The Truth Behind Malaysia's Touch 'N Go Electronic Toll Collection: A Viewpoint from the Netizens

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DOI: https://dx.doi.org/10.47772/IJRISS.2025.923MIC3ST250029

Received: 12 August 2025; Accepted: 20 August 2025; Published: 24 October 2025

ABSTRACT

With the rapid advancement of electronic toll payment technologies in Malaysia, Touch 'n Go (TnG), a local electronic toll collection (ETC) solution provider offering cashless toll payments for road users via prepaid TnG cards, SmartTag devices, and RFID (radio frequency identification) stickers. While widely praised for its convenience and efficiency, especially in urban areas, public discourse on social media reflects mixed reactions regarding its implementation and service quality. Despite its widespread use, limited studies have examined public sentiment over the netizens in Malaysia towards TnG's toll management and performance.

This study analyzes netizen comments on the official Facebook pages of major Malaysian online news portals. In recent years, social media has become a valuable data source for qualitative research, offering deep insights into user experiences and public opinion. Guided by the Theory of Road Pricing and the Theory of Decomposed Planned Behaviour, the study uses qualitative data analysis software, ATLAS.ti, to code and interpret the data the netizens' concerns related to TnG's toll practices and identify improvement areas. The findings are expected to provide valuable insights for TnG's management to enhance their services, as well as assist policymakers in formulating effective strategies and policies for toll collection in Malaysia.

Keywords: Social Media, Electronic Toll collection management, Touch 'n Go, Theory of Road Pricing, Decomposed Theory of Planned Behavior

INTRODUCTION

As Malaysia continues to grow economically and socially, the development of highways has become a vital part of the country's infrastructure. Highways not only connect cities to rural areas but also play a major role in supporting regional development. According to the Malaysian Road Statistic Report (2023), the country's road network—including federal and state roads—spans an impressive 277,846.8 kilometres, of which 2,016 kilometers are highways. The North-South Expressway, which stretches 847.7 kilometres from the Thailand border down to Singapore, is the longest highway in Malaysia and often referred to as the "spine" of Peninsular Malaysia (Yusof, 2020). As part of the Asian Highway Network 2 (AH2), Malaysia's expressways provide vital land connections to over 30 countries across Asia and Europe (Nasir & Husim, 2019). In the Klang Valley region alone, around 20 toll routes cover key districts including Kuala Lumpur, Putrajaya, Petaling Jaya, Klang, and Gombak, reflecting the area's high traffic demand.

Toll collection in Malaysia has evolved significantly over the decades. The country's first tolled road, connecting Tanjung Malim and Slim River, opened in 1966. Back then, tolls were paid in cash directly to a cashier. It wasn't until 1997 that the Malaysian government took major steps to modernize this system by appointing Teras Teknologi Sdn Bhd—later known as Touch 'n Go Sdn Bhd (TnG) that was entrusted to manage toll collection nationwide. This move was part of a government initiative to reduce traffic congestion and increase efficiency by phasing out cash payments (EMIS, 2022).

Over time, TnG gradually introduced more advanced cashless solutions. Initially, drivers could still choose

between paying with cash or using TnG cards, which required tapping the card on a reader. In 2000, the SmartTAG device was launched. It allowed for quicker transactions using infrared signals. This small battery-powered device, mounted on the vehicle's windshield, worked in tandem with a TnG card and enabled toll gates to open automatically as vehicles passed through, without requiring physical contact (Kumar, 2017).

The shift to fully cashless tolling was completed on August 14, 2017 (The Star, 2017). The next major advancement came in 2019 with the launch of the TnG RFID system (Fig. 1). This new system introduced a sticker embedded with a radio frequency chip, which could be placed on a vehicle's windscreen or headlight. As cars approached toll plazas, RFID scanners would automatically detect the chip and deduct the toll fare directly from the user's TnG eWallet. Designed for nationwide implementation, RFID aims to deliver a smoother, faster, and more secure toll payment experience (Touch 'n Go, 2022). This ongoing evolution of toll collection technology marks Malaysia's commitment to creating a more efficient and intelligent transportation network, making everyday travel more convenient for millions of road users.

