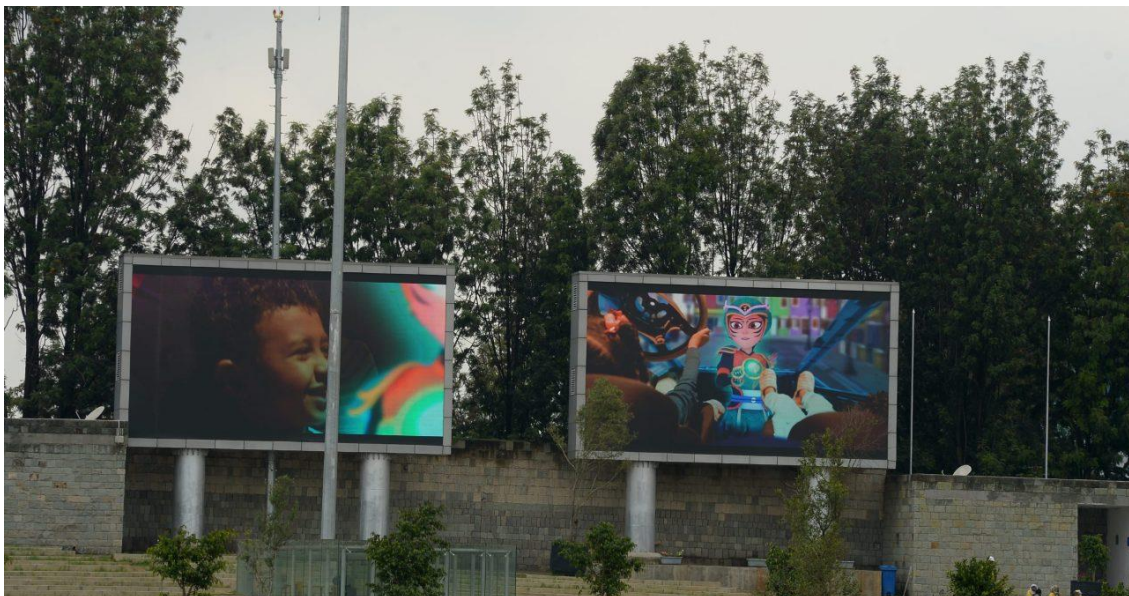


Figure 6. Digital screens for outdoor advertisements (source: field survey, 2024).

3.2.2. Proliferation of Outdoor Advertisements

The information gathered from the key informant interview revealed that the study area has seen a significant increase in outdoor advertisements, utilizing various media formats for commercial purposes. The views reflected by most of the key informant interviews with participants were more or less similar and can be summarized as follows:

“... the growth in outdoor advertising infrastructure such as billboards, digital screens, posters and banners and LED displays in our neighborhood has increased due to competition among businesses, as well as the need for high visibility in an urban environment where attention is constantly sought.” (Key informant interview, 2024)

Quantitative data collected via a questionnaire survey of purposively selected participants support this observation, as shown in Table 5.

Table 5. Questionnaire survey of participants’ opinions on the predominance of outdoor advertisements (source: survey data, 2024).

Variables	Response Option	%
Perceived increase in outdoor advertisement concentration	Yes	78%
	No	15%
	Unsure	7%
Perceived overwhelm by outdoor advertisements	Yes	62%
	No	28%
	Unsure	10%

Based on the survey results, 78% of survey participants perceive that outdoor advertisements have increased significantly within the study area. Although most studies, including Koeck and Warnaby [44], have observed an increase in outdoor advertisements correlating with urban growth, Czajkowski et al. [24] suggest that this trend is not universal. In some cities with stringent regulations, outdoor advertisements have been reduced, leading to a less cluttered urban landscape.

Table 2 shows that 62% of survey participants feel overwhelmed by the high volume of advertisements, which is a phenomenon commonly known as visual pollution. A study by Chmielewski et al. [45], using intervisibility analysis and public surveys, found that excessive outdoor advertisements can lead to sensory overload and disrupt the visual harmony of urban environments, resulting in negative perceptions among the public. Similarly, Bolt [46] indicated that the over-saturation of outdoor advertising can diminish its intended impact, as the community may begin to ignore or feel visually overloaded by the advertisements, ultimately reducing their effectiveness.

3.2.3. Areas with the Highest Concentration of Outdoor Advertisements

Respondents to the survey were asked to identify the locations where they believed there was the most outdoor advertising. The survey findings are displayed in Figure 7 below.

Figure 7 shows that the central business district (CBD) has the highest concentration of outdoor advertisements with 40% of respondents reporting a significant presence of outdoor advertising in this area. Figure 8 visually illustrates the spatial distribution of outdoor advertisements, highlighting clusters of high-density placements along major roads, commercial areas, and landmarks. This pattern demonstrates that the concentration of outdoor advertisements in the CBD is intentional and closely linked to its unique urban layout. Key informant interviews highlighted that the heavy pedestrian and vehicular traffic in the CBD makes it an ideal location for large-scale billboards and digital displays.

This observation is consistent with the study by Dubi et al. [28], which used observation and public opinion surveys and found that urban centers typically attract advertising because of their high visibility and opportunities for consumer engagement. However, contrasting evidence from Boștină-Bratu [47] argues that high-density outdoor advertising in central areas can reduce consumer engagement due to visual saturation and cognitive overload, particularly in smaller cities with less diverse advertising markets.

