

The Effectiveness of Digital Board Advertising Along MRT Railway Lines in Kuala Lumpur: A Conceptual Study on Motorist Engagement

Farah Merican Isahak Merican¹, *Nazirul Mubin Awang Besar², Nizar Nazrin³,
Muhammad Redza Rosman⁴

¹ Faculty of Business and Management, Universiti Teknologi MARA Kedah Branch,
Sungai Petani Campus, Kedah, Malaysia

^{2,3} Faculty of Art and Design, Universiti Teknologi MARA Kedah Branch, Sungai Petani
Campus, Kedah, Malaysia

⁴ Faculty of Built Environment, Universiti Teknologi MARA (UiTM) Perak Branch, Seri Iskandar
Campus, 32610 Seri Iskandar, Perak, Malaysia

farah339@uitm.edu.my¹, *nazirulab@uitm.edu.my², nizarnazrin@uitm.edu.my³,
redza508@uitm.edu.my⁴
*Corresponding author

Received: 1 June 2025; Accepted: 31 August 2025; Published: 1 September 2025

ABSTRACT

Digital Out-of-Home (DOOH) advertising has rapidly emerged as a dominant medium in urban environments, particularly when integrated with public infrastructure such as Mass Rapid Transit (MRT) systems. In Kuala Lumpur, digital boards installed along MRT railway lines and stations are prominently visible to motorists navigating major roads and highways. These strategically positioned boards aim to capture the attention of thousands of drivers and passengers daily, offering brands unparalleled exposure in high-traffic corridors. This conceptual study explores the effectiveness of such advertising from the perspective of road users rather than commuters. Specifically, it investigates how visibility, message clarity, motion design, environmental distractions, and travel conditions influence brand recall, perception, and behavioral outcomes. The study emphasizes that motorists constitute a unique demographic whose fleeting attention span requires concise, visually engaging, and culturally resonant advertising strategies. A conceptual framework is proposed to guide future empirical research, addressing the cognitive, emotional, and contextual dynamics of driver engagement. By situating the analysis within Kuala Lumpur's distinctive urban and infrastructural context, this paper contributes to both academic discourse and industry practice. It also highlights the importance of localized content, motion graphics, and cultural adaptation to enhance engagement and recall. Ultimately, this research provides theoretical grounding for future studies and practical insights for advertisers seeking to optimize DOOH strategies along MRT corridors.

Keywords: Advertising, Mass Rapid Transit, Digital Board, Commuters, Motorist



1 INTRODUCTION

1.1 Background

In congested urban environments, drivers are often subjected to numerous stimuli, such as roadside signage, traffic signals, and, increasingly, digital billboards. The Digital Out-of-Home (DOOH) formats, especially those affixed to MRT railway infrastructure, provide advertisers an effective method to engage a mobile audience traversing Kuala Lumpur's primary thoroughfares (Camarero, Garrido, & Vicente, 2020). These digital displays, frequently elevated and strategically located for optimal visibility, showcase dynamic content to motorists in both high-traffic and motorway areas.

The positioning of digital advertising boards along MRT viaducts and adjacent to elevated stations is deliberate. These sites are intended to capture the visual focus of drivers and passengers at periods of diminished speed, such as in traffic jams, nearing crossroads, or at highway tolls. In contrast to transit-based advertising targeting train commuters, roadside digital displays depend on quick visual impact, conciseness, and clarity to convey messages successfully within a constrained attention span (Chan & Fung, 2021). In Kuala Lumpur, numerous vehicles traverse thoroughfares including the Sprint Highway, Jalan Damansara, and the Sungai Buloh–Kajang MRT corridor daily, providing a steady and varied driver demographic.

Despite their growing popularity, the efficacy of roadside digital board advertising on MRT infrastructure remains insufficiently studied. Do motorists observe these advertisements? Do they remember them subsequently? Can brief exposure when driving affect brand impression or purchasing decisions? This study aims to address these enquiries by identifying the principal elements influencing motorists' involvement with and response to DOOH advertising situated along MRT railway lines.

1.2 Problem Statement

Despite substantial investment in roadside digital advertising along MRT infrastructure for its perceived visibility and reach, the real effect on road users remains ambiguous. Drivers inherently have a constrained capacity to focus on advertisements because their primary responsibility is operating the vehicle. Moreover, environmental factors including weather, traffic congestion, road signage, and time of day influence the visibility and comprehension of a digital advertisement.

