

THE IMPACT OF BREBES-TEGAL TOLL ROAD CONSTRUCTION ON LOCAL TRAFFIC CONDITIONS**Hasna Nafisah ¹**¹ Rekayasa Sistem Transportasi Jalan, Politeknik Keselamatan Transportasi Jalan
Email: hasnanafisah1701@gmail.com**Abstract**

The construction of the Brebes-Tegal Toll Road is expected to improve transportation connectivity and economic efficiency in the region. This new infrastructure project aims to ease travel between major urban centers, facilitate trade, and reduce travel time for commuters. However, the new infrastructure may also impact local traffic conditions and accident rates in surrounding areas. This study investigates these effects, providing insight into potential benefits and challenges for local transportation systems. The study aims to analyze the impact of the Brebes-Tegal Toll Road construction on local traffic flow and accident rates in the surrounding areas. Specifically, it seeks to determine whether the construction improves or worsens traffic conditions and if there are significant changes in accident rates. To achieve this goal, this research uses a qualitative approach through a Likert scale questionnaire distributed to gather data on local residents' perceptions of traffic changes and safety. Respondents rated their observations on traffic flow, congestion, and accident frequency before and after the toll road construction. The study surveyed a sample of 113 respondents drawn from the local population in areas surrounding the Brebes-Tegal Toll Road. The respondents include cadets of PKTJ, regular road users, residents, and local business operators who experience the effects of the toll road in their daily activities. The findings indicate that while the Brebes-Tegal Toll Road has moderately improved traffic flow by reducing congestion on local roads, there is also a reported increase in accident rates near toll road access points. Respondents noted enhanced road quality and speed of travel on the toll road itself, yet some areas experienced higher accidents risks, likely due to increased vehicle volume and changes in traffic patterns. To mitigate the increased accident rates, it is recommended that traffic safety measures be implemented, such as better road signage, speed management near toll entrances, and public education campaigns on road safety in high-risk areas. Further collaboration with local authorities can enhance traffic flow and minimize accidents.

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INTRODUCTION

The construction of the Brebes-Tegal Toll Road is a significant infrastructure development that is expected to improve regional connectivity and drive economic growth through more efficient transport routes. This infrastructure project, while beneficial in many ways, also carries potential implications for local traffic conditions and accident rates in the area surrounding the toll road. Understanding these impacts is critical to developing effective transport management strategies that address both the positive and negative impacts of new road infrastructure.

Currently, the area around the Brebes-Tegal Toll Road faces challenges related to traffic congestion and driving safety. Toll road construction can address these issues by providing alternative routes, potentially reducing the traffic load on local roads. However, the construction of new roads can also have unintended consequences, such as increased congestion in certain areas and increased accident rates, especially near toll entrances and exits. Ideally, toll road construction can ease traffic flow, reduce travel time, and improve safety without contributing to high accident rates in surrounding communities.

Research has shown that road infrastructure development can significantly alter local traffic patterns and safety conditions. Research on toll roads and major highway projects shows that while toll roads often improve regional connectivity and reduce congestion in some areas, they can inadvertently create traffic congestion and pose safety risks in adjacent areas due to increased traffic volumes and speed variations. For example, surveys and observational studies in similar contexts reveal that new toll roads can produce mixed results: improved travel times but also increased local traffic incidents due to factors such as lack of driver understanding and infrastructure design.

The abstract emphasizes that the toll road construction has moderately improved local traffic flow by alleviating congestion. This finding is consistent with studies such as Litman (2018), which demonstrate that new road infrastructure can redistribute traffic, reduce bottlenecks, and shorten travel times. However, the mixed outcomes noted, particularly the localized congestion near toll access points, resonate with findings from Golob and Regan (2003), which identify the tendency for traffic to concentrate around entry and exit zones, exacerbating issues like bottlenecks and delays in adjacent areas.

The reported increase in accident rates near toll road access points is a common challenge in road development projects. Literature by Elvik and Vaa (2004) suggests that while improved road quality can enhance vehicle safety, changes in traffic patterns and increased vehicle density often lead to a higher frequency of minor collisions, especially in transitional zones. The abstract's observation that these risks stem from increased vehicle volume and unfamiliar traffic patterns reflects well-documented issues in road safety studies.

Its mention of potential economic efficiency improvements suggests alignment with broader literature that links infrastructure development to regional economic growth. Studies like those by Banister and Berechman (2001) indicate that toll roads can stimulate economic activity by improving accessibility, though these benefits may not be uniformly distributed.

