

## نظرة عامة على تأثير إعلانات الطريق من حيث السلامة على الطرق والتلوث

### An Overview Over the Roadside Advertising Effect on Road Safety and Pollution

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#### Abstract

The burgeoning field of high traffic routes intersects with roadside advertising, presenting both opportunities and challenges that impact road safety, visual pollution, and local economic development. This research delves into the multifaceted role of roadside advertising within the context of high traffic routes, exploring its influence on driver behavior and environmental aesthetics. Roadside advertisements, ranging from billboards to digital displays, are ubiquitous elements along roadways, aiming to capture the attention of drivers and influence their consumer behaviors. However, the effectiveness of these advertisements and their impact on traffic safety and visual pollution remain contentious.

This study employs a comprehensive approach, integrating theories from advertising, economics, sociology, and neurological research to assess the tangible and intangible effects of roadside advertising. The research highlights the dual role of roadside advertisements in promoting local businesses and potentially distracting drivers, thereby posing risks to road safety. Furthermore, the study examines the contribution of roadside advertising to visual pollution, which can degrade the aesthetic quality of landscapes and urban environments, potentially impacting the well-being of residents and the attractiveness of tourist destinations.

Empirical evidence is gathered through roadside camera monitoring, traffic accident records, and surveys among road users to evaluate the real-world impacts of these advertisements. The findings of the survey conducted aims to underscore the need for a careful balance between visibility and safety in roadside advertisement design, with a strong emphasis on enhanced regulation and designer education.

**Keywords:** Roadside Advertising, Road Safety, Pollution

#### RESEARCH PROBLEM

The research problem centers on understanding the multifaceted impact of roadside advertising on high traffic routes, specifically focusing on its effects on road safety, visual pollution, and local economic development. The study seeks to answer how roadside advertising influences driver behavior, contributes to visual pollution, and affects the economic viability of local businesses within high traffic routes; therefore, it's a must to try to find answers for these questions:

1. How does roadside advertising influence road safety and contribute to the occurrence of traffic accidents?
2. What are the effects of roadside advertising on visual and light pollution in urban and rural environments?

### Research Hypotheses

1. Roadside advertising significantly distracts drivers, leading to a measurable increase in traffic accidents along routes with high advertisement density.
2. The presence of roadside advertisements contributes to visual pollution, negatively impacting the scenic values.

### Research Aims

1. To assess the impact of roadside advertising on road safety by analyzing traffic accident data and driver behavior in areas with varying densities of roadside advertisements.
2. To evaluate the extent of visual pollution caused by roadside advertisements and its effect on the aesthetic and environmental quality of high traffic routes.

### Methodology

These aims will guide the research methodology, including data collection through surveys, traffic studies, and economic impact analysis, to provide a comprehensive understanding of the implications of roadside advertising in the context of high traffic route

### Introduction



Figure 1: Roadside Advertising Signages, Egypt

Road advertising is one of the strongest forms of advertising and is one of the strongest cultural influences of the day. The culture of advertising has become the basis of the commercial culture that swept most of the world.

Advertising on the streets of cities and outdoor places differs from one to another for many reasons, including the different target audience and different segmentations

and classifications that may seem as a semi-controlled audience, and thus enjoy promotional effectiveness that may be greater than other means of advertising.

In addition, its large and growing presence in modern cities has turned it into an aesthetic and environmental issue that concerns municipal officials and city organizers. The introduction sets the stage for examining the impact of roadside advertising on road safety and pollution. This essay aims to explore the multifaceted effects of visual pollution caused by roadside advertising on road safety and environmental quality. Visual pollution, as highlighted by (Kumar Jana & De, 2015) , encompasses the adverse effects of disorganized, oversized, and excessive billboards. The presence of visual clutter not only affects the aesthetic appeal of the surroundings but also has far-reaching implications on public health, societal well-being, and psychological aspects. By delving into the complexities of visual pollution caused by roadside advertising, this essay seeks to provide a comprehensive understanding of its implications for road safety and pollution control

### 1.1. Background and Significance

Highway tourism is an emerging field in tourism research. This new and emerging area needs examination. The literature on roadside advertising in tourism is rich and varied given its proximity to other fields such as advertising, economics, and sociology. Roadside advertising is advertising to vehicles, the roadside, and pedestrian traffic near roads. The roadside advertising mechanisms have an overall three-tier structure starting from local governments and arrive at road viewers. Roadside advertising is a widely recognized and utilized medium for local businesses to cater to automobiles that come into their business area for purchase. Everything from welcoming and directional to sale and exit advertisements can be placed. Roadside signage is considered a major medium for targeting interactive commuters wishing to stop. Furthermore, roadside billboards are also considered a major and generally inexpensive medium. However, the influence of signage on the growth and success of a location remains questionably tangible at best. Interpreting road viewer response and measuring signage effectiveness remain common challenges. Prior knowledge within the context of roadside advertising across disciplines states that roadside advertising has significantly negative impacts on development between competing localities, on traffic safety, and on roadside visual pollution. Neurological research finds that reading text on billboards while in-transit negatively impacts various task performance measures including steering precision and vehicle speed. Printed roadside advertisements, highway protectors, and road block fences remain major sources of roadside litter. These provide the theoretical foundation for the examination of the impact of roadside advertising on traffic safety and visual pollution in academic research in tourism development. Roadside advertising remains a mandatory embedded component of roadway tourism and therefore highway tourism research. Roadways are arteries connecting a specific origin and destination area and its institutions including local attractions, services, events, and businesses. Road viewer behavior on route to destination is unavoidably influenced by roadside

activities. In translation, roadside advertising efforts are attempts to capture voyeuristic behavior. Therefore, the tourism effect and its impact on the growth and development of a successful locality are conceptualized. Academic research examines the extent of the influence of invasive roadside advertising on viewer behavior with an emphasis on its negative effects. Such inquiry reinforces and highlights the issues of safety and visual pollution. A general research framework is adapted to measure road viewer behaviors concerning roadside advertising activities such as signage, billboard, and navigational devices. Empirical evidence is obtained using roadside camera monitoring and traffic accident records. As a tourism issue, the tourism effect of roadside advertising activities is complex.