Current industry measurements emphasise impressions, specifically the number of vehicles that pass a certain board daily; however, this fails to yield insights into message retention, memory, or behavioural modification. In the absence of a comprehensive knowledge of drivers' cognitive and visual interactions with digital advertisements, advertisers may be overestimating the impact of various media types. Consequently, there is an imperative requirement for a conceptual investigation into the factors that enhance

success in MRT-related roadside advertising, particularly within the framework of Kuala Lumpur's distinctive traffic and infrastructural dynamics.

1.3 Research Objectives

This study seeks to uncover the principal parameters that affect the efficacy of digital board advertising positioned along MRT railway lines from the viewpoint of road users. It notably emphasises visual attention, communication clarity, and behavioural responsiveness among drivers and passengers.

A secondary purpose is to establish a conceptual framework that connects visual exposure to behavioural outcomes, including brand memory, perception, and purchase intention. The objective is to establish a theoretical framework for subsequent empirical investigations and practical implementation of transit-oriented advertising tactics.

2 LITERATURE REVIEW

Digital Out-of-Home (DOOH) advertising signifies a substantial advancement from traditional billboards, utilising dynamic graphics, data-informed material, and geolocation features. As urban areas evolve into data-centric environments, digital out-of-home (DOOH) advertising is progressively connected with intelligent urban infrastructure, providing tailored and contextually pertinent advertisements (Chan & Fung, 2021). Camarero et al. (2020) assert that the capacity of DOOH to provide dynamic images and rotate content in real-time enhances its psychological salience, potentially resulting in more robust brand connections. In urban environments, particularly along major thoroughfares and transportation routes, digital out-of-home (DOOH) displays frequently surpass static formats regarding recall and emotional resonance.

Furthermore, innovations in programmatic DOOH enable marketers to plan advertisements based on traffic patterns, time of day, or weather conditions, hence improving message relevancy and visibility (Wang & Zeng, 2021). These advances establish DOOH as a crucial component in multichannel marketing strategies.

Drivers constitute a distinctive advertising demographic. They are mobile, time-sensitive, and intensely concentrated on the roadway. Consequently, roadside advertisements must generate an effect during a brief period of visibility. Beijer, Smiley, and Eizenman (2004) discovered that drivers allocate 0.5 to 2 seconds to glance at roadside signs, necessitating stringent requirements for advertisement clarity and design. Eye-tracking research demonstrates that effective roadside advertisements employ high contrast, readable typefaces, and concise content for optimal communication (Wedel & Pieters, 2008).

In densely populated regions like Kuala Lumpur, established pathways elevate the likelihood of recurrent exposure. The "frequency effect" enhances brand reinforcement and recall, even with brief individual exposures (Smart & Lam, 2009). Research conducted in Germany (Bressoud, Lehu, & Russell, 2010) corroborates this, indicating that frequent peripheral exposure enhances advertisement memorability without causing cognitive fatigue, as long as the material is straightforward and visually engaging.

Drivers constitute a distinctive advertising demographic. They are mobile, time-sensitive, and intensely concentrated on the roadway. Consequently, roadside advertisements must generate an effect during a brief period of visibility. Beijer, Smiley, and Eizenman (2004) discovered that drivers allocate 0.5 to 2 seconds to glance at roadside signs, necessitating stringent requirements for advertisement clarity and design. Eye-tracking research demonstrates that effective roadside advertisements employ high contrast, readable typefaces, and concise content for optimal communication (Wedel & Pieters, 2008).

In densely populated regions like Kuala Lumpur, established pathways elevate the likelihood of recurrent exposure. The "frequency effect" enhances brand reinforcement and recall, even with brief individual exposures (Smart & Lam, 2009). Research conducted in Germany (Bressoud, Lehu, & Russell, 2010) corroborates this, indicating that frequent peripheral exposure enhances advertisement memorability without causing cognitive fatigue, as long as the material is straightforward and visually engaging.

The urban movement dynamics of Kuala Lumpur establish distinctive advertising conditions. Persistent traffic congestion, particularly during peak hours, extends dwell time adjacent to digital boards. Data from the Malaysian Highway Authority (2021) corroborates that motorways next to the MRT, such as Jalan Damansara and Jalan Cheras, rank among the most crowded corridors in the Klang Valley.