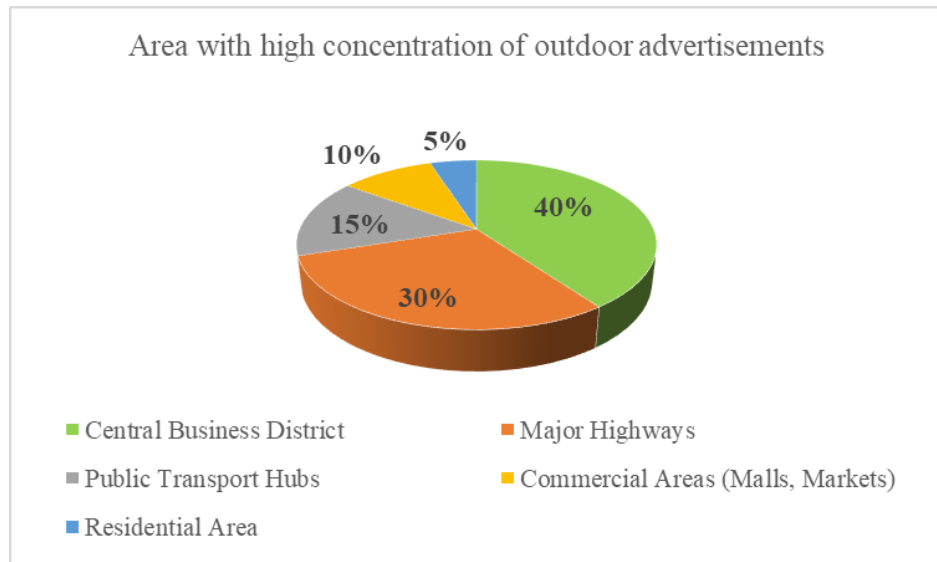


Figure 7. Perceptions of the respondents on the areas with high concentration of outdoor advertisements (source: author’s analysis).

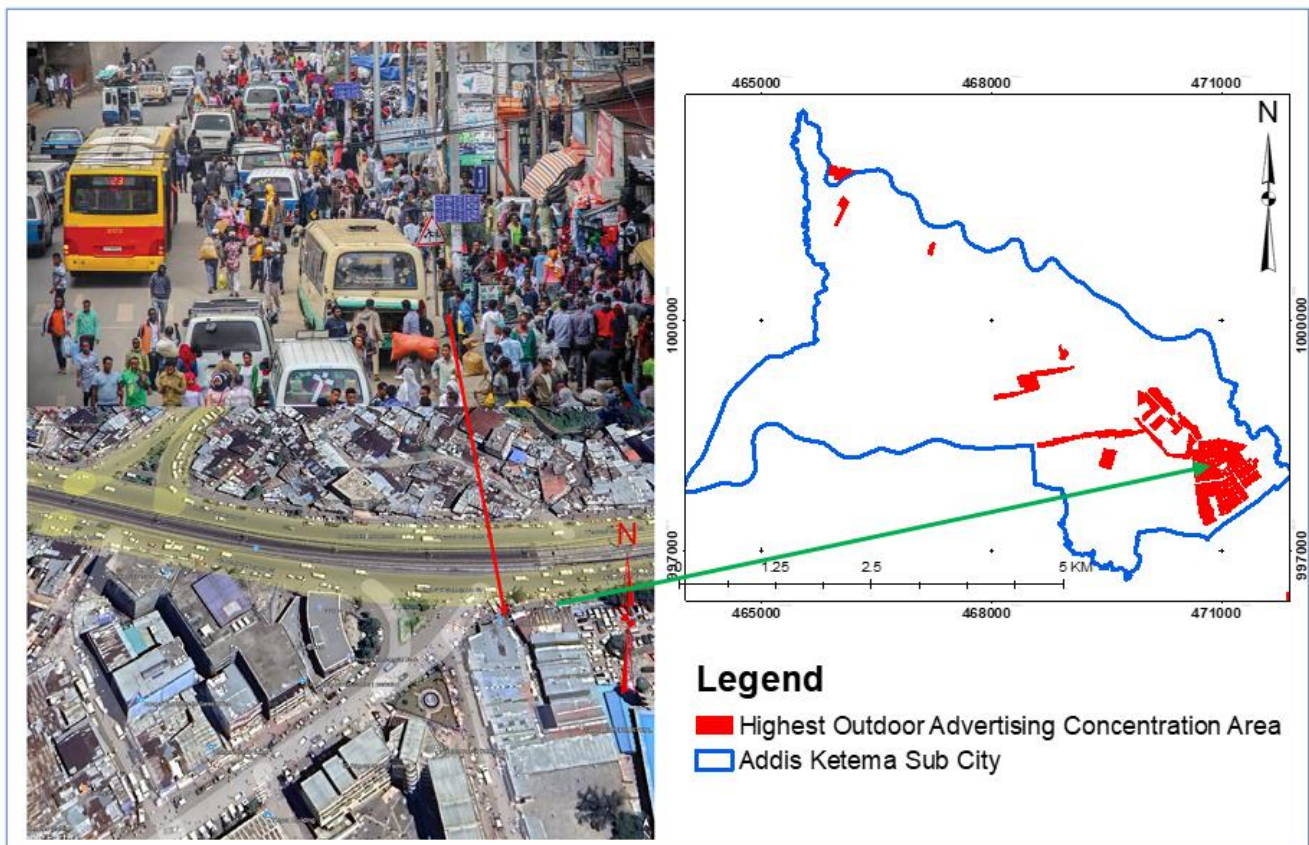


Figure 8. Highest concentration of outdoor advertising in the central business district (source: field survey, 2024).