Therefore, the moderating variables of location type, viewer dynamics, advertising effort, and the roadside and roadway context are equally considered.

## 2. The Role of Roadside Advertising in Society

Roadside advertising is a part of daily life in modern society. Billboards and signs have been commonplace for several decades. Even as society becomes embroiled in new technology, there are certainly no plans to remove roadside advertising. Unfortunately, people do not know the impact of roadside advertising on the world they live in. Roadside advertising receives attention because the nature of the display captures attention. It is not seen prior to the trip or can be visited like other commercial establishments while still on the road. Roadside displays have competitively priced advertising space compared to other media. The majority of people passing roadside advertising are potential customers. Roadside displays have the capacity to immediately persuade passers-by to purchase the advertised product without the need for commitment. This raises several questions indicating a lack of awareness. Should businesses showcasing roadside displays be prohibited because of the advantage it gives them? Can roadside displays not be used for something other than making profit?

The purpose of roadside advertising in society primarily appears to be for the benefit of businesses. All industries, wanting to make a profit, begin their business ventures with both long and short-term goals. The short-term goal of every business is to make the break-even point, whereby revenues equate expenses. If the likelihood of reaching the break-even point is low, the business will often be scrapped. Conversely, if the likelihood is high, the business is continued with hope that, one day, profits will be made. In this context, roadside advertising helps businesses make the break-even point. Commercial establishments are invariably located along the road networks in an effort to reach as many potential customers as possible. As such, roadside advertising is placed at the location of maximum visibility.

In addition to being on the road, roadside advertising also follows people's journey path and is usually only seen when the eyes are not focused on the road. In this sense, roadside advertising contributes to public safety. Additionally, the roadside advertising space rental system matches the business owner with potential clients. On the one hand, commercial establishments wishing to showcase their presence are able to do so in a cost-effective manner.

On the other hand, local residents passively afford a venue for compensation as their towns are transformed into a glorified information board save for the fact that it is more often than not detrimental to the towns they are in. However, even outside these interest groups, roadside advertising is supported in the interest of society as a whole.

### **2.1. Purpose and Function**

Roadside advertising serves multiple purposes and functions, influencing societal behaviors and environmental impact. A Research has highlighted the potential of advertising in promoting sustainable mobility, energy conservation, and climate change awareness (Pedrós Pérez et al., 2019). The shift in public policy towards engaging individuals as citizens and consumers for promoting socio-environmental change has underscored the role of advertising in shaping attitudes and lifestyles associated with sustainable mobility. However, it is important to note that the ubiquitous promotion of a car-dependent culture through advertising can hinder governmental efforts to promote sustainable transport and minimize greenhouse gas emissions. Therefore, there is a need for responsible advertising practices, including self-regulation and governmental regulations, to align with the goals of reducing environmental impact and promoting sustainability.

## **3. Road Safety Concerns Associated with Roadside Advertising**

Roadside advertising has been a subject of concern due to its potential impact on road safety, particularly in terms of driver distraction and inattention. Research by Beanland and Wynne (Beanland & A. Wynne, 2019) on the effects of roadside memorials provides insight into the potential distractions posed by roadside elements. The study found that while memorials may capture drivers' attention, they do not have a significant impact on behavior and are unlikely to substantially affect road safety. This suggests that while roadside advertising may attract attention, its actual influence on driver behavior and safety may be limited. Moreover, the study highlights the importance of regulating the design and placement of roadside elements to ensure they are not excessively eye-catching and do not compromise safety.

The findings of this study underscore the complexity of assessing the impact of roadside elements on road safety and the need for further research to understand the specific effects of roadside advertising in different contexts.

### **3.1. Distraction and Inattention**

Distraction and inattention are critical issues associated with roadside advertising, impacting overall road safety. Research has shown that changes in the traffic environment activate the parts of the brain responsible for visual perception first, indicating the significance of visual stimuli such as roadside advertising. Early studies from the 1950s yielded differing results on the influence of advertising boards on driving, with King and Sutro (1957) concluding that one out of eight traffic accidents is due to visual hindrance to the driver's field. Furthermore, eye tracking technology has been used to explore drivers' overt visual attention since the 1970s, revealing differences in gaze direction and fixation duration among drivers under varying cognitive loads. In addition, driver distraction refers to situations where a driver's

attention is diverted from driving, significantly affecting driving performance and safety (Cvahte Ojsteršek & Topolšek, 2019). Inattention behind the wheel impacts attentional control while driving, influencing drivers' driving performance and eye movement behavior. This underscores the need to understand the implications of distraction and inattention resulting from roadside advertising on road safety and pollution.