On September 29, 2023, Malaysia introduced a major advancement in toll payment with the implementation of the Open Payment System on 11 highways. This system allows road users to pay tolls using Near Field Communication (NFC) technology via smart devices or physical credit/debit cards. The initiative aims to reduce congestion and improve the overall efficiency of electronic toll collection (ETC) nationwide (Bernama, 2023; Touch 'n Go, 2022). Importantly, it also provides an alternative to Touch 'n Go, to reduce its long-standing monopoly as the sole toll payment method.

Fig 1 A RFID Sticker placed at headlights for toll payment in Malaysia

Fig 2 Open Payment System using credit or debit card in Malaysia

To further ease congestion and offer more flexibility, hybrid lanes have been introduced. These lanes support multiple payment methods—TnG, SmartTag, RFID, and now Open Payment, making tolls more accessible and user-friendly. Despite these innovations, traffic congestion, especially during peak hours, remains a persistent issue. To address this, Malaysia has proposed transitioning to a Barrierless Multi-Lane Free Flow (MLFF) system. This system eliminates toll booths and uses overhead gantries equipped with RFID and Automated Number Plate Recognition (ANPR) to collect tolls seamlessly as vehicles pass through without stopping. While similar systems were successfully implemented in Singapore as early as 1998 (Rizal, 2024), Malaysia lags behind in its implementation.

A major hurdle to MLFF implementation is resistance from 13 out of 33 toll concessionaires leading the government to postpone to 2027 the rollout (Mohamed Radhi & Sallehuddin, 2024; Azmi, 2025). Despite

technological advancements, the full transition to an efficient and congestion-free toll system in Malaysia still faces operational and stakeholder challenges. Dr. Lye Chun Teck, an assistant professor at Multimedia University's Faculty of Business, emphasized that policymakers must actively engage with both industry stakeholders and consumers when formulating national toll collection policies (Musthafa, 2023). In line with this, the Ministry of Domestic Trade and Cost of Living, earlier in 2023, tasked Touch 'n Go (TnG) with conducting research to better understand public sentiment regarding the current toll system (Bernama, 2023).

On a similar note, the present Prime Minister of Malaysia, Datuk Seri Anwar Ibrahim called for an in-depth review of TnG's monopoly on March 19, 2023. His objective was to explore the feasibility of implementing alternative toll payment options, such as the Open Payment System (Tan, 2023). However, any shift to a new approach must take into account actual user experiences to ensure its effectiveness. Since most highways still depend on TnG as the primary payment method, there is a noticeable lack of research focusing on public dissatisfaction and potential solutions for enhancing the current toll system.

Studies from countries like Bosnia and Herzegovina (Glavic et al., 2017), Indonesia (Rohman et al., 2017), and Norway (Aasness & Odeck, 2023) have examined public attitudes towards toll systems, highlighting factors such as income, familiarity, and perceived usefulness of electronic toll collection (ETC)—such insights are still scarce in the Malaysian context. To bridge this gap, this study analysed Facebook comments from the pages of major English-language online newspapers in Malaysia using content analysis. The research was guided by the Decomposed Theory of Planned Behavior and the Theory of Road Pricing to identify recurring concerns among Malaysian netizens about TnG toll management. Social media content analysis is increasingly recognised as a powerful tool to gauge public sentiment, offering authorities valuable insights for making informed and responsive policy decisions (Das et al., 2022).

Therefore, this research aims to achieve two objectives:

1. To explore the concerns expressed by Malaysian netizens regarding the management and operation of the Touch 'n Go (TnG) toll collection system.

2. To identify and analyse the key areas of dissatisfaction and the proposed improvements suggested by netizens to enhance the effectiveness and user experience of the TnG toll collection system.

LITERATURE REVIEW

The Theory of Road Pricing

The Theory of Road Pricing outlines the fundamental principles for determining toll rates and managing toll systems, with emphasis on the need to consider factors such as traffic demand, congestion levels, road maintenance costs, and user equity when setting toll charges and designing toll policies. The evolution of this theory reflects changing views on balancing economic efficiency with effective infrastructure management. It serves as a crucial foundation for evaluating the effectiveness and issues related to toll collection systems across different settings. One of the most influential references on road pricing management was by Pigou (1920) in his seminal work, The Economics of Welfare, proposed the concept of taxing drivers who use alternative routes to reduce travel time or cost. However, Pigou cautioned that such taxation should be implemented with careful consideration and highlighting the need to manage road use efficiently. (Pigou, 1920, p. 194).