Thirty percent of respondents reported that major highways have a high concentration of outdoor advertisements (Figure 9). This aligns with the findings of Madlenak et al. [8], who claim that strategically placing outdoor advertisements along high-traffic corridors is essential for maximizing exposure and reinforcing brand messages among commuters. One of the key informant revealed the following:

“... major highways and roads leading into and out of the city are heavily populated with outdoor advertisements structures. These are often used for long-term advertising campaigns by prominent sectors such as telecommunications, banking, and real estate. These outdoor advertisements target both drivers and passengers.” (Key informant interview, 2024)



Figure 9. Billboards around major highways (source: field survey, 2024).

Public transport hubs, such as bus and taxi stations, were identified by 15% of respondents as areas with a high concentration of outdoor advertisement placements. Key informants noted that the large number of commuters passing through these locations presents significant opportunities for advertising to reach a broad audience. This finding is consistent with the study conducted by Wilson and Chen [48], which utilized observation, surveys, and reviews. The study claims that transport hubs are strategic locations for outdoor advertising due to the continuous flow of commuters.

According to 10% of respondents, commercial places with large concentrations of outdoor advertisements include shopping malls and local markets (Figure 10). According to the data gathered from the key informants, outdoor advertisements especially banners and lit signs are frequently seen around shopping centers and neighborhood markets, where they draw customers and advertise retail brands. The finding of the study is consistent with the study conducted by Abu Hasna and Ajeeb [30], who conducted an online survey and

found that vibrant advertising in commercial districts significantly contributes to consumer attraction and enhances the shopping experience.



Figure 10. Outdoor advertisements around mall and commercial centers (source: field survey, 2024).

Based on Figure 7, only 5% of respondents identified residential areas as the primary locations for outdoor advertisements. Field observations indicate that these outdoor advertisements are generally smaller in scale and often promote local services or businesses.

Spatial analysis shows significant variations in advertisement density across the four studied sub-cities. Addis Ketema and Yeka stand out with the highest densities, as illustrated in Figure 11. These areas exhibit a notably greater number of outdoor advertisements, which is a trend that is less evident in the other sub-cities. Key informant interviews suggest several factors contributing to this higher concentration.

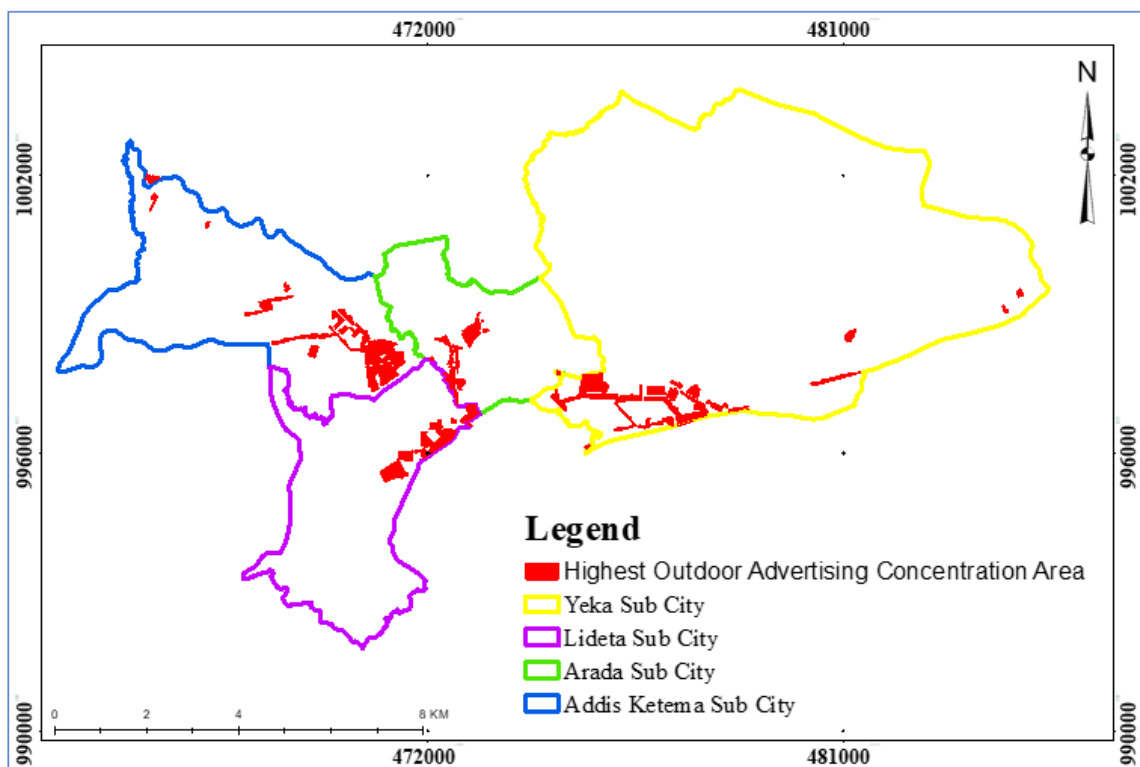


Figure 11. Areas with highest concentration of outdoor advertising (source: author’s analysis).