#### **4. Environmental Impact of Roadside Advertising**

Roadside advertising has been found to contribute to visual pollution, which encompasses irregular formations altered by human activities that hinder people's ability to enjoy or appreciate the surrounding view (Kumar Jana & De, 2015). This visual pollution, caused by elements such as billboards and disorganized cables, can have detrimental effects on communities, leading to irritability and character-changing effects, particularly in children growing up in the vicinity. Additionally, the promotion of a car-dependent culture through advertising hampers governmental campaigns for sustainable transport and can lead to environmentally insensitive behaviors (Pedrós Pérez et al., 2019).

These findings highlight the need to consider the environmental impact of roadside advertising, particularly in terms of visual pollution and its effects on communities and sustainable mobility efforts. Understanding these impacts is crucial for developing effective policies and practices to mitigate the negative effects of roadside advertising on the environment.

##### **4.1. Visual Pollution**

Visual pollution caused by roadside advertising has been shown to have adverse effects on the environment and the surrounding community. Research conducted in India revealed that billboards and other visual pollutants can distract drivers and pedestrians, leading to decreased concentration on traffic signals and increased difficulty in finding destinations in congested cities (Kumar Jana & De, 2015). Moreover, visual pollution can contribute to a loss of community identity and homogenization due to the prevalence of similar visual pollutants in urban areas. To address these issues, it has been suggested that car advertising should promote maximum occupancy and emphasize environmental information, such as climate change and low carbon mobility (Pedrós Pérez et al., 2019). Additionally, efforts should be made to shift the focus of car advertisements from high-consuming models to more efficient vehicles with lower emissions rates.

#### **5. Regulations and Policies Governing Roadside Advertising**

The roadside advertising industry is under a federal ban, with the responsibility for making rules for controlling roadside advertising and granting exemptions assigned to states. Later, states were also assigned the duty of making regulations and orders on their own accord, and regulating roadside advertising on state highways. The Act was amended in 1986 to comply with international commitments made by the United States, by prohibiting the display of certain new types of advertising signs or devices

along interstate highways. Construction signs, directional signs, and information signs regarding highways and roadside service facilities were excluded from the definition of advertising signs. The Act established the location and spacing of roadside advertising signs, including permit fees and penalties for violations, as one of the functions of the state. The responsibility for initiating the rule-making process was placed on the state agency by requiring states that wanted to engage in roadside advertising on interstate highways to identify the applicable limits of the highway corridor. There was a simultaneous detailed profile of the roadway corridor along with the proposed regulations. The state was also required to identify any signs and devices within the roadway corridor apart from those permitted by state regulation.

The use of public rights-of-way for roadside advertising purposes was prohibited, and the responsibilities of state transportation agencies were prescribed therein.

The Act expressed national policy in favor of sign control, a responsibility to be exercised by each state highway agency, and the authority to make rules and regulations on roadside advertising, direction and informational signs, and regulations about nonconforming signs. The state was also required to identify the spacing and location of billboard signs permitted by federal regulation, and there was a prohibition on the construction of new billboard signs at the same location as any permitted bills and on the same side of the highway. Nonconforming signs were required to be marked with an approved identification label, and condemnation was required for signs erected after a ban on construction or that were not in compliance with state regulations. Roadside advertising was generally prohibited on the roadsides of freeway access roads.

### **5.1. National and International Perspectives**

Regulation of roadside advertising (billboards) is an issue of concern for governments in countries around the world. Some countries have sought to abolish billboards altogether, motivated by concerns about road safety and the visual environment. Other countries, particularly those in the developing world, have encouraged privatization and deregulation of roadside advertising, with the belief that it will enhance competition and promote economic growth.

Roadside advertising presents hazards to motorists that can impact road safety. Roadside advertising may distract the attention of motorists away from the driving task because of the substantial visual stimuli posed by such billboards. In an attempt to describe and quantify the potential impact of such roadside advertising on road safety, a review of research studies and experience from equal countries was undertaken. Empirical studies support the contention that roadside advertising has an impact on road safety. Statistically significant and plausible increases in the probability of accidents, particularly lane departures and rear-end collisions, were observed in these studies. Roadside advertising was also found to impair driver perception of warning road signs and slow response time to critical events.

Regulation of advertising is more controversial than other efforts to eliminate hazards to motorists. Reasons for regulation include the importance and safety of the motoring public, the value of protecting the scenic beauty of national and state highways, and the liberal tradition against general prohibition of free speech. The national system of

interstate and defense highways was created by the Federal Aid Highway Act of 1956, which envisioned an integrated interstate highway system. Congress authorized states to regulate outdoor advertising in order to protect the reasonable interests of the traveling public and give full attention to the national welfare and policy.

Federal regulation of billboards is constitutionally contentious because they are a form of commercial speech. Constitutionally permissible regulation is concerned with commercial and noncommercial tastes, weighing heavily in vending national interests. No First Amendment precedents prevent state and local governments from removing a billboard once a billboard's advertising is terminated. However, states cannot prohibit a billboard and then regulate that billboard's advertising in a manner that prohibits obscene or illegal speech. Public advertising is constitutionally less susceptible to regulation than is advertising generally.

Overall, regulation of advertising is a constitutional quagmire. However, there are effective techniques for regulating billboards within the context of the law. Better regulation of roadside advertising is necessary if the roadway architectural quality is significantly improved. Better regulation will help to eliminate viewing platforms, accidental billboards, and obscenity at the roadside. Better regulation will allow more creative expression in advertisement design and will reduce the size of billboard poster panels.