Cultural and behavioural elements at the local level also exert influence. Malaysian drivers are used with visually congested environments, characterised by an abundance of banners, advertising, and advertisements vying for attention. Successful DOOH advertising in this setting must employ striking motion, localised content (e.g., promotions in Bahasa Malaysia), and culturally relevant visuals. Research conducted in Singapore and Bangkok indicates that localisation markedly enhances viewer engagement with public advertisements (Tan & Low, 2020).

The efficacy of DOOH is contingent not just on attention acquisition but also on emotional resonance. Advertisements that provoke emotional engagement—via humour, relevance, or aesthetics—generally exhibit elevated memory rates and behavioural intention. Studies conducted in Japan and the UK indicate that emotional resonance in visual design can transform passive observation into active memory encoding, especially in restricted contexts such as vehicle travel (Lopez & Sakamoto, 2019).

Furthermore, encountering brand messaging during periods of inactivity (e.g., being ensnared in traffic) may enhance curiosity and prompt subsequent digital engagement. A strategically placed QR code or social media account can elicit further engagement when observed over an extended duration.

Despite the increasing implementation of DOOH in transit-adjacent regions, there exists a paucity of studies specifically addressing digital advertising visibility and efficacy from the motorist's viewpoint, especially in Southeast Asia. Most studies focus on transit users, airport spectators, or shopping mall patrons. This study seeks to address the gap by providing a conceptual framework based on the distinctive behavioural patterns of Malaysian road users exposed to DOOH advertisements while traversing roadways adjacent to the MRT.

3 CONCEPTUAL FRAMEWORKS

This study presents a conceptual framework that positions Digital Board Advertising (DBA) as the independent variable affecting Advertising Effectiveness (AE) among road users. The relationship is influenced by Driver Engagement Factors and affected by contextual and demographic variables.

Digital Board Advertising pertains to the positioning, design, and kinetic elements of digital advertisements situated along MRT rail lines and structures observable from primary thoroughfares. These advertisements seek to swiftly attract attention with high-contrast imagery, succinct message, and dynamic elements to differentiate themselves from urban visual congestion.

The efficacy of these advertisements—characterized by brand recall, message retention, and purchase intention—is affected by variables including visibility time (associated with traffic velocity), message clarity, and emotional reaction to the content. These are classified as Driver Engagement Factors, encompassing both cognitive and emotional responses derived from visual stimuli. The correlation between DBA and efficacy is influenced by variables including driver demographics (e.g., age, occupation), vehicle category (private automobile, public transit, ride-hailing), driving circumstances, and exposure frequency. Individuals that traverse the same route daily may demonstrate greater familiarity and memory retention compared to infrequent travellers.

The concept posits that for digital advertising on MRT lines to be effective, it must optimise for brief exposure durations, contextual relevance, and visual clarity to meet the cognitive demands of driving.

4 PROPOSED METHODOLOGIES FOR FUTURE STUDY

A mixed-methods study approach is proposed to assess the conceptual framework. The quantitative phase will consist of organised questionnaires aimed at road users who regularly traverse routes adjacent to the MRT. Participants will be enquired about their recollection of digital advertisements, brand impression, emotional reactions, and any further actions taken (e.g., online searches or discussions with others) following exposure.

The qualitative phase will consist of interviews with advertising executives and media buyers overseeing campaigns for MRT-based digital boards. These workshops will examine decision-making processes for geographic targeting, design principles, content scheduling, and campaign performance measures.

Furthermore, traffic pattern data from highway and urban planning agencies can be examined to identify appropriate zones for advertisement placement and the correlation between traffic velocity and advertisement dwell time. Where applicable, the analysis of dashboard camera footage or eye-tracking research in driving simulators may be employed to investigate the distribution of visual attention in real-world driving scenarios.

This multifaceted approach will elucidate the impact of visual and environmental elements on the effectiveness of DOOH among drivers in Kuala Lumpur.

5 DISCUSSIONS

Digital board advertising positioned along MRT railway lines presents an underexploited yet potent method to attract motorists in Kuala Lumpur's urban traffic corridors. These advertisements capitalise on elevated positioning, extensive sightlines, and substantial daily visibility, particularly in regions with recurrent traffic congestion. Nonetheless, efficacy depends on the capacity to communicate a concise, memorable message swiftly, without jeopardising driving responsibilities.

Advertisers must create material characterised by simplicity, movement, and clarity, use colours and typography that facilitate instant understanding to achieve success. Relevance is crucial; for instance, time-sensitive promotions or geo-targeted offers can enhance engagement significantly. Moreover, ads ought to use repetitive exposure as a branding tactic, utilising the routine nature of everyday travel patterns to enhance memory retention over time.