Firstly, Addis Ketema and Yeka experience heavier foot and vehicle traffic, both of which are essential for maximizing the visibility and effectiveness of outdoor advertising. The continuous flow of pedestrians and vehicles in these areas provides advertisers with ongoing exposure, making them more attractive locations for large-scale billboards, digital displays, and other forms of outdoor advertising, as noted by one key informant:

“... the high volume of people and vehicles passing through these areas makes them prime spots for advertisers who want to capture the attention of a large, diverse audience.”

Secondly, both sub-cities contain major commercial hubs, including shopping centers, markets, and business districts, which further increase the demand for advertising aimed at both locals and visitors. The commercial activity in Addis Ketema and Yeka fosters a competitive environment where businesses are eager to utilize outdoor advertising as a means of enhancing brand visibility and engaging consumers, as observed by one key informant:

“... Addis Ketema and Yeka are home to some of the busiest commercial centers in the city, where outdoor advertisements play a vital role in marketing strategies.”
(Key informant interview, 2024)

Consequently, these sub-cities emerge as prime locations for outdoor advertising, contrasting sharply with the other sub-cities that may lack the same level of foot traffic or commercial infrastructure to support such high concentrations of advertisements (Figure 11).

3.3. Outdoor Advertisements and Urban Visual Quality

The impact of outdoor advertisements on urban visual quality is evaluated based on specific criteria, including visual clutter, compatibility with architectural and landscape design, advertisement density in public spaces, and light pollution from digital signage. These criteria were adapted from similar studies conducted by Wakil et al. [10], Abu Hasna and Ajeeb [30], Bankole [22], and Nowghabi and Talebzadeh [42].

The findings of the study reveal consistent concerns regarding the impact of outdoor advertisements on urban visual quality with a particular focus on visual clutter and the diminished aesthetic appeal of public spaces.

Based on Figure 12, 82% of respondents responded that outdoor advertisements have a negative impact on the visual aesthetics of the study area. Many expressed dissatisfaction with the way advertisements dominate public spaces, making the area feel crowded and visually overwhelming. Insights from key informant interviews support these findings, indicating that the abundance of advertisements contributes to a chaotic urban environment. One key informant stated their concern:

“... the amount of outdoor advertising around our working and living area has grown rapidly in recent years, and it’s starting to make public spaces feel more like commercial zones rather than areas people can enjoy. The advertisements often don’t fit with the city’s architecture or landscape, and it’s becoming an eyesore.” (Key informant interview, 2024)

Another key informant, mentioned:

“... the unregulated proliferation of outdoor advertisement infrastructure in the city has created visual pollution. Billboards, posters, banners, and digital signs are installed without proper planning and standards, and this is affecting how residents and visitors perceive the urban environment.” (Key informant interview, 2024)

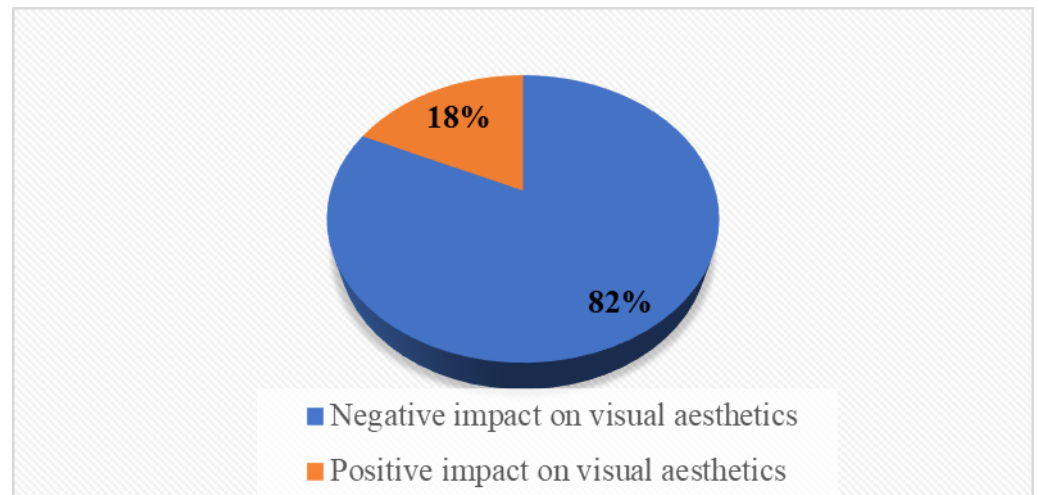


Figure 12. The impact of outdoor advertisements on visual aesthetic (source: author's analysis).