## 6. Case Studies and Empirical Research

Case studies and empirical research provide valuable insights into the impact of roadside advertising on driver behavior. For instance, a study by (Buccoliero et al., 2016) found that social marketing communication, particularly through shock advertising in online videos, has a significant impact on improving risk self-assessment and risk propensity among drivers, especially women. The research also highlighted that video advertising campaigns, when broadcasted online, are more likely to be shared on social networks, emphasizing their effectiveness in reaching and influencing drivers. Additionally, the study indicated that advertising through television and social media has the highest impact on drivers' behaviors, shedding light on the importance of the medium through which roadside advertising is delivered (Buccoliero et al., 2016). These empirical findings contribute to a better understanding of the mechanisms through which roadside advertising can influence driver behavior and attitudes.





**Figure 2: Visual Pollution in Billboards, Egypt**

In Egypt, Cairo became a permanent exhibition of billboards and posters. Therefore, the Supreme Council for Urban Planning and Development worked on laying the foundations and standards of cultural coordination for advertising and banners in 2008 in order to solve traffic issues and achieve urban and visual requirements. The general objectives of the guide include the following principles:

- Developing a respected visual image and preserve the aesthetics of the city:  
The road, its scope and the surrounding environment.
- Setting standard rules for the sizes and shapes of all advertisements and signs, viewing angles and directions of motor and pedestrian traffic to achieve safety to prevent accidents and possible hazards.
- Ensuring compatibility of design advertising and signs with the urban environment.
- Setting the requirements for the quality and levels of advertising and banners and establishing controls over the growth of slums advertising and signs which cause visual pollution and aesthetic and urban environment.

But despite this guide, and perhaps because people didn't follow these rules as there's no severe fine to not applying this guide, Cairo is still full of billboards which cause a lot of problems to roads' safety.

### **6.1. Effects on Driver Behavior**

Research on the effects of roadside advertising on driver behavior has yielded valuable insights. For example, a study by Beanland and Wynne (Beanland & A. Wynne, 2019) examined the impact of roadside memorials on drivers' risk perception and eye movements. The presence of memorials in road scenes was found to trigger more fixations to the left roadside and higher risk ratings for roads with memorials.

This suggests that roadside elements can influence drivers' attention and perception of risk, potentially affecting their behavior.

Moreover, Carey and Sarma (N. Carey & M. Sarma, 2016) conducted research on threat appeals in health communication and their impact on young male drivers. The study revealed that messages combining threat and efficacy led to a reduction in speed among participants. However, the research also highlighted the need to consider individual differences, such as personality traits, and to explore enduring effects of road safety advertisements. This underscores the complexity of understanding how different types of roadside advertising may influence driver behavior, emphasizing the importance of further empirical investigation in this area.

## **7. Innovations and Technologies in Roadside Advertising**

Innovations and technologies in roadside advertising have the potential to significantly impact road safety and pollution. Digital and interactive displays, as highlighted by (Pedrós Pérez et al., 2019) , offer new avenues for promoting transport policy goals such as maximum occupancy, low-carbon mobility, and sustainable transportation. These advancements enable advertisers to showcase vehicles with several passengers, emphasize environmental information, and promote efficient models with lower emissions rates. Moreover, the use of social media platforms for emissions information dissemination and the positive reinforcement of collective transport users' image contribute to a shift towards more sustainable advertising practices. As the advertising landscape continues to evolve, it is crucial to establish a regulatory framework to ensure that innovations in roadside advertising align with road safety and pollution reduction objectives.

### **7.1. Digital and Interactive Displays**

Digital and interactive displays in roadside advertising have garnered attention for their potential impact on road safety and environmental concerns. (Geiger et al., 2019) found that pedestrians exhibited a strong interest in and acceptance of windshield displays for cars, particularly noting the potential for increased awareness of traffic situations, especially at night. However, concerns were raised regarding technical malfunctions, reliance on the technology, and privacy issues. Additionally, participants expressed varying opinions on the necessity of the display, with some emphasizing the sufficiency of existing traffic lights and others acknowledging the potential security enhancement next to view-blocking cars. The study highlighted that for pedestrians to fully embrace such displays, the technology must be proven safe and reliable, and it must be established that it complements, rather than replaces, their own senses for road safety.

Furthermore, (Buccoliero et al., 2016) emphasized the role of social marketing communications in influencing behaviors related to distracted driving, such as texting while driving. They noted the use of shock advertising as a strategy to elicit attention, enhance message comprehension, and modify specific behaviors, as seen in other public health contexts like seat belt safety and smoking habits. The authors highlighted the importance of engaging individuals with positive behaviors rather than negative ones in addressing social issues, such as distracted driving, and the potential

of shock advertising to create large-scale changes in attitudes and behaviors. This underscores the multifaceted nature of digital and interactive displays in roadside advertising, as they not only have the potential to influence road safety but also to shape societal behaviors related to distracted driving.

## **8. Community Perceptions and Attitudes Towards Roadside Advertising**

Community perceptions and attitudes towards roadside advertising play a crucial role in understanding the impact of these advertisements. A study conducted in 2017 aimed to gauge the visual contamination caused by advertising panels and posters from a legal perspective. The descriptive design involved surveying 80 individuals in close proximity to the advertising panels. The results revealed that 70% of the respondents were unaware of visual contamination despite being directly affected. Additionally, 80% reported experiencing visual irritation, 20% reported stress, and 90% had never lodged a complaint. Furthermore, 60% of the citizens were unsure how to address this issue, and only 30% demonstrated knowledge about visual contamination. This underscores the need for heightened awareness and regulation to address visual pollution (Brañez Meza et al., 2017).