Nonetheless, his ideas sparked further debate among economists with issues revolving on traffic congestion that are developed from the new roads. For instance, Frank Knight (1924) reasoned, despite attempts to reduce congestion by building alternative roads, it only leads to another traffic congestion as road users start to divert to the new roads that eventually diminish their effectiveness. Whereas Jacob Viner (1932) believed as industries grow, so does traffic congestion as more industrial transport such as trucks roaming on the roads contribute towards the congestion. This scenario has unintentionally created external diseconomies or external cost. Since roads are shared infrastructure, third parties who are caused the congestion need to endure the burden of traffic congestion as well.

In contrast, Richard Kahn (1935) criticized monopolistic control of road infrastructure, asserting that it could hinder innovation and efficiency in ensuring traffic congestion is kept minimal. He advocated for greater competition in road ownership and proposed that road usage be monitored over time to assess returns on investment. Economists such as James Buchanan (1952) and William Vickrey (1955) took a different stand to minimize traffic congestion such as toll rates that vary based on vehicle type, time of travel, and road usage. Vickrey also pioneered the concept of automated toll collection, laying the groundwork for modern electronic toll systems.

Drawing upon the works of classical economists, contemporary studies in road pricing continue to focus on strategies to reduce traffic congestion through mechanisms that account for trip characteristics and vehicle types. For example, studies in Bosnia and Herzegovina found that people are more willing to pay tolls on weekdays, with income being a key factor (Glavic et al., 2017). In Spain, toll rates differ by vehicle type, and commercial drivers are more likely to adopt electronic toll collection (ETC), particularly when incentives like free tags are offered (Heras-Molina et al., 2019). Meanwhile, in Norway, removing toll exemptions for electric vehicles proved unpopular as EV costs approach those of traditional cars (Aasness & Odeck, 2023).

Research also reveals that demographic factors such as gender, age, region, and nationality often do not significantly impact users' willingness to pay or their maximum acceptable toll price (Glavic et al., 2017; Milenković et al., 2021). However, factors like income, education level, and employment status are consistently linked to willingness to pay (Milenković et al., 2021; Aasness & Odeck, 2023; Bari et al., 2023). Additionally, users' experiences with congestion and familiarity with ETC systems are significantly associated with travel behaviours—such as trip frequency, purpose, fuel type, and vehicle class (Bari et al., 2023; Aasness & Odeck, 2023; Glavic et al., 2017). Overall, research based on the Theory of Road Pricing suggests that beyond just trip or vehicle characteristics, socio-economic and behavioural factors are crucial for setting fair and effective toll policies.

The Decomposed Theory of Planned Behavior (DTPB)

Acknowledging the determinants of electronic toll payment among road users are growingly focused on the role of psychological and attitudinal factors, recent studies highlight the importance of social norms, beliefs and values in accepting toll payments. These factors attempt to understand traditional factors other than cost and convenience per se. In recent years, the Theory of Planned Behavior (TPB) has frequently been used to explore user intentions in the context of ETC (e.g., Jamaluddin et al., 2023; Ramadhanti et al., 2020). Nonetheless, the Decomposed Theory of Planned Behavior (DTPB) offers a more rigor framework. The Technology Acceptance Model (TAM) (Davis, 1989) and TPB (Ajzen, 1991) were integrated and formed DTPB that helped to elucidate understanding in technological adoption and complex decision-making (Lin et al., 2021; Nyasulu & Chawinga, 2019). Pioneered by Taylor and Todd (1995), DTPB explains behavior through three key components: attitude, subjective norms, and perceived behavioral control (Sansom, 2022).

Attitude

On individual assessments of technology innovation, the attitude is subdivided into three elements: perceived usefulness, perceived ease of use, and compatibility with the dissemination of the innovation concept (Tao & Fan, 2017).