The survey data revealed that 72% of respondents viewed outdoor advertisements as a significant source of visual clutter. This perception was particularly strong among individuals who frequently travel through the central business district and along high-traffic roads, where outdoor advertisements are densely concentrated. Figure 13 below presents the key concerns reported by respondents:

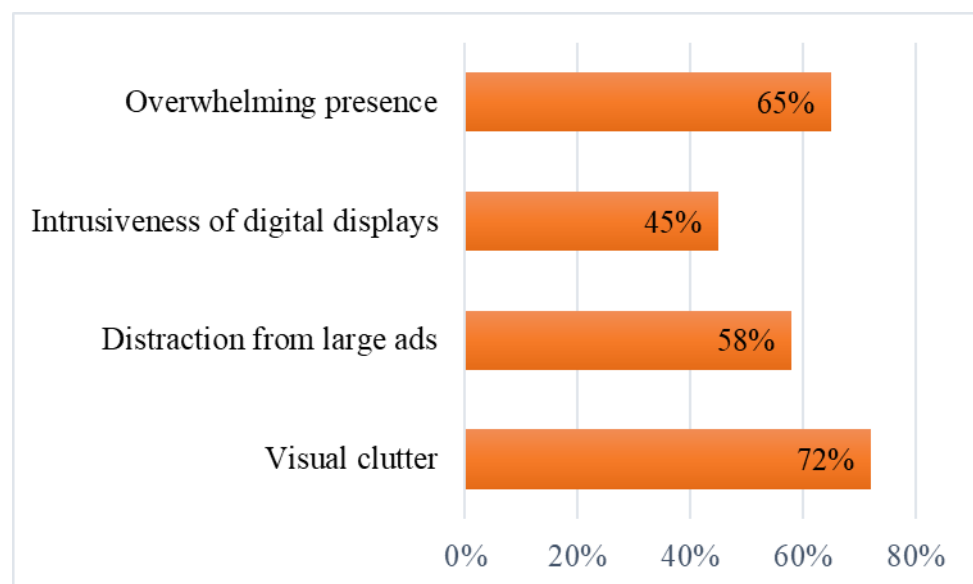


Figure 13. Perception of respondents related to visual aesthetic (source: author's analysis).

The information obtained from the key informants has further supported the survey results, emphasizing the growing frustration among residents regarding the excessive presence of outdoor advertisements. The views reflected by most of the participants were more or less similar and can be summarized as follows:

“... the unplanned growth of outdoor advertisements is creating a city where the urban landscape is constantly competing with commercial interests. It makes it difficult for people to enjoy the city as a public space.” (Key informant interview, 2024)

“... I feels like every corner of the city is taken over by advertisements, and it ruins the beauty of our public spaces.” (Key informant interview, 2024)

“... the digital screens are the worst. They’re too bright, and they flash too much. They don’t blend in with the environment at all.” (Key informant interview, 2024)

The response shows a consensus among the public about the negative impact of outdoor advertisements on visual quality. This finding is consistent with similar studies conducted in various urban contexts. For instance, the study conducted by Wakil et al. [17], which conducted site suitability analysis urban centers of Pakistan, revealed that the proliferation of outdoor advertising significantly diminishes the visual appeal of urban environments. Additionally, the study conducted by Abu Hasna and Ajeeb [30] revealed that excessive outdoor advertisements can create a sensory overload that diminishes the enjoyment of public spaces. Bankole [22] highlights the significant issue of graphic communication and visual pollution resulting from improperly placed outdoor advertisements, which is particularly evident in Nigeria. Instead of improving the environmental aesthetics of Nigerian cities, billboards often detract from their charm. Similarly, Nowghabi and Talebzadeh [42] argue that outdoor advertisements have exacerbated visual disturbances in this era of rapid urbanization. Based on their findings, this form of visual pollution leads to mental confusion and hampers the intellectual concentration of individuals with its effects and repercussions intensifying over time.

3.4. Factors Contributing to Visual Pollution from Outdoor Advertisements

The analysis of factors contributing to visual pollution from outdoor advertisements in Addis Ababa is based on survey data and insights from key informants. Several significant factors have been identified, and these are assessed according to objective criteria, including regulation and enforcement, placement strategies, advertisement density, design consistency, and maintenance quality. These criteria were adapted from similar studies conducted by Okosun and Jiburum [23], Nowghabi and Talebzadeh [42], and Bankole [22].

According to Figure 14, 79% of survey respondents point to a lack of regulation, and 70% highlight poor placement of advertisements as the most significant contributors to visual pollution. This finding is supported by the key informant interviews, which revealed that the absence of clear guidelines allows for haphazard advertising practices, leading to a cluttered urban landscape. The views reflected by most of the participants were more or less similar and can be summarized as follows:

“... the lack of clear regulation and guidelines regarding the placement of outdoor advertisements leads to a chaotic appearance across the city. Advertisers often place their advertisements in high-traffic areas, commercial centers and transposition hub without considering the impact on the surroundings.” (Key informant interview, 2024)

“... even though the Ethiopian constitution provides some general guidelines for outdoor advertisements (Proclamation No. 759/2012), there are no specific regulations addressing visual pollution. At the city administration level, it seems the proclamation is not utilized by the authorities. Consequently, over time, local authorities involved in the city’s development lose track of and control over what is clustered or assembled in public spaces.” (Key informant interview, 2024)

“... there is a notable lack of coordination among regulatory agencies in our city, which complicates enforcement efforts and allows visual pollution to persist unchallenged. This regulatory failure has led to a proliferation of unregulated advertisements that detract from the urban landscape and cultural significance of key areas.” (Key informant interview, 2024)