Moreover, a 2014 study examined cross-cultural perspectives on attitudes towards outdoor advertising, revealing significant cultural variations in attitudes. Hong Kong respondents exhibited the most positive attitude, while UK respondents displayed the least positive attitude.

The study identified economic, personal, social, and ethical factors as influencing attitudes towards outdoor advertising. The findings indicated that outdoor ads were viewed most favorably across all three areas, emphasizing the significance of understanding cultural nuances in shaping attitudes towards roadside advertising (Sau-Lan Cheung . & Leung ., 2014).

### **8.1. Public Opinion Surveys**

Public opinion surveys are valuable tools for gauging community attitudes towards roadside advertising. These surveys provide insights into public preferences, concerns, and overall perceptions of the impact of roadside advertising on road safety and pollution. For instance, a study by Fahim, Siddiqui, Anjam, and Aziz (Muhammad Fahim et al., 2013) in Pakistan utilized factor analysis to explore consumer attitudes towards advertising, shedding light on the nuanced perspectives that individuals hold towards various forms of advertising. Similarly, Churchill and Tay (Churchill & Tay, 2009) conducted surveys to understand public attitudes towards roadside memorials and policy, using Likert scale responses and demographic information to capture a comprehensive view of the driving public's perceptions. Such surveys not only capture the diversity of opinions but also provide crucial data for policymakers and agencies to align strategies with public attitudes and improve road safety.

These surveys, when conducted rigorously and with a representative sample, offer valuable insights into the nuanced and diverse attitudes of the public towards roadside

advertising, serving as a crucial resource for informing evidence-based policies and interventions.

## 9. Corporate Social Responsibility in Roadside Advertising

Corporate social responsibility (CSR) in roadside advertising entails a focus on sustainable and ethical practices. The CSR activities of advertising agencies play a crucial role in promoting sustainable mobility and reducing the environmental impact of roadside advertising. The analysis of annual reports of top advertising holding companies revealed various CSR activities related to human resources, the environment, and community commitment, demonstrating a growing emphasis on sustainable development and environmental responsibility (Waller & Lanis, 2008).

Moreover, the promotion of a car-dependent culture through advertising hampers governmental campaigns for sustainable transport, highlighting the need for socially responsible advertising practices that align with the goals of reducing environmental impact and promoting sustainable mobility (Pedrós Pérez et al., 2019).

The CSR disclosure by advertising agencies reflects a shift towards promoting sustainable practices and environmental responsibility, as evidenced by initiatives related to energy consumption, recycling, community commitment, and sustainable development. These findings underscore the significance of incorporating CSR principles into roadside advertising to mitigate the environmental impact and promote sustainable mobility.

Furthermore, the Spanish Strategy on Corporate Social Responsibility emphasizes the reduction of environmental impact and the promotion of sustainability, aligning with the growing emphasis on CSR in advertising practices. Overall, the integration of CSR in roadside advertising is pivotal in fostering environmentally responsible practices and promoting sustainable mobility.

### 9.1. Sustainable Practices

Sustainable practices in roadside advertising play a crucial role in promoting environmentally conscious approaches within the advertising industry. Research has indicated that sustainable mobility aims to reduce the impact of emissions due to increasing transport demand, emphasizing the responsibilities of citizens to reduce their impact through behavioral change (Pedrós Pérez et al., 2019). This highlights the potential for advertising to emotionally stimulate audiences about climate change and sustainable mobility, conveying scientific and environmental concepts in society. However, it is essential to note that the promotion of a car-dependent culture through advertising can hinder governmental campaigns for sustainable transport, as cars are often advertised as the usual means of transport, promoting environmentally insensitive or destructive behaviors.

Moreover, the integration of corporate social responsibility (CSR) into the marketing department and communication strategies is crucial for promoting sustainable practices in advertising (Kolberg, 2018). This interdisciplinary approach to CSR, when strategically organized for the interest groups, can lead to meaningful benefits for society and valuable outcomes for businesses. However, it is important to note that

green advertising has not always had the expected effect, and skepticism towards it exists, particularly among those most engaged with the environment.

Therefore, transparent CSR activities and sustainable advertising practices are vital for diminishing skepticism and promoting responsible approaches within the advertising industry.

## 10. Practical Study

An online survey was conducted...

### Objective

The survey was designed to gather insights from design experts on the impact of roadside advertisements on driver attention, road safety, and environmental pollution. The goal was to identify common design elements that may distract drivers, understand the challenges faced in balancing safety with visibility, and explore potential improvements in the design and regulation of roadside advertisements.

### Target Audience

The survey targeted 10 professionals with expertise in design, particularly those involved in creating or evaluating roadside advertisements. These individuals were expected to have a deep understanding of how visual elements impact driver behavior and road safety.

### Survey Structure

The survey comprised a series of multiple-choice and open-ended questions. It was structured to address the following key areas:

#### 1. Frequency of Evaluation:

- Respondents were asked how often they assess the impact of roadside advertisements on driver attention in their projects. This aimed to gauge the level of attention given to safety considerations in their work.

#### 2. Distracting Design Elements:

- Multiple-choice questions allowed respondents to select which design elements (e.g., bright colors, flashing lights) they believed were most likely to distract drivers. This helped identify common concerns regarding ad design.

#### 3. Consideration of Driving Behavior:

- Respondents were asked how frequently they consider the potential impact of advertisements on driving behavior. This was intended to measure the integration of safety considerations in the design process.

#### 4. Challenges in Ad Design:

- This section asked respondents to identify the most challenging aspects of designing advertisements with respect to road safety. Multiple-choice options covered issues such as ensuring visibility without distraction and complying with regulatory standards.