This study aims to analyze the impact of the Brebes-Tegal Toll Road on local traffic flows and accident rates, with the aim of finding out whether the construction has met its objectives of improving transport efficiency and safety. Specifically, the study examined local residents' and general road users' perceptions of changes in traffic conditions and safety since the construction of the toll road. Through a survey-based approach using a Likert scale questionnaire, data was collected from cadets of the Politeknik Keselamatan Transportasi Jalan (PKTJ), public road users, residents, and local business operators affected by the toll road. The findings from this study are expected to provide valuable recommendations for traffic safety interventions, such as improved signage, speed control, and safety campaigns, to improve transportation outcomes in the region.

METHOD

This research a survey approach technique combined with descriptive case study methodology to analyze the impact of the Brebes-Tegal Toll Road construction on traffic conditions and accident rates in the vicinity. The survey was conducted to explore people's perceptions and experiences related to changes in traffic flow and safety aspects before and after the toll road. In addition, descriptive case studies focused on strategic locations such as toll entrances and exits, as well as surrounding roads, to disseminate changes in traffic patterns and accident frequency. Real-time data on traffic conditions and driver behavior were collected through observations at key points, resulting in more in-depth analysis.

In this section the required Likert-scale questionnaires were distributed to assess respondents' perceptions of traffic flow, congestion level, and accident frequency. The research also involved semi-structured interviews with various key stakeholders, such as PKTJ cadets, local businesses, and road users. The interviews aimed to gain qualitative insights into the

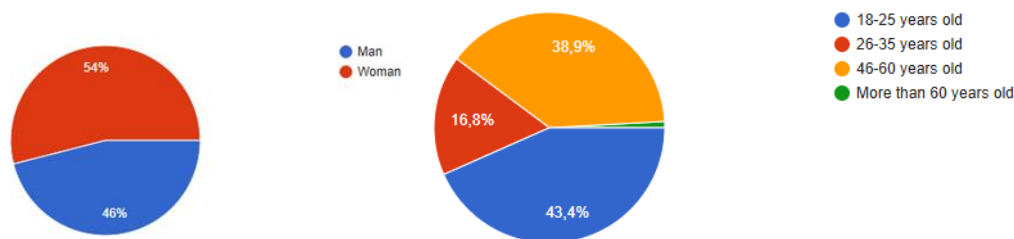
impact of the Brebes-Tegal Toll Road on changes in transportation patterns in the area. Through this approach, researchers were able to explore in-depth information from diverse perspectives, resulting in more comprehensive research results. The research also involved observational studies at a number of strategic locations to record traffic movement, identify congestion points, and propagate safety risks arising from the presence of toll road infrastructure.

The population in this study included people living around the Brebes-Tegal Toll Road. A total of 113 respondents were purposively selected to represent various viewpoints, including PKTJ cadets, local residents, road users and business operators. PKTJ cadets provided expert insight into road safety first-hand experiences of traffic and safety conditions in the area. Meanwhile, business operators expressed their views on the impact of toll roads on economic activity and accessibility.

Based on the results of a survey made using 20 questions that can support the opinions of local communities and cadets about the impact of the Brebes-Tegal toll road construction. As a result of the 113 answers with 54% answered by women and 46% answered by men. with their age vulnerable 18-25 years as much as 43.4%, age 26-35 years 16.8%, age 46-60 years as much as 38.9% and more than 60 years about 0.9% of respondents.

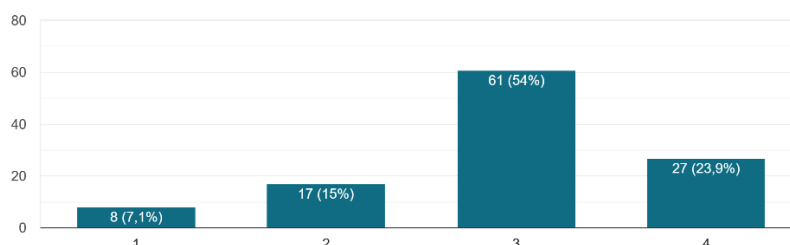
Gender

113 jawaban



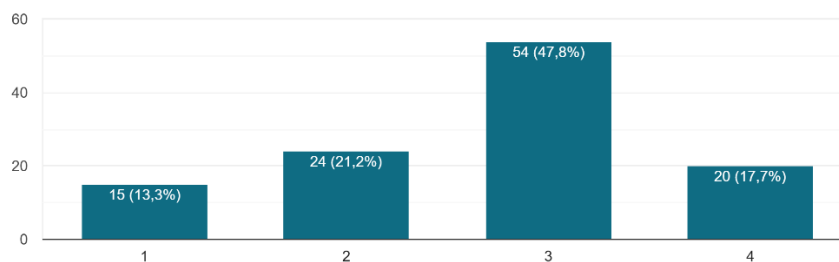
The construction of toll roads has had a significant impact on my daily commuting routes