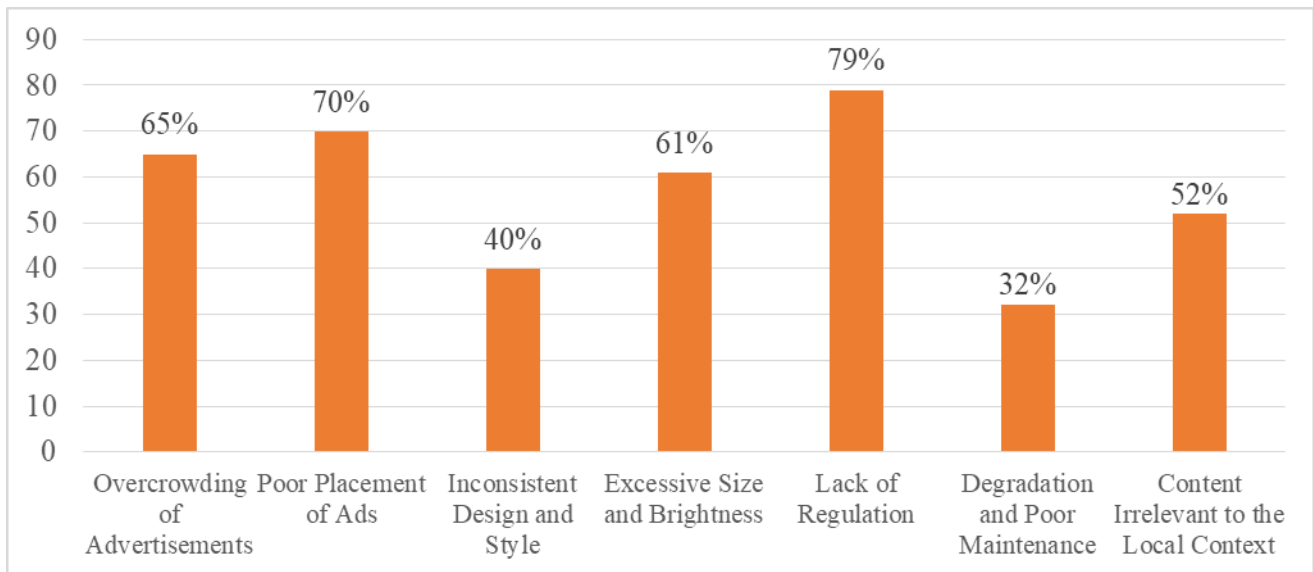


Figure 14. Factors contributing to visual pollution from outdoor advertisements (source: author's analysis).

A comparative study in Nigeria reflects similar challenges, where the absence of regulatory frameworks has led to unchecked proliferation and visual clutter that detracts from urban aesthetics [22]. Similarly, a study conducted by Okosun and Jiburum [23] based on observations and field surveys revealed that the lack of comprehensive policies leads to a chaotic advertising environment, where businesses prioritize visibility over aesthetic considerations, further exacerbating visual pollution.

The survey also identified the overcrowding of advertisements (65%), excessive size and brightness (61%), and irrelevant content (52%) as major factors in visual pollution (Figure 14). The views of key informant interview participant on the above factors were similar and can be summarized as follows:

“... in some areas, the concentration of outdoor advertisements is overwhelming. It not only distracts people but also diminishes the value of each advertisement. This is something that could be controlled better if the number of outdoor advertisement per location was limited.” (Key informant interview, 2024)

“... some outdoor advertisement are simply too large or too bright, especially at night. It disrupts the visual harmony of the environment and even becomes a safety concern in certain cases.” (Key informant interview, 2024)

This finding is consistent with similar studies conducted in various urban contexts. For instance, a study conducted by Okosun and Jiburum [23] in Nigeria revealed that large, brightly lit advertisements have negatively affected the nighttime aesthetics of urban areas, disrupting the natural ambiance and affecting local communities. Additionally, the study conducted by Nowghabi and Talebzadeh [42] in Iran emphasizes that high-density advertising areas, particularly in commercial districts, lead to visual overload, making it difficult for individuals to process information effectively.

According to the survey data presented in Figure 14, 40% of survey respondents identify inconsistent design and style as a contributor to visual pollution from outdoor advertisements, while 32% identify degradation or poor maintenance as a key factor. Similarly, in related studies, inconsistent design and a lack of cohesive style in outdoor advertisements are frequently noted as contributing to visual clutter, diminishing overall urban aesthetics. For instance, Adam et al. [49] discovered that varying styles and designs disrupt the visual harmony of cityscapes, resulting in a fragmented appearance. Furthermore, poorly

maintained advertisements, characterized by faded colors or physical damage, worsen visual pollution. The study conducted by Borowiak et al. [50] supports these findings, demonstrating that neglected advertisements detract from the urban environment and negatively influence residents' perceptions of city maintenance and cleanliness.

3.5. Impacts of Outdoor Advertisements

The impact of outdoor advertising extends beyond visual effects. There are several interrelated impacts that often go unrecognized. According to the survey, several significant effects of outdoor advertising on the urban environment have been identified, including visual pollution and its impact on quality of life (Figure 15).