## 5. Recommended Improvements:

- Finally, respondents were asked to suggest improvements for the design and regulation of roadside advertisements to enhance road safety and reduce pollution. Multiple-choice options included stricter design guidelines, more comprehensive regulatory oversight, and enhanced training for designers.

## Data Collection

Responses were collected via an online form, ensuring ease of access for participants and efficient data compilation. The survey's structure allowed for both quantitative analysis of multiple-choice responses and qualitative insights from open-ended questions.

## Conclusion

The survey was constructed to provide a comprehensive understanding of the impact of roadside advertisements on road safety and pollution, drawing on the expertise of design professionals. The findings aim to inform better design practices and regulatory approaches to mitigate potential risks associated with roadside advertising.

### 10.1 Survey Analysis and Identifying Trends

The Survey focused on the following aspects:

1. **Frequency of Evaluating Impact:** How often respondents evaluate the impact of roadside ads on driver attention?
2. **Common Distracting Design Elements:** Which design elements are frequently identified as distracting?
3. **Consideration of Driving Behavior:** How often designers consider the impact of ads on driving behavior?
4. **Challenges in Ad Design:** Common challenges faced in balancing safety with visibility and other factors.
5. **Recommended Improvements:** Common suggestions for improving ad design and regulation.

The key trends identified from the survey data:

As a design expert, how often do you evaluate the impact of roadside advertisements on driver attention in your projects?  
10 responses

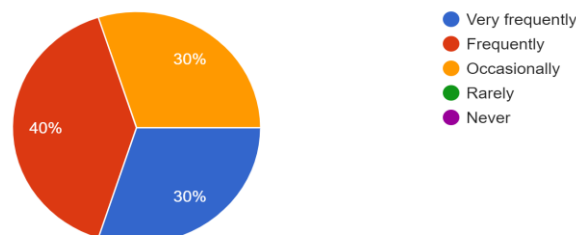


Figure 3: Evaluating the impact of roadside Ads

### 1. Frequency of Evaluating the Impact of Roadside Ads

- **Frequently:** 4 responses
- **Very Frequently:** 3 responses
- **Occasionally:** 3 responses

**Insight:** Most respondents evaluate the impact of roadside advertisements on driver attention either frequently or very frequently.

In your professional opinion, what design elements of roadside advertisements are most likely to distract drivers? multiple choice answers are allowed

10 responses

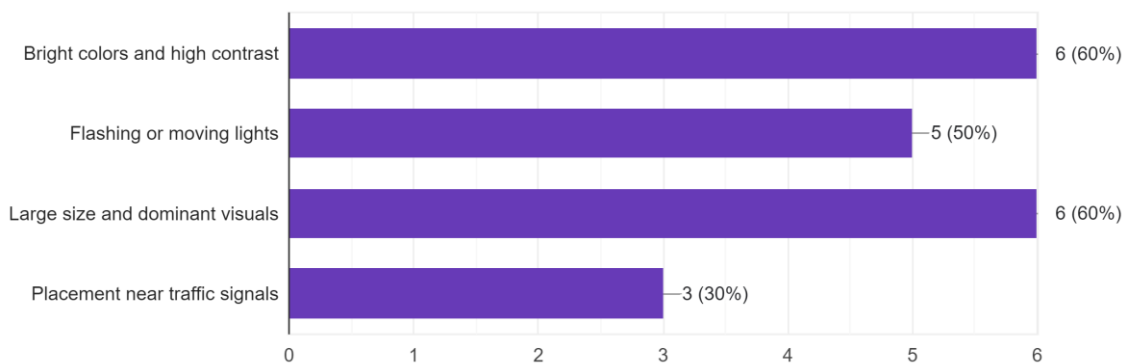


Figure 4: Common Distracting Design Elements

### 2. Common Distracting Design Elements

- **Bright colors and high contrast:** 6 mentions
- **Flashing or moving lights:** 5 mentions
- **Large size and dominant visuals:** 6 mentions
- **Placement near traffic signals:** 3 mentions

**Insight:** Bright colors, high contrast, and large, dominant visuals are considered the most distracting elements in roadside advertisements.

Do you consider potential impacts on driving behavior when designing roadside advertisements?

10 responses

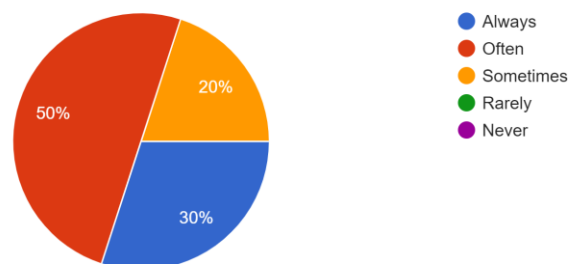


Figure 5: Consideration of Driving Behavior

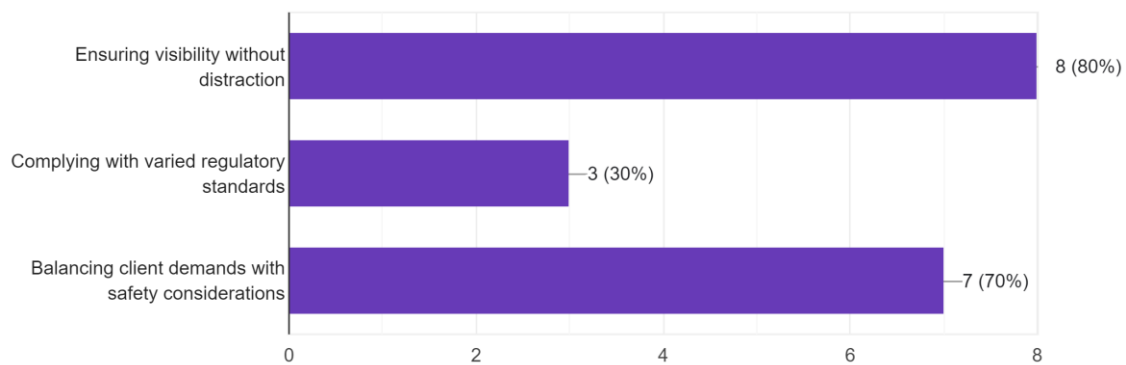
### 3. Consideration of Driving Behavior