Comprehending the psychological and contextual realities of drivers is essential. In contrast to transit riders, who may possess extended attention spans, drivers are purpose-driven and concentrated on navigation. Consequently, advertising strategies must correspond with these behavioural characteristics to optimise effectiveness.

6 CONCLUSIONS

Digital billboard advertising along MRT railway lines in Kuala Lumpur offers a significant potential to engage thousands of commuters every day. Nonetheless, its success relies not alone on strategic positioning but also on comprehending the distinct attributes of the motorist demographic. This conceptual study presents a paradigm that considers visual engagement, driving circumstances, and psychological response, establishing a basis for future empirical validation and enhanced advertising campaign design.

As urban areas increasingly merge transportation infrastructure with digital technology, the significance of roadside digital out-of-home (DOOH) advertising will grow in moulding consumer awareness and influencing decision-making, even during brief intervals such as a red light or traffic congestion.

ACKNOWLEDGMENT

No acknowledgement is due to any person or organisation in this paper.

FUNDING

This research is self-funded.

AUTHOR CONTRIBUTIONS

All authors played equal contributions towards the production of this paper.

CONFLICT OF INTEREST

The author declares no potential conflict of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

- Amati, S. (2024). Harnessing the Power of Latest Technologies in Digital Out-of-Home Advertising: A Study on Interaction Models and Audience Impact. *CINECA*, 1-224.
- Beijer, D., Smiley, A., & Eizenman, M. (2004). Observed driver glance behavior at roadside advertising signs. *Transportation Research Record*, 1899(1), 96–103.
- Bhatti, G.S., & Kumar, P. (2023). Emerging Trends in Out-of-Home (OOH) Advertising: An Overview. *Journal of Propulsion Technology*, 44 (6), 5453-5461
- Camarero, C., Garrido, M. J., & Vicente, E. (2020). Components of effective digital signage advertising: A review. *Journal of Advertising Research*, 60(2), 192–205.
- Chan, S. H., & Fung, C. Y. (2021). Contextual targeting in DOOH: The role of environmental and content alignment. *Marketing Intelligence & Planning*, 39(3), 345–359.
- Chowdhury, S., & Dighe, N. (2025). *Vidyabharati International Interdisciplinary Research Journal*, 382-389
- Felisberto, L. L., & Casarin, V. (2024). The Influence of Digital Out-of-Home Media on Driver Perception and Driving: An Integrative Literature Review. *InfoDesign: Revista Brasileira de Design da Informacao*, 21 (3), 1.
- Lyder, H. (2025). How effective are billboards ads in the digital age? A look at DOOH vs static billboards. New York: Vista Media. <https://www.vistarmedia.com/blog/dooh-vs-static-billboards>
- Malaysian Highway Authority. (2021). *Traffic Volume and Flow Report 2021*. Kuala Lumpur: MHA Publications.
- Muhammad Shamie Khairulah, Sharkawi Che Din, Nur Aniza Mohd Lazim, Nabila Aimi Mohamed Ghazali. The Content Analysis of Motion Graphic Element in Malaysia Music Videos. *Ideology Journal*, 8(2), 250-256.
- Nur Iylia Amani Abdul Nasir, Nur Aniza Mohd Lazim, Mastura Omar, Ellyana Mohd Muslim Tan, and Siti Norfatulhana Ishak. A Visual Analysis Study of Motion Graphic Effect as Visual Communication for Mental Health Empowerment. *Ideology Journal*, 9(2), 49-54
- Sharifah Nuriffah Husna Syed Rizakri, Nabila Aimi Mohamed Ghazali, Nur Aniza Mohd Lazim, & Sharkawi Che Din. (2024). An Inspiration Analysis of Digital Illustration Used in Augmented Reality. *Ideology Journal*, 9(1), 157-164.
- Smart, D. T., & Lam, S. K. (2009). Captive audience and advertising receptiveness in public transport. *Journal of Consumer Behaviour*, 8(4), 241–252.
- Wedel, M., & Pieters, R. (2008). Eye tracking for visual marketing. *Foundations and Trends® in Marketing*, 1(4), 231–320.
- Young, M. S., Mahfoud, J. M., & Stanton, N. A. (2009). Roadside advertising: Distraction or reassurance? *Applied Ergonomics*, 40(1), 106–114.