113 jawaban



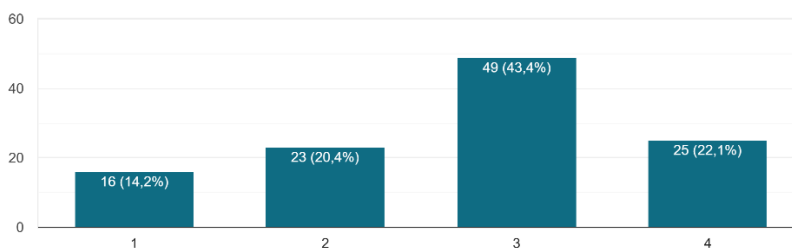
From the survey results figure above, most respondents (54%) considered that the toll road construction has a significant impact on their daily travel routes, giving a score of 3 (Agree). A total of 23.9% of respondents gave a score of 4 (Strongly Agree), indicating a greater impact. On the other hand, there were 15% of respondents who rated the impact at level 2 (Disagree), while another 7.1% felt the impact was minimal with a score of 1 (Strongly Disagree). This indicates that most people perceive moderate to significant changes to their travel routes due to the construction of the toll road, although there are a small number who are less affected.

I have observed an increase in minor accidents in areas near the construction zones
113 jawaban



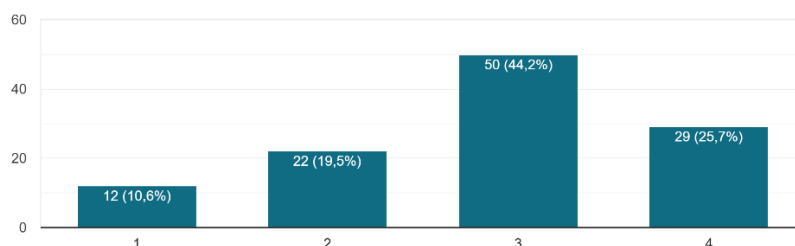
The second figure with questions in the area of Perceptions of Accident Rates shows that a large number of respondents (47.8%) have observed an increase in minor accidents in areas near construction zones. This was followed by 21.2% who observed no change, 17.7% who observed a decrease, and 13.3% who were unsure. This means that the presence of construction zones is perceived as a potential hazard, with the majority of respondents seeing an increase in minor accidents in these areas.

I feel that pedestrian and cyclist safety is adequately considered in construction areas
113 jawaban



In the third result from the Safety Conditions and Public Perception area, the survey revealed a diversity of considerations regarding pedestrian and cyclist safety in construction areas. While the majority of respondents (43.4%) believed that adequate measures were being taken, a significant proportion of respondents (26.1%) felt otherwise. In more detail, 14.2% of respondents were unsure about safety considerations in construction zones. In addition, 20.4% of respondents believed that pedestrian and cyclist safety was not adequately considered. This indicates a lack of clarity in the information regarding safety measures implemented, and suggests that there are areas where improvements can be made to ensure the well-being of pedestrians and cyclists in construction zones. In essence, the survey results highlight the need for further efforts to improve pedestrian and cyclist safety in construction areas. While some respondents expressed satisfaction with current efforts, most felt that more could be done.

Local businesses have financially benefited from increased construction-related traffic
113 jawaban



In the Economic Impact on the Local Community survey results were obtained with the majority of respondents (44.2%) believing that local businesses have benefited financially, and the majority (25.7%) feeling otherwise. 10.6% of respondents were unsure about the financial impact of construction-related traffic on local businesses and 19.5% of respondents believed that local businesses have not benefited financially from increased construction-related traffic and 19.5% of respondents believe that local businesses have not benefited financially from increased construction-related traffic. This indicates a lack of clarity on the economic impact of traffic-related construction projects and points to potential negative impacts on certain businesses, such as increased congestion and decreased customer accessibility.