- **Often:** 5 responses
- **Always:** 3 responses
- **Sometimes:** 2 responses

**Insight:** The majority of respondents often or always consider the potential impacts on driving behavior when designing roadside advertisements.

What is the most challenging aspect of designing roadside advertisements with respect to road safety? multiple choice answers are allowed

10 responses



**Figure 6: Challenges in Ad Design**

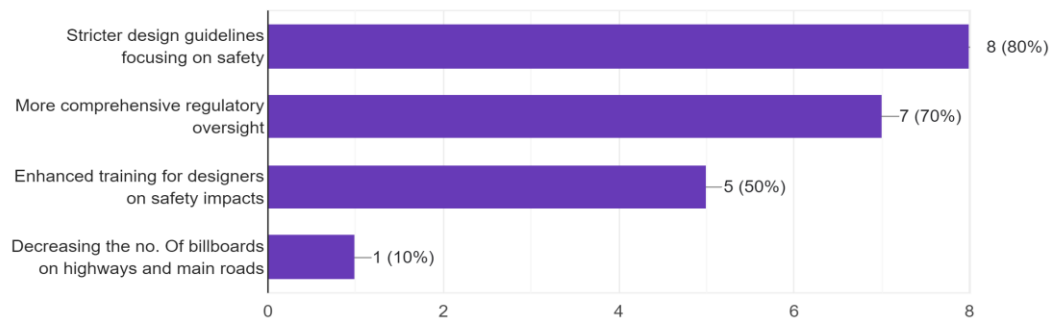
### 3. Challenges in Ad Design

- **Ensuring visibility without distraction:** 8 mentions
- **Balancing client demands with safety considerations:** 7 mentions
- **Complying with varied regulatory standards:** 3 mentions

**Insight:** Ensuring visibility without causing distraction is the most significant challenge faced by designers, followed by balancing client demands with safety considerations.

What improvements would you recommend for the design and regulation of roadside advertisements to enhance road safety and reduce pollution? multiple choice answers are allowed

10 responses



**Figure 7: Recommended Improvements**



## 5. Recommended Improvements

- **Stricter design guidelines focusing on safety:** 8 mentions
- **More comprehensive regulatory oversight:** 7 mentions
- **Enhanced training for designers on safety impacts:** 5 mentions
- **Decreasing the number of billboards on highways and main roads:** 1 mention

**Insight:** Respondents widely recommend stricter design guidelines and more comprehensive regulatory oversight to enhance road safety and reduce pollution.

These trends highlight the importance of balancing visibility and safety in roadside advertisement design, with a strong emphasis on stricter guidelines and improved oversight.

## 10.2 Key Findings and Results

### Key Findings from the Survey on Roadside Advertisement Impact on Road Safety and Pollution

#### 1. Frequent Evaluation of Impact:

- Most design experts frequently evaluate the impact of roadside advertisements on driver attention, indicating a strong awareness of the potential safety risks associated with these ads.

#### 2. Distracting Design Elements:

- The most commonly identified distracting elements in roadside ads include bright colors, high contrast, large and dominant visuals, and flashing or moving lights. These elements are perceived to significantly distract drivers, potentially leading to unsafe driving conditions.

#### 3. Consideration of Driving Behavior:

- A majority of respondents often or always consider the impact of their designs on driving behavior. This highlights a prevalent concern among designers to ensure that their work does not negatively affect road safety.

#### 4. Challenges in Ad Design:

- The primary challenge in designing roadside advertisements is ensuring visibility without causing distraction. Additionally, balancing client demands with safety considerations and complying with varied regulatory standards are also significant challenges faced by designers.

#### 5. Recommended Improvements:

- Respondents strongly recommend stricter design guidelines focused on safety and more comprehensive regulatory oversight. Enhanced training for designers on the safety impacts of their work is also seen as crucial. There is also a call for reducing the number of billboards on highways and main roads to further improve road safety and reduce environmental pollution.

These findings underscore the need for a careful balance between visibility and safety in roadside advertisement design, with a strong emphasis on enhanced regulation and designer education.

## 11. Conclusion and Future Directions

Roadside advertising has exponentially grown over the last decade to become an integral part of the urban landscape. As advertising clutter increases on the roadsides, the negative impacts of advertising on road safety, especially pedestrian safety, are increasingly investigated. Relying on the case of Pune, one of the fastest-growing metropolitan cities in India, a few recent studies have explored the impact of roadside advertising on pedestrian safety. It has been observed that roadside advertising distracts other road users too, due to the colourful and flashing lights. The excessive advertising clutter affects the visibility of vital road signs and signals, often leading to road crashes.