Perceived Usefulness

When individuals view a particular system improves their daily life performance and effectiveness, it is known as perceived usefulness (Davis, 1989; Tao & Fan, 2017). In the context of ETC, this concept is associated with benefits such as faster transactions, improved accuracy, and greater convenience compared to traditional cash-based methods. Hidayat and Akhmad (2021) found that users who perceive ETC systems as useful are more likely to view them positively due to their efficiency and functionality. Similarly, Ramadhanti et al. (2020) reported that perceived usefulness contributed to increased productivity and smoother processing in Indonesia's e-toll card system.

Perceived Ease of Use

Perceived ease of use refers to individual assessments on how effortless and user-friendly a system is perceived to be (Davis, 1989). When a system is perceived by the users as straightforward and intuitive, which require little training and is easy to navigate are more likely to adopt and continue using ETC solutions consistently. Hossain and Prybutok (2008) identified ease of use as a key driver in the adoption of RFID technology, while Jamaluddin et al. (2023) found that users' acceptance of toll systems was linked to how easily they could navigate and operate them. However, Hidayat et al. (2021) noted that in the case of Indonesia's e-toll cards, ease of use alone did not significantly influence user attitudes—implying that factors such as trust, awareness, and familiarity may also play a crucial role in shaping user perceptions.

Compatibility

Compatibility measures how well a new system aligns with users' existing experiences, values, and expectations (Taylor & Todd, 1995). In electronic toll collection, compatibility reflects the degree to which the system matches users' previous toll payment experiences. A system perceived as compatible with users' routines and preferences is more likely to be accepted. Tao and Fan (2017) emphasized that compatibility has a strong influence on user attitudes toward E-tag toll systems, as familiarity and consistency with past practices increase the likelihood of adoption.

Subjective norms

Subjective norms refer to the social pressure individuals feel from influential people like family, friends, or supervisors, shaping their intentions and behaviors (Lin et al., 2021; Chang et al., 2021). In the DTPB, subjective norms include peer and superior influences (Tao & Fan, 2017). Studies show subjective norms positively impact behavioral intention, especially regarding e-tag toll usage. However, Hidayat et al. (2021) found no significant link between subjective norms and e-toll card adoption in Indonesia, suggesting social acceptance of such ETC technology varies by region and exposure because technology-related applications have not yet become an established social norm.

Perceived Behavioral Control

Perceived Behavioral Control (PBC) refers to an individual's belief in their capability to successfully carry out a specific action or behavior (Drew, 2023). Ajzen (2002) emphasized that PBC plays a critical role in shaping behavioral intentions, as individuals with a high sense of control are more motivated and confident in performing a task. In the context of ETC systems, PBC encompasses two main components, namely self-efficacy which is the user's confidence in their ability to use the technology and facilitating conditions, such as the availability of resources, technical support, and system accessibility (Taylor & Todd, 1995). Tao and Fan (2017) and Hidayat et al. (2021) confirmed a strong link between PBC and the intention to use e-toll cards.

Findings on DTPB indicate that when users perceive the toll system as easy to understand, use and control as well as, when necessary, support is available—their likelihood of adoption increases significantly. Considering, recent research highlights a growing focus on attitudinal factors to better understand user behavior toward electronic toll collection (ETC) systems, the application of DTPB and the Theory of Road Pricing hands in hands are relevant and well-justified for this study.

METHODOLOGY

Content analysis was chosen due to its proven effectiveness in exploring attitudes and behaviors in social research (Jansen, 2021). This study employed qualitative content analysis to examine public perceptions regarding the Touch 'n Go (TnG) toll collection system in Malaysia. Following the structured eight-step process outlined by Kibiswa (2019), the primary objective was to uncover netizens' key concerns and propose potential improvements.

In Step 1, the researchers identified relevant theoretical frameworks to guide the study. This early stage is critical in qualitative research, as it helps establish a clear direction by predefining themes and subthemes (Boyatzis, 1998). DTPB was selected to frame the coding process for the first research objective. For the second objective, a hybrid coding approach was used, combining predetermined codes derived from the Theory of Road Pricing with open coding to capture emerging themes. Initial codebooks were created and refined over time into theory-driven models (Saldana, 2016).