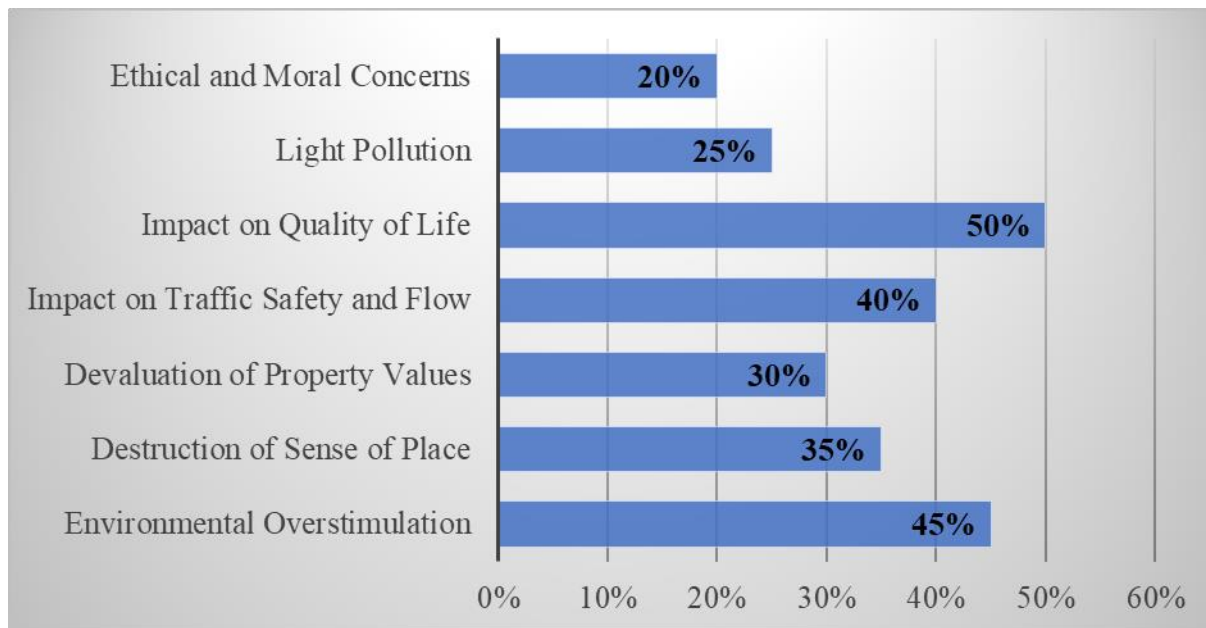


Figure 15. Impacts of outdoor advertisements (source: author's analysis).

In this study, a threshold of 35% was considered as the point at which an impact was deemed critical. This threshold was chosen based on the idea that if a substantial portion of the respondents (35% or more) recognizes a particular impact, it should be considered significant in shaping urban policy and planning. Any impact identified by over 35% of respondents indicates a potential area of concern for the urban environment and its residents. The impact identified in this study by more than 35% of the survey respondents aligns with the impact recognized by the majority of similar studies conducted in different parts of the world [51–53]. This is why the 35% threshold was chosen.

According to Figure 15 above, 45% of respondents identified environmental overstimulation as a key impact of outdoor advertisements, including the following key informant:

“... the overwhelming number of advertisements in my work and residential areas leads to environmental overstimulation, causing residents to feel bombarded with visual stimuli. This contributes to a sense of chaos and diminishes the aesthetic appeal of the urban landscape.” (Key informant interview, 2024)

Similar findings have been identified in the study conducted by Rosenholtz et al. [51], which revealed that visual clutter in urban settings can lead to an overloaded sense, diminishing the quality of life and negatively affecting residents' mental well-being.

Based on the survey results, 35% of the respondents identified the destruction of sense of place as a main impact of outdoor advertisements. Studies support this finding; for

instance, Jordaan [52] discusses how the over-commercialization of public spaces can strip neighborhoods of their distinctiveness, leading to a loss of community identity.

According to Figure 15 above, 40% of respondents expressed concerns about the impact of distractions from outdoor advertisements on traffic safety and flow. The views of key informant interview participants on the above impact were similar and can be summarized as follows:

“... drivers often find themselves diverted by large, flashy outdoor advertisement, which can lead to accidents.” (Key informant interview, 2024)

The findings of this study are in line with the study conducted by Decker et al. [53], which found that distractions from visual stimuli, including outdoor advertisements, impair driving performance and increase the risk of accidents. Furthermore, a study conducted by Alemdar et al. [54] revealed that cities with high levels of visual pollution experience higher rates of traffic incidents due to driver distraction.

Based on the survey results, 50% of the respondents reported a diminishing quality of life due to the prevalence of outdoor advertisements in the study area, including the following key informant:

“... outdoor advertisement has created a sense of degradation in our neighborhoods, making them less enjoyable places to live and work.” (Key informant interview, 2024)

This finding is consistent with the study conducted by Jana and De [3], which indicates that visual pollution leads to a decline in residents' quality of life, particularly in urban areas. Additionally, the study conducted by Otamendi and Sutil Martín [55] revealed that exposure to excessive advertising is associated with negative emotional responses, such as stress and frustration, which ultimately detract from residents' overall satisfaction with their living environment. On the other hand, some studies, such as the one by Hassan et al. [56], suggest that well-enforced regulatory frameworks can prevent visual pollution while allowing advertising to flourish in an organized manner.

3.6. Suggestions for Mitigating Visual Pollution in Addis Ababa

Based on insights gained from the literature, stakeholders' interviews, and field observations, this study provides some important practical implications that help to effectively mitigate visual pollution from outdoor advertisements in the study area.

Develop Clear Regulatory Framework and Guidelines: The lack of a proper regulatory framework for outdoor advertisements was identified as the major contributor to visual pollution in the study area. Hence, it is important to create and enforce detailed regulations specifying appropriate sizes, brightness levels, locations, and acceptable content for outdoor advertising. For instances, in Paris, France, strict controls on outdoor advertisements have led to a harmonious urban landscape by preserving the cultural and historical aesthetic value of key areas [33].