With regards to pollution, roadside visual pollutions create visual obstructions to pedestrians and vehicular movements. The number of roadside hoardings significantly reduces the visibility of road signs, signal boards, and road intersections and merging zones. Outside visual obstructions along other roads, roads and highways are negligent, which are well studied in other countries.

The findings of this research indicate that roadside advertising has a considerable impact on driver distraction, leading to potential safety hazards on high traffic routes. Additionally, the presence of roadside advertisements significantly contributes to visual pollution, detracting from the aesthetic and environmental quality of both urban and rural landscapes. However, the study also notes the economic benefits that roadside advertising can provide to local businesses by increasing visibility and customer traffic. The dual nature of roadside advertising's impact suggests the need for a balanced approach in policy-making and regulation. Stricter guidelines and thoughtful placement of advertisements could mitigate negative effects while preserving economic benefits. Future research should continue to explore innovative solutions and technologies that minimize safety risks and visual pollution while supporting local economic development. This study contributes to a more comprehensive understanding of the complex role roadside advertising plays in modern landscapes and offers insights for stakeholders in traffic management, urban planning, and business development.

## Research Appendix

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Outdoor Adv Effect on Road Safety &amp; Pollution

### Outdoor Adv Effect on Road Safety & Pollution

\* Indicates required question

1. **As a design expert, how often do you evaluate the impact of roadside advertisements on driver attention in your projects?** \*

Mark only one oval.

- ☐ Very frequently  
☐ Frequently  
☐ Occasionally  
☐ Rarely  
☐ Never

2. **In your professional opinion, what design elements of roadside advertisements are most likely to distract drivers? multiple choice answers are allowed** \*

Check all that apply.

- ☐ Bright colors and high contrast  
☐ Flashing or moving lights  
☐ Large size and dominant visuals  
☐ Placement near traffic signals  
☐ Other: \_\_\_\_\_

<https://docs.google.com/forms/d/1KWjklPDExJQHfNY1f4GzBWu8g14QPLY8cHPVHSIC9U/edit>

1/5

8/26/24, 7:00 PM

Outdoor Adv Effect on Road Safety &amp; Pollution

3. Do you consider potential impacts on driving behavior when designing roadside advertisements? \*

Mark only one oval.

- ☐ Always  
☐ Often  
☐ Sometimes  
☐ Rarely  
☐ Never

4. How do you balance the need for advertisement visibility with road safety concerns in your designs? multiple choice answers are allowed \*

Check all that apply.

- ☐ Prioritize safety over visibility  
☐ Balance safety and visibility equally  
☐ Prioritize visibility over safety  
☐ Other: \_\_\_\_\_

5. Are you aware of the effects of visual pollution caused by roadside advertisements and how do you address it in your designs? \*

Mark only one oval.

- ☐ Fully aware and actively incorporate solutions  
☐ Somewhat aware and occasionally incorporate solutions  
☐ Aware but rarely address it  
☐ Not aware

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Outdoor Adv Effect on Road Safety &amp; Pollution

6. **What strategies do you employ to minimize light pollution from illuminated roadside advertisements? multiple choice answers are allowed** \*

*Check all that apply.*

- ☐ Use of ambient light sensors  
☐ Limiting hours of illumination  
☐ Employing lower intensity lighting  
☐ Not a consideration in my designs  
☐ Other: \_\_\_\_\_

7. **Do you believe current regulations are sufficient to manage the impact of roadside advertisements on road safety and pollution?** \*

*Mark only one oval.*

- ☐ Strongly agree  
☐ Agree  
☐ Neutral  
☐ Disagree  
☐ Strongly disagree

8. **How effective do you think current design practices are in mitigating the negative impacts of roadside advertisements?** \*

*Mark only one oval.*

- ☐ Very effective  
☐ Somewhat effective  
☐ Neutral  
☐ Somewhat ineffective  
☐ Very ineffective

8/26/24, 7:00 PM

Outdoor Adv Effect on Road Safety &amp; Pollution

9. **What is the most challenging aspect of designing roadside advertisements with respect to road safety? multiple choice answers are allowed** \*

*Check all that apply.*

- ☐ Ensuring visibility without distraction
- ☐ Complying with varied regulatory standards
- ☐ Balancing client demands with safety considerations
- ☐ Other: \_\_\_\_\_

10. **What improvements would you recommend for the design and regulation of roadside advertisements to enhance road safety and reduce pollution? multiple choice answers are allowed** \*

*Check all that apply.*

- ☐ Stricter design guidelines focusing on safety
- ☐ More comprehensive regulatory oversight
- ☐ Enhanced training for designers on safety impacts
- ☐ Other: \_\_\_\_\_

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Figure 1: Roadside Advertising Signages, Egypt, Roadside Advertising Signages, Egypt, Retrieved at 24 September 2019, from <https://img.soutalomma.com/Large/20181102013706376.jpg> 333

Figure 2: Visual Pollution in Billboards, Egypt, Cairo's Random Road Signage, 2019, photographed by the researcher. 340

Figure 3: Evaluating the impact of roadside Ads, google analysis for Outdoor Adv Effect on Road Safety & Pollution survey 345

Figure 4: Common Distracting Design Elements, google analysis for Outdoor Adv Effect on Road Safety & Pollution survey 346

Figure 5: Consideration of Driving Behavior, google analysis for Outdoor Adv Effect on Road Safety & Pollution survey 346

Figure 6: Challenges in Ad Design, google analysis for Outdoor Adv Effect on Road Safety & Pollution survey 347

Figure 7: Recommended Improvements, google analysis for Outdoor Adv Effect on Road Safety & Pollution survey 347