Step 2 involved defining the unit of analysis, which in this case was social media data. Facebook was chosen as the data source because social interactions on platforms like Facebook are widely regarded as reflective of human behavior and societal issues (Olteanu et al., 2019). Comments were collected from posts by prominent Malaysian English-language newspapers such as The Star, Malaysiakini, and The News Straits Times based on criteria including follower count (over 100,000), public accessibility, active engagement, and relevant content between 2022 and 2023. Keywords such as "Touch 'n Go," "toll congestion," and "RFID" guided comment selection, which were then extracted using exportcomments.com, a tool widely used in social media research for exporting data into standardized CSV files containing dates, user IDs, likes, and comment text (Gupta, 2024; Mehmet et al., 2021).

During Step 3, the researchers undertook data cleaning and organization by removing irrelevant emojis and irrelevant, unclear, or off-topic comments. The remaining comments were then categorized according to the predetermined codes from DTPB, the Theory of Road Pricing, and any new themes identified through open coding. Using Creswell and Creswell's (2018) recommendations, the comments were systematically reviewed and grouped, with researchers referring to original posts when necessary to ensure contextual accuracy. Clear and concise coding labels, such as "+ve ATT: Perceived Ease of Use," were applied to avoid ambiguity. Ultimately, 684 comments were deemed relevant for analysis. In Step 4, the data was coded using ATLAS.ti Version 25, with ongoing refinement of codes throughout the process. Specifically, 355 comments were coded under Research Objective 1 using the predetermined framework (Table 1), while 340 comments underwent open coding for Research Objective 2 (Table 2).

Step 5 focused on interpreting the data by linking insights to the theoretical frameworks. In Step 6, to ensure the reliability and trustworthiness of coding, the study employed theoretical triangulation using both the DTPB and the Theory of Road Pricing. Internal consistency was verified following Miles and Huberman's (1994) methodology, which involved validating that the coded data accurately reflected the merged themes and subthemes.

In Step 7, the researchers prepared comprehensive coding tables and illustrative quotations to effectively communicate their findings. Finally, Step 8 synthesized the results by highlighting relationships between codes and substantiating key points with selected quotes. The study's validity was reinforced by integrating theoretical perspectives with real-world public opinions, thereby providing valuable insights into the challenges and opportunities within Malaysia's TnG toll collection system.

Ethical Compliance

In line with Bhandari's (2021) recommendations, all Facebook user profiles in this study were anonymized, with no identifying information disclosed in the report to protect participants' confidentiality and privacy throughout the research process. The data were exclusively used for research purposes and were retained only for the minimum duration necessary, in accordance with ethical standards (Denison, 2023). This study also received formal ethical approval from Multimedia University (EA0852024), ensuring full compliance with established protocols for the responsible handling and reporting of social media data.

RESULTS

Findings of Research Objective 1

To address the first research objective, which aimed to examine netizens' concerns regarding the Touch 'n Go (TnG) toll collection management, data were analyzed through directed coding guided by the Decomposed

Theory of Planned Behavior (DTPB). The analysis yielded five primary themes: Attitude (subdivided into perceived ease of use, perceived usefulness, and compatibility), subjective norms, and perceived behavioral control. A total of 355 comments were coded under this framework. Each theme encompassed both favorable and unfavorable sentiments; however, the data revealed a predominance of negative responses, indicating substantial dissatisfaction with various aspects of the TnG toll system.

Table 1: Codes Created Using Predetermine Coding (DTPB)