The survey results show that toll road construction has a noticeable impact on various aspects, especially on daily travel routes, safety conditions, and the local economy. Most respondents (54%) felt a moderate impact on their daily commute, with others feeling a more significant impact. Even so, safety in construction areas remains a concern, as while there are respondents who feel that safety measures are sufficient, many also see the need for improvements, especially to protect pedestrians and cyclists. In addition, the majority of respondents noted an increase in minor accidents around construction areas, indicating a potential risk due to construction activities.

On the economic side, respondents' opinions were divided. Some believe that local businesses benefit financially from increased traffic, but others note challenges such as reduced accessibility and increased congestion. This suggests that the economic impact of toll road construction has not been felt equally across sectors.

Overall, the survey results highlight the importance of improved traffic management, strengthened safety measures in construction areas, and clearer communication of the benefits and support provided to local businesses during development projects. These measures are expected to minimize negative impacts and ensure that the benefits of development are felt by all affected parties.

FINDING AND DISCUSSION

RESEARCH RESULT

This study examines the impact of the Brebes-Tegal Toll Road construction on local traffic conditions and accident rates in the surrounding area. Using a qualitative approach through a Likert scale questionnaire, data was collected from 113 respondents representing various groups, including cadets of the Road Transportation Safety Polytechnic (PKTJ), regular road users, local residents, and local businesses. The main objective of the study was to analyze the impact of the development on traffic flow and accident rates, and determine whether the development improved or worsened these conditions.

One important finding is that the Brebes-Tegal Toll Road has considerably improved traffic flow by reducing congestion on local roads. According to the resulting survey, as many as 54% of respondents agreed that the construction of the toll road had a significant impact on their daily travel routes, scoring high on the Likert scale. In addition, 23.9% strongly agreed that the impact was considerable, indicating widespread recognition of the improved traffic dynamics. This improvement is due to the provision of alternative routes, which help to distribute the traffic load more evenly, thereby reducing congestion on traditional routes.

DISCUSSION

An alarming trend emerged from the survey data regarding accident rates. About 47.8% of respondents observed an increase in minor accidents near construction zones. In contrast, only 17.7% saw a decrease in accidents, with the remaining 21.2% seeing no change. These statistics suggest that the introduction of toll roads has created additional hazards, mainly due to changes in traffic behavior and increased vehicle density. Notably, 13.3% remained unconvinced about the change in accident frequency, highlighting continued concerns among locals regarding safety.

In addition, when examining perceptions of safety conditions specifically in construction areas, divergent opinions emerged. While 43.4% of respondents believed that adequate measures were being taken to protect pedestrians and cyclists, a minority of 26.1% expressed skepticism about such efforts. This dichotomy underscores the ongoing challenge of ensuring comprehensive safety protocols are implemented and effectively communicated to all stakeholders involved.

The economic implications of toll road construction were also developed through this study. Interestingly, opinions regarding the financial benefits to local businesses varied widely among respondents. While 44.2% believed that their operations have benefited financially from the increased traffic volume associated with the project, another substantial group, around 25.7% of respondents felt otherwise. Additionally, 10.6% remained unsure about the positive or negative impact on business finances, while 19.5% directly stated that no such benefits were accrued due to factors such as reduced accessibility and increased levels of congestion around certain areas.

These mixed findings suggest that the economic impact is not felt equally across different sectors in society. Some businesses may indeed experience increased revenue due to better connectivity and increased vehicular activity, while others may face difficulties stemming from reduced customer accessibility and higher operating costs associated with congested routes.

CONCLUSION

The construction of the Brebes-Tegal Toll Road has had a multifaceted impact on local traffic conditions and accident rates in the surrounding area. The study, which used a qualitative approach through a Likert-scale questionnaire, gathered insights from 113 respondents, including local residents, road users, and business operators. Findings show that while toll roads have significantly improved traffic flow by reducing congestion on local roads 54% of respondents recognized this improvement, there is a worrying trend regarding safety. In particular, nearly half of the respondents (47.8%) reported an increase in minor accidents near construction zones, indicating that the introduction of toll roads has inadvertently created new risks due to increased vehicle density and changing traffic patterns.

While 43.4% felt that adequate precautions had been taken, a large proportion of 26.1% expressed misgivings about the effectiveness of these measures. This gap highlights the need for improved communication and implementation of safety protocols to ensure all road

users feel safe. Economically, opinions were divided, with 44.2% believing that local businesses benefit from increased traffic, while others noted challenges such as reduced accessibility and increased congestion that could negatively impact their operations.

In summary, while the Brebes-Tegal Toll Road presents opportunities for improved connectivity and economic growth, it also poses challenges that require careful management to mitigate adverse impacts on safety and local businesses.

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