Limit the Density of Advertisements: The study finding indicated that the high density of advertisements contributes significantly to visual pollution and public dissatisfaction. To address this issue, the city administration could impose restrictions on the number of advertisements allowed per building or area, creating a more visually coherent and organized cityscape. São Paulo, Brazil's "Clean City" law serve as an exemplary model as it has severely limited outdoor advertisements, thereby reducing visual pollution and enhancing public space, which fosters community pride and improves safety [57].

Enforce Uniform and Contextual Design Standards: Standardizing in outdoor advertisement design can greatly improve aesthetic quality and minimize distractions in the urban environment [58]. Hence, it is important to develop and enforce design standards which restrict color schemes, brightness, and font sizes, especially in residential or cul-

turally significant areas. For example, in Tokyo, Japan, the governments collaborate with advertisers to ensure that outdoor advertisement designs respect their surroundings.

Designate Specific Zones for Advertising: Restricting outdoor advertisements to designated high-commercial zones would help manage their spread, preserving the integrity of residential and culturally sensitive areas [59]. For instance, in New York City, specific districts like Times Square allow for concentrated advertisement displays, while other areas have strict ad limitations to maintain a balanced aesthetic. In Addis Ababa, this zoning approach could prevent outdoor advertisements from encroaching on residential spaces, enhancing both the livability and attractiveness of neighborhoods.

Regular Maintenance and Monitoring of Advertisements: The findings of the study revealed that poorly maintained outdoor advertisements have detracted the urban aesthetics and contribute to visual pollution. Establishing a mandatory maintenance requirement for outdoor advertisements, including regular inspections, would ensure outdoor advertisements remain in good condition.

Promote Awareness and Education Campaigns: Raising awareness among advertisers and the urban dwellers about the negative impacts of visual pollution can create a more engaged community willing to support and uphold these regulations [19]. The Addis Ababa city administration could enhance participatory planning and decision making regarding outdoor advertising.

4. Conclusions

The general objective of this study was to evaluate the current state of outdoor advertising, assessing its impact on urban aesthetics and identifying major factors contributing to visual pollution due to outdoor advertisements. The findings reveal that outdoor advertisements in the study area are widespread with varied formats such as billboards, posters, banners, and digital screens dominating commercial zones, transportation hubs, major roads and high traffic areas. Although outdoor advertisements play a crucial role in the economic and promotional landscape, a significant number of survey respondents (72%) perceive them as visual pollution, particularly in areas like the central business district and along major highways. This saturation of outdoor advertising has led to a cluttered and chaotic urban environment, detracting from the city's visual appeal and raising concerns among the urban dwellers.

The proliferation of outdoor advertisements in the study area has introduced significant visual pollution, impacting the urban landscape and public perception of the city's aesthetic appeal. Key contributing factors include unregulated placement, a lack of cohesive guidelines, excessive advertisement size and brightness, overcrowding, and often culturally irrelevant content.

Based on the findings, it is clear that outdoor advertising significantly impacts public spaces, creating visual clutter and diminishing the overall aesthetic quality of urban environments. This issue has raised concerns among survey respondents, particularly in central business districts (CBDs) and high-traffic areas, where the concentration of advertisements is highest. Therefore, a more targeted approach to policy development is necessary to regulate the placement, size, and content of outdoor advertisements in these sensitive locations. The study emphasizes the need for specific policies that balance outdoor advertising regulation with urban design principles and the preservation of public space aesthetics.

Additionally, the study highlights the importance of establishing a more robust framework for policy implementation that addresses the regulatory gaps identified during the research. This framework should include clear guidelines for the design, placement, and regulation of outdoor advertisements, especially in areas with high concentrations, such as CBDs and transportation hubs. Furthermore, involving local communities and urban

planners in the decision-making process is essential for creating policies that are effective and responsive to the needs and concerns of residents.

The findings inform policymakers about the urgent need to establish advertising guidelines that prioritize visual harmony and address community concerns regarding the overcrowding of outdoor advertisements.

This study acknowledges several limitations that could be addressed in future research to enhance the reliability and applicability of its findings. One key limitation is the relatively small sample size, which, while providing valuable insights, may not fully capture the perspectives of all stakeholders in Addis Ababa. Future studies could expand the sample size to ensure a more comprehensive representation of diverse demographic groups across various districts of the city, including underrepresented communities. A larger, more diverse sample would improve the robustness and generalizability of the findings.

Another limitation is the potential for response bias and particularly social desirability bias in interviews. Although efforts were made to ensure respondent anonymity and encourage honest feedback, future research could adopt mixed-method approaches, combining quantitative surveys with qualitative in-depth interviews, to obtain a more nuanced understanding of residents' perceptions of visual pollution. Additionally, longitudinal studies could help track changes over time as new policies are implemented.

Future research should also focus on examining the impact of outdoor advertising on urban aesthetics across different types of urban environments, such as residential or mixed-use areas. This would allow for a comparison of how various settings experience visual pollution. Additionally, future studies could explore the potential role of technological advancements in regulating outdoor advertising, particularly through the use of digital tools for the real-time monitoring of advertising density and its effects on the visual environment. Investigating the long-term impacts of outdoor advertising on public health, urban behavior, and the social fabric of cities would offer more comprehensive insights into its broader implications. Moreover, studies focused on land use spatial distribution and its relationship with outdoor advertising could provide a valuable understanding of how advertising intersects with urban planning and spatial dynamics.

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