No	Sub -themes	Definitions	Themes	Quotations
1	+ve PBC: Debit/Credit card	Positive user's belief about their ability to use debit card/ credit (Hidayat et al., 2021)	Perceived Behaviour Control	8
2	+ve PBC: RFID	Positive / negative users' belief about their ability to use RFID (Hidayat et al., 2021)		1
3	-ve PBC: RFID			1
4	+ve PBC: SE (Knowing ETC System)	Self-efficacy (SE) is a user's familiarity in their ability to comprehend and use the ETC system. (Milenkovi et al., 2021)		5
5	+ve PBC: Smart Tag	Users' belief about their ability to use Smart Tag (Hidayat et al., 2021)		12
6	+ve PBC: TnG card	Users' belief about their ability to use TnG (Hidayat et al., 2021)		29
No	Sub -themes	Definitions	Themes	Quotations
7	+ve ATT: Compatibility	Users find ETC fit/does not with their current values, previous experiences, and actual demand (Tao & Fan, 2017)	Attitude	11
8	-ve ATT: Compatibility			71
9	+ve ATT: Perceived Ease of Use	Users find ETC system convenient / inconvenient to use (Jamaluddin et al., 2023; Tao & Fan, 2017)		14
10	-ve ATT: Perceived Ease of use			75
11	+ve ATT: Perceived Usefulness	Positive / negative users' attitudes about the usefulness or performance as a result of the ETC system (Jamaluddin et al., 2023; Tao & Fan, 2017)		3
12	-ve ATT: Perceived Usefulness			58
13	SN: Monopoly	Users perceive the pressure imposed by a monopoly (Wan Zakaria, 2023)	Subjective Norm	67
	Total			355

Attitude

There are three sub-themes under Attitude, emerged namely perceived ease of use, perceived usefulness, compatibility.

Perceived Ease of Use

A total of 89 quotations were identified under the theme "Perceived Ease of Use", reflecting mixed perceptions among users. While some comments conveyed satisfaction, the majority highlighted persistent problems, notably traffic congestion frequently attributed to RFID lane malfunctions. Users reported recurring detection failures necessitating repeated vehicle maneuvers, which require the vehicles need to adjust back and forth until the signal detected, which exacerbated delays. A netizen shared: "Yesterday I saw a car in RFID lane go forward, reverse many times but the gate was not opened...."

Additionally, netizens expressed frustration over the insufficient number of RFID lanes and poor signages for the road users to choose the lanes that suit the payment methods, which caused confusion and bottlenecks. Despite the apparent convenience of the open payment system, its limited access points and inadequate signage further contributed to delays. Common complaints also included issues related to TnG cards such as stock shortages, difficulties reloading, system errors, and restricted cash payment options, especially in high-traffic areas like Kuala Lumpur. Many users were unaware that expired cards automatically deactivate, leading to loss of balances that were often only discovered at toll booths. The lengthy refund process, sometimes taking up to three months, added to user dissatisfaction. The increase in RFID sticker prices from RM25 to RM35 drew significant criticism, with calls for toll discounts to compensate for system inefficiencies, time wasted, and fuel consumption.

Perceived Usefulness

This sub-theme comprised 61 quotations, reflecting both positive and negative attitudes towards Malaysia's electronic toll collection (ETC) system. Similar to perceived ease of use, negative feedback was more prevalent. Some users appreciated features like low balance notifications on TnG cards; however, many expressed dissatisfactions with RFID, describing it as a failed system due to frequent malfunctions and its contribution to congestion. Here are some comments from the netizens, Netizen 675- "Low quality....worst than third world" and Netizen 683 – "Don't change smart tag into RFID, we don't need that RFID, really useless".

Users also contested government claims of improved transaction speed, instead reporting frequent full stops and unresponsive toll gates. Other concerns included inadequate system upgrades, short lifespan of RFID stickers, high costs, and durability issues. Some participants preferred the more dependable TnG card and Smart Tag, though Smart Tag also faced criticism for reducing its reliability during peak periods.

Compatibility

82 quotations were coded under compatibility, reflecting the degree to which users felt the ETC system aligned with their previous experiences, values, and expectations (Tao & Fan, 2017). Negative perceptions predominated, with many expressing that RFID technology failed to meet public expectations and performed worse than established systems such as TnG cards and Smart Tag. Users criticized RFID for creating more problems than solutions. Netizen #537 voiced out his/her unfairness in paying another RM35 for a defective sticker. Concerns were also raised about RFID limited utility, as one sticker could only be linked to a single vehicle. Furthermore, the newly introduced open payment system, in which debit card and credit card could be tapped on the scanning device was perceived as conflicting with RFID's intended contactless convenience although the intention was provided more payment options to the users.

Subjective Norms

67 quotations were categorized under subjective norms, which pertain to social pressures exerted by significant others (Chang et al., 2021). A prominent theme was public discontent with the perceived monopoly held by Touch 'n Go over the ETC system. Users lamented the slow responsiveness to complaints, lack of innovation, and worsening traffic despite rising toll fees. The limited choices available—such as the high cost of RFID stickers and ineffective card deactivation policies, were widely criticized. For example, Netizen #412 illustrated how the monopoly enabled unethical practices, including setting exorbitant RFID prices without

regard to the financial burden on ordinary users to get the stickers or the need to replace the stickers that are easily damaged. This monopoly was seen as facilitating poor service quality and lack of accountability, compounded by insufficient and timely government intervention to overcome these problems.

Perceived Behavioral Control

This theme included 56 comments, with most users expressing willingness to use various toll payment methods and demonstrating understanding of the ETC system. The TnG card was described as the most reliable option (29 comments), followed by Smart Tag (12 comments) and debit/credit cards (8 comments), particularly appreciated by tourists. Nonetheless, concerns were raised about challenges faced by elderly and younger users in navigating technology and registration processes.

Findings of Research Objective 2

To address the second research objective which is to identify key areas of concern and proposed improvements in the TnG toll collection system based on netizens' feedback, a combined coding strategy was employed, incorporating both inductive coding and predetermined coding based on the Theory of Road Pricing were used. Themes that are reflected in the theory highlighted externalities (the unintended outcomes of traffic congestions without being reflected in the cost of the travelling but still need to be borne by the toll users) such as time and fuel spent because of trapping longer in traffic congestions and the process of getting refunds.

The sub-themes created were "government", "removing" and "refund". In the context of this study, these sub-themes are referred to the unintended costs of traffic congestions that are borne by the users because of using tolls in Malaysia. Besides that, other sub-themes generated were inductive / surprising codes in which "Practices by Other Countries", "payment alternatives", "public transports" and "security issues".

Under externalities theme, the sub-theme "government" reflected users demand faster and more proactive participations from government to address toll congestions issue at toll booths. In total, 159 quotations generated under this sub-theme. This is a dominant sub-theme in this study that amplifying the needs for stronger actions from the government to be more sensitive and responsive to user feedback as the netizens perceived power imbalance between the public and toll service providers. For instance, the netizens voiced out frustration over the unmet promises by government to abolish tolls and slow policy implementation on mechanism to overcome traffic congestion issue.

Meanwhile, "removing" garnered (82 quotations), whereby, netizens wanted toll booths to be complexly removed citing traffic congestion, user inconvenience, and financial burden primarily due to the presence of toll booths. Many also demanded the discontinuation of RFID due to its poor performance, RM0.50 reload surcharge, and dissatisfaction with TnG's exclusive role as the sole service provider. Adding more lanes on the other hand, was categorised as "adding" with 28 quotations. Under "added" codes (28 quotations), toll users demanded added additional hybrid lanes (e.g., RFID + Smart Tag) and RFID lanes to improve traffic flow and reduce congestion, especially during peak hours.

On the other hands, the netizens seek for more convenient and transparent ways to improve refunds process (12 quotations) particularly refund processes nearby the toll booths for incorrectly charged, the process of handling discontinued or faulty devices such as Smart Tag units and expired TnG cards. This process will be troublesome if users, for instance, only realise their devices are faulty or the card has expired nearby the toll booths. To make matter worse, sometimes the reading panel screen shows blurry electronic signage which is quite difficult for the users to know their balance while driving through the toll booth or if the users enter and exit toll booths using different cards. For example, if they enter toll gate using RFID but exit using TnG card. This somehow contribute towards traffic congestions if staff assistance at toll booths delays in troubleshooting and solving the problem. Netizens urged government authorities to be more responsive to user feedback, calling for features such as auto-reload capabilities and universal payment lanes to improve efficiency and convenience to resolve the issue.

Netizens drew comparisons with international best practices which captured under "Practice by other countries" that gathered 37 quotations. Netizens cited examples such as Singapore's barrier-free RFID tolling and Japan's multi-modal, flexible payment systems. Netizens believe Malaysia could adopt more advanced, user-centric tolling approaches that prioritize convenience, interoperability, and inclusivity.

Netizens also demanded the availability of more payment alternatives, coded as "alternatives" with 12 quotations. This sub-theme reflected public interest in reintroducing cash payments, leveraging identity cards (ICs), and integrating additional e-wallet options. These suggestions reflect a desire for payment flexibility and greater inclusivity for users of varying technological familiarity. Thus, netizens recommended government to introduce features such as auto-reload capabilities and universal payment lanes to improve efficiency and convenience road flows. Additionally, "TnG Card Linkages" (5 quotations) illustrated users called for improved integration between the TnG card and other digital payment platforms, such as credit/debit cards and mobile e-wallets, to facilitate seamless transactions.

The least codes generated was "public Transport" (2 quotations) and security issues (3 quotations). Two users emphasized the need for better public transportation infrastructure as a long-term strategy to reduce road congestion and reliance on toll roads. "Security issues" focus on data privacy and protection concerns associated with the open payment system, with users questioning the safety of personal and financial information when using this payment option.

DISCUSSIONS AND CONCLUSIONS

This study explored netizens' concerns surrounding the Touch 'n Go (TnG) toll collection system in Malaysia, employing the Decomposed Theory of Planned Behavior (DTPB) and the Theory of Road Pricing as the guiding theoretical frameworks. Key findings were categorized under the five core components of DTPB: Perceived Ease of Use, Perceived Usefulness, Compatibility, Subjective Norms, and Perceived Behavioral Control. The results indicated that negative sentiments far outweighed positive feedback, particularly in relation to system compatibility, ease of use, and perceived usefulness, demonstrating widespread dissatisfaction among users with Malaysia's current toll collection mechanisms. Interestingly, the limited number of comments related to cash payment options and enhancing public transport infrastructure suggests a growing public acceptance of Electronic Toll Collection (ETC) systems.

However, the preference for private vehicles remains dominant. This trend aligns with recent statistics indicating that approximately 80% of commuters in the Klang Valley continue to rely on private transportation (Ibrahim et al., 2023). Notably, many netizens echoed Richard Kahn's (1935) perspective on the need for increased competition in road ownership to improve infrastructure outcomes. Criticism was directed at perceived monopolistic practices, lack of transparency, and the government's failure to fulfil promises, such as the abolishment of tolls.

This discontent reflects broader structural dynamics within Malaysian governance. Drawing on Hofstede's cultural dimensions theory, Malaysia exhibits a high-power distance index (104/120), which indicates a centralized decision-making structure with limited public involvement (Harun et al., 2020; Brace, 2022). Within this context, the study's findings emphasize netizens' desire for greater governmental responsiveness and participatory engagement, particularly before implementing major toll system reforms.

The findings for the second research objectives were combined coding process revealed several recurring themes in netizens' recommendations, including removal of ineffective systems, addition of infrastructure, government accountability, and refund processes. The findings further reinforce Knight's (1924) argument that newly developed roads often become congested over time as usage increases. Respondents reported that toll roads, contrary to expectations, did not substantially reduce travel time—largely due to persistent congestion near toll plazas. While some netizens supported a Singapore-style Electronic Road Pricing (ERP) system, Malaysia's proposed Multi-Lane Free Flow (MLFF) system has faced repeated delays, largely due to complexities involving the country's 33 highway concessionaires. Parliamentary debates since 2021 underscore the political and logistical hurdles associated with this transition.

Many netizens viewed, TnG should first address existing deficiencies, particularly RFID detection reliability, refund processing, and infrastructure issues such as lane clarity and signage before the rollout of advanced systems such as MLFF. Suggestions also included the expansion of hybrid lanes, improved staff assistance nearby toll booths, and more transparent communication with users could improve the quality of the services.

In conclusion, this study highlights the necessity for TnG and relevant government agencies to prioritize user convenience, transparency, and satisfaction. Future research could explore longitudinal patterns in user sentiment and assess governmental responsiveness to public concerns. The collective findings reflect strong and well-articulated public feedback, calling for enhanced accountability, competition, and service improvements in Malaysia's toll collection landscape. By systematically analyzing these insights, the study amplifies the voices of Malaysian road users, emphasizing the critical role of public engagement in infrastructure policy and management reform.

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